LeCroy

Optical-to-Electrical Converter
OE695G

OE695G optical-to-electrical converter shown with supplied RF and Power cables

Key Features

- **Compatible with LeCroy WaveMaster 8 Zi/Zi-A, LabMaster 9 Zi-A, and LabMaster 10 Zi oscilloscopes**
- **Frequency range DC to 9.5 GHz (electrical, -3 dB)**
- **Reference receiver support from 8GFC to 10GFC FEC, or Custom (<12.5Gb/s)**
- **Full bandwidth mode (no reference receiver applied)**
- **62.5/125 µm multi-mode or single-mode fiber input**
- **Broad wavelength range (750 to 1650 nm)**
- **+7 dBm (5 mW) max peak optical power**
- **Low noise (as low as 25 pW/√Hz)**
- **Ideal for Eye Mask, Extinction Ratio, and Optical Modulation Amplitude (OMA) testing**

LeCroy's OE695G wide-band optical-to-electrical converter is ideal for measuring optical datacom and telecom signals with data rates from 622 Mb/s to 12.5+ Gb/s. Connection to a real-time LeCroy oscilloscope is through the 2.92mm interface, with a provided adapter to connect to ProLink interfaces.

Built-in Reference Receiver

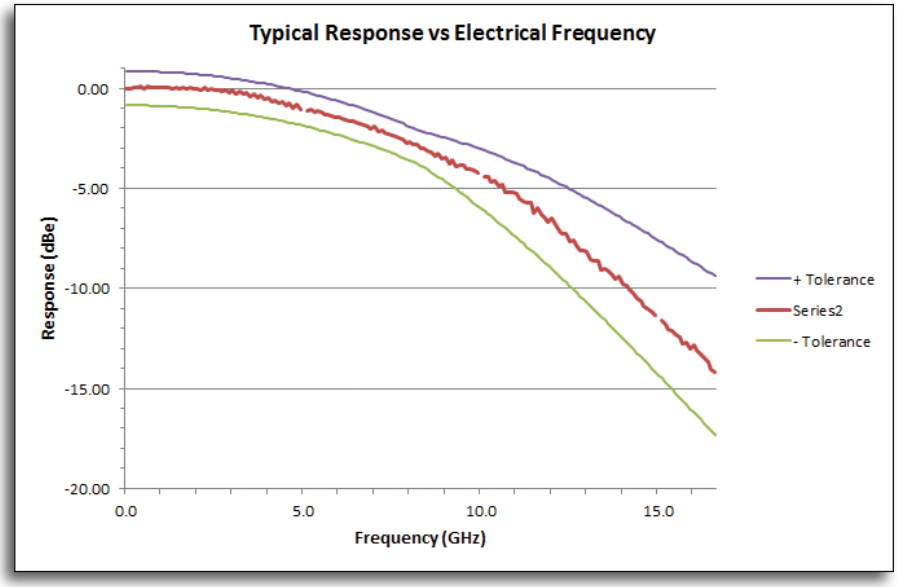
The OE695G contains built-in software reference receiver filters for common Fiber Channel, Ethernet, and ITU telecom standards. These reference receiver filters provide a 4-pole Bessel Thompson low pass filter response for the combined oscilloscope and optical-to-electrical (O-E) system with the -3dBe (electrical) at 0.75*bit rate. Combined passband response (compared to ideal) is ±1.6dBe (typical). If desired, a custom reference receiver for any bit rate up to 12.5Gb/s can also be applied. Additionally, the OE695G can be operated without any reference receiver applied, providing 9.5 GHz of bandwidth at -3 dB and Tr(10-90%) of approximately 45 ps when used with a LeCroy oscilloscope of ≥ 20 GHz of bandwidth.

