The P7600 Series TriMode probes and the MSO/DPO70000DX and DPO/DSA70000D Series Oscilloscopes are designed to deliver the industry's lowest system noise levels. This high sensitivity is critical for being able to make accurate measurements on low amplitude signals.

**Key performance specs**
- Full 33 GHz bandwidth to the probe tip (P7633)
- Industry's lowest probe and oscilloscope system noise

**Key features**
- TriMode™ probe - one setup, three measurements without adjusting probe tip connections
  - Differential
  - Single ended
  - Common mode
- Remote head design connectivity
  - Allows placement of probe amplifier close to the circuit being measured
  - Coaxial adapters
    - 2.92mm
    - SMP
  - P7500 probe tip adapter
    - Use P7500 Series TriMode solder-in probe tips
    - Probe automatically detects tips and applies DSP correction filters
- Probe-specific S-parameters
  - Unique DSP filters created from data stored in the probe

**Applications**
- Including, but not limited to:
  - MIPI M-PHY, PCI Express, Serial ATA, Serial Attached SCSI, Fibre Channel, and HDMI

**Combining TriMode probing with low noise performance**
TriMode probing enhances productivity by enabling differential, single-ended, and common mode measurements with a single probe setup. Connecting a probe to the device under test can be a time consuming activity, especially if the probe has to be set up differently to make all the necessary measurements. TriMode probing improves productivity by reducing setup time, because only one setup is needed to make the three different types of measurements. Switching between Differential Mode [A-B], Single-Ended Mode [A-Gnd, B-Gnd], and Common Mode [((A+B)/2)-Gnd] is as easy as a press of a button.

As high speed serial data standards increase in speed and signal swings shrink, probes with high bandwidth coupled with low noise and high sensitivity are increasingly important for making accurate measurements.
The MSO/DPO70000DX and DPO70000SX Series oscilloscopes and the P7600 Series TriMode probes were designed to deliver the industry's lowest system noise levels. When used with a P76CA-xxx Coaxial Adapters, the vertical setting on the oscilloscope can be set as low as 3.48 mV/div with a system noise <1.1 mV rms at 33 GHz bandwidth.

This high sensitivity is critical for being able to make accurate measurements on low amplitude signals. The P7600 Series TriMode probes were designed to deliver superior sensitivity and allow the oscilloscope to directly measure small signals without using a zoom function. Using a zoom function to look at small signals does not change the intrinsic noise floor of the instrument which can make measurements on small signals problematic.

**Connectivity**

The P7600 Series probes utilize an interchangeable active tip design built around a custom tip interface using high frequency SMPM connectors. The P7600 Series probes feature an Automatic Adapter ID function that recognizes the attached adapter and automatically applies the correct DSP filters that eliminate imperfections in the frequency response all the way to the probe tip. This feature eliminates the risk of manually selecting the wrong tip type and is more efficient for the user.

**Coaxial adapters**

Coaxial adapters enable the probe to act like a differential input channel for the oscilloscope which effectively doubles the number of differential signals a single oscilloscope can measure simultaneously.
33 GHz Bandwidth Coaxial Adapter with SMP (Female) connectors and 6" of high performance cable. This adapter is calibrated at the input connectors and is ideal for directly connecting to devices with SMP output connectors.

**P7600 Series solder tip adapter**

This adapter allows the P7630 probe to use existing Tektronix P7500 probe tips. The P7600 Series probe amplifiers have a 50 Ω input. When combined with a P7500 probe tip, the probe turns into a passive Z0 style probe with 450 Ω of differential input impedance. While Z0 probes can typically present a significant DC load to the device under test, the P7600 Series probes will minimize the effect of DC loading through the use of termination voltage adjustment.

