TekConnect™ Adapters

TCA75 • TCA-BNC • TCA-SMA • TCA-N Data Sheet

Features & Benefits

- **TCA75** - TekConnect-to-75 Ω BNC
  - DC to ≥8 GHz (Instrument Dependent)
  - VSWR - 1.1:1 (-26.45 dB) to 4 GHz; 1.3:1 (-18 dB) to 8 GHz
  - 75 Ω Input
  - Auto Attenuation Factor Correction
- **TCA-BNC** - TekConnect-to-TEKPROBE™ BNC 50 Ω
  - DC to ≥4 GHz (Instrument Dependent)
  - 50 Ω Input (Only)
  - Probe Control TEKPROBE BNC (50 Ω)
- **TCA-SMA** - TekConnect-to-SMA
  - DC to ≥18 GHz (Instrument Dependent)
  - 50 Ω Input (Only)
- **TCA-N** - TekConnect-to-N
  - DC to ≥11 GHz (Instrument Dependent)
  - 50 Ω Input (Only)

Applications

- Signal Integrity, Jitter, and Timing Analysis
- Verification, Characterization, and Debug of Sophisticated Designs
- High-Speed Digital Devices and Circuits
- Power Supplies/Inverters
- Semiconductor Devices
- Electronic Ballasts
- Industrial/Consumer Electronics
- Mobile Communications
- Motor Drives
- Transportation Systems
- Disk Drive Analysis
- Investigation of Transient Phenomena
- Spectral Analysis
- Video Design and Development
  - HDTV and Streaming Digital Video
  - 3 Gbps HD-SDI

Tektronix®

TekConnect Interface Delivers Superior Signal Fidelity, Unparalleled Versatility, and Ease-of-Use

Tektronix award-winning TDS7000, CSA7000, and TDS6000 Series oscilloscopes allow engineers to make high-speed measurements quickly and efficiently. In addition to these high-speed measurements, many of today's designers also face the challenges of measuring high voltage, current, power, or even microvolt level signals to gain a more complete understanding of their designs.

The TekConnect interface ensures superior signal fidelity with useful bandpass up to 18 GHz at the TDS/CSA7000B and TDS6000 series oscilloscope inputs, while offering unparalleled versatility with the world's widest array of accessory signal acquisition solutions for high-performance, real-time oscilloscopes. This interface delivers a more robust oscilloscope interface for next-generation products with multi-GHz analog bandwidths, overcoming many of the inherent bandwidth limitations of BNC-based interfaces. The TekConnect interface preserves a low-voltage standing wave ratio (VSWR) 50 Ω environment as well as a reliable electrical connection. A convenient, one-button release and locking mechanism provides quick, easy installation and removal of probes, amplifiers, and adapters.

TekConnect TCA Series Adapters Expand the Functionality of Tektronix High-Performance Oscilloscopes

This family of adapter systems provides less signal distortion and better performance than traditional connections used to move a signal from one environment to another, such as BNC to N or BNC to SMA.

TCA75 Adapter (75 to 50 Ω)

The TCA75 adapter allows Tektronix oscilloscopes with TekConnect interface to easily access and measure 75 Ω terminated circuitry. The TCA75's attenuation factor is automatically corrected to provide the end user with correctly displayed signal magnitudes.

TCA-BNC Adapter (50 Ω only)

A direct 50 Ω input with TEKPROBE BNC 50 Ω capability, this adapter may be used as a direct 50 Ω BNC input or with Tektronix high-speed active and differential probes requiring the TEKPROBE BNC 50 Ω interface.

TCA-SMA and TCA-N Adapters (50 Ω only)

The high-speed SMA and N type adapters allow a more direct connection to the signal under test requiring N or SMA connections without losing performance by adding other external conversion adapters.

