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Tektronix

P6700 Series Optical-to-Electrical Converters



Broad Wavelength Response 500 to 950 nm or 1100 to 1700 nm

High Bandwidth DC up to 1.2 GHz

High Gain 1 V/mW

Low Noise ≤11 pW/√Hz

0 to –35 dBm Dynamic Range

Eye-Pattern Testing of Optical Communication Signals (SONET/SDH and Fibre Channel)

Probe Connects Directly to TDS Series Scope (TEKPROBE®) or Other 50 Ω Instruments with 1103 TEKPROBE® Power Supply

SONET/SDH and Fibre Channel Reference Receiver Performance: TDS 500C/700C Options (3C or 4C) P6701B: Fibre Channel up to 1063 Mb/s P6703B: SONET/SDH up to 622 Mb/s

Product Description

The Tektronix P6700 Series optical-to-electrical (O/E) convertors change optical signals into electrical signals for convenient analysis on Tektronix TDS Series oscilloscopes equipped with the TEKPROBE® interface, or any other oscilloscope when used with the 1103 TEKPROBE® power supply. The P6700 Series O/E convertors are ideal for optical source characterization in the development, manufacture, or service of optical communication systems and devices.

Small, conveniently packaged P6701B and P6703B optical-to-electrical analog converters provide an accurate interface for optical pulse shape measurements. The high gain, large dynamic range, and stable output offset of these O/E converters make them ideal for performing eye-pattern analysis and extinction measurements.

The P6723 optical logic probe provides a digital conversion of up to 650 Mb/s, NRZ optical signals and converts the data stream into a constant amplitude electrical 1 V pulse train. The P6723 has a sensitivity range similar to standard SONET/SDH optical receivers. It can be used as an optical interface to an electrical clock recovery circuit in support of data stream triggering or to a Bit Error Rate Tester (BERT). The LED on the P6723 indicates a valid optical input signal.

The P6701B/P6703B/P6723 optical input is a one meter, 62.5 µm multimode fiber with an FC/PC connector. Using the standard assortment of hybrid fiber optic mating sleeves, these O/Es can accommodate the various industry connector standards.

The TEKPROBE® interface provides power, auto-scaling, auto-termination, and correct units (microwatts) when used with Tektronix TDS Series oscilloscopes.

SONET/SDH and Fibre Channel Reference Receiver Performance

The P6701B and P6703B can be transformed into ITU G.957 or ANSI FC-PH reference receivers when they are either ordered as an option (3C – P6701B, 4C – P6703B) to the latest Tektronix TDS 500C/700C series digitizing oscilloscopes or as a standalone hardware solution (nominal).

The TDS Option 3C provides a calibrated P6701B reference receiver for Fibre Channel dates rates from 133 Mb/s up to 1063 Mb/s. Option 4C provides a calibrated P6703B reference receiver for SONET/SDH dates rates from 52 Mb/s up to 622 Mb/s. The optical-to-electrical convertors are matched and calibrated to a specific scope channel which ensures complete system compliance with the fourth-order Bessel-Thompson frequency response.

The P6703B, when used in conjunction with the FS52, FS156, or FS622 SONET/SDH hardware filters, provide customers with a nominal reference receiver performance for 51.84 Mb/s, 155.52 Mb/s, and 622 Mb/s. The standard P6701B has a nominal frequency response which follows the fourth-order Bessel-Thompson for Fibre Channel 1063 Mb/s. The 1103 TEKPROBE® power supply can be used to connect these products to the 11800 Series or CSA803 Series sampling scopes.

