

Supplement



TDS1000 and TDS2000 Series User Manual Specifications Update 071-1858-01

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- In North America, call 1-800-833-9200.
- Worldwide, visit www.tektronix.com to find contacts in your area.

Environmental Considerations

This section provides information about the environmental impact of the product.

Product End-of-Life Handling

Observe the following guidelines when recycling an instrument or component:

Equipment Recycling. Production of this equipment required the extraction and use of natural resources. The equipment may contain substances that could be harmful to the environment or human health if improperly handled at the product's end of life. In order to avoid release of such substances into the environment and to reduce the use of natural resources, we encourage you to recycle this product in an appropriate system that will ensure that most of the materials are reused or recycled appropriately.



The symbol shown to the left indicates that this product complies with the European Union's requirements according to Directive 2002/96/EC on waste electrical and electronic equipment (WEEE). For information about recycling options, check the Support/Service section of the Tektronix Web site (www.tektronix.com).

Mercury Notification. This product uses an LCD backlight lamp that contains mercury. Disposal may be regulated due to environmental considerations. Please contact your local authorities or, within the United States, the Electronics Industries Alliance (www.eiae.org) for disposal or recycling information.

Restriction of Hazardous Substances

This product has been classified as Monitoring and Control equipment, and is outside the scope of the 2002/95/EC RoHS Directive. This product is known to contain lead, cadmium, mercury, and hexavalent chromium.

Specifications Update

The next table shows specifications for the new TDS1001 and TDS2004 models, and includes three corrections. These specifications supersede the corresponding specifications in the TDS1000 and TDS2000 series oscilloscope user manual.

The corrections are for the following specifications:

- Channel-to-Channel Common Mode Rejection, typical
- Trigger Sensitivity, Edge Trigger Type
- Not Equal Guardband

NOTE. All *Vertical* specifications are relative to a 1X probe. To modify displayed values, change the Probe option attenuation (default is 10X) to match the probe.

Updates for the TDS1000 and TDS2000 series oscilloscope specifications

| Inputs | | | | |
|--|---|----------------------------------|--|-------------------------|
| Channel-to-Channel Common Mode Rejection, typical | <i>TDS1001</i> | <i>TDS1002, TDS2002, TDS2004</i> | <i>TDS1012, TDS2012, TDS2014, TDS2022, TDS2024</i> | |
| | 100:1 at 60 Hz 20:1 at 20 MHz | 100:1 at 60 Hz 20:1 at 30 MHz | 100:1 at 60 Hz 10:1 at 50 MHz | |
| | Measured on MATH Ch1 - Ch2 waveform, with test signal applied between signal and common of both channels, and with the same VOLTS/DIV and coupling settings on each channel | | | |
| Measured on MATH Ch3 - Ch4 waveform for 4-channel models | | | | |
| Channel-to-Channel Crosstalk | <i>TDS1001</i> | <i>TDS1002, TDS2002, TDS2004</i> | <i>TDS1012, TDS2012, TDS2014</i> | <i>TDS2022, TDS2024</i> |
| | ≥ 100:1 at 20 MHz | ≥ 100:1 at 30 MHz | ≥ 100:1 at 50 MHz | ≥ 100:1 at 100 MHz |
| | Measured on one channel, with test signal applied between signal and common of the other channel, and with the same VOLTS/DIV and coupling settings on each channel | | | |

Updates for the TDS1000 and TDS2000 series oscilloscope specifications (cont.)

