

# P7630 30 GHz Low Noise TriMode™ Probe

## Datasheet



P7630 Low Noise TriMode Probe

### Features & Benefits

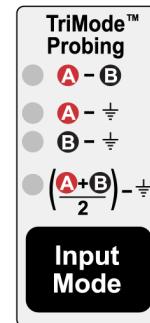
- Full 30 GHz Bandwidth to the Probe Tip
- Industry's Lowest Probe and Scope System Noise
- TriMode™ Probe – One Setup, Three Measurements without Adjusting Probe Tip Connections
  - Differential
  - Single Ended
  - Common Mode
- Connectivity
  - Coaxial Adapters
    - 2.92mm
    - SMP
  - P7500 Probe Tip Adapter
    - Use P7500 Series TriMode Probe Tips
  - Probe automatically detects tips and applies DSP correction filters
- Probe Specific S-parameters
  - Unique DSP filters created from data stored in the probe
- TekConnect® Interface – TekConnect Scope/Probe Control and Usability
  - Direct Control from Probe Compensation Box or from Scope Menu

### Applications

- Examples Include, but are Not Limited To:
  - PCI Express Gen3, Serial ATA III, HDMI

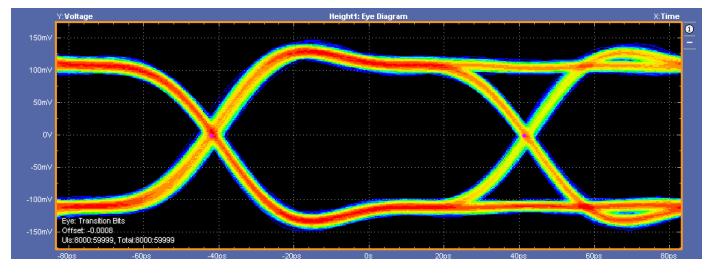
### Combining TriMode Probing with Low Noise Performance

TriMode Probing enhances productivity by enabling differential, single-ended, and common mode measurements with a single probe setup. Connecting a probe to the device under test can be a time consuming activity, especially if the probe has to be set up differently to make all the necessary measurements. TriMode Probing improves productivity by reducing setup time because only one setup is needed to make the three different types of measurements. Switching between Differential Mode [A-B], Single-Ended Mode [A-Gnd, B-Gnd], and Common Mode [ $((A+B)/2)$ -Gnd] is as easy as a press of a button.



Changing Input Modes on the probe is as easy as a press of a button.

As high speed serial data standards increase in speed and signal swings shrink, probes with high bandwidth coupled with low noise and high sensitivity are increasingly important for making accurate measurements.



12 Gb/s 200 mVpp signal measured with a P7630 and P76CA-292C

The DPO/DSA70000D Series Oscilloscopes and the P7630 TriMode probe were designed to deliver the industry's lowest system noise levels. When used with a P76CA-xxx Coaxial Adapter, the vertical setting on the oscilloscope can be set as low as 3.48 mV/div with a system noise < 1 mVrms at 30 GHz bandwidth.

## P7630 30 GHz Low Noise TriMode Probe

This high sensitivity is critical for being able to make accurate measurements on low amplitude signals. The P7630 probe was designed to deliver superior sensitivity and allow the oscilloscope to directly measure small signals without using a zoom function. Using a zoom function to look at small signals does not change the intrinsic noise floor of the instrument which can make measurements on small signals problematic.

### Connectivity

The P7630 probes utilize an interchangeable active tip design built around a custom probe tip interface using high frequency SMPM connectors. The P7630 probe features an Automatic Adapter ID function that recognizes the attached adapter and automatically applies the correct DSP filters. This feature eliminates the risk of manually selecting the wrong tip type and is much more efficient for the user.

### Coaxial Adapters

Coaxial adapters enable the probe to act like a differential input channel for the oscilloscope which effectively doubles the number of differential signals a single oscilloscope can measure simultaneously.



#### P76CA-292

30 GHz Bandwidth Coaxial Adapter with 2.92 mm (F) connectors. This adapter is calibrated at the input connectors and is ideal for use with off the shelf or custom cables. Low skew cable pairs should be used to preserve full bandwidth performance.



#### P76CA-292C

30 GHz Bandwidth Coaxial Adapter with 2.92 mm (M) connectors and 6" of high performance cable. This adapter is calibrated at the input connectors and is ideal for directly connecting to devices with 2.92 mm or SMA output connectors.



#### P76CA-SMP

30 GHz Bandwidth Coaxial Adapter with SMP (F) connectors and 6" of high performance cable. This adapter is calibrated at the input connectors and is ideal for directly connecting to devices with SMP output connectors.

### P7500 Series Solder Tip Adapter

P7500 Tip Adapter. This adapter allows the P7630 probe to use existing Tektronix P7500 probe tips. The P7630 probe amplifier has a 50Ω input. When combined with a P7500 probe tip, the probe turns into a passive Z0 style probe with 450Ω of differential input impedance. While Z0 probes can typically present a significant DC load to the device under test, the P7630 will minimize the effect of DC loading through the use of termination voltage adjustment.



### P76TA

30 GHz Bandwidth P7500 Tip Adapter. The probe and oscilloscope system will support up to 30 GHz of bandwidth when this adapter is used with the P75PST Performance Solder Tip.

### Unique Probe Filters

The P7630 probes contain probe specific S-parameter data. Attaching a P7630 probe to a DSA/DPO70000D oscilloscope transfers this data to the instrument to create unique system DSP filters based on the specific S-parameter data of the oscilloscope and the probe. Creating unique filters based on the specific response of the system is critical as bandwidths increase. At bandwidths of 30 GHz, small variations in the signal path can lead to significant variation in frequency response which cannot be corrected using a nominal DSP filter.

