

Datasheet

HCA-S-400M-IN

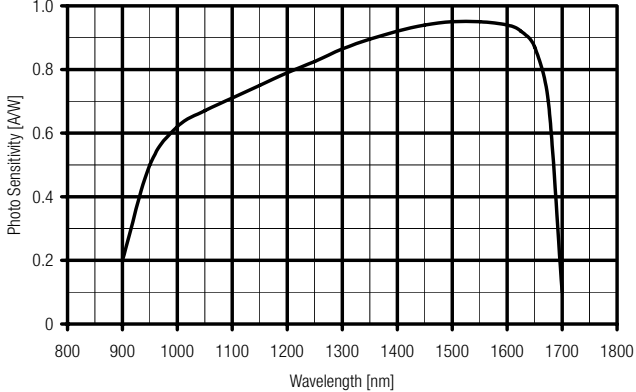
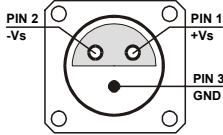
400 MHz Photoreceiver with InGaAs PIN Photodiode



The picture shows the HCA-S-400M-IN-FS with free space input. The photoreceiver will be delivered without post holder and post.

Features	<ul style="list-style-type: none"> • InGaAs PIN Detector, 0.3 mm Active Diameter • Spectral Range 900 ... 1700 nm • Bandwidth DC ... 400 MHz • Amplifier Transimpedance (Gain) 5.0×10^3 V/A • Max. Conversion Gain 4.8×10^3 V/W @ 1550 nm 																																		
Applications	<ul style="list-style-type: none"> • Spectroscopy • Fast Pulse and Transient Measurements • Optical Triggering • Optical Front-End for Oscilloscopes and A/D Converters 																																		
Specifications	<table border="0"> <tr> <td></td> <td><i>Test Conditions</i></td> <td><i>V_s = ± 15 V, T_a = 25°C</i></td> </tr> <tr> <td rowspan="2">Gain</td> <td>Transimpedance</td> <td>5.0×10^3 V/A (@ 50 Ω load)</td> </tr> <tr> <td>Max. Conversion Gain</td> <td>4.8×10^3 V/W (@ 1550 nm)</td> </tr> <tr> <td rowspan="4">Frequency Response</td> <td>Lower Cut-Off Frequency</td> <td>DC</td> </tr> <tr> <td>Upper Cut-Off Frequency (- 3 dB)</td> <td>400 MHz (± 10 %)</td> </tr> <tr> <td>Rise/Fall Time (10% - 90%)</td> <td>1.0 ns</td> </tr> <tr> <td>Gain Flatness</td> <td>± 1 dB</td> </tr> <tr> <td rowspan="3">Detector</td> <td>Detector Material</td> <td>InGaAs PIN photodiode</td> </tr> <tr> <td>Active Area</td> <td>Ø 0.3 mm</td> </tr> <tr> <td>Spectral Response</td> <td>900 ... 1700 nm</td> </tr> <tr> <td></td> <td>Input Offset Compensation Range</td> <td>± 200 mA adjustable by offset trim pot</td> </tr> <tr> <td></td> <td>Optical Saturation Power</td> <td>200 μW (for linear amplification, @ 1550 nm)</td> </tr> <tr> <td></td> <td>Min. NEP</td> <td>24 pW/√Hz (@ 1550 nm, 100 MHz)</td> </tr> </table>			<i>Test Conditions</i>	<i>V_s = ± 15 V, T_a = 25°C</i>	Gain	Transimpedance	5.0×10^3 V/A (@ 50 Ω load)	Max. Conversion Gain	4.8×10^3 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	Ø 0.3 mm	Spectral Response	900 ... 1700 nm		Input Offset Compensation Range	± 200 mA adjustable by offset trim pot		Optical Saturation Power	200 μW (for linear amplification, @ 1550 nm)		Min. NEP	24 pW/√Hz (@ 1550 nm, 100 MHz)
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Datasheet**HCA-S-400M-IN****400 MHz Photoreceiver with InGaAs PIN Photodiode**