Calibration Option for Maximum Accuracy

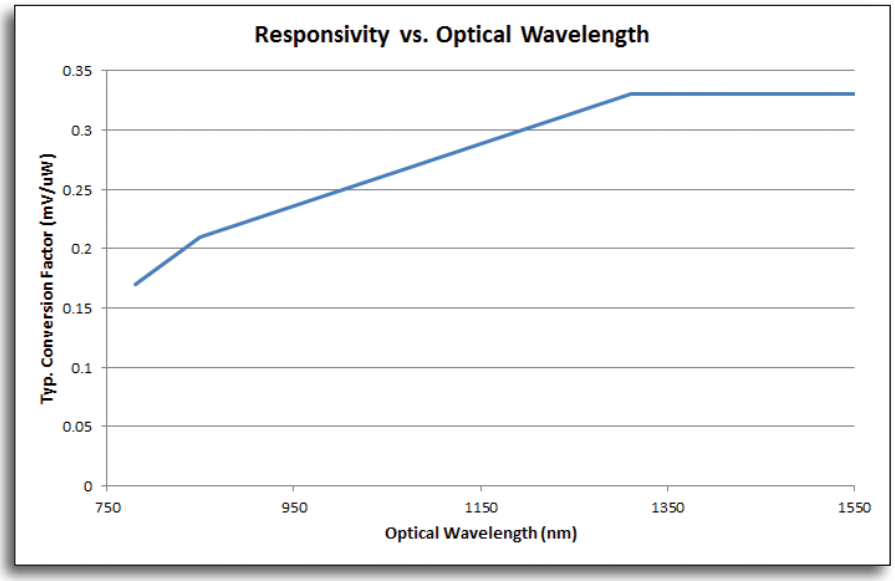
If guaranteed reference receiver response is required (±0.85 dB max through the passband, with a relaxed requirement through 1.5*bit rate, per the reference receiver requirement), the optional OE695G-REFCAL may be ordered with the OE695G. This will provide a documented calibration response for the various standard reference receivers and up to 12.5Gb/s "custom" reference receiver on all four oscilloscope channels at specific gain ranges (with typical response provided at other gain ranges).

PERFORMANCE

Typical Response vs. Electrical Frequency and Responsivity vs. Optical Wavelength



Typical frequency response of the OE695G with the 10 GbE FEC Optical Reference Receiver enabled. With the optional channel specific calibration the response is well within the ORR specification limit traces.



Typical Optical to Electrical conversion sensitivity variation with optical wavelength. The OE695G receiver functions over a broad range of optical wavelengths.

Reference Receiver Setting	Bit Rate	fr = 0.75*Bit Rate	freq = 2*Bit Rate	Oscilloscope Bandwidth Required
8GFC	8.5 Gb/s	6.375 GHz	12.750 GHz	13 GHz
10GBASE-W	9.953 Gb/s	7.465 GHz	14.930 GHz	16 GHz
OC192 (STM64)	9.953 Gb/s	7.465 GHz	14.930 GHz	16 GHz
10GBASE-R	10.3125 Gb/s	7.734 GHz	15.468 GHz	16 GHz
10GFC	10.519 Gb/s	7.889 GHz	15.779 GHz	16 GHz
ITU-T G.975 FEC	10.664 Gb/s	7.998 GHz	15.996 GHz	16 GHz
ITU-T G.709 FEC	10.709 Gb/s	8.032 GHz	16.064 GHz	20 GHz
10GbE FEC	11.096 Gb/s	8.322 GHz	16.644 GHz	20 GHz
10GFC FEC	11.317 Gb/s	8.488 GHz	16.976 GHz	20 GHz
None (Maximum)	12.667 Gb/s	9.500 GHz	19.000 GHz	20 GHz

