Differential Probes

P6248 • P6247 • P6246 Data Sheet

P6248

Features & Benefits

P6248

- 1.7 GHz (Typical Probe Only ≤27 °C) 1X Mode
- 1.5 GHz Bandwidth (Guaranteed)
- 1.85 GHz (Typical Probe Only ≤27 °C) 10X Mode

P6247

- >1.0 GHz Bandwidth (Guaranteed)

P6246

- 400 MHz Bandwidth (Guaranteed)

General

- Low Input Capacitance: <1 pF Differential
- Probe Input Connector: Two Standard 0.025 in./0.63 mm (0.1 in. Center) Square Pin Receptacle (Female)
- Electrostatic Discharge Tolerant (IEC 801-2)
- Connects to TekProbe® BNC Interface on TDS Series Oscilloscopes or Other Instruments using 1103 TekProbe® Power Supply
- For use with Oscilloscopes, Spectrum Analyzers, or Network Analyzers
- >60 dB (1000:1) Common Mode Rejection Ratio (CMRR)
- Small Probe Head Allows Easy Probing of SMDs

Applications

- Communications (Gigabit Ethernet, IEEE-1394, Fibre Channel)
- Semiconductor Characterization (RAMBUS)
- Disk Drive Read Channel Design
- Communication Pulse Shape Compliance
- Jitter, Crosstalk, and BERT Measurements
- Location of Ground Bounce

The P6246, P6247, and P6248 Differential Probes

The P6248, P6247, and P6246 enable users to make time-domain or frequency-domain measurements on high-bandwidth signals commonly found in disk drive, digital IC design (RAMBUS), and communication applications (Gigabit Ethernet, IEEE-1394 Firewire, and Fibre Channel). The P6248 includes accessories that allow RAMBUS via probing and IEEE-1394 interconnect access. The small probe head geometry and assorted probe tip accessories allow these probes to easily accommodate manual probing of surface-mount devices while maintaining high CMRR.

The P6246, P6247, and P6248 are ideal for design verification of disk drive read, channel electronics, and timing analysis for troubleshooting ground-bounce problems associated with high-speed logic. They can also be used for pulse shape or crosstalk compliance testing of high-speed communication signals.

Tektronix®

Characteristics

Characteristic	Description
Bandwidth (Guaranteed)	P6248: DC to 1.5 GHz P6247: DC to 1.0 GHz P6246: DC to 400 MHz
Rise Time (Specified)	<265 ps (P6248) <350 ps (P6247) <875 ps (P6246)
DC Attenuation Accuracy	±2%
Common Input Voltage Range	±7.0 V, 1X ±7.0 V, 10X
Differential Input Voltage Range	±850 mV, 1X ±8.5 V, 10X
Max Nondestruct Input Voltage	±25 V (DC + peak AC)
Electrostatic Immunity	>15 kV
TekProbe® Interface	Probe power, auto-scaling, auto-termination with TDS oscilloscopes
Bandwidth Limit	Switchable, 200 MHz (P6246 and P6247)
DC Reject	0.4 Hz, 1X 4.0 Hz, 10X (P6246 and P6247)

Typical Specifications

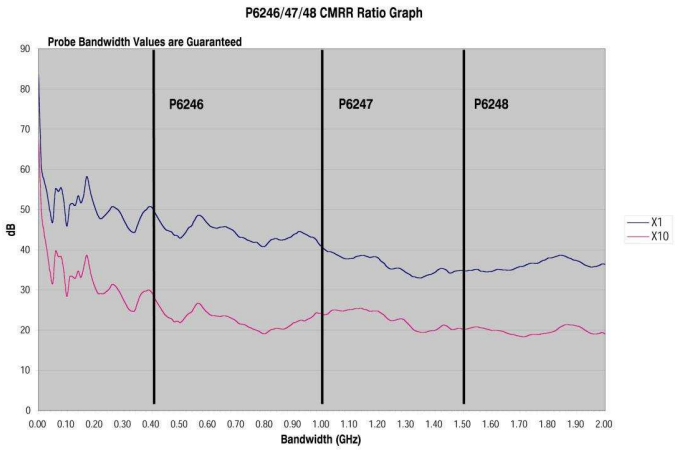
Characteristic	Description
Input C	<1 pF (Differential mode) <2 pF (Common mode)
Input R	200 kΩ (Differential mode) 100 kΩ (Common mode)
Linearity	±2%
Noise	<50 nV/squareroot Hz
Harmonic Distortion	≤1.5%
Passband Ripple	< ±0.25 dB P6248: DC to 1.5 GHz P6247: DC to 850 MHz P6246: DC to 400 MHz
Output Termination	Terminate into 50 Ω

Physical Characteristics

Characteristic	Description
Weight (Probe only)	160 g (0.36 lb.)
Probe Head Volume	6 cm^3 (0.3 $in.^3$)
Probe Head Input Connection	0.63 mm (0.025 in.) square pins on 2.54 mm (0.1 in.) centers
Output Cable Length	1.2 m (4.0 ft.)