<p>Specifications (continued)</p> <p>Output</p> <p>Power Supply</p> <p>Case</p> <p>Temperature Range</p>	<p>Output Voltage Range $\pm 1.0\text{ V}$ (@ 50 Ω load) for linear operation and low harmonic distortion</p> <p>Max. Output Voltage Range $\pm 1.5\text{ V}$ (@ 50 Ω load)</p> <p>Output Impedance 50 Ω (designed for 50 Ω load)</p> <p>Output Noise ca. 20 mV peak-peak or 3 mV rms (@ 50 Ω load, no signal on detector)</p> <p>Supply Voltage $\pm 15\text{ V}$</p> <p>Supply Current $\pm 55\text{ mA typ.}$ (depends on operating conditions, recommended power supply capability minimum $\pm 150\text{ mA}$)</p> <p>Weight 210 g (0.5 lbs)</p> <p>Material AlMg4.5Mn, nickel-plated</p> <p>Storage Temperature - 40 ... + 100 $^{\circ}\text{C}$</p> <p>Operating Temperature 0 ... + 60 $^{\circ}\text{C}$</p>
<p>Absolute Maximum Ratings</p>	<p>Optical Input Power 10 mW</p> <p>Power Supply Voltage $\pm 22\text{ V}$</p>
<p>Spectral Response</p>	
<p>Connectors</p>	<p>Input HCA-S-400M-IN-FS 25 mm round flange for free space applications</p> <p> HCA-S-400M-IN-FC FC fiber optic receptacle</p> <p>Output BNC</p> <p>Power Supply LEMO series 1S, 3-pin fixed socket</p> <p> Pin 1: + 15V</p> <p> Pin 2: - 15V</p> <p> Pin 3: GND</p> 

400 MHz Photoreceiver with InGaAs PIN Photodiode

Typical Performance Characteristics

Frequency Response

Offs 5.00 dB * RBW 300 kHz
 Att 0 dB VBW 1 MHz M1[1] -3.06 dB
 Ref -15.00 dBm SWT 10ms 400.000000000 MHz

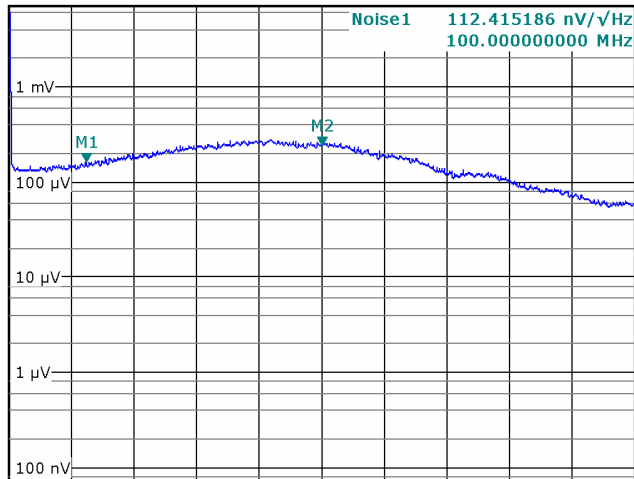


Start 10.0 MHz

Stop 800.0 MHz

Noise Spectrum

* RBW 3 MHz
 Att 0 dB * VBW 3 kHz Noise2 181.939740 nV/√Hz
 Ref 7.07 mV SWT 180ms 400.000000000 MHz



CF 400.0 MHz

Span 800.0 MHz

Note: Spectral noise data is measured at the amplifier output with no signal on the photodiode. To determine the spectral input noise divide the measured output noise by the amplifier conversion gain.

