Tektronix®

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B
Series Oscilloscopes

Specifications and Performance Verification

Warning: The servicing instructions are for use by qualified personnel only. To avoid personal injury, do not perform any servicing unless you are qualified to do so. Refer to all safety summaries prior to performing service.

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Warranty

Tektronix warrants that this product will be free from defects in materials and workmanship for a period of one (1) year from the date of shipment. If any such product proves defective during this warranty period, Tektronix, at its option, either will repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product. Parts, modules and replacement products used by Tektronix for warranty work may be new or reconditioned to like new performance. All replaced parts, modules and products become the property of Tektronix.

In order to obtain service under this warranty, Customer must notify Tektronix of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. Customer shall be responsible for packaging and shipping the defective product to the service center designated by Tektronix, with shipping charges prepaid. Tektronix shall pay for the return of the product to Customer if the shipment is to a location within the country in which the Tektronix service center is located. Customer shall be responsible for paying all shipping charges, duties, taxes, and any other charges for products returned to any other locations.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. Tektronix shall not be obligated to furnish service under this warranty a) to repair damage resulting from attempts by personnel other than Tektronix representatives to install, repair or service the product; b) to repair damage resulting from improper use or connection to incompatible equipment; c) to repair any damage or malfunction caused by the use of non-Tektronix supplies; or d) to service a product that has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty of servicing the product.

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Important safety information

This manual contains information and warnings that must be followed by the user for safe operation and to keep the product in a safe condition.

General safety summary

Use the product only as specified. Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it. Carefully read all instructions. Retain these instructions for future reference.

This product shall be used in accordance with local and national codes.

For correct and safe operation of the product, it is essential that you follow generally accepted safety procedures in addition to the safety precautions specified in this manual.

The product is designed to be used by trained personnel only.

Only qualified personnel who are aware of the hazards involved should remove the cover for repair, maintenance, or adjustment.

Before use, always check the product with a known source to be sure it is operating correctly.

This product is not intended for detection of hazardous voltages.

Use personal protective equipment to prevent shock and arc blast injury where hazardous live conductors are exposed.

To avoid fire or personal injury

Use proper power cord   Use only the power cord specified for this product and certified for the country of use. Do not use the provided power cord for other products.

Ground the product   This product is grounded through the grounding conductor of the power cord. To avoid electric shock, the grounding conductor must be connected to earth ground. Before making connections to the input or output terminals of the product, ensure that the product is properly grounded. Do not disable the power cord grounding connection.

Power disconnect   The power cord disconnects the product from the power source. See instructions for the location. Do not position the equipment so that it is difficult to operate the power cord; it must remain accessible to the user at all times to allow for quick disconnection if needed.

Connect and disconnect properly   Do not connect or disconnect probes or test leads while they are connected to a voltage source.

Use only insulated voltage probes, test leads, and adapters supplied with the product, or indicated by Tektronix to be suitable for the product.

Observe all terminal ratings   To avoid fire or shock hazard, observe all rating and markings on the product. Consult the product manual for further ratings information before making connections to the product. Do not exceed the Measurement Category (CAT) rating and voltage or current rating of the lowest rated individual component of a product, probe, or accessory. Use caution when using 1:1 test leads because the probe tip voltage is directly transmitted to the product.

Do not apply a potential to any terminal, including the common terminal, that exceeds the maximum rating of that terminal.

Do not operate without covers   Do not operate this product with covers or panels removed, or with the case open. Hazardous voltage exposure is possible.

Avoid exposed circuitry   Do not touch exposed connections and components when power is present.

Do not operate with suspected failures	If you suspect that there is damage to this product, have it inspected by qualified service personnel.
	Disable the product if it is damaged. Do not use the product if it is damaged or operates incorrectly. If in doubt about safety of the product, turn it off and disconnect the power cord. Clearly mark the product to prevent its further operation.
	Before use, inspect voltage probes, test leads, and accessories for mechanical damage and replace when damaged. Do not use probes or test leads if they are damaged, if there is exposed metal, or if a wear indicator shows.
	Examine the exterior of the product before you use it. Look for cracks or missing pieces.
	Use only specified replacement parts.
Do not operate in wet/damp conditions	Be aware that condensation may occur if a unit is moved from a cold to a warm environment.
Do not operate in an explosive atmosphere	
Keep product surfaces clean and dry	Remove the input signals before you clean the product.
Provide proper ventilation	Refer to the installation instructions in the manual for details on installing the product so it has proper ventilation.
	Slots and openings are provided for ventilation and should never be covered or otherwise obstructed. Do not push objects into any of the openings.
Provide a safe working environment	Always place the product in a location convenient for viewing the display and indicators.
	Avoid improper or prolonged use of keyboards, pointers, and button pads. Improper or prolonged keyboard or pointer use may result in serious injury.
	Be sure your work area meets applicable ergonomic standards. Consult with an ergonomics professional to avoid stress injuries.
	Use care when lifting and carrying the product. This product is provided with a handle or handles for lifting and carrying.
	⚠ **WARNING:** The product is heavy. To reduce the risk of personal injury or damage to the device get help when lifting or carrying the product.
	Use only the Tektronix rackmount hardware specified for this product.

Probes and test leads

Before connecting probes or test leads, connect the power cord from the power connector to a properly grounded power outlet.

Keep fingers behind the protective barrier, protective finger guard, or tactile indicator on the probes.

Remove all probes, test leads and accessories that are not in use.

Use only correct Measurement Category (CAT), voltage, temperature, altitude, and amperage rated probes, test leads, and adapters for any measurement.

Terms in the manual

These terms may appear in this manual:

⚠ **WARNING:** Warning statements identify conditions or practices that could result in injury or loss of life.

⚠ **CAUTION:** Caution statements identify conditions or practices that could result in damage to this product or other property.

Terms on the product

These terms may appear on the product:

- DANGER indicates an injury hazard immediately accessible as you read the marking.
- WARNING indicates an injury hazard not immediately accessible as you read the marking.
- CAUTION indicates a hazard to property including the product.

Symbols on the product

⚠ When this symbol is marked on the product, be sure to consult the manual to find out the nature of the potential hazards and any actions which have to be taken to avoid them. (This symbol may also be used to refer the user to ratings in the manual.)

The following symbols may appear on the product:

| CAUTION Refer to Manual | Protective Ground (Earth) Terminal | Earth Terminal | Chassis Ground | Mains Disconnected OFF (Power) | Mains Connected ON (Power) | Standby | WARNING High Voltage |

Specifications (MSO70000C/DX, DPO70000C/DX, and DPO7000C series)

This chapter contains specifications for the instrument. All specifications are guaranteed unless noted as "typical." Typical specifications are provided for your convenience but are not guaranteed. Specifications that are marked with the ✔ symbol are checked in this manual. All specifications apply to all models unless noted otherwise.

DPO7000C models. Includes the DPO7000C Series instruments unless noted otherwise.

Table 1: Instrument Model Numbers (DPO7000C)

DPO
7354C (3.5 GHz)
7254C (2.5 GHz)
7104C (1 GHz)
7054C (500 MHz)

MSO/DPO70000C models. Includes the MSO70000C and DPO70000C Series instruments unless noted otherwise.

Table 2: Instrument Model Numbers (MSO/DPO70000C)

MSO	DPO
70404C (4 GHz)	70404C (4 GHz)
70604C (6 GHz)	70604C (6 GHz)
70804C (8 GHz)	70804C (8 GHz)
71254C (12.5 GHz)	71254C (12.5 GHz)
71604C (16 GHz)	71604C (16 GHz)
72004C (20 GHz)	72004C (20 GHz)

MSO/DPO70000DX Includes the MSO70000DX and DPO70000DX Series instruments unless noted otherwise.

Table 3: Instrument Model Numbers (MSO/DPO70000DX)

MSO	DPO
70804DX (8 GHz)	70804DX (8 GHz)
71254DX (12.5 GHz)	71254DX (12.5 GHz)
71604DX (16 GHz)	71604DX (16 GHz)
72004DX (20 GHz)	72004DX (20 GHz)
72304DX (23 GHz)	72304DX (23 GHz)
72504DX (25 GHz)	72504DX (25 GHz)
73304DX (33 GHz)	73304DX (33 GHz)

MSO/DPO70000C/DX models. Includes all MSO70000C/DX and DPO70000C/DX Series instruments.

To meet specifications, two conditions must first be met:

- The instrument must have been calibrated in an ambient temperature between 18 °C and 28 °C (64 °F and 82 °F).
- The instrument must be operating within the environmental limits. (See page 1-78.)

- The instrument must be powered from a source that meets the specifications. (See page 2-18.)
- The instrument must have been operating continuously for at least 20 minutes within the specified operating temperature range. (60 minutes continuous operation required for the MSO/DPO70000DX instruments if the ambient relative humidity is greater than 60%.)
- You must perform the Signal Path Compensation procedure after the warm-up period. See the online help for instructions on how to perform signal path compensation. If the ambient temperature changes more than 5 °C, repeat the procedure.

Vertical system analog channels

Number of channels	Four channels, all identical

Input connector

MSO/DPO70000C/DX models	TekConnect. Power supply compatible with VPI.
DPO7000C models	BNC and VPI probe

Input coupling

MSO/DPO70000DX models	DC, 50 Ω to a programmable termination voltage, and GND.
	GND coupling disconnects the input connector from all channel input circuitry and connects a ground reference to the channel input circuitry.
	The termination in 50 Ω coupling can be connected to any DC value from –3.5 V to +3.5 V.
MSO/DPO70000C models	DC, 50 Ω, and GND. GND coupling disconnects the input connector from all channel input circuitry and connects a ground reference to the channel input circuitry.
DPO7000C models	DC, AC, or GND. GND coupling approximates ground reference by measuring an unused preamplifier input that has been connected to ground. The signal being measured is not disconnected from the channel input load.

✔ **Input resistance MSO/DPO70000DX models**

≤1.2 VFS settings	50 Ω ±3% at 18 to 28 ºC (64 to 82 ºF)
	50 Ω ±4% over 5 to 45 ºC (45 to 113 ºF), type tested
>1.2 VFS settings	50 Ω ±4.4% over 5 to 45 ºC (45 to 113 ºF), type tested

✔ **Input resistance MSO/DPO70000C models**

100 mV$_{FS}$ to 995 mV$_{FS}$:	50 Ω ±1.5% at 25 ºC (77 ºF)
	50 Ω ±2% over 10 to 45 ºC (50 to 113 ºF), type tested
1 V$_{FS}$ to 5 V$_{FS}$:	50 Ω ±2.2 Ω over 10 to 45 ºC (50 to 113 ºF), type tested

Input impedance DC coupled DPO7000C models

1 MΩ, DC coupled	1 MΩ ± 1% in parallel with 13 pF ± 2 pF
50 Ω, DC coupled	50 Ω ± 1%, typical

Maximum input voltage range MSO/DPO70000DX models

≤1.2 VFS settings:	±1.5 V relative to the termination bias (30 mA maximum)

±5 V absolute maximum input

| **>1.2 VFS settings:** | 8 V. Limited by maximum Vterm current and the attenuator power rating at maximum temperature. |

Maximum input voltage MSO/DPO70000C models

| **<1.0 V/Full Scale settings:** | ±3.3 V Maximum |
| **≥ 1.0 V/Full Scale settings:** | ±5.0 V Maximum |

Maximum input voltage DPO7000C models

1 MΩ – DC coupled	150 V. Derate at 20 dB/decade to 9 VRMS above 200 kHz.
1 MΩ – AC coupled, or GND coupled	The maximum input voltage at the BNC, between center conductor and ground is 400 V peak. The RMS voltage is limited to <150 V for arbitrary waveshapes including DC. The maximum pulse width for impulses with peaks over 150 V is 50 μs. Example: At 0 V to 400 V peak, rectangular wave, the duty factor is 14%.
	The maximum transient withstand voltage is ± 800 V peak.
50 Ω	5 V RMS, with peaks ≤ ± 24 V

| **Measurement category for MSO-DPO70K and DPO7K series only** | The measuring terminals on this product are not rated for connection to mains or Measurement Category II, III or IV circuits. |

Input termination voltage (VTerm) range MSO/DPO70000DX models

| **≤1.2 VFS settings:** | -3.5 V to +3.5 V |
| **>1.2 VFS settings:** | 0 V |

| **Input termination voltage (VTerm) range MSO/ DPO70000C and DPO7000C models** | 0 V |

Input VSWR MSO/DPO70000DX models, typical

Measured with a TekConnect TCA-292D adaptor and a network analyzer.

≤1.2 VFS settings:	0 – 17 GHz: 1.4:1
	17 – 20 GHz: 1.6:1
	20 – 33 GHz: 2.0:1
>1.2 VFS settings:	0 – 17 GHz: 1.4:1
	17 – 33 GHz: 2.0:1

Input VSWR MSO/DPO70000C models

Measured with a TekConnect SMA adapter and a network analyzer

Input Frequency	VSWR < 1 V/Full Scale	VSWR ≥ 1 V/Full Scale
<2.5 GHz	1.25:1	1.2:1
<6 GHz	1.5:1	1.2:1
Table continued…		

Input Frequency	VSWR < 1 V/Full Scale	VSWR ≥ 1 V/Full Scale
<14 GHz	2.1:1	1.5:1
<15 GHz	2.5:1	1.5:1
<20 GHz	3.2:1	1.9:1

Input VSWR DPO7000C models

Input Frequency	VSWR
<3.5 GHz	3.0:1
<2.5 GHz	2.0:1
<2 GHz	1.5:1
<1 GHz	1.2:1

Number of digitized bits	8 bits
Digitizer nonlinearity, typical	< 1.0 DL (digitization level), differential; < 1 DL integral, independently based

Sensitivity range

MSO/DPO70000DX models, 50 Ω	62.5 mV$_{FS}$ to 6 V$_{FS}$
MSO/DPO70000C models, 50 Ω	100 mV$_{FS}$ to 5 V$_{FS}$. Below 100 mV$_{FS}$, Full Scale (FS) is software zoom.
DPO7000C models, 50 Ω	1 mV/div to 1 V/division, in a 1-2-5 sequence Fine adjustment available with ≥1% resolution
DPO7000C models, 1 MΩ	1 mV/div to 10 V/division, in a 1-2-5 sequence Fine adjustment available with ≥1% resolution

⤳ DC gain accuracy sample or average acquisition mode MSO/DPO70000C/DX models	± 2%
DC gain accuracy sample or average acquisition mode DPO7000C models	± 1.0% with 0 V net offset Add 0.5% for ranges <2 mV/div Add 1.5% x | net offset/Max offset | for ranges <5 mV/div Add 0.5% x | net offset/Max offset | for ranges ≥ 5 mV/div Add 0.5% for ranges ≥ 1 V/div in 1 MΩ coupling and with net offset >10 V

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✓ DC voltage measurement accuracy MSO/DPO70000DX models

	Gain setting	DC measurement accuracy
Average acquisition mode (≥16 averages)	$62.5\ mV_{FS} - 1.2\ V_{FS}$	±[2% | reading - net offset | + 0.4% | net offset | + 0.2% | net offset – Vterm setting | +2.5 mV + 0.014 FS]
	$1.21\ V_{FS} - 6\ V_{FS}$	±[2% | reading - net offset | + 0.4% | net offset | + 12.5 mV + 0.014 FS]
Delta voltage measurement between any two averages of ≥16 waveforms acquired under the same setup and ambient conditions	$62.5\ mV_{FS} - 6\ V_{FS}$	±[2% | reading – net offset | + 0.008 FS]

✓ DC voltage measurement accuracy MSO/DPO70000C models

	Gain setting	DC measurement accuracy
Average acquisition mode (≥16 averages)	$100\ mV_{FS}$ to $995\ mV_{FS}$	±[2% | reading – net offset | + 0.35% | net offset | +1.5 mV + 0.014 FS]
	$1\ V_{FS}$ to $5\ V_{FS}$	±[2% | reading – net offset | + 0.35% | net offset | +7.5 mV + 0.014 FS]
Delta voltage measurement between any two averages of ≥16 waveforms acquired under the same setup and ambient conditions	$100\ mV_{FS}$ to $5\ V_{FS}$	±[2% | reading | + 0.008 FS]

✓ DC voltage measurement accuracy DPO7000C models

DC accuracy (in volts)

Net offset = offset - (position × volts/division).

Average acquisition mode (≥16 averages)	±(DC Gain Accuracy × | reading -(net offset) | + offset accuracy + 0.1 division)
Delta voltage measurement between any two averages of ≥16 waveforms acquired with the same setup and ambient conditions	±(DC Gain Accuracy × | reading | + 0.05 division)
Sample acquisition mode, typical	±(DC Gain Accuracy × | reading -(net offset) | + offset accuracy + 0.15 division + 0.6 mV)
Delta voltage measurement between any two samples acquired with the same setup and ambient conditions, typical	±(DC Gain Accuracy × | reading | + 0.15 division + 1.2 mV)

Convert offset, position and the constant offset term to volts by multiplying by the appropriate volts/div.

Specification applies to any sample and to the High, Low, Max, Min, Mean, Cycle Mean, RMS, and Cycle RMS measurements. Delta volts specification applies to subtractive calculations involving two of these |

measurements. Delta volts specification applies to the Positive Overshoot, Negative Overshoot, peak-peak, and amplitude measurements.

Position range   ± 5 divisions

Offset range

   MSO/DPO70000DX models

Full Scale voltage range	Offset range
62.5 mV$_{FS}$ – 1.2 V$_{FS}$	±3.4 V
>1.2 V$_{FS}$ – 6 V$_{FS}$	±6 V

   MSO/DPO70000C models   Offset is reduced to allow for position control according to the following formulas:

10 mV/div to 99.5 mV/div: Offset range = ±(0.5 V - (V/div setting × 5 div))

100 mV/div to 500 mV/div: Offset range = ±(2.5 V - (V/div setting × 5 div))

SCALE range	Offset range
10 mV/div	±0.450 V
12 mV/div	±0.440 V
14 mV/div	±0.430 V
16 mV/div	±0.420 V
18 mV/div	±0.410 V
19.9 mV/div	±0.4005 V
20 mV/div	±0.400 V
30 mV/div	±0.350 V
40 mV/div	±0.300 V
49.8 mV/div	±0.251 V
50 mV/div	±0.250 V
60 mV/div	±0.200 V
70 mV/div	±0.150 V
80 mV/div	±0.100 V
90 mV/div	±0.050 V
99.5 mV/div	±0.0025 V
100 mV/div	±2.00 V
120 mV/div	±1.90 V
140 mV/div	±1.80 V
160 mV/div	±1.70 V
200 mV/div	±1.50 V
248 mV/div	±1.260 V
250 mV/div	±1.250 V

Table continued…

SCALE range	Offset range
300 mV/div	±1.00 V
400 mV/div	±0.50 V
500 mV/div	±0.00 V

DPO7000C models, 50 Ω coupling

SCALE range	Offset range
1 mV/div to 50 mV/div	±1.0 V
50.5 mV/div to 99.5 mV/div	±1.5 V - 10 divisions
100 mV/div to 500 mV/div	±10 V
505 mV/div to 1 V/div	±15 V - 10 divisions

DPO7000C models, 1 MΩ coupling

SCALE range	Offset range
1 mV/div to 50 mV/div	±1 V
50.5 mV/div to 99.5 mV/div	±1.5 V - 10 divisions
100 mV/div to 500 mV/div	±10 V
505 mV/div to 995 mV/div	±15 V - 10 divisions
1.0 V/div to 5 V/div	±100 V
5.05 V/div to 10 V/div	±150 V - 10 divisions

Offset accuracy

Net offset = offset - (position × volts/division).

✔ **MSO/DPO70000DX models**

Full scale voltage range	Offset accuracy
62.5 mV$_{FS}$ to 1.2 V$_{FS}$	±(0.4% | net offset | + 0.2% | net offset – Vterm setting | + 2.5 mV + 1% Full Scale)
>1.2 V$_{FS}$ to 6 V$_{FS}$	±(0.6% | net offset | + 13.4 mV + 1% Full Scale)

✔ **MSO/DPO70000C models**

SCALE range	Offset accuracy	Temperature variation
10 mV/div to 99.5 mV/div	±(0.35% × | net offset | + 1.5 mV + 1% x Full Scale)	
100 mV/div to 0.5 V/div	±(0.35% × | net offset | + 7.5 mV + 1% x Full Scale)	±(0.45% × | offset | /°C)

DPO7000C models

SCALE range	Offset accuracy
1 mV/div to 9.95 mV/div	±(0.2% × | net offset | + 1.5 mV + 0.1 div × V/div setting)
10 mV/div to 99.5 mV/div	±(0.35% × | net offset | + 1.5 mV + 0.1 div × V/div setting)
100 mV/div to 1 V/div	±(0.35% × | net offset | + 15 mV + 0.1 div × V/div setting)
1.01 V/div to 10 V/div	±(0.25% × | net offset | + 150 mV + 0.1 div × V/div setting)

⌐ **Analog bandwidth MSO/DPO70000DX models**

Bandwidth with a TCA292D adapter.

Operating ambient temperature <30 °C. Use the Temperature variation table to determine the amount of performance derating above the temperature limit.

Enhanced bandwidth only applies to full scale (FS) stepped gain settings of 62.5 mV, 100 mV, 200 mV, 500 mV, 1 V, 2 V, and 5 V.

The MSO/DPO73304DX, MSO/DPO72504DX, and MSO/DPO72304DX instrument bandwidths with BWE disabled are typical.

MSO/DPO73304DX

BW settings	Bandwidth	Sample rate
No BWE	DC to >33 GHz, typical	All
33 GHz BWE	DC to >33 GHz	100 GS/s
23 GHz BWE	DC to >23 GHz	50 GS/s

MSO/DPO72504DX

BW settings	Bandwidth	Sample rate
No BWE	DC to >25 GHz, typical	All
25 GHz BWE	DC to >25 GHz	100 GS/s
23 GHz BWE	DC to >23 GHz	50 GS/s

MSO/DPO72304DX

BW settings	Bandwidth	Sample rate
No BWE	DC to >23 GHz, typical	50, 100 GS/s
23 GHz BWE	DC to >23 GHz	50, 100 GS/s

MSO/DPO72004DX

BW settings	Bandwidth	Sample rate
No BWE	DC to >20 GHz, typical	50, 100 GS/s
20 GHz BWE	DC to >20 GHz	50, 100 GS/s

MSO/DPO71604DX

BW settings	Bandwidth	Sample rate
No BWE	DC to >16 GHz, typical	50, 100 GS/s
16 GHz BWE	DC to >16 GHz	50, 100 GS/s

MSO/DPO71254DX

BW settings	Bandwidth	Sample rate
No BWE	DC to >12.5 GHz, typical	50, 100 GS/s
12.5 GHz BWE	DC to >12.5 GHz	50, 100 GS/s

MSO/DPO70804DX

BW settings	Bandwidth	Sample rate
No BWE	DC to >8 GHz, typical	50, 100 GS/s
8 GHz BWE	DC to >8 GHz	50, 100 GS/s

Typical temperature derating	
Frequency	TC, (dB/°C)
DC — 5 GHz	0.005 dB/°C
10 GHz	0.010 dB/°C
15 GHz	0.025 dB/°C
20 GHz	0.045 dB/°C
25 GHz	0.065 dB/°C
30 GHz	0.115 dB/°C
33 GHz	0.160 dB/°C

↙ **Analog bandwidth MSO/DPO70000C models**

DC 50 Ω coupling, full bandwidth, TCA-292mm or TCA-N adapter, operating ambient temperature 15 °C to 40 °C (59 °F to 104 °F).

Enhanced bandwidth only applies to full scale (FS) settings of 100 mV, 200 mV, 500 mV, 1 V, and 2.5 V. Enhanced bandwidth of 4 GHz, 6 GHz, and 8 GHz is only available at 25 GS/s and 50 GS/s.

Use the Temperature variation table to determine the amount of performance derating above the temperature limit.

The MSO/DPO72004C and MSO/DPO71604C instrument bandwidths with BWE disabled are typical.

MSO/DPO72004C

BW Settings	Bandwidth	Temp constraint
20 GHz BWE 20 mV, 50 mV, 100 mV, and 250 mV/div	DC to MSO/DPO70000DX	<30 °C
20 GHz BWE 100 mV full scale (10 mV/div)	DC to >18 GHz	<30 °C
Table continued…		

BW Settings	Bandwidth	Temp constraint
No BWE	DC to >16 GHz, typical	<30 °C

MSO/DPO71604C

BW Settings	Bandwidth	Temp constraint
BWE	DC to >16 GHz	<30 °C
No BWE	DC to >16 GHz, typical	<30 °C

MSO/DPO71254C

BW Settings	Bandwidth	Temp constraint
BWE	DC to >12.5 GHz	<30 °C
No BWE	DC to >12.5 GHz	<30 °C

MSO/DPO70804C

BW Settings	Bandwidth	Temp constraint
BWE	DC to >8 GHz	<45 °C
No BWE	DC to >8 GHz	<45 °C

MSO/DPO70604C

BW Settings	Bandwidth	Temp constraint
BWE	DC to >6 GHz	<45 °C
No BWE	DC to >6 GHz	<45 °C

MSO/DPO70404C

BW Settings	Bandwidth	Temp constraint
BWE	DC to >4 GHz	<45 °C
No BWE	DC to >4 GHz	<45 °C

Typical temperature variation	
Frequency	TC, (dB/°C)
DC — 11 GHz	0
12.5 GHz	– 0.02
16 GHz	– 0.04
18 GHz	– 0.09
20 GHz	– 0.09

Analog bandwidth with P7313 active probe, MSO/ DPO70000C/DX models	MSO/DPO72004DX, MSO/DPO71604DX, MSO/ DPO72004C, MSO/DPO71604C	DC >12.5 GHz, typical
	MSO/DPO71254DX, MSO/DPO71254C	DC >11 GHz, typical
	MSO/DPO70804DX, MSO/DPO70804C	DC >8 GHz, typical
	MSO/DPO70604C	DC >6 GHz, typical
	MSO/DPO70404C	DC >4 GHz, typical

✔ **Analog bandwidth 50 Ω DC coupled DPO7000C models**

Full bandwidth, operating ambient of ≤ 30 °C (86 °F), derated by 1% for each °C above 30 °C (86 °F)

Note: The DPO7354C is guaranteed 3.5 GHz bandwidth with BWE On and can be verified with a 4-division sine wave. Typical bandwidth when measured with an 8-division sine wave is 3 GHz.

DPO7354C

SCALE range	Bandwidth
10 mV/div to 1 V/div	DC to 3.5 GHz, BWE on DC to 2.5 GHz, BWE off
5 mV/div to 9.99 mV/div	DC to 2.0 GHz
2 mV/div to 4.99 mV/div	DC to 500 MHz, typical
1 mV/div to 1.99 mV/div	DC to 200 MHz, typical

DPO7254C

SCALE range	Bandwidth
10 mV/div to 1 V/div	DC to 2.5 GHz
5 mV/div to 9.99 mV/div	DC to 2.0 GHz
2 mV/div to 4.99 mV/div	DC to 500 MHz, typical
1 mV/div to 1.99 mV/div	DC to 200 MHz, typical

DPO7104C

SCALE range	Bandwidth
5 mV/div to 1 V/div	DC to 1.0 GHz
2 mV/div to 4.99 mV/div	DC to 500 MHz, typical
1 mV/div to 1.99 mV/div	DC to 200 MHz, typical

DPO7054C

SCALE range	Bandwidth
5 mV/div to 1 V/div	DC to 500 MHz
2 mV/div to 4.99 mV/div	DC to 400 MHz, typical
1 mV/div to 1.99 mV/div	DC to 200 MHz, typical

Analog bandwidth 1 MΩ DC coupled DPO7000C models	Full bandwidth, operating ambient temperature of ≤ 30 °C (86 °F), derated by 1% for each °C above 30 °C (86 °F)

SCALE range	Bandwidth
5 mV/div to 10 V/div	DC to 500 MHz, typical
2 mV/div to 4.98 mV/div	DC to 350 MHz, typical
1 mV/div to 1.99 mV/div	DC to 175 MHz, typical

Analog bandwidth with TAP2500 VPI probe, typical, DPO7254C

Full bandwidth, operating ambient of ≤ 30 °C (86 °F), derated by 1% for each °C above 30 °C (86 °F)

SCALE range	Bandwidth
≥ 100 mV/div	DC to 2.5 GHz
50 mV/div to 99.5 mV/div	DC to 2.0 GHz
20 mV/div to 49.8 mV/div	DC to 500 MHz
10 mV/div to 19.9 mV/div	DC to 200 MHz

Analog bandwidth with X10 passive probe, typical, DPO7000C models

Full bandwidth, operating ambient of ≤ 30 °C (86 °F), derated by 1% for each °C above 30 °C (86 °F)

SCALE range	Bandwidth
5 mV/div to 10 V/div	DC to 500 MHz
2 mV/div to 4.98 mV/div	DC to 300 MHz
1 mV/div to 1.99 mV/div	DC to 175 MHz

Analog bandwidth selections DPO7000C models

20 MHz, 250 MHz, and Full

Lower frequency limit AC coupled DPO7000C models

10 Hz when 1 MΩ, AC coupled. The limit is reduced by a factor of 10 when 10X, passive probes are used.

Upper frequency limit 250 MHz bandwidth limited DPO7000C models

250 MHz

Upper frequency limit 20 MHz bandwidth limited DPO7000C models

20 MHz

Passband flatness, BWE, typical

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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MSO/DPO73304DX, MSO/ DPO72504DX, MSO/ DPO72304DX, MSO/ DPO72004DX, MSO/ DPO71604DX, MSO/ DPO71254DX, MSO/ DPO70804DX

Step settings	Temperature constraint
62.5 mV$_{FS}$, 100 mV$_{FS}$, 200 mV$_{FS}$, 500 mV$_{FS}$, 1 V$_{FS}$, 2 V$_{FS}$, and 5 V$_{FS}$ ± 0.5 dB from DC to 50% of nominal bandwidth. ± 1.5 dB from 50% to 80% of nominal bandwidth.	At 25 °C
All other gain settings	
± 1.0 dB from DC to 50% of nominal bandwidth ± 2.0 dB from 50% to 80% of nominal bandwidth.	

MSO/DPO72004C, MSO/ DPO71604C, MSO/ DPO71254C

Use the Temperature variation table to determine the amount of performance derating above the temperature limit.

Step settings	Temperature constraint
100 mVFS, 200 mVFS, 500 m VFS, 1 VFS, and 2.5 VFS ± 0.5 dB from DC to 50% of nominal bandwidth. ± 1.5 dB from 50% to 80% of nominal bandwidth.	At 25 °C
Non-step settings	
± 1.0 dB from DC to 50% of nominal bandwidth ± 2.0 dB from 50% to 80% of nominal bandwidth.	

MSO/DPO70804C, MSO/ DPO70604C, MSO/ DPO70404C

Step settings	Temperature constraint
± 0.5 dB from DC to 50% of nominal bandwidth. ± 1 dB from 50% to 80% of nominal bandwidth.	10 °C to 40 °C

Typical temperature variation

Frequency	TC, (dB/°C)
DC – 11 GHz	0
12.5 GHz	– 0.02
16 GHz	– 0.04
18 GHz	– 0.09
20 GHz	– 0.09

Calculated rise time 50 Ω, typical, MSO/DPO70000DX models

	DSP On		DSP Off	
	10% - 90%	20% - 80%	10% - 90%	20% - 80%
MSO/DPO73304DX	13 ps	9 ps	21 ps	14 ps
MSO/DPO72504DX	16 ps	12 ps	22 ps	15 ps
MSO/DPO72304DX	17 ps	13 ps	24 ps	16 ps
MSO/DPO72004DX	22 ps	15 ps	25 ps	17 ps
MSO/DPO71604DX	26 ps	19 ps	26 ps	18 ps
MSO/DPO71254DX	32 ps	23 ps	28 ps	19 ps
MSO/DPO70804DX	52 ps	38 ps	30 ps	22 ps

Calculated rise time 50 Ω, typical, MSO/DPO70000C models

	DSP On		DSP Off	
	10% - 90%	20% - 80%	10% - 90%	20% - 80%
MSO/DPO72004C at 20 GHz	19 ps	14 ps	NA	NA
MSO/DPO72004C at 18 GHz	22 ps	15 ps	NA	NA
MSO/DPO71604C	24.5 ps	17 ps	30 ps	20 ps
MSO/DPO71254C	32 ps	22 ps	33 ps	23 ps
MSO/DPO70804C	49 ps	34 ps	47 ps	32 ps
MSO/DPO70604C	65 ps	45 ps	62 ps	43 ps
MSO/DPO70404C	98 ps	68 ps	93 ps	65 ps

Calculated rise time 50 Ω, typical, DPO7000C models

DPO7354C

Scale	10% - 90%
1 mV/div - 1.99 mV/div	1.2 ns
2 mV/div - 4.99 mV/div	650 ps
5 mV/div - 9.9 mV/div	180 ps
10 mV/div - 1 V/div, BWE off	145 ps
10 mV/div - 1 V/div, BWE on	115 ps (signals limited to 4 vertical divisions)

DPO7254C

Scale	10% - 90%
1 mV/div - 1.99 mV/div	1.2 ns
2 mV/div - 4.99 mV/div	650 ps
5 mV/div - 9.9 mV/div	180 ps
10 mV/div - 1 V/div	160 ps

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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DPO7104C

Scale	10% - 90%
1 mV/div - 1.99 mV/div	1.2 ns
2 mV/div - 4.99 mV/div	580 ps
5 mV/div - 9.9 mV/div	300 ps
10 mV/div - 1 V/div	300 ps

DPO7054C

Scale	10% - 90%
1 mV/div - 1.99 mV/div	1.2 ns
2 mV/div - 4.99 mV/div	680 ps
5 mV/div - 9.9 mV/div	460 ps
10 mV/div - 1 V/div	460 ps

Step response settling time, typical, MSO/DPO70000DX models

The time by which the step response enters and stays below the indicated % error. Step transition occurs at the 50% amplitude point of the step leading edge.

DSP off

Instrument	Gain setting (FS)	Settling Error	
		Amount	Time
MSO/DPO73304DX	62.5mV, 100mV, 200mV, 500mV, 1V, 1.2V, 1.4V, 2V, 4V	<6%	150 ps – 400 ps
		<5.5%	400 ps – 3 ns
		<3%	3 ns – 1 ms
MSO/DPO72504DX MSO/DPO72304DX MSO/DPO72004DX MSO/DPO71604DX MSO/DPO71254DX MSO/DPO70804DX	62.5mV, 100mV, 200mV, 500mV, 1V, 1.2V, 1.4V, 2V, 4V	<6%	150 ps – 400 ps
		<5.5%	400 ps – 3 ns
		<3%	3 ns – 1 ms

DSP on (fastest BWE setting)

DSP on (fastest BWE setting) Instrument Gain setting (FS) Settling

Instrument	Gain setting (FS)	Settling Error	
		Amount	Time
MSO/DPO73304DX	62.5mV, 100mV, 200mV, 500mV, 1V, 1.2V, 1.4V, 2V, 4V	<3.5%	150 ps – 400 ps
		<2.5%	400 ps – 3 ns
		<1.5%	3 ns – 1 ms

Table continued…

Instrument	Gain setting (FS)	Settling Error	
		Amount	**Time**
MSO/DPO72504DX	62.5mV, 100mV, 200mV, 500mV, 1V, 1.2V, 1.4V, 2V, 4V	<3.5%	150 ps – 400 ps
MSO/DPO72304DX		<2.5%	400 ps – 3 ns
MSO/DPO72004DX		<1.5%	3 ns – 1 ms
MSO/DPO71604DX			
MSO/DPO71254DX			
MSO/DPO70804DX			

Step response settling time MSO/DPO70000C models

The time by which the step response enters and stays below the indicated % error. Step transition occurs at the 50% amplitude point of the step leading edge.

DSP off

Instrument	Gain setting (FS)	± Step amplitude	Settling Error	Time
MSO/DPO72004C	100 mV, 200 mV, 500 mV, 1 V, 2 V, 5 V	≤ 100% FS, ≤ 50% FS overdrive	< 9%	150 ps
MSO/DPO71604C			< 5.5%	400 ps
MSO/DPO71254C			< 2.5%	3 ns
			< 0.15%	1 ms
MSO/DPO70804C	100 mV, 200 mV, 500 mV, 1 V, 2 V, 5 V	≤ 100% FS, ≤ 50% FS overdrive	< 6%	150 ps
MSO/DPO70604C			< 3%	600 ps
MSO/DPO70404C			<2.5%	3 ns
			<0.15%	1 ms

DSP on

Instrument	Gain setting (FS)	± Step amplitude	Settling Error	
			Amount	Time
MSO/DPO72004C	100 mV	≤ 100% FS, ≤ 50% FS overdrive	<6%	100 ps
MSO/DPO71604C	200 mV		<3%	400 ps
MSO/DPO71254C	500 mV		<2.5%	3 ns
	1 V		<0.15%	1 ms
	2 V			
	5 V			

Table continued…

Instrument	Gain setting (FS)	± Step amplitude	Settling Error	
MSO/DPO70804C	100 mV	≤ 100% FS,	< 6%	150 ps
	200 mV	≤ 50% FS overdrive	< 3%	600 ps
	500 mV		< 2.5%	3 ns
	1 V		< 0.15%	1 ms
	2 V			
	5 V			
MSO/DPO70604C	100 mV	≤ 100% FS,	< 6%	200 ps
	200 mV	≤ 50% FS overdrive	< 3%	800 ps
	500 mV		< 2.5%	3 ns
	1 V		< 0.15%	1 ms
	2 V			
	5 V			
MSO/DPO70404C	100 mV	≤ 100% FS,	< 6%	300 ps
	200 mV	≤ 50% FS overdrive	< 3%	1.2 ns
	500 mV		< 2.5%	3 ns
	1 V		< 0.15%	1 ms
	2 V			
	5 V			

Pulse response peak detect or envelope mode DPO7000C models

This instrument uses analog peak detection for pulse capture in Peak Detect or Envelope mode at sample rates of 125 MS per second and slower. At faster sample rates the instrument uses conventional sampling.

The minimum single pulse widths for 50% or greater amplitude capture for pulses greater than 2 divisions in magnitude.

Sample rate setting	Minimum pulse width
≤ 10 GS/s	1 ÷ (sample rate) or 100 ps
40 MS/s	1 ÷ (sample rate) or 25 ps

Effective bits, typical, MSO/DPO70000C/DX models

Nine division sine wave input at the indicated frequency, sampled at 500 mV$_{FS}$ vertical sensitivity and maximum sample rate.

DSP on, Enhanced MIMO filter, full bandwidth

	MSO/DPO73304DX		MSO/DPO72504DX		MSO/DPO72304DX	
Input frequency	50 GS/s	100 GS/s	50 GS/s	100 GS/s	50 GS/s	100 GS/s
10 MHz	5.4 bits	5.4 bits	5.3 bits	5.7 bits	5.3 bits	5.9 bits
Table continued…						

	MSO/DPO73304DX		MSO/DPO72504DX		MSO/DPO72304DX	
1 GHz	5.3 bits	5.2 bits	5.3 bits	5.7 bits	5.2 bits	5.8 bits
2 GHz	5.2 bits	5.2 bits	5.2 bits	5.5 bits	5.2 bits	5.7 bits
3 GHz	5.1 bits	5.1 bits	5.1 bits	5.4 bits	5.1 bits	5.6 bits
4 GHz	5.2 bits	5.1 bits	5.2 bits	5.4 bits	5.2 bits	5.6 bits
5 GHz	5.1 bits	5.2 bits	5.1 bits	5.4 bits	5.1 bits	5.6 bits
6 GHz	5.1 bits	5.0 bits	5.1 bits	5.3 bits	5.0 bits	5.6 bits
7 GHz	5.1 bits	5.0 bits	5.1 bits	5.3 bits	5.1 bits	5.5 bits
8 GHz	5.1 bits	5.1 bits	5.1 bits	5.3 bits	5.1 bits	5.6 bits
9 GHz	5.0 bits	5.1 bits	5.1 bits	5.3 bits	5.0 bits	5.6 bits
10 GHz	5.1 bits	5.2 bits	5.1 bits	5.5 bits	5.0 bits	5.5 bits
11 GHz	4.9 bits	5.1 bits	4.9 bits	5.4 bits	4.9 bits	5.4 bits
12 GHz	5.0 bits	5.2 bits	5.0 bits	5.5 bits	5.0 bits	5.5 bits
13 GHz	4.9 bits	5.1 bits	4.9 bits	5.4 bits	4.9 bits	5.4 bits
14 GHz	4.9 bits	5.1 bits	4.9 bits	5.3 bits	4.8 bits	5.3 bits
15 GHz	4.8 bits	4.9 bits	4.8 bits	5.2 bits	4.8 bits	5.1 bits
16 GHz	4.8 bits	4.8 bits	4.8 bits	5.2 bits	4.7 bits	5.2 bits
17 GHz	4.8 bits	4.9 bits	4.8 bits	5.1 bits	4.7 bits	5.2 bits
18 GHz	4.8 bits	4.9 bits	4.8 bits	5.1 bits	4.8 bits	5.3 bits
19 GHz	4.8 bits	4.8 bits	4.7 bits	5.1 bits	4.7 bits	5.2 bits
20 GHz	4.6 bits	4.7 bits	5.1 bits	5.1 bits	4.7 bits	5.1 bits
21 GHz	4.8 bits	4.8 bits	4.9 bits	5.2 bits	4.8 bits	5.3 bits
22 GHz	4.6 bits	4.8 bits		5.1 bits	4.8 bits	5.3 bits
23 GHz		4.9 bits		5.2 bits		5.2 bits
24 GHz		5.0 bits		5.2 bits		
25 GHz		4.8 bits		5.2 bits		
26 GHz		4.9 bits				
27 GHz		4.8 bits				
28 GHz		4.7 bits				
29 GHz		4.9 bits				
30 GHz		4.9 bits				
31 GHz		4.8 bits				
32 GHz		4.8 bits				
33 GHz		4.8 bits				

	MSO/DPO72004DX		MSO/DPO71604DX		MSO/DPO71254DX		MSO/DPO70804DX	
Input frequency	50 GS/s	100 GS/s	50 GS/s	100 GS/s	50 GS/s	100 GS/s	50 GS/s	100 GS/s

Table continued…

	MSO/DPO72004DX		MSO/DPO71604DX		MSO/DPO71254DX		MSO/DPO70804DX	
10 MHz	5.3 bits	5.6 bits	5.6 bits	5.9 bits	5.6 bits	6.1 bits	6.1 bits	6.4 bits
1 GHz	5.3 bits	5.6 bits	5.5 bits	5.8 bits	5.6 bits	6.0 bits	6.0 bits	6.3 bits
2 GHz	5.1 bits	5.5 bits	5.5 bits	5.8 bits	5.5 bits	5.9 bits	6.0 bits	6.3 bits
3 GHz	5.0 bits	5.4 bits	5.4 bits	5.7 bits	5.5 bits	5.8 bits	5.8 bits	6.1 bits
4 GHz	5.1 bits	5.4 bits	5.4 bits	5.7 bits	5.5 bits	5.8 bits	5.9 bits	6.2 bits
5 GHz	5.1 bits	5.5 bits	5.4 bits	5.6 bits	5.5 bits	5.9 bits	5.9 bits	6.2 bits
6 GHz	5.1 bits	5.4 bits	5.4 bits	5.6 bits	5.5 bits	5.8 bits	5.9 bits	6.2 bits
7 GHz	5.2 bits	5.5 bits	5.4 bits	5.7 bits	5.5 bits	5.9 bits	5.9 bits	6.2 bits
8 GHz	5.2 bits	5.5 bits	5.4 bits	5.7 bits	5.5 bits	5.9 bits	5.9 bits	6.2 bits
9 GHz	5.0 bits	5.4 bits	5.3 bits	5.6 bits	5.5 bits	5.8 bits		
10 GHz	5.1 bits	5.4 bits	5.2 bits	5.6 bits	5.4 bits	5.8 bits		
11 GHz	5.0 bits	5.3 bits	5.1 bits	5.5 bits	5.4 bits	5.7 bits		
12 GHz	5.1 bits	5.4 bits	5.2 bits	5.6 bits	5.5 bits	5.8 bits		
13 GHz	5.0 bits	5.3 bits	5.2 bits	5.5 bits				
14 GHz	5.0 bits	5.3 bits	5.2 bits	5.5 bits				
15 GHz	4.9 bits	5.3 bits	5.2 bits	5.6 bits				
16 GHz	5.0 bits	5.3 bits	5.2 bits	5.6 bits				
17 GHz	5.0 bits	5.4 bits						
18 GHz	5.0 bits	5.4 bits						
19 GHz	5.0 bits	5.4 bits						
20 GHz	4.9 bits	5.3 bits						
21 GHz								
22 GHz								
23 GHz								
24 GHz								
25 GHz								
26 GHz								
27 GHz								
28 GHz								
29 GHz								
30 GHz								
31 GHz								
32 GHz								
33 GHz								

DSP on, full bandwidth   Nine division sine wave input at the indicated frequency, sampled at 500 mV$_{FS}$ vertical sensitivity and maximum sample rate

	MSO/DPO73304DX		MSO/DPO72504DX		MSO/DPO72304DX	
Input frequency	50 GS/s	100 GS/s	50 GS/s	100 GS/s	50 GS/s	100 GS/s
10 MHz	5.2 bits	5.4 bits	5.2 bits	5.7 bits	5.2 bits	6.0 bits
1 GHz	5.0 bits	5.4 bits	5.0 bits	5.4 bits	5.0 bits	5.5 bits
2 GHz	5.0 bits	5.4 bits	5.0 bits	5.1 bits	5.0 bits	5.3 bits
3 GHz	4.9 bits	5.0 bits	4.9 bits	5.3 bits	4.9 bits	5.4 bits
4 GHz	4.8 bits	4.5 bits	4.6 bits	4.6 bits	4.5 bits	4.8 bits
5 GHz	4.7 bits	4.7 bits	4.7 bits	5.0 bits	4.7 bits	5.3 bits
6 GHz	4.7 bits	4.8 bits	4.7 bits	5.0 bits	4.7 bits	5.2 bits
7 GHz	4.8 bits	4.9 bits	4.8 bits	5.2 bits	4.8 bits	5.3 bits
8 GHz	4.8 bits	5.0 bits	4.8 bits	5.0 bits	4.8 bits	5.4 bits
9 GHz	4.7 bits	5.0 bits	4.7 bits	5.2 bits	4.7 bits	5.3 bits
10 GHz	4.7 bits	5.0 bits	4.7 bits	5.3 bits	4.7 bits	5.4 bits
11 GHz	4.7 bits	5.0 bits	4.7 bits	5.1 bits	4.7 bits	5.2 bits
12 GHz	4.7 bits	5.1 bits	4.7 bits	5.2 bits	4.7 bits	5.3 bits
13 GHz	4.7 bits	4.7 bits	4.7 bits	5.1 bits	4.7 bits	5.2 bits
14 GHz	4.8 bits	5.0 bits	4.8 bits	5.2 bits	4.8 bits	5.2 bits
15 GHz	4.6 bits	4.8 bits	4.6 bits	5.0 bits	4.6 bits	5.1 bits
16 GHz	4.6 bits	4.6 bits	4.6 bits	5.0 bits	4.6 bits	5.2 bits
17 GHz	4.6 bits	4.8 bits	4.6 bits	5.0 bits	4.6 bits	5.1 bits
18 GHz	4.6 bits	4.7 bits	4.6 bits	4.9 bits	4.6 bits	5.1 bits
19 GHz	4.6 bits	4.5 bits	4.6 bits	4.8 bits	4.6 bits	5.0 bits
20 GHz	4.5 bits	4.4 bits	4.6 bits	4.8 bits	4.6 bits	5.0 bits
21 GHz	4.6 bits	4.4 bits	4.6 bits	4.8 bits	4.6 bits	5.1 bits
22 GHz	4.6 bits	4.6 bits	4.6 bits	4.8 bits	4.6 bits	5.1 bits
23 GHz		4.6 bits		5.0 bits		5.1 bits
24 GHz		4.7 bits		4.9 bits		
25 GHz		4.7 bits		5.1 bits		
26GHz		4.6 bits				
27 GHz		4.6 bits				
28 GHz		4.6 bits				
29 GHz		4.6 bits				
30 GHz		4.6 bits				
31 GHz		4.5 bits				
32 GHz		4.5 bits				
33 GHz		4.5 bits				

	MSO/DPO72004DX		MSO/DPO71604DX		MSO/DPO71254DX		MSO/DPO70804DX	
Input frequency	50 GS/s	100 GS/s	50 GS/s	100 GS/s	50 GS/s	100 GS/s	50 GS/s	100 GS/s
10 MHz	5.3 bits	5.6 bits	5.6 bits	5.9 bits	5.7 bits	6.1 bits	6.1 bits	6.4 bits
1 GHz	5.2 bits	5.6 bits	5.4 bits	5.7 bits	5.5 bits	5.9 bits	6.0 bits	6.4 bits
2 GHz	5.1 bits	5.3 bits	5.2 bits	5.5 bits	5.3 bits	5.8 bits	6.0 bits	6.3 bits
3 GHz	4.9 bits	5.1 bits	5.1 bits	5.3 bits	5.2 bits	5.5 bits	5.8 bits	6.1 bits
4 GHz	4.6 bits	4.8 bits	4.7 bits	5.0 bits	5.0 bits	5.2 bits	5.7 bits	5.9 bits
5 GHz	4.9 bits	5.1 bits	5.1 bits	5.4 bits	5.3 bits	5.4 bits	5.5 bits	5.8 bits
6 GHz	4.9 bits	5.1 bits	5.2 bits	5.5 bits	5.4 bits	5.7 bits	5.5 bits	5.8 bits
7 GHz	5.0 bits	5.2 bits	5.3 bits	5.6 bits	5.4 bits	5.8 bits	5.5 bits	5.8 bits
8 GHz	5.0 bits	5.3 bits	5.3 bits	5.6 bits	5.3 bits	5.7 bits	5.4 bits	5.8 bits
9 GHz	5.0 bits	5.3 bits	5.2 bits	5.6 bits	5.3 bits	5.6 bits		
10 GHz	4.9 bits	5.3 bits	5.2 bits	5.5 bits	5.3 bits	5.6 bits		
11 GHz	4.9 bits	5.3 bits	5.1 bits	5.4 bits	5.4 bits	5.6 bits		
12 GHz	5.0 bits	5.2 bits	5.1 bits	5.4 bits	5.1 bits	5.2 bits		
13 GHz	5.0 bits	5.3 bits	5.1 bits	5.4 bits				
14 GHz	4.9 bits	5.2 bits	5.1 bits	5.4 bits				
15 GHz	4.7 bits	5.1 bits	5.0 bits	5.3 bits				
16 GHz	4.8 bits	5.2 bits	5.1 bits	5.4 bits				
17 GHz	4.8 bits	5.2 bits						
18 GHz	4.7 bits	5.1 bits						
19 GHz	4.6 bits	5.2 bits						
20 GHz	4.4 bits	5.1 bits						
21 GHz								
22 GHz								
23 GHz								
24 GHz								
25 GHz								
26 GHz								
27 GHz								
28 GHz								
29 GHz								
30 GHz								
31 GHz								
32 GHz								
33 GHz								

Enhanced bandwidth

	MSO/DPO72004C		MSO/DPO71604C		MSO/DPO71254C	
Input frequency	50 GS/s	100 GS/s	50 GS/s	100 GS/s	50 GS/s	100 GS/s
10 MHz	5.0 bits	5.3 bits	5.6 bits	6.0 bits	5.9 bits	6.2 bits
1 GHz	5.0 bits	5.3 bits	5.6 bits	5.9 bits	5.8 bits	6.1 bits
2 GHz	4.9 bits	5.2 bits	5.6 bits	5.9 bits	5.7 bits	5.9 bits
3 GHz	4.9 bits	5.0 bits	4.6 bits	4.4 bits	4.8 bits	4.5 bits
4 GHz	4.8 bits	4.9 bits	4.2 bits	4.0 bits	4.3 bits	4.0 bits
5 GHz	4.8 bits	4.9 bits	4.6 bits	4.4 bits	5.5 bits	5.2 bits
6 GHz	4.7 bits	4.8 bits	4.5 bits	4.3 bits	4.9 bits	4.8 bits
7 GHz	4.0 bits	3.97 bits	3.9 bits	3.7 bits	5.5 bits	5.6 bits
8 GHz	3.6 bits	3.9 bits	3.4 bits	3.5 bits	5.6 bits	5.8 bits
9 GHz	3.2 bits	3.2 bits	5.1 bits	5.1 bits	5.6 bits	5.8 bits
10 GHz	2.8 bits	2.8 bits	5.5 bits	5.7 bits	5.6 bits	5.8 bits
11 GHz	3.9 bits	3.9 bits	5.4 bits	5.6 bits	5.6 bits	5.8 bits
12 GHz	4.8 bits	5.0 bits	5.4 bits	5.6 bits	5.6 bits	5.7 bits
13 GHz	4.5 bits	4.7 bits	5.2 bits	5.4 bits		
14 GHz	4.4 bits	4.6 bits	5.1 bits	5.3 bits		
15 GHz	4.5 bits	4.7 bits	5.1 bits	5.0 bits		
16 GHz	4.5 bits	4.7 bits	4.8 bits	5.0 bits		
17 GHz	4.1 bits	4.6 bits				
18 GHz	4.2 bits	4.7 bits				
19 GHz	4.6 bits	4.8 bits				
20 GHz	4.8 bits	5.0 bits				

Enhanced bandwidth

	MSO/DPO70804C	MSO/DPO70604C	MSO/DPO70404C
Input frequency	25 GS/s	25 GS/s	25 GS/s
10 MHz	5.7 bits	5.8 bits	6.0 bits
1 GHz	5.7 bits	5.8 bits	5.9 bits
2 GHz	5.7 bits	5.7 bits	5.8 bits
3 GHz	5.5 bits	5.6 bits	5.7 bits
4 GHz	5.5 bits	5.6 bits	5.7 bits
5 GHz	5.5 bits	5.5 bits	
6 GHz	5.4 bits	5.4 bits	
7 GHz	5.4 bits		
8 GHz	5.3 bits		

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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Without enhanced bandwidth

	MSO/DPO73304DX		MSO/DPO72504DX		MSO/DPO72304DX	
Input frequency	50 GS/s	100 GS/s	50 GS/s	100 GS/s	50 GS/s	100 GS/s
10 MHz	5.2 bits	5.2 bits	5.2 bits	5.2 bits	5.2 bits	5.4 bits
1 GHz	4.8 bits	4.8 bits	5.0 bits	5.0 bits	5.0 bits	5.0 bits
2 GHz	4.9 bits	4.9 bits	5.0 bits	5.0 bits	5.0 bits	5.1 bits
3 GHz	4.8 bits	4.8 bits	4.9 bits	4.9 bits	4.9 bits	5.1 bits
4 GHz	4.7 bits	4.7 bits	4.5 bits	4.7 bits	4.7 bits	4.7 bits
5 GHz	4.7 bits	4.7 bits	4.7 bits	4.7 bits	4.7 bits	4.8 bits
6 GHz	4.7 bits	4.7 bits	4.7 bits	4.7 bits	4.7 bits	4.8 bits
7 GHz	4.7 bits	4.7 bits	4.7 bits	4.7 bits	4.7 bits	4.9 bits
8 GHz	4.6 bits	4.6 bits	4.8 bits	4.8 bits	4.7 bits	4.9 bits
9 GHz	4.7 bits	4.6 bits	4.7 bits	4.7 bits	4.7 bits	4.9 bits
10 GHz	4.7 bits	4.7 bits	4.7 bits	4.7 bits	4.7 bits	4.9 bits
11 GHz	4.7 bits	4.7 bits	4.7 bits	4.7 bits	4.7 bits	4.9 bits
12 GHz	4.7 bits	4.7 bits	4.7 bits	4.7 bits	4.7 bits	4.9 bits
13 GHz	4.5 bits	4.5 bits	4.5 bits	4.5 bits	4.5 bits	4.8 bits
14 GHz	4.7 bits	4.7 bits	4.7 bits	4.7 bits	4.7 bits	4.9 bits
15 GHz	4.6 bits	4.6 bits	4.6 bits	4.6 bits	4.6 bits	4.7 bits
16 GHz	4.5 bits	4.4 bits	4.5 bits	4.4 bits	4.5 bits	4.7 bits
17 GHz	4.5 bits	4.4 bits	4.5 bits	4.4 bits	4.5 bits	4.7 bits
18 GHz	4.5 bits	4.4 bits	4.5 bits	4.4 bits	4.5 bits	4.6 bits
19 GHz	4.2 bits	4.1 bits	4.5 bits	4.4 bits	4.5 bits	4.5 bits
20 GHz	4.3 bits	4.2 bits	4.5 bits	4.5 bits	4.5 bits	4.5 bits
21 GHz	4.5 bits	4.5 bits	4.6 bits	4.6 bits	4.5 bits	4.6 bits
22 GHz	4.5 bits	4.4 bits	4.6 bits	4.6 bits	4.5 bits	4.8 bits
23 GHz	4.5 bits	4.4 bits	4.6 bits	4.6 bits	4.3 bits	4.8 bits
24 GHz	4.4 bits	4.5 bits	4.6 bits	4.6 bits		
25 GHz	4.5 bits	4.4 bits	4.5 bits	4.5 bits		
26GHz	4.4 bits	4.3 bits				
27 GHz	4.1 bits	4.34 bits				
28 GHz	4.1 bits	4.1 bits				
29 GHz	4.2 bits	3.8 bits				
30 GHz	4.2 bits	4.2 bits				
31 GHz	4.4 bits	4.2 bits				
32 GHz	4.1 bits	4.1 bits				
33 GHz	4.3 bits	4.2 bits				

Input frequency	MSO/DPO72004DX		MSO/DPO71604DX		MSO/DPO71254DX		MSO/DPO70804DX	
	50 GS/s	100 GS/s	50 GS/s	100 GS/s	50 GS/s	100 GS/s	50 GS/s	100 GS/s
10 MHz	5.4 bits	5.3 bits	5.4 bits	5.4 bits	5.5 bits	5.5 bits	5.4 bits	5.4 bits
1 GHz	5.2 bits	5.2 bits	5.2 bits	5.2 bits	5.3 bits	5.3 bits	5.2 bits	5.2 bits
2 GHz	5.1 bits	5.1 bits	5.1 bits	5.1 bits	5.2 bits	5.2 bits	5.0 bits	5.1 bits
3 GHz	4.9 bits	4.9 bits	4.9 bits	5.0 bits	5.0 bits	5.0 bits	4.9 bits	4.9 bits
4 GHz	4.7 bits	4.7 bits	4.7 bits	4.8 bits	4.7 bits	4.8 bits	4.7 bits	4.7 bits
5 GHz	4.9 bits	4.9 bits	4.9 bits	4.9 bits	5.0 bits	5.0 bits	4.9 bits	4.9 bits
6 GHz	4.8 bits	4.9 bits	4.9 bits	4.9 bits	4.9 bits	5.0 bits	4.9 bits	4.8 bits
7 GHz	4.9 bits	4.9 bits	4.9 bits	4.9 bits	5.0 bits	5.0 bits	4.9 bits	4.9 bits
8 GHz	4.8 bits	4.8 bits	4.8 bits	4.9 bits	4.9 bits	4.9 bits	4.8 bits	4.8 bits
9 GHz	4.9 bits	4.9 bits	5.0 bits	5.0 bits	4.9 bits	5.0 bits		
10 GHz	4.9 bits	4.9 bits	5.0 bits	5.0 bits	4.9 bits	4.9 bits		
11 GHz	5.0 bits	4.9 bits	5.0 bits	5.0 bits	5.0 bits	5.1 bits		
12 GHz	5.0 bits	4.9 bits	5.0 bits	5.0 bits	4.6 bits	4.7 bits		
13 GHz	4.9 bits	4.9 bits	5.0 bits	5.0 bits				
14 GHz	4.9 bits	4.8 bits	4.9 bits	4.9 bits				
15 GHz	4.7 bits	4.7 bits	4.7 bits	4.8 bits				
16 GHz	4.8 bits	4.7 bits	4.8 bits	4.9 bits				
17 GHz	4.7 bits	4.7 bits						
18 GHz	4.6 bits	4.6 bits						
19 GHz	4.6 bits	4.6 bits						
20 GHz	4.5 bits	4.6 bits						
21 GHz								
22 GHz								
23 GHz								
24 GHz								
25 GHz								
26 GHz								
27 GHz								
28 GHz								
29 GHz								
30 GHz								
31 GHz								
32 GHz								
33 GHz								

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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Without enhanced bandwidth

	MSO/DPO72004C		MSO/DPO71604C		MSO/DPO71254C	
Input frequency	50 GS/s	100 GS/s	50 GS/s	100 GS/s	50 GS/s	100 GS/s
10 MHz	5.4 bits	2.0 bits	5.4 bits	2.0 bits	5.6 bits	2.0 bits
1 GHz	5.4 bits	2.0 bits	5.4 bits	2.0 bits	5.5 bits	2.0 bits
2 GHz	5.3 bits	2.0 bits	5.3 bits	2.0 bits	5.4 bits	2.0 bits
3 GHz	5.3 bits	2.0 bits	4.6 bits	2.0 bits	4.6 bits	2.0 bits
4 GHz	5.2 bits	2.0 bits	4.3 bits	2.0 bits	4.4 bits	2.0 bits
5 GHz	5.2 bits	2.0 bits	4.6 bits	2.0 bits	5.3 bits	2.0 bits
6 GHz	5.0 bits	2.0 bits	4.4 bits	2.0 bits	5.2 bits	2.0 bits
7 GHz	4.8 bits	2.0 bits	4.1 bits	2.0 bits	4.5 bits	2.0 bits
8 GHz	4.4 bits	2.0 bits	3.4 bits	2.0 bits	5.0 bits	2.0 bits
9 GHz	4.1 bits	2.0 bits	3.2 bits	2.0 bits	5.0 bits	2.0 bits
10 GHz	4.0 bits	2.0 bits	3.5 bits	2.0 bits	5.1 bits	2.0 bits
11 GHz	4.1 bits	2.0 bits	4.1 bits	2.0 bits	5.2 bits	2.0 bits
12 GHz	3.8 bits	2.0 bits	3.5 bits	2.0 bits	5.1 bits	2.0 bits
13 GHz	4.1 bits	2.0 bits	4.1 bits	2.0 bits		
14 GHz	4.7 bits	2.0 bits	4.7 bits	2.0 bits		
15 GHz	4.7 bits	2.0 bits	4.7 bits	2.0 bits		
16 GHz	4.7 bits	2.0 bits	4.7 bits	2.0 bits		

Without enhanced bandwidth

	MSO/DPO70804C	MSO/DPO70604C	MSO/DPO70404C
Input frequency	25 GS/s	25 GS/s	25 GS/s
10 MHz	5.6 bits	5.7 bits	5.8 bits
1 GHz	5.6 bits	5.7 bits	5.8 bits
2 GHz	5.4 bits	5.6 bits	5.7 bits
3 GHz	5.4 bits	5.5 bits	5.6 bits
4 GHz	5.3 bits	5.4 bits	5.6 bits
5 GHz	5.2 bits	5.3 bits	
6 GHz	5.2 bits	5.3 bits	
7 GHz	5.2 bits		
8 GHz	5.7 bits		

Effective bits, typical, DPO7000C models

DPO7354C, Enhanced bandwidth

40 GS/s	Analog bandwidth setting					
Input Frequency	3.5 GHz	3.0 GHz	2.5 GHz	2.0 GHz	1.0 GHz	0.5 GHz
10 MHz	5.9 bits	6.1 bits	6.2 bits	6.4 bits	6.8 bits	7.1 bits

Table continued…

40 GS/s	Analog bandwidth setting					
510 MHz	5.9 bits	6.0 bits	6.1 bits	6.4 bits	6.8 bits	7.1 bits
1010 MHz	5.6 bits	5.7 bits	5.8 bits	6.1 bits	6.8 bits	
1510 MHz	5.6 bits	5.8 bits	6.2 bits	6.3 bits		
2010 MHz	5.8 bits	6.0 bits	6.1 bits	6.3 bits		
2510 MHz	5.7 bits	5.7 bits	5.9 bits			
3010 MHz	5.7 bits	5.8 bits				
3510 MHz	5.6 bits					

20 GS/s	Analog bandwidth setting					
Input Frequency	3.5 GHz	3.0 GHz	2.5 GHz	2.0 GHz	1.0 GHz	0.5 GHz
10 MHz	5.8 bits	6.0 bits	6.2 bits	6.3 bits	6.7 bits	7.0 bits
510 MHz	5.8 bits	6.0 bits	6.1 bits	6.3 bits	6.7 bits	7.0 bits
1010 MHz	5.6 bits	5.6 bits	5.7 bits	6.0 bits	6.7 bits	
1510 MHz	5.6 bits	5.8 bits	6.1 bits	6.2 bits		
2010 MHz	5.8 bits	6.0 bits	6.1 bits	6.2 bits		
2510 MHz	5.6 bits	5.7 bits	5.8 bits			
3010 MHz	5.7 bits	5.7 bits				
3510 MHz	5.5 bits					

10 GS/s	Analog bandwidth setting					
Input Frequency	3.5 GHz	3.0 GHz	2.5 GHz	2.0 GHz	1.0 GHz	0.5 GHz
10 MHz	5.8 bits	5.9 bits	6.1 bits	6.2 bits	6.7 bits	7.0 bits
510 MHz	5.7 bits	5.9 bits	6.0 bits	6.2 bits	6.7 bits	7.0 bits
1010 MHz	5.5 bits	5.6 bits	5.7 bits	6.0 bits	6.7 bits	
1510 MHz	5.5 bits	5.7 bits	6.0 bits	6.1 bits		
2010 MHz	5.6 bits	5.8 bits	6.0 bits	6.1 bits		
2510 MHz	5.5 bits	5.6 bits	5.7 bits			
3010 MHz	5.6 bits	5.7 bits				
3510 MHz	5.4 bits					

DPO7354C, Without enhanced bandwidth

40 GS/s	Analog bandwidth setting			
Input Frequency	2.5 GHz	0.5 GHz	0.25 GHz	0.02 GHz
10 MHz	5.9 bits	6.3 bits	6.5 bits	6.6 bits
510 MHz	5.8 bits	6.3 bits		
1010 MHz	5.6 bits			
1510 MHz	5.6 bits			
2010 MHz	5.1 bits			

Table continued…

40 GS/s	Analog bandwidth setting			
2510 MHz	4.6 bits			

20 GS/s	Analog bandwidth setting			
Input Frequency	2.5 GHz	0.5 GHz	0.25 GHz	0.02 GHz
10 MHz	5.9 bits	6.3 bits	6.5 bits	6.6 bits
510 MHz	5.8 bits	6.3 bits		
1010 MHz	5.6 bits			
1510 MHz	5.6 bits			
2010 MHz	5.2 bits			
2510 MHz	4.6 bits			

10 GS/s	Analog bandwidth setting			
Input Frequency	2.5 GHz	0.5 GHz	0.25 GHz	0.02 GHz
10 MHz	5.9 bits	6.3 bits	6.5 bits	6.6 bits
510 MHz	5.8 bits	6.3 bits		
1010 MHz	5.6 bits			
1510 MHz	5.7 bits			
2010 MHz	5.7 bits			
2510 MHz	5.5 bits			

DPO7254C, Enhanced bandwidth

40 GS/s	Analog bandwidth setting			
Input Frequency	2.5 GHz	2.0 GHz	1.0 GHz	0.5 GHz
10 MHz	6.2 bits	6.4 bits	6.9 bits	7.2 bits
510 MHz	6.1 bits	6.3 bits	6.9 bits	7.2 bits
1010 MHz	5.9 bits	6.1 bits	6.9 bits	
1510 MHz	6.1 bits	6.4 bits		
2010 MHz	6.1 bits	6.3 bits		
2510 MHz	5.6 bits			

20 GS/s	Analog bandwidth setting			
Input Frequency	2.5 GHz	2.0 GHz	1.0 GHz	0.5 GHz
10 MHz	6.1 bits	6.3 bits	6.8 bits	7.1 bits
510 MHz	6.1 bits	6.3 bits	6.8 bits	7.1 bits
1010 MHz	5.8 bits	6.1 bits	6.8 bits	
1510 MHz	6.0 bits	6.3 bits		
2010 MHz	6.1 bits	6.3 bits		

Table continued…

20 GS/s	Analog bandwidth setting			
2510 MHz	5.6 bits			

10 GS/s	Analog bandwidth setting			
Input Frequency	2.5 GHz	2.0 GHz	1.0 GHz	0.5 GHz
10 MHz	6.1 bits	6.4 bits	6.9 bits	7.2 bits
510 MHz	6.1 bits	6.3 bits	6.9 bits	7.2 bits
1010 MHz	5.7 bits	6.1 bits	6.9 bits	
1510 MHz	5.9 bits	6.4 bits		
2010 MHz	6.0 bits	6.3 bits		
2510 MHz	5.5 bits			

DPO7254C, Without enhanced bandwidth

40 GS/s	Analog bandwidth setting			
Input Frequency	2.5 GHz	0.5 GHz	0.25 GHz	0.02 GHz
10 MHz	5.9 bits	6.3 bits	6.5 bits	6.6 bits
510 MHz	5.9 bits	6.3 bits		
1010 MHz	5.6 bits			
1510 MHz	5.6 bits			
2010 MHz	5.2 bits			
2510 MHz	4.5 bits			

20 GS/s	Analog bandwidth setting			
Input Frequency	2.5 GHz	0.5 GHz	0.25 GHz	0.02 GHz
10 MHz	5.9 bits	6.3 bits	6.5 bits	6.6 bits
510 MHz	5.9 bits	6.3 bits		
1010 MHz	5.6 bits			
1510 MHz	5.6 bits			
2010 MHz	5.2 bits			
2510 MHz	4.5 bits			

10 GS/s	Analog bandwidth setting			
Input Frequency	2.5 GHz	0.5 GHz	0.25 GHz	0.02 GHz
10 MHz	5.9 bits	6.3 bits	6.5 bits	6.6 bits
510 MHz	5.9 bits	6.3 bits		
1010 MHz	5.6 bits			
1510 MHz	5.7 bits			
2010 MHz	5.8 bits			

Table continued…

10 GS/s	Analog bandwidth setting	
2510 MHz	5.5 bits	

DPO7104C, Enhanced bandwidth

20 GS/s	Analog bandwidth setting	
Input Frequency	1.0 GHz	0.5 GHz
10 MHz	6.7 bits	7.2 bits
510 MHz	6.7 bits	7.2 bits
1010 MHz	6.7 bits	

10 GS/s	Analog bandwidth setting	
Input Frequency	1.0 GHz	0.5 GHz
10 MHz	6.6 bits	7.1 bits
510 MHz	6.5 bits	7.1 bits
1010 MHz	6.5 bits	

5 GS/s	Analog bandwidth setting	
Input Frequency	1.0 GHz	0.5 GHz
10 MHz	6.4 bits	7.0 bits
510 MHz	6.4 bits	7.0 bits
1010 MHz	6.3 bits	

DPO7104C, Without enhanced bandwidth

20 GS/s	Analog bandwidth setting			
Input Frequency	1.0 GHz	0.5 GHz	0.25 GHz	0.02 GHz
10 MHz	6.4 bits	6.4 bits	6.6 bits	6.7 bits
510 MHz	6.1 bits	6.4 bits		
1010 MHz	5.7 bits			

10 GS/s	Analog bandwidth setting			
Input Frequency	1.0 GHz	0.5 GHz	0.25 GHz	0.02 GHz
10 MHz	6.4 bits	6.4 bits	6.6 bits	6.7 bits
510 MHz	6.3 bits	6.4 bits		
1010 MHz	6.3 bits			

5 GS/s	Analog bandwidth setting			
Input Frequency	1.0 GHz	0.5 GHz	0.25 GHz	0.02 GHz
10 MHz	6.4 bits	6.4 bits	6.6 bits	6.7 bits
510 MHz	6.3 bits	6.4 bits		

Table continued…

5 GS/s	Analog bandwidth setting		
1010 MHz	6.3 bits		

DPO7054C, Enhanced bandwidth

10 GS/s	Analog bandwidth setting
Input Frequency	0.5 GHz
10 MHz	6.8 bits
510 MHz	6.8 bits

5 GS/s	Analog bandwidth setting
Input Frequency	0.5 GHz
10 MHz	6.7 bits
510 MHz	6.7 bits

2.5 GS/s	Analog bandwidth setting
Input Frequency	0.5 GHz
10 MHz	6.5 bits
510 MHz	6.4 bits

DPO7054C, Without enhanced bandwidth

10 GS/s	Analog bandwidth setting		
Input Frequency	0.5 GHz	0.25 GHz	0.02 GHz
10 MHz	6.5 bits	6.6 bits	6.7 bits
510 MHz	6.4 bits		

5 GS/s	Analog bandwidth setting		
Input Frequency	0.5 GHz	0.25 GHz	0.02 GHz
10 MHz	6.5 bits	6.6 bits	6.7 bits
510 MHz	6.4 bits		

2.5 GS/s	Analog bandwidth setting		
Input Frequency	0.5 GHz	0.25 GHz	0.02 GHz
10 MHz	6.5 bits	6.6 bits	6.7 bits
510 MHz	6.4 bits		

Noise typical MSO/DPO70000DX models

Without enhanced bandwidth

Gain setting, full scale	MSO/DPO73304DX	MSO/DPO72504DX	MSO/DPO72304DX
62.5 mV	0.88 mV	0.83 mV	0.79 mV
100 mV	0.96 mV	0.90 mV	0.86 mV
200 mV	1.53 mV	1.47 mV	1.41 mV
500 mV	4.19 mV	3.57 mV	3.14 mV
1 V	8.30 mV	6.94 mV	6.10 mV
2.0 V	18.84 mV	16.70 mV	14.19 mV
3.0 V	24.64 mV	21.53 mV	19.09 mV
4.0 V	37.91 mV	31.53 mV	26.01 mV
5.0 V	43.36 mV	36.74 mV	31.84 mV
6.0 V	47.93 mV	41.00 mV	36.97 mV

Gain setting, full scale	MSO/DPO72004DX	MSO/DPO71604DX	MSO/DPO71254DX	MSO/DPO70804DX
62.5 mV	0.76 mV	0.73 mV	0.69 mV	0.65 mV
100 mV	0.86 mV	0.83 mV	0.79 mV	0.76 mV
200 mV	1.50 mV	1.37 mV	1.35 mV	1.33 mV
500 mV	3.43 mV	3.23 mV	3.09 mV	3.11 mV
1 V	6.76 mV	6.39 mV	6.17 mV	6.26 mV
2.0 V	14.85 mV	14.56 mV	13.61 mV	12.99 mV
3.0 V	20.88 mV	19.37 mV	18.97 mV	19.16 mV
4.0 V	29.67 mV	27.46 mV	25.90 mV	25.75 mV
5.0 V	34.40 mV	31.82 mV	31.32 mV	32.02 mV
6.0 V	41.13 mV	38.10 mV	37.47 mV	37.68 mV

Enhanced bandwidth

Gain setting, full scale	MSO/DPO73304DX		MSO/DPO72504DX		MSO/DPO72304DX	
	100 GS/s	50 GS/s	100 GS/s	50 GS/s	100 GS/s	50 GS/s
62.5 mV	0.84 mV	0.84 mV	0.82 mV	0.90 mV	0.75 mV	0.76 mV
100 mV	0.93 mV	0.93 mV	0.81 mV	0.92 mV	0.78 mV	0.79 mV
150 mV	1.31 mV	1.29 mV	1.17 mV	1.29 mV	1.08 mV	1.19 mV
200 mV	1.52 mV	1.6 mV	1.40 mV	1.56 mV	1.14 mV	1.19 mV
300 mV	2.49 mV	2.52 mV	2.28 mV	2.49 mV	2.10 mV	2.29 mV
400 mV	2.92 mV	2.52 mV	2.80 mV	3.08 mV	2.58 mV	2.29 mV
500 mV	3.55 mV	2.52 mV	3.35 mV	3.75 mV	2.65 mV	2.67 mV
600 mV	4.86 mV	4.86 mV	4.5 mV	4.80 mV	4.14 mV	4.42 mV
700 mV	5.25 mV	5.39 mV	5.04 mV	5.39 mV	4.64 mV	4.96 mV
800 mV	5.76 mV	6.08 mV	5.52 mV	6.00 mV	5.08 mV	5.52 mV
900 mV	5.76 mV	6.66 mV	6.12 mV	6.66 mV	5.63 mV	6.13 mV

Table continued…

Gain setting, full scale	MSO/DPO73304DX		MSO/DPO72504DX		MSO/DPO72304DX	
	100 GS/s	50 GS/s	100 GS/s	50 GS/s	100 GS/s	50 GS/s
1 V	6.80 mV	7.30 mV	6.70 mV	7.20 mV	5.09 mV	5.11 mV
1.1 V	8.69 mV	9.02 mV	8.47 mV	8.91 mV	7.79 mV	8.20 mV
1.2 V	9.12 mV	9.60 mV	9.00 mV	9.48 mV	8.28 mV	8.72 mV
2.0 V	15.4 mV	16.4 mV	12.4 mV	12.9 mV	11.7 mV	11.9 mV
3.0 V	19.9 mV	22.8 mV	17.2 mV	17.7 mV	15.3 mV	15.5 mV
4.0 V	28.8 mV	31.8 mV	24.4 mV	24.9 mV	21.6 mV	21.9 mV
5.0 V	34.3 mV	31.8 mV	28.1 mV	28.7 mV	25.7 mV	25.1 mV
6.0 V	39.8 mV	43.8 mV	34.1 mV	34.8 mV	29.7 mV	30.1 mV

Gain setting, full scale	MSO/DPO72004DX		MSO/DPO71604DX		MSO/DPO71254DX		MSO/DPO70804DX	
	100 GS/s	50 GS/s	100 GS/s	50 GS/s	100 GS/s	50 GS/s	100 GS/s	50 GS/s
62.5 mV	0.68 mV	0.71 mV	0.69 mV	0.67 mV	0.66 mV	0.62 mV	0.48 mV	0.49 mV
100 mV	0.72 mV	0.82 mV	0.70 mV	0.75 mV	0.63 mV	0.69 mV	0.56 mV	0.54 mV
200 mV	1.22 mV	1.43 mV	1.03 mV	1.21 mV	0.91 mV	1.15 mV	0.75 mV	0.84 mV
500 mV	2.78 mV	3.38 mV	2.37 mV	2.82 mV	2.08 mV	2.59 mV	1.58 mV	1.98 mV
1 V	5.50 mV	6.72 mV	4.41 mV	5.32 mV	3.97 mV	5.10 mV	3.01 mV	3.75 mV
2.0 V	12.41 mV	14.97 mV	11.19 mV	13.19 mV	10.06 mV	10.83 mV	6.59 mV	8.16 mV
3.0 V	16.88 mV	20.78 mV	15.02 mV	16.98 mV	12.79 mV	15.58 mV	9.06 mV	11.64 mV
4.0 V	23.65 mV	27.53 mV	20.11 mV	23.70 mV	17.62 mV	21.40 mV	13.22 mV	15.51 mV
5.0 V	28.86 mV	34.69 mV	22.58 mV	27.67 mV	21.34 mV	25.61 mV	15.33 mV	18.80 mV
6.0 V	33.37 mV	39.95 mV	27.33 mV	33.16 mV	24.74 mV	29.99 mV	17.51 mV	22.24 mV

Noise, typical, MSO/DPO70000C models

Without enhanced bandwidth

Gain setting, full scale	MSO/ DPO 72004C	MSO/ DPO 71604C	MSO/ DPO 71254C	MSO/ DPO 70804C	MSO/ DPO 70604C	MSO/ DPO 70404C
100 mV	0.87 mV	0.87 mV	0.67 mV	0.58 mV	0.53 mV	0.50 mV
150 mV	1.06 mV	1.06 mV	0.84 mV	0.74 mV	0.73 mV	0.69 mV
200 mV	1.21 mV	1.21 mV	0.98 mV	0.90 mV	0.86 mV	0.86 mV
300 mV	1.82 mV	1.82 mV	1.49 mV	1.34 mV	1.25 mV	1.25 mV
400 mV	2.29 mV	2.29 mV	1.80 mV	1.76 mV	1.67 mV	1.67 mV
500 mV	2.78 mV	2.78 mV	2.29 mV	2.02 mV	2.02 mV	2.02 mV
600 mV	3.35 mV	3.35 mV	2.78 mV	2.52 mV	2.46 mV	2.46 mV
700 mV	3.92 mV	3.92 mV	3.27 mV	3.02 mV	2.90 mV	2.90 mV

Table continued…

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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Gain setting, full scale	MSO/ DPO 72004C	MSO/ DPO 71604C	MSO/ DPO 71254C	MSO/ DPO 70804C	MSO/ DPO 70604C	MSO/ DPO 70404C
800 mV	4.49 mV	4.49 mV	3.76 mV	3.52 mV	3.34 mV	3.34 mV
900 mV	5.14 mV	5.14 mV	4.25 mV	3.87 mV	3.78 mV	3.78 mV
1.0 V	6.48 mV	6.48 mV	4.89 mV	4.50 mV	4.28 mV	4.28 mV
2.0 V	11.47 mV	11.47 mV	8.98 mV	8.80 mV	8.36 mV	8.36 mV
2.5 V	14.04 mV	14.04 mV	11.43 mV	10.81 mV	10.34 mV	10.34 mV
3.0 V	16.61 mV	16.61 mV	13.88 mV	12.82 mV	12.32 mV	12.32 mV
4.0 V	21.83 mV	21.83 mV	18.78 mV	17.36 mV	16.91 mV	16.91 mV
4.5 V	24.41 mV	24.41 mV	21.30 mV	19.44 mV	18.97 mV	18.97 mV
5.0 V	26.99 mV	26.99 mV	23.59 mV	21.51 mV	21.02 mV	21.02 mV

Enhanced bandwidth, sample rates less than 100 GS/s.

MSO/DPO72004C MSO/ DPO71604C MSO/ DPO71254C where applicable	20 GHz	19 GHz	18 GHz	17 GHz	16 GHz	15 GHz
Gain Setting, full scale						
100 mV	NA	NA	1.09 mV	0.70 mV	0.63 mV	0.59 mV
150 mV	NA	NA	1.06 mV	0.93 mV	0.75 mV	0.79 mV
200 mV	2.08 mV	1.67 mV	1.34 mV	1.09 mV	0.88 mV	0.92 mV
300 mV	3.70 mV	2.35 mV	1.90 mV	1.57 mV	1.35 mV	1.31 mV
400 mV	4.18 mV	3.10 mV	2.53 mV	2.08 mV	1.68 mV	1.67 mV
500 mV	3.55 mV	3.10 mV	2.61 mV	2.29 mV	2.04 mV	2.02 mV
600 mV	5.06 mV	3.70 mV	3.13 mV	2.78 mV	2.45 mV	2.46 mV
700 mV	6.09 mV	4.30 mV	3.65 mV	3.27 mV	2.99 mV	2.90 mV
800 mV	6.62 mV	4.90 mV	4.16 mV	3.76 mV	3.40 mV	3.34 mV
900 mV	7.21 mV	5.31 mV	4.57 mV	4.16 mV	3.71 mV	3.59 mV
1.0 V	10.52 mV	8.35 mV	7.98 mV	5.32 mV	4.55 mV	4.50 mV
2.0 V	21.38 mV	15.54 mV	12.66 mV	10.28 mV	8.33 mV	8.70 mV
2.5 V	17.77 mV	17.87 mV	14.82 mV	12.26 mV	9.96 mV	10.51 mV
3.0 V	25.05 mV	20.20 mV	16.88 mV	14.24 mV	12.17 mV	12.32 mV
4.0 V	33.34 mV	24.86 mV	21.17 mV	18.26 mV	17.07 mV	15.98 mV
4.5 V	35.86 mV	27.20 mV	23.29 mV	20.25 mV	18.6 mV	17.80 mV
5.0 V	38.40 mV	29.53 mV	25.41 mV	22.23 mV	20.29 mV	19.61 mV

MSO/DPO72004C MSO/ DPO71604C MSO/ DPO71254C where applicable	14 GHz	13 GHz	12.5 GHz	12 GHz	11 GHz	10 GHz
Gain Setting, full scale						
100 mV	0.58 mV	0.58 mV	0.55 mV	0.53 mV	0.51 mV	0.49 mV
150 mV	0.77 mV	0.73 mV	0.72 mV	0.71 mV	0.68 mV	0.65 mV
200 mV	0.87 mV	0.84 mV	0.82 mV	0.81 mV	0.78 mV	0.75 mV
300 mV	1.28 mV	1.26 mV	1.28 mV	1.20 mV	1.16 mV	1.10 mV
400 mV	1.63 mV	1.59 mV	1.67 mV	1.49 mV	1.43 mV	1.39 mV
500 mV	1.92 mV	1.85 mV	1.80 mV	1.78 mV	1.72 mV	1.65 mV
600 mV	2.35 mV	2.27 mV	2.42 mV	2.18 mV	2.12 mV	1.99 mV
700 mV	2.79 mV	2.69 mV	2.94 mV	2.58 mV	2.51 mV	2.34 mV
800 mV	3.23 mV	3.10 mV	3.40 mV	2.98 mV	2.90 mV	2.78 mV
900 mV	3.51 mV	3.39 mV	3.63 mV	3.27 mV	3.14 mV	3.02 mV
1.0 V	4.26 mV	4.22 mV	4.09 mV	4.05 mV	3.94 mV	3.73 mV
2.0 V	8.23 mV	7.96 mV	8.39 mV	7.47 mV	7.16 mV	6.93 mV
2.5 V	9.95 mV	9.62 mV	9.57 mV	9.03 mV	8.68 mV	8.35 mV
3.0 V	11.68 mV	11.27 mV	12.35 mV	10.58 mV	10.19 mV	9.76 mV
4.0 V	15.19 mV	15.34 mV	17.26 mV	14.79 mV	14.29 mV	13.60 mV
4.5 V	16.92 mV	17.09 mV	18.49 mV	16.47 mV	15.93 mV	15.12 mV
5.0 V	18.66 mV	18.83 mV	19.60 mV	18.15 mV	17.56 mV	16.65 mV

MSO/DPO72004C MSO/ DPO71604C MSO/ DPO71254C where applicable	9 GHz	8 GHz	7 GHz	6 GHz	5 GHz	4 GHz
Gain Setting, full scale						
100 mV	0.46 mV	0.45 mV	0.43 mV	0.40 mV	0.37 mV	0.34 mV
150 mV	0.63 mV	0.60 mV	0.57 mV	0.54 mV	0.51 mV	0.48 mV
200 mV	0.71 mV	0.67 mV	0.63 mV	0.60 mV	0.57 mV	0.53 mV
300 mV	1.03 mV	0.99 mV	0.95 mV	0.89 mV	0.84 mV	0.77 mV
400 mV	1.33 mV	1.27 mV	1.18 mV	1.10 mV	1.06 mV	0.98 mV
500 mV	1.57 mV	1.48 mV	1.41 mV	1.31 mV	1.22 mV	1.10 mV
600 mV	1.89 mV	1.79 mV	1.71 mV	1.60 mV	1.49 mV	1.35 mV
700 mV	2.21 mV	2.11 mV	2.01 mV	1.88 mV	1.76 mV	1.59 mV
800 mV	2.21 mV	2.11 mV	2.01 mV	1.88 mV	1.76 mV	1.59 mV
900 mV	2.86 mV	2.74 mV	2.61 mV	2.45 mV	2.29 mV	2.08 mV

Table continued…

MSO/DPO72004C MSO/ DPO71604C MSO/ DPO71254C where applicable	9 GHz	8 GHz	7 GHz	6 GHz	5 GHz	4 GHz
1.0 V	3.55 mV	3.36 mV	3.18 mV	2.99 mV	2.77 mV	2.65 mV
2.0 V	6.55 mV	6.33 mV	5.94 mV	5.51 mV	5.28 mV	4.90 mV
2.5 V	7.92 mV	7.63 mV	7.20 mV	6.68 mV	6.34 mV	5.83 mV
3.0 V	9.30 mV	8.93 mV	8.46 mV	7.84 mV	7.40 mV	6.77 mV
4.0 V	13.01 mV	12.40 mV	11.81 mV	11.07 mV	10.37 mV	9.51 mV
4.5 V	14.50 mV	13.80 mV	13.17 mV	12.34 mV	11.53 mV	10.54 mV
5.0 V	15.98 mV	15.20 mV	14.53 mV	13.61 mV	12.68 mV	11.57 mV

MSO/DPO72004C, MSO/ DPO71604C, MSO/DPO71254C where applicable	3 GHz	2 GHz	1 GHz	500 MHz
Gain Setting, full scale				
100 mV	0.31 mV	0.26 mV	0.20 mV	0.17 mV
150 mV	0.44 mV	0.39 mV	0.34 mV	0.27 mV
200 mV	0.48 mV	0.44 mV	0.37 mV	0.31 mV
300 mV	0.69 mV	0.61 mV	0.52 mV	0.44 mV
400 mV	0.88 mV	0.78 mV	0.66 mV	0.57 mV
500 mV	1.03 mV	0.91 mV	0.76 mV	0.68 mV
600 mV	1.24 mV	1.09 mV	0.91 mV	0.82 mV
700 mV	1.45 mV	1.27 mV	1.06 mV	0.95 mV
800 mV	1.76 mV	1.51 mV	1.10 mV	1.10 mV
900 mV	1.88 mV	1.63 mV	1.35 mV	1.22 mV
1.0 V	2.38 mV	2.02 mV	1.57 mV	1.31 mV
2.0 V	4.43 mV	4.12 mV	3.42 mV	2.88 mV
2.5 V	4.43 mV	4.12 mV	3.42 mV	2.88 mV
3.0 V	6.22 mV	5.63 mV	4.72 mV	4.10 mV
4.0 V	8.83 mV	7.86 mV	6.63 mV	5.86 mV
4.5 V	9.81 mV	8.68 mV	7.34 mV	6.53 mV
5.0 V	10.80 mV	9.51 mV	8.06 mV	7.20 mV

MSO/DPO70804C, MSO/ DPO70604C, MSO/ DPO70404C, where applicable	8 GHz	7 GHz	6 GHz	5 GHz	4 GHz	3 GHz
Gain Setting, full scale						

Table continued…

MSO/DPO70804C, MSO/DPO70604C, MSO/DPO70404C, where applicable	8 GHz	7 GHz	6 GHz	5 GHz	4 GHz	3 GHz
100 mV	0.54 mV	0.51 mV	0.48 mV	0.45 mV	0.42 mV	0.40 mV
150 mV	0.73 mV	0.69 mV	0.64 mV	0.60 mV	0.55 mV	0.50 mV
200 mV	0.86 mV	0.80 mV	0.77 mV	0.72 mV	0.68 mV	0.60 mV
300 mV	1.34 mV	1.25 mV	1.16 mV	1.07 mV	0.98 mV	0.89 mV
400 mV	1.67 mV	1.58 mV	1.50 mV	1.41 mV	1.32 mV	1.14 mV
500 mV	1.94 mV	1.85 mV	1.76 mV	1.67 mV	1.58 mV	1.41 mV
600 mV	2.41 mV	2.29 mV	2.17 mV	2.04 mV	1.91 mV	1.70 mV
700 mV	2.87 mV	2.73 mV	2.58 mV	2.41 mV	2.23 mV	1.99 mV
800 mV	3.34 mV	3.17 mV	2.99 mV	2.77 mV	2.55 mV	2.29 mV
900 mV	3.70 mV	3.56 mV	3.34 mV	3.12 mV	2.90 mV	2.55 mV
1.0 V	4.28 mV	3.99 mV	3.83 mV	3.46 mV	3.38 mV	3.00 mV
2.0 V	8.36 mV	8.09 mV	7.48 mV	6.95 mV	6.60 mV	5.80 mV
2.5 V	10.23 mV	9.86 mV	9.20 mV	8.61 mV	8.18 mV	7.21 mV
3.0 V	12.10 mV	11.62 mV	10.92 mV	10.27 mV	9.75 mV	8.62 mV
4.0 V	16.61 mV	15.90 mV	14.99 mV	14.18 mV	12.97 mV	11.50 mV
4.5 V	18.57 mV	17.75 mV	16.78 mV	15.91 mV	14.55 mV	12.92 mV
5.0 V	20.53 mV	19.60 mV	18.58 mV	17.65 mV	16.13 mV	14.34 mV

MSO/DPO70804C, MSO/DPO70604C, MSO/DPO70404C, where applicable	2 GHz	1 GHz	500 MHz
Gain Setting, full scale			
100 mV	0.37 mV	0.32 mV	0.24 mV
150 mV	0.46 mV	0.39 mV	0.32 mV
200 mV	0.55 mV	0.46 mV	0.40 mV
300 mV	0.78 mV	0.67 mV	0.57 mV
400 mV	1.01 mV	0.88 mV	0.76 mV
500 mV	1.23 mV	1.01 mV	0.92 mV
600 mV	1.50 mV	1.23 mV	1.10 mV
700 mV	1.76 mV	1.44 mV	1.28 mV
800 mV	2.02 mV	1.65 mV	1.45 mV
900 mV	2.24 mV	1.89 mV	1.67 mV
1.0 V	2.59 mV	2.03 mV	1.65 mV
2.0 V	5.08 mV	4.19 mV	3.66 mV
2.5 V	6.32 mV	5.20 mV	4.61 mV

Table continued…

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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MSO/DPO70804C, MSO/DPO70604C, MSO/DPO70404C, where applicable	2 GHz	1 GHz	500 MHz
3.0 V	6.32 mV	5.20 mV	4.61 mV
4.0 V	10.07 mV	8.28 mV	7.50 mV
4.5 V	10.07 mV	8.28 mV	7.50 mV
5.0 V	12.55 mV	10.31 mV	9.41 mV

Enhanced bandwidth, at 100 GS/s.