| Vertical | | | | |
|---|---|----------------------------------|--|--|
| Analog Bandwidth in Sample and Average modes at BNC or with P2220 probe, DC Coupled | <i>TDS1001</i> | <i>TDS1002, TDS2002, TDS2004</i> | <i>TDS1012, TDS2012, TDS2014</i> | <i>TDS2022, TDS2024</i> |
| | 40 MHz*† | 60 MHz*† | 100 MHz*† | 200 MHz*† 0 °C to +40 °C (32 °F to 104 °F) 160 MHz*† 0 °C to +50 °C (32 °F to 122 °F) |
| 20 MHz* (when vertical scale is set to < 5 mV) | | | | |
| Analog Bandwidth in Peak Detect mode (50 s/div to 5 µs/div‡), typical | <i>TDS1001</i> | <i>TDS1002, TDS2002, TDS2004</i> | <i>TDS1012, TDS2012, TDS2014, TDS2022, TDS2024</i> | |
| | 30 MHz*† | 50 MHz*† | 75 MHz*† | |
| 20 MHz* (when vertical scale is set to < 5 mV) | | | | |
| Rise Time at BNC, typical | <i>TDS1001</i> | <i>TDS1002, TDS2002, TDS2004</i> | <i>TDS1012, TDS2012, TDS2014</i> | <i>TDS2022, TDS2024</i> |
| | < 8.4 ns | < 5.8 ns | < 3.5 ns | < 2.1 ns |
| Horizontal | | | | |
| Sample Rate Range | <i>TDS2022, TDS2024</i> | | <i>TDS1001, TDS1002, TDS1012, TDS2002, TDS2004, TDS2012, TDS2014</i> | |
| | 5 S/s to 2 GS/s | | 5 S/s to 1 GS/s | |
| SEC/DIV Range | <i>TDS2022, TDS2024</i> | | <i>TDS1001, TDS1002, TDS1012, TDS2002, TDS2004, TDS2012, TDS2014</i> | |
| | 2.5 ns/div to 50 s/div, in a 1, 2.5, 5 sequence | | 5 ns/div to 50 s/div, in a 1, 2.5, 5 sequence | |

* Bandwidth reduced to 6 MHz with a 1X probe.

† When vertical scale is set to ≥ 5 mV.

‡ The oscilloscope reverts to Sample mode when the SEC/DIV (horizontal scale) is set from 2.5 µs/div to 5 ns/div on 1 GS/s models, or from 2.5 µs/div to 2.5 ns/div on 2 GS/s models. The Sample mode can still capture 10 ns glitches.

Updates for the TDS1000 and TDS2000 series oscilloscope specifications (cont.)

| Trigger | | | | |
|--|--|--------------------|---|--|
| Trigger Sensitivity, Edge Trigger Type | Coupling | Sensitivity | TDS1001, TDS1002, TDS1012, TDS2002, TDS2004, TDS2012, TDS2014 | TDS2022, TDS2024 |
| | DC | EXT | 200 mV from DC to 100 MHz* | 200 mV from DC to 100 MHz* 350 mV from 100 MHz to 200 MHz* |
| | | EXT/5 | 1 V from DC to 100 MHz* | 1 V from DC to 100 MHz* 1.75 V from 100 MHz to 200 MHz* |
| | | CH1, CH2, CH3, CH4 | 1 div from DC to 10 MHz* 1.5 div from 10 MHz to Full | 1 div from DC to 10 MHz* 1.5 div from 10 MHz to 100 MHz 2 div from 100 MHz to full |
| Not Equal Guardband | $t > 330 \text{ ns: } \pm 5\% \leq \text{guardband} < \pm(5.1\% + 16.5 \text{ ns})$ $165 \text{ ns} < t \leq 330 \text{ ns: guardband} = -16.5 \text{ ns}/+33 \text{ ns}$ $t \leq 165 \text{ ns: guardband} = \pm 16.5 \text{ ns}$ | | | |

* Bandwidth reduced to 6 MHz with a 1X probe.

Certifications and Compliances

EN 61326. EMC requirements for Class A electrical equipment for measurement, control, and laboratory use. Annex D.

