400 MHz Photoreceiver with InGaAs PIN Photodiode

Features

- **InGaAs PIN Detector, 0.1 mm Active Diameter in FC Receptacle**
- **Spectral Range 900 ... 1700 nm**
- **Bandwidth DC ... 400 MHz**
- **Amplifier Transimpedance (Gain) 5.0 x 10^3 V/A**
- **Max. Conversion Gain 5.0 x 10^3 V/W (@ 1550 nm)**

Applications

- **Spectroscopy**
- **Fast Pulse and Transient Measurements**
- **Optical Triggering**
- **Optical Front-End for Oscilloscopes and A/D Converters**

Specifications

	Test Conditions	*Vs = ± 15 V, Ta = 25°C*
Gain	Transimpedance	5.0 x 10^3 V/A (@ 50 Ω load)
	Max. Conversion Gain	5.0 x 10^3 V/W (@ 1550 nm)
Frequency Response	Lower Cut-Off Frequency	DC
	Upper Cut-Off Frequency (- 3 dB)	400 MHz (± 10%)
	Rise/Fall Time (10% - 90%)	1.0 ns
	Gain Flatness	± 1 dB
Detector	Detector Material	InGaAs PIN photodiode
	Active Area	∅ 0.1 mm in FC receptacle
	Spectral Response	900 ... 1700 nm
Input	Input Offset Compensation	± 200 µA adjustable by offset trimpot
	Max. Optical Input Power	200 µW (for linear amplification, @ 1550 nm)
	Min. NEP	21 pW/√Hz (@ 1550 nm, 100 MHz)
Output	Output Voltage Range	± 1.0 V (@ 50 Ω load) for linear operation and low harmonic distortion
	Max. Output Voltage Range	± 1.5V (@ 50 Ω load)
	Output Impedance	50 Ω (terminate with 50 Ω load for best performance)
	Output Noise	ca. 20 mV peak-peak (@ 50 Ω load, no signal on detector)
Power Supply	Supply Voltage	± 15 V
	Supply Current	± 55 mA typ. (depends on operating conditions, recommended power supply capability minimum ± 150 mA)
Case	Weight	210 g (0.5 lbs)
	Material	AlMg4.5Mn, nickel-plated
Temperature Range	Storage Temperature	-40 ... +100 °C
	Operating Temperature	0 ... +60 °C

Absolute Maximum Ratings

Optical Input Power	10 mW
Power Supply Voltage	± 22 V

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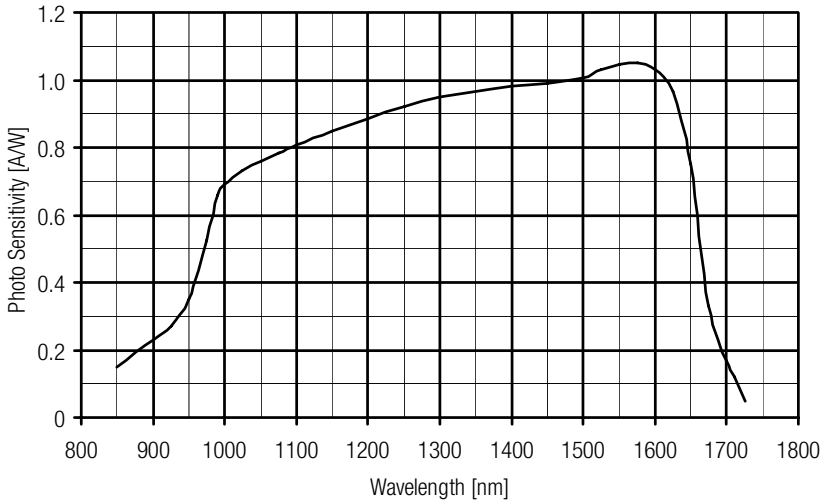
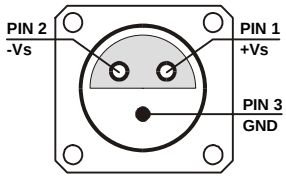
Spectral Response



Connectors

Input	optical, FC receptacle
Output	BNC
Power Supply	LEMO series 1S, 3-pin fixed socket
	Pin 1: + 15V
	Pin 2: - 15V
	Pin 3: GND