**Unique probe filters**

The P7600 Series probes contain probe specific S-parameter data. Attaching a P7600 probe to a MSO/DPO70000DX or DPO70000SX oscilloscope transfers this data to the instrument to create unique system DSP filters based on the specific S-parameter data of the oscilloscope and the probe. Creating unique filters based on the specific response of the system is critical as bandwidths increase. At bandwidths of 33 GHz, small variations in the signal path can lead to significant variation in frequency response. These variations are corrected using DSP filtering.
Specifications

Model Overview

Typical system specifications

<table>
<thead>
<tr>
<th>Probe model</th>
<th>P7633</th>
<th>P7625</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adapter</td>
<td>P76CA-xxx</td>
<td>P76TA</td>
</tr>
<tr>
<td>Characteristic</td>
<td>(Typical)</td>
<td>(Typical)</td>
</tr>
<tr>
<td>Bandwidth (typical)</td>
<td>33 GHz</td>
<td>30 GHz</td>
</tr>
<tr>
<td>Rise time (10-90%) (typical)</td>
<td>14 ps</td>
<td>16 ps</td>
</tr>
<tr>
<td>Rise time (20-80%) (typical)</td>
<td>11 ps</td>
<td>12 ps</td>
</tr>
</tbody>
</table>

Characteristics

The following characteristics are typical unless noted as guaranteed.

**Attenuation**
- P76CA-xxx: 0.25X / 0.5X / 1X / 2X / 4X
- P76TA: 1.25X / 2.5X / 5X / 10X / 20X

**Input voltage range**
- P76CA-xxx: 1.2 Vpp single-ended, 2.0 Vpp differential
- P76TA: 6.0 Vpp single-ended, 10.0 Vpp differential

**Operating voltage window**
- P76CA-xxx: -4 V to +4 V
- P76TA: -5 V to +5 V

**Offset voltage range**
- -4 V to +4 V

**Termination voltage range**
- -4 V to +4 V

**DC input resistance**
- P76CA-xxx: 50 Ω ±2 Ω
- P76TA: 225 Ω

**DC output zero common mode imbalance (guaranteed)**
- < +/- 4 mV

**DC gain accuracy, probe only (guaranteed)**
- +/- 2.0% all gain settings

**Input return loss**
- P76CA-xxx: >20 dB to 5 GHz
- >12 dB 5 GHz to 20 GHz
>10 dB 20 GHz to 30 GHz
>8 dB 30 GHz to 33 GHz

P76TA
NA

Z min
P76CA-xxx
NA
P76TA
225 Ω at 1 GHz, 150 Ω at 10 GHz, 100 Ω at 25 GHz

Noise, referred to input (System noise with oscilloscope set in minimum V/div setting)
<1.1 mV$_{\text{rms}}$ (33 GHz)
<0.9 mV$_{\text{rms}}$ (25 GHz)

CMRR (differential mode)
P76CA-xxx
>40 dB at DC
>14 dB DC to 15 GHz
>6 dB 15 GHz to 30 GHz
>4 dB 30 GHz to 33 GHz
P76TA
NA

Nondestructive input voltage range
P76CA-xxx
-5 V to +5 V (DC + peak AC)
P76TA
-8 V to +8 V (DC + peak AC)

Interface
TekConnect

Minimum system requirements

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Bandwidth</th>
<th>Firmware version</th>
<th>Recommended probe</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSO/DPO73304DX, DPO73304SX, and DPO/DSA73304D</td>
<td>33 GHz</td>
<td>V6.8 and above</td>
<td>P7633</td>
</tr>
<tr>
<td>MSO/DPO72504DX, DPO73304SX, and DPO/DSA72504D</td>
<td>25 GHz</td>
<td>V6.8 and above</td>
<td>P7625</td>
</tr>
</tbody>
</table>

Environmental characteristics

Temperature
Operating 0 to +40 °C (+32 °F to +104 °F)
Nonoperating -20 °C to +71 °C (-4 °F to +160 °F)

Humidity
Operating Up to +40 °C (+104 °F) 20%-80% RH
Nonoperating: +30 °C to +46 °C (+86 °F to +115 °F) 0-90% RH

Altitude

Operating: 3000 meters (9842 feet)

Nonoperating: 12000 meters (39,370 feet)
Ordering information

Models

P7633  Low Noise TriMode™ Probe, 33 GHz, TekConnect Interface
P7625  Low Noise TriMode™ Probe, 25 GHz, TekConnect Interface

NOTE: All P7600 Series probes require a P76CA-SMP, P76CA-292, P76CA-292C, or P76TA adapter for connection to the device under test. These adapters are ordered separately.

