

# Tektronix Logic Analyzer Probes

## P6900 Series Datasheet for DDR Memory Applications



Verification and debug of today's high speed, low voltage DDR Memory interface signals requires probing solutions that can accurately acquire from a wide variety of form factors and provide excellent signal fidelity. Tektronix logic analyzer probes contain a variety of connectivity options that are engineered to ensure that signal acquisition is a true reflection of your design's performance.

### Key features

- <math>0.7\text{ pF}</math> total capacitive loading minimizes intrusion on circuits
- 20 k $\Omega$  input resistance
- 6.5 V<sub>p-p</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

- DDR3/DDR4 Debug and Verification
- LPDDR Debug and Validation
- Embedded Systems integration, debug, and verification

### Leading probe solutions for real-time digital systems analysis

#### P6900 series probes

The DDR memory interface has evolved to support higher data rates at lower voltages creating several debug and validation challenges. With the industry's lowest capacitance, the P6900 specialty probes for DDR Memory applications offer excellent signal integrity to ensure a true representation of the signal - critical for connecting to high-speed memory interfaces and performing debug and analysis.

Probes with a variety of attachment mechanisms for different applications are available. Where circuit board space is at a premium, the high-density P6960DBL and P6962DBL probes with D-Max<sup>®</sup> Probing Technology offers the industry's smallest available footprint. For use with interposers, the P6960HCD, P6960HCD-LV and P6962HCD offer a low profile connection mechanism making it mechanically easy to use with the interposers. For low signal swing application the P6960HS based on the D-Max<sup>®</sup> Probing Technology is suitable.

For debugging the signal integrity problems common on high-speed DDR buses, the P6900 specialty probes for DDR applications work with the TLA7Bxx modules to provide iCapture<sup>™</sup> 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.

# Specifications

All specifications apply to all models unless noted otherwise.

## Model overview

Compatible with TLA7BBx and TLA7ACx modules

	P6960DBL	P6962DBL	P6960HS	P6960HCD	P6962HCD	P6960HCD-LV
Data	Single-ended	Single-ended	Single-ended	Single-ended	Single-ended	Single-ended
Clock	Differential			Single-ended		
Number of input channels	68	68	34	68	68	34
Attachment to target system	D-Max® probing technology compression cLGA	D-Max® probing technology compression cLGA	D-Max® probing technology compression cLGA	HCD Connector	HCD Connector	HCD Connector

## Probe specifications

### Input resistance

P6960DBL, P6962DBL, P6960HS	11.7K kΩ to Ground (typical)
P6960HCD, P6962HCD, P6960HCD-LV	Tip resistor on the interposer + 75 Ω to 0.75 V (typ)

### Input capacitance

P6960DBL, P6962DBL, P6960HS	<0.7 pF
P6960HCD, P6962HCD, P6960HCD-LV	Depends on the tip resistor on the Interposer used with the probe

### Minimum digital swing

with TLA7BBx or TLA7ACx modules

P6960DBL, P6962DBL	P6960HS	P6960HCD, P6962HCD, P6960HCD-LV
200 mV single-ended	100 mV single-ended	150 mV single-ended

### Analog bandwidth<sup>1</sup>

With TLA7Bxx module 3 GHz through iCapture™ to analog out BNCs

### Operating range

P6960DBL, P6962DBL	-2 V to +5 V
P6960HS	-1 V to +2.5 V
P6960HCD, P6962HCD, P6960HCD-LV	0 V to 1.5 V (compatible with DDR3/DDR4)

### Maximum nondestructive voltage

P6960DBL, P6962DBL	±15 V
P6960HS, P6960HCD, P6962HCD, P6960HCD-LV	±7.5 V

<sup>1</sup> Analog bandwidth is less with the flying lead set attached.

## Ordering information

### P6900 models

Model	Description
P6960DBL	Single-ended 34-channel high-density connectorless with D-Max Probing Technology with double back end connectors to the Tektronix logic analyzer module for double probing the signals with a single probe head.
P6962DBL	Single-ended 34-channel high-density connectorless with D-Max Probing Technology, optimized for 2X Demux (half channel acquisition), with double back end connectors to the TLA logic analyzer module for double probing the signals.
P6960HCD	Single-ended 34-channel HCD connector to LAI with two full channel back-end connectors to the Tektronix logic analyzer module for double probing the signals with 0.75 V pull-up resistors.
P6962HCD	Single-ended 34-channel HCD connector to LAI with four 2X Demux (half channel acquisition) back-end connectors to the Tektronix logic analyzer module for double probing the signals.
P6962HCD-LV	Single-ended 34-channel HCD connector to LAI with two full channel back-end connectors to the Tektronix logic analyzer module for double probing the signals with 0.6 V pull-up resistors.
P6960HS	34-channel, high-density connectorless, single-ended data, differential clock, higher sensitivity; for use with Tektronix logic analyzer modules.

### Standard accessories

#### P6960DBL

335-1955-xx

Sheet of probe labels

020-2908-xx

Probe retention kit for D-Max® Probing Technology (contains 2 retention shrouds)

#### P6962DBL

335-1955-xx

Sheet of probe labels

020-2908-xx

Probe retention kit for D-Max® Probing Technology (contains 2 retention shrouds)

#### P6960HS

355-3009-xx

Sheet of probe labels

020-2908-xx

Probe retention kit for D-Max® Probing Technology (contains 2 retention shrouds)

#### P6960HCD

335-2069-xx

Sheet of probe labels

#### P6960HCD-LV

335-3012-xx

Sheet of probe labels

#### P6962HCD

335-2071-xx

Sheet of probe labels

## Language options

Opt. L0	English manual
Opt. L99	No manual

## ServiceOptions

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
CA1	Single calibration event or coverage for the designated calibration interval, whichever comes first
C3	Calibration Service, 3 Years
C5	Calibration Service, 5 Years
R3	Repair Service, 3 Years
R5	Repair Service, 5 Years
R1PW	Repair Service Coverage, 1-year Post Warranty
R2PW	Repair Service Coverage, 2-years Post Warranty
R3DW	Repair Service Coverage, 3 Years (includes product warranty period). 3-year period starts at time of instrument purchase
R5DW	Repair Service Coverage, 5 Years (includes product warranty period). 5-year period starts at time of instrument purchase

## Recommended accessories

### P6960DBL

<b>020-2910-xx (50 included)</b>	Probe retention kit for D-Max Probing Technology
<b>020-2539-xx</b>	Post-style retention kit for D-Max Probing Technology

### P6962DBL

<b>020-2910-xx (50 included)</b>	Probe retention kit for D-Max Probing Technology
<b>020-2539-xx</b>	Post-style retention kit for D-Max Probing Technology

### P6960HS

<b>020-2910-xx (50 included)</b>	Probe retention kit for D-Max Probing Technology
<b>020-2539-xx</b>	Post-style retention kit for D-Max Probing Technology



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



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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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