

Datasheet

HCA-S-200M-SI

**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.

Features	<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 																															
Applications	<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 																															
Specifications	<table border="0"> <tr> <td colspan="2"><i>Test Conditions</i></td> <td>$V_s = \pm 15$ V, $T_a = 25^\circ$ C</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>\varnothing 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/\sqrtHz (@ 800 nm, 10 MHz)</td> </tr> </table>	<i>Test Conditions</i>		$V_s = \pm 15$ V, $T_a = 25^\circ$ C	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	\varnothing 0.8 mm	Spectral Response	320 ... 1000 nm	Input	Input Offset Compensation Range	± 100 μ A adjustable by offset trimpot	Optical Saturation Power	110 μ W (for linear amplification, @ 800 nm)	Min. NEP	9.4 pW/ \sqrt Hz (@ 800 nm, 10 MHz)
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SOPHISTICATED TOOLS FOR SIGNAL RECOVERY



DE-HCA-S-200M-SI_R11/SP_JM/20FEB2019

01/24 / V4 / CHHW / femto/photoreceiver/hcas-200m-si

Datasheet

HCA-S-200M-SI

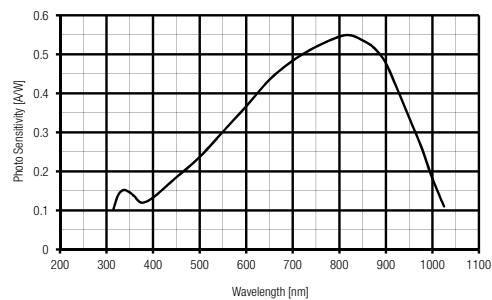
**200 MHz Photoreceiver with
Si PIN Photodiode**

Specifications (continued)

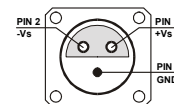
Output	Output Voltage Range	± 1.2 V (@ 50 Ω load) for linear operation and low harmonic distortion
	Max. Output Voltage Range	± 1.7 V (@ 50 Ω load)
	Output Impedance	50 Ω (designed for 50 Ω load)
	Output Noise	ca. 20 mV peak-peak or 3 mV rms (@ 50 Ω load, no signal on detector)
Power Supply	Supply Voltage	± 15 V
	Supply Current	± 50 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	20 mW
	Power Supply Voltage	± 22 V

Spectral Response



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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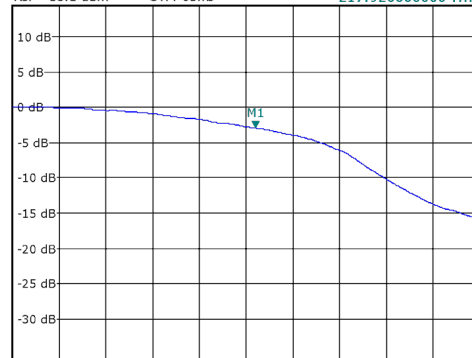
HCA-S-200M-SI

200 MHz Photoreceiver with
Si PIN Photodiode

Typical Performance
Characteristics

Frequency Response

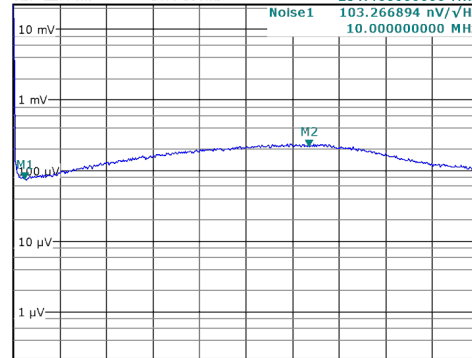
Offs -34.1 dB RBW 3 MHz
Att 5 dB * VBW 10 kHz M1[1] -2.95 dB
Ref -53.1 dBm SWT 65ms 217.92000000 MHz



Start 20.0 MHz Stop 400.0 MHz

Noise Spectrum

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



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)