MSO/DPO72004C MSO/ DPO71604C MSO/ DPO71254C	20 GHz	19 GHz	18 GHz	17 GHz	16 GHz	15 GHz
Gain Setting, full scale						
100 mV	N/A	N/A	0.981 mV	0.63 mV	0.5706 mV	0.531 mV
150 mV	N/A	N/A	0.954 mV	0.837 mV	0.729 mV	0.711 mV
200 mV	1.736 mV	1.4195 mV	1.139 mV	0.9265 mV	0.816 mV	0.782 mV
300 mV	2.92 mV	1.9975 mV	1.615 mV	1.3345 mV	1.156 mV	1.1135 mV
400 mV	3.072 mV	2.635 mV	2.1506 mV	1.768 mV	1.53 mV	1.4195 mV
500 mV	2.944 mV	2.635 mV	2.2185 mV	1.9465mV	1.802 mV	1.717 mV1.802 mV
600 mV	3.784 mV	3.145 mV	2.6605 mV	2.363 mV	2.176 mV	2.091 mV
700 mV	4.424 mV	3.655 mV	3.1025 mV	2.7795 mV	2.737 mV	2.465 mV
800 mV	4.704 mV	4.165 mV	3.536 mV	3.196 mV	2.9155 mV	2.839 mV
900 mV	5.296 mV	4.5135 mV	3.8845 mV	3.536 mV	3.196 mV	3.0515 mV
1.0 V	8.688 mV	7.0975 mV	6.783 mV	4.522 mV	4.0545 mV	3.825 mV
2.0 V	15.352 mV	13.209 mV	10.761 mV	8.738 mV	7.735 mV	7.395 mV
2.5 V	17.392 mV	15.1895 mV	12.597 mV	10.421mV	9.248 mV	8.9335 mV
3.0 V	19.432 mV	17.17 mV	14.348 mV	12.104 mV	11.407 mV	10.742 mV
4.0 V	25.736 mV	21.131 mV	17.9945 mV	15.521mV	15.2575 mV	13.583 mV
4.5 V	27.52 mV	23.12 mV	19.7965 mV	17.2125 mV	16.184 mV	15.13 mV
5.0 V	30.064 mV	25.1005 mV	21.5985 mV	18.8955 mV	18.0795 mV	16.6685 mV

MSO/DPO72004C MSO/ DPO71604C MSO/ DPO71254C	14 GHz	13 GHz	12.5 GHz	12 GHz	11 GHz	10 GHz
Gain Setting, full scale						
100 mV	0.522 mV	0.493 mV	0.4675 mV	0.4505 mV	0.4335 mV	0.4165 mV
150 mV	0.693 mV	0.6205 mV	0.612 mV	0.6035 mV	0.578 mV	0.5525 mV

Table continued…

MSO/DPO72004C MSO/ DPO71604C MSO/ DPO71254C	14 GHz	13 GHz	12.5 GHz	12 GHz	11 GHz	10 GHz
200 mV	0.7395 mV	0.714 mV	0.697 mV	0.6885 mV	0.663 mV	0.6375 mV
300 mV	1.088 mV	1.071 mV	1.088 mV	1.02 mV	0.986 mV	0.935 mV
400 mV	1.3855 mV	1.3515 mV	1.4195 mV	1.2665 mV	1.2155 mV	1.1815 mV
500 mV	1.632 mV	1.5725 mV	1.53 mV	1.513 mV	1.462 mV	1.4025 mV
600 mV	1.9975 mV	1.9295 mV	2.057 mV	1.853 mV	1.802 mV	1.6915 mV
700 mV	2.3715 mV	2.2865 mV	2.499 mV	2.193 mV	2.1335 mV	1.989 mV
800 mV	2.7455 mV	2.635 mV	2.89 mV	2.533 mV	2.465 mV	2.363 mV
900 mV	2.9835mV	2.8815mV	3.0855 mV	2.7795mV	2.669 mV	2.567 mV
1.0 V	3.621 mV	3.587 mV	3.4765 mV	3.4425 mV	3.349 mV	3.1705 mV
2.0 V	6.9955 mV	6.766 mV	7.1315 mV	6.3495 mV	6.086 mV	5.8905 mV
2.5 V	8.4575 mV	8.177 mV	8.1345 mV	7.6755 mV	7.378 mV	7.0975 mV
3.0 V	9.928 mV	9.5795 mV	10.4975 mV	8.993 mV	8.6615 mV	8.177 mV
4.0 V	12.9115 mV	13.039 mV	14.671 mV	12.5715 mV	12.1465 mV	11.56 mV
4.5 V	14.382 mV	14.5265 mV	15.7165 mV	13.9995 mV	13.5405 mV	12.852 mV
5.0 V	15.861 mV	16.0055 mV	16.66 mV	15.4275 mV	14.926 mV	14.1525 mV

MSO/DPO72004C MSO/ DPO71604C MSO/ DPO71254C	9 GHz	8 GHz	7GHz	6 GHz	5 GHz	4 GHz
Gain Setting, full scale						
100 mV	0.391 mV	0.3825 mV	0.387 mV	0.36 mV	0.333 mV	0.306 mV
150 mV	0.5355 mV	0.51 mV	0.513 mV	0.486 mV	0.459 mV	0.432 mV
200 mV	0.6035 mV	0.5695 mV	0.5355 mV	0.51 mV	0.4845 mV	0.4505 mV
300 mV	0.8755 mV	0.8415mV	0.8075 mV	0.7565mV	0.714 mV	0.6545 mV
400 mV	1.1305 mV	1.0795 mV	1.003 mV	0.935 mV	0.901 mV	0.833 mV
500 mV	1.3345 mV	1.258 mV	1.1985 mV	1.1135 mV	1.037 mV	0.935 mV
600 mV	1.6065 mV	1.5215 mV	1.4535 mV	1.36 mV	1.2665 mV	1.1475 mV
700 mV	1.8785 mV	1.7935 mV	1.7085 mV	1.598 mV	1.496 mV	1.3515 mV
800 mV	2.2185 mV	2.1165 mV	2.0145 mV	1.9125 mV	1.768 mV	1.666 mV
900 mV	2.431 mV	2.329 mV	2.2185 mV	2.0825mV	1.9465mV	1.768 mV
1.0 V	2.431 mV	2.329 mV	2.2185 mV	2.0825mV	1.9465mV	1.768 mV
2.0 V	5.5675 mV	5.3805 mV	5.049 mV	4.6835 mV	4.488 mV	4.165 mV
2.5 V	6.732 mV	6.4855 mV	6.12 mV	5.678 mV	5.389 mV	4.9555 mV
3.0 V	7.905 mV	7.5905 mV	7.191 mV	6.664 mV	6.29 mV	5.7545 mV
4.0 V	11.0585mV	10.54 mV	10.0385 mV	9.4095 mV	8.8145 mV	8.0835 mV
4.5 V	12.325 mV	11.73 mV	11.1945 mV	10.489 mV	9.8005 mV	8.959 mV

Table continued…

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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MSO/DPO72004C MSO/ DPO71604C MSO/ DPO71254C	9 GHz	8 GHz	7GHz	6 GHz	5 GHz	4 GHz
5.0 V	13.583 mV	12.92 mV	12.3505 mV	11.5685 mV	10.778 mV	9.8345 mV

MSO/DPO72004C MSO/ DPO71604C MSO/DPO71254C	3 GHz	2 GHz	1GHz	500 MHz
Gain Setting, full scale				
100 mV	0.279 mV	0.234 mV	0.18 mV	0.153 mV
150 mV	0.396 mV	0.351 mV	0.306 mV	0.243 mV
200 mV	0.408 mV	0.374 mV	0.3145 mV	0.2635 mV
300 mV	0.5865 mV	0.5185mV	0.442 mV	0.374 mV
400 mV	0.748 mV	0.663 mV	0.561 mV	0.4845 mV
500 mV	0.8755 mV	0.7735 mV	0.646 mV	0.578 mV
600 mV	1.054 mV	0.9265 mV	0.7735 mV	0.697 mV
700 mV	1.2325 mV	1.0795 mV	0.901 mV	0.8075 mV
800 mV	1.496 mV	1.2835 mV	1.037 mV	0.935 mV
900 mV	1.598 mV	1.3855mV	1.1475 mV	1.037 mV
1.0 V	1.598 mV	1.3855mV	1.1475 mV	1.037 mV
2.0 V	3.7655 mV	3.502 mV	2.907 mV	2.448 mV
2.5 V	4.5305 mV	4.1395 mV	3.4595 mV	2.9665 mV
3.0 V	5.287 mV	4.7855 mV	4.012 mV	3.485 mV
4.0 V	7.5055 mV	6.681 mV	5.6355 mV	4.981 mV
4.5 V	8.3385 mV	7.738 mV	6.239 mV	5.5505 mV
5.0 V	9.18 mV	8.0835 mV	6.851 mV	6.12 mV

Noise, typical, DPO7000C models

DPO7354C Enhanced bandwidth

40 GS/s						
Step gain	3.5 GHz	3.0 GHz	2.5 GHz	2.0 GHz	1.0 GHz	0.5 GHz
500 mV/div	23.5 mV	20.2 mV	18.9 mV	16.5 mV	12.2 mV	9.7 mV
200 mV/div	10.9 mV	9.2 mV	8.1 mV	7.05 mV	5.3 mV	4.1 mV
100 mV/div	6.6 mV	5.4 mV	4.9 mV	4.2 mV	3.05 mV	2.35 mV
50 mV/div	2.35 mV	2.1 mV	1.9 mV	1.7 mV	1.3 mV	1.0 mV
20 mV/div	1.03 mV	0.89 mV	0.811 mV	0.72 mV	0.53 mV	0.43 mV
10 mV/div	0.61 mV	0.55 mV	0.47 mV	0.42 mV	0.3 mV	0.23 mV
5 mV/div	0.41 mV	0.415 mV	0.41 mV	0.4 mV	0.21 mV	0.16 mV
2 mV/div	0.19 mV	0.19 mV	0.19 mV	0.19 mV	0.185 mV	0.185 mV
Table continued…						

40 GS/s						
Step gain	**3.5 GHz**	**3.0 GHz**	**2.5 GHz**	**2.0 GHz**	**1.0 GHz**	**0.5 GHz**
1 mV/div	0.12 mV	0.12 mV	0.12 mV	0.12 mV	0.12 mV	0.12 mV

20 GS/s						
Step gain	**3.5 GHz**	**3.0 GHz**	**2.5 GHz**	**2.0 GHz**	**1.0 GHz**	**0.5 GHz**
500 mV/div	24.3 mV	21.6 mV	19.1 mV	16.7 mV	12.4 mV	9.9 mV
200 mV/div	11.1 mV	9.3 mV	8.4 mV	7.1 mV	5.35 mV	4.2 mV
100 mV/div	6.65 mV	5.5 mV	4.95 mV	4.25 mV	3.1 mV	2.4 mV
50 mV/div	2.45 mV	2.2 mV	1.95 mV	1.8 mV	1.35 mV	1.1 mV
20 mV/div	1.055 mV	0.93 mV	0.83 mV	0.75 mV	0.55 mV	0.435 mV
10 mV/div	0.625 mV	0.55 mV	0.475 mV	0.425 mV	0.31 mV	0.24 mV
5 mV/div	0.415 mV	0.415 mV	0.415 mV	0.415 mV	0.215 mV	0.16 mV
2 mV/div	0.19 mV	0.19 mV	0.19 mV	0.19 mV	0.185 mV	0.185 mV
1 mV/div	0.12 mV	0.12 mV	0.12 mV	0.12 mV	0.12 mV	0.12 mV

10 GS/s						
Step gain	**3.5 GHz**	**3.0 GHz**	**2.5 GHz**	**2.0 GHz**	**1.0 GHz**	**0.5 GHz**
500 mV/div	25.8 mV	22.2 mV	20.0 mV	17.7 mV	13.2 mV	10.4 mV
200 mV/div	11.7 mV	9.9 mV	8.7 mV	7.5 mV	5.5 mV	4.3 mV
100 mV/div	6.9 mV	5.6 mV	5.0 mV	4.3 mV	3.2 mV	2.4 mV
50 mV/div	2.6 mV	2.3 mV	2.05 mV	1.85 mV	1.4 mV	1.15 mV
20 mV/div	1.11 mV	0.99 mV	0.87 mV	0.77 mV	0.58 mV	0.45 mV
10 mV/div	0.65 mV	0.55 mV	0.49 mV	0.43 mV	0.32 mV	0.25 mV
5 mV/div	0.415 mV	0.42 mV	0.42 mV	0.42 mV	0.22 mV	0.16 mV
2 mV/div	0.19 mV	0.19 mV	0.19 mV	0.19 mV	0.185 mV	0.185 mV
1 mV/div	0.12 mV	0.12 mV	0.12 mV	0.12 mV	0.12 mV	0.12 mV

DPO7354C Without enhanced bandwidth

40 GS/s				
Step gain	**2.5 GHz**	**0.5 GHz**	**0.25 GHz**	**0.02 GHz**
500 mV/div	23.5 mV	16.3 mV	14.5 mV	14.0 mV
200 mV/div	10.7 mV	6.9 mV	6.1 mV	5.8 mV
100 mV/div	6.3 mV	3.8 mV	3.2 mV	3.0 mV
50 mV/div	2.4 mV	1.75 mV	1.6 mV	1.5 mV
20 mV/div	1.07 mV	0.7 mV	0.63 mV	0.595 mV
10 mV/div	0.61 mV	0.38 mV	0.32 mV	0.3 mV
5 mV/div	0.41 mV	0.24 mV	0.18 mV	0.151 mV
2 mV/div	0.19 mV	0.18 mV	0.115 mV	0.065 mV

Table continued…

40 GS/s				
Step gain	2.5 GHz	0.5 GHz	0.25 GHz	0.02 GHz
1 mV/div	0.12 mV	0.12 mV	0.115 mV	0.045 mV

20 GS/s				
Step gain	2.5 GHz	0.5 GHz	0.25 GHz	0.02 GHz
500 mV/div	23.0 mV	16.3 mV	14.5 mV	14.0 mV
200 mV/div	10.5 mV	6.9 mV	6.1 mV	5.8 mV
100 mV/div	6.25 mV	3.8 mV	3.2 mV	3.0 mV
50 mV/div	2.4 mV	1.75 mV	1.6 mV	1.5 mV
20 mV/div	1.04 mV	0.7 mV	0.63 mV	0.595 mV
10 mV/div	0.605 mV	0.38 mV	0.32 mV	0.3 mV
5 mV/div	0.4 mV	0.24 mV	0.18 mV	0.151 mV
2 mV/div	0.19 mV	0.18 mV	0.115 mV	0.065 mV
1 mV/div	0.12 mV	0.12 mV	0.115 mV	0.045 mV

10 GS/s				
Step gain	2.5 GHz	0.5 GHz	0.25 GHz	0.02 GHz
500 mV/div	22.8 mV	16.3 mV	14.5 mV	14.0 mV
200 mV/div	10.4 mV	6.9 mV	6.1 mV	5.8 mV
100 mV/div	6.15 mV	3.8 mV	3.2 mV	3.0 mV
50 mV/div	2.4 mV	1.75 mV	1.6 mV	1.5 mV
20 mV/div	1.035 mV	0.7 mV	0.63 mV	0.595 mV
10 mV/div	0.59 mV	0.38 mV	0.32 mV	0.3 mV
5 mV/div	0.395 mV	0.24 mV	0.18 mV	0.151 mV
2 mV/div	0.19 mV	0.18 mV	0.115 mV	0.065 mV
1 mV/div	0.12 mV	0.12 mV	0.115 mV	0.045 mV

DPO7254C Enhanced bandwidth

40 GS/s				
Step gain	2.5 GHz	2.0 GHz	1.0 GHz	0.5 GHz
500 mV/div	19.7 mV	16.2 mV	12.1 mV	9.9 mV
200 mV/div	8.71 mV	6.97 mV	4.97 mV	4.0 mV
100 mV/div	5.23 mV	4.25 mV	2.97 mV	2.36 mV
50 mV/div	2.0 mV	1.64 mV	1.23 mV	1.03 mV
20 mV/div	0.866 mV	0.707 mV	0.528 mV	0.431 mV
10 mV/div	0.523 mV	0.425 mV	0.297 mV	0.236 mV
5 mV/div	0.343 mV	0.349 mV	0.21 mV	0.154 mV
2 mV/div	0.135 mV	0.135 mV	0.135 mV	0.135 mV

Table continued…

40 GS/s				
Step gain	2.5 GHz	2.0 GHz	1.0 GHz	0.5 GHz
1 mV/div	0.095 mV	0.095 mV	0.095 mV	0.095 mV

20 GS/s				
Step gain	2.5 GHz	2.0 GHz	1.0 GHz	0.5 GHz
500 mV/div	19.5 mV	16.1 mV	12.0 mV	9.8 mV
200 mV/div	8.7 mV	7.05 mV	5.1 mV	4.0 mV
100 mV/div	5.15 mV	4.2 mV	2.95 mV	2.35 mV
50 mV/div	2.0 mV	1.65 mV	1.25 mV	1.05 mV
20 mV/div	0.855 mV	0.71 mV	0.52 mV	0.425 mV
10 mV/div	0.515 mV	0.42 mV	0.295 mV	0.235 mV
5 mV/div	0.34 mV	0.345 mV	0.21 mV	0.155 mV
2 mV/div	0.135 mV	0.135 mV	0.135 mV	0.135 mV
1 mV/div	0.095 mV	0.095 mV	0.095 mV	0.095 mV

10 GS/s				
Step gain	2.5 GHz	2.0 GHz	1.0 GHz	0.5 GHz
500 mV/div	20.2 mV	16.7 mV	12.5 mV	10.3 mV
200 mV/div	8.9 mV	7.3 mV	5.3 mV	4.16 mV
100 mV/div	5.3 mV	4.3 mV	3.05 mV	2.4 mV
50 mV/div	2.1 mV	1.7 mV	1.3 mV	1.1 mV
20 mV/div	0.88 mV	0.74 mV	0.55 mV	0.435 mV
10 mV/div	0.52 mV	0.43 mV	0.3 mV	0.24 mV
5 mV/div	0.345 mV	0.33 mV	0.21 mV	0.155 mV
2 mV/div	0.135 mV	0.135 mV	0.135 mV	0.135 mV
1 mV/div	0.095 mV	0.095 mV	0.095 mV	0.095 mV

DPO7254C Without enhanced bandwidth

40 GS/s				
Step gain	2.5 GHz	0.5 GHz	0.25 GHz	0.02 GHz
500 mV/div	22.7 mV	16.4 mV	15.0 mV	14.5 mV
200 mV/div	9.84 mV	6.97 mV	6.2 mV	5.8 mV
100 mV/div	5.89 mV	3.74 mV	3.2 mV	2.9 mV
50 mV/div	2.31 mV	1.69 mV	1.55 mV	1.45 mV
20 mV/div	0.964 mV	0.697 mV	0.63 mV	0.59 mV
10 mV/div	0.574 mV	0.379 mV	0.325 mV	0.295 mV
5 mV/div	0.4 mV	0.231 mV	0.175 mV	0.145 mV
2 mV/div	0.19 mV	0.195 mV	0.12 mV	0.065 mV

Table continued…

40 GS/s				
Step gain	2.5 GHz	0.5 GHz	0.25 GHz	0.02 GHz
1 mV/div	0.12 mV	0.12 mV	0.12 mV	0.045 mV

20 GS/s				
Step gain	2.5 GHz	0.5 GHz	0.25 GHz	0.02 GHz
500 mV/div	21.8 mV	16.0 mV	15.0 mV	14.5 mV
200 mV/div	9.6 mV	6.8 mV	6.2 mV	5.8 mV
100 mV/div	5.7 mV	3.65 mV	3.2 mV	2.9 mV
50 mV/div	2.25 mV	1.65 mV	1.55 mV	1.45 mV
20 mV/div	0.94 mV	0.68 mV	0.63 mV	0.49 mV
10 mV/div	0.56 mV	0.37 mV	0.325 mV	0.295 mV
5 mV/div	0.38 mV	0.225 mV	0.175 mV	0.145 mV
2 mV/div	0.19 mV	0.195 mV	0.12 mV	0.065 mV
1 mV/div	0.12 mV	0.12 mV	0.12 mV	0.045 mV

10 GS/s				
Step gain	2.5 GHz	0.5 GHz	0.25 GHz	0.02 GHz
500 mV/div	21.8 mV	16.0 mV	15.0 mV	15.5 mV
200 mV/div	9.6 mV	6.8 mV	6.2 mV	5.8 mV
100 mV/div	5.65 mV	3.65 mV	3.2 mV	2.9 mV
50 mV/div	2.2 mV	1.65 mV	1.55 mV	1.45 mV
20 mV/div	0.94 mV	0.68 mV	0.63 mV	0.59 mV
10 mV/div	0.56 mV	0.37 mV	0.325 mV	0.295 mV
5 mV/div	0.37 mV	0.225 mV	0.175 mV	0.145 mV
2 mV/div	0.19 mV	0.195 mV	0.12 mV	0.065 mV
1 mV/div	0.12 mV	0.12 mV	0.12 mV	0.045 mV

DPO7104C Enhanced bandwidth

20 GS/s		
Step gain	1.0 GHz	0.5 GHz
500 mV/div	13.2 mV	9.7 mV
200 mV/div	5.57 mV	3.93 mV
100 mV/div	3.27 mV	2.24 mV
50 mV/div	1.36 mV	0.98 mV
20 mV/div	0.574 mV	0.408 mV
10 mV/div	0.328 mV	0.232 mV
5 mV/div	0.229 mV	0.16 mV
2 mV/div	0.135 mV	0.135 mV

Table continued…

20 GS/s		
Step gain	1.0 GHz	0.5 GHz
1 mV/div	0.095 mV	0.095 mV

10 GS/s		
Step gain	1.0 GHz	0.5 GHz
500 mV/div	14.7 mV	10.3 mV
200 mV/div	6.09 mV	4.34 mV
100 mV/div	3.55 mV	2.38 mV
50 mV/div	1.53 mV	1.05 mV
20 mV/div	0.625 mV	0.441 mV
10 mV/div	0.350 mV	0.24 mV
5 mV/div	0.236 mV	0.16 mV
2 mV/div	0.135 mV	0.135 mV
1 mV/div	0.095 mV	0.095 mV

5 GS/s		
Step gain	1.0 GHz	0.5 GHz
500 mV/div	15.9 mV	10.7 mV
200 mV/div	6.71 mV	4.48 mV
100 mV/div	3.74 mV	2.46 mV
50 mV/div	1.68 mV	1.1 mV
20 mV/div	0.682 mV	0.454 mV
10 mV/div	0.378 mV	0.247 mV
5 mV/div	0.241 mV	0.16 mV
2 mV/div	0.135 mV	0.135 mV
1 mV/div	0.095 mV	0.095 mV

DPO7104C Without enhanced bandwidth

20 GS/s				
Step gain	1.0 GHz	0.5 GHz	0.025 GHz	0.02 GHz
500 mV/div	16.2 mV	15.2 mV	14.0 mV	13.3 mV
200 mV/div	6.8 mV	6.3 mV	5.7 mV	5.3 mV
100 mV/div	3.7 mV	3.4 mV	3.0 mV	2.8 mV
50 mV/div	1.7 mV	1.6 mV	1.45 mV	1.4 mV
20 mV/div	0.7 mV	0.64 mV	0.58 mV	0.55 mV
10 mV/div	0.38 mV	0.35 mV	0.3 mV	0.285 mV
5 mV/div	0.25 mV	0.21 mV	0.17 mV	0.14 mV
2 mV/div	0.15 mV	0.15 mV	0.1 mV	0.065 mV

Table continued…

20 GS/s				
Step gain	1.0 GHz	0.5 GHz	0.025 GHz	0.02 GHz
1 mV/div	0.11 mV	0.11 mV	0.11 mV	0.04 mV

10 GS/s				
Step gain	1.0 GHz	0.5 GHz	0.025 GHz	0.02 GHz
500 mV/div	16.2 mV	15.2 mV	14.0 mV	13.3 mV
200 mV/div	6.8 mV	6.3 mV	5.7 mV	5.3 mV
100 mV/div	3.7 mV	3.4 mV	3.0 mV	2.8 mV
50 mV/div	1.7 mV	1.6 mV	1.45 mV	1.4 mV
20 mV/div	0.7 mV	0.64 mV	0.58 mV	0.55 mV
10 mV/div	0.38 mV	0.35 mV	0.3 mV	0.285 mV
5 mV/div	0.25 mV	0.21 mV	0.17 mV	0.14 mV
2 mV/div	0.15 mV	0.15 mV	0.1 mV	0.065 mV
1 mV/div	0.11 mV	0.11 mV	0.11 mV	0.04 mV

5 GS/s				
Step gain	1.0 GHz	0.5 GHz	0.025 GHz	0.02 GHz
500 mV/div	16.2 mV	16.2 mV	14.0 mV	13.3 mV
200 mV/div	6.8 mV	6.3 mV	5.7 mV	5.3 mV
100 mV/div	3.7 mV	3.4 mV	3.0 mV	2.8 mV
50 mV/div	1.7 mV	1.6 mV	1.45 mV	1.4 mV
20 mV/div	0.7 mV	0.64 mV	0.58 mV	0.550 mV
10 mV/div	0.38 mV	0.35 mV	0.3 mV	0.285 mV
5 mV/div	0.25 mV	0.21 mV	0.17 mV	0.14 mV
2 mV/div	0.15 mV	0.15 mV	0.1 mV	0.065 mV
1 mV/div	0.11 mV	0.11 mV	0.11 mV	0.04 mV

DPO7054C Enhanced bandwidth

10 GS/s	
Step gain	0.5 GHz
500 mV/div	11.9 mV
200 mV/div	5.0 mV
100 mV/div	2.75 mV
50 mV/div	1.2 mV
20 mV/div	0.5 mV
10 mV/div	0.28 mV
5 mV/div	0.185 mV
2 mV/div	0.11 mV

Table continued…

10 GS/s	
Step gain	0.5 GHz
1 mV/div	0.09 mV

5 GS/s	
Step gain	0.5 GHz
500 mV/div	13.0 mV
200 mV/div	5.35 mV
100 mV/div	2.95 mV
50 mV/div	1.35 mV
20 mV/div	0.54 mV
10 mV/div	0.3 mV
5 mV/div	0.19 mV
2 mV/div	0.11 mV
1 mV/div	0.09 mV

2.5 GS/s	
Step gain	0.5 GHz
500 mV/div	15.0 mV
200 mV/div	6.2 mV
100 mV/div	3.35 mV
50 mV/div	1.56 mV
20 mV/div	0.63 mV
10 mV/div	0.375 mV
5 mV/div	0.205 mV
2 mV/div	0.11 mV
1 mV/div	0.09 mV

DPO7054C Without enhanced bandwidth

10 GS/s			
Step gain	0.5 GHz	0.025 GHz	0.02 GHz
500 mV/div	15.1 mV	14.0 mV	13.2 mV
200 mV/div	6.35 mV	5.7 mV	5.4 mV
100 mV/div	3.4 mV	2.95 mV	2.75 mV
50 mV/div	1.6 mV	1.45 mV	1.38 mV
20 mV/div	0.645 mV	0.58 mV	0.55 mV
10 mV/div	0.34 mV	0.3 mV	0.277 mV
5 mV/div	0.21 mV	0.165 mV	0.141 mV
2 mV/div	0.13 mV	0.1 mV	0.062 mV

Table continued…

10 GS/s			
Step gain	0.5 GHz	0.025 GHz	0.02 GHz
1 mV/div	0.096 mV	0.097 mV	0.04 mV

5 GS/s			
Step gain	0.5 GHz	0.025GHz	0.02 GHz
500 mV/div	15.1 mV	14.0 mV	13.2 mV
200 mV/div	6.35 mV	5.7 mV	5.4 mV
100 mV/div	3.4 mV	2.95 mV	2.75 mV
50 mV/div	1.6 mV	1.45 mV	1.38 mV
20 mV/div	0.645 mV	0.58 mV	0.55 mV
10 mV/div	0.34 mV	0.3 mV	0.277 mV
5 mV/div	0.21 mV	0.165 mV	0.141 mV
2 mV/div	0.13 mV	0.1 mV	0.062 mV
1 mV/div	0.096 mV	0.097 mV	0.04 mV

2.5 GS/s			
Step gain	0.5 GHz	0.025GHz	0.02 GHz
500 mV/div	15.1 mV	14.0 mV	13.2 mV
200 mV/div	6.35 mV	5.7 mV	5.4 mV
100 mV/div	3.4 mV	2.95 mV	2.75 mV
50 mV/div	1.6 mV	1.45 mV	1.38 mV
20 mV/div	0.645 mV	0.58 mV	0.55 mV
10 mV/div	0.34 mV	0.3 mV	0.277 mV
5 mV/div	0.21 mV	0.165 mV	0.141 mV
2 mV/div	0.13 mV	0.1 mV	0.062 mV
1 mV/div	0.096 mV	0.097 mV	0.04 mV

Channel-to-channel crosstalk (channel isolation)

MSO/DPO70000DX models, typical Input frequency range (up to the rated bandwidth). Assumes two channels with the same scale and bandwidth settings.

0 to 9 GHz	≥ 120:1 isolation
>9 to 12 GHz	≥ 80:1 isolation
>12 to 15 GHz	≥ 50:1 isolation
>15 to 20 GHz	≥ 25:1 isolation
>20 to 33 GHz	≥ 20:1 isolation

MSO/DPO70000C models, typical	Input frequency range (up to the rated bandwidth). Assumes two channels with the same scale and bandwidth settings.

0 to 10 GHz	≥ 120:1 isolation
>10 GHz to 12 GHz	≥ 80:1 isolation
>12 GHz to 15 GHz	≥ 50:1 isolation
>15 GHz to 20 GHz	≥ 25:1 isolation

DPO7000C models, typical	RMS voltage ratio of ≥ 100:1 at ≤ 100 MHz and ≥ 30:1 at > 100 MHz up to 2.5 GHz, and ≥20:1 above 2.5 GHz

Delay between channels, BWE, typical

MSO/DPO70000DX models	≤ 1 ps between any two channels at any gain setting at 25 °C ±5 °C. Derate linearly to ≤ 3 ps at 5 °C and 45 °C.

Delay between channels, full bandwidth, equivalent time, typical

MSO/DPO70000DX models	≤ 3 ps between any two channels at any gain setting at 25 °C.
	≤ 10 ps for any two channels at any gain setting over temperature.
MSO/DPO70000C models	≤ 10 ps between any two channels with equal volts/div and coupling settings.
	≤ 10 ps delay change when enabling and disabling Channel Equalization (DSP matching).

Delay between channels, typical DPO7000C models	≤ 100 ps between any two channels with the same scale and coupling settings with input impedance set to 50 Ω, DC coupling and scale set at or above 10 mV/div.
Internal probe power DPO7000C models	50 W maximum

Probe power per probe, DPO7000C models	

Voltage	Maximum Amperage	Voltage Tolerance
5 V	50 mA	± 5%
12 V	1 A	±10%

Horizontal and acquisition system

Real-time sample rate range

	Number of channels acquired	Sample rate, maximum	
		(Standard)	(Option 2SR)
MSO/DPO70804C MSO/DPO70604C MSO/DPO70404C	All channels	Up to 25 GS/s	
Table continued…			

	Number of channels acquired	Sample rate, maximum	
		(Standard)	(Option 2SR)
MSO/DPO73304DX	All channels	Up to 50 GS/s	
MSO/DPO72504DX	Two channels	Up to 100 GS	
MSO/DPO72304DX			
MSO/DPO72004DX			
MSO/DPO71604DX			
MSO/DPO71254DX			
MSO/DPO70804DX			
MSO/DPO72004C			
MSO/DPO71604C			
MSO/DPO71254C			
DPO7354C and DPO7254C	1	40 GS/s	
	2	20 GS/s	
	3 or 4	10 GS/s	
DPO7104C	1	20 GS/s	40 GS/s
	2	10 GS/s	20 GS/s
	3 or 4	5 GS/s	10 GS/s
DPO7054C	1	20 GS/s	
	2	10 GS/s	
	3 or 4	5 GS/s	

Equivalent-time sample rate or interpolated waveform rate range

Equivalent-time acquisition can be enabled or disabled. When disabled, waveforms are interpolated at the fastest time base settings.

MSO/DPO70000C/DX models   Up to 5 TS/s and 0.2 ps trigger placement resolution

DPO7000C models   Up to 4 TS/s

Maximum record length, sample mode, MSO/ DPO70000C/DX GHz models

The maximum record length depends on the installed record length options. Maximum record length is less in serial trigger mode, hi-res mode, or when using the FIR filter.

Option 2XL installed (standard on DPO70000C Series)	31,250,000 points
Option 5XL installed (standard on MSO70000DX Series)	62,500,000 points (all channels)
Option 10XL installed	125,000,000 points (all channels)
Option 20XL installed	250,000,000 points (all channels)

Table continued…

Option 50XL installed (DX models only)	500,000,000 points (all channels), 1 G on 1–2 channels at 50 GS/s and 100 GS/s sample rates or greater (interpolated or equivalent time)

Maximum record length, sample mode DPO7000C models

The maximum record length depends on the number of active channels and the record length options installed. Maximum record length is less in serial trigger mode, hi-res mode or when using the FIR filter.

Standard, DPO7354C and DPO7254C

10 GS/s	12,500,000 points (3 or 4 channels)
20 GS/s or less	25,000,000 points (2 channels)
40 GS/s or less	50,000,000 points (1 channel)

DPO7104C

5 GS/s	12,500,000 points (3 or 4 channels)
10 GS/s or less	25,000,000 points (2 channels)
20 GS/s or less	50,000,000 points (1 channel)

DPO7054C

2.5 GS/s	12,500,000 points (3 or 4 channels)
5 GS/s or less	25,000,000 points (2 channels)
10 GS/s or less	50,000,000 points (1 channel)

Option 2RL installed, DPO7354C and DPO7254C

10 GS/s	25,000,000 points (3 or 4 channels)
20 GS/s or less	50,000,000 points (2 channels only)
40 GS/s or less	125,000,000 points (1 channel only)

DPO7104C

5 GS/s	25,000,000 points (3 or 4 channels)
10 GS/s or less	50,000,000 points (2 channels only)
20 GS/s or less	125,000,000 points (1 channel only)

DPO7054C

2.5 GS/s	25,000,000 points (3 or 4 channels)
5 GS/s or less	50,000,000 points (2 channels only)
10 GS/s or less	125,000,000 points (1 channel only)

**Option 5RL installed,
DPO7354C and DPO7254C**

10 GS/s	50,000,000 points (3 or 4 channels)
20 GS/s or less	125,000,000 points (2 channels only)
40 GS/s or less	250,000,000 points (1 channel only)

DPO7104C

5 GS/s	50,000,000 points (3 or 4 channels)
10 GS/s or less	125,000,000 points (2 channels only)
20 GS/s or less	250,000,000 points (1 channel only)

DPO7054C

2.5 GS/s	50,000,000 points (3 or 4 channels)
5 GS/s or less	125,000,000 points (2 channels only)
10 GS/s or less	250,000,000 points (1 channel only)

**Option 10RL installed,
DPO7354C and DPO7254C**

10 GS/s	125,000,000 points (3 or 4 channels)
20 GS/s or less	250,000,000 points (2 channels only)
40 GS/s or less	500,000,000 points (1 channel only)

Maximum record length, HiRes mode Half the record length of sample mode

Seconds division range

MSO/DPO70000C/DX GHz models, Fastest sweep speed is 20 ps per division

DPO7000C models

DPO7354C, DPO7254C	Record Length						
Horizontal mode	1 K	10 K	100 K	1 M	10 M	100 M	400/500 M
Automatic	25 ps - 20 s	250 ps - 200 s	2.5 ns - 1ks	50 ns - 1 ks	500 ns - 1 ks	5 us - 1 ks	5 us - 1 ks
Constant SR	25 ps - 20 s	250 ps - 200 s	2.5 ns - 1ks	50 ns - 1 ks	500 ns - 1 ks	5 us - 1 ks	10 us - 1 ks
Manual	25 ps - 40 s	250 ps - 400 s	2.5 ns - 4ks	25 ns - 40 ks	250 ns - 400 ks	2.5 us - 4 Ms	12.5 us - 8.19 Ms

DPO7104C, DPO7054C	Record Length						
Horizontal mode	**1 K**	**10 K**	**100 K**	**1 M**	**10 M**	**100 M**	**200/250 M**
Automatic	25 ps - 20 s	250 ps - 200 s	2.5 ns - 1ks	50 ns - 1 ks	500 ns - 1 ks	5 us - 1 ks	5 us - 1 ks
Constant SR	25 ps - 20 s	250 ps - 200 s	2.5 ns - 1ks	50 ns - 1 ks	500 ns - 1 ks	5 us - 1 ks	10 us - 1 ks
Manual	25 ps - 40 s	250 ps - 400 s	2.5 ns - 4ks	25 ns - 40 ks	250 ns - 400 ks	2.5 us - 4Ms	5 us - 8 Ms

Acquisition update rate, typical

MSO/DPO70000C/DX GHz models   Fast Acquisition on: 300,000 waveforms per second maximum

DPO7000C models   Fast Acquisition on: 250,000 waveforms per second maximum

Time base delay time range   5 ns to 250 s

Internal time-base reference frequency   10 MHz

Electronically adjustable over about ±5 ppm.

✔ Long term sample rate accuracy

MSO/DPO70000C/DX GHz models   ± 1.5 ppm initial accuracy. Aging < 1 ppm per year. Applies only when using the internal reference.

DPO7000C models   ± 2.5 ppm initial accuracy. Aging < 1 ppm per year. Applies only when using the internal reference.

Timing jitter (aperture uncertainty), typical

MSO/DPO70000DX models   Measured at the maximum sample rate.

External Reference Low with ~0 dBm input drive at 10 MHz

<250 fs rms for record durations less than 10 µs

<350 fs rms for record durations less than 100 µs

<400 fs rms for record durations less than 10 ms

<600 fs rms for record durations less than 10 s

External Reference Hi with ~0 dBm input drive at 10 MHz

<250 fs rms for record durations less than 2 µs

<700 fs rms for record durations less than 10 s

For external reference in high (tracking) mode, the input reference must be low noise and the

edge slew rate must exceed 1.5 V/ns to achieve the typical jitter results.

Internal Reference

<250 fs rms for record durations less than 10 µs

<350 fs rms for record durations less than 100 µs

<400 fs rms for record durations less than 5 ms

In high (tracking) mode, the input reference must be low noise and the edge slew rate must

exceed 1.5 V/ns.

For internal reference, specification assumes no signal attached to the external reference input.

MSO/DPO70000C models	**Measured at the maximum BWE enabled bandwidth.**

Total:

<250 fs rms for record durations less than 10 µs

<350 fs rms for record durations less than 100 µs

<650 fs rms for record durations less than 1 ms

<15 parts/trillion for record durations less than 60 s

<2 ps peak-to-peak for record durations less than 10 µs

<3 ps peak-to-peak for record durations less than 100 µs

<4 ps peak-to-peak for record durations less than 1 ms

This assumes either internal reference, or external reference in low (stable) mode. For external reference in high (tracking) mode, the input reference must be low noise, and the edge slew rate must exceed 1.5 V/ns to achieve the above approximate jitter results. For the general case, external reference in high (tracking) mode, the specification is:

<250 fs rms for record durations less than 2 µs

You can approach the performance of internal reference using a clean reference signal with input slew rate exceeding 1.5 V/ns. This is most easily achieved either with a square wave meeting that slew rate or using a 100 MHz sine wave (≈2 Vp-p). This is required for the best possible performance in synchronous sampling applications.

DPO7000C models   Total:

<1 ps rms for record durations less than 10 µs.

<2.5 ps rms for record durations less than 30 ms.

<65 parts/trillion for record durations less than 10 s.

Jitter noise floor, typical

Applies to time periods as long as 10.0 µs. Typical jitter noise floor is measured at the maximum, BWE enabled bandwidth:

MSO/DPO70000DX models   Calculate the jitter noise floor (JNF) for a given instrument setting using the following formula:

N_{typ} = typical input-referred noise spec (volts rms)

FN = 1.3 for instrument bandwidth ≤9 GHz; 1.5 for instrument bandwidth ≥10 GHz

SR = slew rate around the measurement

FI = $(1.7 \times 10{-2})/\sqrt{2} = 1.2 \times 10{-2}$

t_r = rise time of the measurement edge

t_j = timebase jitter or aperture uncertainty

$$JNF_{rms} = \sqrt{\left(N_{typ} \times F_N\right)^2 \times \left[\left(\frac{1}{SR}\right)^2\right] + F_I^2 \times t_r^2 + \left(t_j\right)^2}$$

The interpolated sample rate of the waveform must be at least 25 times the bandwidth of the signal being measured.

MSO/DPO70000C models   Calculate the jitter noise floor (JNF) for a given instrument setting using the following formula:

FS = full-scale setting (volts)

A = signal amplitude as a fraction of full-scale

trm = 10 - 90% displayed (or measured) rise time (seconds)

N = input-referred noise (volts rms)

tj = short term timing jitter (seconds rms)

Timebase stability (sample rate jitter or jitter noise floor), typical

Total:

DPO7000C models   <1.0 ps rms for record durations less than 10 µs

<2.5 ps rms for record durations less than 30 ms

<65 parts/trillion for record durations less than 10 s

Timebase jitter with external reference, typical, MSO/ DPO70000C/DX GHz models   ≤3 ps$_{RMS}$ at 100 ms delay

✓ Delta time measurement accuracy for MSO/DPO70000DX models

The formula to calculate the maximum delta-time measurement accuracy (DTAmax) for a given instrument setting and input signal is given below (assumes insignificant signal content above Nyquist and insignificant error due to aliasing, overdrive recovery and overdrive interpolation):

N_{typ} = typical input-referred noise spec (volts rms)

F_N = 1.3 for instrument bandwidth ≤9 GHz; 1.5 for instrument bandwidth ≥10 GHz

SR_1 = slew rate around 1st point in measurement (1st edge)

SR_2 = slew rate around 2nd point in measurement (2nd edge)

TBA = timebase accuracy (2 ppm)

F_I = 1.2 × 10–2

$t^r{}_1$ = rise time of first edge

$t^r{}_2$ = rise time of second edge

t_j = sample jitter/aperture uncertainty (about 250 fs for time durations less than 10 µs)

$t_{reading}$ = delta-time measurement (seconds)

Peak-peak based on statistical accumulation of 1000 waveforms.

RMS is guaranteed regardless of data-gathering duration.

The term under the square-root sign is the stability and is due to time interval error (TIE). The errors due to this term occur throughout a single-shot measurement. The second term is due to both the absolute center-frequency accuracy and the center-frequency stability of the timebase and varies between multiple single-shot measurements over the observation interval (the amount of time from the first single-shot measurement to the final single-shot measurement). The observation interval may not exceed 1 year.

Test at maximum bandwidth.

Test at 62.5 mVFS, 50 mVFS, 100 mVFS.

MSO/DPO73304DX at 100 GS/s, BWE on	6.25 mV/div, <10 ns measurement interval, 19.5 GHz, amplitude = 80% FS, 0.729 ps rms, 7.29 ps$_{pk-pk}$
	50 mV/div, <10 ns measurement interval, 19.5 GHz, amplitude = 80% FS, 0.536 ps rms, 5.36 ps$_{pk-pk}$
	100 mV/div, <10 ns measurement interval, 19.5 GHz, amplitude = 80% FS, 0.529 ps rms, 5.29 ps$_{pk-pk}$
MSO/DPO72504DX at 100 GS/s, BWE on	6.25 mV/div, <10 ns measurement interval, 15.5 GHz, amplitude = 80% FS, 0.861 ps rms, 8.61 ps$_{pk-pk}$
	50 mV/div, <10 ns measurement interval, 15.5 GHz, amplitude = 80% FS, 0.604 ps rms, 6.04 ps$_{pk-pk}$
	100 mV/div, <10 ns measurement interval, 15.5 GHz, amplitude = 80% FS, 0.604 ps rms, 6.04 ps$_{pk-pk}$
MSO/DPO72304DX at 100 GS/s, BWE on	6.25 mV/div, <10 ns measurement interval, 14.3 GHz, amplitude = 80% FS, 0.868 ps rms, 8.68 ps$_{pk-pk}$
	50 mV/div, <10 ns measurement interval, 14.3 GHz, amplitude = 80% FS, 0.591 ps rms, 5.91 ps$_{pk-pk}$
	100 mV/div, <10 ns measurement interval, 14.3 GHz, amplitude = 80% FS, 0.585 ps rms, 5.85 ps$_{pk-pk}$
MSO/DPO72004DX at 100 GS/s, BWE on	6.25 mV/div, <10 ns measurement interval, 12.4 GHz, amplitude = 80% FS, 0.918 ps rms, 9.18 ps$_{pk-pk}$
	50 mV/div, <10 ns measurement interval, 12.4 GHz, amplitude = 80% FS, 0.661 ps rms, 6.61 ps$_{pk-pk}$
	100 mV/div, <10 ns measurement interval, 12.4 GHz, amplitude = 80% FS, 0.659 ps rms, 6.59 ps$_{pk-pk}$
MSO/DPO71604DX at 100 GS/s, BWE on	6.25 mV/div, <10 ns measurement interval, 9.94 GHz, amplitude = 80% FS, 1.125 ps rms, 11.25 ps$_{pk-pk}$
	50 mV/div, <10 ns measurement interval, 9.94 GHz, amplitude = 80% FS, 0.741 ps rms, 7.41 ps$_{pk-pk}$
	100 mV/div, <10 ns measurement interval, 9.94 GHz, amplitude = 80% FS, 0.726 ps rms, 7.26 ps$_{pk-pk}$
MSO/DPO71254DX at 100 GS/s, BWE on	6.25 mV/div, <10 ns measurement interval, 7.76 GHz, amplitude = 80% FS, 1.369 ps rms, 13.69 ps$_{pk-pk}$
	50 mV/div, <10 ns measurement interval, 7.76 GHz, amplitude = 80% FS, 0.872 ps rms, 8.72 ps$_{pk-pk}$
	100 mV/div, <10 ns measurement interval, 7.76 GHz, amplitude = 80% FS, 0.861 ps rms, 8.61 ps$_{pk-pk}$
MSO/DPO70804DX at 100 GS/s, BWE on	6.25 mV/div, <10 ns measurement interval, 4.97 GHz, amplitude = 80% FS, 1.696 ps rms, 16.96 ps$_{pk-pk}$
	50 mV/div, <10 ns measurement interval, 4.97 GHz, amplitude = 80% FS, 1.209 ps rms, 12.09 ps$_{pk-pk}$
	100 mV/div, <10 ns measurement interval, 4.97 GHz, amplitude = 80% FS, 1.198 ps rms, 11.98 ps$_{pk-pk}$
MSO/DPO73304DX at 100 GS/s, BWE off, typical	6.25 mV/div, <10 ns measurement interval, 19.5 GHz, amplitude = 80% FS, 0.752 ps rms, 7.52 ps$_{pk-pk}$
	50 mV/div, <10 ns measurement interval, 19.5 GHz, amplitude = 80% FS, 0.570 ps rms, 5.70 ps$_{pk-pk}$
	100 mV/div, <10 ns measurement interval, 19.5 GHz, amplitude = 80% FS, 0.568 ps rms, 5.68 ps$_{pk-pk}$

MSO/DPO72504DX at 100 GS/s, BWE off, typical	6.25 mV/div, <10 ns measurement interval, 15.5 GHz, amplitude = 80% FS, 0.868 ps rms, 8.68 ps$_{pk-pk}$
	50 mV/div, <10 ns measurement interval, 15.5 GHz, amplitude = 80% FS, 0.619 ps rms, 6.19 ps$_{pk-pk}$
	100 mV/div, <10 ns measurement interval, 15.5 GHz, amplitude = 80% FS, 0.612 ps rms, 6.12 ps$_{pk-pk}$
MSO/DPO72304DX at 100 GS/s, BWE off, typical	6.25 mV/div, <10 ns measurement interval, 14.3 GHz, amplitude = 80% FS, 0.900 ps rms, 9.00 ps$_{pk-pk}$
	50 mV/div, <10 ns measurement interval, 14.3 GHz, amplitude = 80% FS, 0.624 ps rms, 6.24 ps$_{pk-pk}$
	100 mV/div, <10 ns measurement interval, 14.3 GHz, amplitude = 80% FS, 0.618 ps rms, 6.18 ps$_{pk-pk}$
MSO/DPO72004DX at 100 GS/s, BWE off, typical	6.25 mV/div, <10 ns measurement interval, 12.4 GHz, amplitude = 80% FS, 0.988 ps rms, 9.88 ps$_{pk-pk}$
	50 mV/div, <10 ns measurement interval, 12.4 GHz, amplitude = 80% FS, 0.714 ps rms, 7.14 ps$_{pk-pk}$
	100 mV/div, <10 ns measurement interval, 12.4 GHz, amplitude = 80% FS, 0.710 ps rms, 7.10 ps$_{pk-pk}$
MSO/DPO71604DX at 100 GS/s, BWE off, typical	6.25 mV/div, <10 ns measurement interval, 9.94 GHz, amplitude = 80% FS, 1.17 ps rms, 11.7 ps$_{pk-pk}$
	50 mV/div, <10 ns measurement interval, 9.94 GHz, amplitude = 80% FS, 0.830 ps rms, 8.30 ps$_{pk-pk}$
	100 mV/div, <10 ns measurement interval, 9.94 GHz, amplitude = 80% FS, 0.826 ps rms, 8.26 ps$_{pk-pk}$
MSO/DPO71254DX at 100 GS/s, BWE off, typical	6.25 mV/div, <10 ns measurement interval, 7.76 GHz, amplitude = 80% FS, 1.41 ps rms, 14.1 ps$_{pk-pk}$
	50 mV/div, <10 ns measurement interval, 7.76 GHz, amplitude = 80% FS, 1.00 ps rms, 10.0 ps$_{pk-pk}$
	100 mV/div, <10 ns measurement interval, 7.76 GHz, amplitude = 80% FS, 1.00 ps rms, 10.0 ps$_{pk-pk}$
MSO/DPO70804DX at 100 GS/s, BWE off, typical	6.25 mV/div, <10 ns measurement interval, 4.97 GHz, amplitude = 80% FS, 1.88 ps rms, 18.8 ps$_{pk-pk}$
	50 mV/div, <10 ns measurement interval, 4.97 GHz, amplitude = 80% FS, 1.42 ps rms, 14.2 ps$_{pk-pk}$
	100 mV/div, <10 ns measurement interval, 4.97 GHz, amplitude = 80% FS, 1.42 ps rms, 14.2 ps$_{pk-pk}$

✒ Delta time measurement accuracy for MSO/DPO 70000C models

The formula to calculate the maximum delta-time measurement accuracy (DTAmax) for a given instrument setting and input signal is given below (assumes insignificant signal content above Nyquist and insignificant error due to aliasing, overdrive recovery and overdrive interpolation):

SR_1 = slew rate around 1st point in measurement (1st edge)

SR_2 = slew rate around 2nd point in measurement (2nd edge)

F_N = 1.3 for instrument bandwidth ≤9 GHz; 1.5 for instrument bandwidth ≥10 GHz

N_{typ} = typical input-referred noise spec (volts rms)

TBA = timebase accuracy (1.5 ppm)

$t_{reading}$ = delta-time measurement (seconds)

Peak-peak based on statistical accumulation of 1000 waveforms.

$$DTA_{MAX_{pk-pk}} = 10 * \sqrt{\left(N_{typ} * F_N\right)^2 \left[\left(\frac{1}{SR_1}\right)^2 + \left(\frac{1}{SR_2}\right)^2\right] + {F_1}^2 * \left(t_{r1}^2 + t_{r2}^2\right) + \left(2 * t_j\right)^2} + TBA$$
$$* t_{reading} seconds_{pk-pk}$$

RMS is guaranteed regardless of data-gathering duration.

$$DTA_{MAX_{RMS}} = 10 * \sqrt{\left(N_{typ} * F_N\right)^2 \left| \left(\frac{1}{SR_1}\right)^2 + \left(\frac{1}{SR_2}\right)^2 \right| + F_1^2 * \left(t_{r1}^2 + t_{r2}^2\right) + \left(2 * t_j\right)^2 + TBA}$$
$$* \, t_{reading} \, seconds_{RMS}$$

The term under the square-root sign is the stability and is due to time interval error (TIE). The errors due to this term occur throughout a single-shot measurement. The second term is due to both the absolute center-frequency accuracy and the center-frequency stability of the timebase and varies between multiple single-shot measurements over the observation interval (the amount of time from the first single-shot measurement to the final single-shot measurement). The observation interval may not exceed 1 year.

Test at maximum bandwidth. Test at 10 mV, 50 mV, 100 mV.

MSO/DPO72004C at 500 GS/s (IT mode), BWE off	10 mV/div, <10 ns measurement interval, 9.94 GHz, amplitude = 80% FS, 1.280 ps rms, 12.80 ps$_{pk-pk}$
	50 mV/div, <10 ns measurement interval, 9.94 GHz, amplitude = 80% FS, 1.172 ps rms, 11.72 ps$_{pk-pk}$
	100 mV/div, <10 ns measurement interval, 9.94 GHz, amplitude = 80% FS, 1.186 ps rms, 11.86 ps$_{pk-pk}$
MSO/DPO71604C at 500 GS/s (IT mode), BWE off	10 mV/div, <10 ns measurement interval, 9.94 GHz, amplitude = 80% FS, 1.280 ps rms, 12.80 ps$_{pk-pk}$
	50 mV/div, <10 ns measurement interval, 9.94 GHz, amplitude = 80% FS, 1.172 ps rms, 11.72 ps$_{pk-pk}$
	100 mV/div, <10 ns measurement interval, 9.94 GHz, amplitude = 80% FS, 1.186 ps rms, 11.86 ps$_{pk-pk}$
MSO/DPO71254C at 500 GS/s (IT mode), BWE off	10 mV/div, <10 ns measurement interval, 7.76 GHz, amplitude = 80% FS, 1.304 ps rms, 13.04 ps$_{pk-pk}$
	50 mV/div, <10 ns measurement interval, 7.76 GHz, amplitude = 80% FS, 1.201 ps rms, 12.01 ps$_{pk-pk}$
	100 mV/div, <10 ns measurement interval, 7.76 GHz, amplitude = 80% FS, 1.205 ps rms, 12.05 ps$_{pk-pk}$
MSO/DPO70804C at 500 GS/s (IT mode), BWE off	10 mV/div, <10 ns measurement interval, 4.97 GHz, amplitude = 80% FS, 1.462 ps rms, 14.62 ps$_{pk-pk}$
	50 mV/div, <10 ns measurement interval, 4.97 GHz, amplitude = 80% FS, 1.295 ps rms, 12.95 ps$_{pk-pk}$
	100 mV/div, <10 ns measurement interval, 4.97 GHz, amplitude = 80% FS, 1.336 ps rms, 13.36 ps$_{pk-pk}$
MSO/DPO70604C at 500 GS/s (IT mode), BWE off	10 mV/div, <10 ns measurement interval, 3.73 GHz, amplitude = 80% FS, 1.625 ps rms, 16.25 ps$_{pk-pk}$
	50 mV/div, <10 ns measurement interval, 3.73 GHz, amplitude = 80% FS, 1.427 ps rms, 14.27 ps$_{pk-pk}$
	100 mV/div, <10 ns measurement interval, 3.73 GHz, amplitude = 80% FS, 1.463 ps rms, 14.63 ps$_{pk-pk}$
MSO/DPO70404C at 500 GS/s (IT mode), BWE off	10 mV/div, <10 ns measurement interval, 2.48 GHz, amplitude = 80% FS, 2.022 ps rms, 20.22 ps$_{pk-pk}$
	50 mV/div, <10 ns measurement interval, 2.48 GHz, amplitude = 80% FS, 1.762 ps rms, 17.62 ps$_{pk-pk}$
	100 mV/div, <10 ns measurement interval, 2.48 GHz, amplitude = 80% FS, 1.821 ps rms, 18.21 ps$_{pk-pk}$
MSO/DPO72004C at 500 GS/s (IT mode), 20 GHz, BWE on	50 mV/div, <10 ns measurement interval, 9.94 GHz, amplitude = 80% FS, 1.260 ps rms, 12.60 ps$_{pk-pk}$
	100 mV/div, <10 ns measurement interval, 9.94 GHz, amplitude = 80% FS, 1.432 ps rms, 14.32 ps$_{pk-pk}$
MSO/DPO72004C at 500 GS/s (IT mode), 18 GHz, BWE on	10 mV/div, <10 ns measurement interval, 9.94 GHz, amplitude = 80% FS, 1.336 ps rms, 13.36 ps$_{pk-pk}$
	50 mV/div, <10 ns measurement interval, 9.94 GHz, amplitude = 80% FS, 1.182 ps rms, 11.82 ps$_{pk-pk}$

	100 mV/div, <10 ns measurement interval, 9.94 GHz, amplitude = 80% FS, 1.234 ps rms, 12.34 ps$_{pk\text{-}pk}$
MSO/DPO72004C, MSO/ DPO71654C at 500 GS/s (IT mode), 16 GHz, BWE on	10 mV/div, <10 ns measurement interval, 9.94 GHz, amplitude = 80% FS, 1.219 ps rms, 12.19 ps$_{pk\text{-}pk}$
	50 mV/div, <10 ns measurement interval, 9.94 GHz, amplitude = 80% FS, 1.154 ps rms, 11.54 ps$_{pk\text{-}pk}$
	100 mV/div, <10 ns measurement interval, 9.94 GHz, amplitude = 80% FS, 1.159 ps rms, 11.59 ps$_{pk\text{-}pk}$
MSO/DPO72004C, MSO/ DPO71654C, MSO/ DPO71254C at 500 GS/s (IT mode), 12.5 GHz, BWE on	10 mV/div, <10 ns measurement interval, 7.45 GHz, amplitude = 80% FS, 1.333 ps rms, 13.33 ps$_{pk\text{-}pk}$
	50 mV/div, <10 ns measurement interval, 7.45 GHz, amplitude = 80% FS, 1.212 ps rms, 12.12 ps$_{pk\text{-}pk}$
	100 mV/div, <10 ns measurement interval, 7.45 GHz, amplitude = 80% FS, 1.228 ps rms, 12.287 ps$_{pk\text{-}p}$k
MSO/DPO70804C at 500 GS/s (IT mode), 8 GHz, BWE on	10 mV/div, <10 ns measurement interval, 4.97 GHz, amplitude = 80% FS, 1.354 ps rms, 13.54 ps$_{pk\text{-}pk}$
	50 mV/div, <10 ns measurement interval, 4.97 GHz, amplitude = 80% FS, 1.235 ps rms, 12.35 ps$_{pk\text{-}pk}$
	100 mV/div, <10 ns measurement interval, 4.97 GHz, amplitude = 80% FS, 1.241 ps rms, 12.41 ps$_{pk\text{-}pk}$
MSO/DPO70804C, MSO/ DPO70604C at 500 GS/s (IT mode), 6 GHz, BWE on	10 mV/div, <10 ns measurement interval, 3.73 GHz, amplitude = 80% FS, 1.445 ps rms, 14.45 ps$_{pk\text{-}pk}$
	50 mV/div, <10 ns measurement interval, 3.73 GHz, amplitude = 80% FS, 1.295 ps rms, 12.95 ps$_{pk\text{-}pk}$
	100 mV/div, <10 ns measurement interval, 3.73 GHz, amplitude = 80% FS, 1.329 ps rms, 13.29 ps$_{pk\text{-}pk}$
MSO/DPO70804C, MSO/ DPO70604C, MSO/ DPO70404C at 500 GS/s (IT mode), 4 GHz, BWE on	10 mV/div, <10 ns measurement interval, 2.48 GHz, amplitude = 80% FS, 1.674 ps rms, 16.74 ps$_{pk\text{-}pk}$
	50 mV/div, <10 ns measurement interval, 2.48 GHz, amplitude = 80% FS, 1.437 ps rms, 14.37 ps$_{pk\text{-}pk}$
	100 mV/div, <10 ns measurement interval, 2.48 GHz, amplitude = 80% FS, 1.478 ps rms, 14.78 ps$_{pk\text{-}pk}$

✔ **Delta time measurement accuracy for DPO7000C**

For signals having amplitude greater than 5 divisions, reference level = 50%, filter set to sin(x)/x, acquired at 10 mV/div or greater. The displayed risetime/sample interval must be greater than 1.4 but less than 4. Extra error will occur for two channel measurements due to channel to channel skew. Peak specification is based on statistical accumulation of 1000 waveforms.

Single shot, sample or HiRes, full bandwidth	(0.06/sample rate + 2.5 ppm x | reading |)RMS
	± (0.30/(sample rate) + (2.5 ppm x | reading |)) peak
Average Mode, ≥100 averages, full bandwidth selected.	± (2.5 ppm x | reading | + 4 ps)

Trigger specifications

Trigger jitter DC coupled A edge random holdoff, typical

MSO/DPO70000C/DX models

100 fs using enhanced trigger placement.

1.3 ps rms for low frequency, fast rise time signal, A edge, time holdoff = 30 µs

DPO7000C models   1.5 ps rms for low frequency, fast rise time signal

(DPO7104C and DPO7054C: 3 ps total trigger jitter.)

✔ Edge trigger sensitivity DC coupled, typical

All sources, positive or negative edge, for vertical scale settings ≥10 mV/div and ≤1 V/div

MSO/DPO70000C/DX models

Trigger Source	Sensitivity
A Event trigger	≤ 4%FS from DC to 50 MHz
	≤ 10%FS at 4 GHz
	≤ 15%FS at 6 GHz
	≤ 20%FS at 8 GHz
	≤ 50%FS at 11 GHz
	20%FS from DC to instrument bandwidth (typical, enhanced trigger on, auto mode only for frequencies above 8 GHz)
B Event trigger	≤ 4%FS from DC to 50 MHz
	≤ 10%FS at 4 GHz
	≤ 15%FS at 6 GHz
	≤ 50%FS at 9 GHz
	20%FS from DC to instrument bandwidth (typical, enhanced trigger on, auto mode only for frequencies above 6 GHz)
Auxiliary input	250 mV from DC to 50 MHz, increasing to 350 mV at 1 GHz

DPO7000C models

Trigger Source	Sensitivity
Main and Delayed trigger	≤ 0.7 div from DC to 50 MHz
	≤ 1.2 div at 2.5 GHz
	≤ 2.5 div at 3.5 GHz with BWE on
Auxiliary input	1 MΩ: 250 mV from DC to 50 MHz, increasing to 350 mV at 250 MHz
	50 Ω: 150 mV from DC to 50 MHz, increasing to 200 mV at 1.8 GHz
Video trigger, Ch1 - Ch4	0.6 to 2.5 divisions of video sync tip

Trigger sensitivity TPC, typical

The minimum signal levels required for stable triggering of a waveform when the hardware is incapable of doing so (excessive frequency, small input).

MSO/DPO70000DX models

Trigger Source	Sensitivity
A Event trigger, Ch1 – Ch4	20%×FS from DC to instrument bandwidth
B Event trigger, Ch1 – Ch4	20%×FS from DC to instrument bandwidth

Edge trigger sensitivity not DC coupled, typical

All sources, positive or negative edge, for vertical scale settings ≥10 mV/div and ≤1 V/div

MSO/DPO70000C/DX models

Trigger Coupling	Sensitivity
NOISE REJ	15%FS from DC to 50 MHz 35%FS at 3 GHz 50%FS at 5 GHz
AC	Same as DC-coupled limits for frequencies > 100 Hz, attenuates signals <100 Hz
HF REJ	Same as DC-coupled limits for frequencies < 20 kHz, attenuates signals > 20 kHz
LF REJ	Same as DC-coupled limits for frequencies > 200 kHz, attenuates signals < 200 kHz

DPO7000C models

Trigger coupling	Sensitivity
NOISE REJ	3 times the DC-coupled limits
AC	Same as DC-coupled limits for frequencies > 100 Hz, attenuates signals <100 Hz
HF REJ	Same as DC-coupled limits for frequencies < 20 kHz, attenuates signals > 20 kHz
LF REJ	Same as DC-coupled limits for frequencies > 200 kHz, attenuates signals < 200 kHz

Trigger level or threshold range

MSO/DPO70000DX models

Trigger Source	Range
Any channel	±100% FS from center of screen
Auxiliary input	±4.0 V
Table continued…	

Trigger Source	Range
Line	0 V, Not settable

MSO/DPO70000C models

Trigger Source	Range
Any channel	±120% FS from center of screen
Auxiliary input	±4.0 V
Line	0 V, Not settable

DPO7000C models

Trigger Source	Range
Any channel	±12 divisions from center of screen
Auxiliary input	±5 V
Line	Not settable

Trigger level or threshold accuracy, typical

Edge trigger, DC coupled

MSO/DPO70000C/DX models

Trigger Source	Accuracy
Channel 1, 2, 3, or 4	± [(2% | trigger level - net offset |) + (3.5% FS) + offset accuracy]
Auxiliary	Not specified

DPO7000C models

Trigger Source	Accuracy
Channel 1, 2, 3, or 4	± [(2% | deflection |) + (0.7 divisions ×
Auxiliary	Not specified

Trigger position error, typical

Edge trigger, DC coupling, for signals having a slew rate at the trigger point of ≥ 0.5 divisions/ns

MSO/DPO70000C/DX models

Acquisition mode	Trigger Position Error
Sample, Average	± (1 waveform interval + 50 ps)
Peak Detect, Envelope	± (2 waveform intervals + 50 ps)

DPO7000C models

Acquisition mode	Trigger Position Error
Sample, Average	± (1 waveform interval + 200 ps)
Table continued…	

Acquisition mode	Trigger Position Error
Peak Detect, Envelope	± (2 waveform intervals + 200 ps)

Time range for time-qualified triggers

MSO/DPO70000C/DX models

Setup/Hold Violation		
	Setup time	-100 ns to +100 ns
	Hold time	-1 ns to +100 ns
	Setup + hold time	500 ps minimum
Timeout		400 ps to 1 s
Time qualified window, outside >t		600 ps to 1 s
All other types		300 ps to 1 s

DPO7000C models   300 ps to 1 s

✔ Time-qualified trigger timer accuracy

For Glitch, Width, Time qualified runt, Transition, or Setup/hold violation types

MSO/DPO70000C/DX models

Time range	Accuracy
Glitch and width triggering (300 ps to 1.0 ns typical)	
<300 ns to 1.01 µs	±(3% of setting + 80 ps)
1.02 µs to 1 s	±(TB accuracy + 100 ns)
Other time-qualified types (300 ps to 1.0 ns typical)	
<300 ps to 1.01 µs	±(5% of setting + 200 ps)
1.02 µs to 1 s	±(TB accuracy + 20 ns)

DPO7000C models

Time range	Accuracy
<1 µs (<2 ns typical)	±(20% of setting + 0.5 ns)
1 µs to 1 s	±(0.01% of setting + 100 ns)

Width and glitch trigger sensitivity, typical

MSO/DPO70000C/DX models   15% x FS from DC to 1 GHz, not violating the minimum timing requirements for each type (for vertical settings from 10 mV/div to 1 V/div at the input connector)

DPO7000C models   1.0 division from DC to 1 GHz (at input connector)

Width and glitch trigger minimum timing requirements

For vertical scale settings 10 mV/div and 1 V/div

MSO/DPO70000C/DX models

	Minimum pulse width	Minimum rearm time	Setup time	Hold time
Width and glitch types	150 ps	300 ps	N.A.	N.A.
Logic qualified width and glitch types	150 ps	300 ps	20 ps	40 ps

DPO7000C models

	Minimum pulse width	Minimum rearm time	Setup time	Hold time
Width type	225 ps	250 ps	N.A.	N.A.
Logic qualified width type	190 ps	250 ps	40 ps	175 ps
Glitch type	170 ps	250 ps	N.A.	N.A.
Logic qualified glitch type	100 ps	250 ps	40 ps	60 ps

Runt trigger sensitivity, typical

MSO/DPO70000C/DX models

15% x FS from DC to 1 GHz, not violating the minimum timing requirements for each type (for vertical settings from 10 mV/div to 1 V/div at the input connector)

DPO7000C models

1.0 division (at input connector)

Runt trigger, minimum timing requirements

A runt event occurs at the end of the runt whether or not the runt was time qualified. Logic qualified runt triggers require that the logic condition be true during the entire duration of the runt plus some minimum amount of time after the runt event occurred.

MSO/DPO70000C/DX models

	Minimum pulse time	Minimum rearm time	Setup time	Hold time
Runt type	200 ps	300 ps		
Logic qualified runt type	200 ps	300 ps	300 ps	300 ps
Time qualified runt type	476 ps	510 ps	N.A.	N.A.
Time and logic qualified runt type	520 ps	360 ps	160 ps	105 ps

DPO7000C models

	Minimum pulse time	Minimum rearm time	Setup time	Hold time
Runt type	225 ps	250 ps	N.A.	N.A.
Time qualified runt type	360 ps	450 ps	N.A.	N.A.
Logic qualified runt type	Runt width + 150 ps	250 ps	160 ps	-16 ps
Time and logic qualified runt type	Runt width + 330 ps	250 ps	160 ps	175 ps

Pattern and state trigger sensitivity DC coupled, typical, MSO/DPO70000C/DX models	15% x FS from DC to 1 GHz, not violating the minimum timing requirements for each type (for vertical settings from 10 mV/div to 1 V/div at input connector)
Logic and state trigger sensitivity DC coupled, typical, DPO7000C models	1.0 division from DC to 1 GHz (for vertical settings from 10 mV/div to 1 V/div at input connector)

Logic and state trigger minimum timing requirements, typical, DPO7000C models

Minimum duration of logic state: 100 ps (10 GB/s). The minimum duration of the logic pattern includes delay mismatch between channels.

	Minimum pulse width	Rearm time
Logic type	100 ps (10 GB/s)	100 ps
State type	500 ps	500 ps
Time qualified logic type	300 ps	500 ps

Video-type trigger formats and field rates, DPO7000C models	Triggers from negative sync composite video, field 1 or field 2 for interlaced systems, any field, specific line, or any line for interlaced or non-interlaced systems. Supported systems include NTSC, PAL, SECAM, and HDTV 1080/24sF, 1080p/25, 1080i/50, 1080i/60, 1080p/24, 720p/60, 480p/60.

Timeout trigger minimum timing requirements

Timeout event occurs after the signal has stayed in some state the minimum amount of time. Setup and hold times are how long before and after the timeout event the logic level must remain valid in order to generate a trigger.

MSO/DPO70000C/DX models

	Minimum pulse width	Minimum rearm time	Setup time	Hold time
Timeout type	N.A.	300 ps + pulse width	N.A.	N.A.
Logic qualified timeout type	N.A.	300 ps + pulse width	50 ps	50 ps

DPO7000C models

	Minimum pulse width	Minimum rearm time	Setup time	Hold time
Timeout type	300 ps	500 ps + pulse width	N.A.	N.A.
Logic qualified timeout type	300 ps	500 ps + pulse width	200 ps	200 ps

Window trigger minimum timing requirements

MSO/DPO70000C/DX models

	Minimum pulse width	Minimum rearm time	Setup time	Hold time
Window enters	150 ps	500 ps	N.A.	N.A.
Window exits	500 ps	150 ps	N.A.	N.A.
Logic qualified window enters	150 ps	500 ps	N.A.	N.A.
Table continued…				

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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	Minimum pulse width	Minimum rearm time	Setup time	Hold time
Logic qualified window exits	500 ps	150 ps	N.A.	N.A.
Window inside >t	N.A.	500 ps	N.A.	N.A.
Window outside >t	N.A.	150 ps	N.A.	N.A.

DPO7000C models

	Minimum pulse width	Minimum rearm time	Setup time	Hold time
Window	225 ps	300 ps	N.A.	N.A.
Logic qualified window	190 ps	300 ps	-20 ps	0 ps

Transition trigger, minimum timing requirements

The transition trigger event occurs at the end of the transition. The logic condition must be valid at the moment the transition event occurs minus the setup time plus the hold time. Rearm time is the time below the lower threshold and the time above the upper threshold. Neither time can be violated.

MSO/DPO70000C/DX models

	Minimum pulse width	Minimum rearm time	Setup time	Hold time
Transition type	0 ps	500 ps	N.A.	N.A.
Logic qualified transition type	0 ps	500 ps	50 ps	50 ps

DPO7000C models

	Minimum pulse width	Minimum rearm time	Setup time	Hold time
Transition type	0 ps	225 ps	N.A.	N.A.
Logic qualified transition type	330 ps	225 ps	225 ps	175 ps

Transition trigger delta time range

1 ns to 1 s

Setup-Hold violation trigger, setup and hold time ranges

	Minimum	Maximum
Setup time	-100 ns	100 ns
Hold time	-1 ns	102 ns
Setup + hold time	500 ps	

Setup-hold time violation trigger, minimum clock pulse widths, typical

MSO/DPO70000C/DX models

Minimum time from active clock edge to inactive edge	Minimum time from inactive clock edge to active edge
Hold times ≥ 0: Hold time + 550 ps	500 ps
Table continued…	

Minimum time from active clock edge to inactive edge	Minimum time from inactive clock edge to active edge
Hold times <0: Hold time + 1.6 ns	500 ps

DPO7000C models

Minimum time from active clock edge to inactive edge	Minimum time from inactive clock edge to active edge
Hold times ≥ 0: Hold time + 500 ps	500 ps
Hold times <0: Hold time + 1.5 ns	

Pattern and state trigger, minimum timing requirements, typical, MSO/DPO70000C/DX models

The transition trigger event occurs at the end of the transition. The logic condition must be valid at the moment the transition event occurs minus the setup time plus the hold time.

	Minimum pulse width	Minimum rearm time	Setup time	Hold time
Pattern type	150 ps	200 ps	N.A.	N.A.
Time qualified pattern type	150 ps	300 ps	N.A.	N.A.
State type	1.7 GHz	N.A.	25 ps	100 ps

Period trigger sensitivity, typical

    MSO/DPO70000C/DX models — 1.5 divisions (at input connector)

    DPO7000C models — 1.0 division (at input connector)

B trigger after events minimum timing requirements, typical

    MSO/DPO70000C/DX models

Minimum pulse width	Maximum counting frequency	Minimum time between channels
140 ps	3.5 GHz	1 ns

    DPO7000C models

Minimum pulse width	Maximum counting frequency	Minimum time between channels
200 ps		1 ns

B trigger after events, event counter range

    MSO/DPO70000C/DX models — 1 to 2,000,000,000

    DPO7000C models — 1 to 10,000,000

B trigger after time, time delay range

    MSO/DPO70000C/DX models — 3.2 ns to 3 Ms

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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DPO7000C models	5 ns to 250 s
Variable A event trigger holdoff range	250 ns to 12 s + random holdoff
Lowest frequency for successful set level to 50%, typical	50 Hz

Trigger jitter (RMS)

MSO/DPO70000C/DX models	100 fs using enhanced Trigger placement. 1.0 ps RMS (typical) for low frequency, fast rise time signal, A edge, time holdoff = 30 μs.
DPO7000C models	1.5 ps RMS (typical)

Serial trigger specifications

Low speed serial trigger, MSO/DPO70000C/DX models

Number of bits	128 bits
Baud rate limits	10 Mbits/s

High speed serial trigger number of bits

MSO/DPO70000C/DX models	64 bits for NRZ data rates ≤ 1.25 GBaud
	40 bits for 8b/10b data rates between 1.25 GBd and 6.25 GBd
DPO7000C models	64 bits

High speed serial trigger, serial word recognizer position accuracy

MSO/DPO70000C/DX models	± 200 ps

DPO7000C models

Acquisition mode	
Sample, Average	± (1 waveform interval + 200 ps)
Peak Detect, Envelope	± (2 waveform intervals + 200 ps)

Serial trigger decoding types

MSO/DPO70000C/DX models

≤ 1.25 GB:	NRZ
≤ 1.25 GB: 1.25 GB to 6.25 GB:	8B10B

DPO7000C models	NRZ

Serial trigger baud rate limits MSO/DPO70000C/DX models

↗ NRZ	Up to 1.25 GBd

Table continued…

8B10B, typical	NRZ 8B10B encoded data at the following bit rates:
	1.25 GBd,
	1.50 GBd,
	1.57 GBd,
	1.62 GBd,
	1.65 GBd,
	2.00 GBd,
	2.50 GBd,
	2.7 GBd,
	3.00 GBd,
	3.125 GBd,
	3.2 GBd,
	4.25 GBd,
	4.80 GBd,
	5.00 GBd,
	5.4 GBd,
	6.00 GBd,
	6.25 GBd

✔ Serial trigger baud rate limits, DPO7000C models　　Up to 1.25 GBd (Option PTM adds protocol trigger to DPO7000C Series)

Error detection jitter tolerance　　≤ 0.4 UI of total jitter on the signal.

Clock recovery frequency range

MSO/DPO70000C/DX models, typical　　1.5 MBaud to 3.125 GBaud. Above 1250 MHz, the clock is only available internally as a trigger source. Below 1250 MHz, the clock is also available at the recovered clock output along with regenerated data.

✔ DPO7000C models　　1.5 MBaud to 1.25 GBaud.

Clock recovery jitter, typical

MSO/DPO70000C/DX models　　< 0.25% bit period + 2 ps rms for PRBS data patterns with 50% transition density.

< 0.25% bit period + 1.5 ps rms for repeating 0011 data patterns.

Bit rate	Pattern	Jitter (ps rms)	
		PRBS	0011
3.125 GBd	00110011	2.8 ps	2.3 ps
2.74 GBd	00110011	2.9 ps	2.4 ps
2.35 GBd	00110011	3.1 ps	2.6 ps
Table continued…			

Bit rate	Pattern	Jitter (ps rms)	
		PRBS	0011
2.34 GBd	00110011	3.1 ps	2.6 ps
1.95 GBd	00110011	3.3 ps	2.8 ps
1.57 GBd	00110011	3.6 ps	3.1 ps
100 MBd	00110011	27 ps	27 ps
10 MBd	00110011	252 ps	252 ps

DPO7000C models

20 ps$_{RMS}$ + 1.25% Unit interval RMS for PRBS data patterns.

20 ps$_{RMS}$ + 1.25% Unit interval RMS for repeating 0011 data patterns. (Transition density of 50%).

Jitter increases by 1.4 every time the transition density is reduced by half.

28 ps$_{RMS}$ + 1.25% Unit interval RMS for 25% transition density.

30 ps$_{RMS}$ + 1.25% Unit interval RMS for 12.5% transition density.

Clock recovery tracking acquisition range

MSO/DPO70000C/DX models

± 2% of requested baud, data rates below 1.25 GBaud.

± 0.25% of requested baud, data rates above 1.25 GBaud.

DPO7000C models

± 5% of requested baud

Minimum signal amplitude needed for clock recovery, typical

MSO/DPO70000C/DX models

1 division peak-peak up to 1.25 GBd

1.5 divisions peak-peak above 1.25 GBd

Tri-level signals need 50% more pk-pk amplitude

DPO7000C models

1 division peak-peak up to 1.25 GBd

50% more peak-to-peak amplitude is required for tri-level signals.

Serial interface triggering standards supported

DPO7000C models

I^{2}C, CAN, SPI, USB1.1, RS232/422/485/UART

Digital acquisition specifications

Minimum signal amplitude

300 mV p-p; logic threshold centered in dynamic range of signal;

f ≤1.5 GHz for P6780

f ≤350 MHz for P6717A

Minimum detectable pulse width (mainframe and logic probe), typical	<400 ps
Number of probe channels	17
Number of digital acquisition channels	16
Digital channel resolution	1 bit, either a 0 or a 1

Logic threshold range

-2 V to +5 V

with P6780 probe	-2 V to +4.5 V
with P6717A probe	-1.5 V to +4.0 V

Logic threshold resolution	5 mV
Logic threshold accuracy (with probe attached), typical	≤3% of threshold setting ±75 mV

Single acquisition displayed timing uncertainty between digital channels with P6780 probe, typical

Without deskew	160 ps
After deskew	80 ps

Number of digital channels available for analog acquisition	4. Any of the 16 acquisition channels + clock qualifier channel can be displayed in place of any analog channel on the instrument
iCapture bandwidth with general purpose probe, typical	>300 MHz
iCapture bandwidth with solder-in differential probe, typical	>2.5 GHz
iCapture rise time with solder-in differential probe, typical	≤200 ps
Position range of analog iCapture channels	±5 divisions
iCapture DC analog accuracy (mainframe and probe)	±(5% of reading +0.2 division)
Gain ranges of analog channels with probe	250 mV/div, 375 mV/div, 750 mV/div, 1.25 V/div, 1.88 V/div, 3.75 V/div
Digital channel comparison values	0, 1, or don't care

Word recognizer trigger functions

Combinational trigger	AND, NAND, OR, NOR
Edge qualified combinational trigger	AND, NAND, OR, NOR qualified on the rising or falling edge, or either edge of CQ, the qualifying channel
Trigger toggle rate, typical	≥1.5 GHz

Single channel trigger jitter, typical	5 ps rms for A event edge trigger using low frequency, fast rise time signal
iCapture trigger level range	± Full scale
iCapture trigger level accuracy	6% of trigger level +0.4 divisions
iCapture trigger sensitivity	5% of FS from DC to 0.5 GHz
	6% of FS from 0.15 GHz to 1 GHz
	8% of FS from 1.01 GHz to 1.5 GHz
	9% of FS from 1.51 GHz to 2.0 GHz
	13% of FS from 2.0 GHz to 2.5 GHz
Low speed serial trigger threshold accuracy, typical	±(3% of setting ±125 mV) relative to the probe tip input
	+20 mV/°C from the operating temperature at which SPC was run
Low speed serial trigger threshold range	-2 to +4.5 V with DI probe
	-1.5 to +4 V with GP probe
Maximum low speed serial trigger toggle rate	I^2C: 3.4 MHz
	SPI: 4.25 MHz
Maximum digital acquisition sample rate	12.5 GS/s

Maximum record length, sample mode

The maximum record length depends on the number of active channels and the installed record length options. The maximum record length is less in serial trigger mode, hi-res mode, or when using the FIR filter.

Standard	12.5 GS/s or less 10,000,000 points (all channels)
Option 2XL installed	12.5 GS/s or less 20,000,000 points (all channels)
Option 5XL installed	12.5 GS/s or less 50,000,000 points (all channels)
Option 10XL installed	12.5 GS/s or less 125,000,000 points (all channels)
Option 20XL installed	12.5 GS/s or less 250,000,000 points (all channels)

Input-output port specifications

Auxiliary trigger input characteristics and range

MSO/DPO70000C/DX models	50 Ω, ±4 V (DC plus peak AC)
	MSO/DPO70000DX: 50 Ω, ±5 V (DC plus peak AC)
DPO7000C models	50 Ω, ± 5%; maximum input voltage ± 5 V (DC + peak AC)

1 MΩ, ±5%, 150 V CAT1. Derate at 20 dB/decade to 9 V RMS above 200 kHz

| **Auxiliary output logic polarity and functionality** | Default output is A trigger low true (a negative edge when the A trigger event occurs). You can also program the output to A trigger high true, B trigger low or high true, disabled, force high, and force low. |

Auxiliary output logic levels

V_{out} **high**	V_{out} **low (true)**
≥2.5 V into 1 MΩ load,	≤0.7 V into 1 MΩ load
≥1.0 V into 50 Ω load to ground	≤0.25 V into 50 Ω load to ground

| **CH3 output voltage typical DPO7000C models** | 50 mV/div ± 20% into a 1 MΩ load |
| | 25 mV/div ±20% into a 50 Ω load |

High speed serial data output baud rate range

| **MSO/DPO70000C/DX models** | Fbaud ≤ 1250 MB. Output swing of 1010 repeating pattern at this baud will be at least 200 mV into 50 Ω. |

High speed serial clock output frequency range

| **MSO/DPO70000C/DX models** | Peak-to-peak output swing at 625 MHz is at least 200 mV p-p into 50 Ω. Higher frequencies are further attenuated by approximately 6 dB per octave above 625 MHz. |
| | Use AC or DC coupled 50 Ω termination; AC coupling the clock provides about 10% more amplitude. |

High speed serial data and clock output voltages, typical

MSO/DPO70000C/DX models	Voh = -1.0 V
	Vol = -1.7 V
	Assumes a load impedance greater than 1 kΩ. (50 Ω source termination.)
	If a 50 Ω or 75 Ω load is used, either use a DC blocking capacitor in series with the signal or reference the termination to about -1.3 V. The signal amplitude will be correspondingly reduced.

High speed serial data output latency, typical

MSO/DPO70000C/DX models	11 ns ± 4 ns, plus the following synchronous latency depending on the data encoding:
	35.5 clock cycles for NRZ, CMI, Manchester, and B-0-V decoded data.
	36.5 clock cycles for NRZI decoded data.
	39.5 clock cycles for B3ZS decoded data.
	40.5 clock cycles for B4ZS decoded data.
	42.5 clock cycles for B6ZS decoded data.
	44.5 clock cycles for B8ZS decoded data.