Environmental Characteristics

Characteristic	Description
Temperature	
Operating	0 °C to 50 °C
Nonoperating	–55 °C to +75 °C
Humidity (0 to 90% RH)	
Operating	30 °C to 50 °C
Nonoperating	30 °C to 60 °C



P6246/P6247/P6248 CMRR

Frequency	Attenuation Setting	P6246	P6247	P6248
1 MHz	÷1	>60 dB	>60 dB	>60 dB
	÷10	>45 dB	>45 dB	>45 dB
100 MHz	÷1	>38 dB	>38 dB	>38 dB
	÷10	>25 dB	>25 dB	>25 dB
500 MHz	÷1	N/A	>35 dB	>35 dB
	÷10	N/A	>20 dB	>20 dB
1 GHz	÷1	N/A	>30 dB	>30 dB
	÷10	N/A	>18 dB	>18 dB
1.5 GHz	÷1	N/A	N/A	>25 dB (typical)
	÷10	N/A	N/A	>18 dB (typical)

Ordering Information

P6248
1.7 GHz Differential Probe (typical ≤27 °C). 1.5 GHz Differential Probe (guaranteed). **Includes**: Certificate of Traceable Calibration, User Manual (English): Order 071-0566-00, Service Manual: Order 071-0573-00, Carrying Case: Order 016-1787-00.

P6247
1.0 GHz Differential Probe (guaranteed). **Includes**: Certificate of Traceable Calibration, User Manual (English, German, French and Japanese): Order 070-9898-02, Service Manual: Order 070-9899-01, Carrying Case: Order 016-1787-00.

P6246
400 MHz Differential Probe (guaranteed). **Includes**: Certificate of Traceable Calibration, User Manual (English, German, French and Japanese): Order 070-9898-02, Service Manual: Order 070-9899-01, Carrying Case: Order 016-0156-06.

Included Accessories

Product	P6246/P6247 Quantity	P6248 Quantity	Re-order Part Number*1
Y Lead Adapter	2 Each	2 Each	196-3434-00 (1 pkg. of 1)*2
3 in. Ground Lead	None	4 Each	196-3437-10 (1 pkg. of 2)*2
6 in. Ground Lead	2 Each	2 Each	196-3436-10 (1 pkg. of 2)*2
SMT KlipChip™ Adapter	3 Each	4 Each	206-0364-00 (1 pkg. of 1)
BNC to Probe Tip Adapter	1 Each	1 Each	679-4094-00 (1 pkg. of 1)
TwinFoot™ Adapter	2 Each	4 Each	016-1785-00 (1 pkg. of 4)
TwinTip™ Adapter	2 Each	4 Each	016-1786-00 (1 pkg. of 4)
Short Ground Contact	2 Each	10 Each	016-1783-00 (1 pkg. of 10)
Spring Loaded Ground	2 Each	6 Each	016-1782-00 (1 pkg. of 6)
Probe Tip Connector Saver	None	2 Each	016-1781-00 (1 pkg. of 2)
Longhorn Via Adapter	None	5 Each	016-1780-00 (1 pkg. of 5)
VariTip™ Adapter	None	8 Each	016-1891-00 (1 pkg. of 8)
Straight Tip	None	8 Each	016-1890-00 (1 pkg. of 8)
Color Coding Clips (2 each of 5 colors)	1 Each	1 Each	016-1315-00 (1 pkg. of 2/ each of 5 colors)
Certificate of Traceability	1 Each	1 Each	

*1 Reorder quantities may differ from original included quantities.

*2 Part number 196-3462-00 includes: 2 each, Y Lead Adapters (replacement part number 196-3434-00 pkg of 1); 2 each, 6 in. Ground Leads (replacement part number 196-3436-10 pkg. of 2); 4 each, 3 in. Ground Leads (replacement part number 196-3437-10 pkg. of 2).

Service

Option	Description
Opt. C3	Calibration Service 3 Years
Opt. C5	Calibration Service 5 Years
Opt. D3	Calibration Data Report 3 Years (with Option C3)
Opt. D5	Calibration Data Report 5 Years (with Option C5)
Opt. R3	Repair Service 3 Years
Opt. R5	Repair Service 5 Years

Recommended/Replacement Accessories

Accessory	Description
679-5027-00	IEEE-1394 Breakout Connector
012-0076-00	18 in., 50 Ω, BNC (M) to BNC (M) Coaxial Cable
011-0049-02	50 Ω, BNC Coaxial Terminator
015-0572-00	50 Ω, SMA (F) to BNC (M) Adapter
013-0309-00	P6046/HP1141A Probe Tip Adapter

Related Products

Product	Description
1103	TekProbe® II power supply for interfacing with other BNC instruments

Power Plug Options for 1103

Option	Description
Opt. A0	North America power
Opt. A1	Universal Euro power
Opt. A2	United Kingdom power
Opt. A3	Australia power
Opt. A4	240 V, North America power
Opt. A5	Switzerland power

CE Marking Not Applicable.

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

Data Sheet

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

Updated 10 February 2011

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**

02 Oct 2011 60W-13148-8

www.tektronix.com