SOPHISTICATED TOOLS FOR SIGNAL RECOVERY



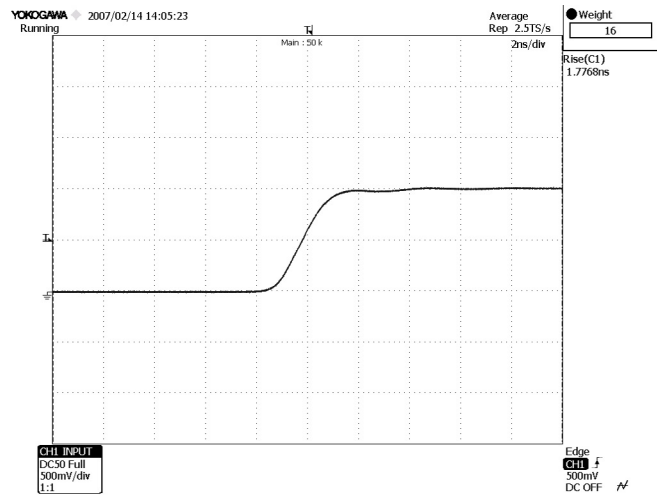
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HCA-S-200M-SI

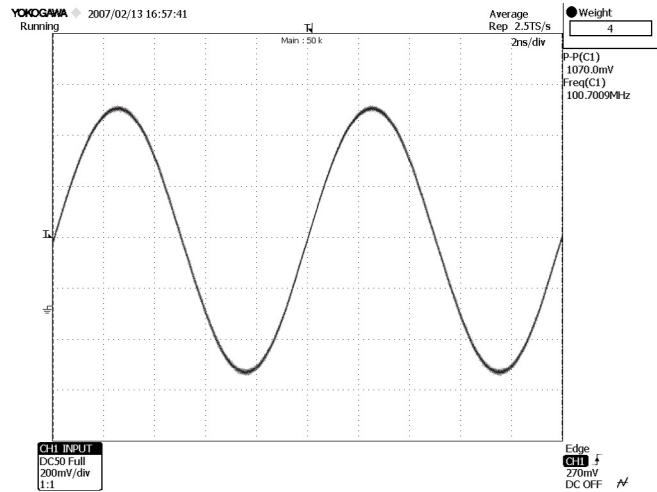
**200 MHz Photoreceiver with
Si PIN Photodiode**

Typical Performance
Characteristics
(continued)

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



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



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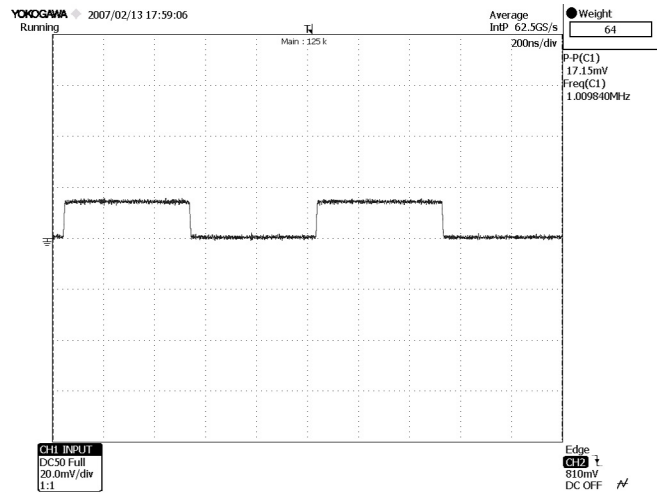
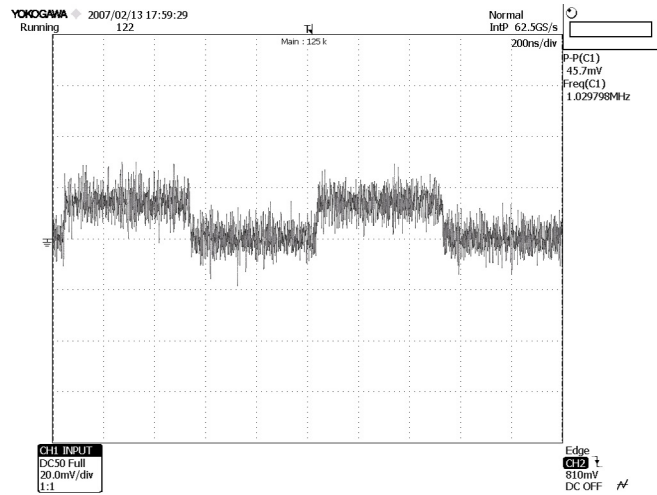
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HCA-S-200M-SI