✔ **Probe compensation output step amplitude and offset**

MSO/DPO70000DX models	440 mV ± 22% into a 50 Ω load (Vol = -0.14 V, Voh = 0.3 V, typical)
	810 mV ± 22% into a ≥10 kΩ load, (Vol = -0.25 V, Voh = 0.56 V, typical)
MSO/DPO70000C models	440 mV ± 22% into a 50 Ω load (Vol = -0.2 V to 0 V, Voh = 0.2 V to 0.4 V, typical)
	810 mV ± 22% into a 10 kΩ load, (Vol = -0.4 V to 0 V, Voh = 0.4 V to 0.8 V)
DPO7000C models	1 V ± 1.5% into a ≥ 100 kΩ load (Vol = -1.0 V, Voh = 0 V typical)
	Add 0.05%/°C for temperatures greater than or less than 25 °C

Probe compensation output step frequency

MSO/DPO70000C/DX models	1 kHz ± 20%
DPO7000C models	1 kHz ± 5%

Probe calibration output step rise time

MSO/DPO70000C/DX models	300 ps (10% to 90%) directly into an input channel. To deskew a probe, use a 50 Ω terminator in series with the deskew fixture to minimize HF aberrations.
DPO7000C models	≤350 ps at 1 V, into a ≥20 KΩ load to ground.
	≤1 ns at 2 V, into a 50 Ω load to ground.
	To deskew a probe, use a 50 Ω terminator in series with the deskew fixture to minimize HF aberrations.

Probe calibration output step aberrations	≤ ± 1% after the first 500 ns following the square wave transition. To deskew a probe, use a 50 Ω terminator in series with the deskew fixture to minimize HF aberrations.
Jitter of internal probe calibration trigger	5 ps RMS

External reference input frequency, typical

Run SPC whenever the external reference is more than 0.1% (1000 ppm) different than the nominal reference or the reference at which SPC was last run.

The timebase changes in correspondence to the fluctuations in the external reference.

MSO/DPO70000C/DX models	10 MHz, 100 MHz
	The instrument scans for either 10 MHz or 100 MHz.
DPO7000C models	10 MHz

External reference input sensitivity, typical

MSO/DPO70000C/DX models	≥ 200 mV$_{p-p}$
DPO7000C models	≥ 1.5 V$_{p-p}$

External reference input voltage, maximum, typical	> 20 GHz models: 4 Vp-p
	MSO/DPO70000C and DPO7000C models: 7 Vp-p

External reference input impedance, typical

MSO/DPO70000DX models	R_{in} = 50 Ω
MSO/DPO70000C models	R_{in} = 1.5 kΩ, C_{in} = 40 pF, measured at >100 kHz
DPO7000C models	385 Ω, C_{in} = 137 pF, measured at 10 MHz

External reference input frequency variation tolerance, typical

MSO/DPO70000DX models	Low (stable) jitter mode: ± 10 ppm
	High (tracking) mode: ± 1%
MSO/DPO70000C models	Low (stable) jitter mode: ± 100 ppm
	High (tracking) mode: ± 1%
	Running SPC is required whenever the external reference is more than 0.1% (1000 ppm) different from the nominal reference frequency or reference at which SPC was last run.
DPO7000C models	9.8 MHz to 10.2 MHz

Internal reference output frequency

MSO/DPO70000C/DX models	10 MHz
DPO7000C models	10 MHz available at AUXOUT

Internal reference output voltage, typical

MSO/DPO70000C/DX models	> 750 mV peak-peak into 50 Ω
	> 1.5 V peak-peak into 1 MΩ (internally AC coupled).

DPO7000C models

V_{out} high	V_{out} low (true)
≥2.5 V into open circuit,	≤0.7 V with ≤4 mA sink,
≥1.0 V into 50 Ω load to ground	≤0.25 V into 50 Ω load to ground

Input and output ports

DVI Video port	MSO/DPO70000DX models: A female Digital Visual Interface (DVI-D) compatible port
	MSO/DPO70000C and DPO7000C models: A female Digital Visual Interface (DVI-I) compatible port
VGA port, DX models only	A female Video Graphics Array (VGA) compatible port
Passive eSATA Port	Instrument must be powered down to make connection
COM1 and COM2 serial ports	9 pin D-Sub ports, use NS16C550-compatible UARTS, transfer speeds up to 115.2 kb/s.
	DX models have only COM1.
Keyboard and Mouse ports	PS-2 compatible, instrument must be powered down to make connection
LAN port	RJ-45 connector, supports 10 base-T, 100 base-T, and Gigabit Ethernet

External audio ports	External audio jacks for microphone input and line output
USB ports	MSO/DPO70000DX models: Four rear panel and 2 front panel USB 2.0 connectors. On DX models, two of the rear panel connectors are USB 3.0/USB 2.0
	MSO/DPO70000C and DPO7000C models: Four side or rear panel and 1 front panel USB 2.0 connectors
GPIB port	IEEE 488.2 standard interface, listener or controller

Data storage specifications

Hard disk

MSO/DPO70000C/DX models	Waveforms and setups are stored on the hard disk.
	2.5 inch SATA solid state disk, ≥500 GB.
DPO7000C models	2.5 inch SATA hard disk, drive capacity is ≥160 GB.

Power source specification

Power consumption

MSO/DPO70000C/DX models	<1200 VA
DPO7000C models	550 Watts maximum

Source voltage and frequency

MSO/DPO70000C/DX models	100 to 240 V_{RMS}, 50 Hz to 60 Hz,
	115 V ± 10%, 400 Hz
	CAT II
DPO7000C models	100 V to 240 V_{RMS} ± 10%, 47 Hz to 63 Hz
	115 V ± 10%, 400 Hz

Value probe interface (VPI), DPO7000C models	Probe interface allows installing, powering, compensating and controlling a wide range of probes offering a variety of features.

Mechanical specifications

Weight

DPO7000C models Benchtop configuration	14.0 kg (31 lbs) instrument only

21.8 kg (48 lbs) when packaged for domestic shipment

Rackmount kit

0.9 kg (2 lbs)

2.2 kg (5 lbs) kit packaged for domestic shipment

DPO70000DX and DPO70000C models, Benchtop configuration

23 kg (50.6 lbs) oscilloscope only

37 kg (81.4 lbs) packaged for domestic shipment

MSO70000C Series, Benchtop configuration

25.0 kg (55 lbs) instrument only

39 kg (86 lbs) when packaged for domestic shipment

MSO70000DX Series, Benchtop configuration

25.0 kg (55 lbs) instrument only

39 kg (86 lbs) when packaged for domestic shipment

Rackmount kit, MSO/ DPO70000C/DX models

2.04 kg (4.5 lbs) rackmount kit

3.4 kg (7.5 lbs) kit packaged for domestic shipment

Dimensions

DPO7000C models, Benchtop configuration

With front cover and feet	Without front cover and feet
295.4 mm (11.6 in) height 468.6 mm (18.4 in) width 318 mm (12.5 in) depth	278 mm (10.95 in) height 450.8 mm (17.75 in) width 308.6 mm (12.15 in) depth
311.15 mm (12.25 in) height 482.6 mm (19.0 in) width 520.7 mm (20.5 in) depth	

DPO7000C models, Rackmount configuration

With front cover and feet	Without front cover and feet
311.15 mm (12.25 in) height 482.6 mm (19.0 in) width 520.7 mm (20.5 in) depth	

MSO/DPO70000C/DX models, Benchtop configuration

With front cover	Without front cover
278 mm (10.95 in) height	277 mm (10.9 in) height
330 mm (13 in) with feet extended	330 mm (13 in) with feet extended
451 mm (17.75 in) width	451 mm (17.75 in) width
442 mm (17.4 in) depth	432 mm (17.02 in) depth

MSO/DPO70000C/DX models, Rackmount configuration

With rack handles	Without rack handles
267 mm (10.5 in) height	267 mm (10.5 in) height
502 mm (19.75 in) width	482 mm (19 in) width
489 mm (19.4 in) depth	442 mm (17.4 in) depth

Cooling

Required clearances

Fan-forced air circulation with no air filter	
Top	0 mm (0 in)
Bottom	6.35 mm (0.25 in) minimum or 0 mm (0 in) when standing on feet, flip stands down
Left side	76 mm (3 in)
Right side	76 mm (3 in) MSO/DPO70000C/DX models 0 mm (0 in) DPO7000C models
Rear	0 mm (0 in) on rear feet

Construction material

Chassis parts are constructed of aluminum alloy, front panel is constructed of plastic laminate, circuit boards are constructed of glass laminate

Environmental specifications

Temperature DPO7000C models

Operating +5 °C to +45 °C (41 °F to +113 °F), with noncondensing conditions

Nonoperating -40 °C to +71 °C (-40 °F to +160 °F), with 15 °C/hour maximum gradient, without disk media installed in disk drives

Temperature MSO/DPO70000C/DX models

Operating +5 °C to +45 °C (41 °F to +113 °F), with 11 °C per hour maximum gradient, noncondensing, derated 1 °C per 300 meters (984.25 feet) above 1500 meters (4921.25 feet) altitude

Nonoperating	-20 °C to +60 °C (-4 °F to +140 °F), with 20 °C/hour maximum gradient, without disk media installed in disk drives

Humidity DPO7000C models

Operating	8% to 80% relative humidity with a maximum wet-bulb temperature of +29 ℃ (84 °F) at or below +45 ℃ (113 °F), noncondensing
	Upper limit derated to 30% relative humidity at +45 ℃ (+113 °F)
Nonoperating	5% to 90% relative humidity with a maximum wet-bulb temperature of +29 ℃ (84 °F) at or below +60 ℃ (140 ℉), noncondensing
	Upper limit derated to 20% relative humidity at +60 ℃ (+140 °F)

Humidity MSO/DPO70000C/DX models

Operating	8% to 80% relative humidity at up to +32 °C (+90 °F)
	5% to 45% relative humidity above +32 °C (+90 °F) up to +45 °C (+113 °F), noncondensing, and is limited by a maximum wet-bulb temperature of +29.4 °C (+85 °F) (derates relative humidity to 32% at +45 °C (+113 °F)
Nonoperating	5% to 95% relative humidity at up to +30 °C (+86 °F),
	5% to 45% relative humidity above +30 °C (+86 °F), up to +60 °C (+140 °F), noncondensing, and is limited by a maximum wet-bulb temperature of +29.4 °C (+85 °F) (derates relative humidity to 11% at +60 °C (+140 °F))

Altitude DPO7000C models

Operating	Up to 3,000 meters (9,843 feet)
Nonoperating	Up to 12,192 meters (40,000 feet)

Altitude MSO/DPO70000C/DX models

Operating	Up to 3,000 meters (9,843 feet), derate maximum operating temperature by 1°C per 300 meters (984.25 feet) above 1500 meters (4921.25 feet) altitude
Nonoperating	Up to 12,000 meters (39,370 feet)

Specifications (MSO/DPO5000/B Series)

This chapter contains specifications for the MSO5000/B and DPO5000/B series oscilloscopes. All specifications are guaranteed unless noted as "typical." Typical specifications are provided for your convenience but are not guaranteed. Specifications that are marked with the ✔ symbol are checked in Performance Verification.

All specifications apply to all MSO5000/B and DPO5000/B models unless noted otherwise. To meet specifications, two conditions must first be met:

- The instrument must have been operating continuously for twenty minutes within the specified operating temperature range.
- You must perform the Signal Path Compensation (SPC) operation before evaluating the instrument's performance to the specifications. (See page 4-32, Self Test.) If the operating temperature changes by more than 10 °C (18 °F), perform the SPC operation again.

Analog channel input and vertical specification

Number of input channels	4 analog channels, digitized simultaneously
Input coupling	DC or AC
Input resistance selection	1 MΩ or 50 Ω
	250 kΩ selectable for performance verification.

✔ **Input impedance DC coupled**

1 MΩ	1 MΩ ±1%

50 Ω

50 Ω ±1%	
MSO5204/B, DPO5204/B	VSWR ≤1.5:1 from DC to 2 GHz, typical
MSO5104/B, DPO5104/B	VSWR ≤1.5:1 from DC to 1 GHz, typical
MSO5054/B, DPO5054B	VSWR ≤1.5:1 from DC to 500 MHz, typical
MSO5034/B, DPO5034/B	VSWR ≤1.5:1 from DC to 350 MHz, typical

Input capacitance 1MΩ DC coupled	13 pF ± 2 pF

Maximum input voltage

1 MΩ	300 VRMS with peaks ≤±425 V at the BNC
	CAT II
	For <100 mV/div, derate at 20 dB/decade above 100 kHz to 30 VRMS at 1 MHz, 10 dB/decade above 1 MHz
	For ≥100 mV/div, derate at 20 dB/decade above 3 MHz to 30 VRMS at 30 MHz, 10 dB/decade above 30 MHz

50 Ω	5 VRMS with peaks ≤±20 V (DF ≤ 6.25%)

Overvoltage trip is intended to protect against overloads that might damage termination resistors. A sufficiently large impulse might cause damage regardless of the overvoltage protection circuitry because of the finite time required to detect and respond.

⌐ DC balance	0.1 div with the input DC 50 Ω coupled and 50 Ω terminated

0.2 div at 1 mV/div with the input DC 50 Ω coupled and 50 Ω terminated

0.2 div with the input DC 1 MΩ coupled and 50 Ω terminated

Number of digitized bits	8 bits

Displayed vertically with 25 digitization levels (DL) per division, 10.24 divisions dynamic range.

"DL" is the abbreviation for "digitization level." A DL is the smallest voltage level change that can be resolved by an 8-bit A-D Converter. This value is also known as the LSB (least significant bit).

Sensitivity range (coarse)

1 MΩ	1 mV/div to 10 V/div in a 1-2-5 sequence
50 Ω	1 mV/div to 1 V/div in a 1-2-5 sequence

Sensitivity range (fine)

1 MΩ

1 mV/div to 5 V/div	<–50% to >+50% of selected setting
10 V/div	<–50% to 0%

50 Ω

1 mV/div to 500 mV/div	<–50% to >+50% of selected setting
1 V/div	<–50% to 0%
Allows continuous adjustment from 1 mV/div to 10 V/div	Allows continuous adjustment from 1 mV/div to 1 V/div

Sensitivity resolution (fine)	≤1% of current setting

⌐ DC gain accuracy	For 50 Ω, 1 MΩ, TPP0500, and TPP1000 path:

±1.5%, derated at 0.100%/°C above 30 °C

±2.0%, derated at 0.100%/°C above 30 °C, 1 mV/Div setting, typical

±3.0% variable gain, derated at 0.100%/°C above 30 °C

Offset ranges, minimum

Volts/div setting	Offset range	
	1 MΩ input	**50 Ω input**
1 mV/div to 50 mV/div	±1 V	±1 V
50.5 mV/div to 99.5 mV/div	±0.5 V	±0.5 V
Table continued…		

Volts/div setting	Offset range	
	1 MΩ input	**50 Ω input**
100 mV/div to 500 mV/div	±10 V	±10 V
505 mV/div to 995 mV/div	±5 V	±5 V
1 V/div to 5 V/div	±100 V	±5 V
5.05 V/div to 10 V/div	±50 V	Not applicable

For 50 Ω path, 1 V/div is the maximum vertical setting.

The input signal cannot exceed Max Input Voltage for the 50 Ω input path. Refer to the Max Input Voltage specification for more information.

Position range   ±5 divisions

⌐ Offset accuracy   ±[0.005 × | offset - position | + DC Balance]

Both the position and constant offset term must be converted to volts by multiplying by the appropriate volts/div term.

Number of waveforms for average acquisition mode   2 to 10,000 waveforms

Default of 16 waveforms

DC voltage measurement accuracy average acquisition mode

Average of ≥ 16 waveforms	±[DC Gain Accuracy × | reading – (offset - position) | + offset accuracy + 0.1 division] Refer to DC Gain Accuracy for temperature derating information.
Delta Volts between any two averages of ≥16 waveforms acquired with the same oscilloscope setup and ambient conditions	±[DC gain accuracy × | reading | + 0.05 div] Refer to DC Gain Accuracy for temperature derating information.
Note: Offset, position, and the constant offset term must be converted to volts by multiplying by the appropriate volts/div term. The basic accuracy specification applies directly to any sample and to the following measurements: High, Low, Max, Min, Mean, Cycle Mean, RMS, and Cycle RMS. The delta volt accuracy specification applies to subtractive calculations involving two of these measurements. The delta volts (difference voltage) accuracy specification applies directly to the following measurements: Positive Overshoot, Negative Overshoot, Peak-to-Peak, and Amplitude.	

DC voltage measurement accuracy, sample acquisition mode, typical

Measurement type	DC Accuracy (in volts)
Any sample	±[DC gain accuracy × | reading - (offset - position) | + offset accuracy +0.15 div + 0.6 mV] Refer to DC Gain Accuracy for temperature derating information.
Delta volts between any two samples acquired with the same oscilloscope setup and ambient conditions	±[DC gain accuracy × | reading | + 0.15 div + 1.2 mV] Refer to DC Gain Accuracy for temperature derating information.

Offset, position, and the constant offset term must be converted to volts by multiplying by the appropriate volts/div term.

⌐ Analog bandwidth 50 Ω DC coupled

Full bandwidth, with amplitude tolerance of -3 dB and operating temperatures of ≤30 °C (86 °F). Reduce the bandwidth by 1% for each °C above 30 °C.

Instrument	SCALE range	Bandwidth
MSO5204/B, DPO5204/B	10 mV/div — 1 V/div	DC to 2.00 GHz
	5 mV/div — 9.98 mV/div	DC to 1.50 GHz
	2 mV/div — 4.98 mV/div	DC to 350 MHz
	1 mV/div — 1.99 mV/div	DC to 175 MHz
MSO5104/B, DPO5104/B	5 mV/div — 9.98 mV/div	DC to 1.00 GHz
	2 mV/div — 4.98 mV/div	DC to 350 MHz
	1 mV/div — 1.99 mV/div	DC to 175 MHz
MSO5054/B, DPO5054/B	5 mV/div — 9.98 mV/div	DC to 500 MHz
	2 mV/div — 4.98 mV/div	DC to 350 MHz
	1 mV/div — 1.99 mV/div	DC to 175 MHz
MSO5034/B, DPO5034/B	2 mV/div — 4.98 mV/div	DC to 350 MHz
	1 mV/div — 1.99 mV/div	DC to 175 MHz

Analog bandwidth 1 MΩ DC coupled

Full bandwidth, with amplitude tolerance of -3 dB and operating temperatures of ≤30 °C (86 °F). Reduce the bandwidth by 1% for each °C above 30 °C.

Instrument	SCALE range	Bandwidth
✔ MSO5204/B, ✔ DPO5204/B, ✔ MSO5104/B, ✔ DPO5104/B	5 mV/div — 10 V/div	DC to 500 MHz
	2 mV/div — 4.98 mV/div	DC to 350 MHz
	1 mV/div — 1.99 mV/div	DC to 175 MHz
MSO5054/B, DPO5054/B	5 mV/div — 10 V/div	DC to 500 MHz
	2 mV/div — 4.98 mV/div	DC to 350 MHz
	1 mV/div — 1.99 mV/div	DC to 175 MHz
MSO5034/B, DPO5034/B	5 mV/div — 10 V/div	DC to 350 MHz
	2 mV/div — 4.98 mV/div	DC to 350 MHz
	1 mV/div — 1.99 mV/div	DC to 175 MHz

The MSO/DPO5204/B and MSO/DPO5104/B models have separate 50 Ω and 1 MΩ analog paths, so they must be tested at both settings. All other models have one analog path, so the analog path is fully tested with the 50 Ω termination.

Analog bandwidth with TPP0500 and TPP1000 probe, typical

Full bandwidth, with amplitude tolerance of -3 dB and operating temperatures of ≤ 30°C (86°F). Reduce the bandwidth by 1% for each °C above 30°C.

Instrument	SCALE range	Bandwidth
MSO5204/B, DPO5204/B, MSO5104/B, DPO5104/B	50 mV/div — 100 V/div	DC to 1 GHz (TPP1000 probe) DC to 500 MHz (TPP0500 probe)
	20 mV/div — 49.8 mV/div	DC to 350 MHz
	10 mV/div — 19.9 mV/div	DC to 175 MHz
MSO5054/B, DPO5054/B	50 mV/div — 100 V/div	DC to 500 MHz
	20 mV/div — 49.8 mV/div	DC to 350 MHz
	10 mV/div — 19.9 mV/div	DC to 175 MHz
MSO5034/B, DPO5034/B	50 mV/div — 100 V/div	DC to 350 MHz
	20 mV/div — 49.8 mV/div	DC to 350 MHz
	10 mV/div — 19.9 mV/div	DC to 175 MHz

Lower frequency limit, AC coupled, typical

< 10 Hz when AC, 1 MΩ coupled

The AC coupled lower frequency limits are reduced by a factor of 10 when 10X passive probes are used.

Upper frequency limit, 250 MHz bandwidth limited, typical   250 MHz, ±20%

Upper frequency limit, 20 MHz bandwidth limited, typical   20 MHz, ±20%

Calculated rise time, typical

Calculated Rise Time at 350/BW (MHz). The formula is calculated by measuring -3 dB bandwidth of the oscilloscope. The formula accounts for the rise time contribution of the oscilloscope independent of the rise time of the signal source.

Instrument	50 Ω 10 mV/div to 1 V/div	50 Ω 5 mV/div to 9.98 mV/div	50 Ω 2 mV/div to 4.99 mV/div	50 Ω 1 mV/div to 1.99 mV/div
MSO5204/B, DPO5204/B	175 ps	233 ps	1 ns	2 ns

Instrument	50 Ω 5 mV/div to 1 V/div	50 Ω 2 mV/div to 4.99 mV/div	50 Ω 1 mV/div to 1.99 mV/div
MSO5104/B, DPO5104/B	350 ps	1 ns	2 ns
MSO5054/B, DPO5054/B	700 ps	1 ns	2 ns
MSO5034/B, DPO5034/B	1 ns	1 ns	2 ns

Instrument	TPP1000 probe 50 mV/div to 100 mV/div	TP1000 probe 20 mV/div to 49.8 mV/div	TPP1000 probe 10 mV/div to 19.9 mV/div
MSO5204/B, DPO5204/B	350 ps	I ns	2 ns
MSO5104/B, DPO5104/B	350 ps	I ns	2 ns
MSO5054/B, DPO5054/B	700 ps	I ns	2 ns
MSO5034/B, DPO5034/B	I ns	I ns	2 ns

Instrument	TPP0500 probe 50 mV/div to 10 V/div	TPP0500 probe 20 mV/div to 49.8 mV/div	TPP0500 probe 10 mV/div to 19.9 mV/div
MSO5204/B, DPO5204/B	700 ps	I ns	2 ns
MSO5104/B, DPO5104/B	700 ps	I ns	2 ns
MSO5054/B, DPO5054/B	700 ps	I ns	2 ns
MSO5034/B, DPO5034/B	I ns	I ns	2 ns

✔ Peak detect or envelope mode pulse response, typical

Instrument (Sample Rate Maximum)	Minimum pulse width
MSO5204/B, DPO5204/B, MSO5104/B, DPO5104/B	>100 ps

Table continued…

Instrument (Sample Rate Maximum)	Minimum pulse width
MSO5054/B, DPO5054/B, MSO5034/B, DPO5034/B	>200 ps

Effective bits, typical

Specifications are valid at maximum per channel sample rate and at 1k record length.

Model	Input frequency	Effective bits
MSO5204/B, DPO5204/B	4.9 MHz	6.0 bits
	2 GHz	6.0 bits
MSO5104/B, DPO5104/B	4.9 MHz	6.0 bits
	1 GHz	6.0 bits
MSO5054/B, DPO5054/B	4.9 MHz	6.0 bits
	500 MHz	6.0 bits
MSO5034/B, DPO5034/B	4.9 MHz	6.0 bits
	350 MHz	6.0 bits

⊿ Random noise, sample acquisition mode

Instrument	Bandwidth limit	RMS noise	
		1 MΩ	50 Ω
MSO5204, DPO5204	Full Bandwidth	≤(180 µV + 8.0% of Volts/div setting)	≤(150 µV + 6.0% of Volts/div setting)
	250 MHz bandwidth	≤(120 µV + 5.0% of Volts/div setting)	≤(75 µV + 4.0% of Volts/div setting)
	20 MHz bandwidth	≤(120 µV + 5.0% of Volts/div setting)	≤(75 µV + 4.0% of Volts/div setting)

Instrument	Bandwidth limit	RMS noise	
		1 MΩ	50 Ω
MSO5104, DPO5104	Full Bandwidth	≤(150 µV + 8.0% of Volts/div setting)	≤(75 µV + 6.0% of Volts/div setting)
	250 MHz bandwidth	≤(100 µV + 5.0% of Volts/div setting)	≤(50 µV + 4.0% of Volts/div setting)
	20 MHz bandwidth	≤(100 µV + 5.0% of Volts/div setting)	≤(50 µV = 4.0% of Volts/div setting)

Instrument	Bandwidth limit	RMS noise	
		1 MΩ	50 Ω
MSO5054, DPO5054	Full Bandwidth	≤(130 µV + 8.0% of Volts/div setting)	≤(130 µV + 8.0% of Volts/div setting)
	250 MHz bandwidth	≤(100 µV + 6.0% of Volts/div setting)	≤(100 µV + 6.0% of Volts/div setting)
	20 MHz bandwidth	≤(100 µV + 4.0% of Volts/div setting)	≤(100 µV + 4.0% of Volts/div setting)

Instrument	Bandwidth limit	RMS noise	
		1 MΩ	50 Ω
MSO5034, DPO5034	Full Bandwidth	≤(130 µV + 8.0% of Volts/div setting)	≤(130 µV + 8.0% of Volts/div setting)
	250 MHz bandwidth	≤(100 µV + 6.0% of Volts/div setting)	≤(100 µV + 6.0% of Volts/div setting)
	20 MHz bandwidth	≤(100 µV + 4.0% of Volts/div setting)	≤(100 µV + 4.0% of Volts/div setting)

MSO/DPO5204B	50 Ω termination			1 MΩ termination		
Vertical Setting	Full BW	250 MHz BW	20 MHz BW	Full BW	250 MHz BW	20 MHz BW
1 mV/div	0.09		0.07	0.20		0.11
2 mV/div	0.20	0.12	0.10	0.45	0.21	0.13
5 mV/div	0.40	0.21	0.20	0.70	0.28	0.24
10 mV/div	0.65	0.37	0.33	0.85	0.45	0.45
20 mV/div	1.10	0.75	0.60	1.10	0.80	0.80
50 mV/div	2.50	1.90	1.50	2.30	2.00	1.90
100 mV/div	6.1	3.7	3.1	5.0	3.8	4.0
1 V/div	43.0	38.0	30.5	50.0	37.5	35.0

MSO/DPO5104B	50 Ω termination			1 MΩ termination		
Vertical Setting	Full BW	250 MHz BW	20 MHz BW	Full BW	250 MHz BW	20 MHz BW
1 mV/div	0.09		0.07	0.21		0.11
2 mV/div	0.17	0.12	0.10	0.38	0.20	0.13
5 mV/div	0.28	0.20	0.18	0.55	0.28	0.23
10 mV/div	0.45	0.37	0.33	0.65	0.45	0.40
20 mV/div	0.80	0.75	0.60	1.00	0.80	0.80
50 mV/div	2.00	1.90	1.50	2.30	2.00	1.90
100 mV/div	4.5	3.7	3.0	4.5	3.8	4.0

Table continued…

MSO/DPO5104B	50 Ω termination			1 MΩ termination		
Vertical Setting	Full BW	250 MHz BW	20 MHz BW	Full BW	250 MHz BW	20 MHz BW
1 V/div	40.0	38.0	30.0	45.0	37.5	35.0

MSO/DPO5054B	50 Ω termination		
Vertical Setting	Full BW	250 MHz BW	20 MHz BW
1 mV/div	0.20		0.11
2 mV/div	0.27	0.21	0.13
5 mV/div	0.38	0.30	0.22
10 mV/div	0.55	0.55	0.45
20 mV/div	1.10	1.00	0.80
50 mV/div	2.50	2.50	1.90
100 mV/div	5.0	4.75	4.0
1 V/div	50.0	50.0	40.0

MSO/DPO5054B	50 Ω termination		
Vertical Setting	Full BW	250 MHz BW	20 MHz BW
1 mV/div	0.20		0.11
2 mV/div	0.27	0.21	0.13
5 mV/div	0.38	0.30	0.22
10 mV/div	0.55	0.55	0.45
20 mV/div	1.10	1.00	0.80
50 mV/div	2.50	2.50	1.90
100 mV/div	5.0	4.75	4.0
1 V/div	50.0	50.0	40.0

Delay between channels, full bandwidth, typical

≤100 ps between any two channels with input impedance set to 50 Ω, DC coupling, with equal volts/division setting or above 10 mV/div

All settings in the instrument can be manually time aligned using the Probe Deskew function

Deskew range

–75 ns to +75 ns

Crosstalk channel isolation

≥100:1 at ≤100 MHz and ≥30:1 at >100 MHz up to the rated bandwidth for any two channels having equal Volts/Div settings

TekVPI interface

The probe interface allows installing, powering, compensating, and controlling a wide range of probes offering a variety of features.

The interface is available on all front panel inputs including Aux In. Aux In only provides 1 MΩ input impedance and does not offer 50 Ω as the other input channels do.

Total probe power	Five TekVPI-compliant probe interfaces (one per channel)
	15 W maximum internal probe power (12 W maximum with firmware versions <6.4.0)
	Provision for 50 W probe power with 119-7465-00 TekVPI External Power Supply

Probe power per channel

Voltage	Max Amperage	Voltage Tolerance
5 V	50 mA (250 mW)	±5%
12 V	2 A (24 W)	±10%

Horizontal and acquisition system specifications

Sample rate

Instrument	Maximum sample rate	Number of channels
MSO5204/B, DPO5204/B, MSO5104/B, DPO5104/B	10 GS/s	1 or 2
	5 GS/s	3 or 4
MSO5054/B, DPO5054/B, MSO5034/B, DPO5034/B	5 GS/s	1 – 4

Record length, analog channels

Option	Number of Channels	2 GHz	1 GHz	500 MHz	350 MHz
Standard (MSO/DPO5000 Series)	3 or 4	12.5 M	12.5 M	12.5 M	12.5 M
	1 or 2	25 M	25 M	12.5 M	12.5 M
Option 2RL (MSO/DPO5000 Series) Standard (MSO/DPO5000B Series)	3 or 4	25 M	25 M	25 M	25 M
	1 or 2	50 M	50 M	25 M	25 M
Option 5RL	3 or 4	50 M	50 M	50 M	50 M
	1 or 2	125 M	125 M	50 M	50 M
Option 10RL	3 or 4	125 M	125 M	125 M	125 M
	1 or 2	250 M	250 M	125 M	125 M

Record length, digital channels The record length ranges for a standard instrument are the same as for the analog channel specification table (above).

The record length ranges for an instrument with an option are the same as for the analog channel specifications, up to 40M.

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Seconds/Division range

MSO5204B, DPO5204B, MSO5104B, DPO5104B	Record Length						
Horizontal Mode	**1 K**	**10 K**	**100 K**	**1 M**	**10 M**	**100 M**	**200/250 M**
Automatic	250 ps - 20 s	2.5 ns - 200 s	50 ns - 1 ks	500 ns - 1 ks	5 us - 1 ks	50 us - 1 ks	50 us - 1 ks
Constant SR	250 ps - 20 s	2.5 ns - 200 s	50 ns - 1 ks	500 ns - 1 ks	5 us - 1 ks	50 us - 1 ks	50 us - 1 ks
Manual	250 ps - 40 s	2.5 ns - 400 s	25 ns - 4 ks	250 ns - 40 ks	2.5 us - 400 ks	25 us - 4 Ms	50 us - 8 Ms

MSO5054B, DPO5054B, MSO5034B, DPO5034B	Record Length					
Horizontal Mode	**1 K**	**10 K**	**100 K**	**1 M**	**10 M**	**100 M**
Automatic	250 ps - 20 s	2.5 ns - 200 s	50 ns - 1 ks	500 ns - 1 ks	5 us - 1 ks	50 us - 1 ks
Constant SR	250 ps - 20 s	2.5 ns - 200 s	50 ns - 1 ks	500 ns - 1 ks	5 us - 1 ks	50 us - 1 ks
Manual	250 ps - 40 s	2.5 ns - 400 s	25 ns - 4 ks	250 ns - 40 ks	2.5 us - 400 ks	25 us - 4 Ms

Maximum update rate   Maximum triggered acquisition rate: >250,000 wfm/s

Aperture uncertainty   ≤(3 ps + 0.1 ppm × record duration)RMS, for records having ≤1 minute duration

✓ Long-term sample rate and delay time accuracy   ±5 ppm over any ≥1 ms time interval

✓ Delta-time measurement accuracy   The formula to calculate the delta-time measurement accuracy (DTAmax) for a given instrument setting and input signal is given below (assumes insignificant signal content above Nyquist and insignificant error due to aliasing):

SR_1 = slew rate around 1st point in measurement (1st edge)

SR_2 = slew rate around 2nd point in measurement (2nd edge)

N =input-referred noise (VRMS)

TBA = time base accuracy (5 ppm)

t_p = delta-time measurement duration (seconds)

RD = (record length)/(sample rate)

t_{sr} = 1/(sample rate)

Assume edge shape that results from Gaussian filter response

$$DTA_{pk-pk} = \pm 5 * \sqrt{2\left[\frac{N}{SR_1}\right]^2 + 2\left[\frac{N}{SR_2}\right]^2 + (3ps + 1*10^{-7}*RD)^2 + 2t_{sr}TBA*t_p}$$

$$DTA_{RMS} = \sqrt{2\left[\frac{N}{SR_1}\right]^2 + 2\left[\frac{N}{SR_2}\right]^2 + (3ps + 1*10^{-7}*RD)^2 + \left(\frac{2*t_{sr}}{\sqrt{12}}\right)^2 + TBA*t_p}$$

The term under the square-root sign is the stability and is due to TIE (Time Interval Error). The errors due to this term occur throughout a single-shot measurement. The second term is due to both the absolute center-frequency accuracy and the center-frequency stability of the time base and varies between multiple single-shot measurements over the observation interval (the amount of time from the first single-shot measurement to the final single-shot measurement).

The observation interval may not exceed 1 year. Peak-to-peak delta time accuracy is typical and is specified over 500 acquisitions.

Trigger specifications

Aux in external trigger input impedance, typical	1 M Ω ±1% in parallel with 13 pF ±2 pF
Aux in (external) trigger maximum input voltage	The maximum input voltage at the BNC 300 VRMS
	Installation Category II
	Derate at 20 dB/decade above 3 MHz to 30 VRMS at 30 MHz, 10 dB/decade above 30 MHz.
Aux in external trigger bandwidth, typical	250 MHz ±20%

Trigger bandwidth, edge, typical

MSO5204/B, DPO5204/B	2 GHz
MSO5104/B, DPO5104/B	1 GHz
MSO5054/B, DPO5054/B	500 MHz
MSO5034/B, DPO5034/B 350 MHz	350 MHz

Trigger bandwidth, pulse and logic, typical

MSO5204/B, DPO5204/B	1 GHz
MSO5104/B, DPO5104/B	1 GHz
MSO5054/B, DPO5054/B	500 MHz
MSO5034/B, DPO5034/B	350 MHz

Edge-type trigger sensitivity, DC coupled, typical

Models	Trigger Source	Sensitivity
MSO5204/B, DPO5204/B MSO5104/B, DPO5104/B	Any input channel	50 Ω path: 0.40 div from DC to 50 MHz, increasing to 1 div at oscilloscope bandwidth
MSO5054/B, DPO5054/B MSO5034/B, DPO5034/B	Any input channel	50 Ω path: 1 mV/div to 4.98 mV/div – 0.75 div from DC to 50 MHz, increasing to 1.3 div at oscilloscope bandwidth. ≥ 5 mV/div 0.40 div from DC to 50 MHz, increasing to 1 div at oscilloscope bandwidth.
All models	Any input channel	1 MΩ path: 1 mV/div to 4.98 mV/div – 0.75 div from DC to 50 MHz, increasing to 1.3 div at oscilloscope bandwidth. ≥ 5 mV/div 0.40 div from DC to 50 MHz, increasing to 1 div at oscilloscope bandwidth.
All models	Aux in (External)	200 mV from DC to 50 MHz, increasing to 500 mV at 250 MHz
All models	Line	Fixed

Trigger jitter

100 fs using enhanced trigger placement. 1 ps rms for low frequency, fast rise time signal, A edge, time holdoff = 30 µs

≤100 ps RMS for non edge-type trigger modes

Edge-type trigger sensitivity, not DC coupled, typical

Trigger Coupling	Typical Sensitivity
AC Coupling	1 div for frequencies above 45 Hz. Attenuates signals below 45 Hz.
NOISE REJ	2.5 times the DC-coupled limits
HF REJ	1.0 times the DC-coupled limit from DC to 50 kHz. Attenuates signals above 50 kHz
LF REJ	1.5 times the DC-coupled limits for frequencies above 50 kHz. Attenuates signals below 50 kHz

Video-type trigger formats and field rates	Triggers from negative sync composite video, field 1 or field 2 for interlaced systems, on any field, specific line, or any line for interlaced or non-interlaced systems. Supported systems include NTSC, PAL, and SECAM.

Video-type trigger sensitivity, typical

Delayed and main trigger	
Source	**Sensitivity**
Any input channel	0.6 to 2.5 divisions of video sync tip
Aux In (External)	Video not supported through Aux In (External) input

Lowest frequency for successful operation of set level to 50 function, typical	45 Hz

Logic-type or logic qualified trigger or events-delay sensitivities, DC coupled, typical	1.0 division from DC to maximum bandwidth

Pulse-type runt trigger sensitivities, typical	1.0 division from DC to maximum bandwidth

Pulse-type trigger width and glitch sensitivities , typical	1.0 division

Logic-type triggering, minimum logic or rearm time, typical

For all vertical settings, the minimums are:

Trigger type	Pulse width	Re-arm time	Time between channels
Logic	Not applicable	2 ns	1 ns
Time Qualified Logic	4 ns	2 ns	1 ns

For logic, time between channels refers to the length of time a logic state derived from more than one channel must exist to be recognized. For events, the time is the minimum time between a main and delayed event that will be recognized if more than one channel is used.

Minimum clock pulse widths for setup-hold time violation trigger, typical

For all vertical settings

Clock active	Clock inactive
User hold time + 2.5 ns	2 ns

An active pulse width is the width of the clock pulse from its active edge to its inactive edge. An inactive pulse width is the width of the pulse from its inactive edge to its active edge. The User hold time is the number selected by the user.

Setup-hold violation trigger setup and hold time ranges

Feature	Min	Max
Setup time	–0.5 ns	1.0 ms
Hold time	1 ns	1.0 ms
Setup + Hold time	0.5 ns	2.0 ms

Input coupling on clock and data channels must be the same.

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For Setup time, positive numbers mean a data transition before the clock.

For Hold time, positive numbers mean a data transition after the clock edge.

Setup + Hold time is the algebraic sum of the Setup Time and Hold Time that you programmed.

Pulse type trigger, minimum pulse, rearm time, transition time

Pulse class	Minimum pulse width	Minimum rearm time
Glitch	4 ns	2 ns + 5% of glitch width setting
2 ns + 5% of glitch width setting	4 ns	2 ns
Time-qualified runt	4 ns	8.5 ns + 5% of width setting
Width	4 ns	2 ns + 5% of width upper limit setting
Slew rate (transition time)	4 ns	8.5 ns + 5% of delta time setting

For the trigger class width and the trigger class runt, the pulse width refers to the width of the pulse being measured. The rearm time refers to the time between pulses.

For trigger class runt, pulse width refers to the width of the pulse being measured. Rearm time refers to the time between pulses.

For the trigger class slew rate, the pulse width refers to the delta time being measured. The rearm time refers to the time it takes the signal to cross the two trigger thresholds again.

Transition time trigger, delta time range

4 ns to 8 s

Time range for glitch, width, timeout, or time-qualified runt

4 ns to 8 s

Time accuracy for glitch, timeout, or width triggering

Time Range	Accuracy
1 ns to 500 ns	±(20% of setting + 0.5 ns)
520 ns to 1 s	±(0.01% of setting + 100 ns)

B trigger after events, minimum pulse width and maximum event frequency, typical

4 ns, 500 MHz

B trigger, minimum time between arm and trigger, typical

4 ns

For trigger after time, this is the time between the end of the time period and the B trigger event.

For trigger after events, this is the time between the last A trigger event and the first B trigger event.

B trigger after time, time range   4 ns to 8 seconds

B trigger after events, event range

1 to 4,000,000 events

Trigger level ranges

Source	Range
Any input channel	±8 divisions from center of screen ±8 divisions from 0 V when vertical LF reject trigger coupling is selected
Aux In (External)	±8 V
Line	Not applicable

Line trigger level is fixed at about 50% of the line voltage.

This specification applies to logic and pulse thresholds.

Trigger level accuracy, DC coupled

Source	Range
Any input channel	±0.20 div
Aux In (External)	±(10% of setting + 25 mV)
Line Not applicable	Not applicable

For signals having rise and fall times ≥10 ns.

Trigger holdoff range   20 ns minimum to 8 s maximum

Maximum serial trigger bits   128 bits

Standard serial bus interface triggering

I²C

Address Triggering: 7 and 10 bit user specified address, as well as General Call, START byte, HS-mode, EEPROM, and CBUS

Data Trigger: 1 to 5 bytes of user specified data

Trigger On: Start, Repeated Start, Stop, Missing Ack, Address, Data, or Address and Data

Maximum Data Rate: 10 Mbps

SPI

Data Trigger: 1 to 16 bytes of user-specified data

Trigger On: SS Active, MOSI, MISO, or MOSI and MISO

Maximum Data Rate: 10 Mbps

RS-232

Bit Rate: 50 bps to 10 Mbps

Data Bits: 7, 8, or 9

Parity: None, Odd, or Even

Trigger On: Tx Start Bit, Rx Start Bit, Tx End of Packet, Rx End of Packet, Tx Data, Rx Data, Tx Parity Error, or Rx Parity Error

End of Packet: 00 (NUL), 0A (LF), 0D (CR), 20 (SP), FF

USB

Data Rates Supported: HS to 480 Mbps, Full to 12 Mbps, Low to 1.5 Mbps

Trigger On: Sync, Reset, Suspend, Resume, End of Packet, Token (Address) Packet, Data Packet, Handshake Packet, Special Packet, Error

Digital acquisition specifications MSO5000/B series

Threshold voltage range	-40 V to +40 V
Digital channel timing resolution	2 ns main memory, 60.6 ps for MagniVu memory
✔ **Logic threshold accuracy**	±(100 mV + 3% of threshold setting after calibration)
	Requires valid SPC.
Minimum detectable pulse width	1 ns
	Using MagniVu memory. Requires the use of 342-1140-00 ground clip per channel.

P6616 digital probe specifications

Number of channels	16 digital inputs
Input resistance, typical	100 kΩ to ground
Input capacitance, typical	3.0 pF
	Measured at the podlet input. Requires the use of 342-1140-00 ground clip per channel
Minimum input signal swing	400 mVp-p
	Requires the use of 342-1140-00 ground clip per channel
Maximum input signal swing	30 Vp-p for fin ≤ 200 MHz (centered around the DC threshold voltage) at the P6616 probe tip.
	10 Vp-p for fin >200 MHz (centered around the DC threshold voltage) at the P6616 probe tip.
	Failure to meet this input signal requirement will compromise the AC performance of the digital channel. It might also damage the input circuitry. See the Absolute maximum input voltage specification.
Maximum input toggle rate	500 MHz
	Maximum frequency sine wave input that can accurately be reproduced as a logic square wave.
	Requires the use of a 342-1140-00 ground clip on each channel.
	This is the maximum frequency at the minimum swing amplitude. Higher toggle rates can be achieved with higher amplitudes.
Absolute maximum input voltage	±42 V peak at the P6616 input (not at the instrument input)
	Probe input voltages beyond this limit could permanently damage the instrument and the P6616 probe.
Channel-to-channel skew	200 ps

Digital channel to digital channel only.

This is the propagation path skew and ignores skew contributions due to threshold inaccuracies (see Threshold accuracy) and sample binning (see Digital channel timing resolution). Factory calibration/deskew is required to achieve this number.

Display specifications

Display type

Display area: 210.4 mm (8.28 in) (H) x 157.8 mm (6.21 in) (V), 264 mm (10.4 in) diagonal, 6-bit RGB full color, XGA (1024 x 768) TFT liquid crystal display (LCD).

Display resolution

1024 X 768 XGA display resolution

Luminance, typical

400 cd/m^2

Waveform display color scale

The TFT display can support up to 262,144 colors. A subset of these colors are used for the oscilloscope display, all of which are fixed colors and not changeable by the user.

Input–Output port specifications

Ethernet interface

Standard on all models: 10/100/1000 Mbps

GPIB interface

Available as an optional accessory that connects to the USB Device and USB Host ports with the TEK-USB-488 GPIB to USB Adapter

The control interface is incorporated into the instrument user interface.

Video signal output

A 15 pin D-sub, VGA-type connector, supporting a minimum resolution range of 640X480 to 1280X1024.

USB interface

1 USB device connector (2.0 Full Speed), on the instrument rear panel.

6 USB host connectors (2.0 HS), two on the instrument front and four on the rear.

Probe compensator output voltage and frequency, typical

Output voltage	0 V to 2.5 V ±1% behind 1 kΩ ±2%
Frequency	1 kHz ±25%

Auxiliary output (AUX OUT), trigger out or reference clock out

You can set the Auxiliary output to Trigger Out or Reference Clock Out.

Reference Clock Out: Outputs the 10 MHz oscilloscope reference clock.

Trigger Out: A HIGH to LOW transition indicates that the trigger occurred.

Trigger output logic levels	
Characteristic	**Limits**
Vout (HI)	≥2.5 V open circuit
	≥1.0 V into a 50 Ω load to ground

Table continued…

Trigger output logic levels	
Characteristic	**Limits**
Vout (LO)	≤0.7 V into a load of ≤4 mA
	≤0.25 V into a 50 Ω load to ground

External reference nominal input frequency	10 MHz You must select either the internal reference (default) or 10 MHz external.
External reference input frequency variation tolerance	9.9 MHz to 10.1 MHz You must run SPC whenever the external reference is more than 0.2% (2000 ppm) different than the nominal reference frequency or reference at which SPC was last run. The time base changes in correspondence to the fluctuations in the external reference.
External reference input sensitivity	Vin 1.5V_{p-p} for input frequencies between 9.9 MHz and 10.1 MHz
External reference input maximum input signal	7 V_{p-p}
External reference input impedance	Rin = 1.5 kΩ ±20% in parallel with 15 pF ±5 pF at 10 MHz
Keyboard and mouse ports	PS-2 compatible, instrument must be powered down to make connection
External audio ports	External audio jacks for microphone input and line output

Data storage specifications

Nonvolatile memory retention time, typical	No time limit for front-panel settings, saved waveforms, setups, and calibration constants
Real-time clock	A programmable clock providing time in years, months, days, hours, minutes, and seconds
Hard disk drive (standard for MSO/DPO5000 Series)	The 2.5-inch SATA hard disk drive capacity is ≥160 GB. Waveforms and setups are stored on the hard disk.
Solid state disk drive (standard for MSO/DPO5000B Series, optional for MSO/DPO5000 Series)	The 2.5-inch solid state disk drive capacity is ≥300 GB. Waveforms and setups are stored on the solid state disk.

Power source specifications

Source voltage	100 V to 240 V ±10%
Source frequency	(85 to 264 V) 45 Hz to 66 Hz (100 V to 132 V) 360 Hz to 440 Hz

| **Fuse rating** | T6.3AH, 250 V$_{ac}$ |

The fuse cannot be replaced by the user.

Environmental specifications

Temperature

| **Operating:** | +5 °C to +50 °C (32 °F to +122 °F) |
| **Nonoperating:** | -20 °C to +60 °C (-4 °F to +140 °F) |

Humidity

With hard disk drive

Operating:	8% to 90% relative humidity with a maximum wet bulb temperature of 29 °C at or below
	+50 °C (upper limit derates to 20.6% relative humidity at +50 °C). Non-condensing.
Nonoperating:	5% to 98% relative humidity with a maximum wet bulb temperature of 40 °C at or below
	+60 °C (upper limit derates to 29.8% relative humidity at +60 °C). Non-condensing.
Operating:	With solid state drive
	High: 40 °C to 50 °C (104 °F to 122 °F), 10% to 60% relative humidity
	Low: 0 °C to 40 °C (32 °F to 104 °F), 10% to 90% relative humidity
Nonoperating:	High: 40 °C to 60 °C (104 °F to 140 °F), 5% to 60% relative humidity
	Low: 0 °C to 40 °C (32 °F to 104 °F), 5% to 90% relative humidity

Altitude

| **Operating:** | 3,000 m (9,843 ft) |
| **Nonoperating:** | 12,000 m (39,370 ft) |

Mechanical specifications

Dimensions

Benchtop configuration (oscilloscope only)

Height:	9.3 in (236 mm) Feet folded in, handle folded down
	9.8 in (249 mm) Feet Folded out, handle folded down
	13.5 in (343 mm) Feet Folded in, handle folded up
	14.0 in (356 mm) Feet Folded out, handle folded up
Width:	17.3 in (439 mm) from handle hub to handle hub.
Depth:	8.0 in (203 mm) from back of feet to front of knobs.

8.9 in (226 mm) from back of feet to front of front cover

8.5 in (216 mm) from handle back to front of knobs.

Box Dimensions:	Height: 19.6 in (498 mm)
	Width: 18.0 in (457 mm)
	Length: 22.6 in (574 mm)
Rackmount configuration (5U Rack Sizes)	Height: 8.6 in (218 mm)
	Width: 19.2 in (488 mm) from outside of handle to outside of handle.
	Depth: 15.1 in (384 mm) from outside of handle to back of slide.
Weight	14.9 lbs (6.8 kg), standalone instrument, without front cover
	22.2 lbs (10.0 kg), instrument with rackmount, without front cover
	27.5 lbs (12.5kg), when packaged for domestic shipment, without rackmount

Clearance requirements

Top:	0 in (0 mm)
Bottom:	0 in (0 mm), on feet, with flip stands down
Left side:	2 in (50.8 mm)
Right side:	0 in (0 mm)
Rear:	2 in (50.8 mm)

Cooling	Fan-forced air circulation with no air filter.
Construction material	Chassis parts are constructed of aluminum alloy, front panel is constructed of plastic laminate, circuit boards are constructed of glass laminate.

Performance verification (MSO/DPO70000C, MSO/ DPO70000DX, and DPO7000C series)

Performance verification (MSO/DPO70000C, MSO/DPO70000DX, and DPO7000C series)

Two types of Performance Verification procedures can be performed on these products: *Brief Procedures* and *Performance Tests*. You may not need to perform all of these procedures, depending on what you want to accomplish.

If you are not familiar with operating this instrument, read the instrument user manual or explore the online help.

* To rapidly confirm that the instrument functions and was adjusted properly, perform only the brief procedures under *Self Tests*.

    Advantages. These procedures are quick to do, require no external equipment or signal sources, and perform extensive functional and accuracy testing to provide high confidence that the instrument will perform properly. They can be used as a quick check before making a series of important measurements.

* To further check functionality, first do the *Self Tests* just mentioned; then do the brief procedures under *Functional Tests*.

    Advantages. These procedures require minimal additional time to perform, require no additional equipment other than cables and adapters, and these procedures more completely test the internal hardware of the instrument. They can be used to quickly determine if the instrument is suitable for putting into service, such as when it is first received.

* If more extensive confirmation of performance is desired, perform the *Performance Tests* after performing the *Functional* and *Self Tests* mentioned above. *Performance tests (MSO/DPO70000C, MSO/DPO70000DX, and DPO7000C series)* on page 122

    Advantages. These procedures add direct checking of the warranted specifications that are marked with the ✔ symbol. These procedures require specific test equipment. *Equipment required* on page 122

Conventions

Throughout these procedures the following conventions apply:

* Each test procedure uses the following general format:

    * Title of Test
    * Equipment Required
    * Prerequisites
    * Procedure

* Each procedure consists of as many steps, substeps, and subparts as required to do the test. Steps, substeps, and subparts are sequenced as follows:

1. First Step

    a. First Substep

        * First Subpart
        * Second Subpart

    b. Second Substep

2. Second Step

* In steps and substeps, the lead-in statement in italics instructs you what to do, while the instructions that follow tell you how to do it, as in the example step below:

    Initialize the instrument: Push the front-panel **Default Setup** button.

STOP. The **STOP** notation at the left is accompanied by information you must read to do the procedure properly.

- The term "toolbar" refers to a row of buttons at the top of the display. The term "menu bar" refers to a row of menus at the top of the display. You can switch between toolbar and menu bar operating modes by using the menu at the top right of the toolbar or menu bar. (See *Figure 1* on page 112.)

- Item numbers in the equipment required lists refer to the equipment. (See *Equipment required* on page 122.)
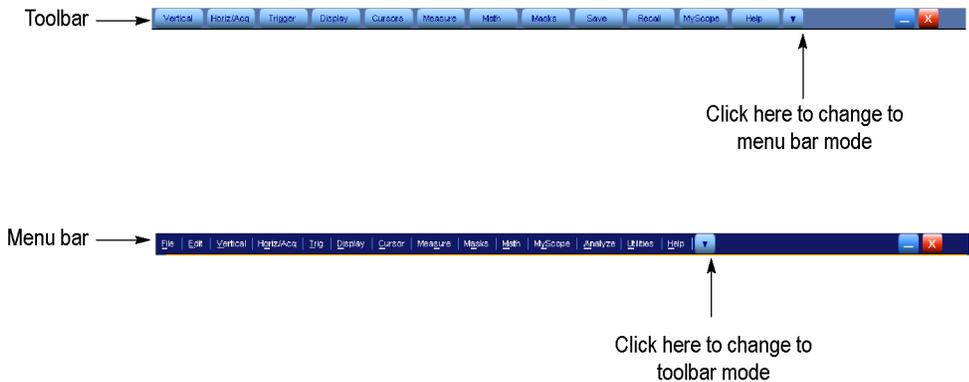
Figure 1: Toolbar and menu bar (DPO7000C models shown)

- The procedures assume you have connected a mouse to the instrument so you can click on the screen controls. If you have not connected a mouse, you can use the touch screen to operate the screen controls.

Brief procedures (MSO/DPO70000C, MSO/DPO70000DX, and DPO7000C series)

The *Self Tests* use internal routines to confirm basic functionality and proper adjustment. No test equipment is required to do these test procedures.

The *Functional Tests* utilize the probe-compensation output at the front panel as a test-signal source for further verifying that the instrument functions properly. A BNC cable and an adaptor or a probe, depending on your instrument model are required to do these test procedures.

Self tests

This procedure uses internal routines to verify that the instrument functions and was adjusted properly. No test equipment or hookups are required.

Equipment required	Prerequisites
None	Power on the instrument and allow a 20 minute warm-up before doing this procedure.

1. *Verify that internal diagnostics pass:* Do the following substeps to verify passing of internal diagnostics.

    a. *Display the System diagnostics menu:*

      If the instrument is in toolbar mode, put the instrument into menu bar mode.

      Pull down the **Utilities** menu and select **Instrument Diagnostics. . .** . This displays the diagnostics control window.

    b. *Run the System Diagnostics:*

      - First disconnect any input signals from all four channels.

- Click the **Run** button in the diagnostics control window.

c. *Wait:* The internal diagnostics do an exhaustive verification of proper instrument function. This verification may take several minutes. When the verification is finished, the resulting status will appear in the diagnostics control window.

d. *Verify that no failures are found and reported on-screen.* All tests should pass.

e. *Run the signal-path compensation routine:*

Pull down the **Utilities** menu and select **Instrument Calibration. . .** . This displays the instrument calibration control window.

If required because the instrument is in service mode, select the **Signal Path** button under Calibration Area.

Click the **Run SPC** (**Calibrate** on some instruments) button to start the routine.

f. *Wait:* Signal-path compensation may take five to fifteen minutes to run.

g. *Confirm signal-path compensation returns passed status:* Verify that the word **Pass** appears in the instrument calibration control window.

2. *Return to regular service:* Click the **X** (close) button to exit the instrument calibration control window.

Functional tests

The purpose of these procedures is to confirm that the instrument functions properly. The only equipment required is a BNC or SMA cable and an adapter or the instrument probe. If you need to store settings during these procedures, access the local C: drive and store them in the TekScope > Setups directory.

STOP. These procedures verify functions; that is, they verify that the instrument features operate. They do not verify that they operate within limits.

Therefore, when the instructions in the functional tests that follow call for you to verify that a signal appears on-screen "that is about five divisions in amplitude" or "has a period of about six horizontal divisions," etc., do NOT interpret the quantities given as limits. Operation within limits is checked in Performance Tests. (See *Performance tests (MSO/DPO70000C, MSO/DPO70000DX, and DPO7000C series)* on page 122.)

STOP. DO NOT make changes to the front-panel settings that are not called out in the procedures. Each verification procedure will require you to set the instrument to certain default settings before verifying functions. If you make changes to these settings, other than those called out in the procedure, you may obtain invalid results. In this case, just redo the procedure from step 1.

When you are instructed to press a front-panel or screen button, the button may already be selected (its label will be highlighted). If this is the case, it is not necessary to press the button.

Verify all analog input channels

Equipment required	Prerequisites
DPO7000C models: One precision 50 Ω coaxial cable (Item 4)	None
DPO7000C models: One BNC to Minigrabber adapter (item 18)	
MSO/DPO70000C/DX models: One SMA cable (item 21)	
MSO/DPO70000C/DX models: One adapter (item 19)	

1. *Initialize the instrument:* Push the front-panel **Default Setup** button.

2. *Hook up the signal source:* Connect the equipment as shown in the following figure to the channel input you want to test (beginning with Ch 1).
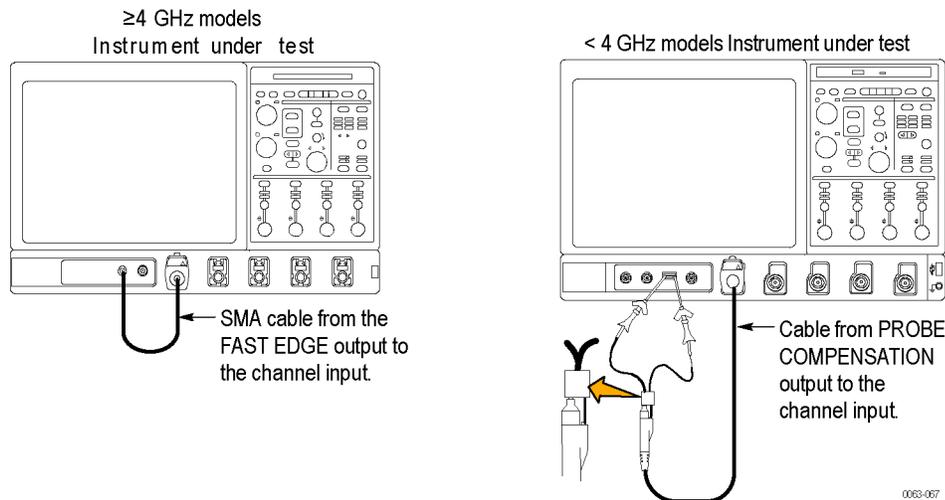
Figure 2: Universal test hookup for functional tests - Ch 1 shown

3. *Turn off all channels:* If any of the front-panel channel buttons are lighted, push those buttons to turn off the displayed channels as shown in the following figure.
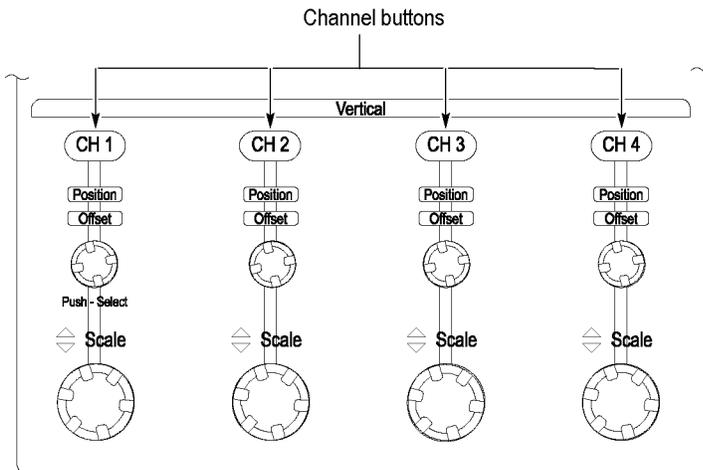
Figure 3: Channel button location

4. *Select the channel to test:* Push the channel button for the channel you are currently testing. The button lights and the channel display comes on.

5. *Set up the instrument:*

⚠️ **Note:** If the AutoSet Undo window appears, click the X.

- Push the front panel **Autoset** button. This sets the horizontal and vertical scale and vertical offset for a usable display and sets the trigger source to the channel you are testing.

- Pull down the **Vertical** menu, select Vertical Setup. Confirm that the Ch1 Offset is about **0.0 mV** (**120 mV** on MSO/DPO70000DX models).

6. *Verify that the channel is operational:* Confirm that the following statements are true.

- Verify that the vertical scale readout and the waveform amplitude for the channel under test. (See *Table 4* on page 115.)

Table 4: Vertical settings

Setting	DPO7000C models	MSO/DPO70000C/DX models
	Without probe	Without probe
Scale	500 mV	100 mV
Waveform amplitude	2 divisions	4 divisions

- The front-panel vertical **Position** knob (for the channel you are testing) moves the signal up and down the screen when rotated.
- Turning the vertical **Scale** knob counterclockwise (for the channel you are testing) decreases the amplitude of the waveform on-screen, turning the knob clockwise increases the amplitude, and returning the knob to the original scale setting returns the original amplitude for that scale setting. (See *Table 4* on page 115.)

7. *Verify that the channel acquires in all acquisition modes:* Pull down the **Horiz/Acq** menu to select **Horizontal/Acquisition Setup. . . .** Click the **Acquisition** tab in the control window that displays. Click each of the acquisition modes and confirm that the following statements are true.

- Sample mode displays an actively acquiring waveform on-screen. (Note that there is a small amount of noise present on the square wave).
- Peak Detect mode displays an actively acquiring waveform on-screen with the noise present in Sample mode "peak detected".
- Hi Res mode displays an actively acquiring waveform on-screen with the noise that was present in Sample mode reduced.
- Average mode displays an actively acquiring waveform on-screen with the noise reduced.
- Envelope mode displays an actively acquiring waveform on-screen with the noise displayed.

⚠️ **Note:** Default setup enables enhanced triggering. Enhanced triggering can cause a slower acquisition rate that can be noticed in waveform database mode. As waveform database mode acquires 100,000 samples, the display intensity will increase, be cleared, and then the process will start over. When enhanced triggering is turned off, and with the specified settings and input signal, the display reaches full intensity right away.

- Waveform Database mode displays an actively acquiring waveform on-screen with the noise displayed.

8. *Test all channels:* Repeat steps *2* on page 113 through *7* on page 115 until all four input channels are verified.

9. *Remove the test hookup:* Disconnect the equipment from the instrument.

Verify the time base

Equipment required	Prerequisites
DPO7000C models: One precision 50 Ω coaxial cable (Item 4)	None
DPO7000C models: One BNC to Minigrabber adapter (item 18)	
MSO/DPO70000C/DX models: One SMA cable (item 21)	
MSO/DPO70000C/DX models: One adapter (item 19)	

1. *Initialize the instrument:* Push the front-panel **Default Setup** button.

2. *Hook up the signal source:* Connect the probe compensation or fast edge output to the Ch 1 input as shown in the following figure.

≥4 GHz models Instrument under test

< 4 GHz models Instrument under test

SMA cable from the FAST EDGE output to the channel input.

Cable from channel input to PROBE COMPENSATION output through Minigrabber.

0063-063

Figure 4: Setup for time base test

3. *Set up the instrument:* Push the front panel **Autoset** button.

4. Set the **Vertical Scale** to **200 mV** /div (DPO7000C, MSO/DPO70000C) or **120 mV**/div (MSO/DPO70000DX models).

5. *Set the time base:* Set the horizontal **Scale** to **200 µs/div**. The time-base readout is displayed at the bottom of the graticule.

6. *Verify that the time base operates:* Confirm the following statements.

   • One period of the square-wave signal is about five horizontal divisions on-screen for the 200 µs/div horizontal scale setting.

   • Rotating the horizontal **Scale** knob clockwise expands the waveform on-screen (more horizontal divisions per waveform period), counterclockwise rotation contracts it, and returning the horizontal scale to 200 µs/div returns the period to about five divisions.

   • The horizontal **Position** knob positions the signal left and right on-screen when rotated.

7. *Verify horizontal delay:*

   a. *Center a rising edge on screen:*

      • Set the horizontal **Position** knob so that the rising edge where the waveform is triggered is lined up with the center horizontal graticule.

      • Change the horizontal **Scale** to **20 µs/div**. The rising edge of the waveform should remain near the center graticule and the falling edge should be off screen.

   b. *Turn on and set horizontal delay:*

      • Pull down the **Horiz/Acq** menu to select **Horizontal/Acquisition Setup. . . .**

      • Click the **Horizontal** tab in the control window that displays.

      • Click the **Delay Mode** button to turn delay on.

      • Double click the **Horiz Delay** control in the control window to display the pop-up keypad. Click the keypad buttons to set the horizontal delay to **1 ms** and then click the **ENTER** key.

   c. *Verify the waveform:* Verify that a rising edge of the waveform is within a few divisions of center screen.

   d. *Adjust the horizontal delay:* Rotate the upper multipurpose knob to change the horizontal delay setting. Verify that the rising edge shifts horizontally. Rotate the front-panel horizontal **Position** knob. Verify that this knob has the same effect (it also adjusts delay, but only when delay mode is on).

   e. *Verify the delay toggle function:*

      • Rotate the front-panel horizontal **Position** knob to center the rising edge horizontally on the screen.

      • Change the horizontal **Scale** to **50 ns/div** (DPO7000C models) or **40 ns/div** (MSO/DPO70000C/DX models). The rising edge of the waveform should remain near the center graticule.

      • Readjust the delay setting to position the rising edge 2 divisions to the right of the center graticule line.

- Push the front-panel **Delay** button several times to toggle delay off and on and back off again. Verify that the display switches quickly between two different points in time (the rising edge shifts horizontally on the display).

8. *Remove the test hookup:* Disconnect the test hookup from the instrument.

Verify the A (Main) and B (Delayed) trigger systems

Equipment required	Prerequisites
DPO7000C models: One precision 50 Ω coaxial cable (Item 4)	None
DPO7000C models: One BNC to Minigrabber adapter (item 18)	
MSO/DPO70000C/DX models: One SMA cable (item 21)	
MSO/DPO70000C/DX models: One adapter (item 19)	

1. *Initialize the instrument:* Push the front-panel **Default Setup** button.
2. *Hook up the signal source:* Connect the probe compensation or fast edge output to the Ch 1 input as shown in the following figure.

≥4 GHz models Instrument under test　　　　　< 4 GHz models Instrument under test

SMA cable from the FAST EDGE output to the channel input.

Cable from channel input to PROBE COMPENSATION output through Minigrabber.

0063-063

Figure 5: Setup for trigger test

3. *Set up the instrument:* Push the front-panel **Autoset** button.
4. Set the **Vertical Scale** to **200 mV** /div (DPO7000C, MSO/DPO70000C models) or **120 mV**/div (MSO/DPO70000DX models).
5. *Verify that the main trigger system operates:* Confirm that the following statements are true.

   - The trigger level readout for the A (main) trigger system changes with the trigger-**Level** knob.
   - The trigger-**Level** knob can trigger and untrigger the square-wave signal as you rotate the knob. (Leave the signal untriggered).
   - Pushing the front-panel trigger **Level** knob sets the trigger level to the 50% amplitude point of the signal and triggers the signal that you just left untriggered. (Leave the signal triggered.)

6. *Verify that the delayed trigger system operates:*

   a. *Set up the delayed trigger:*

   Pull down the **Trig** menu and select **A – B Trigger Sequence. . .** . This displays the A →B Sequence tab of the trigger setup control window.

   Click the **Trig After Time** button under A Then B.

   Click the **B Trig Level** control in the control window.

Set the front-panel trigger mode to **Norm**.

b. *Confirm that the following statements are true*:

- The trigger-level readout for the B trigger system changes as you turn the lower multipurpose knob.
- As you rotate the lower multipurpose knob, the square-wave signal can become triggered and untriggered. (Leave the signal triggered.)

c. *Verify the delayed trigger counter:*

- Double click the **Trig Delay** control to pop up a numeric keypad for that control.
- Click the keypad to enter a trigger delay time of **1 second** (click 1 and None) and then click **Enter**.
- Verify that the trigger **Ready** indicator on the front panel flashes about once every second as the waveform is updated on-screen.

7. *Remove the test hookup:* Disconnect the test hookup from the instrument.

Verify the file system

Equipment required	Prerequisites
DPO7000C models: One precision 50 Ω coaxial cable (Item 4)	None
DPO7000C models: One BNC to Minigrabber adapter (item 18)	
MSO/DPO70000C/DX models: One SMA cable (item 21)	
MSO/DPO70000C/DX models: One adapter (item 19)	

1. *Initialize the instrument:* Push the front-panel **Default Setup** button.

2. *Hook up the signal source:* Connect the probe compensation or fast edge output to the Ch 1 input as shown in the following.

Figure 6: Setup for the file system test

3. *Set up the instrument:* Push the front panel **Autoset** button.

4. Set the **Vertical Scale** to **200 mV** /div (DPO7000C, MSO/DPO70000C models) or **120 mV**/div (MSO/DPO70000DX models).

5. *Set the time base:* Set the horizontal **Scale** to **1 ms/div**. The time-base readout is displayed at the bottom of the graticule.

6. *Save the settings:*

a. Pull down the **File** menu to select **Save As. . . >Setup. . .** . This displays the instrument Save As control window.

b. Note the default location and file name and then click the **Save** button to save the setup to the default file name and location.

7. *Change the settings again:* Set the horizontal **SCALE** to **200 μs/div**.

8. *Verify the file system works:*

   a. Pull down the **File** menu to select **Recall**. This displays the instrument Recall control window.

   b. Click Recall **What > Setup**.

   c. Locate and then double click the setup file that you previously stored.

   d. Verify that the instrument retrieved the saved setup. Do this by noticing the horizontal **SCALE** is again 1 ms and the waveform shows ten cycles just as it did when you saved the setup.

9. *Remove the test hookup:* Disconnect the test hookup from the instrument.

Verify the digital channels (MSO70000C/DX series only)

Equipment required	Prerequisites
MSO70000C/DX Series models: One precision 50 Ω coaxial cable (item*4* on page 123)	None
MSO70000C/DX Series models: One probe tip adapter (item*30* on page 125)	
MSO70000C/DX Series models: One SMA adapter (item*17* on page 124)	
MSO70000C/DX Series models: One logic probe (item*31* on page 125)	

1. *Hook up the signal source:* Connect the probe compensation or fast edge output to the D0 input as shown in the following figure.

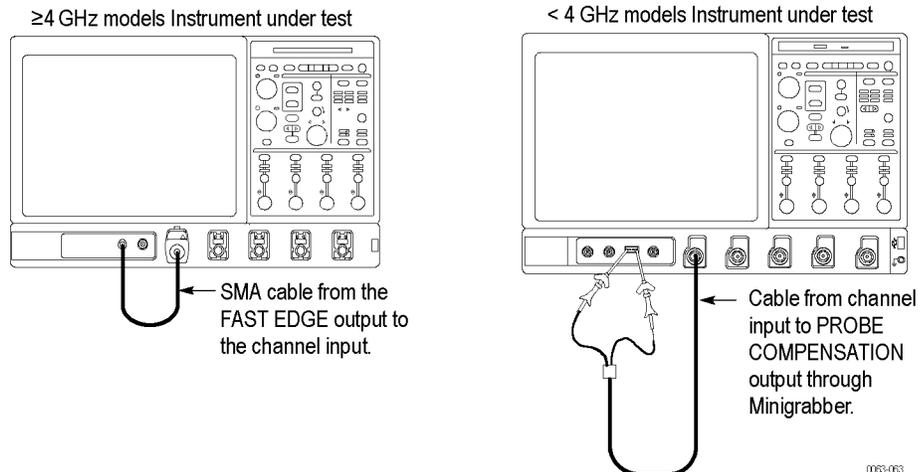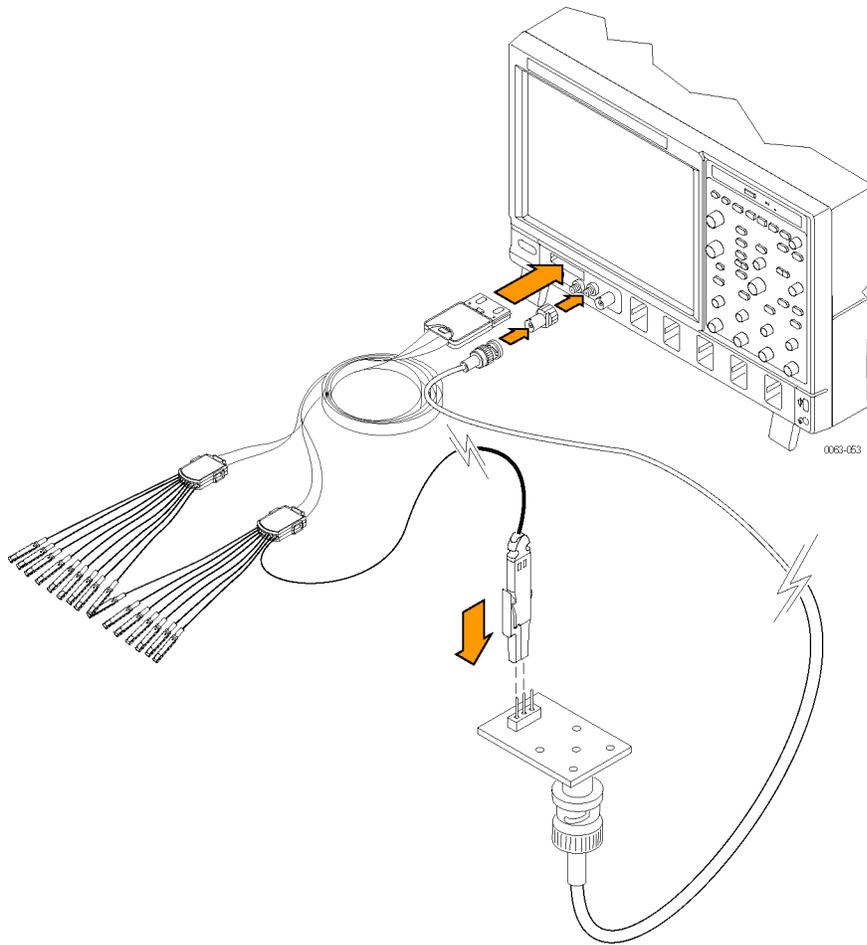*Figure 7: Setup for the digital channels test*

2. *Set up the instrument:* Push the front panel **Default Setup** button.

3. Set the Horizontal Scale to **1 ms/div**.

4. *Initialize the instrument:* Pull down the **Digital** menu and select **Digital Setup**. This displays the instrument Digital Setup control window.

5. Press the **D0** button.

6. Double click **Global Threshold**. Use the keypad to enter **200 mV**.

Press the **Apply** button.

7. Pull down the **Vertical** menu and select **Vertical Setup**.

8. Press Digital input **iCapture**.

9. From the Digital Source list select **D0**.

10. Pull down the **Trig** menu and select **A Event (Main) Trigger Setup**.

11. From the Source list select **D0**.

12. Verify that the both the iCapture and the digital channel are triggered.
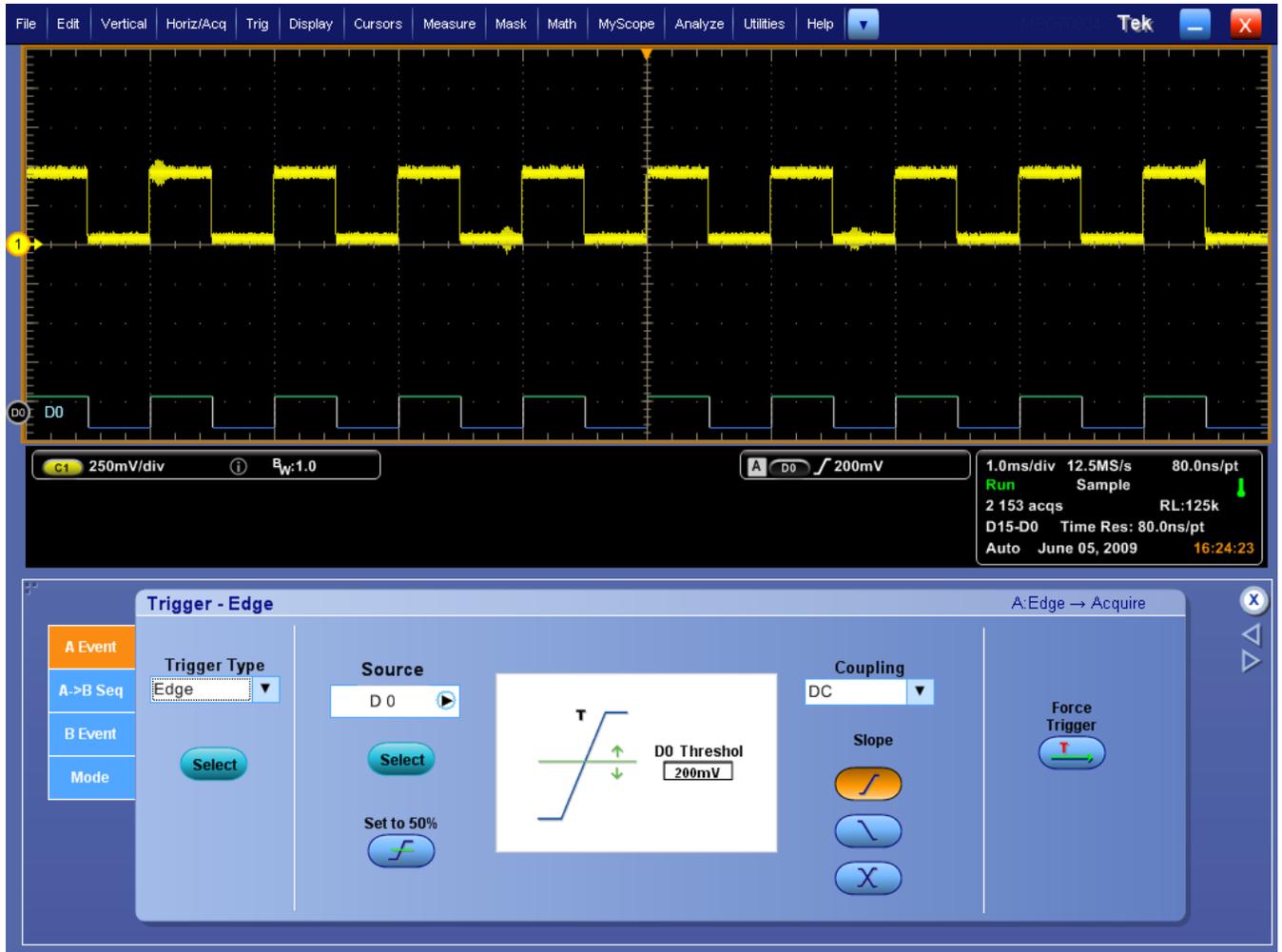
13. Rotate the Vertical **SCALE** knob counter clockwise.

14. Verify that the displayed amplitude of channel 1 is reduced.

15. Rotate the Vertical **SCALE** knob clockwise, back to its original setting.

16. Verify that the displayed amplitude of channel 1 returns to about 1.75 divisions (420 mV).

17. Rotate the Vertical **Position** knob counter clockwise.

18. Verify that the displayed position of channel 1 moves lower on the display.

19. Rotate the Vertical **Position** knob clockwise, back to its original setting.

20. Pull down the **Digital** menu and select **Digital Setup**.

21. Double click the **D0 Position** and enter **-1.66** and press Enter.

22. Verify that the displayed position of digital channel moves up on the display.

23. Repeat steps *1* on page 119 through *22* on page 121, replacing D0 with the digital channel number of the next channel you want to verify.

24. *Remove the test hookup:* Disconnect the test hookup from the instrument.

Performance tests (MSO/DPO70000C, MSO/DPO70000DX, and DPO7000C series)

This section contains a collection of manual procedures for checking that the instrument performs as warranted.

The procedures are arranged in logical groupings: *Signal Acquisition System Checks*, *Time Base System Checks*, *Triggering System Checks*, *Output Ports Checks*, and *Serial Trigger Checks*. They check all the characteristics that are designated as checked in *Specifications*. (The characteristics that are checked appear with a ✔ in *Specifications*).

STOP. These procedures extend the confidence level provided by the basic procedures. The basic procedures should be done first, then these procedures performed if desired.

CAUTION:

⚠ Using settings not asked for by these procedures could damage the instrument. These procedures operate the instrument near its maximum limits. Using settings similar to, but not the settings called for by the procedures, could damage the input circuitry of the instrument. See the Maximum input voltage specification for the maximum nondestructive input voltage level.

Prerequisites

The tests in this section comprise an extensive, valid confirmation of performance and functionality when the following requirements are met:

- The cabinet must be installed on the instrument.
- You must have performed and passed the procedures under *Self Tests*, and those under *Functional Tests*. (See *Functional tests* on page 113.)
- A signal-path compensation must have been done within the recommended calibration interval and at a temperature within ±5 ℃ (±9 ℉) of the present operating temperature. (If at the time you did the prerequisite *Self Tests,* the temperature was within the limits just stated, consider this prerequisite met). A signal-path compensation must have been done at an ambient humidity within 25% of the current ambient humidity and after having been at that humidity for at least 4 hours.
- The instrument must have been last adjusted at an ambient temperature between +18 ℃ (+64 ℉) and +28 ℃ (+82 ℉), must have been operating for a warm-up period of at least 20 minutes (60 minutes for the MSO/DPO73304DX instruments if the humidity is >60%), and must be operating at an ambient temperature as listed in the specifications. (See *Environmental specifications* on page 88.) (The warm-up requirement is usually met in the course of meeting the Self Tests and Functional Tests prerequisites listed above).
- Support sensor, probe, and adapter setups to avoid stress or torque when connected to the device under test (DUT).

Equipment required

The performance verification procedures use external, traceable signal sources to directly check warranted characteristics. The following table lists the required equipment.

1. Attenuator, 10X (two required)

Minimum requirements	Example	Purpose
Ratio: 10X; impedance 50 Ω; connectors: female input, male output	BNC ≤ 2 GHz Tektronix part number 011-0059-03 SMA ≤ 18 GHz Tektronix part number 015-1003-00	Signal attenuation, bandwidth, trigger sensitivity

2. Attenuator, 5X

Ratio: 5X; impedance 50 Ω; connectors: female input, male output	BNC ≤ 2 GHz Tektronix part number 011-0060-02	Signal attenuation, bandwidth, trigger sensitivity
	SMA ≤ 18 GHz Tektronix part number 015-1002-01	

3. Termination, 50 Ω (three required)

Impedance 50 Ω; connectors: female BNC input, male BNC output	Tektronix part number 011-0049-02 (1 GHz)	Signal termination for channel delay test, trigger sensitivity

4. Cable, Precision 50 Ω Coaxial (three required)

50 Ω, 36 in, male-to-male BNC connectors	Tektronix part number 012-0482-00	Signal interconnection, Trigger out, time qualified trigger, timebase delay time, baud rate limit, bandwidth, input resistance, delta time, clock recovery, generator leveling

5. Connector, Dual-Banana (two required)

Female BNC-to-dual banana	Tektronix part number 103-0090-00	Various accuracy tests, input resistance

6. Generator, DC Calibration

DPO7000C, MSO/DPO70000C models:Variable amplitude to ±7 V; accuracy to 0.1%	Fluke 9500B [1]	Checking DC offset, gain, measurement accuracy, probe compensation out, and maximum input voltage
MSO/DPO70000DX models:Variable amplitude to ±7 V; accuracy to 0.1%	Keithley 2400	

7. Generator, Calibration

500 mV square wave calibrator amplitude; accuracy to 0.25%	Fluke 9500B [1]	Checking accuracy of signal out, trigger out

8. Timer-counter

10 MHz and 100 MHz, 1 s gate	Advantest R5360	Checking long-term sample rate and delay time accuracy

9. Generator, Sine-Wave

DPO7000C models ≤3 GHz: 5 kHz to at least the instrument bandwidth. Variable amplitude from 60 mV to 2 V_{p-p} into 50 Ω. Frequency error <2.0%	Fluke 9500B [1]	Checking analog bandwidth, trigger sensitivity, sample-rate, external clock, trigger sensitivity, time qualified trigger, baud rate limit, clock recovery, and delay-time accuracy
DPO7354C, MSO/DPO70000C models: 50 MHz to at least the instrument bandwidth. Variable amplitude from 60 mV to 2.0 V_{p-p} into 50 Ω. Frequency error <2.0%	Anritsu MG3692B or MG3694B Synthesized CW Generator with options 2x (step attenuator), 3 (low noise >2 GHz), 4 (10 MHz to 2 GHz low phase noise), 15 (high power), and 16 (high stability)	
MSO/DPO70000DX models: 50 MHz to at least the instrument bandwidth. Variable amplitude from 60 mV to 2.0 V_{p-p} into 50 Ω. Frequency error <2.0%	Anritsu MG3690C RF/Microwave Signal Generator	

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[1] Fluke 9500B/1100, 9500B/3200, or 9500B/2200 and an output head (9510 or 9530) appropriate for the bandwidth of the instrument being tested.

10. Meter, Level and Power Sensor

Frequency range: 50 MHz to the instrument bandwidth. Amplitude range: 6 mV$_{p-p}$ to 2 V$_{p-p}$	Rohde & Schwarz NRVS and NRV-Z15 (40 GHz)	Checking analog bandwidth and trigger sensitivity

11. Splitter, Power

DPO7000C models: Frequency range: DC to 18 GHz. Tracking: <2.0%	Agilent part number 11667A	Checking analog bandwidth and trigger sensitivity
DPO7354C, MSO/DPO70000C/DX models: Frequency range: DC to 40 GHz. Tracking: <2.0%	Anritsu K241C (40 GHz)	

12. Cable

2.92 mm male-to-female	Gore PhaseFlex cable EL0CQ0CP0360 (40 GHz)	Checking analog bandwidth

13. Adapter

K male-to-male DC to 40 GHz	Anritsu K220B	Checking analog bandwidth

14. Adapter (four required)

Male N-to-female BNC	Tektronix part number 103-0045-00	Checking analog bandwidth

15. Adapter

Female N-to-male BNC	Tektronix part number 103-0058-00 (4 GHz)	Checking analog bandwidth

16. Adapter (three required)

SMA female-to-female	Tektronix part number 015-1012-00 (18 GHz)	Checking trigger sensitivity

17. Adapter (three required)

SMA male-to-female BNC	Tektronix part number 015-1018-00	Checking the delay between channels, delta time

18. Adapter

BNC to Minigrabber	Tektronix part number 013-0342-xx	Checking probe compensation output

19. Adapter (four required)

DPO7000C, MSO/DPO70000C models: SMA male-to-BNC female	TCA-BNC or TCA-292mm and, if required, SMA male-to-BNC female adapter (Tektronix part number 015-0554-00 (4 GHz) or 015-1018-00)	Signal interconnection, measurement accuracy, delay time, time qualified trigger, trigger sensitivity, DC gain, offset, bandwidth, input resistance, probe compensation out, baud rate limit, clock recovery
MSO/DPO70000DX models	TCA-292D	

20. Pulse Generator

250 MHz, ≤ 150 ps rise time, 5 V out	Fluke 9500B [1,2]	Checking delta time measurement accuracy

21. Cable, Coaxial (three required)

[2] For Delta Time Measurement Accuracy, use a Fluke 9500B or a pulse generator with the rise time specified in the procedure.

50 Ω, 20 in, male-to-male SMA connectors	Tektronix part number 174-1427-00	Checking delta time measurement accuracy, probe compensation out, trigger sensitivity

22. Adapter

SMA "T", male to 2 SMA female	Tektronix part number 015-1016-00 (18 GHz)	Checking delta time measurement accuracy

23. Adapter

SMA female to BNC male	Tektronix part number 015-0572-00 (4 GHz)	Used to test delta time measurement accuracy and trigger sensitivity

24. Adapter

BNC male to female elbow	Tektronix part number 103-0031-00	Checking delta time measurement accuracy

25. Termination

Short circuit, SMA connector, female	Tektronix part number 015-1021-00 (18 GHz)	Checking delta time measurement accuracy

26. Attenuator, 2X

Ratio: 2X; impedance 50 Ω; connectors: female BNC input, male BNC output	Tektronix part number 011-0069-02 (2 GHz)	Checking delta time measurement accuracy, pulse trigger accuracy, time qualified trigger, trigger sensitivity, and channel isolation

27. Digital Multimeter

Ohms: <60 Ohms	Keithley 2700	Checking input impedance

28. Cable, coaxial

50 Ω, 39.37 in (1.0 m), male-to-male SMA connectors 50 Ω, 60 in (1.5 m), male-to-male SMA connectors	Tektronix part number 174-1341-00 Tektronix part number 174-1428-00	Checking analog bandwidth and delta time measurement accuracy. Checking ≥ 4 GHz models serial trigger baud rate limits

29. Mouse or keyboard

	Tektronix part numbers: 119-7054-xx (mouse) 119-7083-xx (keyboard)	Used to input test selections

30. Probe tip adapter

BNC female to square pin adapter, 50 Ω	Tektronix part number 067-1734-00	Checking digital channels

31. Logic probe

P6717 or P6780 Logic Probe	Tektronix part P6717 or P6780	Checking digital channels

32. Adapter

BNC "T", male to 2 females	Tektronix part number 103-0030-xx	Checking DC gain and offset accuracy

33. Attenuator 2X

Ratio: 2X; impedance 50 Ω; connectors: female input, male output	BNC ≤ 2 GHz Tektronix part number 011-0069-xx	Checking output signals

34. Source measure unit

Source and Measure < 1 A and <5 V	Keithley 2400 SourceMeter with Model 8605 test leads	Checking TekProtect

35. Instrument controller

GPIB controller	PC with GPIB or Ethernet interface	Checking TekProtect

Test record

Photocopy the test record tables and use them to record the performance test results for your instrument.