Options

Service options

- **Opt. C3**  Calibration Service 3 Years
- **Opt. C5**  Calibration Service 5 Years
- **Opt. D3**  Calibration Data Report 3 Years (with Opt. C3)
- **Opt. D5**  Calibration Data Report 5 Years (with Opt. C5)
- **Opt. G3**  Complete Care 3 Years (includes loaner, scheduled calibration, and more)
- **Opt. G5**  Complete Care 5 Years (includes loaner, scheduled calibration, and more)
- **Opt. R3**  Repair Service 3 Years (including warranty)
- **Opt. R3DW**  Repair Service Coverage 3 Years (includes product warranty period). 3-year period starts at time of instrument purchase
- **Opt. R5**  Repair Service 5 Years (including warranty)
- **Opt. R5DW**  Repair Service Coverage 5 Years (includes product warranty period). 5-year period starts at time of instrument purchase

Accessories

Standard accessories

<table>
<thead>
<tr>
<th>Accessory</th>
<th>Quantity</th>
<th>Tektronix part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Printed Manual</td>
<td>1 kit</td>
<td>071-3026-xx</td>
</tr>
<tr>
<td>Data Calibration Report: Lists the manufacturing test results of your probe at the time of shipment</td>
<td>1 each</td>
<td>Standard with probe</td>
</tr>
<tr>
<td>Certificate of Traceable Calibration</td>
<td>1 each</td>
<td>Standard with probe</td>
</tr>
<tr>
<td>Antistatic wrist strap</td>
<td>1 each</td>
<td>006-3415-xx</td>
</tr>
<tr>
<td>DC probe calibration fixture</td>
<td>1 each</td>
<td>067-3259-xx</td>
</tr>
<tr>
<td>50 Ω BNC-M to BNC-M cable assembly, 10 in.</td>
<td>1 each</td>
<td>012-0208-xx</td>
</tr>
<tr>
<td>ESD protective cap</td>
<td>3 each</td>
<td>276-1152-xx</td>
</tr>
<tr>
<td>Hex wrench, 2 mm</td>
<td>1 each</td>
<td>129-2781-xx</td>
</tr>
<tr>
<td>Color band kit</td>
<td>1 kit</td>
<td>016-0633-xx</td>
</tr>
</tbody>
</table>
### Recommended accessories

<table>
<thead>
<tr>
<th>Description</th>
<th>Tektronix part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.92 mm Coaxial Adapter</td>
<td>P76CA-292</td>
</tr>
<tr>
<td>2.92 mm Coaxial Adapter with Cables</td>
<td>P76CA-292C</td>
</tr>
<tr>
<td>SMP Coaxial Adapter with Cables</td>
<td>P76CA-SMP</td>
</tr>
<tr>
<td>P7500 Tip Adapter</td>
<td>P76TA</td>
</tr>
<tr>
<td>P7500 TriMode Performance Solder Tip</td>
<td>P75PST</td>
</tr>
<tr>
<td>P7500 TriMode Long Reach Solder Tip</td>
<td>P75TLRST</td>
</tr>
<tr>
<td>P7500 TriMode Resistor Solder Tip</td>
<td>020-2936-xx</td>
</tr>
<tr>
<td>P7500 TriMode Extended Resistor Solder Tip</td>
<td>020-2944-xx</td>
</tr>
<tr>
<td>Solder Tip Ramps, Kit of 25</td>
<td>020-3118-xx</td>
</tr>
<tr>
<td>Adhesive Tip Tape, Strip of 10</td>
<td>006-8237-xx</td>
</tr>
<tr>
<td>Deskew Fixture</td>
<td>067-2431-xx</td>
</tr>
<tr>
<td>SMPM Bullet Removal Tool</td>
<td>003-1934-xx</td>
</tr>
<tr>
<td>SMPM Replacement Bullet Contacts (package of 4)</td>
<td>020-3105-xx</td>
</tr>
<tr>
<td>G3PO Bullet Removal Tool</td>
<td>003-1896-xx</td>
</tr>
<tr>
<td>G3PO Replacement Bullet Contacts (package of 4)</td>
<td>013-0359-xx</td>
</tr>
<tr>
<td>Wire Kit</td>
<td>017-0103-xx</td>
</tr>
<tr>
<td>Replacement Resistor Kit</td>
<td>020-2937-xx</td>
</tr>
</tbody>
</table>
Figure 4: P7600 Series Probes Deskew Fixture

Figure 5: P75PST Solder Tip

Figure 6: Bullets and Bullet Removal Tool

Tektronix is registered to ISO 9001 and ISO 14001 by SRI Quality System Registrar.
