1 GHz and 500 MHz High Voltage Differential Probes

The TDP1000, TDP0500, P6251 and P6250 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.

Specifically designed for use with, and direct connection to, Tektronix oscilloscopes with either the TekVPI™ probe interface or TekProbe BNC Interface. The TDP1000, TDP0500, P6251 and P6250 High Voltage Differential 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**

### Characteristics

**Bandwidth (Probe Only)** — 1 GHz (TDP1000, P6251), 500 MHz (TDP0500, P6250).

**Attenuation** — 5X, 50X.

**Rise Time (Probe Only)** — <0.5 ps (TDP1000, P6251), <700 ps (TDP0500, P6250).

**Differential Input Capacitance** — <1 pF.

**Differential Input Resistance** — 1 MΩ.

**CMRR** — > 55 dB at 30 kHz;

> 50 dB at 1 MHz;

> 18 dB at 250 MHz (warranted at 50X attenuation).

### Sensitivity/Noise Level

2 mVRMS (5X attenuation); 1 mVRMS (50X attenuation) referred to the probe output.

10 mVRMS (5X attenuation); 50 mVRMS (50X attenuation) referred to the probe input.

**Differential Mode Input Voltage** — ±42 V (DC + pk AC); 30 Vpp.

**Common Mode Input Voltage** — ±35 V (DC + pk AC); 25 Vpp.

**Max Input Voltage** (non-destruct) — ±100 V (DC + pk AC).

**Gain Accuracy at DC** — ±2%.

**Propagation Delay** — 6.5 ns.

**Scope Interface** — TDP1000, TDP0500 — TekVPI™ Probe Interface.

P6251, P6250 — TekProbe BNC Interface.

**Physical Characteristics**

**Weight**

TDP1000, TDP0500 — 0.320 lbs; 0.146 kg.

P6251, P6250 — 0.360 lbs; 0.163 kg.

**Compensation Box Dimensions**

Height

TDP1000, TDP0500 — 1.6 inches; 4.1 cm.

P6251, P6250 — 1.0 inches; 2.6 cm.

Width

TDP1000, TDP0500 — 1.2 inches; 3.05 cm.

P6251, P6250 — 1.0 inches; 2.54 cm.

Length

TDP1000, TDP0500 — 4.2 inches; 10.7 cm.

P6251, P6250 — 3.2 inches; 8.13 cm.

**Cable Length** — 47.2 inches, 1.2 meter.

### Features & Benefits

**Outstanding Electrical Performance**

1 GHz and 500 MHz probe bandwidth

<1 pF differential input capacitance

1 MΩ differential input resistance

±42 V (DC + pk AC) differential input voltage

> 18 dB CMRR (at 250 MHz 50X attenuation)

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

**Ease-of-Use**

Provides automatic units scaling and readout on the oscilloscope display

- Connect directly to the DPO7000, DPO4000 and MSO4000 series oscilloscopes using TekVPI™ probe interface (no additional power adapters required)
- Easy access to scope-displayed probe menu for probe setup control and operating status information
- AutoZero — zeros out output offset

**Applications**

High-speed switch mode power supply design

CAN/LIN bus design

High-speed digital design

Digital design and characterization

Manufacturing engineering test

Research and development
Power Requirements

TDP1000, TDP0500 – Are powered directly by the DPO7000, DPO4000 and MSO4000 Series oscilloscopes using the TekVPI™ interface.

P6251, P6250 – Are 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.

Standard Warranty

1 year parts and labor.

Recommended Oscilloscopes

TDP1000, TDP0500 – DPO7000, DPO4000 and MSO4000 Series with TekVPI™ probe interface.

P6251, P6250 – TDS5000 Series, TDS500, TDS600 and TDS700 Series and other Tektronix oscilloscopes with TekProbe BNC-Level2 interface. DPO70000, DSA70000, TDS6000 and TDS7000 oscilloscopes with TekConnect® interface. TCA-BNC adapter required only for DPO70000, DSA70000, TDS6000 and TDS7000 oscilloscopes.

Required Oscilloscope Firmware

TDP1000, TDP0500 – DPO7000 Series requires firmware version 3.0.2 or later.

DPO4000/MSO4000 Series requires firmware version 2.06 or later.