Table 5: Test information

Item	Recorded value
Instrument Serial Number	
Technician	
Certificate Number	
Date of Calibration	
Temperature	
RH %	

DC voltage measurement accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1 6.25 mV Vert scale setting, 0 Div position setting				
+3.5 V termination				
+3.4 V offset	3.4012 V	_____	_____	3.4363 V
+2.4 V offset	2.4032 V	_____	_____	2.4343 V
+1.5 V termination				
+2.5 V offset	2.49345 V	_____	_____	2.52456 V
+1.5 V offset	1.49945 V	_____	_____	1.51856 V
+0.5 V offset	501.45 mV	_____	_____	516.56 mV
0 V termination				
0 V offset	14.76 mV	_____	_____	22.25 mV
-1 V offset	-1.00056 V	_____	_____	-981.45 mV
+1 V offset	999.45 mV	_____	_____	1.01856 V
-3.5 V termination				
-3.4 V offset	-3.4363 V	_____	_____	-3.4012 V
-2.4 V offset	-2.4343 V	_____	_____	-2.4032 V
-1.5 V termination				
-2.5 V offset	-2.52456 V	_____	_____	-2.49345 V
-1.5 V offset	-1.51856 V	_____	_____	-1.49945 V
-0.5 V offset	-516.56 mV	_____	_____	-501.45 mV
Table continued…				

DC voltage measurement accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1 10 mV Vert scale setting, 0 Div position setting				
+3.5 V termination				
+3.4 V offset	3.4117 V	_____	_____	3.4483 V
+2.4 V offset	2.4137 V	_____	_____	2.4463 V
1.5 V termination				
2.5 V offset	2.4988 V	_____	_____	2.5312 V
+1.5 V offset	1.5195 V	_____	_____	1.5405 V
+0.5 V offset	521.5 mV	_____	_____	538.5 mV
V termination				
0 V offset	25.5 mV	_____	_____	34.5 mV
-1 V offset	-980.5 mV	_____	_____	-959.5 mV
+1 V offset	1.0195 V	_____	_____	1.0405 V
V termination				
-3.4 V offset	-3.4117 V	_____	_____	-3.4483 V
-2.4 V offset	-2.4137 V	_____	_____	-2.4463 V
-1.5 V termination				
-2.5 V offset	-2.5312 V	_____	_____	-2.4988 V
-1.5 V offset	-1.5405 V	_____	_____	-1.5195 V
-0.5 V offset	-538.5 mV	_____	_____	-521.5 mV

Table continued…

DC voltage measurement accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1 20 mV Vert scale setting, 0 Div position setting				
+3.5 V termination				
+3.4 V offset	3.4397 V	_____	_____	3.4803 V
+2.4 V offset	2.4417 V	_____	_____	2.4783 V
+1.5 V termination				
+2.5 V offset	2.5415 V	_____	_____	2.5785 V
+1.5 V offset	1.5475 V	_____	_____	1.5725 V
+0.5 V offset	549.5 mV	_____	_____	570.5 mV
0 V termination				
0 V offset	53.5 mV	_____	_____	66.5 mV
-1 V offset	-952.5 mV	_____	_____	-927.5 mV
+1 V offset	1.0475 V	_____	_____	1.0725 V
-3.5 V termination				
-3.4 V offset	-3.4803 V	_____	_____	-3.4397 V
-2.4 V offset	-2.47831 V	_____	_____	-2.4417 V
-1.5 V termination				
-2.5 V offset	-2.5785 V	_____	_____	-2.5415 V
-1.5 V offset	-1.5725 V	_____	_____	-1.5475 V
-0.5 V offset	-570.5 mV	_____	_____	-549.5 mV
Table continued…				

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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DC voltage measurement accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1 50 mV Vert scale setting, 0 Div position setting				
+3.5 V termination				
+3.4 V offset	3.5237 V	_____	_____	3.5763 V
+2.4 V offset	2.5257 V	_____	_____	2.5743 V
+1.5 V termination				
+2.5 V offset	2.6255 V	_____	_____	2.6745 V
+1.5 V offset	1.6315 V	_____	_____	1.6685 V
+0.5 V offset	633.5 mV	_____	_____	666.5 mV
0 V termination				
0 V offset	137.5 mV	_____	_____	162.5 mV
-1 V offset	-868.5 mV	_____	_____	-831.5 mV
+1 V offset	1.1315 V	_____	_____	1.1685 V
-3.5 V termination				
-3.4 V offset	-3.5763 V	_____	_____	-3.5237 V
-2.4 V offset	-2.5743 V	_____	_____	-2.5257 V
-1.5 V termination				
-2.5 V offset	-2.6745 V	_____	_____	-2.6255 V
-1.5 V offset	-1.6685 V	_____	_____	-1.6315 V
-0.5 V offset	-666.5 mV	_____	_____	-633.5 mV
Table continued…				

DC voltage measurement accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1 100 mV Vert scale setting, 0 Div position setting				
+3.5 V termination				
+3.4 V offset	3.6637 V	_____	_____	3.7363 V
+2.4 V offset	2.6657 V	_____	_____	2.7343 V
+1.5 V termination				
+2.5 V offset	2.7655 V	_____	_____	2.8345 V
+1.5 V offset	1.7715 V	_____	_____	1.8285 V
+0.5 V offset	773.5 mV	_____	_____	826.5 mV
0 V termination				
0 V offset	277.5 mV	_____	_____	322.5 mV
-1 V offset	-728.5 mV	_____	_____	-671.5 mV
+1 V offset	1.2715 V	_____	_____	1.3285 V
-3.5 V termination				
-3.4 V offset	-3.7363 V	_____	_____	-3.6637 V
-2.4 V offset	-2.7343 V	_____	_____	-2.6657 V
-1.5 V termination				
-2.5 V offset	-2.8345 V	_____	_____	-2.7655 V
-1.5 V offset	-1.8285 V	_____	_____	-1.7715 V
-0.5 V offset	-826.5 mV	_____	_____	-773.5 mV

Table continued…

DC voltage measurement accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1 120 mV Vert scale setting, 0 Div position setting				
+3.5 V termination				
+3.4 V offset	3.7197 V	_____	_____	3.8003 V
+2.4 V offset	2.7217 V	_____	_____	2.7983 V
+1.5 V termination				
+2.5 V offset	2.8215 V	_____	_____	2.8985 V
+1.5 V offset	1.8275 V	_____	_____	1.8925 V
+0.5 V offset	829.5 mV	_____	_____	890.5 mV
0 V termination				
0 V offset	333.5 mV	_____	_____	386.5 mV
-1 V offset	-672.5 mV	_____	_____	-607.5 mV
+1 V offset	1.3275 V	_____	_____	1.3925 V
-3.5 V termination				
-3.4 V offset	-3.8003 V	_____	_____	-3.7197 V
-2.4 V offset	-2.7983 V	_____	_____	-2.7217 V
-1.5 V termination				
-2.5 V offset	-2.8985 V	_____	_____	-2.8215 V
-1.5 V offset	-1.8925 V	_____	_____	-1.8275 V
-0.5 V offset	-890.5 mV	_____	_____	-829.5 mV
Ch1 140 mV Vert scale setting, 0 Div position setting				
0 V termination				
–1 V offset	-624.5 mV	_____	_____	-535.5 mV
0 V offset	379.5 mV	_____	_____	460.5 mV
+1 V offset	1.3755 V	_____	_____	1.4645 V
Ch1 200 mV Vert scale setting, 0 Div position setting				
0 V termination				
–1 V offset	-456.5 mV	_____	_____	-343.5 mV
0 V offset	547.5 mV	_____	_____	652.5 mV
+1 V offset	1.5435 V	_____	_____	1.6565 V
Table continued…				

DC voltage measurement accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1 400 mV Vert scale setting, 0 Div position setting				
0 V termination				
–1 V offset	103.5 mV	_____	_____	296.5 mV
0 V offset	1.1075 V	_____	_____	1.2925 V
+1 V offset	2.1035 V	_____	_____	2.2965 V
Ch2 6.25 mV Vert scale setting, 0 Div position setting				
+3.5 V termination				
+3.4 V offset	3.4012 V	_____	_____	3.4363 V
+2.4 V offset	2.4032 V	_____	_____	2.4343 V
+1.5 V termination				
+2.5 V offset	2.49345 V	_____	_____	2.52456 V
+1.5 V offset	1.49945 V	_____	_____	1.51856 V
+0.5 V offset	501.45 mV	_____	_____	516.56 mV
0 V termination				
0 V offset	14.76 mV	_____	_____	22.25 mV
-1 V offset	-1.00056 V	_____	_____	-981.45 mV
+1 V offset	999.45 mV	_____	_____	1.01856 V
-3.5 V termination				
-3.4 V offset	-3.4363 V	_____	_____	-3.4012 V
-2.4 V offset	-2.4343 V	_____	_____	-2.4032 V
-1.5 V termination				
-2.5 V offset	-2.52456 V	_____	_____	-2.49345 V
-1.5 V offset	-1.51856 V	_____	_____	-1.49945 V
-0.5 V offset	-516.56 mV	_____	_____	-501.45 mV

Table continued…

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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DC voltage measurement accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch2 10 mV Vert scale setting, 0 Div position setting				
+3.5 V termination				
+3.4 V offset	3.4117 V	_____	_____	3.4483 V
+2.4 V offset	2.4137 V	_____	_____	2.4463 V
+1.5 V termination				
+2.5 V offset	2.4988 V	_____	_____	2.5312 V
+1.5 V offset	1.5195 V	_____	_____	1.5405 V
+0.5 V offset	521.5 mV	_____	_____	538.5 mV
0 V termination				
0 V offset	25.5 mV	_____	_____	34.5 mV
-1 V offset	-980.5 mV	_____	_____	-959.5 mV
+1 V offset	1.0195 V	_____	_____	1.0405 V
-3.5 V termination				
-3.4 V offset	-3.4117 V	_____	_____	-3.4483 V
-2.4 V offset	-2.4137 V	_____	_____	-2.4463 V
-1.5 V termination				
-2.5 V offset	-2.5312 V	_____	_____	-2.4988 V
-1.5 V offset	-1.5405 V	_____	_____	-1.5195 V
-0.5 V offset	-538.5 mV	_____	_____	-521.5 mV

Table continued…

DC voltage measurement accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch2 20 mV Vert scale setting, 0 Div position setting				
+3.5 V termination				
+3.4 V offset	3.4397 V	_____	_____	3.4803 V
+2.4 V offset	2.4417 V	_____	_____	2.4783 V
+1.5 V termination				
+2.5 V offset	2.5415 V	_____	_____	2.5785 V
+1.5 V offset	1.5475 V	_____	_____	1.5725 V
+0.5 V offset	549.5 mV	_____	_____	570.5 mV
0 V termination				
0 V offset	53.5 mV	_____	_____	66.5 mV
-1 V offset	-952.5 mV	_____	_____	-927.5 mV
+1 V offset	1.0475 V	_____	_____	1.0725 V
-3.5 V termination				
-3.4 V offset	-3.4803 V	_____	_____	-3.4397 V
-2.4 V offset	-2.47831 V	_____	_____	-2.4417 V
-1.5 V termination				
-2.5 V offset	-2.5785 V	_____	_____	-2.5415 V
-1.5 V offset	-1.5725 V	_____	_____	-1.5475 V
-0.5 V offset	-570.5 mV	_____	_____	-549.5 mV
Table continued…				

DC voltage measurement accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch2 50 mV Vert scale setting, 0 Div position setting				
+3.5 V termination				
+3.4 V offset	3.5237 V	_____	_____	3.5763 V
+2.4 V offset	2.5257 V	_____	_____	2.5743 V
+1.5 V termination				
+2.5 V offset	2.6255 V	_____	_____	2.6745 V
+1.5 V offset	1.6315 V	_____	_____	1.6685 V
+0.5 V offset	633.5 mV	_____	_____	666.5 mV
0 V termination				
0 V offset	137.5 mV	_____	_____	162.5 mV
-1 V offset	-868.5 mV	_____	_____	-831.5 mV
+1 V offset	1.1315 V	_____	_____	1.1685 V
-3.5 V termination				
-3.4 V offset	-3.5763 V	_____	_____	-3.5237 V
-2.4 V offset	-2.5743 V	_____	_____	-2.5257 V
-1.5 V termination				
-2.5 V offset	-2.6745 V	_____	_____	-2.6255 V
-1.5 V offset	-1.6685 V	_____	_____	-1.6315 V
-0.5 V offset	-666.5 mV	_____	_____	-633.5 mV

Table continued…

DC voltage measurement accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch2 100 mV Vert scale setting, 0 Div position setting				
+3.5 V termination				
+3.4 V offset	3.6637 V	_____	_____	3.7363 V
+2.4 V offset	2.6657 V	_____	_____	2.7343 V
+1.5 V termination				
+2.5 V offset	2.7655 V	_____	_____	2.8345 V
+1.5 V offset	1.7715 V	_____	_____	1.8285 V
+0.5 V offset	773.5 mV	_____	_____	826.5 mV
0 V termination				
0 V offset	277.5 mV	_____	_____	322.5 mV
-1 V offset	-728.5 mV	_____	_____	-671.5 mV
+1 V offset	1.2715 V	_____	_____	1.3285 V
-3.5 V termination				
-3.4 V offset	-3.7363 V	_____	_____	-3.6637 V
-2.4 V offset	-2.7343 V	_____	_____	-2.6657 V
-1.5 V termination				
-2.5 V offset	-2.8345 V	_____	_____	-2.7655 V
-1.5 V offset	-1.8285 V	_____	_____	-1.7715 V
-0.5 V offset	-826.5 mV	_____	_____	-773.5 mV

Table continued…

DC voltage measurement accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch2 120 mV Vert scale setting, 0 Div position setting				
+3.5 V termination				
+3.4 V offset	3.7197 V	_____	_____	3.8003 V
+2.4 V offset	2.7217 V	_____	_____	2.7983 V
+1.5 V termination				
+2.5 V offset	2.8215 V	_____	_____	2.8985 V
+1.5 V offset	1.8275 V	_____	_____	1.8925 V
+0.5 V offset	829.5 mV	_____	_____	890.5 mV
0 V termination				
0 V offset	333.5 mV	_____	_____	386.5 mV
-1 V offset	-672.5 mV	_____	_____	-607.5 mV
+1 V offset	1.3275 V	_____	_____	1.3925 V
-3.5 V termination				
-3.4 V offset	-3.8003 V	_____	_____	-3.7197 V
-2.4 V offset	-2.7983 V	_____	_____	-2.7217 V
-1.5 V termination				
-2.5 V offset	-2.8985 V	_____	_____	-2.8215 V
-1.5 V offset	-1.8925 V	_____	_____	-1.8275 V
-0.5 V offset	-890.5 mV	_____	_____	-829.5 mV
Ch2 140 mV Vert scale setting, 0 Div position setting				
0 V termination				
–1 V offset	-624.5 mV	_____	_____	-535.5 mV
0 V offset	379.5 mV	_____	_____	460.5 mV
+1 V offset	1.3755 V	_____	_____	1.4645 V
Ch2 200 mV Vert scale setting, 0 Div position setting				
0 V termination				
–1 V offset	-456.5 mV	_____	_____	-343.5 mV
0 V offset	547.5 mV	_____	_____	652.5 mV
+1 V offset	1.5435 V	_____	_____	1.6565 V

Table continued…

DC voltage measurement accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch2 400 mV Vert scale setting, 0 Div position setting				
0 V termination				
–1 V offset	103.5 mV	_____	_____	296.5 mV
0 V offset	1.1075 V	_____	_____	1.2925 V
+1 V offset	2.1035 V	_____	_____	2.2965 V
Ch3 6.25 mV Vert scale setting, 0 Div position setting				
+3.5 V termination				
+3.4 V offset	3.4012 V	_____	_____	3.4363 V
+2.4 V offset	2.4032 V	_____	_____	2.4343 V
+1.5 V termination				
+2.5 V offset	2.49345 V	_____	_____	2.52456 V
+1.5 V offset	1.49945 V	_____	_____	1.51856 V
+0.5 V offset	501.45 mV	_____	_____	516.56 mV
0 V termination				
0 V offset	14.76 mV	_____	_____	22.25 mV
-1 V offset	-1.00056 V	_____	_____	-981.45 mV
+1 V offset	999.45 mV	_____	_____	1.01856 V
-3.5 V termination				
-3.4 V offset	-3.4363 V	_____	_____	-3.4012 V
-2.4 V offset	-2.4343 V	_____	_____	-2.4032 V
-1.5 V termination				
-2.5 V offset	-2.52456 V	_____	_____	-2.49345 V
-1.5 V offset	-1.51856 V	_____	_____	-1.49945 V
-0.5 V offset	-516.56 mV	_____	_____	-501.45 mV

Table continued…

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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DC voltage measurement accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch3 10 mV Vert scale setting, 0 Div position setting				
+3.5 V termination				
+3.4 V offset	3.4117 V	_____	_____	3.4483 V
+2.4 V offset	2.4137 V	_____	_____	2.4463 V
+1.5 V termination				
+2.5 V offset	2.4988 V	_____	_____	2.5312 V
+1.5 V offset	1.5195 V	_____	_____	1.5405 V
+0.5 V offset	521.5 mV	_____	_____	538.5 mV
0 V termination				
0 V offset	25.5 mV	_____	_____	34.5 mV
-1 V offset	-980.5 mV	_____	_____	-959.5 mV
+1 V offset	1.0195 V	_____	_____	1.0405 V
-3.5 V termination				
-3.4 V offset	-3.4117 V	_____	_____	-3.4483 V
-2.4 V offset	-2.4137 V	_____	_____	-2.4463 V
-1.5 V termination				
-2.5 V offset	-2.5312 V	_____	_____	-2.4988 V
-1.5 V offset	-1.5405 V	_____	_____	-1.5195 V
-0.5 V offset	-538.5 mV	_____	_____	-521.5 mV

Table continued…

DC voltage measurement accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch3 20 mV Vert scale setting, 0 Div position setting				
+3.5 V termination				
+3.4 V offset	3.4397 V	_____	_____	3.4803 V
+2.4 V offset	2.4417 V	_____	_____	2.4783 V
+1.5 V termination				
+2.5 V offset	2.5415 V	_____	_____	2.5785 V
+1.5 V offset	1.5475 V	_____	_____	1.5725 V
+0.5 V offset	549.5 mV	_____	_____	570.5 mV
0 V termination				
0 V offset	53.5 mV	_____	_____	66.5 mV
-1 V offset	-952.5 mV	_____	_____	-927.5 mV
+1 V offset	1.0475 V	_____	_____	1.0725 V
-3.5 V termination				
-3.4 V offset	-3.4803 V	_____	_____	-3.4397 V
-2.4 V offset	-2.47831 V	_____	_____	-2.4417 V
-1.5 V termination				
-2.5 V offset	-2.5785 V	_____	_____	-2.5415 V
-1.5 V offset	-1.5725 V	_____	_____	-1.5475 V
-0.5 V offset	-570.5 mV	_____	_____	-549.5 mV
Table continued…				

DC voltage measurement accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch3 50 mV Vert scale setting, 0 Div position setting				
+3.5 V termination				
+3.4 V offset	3.5237 V	_____	_____	3.5763 V
+2.4 V offset	2.5257 V	_____	_____	2.5743 V
+1.5 V termination				
+2.5 V offset	2.6255 V	_____	_____	2.6745 V
+1.5 V offset	1.6315 V	_____	_____	1.6685 V
+0.5 V offset	633.5 mV	_____	_____	666.5 mV
0 V termination				
0 V offset	137.5 mV	_____	_____	162.5 mV
-1 V offset	-868.5 mV	_____	_____	-831.5 mV
+1 V offset	1.1315 V	_____	_____	1.1685 V
-3.5 V termination				
-3.4 V offset	-3.5763 V	_____	_____	-3.5237 V
-2.4 V offset	-2.5743 V	_____	_____	-2.5257 V
-1.5 V termination				
-2.5 V offset	-2.6745 V	_____	_____	-2.6255 V
-1.5 V offset	-1.6685 V	_____	_____	-1.6315 V
-0.5 V offset	-666.5 mV	_____	_____	-633.5 mV
Table continued…				

DC voltage measurement accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch3 100 mV Vert scale setting, 0 Div position setting				
+3.5 V termination				
+3.4 V offset	3.6637 V	_____	_____	3.7363 V
+2.4 V offset	2.6657 V	_____	_____	2.7343 V
+1.5 V termination				
+2.5 V offset	2.7655 V	_____	_____	2.8345 V
+1.5 V offset	1.7715 V	_____	_____	1.8285 V
+0.5 V offset	773.5 mV	_____	_____	826.5 mV
0 V termination				
0 V offset	277.5 mV	_____	_____	322.5 mV
-1 V offset	-728.5 mV	_____	_____	-671.5 mV
+1 V offset	1.2715 V	_____	_____	1.3285 V
-3.5 V termination				
-3.4 V offset	-3.7363 V	_____	_____	-3.6637 V
-2.4 V offset	-2.7343 V	_____	_____	-2.6657 V
-1.5 V termination				
-2.5 V offset	-2.8345 V	_____	_____	-2.7655 V
-1.5 V offset	-1.8285 V	_____	_____	-1.7715 V
-0.5 V offset	-826.5 mV	_____	_____	-773.5 mV
Table continued…				

DC voltage measurement accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch3 120 mV Vert scale setting, 0 Div position setting				
+3.5 V termination				
+3.4 V offset	3.7197 V	_____	_____	3.8003 V
+2.4 V offset	2.7217 V	_____	_____	2.7983 V
+1.5 V termination				
+2.5 V offset	2.8215 V	_____	_____	2.8985 V
+1.5 V offset	1.8275 V	_____	_____	1.8925 V
+0.5 V offset	829.5 mV	_____	_____	890.5 mV
0 V termination				
0 V offset	333.5 mV	_____	_____	386.5 mV
-1 V offset	-672.5 mV	_____	_____	-607.5 mV
+1 V offset	1.3275 V	_____	_____	1.3925 V
-3.5 V termination				
-3.4 V offset	-3.8003 V	_____	_____	-3.7197 V
-2.4 V offset	-2.7983 V	_____	_____	-2.7217 V
-1.5 V termination				
-2.5 V offset	-2.8985 V	_____	_____	-2.8215 V
-1.5 V offset	-1.8925 V	_____	_____	-1.8275 V
-0.5 V offset	-890.5 mV	_____	_____	-829.5 mV
Ch3 140 mV Vert scale setting, 0 Div position setting				
0 V termination				
–1 V offset	-624.5 mV	_____	_____	-535.5 mV
0 V offset	379.5 mV	_____	_____	460.5 mV
+1 V offset	1.3755 V	_____	_____	1.4645 V
Ch3 200 mV Vert scale setting, 0 Div position setting				
0 V termination				
–1 V offset	-456.5 mV	_____	_____	-343.5 mV
0 V offset	547.5 mV	_____	_____	652.5 mV
+1 V offset	1.5435 V	_____	_____	1.6565 V
Table continued…				

DC voltage measurement accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch3 400 mV Vert scale setting, 0 Div position setting				
0 V termination				
–1 V offset	103.5 mV	_____	_____	296.5 mV
0 V offset	1.1075 V	_____	_____	1.2925 V
+1 V offset	2.1035 V	_____	_____	2.2965 V
Ch4 6.25 mV Vert scale setting, 0 Div position setting				
+3.5 V termination				
+3.4 V offset	3.4012 V	_____	_____	3.4363 V
+2.4 V offset	2.4032 V	_____	_____	2.4343 V
+1.5 V termination				
+2.5 V offset	2.49345 V	_____	_____	2.52456 V
+1.5 V offset	1.49945 V	_____	_____	1.51856 V
+0.5 V offset	501.45 mV	_____	_____	516.56 mV
0 V termination				
0 V offset	14.76 mV	_____	_____	22.25 mV
-1 V offset	-1.00056 V	_____	_____	-981.45 mV
+1 V offset	999.45 mV	_____	_____	1.01856 V
-3.5 V termination				
-3.4 V offset	-3.4363 V	_____	_____	-3.4012 V
-2.4 V offset	-2.4343 V	_____	_____	-2.4032 V
-1.5 V termination				
-2.5 V offset	-2.52456 V	_____	_____	-2.49345 V
-1.5 V offset	-1.51856 V	_____	_____	-1.49945 V
-0.5 V offset	-516.56 mV	_____	_____	-501.45 mV

Table continued…

DC voltage measurement accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch4 10 mV Vert scale setting, 0 Div position setting				
+3.5 V termination				
+3.4 V offset	3.4117 V	_____	_____	3.4483 V
+2.4 V offset	2.4137 V	_____	_____	2.4463 V
+1.5 V termination				
+2.5 V offset	2.4988 V	_____	_____	2.5312 V
+1.5 V offset	1.5195 V	_____	_____	1.5405 V
+0.5 V offset	521.5 mV	_____	_____	538.5 mV
0 V termination				
0 V offset	25.5 mV	_____	_____	34.5 mV
-1 V offset	-980.5 mV	_____	_____	-959.5 mV
+1 V offset	1.0195 V	_____	_____	1.0405 V
-3.5 V termination				
-3.4 V offset	-3.4117 V	_____	_____	-3.4483 V
-2.4 V offset	-2.4137 V	_____	_____	-2.4463 V
-1.5 V termination				
-2.5 V offset	-2.5312 V	_____	_____	-2.4988 V
-1.5 V offset	-1.5405 V	_____	_____	-1.5195 V
-0.5 V offset	-538.5 mV	_____	_____	-521.5 mV

Table continued…

DC voltage measurement accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch4 20 mV Vert scale setting, 0 Div position setting				
+3.5 V termination				
+3.4 V offset	3.4397 V	_____	_____	3.4803 V
+2.4 V offset	2.4417 V	_____	_____	2.4783 V
+1.5 V termination				
+2.5 V offset	2.5415 V	_____	_____	2.5785 V
+1.5 V offset	1.5475 V	_____	_____	1.5725 V
+0.5 V offset	549.5 mV	_____	_____	570.5 mV
0 V termination				
0 V offset	53.5 mV	_____	_____	66.5 mV
-1 V offset	-952.5 mV	_____	_____	-927.5 mV
+1 V offset	1.0475 V	_____	_____	1.0725 V
-3.5 V termination				
-3.4 V offset	-3.4803 V	_____	_____	-3.4397 V
-2.4 V offset	-2.47831 V	_____	_____	-2.4417 V
-1.5 V termination				
-2.5 V offset	-2.5785 V	_____	_____	-2.5415 V
-1.5 V offset	-1.5725 V	_____	_____	-1.5475 V
-0.5 V offset	-570.5 mV	_____	_____	-549.5 mV

Table continued…

DC voltage measurement accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch4 50 mV Vert scale setting, 0 Div position setting				
+3.5 V termination				
+3.4 V offset	3.5237 V	_____	_____	3.5763 V
+2.4 V offset	2.5257 V	_____	_____	2.5743 V
+1.5 V termination				
+2.5 V offset	2.6255 V	_____	_____	2.6745 V
+1.5 V offset	1.6315 V	_____	_____	1.6685 V
+0.5 V offset	633.5 mV	_____	_____	666.5 mV
0 V termination				
0 V offset	137.5 mV	_____	_____	162.5 mV
-1 V offset	-868.5 mV	_____	_____	-831.5 mV
+1 V offset	1.1315 V	_____	_____	1.1685 V
-3.5 V termination				
-3.4 V offset	-3.5763 V	_____	_____	-3.5237 V
-2.4 V offset	-2.5743 V	_____	_____	-2.5257 V
-1.5 V termination				
-2.5 V offset	-2.6745 V	_____	_____	-2.6255 V
-1.5 V offset	-1.6685 V	_____	_____	-1.6315 V
-0.5 V offset	-666.5 mV	_____	_____	-633.5 mV

Table continued…

DC voltage measurement accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch4 100 mV Vert scale setting, 0 Div position setting				
+3.5 V termination				
+3.4 V offset	3.6637 V	_____	_____	3.7363 V
+2.4 V offset	2.6657 V	_____	_____	2.7343 V
+1.5 V termination				
+2.5 V offset	2.7655 V	_____	_____	2.8345 V
+1.5 V offset	1.7715 V	_____	_____	1.8285 V
+0.5 V offset	773.5 mV	_____	_____	826.5 mV
0 V termination				
0 V offset	277.5 mV	_____	_____	322.5 mV
-1 V offset	-728.5 mV	_____	_____	-671.5 mV
+1 V offset	1.2715 V	_____	_____	1.3285 V
-3.5 V termination				
-3.4 V offset	-3.7363 V	_____	_____	-3.6637 V
-2.4 V offset	-2.7343 V	_____	_____	-2.6657 V
-1.5 V termination				
-2.5 V offset	-2.8345 V	_____	_____	-2.7655 V
-1.5 V offset	-1.8285 V	_____	_____	-1.7715 V
-0.5 V offset	-826.5 mV	_____	_____	-773.5 mV
Table continued…				

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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DC voltage measurement accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch4 120 mV Vert scale setting, 0 Div position setting				
+3.5 V termination				
+3.4 V offset	3.7197 V	_____	_____	3.8003 V
+2.4 V offset	2.7217 V	_____	_____	2.7983 V
+1.5 V termination				
+2.5 V offset	2.8215 V	_____	_____	2.8985 V
+1.5 V offset	1.8275 V	_____	_____	1.8925 V
+0.5 V offset	829.5 mV	_____	_____	890.5 mV
0 V termination				
0 V offset	333.5 mV	_____	_____	386.5 mV
-1 V offset	-672.5 mV	_____	_____	-607.5 mV
+1 V offset	1.3275 V	_____	_____	1.3925 V
-3.5 V termination				
-3.4 V offset	-3.8003 V	_____	_____	-3.7197 V
-2.4 V offset	-2.7983 V	_____	_____	-2.7217 V
-1.5 V termination				
-2.5 V offset	-2.8985 V	_____	_____	-2.8215 V
-1.5 V offset	-1.8925 V	_____	_____	-1.8275 V
-0.5 V offset	-890.5 mV	_____	_____	-829.5 mV
Ch4 140 mV Vert scale setting, 0 Div position setting				
0 V termination				
–1 V offset	-624.5 mV	_____	_____	-535.5 mV
0 V offset	379.5 mV	_____	_____	460.5 mV
+1 V offset	1.3755 V	_____	_____	1.4645 V
Ch4 200 mV Vert scale setting, 0 Div position setting				
0 V termination				
–1 V offset	-456.5 mV	_____	_____	-343.5 mV
0 V offset	547.5 mV	_____	_____	652.5 mV
+1 V offset	1.5435 V	_____	_____	1.6565 V

Table continued…

DC voltage measurement accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch4 400 mV Vert scale setting, 0 Div position setting 0 V termination				
–1 V offset	103.5 mV	_____	_____	296.5 mV
0 V offset	1.1075 V	_____	_____	1.2925 V
+1 V offset	2.1035 V	_____	_____	2.2965 V

DC voltage measurement accuracy (averaged), MSO/DPO70000C models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1 10 mV Vert scale setting, -5 Div position setting, +0.45 V offset	+ 524.75 mV	_____	_____	+ 535.25 mV
Ch1 10 mV Vert scale setting, +5 Div position setting, -0.45 V offset	- 535.25 mV	_____	_____	- 524.75 mV
Ch1 20 mV Vert scale setting, -5 Div position setting, +0.4 V offset	+ 552.75 mV	_____	_____	+ 567.25 mV
Ch1 20 mV Vert scale setting, +5 Div position setting, -0.4 V offset	- 567.25 mV	_____	_____	- 552.75 mV
Ch1 50 mV Vert scale setting, -5 Div position setting, +0.25 V offset	+ 636.75 mV	_____	_____	+ 663.25 mV
Ch1 50 mV Vert scale setting, +5 Div position setting, -0.25 V offset	- 663.25 mV	_____	_____	- 636.75 mV
Ch1 100 mV Vert scale setting, -5 Div position setting, +2.0 V offset	+ 2.764 V	_____	_____	+ 2.836 V
Ch1 100 mV Vert scale setting, +5 Div position setting, -2.0 V offset	- 2.836 V	_____	_____	- 2.764 V
Ch1 200 mV Vert scale setting, -5 Div position setting, +1.25 V offset	+ 2.697 V	_____	_____	+ 2.803 V
Ch1 200 mV Vert scale setting, +5 Div position setting, -1.25 V offset	- 2.803 V	_____	_____	- 2.697 V

Table continued…

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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DC voltage measurement accuracy (averaged), MSO/DPO70000C models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1 500 mV Vert scale setting, -5 Div position setting, 0 V offset	+ 3.394 V	_____	_____	+ 3.606 V
Ch1 500 mV Vert scale setting, +5 Div position setting, 0 V offset	- 3.606 V	_____	_____	- 3.394 V
Ch2 10 mV Vert scale setting, -5 Div position setting, +0.45 V offset	+ 524.75 mV	_____	_____	+ 535.25 mV
Ch2 10 mV Vert scale setting, +5 Div position setting, -0.45 V offset	- 535.25 mV	_____	_____	- 524.75 mV
Ch2 20 mV Vert scale setting, -5 Div position setting, +0.4 V offset	+ 552.75 mV	_____	_____	+ 567.25 mV
Ch2 20 mV Vert scale setting, +5 Div position setting, -0.4 V offset	- 567.25 mV	_____	_____	- 552.75 mV
Ch2 50 mV Vert scale setting, -5 Div position setting, +0.25 V offset	+ 636.75 mV	_____	_____	+ 663.25 mV
Ch2 50 mV Vert scale setting, +5 Div position setting, -0.25 V offset	- 663.25 mV	_____	_____	- 636.75 mV
Ch2 100 mV Vert scale setting, -5 Div position setting, +2.0 V offset	+ 2.764 V	_____	_____	+ 2.836 V
Ch2 100 mV Vert scale setting, +5 Div position setting, -2.0 V offset	- 2.836 V	_____	_____	- 2.764 V
Ch2 200 mV Vert scale setting, -5 Div position setting, +1.25 V offset	+ 2.697 V	_____	_____	+ 2.803 V
Ch2 200 mV Vert scale setting, +5 Div position setting, -1.25 V offset	- 2.803 V	_____	_____	- 2.697 V
Ch2 500 mV Vert scale setting, -5 Div position setting, 0 V offset	+ 3.394 V	_____	_____	+ 3.606 V
Table continued…				

DC voltage measurement accuracy (averaged), MSO/DPO70000C models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch2 500 mV Vert scale setting, +5 Div position setting, 0 V offset	- 3.606 V	_____	_____	- 3.394 V
Ch3 10 mV Vert scale setting, -5 Div position setting, +0.45 V offset	+ 524.75 mV	_____	_____	+ 535.25 mV
Ch3 10 mV Vert scale setting, +5 Div position setting, -0.45 V offset	- 535.25 mV	_____	_____	- 524.75 mV
Ch3 20 mV Vert scale setting, -5 Div position setting, +0.4 V offset	+ 552.75 mV	_____	_____	+ 567.25 mV
Ch3 20 mV Vert scale setting, +5 Div position setting, -0.4 V offset	- 567.25 mV	_____	_____	- 552.75 mV
Ch3 50 mV Vert scale setting, -5 Div position setting, +0.25 V offset	+ 636.75 mV	_____	_____	+ 663.25 mV
Ch3 50 mV Vert scale setting, +5 Div position setting, -0.25 V offset	- 663.25 mV	_____	_____	- 636.75 mV
Ch3 100 mV Vert scale setting, -5 Div position setting, +2.0 V offset	+ 2.764 V	_____	_____	+ 2.836 V
Ch3 100 mV Vert scale setting, +5 Div position setting, -2.0 V offset	- 2.836 V	_____	_____	- 2.764 V
Ch3 200 mV Vert scale setting, -5 Div position setting, +1.25 V offset	+ 2.697 V	_____	_____	+ 2.803 V
Ch3 200 mV Vert scale setting, +5 Div position setting, -1.25 V offset	- 2.803 V	_____	_____	- 2.697 V
Ch3 500 mV Vert scale setting, -5 Div position setting, 0 V offset	+ 3.394 V	_____	_____	+ 3.606 V
Ch3 500 mV Vert scale setting, +5 Div position setting, 0 V offset	- 3.606 V	_____	_____	- 3.394 V
Table continued…				

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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DC voltage measurement accuracy (averaged), MSO/DPO70000C models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch4 10 mV Vert scale setting, -5 Div position setting, +0.45 V offset	+ 524.75 mV	_____	_____	+ 535.25 mV
Ch4 10 mV Vert scale setting, +5 Div position setting, -0.45 V offset	- 535.25 mV	_____	_____	- 524.75 mV
Ch4 20 mV Vert scale setting, -5 Div position setting, +0.4 V offset	+ 552.75 mV	_____	_____	+ 567.25 mV
Ch4 20 mV Vert scale setting, +5 Div position setting, -0.4 V offset	- 567.25 mV	_____	_____	- 552.75 mV
Ch4 50 mV Vert scale setting, -5 Div position setting, +0.25 V offset	+ 636.75 mV	_____	_____	+ 663.25 mV
Ch4 50 mV Vert scale setting, +5 Div position setting, -0.25 V offset	- 663.25 mV	_____	_____	- 636.75 mV
Ch4 100 mV Vert scale setting, -5 Div position setting, +2.0 V offset	+ 2.764 V	_____	_____	+ 2.836 V
Ch4 100 mV Vert scale setting, +5 Div position setting, -2.0 V offset	- 2.836 V	_____	_____	- 2.764 V
Ch4 200 mV Vert scale setting, -5 Div position setting, +1.25 V offset	+ 2.697 V	_____	_____	+ 2.803 V
Ch4 200 mV Vert scale setting, +5 Div position setting, -1.25 V offset	- 2.803 V	_____	_____	- 2.697 V
Ch4 500 mV Vert scale setting, -5 Div position setting, 0 V offset	+ 3.394 V	_____	_____	+ 3.606 V
Ch4 500 mV Vert scale setting, +5 Div position setting, 0 V offset	- 3.606 V	_____	_____	- 3.394 V

DC voltage measurement accuracy (averaged), DPO7000C models, 50 Ω				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1 1 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 504.24 mV	_____	_____	+ 509.76 mV
Ch1 1 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 509.76 mV	_____	_____	- 504.24 mV
Ch1 2 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 512.97 mV	_____	_____	+ 519.03 mV
Ch1 2 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 519.03 mV	_____	_____	- 512.97 mV
Ch1 5 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 536.26 mV	_____	_____	+ 543.74 mV
Ch1 5 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 543.74 mV	_____	_____	- 536.26 mV
Ch1 10 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 574.19 mV	_____	_____	+ 585.81 mV
Ch1 10 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 585.81 mV	_____	_____	- 574.19 mV
Ch1 20 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 651.62 mV	_____	_____	+ 668.38 mV
Ch1 20 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 668.38 mV	_____	_____	- 651.62 mV
Ch1 50 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 883.81 mV	_____	_____	+ 916.19 mV
Ch1 50 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 916.19 V	_____	_____	- 883.81 mV
Ch1 90 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 1.192 V	_____	_____	+ 1.248 V
Table continued…				

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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DC voltage measurement accuracy (averaged), DPO7000C models, 50 Ω				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1 90 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 1.248 V	_____	_____	- 1.192 V
Ch1 100 mV Vert scale setting, 0 Div position setting, +4.5 V offset	+ 4.746 V	_____	_____	+ 4.854 V
Ch1 100 mV Vert scale setting, 0 Div position setting, -4.5 V offset	- 4.854 V	_____	_____	- 4.746 V
Ch1 200 mV Vert scale setting, -2 Div position setting, +4.6 V offset	+ 4.725 V	_____	_____	+ 4.875 V
Ch1 200 mV Vert scale setting, +2 Div position setting, -4.6 V offset	- 4.875 V	_____	_____	- 4.725 V
Ch1 500 mV Vert scale setting, -2 Div position setting, +5.0 V offset	+ 4.345 V	_____	_____	+ 4.655 V
Ch1 500 mV Vert scale setting, +2 Div position setting, -5.0 V offset	- 4.655 V	_____	_____	- 4.345 V
Ch1 1.0 V Vert scale setting, 0 Div position setting, +2.0 V offset	+ 4.742 V	_____	_____	+ 5.258 V
Ch1 1.0 V Vert scale setting, 0 Div position setting, -2.0 V offset	- 5.258 V	_____	_____	- 4.742 V
Ch2 1 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 504.24 mV	_____	_____	+ 509.76 mV
Ch2 1 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 509.76 mV	_____	_____	- 504.24 mV
Ch2 2 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 512.97 mV	_____	_____	+ 519.03 mV
Ch2 2 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 519.03 mV	_____	_____	- 512.97 mV
Table continued…				

DC voltage measurement accuracy (averaged), DPO7000C models, 50 Ω				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch2 5 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 536.26 mV	_____	_____	+ 543.74 mV
Ch2 5 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 543.74 mV	_____	_____	- 536.26 mV
Ch2 10 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 574.19 mV	_____	_____	+ 585.81 mV
Ch2 10 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 585.81 mV	_____	_____	- 574.19 mV
Ch2 20 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 651.62 mV	_____	_____	+ 668.38 mV
Ch2 20 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 668.38 mV	_____	_____	- 651.62 mV
Ch2 50 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 883.81 mV	_____	_____	+ 916.19 mV
Ch2 50 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 916.19 V	_____	_____	- 883.81 mV
Ch2 90 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 1.192 V	_____	_____	+ 1.248 V
Ch2 90 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 1.248 V	_____	_____	- 1.192 V
Ch2 100 mV Vert scale setting, 0 Div position setting, +4.5 V offset	+ 4.746 V	_____	_____	+ 4.854 V
Ch2 100 mV Vert scale setting, 0 Div position setting, -4.5 V offset	- 4.854 V	_____	_____	- 4.746 V
Ch2 200 mV Vert scale setting, -2 Div position setting, +4.6 V offset	+ 4.725 V	_____	_____	+ 4.875 V

Table continued…

DC voltage measurement accuracy (averaged), DPO7000C models, 50 Ω				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch2 200 mV Vert scale setting, +2 Div position setting, -4.6 V offset	- 4.875 V	_____	_____	- 4.725 V
Ch2 500 mV Vert scale setting, -2 Div position setting, +5.0 V offset	+ 4.345 V	_____	_____	+ 4.655 V
Ch2 500 mV Vert scale setting, +2 Div position setting, -5.0 V offset	- 4.655 V	_____	_____	- 4.345 V
Ch2 1.0 V Vert scale setting, 0 Div position setting, +2.0 V offset	+ 4.742 V	_____	_____	+ 5.258 V
Ch2 1.0 V Vert scale setting, 0 Div position setting, -2.0 V offset	- 5.258 V	_____	_____	- 4.742 V
Ch3 1 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 504.24 mV	_____	_____	+ 509.76 mV
Ch3 1 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 509.76 mV	_____	_____	- 504.24 mV
Ch3 2 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 512.97 mV	_____	_____	+ 519.03 mV
Ch3 2 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 519.03 mV	_____	_____	- 512.97 mV
Ch3 5 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 536.26 mV	_____	_____	+ 543.74 mV
Ch3 5 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 543.74 mV	_____	_____	- 536.26 mV
Ch3 10 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 574.19 mV	_____	_____	+ 585.81 mV
Ch3 10 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 585.81 mV	_____	_____	- 574.19 mV
Table continued…				

DC voltage measurement accuracy (averaged), DPO7000C models, 50 Ω				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch3 20 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 651.62 mV	_____	_____	+ 668.38 mV
Ch3 20 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 668.38 mV	_____	_____	- 651.62 mV
Ch3 50 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 883.81 mV	_____	_____	+ 916.19 mV
Ch3 50 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 916.19 V	_____	_____	- 883.81 mV
Ch3 90 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 1.192 V	_____	_____	+ 1.248 V
Ch3 90 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 1.248 V	_____	_____	- 1.192 V
Ch3 100 mV Vert scale setting, 0 Div position setting, +4.5 V offset	+ 4.746 V	_____	_____	+ 4.854 V
Ch3 100 mV Vert scale setting, 0 Div position setting, -4.5 V offset	- 4.854 V	_____	_____	- 4.746 V
Ch3 200 mV Vert scale setting, -2 Div position setting, +4.6 V offset	+ 4.725 V	_____	_____	+ 4.875 V
Ch3 200 mV Vert scale setting, +2 Div position setting, -4.6 V offset	- 4.875 V	_____	_____	- 4.725 V
Ch3 500 mV Vert scale setting, -2 Div position setting, +5.0 V offset	+ 4.345 V	_____	_____	+ 4.655 V
Ch3 500 mV Vert scale setting, +2 Div position setting, -5.0 V offset	- 4.655 V	_____	_____	- 4.345 V
Ch3 1.0 V Vert scale setting, 0 Div position setting, +2.0 V offset	+ 4.742 V	_____	_____	+ 5.258 V
Table continued…				

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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DC voltage measurement accuracy (averaged), DPO7000C models, 50 Ω				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch3 1.0 V Vert scale setting, 0 Div position setting, -2.0 V offset	- 5.258 V	_____	_____	- 4.742 V
Ch4 1 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 504.24 mV	_____	_____	+ 509.76 mV
Ch4 1 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 509.76 mV	_____	_____	- 504.24 mV
Ch4 2 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 512.97 mV	_____	_____	+ 519.03 mV
Ch4 2 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 519.03 mV	_____	_____	- 512.97 mV
Ch4 5 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 536.26 mV	_____	_____	+ 543.74 mV
Ch4 5 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 543.74 mV	_____	_____	- 536.26 mV
Ch4 10 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 574.19 mV	_____	_____	+ 585.81 mV
Ch4 10 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 585.81 mV	_____	_____	- 574.19 mV
Ch4 20 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 651.62 mV	_____	_____	+ 668.38 mV
Ch4 20 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 668.38 mV	_____	_____	- 651.62 mV
Ch4 50 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 883.81 mV	_____	_____	+ 916.19 mV
Ch4 50 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 916.19 V	_____	_____	- 883.81 mV
Table continued…				

DC voltage measurement accuracy (averaged), DPO7000C models, 50 Ω				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch4 90 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 1.192 V	_____	_____	+ 1.248 V
Ch4 90 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 1.248 V	_____	_____	- 1.192 V
Ch4 100 mV Vert scale setting, 0 Div position setting, +4.5 V offset	+ 4.746 V	_____	_____	+ 4.854 V
Ch4 100 mV Vert scale setting, 0 Div position setting, -4.5 V offset	- 4.854 V	_____	_____	- 4.746 V
Ch4 200 mV Vert scale setting, -2 Div position setting, +4.6 V offset	+ 4.725 V	_____	_____	+ 4.875 V
Ch4 200 mV Vert scale setting, +2 Div position setting, -4.6 V offset	- 4.875 V	_____	_____	- 4.725 V
Ch4 500 mV Vert scale setting, -2 Div position setting, +5.0 V offset	+ 4.345 V	_____	_____	+ 4.655 V
Ch4 500 mV Vert scale setting, +2 Div position setting, -5.0 V offset	- 4.655 V	_____	_____	- 4.345 V
Ch4 1.0 V Vert scale setting, 0 Div position setting, +2.0 V offset	+ 4.742 V	_____	_____	+ 5.258 V
Ch4 1.0 V Vert scale setting, 0 Div position setting, -2.0 V offset	- 5.258 V	_____	_____	- 4.742 V

DC voltage measurement accuracy (averaged), DPO7000C models, 1 MΩ				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1 1 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 504.24 mV	_____	_____	+ 509.76 mV
Ch1 1 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 509.76 mV	_____	_____	- 504.24 mV

Table continued…

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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DC voltage measurement accuracy (averaged), DPO7000C models, 1 MΩ				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1 2 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 512.97 mV	_____	_____	+ 519.03 mV
Ch1 2 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 519.03 mV	_____	_____	- 512.97 mV
Ch1 5 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 536.26 mV	_____	_____	+ 543.74 mV
Ch1 5 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 543.74 mV	_____	_____	- 536.26 mV
Ch1 10 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 574.19 mV	_____	_____	+ 585.81 mV
Ch1 10 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 585.81 mV	_____	_____	- 574.19 mV
Ch1 20 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 651.62 mV	_____	_____	+ 668.38 mV
Ch1 20 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 668.38 mV	_____	_____	- 651.62 mV
Ch1 50 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 883.81 mV	_____	_____	+ 916.19 mV
Ch1 50 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 916.19 V	_____	_____	- 883.81 mV
Ch1 90 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 1.192 V	_____	_____	+ 1.248 V
Ch1 90 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 1.248 V	_____	_____	- 1.192 V
Ch1 100 mV Vert scale setting, 0 Div position setting, +4.5 V offset	+ 4.746 V	_____	_____	+ 4.854 V

Table continued…

DC voltage measurement accuracy (averaged), DPO7000C models, 1 MΩ				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1 100 mV Vert scale setting, 0 Div position setting, -4.5 V offset	- 4.854 V	_____	_____	- 4.746 V
Ch1 200 mV Vert scale setting, -2 Div position setting, +4.6 V offset	+ 4.725 V	_____	_____	+ 4.875 V
Ch1 200 mV Vert scale setting, +2 Div position setting, -4.6 V offset	- 4.875 V	_____	_____	- 4.725 V
Ch1 500 mV Vert scale setting, -2 Div position setting, +5.0 V offset	+ 4.345 V	_____	_____	+ 4.655 V
Ch1 500 mV Vert scale setting, +2 Div position setting, -5.0 V offset	- 4.655 V	_____	_____	- 4.345 V
Ch1 1.0 V Vert scale setting, 0 Div position setting, +96.0 V offset	+ 98.390 V	_____	_____	+ 99.610 V
Ch1 1.0 V Vert scale setting, 0 Div position setting, -96.0 V offset	- 99.610 V	_____	_____	- 98.390 V
Ch2 1 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 504.24 mV	_____	_____	+ 509.76 mV
Ch2 1 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 509.76 mV	_____	_____	- 504.24 mV
Ch2 2 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 512.97 mV	_____	_____	+ 519.03 mV
Ch2 2 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 519.03 mV	_____	_____	- 512.97 mV
Ch2 5 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 536.26 mV	_____	_____	+ 543.74 mV
Ch2 5 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 543.74 mV	_____	_____	- 536.26 mV
Table continued…				

DC voltage measurement accuracy (averaged), DPO7000C models, 1 MΩ				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch2 10 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 574.19 mV	_____	_____	+ 585.81 mV
Ch2 10 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 585.81 mV	_____	_____	- 574.19 mV
Ch2 20 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 651.62 mV	_____	_____	+ 668.38 mV
Ch2 20 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 668.38 mV	_____	_____	- 651.62 mV
Ch2 50 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 883.81 mV	_____	_____	+ 916.19 mV
Ch2 50 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 916.19 V	_____	_____	- 883.81 mV
Ch2 90 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 1.192 V	_____	_____	+ 1.248 V
Ch2 90 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 1.248 V	_____	_____	- 1.192 V
Ch2 100 mV Vert scale setting, 0 Div position setting, +4.5 V offset	+ 4.746 V	_____	_____	+ 4.854 V
Ch2 100 mV Vert scale setting, 0 Div position setting, -4.5 V offset	- 4.854 V	_____	_____	- 4.746 V
Ch2 200 mV Vert scale setting, -2 Div position setting, +4.6 V offset	+ 4.725 V	_____	_____	+ 4.875 V
Ch2 200 mV Vert scale setting, +2 Div position setting, -4.6 V offset	- 4.875 V	_____	_____	- 4.725 V
Ch2 500 mV Vert scale setting, -2 Div position setting, +5.0 V offset	+ 4.345 V	_____	_____	+ 4.655 V
Table continued…				

DC voltage measurement accuracy (averaged), DPO7000C models, 1 MΩ				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch2 500 mV Vert scale setting, +2 Div position setting, -5.0 V offset	- 4.655 V	_____	_____	- 4.345 V
Ch2 1.0 V Vert scale setting, 0 Div position setting, +96.0 V offset	+ 98.390 V	_____	_____	+ 99.610 V
Ch2 1.0 V Vert scale setting, 0 Div position setting, -96.0 V offset	- 99.610 V	_____	_____	- 98.390 V
Ch3 1 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 504.24 mV	_____	_____	+ 509.76 mV
Ch3 1 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 509.76 mV	_____	_____	- 504.24 mV
Ch3 2 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 512.97 mV	_____	_____	+ 519.03 mV
Ch3 2 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 519.03 mV	_____	_____	- 512.97 mV
Ch3 5 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 536.26 mV	_____	_____	+ 543.74 mV
Ch3 5 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 543.74 mV	_____	_____	- 536.26 mV
Ch3 10 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 574.19 mV	_____	_____	+ 585.81 mV
Ch3 10 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 585.81 mV	_____	_____	- 574.19 mV
Ch3 20 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 651.62 mV	_____	_____	+ 668.38 mV
Ch3 20 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 668.38 mV	_____	_____	- 651.62 mV
Table continued…				

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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DC voltage measurement accuracy (averaged), DPO7000C models, 1 MΩ				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch3 50 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 883.81 mV	_____	_____	+ 916.19 mV
Ch3 50 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 916.19 V	_____	_____	- 883.81 mV
Ch3 90 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 1.192 V	_____	_____	+ 1.248 V
Ch3 90 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 1.248 V	_____	_____	- 1.192 V
Ch3 100 mV Vert scale setting, 0 Div position setting, +4.5 V offset	+ 4.746 V	_____	_____	+ 4.854 V
Ch3 100 mV Vert scale setting, 0 Div position setting, -4.5 V offset	- 4.854 V	_____	_____	- 4.746 V
Ch3 200 mV Vert scale setting, -2 Div position setting, +4.6 V offset	+ 4.725 V	_____	_____	+ 4.875 V
Ch3 200 mV Vert scale setting, +2 Div position setting, -4.6 V offset	- 4.875 V	_____	_____	- 4.725 V
Ch3 500 mV Vert scale setting, -2 Div position setting, +5.0 V offset	+ 4.345 V	_____	_____	+ 4.655 V
Ch3 500 mV Vert scale setting, +2 Div position setting, -5.0 V offset	- 4.655 V	_____	_____	- 4.345 V
Ch3 1.0 V Vert scale setting, 0 Div position setting, +96.0 V offset	+ 98.390 V	_____	_____	+ 99.610 V
Ch3 1.0 V Vert scale setting, 0 Div position setting, -96.0 V offset	- 99.610 V	_____	_____	- 98.390 V
Ch4 1 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 504.24 mV	_____	_____	+ 509.76 mV

Table continued…

DC voltage measurement accuracy (averaged), DPO7000C models, 1 MΩ				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch4 1 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 509.76 mV	_____	_____	- 504.24 mV
Ch4 2 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 512.97 mV	_____	_____	+ 519.03 mV
Ch4 2 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 519.03 mV	_____	_____	- 512.97 mV
Ch4 5 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 536.26 mV	_____	_____	+ 543.74 mV
Ch4 5 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 543.74 mV	_____	_____	- 536.26 mV
Ch4 10 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 574.19 mV	_____	_____	+ 585.81 mV
Ch4 10 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 585.81 mV	_____	_____	- 574.19 mV
Ch4 20 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 651.62 mV	_____	_____	+ 668.38 mV
Ch4 20 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 668.38 mV	_____	_____	- 651.62 mV
Ch4 50 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 883.81 mV	_____	_____	+ 916.19 mV
Ch4 50 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 916.19 V	_____	_____	- 883.81 mV
Ch4 90 mV Vert scale setting, -5 Div position setting, +0.5 V offset	+ 1.192 V	_____	_____	+ 1.248 V
Ch4 90 mV Vert scale setting, +5 Div position setting, -0.5 V offset	- 1.248 V	_____	_____	- 1.192 V
Table continued…				

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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DC voltage measurement accuracy (averaged), DPO7000C models, 1 MΩ				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch4 100 mV Vert scale setting, 0 Div position setting, +4.5 V offset	+ 4.746 V	_____	_____	+ 4.854 V
Ch4 100 mV Vert scale setting, 0 Div position setting, -4.5 V offset	- 4.854 V	_____	_____	- 4.746 V
Ch4 200 mV Vert scale setting, -2 Div position setting, +4.6 V offset	+ 4.725 V	_____	_____	+ 4.875 V
Ch4 200 mV Vert scale setting, +2 Div position setting, -4.6 V offset	- 4.875 V	_____	_____	- 4.725 V
Ch4 500 mV Vert scale setting, -2 Div position setting, +5.0 V offset	+ 4.345 V	_____	_____	+ 4.655 V
Ch4 500 mV Vert scale setting, +2 Div position setting, -5.0 V offset	- 4.655 V	_____	_____	- 4.345 V
Ch4 1.0 V Vert scale setting, 0 Div position setting, +96.0 V offset	+ 98.390 V	_____	_____	+ 99.610 V
Ch4 1.0 V Vert scale setting, 0 Div position setting, -96.0 V offset	- 99.610 V	_____	_____	- 98.390 V

DC gain accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1 6.25 mV Vert scale setting				
0 V termination				
0 Div position setting, 0 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, +1 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, -1 V offset	37.24 mV	_____	_____	38.76 mV
+1.5 V termination				
0 Div position setting, +2.5 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, +1.5 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, +0.5 V offset	37.24 mV	_____	_____	38.76 mV
+3.4 V termination				
0 Div position setting, +3.4 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, +2.4 V offset	37.24 mV	_____	_____	38.76 mV
-3.4 V termination				
0 Div position setting, -3.4 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, -2.4 V offset	37.24 mV	_____	_____	38.76 mV
-1.5 V termination				
0 Div position setting, -2.5 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, -1.5 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, -0.5 V offset	37.24 mV	_____	_____	38.76 mV
Table continued…				

DC gain accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1 10 mV Vert scale setting,				
0 V termination				
0 Div position setting, 0 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, +1 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, -1 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
+1.5 V termination				
0 Div position setting, +2.5 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, +1.5 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, +0.5 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
+3.4 V termination				
0 Div position setting, +3.4 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, +2.4 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
-3.4 V termination				
0 Div position setting, -3.4 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, -2.4 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
-1.5 V termination				
0 Div position setting, -2.5 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, -1.5 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, -0.5 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV

Table continued…

DC gain accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1 20 mV Vert scale setting,				
0 V termination				
0 Div position setting, 0 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, +1 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, -1 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
+1.5 V termination				
0 Div position setting, +2.5 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, +1.5 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, +0.5 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
+3.4 V termination				
0 Div position setting, +3.4 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, +2.4 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
-3.4 V termination				
0 Div position setting, -3.4 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, -2.4 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
-1.5 V termination				
0 Div position setting, -2.5 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, -1.5 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, -0.5 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
Table continued…				

DC gain accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1 50 mV Vert scale setting,				
0 V termination				
0 Div position setting, 0 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, +1 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, -1 V offset	+ 294 mV	_____	_____	+ 306 mV
+1.5 V termination				
0 Div position setting, +2.5 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, +1.5 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, +0.5 V offset	+ 294 mV	_____	_____	+ 306 mV
+3.4 V termination				
0 Div position setting, +3.4 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, +2.4 V offset	+ 294 mV	_____	_____	+ 306 mV
-3.4 V termination				
0 Div position setting, -3.4 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, -2.4 V offset	+ 294 mV	_____	_____	+ 306 mV
-1.5 V termination				
0 Div position setting, -2.5 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, -1.5 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, -0.5 V offset	+ 294 mV	_____	_____	+ 306 mV

Table continued…

DC gain accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1 100 mV Vert scale setting,				
0 V termination				
0 Div position setting, 0 V offset	+ 588 mV	_____	_____	+ 612 mV
0 Div position setting, +1 V offset	+ 588 mV	_____	_____	+ 612 mV
0 Div position setting, -1 V offset	+ 588 mV	_____	_____	+ 612 mV
+1.5 V termination				
0 Div position setting, +2.5 V offset	+ 588 mV	_____	_____	+ 612 mV
0 Div position setting, +1.5 V offset	+ 588 mV	_____	_____	+ 612 mV
0 Div position setting, +0.5 V offset	+ 588 mV	_____	_____	+ 612 mV
+3.4 V termination				
0 Div position setting, +3.4 V offset	+ 588 mV	_____	_____	+ 612 mV
0 Div position setting, +2.4 V offset	+ 588 mV	_____	_____	+ 612 mV
-3.4 V termination				
0 Div position setting, -3.4 V offset	+ 588 mV	_____	_____	+ 612 mV
0 Div position setting, -2.4 V offset	+ 588 mV	_____	_____	+ 612 mV
-1.5 V termination				
0 Div position setting, -1.5 V offset	+ 588 mV	_____	_____	+ 612 mV
0 Div position setting, -0.5 V offset	+ 588 mV	_____	_____	+ 612 mV

Table continued…

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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DC gain accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1 120 mV Vert scale setting,				
0 V termination				
0 Div position setting, 0 V offset	705.6 mV	_____	_____	734.4 mV
0 Div position setting, +1 V offset	705.6 mV	_____	_____	734.4 mV
0 Div position setting, -1 V offset	705.6 mV	_____	_____	734.4 mV
+1.5 V termination				
0 Div position setting, +2.5 V offset	705.6 mV	_____	_____	734.4 mV
0 Div position setting, +1.5 V offset	705.6 mV	_____	_____	734.4 mV
0 Div position setting, +0.5 V offset	705.6 mV	_____	_____	734.4 mV
+3.4 V termination				
-5 Div position setting, +3.4 V offset	705.6 mV	_____	_____	734.4 mV
-5Div position setting, +2.4 V offset	705.6 mV	_____	_____	734.4 mV
-3.4 V termination				
5 Div position setting, -3.4 V offset	705.6 mV	_____	_____	734.4 mV
5Div position setting, -2.4 V offset	705.6 mV	_____	_____	734.4 mV
-1.5 V termination				
5 Div position setting, -1.5 V offset	705.6 mV	_____	_____	734.4 mV
5 Div position setting, -0.5 V offset	705.6 mV	_____	_____	734.4 mV
Ch1 140 mV Vert scale setting,				
0 V termination				
0 Div position setting, -1 V offset	823.2 mV	_____	_____	856.8 mV
0 Div position setting, 0 V offset	823.2 mV	_____	_____	856.8 mV
0 Div position setting, +1 V offset	823.2 mV	_____	_____	856.8 mV
Ch1 200 mV Vert scale setting,				
0 V termination				
0 Div position setting, -0.9 V offset	1176 mV	_____	_____	1224 mV
0 Div position setting, 0 V offset	1176 mV	_____	_____	1224 mV
0 Div position setting, +0.9 V offset	1176 mV	_____	_____	1224 mV
Table continued…				

DC gain accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1 400 mV Vert scale setting,				
0 V termination				
0 Div position setting, -0.3 V offset	2352 mV	_____	_____	2448 mV
0 Div position setting, 0 V offset	2352 mV	_____	_____	2448 mV
0 Div position setting, +0.3 V offset	2352 mV	_____	_____	2448 mV
Ch2 6.25 mV Vert scale setting				
0 V termination				
0 Div position setting, 0 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, +1 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, -1 V offset	37.24 mV	_____	_____	38.76 mV
+1.5 V termination				
0 Div position setting, +2.5 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, +1.5 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, +0.5 V offset	37.24 mV	_____	_____	38.76 mV
+3.4 V termination				
0 Div position setting, +3.4 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, +2.4 V offset	37.24 mV	_____	_____	38.76 mV
-3.4 V termination				
0 Div position setting, -3.4 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, -2.4 V offset	37.24 mV	_____	_____	38.76 mV
-1.5 V termination				
0 Div position setting, -2.5 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, -1.5 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, -0.5 V offset	37.24 mV	_____	_____	38.76 mV

Table continued…

DC gain accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch2 10 mV Vert scale setting,				
0 V termination				
0 Div position setting, 0 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, +1 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, -1 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
+1.5 V termination				
0 Div position setting, +2.5 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, +1.5 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, +0.5 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
+3.4 V termination				
0 Div position setting, +3.4 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, +2.4 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
-3.4 V termination				
0 Div position setting, -3.4 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, -2.4 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
-1.5 V termination				
0 Div position setting, -2.5 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, -1.5 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, -0.5 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV

Table continued…

DC gain accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch2 20 mV Vert scale setting,				
0 V termination				
0 Div position setting, 0 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, +1 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, -1 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
+1.5 V termination				
0 Div position setting, +2.5 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, +1.5 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, +0.5 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
+3.4 V termination				
0 Div position setting, +3.4 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, +2.4 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
-3.4 V termination				
0 Div position setting, -3.4 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, -2.4 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
-1.5 V termination				
0 Div position setting, -2.5 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, -1.5 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, -0.5 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
Table continued…				

DC gain accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch2 50 mV Vert scale setting,				
0 V termination				
0 Div position setting, 0 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, +1 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, -1 V offset	+ 294 mV	_____	_____	+ 306 mV
+1.5 V termination				
0 Div position setting, +2.5 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, +1.5 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, +0.5 V offset	+ 294 mV	_____	_____	+ 306 mV
+3.4 V termination				
0 Div position setting, +3.4 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, +2.4 V offset	+ 294 mV	_____	_____	+ 306 mV
-3.4 V termination				
0 Div position setting, -3.4 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, -2.4 V offset	+ 294 mV	_____	_____	+ 306 mV
-1.5 V termination				
0 Div position setting, -2.5 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, -1.5 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, -0.5 V offset	+ 294 mV	_____	_____	+ 306 mV

Table continued…

DC gain accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch2 100 mV Vert scale setting,				
0 V termination				
0 Div position setting, 0 V offset	+ 588 mV	_____	_____	+ 612 mV
0 Div position setting, +1 V offset	+ 588 mV	_____	_____	+ 612 mV
0 Div position setting, -1 V offset	+ 588 mV	_____	_____	+ 612 mV
+1.5 V termination				
0 Div position setting, +2.5 V offset	+ 588 mV	_____	_____	+ 612 mV
0 Div position setting, +1.5 V offset	+ 588 mV	_____	_____	+ 612 mV
0 Div position setting, +0.5 V offset	+ 588 mV	_____	_____	+ 612 mV
+3.4 V termination				
0 Div position setting, +3.4 V offset	+ 588 mV	_____	_____	+ 612 mV
0 Div position setting, +2.4 V offset	+ 588 mV	_____	_____	+ 612 mV
-3.4 V termination				
0 Div position setting, -3.4 V offset	+ 588 mV	_____	_____	+ 612 mV
0 Div position setting, -2.4 V offset	+ 588 mV	_____	_____	+ 612 mV
-1.5 V termination				
0 Div position setting, -1.5 V offset	+ 588 mV	_____	_____	+ 612 mV
0 Div position setting, -0.5 V offset	+ 588 mV	_____	_____	+ 612 mV

Table continued…

DC gain accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch2 120 mV Vert scale setting, 0 V termination				
0 Div position setting, 0 V offset	705.6 mV	_____	_____	734.4 mV
0 Div position setting, +1 V offset	705.6 mV	_____	_____	734.4 mV
0 Div position setting, -1 V offset	705.6 mV	_____	_____	734.4 mV
+1.5 V termination				
0 Div position setting, +2.5 V offset	705.6 mV	_____	_____	734.4 mV
0 Div position setting, +1.5 V offset	705.6 mV	_____	_____	734.4 mV
0 Div position setting, +0.5 V offset	705.6 mV	_____	_____	734.4 mV
+3.4 V termination				
0 Div position setting, +3.4 V offset	705.6 mV	_____	_____	734.4 mV
0 Div position setting, +2.4 V offset	705.6 mV	_____	_____	734.4 mV
-3.4 V termination				
0 Div position setting, -3.4 V offset	705.6 mV	_____	_____	734.4 mV
0 Div position setting, -2.4 V offset	705.6 mV	_____	_____	734.4 mV
-1.5 V termination				
0 Div position setting, -1.5 V offset	705.6 mV	_____	_____	734.4 mV
0 Div position setting, -0.5 V offset	705.6 mV	_____	_____	734.4 mV
Ch2 140 mV Vert scale setting, 0 V termination				
0 Div position setting, -1 V offset	823.2 mV	_____	_____	856.8 mV
0 Div position setting, 0 V offset	823.2 mV	_____	_____	856.8 mV
0 Div position setting, +1 V offset	823.2 mV	_____	_____	856.8 mV
Ch2 200 mV Vert scale setting, 0 V termination				
0 Div position setting, -0.9 V offset	1176 mV	_____	_____	1224 mV
0 Div position setting, 0 V offset	1176 mV	_____	_____	1224 mV
0 Div position setting, +0.9 V offset	1176 mV	_____	_____	1224 mV
Table continued…				

DC gain accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch2 400 mV Vert scale setting,				
0 V termination				
0 Div position setting, -0.3 V offset	2352 mV	_____	_____	2448 mV
0 Div position setting, 0 V offset	2352 mV	_____	_____	2448 mV
0 Div position setting, +0.3 V offset	2352 mV	_____	_____	2448 mV
Ch3 6.25 mV Vert scale setting				
0 V termination				
0 Div position setting, 0 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, +1 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, -1 V offset	37.24 mV	_____	_____	38.76 mV
+1.5 V termination				
0 Div position setting, +2.5 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, +1.5 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, +0.5 V offset	37.24 mV	_____	_____	38.76 mV
+3.4 V termination				
0 Div position setting, +3.4 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, +2.4 V offset	37.24 mV	_____	_____	38.76 mV
-3.4 V termination				
0 Div position setting, -3.4 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, -2.4 V offset	37.24 mV	_____	_____	38.76 mV
-1.5 V termination				
0 Div position setting, -2.5 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, -1.5 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, -0.5 V offset	37.24 mV	_____	_____	38.76 mV

Table continued…

DC gain accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch3 10 mV Vert scale setting,				
0 V termination				
0 Div position setting, 0 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, +1 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, -1 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
+1.5 V termination				
0 Div position setting, +2.5 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, +1.5 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, +0.5 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
+3.4 V termination				
0 Div position setting, +3.4 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, +2.4 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
-3.4 V termination				
0 Div position setting, -3.4 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, -2.4 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
-1.5 V termination				
0 Div position setting, -2.5 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, -1.5 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, -0.5 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV

Table continued…

DC gain accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch3 20 mV Vert scale setting,				
0 V termination				
0 Div position setting, 0 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, +1 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, -1 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
+1.5 V termination				
0 Div position setting, +2.5 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, +1.5 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, +0.5 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
+3.4 V termination				
0 Div position setting, +3.4 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, +2.4 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
-3.4 V termination				
0 Div position setting, -3.4 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, -2.4 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
-1.5 V termination				
0 Div position setting, -2.5 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, -1.5 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, -0.5 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
Table continued…				

DC gain accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch3 50 mV Vert scale setting,				
0 V termination				
0 Div position setting, 0 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, +1 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, -1 V offset	+ 294 mV	_____	_____	+ 306 mV
+1.5 V termination				
0 Div position setting, +2.5 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, +1.5 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, +0.5 V offset	+ 294 mV	_____	_____	+ 306 mV
+3.4 V termination				
0 Div position setting, +3.4 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, +2.4 V offset	+ 294 mV	_____	_____	+ 306 mV
-3.4 V termination				
0 Div position setting, -3.4 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, -2.4 V offset	+ 294 mV	_____	_____	+ 306 mV
-1.5 V termination				
0 Div position setting, -2.5 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, -1.5 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, -0.5 V offset	+ 294 mV	_____	_____	+ 306 mV

Table continued…

DC gain accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch3 100 mV Vert scale setting,				
0 V termination				
0 Div position setting, 0 V offset	+ 588 mV	_____	_____	+ 612 mV
0 Div position setting, +1 V offset	+ 588 mV	_____	_____	+ 612 mV
0 Div position setting, -1 V offset	+ 588 mV	_____	_____	+ 612 mV
+1.5 V termination				
0 Div position setting, +2.5 V offset	+ 588 mV	_____	_____	+ 612 mV
0 Div position setting, +1.5 V offset	+ 588 mV	_____	_____	+ 612 mV
0 Div position setting, +0.5 V offset	+ 588 mV	_____	_____	+ 612 mV
+3.4 V termination				
0 Div position setting, +3.4 V offset	+ 588 mV	_____	_____	+ 612 mV
0 Div position setting, +2.4 V offset	+ 588 mV	_____	_____	+ 612 mV
-3.4 V termination				
0 Div position setting, -3.4 V offset	+ 588 mV	_____	_____	+ 612 mV
0 Div position setting, -2.4 V offset	+ 588 mV	_____	_____	+ 612 mV
-1.5 V termination				
0 Div position setting, -1.5 V offset	+ 588 mV	_____	_____	+ 612 mV
0 Div position setting, -0.5 V offset	+ 588 mV	_____	_____	+ 612 mV
Table continued…				

DC gain accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch3 120 mV Vert scale setting, 0 V termination				
0 Div position setting, 0 V offset	705.6 mV	_____	_____	734.4 mV
0 Div position setting, +1 V offset	705.6 mV	_____	_____	734.4 mV
0 Div position setting, -1 V offset	705.6 mV	_____	_____	734.4 mV
+1.5 V termination				
0 Div position setting, +2.5 V offset	705.6 mV	_____	_____	734.4 mV
0 Div position setting, +1.5 V offset	705.6 mV	_____	_____	734.4 mV
0 Div position setting, +0.5 V offset	705.6 mV	_____	_____	734.4 mV
+3.4 V termination				
0 Div position setting, +3.4 V offset	705.6 mV	_____	_____	734.4 mV
0 Div position setting, +2.4 V offset	705.6 mV	_____	_____	734.4 mV
-3.4 V termination				
0 Div position setting, -3.4 V offset	705.6 mV	_____	_____	734.4 mV
0 Div position setting, -2.4 V offset	705.6 mV	_____	_____	734.4 mV
-1.5 V termination				
0 Div position setting, -1.5 V offset	705.6 mV	_____	_____	734.4 mV
0 Div position setting, -0.5 V offset	705.6 mV	_____	_____	734.4 mV
Ch3 140 mV Vert scale setting, 0 V termination				
0 Div position setting, -1 V offset	823.2 mV	_____	_____	856.8 mV
0 Div position setting, 0 V offset	823.2 mV	_____	_____	856.8 mV
0 Div position setting, +1 V offset	823.2 mV	_____	_____	856.8 mV
Ch3 200 mV Vert scale setting, 0 V termination				
0 Div position setting, -0.9 V offset	1176 mV	_____	_____	1224 mV
0 Div position setting, 0 V offset	1176 mV	_____	_____	1224 mV
0 Div position setting, +0.9 V offset	1176 mV	_____	_____	1224 mV
Table continued…				

DC gain accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch3 400 mV Vert scale setting,				
0 V termination				
0 Div position setting, -0.3 V offset	2352 mV	_____	_____	2448 mV
0 Div position setting, 0 V offset	2352 mV	_____	_____	2448 mV
0 Div position setting, +0.3 V offset	2352 mV	_____	_____	2448 mV
Ch4 6.25 mV Vert scale setting				
0 V termination				
0 Div position setting, 0 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, +1 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, -1 V offset	37.24 mV	_____	_____	38.76 mV
+1.5 V termination				
0 Div position setting, +2.5 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, +1.5 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, +0.5 V offset	37.24 mV	_____	_____	38.76 mV
+3.4 V termination				
0 Div position setting, +3.4 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, +2.4 V offset	37.24 mV	_____	_____	38.76 mV
-3.4 V termination				
0 Div position setting, -3.4 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, -2.4 V offset	37.24 mV	_____	_____	38.76 mV
-1.5 V termination				
0 Div position setting, -2.5 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, -1.5 V offset	37.24 mV	_____	_____	38.76 mV
0 Div position setting, -0.5 V offset	37.24 mV	_____	_____	38.76 mV

Table continued…

DC gain accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch4 10 mV Vert scale setting,				
0 V termination				
0 Div position setting, 0 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, +1 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, -1 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
+1.5 V termination				
0 Div position setting, +2.5 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, +1.5 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, +0.5 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
+3.4 V termination				
0 Div position setting, +3.4 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, +2.4 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
-3.4 V termination				
0 Div position setting, -3.4 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, -2.4 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
-1.5 V termination				
0 Div position setting, -2.5 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, -1.5 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV
0 Div position setting, -0.5 V offset	+ 58.8 mV	_____	_____	+ 61.2 mV

Table continued…

DC gain accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch4 20 mV Vert scale setting,				
0 V termination				
0 Div position setting, 0 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, +1 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, -1 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
+1.5 V termination				
0 Div position setting, +2.5 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, +1.5 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, +0.5 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
+3.4 V termination				
0 Div position setting, +3.4 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, +2.4 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
-3.4 V termination				
0 Div position setting, -3.4 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, -2.4 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
-1.5 V termination				
0 Div position setting, -2.5 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, -1.5 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
0 Div position setting, -0.5 V offset	+ 117.6 mV	_____	_____	+ 122.4 mV
Table continued…				

DC gain accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch4 50 mV Vert scale setting,				
0 V termination				
0 Div position setting, 0 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, +1 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, -1 V offset	+ 294 mV	_____	_____	+ 306 mV
+1.5 V termination				
0 Div position setting, +2.5 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, +1.5 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, +0.5 V offset	+ 294 mV	_____	_____	+ 306 mV
+3.4 V termination				
0 Div position setting, +3.4 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, +2.4 V offset	+ 294 mV	_____	_____	+ 306 mV
-3.4 V termination				
0 Div position setting, -3.4 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, -2.4 V offset	+ 294 mV	_____	_____	+ 306 mV
-1.5 V termination				
0 Div position setting, -2.5 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, -1.5 V offset	+ 294 mV	_____	_____	+ 306 mV
0 Div position setting, -0.5 V offset	+ 294 mV	_____	_____	+ 306 mV

Table continued…

DC gain accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch4 100 mV Vert scale setting,				
0 V termination				
0 Div position setting, 0 V offset	+ 588 mV	_____	_____	+ 612 mV
0 Div position setting, +1 V offset	+ 588 mV	_____	_____	+ 612 mV
0 Div position setting, -1 V offset	+ 588 mV	_____	_____	+ 612 mV
+1.5 V termination				
0 Div position setting, +2.5 V offset	+ 588 mV	_____	_____	+ 612 mV
0 Div position setting, +1.5 V offset	+ 588 mV	_____	_____	+ 612 mV
0 Div position setting, +0.5 V offset	+ 588 mV	_____	_____	+ 612 mV
+3.4 V termination				
0 Div position setting, +3.4 V offset	+ 588 mV	_____	_____	+ 612 mV
0 Div position setting, +2.4 V offset	+ 588 mV	_____	_____	+ 612 mV
-3.4 V termination				
0 Div position setting, -3.4 V offset	+ 588 mV	_____	_____	+ 612 mV
0 Div position setting, -2.4 V offset	+ 588 mV	_____	_____	+ 612 mV
-1.5 V termination				
0 Div position setting, -1.5 V offset	+ 588 mV	_____	_____	+ 612 mV
0 Div position setting, -0.5 V offset	+ 588 mV	_____	_____	+ 612 mV

Table continued…

DC gain accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch4 120 mV Vert scale setting, 0 V termination				
0 Div position setting, 0 V offset	705.6 mV	_____	_____	734.4 mV
0 Div position setting, +1 V offset	705.6 mV	_____	_____	734.4 mV
0 Div position setting, -1 V offset	705.6 mV	_____	_____	734.4 mV
+1.5 V termination				
0 Div position setting, +2.5 V offset	705.6 mV	_____	_____	734.4 mV
0 Div position setting, +1.5 V offset	705.6 mV	_____	_____	734.4 mV
0 Div position setting, +0.5 V offset	705.6 mV	_____	_____	734.4 mV
+3.4 V termination				
0 Div position setting, +3.4 V offset	705.6 mV	_____	_____	734.4 mV
0 Div position setting, +2.4 V offset	705.6 mV	_____	_____	734.4 mV
-3.4 V termination				
0 Div position setting, -3.4 V offset	705.6 mV	_____	_____	734.4 mV
0 Div position setting, -2.4 V offset	705.6 mV	_____	_____	734.4 mV
-1.5 V termination				
0 Div position setting, -1.5 V offset	705.6 mV	_____	_____	734.4 mV
0 Div position setting, -0.5 V offset	705.6 mV	_____	_____	734.4 mV
Ch4 140 mV Vert scale setting, 0 V termination				
0 Div position setting, -1 V offset	823.2 mV	_____	_____	856.8 mV
0 Div position setting, 0 V offset	823.2 mV	_____	_____	856.8 mV
0 Div position setting, +1 V offset	823.2 mV	_____	_____	856.8 mV
Ch4 200 mV Vert scale setting, 0 V termination				
0 Div position setting, -0.9 V offset	1176 mV	_____	_____	1224 mV
0 Div position setting, 0 V offset	1176 mV	_____	_____	1224 mV
0 Div position setting, +0.9 V offset	1176 mV	_____	_____	1224 mV

Table continued…

DC gain accuracy (averaged), MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch4 400 mV Vert scale setting, 0 V termination				
0 Div position setting, -0.3 V offset	2352 mV	_____	_____	2448 mV
0 Div position setting, 0 V offset	2352 mV	_____	_____	2448 mV
0 Div position setting, +0.3 V offset	2352 mV	_____	_____	2448 mV

DC gain accuracy (averaged), MSO/DPO70000C models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1 10 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 74.48 mV	_____	_____	+ 77.52 mV
-5 Div position setting, +0.45 V offset	+ 74.48 mV	_____	_____	+ 77.52 mV
+5 Div position setting, -0.45 V offset	+ 74.48 mV	_____	_____	+ 77.52 mV
Ch1 20 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 148.96 mV	_____	_____	+ 155.04 mV
-5 Div position setting, +0.4 V offset	+ 148.96 mV	_____	_____	+ 155.04 mV
+5 Div position setting, -0.4 V offset	+ 148.96 mV	_____	_____	+ 155.04 mV
Ch1 50 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 372.40 mV	_____	_____	+ 387.60 mV
-5 Div position setting, +0.25 V offset	+ 372.40 mV	_____	_____	+ 387.60 mV
+5 Div position setting, -0.25 V offset	+ 372.40 mV	_____	_____	+ 387.60 mV
Ch1 100 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 744.80 mV	_____	_____	+ 775.20 mV
-5 Div position setting, +2.0 V offset	+ 744.80 mV	_____	_____	+ 775.20 mV
+5 Div position setting, -2.0 V offset	+ 744.80 mV	_____	_____	+ 775.20 mV
Ch1 200 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 1.49 V	_____	_____	+ 1.55 V
-5 Div position setting, +1.25 V offset	+ 1.849 V	_____	_____	+ 1.55 V
+5 Div position setting, -1.25 V offset	+ 1.49 V	_____	_____	+ 1.55 V

Table continued…

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DC gain accuracy (averaged), MSO/DPO70000C models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1 500 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 3.724 V	_____	_____	+ 3.876 V
-5 Div position setting, 0 V offset	+ 3.724 V	_____	_____	+ 3.876 V
+5 Div position setting, 0 V offset	+ 3.724 V	_____	_____	+ 3.876 V
Ch2 10 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 74.48 mV	_____	_____	+ 77.52 mV
-5 Div position setting, +0.45 V offset	+ 74.48 mV	_____	_____	+ 77.52 mV
+5 Div position setting, -0.45 V offset	+ 74.48 mV	_____	_____	+ 77.52 mV
Ch2 20 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 148.96 mV	_____	_____	+ 155.04 mV
-5 Div position setting, +0.4 V offset	+ 148.96 mV	_____	_____	+ 155.04 mV
+5 Div position setting, -0.4 V offset	+ 148.96 mV	_____	_____	+ 155.04 mV
Ch2 50 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 372.40 mV	_____	_____	+ 387.60 mV
-5 Div position setting, +0.25 V offset	+ 372.40 mV	_____	_____	+ 387.60 mV
+5 Div position setting, -0.25 V offset	+ 372.40 mV	_____	_____	+ 387.60 mV
Ch2 100 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 744.80 mV	_____	_____	+ 775.20 mV
-5 Div position setting, +2.0 V offset	+ 744.80 mV	_____	_____	+ 775.20 mV
+5 Div position setting, -2.0 V offset	+ 744.80 mV	_____	_____	+ 775.20 mV
Ch2 200 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 1.49 V	_____	_____	+ 1.55 V
-5 Div position setting, +1.25 V offset	+ 1.49 V	_____	_____	+ 1.55 V
+5 Div position setting, -1.25 V offset	+ 1.49 V	_____	_____	+ 1.55 V
Ch2 500 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 3.724 V	_____	_____	+ 3.876 V
-5 Div position setting, 0 V offset	+ 3.724 V	_____	_____	+ 3.876 V
+5 Div position setting, 0 V offset	+ 3.724 V	_____	_____	+ 3.876 V
Table continued…				

DC gain accuracy (averaged), MSO/DPO70000C models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch3 10 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 74.48 mV	_____	_____	+ 77.52 mV
-5 Div position setting, +0.45 V offset	+ 74.48 mV	_____	_____	+ 77.52 mV
+5 Div position setting, -0.45 V offset	+ 74.48 mV	_____	_____	+ 77.52 mV
Ch3 20 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 148.96 mV	_____	_____	+ 155.04 mV
-5 Div position setting, +0.4 V offset	+ 148.96 mV	_____	_____	+ 155.04 mV
+5 Div position setting, -0.4 V offset	+ 148.96 mV	_____	_____	+ 155.04 mV
Ch3 50 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 372.40 mV	_____	_____	+ 387.60 mV
-5 Div position setting, +0.25 V offset	+ 372.40 mV	_____	_____	+ 387.60 mV
+5 Div position setting, -0.25 V offset	+ 372.40 mV	_____	_____	+ 387.60 mV
Ch3 100 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 744.80 mV	_____	_____	+ 775.20 mV
-5 Div position setting, +2.0 V offset	+ 744.80 mV	_____	_____	+ 775.20 mV
+5 Div position setting, -2.0 V offset	+ 744.80 mV	_____	_____	+ 775.20 mV
Ch3 200 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 1.49 V	_____	_____	+ 1.55 V
-5 Div position setting, +1.25 V offset	+ 1.49 V	_____	_____	+ 1.55 V
+5 Div position setting, -1.25 V offset	+ 1.49 V	_____	_____	+ 1.55 V
Ch3 500 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 3.724 V	_____	_____	+ 3.876 V
-5 Div position setting, 0 V offset	+ 3.724 V	_____	_____	+ 3.876 V
+5 Div position setting, 0 V offset	+ 3.724 V	_____	_____	+ 3.876 V
Ch4 10 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 74.48 mV	_____	_____	+ 77.52 mV
-5 Div position setting, +0.45 V offset	+ 74.48 mV	_____	_____	+ 77.52 mV
+5 Div position setting, -0.45 V offset	+ 74.48 mV	_____	_____	+ 77.52 mV

Table continued…

DC gain accuracy (averaged), MSO/DPO70000C models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch4 20 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 148.96 mV	_____	_____	+ 155.04 mV
-5 Div position setting, +0.4 V offset	+ 148.96 mV		_____	+ 155.04 mV
+5 Div position setting, -0.4 V offset	+ 148.96 mV	_____	_____	+ 155.04 mV
Ch4 50 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 372.40 mV	_____	_____	+ 387.60 mV
-5 Div position setting, +0.25 V offset	+ 372.40 mV	_____	_____	+ 387.60 mV
+5 Div position setting, -0.25 V offset	+ 372.40 mV	_____	_____	+ 387.60 mV
Ch4 100 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 744.80 mV	_____	_____	+ 775.20 mV
-5 Div position setting, +2.0 V offset	+ 744.80 mV	_____	_____	+ 775.20 mV
+5 Div position setting, -2.0 V offset	+ 744.80 mV	_____	_____	+ 775.20 mV
Ch4 200 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 1.49 V	_____	_____	+ 1.55 V
-5 Div position setting, +1.25 V offset	+ 1.49 V	_____	_____	+ 1.55 V
+5 Div position setting, -1.25 V offset	+ 1.49 V	_____	_____	+ 1.55 V
Ch4 500 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 3.724 V	_____	_____	+ 3.876 V
-5 Div position setting, 0 V offset	+ 3.724 V	_____	_____	+ 3.876 V
+5 Div position setting, 0 V offset	+ 3.724 V	_____	_____	+ 3.876 V

DC gain accuracy (averaged), MSO/DPO70000C models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1 10 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 74.48 mV	_____	_____	+ 77.52 mV
-5 Div position setting, +0.45 V offset	+ 74.48 mV	_____	_____	+ 77.52 mV
+5 Div position setting, -0.45 V offset	+ 74.48 mV	_____	_____	+ 77.52 mV

