

Tektronix Logic Analyzer Probes

P6400/P6700/P6800/P6900 Series Data Sheet



Features & Benefits

- <math><0.7\text{ pF}</math> Total Capacitive Loading Minimizes Intrusion on Circuits
- 20 k Ω Input Resistance
- 6.5 V_{p-p} Dynamic Range Supports a Broad Range of Logic Families
- General-purpose Probing Allows Flexible Attachment to Industry-standard Connections
- Connectorless Probing System Eliminates Need for Onboard Connectors

Applications

- Hardware Debug and Verification
- Processor/Bus Debug and Verification
- Embedded Software Integration, Debug, and Verification

Leading Probing Solutions for Real-time Digital Systems Analysis

P6400 Series Probes

No test and measurement solution is complete without probing and the consideration of its impact on your system and your measurement time. With the industry's lowest probe loading, the P6400 Series logic analyzer probes protect the integrity of your signal – minimizing the impact on your design. The P6400 Series logic analyzer probes when used with the TLA5000 Series logic analyzers make sophisticated logic analysis available at an affordable price. Select from a variety of attachment mechanisms, including the high-density D-Max® Probing Technology that eliminates the need for onboard connectors.

- For applications where circuit board space is limited, the high-density P6450 offers the smallest available footprint and a quick connection mechanism.
- With low loading capacitance, the P6400 Series can accurately acquire signals with faster edges without distorting the signal.
- Flexible general-purpose probing, with support for 0.100 in. and 2 mm pin spacing, low input capacitance, and accessories for connecting to many industry-standard connections.

P6800 and P6900 Series Probes

With the industry's lowest capacitance, the P6800 and P6900 Series logic analyzer probes for the TLA7000 Series protect the integrity of your signal – critical for connecting to fast buses like DDR2 and DDR3 where low intrusion is key to the proper operation of your design. Select from single-ended and differential probes and a variety of attachment

mechanisms, including the “connectorless” compression connection that eliminates the need for onboard connectors.

For applications where circuit board space is at a premium, the high-density P6900 Series with D-Max® Probing Technology offers the industry's smallest available footprint. For debugging the signal integrity glitches common on fast buses, the P6900 Series works with the TLA7Bxx and TLA7ACx modules and their iLink™ Tool Set capability to provide iCapture™ simultaneous digital-analog acquisition. This allows you to clearly see the time-correlated digital and analog behavior of your design, without the extra capacitance and setup time of double probing.

For differential signaling applications where signal integrity is critical, the high-fidelity P6980 and P6982 are perfect for those applications where noise performance is critical. In addition, the P6980 and P6982 can support the small voltage swings that differential signaling often requires. The P6962DBL, when used with a TLA7000 logic analyzer with the TLA7Bxx module, supports digital validation and debug of DDR3 memory with data rates up to 1600 mega-transfers per second. For board designs that do not include high-density probe footprints, the P6960 with its companion flying leadset or the P6810 provide the flexibility required to meet many different debug needs.

P6700 Series Probes for PCI Express

The P6700 Series probes provide validation engineers with a comprehensive set of PCI Express probing solutions, including midbus, slot interposer, and solder-down connectors. With support for PCI Express Gen3 channel lengths up to 24 in. with 2 connectors, these probes offer minimal electrical loading with the highest signal fidelity and active equalization to ensure accurate data recovery of closed eyes. All P6700 Series probes feature a graphical lane swizzling capability for maximum flexibility to accommodate unique circuit board layouts.