SPECIFICATIONS

Optical Wavelength Range	780 to 1550 nm (calibrated range) 750 to 1650 nm (usable range)
Maximum Modulation Bandwidth	DC to 8.625 GHz (-3 dBe, electrical) DC to 11.64 GHz (-3 dBo, optical) (Reference Receiver Applied) DC to 9.5 GHz (-3 dBe) DC to 12 GHz (-6 dBe) DC to 17 GHz (-14 dBe) (+/-1 dBe passband variations typical, no Reference Receiver Applied)
Reference Receiver Uncertainty	±1.6 dBe up to Fref =0.75*bit rate ±4 dBe 2*bit rate setting (typical) ±0.85 dBe up to Fref =0.75*bit rate ±4 dBe 2*bit rate setting (on matched oscilloscope input channel 4 with 11, 17, 20, 30, 39, 50, 75, 90, or 100 mV/div gain ranges) with purchase of OE695G-REFCAL)
Reference Receiver Settings	8GFC, OC192/STM64,10GBASE-W,10GBASE-R,10GFC, ITU-T G.975 FEC, ITU-T G.709 FEC, 10GbE FEC, 10GFC FEC, Custom (622 Mb/s to 12.5 Gb/s), None (Maximum Bandwidth)
Noise Equivalent Power	25 pW/√Hz @ 1310 nm (typical) 50 pW/√Hz @ 850 nm (typical) Average noise spectral density 0-10 GHz using most sensitive vertical scale
Rise Time (10-90%)	33 ps (typical, no reference receiver applied)
Connector Type	FC/PC, compatible with 62.5/125 µm Multi-Mode fiber, or mechanically compatible Single-Mode fiber
Maximum Optical Linear Input (1 dB compression point)	-2 dBm (typical), -3 dBm (minimum) at 1550/1310 nm +4 dBm (typical), +3 dBm (minimum) at 850 nm
Maximum Optical Power	+7 dBm (5 mW) Peak
Conversion Gain (typical)	0.17 V/mW (785 nm) 0.21 V/mW (850 nm) 0.33 V/mW (1310 nm) 0.33 V/mW (1550 nm)
Optical Input Return Loss	-30 dB (typical), -27 dB (maximum) for 1310/1550 nm, single-mode -16 dB (typical), -14 dB (maximum) for 850 nm, multi-mode
Dark Calibration Accuracy	1 µW (typical, depending on gain setting)
Dark Calibration Level Variation With Temperature	-2 µW/ ºC (typical)
Vertical Level Power Accuracy	5% typical, 10% maximum at 785, 850, 1310, 1550 nm Linearly interpolated gain at other values
Temperature (Operating)	5ºC to 40ºC
Temperature (Non-Operating)	-20ºC to 60ºC
Humidity (Operating)	5% to 80% relative humidity (non-condensing) up to +31ºC. Upper limit derates to 50% relative humidity (non-condensing) at +40ºC
Humidity (Non-Operating)	5% to 95% relative humidity (non-condensing) as tested per MIL-PRF-28800F
Altitude (Operating)	Up to 10,000 ft (3049 m) at or below +25ºC

ORDERING INFORMATION

Product Description	Product Code
OE695G Options	
Optical-to-Electrical Converter, 785 to 1550 nm 2.92mm connector with ProLink adapter	OE695G
Reference Receiver Calibration Certificate for up to four channels of a WaveMaster 8 Zi/Zi-A, LabMaster 9 Zi-A, or LabMaster 10 Zi oscilloscope	OE695G-REFCAL

Included Accessories

1 Optical-Electrical Converter Module
1 LPA-2.92 ProLink to 2.92mm Adapter with probe pass through
1 25cm SMA (M-M) Cable*
1 30cm Power and Control Interface Cable
1 Finger Wrench
1 Carrying Case
1 Operator's Manual

* This cable is part of the calibration characteristic of the OE695G receiver and should not be separated from the receiver.

Customer Service

LeCroy oscilloscopes and probes are designed, built, and tested to ensure high reliability. In the unlikely event you experience difficulties, our digital oscilloscopes are fully warranted for three years and our probes are warranted for one year.

This warranty includes:

- No charge for return shipping
- Long-term 7-year support
- Upgrade to latest software at no charge

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1-800-5-LeCroy
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Local sales offices are located throughout the world.
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