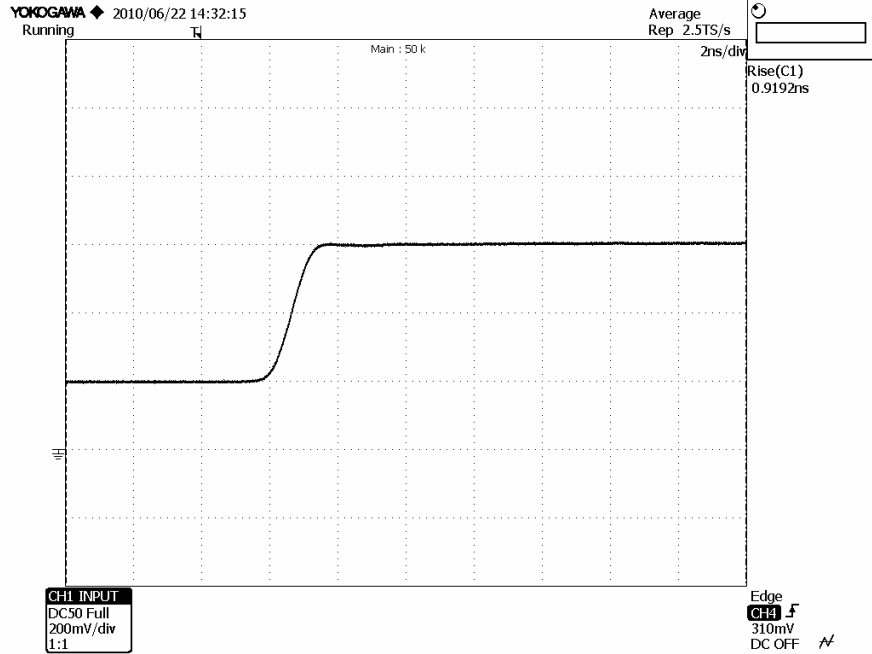
Conversion gain (V/W) = amplifier gain (5,000 V/A) x photo sensitivity (A/W).

Marker	Frequency	Output Noise	Resulting Input Noise (NEP)
1	100 MHz	112 nV/√Hz	24 pW/√Hz (@ 1550 nm)
2	400 MHz	182 nV/√Hz	38 pW/√Hz (@ 1550 nm)

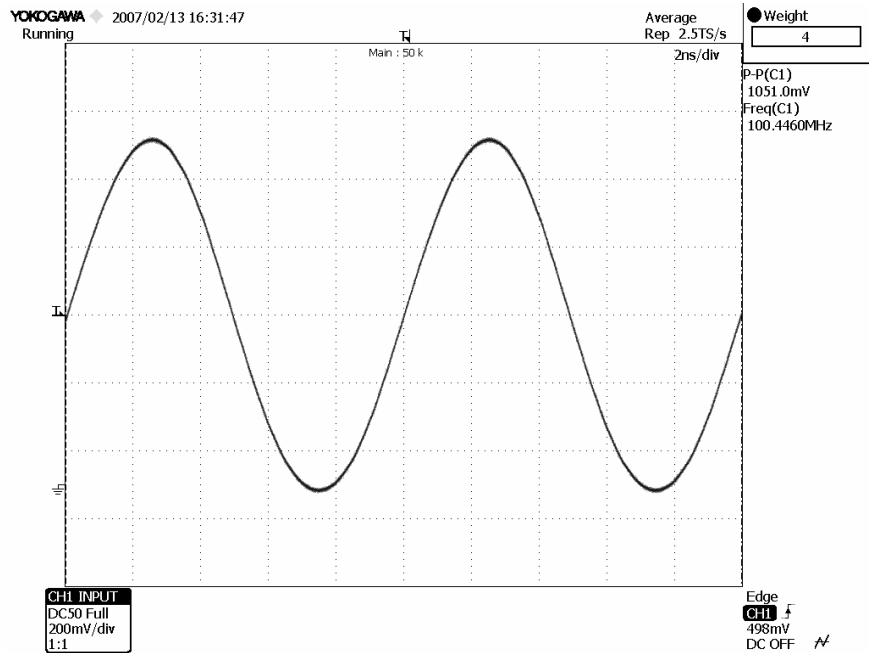
400 MHz Photoreceiver with InGaAs PIN Photodiode