Characteristics

P6400 Series Probe Characteristics

General

Characteristic	P6410	P6419	P6434	P6450
Probe Type	Single-ended Data Single-ended Clock (General Purpose)	Single-ended Data Single-ended Clock (Compression 17-channel)	Single-ended Data Single-ended Clock (Mictor 34-channel)	Single-ended Data Single-ended Clock (D-Max Probing Technology)
Number of Channels	17	17	34	34
Recommended Usage for:	Most general-purpose applications	Applications requiring good signal density and quick reliable attachment	Applications requiring many channels to be quickly connected in a small footprint	Applications requiring many channels to be quickly connected in a small footprint
Attachment to Target System	Fits both 0.100 in. and 2 mm square pin configurations	Compression Elastomer	Amp Mictor 34 Channel Connector	D-Max probing technology compression cLGA
Probe Loading AC/DC	2 pF/20 k Ω to 0 V (TLA5000) <2 pF/20 k Ω to 2.2 V (TLA600, TLA7N/P/Qx)	< 0.7 pF/20 k Ω to 0 V (TLA5000) < 0.7 pF/20 k Ω to 2.2 V (TLA600, TLA7N/P/Qx)	2 pF/20 k Ω to 0 V (TLA5000) 2 pF/20 k Ω to 2.2 V (TLA600, TLA7N/P/Qx)	<0.7 pF/20 k Ω to 0 V (TLA5000) < 0.7 pF/20 k Ω to 2.2 V (TLA600, TLA7N/P/Qx)
Input Range	-5 V to 8 V			
Max Voltage (Nondestruct)	\pm 15 V			
Cable Length	1.8 m (6 ft.)			

P6800/6900 Series Probe Characteristics

General

Characteristic	P6810	P6860	P6864	P6880	P6960	P6962 / P6964	P6962DBL	P6980	P6982
Data	Differential	Single-ended	Single-ended	Differential	Single-ended	Single-ended	Single-ended	Differential	Differential
Clock	Differential								
Number of Channels	34	34	17	34	34	34	34	34	17
Number of Probe Heads	1	2	1	4	1	1	1	2	1
Recommended Use	General-purpose applications	Good signal density and quick reliable attachment	Data rates in excess of 750 MHz (TLA7Bxx) or 450 MHz (TLA7ACx) with good signal density	Full differential probing with good signal density	Best signal density and quick reliable attachment. Flying leads for general-purpose probing is optional	Data rates in excess of 750 MHz (TLA7Bxx) or 450 MHz (TLA7ACx) with the best signal density	Highest performance applications, such as the fastest data rate DDR memory	Full differential probing with the best signal density	Full differential with the best signal density for data rates in excess of 750 MHz (TLA7Bxx) or 450 MHz (TLA7ACx)
Attachment to Target System	Fits both 0.100 in. and 2 mm square pin configurations	Compression Elastomer			D-Max® probing technology compression cLGA				
Probe Loading AC/DC	< 0.7 pF/20 kΩ to Ground				0.5 pF/20 kΩ to Ground, typical		0.7 pF/11.7 kΩ to Ground, typical	0.5 pF/20 kΩ to Ground, typical	
Analog Bandwidth	Module Dependent								
TLA7Bxx module	3 GHz through iCapture™ to analog out BNCs*1								
TLA7ACx module	2 GHz through iCapture™ to analog out BNCs*1								
Input Range	-2.5 V to 5.0 V						-1.25 V to +2.5 V	-2.5 V to 5.0 V	
Max Voltage (Nondestruct)	±15 V						±7.5 V	±15 V	
Cable Length	1.8 m (6 ft.)								

*1 Analog bandwidth of P6960 is less with flying lead set attached.

P6700 Series Probe Characteristics**General**

Characteristic	P67SA08	P67SA16	P67SA16G2	P67SA01S	P67SA04S	P67SA08S	P67SA16S	P67SA01SD
Probe Type	PCI Express Midbus Differential Data	PCI Express Midbus Differential Data	PCI Express Midbus Differential Data	PCI Express Slot Interposer	PCI Express Slot Interposer	PCI Express Slot Interposer	PCI Express Slot Interposer	PCI Express Differential Solder-down Probe
Number of Differential Pairs	8	16	16	2	4	16	32	1
Recommended Use	Recommended where signal integrity is critical	Recommended where signal integrity is critical	Recommended for midbus probing of PCIe Gen2	Recommended for platforms with no midbus footprints and the PCI Express slot is the only probe access point	Recommended for platforms with no midbus footprints and the PCI Express slot is the only probe access point	Recommended for platforms with no midbus footprints and the PCI Express slot is the only probe access point	Recommended for platforms with no midbus footprints and the PCI Express slot is the only probe access point	Recommended for platforms with no midbus footprint, PCI Express slot; or where space is limited
Attachment to Target System	Compression cSpring	Compression cSpring		PCI Express Slot	PCI Express Slot	PCI Express Slot	PCI Express Slot	Solder Down
Probe Loading AC/DC	See P6700 Series Probe Manual							
Cable Length	1.8 m (6 ft.)							

