TriMode™ Probe Family

▶ **P7500 Series**

▶ P7520 with optional P75PDPM.

TriMode Probing, Connectivity, and Performance

Revolutionary TriMode Probing Architecture

Tektronix P7500 Series – A New Differential Probe Architecture Leading The Way In High-Speed Probing Solutions — One probe setup makes differential, single-ended, and common mode measurements accurately and definitively.

Tektronix is a known leader when it comes to signal fidelity and signal acquisition. Building on our history of market leading innovations in probing, we have invented a revolutionary new probing architecture called TriMode Probing that defines the next genera-tion industry benchmark for usability and signal fidelity. Tektronix' new differ-ential architecture changes the rules and allows you to work more effectively and efficiently. By enabling unique func-tionality, the P7500 Series differential probes allow you to switch between differential, single-ended, and common mode measurements without moving the probe from its connection points.

▶ End panel view.

Improved productivity is achieved by reducing set up time. With this new differential probe architecture you setup once and make three different meas-urements by changing the probe settings. The TriMode probe architec-ture for the P7500 Series probes continues the tradition of highest bandwidth and low DUT loading while providing improved connectivity and value.

▶ Features & Benefits

TriMode – One setup, three measurements without adjusting probe tip connections
– Differential
– Single-ended
– Common mode (Requires only one probe vs. conventional probing techniques)

Signal Fidelity
– P7520
  – Bandwidth: >20 GHz
  – Risetime 10% - 90%: <27 ps (guaranteed)
  – Risetime 20% - 80%: <18 ps (typical)
– P7516
  – Bandwidth: >16 GHz (typical)
  – Risetime 10% - 90%: <32 ps (guaranteed)
  – Risetime 20% - 80%: <24 ps (typical)
– P7513
  – Bandwidth: >13 GHz (typical)
  – Risetime 10% - 90%: <40 ps (guaranteed)
  – Risetime 20% - 80%: <28 ps (typical)

Versatile Connectivity
Solderdown, hand-held, fixtured
– TriMode™ solder down
  – Small form factor allowing easy access between PCB's
  – Long reach accessibility with superior signal fidelity
– Precision differential probing module – optional hand-held and fixtured probing
  – Small Precision Tapered Tips, an Articulated Joint for Compliance, and Variable Tip Spacing

TekConnect® Interface – TekConnect Scope/Probe Control and Usability
– Direct control from probe compensation box or from scope menu;
– Automated measurement control through the TekConnect interface to Connect to tektronix real-time oscilloscopes
– View TriMode/Attenuation settings on probe comp box from top or end panel

▶ Applications
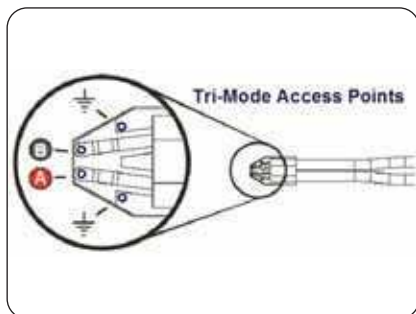
Examples include, but are not limited to:
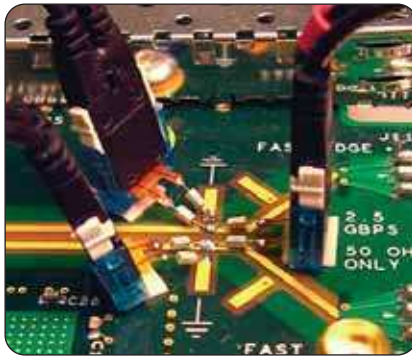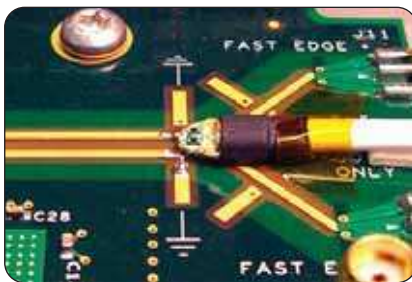– PCI-express II, serial ATA III, DDRII, FB-DIMM, Rambus, XAUI, 2*XAUI
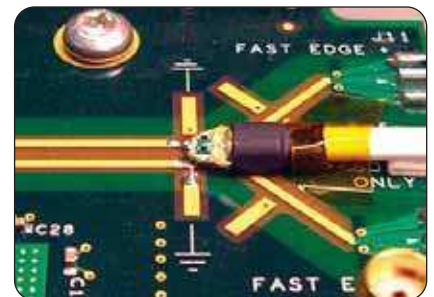
Tektronix®

▶ Top panel view.

▶ Tip view.

▶ Before TriMode™ : One probe for differential; two probes for SE and common mode; or one probe soldered and re-soldered three times; two probes for common mode.

▶ After TriMode (P75TLRST): One probe for differential, single-ended and common mode, with only One setup required.

▶ P75TLRST TriMode Long Reach Solder Tip.