P6251, P6250 – TekProbe-BNC Level II Oscilloscopes and adapter (TCA-BNC) requires the TekProbe-BNC Interface which is firmware-independent.

Ordering Information

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.

P6250

500 MHz High Voltage Differential Probe with TekProbe-BNC Level II Interface.

Standard Accessories

Certificate of Traceable Calibration included standard on all models.

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity Included With Product</th>
<th>Reorder Part Number (Quantity in Reorder)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y-Lead Set</td>
<td>2 each</td>
<td>196-3434-xx (1)</td>
</tr>
<tr>
<td>Solder down lead set, 1 inch</td>
<td>1 each</td>
<td>196-3504-xx (1)</td>
</tr>
<tr>
<td>Solder down lead set, 3 inch</td>
<td>1 each</td>
<td>196-3505-xx (1)</td>
</tr>
<tr>
<td>MicroCKT Test Tip</td>
<td>3 each</td>
<td>206-0569-xx (1)</td>
</tr>
<tr>
<td>Tip Savers</td>
<td>2 each</td>
<td>016-1781-xx (2)</td>
</tr>
<tr>
<td>Longhorn adapters</td>
<td>2 each</td>
<td>016-1780-xx (5)</td>
</tr>
<tr>
<td>Straight pin probe tips</td>
<td>8 each</td>
<td>016-1891-xx (8)</td>
</tr>
<tr>
<td>3-inch ground leads</td>
<td>2 each</td>
<td>196-3437-10 (2)</td>
</tr>
<tr>
<td>Color coding bands</td>
<td>2 each of 5 colors</td>
<td>016-1315-xx (2 each of 5 colors)</td>
</tr>
<tr>
<td>Nylon Carrying Case</td>
<td>1 each</td>
<td>016-1952-xx (1)</td>
</tr>
<tr>
<td>CD with Technical Reference Manual and Quick Start Users Guides</td>
<td>1 each</td>
<td>063-4110-xx (1)</td>
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TDP0500 and TDP1000 only

Quick Start Users Guide (1 each)

- English: 071-1974-xx (1)


P6250 and P6251 only


1 each | 063-3941-xx (1) | 063-4110-xx (1)
Manual Options
(TDP1000, TDP0500 only)

Service Options
Opt. CA1 – A single calibration event or coverage for the designated calibration interval, whichever comes first.
Opt. C5 – Calibration Service 5 Years.

Recommended Accessories

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
<th>Quantity</th>
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<tbody>
<tr>
<td>BNC to probe tip adapter</td>
<td>067-1734-xx</td>
<td>1 each</td>
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<tr>
<td>Spring loaded grounds</td>
<td>016-1762-xx</td>
<td>1 pkg of 6</td>
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<tr>
<td>Twin foot adapter</td>
<td>016-1785-xx</td>
<td>1 pkg of 4</td>
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<tr>
<td>Twin tip adapter</td>
<td>016-1786-xx</td>
<td>1 pkg of 4</td>
</tr>
<tr>
<td>IC micro grabber</td>
<td>SMK4</td>
<td>1 pkg of 4</td>
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<tr>
<td>TekProbe® probe power supply</td>
<td>1103</td>
<td>1 each</td>
</tr>
</tbody>
</table>

Additional service products available during warranty (DW) or post warranty (PW).

TDP0500 and TDP1000
- TDP0500-CA1/TDP1000-CA1 – 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.

P6250 and P6251
- P6250-CA1/P6251-CA1 – A single calibration event or coverage for the designated calibration interval, whichever comes first.
- P6250-R1PW/P6251-R1PW – Repair service coverage 1 year post warranty.
- P6250-R2PW/P6251-R2PW – Repair service coverage 2 year post warranty.
- P6250-R3DW/P6251-R3DW – Repair service coverage 3 years (includes product warranty period) 3 year period starts at time of customer instrument purchase.
- P6250-R5DW/P6251-R5DW – Repair service coverage 5 years (includes product warranty period) 5 year period starts at time of customer instrument purchase.
1 GHz and 500 MHz High Voltage Differential Probes

- TDP1000
- TDP0500
- P6251
- P6250

Product(s) are manufactured in ISO registered facilities.


For Further Information

Tektronix maintains a comprehensive, constantly expanding collection of application notes, technical briefs and other resources to help engineers working on the cutting edge of technology. Please visit www.tektronix.com

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