Optical-to-Electrical Converters
P6701B & P6703B Datasheet

Small, conveniently packaged P6701B and P6703B optical-to-electrical analog converters provide an accurate interface for optical pulse shape measurements.

Features and benefits
- 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
- Probe Connects to DPO7000 ¹ and DPO/MSO70000 ² Series
- SONET/SDH and Fibre Channel Reference Receiver Performance:
  - TDS500C/700C (Opt. 3C or 4C)
  - P6701B – Fibre Channel up to 1063 Mb/s
  - P6703B – SONET/SDH up to 622 Mb/s

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

Product description
The Tektronix P6700 Series optical-to-electrical (O/E) converters change optical signals into electrical signals for convenient analysis on Tektronix DPO7000 and DPO/MSO70000 Series oscilloscopes with appropriate adapters (see footnote 1 and 2), any other Tektronix oscilloscope equipped with a TekProbe interface, or when used with the 1103 TekProbe power supply. The P6700 Series O/E converters 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 P6701B/P6703B optical input is a 1 meter, 62.5μ Multi Mode 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 DPO7000 or DPO/MSO70000 and earlier TekProbe-equipped Series oscilloscopes.

Performance you can count on
Depend on Tektronix to provide you with performance you can count on. In addition to industry-leading service and support, this product comes backed by a one-year warranty as standard.

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 DSA8300 Series sampling oscilloscopes.

¹ Requires the TPA-to-BNC adapter
² Requires the TCA-to-BNC adapter
OC-3/STM-1 SONET/SDH Transmitter Eye Pattern Test

P6701B: Typical Wavelength-dependent Gain (at 25 °C)

P6703B: Typical Wavelength-dependent Gain (at 25 °C)
## Specifications

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

### Probe overview

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>P6701B</th>
<th>P6703B</th>
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<tbody>
<tr>
<td>Wavelength response</td>
<td>500 to 950 nm</td>
<td>1100 to 1650 nm</td>
</tr>
<tr>
<td>Bandwidth (^3) (Typical)</td>
<td>DC to 1.0 GHz</td>
<td>DC to 1.2 GHz</td>
</tr>
<tr>
<td>Rise time (Typical)</td>
<td>≤ 500 ps</td>
<td>≤ 395 ps</td>
</tr>
<tr>
<td>Conversion gain</td>
<td>1 V/mW</td>
<td>1 V/mW</td>
</tr>
<tr>
<td>Maximum input optical power</td>
<td>1 mW (0 dBm) (^4)</td>
<td>1 mW (0 dBm) (^4)</td>
</tr>
<tr>
<td></td>
<td>10 mW (10 dBm) (^5)</td>
<td>10 mW (10 dBm) (^5)</td>
</tr>
<tr>
<td></td>
<td>20 mW (13 dBm) (^6)</td>
<td>20 mW (13 dBm) (^6)</td>
</tr>
<tr>
<td>Maximum output modulation depth for reference</td>
<td>≤ 200 mV(_{\text{p-p}})</td>
<td>≤ 200 mV(_{\text{p-p}})</td>
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<tr>
<td>receiver performance</td>
<td></td>
<td></td>
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<tr>
<td>Noise equivalent power</td>
<td>≤ 0.87 Noise Equivalent Power (\mu\text{W (RMS)}) (^7)</td>
<td>≤ 0.59 (\mu\text{W (RMS)}) (^7)</td>
</tr>
<tr>
<td></td>
<td>≤ 28 pW per (\sqrt{\text{Hz}})</td>
<td>≤ 19 pW per (\sqrt{\text{Hz}})</td>
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<tr>
<td>Maximum input fiber core diameter</td>
<td>62.5 (\mu\text{m})</td>
<td>62.5 (\mu\text{m})</td>
</tr>
</tbody>
</table>

### Ordering information

#### Models

**P6701B**  
Optical-to-electrical Converter with FC/PC Connector  

**P6703B**  
Optical-to-electrical Converter with FC/PC Connector  

Both probes include:  
Hard case, Instruction manual (English), Certificate of Traceable Calibration, One-year warranty

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\(^3\) Optical bandwidth (-6 dB electrical)  
\(^4\) Maximum average operating power  
\(^5\) Maximum average nondestruct  
\(^6\) Maximum peak nondestruct  
\(^7\) 1 GHz low-pass filter in series with the output
Options

Service options

- **Opt. C3**: Calibration Service 3 Years
- **Opt. C5**: Calibration Service 5 Years
- **Opt. D1**: Calibration Data Report
- **Opt. D5**: Calibration Data Report 5 Years (with Opt. C5)
- **Opt. R3**: Repair Service 3 Years (including warranty)
- **Opt. R5**: Repair Service 5 Years (including warranty)

Power supply

1103

TekProbe Power Supply. Please specify power plug when ordering.

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Tektronix is registered to ISO 9001 and ISO 14001 by SRI Quality System Registrar.

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

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