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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

- **Si PIN Detector, 0.8 mm Active Diameter**
- **Spectral Range 320 ... 1000 nm**
- **Bandwidth DC ... 200 MHz**
- **Amplifier Transimpedance (Gain) 2.0 x 10^4 V/A**
- **Max. Conversion Gain 1.1 x 10^4 V/W @ 800 nm**

Applications

- **Spectroscopy**
- **Fast Pulse and Transient Measurements**
- **Optical Triggering**
- **Optical Front-End for Oscilloscopes, A/D Converters and HF Lock-In Amplifiers**

Specifications

	Test Conditions	*Vs = ± 15 V, Ta = 25°C*	
Gain	Transimpedance	2.0 x 10^4 V/A	(@ 50 Ω load)
	Max. Conversion Gain	1.1 x 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	∅ 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)

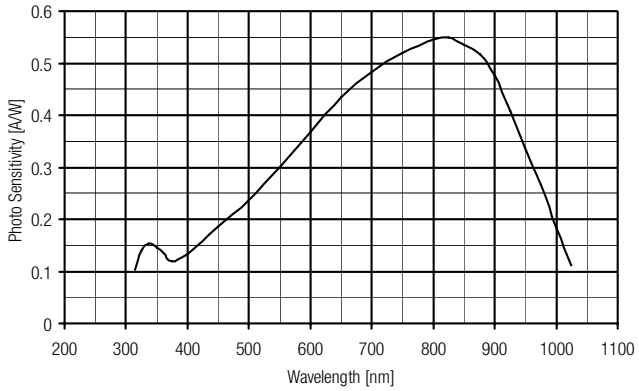
200 MHz Photoreceiver with Si PIN Photodiode

Specifications (continued)

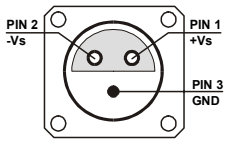
Output	Output Voltage Range	± 1.2 V (@ 50 Ω load) for linear operation and low harmonic distortion
	Max. Output Voltage Range	± 1.7 V (@ 50 Ω load)
	Output Impedance	50 Ω (designed for 50 Ω load)
	Output Noise	ca. 20 mV peak-peak or 3 mV rms (@ 50 Ω load, no signal on detector)
Power Supply	Supply Voltage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



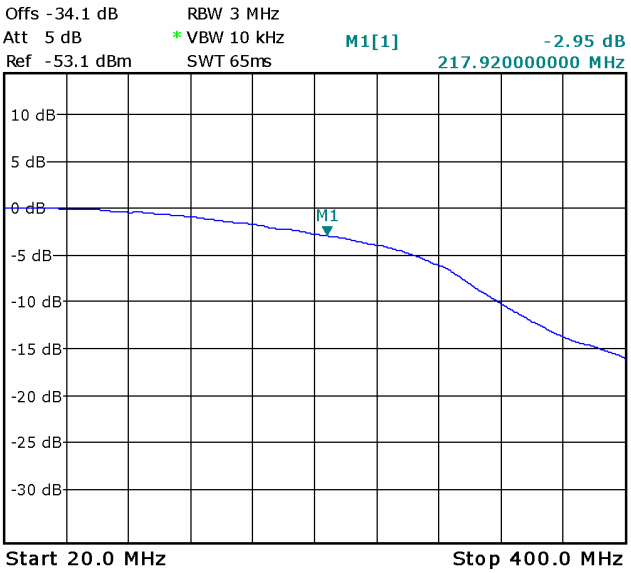
Connectors	Input	HCA-S-200M-SI-FS	25 mm round flange for free space applications
		HCA-S-200M-SI-FC	FC fiber optic receptacle
		HCA-S-200M-SI-SMA	SMA fiber optic receptacle
	Output	BNC	
	Power Supply	LEMO series 1S, 3-pin fixed socket Pin 1: + 15V Pin 2: - 15V Pin 3: GND	