Table continued…

DC gain accuracy (averaged), MSO/DPO70000C models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1 20 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 148.96 mV	_____	_____	+ 155.04 mV
-5 Div position setting, +0.4 V offset	+ 148.96 mV		_____	+ 155.04 mV
+5 Div position setting, -0.4 V offset	+ 148.96 mV	_____	_____	+ 155.04 mV
Ch1 50 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 372.40 mV	_____	_____	+ 387.60 mV
-5 Div position setting, +0.25 V offset	+ 372.40 mV	_____	_____	+ 387.60 mV
+5 Div position setting, -0.25 V offset	+ 372.40 mV	_____	_____	+ 387.60 mV
Ch1 100 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 744.80 mV	_____	_____	+ 775.20 mV
-5 Div position setting, +2.0 V offset	+ 744.80 mV	_____	_____	+ 775.20 mV
+5 Div position setting, -2.0 V offset	+ 744.80 mV	_____	_____	+ 775.20 mV
Ch1 200 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 1.49 V	_____	_____	+ 1.55 V
-5 Div position setting, +1.25 V offset	+ 1.849 V	_____	_____	+ 1.55 V
+5 Div position setting, -1.25 V offset	+ 1.49 V	_____	_____	+ 1.55 V
Ch1 500 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 3.724 V	_____	_____	+ 3.876 V
-5 Div position setting, 0 V offset	+ 3.724 V	_____	_____	+ 3.876 V
+5 Div position setting, 0 V offset	+ 3.724 V	_____	_____	+ 3.876 V
Ch2 10 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 74.48 mV	_____	_____	+ 77.52 mV
-5 Div position setting, +0.45 V offset	+ 74.48 mV	_____	_____	+ 77.52 mV
+5 Div position setting, -0.45 V offset	+ 74.48 mV	_____	_____	+ 77.52 mV
Ch2 20 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 148.96 mV	_____	_____	+ 155.04 mV
-5 Div position setting, +0.4 V offset	+ 148.96 mV	_____	_____	+ 155.04 mV
+5 Div position setting, -0.4 V offset	+ 148.96 mV	_____	_____	+ 155.04 mV
		_____		

Table continued…

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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DC gain accuracy (averaged), MSO/DPO70000C models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch2 50 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 372.40 mV	_____	_____	+ 387.60 mV
-5 Div position setting, +0.25 V offset	+ 372.40 mV	_____	_____	+ 387.60 mV
+5 Div position setting, -0.25 V offset	+ 372.40 mV	_____	_____	+ 387.60 mV
Ch2 100 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 744.80 mV	_____	_____	+ 775.20 mV
-5 Div position setting, +2.0 V offset	+ 744.80 mV	_____	_____	+ 775.20 mV
+5 Div position setting, -2.0 V offset	+ 744.80 mV	_____	_____	+ 775.20 mV
Ch2 200 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 1.49 V	_____	_____	+ 1.55 V
-5 Div position setting, +1.25 V offset	+ 1.49 V	_____	_____	+ 1.55 V
+5 Div position setting, -1.25 V offset	+ 1.49 V	_____	_____	+ 1.55 V
Ch2 500 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 3.724 V	_____	_____	+ 3.876 V
-5 Div position setting, 0 V offset	+ 3.724 V	_____	_____	+ 3.876 V
+5 Div position setting, 0 V offset	+ 3.724 V	_____	_____	+ 3.876 V
Ch3 10 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 74.48 mV	_____	_____	+ 77.52 mV
-5 Div position setting, +0.45 V offset	+ 74.48 mV	_____	_____	+ 77.52 mV
+5 Div position setting, -0.45 V offset	+ 74.48 mV	_____	_____	+ 77.52 mV
Ch3 20 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 148.96 mV	_____	_____	+ 155.04 mV
-5 Div position setting, +0.4 V offset	+ 148.96 mV	_____	_____	+ 155.04 mV
+5 Div position setting, -0.4 V offset	+ 148.96 mV	_____	_____	+ 155.04 mV
Ch3 50 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 372.40 mV	_____	_____	+ 387.60 mV
-5 Div position setting, +0.25 V offset	+ 372.40 mV	_____	_____	+ 387.60 mV
+5 Div position setting, -0.25 V offset	+ 372.40 mV	_____	_____	+ 387.60 mV
Table continued…				

DC gain accuracy (averaged), MSO/DPO70000C models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch3 100 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 744.80 mV	_____	_____	+ 775.20 mV
-5 Div position setting, +2.0 V offset	+ 744.80 mV	_____	_____	+ 775.20 mV
+5 Div position setting, -2.0 V offset	+ 744.80 mV	_____	_____	+ 775.20 mV
Ch3 200 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 1.49 V	_____	_____	+ 1.55 V
-5 Div position setting, +1.25 V offset	+ 1.49 V	_____	_____	+ 1.55 V
+5 Div position setting, -1.25 V offset	+ 1.49 V	_____	_____	+ 1.55 V
Ch3 500 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 3.724 V	_____	_____	+ 3.876 V
-5 Div position setting, 0 V offset	+ 3.724 V	_____	_____	+ 3.876 V
+5 Div position setting, 0 V offset	+ 3.724 V	_____	_____	+ 3.876 V
Ch4 10 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 74.48 mV	_____	_____	+ 77.52 mV
-5 Div position setting, +0.45 V offset	+ 74.48 mV	_____	_____	+ 77.52 mV
+5 Div position setting, -0.45 V offset	+ 74.48 mV	_____	_____	+ 77.52 mV
Ch4 20 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 148.96 mV	_____	_____	+ 155.04 mV
-5 Div position setting, +0.4 V offset	+ 148.96 mV	_____	_____	+ 155.04 mV
+5 Div position setting, -0.4 V offset	+ 148.96 mV	_____	_____	+ 155.04 mV
Ch4 50 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 372.40 mV	_____	_____	+ 387.60 mV
-5 Div position setting, +0.25 V offset	+ 372.40 mV	_____	_____	+ 387.60 mV
+5 Div position setting, -0.25 V offset	+ 372.40 mV	_____	_____	+ 387.60 mV
Ch4 100 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 744.80 mV	_____	_____	+ 775.20 mV
-5 Div position setting, +2.0 V offset	+ 744.80 mV	_____	_____	+ 775.20 mV
+5 Div position setting, -2.0 V offset	+ 744.80 mV	_____	_____	+ 775.20 mV

Table continued…

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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DC gain accuracy (averaged), MSO/DPO70000C models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch4 200 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 1.49 V	_____	_____	+ 1.55 V
-5 Div position setting, +1.25 V offset	+ 1.49 V	_____	_____	+ 1.55 V
+5 Div position setting, -1.25 V offset	+ 1.49 V	_____	_____	+ 1.55 V
Ch4 500 mV Vert scale setting,				
0 Div position setting, 0 V offset	+ 3.724 V	_____	_____	+ 3.876 V
-5 Div position setting, 0 V offset	+ 3.724 V	_____	_____	+ 3.876 V
+5 Div position setting, 0 V offset	+ 3.724 V	_____	_____	+ 3.876 V

Offset accuracy, MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1 6.25 mV Vert scale, 0 Div position setting,				
0 V offset, 0 V termination	–3.13 mV	_____	_____	+3.125 mV
+3.4 V offset, +3.5 V termination	+3.3831 V	_____	_____	+3.4169 V
-3.4 V offset, -3.5 V termination	–3.4169 V	_____	_____	–3.3831 V
Ch1 10 mV Vert scale, 0 Div position setting,				
0 V offset, 0 V termination	–3.5 mV	_____	_____	+3.5 mV
+3.4 V offset, +3.5 V termination	+3.3827 V	_____	_____	+3.4173 V
-3.4 V offset, -3.5 V termination	–3.4173 V	_____	_____	–3.3827 V
Ch1 20 mV Vert scale, 0 Div position setting,				
0 V offset, 0 V termination	–4.5 mV	_____	_____	+4.5 mV
+3.4 V offset, +3.5 V termination	+3.3817 V	_____	_____	+3.4183 V
-3.4 V offset, -3.5 V termination	–3.4183 V	_____	_____	–3.3817 V
Ch1 50 mV Vert scale, 0 Div position setting,				
0 V offset, 0 V termination	–7.5 mV	_____	_____	+7.5 mV
+3.4 V offset, +3.5 V termination	+3.3787 V	_____	_____	+3.4213 V
-3.4 V offset, -3.5 V termination	–3.4213 V	_____	_____	–3.3787 V

Table continued…

Offset accuracy, MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1 100 mV Vert scale, 0 Div position setting,				
0 V offset, 0 V termination	−12.5 mV	_____	_____	+12.5 mV
+3.4 V offset, +3.5 V termination	+3.3737 V	_____	_____	+3.4263 V
-3.4 V offset, -3.5 V termination	−3.4263 V	_____	_____	−3.3737 V
Ch1 120 mV Vert scale, 0 Div position setting,				
0 V offset, 0 V termination	−14.5 mV	_____	_____	+14.5 mV
+3.4 V offset, +3.5 V termination	+3.3717 V	_____	_____	+3.4283 V
-3.4 V offset, -3.5 V termination	−3.4283 V	_____	_____	−3.3717 V
Ch1 140 mV Vert scale, 0 Div position setting,				
-6 V offset, 0 V termination	−6.0525 V	_____	_____	−5.9475 V
0 V offset, 0 V termination	−16.5 mV	_____	_____	+16.5 mV
+6 V offset, 0 V termination	+5.9475 V	_____	_____	+6.0525 V
Ch1 200 mV Vert scale, 0 Div position setting,				
-6 V offset, 0 V termination	−6.0585 V	_____	_____	−5.9415 V
0 V offset, 0 V termination	−22.5 mV	_____	_____	+22.5 mV
+6 V offset, 0 V termination	+5.9415 V	_____	_____	+6.0585 V
Ch1 400 mV Vert scale, 0 Div position setting,				
-6 V offset, 0 V termination	−6.0785 mV	_____	_____	−5.9215 mV
0 V offset, 0 V termination	−42.5 mV	_____	_____	+42.5 mV
+6 V offset, 0 V termination	+5.9215 V	_____	_____	+6.0785 V
Ch2 6.25 mV Vert scale, 0 Div position setting,				
0 V offset, 0 V termination	−3.13 mV	_____	_____	+3.125 mV
+3.4 V offset, +3.5 V termination	+3.3831 V	_____	_____	+3.4169 V
-3.4 V offset, -3.5 V termination	−3.4169 V	_____	_____	−3.3831 V
Ch2 10 mV Vert scale, 0 Div position setting,				
0 V offset, 0 V termination	−3.5 mV	_____	_____	+3.5 mV
+3.4 V offset, +3.5 V termination	+3.3827 V	_____	_____	+3.4173 V
-3.4 V offset, -3.5 V termination	−3.4173 V	_____	_____	−3.3827 V

Table continued…

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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Offset accuracy, MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch2 20 mV Vert scale, 0 Div position setting,				
0 V offset, 0 V termination	–4.5 mV	_____	_____	+4.5 mV
+3.4 V offset, +3.5 V termination	+3.3817 V	_____	_____	+3.4183 V
-3.4 V offset, -3.5 V termination	–3.4183 V	_____	_____	–3.3817 V
Ch2 50 mV Vert scale, 0 Div position setting,				
0 V offset, 0 V termination	–7.5 mV	_____	_____	+7.5 mV
+3.4 V offset, +3.5 V termination	+3.3787 V	_____	_____	+3.4213 V
-3.4 V offset, -3.5 V termination	–3.4213 V	_____	_____	–3.3787 V
Ch2 100 mV Vert scale, 0 Div position setting,				
0 V offset, 0 V termination	–12.5 mV	_____	_____	+12.5 mV
+3.4 V offset, +3.5 V termination	+3.3737 V	_____	_____	+3.4263 V
-3.4 V offset, -3.5 V termination	–3.4263 V	_____	_____	–3.3737 V
Ch2 120 mV Vert scale, 0 Div position setting,				
0 V offset, 0 V termination	–14.5 mV	_____	_____	+14.5 mV
+3.4 V offset, +3.5 V termination	+3.3717 V	_____	_____	+3.4283 V
-3.4 V offset, -3.5 V termination	–3.4283 V	_____	_____	–3.3717 V
Ch2 140 mV Vert scale, 0 Div position setting,				
-6 V offset, 0 V termination	–6.0525 V	_____	_____	+5.9475 V
0 V offset, 0 V termination	–16.5 mV	_____	_____	+16.5 mV
+6 V offset, 0 V termination	+5.9475 V	_____	_____	+6.0525 V
Ch2 200 mV Vert scale, 0 Div position setting,				
-6 V offset, 0 V termination	–6.0585 V	_____	_____	–5.9415 V
0 V offset, 0 V termination	–22.5 mV	_____	_____	+22.5 mV
+6 V offset, 0 V termination	+5.9414 V	_____	_____	+6.0585 V
Ch2 400 mV Vert scale, 0 Div position setting,				
-6 V offset, 0 V termination	–6.0785 mV	_____	_____	–5.9215 V
0 V offset, 0 V termination	–42.5 mV	_____	_____	+42.5 mV
+6 V offset, 0 V termination	+5.9215 V	_____	_____	+6.0785 mV

Table continued…

Offset accuracy, MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch3 6.25 mV Vert scale, 0 Div position setting,				
0 V offset, 0 V termination	–3.13 mV	_____	_____	+3.125 mV
+3.4 V offset, +3.5 V termination	+3.3831 V	_____	_____	+3.4169 V
-3.4 V offset, -3.5 V termination	–3.4169 V	_____	_____	–3.3831 V
Ch3 10 mV Vert scale, 0 Div position setting,				
0 V offset, 0 V termination	–3.5 mV	_____	_____	+3.5 mV
+3.4 V offset, +3.5 V termination	+3.3827 V	_____	_____	+3.4173 V
-3.4 V offset, -3.5 V termination	–3.4173 V	_____	_____	–3.3827 V
Ch3 20 mV Vert scale, 0 Div position setting,				
0 V offset, 0 V termination	–4.5 mV	_____	_____	+4.5 mV
+3.4 V offset, +3.5 V termination	+3.3817 V	_____	_____	+3.4183 V
-3.4 V offset, -3.5 V termination	–3.4183 V	_____	_____	–3.3817 V
Ch3 50 mV Vert scale, 0 Div position setting,				
0 V offset, 0 V termination	–7.5 mV	_____	_____	+7.5 mV
+3.4 V offset, +3.5 V termination	+3.3787 V	_____	_____	+3.4213 V
-3.4 V offset, -3.5 V termination	–3.4213 V	_____	_____	–3.3787 V
Ch3 100 mV Vert scale, 0 Div position setting,				
0 V offset, 0 V termination	–12.5 mV	_____	_____	+12.5 mV
+3.4 V offset, +3.5 V termination	+3.3737 V	_____	_____	+3.4263 V
-3.4 V offset, -3.5 V termination	–3.4263 V	_____	_____	–3.3737 V
Ch3 120 mV Vert scale, 0 Div position setting,				
0 V offset, 0 V termination	–14.5 mV	_____	_____	+14.5 mV
+3.4 V offset, +3.5 V termination	+3.3717 V	_____	_____	+3.4283 V
-3.4 V offset, -3.5 V termination	–3.4283 V	_____	_____	–3.3717 V
Ch3 140 mV Vert scale, 0 Div position setting,				
-6 V offset, 0 V termination	–6.0525 V	_____	_____	–5.9475 V
0 V offset, 0 V termination	–16.5 mV	_____	_____	+16.5 mV
+6 V offset, 0 V termination	+5.9475 V	_____	_____	+6.0525 V

Table continued…

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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Offset accuracy, MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch3 200 mV Vert scale, 0 Div position setting,				
-6 V offset, 0 V termination	–6.0585 V	_____	_____	–5.9415 V
0 V offset, 0 V termination	–22.5 mV	_____	_____	+22.5 mV
+6 V offset, 0 V termination	+5.9415 V	_____	_____	+6.0585 V
Ch3 400 mV Vert scale, 0 Div position setting,				
-6 V offset, 0 V termination	–6.0785 V	_____	_____	–5.9215 V
0 V offset, 0 V termination	–42.5 mV	_____	_____	+42.5 mV
+6 V offset, 0 V termination	+5.9215 V	_____	_____	+6.0785 V
Ch4 6.25 mV Vert scale, 0 Div position setting,				
0 V offset, 0 V termination	–3.13 mV	_____	_____	+3.125 mV
+3.4 V offset, +3.5 V termination	+3.3831 V	_____	_____	+3.4169 V
-3.4 V offset, -3.5 V termination	–3.4169 V	_____	_____	–3.3831 V
Ch4 10 mV Vert scale, 0 Div position setting,				
0 V offset, 0 V termination	–3.5 mV	_____	_____	+3.5 mV
+3.4 V offset, +3.5 V termination	+3.3827 V	_____	_____	+3.4173 V
-3.4 V offset, -3.5 V termination	–3.4173 V	_____	_____	–3.3827 V
Ch4 20 mV Vert scale, 0 Div position setting,				
0 V offset, 0 V termination	–4.5 mV	_____	_____	+4.5 mV
+3.4 V offset, +3.5 V termination	+3.3817 V	_____	_____	+3.4183 V
-3.4 V offset, -3.5 V termination	–3.4183 V	_____	_____	–3.3817 V
Ch4 50 mV Vert scale, 0 Div position setting,				
0 V offset, 0 V termination	–7.5 mV	_____	_____	+7.5 mV
+3.4 V offset, +3.5 V termination	+3.3787 V	_____	_____	+3.4213 V
-3.4 V offset, -3.5 V termination	–3.4213 V	_____	_____	–3.3787 V
Ch4 100 mV Vert scale, 0 Div position setting,				
0 V offset, 0 V termination	–12.5 mV	_____	_____	+12.5 mV
+3.4 V offset, +3.5 V termination	+3.3737 V	_____	_____	+3.4263 V
-3.4 V offset, -3.5 V termination	–3.4263 V	_____	_____	–3.3737 V

Table continued…

Offset accuracy, MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch4 120 mV Vert scale, 0 Div position setting,				
0 V offset, 0 V termination	–14.5 mV	_____	_____	+14.5 mV
+3.4 V offset, +3.5 V termination	+3.3717 V	_____	_____	+3.4283 V
-3.4 V offset, -3.5 V termination	–3.4283 V	_____	_____	–3.3717 V
Ch4 140 mV Vert scale, 0 Div position setting,				
-6 V offset, 0 V termination	–6.0525 V	_____	_____	–5.9475 V
0 V offset, 0 V termination	–16.5 mV	_____	_____	+16.5 mV
+6 V offset, 0 V termination	+5.9475 V	_____	_____	+6.0525 V
Ch4 200 mV Vert scale, 0 Div position setting,				
-6 V offset, 0 V termination	–6.0585 V	_____	_____	–5.9415 V
0 V offset, 0 V termination	–22.5 mV	_____	_____	+22.5 mV
+6 V offset, 0 V termination	+5.9415 V	_____	_____	+6.0585 V
Ch4 400 mV Vert scale, 0 Div position setting,				
-6 V offset, 0 V termination	–6.0785 V	_____	_____	–5.9215 V
0 V offset, 0 V termination	–42.5 mV	_____	_____	+42.5 mV
+6 V offset, 0 V termination	+5.9215 V	_____	_____	+6.0785 V

Offset accuracy, MSO/DPO70000C models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1 10 mV Vert scale setting,				
-5 Div position setting, +0.45 V offset	+ 495.75 mV	_____	_____	+ 504.25 mV
5 Div position setting, -0.45 V offset	- 504.25 mV	_____	_____	- 495.75 mV
Ch1 20 mV Vert scale setting,				
-5 Div position setting, +0.4 V offset	+ 494.75 mV	_____	_____	+ 505.25 mV
5 Div position setting, -0.4 V offset	- 505.25 mV	_____	_____	- 494.75 mV
Ch1 50 mV Vert scale setting,				
-5 Div position setting, +0.25 V offset	+ 491.75 mV	_____	_____	+ 508.25 mV
5 Div position setting, -0.25 V offset	- 508.25 mV	_____	_____	- 491.75 mV

Table continued…

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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Offset accuracy, MSO/DPO70000C models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1 100 mV Vert scale setting,				
-5 Div position setting, +2.0 V offset	+ 2.474 V	_____	_____	+ 2.526 V
5 Div position setting, -2.0 V offset	- 2.526 V	_____	_____	- 2.474 V
Ch1 200 mV Vert scale setting,				
-5 Div position setting, +1.5 V offset	+ 2.464 V	_____	_____	+ 2.536 V
5 Div position setting, -1.5 V offset	- 2.536 V	_____	_____	- 2.464 V
Ch1 500 mV Vert scale setting,				
-5 Div position setting, 0 V offset	+ 2.434 V	_____	_____	+ 2.566 V
5 Div position setting, 0 V offset	- 2.566 V	_____	_____	- 2.434 V
Ch2 10 mV Vert scale setting,				
-5 Div position setting, +0.45 V offset	+ 495.75 mV	_____	_____	+ 504.25 mV
5 Div position setting, -0.45 V offset	- 504.25 mV	_____	_____	- 495.75 mV
Ch2 20 mV Vert scale setting,				
-5 Div position setting, +0.4 V offset	+ 494.75 mV	_____	_____	+ 505.25 mV
5 Div position setting, -0.4 V offset	- 505.25 mV	_____	_____	- 494.75 mV
Ch2 50 mV Vert scale setting,				
-5 Div position setting, +0.25 V offset	+ 491.75 mV	_____	_____	+ 508.25 mV
5 Div position setting, -0.25 V offset	- 508.25 mV	_____	_____	- 491.75 mV
Ch2 100 mV Vert scale setting,				
-5 Div position setting, +2.0 V offset	+ 2.474 V	_____	_____	+ 2.526 V
5 Div position setting, -2.0 V offset	- 2.526 V	_____	_____	- 2.474 V
Ch2 200 mV Vert scale setting,				
-5 Div position setting, +1.5 V offset	+ 2.464 V	_____	_____	+ 2.536 V
5 Div position setting, -1.5 V offset	- 2.536 V	_____	_____	- 2.464 V
Ch2 500 mV Vert scale setting,				
-5 Div position setting, 0 V offset	+ 2.434 V	_____	_____	+ 2.566 V
5 Div position setting, 0 V offset	- 2.566 V	_____	_____	- 2.434 V

Table continued…

Offset accuracy, MSO/DPO70000C models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch3 10 mV Vert scale setting,				
-5 Div position setting, +0.45 V offset	+ 495.75 mV	_____	_____	+ 504.25 mV
5 Div position setting, -0.45 V offset	- 504.25 mV	_____	_____	- 495.75 mV
Ch3 20 mV Vert scale setting,				
-5 Div position setting, +0.4 V offset	+ 494.75 mV	_____	_____	+ 505.25 mV
5 Div position setting, -0.4 V offset	- 505.25 mV	_____	_____	- 494.75 mV
Ch3 50 mV Vert scale setting,				
-5 Div position setting, +0.25 V offset	+ 491.75 mV	_____	_____	+ 508.25 mV
5 Div position setting, -0.25 V offset	- 508.25 mV	_____	_____	- 491.75 mV
Ch3 100 mV Vert scale setting,				
-5 Div position setting, +2.0 V offset	+ 2.474 V	_____	_____	+ 2.526 V
5 Div position setting, -2.0 V offset	- 2.526 V	_____	_____	- 2.474 V
Ch3 200 mV Vert scale setting,				
-5 Div position setting, +1.5 V offset	+ 2.464 V	_____	_____	+ 2.536 V
5 Div position setting, -1.5 V offset	- 2.536 V	_____	_____	- 2.464 V
Ch3 500 mV Vert scale setting,				
-5 Div position setting, 0 V offset	+ 2.434 V	_____	_____	+ 2.566 V
5 Div position setting, 0 V offset	- 2.566 V	_____	_____	- 2.434 V
Ch4 10 mV Vert scale setting,				
-5 Div position setting, +0.45 V offset	+ 495.75 mV	_____	_____	+ 504.25 mV
5 Div position setting, -0.45 V offset	- 504.25 mV	_____	_____	- 495.75 mV
Ch4 20 mV Vert scale setting,				
-5 Div position setting, +0.4 V offset	+ 494.75 mV	_____	_____	+ 505.25 mV
5 Div position setting, -0.4 V offset	- 505.25 mV	_____	_____	- 494.75 mV
Ch4 50 mV Vert scale setting,				
-5 Div position setting, +0.25 V offset	+ 491.75 mV	_____	_____	+ 508.25 mV
5 Div position setting, -0.25 V offset	- 508.25 mV	_____	_____	- 491.75 mV
Table continued…				

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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Offset accuracy, MSO/DPO70000C models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch4 100 mV Vert scale setting,				
-5 Div position setting, +2.0 V offset	+ 2.474 V	_____	_____	+ 2.526 V
5 Div position setting, -2.0 V offset	- 2.526 V	_____	_____	- 2.474 V
Ch4 200 mV Vert scale setting,				
-5 Div position setting, +1.5 V offset	+ 2.464 V	_____	_____	+ 2.536 V
5 Div position setting, -1.5 V offset	- 2.536 V	_____	_____	- 2.464 V
Ch4 500 mV Vert scale setting,				
-5 Div position setting, 0 V offset	+ 2.434 V	_____	_____	+ 2.566 V
5 Div position setting, 0 V offset	- 2.566 V	_____	_____	- 2.434 V

Channel bandwidth DPO7000C models <3.5 GHz				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1				
1 V	3.535 V	_____	_____	N/A
500 mV	2.12 V	_____	_____	N/A
200 mV	848 mV	_____	_____	N/A
100 mV	424 mV	_____	_____	N/A
50 mV	212 mV	_____	_____	N/A
20 mV	84.8 mV	_____	_____	N/A
10 mV	42.4 mV	_____	_____	N/A
5 mV	21.2 mV	_____	_____	N/A
Ch2				
1 V	3.535 V	_____	_____	N/A
500 mV	2.12 V	_____	_____	N/A
200 mV	848 V	_____	_____	N/A
100 mV	424 mV	_____	_____	N/A
50 mV	212 mV	_____	_____	N/A
20 mV	84.8 mV	_____	_____	N/A
10 mV	42.4 mV	_____	_____	N/A
5 mV	21.2 mV	_____	_____	N/A

Table continued…

Channel bandwidth DPO7000C models <3.5 GHz				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch3				
1 V	3.535 V	_____	_____	N/A
500 mV	2.12 V	_____	_____	N/A
200 mV	848 V	_____	_____	N/A
100 mV	424 mV	_____	_____	N/A
50 mV	212 mV	_____	_____	N/A
20 mV	84.8 mV	_____	_____	N/A
10 mV	42.4 mV	_____	_____	N/A
5 mV	21.2 mV	_____	_____	N/A
Ch4				
1 V	3.535 V	_____	_____	N/A
500 mV	2.12 V	_____	_____	N/A
200 mV	848 V	_____	_____	N/A
100 mV	424 mV	_____	_____	N/A
50 mV	212 mV	_____	_____	N/A
20 mV	84.8 mV	_____	_____	N/A
10 mV	42.4 mV	_____	_____	N/A
5 mV	21.2 mV	_____	_____	N/A

Channel bandwidth MSO/DPO70000C models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1				
250 mV	1.061 V	_____	_____	N/A
100 mV	424 mV	_____	_____	N/A
50 mV	212 mV	_____	_____	N/A
20 mV	84.8 mV	_____	_____	N/A
10 mV	42.4 mV	_____	_____	N/A

Table continued…

Channel bandwidth MSO/DPO70000C models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch2				
250 mV	1.061 V	_____	_____	N/A
100 mV	424 mV	_____	_____	N/A
50 mV	212 mV	_____	_____	N/A
20 mV	84.8 mV	_____	_____	N/A
10 mV	42.4 mV	_____	_____	N/A
Ch3				
250 mV	1.061 V	_____	_____	N/A
100 mV	424 mV	_____	_____	N/A
50 mV	212 mV	_____	_____	N/A
20 mV	84.8 mV	_____	_____	N/A
10 mV	42.4 mV	_____	_____	N/A
Ch4				
250 mV	1.061 V	_____	_____	N/A
100 mV	424 mV	_____	_____	N/A
50 mV	212 mV	_____	_____	N/A
20 mV	84.8 mV	_____	_____	N/A
10 mV	42.4 mV	_____	_____	N/A

XX

Channel bandwidth MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1				
400 mV	1131 mV	_____	_____	N/A
200 mV	848 mV	_____	_____	N/A
140 mV	594 mV	_____	_____	N/A
120 mV	509 mV	_____	_____	N/A
100 mV	424 mV	_____	_____	N/A
50 mV	212 mV	_____	_____	N/A
20 mV	84.8 mV	_____	_____	N/A
10 mV	42.4 mV	_____	_____	N/A
6.25 mV	26.5 mV	_____	_____	N/A
Ch2				
400 mV	1131 mV	_____	_____	N/A
200 mV	848 mV	_____	_____	N/A
140 mV	594 mV	_____	_____	N/A
120 mV	509 mV	_____	_____	N/A
100 mV	424 mV	_____	_____	N/A
50 mV	212 mV	_____	_____	N/A
20 mV	84.8 mV	_____	_____	N/A
10 mV	42.4 mV	_____	_____	N/A
6.25 mV	26.5 mV	_____	_____	N/A
Ch3				
400 mV	1131 mV	_____	_____	N/A
200 mV	848 mV	_____	_____	N/A
140 mV	594 mV	_____	_____	N/A
120 mV	509 mV	_____	_____	N/A
100 mV	424 mV	_____	_____	N/A
50 mV	212 mV	_____	_____	N/A
20 mV	84.8 mV	_____	_____	N/A
10 mV	42.4 mV	_____	_____	N/A
6.25 mV	26.5 mV	_____	_____	N/A

Table continued…

Channel bandwidth MSO/DPO70000DX models				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch4				
400 mV	1131 mV	_____	_____	N/A
200 mV	848 mV	_____	_____	N/A
140 mV	594 mV	_____	_____	N/A
120 mV	509 mV	_____	_____	N/A
100 mV	424 mV	_____	_____	N/A
50 mV	212 mV	_____	_____	N/A
20 mV	84.8 mV	_____	_____	N/A
10 mV	42.4 mV	_____	_____	N/A
6.25 mV	26.5 mV	_____	_____	N/A

Channel bandwidth DPO7354C model				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch1				
1 V	2.83 V	_____	_____	N/A
500 mV	1.41 V	_____	_____	N/A
200 mV	566 mV	_____	_____	N/A
100 mV	283 mV	_____	_____	N/A
50 mV	141.4 mV	_____	_____	N/A
20 mV	56.6 mV	_____	_____	N/A
10 mV	28.3 mV	_____	_____	N/A
5 mV	21.2 mV	_____	_____	N/A

Table continued…

Channel bandwidth DPO7354C model				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Ch2				
1 V	2.83 V	_____	_____	N/A
500 mV	1.41 V	_____	_____	N/A
200 mV	566 mV	_____	_____	N/A
100 mV	283 mV	_____	_____	N/A
50 mV	141.4 mV	_____	_____	N/A
20 mV	56.6 mV	_____	_____	N/A
10 mV	28.3 mV	_____	_____	N/A
5 mV	21.2 mV	_____	_____	N/A
Ch3				
1 V	2.83 V	_____	_____	N/A
500 mV	1.41 V	_____	_____	N/A
200 mV	566 mV	_____	_____	N/A
100 mV	283 mV	_____	_____	N/A
50 mV	141.4 mV	_____	_____	N/A
20 mV	56.6 mV	_____	_____	N/A
10 mV	28.3 mV	_____	_____	N/A
5 mV	21.2 mV	_____	_____	N/A
Ch4				
1 V	2.83 V	_____	_____	N/A
500 mV	1.41 V	_____	_____	N/A
200 mV	566 mV	_____	_____	N/A
100 mV	283 mV	_____	_____	N/A
50 mV	141.4 mV	_____	_____	N/A
20 mV	56.6 mV	_____	_____	N/A
10 mV	28.3 mV	_____	_____	N/A
5 mV	21.2 mV	_____	_____	N/A

Input resistance				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Input resistance, MSO/DPO70000DX models				
Ch1 6.25 mV/div	48.5 Ω	_____	_____	51.5 Ω
Ch2 6.25 mV/div	48.5 Ω	_____	_____	51.5 Ω
Ch3 6.25 mV/div	48.5 Ω	_____	_____	51.5 Ω
Ch4 6.25 mV/div	48.5 Ω	_____	_____	51.5 Ω
Ch1 140 mV/div	47.8 Ω	_____	_____	52.2 Ω
Ch2 140 mV/div	47.8 Ω	_____	_____	52.2 Ω
Ch3 140 mV/div	47.8 Ω	_____	_____	52.2 Ω
Ch4 140 mV/div	47.8 Ω	_____	_____	52.2 Ω
Input resistance, MSO/DPO70000C models				
Ch1 10 mV/div	49.0 Ω	_____	_____	51.0 Ω
Ch1 100 mV/div	47.8 Ω	_____	_____	52.2 Ω
Ch2 10 mV/div	49.0 Ω	_____	_____	51.0 Ω
Ch2 100 mV/div	47.8 Ω	_____	_____	52.2 Ω
Ch3 10 mV/div	49.0 Ω	_____	_____	51.0 Ω
Ch3 100 mV/div	47.8 Ω	_____	_____	52.2 Ω
Ch4 10 mV/div	49.0 Ω	_____	_____	51.0 Ω
Ch4 100 mV/div	47.8 Ω	_____	_____	52.2 Ω

Table continued…

Input resistance				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
TekProtect				
Ch1 +2.2 V	NA	_____	_____	+100 µA
Ch1 –2.2 V	–100 µA	_____	_____	NA
Ch1 –65 mA	NA	_____	_____	+3.42 V
Ch1 –65 mA	–3.42 V	_____	_____	NA
Ch2 +2.2 V	NA	_____	_____	+100 µA
Ch2 –2.2 V	–100 µA	_____	_____	NA
Ch2 –65 mA	NA	_____	_____	+3.42 V
Ch2 –65 mA	–3.42 V	_____	_____	NA
Ch3 +2.2 V	NA	_____	_____	+100 µA
Ch3 –2.2 V	–100 µA	_____	_____	NA
Ch3 –65 mA	NA	_____	_____	+3.42 V
Ch3 –65 mA	–3.42 V	_____	_____	NA
Ch4 +2.2 V	NA	_____	_____	+100 µA
Ch4 –2.2 V	–100 µA	_____	_____	NA
Ch4 –65 mA	NA	_____	_____	+3.42 V
Ch4 –65 mA	–3.42 V	_____	_____	NA

Time base system				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Long term sample rate, delay time, and internal reference accuracy 10 MHz, DPO7000C models 10 MHz, MSO/DPO70000C/DX models	9999.965 kHz 9999.975 kHz	_____ _____	_____ _____	10000.035 kHz 10000.025 kHz
External reference 10 MHz	Pass/Fail	_____	_____	Pass/Fail
Delta time measurement, DPO7000C models DPO7054C only:	N/A N/A	_____ _____	_____ _____	6.0 ps 12.0 ps
Delta time measurement **MSO/DPO70000C/DX models**				

Table continued…

Time base system				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
MSO/DPO72004C, BWE off				
50 mV, rms	N/A	_____	_____	1.172 ps
50 mV, pk-pk	N/A	_____	_____	11.72 ps
100 mV, rms	N/A	_____	_____	1.186 ps
100 mV, pk-pk	N/A	_____	_____	11.86 ps
10 mV, rms	N/A	_____	_____	1.280 ps
10 mV, pk-pk	N/A	_____	_____	12.80 ps
MSO/DPO71604C, BWE off				
10 mV, rms	N/A	_____	_____	1.280 ps
10 mV, pk-pk	N/A	_____	_____	12.80 ps
50 mV, rms	N/A	_____	_____	1.172 ps
50 mV, pk-pk	N/A	_____	_____	11.72 ps
100 mV, rms	N/A	_____	_____	1.186 ps
100 mV, pk-pk	N/A	_____	_____	11.86 ps
MSO/DPO71254C, BWE off				
10 mV, rms	N/A	_____	_____	1.304 ps
10 mV, pk-pk	N/A	_____	_____	13.04 ps
50 mV, rms	N/A	_____	_____	1.201 ps
50 mV, pk-pk	N/A	_____	_____	12.01 ps
100 mV, rms	N/A	_____	_____	1.205 ps
100 mV, pk-pk	N/A	_____	_____	12.05 ps
MSO/DPO70804C, BWE off				
10 mV, rms	N/A	_____	_____	1.462 ps
10 mV, pk-pk	N/A	_____	_____	14.62 ps
50 mV, rms	N/A	_____	_____	1.295 ps
50 mV, pk-pk	N/A	_____	_____	12.95 ps
100 mV, rms	N/A	_____	_____	1.336 ps
100 mV, pk-pk	N/A	_____	_____	13.36 ps
MSO/DPO70604C, BWE off				

Table continued…

Time base system				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
10 mV, rms	N/A	_____	_____	1.625 ps
10 mV, pk-pk	N/A	_____	_____	16.25 ps
50 mV, rms	N/A	_____	_____	1.427 ps
50 mV, pk-pk	N/A	_____	_____	14.27 ps
100 mV, rms	N/A	_____	_____	1.463 ps
100 mV, pk-pk	N/A	_____	_____	14.63 ps
MSO/DPO70404C, BWE off				
10 mV, rms	N/A	_____	_____	2.022 ps
10 mV, pk-pk	N/A	_____	_____	20.22 ps
50 mV, rms	N/A	_____	_____	1.762 ps
50 mV, pk-pk	N/A	_____	_____	17.62 ps
100 mV, rms	N/A	_____	_____	1.821 ps
100 mV, pk-pk	N/A	_____	_____	18.21 ps
MSO/DPO73304DX, BWE off, typical				
6.25 mV, rms	N/A	_____	_____	0.752 ps
6.25 mV, pk-pk	N/A	_____	_____	7.52 ps
50 mV, rms	N/A	_____	_____	0.570 ps
50 mV, pk-pk	N/A	_____	_____	5.70 ps
100 mV, rms	N/A	_____	_____	0.568ps
100 mV, pk-pk	N/A	_____	_____	5.68 ps
MSO/DPO72504DX, BWE off, typical				
6.25 mV, rms	N/A	_____	_____	0.868 ps
6.25 mV, pk-pk	N/A	_____	_____	8.68 ps
50 mV, rms	N/A	_____	_____	0.619 ps
50 mV, pk-pk	N/A	_____	_____	6.19 ps
100 mV, rms	N/A	_____	_____	0.612 ps
100 mV, pk-pk	N/A	_____	_____	6.12 ps
MSO/DPO72304DX, BWE off, typical				

Table continued…

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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Time base system				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
6.25 mV, rms	N/A	_____	_____	0.900 ps
6.25 mV, pk-pk	N/A	_____	_____	9.00 ps
50 mV, rms	N/A	_____	_____	0.624 ps
50 mV, pk-pk	N/A	_____	_____	6.24 ps
100 mV, rms	N/A	_____	_____	0.618 ps
100 mV, pk-pk	N/A	_____	_____	6.18 ps
MSO/DPO72004DX, BWE off, typical				
6.25 mV, rms	N/A	_____	_____	0.988 ps
6.25 mV, pk-pk	N/A	_____	_____	9.88 ps
50 mV, rms	N/A	_____	_____	0.714 ps
50 mV, pk-pk	N/A	_____	_____	7.14 ps
100 mV, rms	N/A	_____	_____	0.710 ps
100 mV, pk-pk	N/A	_____	_____	7.10 ps
MSO/DPO71604DX, BWE off, typical				
6.25 mV, rms	N/A	_____	_____	1.17 ps
6.25 mV, pk-pk	N/A	_____	_____	11.7 ps
50 mV, rms	N/A	_____	_____	0.830 ps
50 mV, pk-pk	N/A	_____	_____	8.30 ps
100 mV, rms	N/A	_____	_____	0.826 ps
100 mV, pk-pk	N/A	_____	_____	8.26 ps
MSO/DPO71254DX, BWE off, typical				
6.25 mV, rms	N/A	_____	_____	1.41 ps
6.25 mV, pk-pk	N/A	_____	_____	14.1 ps
50 mV, rms	N/A	_____	_____	1.00 ps
50 mV, pk-pk	N/A	_____	_____	10.0 ps
100 mV, rms	N/A	_____	_____	1.00 ps
100 mV, pk-pk	N/A	_____	_____	10.0 ps
MSO/DPO70804DX, BWE off, typical				

Table continued…

Time base system				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
6.25 mV, rms	N/A	_____	_____	1.88 ps
6.25 mV, pk-pk	N/A	_____	_____	18.8 ps
50 mV, rms	N/A	_____	_____	1.42 ps
50 mV, pk-pk	N/A	_____	_____	14.2 ps
100 mV, rms	N/A	_____	_____	1.42 ps
100 mV, pk-pk	N/A	_____	_____	14.2 ps
MSO/DPO73304DX, BWE on				
6.25 mV, rms	N/A	_____	_____	0.729 ps
6.25 mV, pk-pk	N/A	_____	_____	7.29 ps
50 mV, rms	N/A	_____	_____	0.536 ps
50 mV, pk-pk	N/A	_____	_____	5.36 ps
100 mV, rms	N/A	_____	_____	0.529 ps
100 mV, pk-pk	N/A	_____	_____	5.29 ps
MSO/DPO72504DX, BWE on				
6.25 mV, rms	N/A	_____	_____	0.861 ps
6.25 mV, pk-pk	N/A	_____	_____	8.61 ps
50 mV, rms	N/A	_____	_____	0.604 ps
50 mV, pk-pk	N/A	_____	_____	6.04 ps
100 mV, rms	N/A	_____	_____	0.604 ps
100 mV, pk-pk	N/A	_____	_____	6.04 ps
MSO/DPO72304DX, BWE on				
6.25 mV, rms	N/A	_____	_____	0.868 ps
6.25 mV, pk-pk	N/A	_____	_____	8.68 ps
50 mV, rms	N/A	_____	_____	0.591 ps
50 mV, pk-pk	N/A	_____	_____	5.91 ps
100 mV, rms	N/A	_____	_____	0.585 ps
100 mV, pk-pk	N/A	_____	_____	5.85 ps
MSO/DPO72004DX, BWE on				

Table continued…

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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Time base system				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
6.25 mV, rms	N/A	_____	_____	0.918 ps
6.25 mV, pk-pk	N/A	_____	_____	9.18 ps
50 mV, rms	N/A	_____	_____	0.661 ps
50 mV, pk-pk	N/A	_____	_____	6.61 ps
100 mV, rms	N/A	_____	_____	0.659 ps
100 mV, pk-pk	N/A	_____	_____	6.59 ps
MSO/DPO71604DX, BWE on				
6.25 mV, rms	N/A	_____	_____	1.125 ps
6.25 mV, pk-pk	N/A	_____	_____	11.25 ps
50 mV, rms	N/A	_____	_____	0.741 ps
50 mV, pk-pk	N/A	_____	_____	7.41 ps
100 mV, rms	N/A	_____	_____	0.726 ps
100 mV, pk-pk	N/A	_____	_____	7.26 ps
MSO/DPO71254DX, BWE on				
6.25 mV, rms	N/A	_____	_____	1.369 ps
6.25 mV, pk-pk	N/A	_____	_____	13.69 ps
50 mV, rms	N/A	_____	_____	0.872 ps
50 mV, pk-pk	N/A	_____	_____	8.72 ps
100 mV, rms	N/A	_____	_____	0.861 ps
100 mV, pk-pk	N/A	_____	_____	8.61 ps
MSO/DPO70804DX, BWE on				
6.25 mV, rms	N/A	_____	_____	1.696 ps
6.25 mV, pk-pk	N/A	_____	_____	16.96 ps
50 mV, rms	N/A	_____	_____	1.209 ps
50 mV, pk-pk	N/A	_____	_____	12.09 ps
100 mV, rms	N/A	_____	_____	1.198 ps
100 mV, pk-pk	N/A	_____	_____	11.98 ps
MSO/DPO72004C, BWE on				

Table continued…

Time base system				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
10 mV, rms	N/A	_____	_____	1.336 ps
10 mV, pk-pk	N/A	_____	_____	13.36 ps
50 mV, rms	N/A	_____	_____	1.260 ps
50 mV, pk-pk	N/A	_____	_____	12.60 ps
100 mV, rms	N/A	_____	_____	1.432 ps
100 mV, pk-pk	N/A	_____	_____	14.32 ps
MSO/DPO71604C, BWE on				
10 mV, rms	N/A	_____	_____	1.219 ps
10 mV, pk-pk	N/A	_____	_____	12.19 ps
50 mV, rms	N/A	_____	_____	1.154 ps
50 mV, pk-pk	N/A	_____	_____	11.54 ps
100 mV, rms	N/A	_____	_____	1.159 ps
100 mV, pk-pk	N/A	_____	_____	11.59 ps
MSO/DPO71254C, BWE on				
10 mV, rms	N/A	_____	_____	1.333 ps
10 mV, pk-pk	N/A	_____	_____	13.33 ps
50 mV, rms	N/A	_____	_____	1.212 ps
50 mV, pk-pk	N/A	_____	_____	12.12 ps
100 mV, rms	N/A	_____	_____	1.228 ps
100 mV, pk-pk	N/A	_____	_____	12.28 ps
MSO/DPO70804C, BWE on				
10 mV, rms	N/A	_____	_____	1.354 ps
10 mV, pk-pk	N/A	_____	_____	13.54 ps
50 mV, rms	N/A	_____	_____	1.235 ps
50 mV, pk-pk	N/A	_____	_____	12.35 ps
100 mV, rms	N/A	_____	_____	1.241 ps
100 mV, pk-pk	N/A	_____	_____	12.41 ps
MSO/DPO70604C, BWE on				

Table continued…

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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Time base system				
Instrument performance test	**Minimum**	**Incoming**	**Outgoing**	**Maximum**
10 mV, rms	N/A	_____	_____	1.445 ps
10 mV, pk-pk	N/A	_____	_____	14.45 ps
50 mV, rms	N/A	_____	_____	1.295 ps
50 mV, pk-pk	N/A	_____	_____	12.95 ps
100 mV, rms	N/A	_____	_____	1.329 ps
100 mV, pk-pk	N/A	_____	_____	13.29 ps
MSO/DPO70404C, BWE on				
10 mV, rms	N/A	_____	_____	1.674 ps
10 mV, pk-pk	N/A	_____	_____	16.74 ps
50 mV, rms	N/A	_____	_____	1.437 ps
50 mV, pk-pk	N/A	_____	_____	14.37 ps
100 mV, rms	N/A	_____	_____	1.478 ps
100 mV, pk-pk	N/A	_____	_____	14.78 ps

Trigger system accuracy				
Instrument performance test	**Minimum**	**Incoming**	**Outgoing**	**Maximum**
Time accuracy for time qualified triggers, DPO7000C models				
time range < 1 ms				
Lower Limit	3.5 ns	_____	_____	6.5 ns
Upper Limit	3.5 ns	_____	_____	6.5 ns
time range ≥ 1 µs				
Lower Limit	1.9 µs	_____	_____	2.1 µs
Upper Limit	1.9 µs	_____	_____	2.1 µs
Time accuracy for time qualified triggers, MSO/DPO70000C/DX models				

Table continued…

Trigger system accuracy				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
time range < 1 ms				
Lower Limit	4.77 ns	_____	_____	5.23 ns
Upper Limit	4.77 ns	_____	_____	5.23 ns
time range ≥ 1 µs				
Lower Limit	1.9 µs	_____	_____	2.1 µs
Upper Limit	1.9 µs	_____	_____	2.1 µs
Ch1 trigger sensitivity, 50 MHz	Pass/Fail	_____	_____	Pass/Fail
Ch1 delayed trigger sensitivity MSO/DPO70000C/DX models: 50 MHz	Pass/Fail	_____	_____	Pass/Fail
AUX trigger input sensitivity, 50 MHz	Pass/Fail	_____	_____	Pass/Fail
Ch1 trigger sensitivity				
DPO7000C models:	Pass/Fail	_____	_____	Pass/Fail
MSO/DPO70000C/DX models: 4 GHz	Pass/Fail	_____	_____	Pass/Fail
MSO/DPO70000C/DX models: 6 GHz	Pass/Fail	_____	_____	Pass/Fail
MSO/DPO70000C/DX models: 8 GHz	Pass/Fail	_____	_____	Pass/Fail
MSO/DPO70000C/DX models: 11 GHz	Pass/Fail	_____	_____	Pass/Fail
Ch1 B trigger sensitivity				
MSO/DPO70000C/DX models: 4 GHz	Pass/Fail	_____	_____	Pass/Fail
MSO/DPO70000C/DX models: 6 GHz	Pass/Fail	_____	_____	Pass/Fail
MSO/DPO70000C/DX models: 9 GHz	Pass/Fail	_____	_____	Pass/Fail
Ch1 AUX trigger input				
DPO7000C models: 250 MHz	Pass/Fail	_____	_____	Pass/Fail
MSO/DPO70000C/DX models: 1 GHz	Pass/Fail	_____	_____	Pass/Fail
Aux trigger out				
Vout Hi DPO7000C, MSO/DPO70000C models	1.0 V	_____	_____	
Vout Lo DPO7000C, MSO/DPO70000C models		_____	_____	0.25 V
Vout Hi MSO/DPO70000DX models	0.5 V	_____	_____	
Vout Lo MSO/DPO70000DX models		_____	_____	0.125 V
Table continued…				

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Trigger system accuracy				
Instrument performance test	Minimum	Incoming	Outgoing	Maximum
Probe compensation output signal Voltage (difference)				
DPO7000C models	985 mV	_____	_____	1015 mV
MSO/DPO70000C/DX models	343.2 mV	_____	_____	536.8 mV
Serial trigger (MSO/DPO70000C/DX models with Option PTH, ST6G or DPO7000C models with Option PTM only)				
Baud rate limits				
Serial word recognizer Signal path 0, Pattern matching 1				
Trigger 1 UI before 0	Pass	_____	_____	N/A
Trigger on 0	Pass	_____	_____	N/A
Trigger 1 UI after 0	Pass	_____	_____	N/A
Signal path 1, Pattern matching 1				
Trigger 1 UI before 1	Pass	_____	_____	N/A
Trigger on 1	Pass	_____	_____	N/A
Trigger 1 UI after 1	Pass	_____	_____	N/A
Clock recovery frequency range DPO7000C models	Pass	_____	_____	N/A

Signal acquisition system checks

These procedures check those characteristics that relate to the signal-acquisition system and are listed as checked under *Warranted Characteristics* in *Specifications.* See *Equipment required* on page 122 for test equipment specifications.

Check DC voltage measurement accuracy MSO/DPO70000DX models

Equipment Required	Prerequisites
One DC calibration generator (Item *6* on page 123) One SMA male-to-BNC female adapter (Item *19* on page 124) Two Dual-Banana Connectors, (Item *5* on page 123)	The instrument must meet the prerequisites. (See *Prerequisites* on page 122.)

⚠ **WARNING:** The generator is capable of outputting dangerous voltages. Be sure to set the DC calibration generator to off or 0 volts before connecting, disconnecting, and/or moving the test hookup during the performance of this procedure.

1. *Install the test hookup and preset the instrument controls:*

a. *Hook up the test-signal source:*

- Set the output of a DC calibration generator to off or 0 volts.
- Connect the output of a DC calibration generator. (See *Figure 8* on page 225.)

b. *Initialize the instrument:* Press **DEFAULT SETUP**.

c. *Modify the default settings:*

- From the button bar, touch **Horiz/Acq** and select the **Acquisition** tab.
- Set the Horizontal Scale to **1 ms/div**.
- Set the Record Length to **5000**.
- Set the Acquisition Mode to **Hi Res**.
- Set the Trigger Source to **Line**.
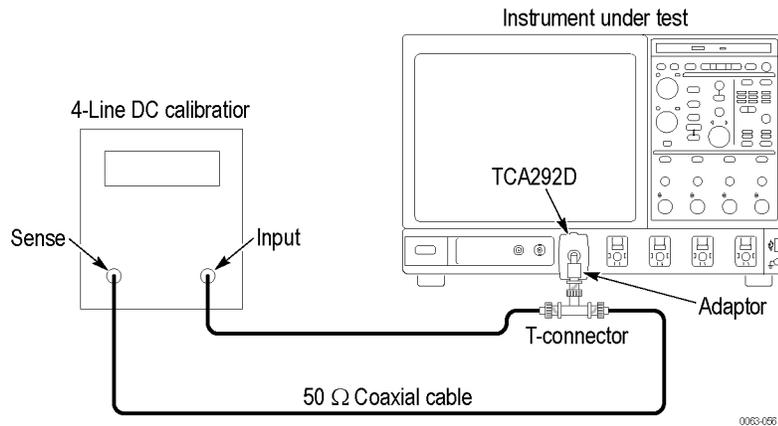
Figure 8: DC voltage accuracy test hookup, MSO/DPO70000DX models

2. *Confirm input channels are within limits for DC accuracy at maximum offset, position, and termination voltage:* Do the following substeps - test Ch 1 first, *skipping substep 2.a* on page 225 of this step *since Ch 1 is already selected from step 1* on page 224.

a. *Select an unchecked channel:*

- From the button bar, touch **Measure** and then **Clear All** to remove the previous measurement.
- Press the Vertical button of the channel just confirmed to remove the channel from the display.
- Press the front-panel Vertical button that corresponds to the channel you are to confirm.
- Set the generator output to 0 V.
- Move the test hookup to the channel you selected.

b. *Turn on the measurement Mean for the channel:*

- From the button bar, touch **Measure** and select the **Ampl** tab, **More**, and then touch **Mean** to measure the mean of the current channel.
- Press the **X** (Close) button.

⚠ **Note:** If any of the voltages supplied by your generator are not calibrated, verify those generator voltages using a digital multimeter, item *27* on page 125.

c. *Set the vertical scale:* Set the vertical **Scale** to one of the settings listed in the following table that is not yet checked, starting with the first setting listed.

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Table 6: DC voltage measurement accuracy

Scale setting	Termination setting	Offset setting [3]	Generator setting	Accuracy limits
6.25 mV	+3.5 V	+3.4 V	3.419 V	3.4012 V to 3.4363 V
	+3.5 V	+2.4 V	2.419 V	2.4032 V to 2.4343 V
	+1.5 V	+2.5 V	2.509 V	2.49345 V to 2.52456 V
	+1.5 V	+1.5 V	1.509 V	1.49945 V to 1.51856
	+1.5 V	+0.5 V	509 mV	501.45 mV to 516.56 mV
	0 V	0 V	18.5 mV	14.76 mV to 22.25 mV
	0 V	−1.0 V	-991 mV	-1.00056 V to -981.45 mV
	0 V	+1.0 V	1.009 V	999.45 mV to 1.01856 V
	-3.5 V	-3.4 V	-3.419 V	-3.4363 V to -3.4012 V
	-3.5 V	-2.4 V	-2.419 V	-2.4343 V to -2.4032 V
	-1.5 V	-2.5 V	-2.509 V	-2.52456 V to -2.49345 V
	-1.5 V	-1.5 V	-1.509 V	-1.51856 V to -1.49945 V
	-1.5 V	-0.5 V	-509 mV	-516.56 mV to -501.45 mV
10 mV	+3.5 V	+3.4 V	3.43 V	3.4117 V to 3.4483 V
	+3.5 V	+2.4 V	2.43 V	2.4137 V to 2.4463 V
	+1.5 V	+2.5 V	2.515 V	2.4988 V to 2.5312 V
	+1.5 V	+1.5 V	1.53 V	1.5195 V to 1.5405 V
	+1.5 V	+0.5 V	530 mV	521.5 mV to 538.5 mV
	0 V	0 V	30 mV	25.5 mV to 34.5 mV
	0 V	−1.0 V	-970 mV	-980.5 mV to -959.5 mV
	0 V	+1.0 V	1.03 V	1.0195 V to 1.0405 V
	-3.5 V	-3.4 V	-3.43 V	-3.4117 V to -3.4483 V
	-3.5 V	-2.4 V	-2.43V	-2.4137 V to -2.4463 V

Table continued…

---

[3] Set as precisely as the instrument's offset resolution permits.

Scale setting	Termination setting	Offset setting [3]	Generator setting	Accuracy limits
	-1.5 V	-2.5 V	-2.515 V	-2.5312 V to -2.4988 V
	-1.5 V	-1.5 V	-1.53 V	-1.5405 V to -1.5195 V
	-1.5 V	-0.5 V	-530 mV	-538.5 mV to -521.5 mV
20 mV	+3.5 V	+3.4 V	3.46 V	3.4397 V to 3.4803 V
	+3.5 V	+2.4 V	2.46 V	2.4417 V to 2.4783 V
	+1.5 V	+2.5 V	2.56 V	2.5415 V to 2.5785 V
	+1.5 V	+1.5 V	1.56 V	1.5475 V to 1.5725 V
	+1.5 V	+0.5 V	560 mV	549.5 mV to 570.5 mV
	0 V	0 V	60 mV	53.5 mV to 66.5 mV
	0 V	−1.0 V	-940 mV	-952.5 mV to -927.5 mV
	0 V	+1.0 V	1.06 V	1.0475 V to 1.0725 V
	-3.5 V	-3.4 V	-3.46 V	-3.4803 V to -3.4397 V
	-3.5 V	-2.4 V	-2.46 V	-2.4783 V to -2.4417 V
	-1.5 V	-2.5 V	-2.56 V	-2.5785 V to -2.5415 V
	-1.5 V	-1.5 V	-1.56 V	-1.5725 V to -1.5475 V
	-1.5 V	-0.5 V	-560 mV	-570.5 mV to -549.5 mV
50 mV	+3.5 V	+3.4 V	3.55 V	3.5237 V to 3.5763 V
	+3.5 V	+2.4 V	2.55 V	2.5257 V to 2.5743 V
	+1.5 V	+2.5 V	2.65 V	2.6255 V to 2.6745 V
	+1.5 V	+1.5 V	1.65 V	1.6315 V to 1.6685 V
	+1.5 V	+0.5 V	650 mV	633.5 mV to 666.5 mV
	0 V	0 V	150 mV	137.5 mV to 162.5 mV
	0 V	−1.0 V	-850 mV	-868.5 mV to -831.5 mV

Table continued…

---

[3] Set as precisely as the instrument's offset resolution permits.

Scale setting	Termination setting	Offset setting [3]	Generator setting	Accuracy limits
	0 V	+1.0 V	1.15 V	1.1315 V to 1.1685 V
	-3.5 V	-3.4 V	-3.55 V	-3.5763 V to -3.5237 V
	-3.5 V	-2.4 V	-2.55 V	-2.5743 V to -2.5257 V
	-1.5 V	-2.5 V	-2.65 V	-2.6745 V to -2.6255 V
	-1.5 V	-1.5 V	-1.65 V	-1.6685 V to -1.6315 V
	-1.5 V	-0.5 V	-650 mV	-666.5 mV to -633.5 mV
100 mV	+3.5 V	+3.4 V	3.7 V	3.6637 V to 3.7363 V
	+3.5 V	+2.4 V	2.7 V	2.6657 V to 2.7343 V
	+1.5 V	+2.5 V	2.8 V	2.7655 V to 2.8345 V
	+1.5 V	+1.5 V	1.8 V	1.7715 V to 1.8285 V
	+1.5 V	+0.5 V	800 mV	773.5 mV to 826.5 mV
	0 V	0 V	300 mV	277.5 mV to 322.5 mV
	0 V	−1.0 V	-700 mV	-728.5 mV to -671.5 mV
	0 V	+1.0 V	1.3 V	1.2715 V to 1.3285 V
	-3.5 V	-3.4 V	-3.7 V	-3.7363 V to -3.6637 V
	-3.5 V	-2.4 V	-2.7 V	-2.7343 V to -2.6657 V
	-1.5 V	-2.5 V	-2.8 V	-2.8345 V to -2.7655 V
	-1.5 V	-1.5 V	-1.8 V	-1.8285 V to -1.7715 V
	-1.5 V	-0.5 V	-800 mV	-826.5 mV to -773.5 mV
120 mV	+3.5 V	+3.4 V	3.76 V	3.7197 V to 3.8003 V
	+3.5 V	+2.4 V	2.76 V	2.7217 V to 2.7983 V
	+1.5 V	+2.5 V	2.86 V	2.8215 V to 2.8985 V
	+1.5 V	+1.5 V	1.86 V	1.8275 V to 1.8925 V

Table continued…

---

[3] Set as precisely as the instrument's offset resolution permits.

Scale setting	Termination setting	Offset setting [3]	Generator setting	Accuracy limits
	+1.5 V	+0.5 V	860 mV	829.5 mV to 890.5 mV
	0 V	0 V	360 mV	333.5 mV to 386.5 mV
	0 V	–1.0 V	-640 mV	-672.5 mV to -607.5 mV
	0 V	+1.0 V	1.36 V	1.3275 V to 1.3925 V
	-3.5 V	-3.4 V	-3.76 V	-3.8003 V to -3.7197 V
	-3.5 V	-2.4 V	-2.76 V	-2.7983 V to -2.7217 V
	-1.5 V	-2.5 V	-2.86 V	-2.8985 V to -2.8215 V
	-1.5 V	-1.5 V	-1.86 V	-1.8925 V to -1.8275 V
	-1.5 V	-0.5 V	-860 mV	-890.5 mV to -829.5 mV
140 mV	0 V	–1.0 V	-580 mV	-624.5 mV to -535.5 mV
	0 V	0 V	420 mV	379.5 mV to 460.5 mV
	0 V	+1.0 V	1.42 V	1.3755 V to 1.4645 V
200 mV	0 V	–1.0 V	-400 mV	-456.5 mV to -343.5 mV
	0 V	0 V	600 mV	547.5 mV to 652.5 mV
	0 V	+1.0 V	1.60 V	1.5435 V to 1.6565 V
400 mV	0 V	–1.0 V	200 mV	103.5 mV to 296.5 mV
	0 V	0 V	1.20 V	1.1075 V to 1.2925 V
	0 V	+1.0 V	2.20 V	2.1035 V to 2.2965 V

d. *Display the test signal:*

- Display the **Vertical Setup** menu.
- Use the keypad to set the Termination Voltage and Offset vertical settings as listed in the table for the current vertical scale setting. The baseline level may move off screen.
- Set the generator to the level and polarity indicated in the table for the vertical scale, termination voltage, and offset settings you have made.

e. *Measure the test signal:* Press the **X** (close) button. Read the measurement results at the measurement statistics **Mean** measurement readout. See the following figure.

---

[3] Set as precisely as the instrument's offset resolution permits.

Turn on the mean measurement and read the results here.

Figure 9: Measurement of DC accuracy

f. *Check against limits:*

- CHECK that the readout for the measurement **Mean** readout on screen is within the limits listed for the current vertical scale and termination/offset/generator settings. Enter the value on test record.

- Repeat substep *2.d* on page 229, reversing the polarity of the termination voltage, offset, and generator settings as is listed in the table.

- CHECK that the **Mean** measurement readout on screen is within the limits listed for the current vertical scale setting and termination/offset/generator settings. Enter the value on test record.

- Repeat substeps *2.c* on page 225 through *2.f* on page 230 until all vertical scale settings are checked for the channel under test. (See *Table 6* on page 226.)

g. *Test all channels:* Repeat substeps *2.a* on page 225 through *2.f* on page 230 for all four channels.

3. *Disconnect the hookup:*

a. *Set the generator output to 0 V.*

b. Disconnect the equipment from the generator output and the input connector of the channel last tested.

Check DC voltage measurement accuracy DPO7000C, MSO/DPO70000C models

Equipment Required	Prerequisites
One DC calibration generator (Item *6* on page 123) One SMA male-to-BNC female adapter (Item *19* on page 124)	The instrument must meet the prerequisites. (See *Prerequisites* on page 122.)

⚠ **WARNING:** The generator is capable of outputting dangerous voltages. Be sure to set the DC calibration generator to off or 0 volts before connecting, disconnecting, and/or moving the test hookup during the performance of this procedure.

1. *Install the test hookup and preset the instrument controls:*

a. *Hook up the test-signal source:*

- Set the output of a DC calibration generator to off or 0 volts. Set the generator to drive a load impedance of 50 Ω.
- Connect the output of a DC calibration generator. (See *Figure 10* on page 231.)

b. *Initialize the instrument:* Press **DEFAULT SETUP**.

c. *Modify the default settings:*

- From the button bar, touch **Horiz/Acq** and select the **Acquisition** tab.
- Touch **Average** and set the number of averages to **16**.
- < 4 GHz models: Touch **Vertical**, select **Vertical Setup**, and then touch Termination **50 Ω**.
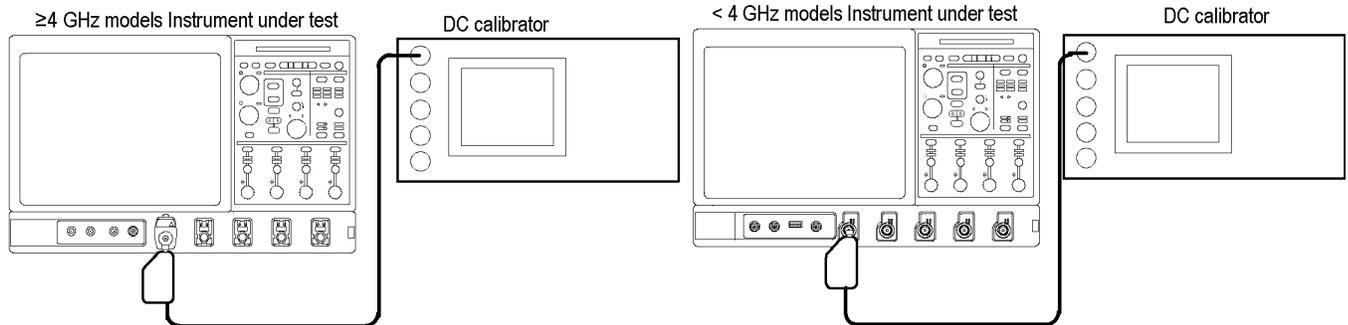
Figure 10: DC voltage accuracy test hookup DPO7000C, MSO/DPO70000C models

2. *Confirm input channels are within limits for DC accuracy at maximum offset and position:* Do the following substeps - test Ch 1 first, *skipping substep* 2.a on page 231 of this step *since Ch 1 is already selected from step* 1 on page 230.

a. *Select an unchecked channel:*

- From the button bar, touch **Measure** and then **Clear All** to remove the previous measurement.
- Press the Vertical button of the channel just confirmed to remove the channel from the display.
- Press the front-panel Vertical button that corresponds to the channel you are to confirm.
- < 4 GHz models: Touch **Vertical**, select **Vertical Setup**, and then touch Termination **50 Ω**.
- Set the generator output to 0 V.
- Move the test hookup to the channel you selected.

b. *Turn on the measurement Mean for the channel:*

- From the button bar, touch **Measure** and select the **Ampl** tab, **More**, and then touch **Mean** to measure the mean of the current channel.
- Press the **X** (Close) button.

> ⚠ **Note:** When setting the Fluke generator to output >5 V with the instrument termination set to 50 Ω, use the following procedure: Press the Aux button. Press the fourth soft key down (Selects the pulse with an exclamation point) Set the amplitude to 5.3 or 5.5 V Press the ->| key to select the pulse energy Set the energy to 50J, and press the Output On key Press the Trig Pulse soft key to trigger the pulse (this will generate a pulse with 25 seconds duration). Use the normal DC output for generator settings ≤5 V at termination setting 50 Ω and for any voltages at a termination setting of 1 MΩ.

> ⚠ **Note:** If any of the voltages supplied by your generator are not calibrated, verify those generator voltages using a digital multimeter, item 27 on page 125.

c. *Set the vertical scale:* Set the vertical **Scale** to one of the settings listed in the following table that is not yet checked, starting with the first setting listed.

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Table 7: DC voltage measurement accuracy

Scale setting	Position setting (Divs)	Offset setting [4]	Generator setting	Accuracy limits
MSO/DPO70000C models				
10 mV	-5	+0.45 V	+530 mV	+524.75 mV to +535.25 mV
	+5	-0.45 V	-530 mV	-535.25 mV to -524.75 mV
20 mV	-5	+0.4 V	+560 mV	+552.75 mV to +567.25 mV
	+5	-0.4 V	-560 mV	-567.25 mV to -552.75 mV
50 mV	-5	+0.25 V	+650 mV	+636.75 mV to +663.25 mV
	+5	-0.25 V	-650 mV	-663.25 mV to -636.75 mV
100 mV	-5	+2.0 V	+2.8 V	+2.764 V to 2.836 V
	+5	-2.0 V	-2.8 V	-2.836 V to -2.764 V
200 mV	-5	+1.25 V	+2.75 V	+2.697 V to 2.803 V
	+5	-1.25 V	-2.75 V	-2.803 V to -2.697 V
500 mV	-5	0 V	+3.5 V	+3.394 V to 3.606 V
	+5	0 V	-3.5 V	-3.606 V to -3.394 V
DPO7000C models, 50 Ω and 1 MΩ				
1 mV	-5	+0.5 V	+507 mV	+504.24 mV to +509.76 mV
	+5	-0.5 V	-507 mV	-509.76 mV to -504.24 mV
2 mV	-5	+0.5 V	+516 mV	+512.97 mV to +519.03 mV
	+5	-0.5 V	-516 mV	-519.03 mV to -512.97 mV
5 mV	-5	+0.5 V	+540 mV	+536.26 mV to +543.74 mV
	+5	-0.5 V	-540 mV	-543.74 mV to -536.26 mV
10 mV	-5	+0.5 V	+580 mV	+574.19 mV to +585.81 mV
	+5	-0.5 V	-580 mV	-585.81 mV to -574.19 mV

Table continued…

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[4] Set as precisely as the instrument's offset resolution permits.

Scale setting	Position setting (Divs)	Offset setting [4]	Generator setting	Accuracy limits
20 mV	-5	+0.5 V	+660 mV	+651.62 mV to +668.38 mV
	+5	-0.5 V	-660 mV	-668.38 mV to -651.62 mV
50 mV	-5	+0.5 V	+900 mV	+883.81 mV to +916.19 mV
	+5	-0.5 V	-900 mV	-916.19 mV to -883.81 mV
90 mV	-5	+0.5 V	+1.22 V	+1.192 V to +1.248 V
	+5	-0.5 V	-1.22 V	-1.248 V to -1.192 V
100 mV	0	+4.5 V	+4.8 V	+4.746 V to +4.854 V
	0	-4.5 V	-4.8 V	-4.854 V to -4.746 V
200 mV	-2	+4.6 V	+4.8 V	+4.725 V to +4.875 V
	+2	-4.6 V	-4.8 V	-4.875 V to -4.725 V
500 mV	-2	+5.0 V	+4.5 V	+4.345 V to +4.655 V
	+2	-5.0 V	-4.5 V	-4.655 V to -4.345 V
1 V 50 Ω	0	+2.0 V	+5.0 V	+4.742 V to +5.258 V
	0	-2.0 V	-5.0 V	-5.258 V to -4.742 V
1 V 1 MΩ	0	+96.0 V	+99.0 V	+98.390 V to +99.610 V
	0	-96.0 V	-99.0 V	-99.610 V to -98.390 V

d. *Display the test signal:*

   • From the button bar touch **Vertical** and touch **Position**.

   • Use the keypad to set vertical position to a position setting listed in the table for the current vertical scale setting. The baseline level may move off screen.

   • Touch **Offset**.

   • Use the keypad to set vertical offset to the positive-polarity setting listed in the table for the current vertical scale setting. The baseline level will remain off screen.

   • Set the generator to the level and polarity indicated in the table for the vertical scale, position, and offset settings you have made.

e. *Measure the test signal:* Press the **X** (close) button. Read the measurement results at the measurement statistics **Mean** measurement readout. See the following figure.

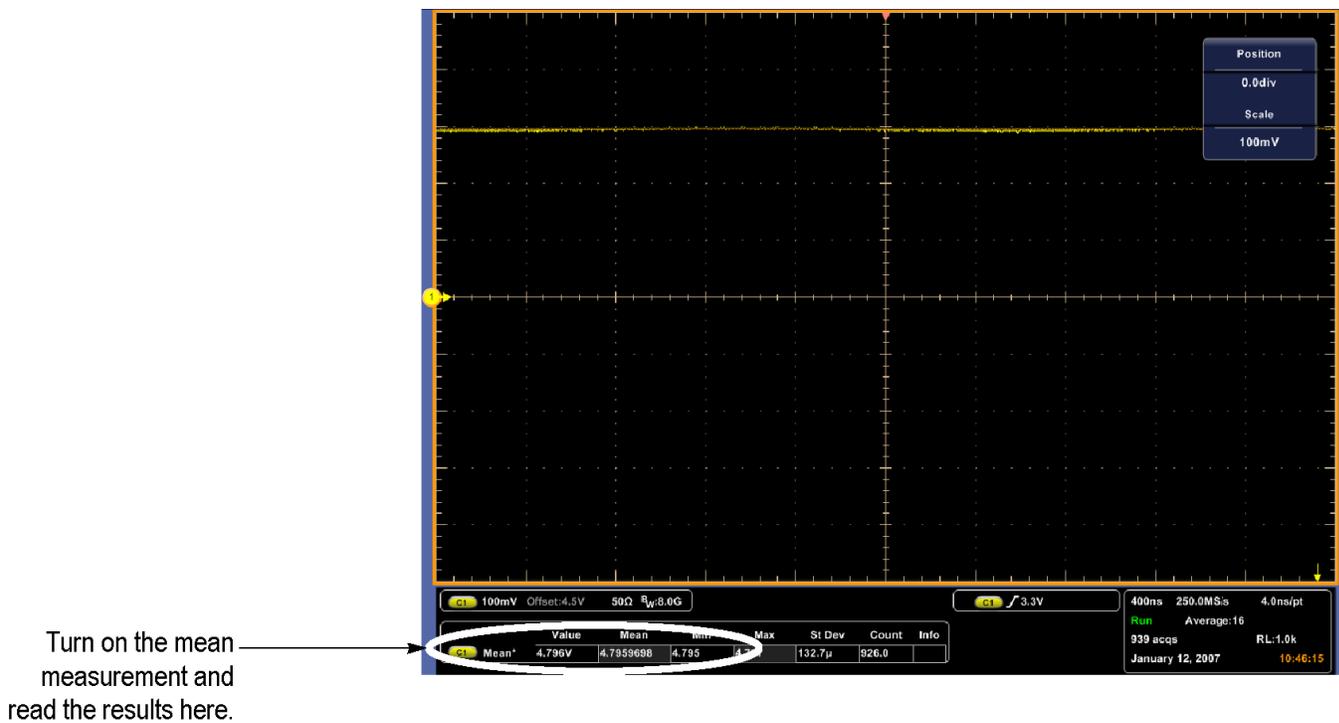[4] Set as precisely as the instrument's offset resolution permits.

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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Turn on the mean measurement and read the results here.

Figure 11: Measurement of DC accuracy at maximum offset and position

f. *Check against limits:*

- CHECK that the readout for the measurement **Mean** readout on screen is within the limits listed for the current vertical scale and position/offset/generator settings. Enter the value on test record.

- Repeat substep *2.d* on page 233, reversing the polarity of the position, offset, and generator settings as is listed in the table.

- CHECK that the **Mean** measurement readout on screen is within the limits listed for the current vertical scale setting and position/offset/generator settings. Enter the value on test record.

- Repeat substeps *2.c* on page 231 through *2.f* on page 234 until all vertical scale settings are checked for the channel under test. (See *Table 7* on page 232.)

g. *Test all channels:* Repeat substeps *2.a* on page 231 through *2.f* on page 234 for all four channels.

h. If testing <4 GHz models, set the DC Calibration generator to drive a load impedance of 1 MΩ. Repeat substeps *2.a* on page 231 through *2.g* on page 234 with the instruments termination set to 1 MΩ.

3. *Disconnect the hookup:*

a. *Set the generator output to 0 V.*

b. Disconnect the equipment from the generator output and the input connector of the channel last tested.

Check DC gain accuracy MSO/DPO70000DX models

Equipment required	Prerequisites
One DC calibration generator (Item *6* on page 123) One SMA male-to-female BNC adapter (Item *19* on page 124) One BNC "T", male to 2 females (Item *32* on page 125)	The instrument must meet the prerequisites. (See *Prerequisites* on page 122.)

⚠ **WARNING:** The generator is capable of outputting dangerous voltages. To avoid injury, be sure to set the DC calibration generator to off or 0 volts before connecting, disconnecting, and/or moving the test hookup during this procedure.

1. *Install the test hookup and preset the instrument controls:*

   a. *Hook up the test-signal source:*

   - Set the output of a DC calibration generator to off or 0 volts. Set the DC impedance of the generator to 50 Ω.

   - Connect the generator to **Ch 1** through an adapter. Refer to the following figure.
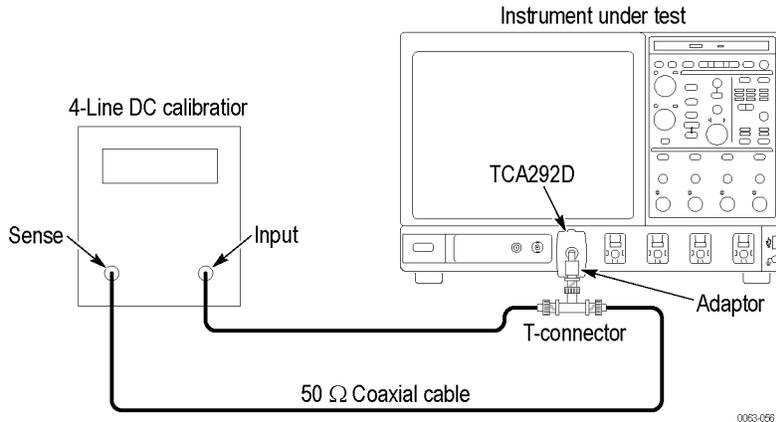
   Figure 12: DC gain accuracy test hookup, MSO/DPO70000DX models

   b. *Initialize the instrument:* Press **Default Setup**

   c. *Modify the default settings:*

   - From the button bar, touch **Horiz/Acq** and select the **Acquisition** tab.

   - Set the Horizontal Scale to **1 ms/div**.

   - Set the Record Length to **5000**.

   - Set the Acquisition Mode to **Hi Res**.

   - Set the Trigger Source to **Line**.

2. *Confirm input channels are within limits for DC gain accuracy.* Do the following substeps - test Ch 1 first, *skipping substep 2.a* on page 235 of this step *since Ch 1 is already selected from step 1* on page 235.

   a. *Select an unchecked channel:*

   - From the tool bar, touch **Measure** and then **Clear All** to remove the previous measurement.

   - Press the Vertical button of the channel just confirmed to remove the channel from the display.

   - Press the front-panel Vertical button that corresponds to the channel you are to confirm.

   - *Set the generator output to 0 V.*

   - Move the test hookup to the channel you selected.

   b. *Turn on the measurement Mean for the channel:*

   - From the tool bar, touch **Measure** and select the **Ampl** tab, **More**, and then touch **Mean** to measure the mean of the current channel.

   - Press the **X** (Close) button.

   c. *Set the vertical scale:* Set the vertical **Scale** to one of the settings in the following table that is not yet checked, starting with the first setting.