## Characteristics

Specification	P7630	
	P76CA-xxx	P76TA <sup>1</sup>
Bandwidth, System <sup>2</sup> (Typical)	30 GHz	30 GHz
Rise Time, System <sup>2</sup> (10-90%)	16 ps	16 ps
Rise Time, System <sup>2</sup> (20-80%)	12 ps	12 ps
Attenuation <sup>3</sup>	0.25/0.5/1/2/4	1.25/2.5/5/10/20
Input Voltage Range	1.2 Vpp, Single-Ended 2.0 Vpp, Differential	6.0 Vpp, Single-Ended 10.0 Vpp, Differential
Operating Voltage Window	-4 V to +4 V	-5 V to +5 V
Offset Voltage Range	-4 V to +4 V	-4 V to +4 V
Termination Voltage Range	-4 V to +4 V	-4 V to +4 V
DC Input Resistance (Single-Ended)	50 Ω ±2 Ω	225 Ω <sup>4</sup>
Input Capacitance	N/A	0.1 pF <sup>4</sup>
Input Return Loss	>20 dB to 5 GHz >12 dB to 20 GHz >10 dB to 30 GHz	
Zmin		225 Ω at 1 GHz 150 Ω at 10 GHz 100 Ω at 25 GHz
Noise, referred to input <sup>5</sup>	<1.0 mVrms	<5.0 mVrms
CMRR (Differential Mode)	>40 dB at DC >14 dB to 15 GHz >6 dB to 30 GHz	
Non-Destructive Input Voltage Range	-5 V to +5 V (DC + peak AC)	-8 V to +8 V (DC + peak AC)
Interface	TekConnect	TekConnect

<sup>1</sup> P76TA used with a P75PST Performance Solder Tip

<sup>2</sup> With a DPO/DSA73304D oscilloscope

<sup>3</sup> Attenuation controlled by the vertical setting on the oscilloscope

<sup>4</sup> Nominal specification

<sup>5</sup> System noise with oscilloscope set in minimum V/div setting

## Minimum System Requirements/Instrument Compatibility

Instrument	Bandwidth	Firmware Version	Recommended Probe
DPO/DSA73304D	33 GHz	V6.7.0	P7630
DPO/DSA72504D	25 GHz	V6.7.0	P7630

## Ordering Information

### P7630

Low Noise TriMode™ Probe, 30 GHz, TekConnect Interface Oscilloscopes

### User Manual

English Manual Standard

### Service Options

Option	Description
C3	Calibration Service 3 Years
C5	Calibration Service 5 Years
D3	Calibration Data Report 3 Years (with Option C3)
D5	Calibration Data Report 5 Years (with Option C5)
G3	Complete Care 3 Years (includes loaner, scheduled calibration, more)
G5	Complete Care 5 Years (includes loaner, scheduled calibration, more)
R3	Repair Service 3 Years
R5	Repair Service 5 Years

### Additional Service Products Available During Warranty (DW)

R3PDW	Repair service coverage 3 years (includes product warranty period). 3-year period starts at time of customer instrument purchase
R5PDW	Repair service coverage 5 years (includes product warranty period). 5-year period starts at time of customer instrument purchase

### Standard accessories

Accessory	P7630	Tektronix part number
The documentation kit contains: Printed Quick Start User Manual, CD-ROM contains PDFs of basic probe and measurement literature, and the probe manuals (Quick Start User Manual and Technical Reference Manual)	1 kit	020-3104-xx
Data Calibration Report: Lists the manufacturing test results of your probe at the time of shipment and is included with every probe	1 each	Standard with probe
Certificate of Traceable Calibration	1 each	Standard with probe
Antistatic Wrist Strap	1 each	006-3415-xx
DC Probe Calibration Fixture	1 each	067-3259-xx
50Ω BNC-M to BNC-M cable assembly, 10 in.	1 each	012-0208-xx
ESD Protective Cap	3 each	276-1152-xx
Hex Wrench, 2 mm	1 each	129-2781-xx
Color Band Kit	1 kit	016-0633-xx

**Recommended accessories**

Description	Tektronix part number
2.92 mm Coaxial Adapter	P76CA-292
2.92 mm Coaxial Adapter with Cables	P76CA-292C
SMP Coaxial Adapter with Cables	P76CA-SMP
P7500 Tip Adapter	P76TA
P7500 TriMode Performance Solder Tip	P75PST
P7500 TriMode Long Reach Solder Tip	P75TLRST
P7500 TriMode Resistor Solder Tip	020-2936-xx
P7500 TriMode Extended Resistor Solder Tip	020-2944-xx
Solder Tip Ramps, Kit of 25	020-3118-xx
Adhesive Tip Tape, Strip of 10	006-8237-xx
Deskew Fixture	067-2431-xx
SMPM Bullet Removal Tool	003-1934-xx
SMPM Replacement Bullet Contacts (package of 4)	020-3105-xx
G3PO Bullet Removal Tool	003-1896-xx
G3PO Replacement Bullet Contacts (package of 4)	013-0359-xx
Wire Kit (package of 3 bobbins)	020-2754-xx
Replacement Resistor Kit	020-2937-xx



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.

**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 7627
- Canada 1 800 833 9200
- Central East Europe 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 (55) 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

Updated 10 February 2011

**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](http://www.tektronix.com)



Copyright © Tektronix, Inc. All rights reserved. Tektronix products are covered by U.S. and foreign patents, issued and pending. Information in this publication supersedes that in all previously published material. Specification and price change privileges reserved. TEKTRONIX and TEK are registered trademarks of Tektronix, Inc. All other trade names referenced are the service marks, trademarks, or registered trademarks of their respective companies.

22 Jan 2013

51W-28184-0

