TekConnect™ Adapters

TCA Series Datasheet

Overview

TekConnect TCA Series Adapters expand the functionality of Tektronix high-performance oscilloscopes. This family of adapter systems provide better performance and less signal distortion than traditional connections used to move a signal from one environment to another, such as BNC to N or BNC to SMA.

Key performance specifications

TCA75 – TekConnect-to-75 Ω BNC

- DC to ≥23 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)
- For control of TekProbe BNC (50 Ω) probes

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

TCA292D – TekConnect-to-2.92 mm

- DC to ≥33 GHz (instrument dependent)
- 50 Ω input (only)
- SMA compatible

TCA-1MEG

- DC to 500 MHz
- 1 MΩ input

TCA-VPI50

- DC to 4 GHz
- Use TekVPI Probes on MSO/DPO70000 Series Osilloscopes
- 50 Ω input (only)

Applications

- Signal integrity, jitter, and timing analysis
- Verification, characterization, and debug of sophisticated designs
- High-speed digital devices and circuits
- Semiconductor devices
- Mobile communications
- 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 33 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 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.

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.

The TCA-BNC Adapter is a standard accessory with MSO/DPO 70000C/DX series oscilloscopes.

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-292D and TCA-292MM Adapters (50 Ω only)

These high-speed 2.92 mm-type adapters allow 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.

The TCA-292MM Adapter is a standard accessory with MSO/DPO 70000C series oscilloscopes and the TCA292D Adapter is a standard accessory with MSO/DPO 70000DX series oscilloscopes.

TCA-1MEG High-impedance Buffer Amplifier

The TCA-1MEG high-impedance buffer amplifier system extends the capabilities of Tektronix high-performance oscilloscopes, making them ideal for a variety of general-purpose measurements. The TCA-1MEG amplifier system provides a 1 MΩ path that is easily removed and replaced with a wide array of TekConnect probes, amplifiers, and adapters.

TCA-VPI50 TekVPI to TekConnect Probe Adapter

The TCA-VPI50 adapter enables 50Ω TekVPI probes to be used on oscilloscopes with TekConnect interfaces. The TCA-VPI50 will only work with 50Ω terminated probes.

Specifications

All specifications are guaranteed unless noted otherwise. All specifications apply to all models unless noted otherwise.

Model specification	TCA75	TCA-BNC	TCA-SMA	TCA-N	TCA-292MM	TCA-292D
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	50 Ω	50 Ω
Bandwidth, typical (–3 dB, maximum frequency, limited by host instrument)	DC to 23 GHz	DC to 4 GHz	DC to 18 GHz	DC to 11 GHz	DC to 25 GHz	DC to 33 GHz
Propagation delay, typical (input-to-output)	<200 ps				<185 ps	<185 ps
RMS noise, typical	Refer to host instrument specification					
Return loss, typical	25 dB: DC to 5 GHz	Refer to host instrument specification				
	15 dB: 5 to 10 GHz					
	8 dB: 10 to 20 GHz					
	5 dB: 20 to 23 GHz					
RF insertion loss, typical (adapter only)	6.05 dB	0.25 dB max	0.06×SQRT (F) (GHz)	0.3 dB max	0.04×SQRT (F) (GHz)	0.04×SQRT (F) (GHz)
Rise time, typical (minimum rise time), limited by host instrument	<18 ps (Calculated small signal t_r = 0.4/F 3 dB)	≤100 ps	≤22 ps	≤36 ps	≤16 ps	≤13 ps
Maximum input voltage, typical (derated with frequency)	Refer to host instrument specification					
Adapter model compatibility	Refer to TekConnect amplifier, adapters, and probes compatibility table					
Warranty	1 year					

Specifications for and probes compatible with the TCA-VPI50 are listed in a separate datasheet. See specific adapter datasheets for comprehensive compatibility

TekConnect adapters and probe compatibility

Tektronix offers a wide selection of probes with native TekConnect interfaces. For applications requiring a probe where there is not a TekConnect probe available, it is possible to use the TCA-1MEG, TCA-BNC, and TCA-VPI50 adapters to connect other Tektronix probes to your scope. This table lists probes that are known to be compatible with the TekConnect adapters.

Accessory type	TCA-1MEG High-impedance Buffer Amplifier (P6139B Probe included)	TCA-BNC Adapter
Instrument input connection	TekProbe BNC 1 MΩ-to-TekConnect interface	TekProbe BNC 50 Ω-to-TekConnect interface
Instrument input impedance	1 MΩ / 10 pF	50 Ω
Passive voltage probes		
1X	P6101B	NA
10X	P6139B	NA
Active voltage probes		
General	NA	P6245, P6243
Differential voltage probes		
>2 GHz	NA	P6330
<1.8 GHz	NA	P6248, P6247, P6246
<8 V logic		
Micro-volt	ADA400A	NA
High-voltage probes		
Differential	P5202A, P5205A, P5210A	P6251
Single-ended	P5100A	NA
Current probes		
AC/DC <15 A	TCP2020	NA
AC/DC 5 mA to 20 A	TCPA300, TCPA400	TCPA300, TCPA400
AC high-frequency	NA	CT6, CT2, CT1
AC low-frequency	TRCP0300, TRCP0600, TRCP3000	NA
O/E converter probes	NA	P6701B, P6703B

Please refer to the individual probe datasheets for more information about probes.

Ordering information

Model	Description
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 (≥25 GHz)
TCA292D	TekConnect-to-2.92 mm Adapter (≥33 GHz)
TCA-N	TekConnect-to-N Adapter
TCA-1MEG	High-impedance Buffer Amplifier
TCA-VPI50 Adapter	TekVPI to TekConnect Probe Adapter

All include: Instruction manual and Certificate of Compliance.

Certifications

Tektronix is registered to ISO 9001:2015 and ISO 14001:2015.

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