

# 1 GHz and 500 MHz High Voltage Differential Probes

► TDP1000 • TDP0500 • P6251 • P6250



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)** –  $\leq 350$  ps (TDP1000, P6251),  $< 700$  ps (TDP0500, P6250).

**Differential Input Capacitance** –  $< 1$  pF.

**Differential Input Resistance** – 1 M $\Omega$

**CMRR** –

$> 55$  dB at 30 kHz;

$> 50$  dB at 1 MHz;

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

**Sensitivity/Noise Level** – 2 mV<sub>RMS</sub> (5X attenuation); 1 mV<sub>RMS</sub> (50X attenuation) referred to the probe output. 10 mV<sub>RMS</sub> (5X attenuation); 50 mV<sub>RMS</sub> (50X attenuation) referred to the probe input.

**Differential Mode Input Voltage** –

$\pm 42$  V (DC + pk AC); 30 V<sub>RMS</sub>.

**Common Mode Input Voltage** –

$\pm 35$  V (DC + pk AC); 25 V<sub>RMS</sub>.

**Input Offset Range**

**TDP1000, TDP0500** –  $\pm 42$  V (5X or 50X attenuation).

**P6251, P6250** –  $\pm 4.25$  V (5X attenuation);  $\pm 42$  V (50X attenuation).

**Max Input Voltage (non-destruct)** –

$\pm 100$  V (DC + pk AC).

**Selectable Bandwidth Filter Limits**

**TDP1000, TDP0500** – 100 Hz, 10 kHz, 1 MHz, Full.

**P6251, P6250** – 5 MHz, Full.

**DC Reject** – 0.4 Hz (5X); 4 Hz (50X).

**Gain Accuracy at DC** –  $\pm 2\%$ .

**Propagation Delay** – 6.5 ns.

**Scope Interface**

**TDP1000, TDP0500** – TekVPI™ Probe Interface.

**P6251, P6250** – TekProbe BNC Level II 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** – 1.6 inches; 4.1 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 M $\Omega$  differential input resistance

$\pm 42$  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

TDP1000, TDP0500

- 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

P6251, P6250

- Connect directly to TDS5000 and other TekProbe™ interface oscilloscopes, or to TekConnect® oscilloscopes using TCA-BNC adapter

## ► 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

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## 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.

Description	Quantity Included With Product	Reorder Part Number (Quantity 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)
MicroCKT 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	196-3437-10 (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)
<b>TDP0500 and TDP1000 only</b>		
Quick Start Users Guide (1 each)	English	071-1974-xx (1)
	Japanese (with Opt. L5)	071-1975-xx (1)
	Simplified Chinese (with Opt. 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)
<b>P6250 and P6251 only</b>		
Documentation Kit CD, includes: Quick Start Users Guide (English, Japanese and Simplified Chinese versions); Technical Reference Manual	1 each	063-4110-xx (1)

**Manual Options  
(TDP1000, TDP0500 only)**

Opt. L5 – Japanese.

Opt. L7 – Simplified Chinese.

**Service Options**

Opt. CA1 – A single calibration event or coverage for the designated calibration interval, whichever comes first.

Opt. C3 – Calibration Service 3 Years.

Opt. C5 – Calibration Service 5 Years.

Opt. R3 – Repair Service 3 Years.

Opt. R5 – Repair Service 5 Years.

**► Recommended Accessories**

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

**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.

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### 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](http://www.tektronix.com)



Product(s) are manufactured in ISO registered facilities.

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

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