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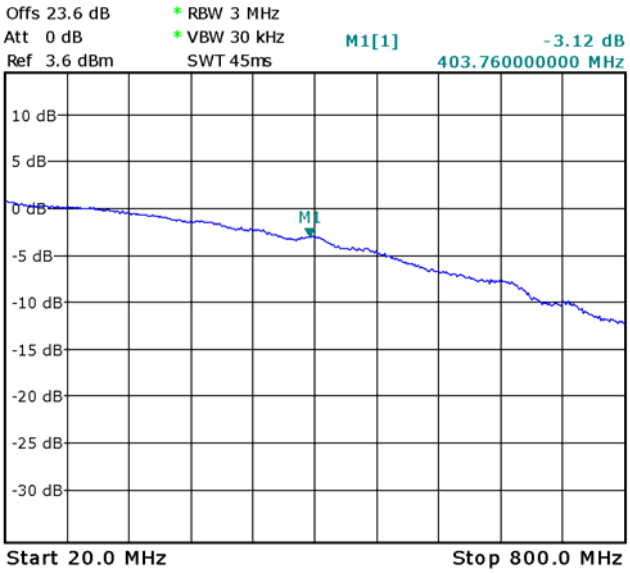
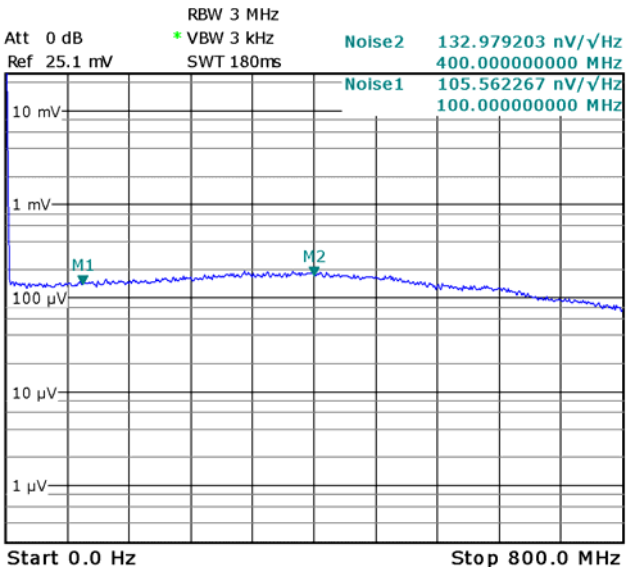
Typical Performance Characteristics

Frequency Response



Noise Spectrum



Note: Spectral noise data is measured at the amplifier output with darkened photo diode. To determine the spectral input noise divide the measured output noise by the amplifier conversion gain.
Conversion gain (V/W) = amplifier gain (5,000 V/A) x photo sensitivity (A/W).

Marker	Frequency	Output Noise	Resulting Input Noise (NEP)
1	100 MHz	106 nV/√Hz	21 pW/√Hz (@ 1550 nm)
2	400 MHz	133 nV/√Hz	27 pW/√Hz (@ 1550 nm)

