

200 MHz Photoreceiver with Si PIN Photodiode



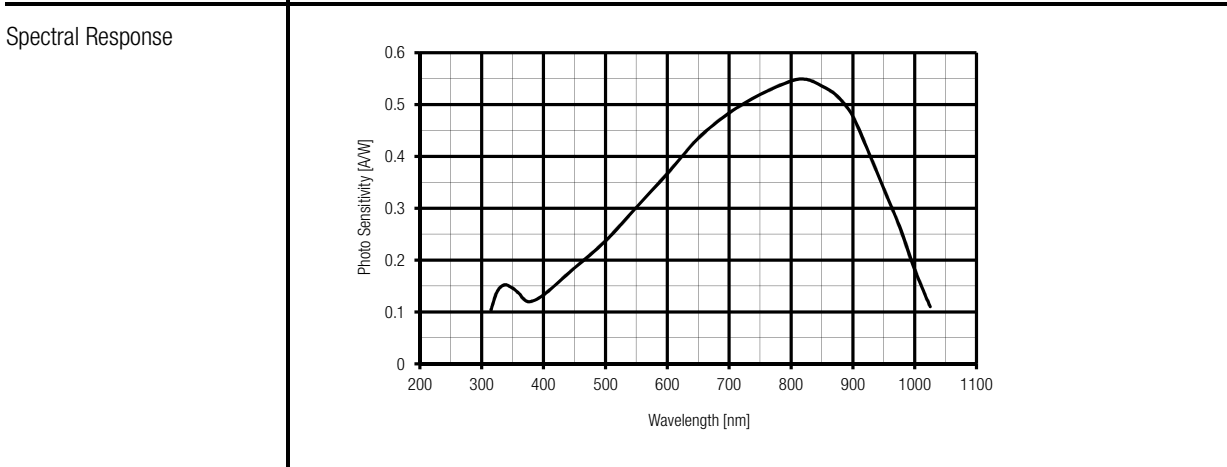
The picture shows the HCA-S-200M-SI-FS with free space input. The photoreceiver will be delivered without post holder and post.