Midbus Probe Recommended Configuration

X1	X4	X8	X16
1 P67SA08 1 TLA7SA08	1 P67SA08 1 TLA7SA08	1 P67SA16 1 TLA7SA16	2 P67SA16 2 TLA7SA16

Solder-down Probe Recommended Configurations

X1	X4	X8	X16
2 P67SA01SD 1 TLA7SA08	8 P67SA01SD 1 TLA7SA08	16 P67SA01SD 1 TLA7SA16	32 P67SA01SD 2 TLA7SA16

Slot Interposer Probe Recommended Configurations

X1	X4	X8	X16
1 P67SA01S 1 TLA7SA08	1 P67SA04S 1 TLA7SA08	1 P67SA08S 1 TLA7SA16	1 P67SA16S 2 TLA7SA16

Ordering Information

Tektronix Logic Analyzer Probes

Models	Description
P6410	17-channel General-purpose Probe with Single-ended Data/Clock with Separable Podlets and Accessories Includes: Podlet Holders, IC Grabbers, Ground Leads, Ground Tips, Extension Ground Tips, Probe Labels, Probe Instruction Manual
P6419	17-channel High-density Compression Probe, with Single-ended Data/Clock and Accessories Includes: Nut Bars, Elastomer Holder (Thin PCBs), Elastomer Holder (Thick PCBs), Probe Labels, Probe Instruction Manual
P6434	34-channel High-density Mictor Probe with Single-ended Data/Clock and Accessories Includes: Latch Housing Assembly (Edge-mount), Latch Housing Assembly (Vertical), Probe Labels, Probe Label Instructions, Probe Instruction Manual
P6450	34-channel High-density D-Max Probing Technology Probe with Single-ended Data/Clock and Accessories Includes: Probe Retention Kit for D-Max Probing Technology, Probe Labels, Probe Instruction Manual
P67SA08	8 Differential Pairs PCI Express Midbus Probe and Accessories Includes: Statement of Compliance, (2) 8-channel Retention Mechanisms, Velcro Cable Managers, Probe Instruction Manual
P67SA16	16 Differential Pairs PCI Express Midbus Probe and Accessories Includes: Statement of Compliance, (2) 16-channel Retention Mechanisms, Velcro Cable Managers, Probe Instruction Manual
P67SA01S	x1 PCI Express Slot Interposer Includes: Statement of Compliance, Velcro Cable Managers, Probe Instruction Manual
P67SA04S	x4 PCI Express Slot Interposer Includes: Statement of Compliance, Velcro Cable Managers, Probe Instruction Manual
P67SA08S	x8 PCI Express Slot Interposer Includes: Statement of Compliance, Velcro Cable Managers, Probe Instruction Manual
P67SA16S	x16 PCI Express Slot Interposer Includes: Statement of Compliance, Velcro Cable Managers, Probe Instruction Manual
P67SA01SD	x1 PCI Express Differential Solder-down Probe Includes: Statement of Compliance, Velcro Cable Managers, Probe Instruction Manual Option 1P: Probe Power Adapter (1 required for every eight (8) P67SA01SD probes)

Models	Description
P6810	34-channel General-purpose Probe with Differential Clock, Differential Data, and Accessories Opt. DL: Differential Flying Lead Set (196-3471-xx)
P6860	34-channel High-density Compression Probe, with Differential Clock, Single-ended Data, and Accessories
P6864	17-channel (optimized for quarter-channel mode) High-density Compression Probe, with Differential Clock, Single-ended Data, and Accessories
P6880	34-channel High-density Compression Probe with Differential Clock, Differential Data, and Accessories
P6960	34-channel Single-ended High-density Compression Probe with D-Max™ Probing Technology, with Differential Clock, Single-ended Data, and Accessories Opt 01: 34-channel General-purpose Flying Lead Set (196-3494-xx)
P6962	34-channel (optimized for half-channel mode) Single-ended High-density Compression Probe with D-Max® Probing Technology with Differential Clock, Single-ended Data, and Accessories
P6962DBL	34-channel (optimized for half-channel mode) Single-ended High-density Compression Probe with D-Max® Probing Technology with Differential Clock, Single-ended Data, and Accessories
P6964	34-channel (optimized for quarter-channel mode) Single-ended High-density Compression Probe with D-Max® Probing Technology with Differential Clock, Single-ended Data, and Accessories
P6980	34-channel Differential High-density Compression Probe with D-Max® Probing Technology, with Differential Clock, Differential Data, and Accessories
P6982	17-channel (optimized for half-channel mode) Differential High-density Compression Probe with D-Max® Probing Technology, with Differential Clock, Differential Data, and Accessories