Characteristics

Model Specification	TCA75	TCA-BNC	TCA-SMA	TCA-N
Attenuation Accuracy at DC	2.46X ±1.5%	Refer to Host Instrument Specification		
Input Resistance at DC	75 Ω ±1.5%	50 Ω	50 Ω	50 Ω
Typical				
Bandwidth (-3 dB)	DC to 8 GHz (Adapter only)	DC to 4 GHz (Maximum Frequency) (Limited By Host Instrument)	DC to ≥18 GHz (Maximum Frequency) (Limited By Host Instrument)	DC to ≥11 GHz (Maximum Frequency) (Limited By Host Instrument)
Propagation Delay (Input-to-Output)	<200 ps			
RMS Noise	Refer to Host Instrument Specification			
VSWR (Return Loss)	1.1:1 (-26.45 dB) to 4 GHz 1.3:1 (-18 dB) to 8 GHz	1.15:1 (23.13 dB)	1.05:1 + 0.01 x F (in GHz) (32.25 dB)	1.3:1 (17.7 dB)
RF Insertion Loss	6.05 dB (Adapter Only)	0.25 dB Max (Adapter Only)	0.06×SQRT F (GHz) (Adapter Only)	0.3 dB Max (Adapter Only)
Rise Time	<50 ps*[1] (Minimum Rise Time) (Limited By Host Instrument)	≤100 ps (Minimum Rise Time) (Limited By Host Instrument)	≤22 ps (Minimum Rise Time) (Limited By Host Instrument)	≤36 ps (Minimum Rise Time) (Limited By Host Instrument)
Maximum Input Voltage (Derated with Frequency)	≤12 V DC or ≤12 V_{RMS} (2 W Max.)	Refer to Host Instrument Specification		
Nominal				
Inputs	1 (BNC 75 Ω)	1 (TEKPROBE BNC 50 Ω)	1 (SMA 50 Ω)	1 (N 50 Ω)
Adapter Model Compatibility	Refer to TekConnect Amplifier, Adapters, and Probes Compatibility Table			
Warranty	1 Year			

TekConnect® Amplifier, Adapters, and Probes Compatibility*2

Accessory Type	Oscilloscope			TekConnect Amplifiers, Adapters, and Probes				
	TekConnect Series			TCA-1MEG High Impedance Buffer Amplifier (P6139A Included)	TCA-BNC Adapter	TCA-SMA Adapter	TCA-N Adapter	TCA75 Adapter
	6 GHz 8 GHz	4 GHz	1.5 GHz 2.5 GHz					
Instrument Input Connection	TekConnect Interface			TEKPROBE BNC 1 MΩ-to-TekConnect Interface	TEKPROBE BNC 50 Ω-to-TekConnect Interface	SMA-to-TekConnect Interface	N-to- TekConnect Interface	75-to-50 Ω TekConnect Adapter
Instrument Input Impedance	TekConnect Interface Probes, Amplifier, and Adapter Dependent			1 MΩ/10 pF	50 Ω	50 Ω	50 Ω	50 Ω
Passive Voltage Probes (1X)	P6101B w/TCA-1MEG			P6101B	N/A	N/A	N/A	N/A
Passive Voltage Probes (10X)	P6139A w/TCA-1MEG			P6139A	N/A	N/A	N/A	N/A
50 Ω Divider Voltage Probes	P6150 w/TCA-SMA P6158 w/TCA-BNC			N/A	P6158	P6150	N/A	N/A
Active Voltage Probes General	P6245 w/TCA-BNC P6243 w/TCA-BNC			N/A	P6245 P6243	N/A	N/A	N/A
Active Voltage Probes >2 GHz	P7260*3 P7240*3 P6249 w/TCA-BNC P6241 w/TCA-BNC			N/A	P6249 P6241	N/A	N/A	N/A
Differential Voltage Probes >2 GHz	P7380*3 P7380SMA*3 P7350*3 P7350SMA*3 P6330 w/ TCA-BNC	P7380*3 P7380SMA*3 P7350*3 P7350SMA*3 P7330*3 P6330 w/ TCA-BNC	P7350*3 P7350SMA*3 P7330*3 P6330 w/ TCA-BNC	N/A	P6330	N/A	N/A	N/A
Differential Voltage Probes <1.8 GHz <8 V Logic	P6248 w/TCA-BNC P6247 w/TCA-BNC P6246 w/TCA-BNC			N/A	P6248 P6247 P6246	N/A	N/A	N/A
Differential Voltage Probes Microvolt	ADA400A w/TCA-1MEG			ADA400A	N/A	N/A	N/A	N/A
High-Voltage Probes Differential	P5205 w/ TCA-1MEG P5210 w/TCA-1MEG			P5205 P5210	N/A	N/A	N/A	N/A
High-Voltage Probes Single-Ended	P5100 w/TCA-1MEG P6015A w/TCA-1MEG			P5100	N/A	N/A	N/A	N/A
Current Probe AC/DC <15 A	TCP202 w/TCA-BNC			N/A	TCP202	N/A	N/A	N/A
Current Probe AC/DC 5 mA to 20 A	TCP300/ TCP400/ AM5030S w/ TCA-BNC or TCA-1MEG			TCP300/ TCP400/ AM5030S	TCP300/ TCP400/ AM5030S	N/A	N/A	N/A
Current Probe AC High Frequency	CT6 w/TCA-BNC CT1 w/TCA-BNC			N/A	CT6 CT1	N/A	N/A	
Current Probe AC Low Frequency	P6021 w/TCA-1MEG P6022 w/TCA-1MEG			P6021 P6022	N/A	N/A	N/A	
O/E Converter Probes	P6701B w/TCA-BNC P6703B w/TCA-BNC			N/A	P6701B P6703B	N/A	N/A	