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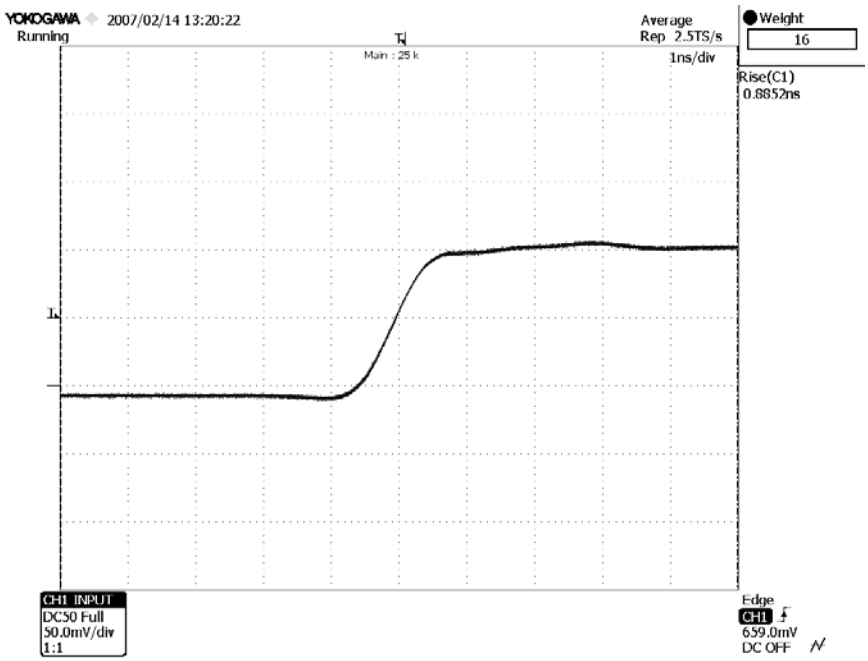
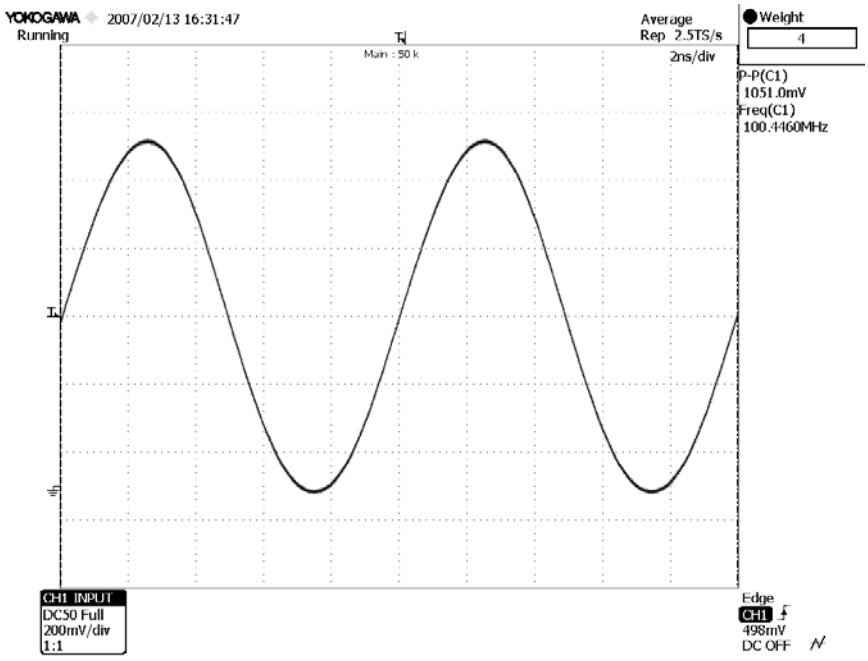
Typical Performance Characteristics (continued)

Pulse Response to Square Wave Input Signal
(with 16 times averaging)



Large Signal Response
output signal for 100 MHz, 200 µW modulated optical input signal
(with 4 times averaging)



