

TekConnect™ Adapters

TCA75 • TCA-BNC • TCA-SMA • TCA-N • TCA-292MM Data Sheet



Features & Benefits

- **TCA75** – TekConnect-to-75 Ω BNC
 - DC to ≥ 4 GHz (Instrument Dependent)
 - VSWR – 1.1:1 (26.45 dB)
 - 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-N** – TekConnect-to-N
 - DC to ≥ 11 GHz (Instrument Dependent)
 - 50 Ω Input (Only)
- **TCA-SMA** – TekConnect-to-SMA
 - DC to ≥ 18 GHz (Instrument Dependent)
 - 50 Ω Input (Only)
- **TCA-292MM** – TekConnect to 2.92 mm
 - DC to ≥ 25 GHz (Instrument Dependent)
 - 50 Ω Input (Only)
 - SMA Compatible

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

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

The TekConnect interface ensures superior signal fidelity with useful bandpass up to 25 GHz, 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 robust oscilloscope interface for next-generation products with multi-GHz analog bandwidths. 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 a TekConnect interface to easily access and measure 75 Ω terminated circuitry. The

TCA75 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.

TCA-292MM Adapter (50 Ω only)

The high-speed 2.92 mm-type adapter allows a more direct connection to the signal under test requiring a 2.92 mm connection without losing performance by adding other external conversion adapters. The locking screw must be used to ensure full bandwidth performance. The 2.92 mm connector is more robust and performs at higher frequencies than an SMA connector. The 2.92 mm connector is compatible with SMA connectors, but the electrical performance will be limited to the bandwidth of the SMA connector.

Characteristics

Model Specification	TCA75	TCA-BNC	TCA-SMA	TCA-N	TCA- 292MM
Attenuation Accuracy at DC	2.46X \pm 1.5%	Refer to host instrument specification			
Input Resistance at DC	75 Ω \pm 1.5%	50 Ω	50 Ω	50 Ω	50 Ω
Typical					
Bandwidth (-3 dB)	DC to 4 GHz (adapter only)	DC to 4 GHz (maximum frequency), limited by host instrument	DC to \geq 18 GHz (maximum frequency), limited by host instrument	DC to \geq 11 GHz (maximum frequency), limited by host instrument	DC to \geq 25 GHz (maximum frequency), limited by host instrument
Propagation Delay (Input-to-Output)	<200 ps				<185 ps
RMS Noise	Refer to host instrument specification				
VSWR (Return Loss)	Refer to host instrument specification				
RF Insertion Loss	6.05 dB (adapter only)	0.25 dB max (adapter only)	0.06 \times SQRT (F) (GHz) (adapter only)	0.3 dB max (adapter only)	0.04 \times SQRT (F) (GHz) (adapter only)
Rise Time	<50 ps*1 (minimum rise time), limited by host instrument	\leq 100 ps (minimum rise time), limited by host instrument	\leq 22 ps (minimum rise time), limited by host instrument	\leq 36 ps (minimum rise time), limited by host instrument	\leq 16 ps (minimum rise time), limited by host instrument
Maximum Input Voltage (Derated with frequency)	\leq 12 V DC or \leq 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)	1 (2.92 mm 50 Ω)
Adapter Model Compatibility	Refer to TekConnect amplifier, adapters, and probes compatibility table				
Warranty	1 year				

*1 Calculated small signal $t_r = 0.4/F_3$ dB.