<p>Features</p>	<ul style="list-style-type: none"> • Si PIN Detector, 0.8 mm Active Diameter • Spectral Range 320 ... 1000 nm • Bandwidth DC ... 200 MHz • Amplifier Transimpedance (Gain) 2.0×10^4 V/A • Max. Conversion Gain 1.1×10^4 V/W @ 800 nm 																															
<p>Applications</p>	<ul style="list-style-type: none"> • Spectroscopy • Fast Pulse and Transient Measurements • Optical Triggering • Optical Front-End for Oscilloscopes, A/D Converters and HF Lock-In Amplifiers 																															
<p>Specifications</p>	<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>2.0×10^4 V/A (@ 50 Ω load)</td> </tr> <tr> <td>Max. Conversion Gain</td> <td>1.1×10^4 V/W (@ 800 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>200 MHz (± 10 %)</td> </tr> <tr> <td>Rise/Fall Time (10% - 90%)</td> <td>1.8 ns</td> </tr> <tr> <td>Gain Flatness</td> <td>± 1 dB</td> </tr> <tr> <td rowspan="3">Detector</td> <td>Detector Material</td> <td>Si PIN photodiode</td> </tr> <tr> <td>Active Area</td> <td>Ø 0.8 mm</td> </tr> <tr> <td>Spectral Response</td> <td>320 ... 1000 nm</td> </tr> <tr> <td rowspan="3">Input</td> <td>Input Offset Compensation Range</td> <td>± 100 μA adjustable by offset trimpot</td> </tr> <tr> <td>Optical Saturation Power</td> <td>110 μW (for linear amplification, @ 800 nm)</td> </tr> <tr> <td>Min. NEP</td> <td>9.4 pW/√Hz (@ 800 nm, 10 MHz)</td> </tr> </table>		<i>Test Conditions</i>	<i>V_s = ± 15 V, T_a = 25°C</i>	Gain	Transimpedance	2.0×10^4 V/A (@ 50 Ω load)	Max. Conversion Gain	1.1×10^4 V/W (@ 800 nm)	Frequency Response	Lower Cut-Off Frequency	DC	Upper Cut-Off Frequency (- 3 dB)	200 MHz (± 10 %)	Rise/Fall Time (10% - 90%)	1.8 ns	Gain Flatness	± 1 dB	Detector	Detector Material	Si PIN photodiode	Active Area	Ø 0.8 mm	Spectral Response	320 ... 1000 nm	Input	Input Offset Compensation Range	± 100 μA adjustable by offset trimpot	Optical Saturation Power	110 μW (for linear amplification, @ 800 nm)	Min. NEP	9.4 pW/√Hz (@ 800 nm, 10 MHz)
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Specifications (continued)	
Output	Output Voltage Range $\pm 1.2\text{ V}$ (@ 50 Ω load) for linear operation and low harmonic distortion Max. Output Voltage Range $\pm 1.7\text{ V}$ (@ 50 Ω load) Output Impedance 50 Ω (designed for 50 Ω load) Output Noise ca. 20 mV peak-peak or 3 mV rms (@ 50 Ω load, no signal on detector)
Power Supply	Supply Voltage $\pm 15\text{ V}$ Supply Current $\pm 50\text{ mA typ.}$ (depends on operating conditions, recommended power supply capability minimum $\pm 150\text{ mA}$)
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 20 mW Power Supply Voltage $\pm 22\text{ V}$
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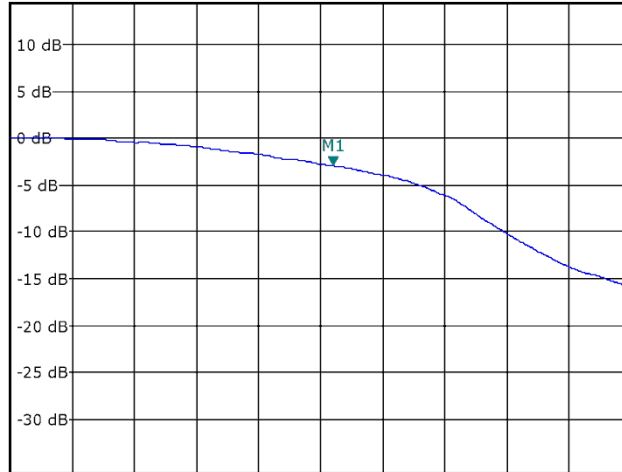
Connectors	Input HCA-S-200M-SI-FS 25 mm round flange for free space applications HCA-S-200M-SI-FC FC fiber optic receptacle HCA-S-200M-SI-SMA SMA fiber optic receptacle Output BNC Power Supply LEMO series 1S, 3-pin fixed socket Pin 1: + 15V Pin 2: - 15V Pin 3: GND
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200 MHz Photoreceiver with Si PIN Photodiode

Typical Performance Characteristics

Frequency Response

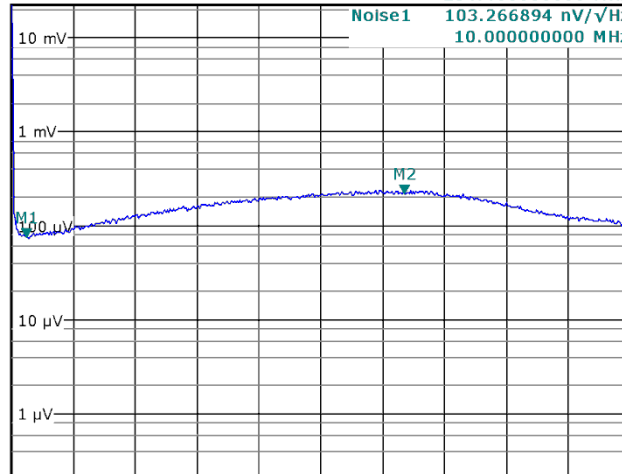
Offs -34.1 dB RBW 3 MHz
 Att 5 dB * VBW 10 kHz M1[1] -2.95 dB
 Ref -53.1 dBm SWT 65ms 217.92000000 MHz



Start 20.0 MHz Stop 400.0 MHz

Noise Spectrum

* RBW 1 MHz
 Att 0 dB * VBW 1 kHz Noise2 292.328379 nV/√Hz
 Ref 22.4 mV SWT 800ms 254.40000000 MHz
 Noise1 103.266894 nV/√Hz
 10.00000000 MHz



Start 0.0 Hz Stop 400.0 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.

