

5.0 GHz Differential Probe with SMA Input

► P7350SMA



Tektronix' proven expertise in differential probing now brings you the first-available high-speed differential SMA input probe. The P7350SMA provides a new tool for measuring differential signals in a 50 Ω signaling environment. Before the introduction of the P7350SMA probe, most serial data compliance measurements required cabling a differential signal to two oscilloscope channels and applying waveform math to calculate the difference. By integrating a dual 50 Ω termination network and a differential amplifier in the probe head, the P7350SMA provides the ability to measure a differential signal pair on each channel of a multiple channel oscilloscope. Since many of the new high-speed serial data standards define differential signaling on multiple channels, the new P7350SMA provides a more efficient measurement solution.

The P7350SMA probe architecture includes an input termination network, a differential buffer amplifier, and a common mode DC bias port. Since many differential data signals operate with a non-zero DC common mode voltage, the DC bias port allows for more flexible interfacing to these logic families. For applications requiring a common mode DC termination voltage, that voltage can be supplied to the P7350SMA DC bias port

through a standard banana plug connector. For other differential measurement applications, such as AC-coupled and some DC-coupled high frequency 8B/10B encoded data streams, the DC bias port can simply be left unconnected.

Input signals are reliably connected to the input termination network through a pair of SMA connectors. The input termination network is implemented on a laser-trimmed hybrid circuit for signal fidelity and high frequency response. The linear buffer amplifier converts the differential input signal to a single-ended output and drives the output signal down the probe cable at full bandwidth.

The use of an active differential buffer amplifier in the probe head enables the P7350SMA probe to move the measurement interface from the oscilloscope front panel to the circuit-under-test. This can reduce the length of electrical interconnect cabling, which for multi-gigabit data signals also reduces frequency dependent loss distortion in signal measurements. The P7350SMA is connected to an oscilloscope with the patented TekConnect Interface, which preserves signal integrity to 10 GHz and beyond to meet present and future bandwidth needs.

► Features & Benefits

- <100 ps Rise Time (Guaranteed)
- 5.0 GHz Bandwidth (Typical)
- Dual SMA Inputs to Internal 50 Ω Termination Network
- Internal Differential Amplifier with High CMRR
- DC Bias Port for Common Mode Voltage Termination (LVPECL and CML Bias Capability)
- Good Differential Input Return Loss
- Low Input Skew
- Supplied with Low Loss Matched Delay Cables
- TekConnect™ Interface

► Applications

Applications

Communications
(Gigabit Ethernet, Fibre Channel, InfiniBand)

Semiconductor Characterization and Validation
(PCI-Express, Serial ATA, IEEE 1394, USB 2.0, RAMBUS, DDR)

COMPUTING

COMMUNICATIONS

VIDEO

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► Characteristics

Rise Time –

<100 ps 10% to 90% (guaranteed).
<65 ps 20% to 80% (typical).

Bandwidth (Probe Only) – 5.0 GHz (typical).

Input – SMA.

Attenuation – 6.25X.

Differential Input Resistance – 100 Ω ±2%.

Common Mode Input Resistance – 50 Ω ±1%.

Input Skew – <1 ps.

Differential Input Range – ±2.5 V (20 °C to 30 °C).

Common Mode Input Range – +6.25 V to –5 V.

Maximum Termination Resistor Power – <0.5 W per side*1.

Max Voltage (Non-destruct) – ±15 V (DC plus peak AC).

CMRR – >60 dB at DC, >55 dB at 1 MHz, >50 dB at 30 MHz, >30 dB at 1 GHz (typical).

*1See manual for calculation.

Differential Input Return Loss

Frequency	Differential Return Loss
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625 MHz (fundamental for 1.25 Gbps)	>20 dB
1.25 GHz (fundamental for 2.5 Gbps)	>16 dB
1.56 GHz (fundamental for 3.125 Gbps)	>14 dB
2.50 GHz	>12 dB
3.125 GHz	>10 dB

Noise – Approximately 46 nV/root Hz.

Interface – TekConnect.

Cable Length – 1.2 m.

► Ordering Information

P7350SMA

5.0 GHz Differential SMA Probe for TekConnect Interface.

Includes

50 Ω Terminator – Order 015-0122-xx, 2 each.

Matched Pair SMA Cables, 12 in. – Order 174-4866-xx, 1 set.

Banana Plug Shorting Strap – Order 012-1667-xx, 1 each.

BNC-M to SMA-F Adapter – Order 015-0572-xx, 1 each.

Cable Marker Set (5 colors) – Order 016-1886-xx, 1 each.

Wrist Strap – Order 006-3415-xx, 1 each.

Certificate of Traceable Calibration – 1 each.

Instruction Manual – Order 017-1264-xx, 1 each.

Recommended Accessories

SMA-M to SMA-M Adapter – Order 015-1011-xx, 2 each.

SMA Phase Adjuster Adapter – Order 015-0708-xx, 2 each.

BNC to Banana Adapter – Order 103-0090-xx, 1 each.

TekConnect Calibration Fixture – Order 067-0422-xx, 1 each.

Service Options

Opt. C3 – Calibration service 3 years.

Opt. C5 – Calibration service 5 years.

Opt. D1 – Calibration data report.

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.

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Our most up-to-date product information is available at:
www.tektronix.com



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