Typical Performance Characteristics
(continued)

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



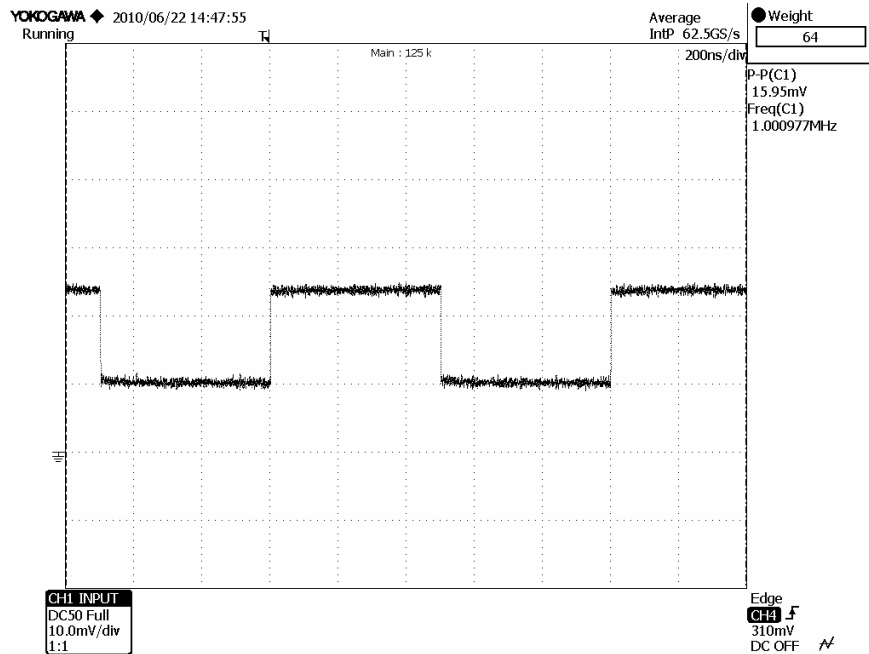
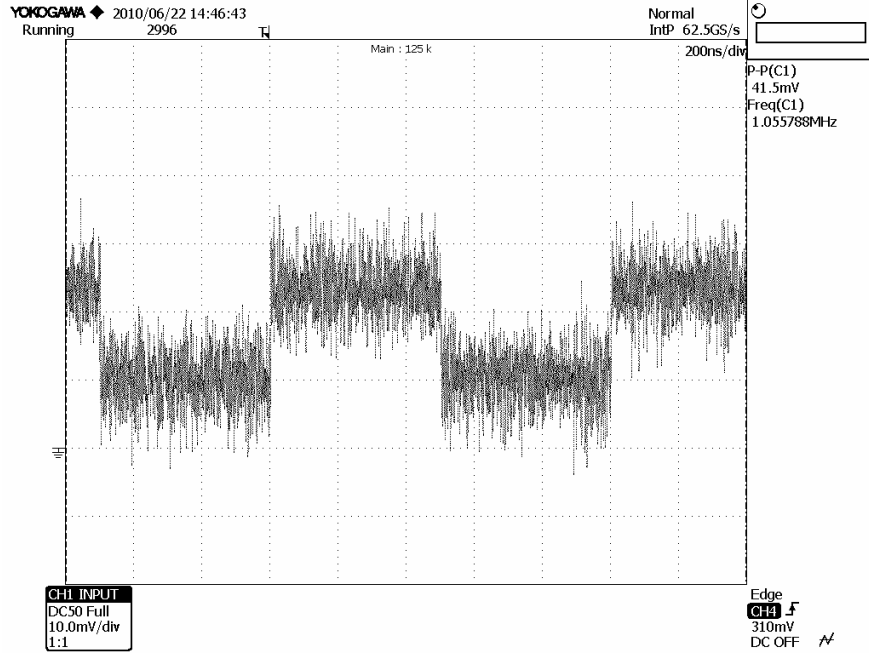
Large Signal Response
output signal for 100 MHz, 210 μ W modulated optical input signal
(with 4 times averaging)