Language Options

Option	Description
Opt. L0	English Manuals
Opt. L99	No Manuals

Service Options

Please refer to the Service section at the rear of this document for information on Calibration and Repair options for these probes.

Accessories

P6400 Series Accessories

Description	P6410		P6419*2		P6434		P6450	
	Qty. per Probe	Part Number	Qty. per Probe	Part Number	Qty. per Probe	Part Number	Qty. per Probe	Part Number
Nut Bar (used on <0.093 in. thick PCB), Bag of 2	—	—	1	020-2453-xx	—	—	—	—
Elastomer Holder Assembly, Thin (used on <0.093 in. thick PCB), Bag of 2	—	—	1	020-2451-xx	—	—	—	—
Elastomer Holder Assembly, Thick (used on >0.093 in. thick PCB), Bag of 2	—	—	1	020-2452-xx	—	—	—	—
Probe Retention Kit for D-Max Probing Technology	—	—	—	—	—	—	1	020-2908-xx
Sheet of Probe Labels	1	334-9979-xx	1	335-1007-xx	1	334-9381-xx	1	335-1990-xx
1 Latch Housing Assembly, Edge-mount	—	—	—	—	1	105-1088-xx	—	—
1 Latch Housing Assembly, Vertical	—	—	—	—	1	105-1089-xx	—	—
High-resistance Adapter for use with General-purpose Probes*3	1	TLAHRA	—	—	—	—	—	—
Optional								
One-to-Two Adapter	1 each	013-0280-xx	—	—	—	—	—	—
1 each – AMP Mictor Connector, Surface-mount	—	—	—	—	1	131-6134-xx	—	—
21 each – AMP Mictor Connector, Surface-mount	—	—	—	—	1	020-2228-xx	—	—
Mictor-on-PCB to P6419 Probe Adapter	—	—	1	020-2457-xx	—	—	—	—
Compression-on-PCB to Mictor Adapter, 17 channel	—	—	1	020-2455-xx	—	—	—	—
Compression-on-PCB to Mictor Adapter, 34 channel	—	—	1	020-2456-xx	1	020-2456-xx	—	—

*2 Recommend PEM KFS-256 or equivalent for >0.093 in. thick PCB.

*3 Provides 1 M Ω input resistance for use in low-power applications.