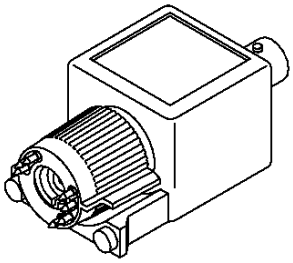
Specifications

	P6701B	P6703B	P6723
Wavelength Response	500 to 950 nm	1100 to 1700 nm	1310/1550 nm
Bandwidth[1] (typical)	DC to 1.0 GHz (1.1 GHz)	DC to 1.2 GHz (1.4 GHz)	20 to 650 Mb/s
Rise Time (typical)	≤495 ps (≤430 ps)	≤395 ps (≤340 ps)	≤455 ps
Conversion Gain	1 V/mW	1 V/mW	1.0 V_{P-P}
Max. Input Optical Power	1 mW (0 dBm)[2] 10 mW (10 dBm)[3] 20 mW (13 dBm)[4]	1 mW (0 dBm)[2] 10 mW (10 dBm)[3] 20 mW (13 dBm)[4]	0.2 mW (–7 dBm)[2] — —
Dynamic Range	0 to –31 dBm	0 to –35 dBm	–8 to –28 dBm
Noise Equivalent Power	≤0.75 µW (RMS)[5] ≤24 pW/$\sqrt{Hz}$	≤0.35 µW (RMS)[5] ≤11 pW/$\sqrt{Hz}$	N/A
Max. Input Fiber Core Diameter	62.5 µm	62.5 µm	62.5 µm

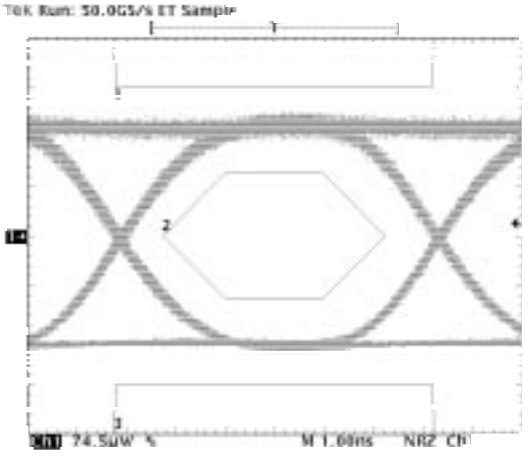
1 Optical bandwidth (-6 dB electrical)
2 Maximum average operating power
3 Max average nondestruct
4 Max peak nondestruct
5 1 GHz low pass filter in series with output

Environmental Characteristics

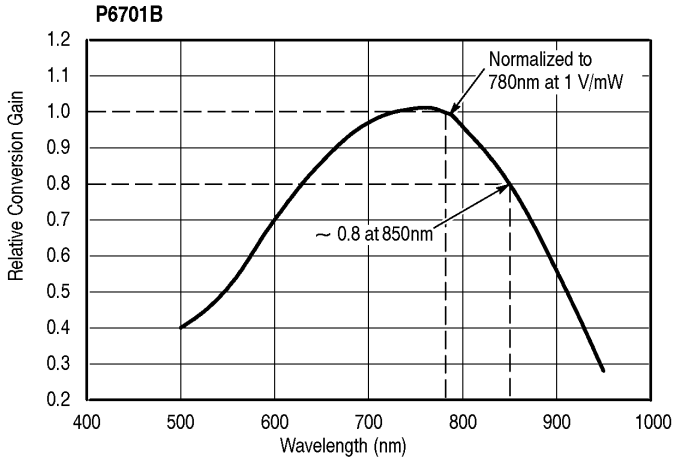
Operating Temperature	0° C to 50° C
Non-operating Temperature	-40° C to 71° C
Electrostatic Discharge (ESO)	up to 8 kV (IEC 801-2)



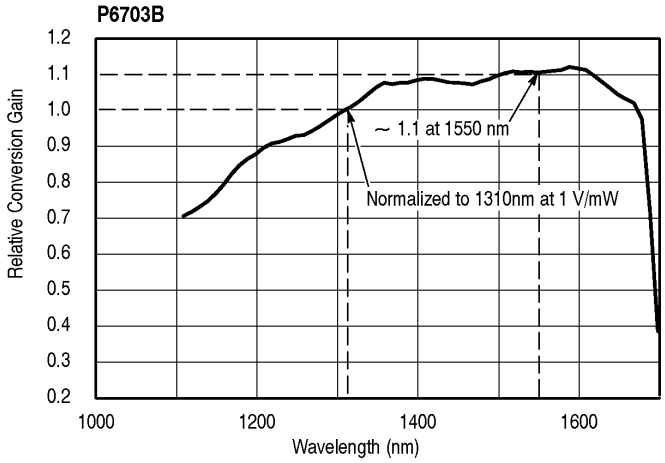
FS52/FS156/FS622 SONET/SDH Hardware Filters