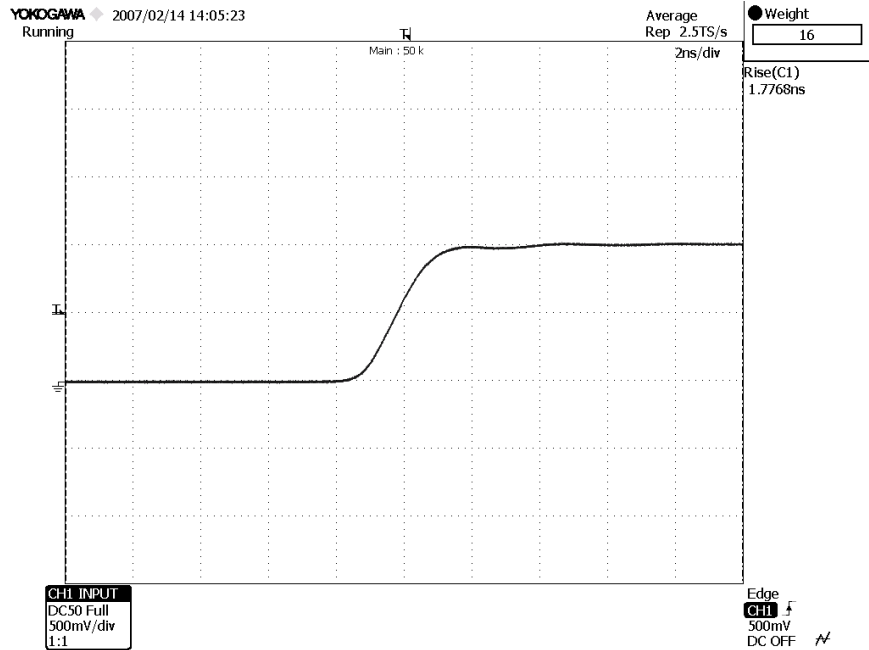
Conversion gain (V/W) = amplifier gain (20,000 V/A) x photo sensitivity (A/W).

Marker	Frequency	Output Noise	Resulting Input Noise (NEP)
1	10 MHz	103 nV/√Hz	9.4 pW/√Hz (@ 800 nm)
2	254 MHz	292 nV/√Hz	27 pW/√Hz (@ 800 nm)

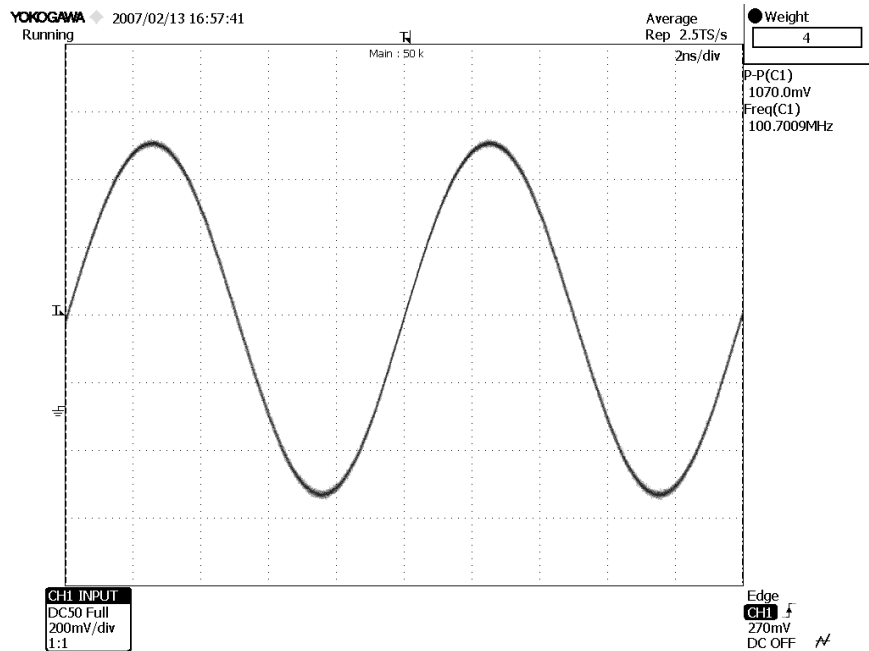
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Typical Performance Characteristics
(continued)

