Differential SMA Probe Family

P7313SMA • P7380SMA Data Sheet

Applications

- Validation and Compliance Testing of Serial Data Standards including, but not limited to:
  - PCI Express I and II
  - Serial ATA
  - FBDIMM
  - DDR
  - XAUI
  - HDMI/DVI (P7313SMA only)

Tektronix continues to demonstrate its proven leadership in differential probing with a significant addition to our Differential SMA Probe Family. Differential SMA probes are designed for measuring differential signals in a 50 Ω signaling environment, providing the ability to convert from a differential SMA signal path to a single oscilloscope input channel. Many of today's high-speed serial data standards employ differential signaling on multiple lanes that are challenging to measure simultaneously on a single oscilloscope. The Tektronix Differential SMA Probes provide the ability to measure a high-speed differential signal on each channel of a multiple-channel oscilloscope. The right oscilloscope can simultaneously acquire up to four high-speed differential signals with the use of four differential SMA probes. As an added benefit, the SMA inputs on the probes connect to high-quality 50 Ω terminations that offer industry-leading return loss, a critical specification that is very important in compliance testing as frequencies increase.

Tektronix Differential SMA Probes also provide a common mode DC voltage input to the termination network. The termination voltage can be supplied either externally by the user or internally by the oscilloscope. In addition, there is also an automatic mode that senses the common mode voltage of the input signal and automatically sets the termination voltage to match. The P7313SMA has an extended termination voltage range that makes it ideal for testing differential standards with high common mode voltages like HDMI and DVI.

Taken together, the high-speed differential amplifier, superior 50 Ω terminations, low return loss, flexible termination voltage, and quality phase-matched SMA cables create a world-class differential acquisition system when used with Tektronix oscilloscopes.

*1 Not available on all oscilloscopes.

Features & Benefits

- >13.0 GHz Bandwidth (P7313SMA only, typical)

- >8.0 GHz Bandwidth (P7380SMA only, typical)

- 50 Ω Termination Network, Differential SMA Inputs

- Industry-leading Differential Return Loss and VSWR

- High-bandwidth Differential Amplifier with Excellent CMRR

- Internal Termination Voltage Generator can be Controlled Internally by the Oscilloscope*1, by an External Source, or Automatically by the Probe

- Phase-matched SMA Cables (38 inch length, <1 ps skew) with Cable Loss Compensation

- Switchable Gain for Extended Dynamic Range

- Auxiliary (Inverted) Output for use with Spectrum Analyzers, Network Analyzers, or as a Clock Recovery Trigger Source

- TekConnect™ Interface

Tektronix®

Characteristics

Characteristic	P7380SMA	P7313SMA
Bandwidth (Typical)	>8 GHz	>13.0 GHz
Rise Time (10-90%) (Guaranteed)	<55 ps	<40 ps
Rise Time (20-80%) (Typical)	<35 ps	<25 ps
Attenuation	2.5X or 12.5X, user selectable	
Differential Input Range	0.625 V_{p-p} (2.5X) 3.0 V_{p-p} (12.5X)	0.800 V_{p-p} (2.5X) 3.6 V_{p-p} (12.5X)
Common Mode Input Range	±2.5 V	+3.6/-2.5 V
Termination Voltage Range	±2.5 V	+3.6/-2.5 V
Noise, Referred to Input	<13 nV/√Hz (2.5X) <40 nV/√Hz (12.5X)	
Differential Return Loss	<27 dB to 5 GHz (VSWR<1.09:1) <20 dB to 8 GHz (VSWR<1.22:1)	<30 dB to 500 MHz (VSWR<1.065:1) <20 dB to 6.5 GHz (VSWR<1.22:1) <15 dB to 10 GHz (VSWR<1.43:1) <12 dB to 13 GHz (VSWR<1.67:1)
CMRR	>50 dB to 100 MHz >35 dB to 1 GHz >20 dB to 5 GHz >15 dB to 8 GHz	>50 dB to 1 GHz >35 dB to 2.5 GHz >25 dB to 5 GHz >20 dB to 10 GHz >15 dB to 13 GHz
Max Voltage (Nondestruct)	±5 V (DC + peak AC)	
Interface	TekConnect®	

Ordering Information

P7313SMA
>13.0 GHz Differential SMA Probe for TekConnect® Interface.

P7380SMA
>8.0 GHz Differential SMA Probe for TekConnect® Interface.

All Include: Standard accessories (see table), Calibration Data Report (Opt. D1), Certificate of Traceable Calibration, One-year Warranty.

Standard Accessories

Description	P7380SMA	P7313SMA	Reorder Part Number
Pouch, Nylon Carrying Case with Inserts	1 each	1 each	016-1952-xx
Instruction Manual	1 each	—	071-1392-xx
User Manual – Printed Includes Reply Card and CD	—	1 each	020-2720-xx English 020-2737-xx Simplified Chinese 020-2738-xx Japanese
Phase-matched Dual SMA Cables (38 in.)	1 pair	1 pair	174-5771-xx
SMA 50 Ω Terminator	3 each	3 each	015-1022-xx
SMA Short	1 each	1 each	015-1020-xx
SMA Female to BNC Male Adapter	1 each	1 each	015-0572-xx
Banana Plug to 0.080 in. Diameter Pin Jack Cable Adapter, Red (4 ft.)	1 each	1 each	012-1674-xx
Banana Plug to 0.080 in. Diameter Pin Jack Cable Adapter, Black (4 ft.)	1 each	1 each	012-1675-xx
0.040 in. Diameter Pin Jack to 0.08 in. Diameter Pin Plug Adapter, Black	2 each	2 each	012-1676-xx
Antistatic Wrist Strap	1 each	1 each	006-3415-xx

Recommended Accessories

Description	P7380SMA	P7313SMA	Part Number
Phase Adjuster (2 required)	Yes	Yes	015-0708-xx
8000 Series TekConnect Probe Interface	Yes	Yes	80A03
Real-time Spectrum Analyzer TekConnect Probe Adapter	Yes	Yes	RTPA2A

Service Options

Option	Description
CA1	Single Calibration or Functional Verification
C3	Calibration Service 3 Years
C5	Calibration Service 5 Years
D3	Calibration Data Report 3 Years (with Opt. C3)
D5	Calibration Data Report 5 Years (with Opt. C5)
R5	Repair Service 5 Years

Language Options

Option	Description
L0	English manual
L5	Japanese manual
L7	Simplified Chinese manual

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

Product(s) complies with IEEE Standard 488.1-1987, RS-232-C, and with Tektronix Standard Codes and Formats.

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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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