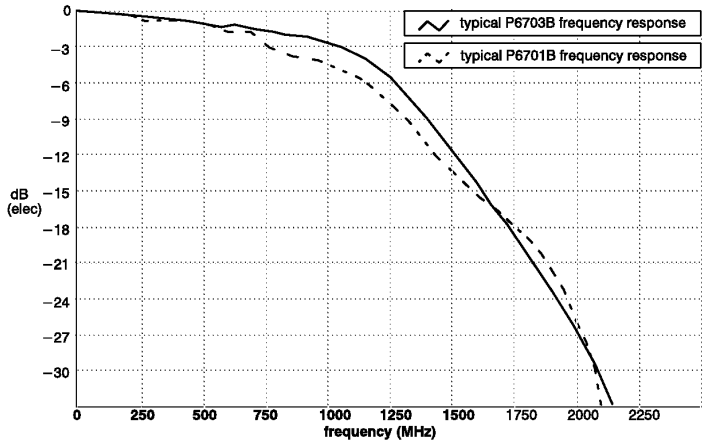
OC-3/STM-1 SONET/SDH Transmitter Eye Pattern Test



P6701B: Typical Wavelength Dependent Gain (@ 25°C)



P6703B: Typical Wavelength Dependent Gain (@ 25°C)



P6701B and P6703B: Typical Frequency Response Curves

Ordering Information

P6701B
Optical to Electrical Converter with FC/PC Connector

Includes: Hard Case, User Manual (English, French, German, and Japanese), Assorted Fiber Optic Hybrid Connectors (FC/FC, FC/ST, and FC/SC), Certificate of Traceable Calibration

P6703B
Optical to Electrical Converter with FC/PC Connector

Includes: Hard Case, User Manual (English, French, German, and Japanese), Assorted Fiber Optic Hybrid Connectors (FC/FC, FC/ST, and FC/SC), Certificate of Traceable Calibration

P6723
Optical Logic Probe with FC/PC Connector

Includes: Hard Case, User Manual (English, French, German, and Japanese), Assorted Fiber Optic Hybrid Connectors (FC/FC, FC/ST, and FC/SC), Certificate of Traceable Calibration

Product/Service Options

Opt. 95
Calibration Data

Option R3
3 Year Extended Warranty

Option C3
3 Year Calibration Service



1103 TEKPROBE Power Supply

Available Accessories

1103 TEKPROBE® Power Supply
1103 Power Cord Options:
Std — North America/Japan
Opt. A1 — Europe
Opt. A2 — UK
Opt. A3 — Australia
Opt. A5 — Switzerland

Single-Mode Fiber Optic Cables
(9/125 µm, 2 meters)
FC/PC to FC/PC (174-1387-00)
FC/PC to ST (174-1386-00)
FC/PC to Biconic (174-1388-00)
FC/PC to Diamond (2.5) (174-1497-00)
FC/PC to Diamond (3.5) (174-1385-00)

Multimode Fiber Optic Cables
(62.5/125 µm, 2 meters)
FC/PC to FC/PC (174-2322-00)
FC/PC to SMA (174-2324-00)
FC/PC to Biconic (174-2323-00)

90/10, 3 Port Single-Mode Optical Splitter
FC/PC Connectors (174-3737-00)

10 dB, In-Line Single-Mode Optical Attenuator
FC/PC Connectors (119-5118-00)

DIN/FC Fiber Optic Hybrid Connector
(020-2209-00)

50 Ω BNC to BNC Coaxial Cable
2 feet, male-to-male (012-1339-00)

50 Ω BNC to SMA Adapter
Female-to-male (015-0554-00)

50 Ω BNC Terminator
(011-0049-01)

FS52
SONET/SDH OC-1 (52 Mb/s)
Hardware Filter

FS156
SONET/SDH OC-3 (155 Mb/s)
Hardware Filter

FS622
SONET/SDH OC-1 (52 Mb/s)
Hardware Filter

For further information, contact Tektronix:

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ISO 9001

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4/97 WCI 60W-11304-0

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