

1 GHz and 500 MHz High Voltage Differential Probes

TDP1000, TDP0500, P6251 Datasheet



The TDP1000, TDP0500, and P6251 High-voltage Differential Probes provide excellent high-speed electrical and mechanical performance required for today's Switch Mode Power Supply (SMPS), CAN/LIN Bus, and high-speed digital system designs.

Key performance specifications

- 1 GHz and 500 MHz probe bandwidth
- <1 pF differential input capacitance
- 1 M Ω differential input resistance
- ± 42 v (DC + pk AC) differential input voltage
- >18 dB CMRR (at 250 MHz 50X attenuation)

Key features

- Outstanding electrical performance
 - Selectable bandwidth-limiting filters
 - DC reject
- Versatile DUT connectivity
 - Small compact probe head for probing small geometry circuit elements
 - Straight pin, square pin, solder down, variable pitch standard accessories
 - Robust design for reliability
- Easy to use
 - Provides automatic units scaling and readout on the oscilloscope display
 - TDP1000, TDP0500
 - Connect directly to oscilloscopes with the TekVPI™ probe interface
 - Easy access to scope-displayed probe menu for probe setup control and operating status information
 - Remote GPIB/USB probe control through the oscilloscope
 - AutoZero – zeros out output offset
 - P6251
 - Connect directly to the TekProbe™ interface oscilloscopes, or to TekConnect® oscilloscopes using TCA-BNC adapter

Applications

- High-speed switch mode power supply design
- CAN/LIN bus design
- Digital design and characterization
- Manufacturing engineering test
- Research and development

High-voltage differential probes

The TDP1000, TDP0500, and P6251 High-voltage Differential Probes are specifically designed for use with and direct connection to Tektronix oscilloscopes with either the TekVPI™ probe interface, or TekProbe BNC

Interface. These probes achieve high-speed signal acquisition and measurement fidelity by solving three traditional measurement challenges:

- Outstanding Electrical Performance
- Versatile Device-Under-Test Connectivity
- Ease of Use

Specifications

All specifications apply to all models unless noted otherwise.

Warranted characteristics

| | |
|--|---|
| Bandwidth (probe only) | |
| TDP1000, P6251 | 1 GHz |
| TDP0500 | 500 MHz |
| Attenuation | |
| | 5X, 50X |
| Differential mode input voltage | |
| | ± 42 v (DC + pk AC); $30 V_{RMS}$ |
| Rise time (probe only) | |
| TDP1000, P6251 | ≤ 350 ps |
| TDP0500 | < 700 ps |
| CMRR | |
| | > 55 dB at 30 kHz |
| | > 50 dB at 1 MHz |
| | > 18 dB at 250 MHz (warranted at 50X attenuation) |
| Max input voltage (nondestruct) | |
| | ± 100 v (DC + pk AC) |
| Gain accuracy at DC | |
| | $\pm 2\%$ |

Typical characteristics

| | |
|--|---|
| Differential input capacitance | |
| | < 1 pF |
| Differential input resistance | |
| | 1 M Ω |
| Sensitivity/noise level | |
| 5X attenuation | 2 mV _{RMS} |
| | 10 mV _{RMS} (referred to the probe output) |
| 50X attenuation | 1 mV _{RMS} |
| | 50 mV _{RMS} (referred to the probe output) |
| Propagation delay | |
| | 6.5 ns |
| Common mode input voltage | |
| | ± 35 v (DC + pk AC); $25 V_{RMS}$ |
| Differential input offset range | |
| TDP1000, TDP0500 | ± 42 v (5X or 50X attenuation) |
| P6251 | ± 4.25 v (5X attenuation) |
| | ± 42 v (50X attenuation) |

TDP1000, TDP0500, and P6251 1 GHz and 500 MHz High Voltage Differential Probes

DC reject

| | |
|-----------------|--------|
| 5X attenuation | 0.4 Hz |
| 50X attenuation | 4 Hz |

Nominal characteristics

Selectable bandwidth filter limits

| | |
|------------------|-----------------------------|
| TDP1000, TDP0500 | 100 Hz, 10 kHz, 1 MHz, Full |
| P6251 | 5 MHz, Full |

Oscilloscope interface recommendations

| | |
|------------------|--------------------------------|
| TDP1000, TDP0500 | TekVPI™ Probe |
| P6251 | TekProbe BNC Level II |
| | TekConnect® (TCA-BNC required) |

Power requirements

| | |
|------------------|---|
| TDP1000, TDP0500 | Powered directly by oscilloscopes with the TekVPI interface |
| P6251 | Powered directly by the TekProbe-BNC interface, eliminating the need for additional power supplies and cables when used with TekProbe-BNC oscilloscopes. May also be powered through the 1103 TEKPROBE power supply for use with non-TekProbe interface instrumentation. |

Physical characteristics

Compensation box dimensions

| Dimension | TDP1000, TDP0500 | | P6251 | |
|--------------|-----------------------------|------|-------|------|
| | in | cm | in | cm |
| Height | 1.6 | 4.1 | 1.0 | 2.6 |
| Width | 1.2 | 3.05 | 1.6 | 4.1 |
| Length | 4.2 | 10.7 | 3.2 | 8.13 |
| Cable length | 47.2 (inches), 1.2 (meters) | | | |