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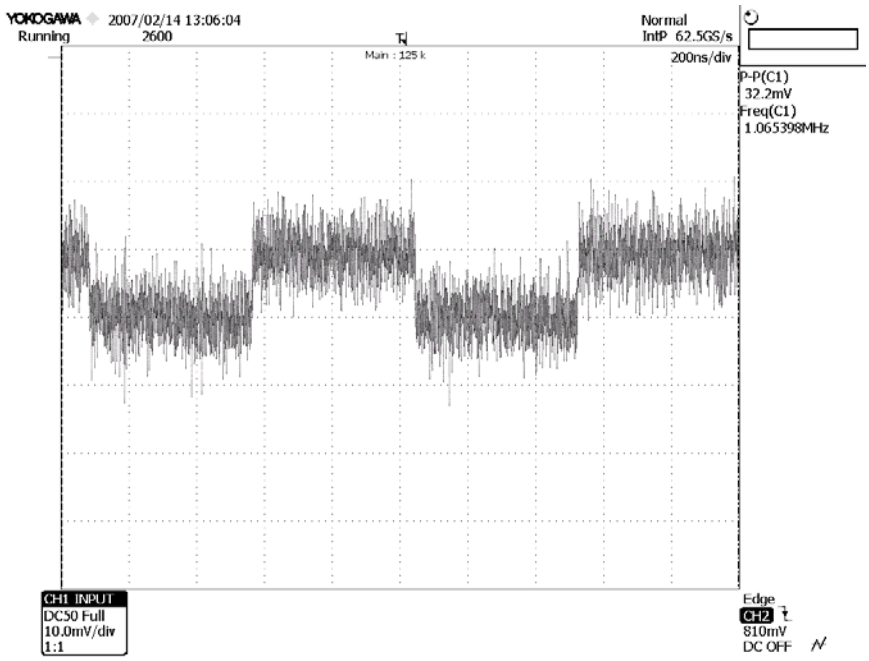
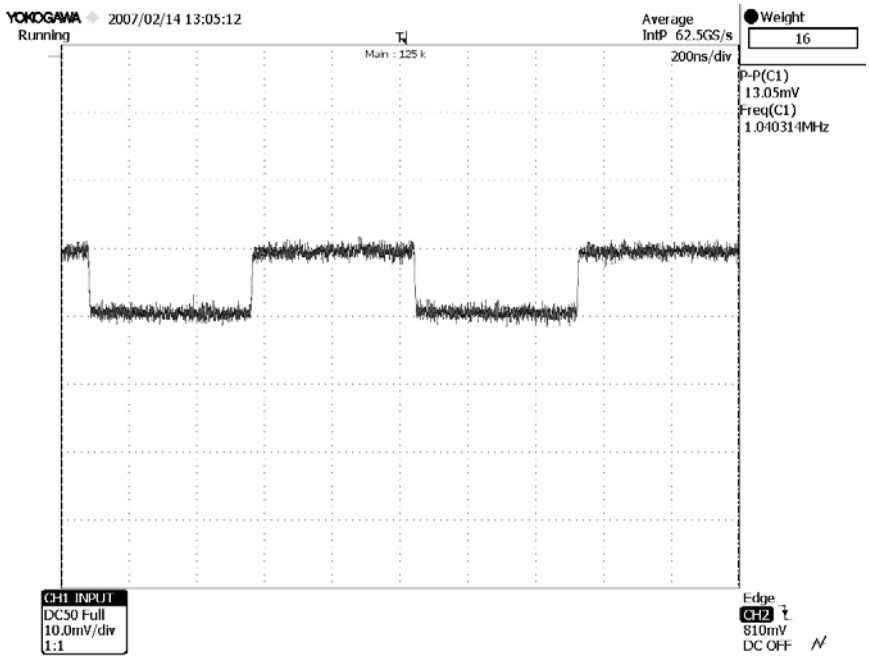
Typical Performance Characteristics (continued)

Small Signal Response
output signal for 2 µW modulated optical input signal, 1 MHz square wave
(without (top) and with 64 times averaging (bottom))





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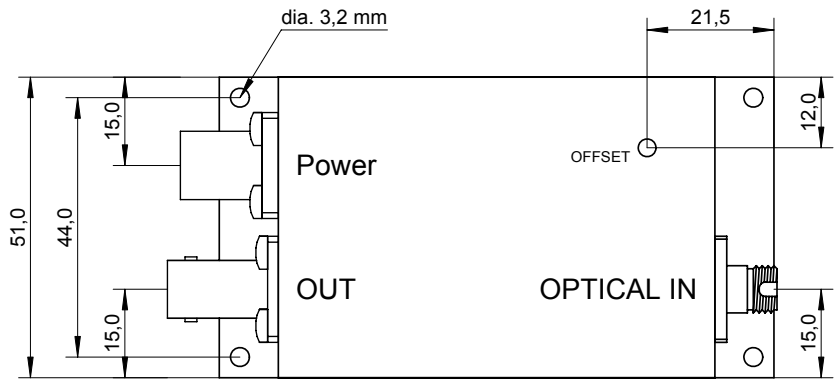
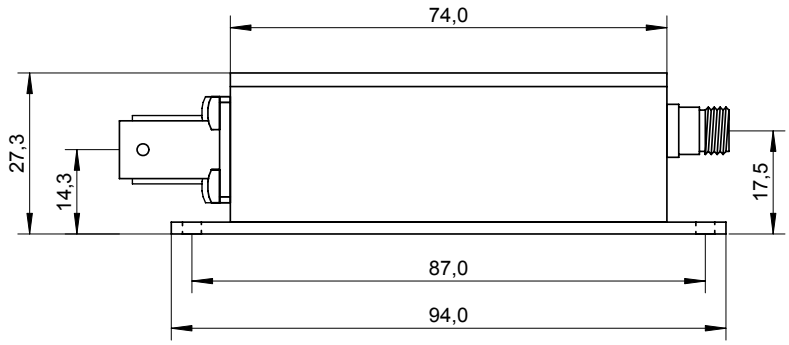
Dimensions





all measures are in mm unless otherwise noted HCA-S-FC_1

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