

# Tektronix Logic Analyzer Probes

## P6400/P6800/P6900 Series Data Sheet



### Features & Benefits

- <math><0.7\text{ pF}</math> Total Capacitive Loading Minimizes Intrusion on Circuits
- 20 k $\Omega$  Input Resistance
- 6.5 V<sub>pp</sub> 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.

## 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 kΩ to 0 V (TLA5000) <2 pF/20 kΩ to 2.2 V (TLA600, TLA7N/P/Qx)	< 0.7 pF/20 kΩ to 0 V (TLA5000) < 0.7 pF/20 kΩ to 2.2 V (TLA600, TLA7N/P/Qx)	2 pF/20 kΩ to 0 V (TLA5000) 2 pF/20 kΩ to 2.2 V (TLA600, TLA7N/P/Qx)	<0.7 pF/20 kΩ to 0 V (TLA5000) < 0.7 pF/20 kΩ to 2.2 V (TLA600, TLA7N/P/Qx)
Input Range	-5 V to 8 V			
Max Voltage (Nondestruct)	±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.

## Ordering Information

### Tektronix Logic Analyzer Probes

Models	Description
P6410	17-channel General-purpose Probe with Single-ended Data/Clock with Separable Podlets and Accessories  <b>Includes:</b> 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  <b>Includes:</b> 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  <b>Includes:</b> 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  <b>Includes:</b> Probe Retention Kit for D-Max® Probing Technology, Probe Labels, Probe Instruction Manual
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

Models	Description
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	—	—	—	—	—	—
<b>Optional</b>								
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 MΩ input resistance for use in low-power applications.

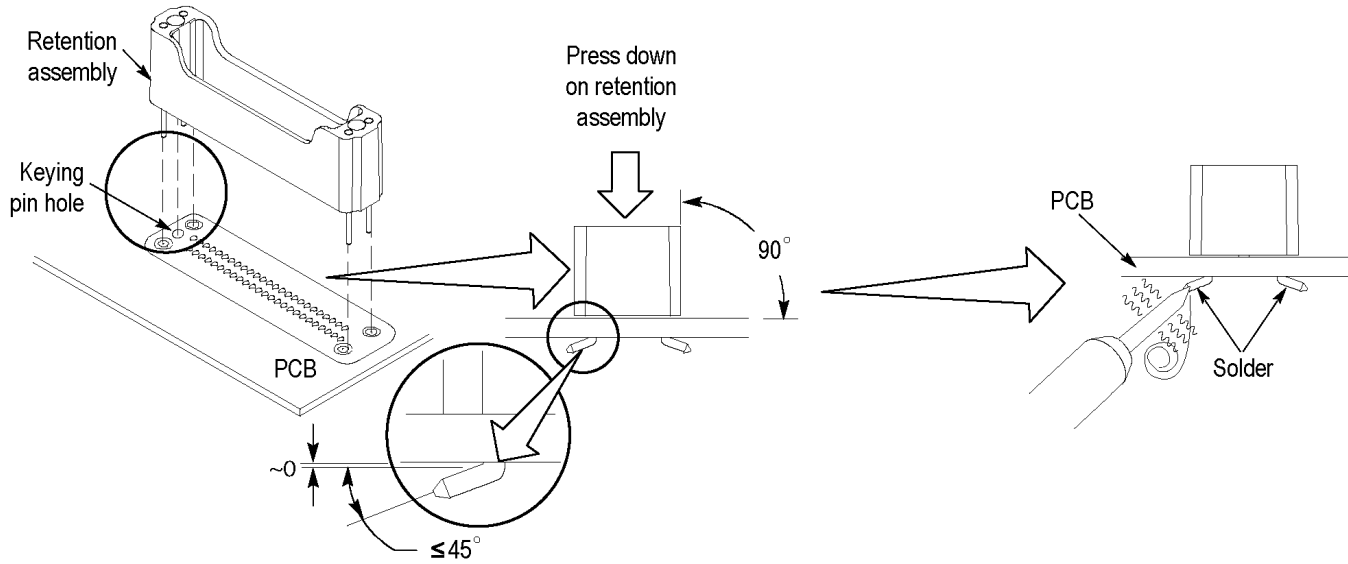
**P6800 Series Standard Accessories**

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 &gt;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



**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.

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

Option	P6400 Series Probes	P6800/P6900 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
Opt. G5 Complete Care 5 Years (includes loaner, scheduled calibration and more). P6708, P6716, P6716S, P6960DBL, P6960HCD only		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	X (Not P6982)
Opt. R2PW Repair Service Coverage, 2-years Post Warranty	X	X (Not P6982)
Opt. R3DW Repair Service Coverage, 3 Years (includes product warranty period). 3-year period starts at time of instrument purchase	X	X (Not P6982)
Opt. R5DW Repair Service Coverage, 5 Years (includes product warranty period). 5-year period starts at time of instrument purchase	X	X (Not P6982)



Tektronix is registered to ISO 9001 and ISO 14001 by SRI Quality System Registrar.





**Contact Tektronix:**

**ASEAN / Australasia** (65) 6356 3900  
**Austria** 00800 2255 4835\*  
**Balkans, Israel, South Africa and other ISE Countries** +41 52 675 3777  
**Belgium** 00800 2255 4835\*  
**Brazil** +55 (11) 3759 7627  
**Canada** 1 800 833 9200  
**Central East Europe and the Baltics** +41 52 675 3777  
**Central Europe & Greece** +41 52 675 3777  
**Denmark** +45 80 88 1401  
**Finland** +41 52 675 3777  
**France** 00800 2255 4835\*  
**Germany** 00800 2255 4835\*  
**Hong Kong** 400 820 5835  
**India** 000 800 650 1835  
**Italy** 00800 2255 4835\*  
**Japan** 81 (3) 6714 3010  
**Luxembourg** +41 52 675 3777  
**Mexico, Central/South America & Caribbean** 52 (55) 56 04 50 90  
**Middle East, Asia, and North Africa** +41 52 675 3777  
**The Netherlands** 00800 2255 4835\*  
**Norway** 800 16098  
**People's Republic of China** 400 820 5835  
**Poland** +41 52 675 3777  
**Portugal** 80 08 12370  
**Republic of Korea** 001 800 8255 2835  
**Russia & CIS** +7 (495) 7484900  
**South Africa** +41 52 675 3777  
**Spain** 00800 2255 4835\*  
**Sweden** 00800 2255 4835\*  
**Switzerland** 00800 2255 4835\*  
**Taiwan** 886 (2) 2722 9622  
**United Kingdom & Ireland** 00800 2255 4835\*  
**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](http://www.tektronix.com)



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