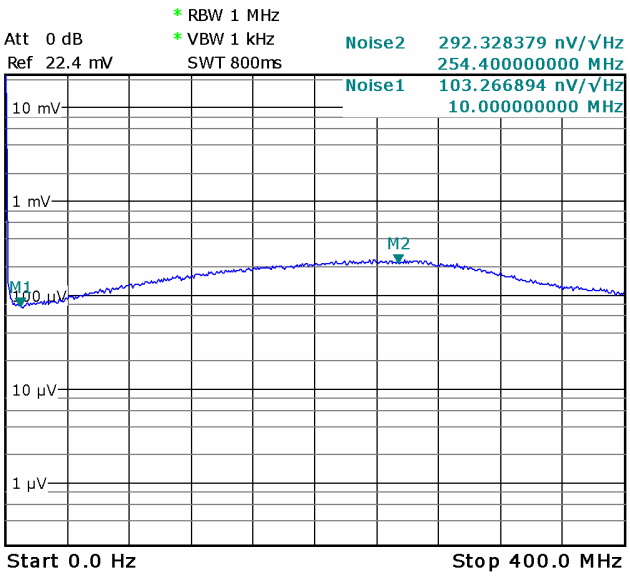
200 MHz Photoreceiver with Si PIN Photodiode

Typical Performance Characteristics

Frequency Response



Noise Spectrum



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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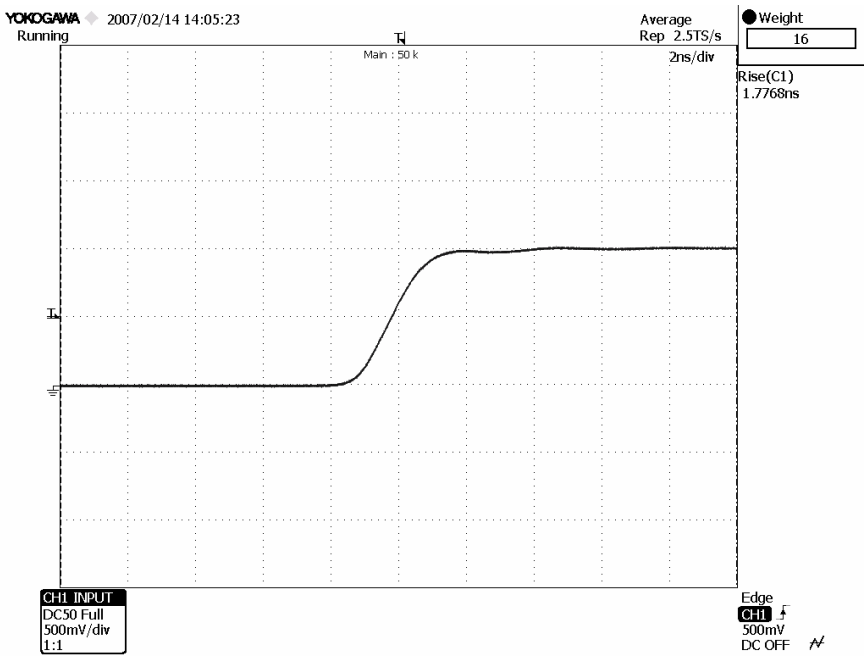
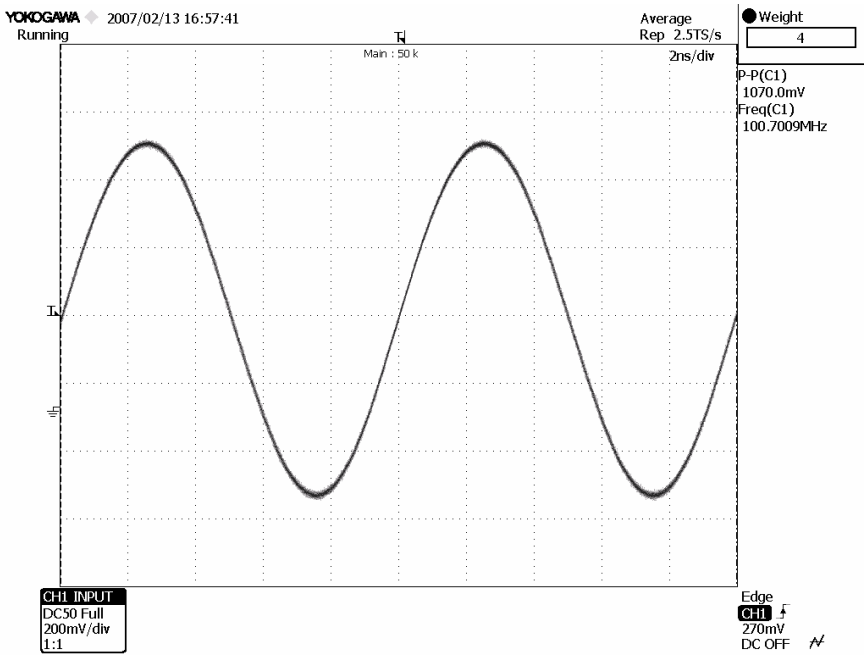
Typical Performance Characteristics (continued)