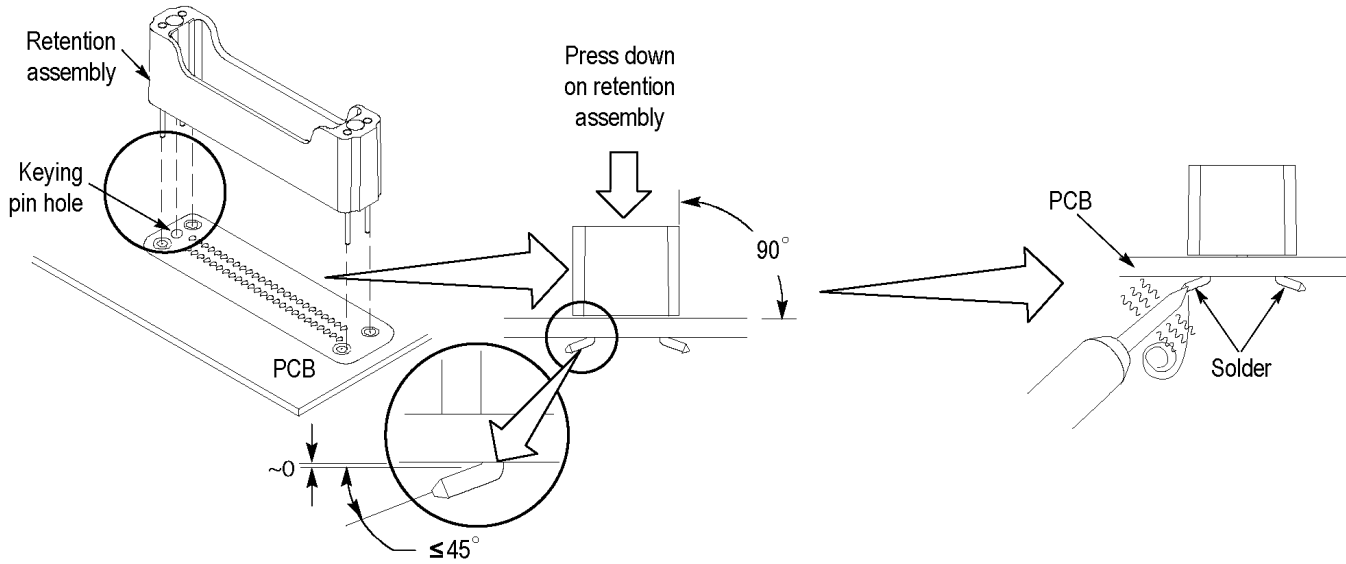
P6800 Series Standard Accessories

Description	P6810		P6860*2		P6864*2		P6880*2	
	Qty. per Probe	Part Number	Qty. per Probe	Part Number	Qty. per Probe	Part Number	Qty. per Probe	Part Number
Podlet Holders, Bag of 4	1	352-1097-xx	—	—	—	—	—	—
1-ch Leadset, Single-ended and Differential	2	196-3471-xx	—	—	—	—	—	—
8-ch Leadset, Single-ended	4	196-3470-xx	—	—	—	—	—	—
SMT KlipChip Grabber Tips, Bag of 20	2	SMG50	—	—	—	—	—	—
Nut Bar (used on <0.093 in. thick PCB)	—	—	2	220-0255-xx	1	220-0255-xx	4	220-0255-xx
Elastomer Holder Assembly, Thin (used on <0.093 in. thick PCB), Bag of 2	—	—	1	020-2451-xx	1	020-2451-xx	2	020-2451-xx
Elastomer Holder Assembly, Thick (used on >0.093 in. thick PCB), Bag of 2	—	—	1	020-2452-xx	1	020-2452-xx	2	020-2452-xx
Sheet of Probe Labels	1	335-0345-xx	1	335-0346-xx	1	335-1017-xx	1	335-0697-xx

*2 Recommend PEM KFS-256 or equivalent for >0.093 in. thick PCB.

P6800 Series Optional Accessories

Order Number	Description
TLAHR	High-resistance Adapter (18 channels) for P6810
020-2457-xx	Mictor-on-PCB to P6860 Probe Adapter
020-2453-xx	Nut Bar for Thin Elastomer Holder Assembly (Bag of 2)



P6900 Series Probe Retention Kit

P6900 Series Standard Accessories

Description	P6960		P6962 / P6964		P6962DBL		P6980		P6982	
	Qty. per Probe	Part Number	Qty. per Probe	Part Number	Qty. per Probe	Part Number	Qty. per Probe	Part Number	Qty. per Probe	Part Number
Sheet of Probe Labels	1	335-1208-xx	1	P6962: 335-1772-xx P6964: 335-1315-xx	1	335-1956-xx	1	335-1209-xx	1	335-1313-xx
P6900 Series Probe Retention Kit	1	020-2908-xx	1	020-2908-xx	1	020-2908-xx	2	020-2908-xx	1	020-2908-xx
Probe Adjustment Tool	1	003-1890-xx	1	003-1890-xx	1	003-1890-xx	1	003-1890-xx	1	003-1890-xx
Velcro Cable Manager (Bag of 2)	1	346-0300-xx	1	346-0300-xx	1	346-0300-xx	1	346-0300-xx	1	346-0300-xx