## Connectivity Plus – Solderdown – Handheld – Fixtured

The P7500 Series differential probe architecture offers a new level of connectivity and provides the highest probe fidelity available for real-time oscilloscopes. The new improved multi-point connectivity solutions of the P7500 Series include:

▶ Standard **TriMode Long Reach Solder Tip** (P75TLRST) — with a longer reach and very small, low profile form factor.

▶ Optional **Precision Differential Probing Module** (P75PDPM) — for handheld and fixtured applications is also available.

Measurements on and between circuit boards is now easier and quicker with the Long Reach Solder Tips. These tips are easily interchanged by simply unplugging the tip (P75TLRST) and plugging in another.

Handheld and fixtured probing needs are met using the optional P75PDPM (Precision Differential Probing Module). Its small precision tapered tips, variable articulation of the probe tip, and quick adjusting-variable tip spacing provides the needed flexibility for adapting to vias and other test points of differing sizes from 30 mils to 180 mils.

These precision connectivity tools enable you to access multiple signals on anything from convenient test pads to hard-to-reach, high-density circuitry.
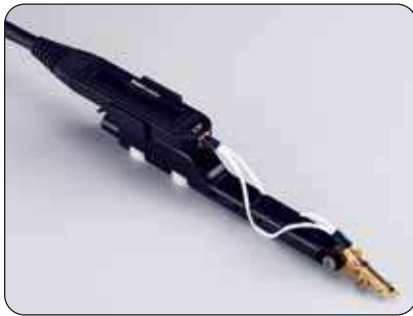
▶ P7500 with P75PDPM.

Signal Fidelity

You can be confident in the signal fidelity of your measurements. Tektronix' innovative new differential architecture coupled with the superior electrical performance of IBM SiGe technology provides the bandwidth and fidelity to meet the industry needs of today as well as tomorrow.

The new P7500 Series differential probe architecture provides:

▶ Highest bandwidth available > 20 GHz

▶ Excellent step response

▶ Low DUT loading

▶ High CMRR

▶ Differential, single-ended, or common mode measurements using one probe

▶ Ordering Information

P7520
TriMode™ Differential Probe, 20 GHz, for TekConnect Interface Oscilloscopes
Includes: See Standard Accessories table.

P7516
TriMode Differential Probe, 16 GHz, for TekConnect Interface Oscilloscopes
Includes: See Standard Accessories table.

P7513
TriMode Differential Probe, 13 GHz, for TekConnect Interface Oscilloscopes
Includes: See Standard Accessories table.

▶ Characteristics

TriMode Probe Architecture	P7520	P7516	P7513
Bandwidth (typical)	> 20 GHz, A-B mode > 18 GHz, P5PDPM, Other modes	> 16 GHz	> 13 GHz
Rise Time (10%-90%) (guaranteed)	< 27 ps, A-B mode < 29 ps, Other modes	< 32 ps	< 40 ps
Rise Time (20%-80%) (typical)	< 18 ps, A-B mode < 20 ps, Other modes	< 24 ps	< 30 ps
Attenuation (user selectable)	5X or 12.5X	5X or 12.5X	5X or 12.5X
Differential Input Range	± 0.625 V (5X) ± 1.60 V (12.5X)	± 0.75 V (5X) ± 1.75 V (12.5X)	± 0.75 V (5X) ± 1.75 V (12.5X)
Operating Voltage Window	+ 3.7 to −2.0 V	+ 4.0 to −2.0 V	+ 4.0 to −2.0 V
Offset Voltage Range	+ 2.5 to −1.5 V, A-B mode + 3.4 to −1.8 V, Other modes	+ 2.5 to −1.5 V, A-B mode + 4.0 to -2.0 V, Other modes	+ 2.5 to −1.5 V, A-B mode + 4.0 to −2.0 V, Other modes
DC Input Resistance (differential)	100 kΩ	100 kΩ	100 kΩ
Noise	<33 nV/√Hz (5X) <48 nV/√Hz(12.5X)	<33 nV/√Hz (5X) <48 nV/√Hz(12.5X)	<33 nV/√Hz (5X) <48 nV/√Hz(12.5X)
CMRR, (A-B Mode)[1]	> 60 dB @ DC >40 dB to 50 MHz >30 dB to 1 GHz >20 dB to 10 GHz >12 dB to 20 GHz	> 60 dB @ DC >40 dB to 50 MHz >30 dB to 1 GHz > 20 dB to 8 GHz > 15 dB to 16 GHz	> 60 dB @ DC >40 dB to 50 MHz >30 dB to 1 GHz > 20 dB to 7 GHz > 15 dB to 13 GHz
Isolation, (A input, B input Mode)	>40 dB to 50 MHz >30 dB to 1 GHz >15 dB to 10 GHz >6 dB to 20 GHz	> 40 dB to 50 MHz > 30 dB to 1 GHz > 20 dB to 7 GHz > 10 dB to 16 GHz	> 40 dB to 50 MHz > 30 dB to 1 GHz > 20 dB to 8 GHz > 10 dB to 13 GHz
DMRR, (Common Mode)	>40 dB to 50 MHz >30 dB to 1 GHz >20 dB to 10 GHz >12 dB to 20 GHz	> 40 dB to 50 MHz > 30 dB to 1 GHz > 20 dB to 8 GHz > 10 dB to 16 GHz	> 40 dB to 50 MHz > 30 dB to 1 GHz > 20 dB to 7 GHz > 15 dB to 13 GHz
Non-Destructive Input Range	± 15 V	± 15 V	± 15 V
Interface	TekConnect®	TekConnect	TekConnect
Cable Length	1 meter	1 meter	1 meter

[1] A-B means the differential mode.

