

Differential Probes

TDP1500 • TDP3500 Datasheet



Features & Benefits

- Outstanding Electrical Performance
 - 3.5 GHz and 1.5 GHz Bandwidth Models – Accurate Measurements for Serial and Digital Applications
 - Excellent Common Mode Rejection – Reduces Measurement Errors in Higher Common Environments
 - Low Capacitive and Resistive Loading – Maintains Signal Fidelity and Reduces DC Biasing Interactions
- Versatile Mechanical Performance
 - Compact Probe Head Size for Probing Small Geometry Circuit Elements
 - DUT Attachment Accessories enable Connection to Fine-spaced SMDs
 - Robust Design for Reliability

- Easy to Use
 - Connects Directly to Oscilloscopes with the TekVPI™ Probe Interface
 - Provides Automatic Units Scaling and Readout on the Oscilloscope Display
 - Easy Access to Probe Comp Box Controls or Oscilloscope Probe Menu Display for Probe Status, Setup Control, and Diagnostic Information
- Integrated Scope/Probe System
 - Direct Connection to and Powered from the TekVPI™ Oscilloscope Interface (Connects directly to TekVPI scopes without the need of an external power supply, like many competitors require)
 - Single-button Oscilloscope Probe Menu Access
 - Setup and Control from Probe Comp Box or Oscilloscope User Interface
 - AutoZero - Zeros Out Output Offset
 - Remote GPIB/USB Probe Control through the Oscilloscope

Applications

- Design, Validation, Debugging, and Characterization of Common High-speed Serial Bus Designs:
 - I²C
 - CAN/LIN
 - SPI
 - Serial ATA
 - Ethernet (GbE)
 - USB 2.0
 - FireWire (1394b)
- Signal Integrity, Jitter, and Timing Analysis
- Manufacturing Engineering and Test

Differential Probes – A Better Measurement Tool

Differential active probes provide truer signal reproduction and fidelity for high-frequency measurements. With ultra-low input capacitance and versatile device-under-test connection capabilities, the TDP1500 and TDP3500 Differential-ended Active probes provide excellent high-speed electrical and mechanical performance required for today's digital system designs.

Specifically designed for use and direct connection to oscilloscopes with the TekVPI™ probe interface, the TDP1500 and TDP3500 Differential probes achieve high-speed signal acquisition and measurement fidelity by solving three traditional problems:

- DUT loading effects – Are reduced by lower input capacitance and high input resistance
- DUT connectivity – A variety of accessories exist for attaching to small SMDs, some come standard or recommended
- Maximizing of system (oscilloscope and probe) bandwidth – probing solutions for all measurements for TekVPI interface oscilloscope models up to 3.5 GHz

Characteristics

Characteristic	Description
Bandwidth (Probe only)	≥1.5 GHz warranted (TDP1500) ≥3.5 GHz warranted (TDP3500)
Attenuation (Probe only)	1x/10x (TDP1500) 5x (TDP3500)
Rise Time (Probe only)	≤265 ps typical (TDP1500) ≤110 ps typical (TDP3500)
Differential Input Capacitance	≤1 pF (TDP1500) ≤0.3 pF (TDP3500)
Differential Input Resistance	200 kΩ (TDP1500) 100 kΩ (TDP3500)
Differential Input Dynamic Range	±8.5 V (10x) (TDP1500) ±850 mV (1x) (TDP1500) ±2 V (TDP3500)
CMRR	>60 dB at 1 MHz (TDP1500, TDP3500) >25 dB at 1 GHz (TDP1500, TDP3500)
Input Offset Range	±7 V (10x or 1x) (TDP1500) ±1 V displayed (TDP3500)
Operation Voltage Input Range (Common Mode Input Range)	±7 V (1x) (TDP1500) ±7 V (10x) (TDP1500) +5 V to -4V (TDP3500)
Noise	<50 nV/root Hz (TDP1500) ≈35 nV/root Hz (TDP3500)
Max Input Voltage (Nondestruct)	±25 V (DC + pk AC) (TDP1500) ±15 V (DC + pk AC) (TDP3500)
Propagation Delay	5.4 ns typical (TDP1500) 5.4 ns typical (TDP3500)

Physical Characteristics

Dimensions	mm	in.
Cable Length*1	1200	48
Weight	g	oz.
Probe Only*1	160	5.4

*1 Typical for TDP1500.

Power Requirements

TDP1500 and TDP3500 are powered directly by oscilloscopes with the TekVPI probe interface.

Recommended Oscilloscopes

Oscilloscopes with the TekVPI probe interface.