Weight

| TDP1000, TDP0500 | | P6251 | |
|------------------|-------|-------|-------|
| lb | kg | lb | kg |
| 0.320 | 0.146 | 0.360 | 0.163 |

Ordering information

Models

| | |
|---------|---|
| TDP1000 | 1 GHz high-voltage differential probe with TekVPI interface. |
| TDP0500 | 500 MHz high-voltage differential probe with TekVPI interface. |
| P6251 | 1 GHz High-voltage Differential Probe with TekProbe-BNC Level II Interface. |

Options

Language options

| | |
|---------|---------------------------|
| Opt. L5 | Japanese manual |
| Opt. L7 | Simplified Chinese manual |

Service options

| | |
|--------------|---|
| Opt. C3 | Calibration Service 3 Years |
| Opt. C5 | Calibration Service 5 Years |
| Opt. R3 | Repair Service 3 Years (including warranty) |
| Opt. R5 | Repair Service 5 Years (including warranty) |
| Opt. SILV600 | Standard warranty extended to 5 years |
| Opt. SILV900 | Standard warranty extended to 5 years |

Additional service products for the TDP0500 or TDP1000

The following are available during either warranty (DW) or postwarranty (PW).

| | |
|-----------------------------|---|
| TDP0500-CA1 / TDP1000-CA | A single calibration event or coverage for the designated calibration interval, whichever comes first |
| TDP0500-R1PW / TDP1000-R1PW | Repair service coverage, 1-year post warranty |
| TDP0500-R2PW / TDP1000-R2PW | Repair service coverage, 2-year post warranty |
| TDP0500-R3DW / TDP1000-R3DW | Repair service coverage 3 years (includes product warranty period) 3-year period starts at time of customer instrument purchase |
| TDP0500-R5DW / TDP1000-R5DW | Repair service coverage 5 years (includes product warranty period) 5-year period starts at time of customer instrument purchase |

Additional service products for the P6251

The following are available during either warranty (DW) or postwarranty (PW).

| | |
|------------|---|
| P6251-CA1 | A single calibration event or coverage for the designated calibration interval, whichever comes first |
| P6251-R1PW | Repair service coverage, 1-year post warranty |
| P6251-R2PW | Repair service coverage, 2-year post warranty |
| P6251-R3DW | Repair service coverage 3 years (includes product warranty period) 3-year period starts at time of customer instrument purchase |
| P6251-R5DW | Repair service coverage 5 years (includes product warranty period) 5-year period starts at time of customer instrument purchase |

Accessories

Common standard accessories

| Description | Quantity included with product | Reorder part number (qty in reorder) |
|---|--------------------------------|--------------------------------------|
| Y-lead set | 2 each | 196-3434-xx (1) |
| Solder-down lead set, 1 inch | 1 each | 196-3504-xx (1) |
| Solder-down lead set, 3 inch | 1 each | 196-3505-xx (1) |
| Micro CKT test tip | 3 each | 206-0569-xx (1) |
| Tip savers | 2 each | 016-1781-xx (2) |
| Longhorn adapters | 2 each | 016-1780-xx (5) |
| Straight-pin probe tips | 8 each | 016-1891-xx (8) |
| 3-inch ground leads | 2 each | 196-3437-xx (2) |
| Color-coding bands | 2 each of 5 colors | 016-1315-xx (2 each of 5 colors) |
| Nylon carrying case | 1 each | 016-1952-xx (1) |
| CD with technical reference manual and quick start users guides | 1 each | 063-4110-xx (1) |

Standard accessories for the TDP0500 and TDP1000

| Description | Qty included with product | Reorder part number (qty in reorder) |
|--|---------------------------|--------------------------------------|
| Quick start users guide | 1 each | |
| English | | 071-1974-xx (1) |
| Japanese (with option L5) | | 071-1975-xx (1) |
| Simplified Chinese (with option L7) | | 071-1976-xx (1) |
| Documentation Kit CD, Includes: Quick Start Users Guide (English, Japanese, and Simplified Chinese versions); Technical Reference Manual | 1 each | 063-3941-xx (1) |

Standard accessories for the P6251

| Description | Qty included with product | Reorder part number (qty in reorder) |
|--|---------------------------|--------------------------------------|
| Documentation Kit CD, Includes: Quick Start Users Guide (English, Japanese, and Simplified Chinese versions); Technical Reference Manual | 1 each | 063-4110-xx (1) |

Standard warranty

1 year parts and labor.

Recommended accessories

| Description | Part number | Quantity |
|-----------------------------|-------------|----------------|
| BNC to probe tip adapter | 067-1734-xx | 1 each |
| Spring loaded grounds | 016-1782-xx | 1 package of 6 |
| Twin foot adapter | 016-1785-xx | 1 package of 4 |
| Twin tip adapter | 016-1786-xx | 1 package of 4 |
| IC micro grabber | SMK4 | 1 package of 4 |
| TEKPROBE probe power supply | 1103 | 1 each |



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



Product(s) complies with IEEE Standard 488.1-1987, RS-232-C, and with Tektronix Standard Codes and Formats.

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