- IEC 61000-4-2. Electrostatic discharge immunity
- IEC 61000-4-3. RF electromagnetic field immunity
- IEC 61000-4-4. Electrical fast transient / burst immunity
- IEC 61000-4-5. Power line surge immunity
- IEC 61000-4-6. Conducted RF Immunity
- IEC 61000-4-11. Voltage dips and interruptions immunity

EN 61000-3-2. AC power line harmonic emissions¹

EN 61000-3-3. Voltage changes, fluctuations, and flicker

¹ Emissions which exceed the levels required by this standard may occur when this equipment is connected to a test object.

| | |
|--|---|
| Australia / New Zealand Declaration of Conformity - EMC | Complies with EMC provision of Radiocommunications Act per these standard(s): <ul style="list-style-type: none">■ AS/NZS 2064.1/2. Industrial, Scientific, and Medical Equipment: 1992 |
| EMC Compliance | Meets the intent of Directive 89/336/EEC for Electromagnetic Compatibility when it is used with the product(s) stated in the specifications table. Refer to the EMC specification published for the stated products. May not meet the intent of the directive if used with other products. |
| FCC Compliance | Emissions comply with FCC 47 CFR, Part 15, Subpart B for Class A equipment. |
| Russian Federation | This product was certified by the GOST ministry of Russia to be in compliance with all applicable EMC regulations. |
| Peoples Republic of China | This product has received the Chinese Metrology Certification. (CMC). |
| EC Declaration of Conformity - Low Voltage | Compliance was demonstrated to the following specification as listed in the Official Journal of the European Communities: Low Voltage Directive 73/23/EEC, amended by 93/68/EEC. <ul style="list-style-type: none">■ EN 61010-1:2001. Safety requirements for electrical equipment for measurement control and laboratory use.■ EN 61010-2-031:2002. Particular requirements for handheld probe assemblies for electrical measurement and test equipment. |
| U.S. Nationally Recognized Testing Laboratory Listing | <ul style="list-style-type: none">■ UL 61010B-1:2004, 2nd Edition. Standard for electrical measuring and test equipment.■ UL 61010B-2-031:2003. Particular requirements for handheld probe assemblies for electrical measurement and test equipment. |
| Canadian Certification | <ul style="list-style-type: none">■ CAN/CSA C22.2 No. 1010.1:1997. Particular requirements for electrical equipment for measurement, control, and laboratory use. Part 1.■ CAN/CSA C22.2 No. 61010-2-031:1994. Particular requirements for handheld probe assemblies for electrical measurement and test equipment. |
| Additional Compliance | <ul style="list-style-type: none">■ IEC 61010-1:2001. Safety requirements for electrical equipment for measurement, control, and laboratory use. |

- IEC 61010-031:2002. Particular requirements for handheld probe assemblies for electrical measurement and test equipment.

Equipment Type Test and measuring equipment.

Pollution Degree Descriptions A measure of the contaminates that could occur in the environment around and within a product. Typically the internal environment inside a product is considered to be the same as the external. Products should be used only in the environment for which they are rated.

- Pollution Degree 1. No pollution or only dry, nonconductive pollution occurs. Products in this category are generally encapsulated, hermetically sealed, or located in clean rooms.
- Pollution Degree 2. Normally only dry, nonconductive pollution occurs. Occasionally a temporary conductivity that is caused by condensation must be expected. This location is a typical office/home environment. Temporary condensation occurs only when the product is out of service.
- Pollution Degree 3. Conductive pollution, or dry, nonconductive pollution that becomes conductive due to condensation. These are sheltered locations where neither temperature nor humidity is controlled. The area is protected from direct sunshine, rain, or direct wind.
- Pollution Degree 4. Pollution that generates persistent conductivity through conductive dust, rain, or snow. Typical outdoor locations.

Pollution Degree Pollution Degree 2 (as defined in IEC 61010-1). Note: Rated for indoor use only.

Installation (Overvoltage) Category Descriptions Terminals on this product may have different installation (overvoltage) category designations. The installation categories are:

- Measurement Category IV. For measurements performed at the source of low-voltage installation.
- Measurement Category III. For measurements performed in the building installation.
- Measurement Category II. For measurements performed on circuits directly connected to the low-voltage installation.
- Measurement Category I. For measurements performed on circuits not directly connected to MAINS.

Overvoltage Category Overvoltage Category II (as defined in IEC 61010-1).