Note: For best probe support, download and install the latest version of the oscilloscope software from www.tektronix.com

Ordering Information

TDP1500

1.5 GHz Differential Probe with TekVPI Interface, Certificate of Traceable Calibration Standard.

TDP3500

3.5 GHz Differential Probe with TekVPI Interface, Certificate of Traceable Calibration Standard.

TDP1500 – Standard Accessories Included

Description	QTY Shipped	Reorder Part No.	Reorder QTY
Pouch, Nylon Carrying Case with Inserts	1 each	016-1952-xx	1 each
Documentation Kit TDP1500, Includes: Printed User Manual (English 071-2209-xx; Japanese 071-2210-xx; Simplified Chinese 071-2211-xx) and a CD containing (Technical Reference Manual PDF English 071-2296-xx)	1 each	020-2866-xx (English w/ Standard)	1 each
		020-2891-xx (Japanese w/ Opt L5)	1 each
		020-2892-xx (Simplified Chinese w/ Opt L7)	1 each
Certificate of Traceability	1 each	Standard w/ Probe	1 each
Accessory Kit TDP1500 (see contents listed below, 0 through 10)	1 each	020-2702-xx	1 each
0) Plastic Accessory Box	1 each	006-7164-xx	
1) Straight Pins	8 each	016-1891-xx	8 each
2) Longhorn VIA Adapter	2 each	016-1780-xx	5 each
3) 1-inch Solder Down	1 each	196-3504-xx	1 each
4) 3-inch Solder Down	1 each	196-3505-xx	1 each
5) Y-Lead Adapter	2 each	196-3434-xx	1 each
6) Micro CKT Test Tip	3 each	206-0569-xx	1 each
7) Tip Saver	2 each	016-1781-xx	2 each
8) 3-inch Ground Lead	2 each	196-3437-xx	2 each
9) Marker Band Set (2 each of 5 colors)	1 each	016-1315-xx	1 each
10) Accessory Performance Summary and Reorder Sheet	1 each	001-1412-xx	1 each

TDP3500 – Standard Accessories Included

Description	QTY Shipped	Reorder Part No.	Reorder QTY
Pouch, Nylon Carrying Case with Inserts	1 each	016-1952-xx	1 each
Documentation Kit TDP3500, Includes: Printed User Manual (English 071-2212-xx; Japanese 071-2213-xx; Simplified Chinese 071-2214-xx) and a CD containing (Technical Reference Manual PDF English 071-2297-xx)	1 each	020-2867-xx (English w/ Standard)	1 each
		020-2893-xx (Japanese w/ Opt L5)	1 each
		020-2894-xx (Simplified Chinese w/ Opt L7)	1 each
Probe Tip Cover	1 each	200-4236-xx	1 each
Anti-static Wrist Strap	1 each	006-3415-xx	1 each
Certificate of Traceability	1 each	Standard w/ Probe	1 each
Accessory Kit TDP3500 (see contents listed below, 1 through 7)	1 each	020-2883-xx	1 each
0) Plastic Accessory Box	1 each	006-7164-xx	1 each
1) Variable Spacing Tip Adapter	4 each	016-1885-xx	4 each
2) Square Pin Adapter	4 each	016-1884-xx	4 each
3) Y-Lead Adapter	2 each	196-3434-xx	1 each
4) Micro CKT Test Tip	3 each	206-0569-xx	1 each
5) 3-inch Ground Lead	2 each	196-3469-xx	2 each
6) Marker Band Set (2 each of 5 colors)	1 each	016-1315-xx	1 each
7) Accessory Performance Summary and Reorder Sheet	1 each	001-1435-xx	1 each
Accessory Kit; Solder-In Differential Probes TDP3500, P6330, P7330, P7350	1 each	020-2505-xx	1 each
1) Adapter, Resistor / Wire	2 each	016-1926-xx	2 each
2) Wire Assembly w/ 0.02 dia	10 each	016-1930-xx	10 each
3) Wire Assembly w/ 0.008 dia	10 each	016-1931-xx	10 each
4) 10 Ω Resistor w/ 0.02 dia Wire	10 each	016-1927-xx	10 each
5) 10 Ω Resistor w/ 0.008 dia Wire	10 each	016-1933-xx	10 each
6) 20 Ω Resistor w/ 0.02 dia Wire	10 each	016-1928-xx	10 each
7) 20 Ω Resistor w/ 0.008 dia Wire	10 each	016-1934-xx	10 each

Optional Accessories

Description	TDP1500	TDP3500	Ordering Part Number (Qty)
BNC to Probe Tip Adapter	X	—	679-4094-xx (set of 1)
TwinFoot™ Adapter	X	X	016-1785-xx (set of 4)
TwinTip™ Adapter	X	—	016-1786-xx (set of 4)
VariTip™ Adapter	X	—	016-1890-xx (set of 8)
IC Micro Grabber	X	X	SMK-4 (set of 4)
IEEE 1394 Adapter	X	X	679-5027-xx (set of 1)
Short Ground Contact	X	—	016-1783-xx (set of 10)
Spring-loaded Ground	X	—	016-1782-xx (set of 6)
TekVPI™ Cal Fixture	X	X	067-1701-xx (set of 1)

Manual Options

Option	Description
Opt. L0	English user instruction manual (Standard)
Opt. L5	Japanese user instruction manual
Opt. L7	Simplified Chinese instruction manual



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.

Service Options

Option	Description
Opt. C3	Calibration Service 3 Years
Opt. C5	Calibration Service 5 Years
Opt. D1	Calibration Data Report
Opt. D3	Calibration Data Report 3 Years (with Opt. C3)
Opt. D5	Calibration Data Report 5 Years (with Opt. C5)
Opt. R3	Repair Service 3 Years
Opt. R5	Repair Service 5 Years
Opt. SILV900	Standard Warranty Extended to 5 Years

Contact Tektronix:

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- India** 000 800 650 1835
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- USA** 1 800 833 9200

* European toll-free number. If not accessible, call: +41 52 675 3777

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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



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