

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) – ≤ 350 ps (TDP1000, P6251), < 700 ps (TDP0500, P6250).

Differential Input Capacitance – < 1 pF.

Differential Input Resistance – $1 \text{ M}\Omega$

CMRR –

> 55 dB at 30 kHz;

> 50 dB at 1 MHz;

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

Sensitivity/Noise Level – $2 \text{ mV}_{\text{RMS}}$ (5X attenuation); $1 \text{ mV}_{\text{RMS}}$ (50X attenuation) referred to the probe output. $10 \text{ mV}_{\text{RMS}}$ (5X attenuation); $50 \text{ mV}_{\text{RMS}}$ (50X attenuation) referred to the probe input.

Differential Mode Input Voltage –

$\pm 42 \text{ V}$ (DC + pk AC); $30 \text{ V}_{\text{RMS}}$.

Common Mode Input Voltage –

$\pm 35 \text{ V}$ (DC + pk AC); $25 \text{ V}_{\text{RMS}}$.

Input Offset Range

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

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

Max Input Voltage (non-destruct) –

$\pm 100 \text{ V}$ (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

$1 \text{ M}\Omega$ differential input resistance

$\pm 42 \text{ V}$ (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)
TDP0500 and TDP1000 only		
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)
P6250 and P6251 only		
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



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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