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



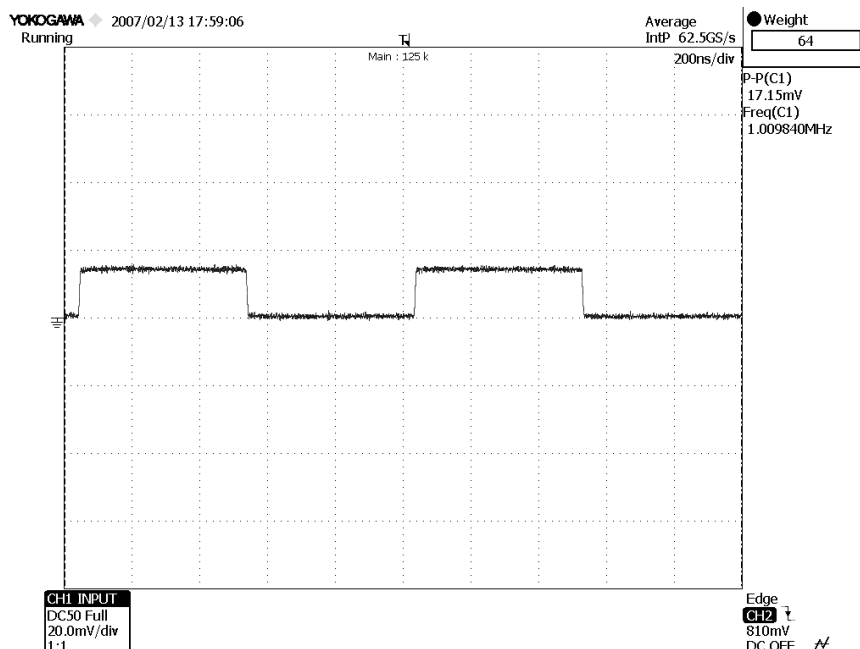
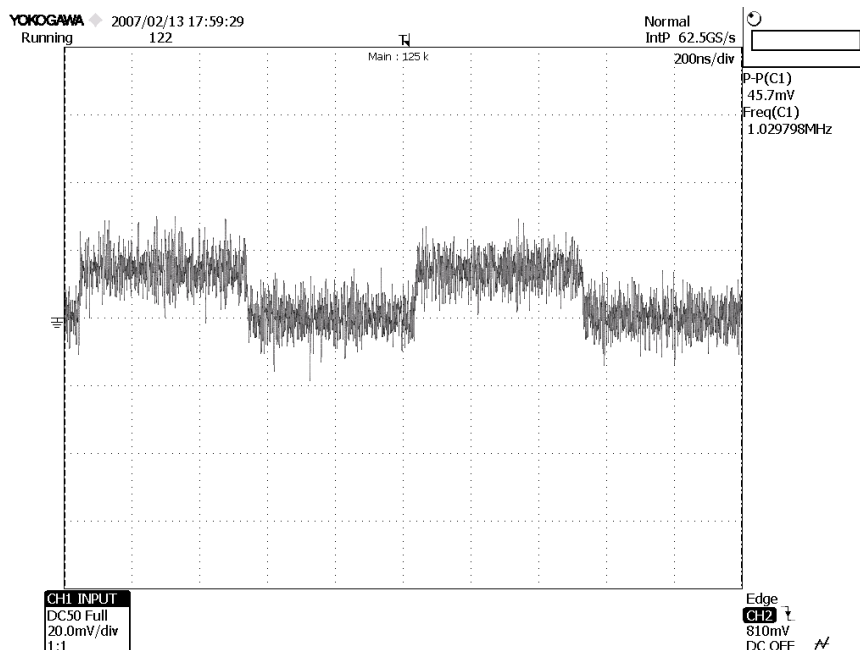
Large Signal Response
output signal for 100 MHz, 100 μ W modulated optical input signal
(with 4 times averaging)