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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Table 8: Gain accuracy

Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
Ch1	6.25 mV	0 V	0	0 V	19 mV ———————— -19 mV			+37.24 mV to +38.76 mV
			0	+1 V	1.019 V ———————— 981 mV			+37.24 mV to +38.76 mV
			0	-1 V	-981 mV ———————— -1.019 V			+37.24 mV to +38.76 mV
		1.5 V	0	2.5 V	2.519 V ———————— 2.481 V			+37.24 mV to +38.76 mV
			0	1.5 V	1.519 V ———————— 1.481 V			+37.24 mV to +38.76 mV
			0	0.5 V	519 mV ———————— 481 mV			+37.24 mV to +38.76 mV
		3.4 V	0	3.4 V	3.419 V ———————— 3.381 V			+37.24 mV to +38.76 mV
			0	2.4 V	2.419 V ———————— 2.381 V			+37.24 mV to +38.76 mV
		-3.4 V	0	-3.4 V	-3.381 V ———————— -3.419 V			+37.24 mV to +38.76 mV
			0	-2.4 V	-2.381 V ———————— -2.419 V			+37.24 mV to +38.76 mV

Table continued…

Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
		-1.5 V	0	-2.5 V	-2.481 V			+37.24 mV to +38.76 mV
					-2.519 V			
			0	-1.5 V	-1.481 V			+37.24 mV to +38.76 mV
					-1.519 V			
			0	-0.5 V	-481 mV			+37.24 mV to +38.76 mV
					-519 mV			
Ch1	10 mV	0 V	0	0 V	30 mV			+58.8 mV to +61.2 mV
					-30 mV			
			0	+1 V	1.03 V			+58.8 mV to +61.2 mV
					970 mV			
			0	-1 V	-970 mV			+58.8 mV to +61.2 mV
					-1.03 V			
		1.5 V	0	2.5 V	2.53 V			+58.8 mV to +61.2 mV
					2.47 V			
			0	1.5 V	1.53 V			+58.8 mV to +61.2 mV
					1.47 V			
			0	0.5 V	530 mV			+58.8 mV to +61.2 mV
					470 mV			
		3.4 V	0	3.4 V	3.43 V			+58.8 mV to +61.2 mV
					3.37 V			
			0	2.4 V	2.43 V			+58.8 mV to +61.2 mV
					2.37 V			

Table continued…

Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
		-3.4 V	0	-3.4 V	-3.37 V			+58.8 mV to +61.2 mV
					-3.43 V			
			0	-2.4 V	-2.37 V			+58.8 mV to +61.2 mV
					-2.43 V			
		-1.5 V	0	-2.5 V	-2.47 V			+58.8 mV to +61.2 mV
					-2.53 V			
			0	-1.5 V	-1.47 V			+58.8 mV to +61.2 mV
					-1.53 V			
			0	-0.5 V	-470 mV			+58.8 mV to +61.2 mV
					-530 mV			
Ch1	20 mV	0 V	0	0 V	60 mV			+117.6 mV to +122.4 mV
					-60 mV			
			0	+1 V	1.06 V			+117.6 mV to +122.4 mV
					940 mV			
			0	-1 V	-940 mV			+117.6 mV to +122.4 mV
					-1.06 V			
		1.5 V	0	2.5 V	2.56 V			+117.6 mV to +122.4 mV
					2.44 V			
			0	1.5 V	1.56 V			+117.6 mV to +122.4 mV
					1.44 V			
			0	0.5 V	560 mV			+117.6 mV to +122.4 mV
					440 mV			

Table continued…

Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
		3.4 V	0	3.4 V	3.46 V ———— 3.34 V			+117.6 mV to +122.4 mV
			0	2.4 V	2.46 V ———— 2.34 V			+117.6 mV to +122.4 mV
		-3.4 V	0	-3.4 V	-3.34 V ———— -3.46 V			+117.6 mV to +122.4 mV
			0	-2.4 V	-2.34 V ———— -2.46 V			+117.6 mV to +122.4 mV
		-1.5 V	0	-2.5 V	-2.44 V ———— -2.56 V			+117.6 mV to +122.4 mV
			0	-1.5 V	-1.44 V ———— -1.56 V			+117.6 mV to +122.4 mV
			0	-0.5 V	-440 mV ———— -560 mV			+117.6 mV to +122.4 mV
Ch1	50 mV	0 V	0	0 V	150 mV ———— -150 mV			+294 mV to +306 mV
			0	+1 V	1.15 V ———— 850 mV			+294 mV to +306 mV
			0	-1 V	-850 mV ———— -1.15 V			+294 mV to +306 mV

Table continued…

Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
		1.5 V	0	2.5 V	2.65 V			+294 mV to +306 mV
					2.35 V			
			0	1.5 V	1.65 V			+294 mV to +306 mV
					1.35 V			
			0	0.5 V	650 mV			+294 mV to +306 mV
					350 mV			
		3.4 V	0	3.4 V	3.55 V			+294 mV to +306 mV
					3.25 V			
			0	2.4 V	2.55 V			+294 mV to +306 mV
					2.25 V			
		-3.4 V	0	-3.4 V	-3.25 V			+294 mV to +306 mV
					-3.55 V			
			0	-2.4 V	-2.25 V			+294 mV to +306 mV
					-2.55 V			
		-1.5 V	0	-2.5 V	-2.35 V			+294 mV to +306 mV
					-2.65 V			
			0	-1.5 V	-1.35 V			+294 mV to +306 mV
					-1.65 V			
			0	-0.5 V	-350 mV			+294 mV to +306 mV
					-650 mV			

Table continued…

Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
Ch1	100 mV	0 V	0	0 V	300 mV			+588 mV to +612 mV
					-300 mV			
			0	+1 V	1.3 V			+588 mV to +612 mV
					700 mV			
			0	-1 V	-700 mV			+588 mV to +612 mV
					-1.3 V			
		1.5 V	0	2.5 V	2.8 V			+588 mV to +612 mV
					2.2 V			
			0	1.5 V	1.8 V			+588 mV to +612 mV
					1.2 V			
			0	0.5 V	800 mV			+588 mV to +612 mV
					200 mV			
		3.4 V	0	3.4 V	3.70 V			+588 mV to +612 mV
					3.10 V			
			0	2.4 V	2.70 V			+588 mV to +612 mV
					2.10 V			
		-3.4 V	0	-3.4 V	-3.10 V			+588 mV to +612 mV
					-3.70 V			
			0	-2.4 V	-2.10 V			+588 mV to +612 mV
					-2.70 V			

Table continued…

Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
		-1.5 V	0	-1.5 V	-1.20 V			+588 mV to +612 mV
					-1.80 V			
			0	-0.5 V	- 200 mV			+588 mV to +612 mV
					-800 mV			
Ch1	120 mV	0 V	0	0 V	360 mV			+705.6 mV to +734.4 mV
					-360 mV			
			0	+1 V	1.36 V			+705.6 mV to +734.4 mV
					640 mV			
			0	-1 V	-640 mV			+705.6 mV to +734.4 mV
					-1.36 V			
		1.5 V	0	2.5 V	2.86 V			+705.6 mV to +734.4 mV
					2.14 V			
			0	1.5 V	1.86 V			+705.6 mV to +734.4 mV
					1.14 V			
			0	0.5 V	860 mV			+705.6 mV to +734.4 mV
					140 mV			
		3.4 V	0	3.4 V	3.76 V			+705.6 mV to +734.4 mV
					3.04 V			
			0	2.4 V	2.76 V			+705.6 mV to +734.4 mV
					2.04 V			

Table continued…

Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
		-3.4 V	0	-3.4 V	-3.04 V			+705.6 mV to +734.4 mV
					-3.76 V			
			0	-2.4 V	-2.04 V			+705.6 mV to +734.4 mV
					-2.76 V			
		-1.5 V	0	-1.5 V	-1.14 V			+705.6 mV to +734.4 mV
					-1.86 V			
			0	-0.5 V	-140 mV			+705.6 mV to +734.4 mV
					-860 mV			
Ch1	140 mV	0 V	0	–1 V	–580 mV			+823.2 mV to +856.8 mV
					–1.42 V			
			0	0 V	420 mV			+823.2 mV to +856.8 mV
					–420 mV			
			0	+1 V	1.42 V			+823.2 mV to +856.8 mV
					580 mV			
Ch1	200 mV	0 V	0	–0.9 V	–300 mV			+1.176 V to +1.224 V
					–1.50 V			
			0	0 V	600 mV			+1.176 V to +1.224 V
					–600 mV			
			0	+0.9 V	1.50 V			+1.176 V to +1.224 V
					300 mV			

Table continued…

Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
Ch1	400 mV	0 V	0	–0.3 V	900 mV –1.50 V			+2.352 V to +2.448 V
			0	0 V	1.20 V –1.20 V			+2.352 V to +2.448 V
			0	+0.3 V	1.50 V –900 mV			+2.352 V to +2.448 V
Ch2	6.25 mV	0 V	0	0 V	19 mV -19 mV			+37.24 mV to +38.76 mV
			0	+1 V	1.019 V 981 mV			+37.24 mV to +38.76 mV
			0	-1 V	-981 mV -1.019 V			+37.24 mV to +38.76 mV
		1.5 V	0	2.5 V	2.519 V 2.481 V			+37.24 mV to +38.76 mV
			0	1.5 V	1.519 V 1.481 V			+37.24 mV to +38.76 mV
			0	0.5 V	519 mV 481 mV			+37.24 mV to +38.76 mV
		3.4 V	0	3.4 V	3.419 V 3.381 V			+37.24 mV to +38.76 mV
			0	2.4 V	2.419 V 2.381 V			+37.24 mV to +38.76 mV

Table continued…

Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
		-3.4 V	0	-3.4 V	-3.381 V			+37.24 mV to +38.76 mV
					-3.419 V			
			0	-2.4 V	-2.381 V			+37.24 mV to +38.76 mV
					-2.419 V			
		-1.5 V	0	-2.5 V	-2.481 V			+37.24 mV to +38.76 mV
					-2.519 V			
			0	-1.5 V	-1.481 V			+37.24 mV to +38.76 mV
					-1.519 V			
			0	-0.5 V	-481 mV			+37.24 mV to +38.76 mV
					-519 mV			
Ch2	10 mV	0 V	0	0 V	30 mV			+58.8 mV to +61.2 mV
					-30 mV			
			0	+1 V	1.03 V			+58.8 mV to +61.2 mV
					970 mV			
			0	-1 V	-970 mV			+58.8 mV to +61.2 mV
					-1.03 V			
		1.5 V	0	2.5 V	2.53 V			+58.8 mV to +61.2 mV
					2.47 V			
			0	1.5 V	1.53 V			+58.8 mV to +61.2 mV
					1.47 V			
			0	0.5 V	530 mV			+58.8 mV to +61.2 mV
					470 mV			

Table continued…

Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
		3.4 V	0	3.4 V	3.43 V			+58.8 mV to +61.2 mV
					3.37 V			
			0	2.4 V	2.43 V			+58.8 mV to +61.2 mV
					2.37 V			
		-3.4 V	0	-3.4 V	-3.37 V			+58.8 mV to +61.2 mV
					-3.43 V			
			0	-2.4 V	-2.37 V			+58.8 mV to +61.2 mV
					-2.43 V			
		-1.5 V	0	-2.5 V	-2.47 V			+58.8 mV to +61.2 mV
					-2.53 V			
			0	-1.5 V	-1.47 V			+58.8 mV to +61.2 mV
					-1.53 V			
			0	-0.5 V	-470 mV			+58.8 mV to +61.2 mV
					-530 mV			
Ch2	20 mV	0 V	0	0 V	60 mV			+117.6 mV to +122.4 mV
					-60 mV			
			0	+1 V	1.06 V			+117.6 mV to +122.4 mV
					940 mV			
			0	-1 V	-940 mV			+117.6 mV to +122.4 mV
					-1.06 V			

Table continued…

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Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
		1.5 V	0	2.5 V	2.56 V			+117.6 mV to +122.4 mV
					2.44 V			
			0	1.5 V	1.56 V			+117.6 mV to +122.4 mV
					1.44 V			
			0	0.5 V	560 mV			+117.6 mV to +122.4 mV
					440 mV			
		3.4 V	0	3.4 V	3.46 V			+117.6 mV to +122.4 mV
					3.34 V			
			0	2.4 V	2.46 V			+117.6 mV to +122.4 mV
					2.34 V			
		-3.4 V	0	-3.4 V	-3.34 V			+117.6 mV to +122.4 mV
					-3.46 V			
			0	-2.4 V	-2.34 V			+117.6 mV to +122.4 mV
					-2.46 V			
		-1.5 V	0	-2.5 V	-2.44 V			+117.6 mV to +122.4 mV
					-2.56 V			
			0	-1.5 V	-1.44 V			+117.6 mV to +122.4 mV
					-1.56 V			
			0	-0.5 V	-440 mV			+117.6 mV to +122.4 mV
					-560 mV			

Table continued…

Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
Ch2	50 mV	0 V	0	0 V	150 mV			+294 mV to +306 mV
					-150 mV			
			0	+1 V	1.15 V			+294 mV to +306 mV
					850 mV			
			0	-1 V	-850 mV			+294 mV to +306 mV
					-1.15 V			
		1.5 V	0	2.5 V	2.65 V			+294 mV to +306 mV
					2.35 V			
			0	1.5 V	1.65 V			+294 mV to +306 mV
					1.35 V			
			0	0.5 V	650 mV			+294 mV to +306 mV
					350 mV			
		3.4 V	0	3.4 V	3.55 V			+294 mV to +306 mV
					3.25 V			
			0	2.4 V	2.55 V			+294 mV to +306 mV
					2.25 V			
		-3.4 V	0	-3.4 V	-3.25 V			+294 mV to +306 mV
					-3.55 V			
			0	-2.4 V	-2.25 V			+294 mV to +306 mV
					-2.55 V			

Table continued…

Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
		-1.5 V	0	-2.5 V	-2.35 V			+294 mV to +306 mV
					-2.65 V			
			0	-1.5 V	-1.35 V			+294 mV to +306 mV
					-1.65 V			
			0	-0.5 V	-350 mV			+294 mV to +306 mV
					-650 mV			
Ch2	100 mV	0 V	0	0 V	300 mV			+588 mV to +612 mV
					-300 mV			
			0	+1 V	1.3 V			+588 mV to +612 mV
					700 mV			
			0	-1 V	-700 mV			+588 mV to +612 mV
					-1.3 V			
		1.5 V	0	2.5 V	2.8 V			+588 mV to +612 mV
					2.2 V			
			0	1.5 V	1.8 V			+588 mV to +612 mV
					1.2 V			
			0	0.5 V	800 mV			+588 mV to +612 mV
					200 mV			
		3.4 V	0	3.4 V	3.70 V			+588 mV to +612 mV
					3.10 V			
			0	2.4 V	2.70 V			+588 mV to +612 mV
					2.10 V			

Table continued…

Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
		-3.4 V	0	-3.4 V	-3.10 V			+588 mV to +612 mV
					-3.70 V			
			0	-2.4 V	-2.10 V			+588 mV to +612 mV
					-2.70 V			
		-1.5 V	0	-1.5 V	-1.20 V			+588 mV to +612 mV
					-1.80 V			
			0	-0.5 V	- 200 mV			+588 mV to +612 mV
					-800 mV			
Ch2	120 mV	0 V	0	0 V	360 mV			+705.6 mV to +734.4 mV
					-360 mV			
			0	+1 V	1.36 V			+705.6 mV to +734.4 mV
					640 mV			
			0	-1 V	-640 mV			+705.6 mV to +734.4 mV
					-1.36 V			
		1.5 V	0	2.5 V	2.86 V			+705.6 mV to +734.4 mV
					2.14 V			
			0	1.5 V	1.86 V			+705.6 mV to +734.4 mV
					1.14 V			
			0	0.5 V	860 mV			+705.6 mV to +734.4 mV
					140 mV			

Table continued…

Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
		3.4 V	0	3.4 V	3.76 V ——————— 3.04 V			+705.6 mV to +734.4 mV
			0	2.4 V	2.76 V ——————— 2.04 V			+705.6 mV to +734.4 mV
		-3.4 V	0	-3.4 V	-3.04 V ——————— -3.76 V			+705.6 mV to +734.4 mV
			0	-2.4 V	-2.04 V ——————— -2.76 V			+705.6 mV to +734.4 mV
		-1.5 V	0	-1.5 V	-1.14 V ——————— -1.86 V			+705.6 mV to +734.4 mV
			0	-0.5 V	-140 mV ——————— -860 mV			+705.6 mV to +734.4 mV
Ch2	140 mV	0 V	0	–1 V	–580 mV ——————— –1.42 V			+823.2 mV to +856.8 mV
			0	0 V	420 mV ——————— –420 mV			+823.2 mV to +856.8 mV
			0	+1 V	1.42 V ——————— 580 V			+823.2 mV to +856.8 mV

Table continued…

Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
Ch2	200 mV	0 V	0	–0.9 V	–300 mV			+1.176 V to +1.224 V
					–1.50 V			
			0	0 V	600 mV			+1.176 V to +1.224 V
					–600 mV			
			0	+0.9 V	1.50 V			+1.176 V to +1.224 V
					300 mV			
Ch2	400 mV	0 V	0	–0.3 V	900 mV			+2.352 mV to +2.448 mV
					–1.50 V			
			0	0 V	1.20 V			+2.352 mV to +2.448 mV
					–1.20 V			
			0	+0.3 V	1.50 V			+2.352 mV to +2.448 mV
					–900 mV			
Ch3	6.25 mV	0 V	0	0 V	19 mV			+37.24 mV to +38.76 mV
					-19 mV			
			0	+1 V	1.019 V			+37.24 mV to +38.76 mV
					981 mV			
			0	-1 V	-981 mV			+37.24 mV to +38.76 mV
					-1.019 V			

Table continued…

Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
		1.5 V	0	2.5 V	2.519 V			+37.24 mV to +38.76 mV
					2.481 V			
			0	1.5 V	1.519 V			+37.24 mV to +38.76 mV
					1.481 V			
			0	0.5 V	519 mV			+37.24 mV to +38.76 mV
					481 mV			
		3.4 V	0	3.4 V	3.419 V			+37.24 mV to +38.76 mV
					3.381 V			
			0	2.4 V	2.419 V			+37.24 mV to +38.76 mV
					2.381 V			
		-3.4 V	0	-3.4 V	-3.381 V			+37.24 mV to +38.76 mV
					-3.419 V			
			0	-2.4 V	-2.381 V			+37.24 mV to +38.76 mV
					-2.419 V			
		-1.5 V	0	-2.5 V	-2.481 V			+37.24 mV to +38.76 mV
					-2.519 V			
			0	-1.5 V	-1.481 V			+37.24 mV to +38.76 mV
					-1.519 V			
			0	-0.5 V	-481 mV			+37.24 mV to +38.76 mV
					-519 mV			

Table continued…

Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
Ch3	10 mV	0 V	0	0 V	30 mV			+58.8 mV to +61.2 mV
					-30 mV			
			0	+1 V	1.03 V			+58.8 mV to +61.2 mV
					970 mV			
			0	-1 V	-970 mV			+58.8 mV to +61.2 mV
					-1.03 V			
		1.5 V	0	2.5 V	2.53 V			+58.8 mV to +61.2 mV
					2.47 V			
			0	1.5 V	1.53 V			+58.8 mV to +61.2 mV
					1.47 V			
			0	0.5 V	530 mV			+58.8 mV to +61.2 mV
					470 mV			
		3.4 V	0	3.4 V	3.43 V			+58.8 mV to +61.2 mV
					3.37 V			
			0	2.4 V	2.43 V			+58.8 mV to +61.2 mV
					2.37 V			
		-3.4 V	0	-3.4 V	-3.37 V			+58.8 mV to +61.2 mV
					-3.43 V			
			0	-2.4 V	-2.37 V			+58.8 mV to +61.2 mV
					-2.43 V			

Table continued…

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Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
		-1.5 V	0	-2.5 V	-2.47 V			+58.8 mV to +61.2 mV
					-2.53 V			
			0	-1.5 V	-1.47 V			+58.8 mV to +61.2 mV
					-1.53 V			
			0	-0.5 V	-470 mV			+58.8 mV to +61.2 mV
					-530 mV			
Ch3	20 mV	0 V	0	0 V	60 mV			+117.6 mV to +122.4 mV
					-60 mV			
			0	+1 V	1.06 V			+117.6 mV to +122.4 mV
					940 mV			
			0	-1 V	-940 mV			+117.6 mV to +122.4 mV
					-1.06 V			
		1.5 V	0	2.5 V	2.56 V			+117.6 mV to +122.4 mV
					2.44 V			
			0	1.5 V	1.56 V			+117.6 mV to +122.4 mV
					1.44 V			
			0	0.5 V	560 mV			+117.6 mV to +122.4 mV
					440 mV			
		3.4 V	0	3.4 V	3.46 V			+117.6 mV to +122.4 mV
					3.34 V			
			0	2.4 V	2.46 V			+117.6 mV to +122.4 mV
					2.34 V			

Table continued…

Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
		-3.4 V	0	-3.4 V	-3.34 V			+117.6 mV to +122.4 mV
					-3.46 V			
			0	-2.4 V	-2.34 V			+117.6 mV to +122.4 mV
					-2.46 V			
		-1.5 V	0	-2.5 V	-2.44 V			+117.6 mV to +122.4 mV
					-2.56 V			
			0	-1.5 V	-1.44 V			+117.6 mV to +122.4 mV
					-1.56 V			
			0	-0.5 V	-440 mV			+117.6 mV to +122.4 mV
					-560 mV			
Ch3	50 mV	0 V	0	0 V	150 mV			+294 mV to +306 mV
					-150 mV			
			0	+1 V	1.15 V			+294 mV to +306 mV
					850 mV			
			0	-1 V	-850 mV			+294 mV to +306 mV
					-1.15 V			
		1.5 V	0	2.5 V	2.65 V			+294 mV to +306 mV
					2.35 V			
			0	1.5 V	1.65 V			+294 mV to +306 mV
					1.35 V			
			0	0.5 V	650 mV			+294 mV to +306 mV
					350 mV			

Table continued…

Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
		3.4 V	0	3.4 V	3.55 V			+294 mV to +306 mV
					3.25 V			
			0	2.4 V	2.55 V			+294 mV to +306 mV
					2.25 V			
		-3.4 V	0	-3.4 V	-3.25 V			+294 mV to +306 mV
					-3.55 V			
			0	-2.4 V	-2.25 V			+294 mV to +306 mV
					-2.55 V			
		-1.5 V	0	-2.5 V	-2.35 V			+294 mV to +306 mV
					-2.65 V			
			0	-1.5 V	-1.35 V			+294 mV to +306 mV
					-1.65 V			
			0	-0.5 V	-350 mV			+294 mV to +306 mV
					-650 mV			
Ch3	100 mV	0 V	0	0 V	300 mV			+588 mV to +612 mV
					-300 mV			
			0	+1 V	1.3 V			+588 mV to +612 mV
					700 mV			
			0	-1 V	-700 mV			+588 mV to +612 mV
					-1.3 V			

Table continued…

Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
		1.5 V	0	2.5 V	2.8 V			+588 mV to +612 mV
					2.2 V			
			0	1.5 V	1.8 V			+588 mV to +612 mV
					1.2 V			
			0	0.5 V	800 mV			+588 mV to +612 mV
					200 mV			
		3.4 V	0	3.4 V	3.70 V			+588 mV to +612 mV
					3.10 V			
			0	2.4 V	2.70 V			+588 mV to +612 mV
					2.10 V			
		-3.4 V	0	-3.4 V	-3.10 V			+588 mV to +612 mV
					-3.70 V			
			0	-2.4 V	-2.10 V			+588 mV to +612 mV
					-2.70 V			
		-1.5 V	0	-1.5 V	-1.20 V			+588 mV to +612 mV
					-1.80 V			
			0	-0.5 V	- 200 mV			+588 mV to +612 mV
					-800 mV			

Table continued…

Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
Ch3	120 mV	0 V	0	0 V	360 mV			+705.6 mV to +734.4 mV
					-360 mV			
			0	+1 V	1.36 V			+705.6 mV to +734.4 mV
					640 mV			
			0	-1 V	-640 mV			+705.6 mV to +734.4 mV
					-1.36 V			
		1.5 V	0	2.5 V	2.86 V			+705.6 mV to +734.4 mV
					2.14 V			
			0	1.5 V	1.86 V			+705.6 mV to +734.4 mV
					1.14 V			
			0	0.5 V	860 mV			+705.6 mV to +734.4 mV
					140 mV			
		3.4 V	0	3.4 V	3.76 V			+705.6 mV to +734.4 mV
					3.04 V			
			0	2.4 V	2.76 V			+705.6 mV to +734.4 mV
					2.04 V			
		-3.4 V	0	-3.4 V	-3.04 V			+705.6 mV to +734.4 mV
					-3.76 V			
			0	-2.4 V	-2.04 V			+705.6 mV to +734.4 mV
					-2.76 V			

Table continued…

Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
		-1.5 V	0	-1.5 V	-1.14 V			+705.6 mV to +734.4 mV
					-1.86 V			
			0	-0.5 V	-140 mV			+705.6 mV to +734.4 mV
					-860 mV			
Ch3	140 mV	0 V	0	–1 V	–580 mV			+8.232 mV to +8.568 mV
					–1.42 V			
			0	0 V	420 mV			+8.232 mV to +8.568 mV
					–420 mV			
			0	+1 V	1.42 V			+8.232 mV to +8.568 mV
					580 mV			
Ch3	200 mV	0 V	0	–0.9 V	–300 mV			+1.176 mV to +1.224 mV
					–1.50 V			
			0	0 V	600 mV			+1.176 mV to +1.224 mV
					–600 mV			
			0	+0.9 V	1.50 V			+1.176 mV to +1.224 mV
					300 mV			
Ch3	400 mV	0 V	0	–0.3 V	900 mV			+2.352 mV to +2.448 mV
					–1.50 V			
			0	0 V	1.20 V			+2.352 mV to +2.448 mV
					–1.20 V			
			0	+0.3 V	1.50 V			+2.352 mV to +2.448 mV
					–900 mV			

Table continued…

Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
Ch4	6.25 mV	0 V	0	0 V	19 mV			+37.24 mV to +38.76 mV
					-19 mV			
			0	+1 V	1.019 V			+37.24 mV to +38.76 mV
					981 mV			
			0	-1 V	-981 mV			+37.24 mV to +38.76 mV
					-1.019 V			
		1.5 V	0	2.5 V	2.519 V			+37.24 mV to +38.76 mV
					2.481 V			
			0	1.5 V	1.519 V			+37.24 mV to +38.76 mV
					1.481 V			
			0	0.5 V	519 mV			+37.24 mV to +38.76 mV
					481 mV			
		3.4 V	0	3.4 V	3.419 V			+37.24 mV to +38.76 mV
					3.381 V			
			0	2.4 V	2.419 V			+37.24 mV to +38.76 mV
					2.381 V			
		-3.4 V	0	-3.4 V	-3.381 V			+37.24 mV to +38.76 mV
					-3.419 V			
			0	-2.4 V	-2.381 V			+37.24 mV to +38.76 mV
					-2.419 V			

Table continued…

Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
		-1.5 V	0	-2.5 V	-2.481 V			+37.24 mV to +38.76 mV
					-2.519 V			
			0	-1.5 V	-1.481 V			+37.24 mV to +38.76 mV
					-1.519 V			
			0	-0.5 V	-481 mV			+37.24 mV to +38.76 mV
					-519 mV			
Ch4	10 mV	0 V	0	0 V	30 mV			+58.8 mV to +61.2 mV
					-30 mV			
			0	+1 V	1.03 V			+58.8 mV to +61.2 mV
					970 mV			
			0	-1 V	-970 mV			+58.8 mV to +61.2 mV
					-1.03 V			
		1.5 V	0	2.5 V	2.53 V			+58.8 mV to +61.2 mV
					2.47 V			
			0	1.5 V	1.53 V			+58.8 mV to +61.2 mV
					1.47 V			
			0	0.5 V	530 mV			+58.8 mV to +61.2 mV
					470 mV			
		3.4 V	0	3.4 V	3.43 V			+58.8 mV to +61.2 mV
					3.37 V			
			0	2.4 V	2.43 V			+58.8 mV to +61.2 mV
					2.37 V			

Table continued…

Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
		-3.4 V	0	-3.4 V	-3.37 V			+58.8 mV to +61.2 mV
					-3.43 V			
			0	-2.4 V	-2.37 V			+58.8 mV to +61.2 mV
					-2.43 V			
		-1.5 V	0	-2.5 V	-2.47 V			+58.8 mV to +61.2 mV
					-2.53 V			
			0	-1.5 V	-1.47 V			+58.8 mV to +61.2 mV
					-1.53 V			
			0	-0.5 V	-470 mV			+58.8 mV to +61.2 mV
					-530 mV			
Ch4	20 mV	0 V	0	0 V	60 mV			+117.6 mV to +122.4 mV
					-60 mV			
			0	+1 V	1.06 V			+117.6 mV to +122.4 mV
					940 mV			
			0	-1 V	-940 mV			+117.6 mV to +122.4 mV
					-1.06 V			
		1.5 V	0	2.5 V	2.56 V			+117.6 mV to +122.4 mV
					2.44 V			
			0	1.5 V	1.56 V			+117.6 mV to +122.4 mV
					1.44 V			
			0	0.5 V	560 mV			+117.6 mV to +122.4 mV
					440 mV			

Table continued…

Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
		3.4 V	0	3.4 V	3.46 V ———————— 3.34 V			+117.6 mV to +122.4 mV
			0	2.4 V	2.46 V ———————— 2.34 V			+117.6 mV to +122.4 mV
		-3.4 V	0	-3.4 V	-3.34 V ———————— -3.46 V			+117.6 mV to +122.4 mV
			0	-2.4 V	-2.34 V ———————— -2.46 V			+117.6 mV to +122.4 mV
		-1.5 V	0	-2.5 V	-2.44 V ———————— -2.56 V			+117.6 mV to +122.4 mV
			0	-1.5 V	-1.44 V ———————— -1.56 V			+117.6 mV to +122.4 mV
			0	-0.5 V	-440 mV ———————— -560 mV			+117.6 mV to +122.4 mV
Ch4	50 mV	0 V	0	0 V	150 mV ———————— -150 mV			+294 mV to +306 mV
			0	+1 V	1.15 V ———————— 850 mV			+294 mV to +306 mV
			0	-1 V	-850 mV ———————— -1.15 V			+294 mV to +306 mV

Table continued…

Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
		1.5 V	0	2.5 V	2.65 V			+294 mV to +306 mV
					2.35 V			
			0	1.5 V	1.65 V			+294 mV to +306 mV
					1.35 V			
			0	0.5 V	650 mV			+294 mV to +306 mV
					350 mV			
		3.4 V	0	3.4 V	3.55 V			+294 mV to +306 mV
					3.25 V			
			0	2.4 V	2.55 V			+294 mV to +306 mV
					2.25 V			
		-3.4 V	0	-3.4 V	-3.25 V			+294 mV to +306 mV
					-3.55 V			
			0	-2.4 V	-2.25 V			+294 mV to +306 mV
					-2.55 V			
		-1.5 V	0	-2.5 V	-2.35 V			+294 mV to +306 mV
					-2.65 V			
			0	-1.5 V	-1.35 V			+294 mV to +306 mV
					-1.65 V			
			0	-0.5 V	-350 mV			+294 mV to +306 mV
					-650 mV			

Table continued…

Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
Ch4	100 mV	0 V	0	0 V	300 mV -300 mV			+588 mV to +612 mV
			0	+1 V	1.3 V 700 mV			+588 mV to +612 mV
			0	-1 V	-700 mV -1.3 V			+588 mV to +612 mV
		1.5 V	0	2.5 V	2.8 V 2.2 V			+588 mV to +612 mV
			0	1.5 V	1.8 V 1.2 V			+588 mV to +612 mV
			0	0.5 V	800 mV 200 mV			+588 mV to +612 mV
		3.4 V	0	3.4 V	3.70 V 3.10 V			+588 mV to +612 mV
			0	2.4 V	2.70 V 2.10 V			+588 mV to +612 mV
		-3.4 V	0	-3.4 V	-3.10 V -3.70 V			+588 mV to +612 mV
			0	-2.4 V	-2.10 V -2.70 V			+588 mV to +612 mV

Table continued…

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Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
		-1.5 V	0	-1.5 V	-1.20 V			+588 mV to +612 mV
					-1.80 V			
			0	-0.5 V	- 200 mV			+588 mV to +612 mV
					-800 mV			
Ch4	120 mV	0 V	0	0 V	360 mV			+705.6 mV to +734.4 mV
					-360 mV			
			0	+1 V	1.36 V			+705.6 mV to +734.4 mV
					640 mV			
			0	-1 V	-640 mV			+705.6 mV to +734.4 mV
					-1.36 V			
		1.5 V	0	2.5 V	2.86 V			+705.6 mV to +734.4 mV
					2.14 V			
			0	1.5 V	1.86 V			+705.6 mV to +734.4 mV
					1.14 V			
			0	0.5 V	860 mV			+705.6 mV to +734.4 mV
					140 mV			
		3.4 V	0	3.4 V	3.76 V			+705.6 mV to +734.4 mV
					3.04 V			
			0	2.4 V	2.76 V			+705.6 mV to +734.4 mV
					2.04 V			

Table continued…

Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
		-3.4 V	0	-3.4 V	-3.04 V			+705.6 mV to +734.4 mV
					-3.76 V			
			0	-2.4 V	-2.04 V			+705.6 mV to +734.4 mV
					-2.76 V			
		-1.5 V	0	-1.5 V	-1.14 V			+705.6 mV to +734.4 mV
					-1.86 V			
			0	-0.5 V	-140 mV			+705.6 mV to +734.4 mV
					-860 mV			
Ch4	140 mV	0 V	0	–1 V	–580 mV			+823.2 mV to +856.8 mV
					–1.42 V			
			0	0 V	420 V			+823.2 mV to +856.8 mV
					–420 mV			
			0	+1 V	1.42 V			+823.2 mV to +856.8 mV
					580 mV			
Ch4	200 mV	0 V	0	–0.9 V	–300 mV			+1.176 V to +1.224 V
					–1.50 V			
			0	0 V	600 mV			+1.176 V to +1.224 V
					–600 mV			
			0	+0.9 V	1.50 mV			+1.176 V to +1.224 V
					300 V			

Table continued…

Ch	Scale setting	Termination setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
Ch4	400 mV	0 V	0	–0.3 V	900 mV			+2.352 mV to +2.448 mV
					–1.50 V			
			0	0 V	1.20 V			+2.352 mV to +2.448 mV
					–1.20 V			
			0	+0.3 V	1.50 V			+2.352 mV to +2.448 mV
					–900 mV			

d. *Display the test signal:*

- Display the **Vertical Setup** menu.
- Use the keypad to set the Termination Voltage, Position, and Offset vertical settings as listed in the table for the current vertical scale setting. The baseline level may move off screen.
- Set the generator so that its Sense value and polarity matches the generator setting in the table for the vertical scale, position, offset, and termination settings you have made. The DC test level should appear at about 3 division on screen. Using the Vertical Position knob, move the test level to 3 divisions above the center screen.

⚠ **Note:** It's important to use the Sense reading of the generator instead of the Output level when adjusting the generator to the specified voltage setting.

e. *Measure the test signal:* Press the **Close** button.

- Read the measurement results at the measurement statistics **Mean** measurement readout. Refer to the following figure.
- Record the Mean in the Measurement Mean column. (See *Table 8* on page 236.)
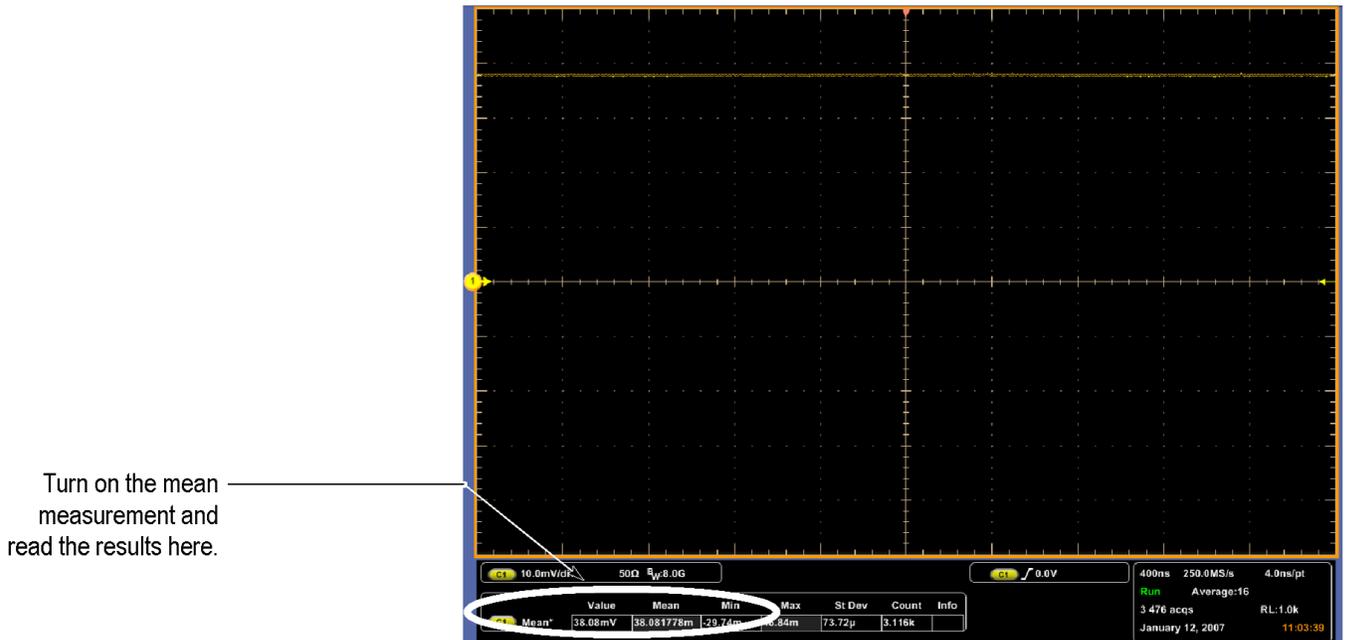
Turn on the mean measurement and read the results here.

Figure 13: Measurement of DC gain accuracy

    f. *Measure second mean:*

- Set the generator to the second level and polarity indicated in the table for the vertical scale, termination voltage, position, and offset settings you have made.

- Repeat substep *2.e* on page 269 using the current vertical scale, termination voltage, position, offset, and new generator setting for the second mean.

    g. *Check against limits:*

- Subtract the second measurement mean from the first measurement mean for the current vertical scale, termination voltage, position, and offset.

- Record the difference of the two mean measurements in the Difference of Measurement Means column of the table. (See *Table 8* on page 236.)

- CHECK that the Difference of Measurement Mean is within the limits listed for the current vertical scale/termination/position/offset/generator settings. Enter measurement mean difference value on test record.

    h. Repeat substeps *2.d* on page 269 through *2.g* on page 270, using the next position, offset and generator settings listed in the table for the current vertical scale.

    i. Repeat substeps *2.c* on page 235 through *2.h* on page 270 until all vertical scale settings, listed in the table, are checked for the channel under test. (See *Table 8* on page 236.)

    j. *Test all channels:* Repeat substeps *2.a* on page 235 through *2.i* on page 270 for all four channels.

3. *Disconnect the hookup:*

    a. *Set the generator output to 0 V.*

    b. Disconnect the generator output from the channel last tested.

Check DC gain accuracy MSO/DPO70000C models

Equipment required	Prerequisites
One DC calibration generator (Item *6* on page 123) One SMA male-to-female BNC adapter (Item *19* on page 124)	The instrument must meet the prerequisites. (See *Prerequisites* on page 122.)

⚠️ **WARNING:** The generator is capable of outputting dangerous voltages. To avoid injury, be sure to set the DC calibration generator to off or 0 volts before connecting, disconnecting, and/or moving the test hookup during this procedure.

1. *Install the test hookup and preset the instrument controls:*

    a. *Hook up the test-signal source:*

- Set the output of a DC calibration generator to off or 0 volts. Set the DC impedance of the generator to 50 Ω.

- Connect the generator to **Ch 1** through an adapter. Refer to the following figure.

Figure 14: DC gain accuracy test hookup, MSO/DPO70000C GHz models

b. *Initialize the instrument:* Press **Default Setup**

c. *Modify the default settings:*

- From the tool bar, touch **Horiz/Acq** and select the **Acquisition** tab.

- Touch **Average** and set the number of averages to **16**.

2. *Confirm input channels are within limits for DC gain accuracy.* Do the following substeps - test Ch 1 first, *skipping substep 2.a* on page 271 of this step *since Ch 1 is already selected from step 1* on page 270.

a. *Select an unchecked channel:*

- From the tool bar, touch **Measure** and then **Clear All** to remove the previous measurement.

- Press the Vertical button of the channel just confirmed to remove the channel from the display.

- Press the front-panel Vertical button that corresponds to the channel you are to confirm.

- *Set the generator output to 0 V.*

- Move the test hookup to the channel you selected.

b. *Turn on the measurement Mean for the channel:*

- From the tool bar, touch **Measure** and select the **Ampl** tab, **More**, and then touch **Mean** to measure the mean of the current channel.

- Press the **X** (Close) button.

c. *Set the vertical scale:* Set the vertical **Scale** to one of the settings in the following table that is not yet checked, starting with the first setting.

Table 9: Gain accuracy

Channel	Scale setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
MSO/DPO70000C models							
Table continued…							

Channel	Scale setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
Ch1	10 mV	0	0 V	+38.0 mV			+74.48 mV to +77.52 mV
				-38.0 mV			
		-5	+0.45 V	+538 mV			+74.48 mV to +77.52 mV
				+462 mV			
		5	-0.45 V	-462 mV			+74.48 mV to +77.52 mV
				-538 mV			
	20 mV	0	0 V	+76.0 mV			+148.960 mV to +155.040 mV
				-76.0 mV			
		-5	+0.4 V	+576.0 mV			+148.960 mV to +155.040 mV
				+424.0 mV			
		5	-0.4 V	-424.0 mV			+148.960 mV to +155.040 mV
				-576.0 mV			
Ch1	50 mV	0	0 V	+190 mV			+372.40 mV to +387.60 mV
				-190 mV			
		-5	+0.25 V	+690 mV			+372.40 mV to +387.60 mV
				+310 mV			
		5	-0.25 V	-310 mV			+372.40 mV to +387.60 mV
				-690 mV			

Table continued…

Channel	Scale setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
	100 mV	0	0 V	+380 mV			+744.80 mV to +775.20 mV
				-380 mV			
		-5	+2.0 V	+2.88 V			+744.80 mV to +775.20 mV
				+2.12 V			
		5	-2.0 V	-2.12 V			+744.80 mV to +775.20 mV
				-2.88 V			
	200 mV	0	0 V	+760 mV			+1.49 V to +1.55 V
				-760 mV			
		-5	+1.25 V	+3.01 V			+1.49 V to +1.55 V
				+1.49 V			
		5	-1.25 V	-1.49 V			+1.49 V to +1.55 V
				-3.01 V			
	500 mV	0	0 V	+1.90 V			+3.724 V to +3.876 V
				-1.90 V			
		-5	0 V	+4.40 V			+3.724 V to +3.876 V
				+0.60 V			
		5	0 V	-0.60 V			+3.724 V to +3.876 V
				–4.40 V			

Table continued…

Channel	Scale setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
Ch2	10 mV	0	0 V	+38.0 mV			+74.48 mV to +77.52 mV
				-38.0 mV			
		-5	+0.45 V	+538 mV			+74.48 mV to +77.52 mV
				+462 mV			
		5	-0.45 V	-462 mV			+74.48 mV to +77.52 mV
				-538 mV			
Ch2	20 mV	0	0 V	+76.0 mV			+148.960 mV to +155.040 mV
				-76.0 mV			
		-5	+0.4 V	+576.0 mV			+148.960 mV to +155.040 mV
				+424.0 mV			
		5	-0.4 V	-424.0 mV			+148.960 mV to +155.040 mV
				-576.0 mV			
	50 mV	0	0 V	+190 mV			+372.40 mV to +387.60 mV
				-190 mV			
		-5	+0.25 V	+690 mV			+372.40 mV to +387.60 mV
				+310 mV			
		5	-0.25 V	-310 mV			+372.40 mV to +387.60 mV
				-690 mV			

Table continued…

Channel	Scale setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
	100 mV	0	0 V	+380 mV			+744.80 mV to +775.20 mV
				-380 mV			
		-5	+2.0 V	+2.88 V			+744.80 mV to +775.20 mV
				+2.12 V			
		5	-2.0 V	-2.12 V			+744.80 mV to +775.20 mV
				-2.88 V			
	200 mV	0	0 V	+760 mV			+1.49 V to +1.55 V
				-760 mV			
		-5	+1.25 V	+3.01 V			+1.49 V to +1.55 V
				+1.49 V			
		5	-1.25 V	-1.49 V			+1.49 V to +1.55 V
				-3.01 V			
	500 mV	0	0 V	+1.90 V			+3.724 V to +3.876 V
				-1.90 V			
		-5	0 V	+4.40 V			+3.724 V to +3.876 V
				+0.60 V			
		5	0 V	-0.60 V			+3.724 V to +3.876 V
				–4.40 V			

Table continued…

Channel	Scale setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
Ch3	10 mV	0	0 V	+38.0 mV			+74.48 mV to +77.52 mV
				-38.0 mV			
		-5	+0.45 V	+538 mV			+74.48 mV to +77.52 mV
				+462 mV			
		5	-0.45 V	-462 mV			+74.48 mV to +77.52 mV
				-538 mV			
	20 mV	0	0 V	+76.0 mV			+148.960 mV to +155.040 mV
				-76.0 mV			
		-5	+0.4 V	+576.0 mV			+148.960 mV to +155.040 mV
				+424.0 mV			
		5	-0.4 V	-424.0 mV			+148.960 mV to +155.040 mV
				-576.0 mV			
	50 mV	0	0 V	+190 mV			+372.40 mV to +387.60 mV
				-190 mV			
		-5	+0.25 V	+690 mV			+372.40 mV to +387.60 mV
				+310 mV			
		5	-0.25 V	-310 mV			+372.40 mV to +387.60 mV
				-690 mV			

Table continued…

Channel	Scale setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
	100 mV	0	0 V	+380 mV			+744.80 mV to +775.20 mV
				-380 mV			
		-5	+2.0 V	+2.88 V			+744.80 mV to +775.20 mV
				+2.12 V			
		5	-2.0 V	-2.12 V			+744.80 mV to +775.20 mV
				-2.88 V			
	200 mV	0	0 V	+760 mV			+1.49 V to +1.55 V
				-760 mV			
		-5	+1.25 V	+3.01 V			+1.49 V to +1.55 V
				+1.49 V			
		5	-1.25 V	-1.49 V			+1.49 V to +1.55 V
				-3.01 V			
Ch3	500 mV	0	0 V	+1.90 V			+3.724 V to +3.876 V
				-1.90 V			
		-5	0 V	+4.40 V			+3.724 V to +3.876 V
				+0.60 V			
		5	0 V	-0.60 V			+3.724 V to +3.876 V
				–4.40 V			

Table continued…

Channel	Scale setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
Ch4	10 mV	0	0 V	+38.0 mV			+74.48 mV to +77.52 mV
				-38.0 mV			
		-5	+0.45 V	+538 mV			+74.48 mV to +77.52 mV
				+462 mV			
		5	-0.45 V	-462 mV			+74.48 mV to +77.52 mV
				-538 mV			
	20 mV	0	0 V	+76.0 mV			+148.960 mV to +155.040 mV
				-76.0 mV			
		-5	+0.4 V	+576.0 mV			+148.960 mV to +155.040 mV
				+424.0 mV			
		5	-0.4 V	-424.0 mV			+148.960 mV to +155.040 mV
				-576.0 mV			
	50 mV	0	0 V	+190 mV			+372.40 mV to +387.60 mV
				-190 mV			
		-5	+0.25 V	+690 mV			+372.40 mV to +387.60 mV
				+310 mV			
		5	-0.25 V	-310 mV			+372.40 mV to +387.60 mV
				-690 mV			

Table continued…

Channel	Scale setting	Position setting (Divs)	Offset setting	Generator setting	Measurement mean	Difference of measurement means	Accuracy limits
	100 mV	0	0 V	+380 mV			+744.80 mV to +775.20 mV
				-380 mV			
		-5	+2.0 V	+2.88 V			+744.80 mV to +775.20 mV
				+2.12 V			
		5	-2.0 V	-2.12 V			+744.80 mV to +775.20 mV
				-2.88 V			
Ch4	200 mV	0	0 V	+760 mV			+1.49 V to +1.55 V
				-760 mV			
		-5	+1.25 V	+3.01 V			+1.49 V to +1.55 V
				+1.49 V			
		5	-1.25 V	-1.49 V			+1.49 V to +1.55 V
				-3.01 V			
	500 mV	0	0 V	+1.90 V			+3.724 V to +3.876 V
				-1.90 V			
		-5	0 V	+4.40 V			+3.724 V to +3.876 V
				+0.60 V			
		5	0 V	-0.60 V			+3.724 V to +3.876 V
				–4.40 V			

d. *Display the test signal:*

- From the tool bar touch **Vertical** and then touch **Position**.
- Use the keypad to set vertical position to the number of divisions listed in the table for the current vertical scale setting and offset.
- Touch **Offset**.
- Use the keypad to set vertical offset to the setting listed in the table for the current vertical scale and position settings. The baseline level may move off screen.
- Set the generator to the level and polarity indicated in the table for the vertical scale, position, and offset settings you have made. The DC test level should appear on screen. (If it does not return, the accuracy check has failed for the current vertical scale, position, and offset settings of the current channel.)

e. *Measure the test signal:* Press the **Close** button.

- Read the measurement results at the measurement statistics **Mean** measurement readout. Refer to the following figure.
- Record the Mean in the Measurement Mean column. (See *Table 9* on page 271.)

Turn on the mean measurement and read the results here.
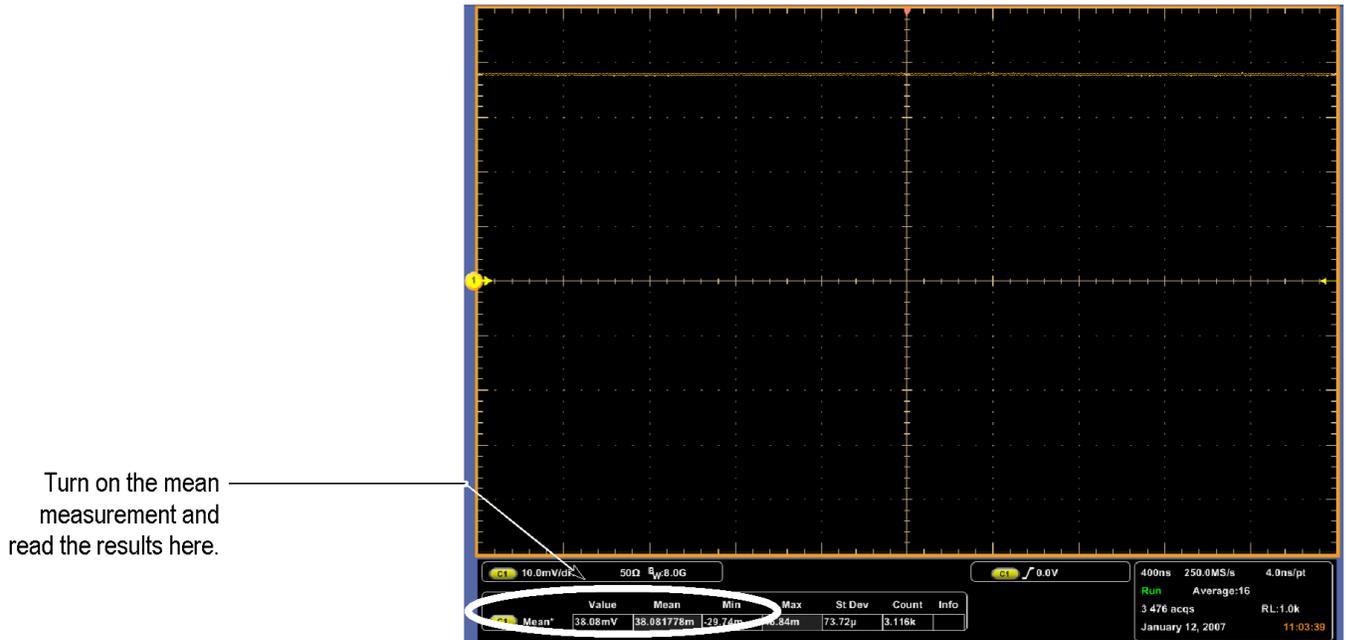
Figure 15: Measurement of DC gain accuracy

f. *Measure second mean:*

- Set the generator to the second level and polarity indicated in the table for the vertical scale, position, and offset settings you have made.
- Repeat substep *2.e* on page 279 using the current vertical scale, position, offset, and new generator setting for the second mean.

g. *Check against limits:*

- Subtract the second measurement mean from the first measurement mean for the current vertical scale, position, and offset.
- Record the difference of the two mean measurements in the Difference of Measurement Means column of the table. (See *Table 9* on page 271.)
- CHECK that the Difference of Measurement Mean is within the limits listed for the current vertical scale/position/offset/ generator settings. Enter measurement mean difference value on test record.

h. Repeat substeps *2.d* on page 279 through *2.g* on page 280, using the next position, offset and generator settings listed in the table for the current vertical scale.

i. Repeat substeps *2.c* on page 271 through *2.h* on page 280 until all vertical scale settings, listed in the table, are checked for the channel under test. (See *Table 9* on page 271.)

j. *Test all channels:* Repeat substeps *2.a* on page 271 through *2.i* on page 280 for all four channels.

3. *Disconnect the hookup:*

a. *Set the generator output to 0 V.*

b. Disconnect the generator output from the channel last tested.

Check offset accuracy MSO/DPO70000DX models

Equipment Required	Prerequisites
One DC calibration generator (Item *6* on page 123) One SMA male-to-female BNC adapter (Item *19* on page 124) One BNC "T" adapter (Item *32* on page 125)	The instrument must meet the prerequisites. (See *Prerequisites* on page 122.)

⚠ **WARNING:** The generator is capable of outputting dangerous voltages. To avoid injury, be sure to set the DC calibration generator to off or 0 volts before connecting, disconnecting, and/or moving the test hookup during this procedure.

1. *Install the test hookup and preset the instrument controls:*

   a. *Hook up the test-signal source:*

      • Set the output of a DC calibration generator to off or 0 volts. Set the DC impedance of the generator to 50 Ω.

      • Connect the output of a DC calibration generator to **Ch 1** through an adapter. Refer to the following figure.

Figure 16: Offset accuracy test hookup, MSO/DPO70000DX models

   b. *Initialize the instrument:* Press **Default Setup**.

   c. *Modify the default settings:*

      • Set the Horizontal Scale to **1 ms/div**.

      • Set the Record Length to **5000**.

      • Set the Acquisition Mode to **Hi Res**.

      • Set the Trigger Source to **Line**.

2. *Confirm input channels are within limits for offset accuracy.* Do the following substeps - test Ch 1 first, *skipping substep 2.a* on page 281 *since Ch 1 is already selected from step 1* on page 281.

   a. *Select an unchecked channel:*

      • From the tool bar, touch **Measure** and then **Clear All** to remove the previous measurement.

      • Press the Vertical button of the channel just confirmed to remove the channel from the display.

      • Press the front-panel Vertical button that corresponds to the channel you are to confirm.

      • *Set the generator output to 0 V.*

      • Move the test hookup to the channel you selected.

   b. *Turn on the measurement Mean for the channel:*

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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- From the tool bar, touch **Measure** and select the **Ampl** tab, **More**, and then touch **Mean** to measure the mean of the current channel.
- Press the **X** (Close) button.

c. *Set the vertical scale:* Set the vertical **Scale** to one of the settings in the following table that is not yet checked.

Table 10: Offset accuracy

Scale setting	Position setting (Divs)	Offset setting [5]	Termination setting	Generator setting	Accuracy limits
6.25 mV	0	0 V	0 V	0 V	–3.13 mV to +3.25 mV
		+3.4 V	+3.5 V	+3.4 V	+3.3831 V to +3.4169 V
		-3.4 V	-3.5 V	-3.4 V	–3.4169 V to –3.3831 V
10 mV	0	0 V	0 V	0 V	–3.5 mV to +3.5 mV
		+3.4 V	+3.5 V	+3.4 V	+3.3827 V to +3.4173 V
		-3.4 V	-3.5 V	-3.4 V	–3.4173 V to –3.3827 V
20 mV	0	0 V	0 V	0 V	–4.5 mV to +4.5 mV
		+3.4 V	+3.5 V	+3.4 V	+3.3817 V to +3.4183 V
		-3.4 V	-3.5 V	-3.4 V	–3.4183 V to –3.3817 V
50 mV	0	0 V	0 V	0 V	–7.5 mV to +7.5 mV
		+3.4 V	+3.5 V	+3.4 V	+3.3787 V to +3.4213 V
		-3.4 V	-3.5 V	-3.4 V	–3.4213 V to –3.3787 V
100 mV	0	0 V	0 V	0 V	–12.5 mV to +12.5 mV
		+3.4 V	+3.5 V	+3.4 V	+3.3737 V to +3.4263 V
		-3.4 V	-3.5 V	-3.4 V	–3.4263 V to –3.3737 V
120 mV	0	0 V	0 V	0 V	–14.5 mV to +14.5 mV
		+3.4 V	+3.5 V	+3.4 V	+3.3717 V to +3.4283 V
		-3.4 V	-3.5 V	-3.4 V	–3.4283 V to –3.3717 V

Table continued…

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[5] Set as precisely as the instrument's offset resolution permits.

Scale setting	Position setting (Divs)	Offset setting [5]	Termination setting	Generator setting	Accuracy limits
140 mV	0	–6 V	0 V	–6 V	–6.0525 V to +5.9475 V
		0 V	0 V	0 V	–16.5 mV to +16.5 mV
		+6 V	0 V	+6 V	–5.9475 V to +6.0525 V
200 mV	0	–6 V	0 V	–6 V	–6.0585 V to –5.9415 V
		0 V	0 V	0 V	–22.5 V to +22.5 V
		+6 V	0 V	+6 V	+5.9415 V to +6.0585 V
400 mV	0	–6 V	0 V	–6 V	–6.0785 V to –5.9215 V
		0 V	0 V	0 V	–42.5 mV to +42.5 mV
		+6 V	0 V	+6 V	+5.9215 mV to +6.0785 mV

d. *Display the test signal:*

- Display the **Vertical Setup** menu.
- Use the keypad to set the Termination Voltage, Position, and Offset vertical settings as listed in the table for the current vertical scale setting. The baseline level may move off screen.
- Set the generator so that its Sense value and polarity matches the generator setting in the table for the vertical scale, termination voltage, position, and offset settings you have made.

⚠ **Note:** It's important to use the Sense reading of the generator instead of the Output level when adjusting the generator to the specified voltage setting.

e. *Measure the test signal:* Press **Close**. Read the measurement results at the **Mean** measurement readout. Refer to the following figure.

---

[5] Set as precisely as the instrument's offset resolution permits.

Turn on the measurement called mean and read the results here.

Figure 17: Measurement of offset accuracy

f. *Check against limits:*

- CHECK that the readout for the measurement **Mean** readout on screen is within the limits listed for the current vertical scale and position/offset/generator settings. Enter the value on the test record.

- Repeat substep *2.d* on page 283, using the offset and generator settings as is listed in the table.

- CHECK that the **Mean** measurement readout on screen is within the limits listed for the current vertical scale setting and position/offset/termination/generator settings. Enter the value on the test record.

- Repeat substep *2.d* on page 283, using the negative-polarity offset and generator settings as is listed in the table.

- CHECK that the **Mean** measurement readout on screen is within the limits listed for the current vertical scale setting and position/offset/termination/generator settings. Enter the value on the test record.

- Repeat substeps *2.c* on page 282 through *2.f* on page 284 until all vertical scale settings, are checked for the channel under test. (See *Table 10* on page 282.)

g. *Test all channels:* Repeat substeps *2.a* on page 281 through *2.f* on page 284 for all four channels.

3. *Disconnect the hookup:*

- **a.** Set the generator output to 0 V.
- **b.** Disconnect the generator from the channel last tested.

Check offset accuracy MSO/DPO70000C models

Equipment Required	Prerequisites
One DC calibration generator (Item *6* on page 123) One SMA male-to-female BNC adapter (Item *19* on page 124)	The instrument must meet the prerequisites. (See *Prerequisites* on page 122.)

⚠️ **WARNING:** The generator is capable of outputting dangerous voltages. To avoid injury, be sure to set the DC calibration generator to off or 0 volts before connecting, disconnecting, and/or moving the test hookup during this procedure.

1. *Install the test hookup and preset the instrument controls:*

a. *Hook up the test-signal source:*

- Set the output of a DC calibration generator to off or 0 volts. Set the DC impedance of the generator to 50 Ω.

- Connect the output of a DC calibration generator to **Ch 1** through an adapter. Refer to the following figure.

Figure 18: Offset accuracy test hookup, MSO/DPO70000C models

b. *Initialize the instrument:* Press **Default Setup**.

c. *Modify the default settings:*

- From the tool bar, touch **Horiz/Acq** and select the **Acquisition** tab.

- Touch **Average** and set the number of averages to **16**.

2. *Confirm input channels are within limits for offset accuracy*. Do the following substeps - test Ch 1 first, *skipping substep 2.a* on page 285 *since Ch 1 is already selected from step 1* on page 284.

   a. *Select an unchecked channel:*

   - From the tool bar, touch **Measure** and then **Clear All** to remove the previous measurement.

   - Press the Vertical button of the channel just confirmed to remove the channel from the display.

   - Press the front-panel Vertical button that corresponds to the channel you are to confirm.

   - *Set the generator output to 0 V.*

   - Move the test hookup to the channel you selected.

   b. *Turn on the measurement Mean for the channel:*

   - From the tool bar, touch **Measure** and select the **Ampl** tab, **More**, and then touch **Mean** to measure the mean of the current channel.

   - Press the **X** (Close) button.

   c. *Set the vertical scale:* Set the vertical **Scale** to one of the settings in the following table that is not yet checked.

Table 11: Offset accuracy

Scale setting	Position setting (Divs)	Offset setting [6]	Generator setting	Accuracy limits
10 mV	-5	+0.45 V	+500 mV	+495.75 mV to +504.25 mV
	5	-0.45 V	-500 mV	-504.25 mV to -495.75 mV
Table continued…				

---

[6] Set as precisely as the instrument's offset resolution permits.

Scale setting	Position setting (Divs)	Offset setting [6]	Generator setting	Accuracy limits
20 mV	-5	+0.4 V	+500 mV	+494.75 mV to +505.25 mV
	5	-0.4 V	-500 mV	-505.25 mV to -494.75 mV
50 mV	-5	+0.25 V	+500 mV	+491.75 mV to +508.25 mV
	5	-0.25 V	-500 mV	-508.25 mV to -491.75 mV
100 mV	-5	+2.0 V	+2.5 V	+2.474 V to +2.526 V
	5	-2.0 V	-2.5 V	-2.526 V to -2.474 V
200 mV	-5	+1.5 V	+2.5 V	+2.464 V to +2.536 V
	5	-1.5 V	-2.5 V	-2.536 V to -2.464 V
500 mV	-5	0 V	+2.5 V	+2.434 V to +2.566 V
	5	0 V	-2.5 V	-2.566 V to -2.434 V

d. *Display the test signal:*

- From the tool bar touch **Vertical** and then touch **Position**.
- Use the keypad to set vertical position to the setting listed in the table.
- Touch **Offset**.
- Use the keypad to set vertical offset to the positive-polarity setting listed in the table for the current vertical scale setting. The baseline level may move off screen.
- Set the generator to the level and polarity indicated in the table for the vertical scale, position, and offset settings you have made.

e. *Measure the test signal:* Press **Close**. Read the measurement results at the **Mean** measurement readout. Refer to the following figure.

---

[6] Set as precisely as the instrument's offset resolution permits.

Turn on the measurement called mean and read the results here.

Figure 19: Measurement of offset accuracy

f. *Check against limits:*

- CHECK that the readout for the measurement **Mean** readout on screen is within the limits listed for the current vertical scale and position/offset/generator settings. Enter the value on the test record.

- Repeat substep*2.d* on page 286, using the offset and generator settings as is listed in the table.

- CHECK that the **Mean** measurement readout on screen is within the limits listed for the current vertical scale setting and position/offset/generator settings. Enter the value on the test record.

- Repeat substep*2.d* on page 286, using the negative-polarity offset and generator settings as is listed in the table.

- CHECK that the **Mean** measurement readout on screen is within the limits listed for the current vertical scale setting and position/offset/generator settings. Enter the value on the test record.

- Repeat substeps*2.c* on page 285 through*2.f* on page 287 until all vertical scale settings, are checked for the channel under test. (See *Table 11* on page 285.)

g. *Test all channels:* Repeat substeps*2.a* on page 285 through*2.f* on page 287 for all four channels.

3. *Disconnect the hookup:*

a. *Set the generator output to 0 V*.

b. Disconnect the generator from the channel last tested.

Check analog bandwidth DPO7000C models <3.5 GHz

Equipment required	Prerequisites
One sine wave generator (Item *9* on page 123)	(See *Prerequisites* on page 122.)
One level meter and power sensor (Item *10* on page 124)	
One power splitter (Item *11* on page 124)	
50 Ω precision cable 2.92 mm male-to-female (Item *12* on page 124)	
One K male-to-male adapter (Item *13* on page 124)	
SMA male-to-BNC female adapter (Item *19* on page 124)	

1. *Install the test hookup and preset the instrument controls:*

    a. *Initialize the instrument:*

        •   Press **Default Setup**.

    b. *Modify the default settings:*

        •   Touch **Vertical**, select **Vertical Setup**, and then touch Termination **50 Ω**.

        •   From the Bandwidth drop-down list, select the maximum bandwidth for your instrument.

        •   Turn the horizontal **Scale** knob to **50 ns**.

        •   From the button bar, touch **Horiz/Acq** and select the **Horizontal** tab. Select Constant Sample Rate mode. Set the Sample Rate to **200 GS/s**.

        •   From the button bar, touch **Horiz/Acq** and select the **Acquisition** tab. Set the acquisition mode as follows: Touch **Average** and set the number of averages to **16**.

        •   Set the sampling mode as follows: Touch the **Equivalent ET** button.

        •   From the button bar, touch **Measure**. Touch Setups **Ref Levs**; then touch the **Histogram** button.

    c. *Hook up the test-signal source:* Connect the sine wave output of a sine wave generator to **Ch 1** through a power splitter. Connect the power sensor of the power meter to the power splitter. (See *Figure 20* on page 289.) Set the output of the generator to a reference frequency of 50 MHz or less.
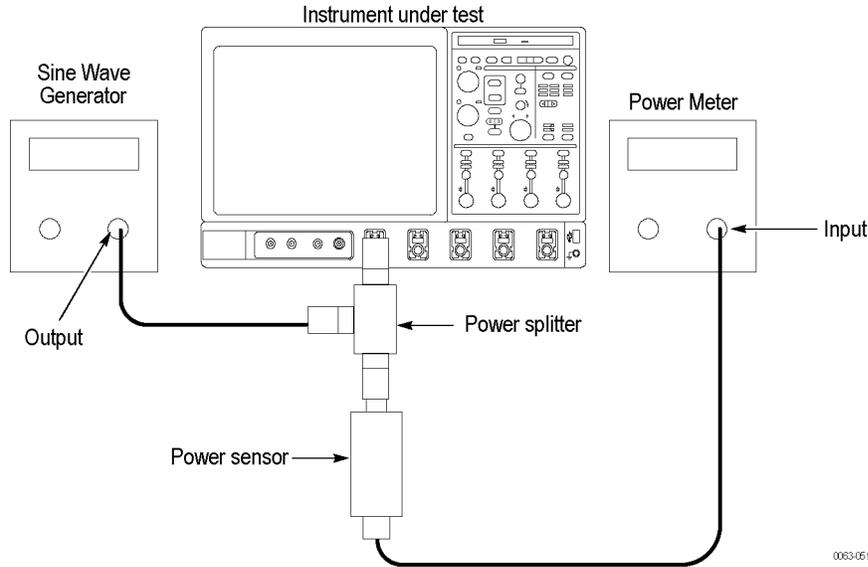
Figure 20: Analog bandwidth test hookup, DPO7000C models <3.5 GHz

2. *Confirm the input channels are within limits for analog bandwidth:* Do the following substeps - test Ch 1 first, *skipping substeps 2.a* on page 289 *and* 2.b *on page 289 since Ch 1 is already set up for testing from step* 1 *on page 288.*

   a. *Select an unchecked channel:*

      • From the button bar, touch **Measure** and then **Clear All** to remove the previous measurement.
      • Press the Vertical button of the channel just confirmed to remove the channel from the display.
      • Press the front-panel Vertical button that corresponds to the channel you are to confirm.
      • Touch **Vertical**, select **Vertical Setup**, and then touch Termination **50 Ω**.
      • Move the leveled output of the sine wave generator to the channel you selected.

   b. *Match the trigger source to the channel selected:* Press the Trigger **Source** button until the source that corresponds to the channel you are to confirm is on.

   x

Table 12: Analog bandwidth DPO7000C models <3.5 GHz

Vertical scale	Reference amplitude	Horizontal scale	Test frequency			-3 dB
			DPO7254C	DPO7104C	DPO7054C	
5 mV	30 mV	1 ns	2.0 GHz	1 GHz	500 MHz	≥21.2 mV
10 mV	60 mV	1 ns	2.501 GHz	1 GHz	500 MHz	≥42.4 mV
20 mV	120 mV	1 ns	2.501 GHz	1 GHz	500 MHz	≥84.8 mV
50 mV	300 mV	1 ns	2.501 GHz	1 GHz	500 MHz	≥212 mV
100 mV	600 mV	1 ns	2.501 GHz	1 GHz	500 MHz	≥424 mV
200 mV	1.2 V	1 ns	2.501 GHz	1 GHz	500 MHz	≥848 mV
500 mV	3 V [7]	1 ns	2.501 GHz	1 GHz	500 MHz	≥2.12 V [7]

Table continued…

Vertical scale	Reference amplitude	Horizontal scale	Test frequency			-3 dB
			DPO7254C	DPO7104C	DPO7054C	
1 V	5 V [7]	1 ns	2.501 GHz	1 GHz	500 MHz	≥3.535 V [7]

c. *Set the vertical scale:*

For the channel you are testing, set the vertical **Scale** to the next setting in the table, starting with the 100 mV setting. (See *Table 12* on page 289.)

d. *Set the triggering coupling:* From the button bar, touch Trigger, then select Coupling **DC**.

e. *Display the test signal:* Do the following subparts to first display the reference signal and then the test signal.

  • From the button bar touch **Measure**; then select the **Time** tab.

  • Touch the **Freq** button to measure the frequency of the current channel.

  • Select the **Ampl** tab. Touch the **Amplitude** button.

  • Touch the **Statistics** button, then touch the **Mean** button.

  • Touch the **X** (Close) button.

  • Set the generator output so the Chx Amplitude mean readout equals the reference amplitude in the table. This corresponds to the vertical scale set in substep *2.c* on page 290. (See *Table 12* on page 289.)

  • Record the reading on the power meter.

  • Set the trigger as follows:

Press the front-panel **Push-Set 50%** as necessary to trigger a stable display. At full bandwidth, you may also want to make small, manual adjustments to the trigger level. You can use the **Trigger Level** knob to do this.

f. *Measure the test signal:*

Set the frequency of the generator, as shown on screen to the test frequency in the table that corresponds to the vertical scale set in substep *2.c* on page 290. (See *Table 12* on page 289.) (See *Figure 21* on page 291.)

Set the horizontal **Scale** to the horizontal scale setting that corresponds to the vertical scale set in substep *2.c* on page 290. (See *Table 12* on page 289.) Press **PUSH-SET 50%** as necessary to trigger the signal.

Adjust the output of the generator until the reading on the power meter is equal to the reading recorded on the power meter in substep *2.e* on page 290.

Read the results at the Chx Amplitude mean readout, which will automatically measure the amplitude of the test signal. Refer to the following figure.

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[7] If your generator cannot output the required amplitude, determine its maximum output at the Test frequency, and use this for the reference amplitude. The -3 dB limit can be calculated as: 0.707 × reference amplitude.
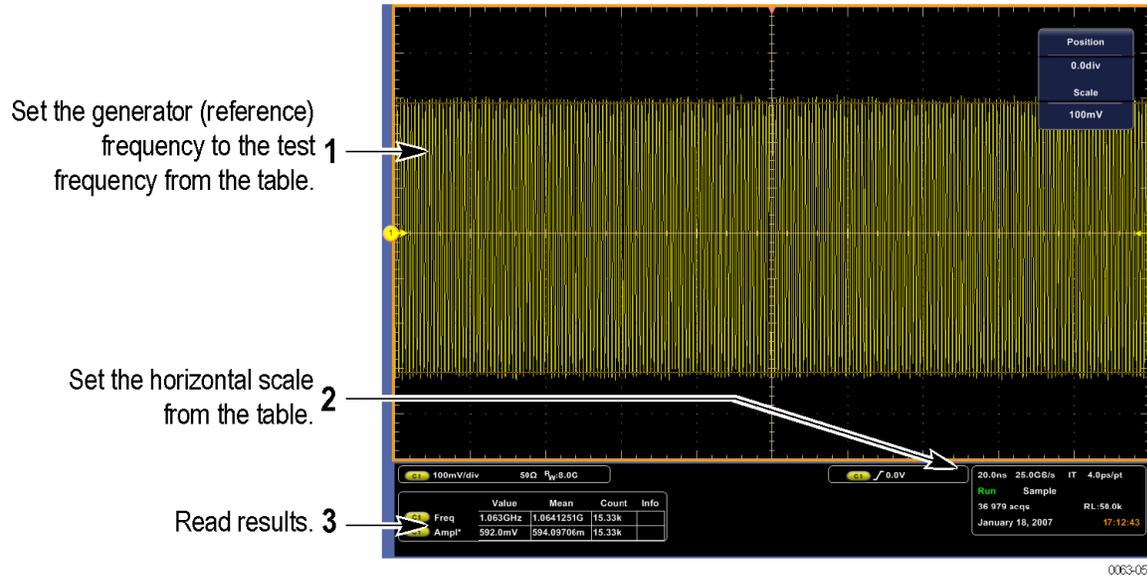
Figure 21: Measurement of analog bandwidth

g. *Check against limits:*

- CHECK that the **Amplitude** mean readout on screen is within the limits listed in the table for the current vertical scale setting. (See *Table 12* on page 289.)
- Enter the voltage on the test record.
- When finished checking, set the horizontal **Scale** back to the 20 ns.

h. *Check remaining vertical scale settings against limits:*

- Check the remaining vertical scale settings for the channel under test by repeating substeps *2.c* on page 290 through *2.g* on page 291 for each of the remaining scale settings for the channel under test.
- When doing substep *2.f* on page 290, skip the subparts that turn on the Chx Amplitude mean measurement until you check a new channel.
- When selecting a new channel and before doing substep *2.f* on page 290, touch the **Clear All** button to remove the previous channel measurements.

i. *Test all channels:* Repeat substeps *2.a* on page 289 through *2.g* on page 291 for all four channels.

3. *Disconnect the hookup:* Disconnect the test hook up from the input connector of the channel last tested.

Check channel bandwidth DPO7354C model

Equipment Required	Prerequisites
One sine wave generator (Item *9* on page 123)	(See *Prerequisites* on page 122.)
One level meter and power sensor (Item *10* on page 124)	
One power splitter (Item *11* on page 124)	
50 Ω precision cable 2.92 mm male-to-female (Item *12* on page 124)	
One K male-to-male adapter (Item *13* on page 124)	
SMA male-to-BNC female adapter (Item *19* on page 124)	

1. *Install the test hookup and preset the instrument controls:*

   a. *Initialize the instrument:*

      - Press **Default Setup**.

   b. *Modify the default settings:*

      - Touch **Vertical**, select **Vertical Setup**.
      - DPO7354C: Touch Termination **50 Ω**.
      - From the Bandwidth drop-down list, select the maximum bandwidth for your instrument.
      - Turn the horizontal **Scale** knob to **40 ns**. (DPO7354C: set to **50 ns**.)
      - From the button bar, touch **Horiz/Acq** and select the **Horizontal** tab. Select Constant Sample Rate mode. Set the Sample Rate to **250 GS/s** or **200 GS/s**, depending on instrument setup. (DPO7354C: set to **200 GS/s**.)
      - From the button bar, touch **Horiz/Acq** and select the **Acquisition** tab. Set the acquisition mode as follows: Touch **Sample**.
      - Set the sampling mode as follows: Touch the **Interpolate IT** button.
      - From the button bar, touch **Measure**. Touch Setups **Ref Levs**; then touch the **Histogram Mode** button.
      - If your instrument has enhanced bandwidth, from the toolbar, touch **Vertical** and check **Force Constant Sample Rate** (Digital filters ensured). Select **Apply to All Channels**.

   c. *Hook up the test-signal source:* Connect the sine wave output of the sine wave generator to **Ch 1** through a power splitter. Connect the power sensor of the power meter to the power splitter. Set the output of the generator to a reference frequency of 50 MHz. (See *Figure 22* on page 292.)
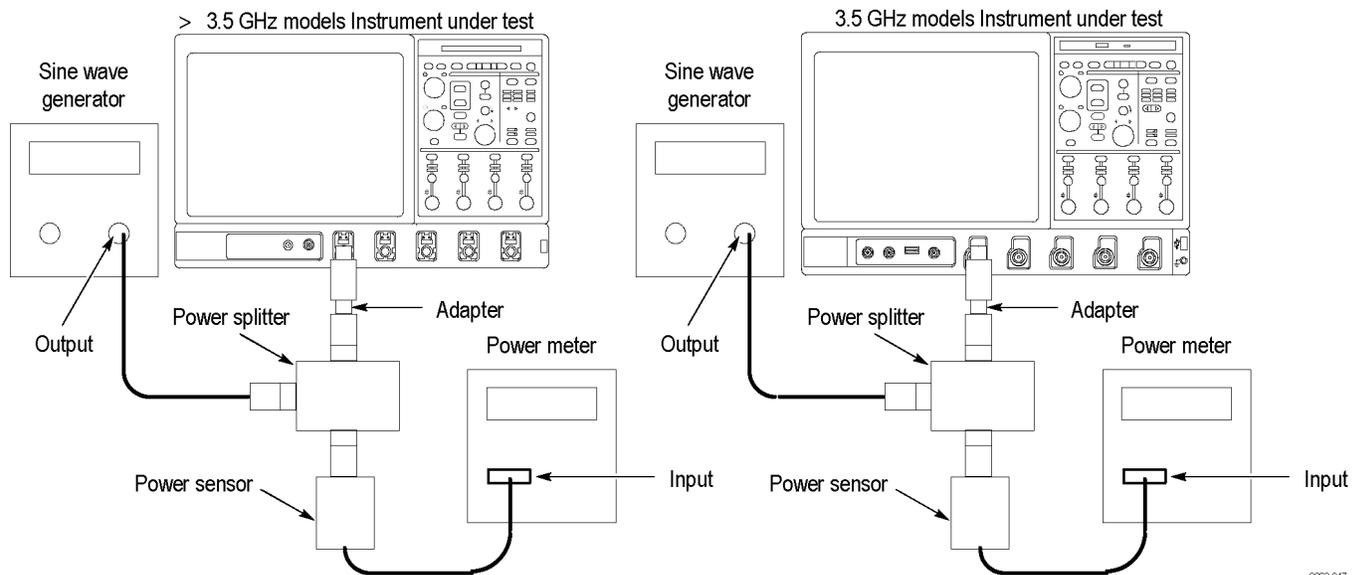
Figure 22: Channel bandwidth test hookup, DPO7354C model

2. *Confirm the input channels are within limits for bandwidth:* Do the following substeps - test Ch 1 first, *skipping substeps 2.a* on page 292 *and 2.b* on page 294 *since Ch 1 is already set up for testing from step 1* on page 292.

   a. *Select an unchecked channel:*

      - MSO/DPO71254C and MSO/DPO72504DX: Press **Cursors** to remove cursors from the display.
      - From the button bar, touch **Measure** and then **Clear All** to remove the previous measurement.
      - Press the Vertical button of the channel just confirmed to remove the channel from the display.
      - Press the front-panel Vertical button that corresponds to the channel you are to confirm.
      - DPO7354C: Touch **Vertical**, select **Vertical Setup**, and then touch Termination **50 Ω**.
      - Move the test setup to the channel you selected.

Table 13: Channel bandwidth MSO/DPO70000DX models

Vertical scale	Reference amplitude (6 div)	Horizontal scale	Test frequency			-3 dB limits
			MSO/DPO/ 73304DX	MSO/DPO/ 72504DX	MSO/DPO/ 72304DX	
6.25 mV	37.5 mV	1 ns	33 GHz	24.9 GHz	23 GHz	≥26.5 mV
10 mV	60 mV	1 ns	33 GHz	24.9 GHz	23 GHz	≥42.4 mV
20 mV	120 mV	1 ns	33 GHz	24.9 GHz	23 GHz	≥84.8 mV
50 mV	300 mV	1 ns	33 GHz	24.9 GHz	23 GHz	≥212 mV
100 mV	600 mV	1 ns	33 GHz	24.9 GHz	23 GHz	≥424 mV
120 mV	720 mV	1 ns	33 GHz	24.9 GHz	23 GHz	≥509 mV
140 mV	840 mV	1 ns	33 GHz	24.9 GHz	23 GHz	≥594 mV
200 mV	1200 mV [8]	1 ns	33 GHz	24.9 GHz	23 GHz	≥848 mV
400 mV	1600 mV [8]	1 ns	33 GHz	24.9 GHz	23 GHz	≥1131 mV

Table 14: Channel bandwidth MSO/DPO70000C models

Vertical scale	Reference amplitude (6 div)	Horizontal scale	Test frequency						-3 dB limits
			MSO/DPO/ 72004C	MSO/DPO/ 71604C	MSO/DPO/ 71254C	MSO/DPO/ 70804C	MSO/DPO/ 70604C	MSO/DPO/ 70404C	
10 mV	60 mV	1 ns	18 GHz	16 GHz	12.5 GHz	8 GHz	6 GHz	4 GHz	≥42.4 mV
20 mV	120 mV	1 ns	20 GHz	16 GHz	12.5 GHz	8 GHz	6 GHz	4 GHz	≥84.8 mV
50 mV	300 mV	1 ns	20 GHz	16 GHz	12.5 GHz	8 GHz	6 GHz	4 GHz	≥212 mV
100 mV	600 mV	1 ns	20 GHz	16 GHz	12.5 GHz	8 GHz	6 GHz	4 GHz	≥424 mV
250 mV	1.5 V	1 ns	20 GHz	16 GHz	12.5 GHz	8 GHz	6 GHz	4 GHz	≥1.061 V

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[8] If your generator cannot output the required amplitude, determine its maximum output at the Test frequency, and use this for the reference amplitude. The -3 dB limit can be calculated as: 0.707 × reference amplitude.

Table 15: Channel bandwidth DPO7354C model

Vertical scale	Reference amplitude	Horizontal scale	Test frequency	
			DPO7354C	-3 dB limits
5 mV	30 mV	1 ns	2.0 GHz	≥21.2 mV
10 mV	40 mV	1 ns	3.5 GHz	≥28.3 mV
20 mV	80 mV	1 ns	3.5 GHz	≥56.6 mV
50 mV	200 mV	1 ns	3.5 GHz	≥141.4 mV
100 mV	400 mV	1 ns	3.5 GHz	≥283 mV
200 mV	800 mV	1 ns	3.5 GHz	≥566 mV
500 mV	2 V [8]	1 ns	3.5 GHz	≥1.41 V [8]
1 V	4 V [8]	1 ns	3.5 GHz	≥2.83 V [8]

b. *Match the trigger source to the channel selected:* Press the Trigger **Source** button until the source that corresponds to the channel you are to confirm is on.

For models with bandwidth >9 GHz: Set the trigger Source to **Line**.

c. DPO7354C: Set the input impedance to **50 Ω**.

d. *Set the vertical scale:*

For the channel you are testing, set the vertical **Scale** to the setting listed in the tables (starting with the lowest setting). See the preceding Channel bandwidth table that applies to your instrument.

e. *Set the trigger coupling:* From the button bar, touch **Trigger** and select Coupling **DC**.

f. *Display the test signal:* Do the following subparts to first display the reference signal and then the test signal.

- MSO/DPO71254C and MSO/DPO72504DX: From the button bar, touch **Cursors**. Touch Cursor Type **H Bars**.
- From the button bar touch **Measure**; then select the **Time** tab.
- Touch the **Freq** button to measure the frequency of the current channel.
- Select the **Ampl** tab. Touch the **Amplitude** button.
- From the Annotation drop-down list, select **None**.
- Touch the **Statistics** button, then touch the **Mean** button.
- Touch the **X** (Close) button.
- Set the generator output so the Chx Amplitude mean readout equals the reference amplitude. See the preceding Channel Bandwidth table that applies to your oscilloscope model. This corresponds to the vertical scale set in substep *2.d* on page 294.
- Record the reading on the power meter.
- Set the trigger as follows:Press the front-panel **Push-Set 50%** button as necessary to trigger a stable display. At full bandwidth, you may also want to make small, manual adjustments to the trigger level. You can use the **Trigger Level** knob to do this.

⚠ **Note:** If you are using Line trigger, the test signal is not shown as a stable display.

g. *Measure the test signal:*

- MSO/DPO71254C and MSO/DPO72504DX: Set the frequency of the generator to the test frequency in the tables that corresponds to the vertical scale set in substep *2.d* on page 294.

- All instruments except the MSO/DPO71254C and MSO/DPO72504DX: Set the frequency of the generator, as shown on screen, to the test frequency in the tables that corresponds to the vertical scale set in substep *2.d* on page 294.

- Set the horizontal **Scale** to the horizontal scale setting in the tables that corresponds to the vertical scale set in substep *2.d* on page 294. Press **PUSH-SET 50%** as necessary to trigger the signal.

- Adjust the output of the generator until the reading on the power meter is equal to the reading recorded on the power meter in step *2.f* on page 294.

- MSO/DPO71254C and MSO/DPO72504DX: Using the Multipurpose knobs, adjust Cursor 1 to the top of the waveform and Cursor 2 to the bottom of the waveform. Read the absolute value of the result at the ΔV readout.

- All instruments except the MSO/DPO71254C and MSO/DPO72504DX: Read the results at the Chx Amplitude mean readout, which will automatically measure the amplitude of the test signal. (See *Figure 23* on page 295.)
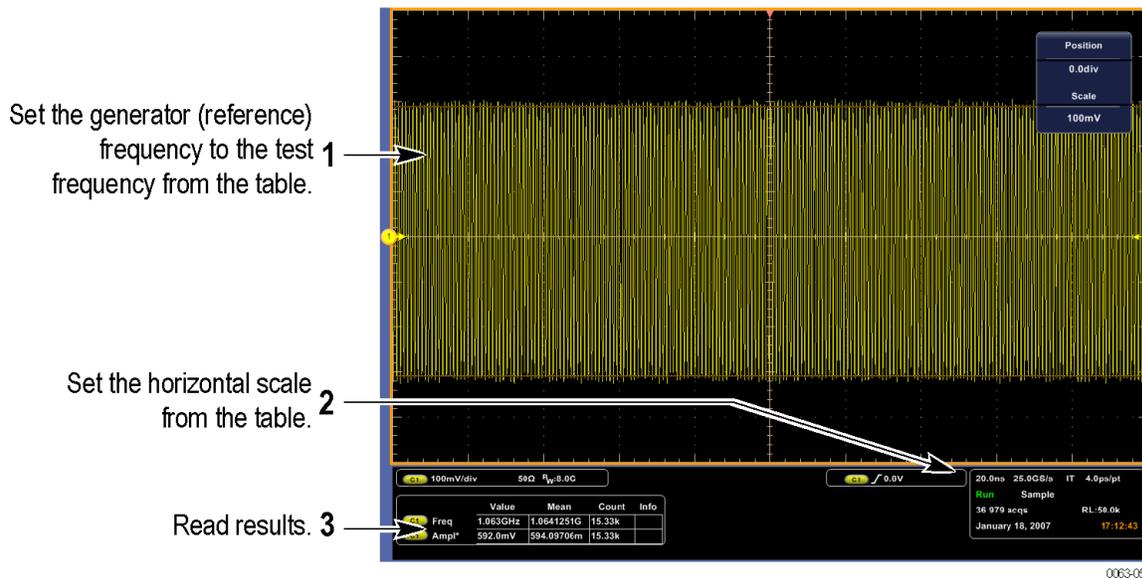
Figure 23: Measurement of analog bandwidth

h. *Check against limits:*

- CHECK that the measured amplitude is within the limits for the current vertical scale setting in the table.

- Enter the voltage on the test record.

- When finished checking, set the horizontal **Scale** back to the 20 ns.

i. *Check remaining vertical scale settings against limits:*

- Check the remaining vertical scale settings for the channel under test by repeating substeps *2.a* on page 292 through *2.h* on page 295 for each of the remaining scale settings for the channel under test.

- When doing substep *2.f* on page 294, skip the subparts that turn on the Chx Amplitude mean measurement until you check a new channel.

- When selecting a new channel and before doing substep *2.e* on page 294, touch the **Clear All** button to remove the previous channel measurements.

j. *Test all channels:* Repeat substeps *2.a* on page 292 through *2.i* on page 295 for all four channels.

3. *Disconnect the hookup:* Disconnect the test hook up from the input connector of the channel last tested.

Check input resistance MSO/DPO70000C/DX models

Equipment Required	Prerequisites
One Digital Multimeter (Item *27* on page 125)	(See *Prerequisites* on page 122.)
One Dual-Banana Connector, (Item *5* on page 123)	
One precision 50 Ω coaxial cable (Item *4* on page 123)	
One SMA male-to-female BNC adapter (Item *19* on page 124)	
One SMA female-to-female adapter (Item *16* on page 124)	
One SMA male short circuit adapter (Item *25* on page 125)	
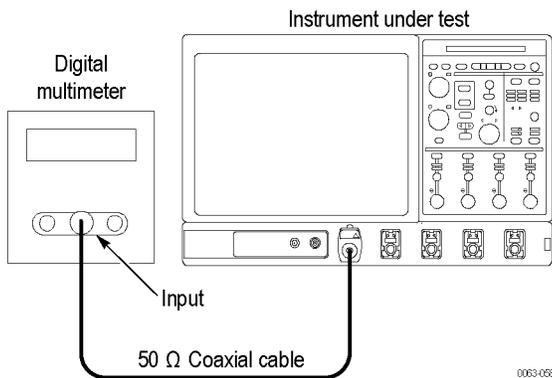
Figure 24: Input resistance test hookup, MSO/DPO70000C/DX models

1. *Install the test hookup and preset the instrument controls:*

   a. *Initialize the instrument:* Press the **Default Setup** button.

   b. Short the cable from the multimeter by connecting a shorting adapter and SMA-to-SMA adapter to the BNC-to-SMA adapter.

   c. Read and record the resistance of the multimeter leads.

   d. *Hook up the test-signal source*: Connect, through a 50 Ω precision coaxial cable, the input of the multimeter to **Ch 1** through adapters. (See *Figure 24* on page 296.)

   e. Set the Vertical **Scale** to **10 mV** (6.25 mv for MSO/DPO70000DX models) per division

2. *Check input impedance against limits:*

   a. *Measure the impedance:* Read and record the measured impedance.

   b. Remove the dual banana connector from the digital multimeter (DMM), turn it 180 degrees and reinsert it in the DMM input.

   c. *Measure the impedance:* Read and record the measured impedance.

   d. Add the two measurements and divide the result by 2.

   e. Subtract the resistance of the multimeter leads from the average that you calculated.

   f. Enter the result on the test record.

   g. Check - The measurement is within the limits specified in the test record.

3. Set the Vertical **Scale** to **100 mV** (140 mV for MSO/DPO70000DX models) per division and repeat step *2* on page 296.

4. *Repeat steps *2* on page 296 *through* *3* on page 296 *for the remaining input channels:*

   a. Move the test setup to an unchecked input channel.

    b. Set the Vertical **Scale** of the channel to **10 mV** (6.25 mv for MSO/DPO70000DX models) per division.

    c. Repeat steps *2* on page 296 through *3* on page 296.

5. *Disconnect the hookup:* Disconnect the equipment from the instrument.

Check TekProtect

This procedure is only for MSO/DPO70000C instruments that have TekProtect installed. TekProtect provides protection from electrical overstress (EOS) and electrostatic discharge (ESD) on the four analog input channels.

Equipment required	Prerequisites
Source Measure Unit (Item *34* on page 125)	(See *Prerequisites* on page 122.)
Adapter, TCA-BNC (Item *19* on page 124)	
Adapter, BNC to minigrabber (Item *18* on page 124)	
Instrument controller (Item *35* on page 126)	
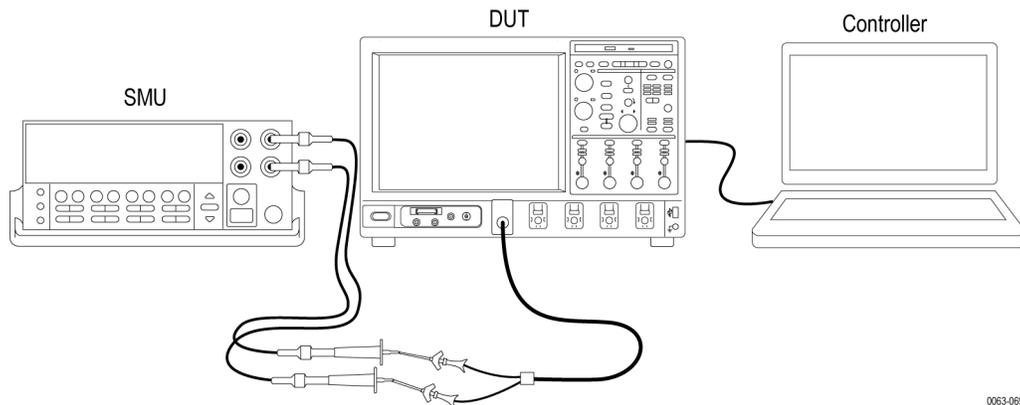
Figure 25: TekProtect initial test hookup

1. *Install the test hookup and preset the instrument controls:*

    a. *Initialize the instrument:* Press the Default Setup button.

    b. Using the instrument controller, send the INSPECT command to the oscilloscope. Do not make additional settings changes to the instrument until asked to in Step *9* on page 298.

    c. Hook up the test-signal source: Connect the Source Measure Unit to the CH 1 input of the oscilloscope using the SMU test leads and the two adapters. Connect the SMU High Sense to the center conductor. Connect the SMU Low Sense to the ground (outer) conductor.

2. Set the Source Measure Unit to output +2.0 V. Verify that the measured current is less than +100 µA. Enter the value in the test record.

3. Set the Source Measure Unit to output –2.0 V. Verify that the measured current is less than –100 µA. Enter the value in the test record.

4. Set the Source Measure Unit to output +65 mA, with the overvoltage limit set to +3.5 V. Verify that the measured voltage is ≤3.42 V. Enter the value in the test record.

5. Set the Source Measure Unit to output –65 mA, with the overvoltage limit set to –3.5 V. Verify that the measured voltage is ≥–3.42 V. Enter the value in the test record.

6. Move the test setup to an unchecked input channel.

7. Repeat steps *2* on page 297 through *6* on page 297 until all 4 input channels have been checked.

8. *Disconnect the hookup:* Disconnect the equipment from the instrument.

9. Return the instrument to normal operation by pressing the Default Setup button.

10. Check the completion status: If any of the 4 checks on any of the 4 channels is outside the limits, return the instrument to Tektronix Service for repair.

Time base system checks

These procedures check those characteristics that relate to the time base system and are listed as checked under *Warranted Characteristics* in *Specifications.*

Check timebase and delay time accuracy and reference

Equipment Required	Prerequisites
One timer-counter (Item *8* on page 123) One 50 Ω, precision coaxial cable (Item *4* on page 123) One SMA male-to-female BNC adapter (Item *19* on page 124) One sine wave generator (Item *9* on page 123)	(See *Prerequisites* on page 122.)
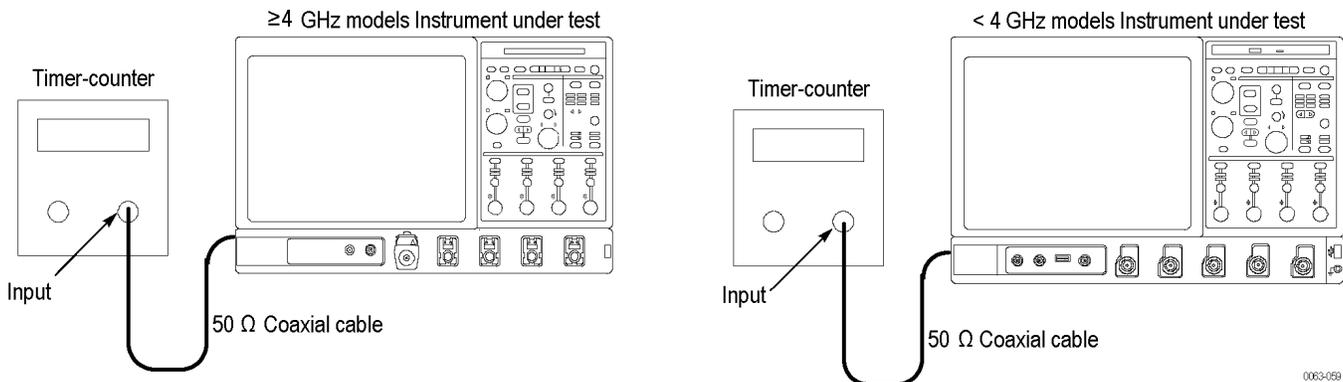
Figure 26: Timebase and delay time initial test hookup

1. *Install the test hookup and preset the instrument controls:*

   a. *Hook up the test-signal source*: Connect the input of the timer-counter to **AUX Out** (DPO7000C models) or reference output (MSO/DPO70000C/DX models). (See *Figure 26* on page 298.)

      • Set the timer-counter gate to 1 s.

      • Set the timer-counter to count the 10 MHz reference output.

   b. *Initialize the instrument:* Press the **Default Setup** button.

   c. DPO7000C models: Display menu mode. Select Utilities > External Signals and press **Ref Out**.

2. *Confirm the time base is within limits for accuracies:*

   a. *Check long-term sample rate, delay time accuracies, and reference output frequency:*

      • CHECK that the count on the timer-counter is within limits. (See *Long term sample rate, delay time, and internal reference accuracy* in the test record.)

      • Enter the count on the test record.

3. *Disconnect the hookup:* Disconnect the equipment from the instrument.
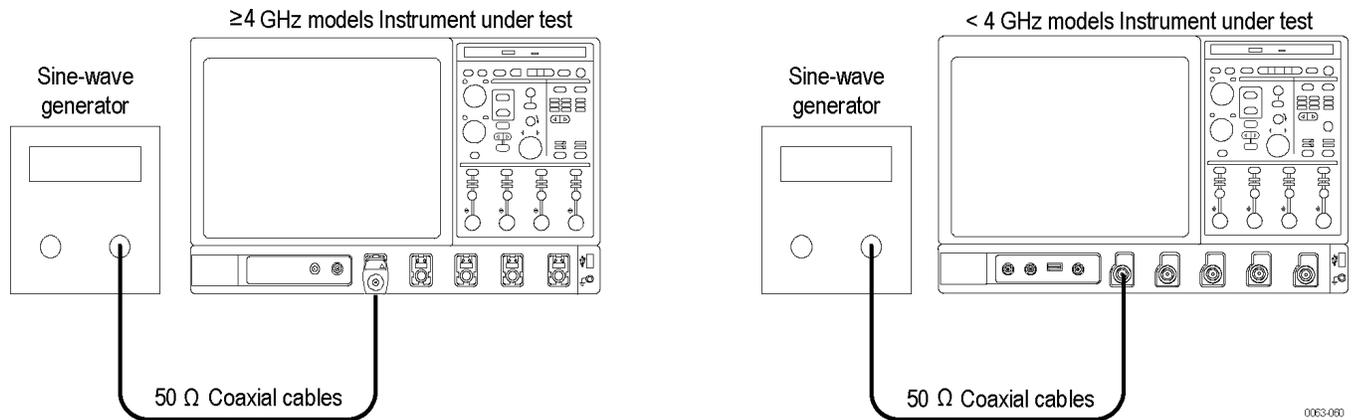
Figure 27: Timebase and delay time second test hookup

4. *Install the test hookup and preset the instrument controls:*

   a. *Initialize the instrument:* Press the **Default Setup** button.

   b. *Hook up the test-signal source*: Connect the output of the sine wave generator to **Ch 1** input. (See *Figure 27* on page 299.)