Minimum System Requirements / Instrument Compatibility
P7500 Series TriMode Probes are compatible with the DPO/DSA70000 series and the TDS6000B/C[2] TekConnect interface oscilloscopes. The chart below shows recommended probe/oscilloscope model combinations.

Instrument	BW (Scope)	Recommended Probe
DPO/DSA72004	20 GHz	P7520
DPO/DSA71604	16 GHz	P7516
DPO/DSA71254	12.5 GHz	P7513, P7313
80A03 8200 Series TekConnect Probe Interface[3]		P7516, P7513, P7520
RTPA2A RTSA Series TekConnect Probe Interface[3]		P7516, P7513, P7520

[2] TDS6154C and 61254C require firmware version 5.1.5 and above.

[3] 80A03 and RTPA2A require firmware version 2.3 and above.

User Manual Options
Opt. L5– Japanese.
Opt. L7– Simplified Chinese.

Service Options

CA1 – A single calibration event or coverage for the designated calibration interval, whichever comes first.
C3 – Calibration Service 3 Years.
C5 – Calibration Service 5 Years.
D3 – Calibration Data Report 3 Years (with Option C3).
D5 – Calibration Data Report 5 Years (with Option C5).
R3 – Repair Service 3 Years.
R5 – Repair Service 5 Years.

Additional Service Products Available During Warranty (DW) or Post Warranty (PW)

CA1 – A single calibration event or coverage for the designated calibration interval, whichever comes first.
R1PW – Repair service coverage 1 year post warranty.
R2PW – Repair service coverage 2 year post warranty.
R3PW – Repair service coverage 3 years (includes product warranty period) 3 year period starts at time of customer instrument purchase.
R5PW – Repair service coverage 5 years (includes product warranty period) 5 year period starts at time of customer instrument purchase.

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TriMode™ Probe Family

▶ **P7500 Series**

▶ **Standard Accessories**

Description	P7520/P7516/P7513	Reorder Part Number
Probe Carrying Case	1 each	016-1997-XX
The documentation kit contains: Printed Quick Start Users Manual, CD-ROM contains PDFs of basic probe and measurement literature, and the probe manuals (the user manual and a probe specific technical reference PDF).	1 each	020-2790-XX (English w/Standard)
		020-2791-XX (Japanese with Opt L5)
		020-2792-XX (Simplified Chinese with Opt L7)
Anti-Static Wrist Strap	1 each	006-3415-XX
Certificate of Traceable Calibration	1 each	Standard with probe
Data Calibration Report: lists the manufacturing test results of your probe at the time of shipment and is included with every probe	1 each	Standard with probe
Probe Calibration Fixture	1 each	067-1821-XX
50 Ω Coax Cable - Male BNC to Male BNC	1 each	012-0208-XX
50 Ω Coax Cable - Male SMA to Male SMA	1 each	174-1120-XX
Accessory Box with foam inserts (see contents listing below 1 through 7)	1 each	020-2729-XX
1) P7500 TriMode™ Long Reach Solder Tip	2 each	P75TLRST
2) G3PO Bullet Kit (includes 4 bullets)	1 kit	013-0359-XX
3) G3PO Bullet Removal Tool	1 each	003-1896-XX
4) Solder kit: (Solder Spool, Wire Spool)	1 each	020-2754-XX
5) Tape, Adhesive (Strips, 10 each)	1 kit	006-8237-XX
6) Marker Band Set (2 each of 5 colors)	1 kit	016-0633-XX
7) Accessory Performance Summary and Reorder Sheet	1 each	001-1423-XX

Optional Tip Accessories

P7500 Series Precision Differential Probing Module P7500 Precision Differential Probing Module Accessory Kit – P75PDPM.

Accessory Performance Summary and Reorder Sheet – 001-1423-XX.

P7500 Tip Cable pair (matched to 1 ps, 1 each) – P75TC.

P7500 Probing Module TipProbe Tips Replacement Kit (1-Right and 1-Left) – P75PMT.

Accessory Kit; Ground Spring, Large 4 each – 016-1998-XX.

Accessory Kit; Ground Spring, Small 4 each – 016-1999-XX.

Handle, Adapter (Probing Module) – 367-0545-XX.

G3PO Separator Tool – 003-1897-XX.

Ground Spring Tool – 003-1900-XX.

Resistor Solder Tip – 020-2936-XX.

Extended Resistor Solder Tip – 020-2944-XX.

Resistor Replacement Kit – 020-2937-XX.

Recommended Accessories

Deskew Fixture – 067-1586-XX.

Probe Positioner – PPM100.

Precision, 3 Position, Probe Positioner – PPM203B.

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**

CE   ISO 9001   GPIB

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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