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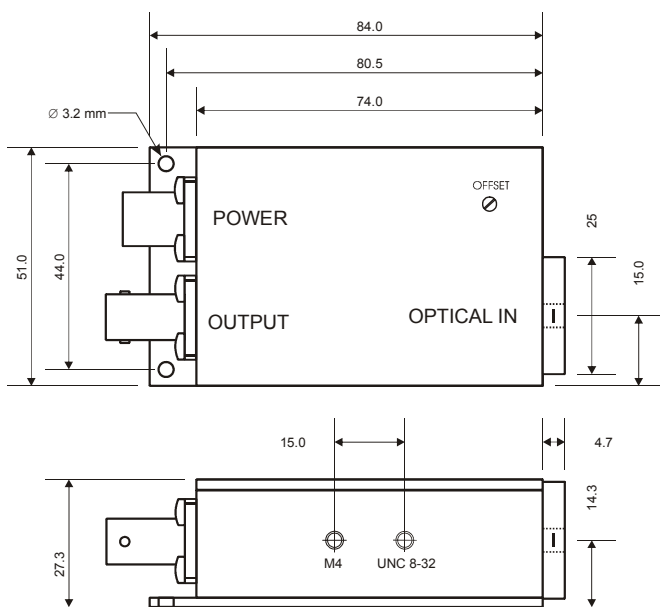
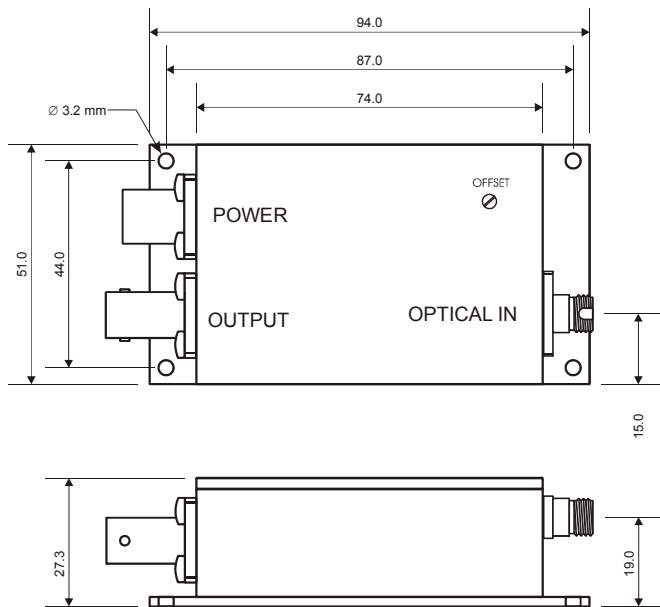
Typical Performance Characteristics (continued)

Small Signal Response
output signal for 1.5 μ W modulated optical input signal, 1 MHz square wave (without (top) and with 64 times averaging (bottom))



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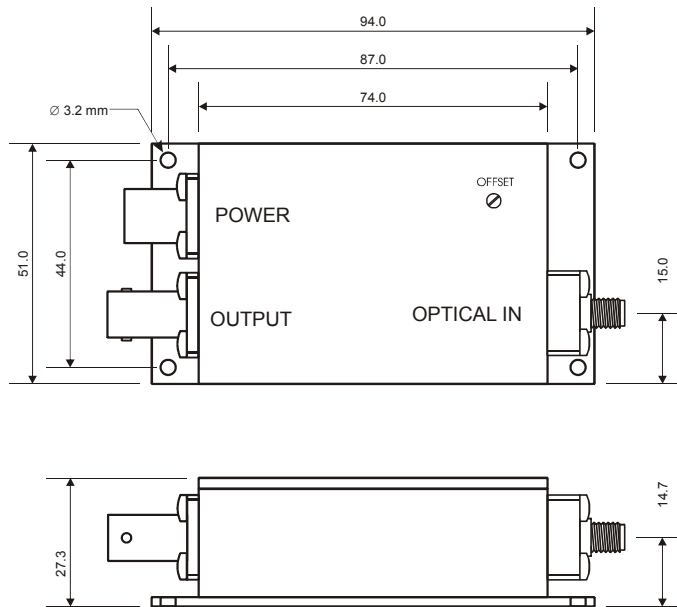
Available Models	HCA-S-200M-SI-FS free space input HCA-S-200M-SI-FC FC fiber optic receptacle HCA-S-200M-SI-SMA SMA fiber optic receptacle HCA-S customized versions available on request
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Dimensions	<p>HCA-S-200M-SI-FS</p>  <p>all measures in mm unless otherwise noted DZ-HCA-S-FS_R2</p> <p>HCA-S-200M-SI-FC</p>  <p>all measures in mm unless otherwise noted DZ-HCA-S-FC_R4</p>
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Dimensions (continued)

HCA-S-200M-SI-SMA



all measures in mm unless otherwise noted

DZ-HCA-S-SMA_R2

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