*1 Calculated Small Signal $t_r = 0.4/F_3$ dB.

*2 Firmware version 2.1 or greater required for all referenced oscilloscopes.

*3 P7225, P7240, P7260, P7330, P7350, and P7350SMA are high-speed active and differential probing solutions for Tektronix oscilloscopes with TekConnect interface. These probes require no other adapters.

Please refer to the TekConnect Amplifier data sheet for more information about amplifiers.

Ordering Information

TCA75
TekConnect-to-75 Ω Adapter.

TCA-BNC
TekConnect-to-BNC Adapter.

TCA-SMA
TekConnect-to-SMA Adapter.

TCA-N
TekConnect-to-N Adapter.

All Include: Instruction Manual and Certificate of Compliance.

Recommended Accessories

Passive Voltage Probes
P6150 – (Use with TCA-SMA), 9 GHz, 1X/10X, 50 Ω divider probe.
P6158 – (Use with TCA-BNC), 3 GHz, 20X, 50 Ω divider probe.

High-Speed Active Voltage Probes
P6205 – (Use with TCA-BNC), 750 MHz, 10X, <2 pF/10 MΩ
P6243 – (Use with TCA-BNC), 1 GHz, 10X, <1 pF/1 MΩ
P6245 – (Use with TCA-BNC), 1.5 GHz, 10X, <1 pF/1 MΩ
P6249 – (Use with TCA-BNC), 4 GHz, 5X, <1 pF/20 kΩ
P6241 – (Use with TCA-BNC), 4 GHz, 10X, <0.5 pF/40 kΩ

High-Speed Active Differential Voltage Probes
P6247 – (Use with TCA-BNC), 1 GHz, 1X/10X, <1 pF/200 kΩ differential.
P6248 – (Use with TCA-BNC), 1.5 GHz, 1X/10X, <1 pF/200 kΩ differential.
P6330 – (Use with TCA-BNC), 3.5 GHz, 1X/10X, <1 pF/200 kΩ differential.

Electrical Communication Adapters
AMT75 – (Use with TCA-BNC), 75 Ω to 50 Ω Video Adapter.

AFTDS – (Use with TCA-BNC), Differential Communications Adapter.

Current Measurement Tools
TCP202 – (Use with TCA-BNC), AC/DC, 20 Amps, TEKPROBE™ Interconnect Current Probe 20 Amps.

AM503S – (Use with TCA-BNC), AC/DC, 5 mA to 700 Amp, Current Amplifier Measurement System. (Extended Current Capability by ordering additional Current Probes).

CT-1 – (Use with TCA-BNC), 1 GHz, AC Current Transformer.

CT-2 – (Use with TCA-BNC), 200 MHz, AC Current Transformer.

CT-6 – (Use with TCA-BNC), 2 GHz, AC Current Transformer.

Cables and Terminations
012-0057-01 – (Use with TCA-BNC), 50 Ω BNC to BNC coaxial cable.

012-0482-00 – (Use with TCA-BNC), 50 Ω BNC to BNC coaxial cable, precision 1%, male-to-male.

011-0049-02 – (Use with TCA-BNC), 50 Ω feed through termination.

CE

ISO 9001 — Product(s) are manufactured in ISO registered facilities.

GPIB IEEE-488 — Product(s) complies with IEEE Standard 488.1-1987, RS-232-C, and with Tektronix Standard Codes and Formats.