P6900 Series Optional Accessories

Order Number	Description
020-2539-xx	P6900 Series Probe Mounting Posts

P6700 Series Midbus Standard Accessories

Description	P67SA08		P67SA16	
	Qty. per Probe	Part Number	Qty. per Probe	Part Number
Retention Mechanisms	2	020-2785-xx	2	020-2784-xx
Sheet of Probe Labels	1	335-1729-xx	1	335-1728-xx
Probe Adjustment Tool	1	003-1890-xx	1	003-1890-xx
Velcro Cable Manager (Bag of 2)	1	346-0300-xx	1	346-0300-xx

P67SA01SD Solder-down Standard Accessories

Description	Qty. per Probe	Part Number
TriMode™ Long Reach Solder Tip	1	P75TLRST
Storage Case	1	016-2009-xx
Solder Tip Tape (Strip of 10)	1	006-8237-xx
1 – .004 wire / 1 – .008 wire / 1 – SAC305 Solder (Package of 3 bobbins)	1	020-2754-xx
Hook and Loop fastening straps and dots	1	016-1953-xx
Installation Sheet	1	071-2503-xx

P67SA01SD Solder-down Required Accessories

Description	Qty.*4	Part Number
Power Adapter	1	870-0192-xx

*4 See Solder-down Probe Configuration for Required Quantities.

P67SA01SD Solder-down Optional Accessories

Description	Qty.	Part Number
Bullet Removal Tool	1	003-1896-xx
Replacement Bullet Contacts	Pack of 4	003-0359-xx

Service Options

Customers who choose a Tektronix product receive a support partnership focused on making the deployment and operation of their products successful. Tektronix support teams are committed to providing rapid response. A broad range of flexible services is available at the time of product purchase to meet customer service needs.

Option	Description
P6410 C3 P6450 C3	Calibration Service, 3 years
P6410 C5 P6450 C5	Calibration Service, 5 years
P6410 R3 P6450 R3	Repair Service, 3 years (incl. warranty)
P6410 R5 P6450 R5	Repair Service, 5 years (incl. warranty)
P6410 CA1 P6450 CA1	Provides a single calibration event or coverage for the designated calibration interval, whichever comes first
P6410-R1PW P6450-R1PW	Repair Service Coverage, 1-year post warranty
P6410-R2PW P6450-R2PW	Repair Service Coverage, 2-years post warranty
P6410-R3DW P6450-R3DW	Repair Service Coverage, 3 years (incl. product warranty period). 3-year period starts at time of instrument purchase
P6410-R5DW P6450-R5DW	Repair Service Coverage, 5 years (incl. product warranty period). 5-year period starts at time of instrument purchase

The following service options are offered for the TLA logic analyzer probes.

Option	P6800/P6900 Series Probes	P6700 Series Probes
Opt. CA1 provides a single calibration event or coverage for the designated calibration interval, whichever comes first	X	X
Opt. C3 Calibration Service, 3 Years	X	X
Opt. C5 Calibration Service, 5 Years	X	X
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. G3 Complete Care 3 Years (includes loaner, scheduled calibration and more). P6708, P6716, P6716S, P6960DBL, P6960HCD only	X	X
Opt. G5 Complete Care 5 Years (includes loaner, scheduled calibration and more). P6708, P6716, P6716S, P6960DBL, P6960HCD only	X	X
Opt. R3 Repair Service, 3 Years	X	X
Opt. R5 Repair Service, 5 Years	X	X
Opt. S1 On-site service, 1 Year		
Opt. S3 On-site service, 3 Years (with R or C options)		
Opt. R1PW Repair Service Coverage, 1-year Post Warranty	X (Not P6982)	X
Opt. R2PW Repair Service Coverage, 2-years Post Warranty	X (Not P6982)	X
Opt. R3DW Repair Service Coverage, 3 Years (includes product warranty period). 3-year period starts at time of instrument purchase	X (Not P6982)	X
Opt. R5DW Repair Service Coverage, 5 Years (includes product warranty period). 5-year period starts at time of instrument purchase	X (Not P6982)	X



Product(s) are manufactured in ISO registered facilities.

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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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