400 MHz Photoreceiver with InGaAs PIN Photodiode

Typical Performance Characteristics (continued)

Small Signal Response
output signal for 3 μ W modulated optical input signal, 1 MHz square wave (without (top) and with 64 times averaging (bottom))



Available Models

HCA-S-400M-IN-FS
HCA-S-400M-IN-FC
HCA-S

free space input
FC fiber optic receptacle
customized versions available on request

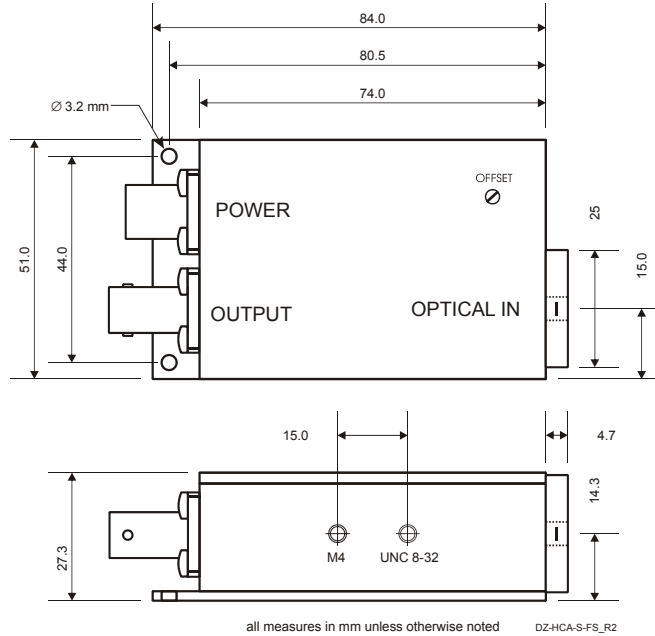
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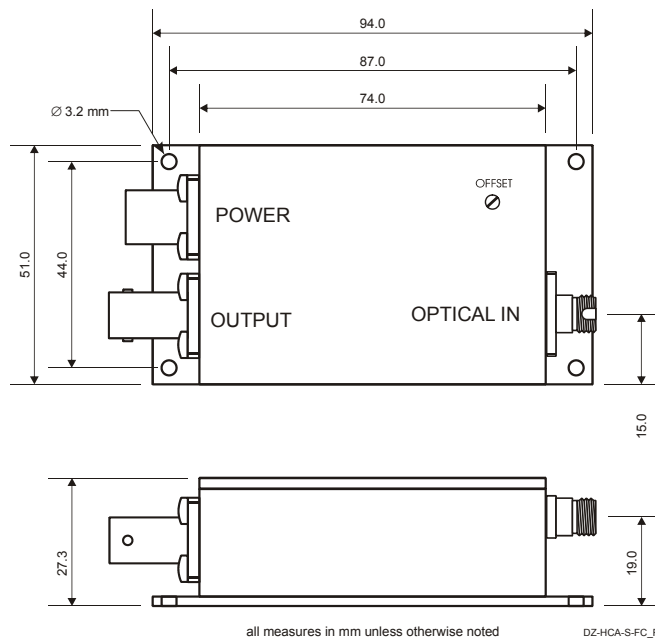
400 MHz Photoreceiver with InGaAs PIN Photodiode

Dimensions

HCA-S-400M-IN-FS



HCA-S-400M-IN-FC



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