**200 MHz Photoreceiver with
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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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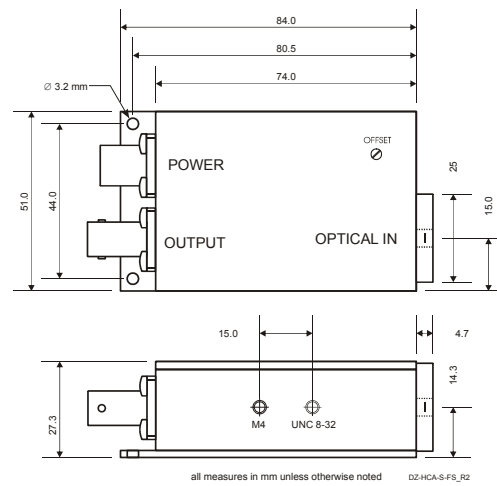
**200 MHz Photoreceiver with
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Available Models

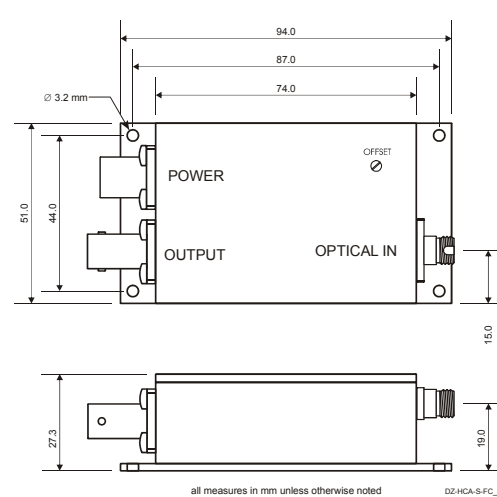
HCA-S-200M-SI-FS free space input
 HCA-S-200M-SI-FC FC fiber optic receptacle
 HCA-S-200M-SI-SMA SMA fiber optic receptacle
 HCA-S customized versions available on request

Dimensions

HCA-S-200M-SI-FS



HCA-S-200M-SI-FC



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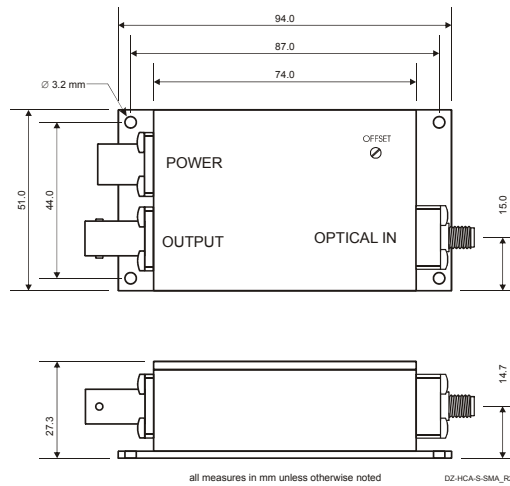
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HCA-S-200M-SI

**200 MHz Photoreceiver with
Si PIN Photodiode**

Dimensions (continued)

HCA-S-200M-SI-SMA



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