   - From the button bar, touch **Measure** and select the **Ampl** tab.
   - Touch the **Pk-Pk** button.
   - Touch the **X** (Close) button.
   - Set the Vertical **Scale** to 50 mV.
   - DPO7000C models: Touch **Vertical**, select **Vertical Setup**, and then touch Termination **50 Ω**.
   - Set the generator for a 10.0 MHz sine wave.
   - Set the generator to output a 4 division signal. Adjust the output until the Pk-Pk readout displays 200 mV.

   c. *Set the instrument controls:*

   - Move the cable from the **Ch 1** input to the rear-panel **Ext Ref** input (See *Figure 28* on page 299.)
   - From menu mode, touch **Utilities** and select **External Signals**.
   - Touch the **External** button to select the external reference.
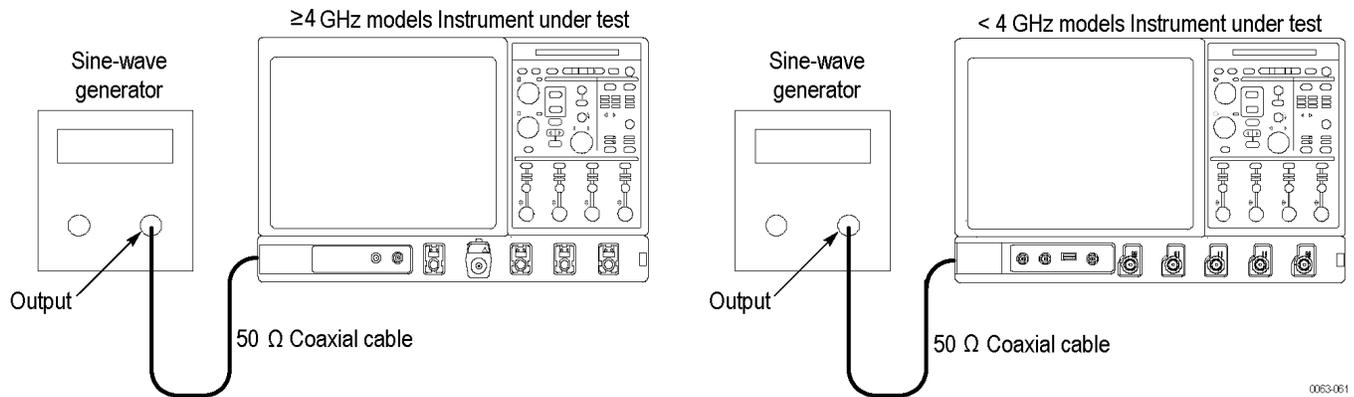
Figure 28: Timebase and delay time final test hookup

5. *Confirm external reference:*

   a. *Perform a signal path compensation:*

   - Touch **Utilities** and select **Instrument Calibration**.
   - Touch **Run SPC** (**Calibrate** on some instruments) and wait for the signal path compensation to finish.

   b. *Check the completion status:* Enter the pass/fail status in the test record. If the Status is Fail, refer the instrument to qualified service personnel.

6. *Disconnect the hookup:*

   a. Disconnect all test equipment from the instrument.

   b. *Set the instrument controls:*

   • From menu mode, touch **Utilities** and select **External Signals**.

   • Touch the **Internal** button to select the internal reference.

   c. *Perform a signal path compensation:*

   • Touch **Utilities** and select **Instrument Calibration**.

   • Touch **Run SPC** (**Calibrate** on some instruments) and wait for the signal path compensation to finish.

Check delta time measurement accuracy DPO7000C models

Equipment Required	Prerequisites
One 50 Ω, precision coaxial cable (Item *4* on page 123)	(See *Prerequisites* on page 122.)
One 50 Ω, 60 inch precision coaxial cable, male-to-male SMA connectors (Item *28* on page 125)	
One Pulse Generator (Item *20* on page 124)	
One BNC elbow connector (Item *24* on page 125)	
One SMA "T", male to two SMA female connectors (Item *22* on page 125)	
One SMA female to BNC male connector (Item *23* on page 125)	
One SMA termination connector, short circuit, (Item *25* on page 125)	
One SMA male-to-female BNC adapter (Item *17* on page 124)	

This procedure checks the "sample rate" portion of the Delta Time Measurement Accuracy as listed in *Specifications.* The previous procedure, that checks the reference, (See *Check timebase and delay time accuracy and reference* on page 298) verified the "PPM" portion of the delta time specification.
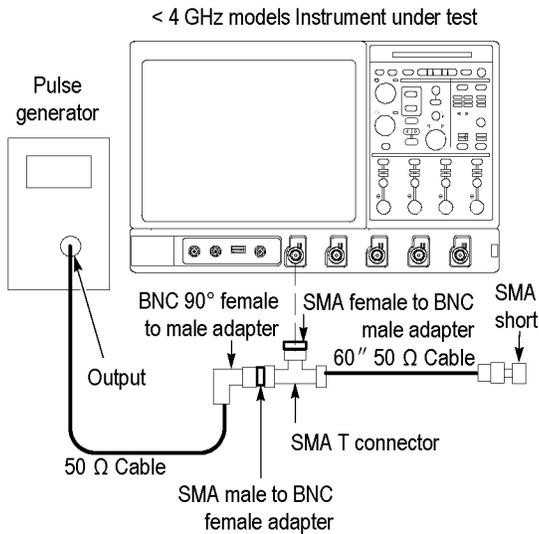
Figure 29: Delta time accuracy test hookup, <4 GHz models

1. *Install the test hookup and preset the instrument controls:*

   a. *Initialize the instrument:* Press the **Default Setup** button.

   b. *Hook up the pulse generator:*

      - DPO7000C models: Touch **Vertical**, select **Vertical Setup**, and then touch Termination **50 Ω**.

      - Connect the pulse generator output to a **50 Ω** precision coaxial cable followed by a 90° right-angle female to male SMA adapter. The adapter is connected to one side of the female SMA T connector. The other side of the SMA T is connected to a 60 inch **50 Ω** coaxial cable. Connect the SMA short, to the remaining end of the cable. Now connect the male SMA T connector to **Ch 1** through an SMA female to BNC male adapter.

      - Set the pulse generator output for a positive-going pulse with a rise-time as shown in the table for your instrument, and for the fastest possible repetition rate (at least 1 kHz). (See *Table 16* on page 301.)

      - Set the pulse generator output for about 500 mV. (This amplitude can be adjusted later to get a 5-division pulse on screen.)

   c. *Modify the initialized front-panel control settings:*

      - Power on the pulse generator.

      - Touch **Utilities**, select **User Preferences**, select the **Units** tab, and then select the **1-2-5** button.

      - Readjust the Trigger **Level** knob so the trigger level is about 50% of the rising edge of the positive pulse.

      - Press **Autoset**. You may see both positive and negative pulses. Adjust the Trigger **Level** knob so the trigger level is about 50% of the rising edge of the positive pulse.

      - From the button bar, touch the **Horiz/Acq** button and select the **Acquisition** tab. Press the **RT** button to turn on Real Time Only.

      - DPO7000C models: Set the horizontal SCALE as indicated in the following table.

Table 16: Delta time measurement settings

Instrument	Pulse generator rise and fall time range	Horizontal scale setting	Sample rate	Delta time accuracy limit
DPO7354C	≤ 150 ps	10 ns/div	10 GS/s	≤ 6.0 ps
DPO7254C	≤ 150 ps	10 ns/div	10 GS/s	≤ 6.0 ps
Table continued…				

Instrument	Pulse generator rise and fall time range	Horizontal scale setting	Sample rate	Delta time accuracy limit
DPO7104C	≤ 150 ps	10 ns/div	10 GS/s	≤ 6.0 ps
DPO7054C	≤ 150 ps	20 ns/div	5 GS/s	≤ 12.0 ps

- Adjust the generator output or instrument vertical scale and position as necessary to obtain at least **5 divisions** of the **positive** pulse.

d. *Set up for statistics measurements:*

- Press **Run/Stop** button to freeze the display.
- From the button bar, touch **Measure** and select the **Time** tab to show the Time Measurements menu.
- Touch the **Pos Width** button.
- Touch Setups **Statistics** and then touch **All**. Touch **Reset** to reset the statistics.
- Touch **Weight n=**. On the keypad press **1000**, then **Enter**. Touch **Setup**.
- Touch Setups **Ref Levs** and then touch **Absolute**.
- Touch **MidRef**. Using the keypad or multipurpose knobs, set the mid reference level. Set the reference level near the center of the upper portion of the pulse, above any noise, and below any overshoot or ringing on the pulse. Touch the **X** (Close) button.
- Press the **Run/Stop** button to start the acquisitions.
- Wait about 30 seconds.
- Press **Run/Stop** button to freeze the display.
- Read the Std Dev statistic measurement.
- The standard deviation (St Dev) measurement must be less than or equal to the Delta-time accuracy limit for your instrument. (See *Table 16* on page 301.)
- Enter the result for delta time on the test record.

e. *Repeat for all other channels:*

- Note the vertical scale setting of the channel just confirmed.
- Press the Vertical channel button for the channel just confirmed to remove the channel from display.
- Touch **Measure** and then **Clear All** to remove the measurement.
- Press the front-panel button that corresponds to the channel you are to confirm.
- Set vertical scale to the setting noted in step *#unique_62*, first bullet.
- Press the Trigger **Source** button to toggle the source to the channel selected.
- DPO7000C models: Touch **Vertical**, select **Vertical Setup**, and then touch Termination **50 Ω**.
- Move the test hookup to the channel you selected.
- Press **Run/Stop** button to start the display.
- Repeat step *1.d* on page 302.
- Touch **Utilities**, select **User Preferences**, select the **Units** tab, and then select the **1-2-3** button.

2. *Disconnect all test equipment from the instrument.*

Check delta time measurement accuracy MSO/DPO70000C/DX models

Equipment Required	Prerequisites
One 50 Ω, precision coaxial cable (Item *4* on page 123)	(See *Prerequisites* on page 122.)
One sine-wave generator (Item *9* on page 123)	
One adapter (Item *19* on page 124)	

This procedure checks the Delta Time Measurement Accuracy as listed in *Specifications.*
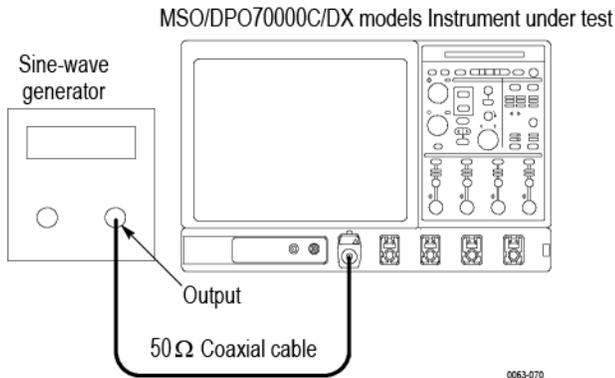
Figure 30: Delta time accuracy test hookup, MSO/DPO70000C/DX models

1. *Install the test hookup and preset the instrument controls:*

   a. *Initialize the instrument:* Press the **Default Setup** button.

   b. *Hook up the sine-wave generator:*

      • Connect the sine-wave output of the sine-wave generator through a **50 Ω** precision coaxial cable to **Ch 1** through an adapter.

      • Power on the generator.

      • Set the sine-wave generator to output a sine wave of the frequency shown in the table. (See *Table 17* on page 304.)

      • Set the generator output for 80 mV. (This amplitude will be adjusted later to get an 8-division pulse on screen.)

      • Set the Vertical Scale to 10 mV per division.

   c. *Modify the initialized front-panel control settings:*

      • Readjust the Trigger **Level** knob so the trigger level is at 50% of the rising edge of the sine wave.

      • From the button bar, touch the **Horiz/Acq** button. Select the **Manual** button to turn on Manual Mode.

      • Select the **Acquisition** tab. Press the **IT** button to turn on Interpolate Time Only.

      • From the button bar, touch the **Vertical** button.

      • Select **Analog Only** (for tests with BWE on, select **Digital Filters (DSP) Enabled**).

      • Set the vertical scale, generator frequency, record length, and sample rate as indicated in the following table for the instrument under test.

Table 17: Delta time measurement settings, MSO/DPO70000C/DX models

Instrument	Volts/div	Sine wave generator frequency	Record length	Sample rate (IT mode)	Burst width	Delta time rms accuracy limit	Delta time pk-pk accuracy limit
BWE off							
MSO/DPO72004C	10 mV	9.94 GHz	10000	500 GS/s	10 ns	1.280 ps	12.80 ps
	50 mV	9.94 GHz	10000	500 GS/s	10 ns	1.172 ps	11.72 ps
	100 mV	9.94 GHz	10000	500 GS/s	10 ns	1.186 ps	11.86 ps
MSO/DPO71604C	10 mV	9.94 GHz	10000	500 GS/s	10 ns	1.280 ps	12.80 ps
	50 mV	9.94 GHz	10000	500 GS/s	10 ns	1.172 ps	11.72 ps
	100 mV	9.94 GHz	10000	500 GS/s	10 ns	1.186 ps	11.86 ps
MSO/DPO71254C	10 mV	7.76 GHz	10000	500 GS/s	10 ns	1.304 ps	13.04 ps
	50 mV	7.76 GHz	10000	500 GS/s	10 ns	1.201 ps	12.01 ps
	100 mV	7.76 GHz	10000	500 GS/s	10 ns	1.205 ps	12.05 ps
MSO/DPO70804C	10 mV	4.97 GHz	10000	500 GS/s	10 ns	1.462 ps	14.62 ps
	50 mV	4.97 GHz	10000	500 GS/s	10 ns	1.295 ps	12.95 ps
	100 mV	4.97 GHz	10000	500 GS/s	10 ns	1.336 ps	13.36 ps
MSO/DPO70604C	10 mV	3.73 GHz	10000	500 GS/s	10 ns	1.625 ps	16.25 ps
	50 mV	3.73 GHz	10000	500 GS/s	10 ns	1.427 ps	14.27 ps
	100 mV	3.73 GHz	10000	500 GS/s	10 ns	1.463 ps	14.63 ps
MSO/DPO70404C	10 mV	2.48 GHz	10000	500 GS/s	10 ns	2.022 ps	20.22 ps
	50 mV	2.48 GHz	10000	500 GS/s	10 ns	1.762 ps	17.62 ps
	100 mV	2.48 GHz	10000	500 GS/s	10 ns	1.821 ps	18.21 ps
BWE on							
MSO/ DPO73304DX, 33 GHz	6.25 mV	19.5 GHz	10000	500 GS/s	10 ns	0.729 ps	7.29 ps
	50 mV	19.5 GHz	10000	500 GS/s	10 ns	0.536 ps	5.36 ps
	100 mV	19.5 GHz	10000	500 GS/s	10 ns	0.529 ps	5.29 ps

Table continued…

Instrument	Volts/div	Sine wave generator frequency	Record length	Sample rate (IT mode)	Burst width	Delta time rms accuracy limit	Delta time pk-pk accuracy limit
MSO/ DPO72504DX, 25 GHz	6.25 mV	15.5 GHz	10000	500 GS/s	10 ns	0.861 ps	8.61 ps
	50 mV	15.5 GHz	10000	500 GS/s	10 ns	0.604 ps	6.04 ps
	100 mV	15.5 GHz	10000	500 GS/s	10 ns	0.604 ps	6.04 ps
MSO/ DPO72304DX, 23 GHz	6.25 mV	14.3 GHz	10000	500 GS/s	10 ns	0.868 ps	8.68 ps
	50 mV	14.3 GHz	10000	500 GS/s	10 ns	0.591 ps	5.91 ps
	100 mV	14.3 GHz	10000	500 GS/s	10 ns	0.585 ps	5.85 ps
MSO/ DPO72004DX, 20 GHz	6.25 mV	12.4 GHz	10000	500 GS/s	10 ns	0.918 ps	9.18 ps
	50 mV	12.4 GHz	10000	500 GS/s	10 ns	0.661 ps	6.61 ps
	100 mV	12.4 GHz	10000	500 GS/s	10 ns	0.659 ps	6.59 ps
MSO/ DPO71604DX, 16 GHz	6.25 mV	9.94 GHz	10000	500 GS/s	10 ns	1.125 ps	11.25 ps
	50 mV	9.94 GHz	10000	500 GS/s	10 ns	0.741 ps	7.41 ps
	100 mV	9.94 GHz	10000	500 GS/s	10 ns	0.726 ps	7.26 ps
MSO/ DPO71254DX, 12.5 GHz	6.25 mV	7.76 GHz	10000	500 GS/s	10 ns	1.369 ps	13.69 ps
	50 mV	7.76 GHz	10000	500 GS/s	10 ns	0.872 ps	8.72 ps
	100 mV	7.76 GHz	10000	500 GS/s	10 ns	0.861 ps	8.61 ps
MSO/ DPO70804DX, 8 GHz	6.25 mV	4.97 GHz	10000	500 GS/s	10 ns	1.696 ps	16.96 ps
	50 mV	4.97 GHz	10000	500 GS/s	10 ns	1.209 ps	12.09 ps
	100 mV	4.97 GHz	10000	500 GS/s	10 ns	1.198 ps	11.98 ps
MSO/DPO72004C, 20 GHz 20 GHz 18 GHz	50 mV	9.94 GHz	10000	500 GS/s	10 ns	1.260 ps	12.60 ps
	100 mV	9.94 GHz	10000	500 GS/s	10 ns	1.432 ps	14.32 ps
	10 mV	9.94 GHz	10000	500 GS/s	10 ns	1.336 ps	13.36 ps

Table continued…

Instrument	Volts/div	Sine wave generator frequency	Record length	Sample rate (IT mode)	Burst width	Delta time rms accuracy limit	Delta time pk-pk accuracy limit
MSO/DPO71604C, 16 GHz	10 mV	9.94 GHz	10000	500 GS/s	10 ns	1.219 ps	12.19 ps
	50 mV	9.94 GHz	10000	500 GS/s	10 ns	1.154 ps	11.54 ps
	100 mV	9.94 GHz	10000	500 GS/s	10 ns	1.159 ps	11.59 ps
MSO/DPO71254C, 12.5 GHz	10 mV	7.45 GHz	10000	500 GS/s	10 ns	1.333 ps	13.33 ps
	50 mV	7.45 GHz	10000	500 GS/s	10 ns	1.212 ps	12.12 ps
	100 mV	7.45 GHz	10000	500 GS/s	10 ns	1.228 ps	12.28 ps
MSO/DPO70804C, 8 GHz	10 mV	4.97 GHz	10000	500 GS/s	10 ns	1.354 ps	13.54 ps
	50 mV	4.97 GHz	10000	500 GS/s	10 ns	1.235 ps	12.35 ps
	100 mV	4.97 GHz	10000	500 GS/s	10 ns	1.241 ps	12.41 ps
MSO/DPO70604C, 6 GHz	10 mV	3.73 GHz	10000	500 GS/s	10 ns	1.445 ps	14.45 ps
	50 mV	3.73 GHz	10000	500 GS/s	10 ns	1.295 ps	12.95 ps
	100 mV	3.73 GHz	10000	500 GS/s	10 ns	1.329 ps	13.29 ps
MSO/DPO70404C, 4 GHz	10 mV	2.48 GHz	10000	500 GS/s	10 ns	1.674 ps	16.74 ps
	50 mV	2.48 GHz	10000	500 GS/s	10 ns	1.437 ps	14.37 ps
	100 mV	2.48 GHz	10000	500 GS/s	10 ns	1.478 ps	14.78 ps

d. Adjust the generator output as necessary to obtain **8 divisions** of displayed waveform.

e. *Set up for statistics measurements:*

- From the button bar, touch **Measure** and select the **More** tab to show the More Measurements menu.
- Touch the **Burst Width** button.
- Touch Setups **Gating** and then touch **Cursor**.
- Touch **Setup**.
- Touch Setups **Statistics** and then touch **All**. Set the Weight n= to **1000**. Touch **Reset** to reset the statistics.
- Touch **Setup**.
- Touch Setups **Ref Levs** and then touch **Absolute**.
- Touch **MidRef**. Using the keypad or multipurpose knobs, set the mid reference level to **0 V**. Touch the **X** (Close) button.
- Click one of the cursors to assign the multipurpose knobs to the cursors.
- Using the multipurpose knobs, set the Cursor 1 x position to –5.0 ns, and set the Cursor 2 x position to +5 ns.
- Press the **Multiview Zoom** front panel button.
- Using the multipurpose knobs, set the Zoom position to 25%, and set the Zoom factor to 20.
- Press the **Cursors** front-panel button once to assign the multipurpose knobs to the Cursors.

- • Set the Cursor 1 x position to align the cursor with the nearest trough of the waveform.
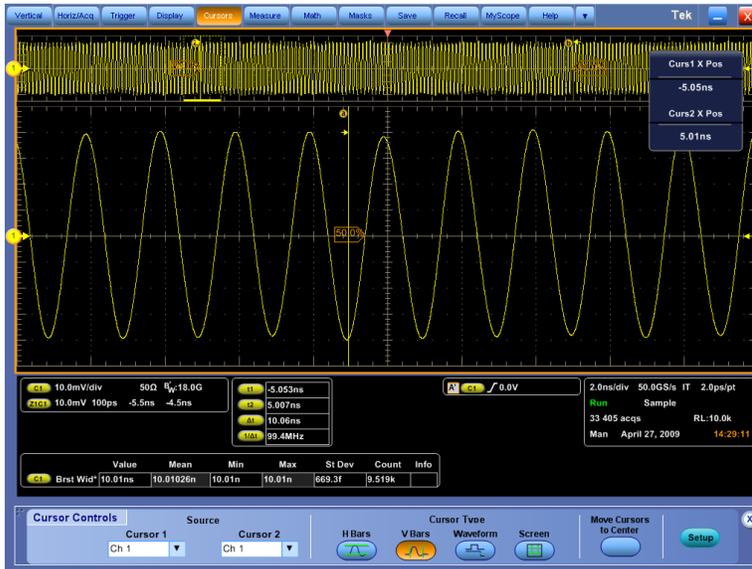
- • Press the **Zoom** button. Set the Zoom position to 75%.
- • Press the **Cursors** button once. Set the Cursor 2 x position to align the cursor with the nearest trough of the waveform.

f. *Read the measurement:*

- • Press the **Clear** button. Allow approximately 1000 acquisitions to accumulate, then press **Run/Stop**.
- • Read the Std Dev statistic measurement.
- • Enter the time on the test record.
- • The standard deviation (St Dev) measurement must be less than or equal to the rms Delta-time accuracy limit for your instrument. (See *Table 17* on page 304.)
- • Read the Max and Min statistic measurements.
- • Subtract the Max and Min statistic measurements.
- • Enter the time on the test record.
- • The absolute value of the difference of the Max and Min measurements must be less than or equal to the pk-pk Delta-time accuracy limit for your instrument and bandwidth setting. (See *Table 17* on page 304.)
- • Press the **Run/Stop** button.

g. *Repeat for all other Volts/div settings in the table:*

- • Set the vertical scale, generator frequency, record length, and sample rate as indicated in the table.
- • Repeat step *1.f* on page 307.

2. *Disconnect all test equipment from the instrument.*

Trigger system checks

These procedures check those characteristics that relate to the trigger system and are listed as checked in *Specifications.*

Check time qualified trigger accuracy

Equipment Required	Prerequisites
One sine wave generator (Item *9* on page 123) One 2X attenuator (Item *26* on page 125) One 50 Ω, precision coaxial cable (Item *4* on page 123) One SMA male-to-female BNC adapter (Item *19* on page 124)	(See *Prerequisites* on page 122.)

1. *Install the test hookup and preset the instrument controls:*

    a. *Initialize the instrument:* Press the **Default Setup** button.

    b. *Modify the default setup:*

        • DPO7000C models: Set the horizontal **Scale** to 2.5 ns.

        • MSO/DPO70000C/DX models: Set the horizontal **Scale** to 2 ns.

        • DPO7000C models: From the button bar, click the **Vertical** button; then click the Termination **50 Ω** button.

    c. *Hook up the test-signal source:* Connect the output of the sine wave generator to Ch 1 as shown in the following figure.
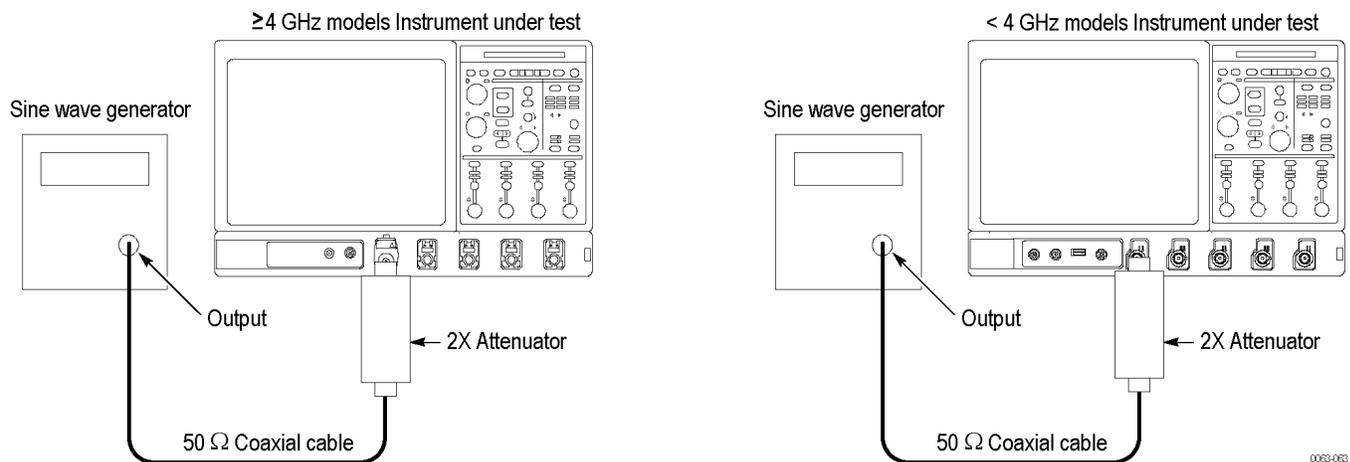
Figure 31: Time qualified trigger test hookup

    d. *Set the trigger mode:* Press the Trigger **Mode** button to toggle it to **Normal**.

Set upper and lower limits that ensure triggering. Then change limits until triggering stops.
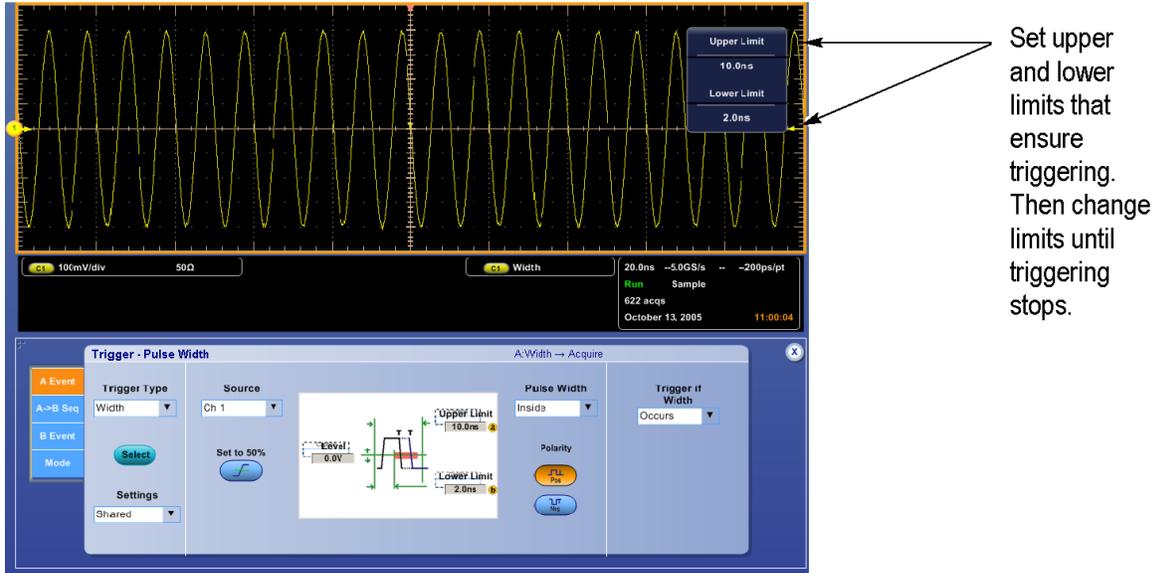
Figure 32: Measurement of time accuracy for pulse and glitch triggering

2. *Confirm the trigger system is within time-accuracy limits for time qualified trigger accuracy (time range <1 µs):*

   a. *Set upper and lower limits that ensure triggering at 100 MHz:* (See *Figure 32* on page 309.)

      • Press the front-panel **Advanced** button and select the **A Event** tab; then pull down on Trigger Type and select **Width** triggering.

      • Pull down Pulse Width and select **Inside** limits.

      • Touch **Upper Limit**. Use the keypad to set the upper limit to 10 ns.

      • Touch **Lower Limit**. Use the keypad to set the lower limit to 2 ns.

   b. *Display the test signal:*

      • Set the Horizontal **Scale** to 20 ns.

      • Set the output of the sine wave generator for a 100 MHz, five-division sine wave on screen. Set the Vertical **Scale** to 20 mV (the waveform will overdrive the display).

      • Press **PUSH-SET 50%**.

   c. *Check against limits:* Do the following subparts in the order listed.

      • While doing the following subparts, monitor the display (it will stop acquiring) and the front-panel light **Trig'd** (it will extinguish) to determine when triggering is lost.

      • MSO/DPO70000C/DX models: Press the multipurpose knobs until Fine is on.

      • Use the multipurpose knob to *increase* the **Lower Limit** readout until triggering is lost.

      • CHECK that the **Lower Limit** readout, after the instrument stops triggering, is within the following limits:

Model	Limit
DPO7000C models	3.5 ns to 6.5 ns
MSO/DPO70000C/DX models	4.77 ns to 5.23 ns

      • Enter the time on the test record.

      • Use the keypad to return the **Lower Limit** to 2 ns and reestablish triggering.

      • Touch **Upper Limit**; then use the multipurpose knob to slowly *decrease* the **Upper Limit** readout until triggering stops.

- CHECK that the **Upper Limit** readout, after the instrument loses triggering, is within the following limits:

Model	Limit
DPO7000C models	3.5 ns to 6.5 ns, inclusive
MSO/DPO70000C/DX models	4.77 ns to 5.23 ns, inclusive

- Enter the time on the test record.

3. *Confirm the trigger system is within time-accuracy limits for pulse-glitch or pulse-width triggering (time range ≥1 μs):*

   a. *Set upper and lower limits that ensure triggering at 250 kHz:*

   - Touch **Upper Limit**. Use the keypad to set the upper limit to 4 μs.
   - Touch **Lower Limit**. Use the keypad to set the lower limit to 500 ns.

   b. *Display the test signal:*

   - DPO7000C models: Set the Horizontal **Scale** to 5 μs.
   - MSO/DPO70000C/DX models: Set the Horizontal **Scale** to 4 μs.
   - Set the Vertical **Scale** to 100 mV.
   - Set the output of the sine wave generator for a 250 kHz, five-division sine wave on screen. Set the Vertical **Scale** to 20 mV (the waveform will overdrive the display).
   - Press **PUSH-SET 50%**.

   c. *Check against limits:* Do the following subparts in the order listed.

   - MSO/DPO70000C/DX models: Press the multipurpose knobs until Fine is on.
   - Use the multipurpose knob to *increase* the **Lower Limit** readout until triggering is lost.
   - CHECK that the **Lower Limit** readout, after the instrument stops triggering, is within the following limits:

Model	Limit
DPO7000C models	1.9 μs to 2.1 μs, inclusive
MSO/DPO70000C/DX models	1.9 μs to 2.1 μs, inclusive

   - Enter the time on the test record.
   - Use the keypad to return the **Lower Limit** to 500 ns and reestablish triggering.
   - Touch **Upper Limit**; then use the multipurpose knob to slowly *decrease* the **Upper Limit** readout until triggering stops.
   - CHECK that the **Upper Limit** readout, after the instrument loses triggering, is within the following limits:

Model	Limit
DPO7000C models	1.9 μs to 2.1 μs, inclusive
MSO/DPO70000C/DX models	1.9 μs to 2.1 μs, inclusive

   - Enter the time on the test record.

4. *Disconnect the hookup:* Disconnect the equipment from the instrument.

Check sensitivity edge trigger DC coupled

Equipment required	Prerequisites
One leveled sine wave generator (Item *9* on page 123)	(See *Prerequisites* on page 122.)
Three precision 50 Ω coaxial cables (Item *21* on page 124)	
Two SMA female to BNC male adapters (Item *23* on page 125)	
Three SMA female-to-female adapters (Item *16* on page 124)	
One 10X attenuator (Item *1* on page 122)	
One power splitter (Item *11* on page 124)	
Male N-to-BNC adapter (Item *14* on page 124)	
One SMA adapter (Item *19* on page 124)	
One 5X attenuator (Item *2* on page 122)	
One 2X attenuator (Item *26* on page 125)	
DPO7000C models, one 50 Ω termination (Item *3* on page 123)	

⚠️ **Note:** The sine wave generator output amplitude must be leveled to within 0.35 dB of the reference frequency (10 MHz) through the trigger frequency being tested. Refer to the Sine Wave Generator Leveling Procedure if your sine wave generator does not have automatic output amplitude leveling. (See *Sine wave generator leveling procedure* on page 328.)

1. *Install the test hookup and preset the instrument controls:*

    a. *Initialize the instrument:* Press the **Default Setup** button.

    b. *Modify the initialized front-panel control settings:*

      • Set the Horizontal **Scale** to 20 ns.

      • DPO7000C models: Touch **Vertical**, select **Vertical Setup**, and then touch Termination **50 Ω**.

      • Press the Trigger **Mode** button to toggle it to **Normal**.

      • From the button bar, touch **Horiz/Acq** and select the **Acquisition** tab.

      • Touch **Average** and set the number of averages to **16**.

      • Touch the **Equivalent ET** button.

    c. *Hook up the test-signal source:*

      • Connect the signal output of the generator to a power splitter. Connect one output of the power splitter to **Ch 1** as shown in the following figure. Connect the other output of the power splitter to the **Aux Input** as in the following figure.
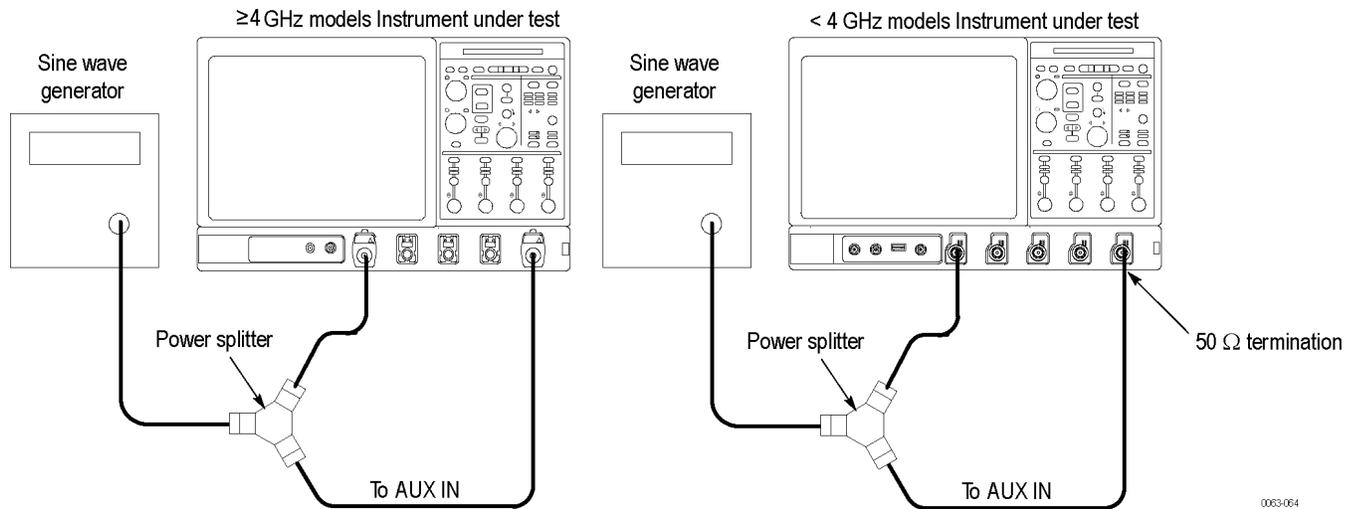
Figure 33: Sensitivity, edge trigger, DC coupled test hookup

2. *Confirm the trigger system is within sensitivity limits (50 MHz):*

   a. *Display the test signal:*

      • Set the generator frequency to 50 MHz.

      • From the button bar, touch **Measure**.

      • Touch Setup **Ref Levs**; then touch the **Min-Max** button.

      • Touch the **Setup** button and select the **Ampl** tab; then touch the **Amplitude** button.

      • Touch the X (close) button.

      • Press **Push-Set 50%**.

      • Set the generator amplitude on screen as follows:

Model	Divisions
MSO/DPO70000C/DX models	4 divisions
DPO7000C models	7 divisions

      • Now fine adjust the generator output until the **Ch 1 Amplitude** readout indicates the amplitude is as follows (Readout may fluctuate):

Model	Amplitude
MSO/DPO70000C/DX models	400 mV
DPO7000C models	700 mV

      • Disconnect the 50 Ω precision coaxial cable at **Ch 1** and reconnect it to **Ch 1** through a 10X attenuator.

   b. *Check the A trigger system for stable triggering at limits:*

      • Read the following definition: A stable trigger is one that is consistent; that is, one that results in a uniform, regular display triggered on the selected slope (positive or negative). This display should *not* have its trigger point switching between opposite slopes, nor should it roll across the screen. At horizontal scale settings of 2 ms/division and faster, **Trig'd** will remain constantly lighted. It will flash for slower settings.

- Press the Trigger **Slope** button to select the positive slope.

- Adjust the Trigger **Level** knob so that there is a stable trigger. CHECK that the trigger is stable for the test waveform on the positive slope.

- Press the Trigger **Slope** button to select the negative slope. Adjust the Trigger **Level** knob so that there is a stable trigger.

- CHECK that the trigger is stable for the test waveform on the negative slope.

- Enter pass or fail in the test record.

- Leave the trigger system triggered on the positive slope of the waveform before continuing to the next step.
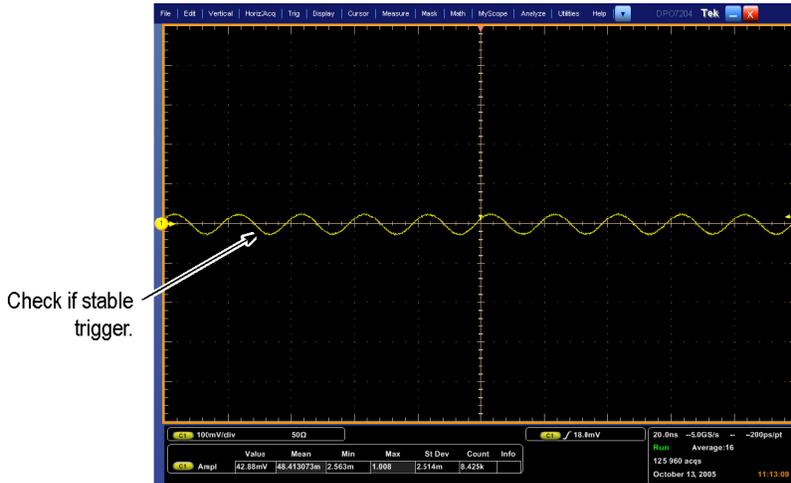
Figure 34: Measurement of trigger sensitivity - 50 MHz results shown

c. MSO/DPO70000C/DX models: *Check B trigger system for stable triggering at limits:* Do the following subparts in the order listed.

- From the button bar touch **Trig**, select the **A Event** tab, and set the **Source** to Line.

- Select the **A->B Seq** tab, and touch the A then B **Trig After Time** button.

- Select the **B Event** tab, and touch the **Set To 50%** button.

- CHECK that a stable trigger is obtained for the test waveform for both the positive and negative slopes of the waveform. Use the **Trigger Level** knob to stabilize the A trigger. Touch **Level** and use the keypad or the multipurpose knob/Fine button to stabilize the B trigger. Touch one of the Slope buttons to switch between trigger slopes. (See *Figure 34* on page 313.)

- Enter pass or fail in the test record.

- Leave the Delayed trigger system triggered on the positive slope of the waveform before continuing to the next step. Also, return to the A trigger: select the **A->B Seq** tab and touch the A->B Sequence **A Only** button. Then select the **A Event** tab.

- Select the **A Event** tab, and set the **Source** to CH1.

- Press the X (Close button).

3. *Confirm the AUX Trigger input (at 50 MHz):*

   a. *Display the test signal:*

   - Remove the 10X attenuator and reconnect the cable to **Ch 1**.

   - Set the signal amplitude as follows: **2.5 divisions**

   - Now fine adjust the generator output until the **Ch 1 Amplitude** readout indicates the amplitude is as follows (readout may fluctuate): **250 mV**

   b. *Check the AUX trigger source for stable triggering at limits:* Do the following in the order listed.

   - Use the definition for stable trigger from step *2.b* on page 312.

   - Press the Trigger **Source** button to toggle it to **Aux** (Ext).

   - Press **Push-Set 50%**.

- CHECK that a stable trigger is obtained for the test waveform on both the positive and negative slopes. Press the Trigger **Slope** button to switch between trigger slopes. Use the Trigger **Level** knob to stabilize the trigger if required.
- Enter pass or fail in the test record.
- Leave the trigger system triggered on the positive slope of the waveform before proceeding to the next check.
- Press the Trigger **Source** button to toggle it to **Ch 1**.

4. *Confirm that the A trigger system is within sensitivity limits (full bandwidth):*

   a. *Set the Horizontal Scale:* Set the Horizontal **Scale** to 200 ps.

   b. *Display the test signal:*

      - Set the generator frequency to full bandwidth as follows:

Model	Generator frequency
MSO/DPO70000C/DX models	4 GHz
DPO7354C	3.5 GHz
DPO7254C	2.5 GHz
DPO7104C	1 GHz
DPO7054C	500 MHz

      - Set the generator amplitude on screen as follows:

Model	Amplitude
MSO/DPO70000C/DX models	2 divisions
DPO7354C	2.5 divisions
DPO7254C	6 divisions
DPO7104C	6 divisions
DPO7054C	6 divisions

      - Now fine adjust the generator output until the **Ch 1 Amplitude** readout indicates the amplitude is as follows (readout may fluctuate):

Model	Amplitude
MSO/DPO70000C/DX models	200 mV
DPO7354C	250 mV
DPO7254C	600 mV
DPO7104C	600 mV
DPO7054C	600 mV

- Disconnect the cable at **Ch 1** and reconnect it to **Ch 1** through an attenuator:

Model	Attenuator
MSO/DPO70000C/DX models	2X
DPO7354C	None
DPO7254C	5X
DPO7104C	5X
DPO7054C	5X

- Check that a stable trigger is obtained.

c. Repeat step *2* on page 312, substeps *2.b* on page 312 and *2.c* on page 313 for the full bandwidth selected.

Table 18: Trigger settings for MSO/DPO70000C/DX models

| Generator amplitude | Generator frequency | | Horizontal scale |
	A trigger	B trigger	
	10 MHz	10 MHz	200 ns
150 mV	6 GHz	6 GHz	200 ps
200 mV	8 GHz	NA	200 ps
500 mV	11 GHz	9 GHz	200 ps

d. MSO/DPO70000C/DX models: *Display the test signal:*

- Remove the attenuator.

- Set the generator frequency to 10 MHz. Set the Horizontal SCALE as indicated in the table. (See *Table 18* on page 315.)

- Fine adjust the generator output until the **Ch 1 Amplitude** readout indicates the amplitude listed in the table for a frequency not yet checked. (See *Table 18* on page 315.)

- Set the generator frequency to the frequency in the table that corresponds to the amplitude just set. Set the Horizontal **SCALE** as indicated in the table. (See *Table 18* on page 315.)

- CHECK that a stable trigger is obtained.

- Read the following definition: A stable trigger is one where the **Trig'd** LED will remain constantly lighted.

- Press the Trigger **Slope** button to select the positive slope.

- Adjust the Trigger **Level** knob so that there is a stable trigger. CHECK that the trigger is stable.

- Press the Trigger **Slope** button to select the negative slope. Adjust the Trigger **Level** knob so that there is a stable trigger.

- CHECK that the trigger is stable.

- Enter pass or fail in the test record.

- Leave the trigger system triggered on the positive slope of the waveform before continuing to the next step.

- From the button bar touch **Trig**, select the **A Event** tab, and set the **Source** to Line.

- If you are using a generator amplitude of 200 mV, skip to step *4.e* on page 316.

- If the generator frequency is different for the B trigger, set the generator frequency to the frequency in the table that corresponds to the amplitude in the table. (See *Table 18* on page 315.)

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- From the button bar touch **Trig**, select the **A->B Seq** tab, and touch the A then B **Trig After Time** button.
- Select the **B Event** tab, and touch the **Set To 50%** button.
- CHECK that a stable trigger is obtained for the test waveform for both the positive and negative slopes of the waveform. Use the **Trigger Level** knob to stabilize the A trigger. Touch **Level** and use the keypad or the multipurpose knob/Fine button to stabilize the B trigger. Touch one of the Slope buttons to switch between trigger slopes. (See *Figure 34* on page 313.)
- Enter pass or fail in the test record.
- Leave the B trigger system triggered on the positive slope of the waveform before continuing to the next step. Also, return to the A trigger: select the **A->B Seq** tab and touch the A->B Sequence **A Only** button. Then select the **A Event** tab.
- From the button bar touch **Trig**, select the **A Event** tab, and set the **Source** to CH1.
- Press the X (Close button).

e. MSO/DPO70000C/DX models: Repeat step *4.d* on page 315 until each frequency in the table is checked. (See *Table 18* on page 315.)

f. *Display the test signal (Aux trigger at bandwidth):*

- Set the Horizontal Scale to 1 ns.
- DPO7000C models: Remove the attenuator and reconnect the cable to **Ch 1**.
- MSO/DPO70000C/DX models: Reconnect the cable to **Ch 1**.
- Set the generator frequency to full bandwidth as follows:

Model	Generator frequency
MSO/DPO70000C/DX models	1 GHz
DPO7000C models	250 MHz

- Set the generator amplitude on screen as follows:

Model	Amplitude
MSO/DPO70000C/DX models	7 divisions
DPO7000C models	7 divisions

- Now fine adjust the generator output until the **Ch 1 Amplitude** readout indicates the amplitude is as follows (readout may fluctuate):

Model	Amplitude
MSO/DPO70000C/DX models	700 mV
DPO7000C models	700 mV

- Disconnect the cable at **Aux In** and reconnect it to **Aux In** through an attenuator:

Model	Attenuator
MSO/DPO70000C/DX models	2X
DPO7000C models	2X

g. Repeat step *4.f* on page 316 only, for the full bandwidth selected.

> ⚠ **Note:** You just checked the trigger sensitivity. If desired, you may repeat steps *1* on page 311 through step *4.c* on page 315 for the other channels (Ch 2, Ch 3, and Ch 4).

5. *Disconnect the hookup:* Disconnect the equipment from Aux In and the channel last tested.

Output signal checks

The procedure that follows checks those characteristics of the output signals that are listed as checked under *Warranted Characteristics* in *Specifications.*

Check aux trigger out

Equipment required	Prerequisites
One precision 50 Ω coaxial cable (Item *4* on page 123) One 2X attenuator (Item *33* on page 125)	(See *Prerequisites* on page 122.) Also, the instrument must have passed the *DC Voltage Measurement Accuracy*. (See *Signal acquisition system checks* on page 224.)

1. *Install the test hookup and preset the instrument controls:*
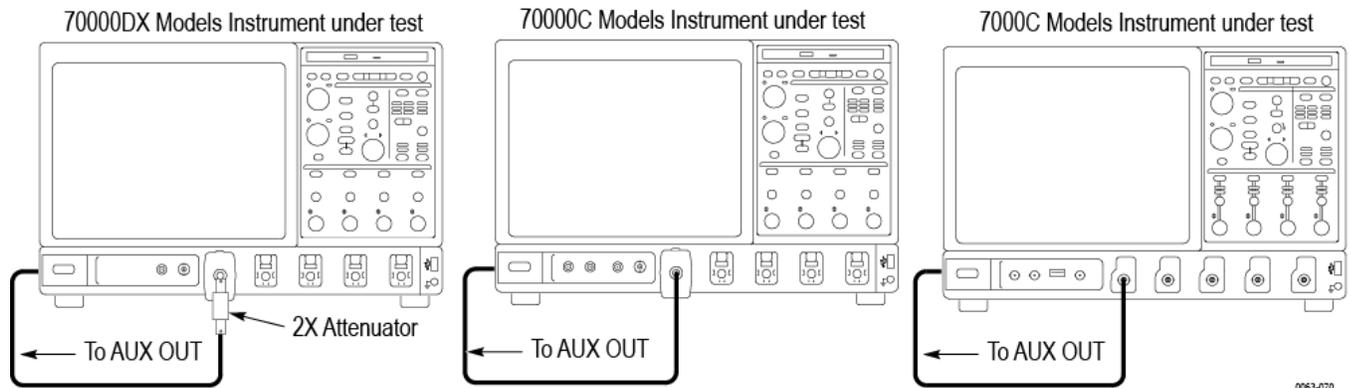
Figure 35: Aux Trigger Out test hookup

a. *Hook up test-signal source:* Connect **Aux Out** to **Ch 1** through a 50 Ω precision cable and an adapter. (See *Figure 35* on page 317.)

b. *Initialize the instrument:* Press the **Default Setup** button.

c. *Modify the initialized front-panel control settings:*

   - Press the Vertical **Ch 1** button to toggle it off.
   - Set the Horizontal **Scale** to 200 μs.
   - From the button bar, touch **Horiz/Acq** and select the **Acquisition** tab.
   - Touch **Average** and set the number of averages to **64**.
   - Touch the **X** (close) button.

2. *Confirm Aux Out is within limits for logic levels:*

a. *Display the test signal:*

   - Press the Vertical **Ch 1** button to display that channel.
   - DPO7000C models: Touch **Vertical**, select **Vertical Setup**, and then touch Termination **50 Ω**.

- Set the **Vertical Scale** to **500 mV** /div (DPO7000C, MSO/DPO70000C models) or **120 mV**/div (MSO/DPO70000DX models).
- Use the Vertical **Position** knob to center the display on screen.

b. *Measure logic levels:*

- From the button bar, touch **Measure** and select the **Ampl** tab.
- Touch the **High** and **Low** buttons.
- Touch the **X** (close) button.

c. *Check Aux Out output against limits:* (See *Figure 36* on page 318.)

- DPO7000C, MSO/DPO70000C models: CHECK that the **Ch 1 High** readout is ≥1.0 volt and that the **Ch 1 Low** readout ≤0.25 volts.

  MSO/DPO70000DX models: CHECK that the **Ch 1 High** readout is ≥0.5 volt and that the **Ch 1 Low** readout ≤0.125 volts.

3. *Disconnect the hookup:* Disconnect the test setup from the inputs and outputs.

Figure 36: Measurement of trigger out limits

Check probe compensation or fast edge output

Equipment required	Prerequisites
One BNC to Minigrabber adapter (item *18* on page 124) One precision 50 Ω coaxial cable (Item *21* on page 124) One DC calibration generator (Item *6* on page 123) One adapter (Item *19* on page 124)	(See *Prerequisites* on page 122.) Also, the instrument must have passed *Check Timebase and Delay Time Accuracy and Reference.* (See *Check timebase and delay time accuracy and reference* on page 298.)

1. *Install the test hookup and preset the instrument controls:*

a. *Hook up test-signal:* Refer to the following figure.

≥4 GHz models Instrument under test

< 4 GHz models Instrument under test

SMA cable from FAST EDGE output to Ch 1 input

Cable from channel input to PROBE COMPENSATION output through minigrabber.

0063-065
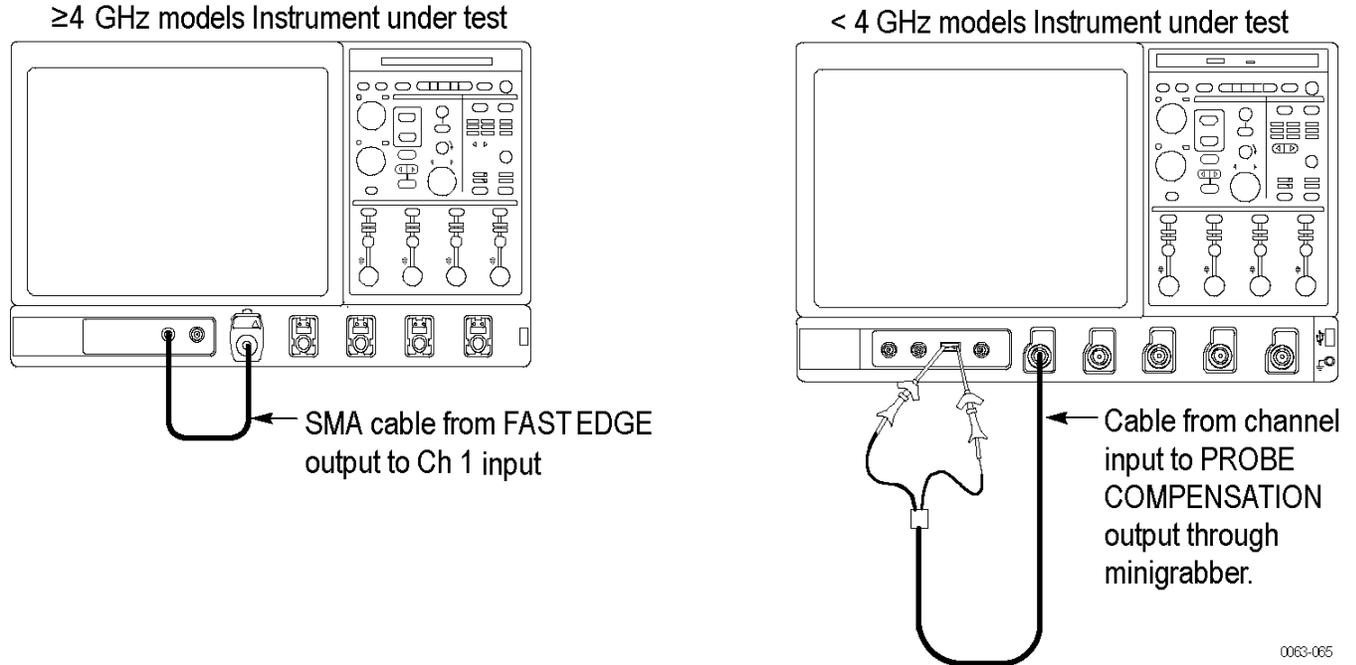
Figure 37: Probe compensation or fast edge output initial test hookup

b. *Initialize the instrument:* Press the **Default Setup** button.

c. *Modify the initialized front-panel control settings:*

- Set the **Vertical Scale** to **200 mV** /div (DPO7000C, MSO/DPO70000C models) or **120 mV**/div (MSO/DPO70000DX models).
- Set the Horizontal **Scale** to 200 µs.
- Press **Push-Set 50%**.
- Use the Vertical **Position** knob to center the display on screen.
- From the button bar, touch **Horiz/Acq** and select the **Acquisition** tab.
- Touch **Average** and set the number of averages to **128**.

2. *Confirm the Probe Compensator signal:*
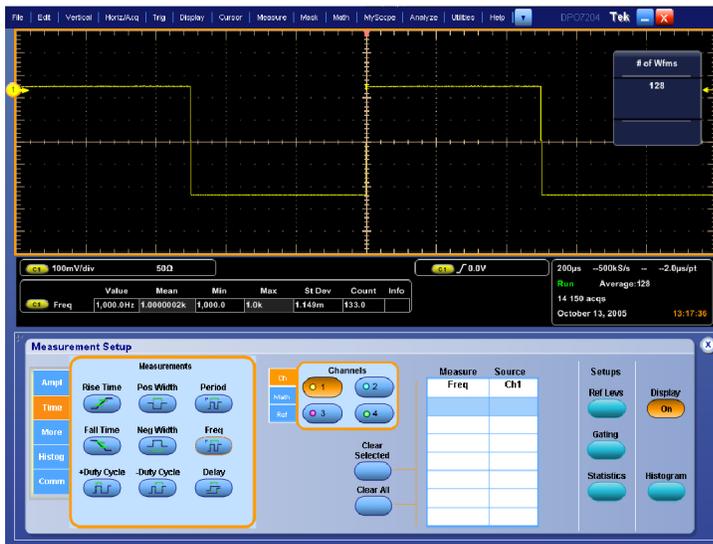
Figure 38: Measurement of probe compensator frequency

a. *Save the probe compensation signal in reference memory:*

- From the menu bar, touch **File**; **Save As . . .**, **Waveform**, and then **Ref 1**.
- Touch the **Save** button to save the probe compensation signal in reference 1.
- DPO7000C models: Disconnect the signal from **Ch 1** and the probe compensation connector.
- MSO/DPO70000C/DX models: Disconnect the signal from **Ch 1** and the Fast Edge connector.
- Touch **File**; **Recall . . .**, **Waveform**, and then select the file name.
- Touch the **Recall** button to recall the probe compensation signal to the display.

b. *Hook up the DC standard source:*

- Set the output of a DC calibration generator to off or 0 volts.
- Connect the output of a DC calibration generator to **Ch 1**. Refer to the following figure.
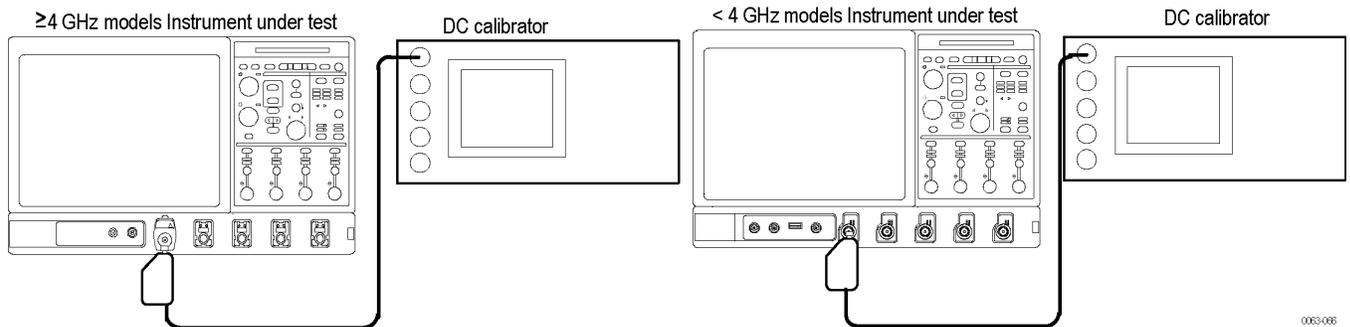
Figure 39: Probe compensation or fast edge output second test hookup

c. *Measure amplitude of the probe compensation signal:*

- From the button bar, touch **Horiz/Acq** and select the **Acquisition** tab.
- Touch **Average** and set the number of averages to **16** using the keypad or the multipurpose knob.
- Adjust the output of the DC calibration generator until it precisely overlaps the top (upper) level of the stored probe compensation signal.
- Record the setting of the DC generator.
- Adjust the output of the DC calibration generator until it precisely overlaps the base (lower) level of the stored probe compensation signal.
- Record the setting of the DC generator.

d. Press the **X** (close) button to remove the menus from the display. (See *Figure 40* on page 321.)

Figure 40: Measurement of probe compensator amplitude

e. *Check against limits:*

- Subtract the value just obtained (base level) from that obtained previously (top level).

- CHECK that the difference obtained is within limits as follows:

Model	Limits
MSO/DPO70000C/DX models	343.2 mV to 536.8 mV
DPO7000C models	985 mV to 1015 mV

- Enter voltage difference on test record.

3. *Disconnect the hookup:* Disconnect the equipment from **Ch 1**.

Serial trigger checks (Optional on some models)

These procedures check those characteristics that relate to the serial trigger system and are listed as checked in *Specifications.*

Check serial trigger baud rate limits

Equipment required	Prerequisites
One precision 50 Ω coaxial cable (Item *4* on page 123) One sine-wave generator (Item *9* on page 123) One adapter (Item *19* on page 124)	(See *Prerequisites* on page 122.) Also, the instrument must have passed *Check DC Voltage Measurement Accuracy.* (See *Signal acquisition system checks* on page 224.)

1. *Install the test hookup and preset the instrument controls:*

Figure 41: Serial trigger baud rate test hookup

a. *Hook Up the test-signal source:* (See *Figure 41* on page 322.)

- Connect the sine wave output of the sine-wave generator through a 50 Ω precision coaxial cable to Ch 1 through an adapter.
- Set the sine-wave generator to output a 416 MHz sine wave.

b. *Initialize the instrument:* Press the **Default Setup** button.

c. Modify the initialized front-panel control settings:

- Set the vertical **Scale** to 50 mV per division.
- DPO7000C models: Touch **Vertical**, select **Vertical Setup**, and then touch Termination **50 Ω**.
- Set the horizontal **Scale** to 1 ns per division.
- Adjust the sine-wave generator output for 4 divisions of amplitude centered on the display.
- Adjust the trigger **Level** to trigger at 25% (-1 division) on the sine wave.

Table 19: Serial pattern data

Serial pattern data	Trigger location
B6DB 6DB6 DB6D B6DB$_{16}$	One UI before the 0
6DB6 DB6D B6DB 6DB6$_{16}$	At the 0
DB6D B6DB 6DB6 DB6D$_{16}$	One UI after the 0

2. *Verify that the signal path can do isolated 0 and pattern matching circuits can do isolated 1:*

a. From the button bar, touch **Cursors** and then the **Setup** button. If using the menu bar, touch **Cursors** and then select **Cursor Setup**. Touch the **Cursor** button to toggle it on and display the cursors.

b. Set the Tracking Mode to **Tracking**.

c. Touch the **X** (close) button.

d. From the button bar, touch **Trig**, select the **A Event** tab, and touch the **Select** button.

e. Touch the **Serial** button, set Coding to NRZ, and then set the Standard to **GB Ethernet**.

f. Touch the **Edit** button.

g. Set the Format to **Hex** and then touch the **Clear** button.

h. Enter data into the Serial Pattern Data field for one of the settings in the table that is not yet checked, starting with the first setting. (See *Table 19* on page 322.)

i. Touch **Enter**.

j. Right click on the graticule, select Cursors > **Move Cursors to Center**.

k. Adjust the cursors until the Δt readout equals 800 ps (one unit interval).

l. Center Cursor 2 in the low of the waveform just to the right of the center graticule line (See *Figure 42* on page 323.)

m. Verify that the instrument triggers one Unit Interval (UI, one baud divided by the bit period) before the 0 in the input signal. The absolute value of the T1 cursor readout must be ≤325 ps. Enter pass or fail in the test record.

n. Touch the **Edit** and then the **Clear** button.

o. Enter data into Serial Pattern Data field for the next setting in the table that is not yet checked. (See *Table 19* on page 322.)

p. Touch **Enter**.

q. Center the Cursor 1 in the low of the waveform nearest the center graticule line. (See *Figure 42* on page 323.)

Triggered 1 UI before a 0	Triggered on a 0	Triggered 1 UI after a 0
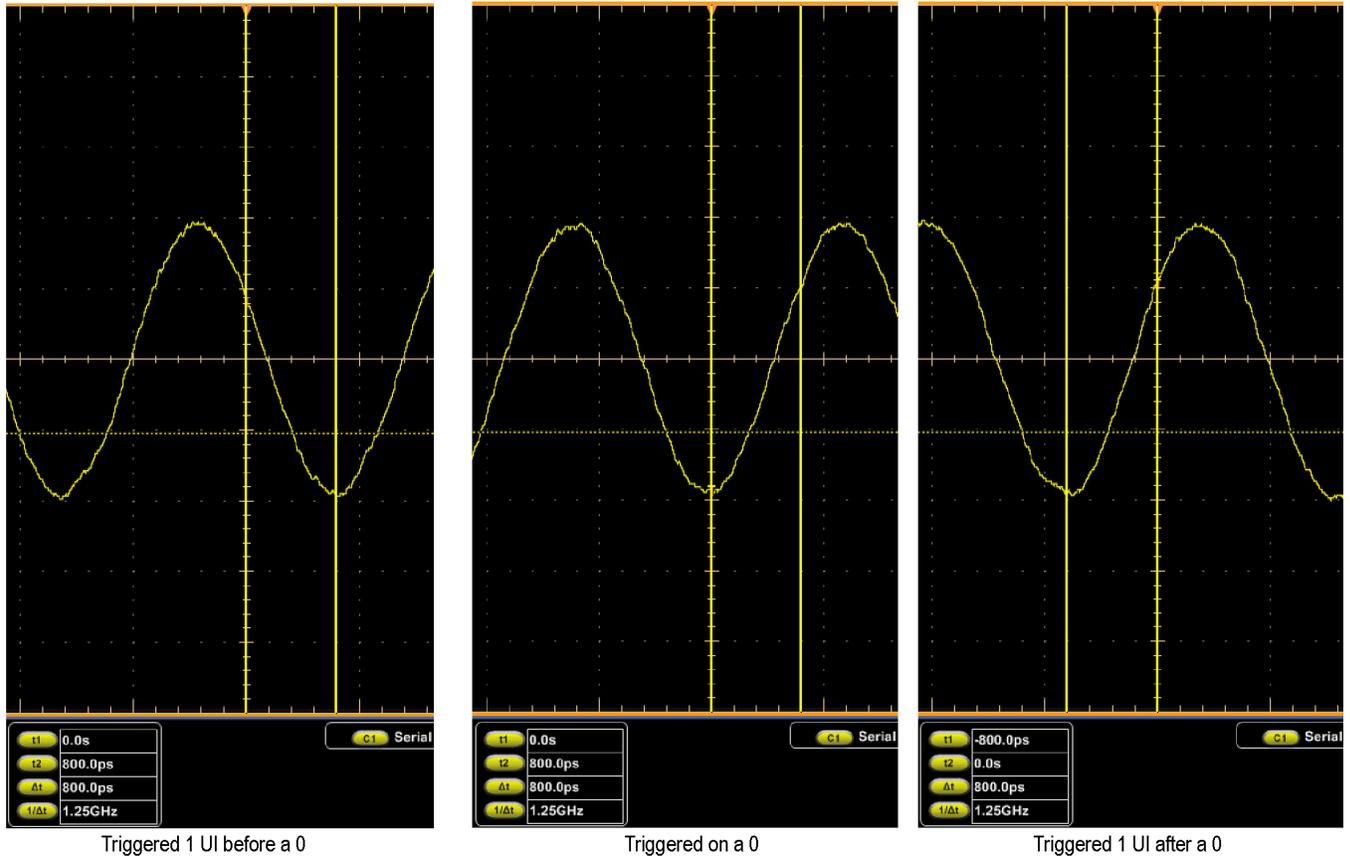
Figure 42: Isolated 0 triggering

r. Verify that the instrument triggers at the 0 in the input signal. The absolute value of the T1 cursor readout must be ≤325 ps. Enter pass or fail in the test record.

s. Touch the **Edit** and then the **Clear** button.

t. Enter data into Serial Pattern Data field for the next setting in the table that is not yet checked. (See *Table 19* on page 322.)

u. Touch **Enter**.

v. Center Cursor 1 in the low of the waveform just to the left of the center graticule line. (See *Figure 42* on page 323.)

w. Verify that the instrument triggers one Unit Interval (UI) after the 0 in the input signal. The absolute value of the T2 cursor readout must be ≤325 ps. Enter pass or fail in the test record.

3. *Verify that the serial path and pattern matching circuits can do isolated 1s:*

    a. Adjust the trigger **Level** to trigger at 75% (+1 division) on the sine wave.

    b. Touch the **Edit** and then the **Clear** button.

c. Enter data into the Serial Pattern Data field for one of the settings in the table that is not yet checked, starting with the first setting. (See *Table 20* on page 324.)

Table 20: Word recognizer data

Serial pattern data	Trigger location
4924 9249 2492 4924$_{16}$	One UI before the 1
9249 2492 4924 9249$_{16}$	At the 1
2492 4924 9249 2492$_{16}$	One UI after the 1

d. Touch **Enter**.

e. Center Cursor 2 in the high of the waveform just to the right of the center graticule line. (See *Figure 43* on page 325.)

f. Verify that the instrument triggers one Unit Interval (UI) before the 1 in the input signal. The absolute value of the T1 cursor readout must be ≤325 ps. Enter pass or fail in the test record.

g. Touch the **Edit** and then the **Clear** button.

h. Enter data into the Serial Pattern Data field for the next setting that is not yet checked.

i. Touch **Enter**.

j. Center the Cursor 1 in the waveform high nearest the center graticule line. (See *Figure 43* on page 325.)

k. Verify that the instrument triggers at the 1 in the input signal. The absolute value of the T1 cursor readout must be ≤325 ps. Enter pass or fail in the test record.

l. Touch the **Edit** and then the **Clear** button.

m. Enter data into the Serial Pattern Data field for the next setting in the table that is not yet checked. (See *Table 20* on page 324.)

n. Touch **Enter**.

o. Center Cursor 1 in the high of the waveform just to the left of the center graticule line. (See *Figure 43* on page 325.)

p. Verify that the instrument triggers one Unit Interval (UI) after the 1 in the input signal. The absolute value of the T2 cursor readout must be ≤325 ps. Enter pass or fail in the test record.

| Triggered 1 UI before a 1 | Triggered on a 1 | Triggered 1 UI after a 1 |
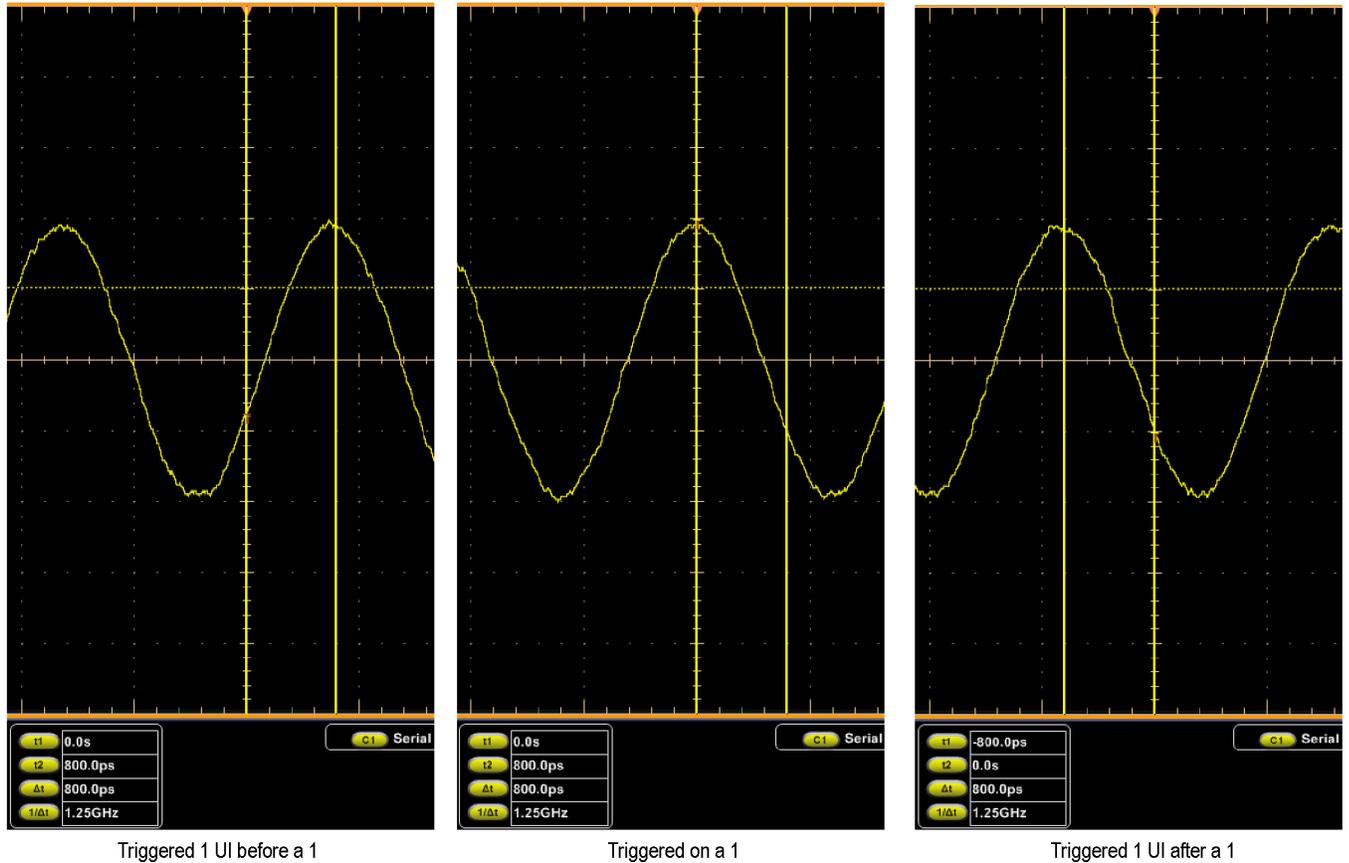
Figure 43: Isolated 1 triggering

Check serial trigger clock recovery range DPO7000C models

Equipment required	Equipment required
One precision 50 Ω coaxial cable (Item *4* on page 123) One sine-wave generator (Item *9* on page 123) One adapter (Item *19* on page 124)	The oscilloscope must meet the prerequisites. Also, the instrument must have passed *Check DC Voltage Measurement Accuracy.* (See *Signal acquisition system checks* on page 224.)

1. *Install the test hookup and preset the instrument controls:*

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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Figure 44: Serial trigger clock recovery range test hookup, DPO7000C Models

a. *Hook up test-signal source 1:* (See *Figure 44* on page 326.)

- Connect the sine wave output of the sine-wave generator through a 50 Ω precision coaxial cable to Ch 1 through an adapter.
- Set the sine-wave generator to output a 1.5625 GHz sine wave.

b. *Initialize the instrument:* Press the **Default Setup** button.

c. *Modify the initialized front-panel control settings:*

- Set the Vertical **Scale** to 50 mV per division.
- Touch **Vertical**, select **Vertical Setup**, and then touch Termination **50 Ω**.
- Set the horizontal **Scale** to 200 ps per division.
- From the button bar, touch the **Display** button.
- Set the Display Style to **Dots**.
- Set the Display Persistence to **Variable**, and set the persist Time to **3.0 s**.
- Touch the **X** (close) button.
- Adjust the sine-wave generator output for 8 divisions of amplitude.
- From the button bar, touch **Trig** and select the **A Event** tab.
- Touch the **Select** button.
- Touch the **Comm** button. Set **Source** to Ch1, **Type** to R Clk, and **Coding** to NRZ.

2. *Verify the clock recovery at frequency:*

   a. From the button bar, touch **Trig** and select the **A Event** tab.

   b. Set the sine-wave generator to output one of the input frequencies in the table that is not yet checked, starting with the first setting. (See *Table 21* on page 327.)

   c. Set the instrument Bit Rate to the Recovered clock Baud rate listed in the table for the current input frequency.

   ⚠ **Note:** The instrument will attempt to acquire lock once. If the input data is disrupted, removed, or heavily distorted, the instrument may not acquire lock or may lose lock. If the recovered clock is not locked to the incoming data, the waveform display will not be stable. Once the input data is available, press the PUSH SET TO 50% knob to force the instrument to acquire lock again.

   d. Press **PUSH-SET 50%**.

   ⚠ **Note:** As the input frequency is lowered, adjust the Horizontal SCALE to maintain about 3 to 5 eyes across the display.

   e. Verify that lock is acquired. (See *Figure 45* on page 328.)

   f. Repeat substeps *2.b* on page 326 through *2.d* on page 326 for each input frequency and Baud rate listed in the table. (See *Table 21* on page 327.)

g. If all tests pass, enter passed in the test record.

3. *Disconnect the hookup:* Disconnect the equipment from the instrument.

Table 21: Clock recovery input frequencies and baud rates

Input frequency	Recovered clock baud rate
625 MHz	1.25 Gbaud
312.5 MHz	1.25 Gbaud
312.5 MHz	1.1875 Gbaud
296.87 MHz	1.25 Gbaud
168.75 MHz	675 Mbaud
300 MHz	1200 Mbaud
156.25 MHz	625 Mbaud
78.12 MHz	312.5 Mbaud
78.12 MHz	296.87 Mbaud
74.21 MHz	312.5 Mbaud
31.25 MHz	125 Mbaud
15.62 MHz	62.5 Mbaud
7.81 MHz	31.25 Mbaud
3.9 MHz	15.62 Mbaud
1.95 MHz	7.81 Mbaud
976.56 kHz	3.9 Mbaud
488.28 kHz	1.95 Mbaud
381 kHz	1.52 Mbaud

Recovered clock locked with input at one-half bit rate
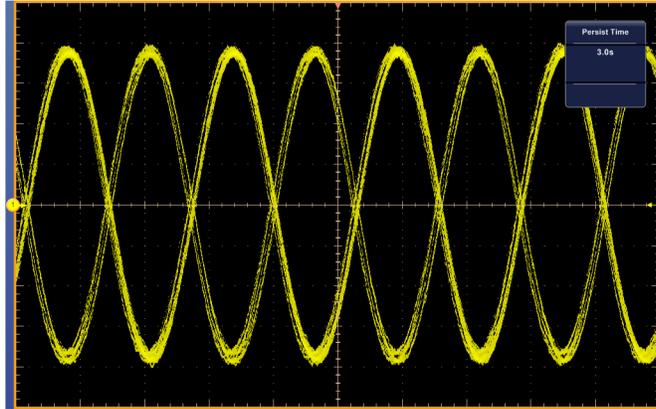
Recovered clock locked with input at one-quarter bit rate
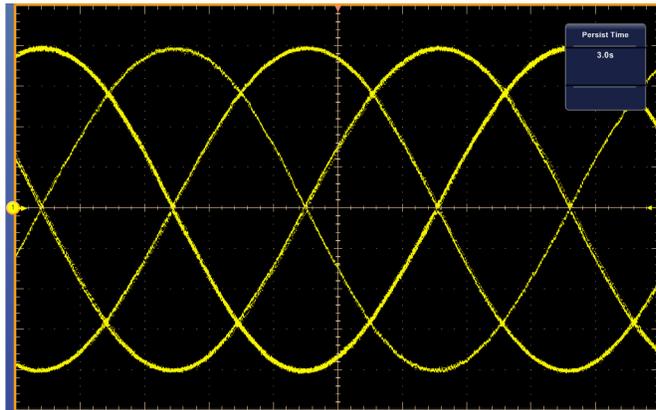
A possible display with the recovered clock not locked
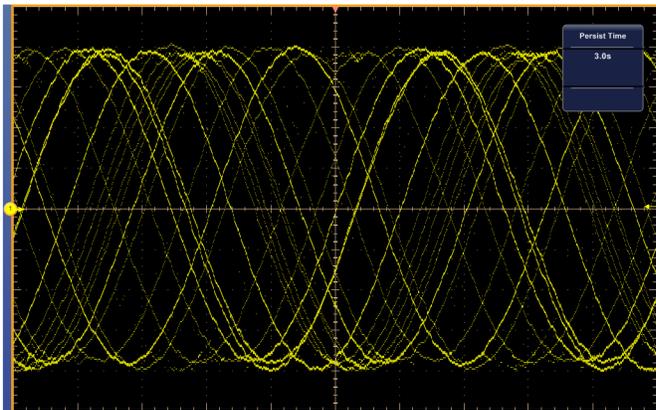
Figure 45: Clock recovery

Sine wave generator leveling procedure

Some procedures in this manual require a sine wave generator to produce the necessary test signals. If you do not have a leveled sine wave generator, use one of the following methods to level the output amplitude of your sine wave generator.

Method 1

Equipment required	Prerequisites
Sine wave generator (Item *9* on page 123) Meter, power and sensor (Item *10* on page 124) Power splitter (Item *11* on page 124) 50 Ω precision cable 2.92 mm male-to-female (Item *12* on page 124) One K male-to-male adapter (Item *13* on page 124)	(See *Prerequisites* on page 122.)
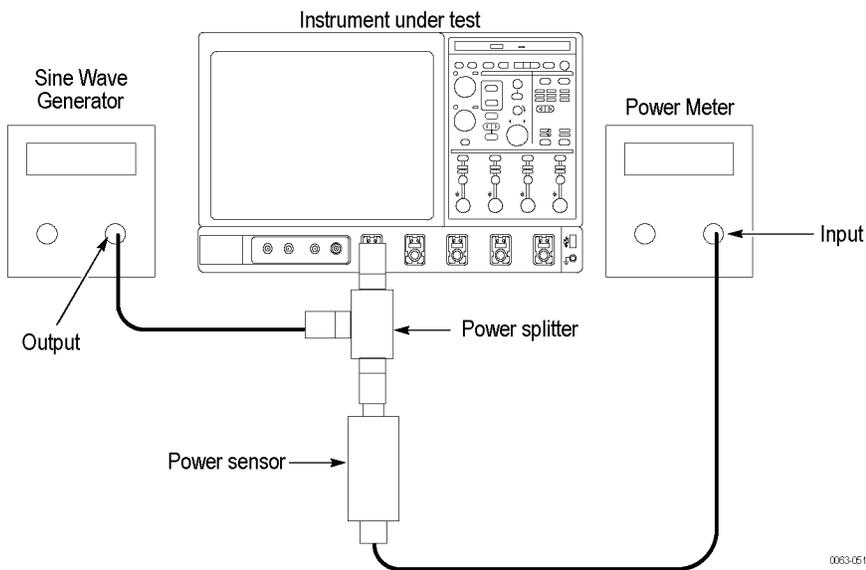
Figure 46: Sine wave generator leveling equipment setup

1. *Install the test hookup:* Connect the equipment as shown in the above figure.

2. *Set the Generator:*

   • Set the sine wave generator to a reference frequency of 10 MHz.

   • Adjust the sine wave generator amplitude to the required number of divisions as measured by the instrument.

3. *Record the reference level:* Note the reading on the level meter.

4. *Set the generator to the new frequency and reference level:*

   • Change the sine wave generator to the desired new frequency.

   • Input the correction factor and/or the new frequency into the level meter.

   • Adjust the sine wave generator amplitude until the level meter again reads the value noted in step *3* on page 329. The signal amplitude is now correctly set for the new frequency.

Method 2

Equipment required	Prerequisites
Sine wave generator (Item *9* on page 123)	(See *Prerequisites* on page 122.)
Level meter and power sensor (Item *10* on page 124)	
Two male N to female BNC adapters (Item *14* on page 124)	
Two precision coaxial cables (Item *4* on page 123)	
One or two SMA male-to-female BNC adapters (Item *19* on page 124)	

1. *Install the test hookup:* Connect the equipment as shown in the figure below (start with the sine wave generator connected to the instrument). (See *Figure 47* on page 330.)
2. *Set the Generator:*

    •   Set the sine wave generator to a reference frequency of 10 MHz.
    •   Adjust the sine wave generator amplitude to the required number of divisions as measured by the instrument.
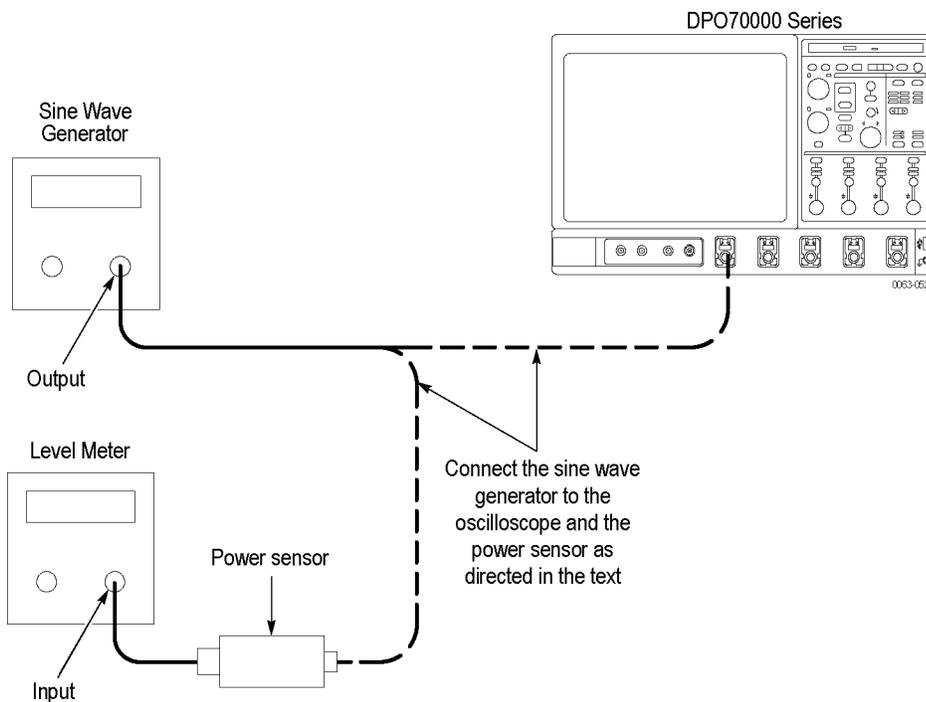
Figure 47: Equipment setup for maximum amplitude

3. *Record the reference level:*

    •   Disconnect the sine wave generator from the instrument.
    •   Connect the sine wave generator to the power sensor.
    •   Note the level meter reading.
4. *Set the generator to the new frequency and reference level:*

    •   Change the sine wave generator to the desired new frequency.
    •   Input the correction factor and/or the new frequency into the level meter.

- Adjust the sine wave generator amplitude until the level meter again reads the value noted in step *3* on page 330. The signal amplitude is now correctly set for the new frequency.
- Disconnect the sine wave generator from the power sensor.
- Connect the sine wave generator to the instrument.

Performance verification (MSO/DPO5000/B series)

Performance verification (MSO/DPO5000/B series)

This chapter contains performance verification procedures for the specifications marked with the ✔ symbol. The following equipment, or a suitable equivalent, is required to complete these procedures.

Required equipment

1. DC voltage source

Minimum requirements	Examples
3 mV to 4 V, ±0.1% accuracy	Fluke 9500B Oscilloscope Calibrator with a 9530 Output Module

2. Leveled sine wave generator

50 kHz to 2 GHz, ±4% amplitude accuracy	

3. Time mark generator

80 ms period, ±1 ppm accuracy, rise time <50 ns	

4. Logic Probe (MSO5000/B Series only)

Low capacitance digital probe, 16 channels.	P6616 probe; standard accessory for MSO5000/B Series oscilloscopes.

5. BNC-to-0.1 inch pin adapter to connect the logic probe to the signal source.(MSO5000/B Series only)

BNC-to-0.1 inch pin adapter; female BNC to 2x16 .01 inch pin headers.	Tektronix adapter part number 679-6240-00; to connect the Fluke 9500 to the P6616 probe.

6. Digital Multimeter (DMM)

0.1% accuracy or better	

7. One 50 Ω terminator

Impedance 50 Ω; connectors: female BNC input, male BNC output	Tektronix part number 011-0049-02

8. One 50 Ω BNC cable

Male-to-male connectors	Tektronix part number 012-0057-01

9. Optical Mouse

USB, PS2	Tektronix part number 119-7054-00; standard accessory for MSO5000/B Series and DPO5000/B Series oscilloscopes.

You might need additional cables and adapters, depending on the actual test equipment you use.

These procedures cover all MSO5000/B series and DPO5000/B series models. Disregard checks that do not apply to the specific model you are testing.

Print the test record on the following pages and use it to record the performance test results for your oscilloscope.

⚠️ **Note:** Completion of the performance verification procedure does not update the stored time and date of the latest successful adjustment. The date and time are updated only when the adjustment procedures in the service manual are successfully completed.

The performance verification procedures verify the performance of your instrument. They do not adjust your instrument. If your instrument fails any of the performance verification tests, you should return the instrument to Tektronix for adjustment or repair.