TekConnect® Amplifier, Adapters, and Probes Compatibility*2

Accessory Type	Oscilloscope		TekConnect Amplifiers, Adapters, and Probes			
	DPO/DSA/MSO TekConnect Series (4-20 GHz)	TCA-1MEG High-impedance Buffer Amplifier (P6139A Included)	TCA-BNC Adapter (Standard w/ TDS7154, TDS7254, CSA7154)	TCA-SMA Adapter (Standard w/ TDS7404, CSA7404)	TCA-N Adapter	TCA75 Adapter
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	NA	NA	NA	NA
10X	P6139A w/ TCA-1MEG	P6139A	NA	NA	NA	NA
50 Ω Divider Voltage Probes	P6150 w/ TCA-SMA P6158 w/ TCA-BNC	NA	P6158	P6150	NA	NA
Active Voltage Probes						
General	P6245 w/ TCA-BNC P6243 w/ TCA-BNC	NA	P6245, P6243	NA	NA	NA
>2 GHz	P7260*3 P7240*3 P6249 w/ TCA-BNC P6241 w/ TCA-BNC	NA	P6249, P6241	NA	NA	NA
Differential Voltage Probes						
>2 GHz	P7500 Series P7300 Series	NA	P6330	NA	NA	NA
<1.8 GHz <8 V Logic	P6248 w/ TCA-BNC P6247 w/ TCA-BNC P6246 w/ TCA-BNC	NA	P6248, P6247, P6246	NA	NA	NA
Micro-volt	ADA400A w/ TCA-1MEG	ADA400A	NA	NA	NA	NA
High-voltage Probes						
Differential	P5205 w/ TCA-1MEG P5210 w/ TCA-1MEG	P5205, P5210	NA	NA	NA	NA
Single-ended	P5100 w/ TCA-1MEG P6015A w/ TCA-1MEG	P5100	NA	NA	NA	NA
Current Probes						
AC/DC <15 A	TCP202 w/ TCA-BNC	NA	TCP202	NA	NA	NA
AC/DC 5 mA to 20 A	TCP300, TCP400, AM5030S w/ TCA-BNC or TCA-1MEG	TCP300, TCP400, AM5030S	TCP300, TCP400, AM5030S	NA	NA	NA
AC High-frequency	CT6 w/ TCA-BNC CT1 w/ TCA-BNC	NA	CT6, CT1	NA	NA	NA
AC Low-frequency	P6021 w/ TCA-1MEG P6022 w/ TCA-1MEG	P6021, P6022	NA	NA	NA	NA
O/E Converter Probes	P6701B w/ TCA-BNC P6703B w/ TCA-BNC	NA	P6701B, P6703B	NA	NA	NA

*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-292MM

TekConnect-to-2.92 mm Adapter.

TCA-N

TekConnect-to-N Adapter.

All Include: Instruction manual and Certificate of Compliance.

Recommended Accessories

Passive Voltage Probes

Probe	Description
P6150	9 GHz, 1X/10X, 50 Ω divider probe (use with TCA-SMA)
P6158	3 GHz, 20X, 50 Ω divider probe (use with TCA-BNC)

High-speed Active Voltage Probes

Probe	Description
P6205	750 MHz, 10X, <2 pF / 10 M Ω (use with TCA-BNC)
P6243	1 GHz, 10X, <1 pF / 1 M Ω (use with TCA-BNC)
P6245	1.5 GHz, 10X, <1 pF / 1 M Ω (use with TCA-BNC)
P6249	4 GHz, 5X, <1 pF / 20 k Ω (use with TCA-BNC)
P6241	4 GHz, 10X, <0.5 pF / 40 k Ω (use with TCA-BNC)

High-speed Active Differential Voltage Probes

Probe	Description
P6247	1 GHz, 1X/10X, <1 pF / 200 k Ω differential (use with TCA-BNC)
P6248	1.5 GHz, 1X/10X, <1 pF / 200 k Ω differential (use with TCA-BNC)
P6330	3.5 GHz, 1X/10X, <1 pF / 200 k Ω differential (use with TCA-BNC)

Electrical Communication Adapters

Adapter	Description
AMT75	75 Ω to 50 Ω video adapter (use with TCA-BNC)
AFTDS	Differential communications adapter (use with TCA-BNC)

Current Measurement Tools

Product	Description
TCP202	AC/DC, 20 A, TekProbe™ interconnect current probe (use with TCA-BNC)
CT-1	1 GHz, AC current transformer (use with TCA-BNC)
CT-2	200 MHz, AC current transformer (use with TCA-BNC)
CT-6	2 GHz, AC current transformer (use with TCA-BNC)

Cables and Terminations

Product	Description
012-0057-01	50 Ω BNC-to-BNC coaxial cable (use with TCA-BNC)
012-0482-00	50 Ω BNC-to-BNC coaxial cable, precision 1%, male-to-male (use with TCA-BNC)
011-0049-02	50 Ω feed-through termination (use with TCA-BNC)



Product(s) are manufactured in ISO registered facilities.



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

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 7600
Canada 1 800 833 9200
Central East Europe, Ukraine, 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) 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

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