Test record

Model	Serial	Procedure performed by	Date

Test	Passed	Failed
Self Test		

Input Impedance				
Performance checks	Vertical scale	Low limit	Test result	High limit
Channel 1 Input Impedance, 1 MΩ	10 mV/div	990 kΩ		1.01 MΩ
	100 mV/div	990 kΩ		1.01 MΩ
	1 V/div	990 kΩ		1.01 MΩ
Channel 1 Input Impedance, 250 kΩ	100 mV/div	246 kΩ		254 kΩ
Channel 1 Input Impedance, 50 Ω	10 mV/div	49.5 Ω		50.5 Ω
	100 mV/div	49.5 Ω		50.5 Ω
Channel 2 Input Impedance, 1 MΩ	10 mV/div	990 kΩ		1.01 MΩ
	100 mV/div	990 kΩ		1.01 MΩ
	1 V/div	990 kΩ		1.01 MΩ
Channel 2 Input Impedance, 250 kΩ	100 mV/div	246 kΩ		254 kΩ
Channel 2 Input Impedance, 50 Ω	10 mV/div	49.5 Ω		50.5 Ω
	100 mV/div	49.5 Ω		50.5 Ω

Table continued…

Input Impedance				
Performance checks	Vertical scale	Low limit	Test result	High limit
Channel 3 Input Impedance, 1 MΩ	10 mV/div	990 kΩ		1.01 MΩ
	100 mV/div	990 kΩ		1.01 MΩ
	1 V/div	990 kΩ		1.01 MΩ
Channel 3 Input Impedance, 250 kΩ	100 mV/div	246 kΩ		254 kΩ
Channel 3 Input Impedance, 50 Ω	10 mV/div	49.5 Ω		50.5 Ω
	100 mV/div	49.5 Ω		50.5 Ω
Channel 4 Input Impedance, 1 MΩ	10 mV/div	990 kΩ		1.01 MΩ
	100 mV/div	990 kΩ		1.01 MΩ
	1 V/div	990 kΩ		1.01 MΩ
Channel 4 Input Impedance, 250 kΩ	100 mV/div	246 kΩ		254 kΩ
Channel 4, Input Impedance, 50 Ω	10 mV/div	49.5 Ω		50.5 Ω
	100 mV/div	49.5 Ω		50.5 Ω

DC Balance				
Performance checks	Vertical scale	Low limit	Test result	High limit
Channel 1 DC Balance, 50 Ω, 20 MHz BW	1 mV/div	-0.2 mV		0.2 mV
	2 mV/div	-0.2 mV		0.2 mV
	5 mV/div	-0.5 mV		0.5 mV
	10 mV/div	-1 mV		1 mV
	20 mV/div	-2 mV		2 mV
	50 mV/div	-5 mV/div		5 mV/div
	100 mV/div	-10 mV		10 mV
	200 mV/div	-20 mV/div		20 mV/div
	500 mV/div	-50 mV/div		50 mV/div
	1 V/div	-100 mV		100 mV
Channel 1 DC Balance, 1 MΩ, 20 MHz BW	1 mV/div	-0.2 mV		0.2 mV
	2 mV/div	-0.4 mV		0.4 mV
	5 mV/div	-1 mV/div		1 mV/div
	10 mV/div	-2 mV		2 mV
	20 mV/div	-4 mV/div		4 mV/div
	100 mV/div	-20 mV		20 mV
	500 mV/div	-100 mV/div		100 mV/div
	1 V/div	-200 mV		200 mV
	10 V/div	-2 V		2 V
Channel 1 DC Balance, 50 Ω, 250 MHz BW	20 mV/div	-2 mV		2 mV
Channel 1 DC Balance, 1 MΩ, 250 MHz BW	20 mV/div	-4 mV		4 mV
Channel 1 DC Balance, 50 Ω, Full BW	20 mV/div	-2 mV		2 mV
Table continued…				

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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DC Balance				
Performance checks	Vertical scale	Low limit	Test result	High limit
Channel 1 DC Balance, 1 MΩ, Full BW	20 mV/div	-4 mV		4 mV
Channel 2 DC Balance, 50 Ω, 20 MHz BW	1 mV/div	-0.2 mV		0.2 mV
	2 mV/div	-0.2 mV		0.2 mV
	5 mV/div	-0.5 mV		0.5 mV
	10 mV/div	-1 mV		1 mV
	20 mV/div	-2 mV		2 mV
	50 mV/div	-5 mV/div		5 mV/div
	100 mV/div	-10 mV		10 mV
	200 mV/div	-20 mV/div		20 mV/div
	500 mV/div	-50 mV/div		50 mV/div
	1 V/div	-100 mV		100 mV
Channel 2 DC Balance, 1 MΩ, 20 MHz BW	1 mV/div	-0.2 mV		0.2 mV
	2 mV/div	-0.4 mV		0.4 mV
	5 mV/div	-1 mV/div		1 mV/div
	10 mV/div	-2 mV		2 mV
	20 mV/div	-4 mV/div		4 mV/div
	100 mV/div	-20 mV		20 mV
	500 mV/div	-100 mV/div		100 mV/div
	1 V/div	-200 mV		200 mV
	10 V/div	-2 V		2 V
Channel 2 DC Balance, 50 Ω, 250 MHz BW	20 mV/div	-2 mV		2 mV
Channel 2 DC Balance, 1 MΩ, 250 MHz BW	20 mV/div	-4 mV		4 mV

Table continued…

DC Balance				
Performance checks	Vertical scale	Low limit	Test result	High limit
Channel 2 DC Balance, 50 Ω, Full BW	20 mV/div	-2 mV		2 mV
Channel 2 DC Balance, 1 MΩ, Full BW	20 mV/div	-4 mV		4 mV
Channel 3 DC Balance, 50 Ω, 20 MHz BW	1 mV/div	-0.2 mV		0.2 mV
	2 mV/div	-0.2 mV		0.2 mV
	5 mV/div	-0.5 mV		0.5 mV
	10 mV/div	-1 mV		1 mV
	20 mV/div	-2 mV		2 mV
	50 mV/div	-5 mV/div		5 mV/div
	100 mV/div	-10 mV		10 mV
	200 mV/div	-20 mV/div		20 mV/div
	500 mV/div	-50 mV/div		50 mV/div
	1 V/div	-100 mV		100 mV
Channel 3 DC Balance, 1 MΩ, 20 MHz BW	1 mV/div	-0.2 mV		0.2 mV
	2 mV/div	-0.4 mV		0.4 mV
	5 mV/div	-1 mV/div		1 mV/div
	10 mV/div	-2 mV		2 mV
	20 mV/div	-4 mV/div		4 mV/div
	100 mV/div	-20 mV		20 mV
	500 mV/div	-100 mV/div		100 mV/div
	1 V/div	-200 mV		200 mV
	10 V/div	-2 V		2 V
Channel 3 DC Balance, 50 Ω, 250 MHz BW	20 mV/div	-2 mV		2 mV

Table continued…

DC Balance				
Performance checks	Vertical scale	Low limit	Test result	High limit
Channel 3 DC Balance, 1 MΩ, 250 MHz BW	20 mV/div	-4 mV		4 mV
Channel 3 DC Balance, 50 Ω, Full BW	20 mV/div	-2 mV		2 mV
Channel 3 DC Balance, 1 MΩ, Full BW	20 mV/div	-4 mV		4 mV
Channel 4 DC Balance, 50 Ω, 20 MHz BW	1 mV/div	-0.2 mV		0.2 mV
	2 mV/div	-0.2 mV		0.2 mV
	5 mV/div	-0.5 mV		0.5 mV
	10 mV/div	-1 mV		1 mV
	20 mV/div	-2 mV		2 mV
	50 mV/div	-5 mV/div		5 mV/div
	100 mV/div	-10 mV		10 mV
	200 mV/div	-20 mV/div		20 mV/div
	500 mV/div	-50 mV/div		50 mV/div
	1 V/div	-100 mV		100 mV
Channel 4 DC Balance, 1 MΩ, 20 MHz BW	1 mV/div	-0.2 mV		0.2 mV
	2 mV/div	-0.4 mV		0.4 mV
	5 mV/div	-1 mV/div		1 mV/div
	10 mV/div	-2 mV		2 mV
	20 mV/div	-4 mV/div		4 mV/div
	100 mV/div	-20 mV		20 mV
	500 mV/div	-100 mV/div		100 mV/div
	1 V/div	-200 mV		200 mV
	10 V/div	-2 V		2 V

Table continued…

DC Balance				
Performance checks	Vertical scale	Low limit	Test result	High limit
Channel 4 DC Balance, 50 Ω, 250 MHz BW	20 mV/div	-2 mV		2 mV
Channel 4 DC Balance, 1 MΩ, 250 MHz BW	20 mV/div	-4 mV		4 mV
Channel 4 DC Balance, 50 Ω, Full BW	20 mV/div	-2 mV		2 mV
Channel 4 DC Balance, 1 MΩ, Full BW	20 mV/div	-4 mV		4 mV

DC Gain Accuracy					
Performance checks	Bandwidth	Vertical scale	Low limit	Test result	High limit
Channel 1 DC Gain Accuracy, 0 V offset, 0 V vertical position, 50 Ω	20 MHz	2 mV/div	-1.5%		1.5%
		5 mV/div	-1.5%		1.5%
		10 mV/div	-1.5%		1.5%
		20 mV/div	-1.5%		1.5%
		50 mV/div	-1.5%		1.5%
		100 mV/div	-1.5%		1.5%
		200 mV/div	-1.5%		1.5%
		500 mV/div	-1.5%		1.5%
		1 V/div	-1.5%		1.5%
	250 MHz	20 mV/div	-1.5%		1.5%
	FULL	20 mV/div	-1.5%		1.5%

Table continued…

DC Gain Accuracy					
Performance checks	Bandwidth	Vertical scale	Low limit	Test result	High limit
Channel 1 DC Gain Accuracy, 0 V offset, 0 V vertical position, 1 MΩ	20 MHz	2 mV/div	-1.5%		1.5%
		5 mV/div	-1.5%		1.5%
		10 mV/div	-1.5%		1.5%
		20 mV/div	-1.5%		1.5%
		50 mV/div	-1.5%		1.5%
		100 mV/div	-1.5%		1.5%
		200 mV/div	-1.5%		1.5%
		500 mV/div	-1.5%		1.5%
		1 V/div	-1.5%		1.5%
	250 MHz	20 mV/div	-1.5%		1.5%
	FULL	20 mV/div	-1.5%		1.5%
Channel 2 DC Gain Accuracy, 0 V offset, 0 V vertical position, 50 Ω	20 MHz	2 mV/div	-1.5%		1.5%
		5 mV/div	-1.5%		1.5%
		10 mV/div	-1.5%		1.5%
		20 mV/div	-1.5%		1.5%
		50 mV/div	-1.5%		1.5%
		100 mV/div	-1.5%		1.5%
		200 mV/div	-1.5%		1.5%
		500 mV/div	-1.5%		1.5%
		1 V/div	-1.5%		1.5%
	250 MHz	20 mV/div	-1.5%		1.5%
	FULL	20 mV/div	-1.5%		1.5%

Table continued…

DC Gain Accuracy					
Performance checks	Bandwidth	Vertical scale	Low limit	Test result	High limit
Channel 2 DC Gain Accuracy, 0 V offset, 0 V vertical position, 1 MΩ	20 MHz	2 mV/div	-1.5%		1.5%
		5 mV/div	-1.5%		1.5%
		10 mV/div	-1.5%		1.5%
		20 mV/div	-1.5%		1.5%
		50 mV/div	-1.5%		1.5%
		100 mV/div	-1.5%		1.5%
		200 mV/div	-1.5%		1.5%
		500 mV/div	-1.5%		1.5%
		1 V/div	-1.5%		1.5%
	250 MHz	20 mV/div	-1.5%		1.5%
	FULL	20 mV/div	-1.5%		1.5%
Channel 3 DC Gain Accuracy, 0 V offset, 0 V vertical position, 50 Ω	20 MHz	2 mV/div	-1.5%		1.5%
		5 mV/div	-1.5%		1.5%
		10 mV/div	-1.5%		1.5%
		20 mV/div	-1.5%		1.5%
		50 mV/div	-1.5%		1.5%
		100 mV/div	-1.5%		1.5%
		200 mV/div	-1.5%		1.5%
		500 mV/div	-1.5%		1.5%
		1 V/div	-1.5%		1.5%
	250 MHz	20 mV/div	-1.5%		1.5%
	FULL	20 mV/div	-1.5%		1.5%

Table continued…

DC Gain Accuracy					
Performance checks	Bandwidth	Vertical scale	Low limit	Test result	High limit
Channel 3 DC Gain Accuracy, 0 V offset, 0 V vertical position, 1 MΩ	20 MHz	2 mV/div	-1.5%		1.5%
		5 mV/div	-1.5%		1.5%
		10 mV/div	-1.5%		1.5%
		20 mV/div	-1.5%		1.5%
		50 mV/div	-1.5%		1.5%
		100 mV/div	-1.5%		1.5%
		200 mV/div	-1.5%		1.5%
		500 mV/div	-1.5%		1.5%
		1 V/div	-1.5%		1.5%
	250 MHz	20 mV/div	-1.5%		1.5%
	FULL	20 mV/div	-1.5%		1.5%
Channel 4 DC Gain Accuracy, 0 V offset, 0 V vertical position, 50 Ω	20 MHz	2 mV/div	-1.5%		1.5%
		5 mV/div	-1.5%		1.5%
		10 mV/div	-1.5%		1.5%
		20 mV/div	-1.5%		1.5%
		50 mV/div	-1.5%		1.5%
		100 mV/div	-1.5%		1.5%
		200 mV/div	-1.5%		1.5%
		500 mV/div	-1.5%		1.5%
		1 V/div	-1.5%		1.5%
	250 MHz	20 mV/div	-1.5%		1.5%
	FULL	20 mV/div	-1.5%		1.5%

Table continued…

DC Gain Accuracy					
Performance checks	Bandwidth	Vertical scale	Low limit	Test result	High limit
Channel 4 DC Gain Accuracy, 0 V offset, 0 V vertical position, 1 MΩ	20 MHz	2 mV/div	-1.5%		1.5%
		5 mV/div	-1.5%		1.5%
		10 mV/div	-1.5%		1.5%
		20 mV/div	-1.5%		1.5%
		50 mV/div	-1.5%		1.5%
		100 mV/div	-1.5%		1.5%
		200 mV/div	-1.5%		1.5%
		500 mV/div	-1.5%		1.5%
		1 V/div	-1.5%		1.5%
	250 MHz	20 mV/div	-1.5%		1.5%
	FULL	20 mV/div	-1.5%		1.5%

DC Offset Accuracy					
Performance checks	Vertical scale	Vertical offset [9]	Low limit	Test result	High limit
All models:					
Channel 1 DC Offset Accuracy, 20 MHz BW, 50 Ω	1 mV/div	900 mV	895.3 mV		904.7 mV
	1 mV/div	-900 mV	-904.7 mV		-895.3 mV
	100 mV/div	5.0 V	4.965 V		5.035 V
	100 mV/div	-5.0 V	-5.035 V		-4.965 V
Table continued…					

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[9] Use this value for both the calibrator output and the oscilloscope offset setting.

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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DC Offset Accuracy					
Performance checks	Vertical scale	Vertical offset [9]	Low limit	Test result	High limit
Channel 1 DC Offset Accuracy, 20 MHz BW, 1 MΩ	1 mV/div	900 mV	895.3 mV		904.7 mV
	1 mV/div	-900 mV	-904.7 mV		-895.3 mV
	100 mV/div	9.0 V	8.935 V		9.065 V
	100 mV/div	- 9.0 V	-9.065 V		-8.935 V
	500 mV/div	9.0 V	8.855 V		9.145 V
	500 mV/div	- 9.0 V	-9.145 V		-8.855 V
	1.01 V/div	99.5 V	98.80 V		100.2 V
	1.01 V/div	-99.5 V	-100.2 V		-98.80 V
	3 V/div	99.5 V	98.4 V		100.6 V
	3 V/div	-99.5 V	-100.6 V		-98.4 V
Channel 2 DC Offset Accuracy, 20 MHz BW, 50 Ω	1 mV/div	900 mV	895.3 mV		904.7 mV
	1 mV/div	-900 mV	-904.7 mV		-895.3 mV
	100 mV/div	5.0 V	4.965 V		5.035 V
	100 mV/div	-5.0 V	-5.035 V		-4.965 V

Table continued…

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[9] Use this value for both the calibrator output and the oscilloscope offset setting.

DC Offset Accuracy					
Performance checks	Vertical scale	Vertical offset [9]	Low limit	Test result	High limit
Channel 2 DC Offset Accuracy, 20 MHz BW, 1 MΩ	1 mV/div	900 mV	895.3 mV		904.7 mV
	1 mV/div	-900 mV	-904.7 mV		-895.3 mV
	100 mV/div	9.0 V	8.935 V		9.065 V
	100 mV/div	-9.0 V	-9.065 V		-8.935 V
	500 mV/div	9.0 V	8.855 V		9.145 V
	500 mV/div	- 9.0 V	-9.145 V		-8.855 V
	1.01 V/div	99.5 V	98.80 V		100.2 V
	1.01 V/div	-99.5 V	-100.2 V		-98.80 V
	3 V/div	99.5 V	98.40 V		100.6 V
	3 V/div	-99.5 V	-100.6 V		-98.4 V
Channel 3 DC Offset Accuracy, 20 MHz BW, 50 Ω	1 mV/div	900 mV	895.3 mV		904.7 mV
	1 mV/div	-900 mV	-904.7 mV		-895.3 mV
	100 mV/div	5.0 V	4.965 V		5.035 V
	100 mV/div	-5.0 V	-5.035 V		-4.965 V

Table continued…

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[9] Use this value for both the calibrator output and the oscilloscope offset setting.

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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Performance verification (MSO/DPO5000/B series)

DC Offset Accuracy					
Performance checks	Vertical scale	Vertical offset [9]	Low limit	Test result	High limit
Channel 3 DC Offset Accuracy, 20 MHz BW, 1 MΩ	1 mV/div	900 mV	895.3 mV		904.7 mV
	1 mV/div	-900 mV	-904.7 mV		-895.3 mV
	100 mV/div	9.0 V	8.935 V		9.065 V
	100 mV/div	-9.0 V	-9.065 V		-8.935 V
	500 mV/div	9.0 V	8.855 V		9.145 V
	500 mV/div	- 9.0 V	-9.145 V		-8.855 V
	1.01 V/div	99.5 V	98.80 V		100.2 V
	1.01 V/div	-99.5 V	-100.2 V		-98.80 V
	3 V/div	99.5 V	98.4 V		100.6 V
	3 V/div	-99.5 V	-100.6 V		-98.4 V
Channel 4 DC Offset Accuracy, 20 MHz BW, 50 Ω	1 mV/div	900 mV	895.3 mV		904.7 mV
	1 mV/div	-900 mV	-904.7 mV		-895.3 mV
	100 mV/div	5.0 V	4.965 V		5.035 V
	100 mV/div	-5.0 V	-5.035 V		-4.965 V

Table continued…

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9 Use this value for both the calibrator output and the oscilloscope offset setting.

DC Offset Accuracy					
Performance checks	Vertical scale	Vertical offset [9]	Low limit	Test result	High limit
Channel 4 DC Offset Accuracy, 20 MHz BW, 1 MΩ	1 mV/div	900 mV	895.3 mV		904.7 mV
	1 mV/div	-900 mV	-904.7 mV		-895.3 mV
	100 mV/div	9.0 V	8.935 V		9.065 V
	100 mV/div	-9.0 V	-9.065 V		-8.935 V
	500 mV/div	9.0 V	8.855 V		9.145 V
	500 mV/div	- 9.0 V	-9.145 V		-8.855 V
	1.01 V/div	99.5 V	98.80 V		100.2 V
	1.01 V/div	-99.5 V	-100.2 V		-98.80 V
	3 V/div	99.5 V	98.4 V		100.6 V
	3 V/div	-99.5 V	-100.6 V		-98.4 V

Analog Bandwidth							
Performance checks							
Bandwidth at Channel	Impedance	Vertical scale	Horizontal scale	V_{in-pp}	V_{bw-pp}	Limit	Test result Gain = V_{bw-pp}/V_{in-pp}
All Models							
Table continued…							

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[9] Use this value for both the calibrator output and the oscilloscope offset setting.

Analog Bandwidth

Performance checks

Bandwidth at Channel	Impedance	Vertical scale	Horizontal scale	$V_{in\text{-}pp}$	$V_{bw\text{-}pp}$	Limit	Test result Gain = $V_{bw\text{-}pp}/V_{in\text{-}pp}$
Channel 1	50 Ω	1 mV/div	5 ns/div (175 MHz)			≥ 0.707	
		2 mV/div	2.5 ns/div (350 MHz)			≥ 0.707	
		5 mV/div MSO/DPO5204/B MSO/DPO5104/ BMSO/DPO5054/ BMSO/DPO5034/B	1 ns/div (1.5 GHz) (Full BW)			≥ 0.707	
		10 mV/div	1 ns/div (Full BW)			≥ 0.707	
		50 mV/div	1 ns/div (Full BW)			≥ 0.707	
		100 mV/div	1 ns/div (Full BW)			≥ 0.707	
		1 V/div	1 ns/div (Full BW)			≥ 0.707	

MSO5204/B, DPO5204/B, MSO5104/B, DPO5104/B Only

Table continued…

Analog Bandwidth							
Performance checks							
Bandwidth at Channel	Impedance	Vertical scale	Horizontal scale	V_{in-pp}	V_{bw-pp}	Limit	Test result Gain = V_{bw-pp}/V_{in-pp}
Channel 1	1 MΩ	1 mV/div	5 ns/div (175 MHz)			≥ 0.707	
		2 mV/div	2.5 ns/div (350 MHz)			≥ 0.707	
		5 mV/div	1 ns/div (Full BW)			≥ 0.707	
		10 mV/div	1 ns/div (Full BW)			≥ 0.707	
		50 mV/div	1 ns/div (Full BW)			≥ 0.707	
		100 mV/div	1 ns/div (Full BW)			≥ 0.707	
		1 V/div	1 ns/div (Full BW)			≥ 0.707	
All Models							

Table continued…

Analog Bandwidth

Performance checks

Bandwidth at Channel	Impedance	Vertical scale	Horizontal scale	V_{in-pp}	V_{bw-pp}	Limit	Test result Gain = V_{bw-pp}/V_{in-pp}
Channel 2	50 Ω	1 mV/div	5 ns/div (175 MHz)			≥ 0.707	
		2 mV/div	2.5 ns/div (350 MHz)			≥ 0.707	
		5 mV/div MSO/DPO5204/B MSO/DPO5104/ BMSO/DPO5054/ BMSO/DPO5034/B	1 ns/div (1.5 GHz) (Full BW)			≥ 0.707	
		10 mV/div	1 ns/div (Full BW)			≥ 0.707	
		50 mV/div	1 ns/div (Full BW)			≥ 0.707	
		100 mV/div	1 ns/div (Full BW)			≥ 0.707	
		1 V/div	1 ns/div (Full BW)			≥ 0.707	
MSO5204/B, DPO5204/B, MSO5104/B, DPO5104/B Only							

Table continued…

Analog Bandwidth

Performance checks

Bandwidth at Channel	Impedance	Vertical scale	Horizontal scale	V_{in-pp}	V_{bw-pp}	Limit	Test result Gain = V_{bw-pp}/V_{in-pp}
Channel 2	1 MΩ	1 mV/div	5 ns/div (175 MHz)			≥ 0.707	
		2 mV/div	2.5 ns/div (350 MHz)			≥ 0.707	
		5 mV/div	1 ns/div (Full BW)			≥ 0.707	
		10 mV/div	1 ns/div (Full BW)			≥ 0.707	
		50 mV/div	1 ns/div (Full BW)			≥ 0.707	
		100 mV/div	1 ns/div (Full BW)			≥ 0.707	
		1 V/div	1 ns/div (Full BW)			≥ 0.707	

All Models

Table continued…

Analog Bandwidth

Performance checks

Bandwidth at Channel	Impedance	Vertical scale	Horizontal scale	$V_{in\text{-}pp}$	$V_{bw\text{-}pp}$	Limit	Test result Gain = $V_{bw\text{-}pp}/V_{in\text{-}pp}$
Channel 3	50 Ω	1 mV/div	5 ns/div (175 MHz)			≥ 0.707	
		2 mV/div	2.5 ns/div (350 MHz)			≥ 0.707	
		5 mV/div MSO/DPO5204/B MSO/DPO5104/ BMSO/DPO5054/ BMSO/DPO5034/B	1 ns/div (1.5 GHz) (Full BW)			≥ 0.707	
		10 mV/div	1 ns/div (Full BW)			≥ 0.707	
		50 mV/div	1 ns/div (Full BW)			≥ 0.707	
		100 mV/div	1 ns/div (Full BW)			≥ 0.707	
		1 V/div	1 ns/div (Full BW)			≥ 0.707	
MSO5204/B, DPO5204/B, MSO5104/B, DPO5104/B Only							

Table continued…

Analog Bandwidth

Performance checks

Bandwidth at Channel	Impedance	Vertical scale	Horizontal scale	V_{in-pp}	V_{bw-pp}	Limit	Test result Gain = V_{bw-pp}/V_{in-pp}
Channel 3	1 MΩ	1 mV/div	5 ns/div (175 MHz)			≥ 0.707	
		2 mV/div	2.5 ns/div (350 MHz)			≥ 0.707	
		5 mV/div	1 ns/div (Full BW)			≥ 0.707	
		10 mV/div	1 ns/div (Full BW)			≥ 0.707	
		50 mV/div	1 ns/div (Full BW)			≥ 0.707	
		100 mV/div	1 ns/div (Full BW)			≥ 0.707	
		1 V/div	1 ns/div (Full BW)			≥ 0.707	

All Models

Table continued…

Analog Bandwidth

Performance checks

Bandwidth at Channel	Impedance	Vertical scale	Horizontal scale	V_{in-pp}	V_{bw-pp}	Limit	Test result Gain = V_{bw-pp}/V_{in-pp}
Channel 4	50 Ω	1 mV/div	5 ns/div (175 MHz)			≥ 0.707	
		2 mV/div	2.5 ns/div (350 MHz)			≥ 0.707	
		5 mV/div MSO/DPO5204/B MSO/DPO5104/ BMSO/DPO5054/ BMSO/DPO5034/B	1 ns/div (1.5 GHz) (Full BW)			≥ 0.707	
		10 mV/div	1 ns/div (Full BW)			≥ 0.707	
		50 mV/div	1 ns/div (Full BW)			≥ 0.707	
		100 mV/div	1 ns/div (Full BW)			≥ 0.707	
		1 V/div	1 ns/div (Full BW)			≥ 0.707	
MSO5204/B, DPO5204/B, MSO5104/B, DPO5104/B Only							

Table continued…

Analog Bandwidth

Performance checks

Bandwidth at Channel	Impedance	Vertical scale	Horizontal scale	V_{in-pp}	V_{bw-pp}	Limit	Test result Gain = V_{bw-pp}/V_{in-pp}
Channel 4	1 MΩ	1 mV/div	5 ns/div (175 MHz)			≥ 0.707	
		2 mV/div	2.5 ns/div (350 MHz)			≥ 0.707	
		5 mV/div	1 ns/div (Full BW)			≥ 0.707	
		10 mV/div	1 ns/div (Full BW)			≥ 0.707	
		50 mV/div	1 ns/div (Full BW)			≥ 0.707	
		100 mV/div	1 ns/div (Full BW)			≥ 0.707	
		1 V/div	1 ns/div (Full BW)			≥ 0.707	

Random Noise, Sample Acquisition Mode					
Performance checks		Vertical sensitivity = 100 mV/div			
		1 MΩ		50 Ω	
	Bandwidth	Test result (mV)	High limit (mV)	Test result (mV)	High limit (mV)
MSO5204, DPO5204					
Channel 1	Full	8.18		6.15	
	250 MHz limit	5.12		4.08	
	20 MHz limit	5.12		4.08	

Table continued…

MSO70000C/DX,DPO70000C/DX, DPO7000C,MSO5000/B, and DPO5000/B Series Oscilloscopes Specifications and Performance Verification

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Random Noise, Sample Acquisition Mode					
Performance checks		Vertical sensitivity = 100 mV/div			
		1 MΩ		50 Ω	
	Bandwidth	Test result (mV)	High limit (mV)	Test result (mV)	High limit (mV)
Channel 2	Full	8.18		6.15	
	250 MHz limit	5.12		4.08	
	20 MHz limit	5.12		4.08	
Channel 3	Full	8.18		6.15	
	250 MHz limit	5.12		4.08	
	20 MHz limit	5.12		4.08	
Channel 4	Full	8.18		6.15	
	250 MHz limit	5.12		4.08	
	20 MHz limit	5.12		4.08	
MSO5104, DPO5104					
Channel 1	Full	8.15		6.08	
	250 MHz limit	5.10		4.05	
	20 MHz limit	5.10		4.05	
Channel 2	Full	8.15		6.08	
	250 MHz limit	5.10		4.05	
	20 MHz limit	5.10		4.05	
Channel 3	Full	8.15		6.08	
	250 MHz limit	5.10		4.05	
	20 MHz limit	5.10		4.05	

Table continued…

Random Noise, Sample Acquisition Mode					
Performance checks		Vertical sensitivity = 100 mV/div			
		1 MΩ		50 Ω	
	Bandwidth	Test result (mV)	High limit (mV)	Test result (mV)	High limit (mV)
Channel 4	Full		8.15		6.08
	250 MHz limit		5.10		4.05
	20 MHz limit		5.10		4.05
MSO5034, DPO5034, MSO5054, DPO5054					
Channel 1	Full		8.13		8.13
	250 MHz limit		6.10		6.10
	20 MHz limit		4.10		4.10
Channel 2	Full		8.13		8.13
	250 MHz limit		6.10		6.10
	20 MHz limit		4.10		4.10
Channel 3	Full		8.13		8.13
	250 MHz limit		6.10		6.10
	20 MHz limit		4.10		4.10
Channel 4	Full		8.13		8.13
	250 MHz limit		6.10		6.10
	20 MHz limit		4.10		4.10

Random Noise, Sample Acquisition Mode					
Performance checks		Vertical sensitivity = 100 mV/div			
		1 MΩ		50 Ω	
	Bandwidth	Test result (mV)	High limit (mV)	Test result (mV)	High limit (mV)
MSO5204B, DPO5204B					

Table continued…

Random Noise, Sample Acquisition Mode					
Performance checks		Vertical sensitivity = 100 mV/div			
		1 MΩ		50 Ω	
	Bandwidth	Test result (mV)	High limit (mV)	Test result (mV)	High limit (mV)
Channel 1	Full		5.0		4.5
	250 MHz limit		3.8		3.7
	20 MHz limit		4.0		3.0
Channel 2	Full		5.0		4.5
	250 MHz limit		3.8		3.7
	20 MHz limit		4.0		3.0
Channel 3	Full		5.0		4.5
	250 MHz limit		3.8		3.7
	20 MHz limit		4.0		3.0
Channel 4	Full		5.0		4.5
	250 MHz limit		3.8		3.7
	20 MHz limit		4.0		3.0
MSO5104B, DPO5104B					
Channel 1	Full		4.5		4.5
	250 MHz limit		3.8		3.7
	20 MHz limit		4.0		3.0
Channel 2	Full		4.5		4.5
	250 MHz limit		3.8		3.7
	20 MHz limit		4.0		3.0

Table continued…

Random Noise, Sample Acquisition Mode					
Performance checks		Vertical sensitivity = 100 mV/div			
		1 MΩ		50 Ω	
	Bandwidth	Test result (mV)	High limit (mV)	Test result (mV)	High limit (mV)
Channel 3	Full		4.5		4.5
	250 MHz limit		3.8		3.7
	20 MHz limit		4.0		3.0
Channel 4	Full		4.5		4.5
	250 MHz limit		3.8		3.7
	20 MHz limit		4.0		3.0
MSO5034B, DPO5034B, MSO5054B, DPO5054B					
Channel 1	Full				5.0
	250 MHz limit				4.75
	20 MHz limit				4.00
Channel 2	Full				5.00
	250 MHz limit				4.75
	20 MHz limit				4.00
Channel 3	Full				5.00
	250 MHz limit				4.75
	20 MHz limit				4.00
Channel 4	Full				5.00
	250 MHz limit				4.75
	20 MHz limit				4.00

Sample Rate and Delay Time Accuracy			
Performance checks	Low limit	Test result	High limit
	-0.8 divisions		+0.8 divisions

Delta Time Measurement Accuracy
Performance checks
MSO/DPO5204/B Channel 1

Sample rate = 10 GS/s, 4 ns/Div, Source freq = 240 MHz

MSO/DPO V/Div	Source V_{pp}	Test result	High limit
1 mV	8 mV		NA
5 mV	40 mV		65 ps
500 mV	4 V		61 ps
1 V	4 V		70 ps

Sample rate = 5 GS/s, 40 ns/Div, Source freq = 24 MHz

1 mV	8 mV		708 ps
5 mV	40 mV		322 ps
100 mV	800 mV		236 ps
500 mV	4 V		233 ps
1 V	4 V		417 ps

Sample rate = 5 GS/s, 400 ns/Div, Source freq = 2.4 MHz

1 mV	8 mV		6.68 ns
5 mV	40 mV		3.01 ns
100 mV	800 mV		2.06 ns
500 mV	4 V		2.02 ns
1 V	4 V		4.01 ns

Sample rate = 2.5 GS/s, 4 µs/Div, Source freq = 240 kHz

Table continued…

Delta Time Measurement Accuracy		
1 mV	8 mV	69.8 ns
5 mV	40 mV	30.0 ns
100 mV	800 mV	20.6 ns
500 mV	4 V	20.2 ns
1 V	4 V	40.1 ns
Sample rate = 200 MS/s, 40 µs/Div, Source freq = 24 kHz		
1 mV	8 mV	698 ns
5 mV	40 mV	300 ns
100 mV	800 mV	206 ns
500 mV	4 V	202 ns
1 V	4 V	401 ns
Sample rate = 20 MS/s, 400 µs/Div, Source freq = 2.4 kHz		
1 mV	8 mV	6.98 µs
5 mV	40 mV	3.00 µs
100 mV	800 mV	2.06 µs
500 mV	4 V	2.02 µs
1 V	4 V	4.01 µs
MSO/DPO5204/B Channel 2		

Table continued…

Delta Time Measurement Accuracy			
Sample rate = 10 GS/s, 4 ns/Div, Source freq = 240 MHz			
MSO/DPO V/Div	**Source V_{pp}**	**Test result**	**High limit**
1 mV	8 mV		NA
5 mV	40 mV		65 ps
500 mV	4 V		61 ps
1 V	4 V		70 ps
Sample rate = 5 GS/s, 40 ns/Div, Source freq = 24 MHz			
1 mV	8 mV		708 ps
5 mV	40 mV		322 ps
100 mV	800 mV		236 ps
500 mV	4 V		233 ps
1 V	4 V		417 ps
Sample rate = 5 GS/s, 400 ns/Div, Source freq = 2.4 MHz			
1 mV	8 mV		6.68 ns
5 mV	40 mV		3.01 ns
100 mV	800 mV		2.06 ns
500 mV	4 V		2.02 ns
1 V	4 V		4.01 ns
Sample rate = 2.5 GS/s, 4 µs/Div, Source freq = 240 kHz			
1 mV	8 mV		69.8 ns
5 mV	40 mV		30.0 ns
100 mV	800 mV		20.6 ns
500 mV	4 V		20.2 ns
1 V	4 V		40.1 ns
Sample rate = 200 MS/s, 40 µs/Div, Source freq = 24 kHz			
1 mV	8 mV		698 ns
5 mV	40 mV		300 ns
100 mV	800 mV		206 ns

Delta Time Measurement Accuracy
MSO/DPO5204/B Channel 3
Table continued…

Delta Time Measurement Accuracy

Sample rate = 10 GS/s, 4 ns/Div, Source freq = 240 MHz

MSO/DPO V/Div	Source V_{pp}	Test result	High limit
1 mV	8 mV		NA
5 mV	40 mV		65 ps
500 mV	4 V		61 ps
1 V	4 V		70 ps

Sample rate = 5 GS/s, 40 ns/Div, Source freq = 24 MHz

1 mV	8 mV		708 ps
5 mV	40 mV		322 ps
100 mV	800 mV		236 ps
500 mV	4 V		233 ps
1 V	4 V		417 ps

Sample rate = 5 GS/s, 400 ns/Div, Source freq = 2.4 MHz

1 mV	8 mV		6.68 ns
5 mV	40 mV		3.00 ns
100 mV	800 mV		2.06 ns
500 mV	4 V		2.02 ns
1 V	4 V		4.01 ns

Sample rate = 2.5 GS/s, 4 µs/Div, Source freq = 240 kHz

1 mV	8 mV		69.8 ns
5 mV	40 mV		30.0 ns
100 mV	800 mV		20.6 ns
500 mV	4 V		20.2 ns
1 V	4 V		40.1 ns

Sample rate = 200 MS/s, 40 µs/Div, Source freq = 24 kHz

1 mV	8 mV		698 ns
5 mV	40 mV		300 ns
100 mV	800 mV		206 ns

Delta Time Measurement Accuracy
MSO/DPO5204/B Channel 4
Table continued…

Delta Time Measurement Accuracy

Sample rate = 10 GS/s, 4 ns/Div, Source freq = 240 MHz

MSO/DPO V/Div	Source V$_{pp}$	Test result	High limit
1 mV	8 mV		NA
5 mV	40 mV		65 ps
500 mV	4 V		61 ps
1 V	4 V		70 ps

Sample rate = 5 GS/s, 40 ns/Div, Source freq = 24 MHz

1 mV	8 mV		708 ps
5 mV	40 mV		322 ps
100 mV	800 mV		236 ps
500 mV	4 V		233 ps
1 V	4 V		417 ps

Sample rate = 5 GS/s, 400 ns/Div, Source freq = 2.4 MHz

1 mV	8 mV		6.68 ns
5 mV	40 mV		3.01 ns
100 mV	800 mV		2.06 ns
500 mV	4 V		2.02 ns
1 V	4 V		4.01 ns

Sample rate = 2.5 GS/s, 4 µs/Div, Source freq = 240 kHz

1 mV	8 mV		69.8 ns
5 mV	40 mV		30.0 ns
100 mV	800 mV		20.6 ns
500 mV	4 V		20.2 ns
1 V	4 V		40.1 ns

Sample rate = 200 MS/s, 40 µs/Div, Source freq = 24 kHz

1 mV	8 mV		698 ns
5 mV	40 mV		300 ns
100 mV	800 mV		206 ns

Delta Time Measurement Accuracy
MSO/DPO5104/B Channel 1
Table continued…

Delta Time Measurement Accuracy			
Sample rate = 5 GS/s, 4 ns/Div, Source freq = 240 MHz			
MSO/DPO V/Div	**Source V$_{pp}$**	**Test result**	**High limit**
1 mV	8 mV		NA
5 mV	40 mV		118 ps
500 mV	4 V		117 ps
1 V	4 V		122 ps
Sample rate = 5 GS/s, 40 ns/Div, Source freq = 24 MHz			
1 mV	8 mV		464 ps
5 mV	40 mV		276 ps
100 mV	800 mV		234 ps
500 mV	4 V		232 ps
1 V	4 V		417 ps
Sample rate = 2.5 GS/s, 400 ns/Div, Source freq = 2.4 MHz			
1 mV	8 mV		4.50 ns
5 mV	40 mV		2.52 ns
100 mV	800 mV		2.06 ns
500 mV	4 V		2.03 ns
1 V	4 V		4.01 ns
Sample rate = 250 MS/s, 4 µs/Div, Source freq = 240 kHz			
1 mV	8 mV		45.0 ns
5 mV	40 mV		25.2 ns
100 mV	800 mV		20.5 ns
500 mV	4 V		20.3 ns
1 V	4 V		40.1 ns
Sample rate = 25 MS/s, 40 µs/Div, Source freq = 24 kHz			
1 mV	8 mV		450 ns
5 mV	40 mV		252 ns
100 mV	800 mV		205 ns

Delta Time Measurement Accuracy
MSO/DPO5104/B Channel 2
Table continued…

Delta Time Measurement Accuracy			
Sample rate = 5 GS/s, 4 ns/Div, Source freq = 240 MHz			
MSO/DPO V/Div	**Source V$_{pp}$**	**Test result**	**High limit**
1 mV	8 mV		NA
5 mV	40 mV		118 ps
500 mV	4 V		117 ps
1 V	4 V		122 ps
Sample rate = 5 GS/s, 40 ns/Div, Source freq = 24 MHz			
1 mV	8 mV		464 ps
5 mV	40 mV		276 ps
100 mV	800 mV		234 ps
500 mV	4 V		232 ps
1 V	4 V		417 ps
Sample rate = 2.5 GS/s, 400 ns/Div, Source freq = 2.4 MHz			
1 mV	8 mV		4.50 ns
5 mV	40 mV		2.52 ns
100 mV	800 mV		2.05 ns
500 mV	4 V		2.03 ns
1 V	4 V		4.01 ns
Sample rate = 250 MS/s, 4 µs/Div, Source freq = 240 kHz			
1 mV	8 mV		45.0 ns
5 mV	40 mV		25.2 ns
100 mV	800 mV		20.5 ns
500 mV	4 V		20.3 ns
1 V	4 V		40.1 ns
Sample rate = 25 MS/s, 40 µs/Div, Source freq = 24 kHz			
1 mV	8 mV		450 ns
5 mV	40 mV		252 ns
100 mV	800 mV		205 ns

Delta Time Measurement Accuracy
MSO/DPO5104/B Channel 3
Table continued…

Delta Time Measurement Accuracy			
Sample rate = 5 GS/s, 4 ns/Div, Source freq = 240 MHz			
MSO/DPO V/Div	**Source V_{pp}**	**Test result**	**High limit**
1 mV	8 mV		NA
5 mV	40 mV		118 ps
500 mV	4 V		117 ps
1 V	4 V		122 ps
Sample rate = 5 GS/s, 40 ns/Div, Source freq = 24 MHz			
1 mV	8 mV		464 ps
5 mV	40 mV		276 ps
100 mV	800 mV		234 ps
500 mV	4 V		232 ps
1 V	4 V		417 ps
Sample rate = 2.5 GS/s, 400 ns/Div, Source freq = 2.4 MHz			
1 mV	8 mV		4.50 ns
5 mV	40 mV		2.52 ns
100 mV	800 mV		2.05 ns
500 mV	4 V		2.03 ns
1 V	4 V		4.01 ns
Sample rate = 250 MS/s, 4 µs/Div, Source freq = 240 kHz			
1 mV	8 mV		45.0 ns
5 mV	40 mV		25.2 ns
100 mV	800 mV		20.5 ns
500 mV	4 V		20.3 ns
1 V	4 V		40.1 ns
Sample rate = 25 MS/s, 40 µs/Div, Source freq = 24 kHz			
1 mV	8 mV		450 ns
5 mV	40 mV		252 ns
100 mV	800 mV		205 ns

Delta Time Measurement Accuracy
MSO/DPO5104/B Channel 4
Table continued…

Delta Time Measurement Accuracy			
Sample rate = 5 GS/s, 4 ns/Div, Source freq = 240 MHz			
MSO/DPO V/Div	**Source V$_{pp}$**	**Test result**	**High limit**
1 mV	8 mV		NA
5 mV	40 mV		118 ps
500 mV	4 V		117 ps
1 V	4 V		122 ps
Sample rate = 5 GS/s, 40 ns/Div, Source freq = 24 MHz			
1 mV	8 mV		464 ps
5 mV	40 mV		276 ps
100 mV	800 mV		234 ps
500 mV	4 V		232 ps
1 V	4 V		417 ps
Sample rate = 2.5 GS/s, 400 ns/Div, Source freq = 2.4 MHz			
1 mV	8 mV		4.50 ns
5 mV	40 mV		2.52 ns
100 mV	800 mV		2.05 ns
500 mV	4 V		2.03 ns
1 V	4 V		4.01 ns
Sample rate = 250 MS/s, 4 µs/Div, Source freq = 240 kHz			
1 mV	8 mV		45.0 ns
5 mV	40 mV		25.2 ns
100 mV	800 mV		20.5 ns
500 mV	4 V		20.3 ns
1 V	4 V		40.1 ns
Sample rate = 25 MS/s, 40 µs/Div, Source freq = 24 kHz			
1 mV	8 mV		450 ns
5 mV	40 mV		252 ns
100 mV	800 mV		205 ns

Delta Time Measurement Accuracy
MSO/DPO5054/B and MSO/DPO5034/B Channel 1
Table continued…

Delta Time Measurement Accuracy

Sample rate = 2.5 GS/s, 4 ns/Div, Source freq = 240 MHz

MSO/DPO V/Div	Source V$_{pp}$	Test result	High limit
1 mV	8 mV		NA
5 mV	40 mV		234 ps
500 mV	4 V		233 ps
1 V	4 V		237 ps

Sample rate = 2.5 GS/s, 40 ns/Div, Source freq = 24 MHz

1 mV	8 mV		735 ps
5 mV	40 mV		422 ps
100 mV	800 mV		357 ps
500 mV	4 V		354 ps
1 V	4 V		581 ps

Sample rate = 2.5 GS/s, 400 ns/Div, Source freq = 2.4 MHz

1 mV	8 mV		6.99 ns
5 mV	40 mV		3.54 ns
100 mV	800 mV		2.72 ns
500 mV	4 V		2.69 ns
1 V	4 V		5.34 ns

Sample rate = 250 MS/s, 4 µs/Div, Source freq = 240 kHz

1 mV	8 mV		69.9 ns
5 mV	40 mV		35.4 ns
100 mV	800 mV		27.2 ns
500 mV	4 V		26.9 ns
1 V	4 V		53.4 ns

Sample rate = 25 MS/s, 40 µs/Div, Source freq = 24 kHz

1 mV	8 mV		699 ns
5 mV	40 mV		354 ns
100 mV	800 mV		272 ns

Delta Time Measurement Accuracy
MSO/DPO5054/B and MSO/DPO5034/B Channel 2
Table continued…

Delta Time Measurement Accuracy

Sample rate = 2.5 GS/s, 4 ns/Div, Source freq = 240 MHz

MSO/DPO V/Div	Source V$_{pp}$	Test result	High limit
1 mV	8 mV		NA
5 mV	40 mV		234 ps
500 mV	4 V		233 ps
1 V	4 V		237 ps

Sample rate = 2.5 GS/s, 40 ns/Div, Source freq = 24 MHz

1 mV	8 mV		735 ps
5 mV	40 mV		422 ps
100 mV	800 mV		357 ps
500 mV	4 V		254 ps
1 V	4 V		581 ps

Sample rate = 2.5 GS/s, 400 ns/Div, Source freq = 2.4 MHz

1 mV	8 mV		6.99 ns
5 mV	40 mV		3.54 ns
100 mV	800 mV		2.72 ns
500 mV	4 V		2.69 ns
1 V	4 V		5.34 ns

Sample rate = 250 MS/s, 4 µs/Div, Source freq = 240 kHz

1 mV	8 mV		69.9 ns
5 mV	40 mV		35.4 ns
100 mV	800 mV		27.2 ns
500 mV	4 V		26.9 ns
1 V	4 V		53.4 ns

Sample rate = 25 MS/s, 40 µs/Div, Source freq = 24 kHz

1 mV	8 mV		699 ns
5 mV	40 mV		354 ns
100 mV	800 mV		272 ns

Delta Time Measurement Accuracy
MSO/DPO5054/B and MSO/DPO5034/B Channel 3
Table continued…

Delta Time Measurement Accuracy

Sample rate = 2.5 GS/s, 4 ns/Div, Source freq = 240 MHz

MSO/DPO V/Div	Source V_{pp}	Test result	High limit
1 mV	8 mV		NA
5 mV	40 mV		234 ps
500 mV	4 V		233 ps
1 V	4 V		237 ps

Sample rate = 2.5 GS/s, 40 ns/Div, Source freq = 24 MHz

1 mV	8 mV		735 ps
5 mV	40 mV		422 ps
100 mV	800 mV		257 ps
500 mV	4 V		254 ps
1 V	4 V		581 ps

Sample rate = 2.5 GS/s, 400 ns/Div, Source freq = 2.4 MHz

1 mV	8 mV		6.99 ns
5 mV	40 mV		3.54 ns
100 mV	800 mV		2.72 ns
500 mV	4 V		2.69 ns
1 V	4 V		5.34 ns

Sample rate = 250 MS/s, 4 µs/Div, Source freq = 240 kHz

1 mV	8 mV		69.9 ns
5 mV	40 mV		35.4 ns
100 mV	800 mV		27.2 ns
500 mV	4 V		26.9 ns
1 V	4 V		53.4 ns

Sample rate = 25 MS/s, 40 µs/Div, Source freq = 24 kHz

1 mV	8 mV		699 ns
5 mV	40 mV		354 ns
100 mV	800 mV		272 ns

Delta Time Measurement Accuracy
MSO/DPO5054/B and MSO/DPO5034/B Channel 4
Table continued…

Delta Time Measurement Accuracy			
Sample rate = 2.5 GS/s, 4 ns/Div, Source freq = 240 MHz			
MSO/DPO V/Div	**Source V_{pp}**	**Test result**	**High limit**
1 mV	8 mV		NA
5 mV	40 mV		234 ps
500 mV	4 V		233 ps
1 V	4 V		237 ps
Sample rate = 2.5 GS/s, 40 ns/Div, Source freq = 24 MHz			
1 mV	8 mV		735 ps
5 mV	40 mV		422 ps
100 mV	800 mV		257 ps
500 mV	4 V		354 ps
1 V	4 V		581 ps
Sample rate = 2.5 GS/s, 400 ns/Div, Source freq = 2.4 MHz			
1 mV	8 mV		6.99 ns
5 mV	40 mV		3.54 ns
100 mV	800 mV		2.72 ns
500 mV	4 V		2.69 ns
1 V	4 V		5.34 ns
Sample rate = 250 MS/s, 4 µs/Div, Source freq = 240 kHz			
1 mV	8 mV		69.9 ns
5 mV	40 mV		35.4 ns
100 mV	800 mV		27.2 ns
500 mV	4 V		26.9 ns
1 V	4 V		53.4 ns
Sample rate = 25 MS/s, 40 µs/Div, Source freq = 24 kHz			
1 mV	8 mV		699 ns
5 mV	40 mV		354 ns
100 mV	800 mV		272 ns

Digital Threshold Accuracy, MSO5000/B series only						
Performance checks:						
Digital channel	Threshold	V_{s-}	V_{s+}	Low limit	Test result	High limit
D0	0 V			-0.1 V		0.1 V
	4 V			3.78 V		4.22 V
D1	0 V			- 0.1 V		0.1 V
	4 V			3.78 V		4.22 V
D2	0 V			-0.1 V		0.1 V
	4 V			3.78 V		4.22 V
D3	0 V			-0.1 V		0.1 V
	4 V			3.78 V		4.22 V
D4	0 V			-0.1 V		0.1 V
	4 V			3.78 V		4.22 V
D5	0 V			-0.1 V		0.1 V
	4 V			3.78 V		4.22 V
D6	0 V			-0.1 V		0.1 V
	4 V			3.78 V		4.22 V
D7	0 V			-0.1 V		0.1 V
	4 V			3.78 V		4.22 V
D8	0 V			-0.1 V		0.1 V
	4 V			3.78 V		4.22 V
D9	0 V			-0.1 V		0.1 V
	4 V			3.78 V		4.22 V
D10	0 V			-0.1 V		0.1 V
	4 V			3.78 V		4.22 V
Table continued…						

Digital Threshold Accuracy, MSO5000/B series only						
Performance checks:						
Digital channel	Threshold	V_{s-}	V_{s+}	Low limit	Test result	High limit
D11	0 V			-0.1 V		0.1 V
	4 V			3.78 V		4.22 V
D12	0 V			-0.1 V		0.1 V
	4 V			3.78 V		4.22 V
D13	0 V			-0.1 V		0.1 V
	4 V			3.78 V		4.22 V
D14	0 V			-0.1 V		0.1 V
	4 V			3.78 V		4.22 V
D15	0 V			-0.1 V		0.1 V
	4 V			3.78 V		4.22 V

Auxiliary (Trigger) Output				
Performance checks		**Low limit**	**Test result**	**High limit**
Trigger Output	High 1 MΩ	≥ 2.5 V		–
	Low 1 MΩ	–		≤ 0.7 V
Trigger Output	High 50 Ω	≥ 1.0 V		–
	Low 50 Ω	–		≤ 0.25 V

Performance tests (MSO/DPO5000-B series)

This section contains a collection of manual procedures for checking that the instrument performs as warranted. They check all the characteristics that are designated as checked in *Specifications*. (The characteristics that are checked appear with a ✔ in *Specifications*).

Prerequisites

The tests in this section comprise an extensive, valid confirmation of performance and functionality when the following requirements are met:

- The cabinet must be installed on the instrument.

- You must have performed and passed the procedures under *Self Test*. (See *Self test* on page 385.)

- A signal-path compensation must have been done within the recommended calibration interval and at a temperature within ±5 ºC (±9 ºF) of the present operating temperature. (If at the time you did the prerequisite *Self Test,* the temperature was within the limits just stated, consider this prerequisite met). A signal-path compensation must have been done at an ambient humidity within 25% of the current ambient humidity and after having been at that humidity for at least 4 hours.

- The instrument must have been last adjusted at an ambient temperature between +18 ºC (+64 ºF) and +28 ºC (+82 ºF), must have been operating for a warm-up period of at least 20 minutes, and must be operating at an ambient temperature as listed in the specifications. (See *Environmental specifications* on page 109.) (The warm-up requirement is usually met in the course of meeting the Self Test prerequisites listed above).

- Support sensor, probe, and adapter setups to avoid stress or torque when connected to the device under test (DUT).

Self test

This procedure verifies that the instrument passes the internal diagnostics and performs signal path compensation. No test equipment or hookups are required.

Equipment required	Prerequisites
None	Power on the instrument and allow a 20 minute warm-up period before performing this procedure.

1. *Run the System Diagnostics (may take several minutes):*

   a. Ensure that an optical mouse is installed on one of the USB connectors.

   b. Disconnect everything from the oscilloscope inputs.

   c. If the instrument is in toolbar mode, put the instrument into menu bar mode by clicking on the down arrow at the top of the display.

   d. Pull down the **Utilities** menu and select **Instrument Diagnostics**. This displays the diagnostics control window.

   e. Click the **Run** button in the diagnostics control window.

   f. Wait. The internal diagnostics perform an exhaustive verification of proper instrument function. This verification may take several minutes. When the verification is finished, the resulting status will appear in the diagnostics control window

   g. Verify that the status of all tests on the readout is **Pass**.

2. *Run the signal-path compensation routine (may take 5 to 15 minutes):*

   a. Pull down the **Utilities** menu and select **Instrument Calibration**. This displays the instrument calibration control window. If required because the instrument is in service mode, select the **Signal Path** button under Calibration Area.

   b. Click the **Run SPC** button to start the routine.

   c. Wait. Signal-path compensation may take 5 to 15 minutes to run.

   d. Verify that the **SPC Status** is **Pass** and that the **Temperature Status** is Ready.

3. *Return to regular service:* Click the **X** (close) button to exit the instrument calibration control window.

Check input impedance (Resistance)

This test checks the Input Impedance.

1. Connect the output of the oscilloscope calibrator (for example, Fluke 9500) to the oscilloscope channel 1 input, as shown in the following illustration.
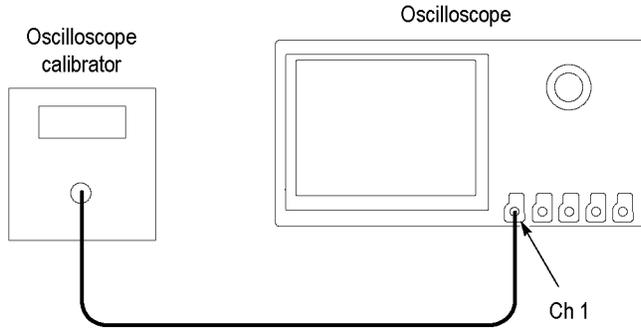
Oscilloscope

Oscilloscope
calibrator

Ch 1

⚠ **WARNING:** The generator is capable of providing dangerous voltages. Be sure to set the generator to off or 0 volts before connecting, disconnecting, and/or moving the test hookup during the performance of this procedure.

2. Push the front-panel **Default Setup** button.

3. *Set the impedance to 1 MΩ as follows:*

   a. Set the calibrator impedance to 1 MΩ.

   b. Push the front-panel Vertical **V** menu button.

   c. Set the **Termination** to **1 MΩ**.

4. Set the Vertical **Scale** to **10 mV/div**.

⚠ **Note:** Impedance measuring equipment that produce a voltage across the channel that exceeds the measurement range of the instrument may report erroneous impedance results. A measurement voltage exceeds the measurement range of the instrument when the resulting trace is not visible on the graticule because of the measurement voltage amplitude.

5. Use the calibrator to measure the input impedance of the oscilloscope and enter the value in the test record.

6. Repeat steps *4* on page 386 and *5* on page 386 for all vertical scale settings in the test record.

7. *Repeat the tests at 250 kΩ as follows:*

   a. Set the calibrator impedance to 1 MΩ.

   b. In the toolbar, click the **Utilities** menu and select **Instrument Diagnostics**.

   c. Click the on-screen **Manual Product Verification** button.

   d. Click the on-screen box to Verify the probe host terminations.

   e. Set the Vertical **Scale** to **100 mV/division**.

   f. Use the calibrator to measure the input impedance of the oscilloscope and enter the value in the test record.

8. *Repeat the tests at 50 Ω as follows:*

   a. Set the calibrator impedance to 50 Ω.

   b. Push the front-panel oscilloscope Vertical **V** menu button.

   c. Set the **Termination** to **50 Ω**.

   d. Repeat steps *4* on page 386 through *6* on page 386.

9. *Repeat the procedure for all remaining channels as follows:*

   a. Push the front-panel button to deselect the channel that you have already tested.

   b. Push the front-panel button to select the next channel to be tested.

   c. Move the calibrator connection to the next channel to be tested.

   d. Starting from step *3* on page 386, repeat the procedure until all channels have been tested.

10. Press the **Menu Off** button.

Check DC balance

This test checks the DC balance. You do not need to connect any test equipment (other than the 50 Ω terminator) to the oscilloscope to perform this check.
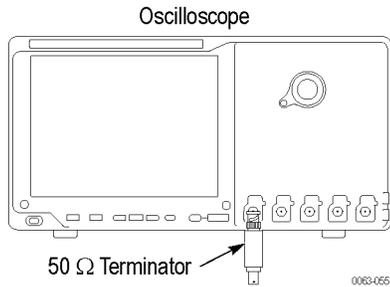
1. Attach a 50 Ω terminator to the oscilloscope channel 1 input.

2. Push the front-panel **Default Setup** button.

3. *Set the oscilloscope impedance to 50 Ω as follows:*

    a. Push the front-panel oscilloscope Vertical **V** menu button.

    b. Set the **Termination** to **50 Ω**.

4. Set the **Bandwidth** to **20 MHz**

5. Set the Horizontal **Scale** to **1 ms/division**.

6. *Set the Acquisition mode to Average as follows:*

    a. Push the front-panel **Acquire** button.

    b. In the Acquisition window, select the **Acquisition** tab at the left.

    c. Select **Average** Acquisition mode.

    d. Ensure that the **number of averages** is set to **16**.

7. *Set the trigger source to AC line as follows:*

    a. Push the front-panel Trigger **Menu** button.

    b. In the Trigger menu, under **Source**, click **Select**.

    c. Click **Line** to set the trigger source to AC line, and then click **OK**.

8. Set the Vertical **Scale** to **1 mV**.

9. *Select the mean measurement (if not already selected) as follows:*

    a. Push the front-panel Wave Inspector **Measure** button.

    b. In the Measurements Setup window, go to the **Measurements** box. Click the **More** button and then select **Mean**.

    c. View the **Mean** measurement value in the display.

10. Enter the mean value as the test result in the test record.

11. Repeat steps *8* on page 387 through *10* on page 387 for each vertical scale setting in the test record.

12. Repeat steps *5* on page 387 through *11* on page 387 for each bandwidth setting in the test record table.

13. *Repeat the tests at 1 MΩ impedance as follows:*

    a. Push the front-panel Vertical **V** menu button.

    b. Set the **Termination** to **1M Ω**.

    c. Repeat steps *4* on page 387 through *12* on page 387.

14. *Repeat the procedure for all remaining channels as follows:*

    a. Push the front-panel button to deselect the channel that you have already tested.

    b. Push the front-panel button to select the next channel to be tested.

    c. Move the 50 Ω terminator to the channel input to be tested.

    d. Starting from step *3* on page 387, repeat the procedure until all channels have been tested.

15. Press the **Menu Off** button.

Check DC gain accuracy

This test checks the DC gain accuracy.

1. Connect the oscilloscope to a DC voltage source. If you are using the Fluke 9500 calibrator, connect the calibrator head to the oscilloscope channel to test.
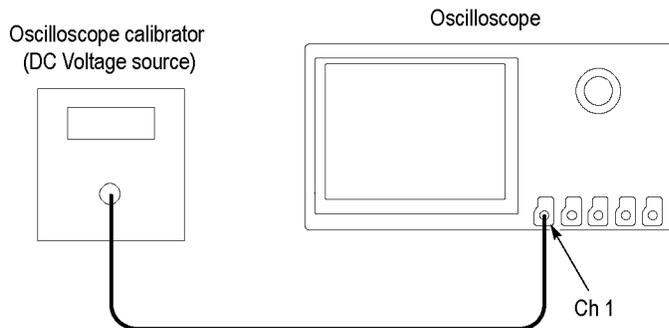
⚠ **WARNING:** The generator is capable of providing dangerous voltages. Be sure to set the generator to off or 0 volts before connecting, disconnecting, and/or moving the test hookup during the performance of this procedure.

2. Push the front-panel **Default Setup** button.

3. *Set the input impedance to 50 Ω as follows:*

    a. Set the calibrator to 50 Ω output impedance.

    b. Push the front-panel oscilloscope Vertical **V** menu button.

    c. Set the **Termination** to **50 Ω**.

4. Set the **Bandwidth** to **20 MHz**.

5. *Set the Acquisition mode to Average as follows:*

    a. Push the front-panel **Acquire** button.

    b. In the Acquisition window, select the **Acquisition** tab at the left.

    c. Select **Average** Acquisition mode.

    d. Ensure that the **number of averages** is set to **16**.

6. *Set the trigger source to AC line as follows:*

    a. Push the Trigger **Menu** front-panel button.

    b. In the Trigger menu, under **Source**, click **Select**.

    c. Click **Line** to set the trigger source to AC line, and then click **OK**.

7. Set the Vertical **Scale** to **2 mV/division**.

8. *Record the negative-measured and positive-measured mean readings in the worksheet as follows:*

    a. Set the DC Voltage Source to $V_{negative}$.

    b. Push the front-panel Wave Inspector **Measure** button.

    c. In the Measurements Setup window, go to the **Measurements** box. Click the **More** button and then select **Mean**.

d. View the **Mean** measurement value in the display.

e. In the Measurement Setup window, select **Statistics**.

f. Click **Reset**.

g. Enter the mean reading in the worksheet as $V_{negative\text{-}measured}$. (See *Table 22* on page 389.)

h. Set the DC Voltage Source to $V_{positive}$.

i. Click **Reset** again.

j. Enter the mean reading in the worksheet as $V_{positive\text{-}measured}$.

Table 22: Gain expected worksheet

Oscilloscope Vertical Scale Setting	$V_{diffExpected}$	$V_{negative}$	$V_{positive}$	$V_{negative\text{-}measured}$	$V_{positive\text{-}measured}$	V_{diff}	Test Result (Gain Accuracy)
2 mV/div	18 mV	-9 mV	+9 mV				
5 mV	45 mV	-22.5 mV	+22.5 mV				
10 mV	90 mV	-45 mV	+45 mV				
20 mV	180 mV	-90 mV	+90 mV				
50 mV	450 mV	-225 mV	+225 mV				
100 mV	900 mV	-450 mV	+450 mV				
200 mV	1800 mV	-900 mV	+900 mV				
500 mV	4900 mV	-2450 mV	+2450 mV				
1.0 V	9000 mV	-4500 mV	+4500 mV				
20 mV at 250 MHz	180 mV	-90 mV	+90 mV				
20 mV at Full bandwidth	180 mV	-90 mV	+90 mV				

9. *Record Gain Accuracy as follows:*

a. Calculate *V diff* as follows:

V diff = | V negative-measured - V positive-measured |

b. Enter *V diff* in the worksheet. (See *Table 22* on page 389.)

c. Calculate *Gain Accuracy* as follows:

Gain Accuracy = ((V diff - V diffExpected)/V diffExpected) × 100%

d. Enter *Gain Accuracy* in the worksheet and in the test record.

10. *Repeat tests at 1 MΩ impedance as follows:*

a. Set the calibrator to 1 MΩ output.

b. Push the front-panel Vertical **V** menu button.

c. Set the **Termination** to **1 MΩ**

    d. Repeat steps *8* on page 388 through *9* on page 389.

11. Repeat steps *7* on page 388 through *10* on page 389 for all vertical scale settings in the test record.

12. Repeat the procedure for all remaining channels:

    a. Push the front-panel button to deselect the channel that you have already tested.

    b. Push the front-panel button to select the next channel to be tested.

    c. Move the DC voltage source connection to the channel input to be tested.

    d. Starting from step *3* on page 388, repeat the procedure until all channels have been tested.

13. Press the **Menu Off** button.

Check offset accuracy

This test checks the offset accuracy.

1. Connect the oscilloscope to a DC voltage source. If you are using the Fluke 9500B calibrator as the DC voltage source, connect the calibrator head to the oscilloscope channel 1.

⚠ **WARNING:** The generator is capable of providing dangerous voltages. Be sure to set the generator to off or 0 volts before connecting, disconnecting, and/or moving the test hookup during the performance of this procedure.

2. Push the front-panel **Default Setup** button.

3. *Set the impedance to 50 Ω as follows:*

    a. Set the calibrator to 50 Ω output impedance.

    b. Push the front-panel oscilloscope Vertical **V** menu button.

    c. Set the **Termination** to **50 Ω**.

4. Set the calibrator to 900 mV, as shown in the test record.

5. Set the **Bandwidth** to **20 MHz**.

6. Set the Horizontal **Scale** to 1 ms/div.

7. Set the Vertical **Scale** to 1 mV/div.

8. In the Vertical menu, set the oscilloscope **Vertical Offset** to 900 mV.

9. Check that the vertical position is set to 0 divisions. If it is not, turn the Vertical **Position** knob to set the position to 0.

10. *Set the Acquisition mode to Average as follows:*

    a. Push the front-panel **Acquire** button.

    b. In the Acquisition window, select the **Acquisition** tab at the left.

    c. Click **Average** Acquisition mode.

    d. Ensure that the **number of averages** is set to **16**.

11. *Set the trigger source to AC line as follows:*

a. Push the Trigger **Menu** front-panel button.

b. In the Trigger menu, under **Source**, click **Select**.

c. Click **Line** to set the trigger source to AC line, and then click **OK**.

12. *Select the mean measurement as follows:*

a. Push the front-panel Wave Inspector **Measure** button.

b. In the Measurements Setup window, go to the **Measurements** box. Click the **More** button and then select **Mean**.

c. View the **Mean** measurement value in the display.

13. Enter the mean value as the test result in the test record.

14. Repeat step *13* on page 391 for each vertical scale and vertical offset setting shown in the test record.

15. *Repeat the tests at 1 MΩ impedance as follows:*

a. Change the calibrator impedance to 1 MΩ.

b. Push the front-panel Vertical **V** menu button.

c. Set the **Termination** to **1 MΩ**.

d. Repeat steps *4* on page 390 through *14* on page 391.

16. *Repeat the procedure for all remaining channels as follows:*

a. Push the front-panel button to deselect the channel that you have already tested.

b. Push the front-panel button to select the next channel to be tested.

c. Move the DC voltage source connection to the channel input to be tested.

d. Starting from step*3* on page 390, repeat the procedure until all channels have been tested.

17. Press the **Menu Off** button.

Check analog bandwidth

This test checks the bandwidth at 50 Ω termination for each channel. The typical bandwidth at 1 M Ω termination is checked on the MSO/DPO5200/B and MSO/DPO5100/B series products as a functional check.

1. Connect the output of the leveled sine wave generator to the oscilloscope channel 1 input as shown in the following illustration.
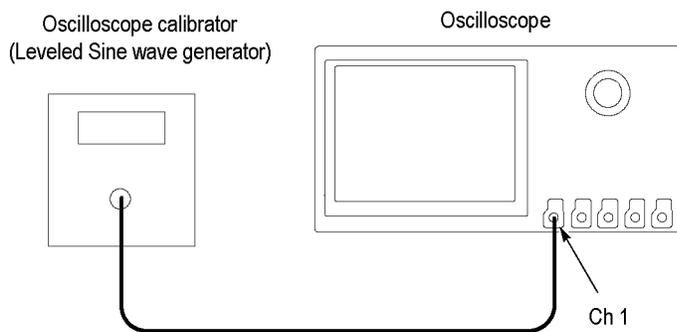
WARNING: The generator is capable of providing dangerous voltages. Be sure to set the generator to off or 0 volts before connecting, disconnecting, and/or moving the test hookup during the performance of this procedure.

2. Push the front-panel **Default Setup** button.

3. *Set the impedance to 50 Ω as follows:*

a. Set the calibrator to 50 Ω output impedance, and to generate a sine wave.

b. Push the front-panel oscilloscope Vertical **V** menu button.

    c. Under **Termination**, click **50 Ω**.

4. Set the Vertical **Scale** to **1 mV**.

5. *Set the Acquisition mode to Sample as follows:*

    a. Push the front-panel **Acquire** button.

    b. In the Acquisition window, select the **Acquisition** tab at the left.

    c. Click **Sample** Acquisition mode.

6. Adjust the signal source to 8 vertical divisions at the selected vertical scale with a set frequency of 50 kHz. For example, at 5 mV/div, use a ≥40 mV_{p-p} signal, and at 2 mV/div, use a ≥16 mV_{p-p} signal.

> ⚠ **Note:** At some V/div settings, the generator may not provide 8 vertical divisions of signal. Use the maximum output setting of the generator to obtain as many vertical divisions of signal as possible.

7. Set the Horizontal **Scale** to **1 ms/division**.

8. *Record the peak-to-peak measurement as follows:*

    a. Push the front-panel Wave Inspector **Measure** button.

    b. In the **Measurements** box, click **Pk-Pk**.

    c. This will provide a mean V_{p-p} of the signal. Call this value **V** $_{in-pp}$.

    d. Enter this value in the test record.

9. Set the Horizontal **Scale** to **5 ns/division**.

10. Adjust the signal source to the maximum bandwidth frequency for the bandwidth and model desired, as shown in the following worksheet.

11. *Record the peak-to-peak measurement as follows:*

    a. With the **Pk-Pk** measurement still displayed from step *8* on page 392, view the measurement at the new frequency.

    b. This will provide a mean V_{p-p} of the signal. Call this value **V** $_{bw-pp}$.

    c. Enter this value in the test record.

> ⚠ **Note:** For more information on the contents of this worksheet, refer to the bandwidth specifications. (See *Analog bandwidth 50 Ω DC coupled*.)

Table 23: Maximum bandwidth frequency worksheet

Model: MSO5204/B, DPO5204/B		
Impedance	Vertical Scale	Maximum bandwidth
50 Ω	10 mV/div — 1 V/div	2 GHz
	5 mV/div — 9.95 mV/div	1.5 GHz
	2 mV/div — 4.98 mV/div	350 MHz
	1 mV/div — 1.99 mV/div	175 MHz
1 MΩ	5 mV/div — 1 V/div	500 MHz, typical
	2 mV/div — 4.98 mV/div	350 MHz, typical
	1 mV/div — 1.99 mV/div	175 MHz, typical

Model: MSO5104/B, DPO5104/B		
Impedance	Vertical Scale	Maximum bandwidth
50 Ω	5 mV/div — 1 V/div	1 GHz
	2 mV/div — 4.98 mV/div	350 MHz
	1 mV/div — 1.99 mV/div	175 MHz
1 MΩ	5 mV/div — 1 V/div	500 MHz, typical
	2 mV/div — 4.98 mV/div	350 MHz, typical
	1 mV/div — 1.99 mV/div	175 MHz, typical

Model: MSO5054/B, DPO5054/B		
50 Ω	5 mV/div — 1 V/div	500 MHz
	2 mV/div — 4.98 mV/div	350 MHz
	1 mV/div — 1.99 mV/div	175 MHz

Model: MSO5034/B, DPO5034/B		
50 Ω	2 mV/div — 1 V/div	350 MHz
	1 mV/div — 1.99 mV/div	175 MHz

12. Use the values of *V bw-pp* and *V in-pp* stored in the test record to calculate the *Gain* at bandwidth with the following equation:

Gain = *V bw-pp* / *V in-pp*

To pass the performance measurement test, Gain should be ≥ 0.707. Enter *Gain* in the test record.

13. Repeat steps *4* on page 392 through *12* on page 393 for all combinations of Vertical Scale and Horizontal Scale settings listed in the test record.

14. *For MSO/DPO5204/B and MSO/DPO5104/B models only, repeat the tests at 1 MΩ impedance as follows:*

    a. Change the calibrator impedance to 1 MΩ.

    b. Push the front-panel Vertical **V** menu button.

    c. Set the **Termination** to **1 MΩ**.

    d. Repeat steps *4* on page 392 through *13* on page 393.

15. *Repeat the procedure for all remaining channels as follows:*

    a. Push the front-panel button to deselect the channel that you have already tested.

    b. Push the front-panel button to select the next channel to be tested.

    c. Move the calibrator connection to the channel input to be tested.

    d. Starting from step *3* on page 391, repeat the procedure until all channels have been tested.

16. Press the **Menu Off** button.

Check random noise sample acquisition mode

This test checks random noise at 50 Ω and 1 M Ω for each channel. You do not need to connect any test equipment to the oscilloscope for this test.

1. Disconnect everything from the oscilloscope inputs.

2. Push the front-panel **Default Setup** button.

3. *Select the RMS measurement as follows:*

    a. Push the front-panel Wave Inspector **Measure** button.

    b. In the Measurement Setup window, select the **RMS** measurement.

    c. Ensure that the channel being tested is selected in the **Channels** box.

4. *Reset the Statistics as follows:*

    a. Select **Statistics**.

    b. Click **Reset**.

    c. Click **OK**.

5. Read and make a note of the RMS Mean value. This is the Sampled Mean Value (SMV).

6. *Set the Acquisition mode to Average as follows:*

    a. Push the front-panel **Acquire** button.

    b. In the Acquisition window, select the **Acquisition** tab at the left.

    c. Click to select **Average** Acquisition mode.

    d. Ensure that the **number of averages** is set to **16**.

7. *Reset statistics as follows:*

    a. Push the front-panel Wave Inspector **Measure** button.

    b. In the Measurement Setup window, select **Statistics**.

    c. Click **Reset**.

8. Read and make a note of the RMS Mean value. This is the Averaged Mean Value (AMV).

9. Calculate the RMS noise (RMS noise = SMV – AMV), and enter the calculated RMS noise in the test record.

10. *Set the Acquisition mode to Sample as follows:*

    a. Push the front-panel **Acquire** button.

    b. In the Acquisition window, select the **Acquisition** tab at the left.

    c. Select the **Sample** Acquisition mode.

11. *Repeat the tests at 50 Ω as follows:*

    a. Push the front-panel oscilloscope Vertical **V** menu button.

    b. Set the **Termination** to **50 Ω**.

    c. Repeat steps *4* on page 394 through *10* on page 394.

12. *Repeat the tests at all bandwidth settings as follows:*

    a. Push the front-panel oscilloscope Vertical **V** menu button.

    b. Set the **Termination** to **1 MΩ**.

    c. Select the next **Bandwidth** at which to test.

    d. Starting at step *4* on page 394, repeat the procedure for each bandwidth setting in the test record.

13. Press the **Menu Off** button.

Check sample rate and delay time accuracy

This test checks the sample rate and delay time accuracy (time base).

1. Connect the output of a time mark generator to the oscilloscope channel 1 input using a 50 Ω cable, as shown in the following illustration.
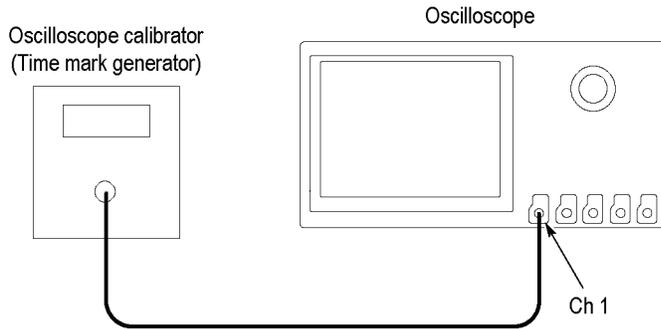
WARNING: The generator is capable of providing dangerous voltages. Be sure to set the generator to off or 0 volts before connecting, disconnecting, and/or moving the test hookup during the performance of this procedure.

2. Set the time mark generator period to **80 ms**. Use a time mark waveform with a fast rising edge.

3. Push the front-panel **Default Setup** button.

4. *Set the impedance to 50 Ω as follows:*

 a. Push the front-panel oscilloscope Vertical **V** menu button.

 b. Set the **Termination** to **50 Ω**.

5. If it is adjustable, set the time mark amplitude to approximately **1 V p-p**.

6. Set the Vertical **Scale** to **500 mV**.

7. Set the Horizontal **Scale** to **20 ms/div**.

8. Set the Vertical **Position** to center the time mark signal on the screen.

9. Set the **Trigger Level** as necessary for a triggered display.

10. Adjust the Horizontal **Position** to move the trigger location to the center of the screen (50%).

11. *Set the delay to 80 ms as follows:*

 a. Push the front-panel **Acquire** button. Ensure that the **Horizontal** tab on the left side of the screen is selected.

 b. Turn **Delay** on.

 c. Turn the Horizontal **Position** knob clockwise (or click the Delay box and use the keypad) to set the delay to exactly **80 ms**.

12. Set the horizontal scale to **500 ns/div** using the Horizontal **Scale** knob or by clicking in the Scale box and using the up/down arrows.

13. Compare the rising edge of the marker with the center horizontal graticule line. The rising edge should be within ±0.8 divisions of center graticule. Enter the deviation in the test record.

Note: A 5 ppm time base error is 400 ns or 0.8 divisions of displacement.

14. Press the **Menu Off** button.

Check delta time measurement accuracy

This test checks the Delta-time measurement accuracy for a given instrument setting and input signal.

1. Connect a 50 Ω coaxial cable from the signal source to the oscilloscope channel 1, as shown in the following illustration.
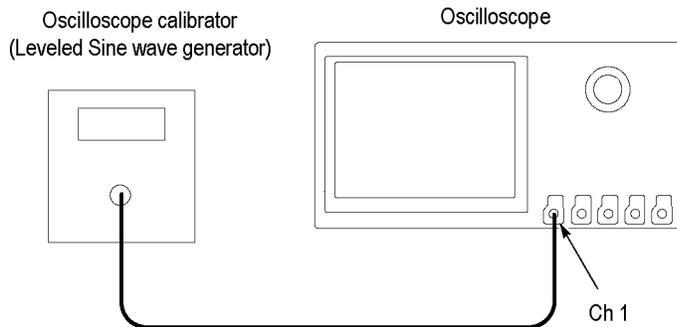
    ⚠ WARNING: The generator is capable of providing dangerous voltages. Be sure to set the generator to off or 0 volts before connecting, disconnecting, and/or moving the test hookup during the performance of this procedure.

2. Push the oscilloscope front-panel **Default Setup** button.

3. *Set the Horizontal* **Scale** *to one of the unchecked values listed in the test record. For example, set the scale to* **4 ns/div** *as follows:*

    a. Turn the Horizontal **Scale** knob to set the time per division as close as you can to the desired setting. In this case, set the scale to **5 ns/div**.

    b. Push the front-panel **Acquire** button.

    c. Select **Manual Mode**.

    d. Click the **Sample Rate** field and set the sample rate to one of the unchecked values listed in the test record.

    e. Click the **Record Length** field to bring up the on screen keypad.

    f. Reduce the record length until the correct Horizontal **Scale** is set.

4. Set the Vertical **Scale** to **5 mV/div**.

5. *Set the impedance to 50 Ω as follows:*

    a. Set the sine wave generator output impedance to 50 Ω.

    b. Push the front-panel oscilloscope Vertical **V** menu button.

    c. Set the **Termination** to **50 Ω**.

6. *Set the Mean & St Dev Samples to 1000 as follows:*

    a. Push the Wave Inspector **Measure** button.

    b. In the Measurements Setup window, select the **More** tab on the left.

    c. Select the **Burst Width** measurement.

    d. Select **Statistics**.

    e. Click in the **Weight n=** box and set the value to 1000.

7. Set the signal source to 240 MHz and 40 mV as shown in the test record.

        ⚠ Note: To provide consistent results, set the signal source frequency such that the zero crossing does not occur at the beginning or end of the record.

8. *Reset statistics as follows:*

    a. Push the front-panel Wave Inspector **Measure** button.

    b. In the Measurement Setup window, select **Statistics**.

    c. Click **Reset**.

    d. Wait 5 or 10 seconds for the oscilloscope to acquire all of the samples before taking the reading.

9. *Check the oscilloscope performance as follows*:

    a. Verify that the **St Dev** is less than the upper limit shown in the test record.

    b. Enter the reading in the test record.

    c. Repeat the check for each combination of oscilloscope and source signal settings in the test record, using the method in step *3* on page 396 to change the Horizontal Scale settings.

10. *Repeat the procedure for all remaining channels as follows:*

    a. Push the front-panel button to deselect the channel that you have already tested.

    b. Push the front-panel channel button for the next channel to be tested.

    c. Connect the signal source to the input for that channel.

    d. Repeat the procedure from step *5* on page 396 until all channels have been tested.

11. Press the **Menu Off** button.

Check digital threshold accuracy (MSO5000/B only)

For the MSO5000/B series only, this test checks the threshold accuracy of the digital channels. This procedure applies to digital channels D0 through D15, and to channel threshold values of 0 V and +4 V.

1. Connect the P6616 digital probe to the MSO5000/B series instrument.
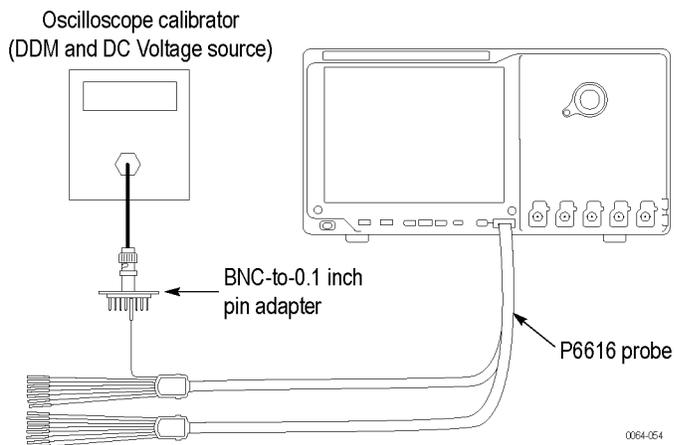
    ⚠️ **WARNING:** The generator is capable of providing dangerous voltages. Be sure to set the generator to off or 0 volts before connecting, disconnecting, and/or moving the test hookup during the performance of this procedure.

2. Connect the DC voltage source to the digital channel D0.

If you are using the Fluke 9500 calibrator as the DC voltage source, connect the calibrator head to the digital channel D0, using the BNC-to-0.1 inch pin adapter listed in the *Required equipment* table. Be sure to connect channel D0 from the probe connector to both the corresponding signal pin and to a ground pin on the adapter.

3. Push the front-panel **Default Setup** button.

4. *Turn on the digital channels and set the thresholds as follows:*

    a. Push the front-panel **D15-D0** button.

    b. Select the **D7-D0** tab on the left and turn channels D7-D0 **On**.

    c. Select the **D15-D8** tab and turn channels D15-D8 **On**.

    d. The instrument will display the 16 digital channels.

    e. Click in the **Global Threshold** box and set the value to **0.00 V**.

    f. Click **Apply**.

    g. All thresholds are now set for the 0 V threshold check.

5. Set the Horizontal Scale to 5 µs/div.

6. *Set the source as follows:*

    a. Push the front-panel **Trigger Menu** button.

    b. Under **Source**, click **Select**.

    c. In the Source Selection box, select **Ch D0**. Click OK.

7. Set the DC voltage source (Vs) to -400 mV. Wait 3 seconds. Check the logic level of the channel D0 signal display. If it is at a static logic high, change the DC voltage source Vs to -500 mV.

8. Increment Vs by +10 mV. Wait 3 seconds and check the logic level of the channel D0 signal display. If it is a static logic high, record the Vs value as in the 0 V row of the test record.

    If the signal level is a logic low or is alternating between high and low, repeat this step (increment Vs by 10 mV, wait 3 seconds, and check for a static logic high) until a value for **V s-** is found.

9. Click the lower **Slope** button to change the slope to **Falling**.

10. Set the DC voltage source (Vs) to +400 mV. Wait 3 seconds. Check the logic level of the channel D0 signal display.

    If it is at a static logic low, change the DC voltage source Vs to +500 mV.

11. Reduce Vs by -10 mV. Wait 3 seconds and check the logic level of the channel D0 signal display. If it is a static logic low, record the Vs value as **Vs+** in the 0 V row of the test record.

    If the signal level is a logic high or is alternating between high and low, repeat this step (decrement Vs by 10 mV, wait 3 seconds, and check for a static logic low) until a value for **Vs+** is found.

12. Find the average using this formula: $V_{sAvg} = (V_{s-} + V_{s+})/2$. Record the average as the test result in the test record.

    Compare the test result to the limits. If the result is between the limits, continue with the procedure to test the channel at the +4 V threshold value.

13. *Begin the +4 V threshold test as follows:*

    a. Push the front-panel **D15-D0** button.

    b. Set the **D0 Threshold** value to **4.00 V** (+4.0 V/div).

14. Set the DC voltage source (Vs) to +4.4 V. Wait 3 seconds. Check the logic level of the channel D0 signal display.

    If it is a static logic low, change the DC voltage source Vs to +4.5 V.

15. Decrement Vs by -10 mV. Wait 3 seconds and check the logic level of the channel D0 signal display. If it is a static logic low, record the Vs value as **Vs+** in the 4 V row of the test record.

    If the signal level is a logic high or is alternating between high and low, repeat this step (decrement Vs by 10 mV, wait 3 seconds, and check for a static logic low) until a value for **Vs+** is found.

16. Push the front-panel **Trigger Menu** button.

17. Click the lower **Slope** button to change the slope to **Rising**.

18. Set the DC voltage source (Vs) to +3.6 V. Wait 3 seconds. Check the logic level of the channel D0 signal display.

    If the signal level is a static logic high, change the DC voltage source Vs to +3.5 V.

19. Increment Vs by +10 mV. Wait 3 seconds and check the logic level of the channel D0 signal display. If it is a static logic high, record the Vs value in the 4 V row of the test record.

    If the signal level is a logic low or is alternating between high and low, repeat this step (increment Vs by 10 mV, wait 3 seconds, and check for a static logic high) until a value for **Vs-** is found.

20. Find the average using this formula: $V_{sAvg} = (V_{s-} + V_{s+})/2$. Record the average as the test result in the test record.

Compare the test result to the limits. If the result is between the limits, the channel passes the test.

21. *Repeat the procedure for all remaining digital channels as follows:*

   a. Push the front-panel **Trigger Menu** button.

   b. Under **Source**, click **Select**.

   c. In the Source Selection box, select the next digital channel (such as D1) to be tested.

   d. Connect the DC voltage source to the digital channel to be tested.

   e. Starting from step *7* on page 398, repeat the procedure until all 16 digital channels have been tested.

22. Press the **Menu Off** button.

Check trigger out

This test checks the trigger output.

1. Connect the Trigger Out (AUX OUT) signal from the rear of the instrument to the channel 1 input using a 50 Ω cable, as shown in the following illustration.
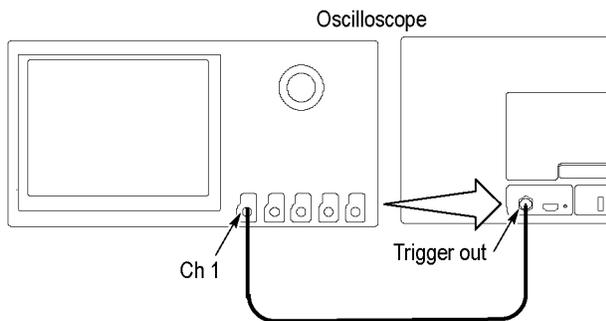
2. Push the front-panel **Default Setup** button.

3. Set the acquisition mode to Average as follows:

   a. Push the front-panel **Acquire** button.

   b. In the Acquisition window, select the **Acquisition** tab at the left.

   c. Select **Average** Acquisition mode.

   d. Ensure that the **number of averages** is set to **16.**

4. Set the Vertical **Scale** to **1 V/div**.

5. Set the Horizontal **Scale** to **200 ns**.

6. *Record the Low and High measurements at 1 MΩ as follows:*

   a. Push the front-panel Wave Inspector **Measure** button.

   b. Ensure that the **Amplitude** tab is selected.

   c. Select the **Low** measurement.

   d. Enter the Low measurement reading in the test record.

   e. Select the **High** measurement.

   f. Enter the High measurement reading in the test record.

7. *Record the Low and High measurements at 50 Ω as follows:*

   a. Push the front-panel oscilloscope Vertical **V** menu button.

   b. Set the **Termination** to **50 Ω**.

   c. Push the front-panel Wave Inspector **Measure** button.

    d. Ensure that the **Amplitude** tab is selected.

    e. Select the **Low** measurement.

    f. Enter the Low measurement reading in the test record.

    g. Select the **High** measurement.

    h. Enter the High measurement reading in the test record.

This completes the performance verification procedure.

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