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



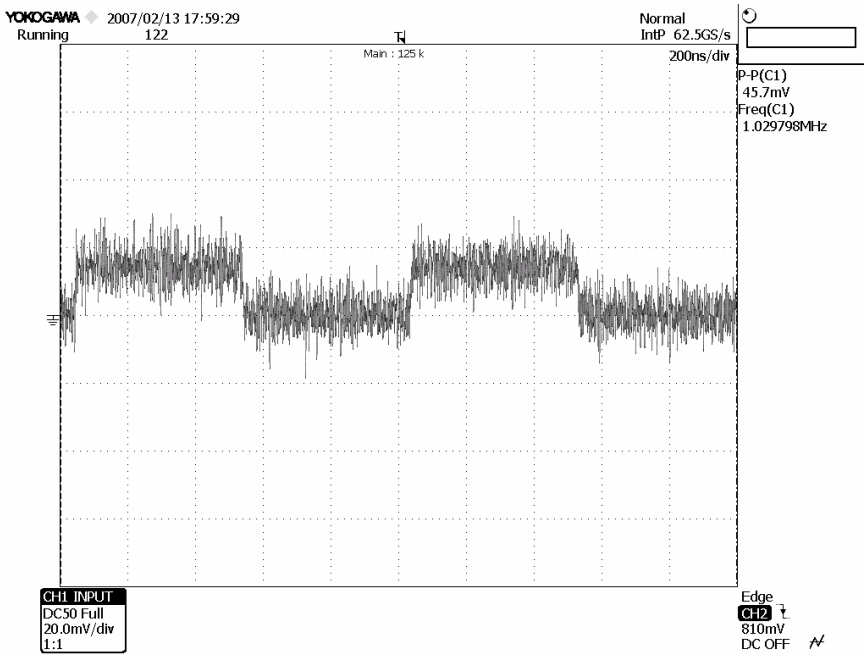
Large Signal Response
output signal for 100 MHz, 100 µW modulated optical input signal
(with 4 times averaging)

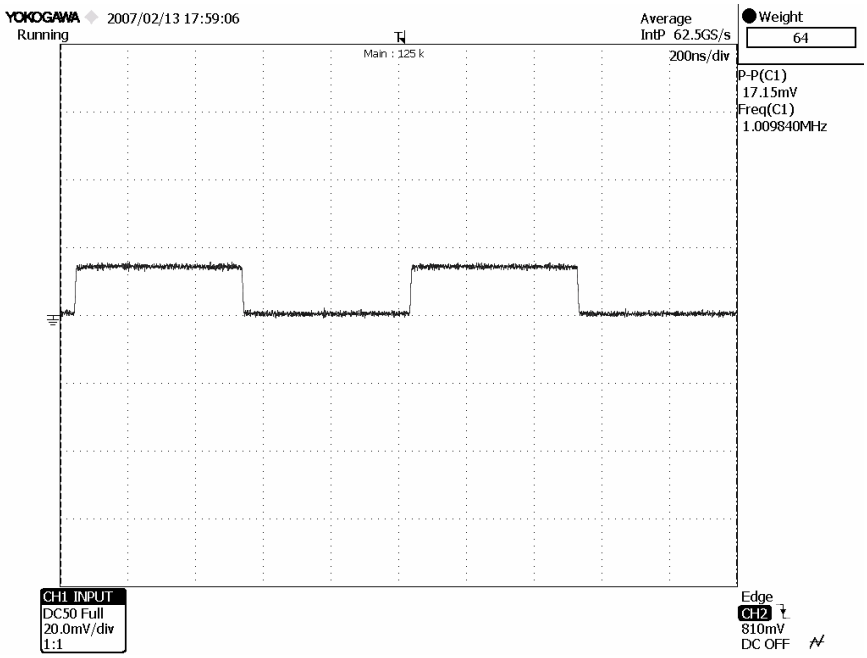


200 MHz Photoreceiver with Si PIN Photodiode

Typical Performance Characteristics (continued)

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



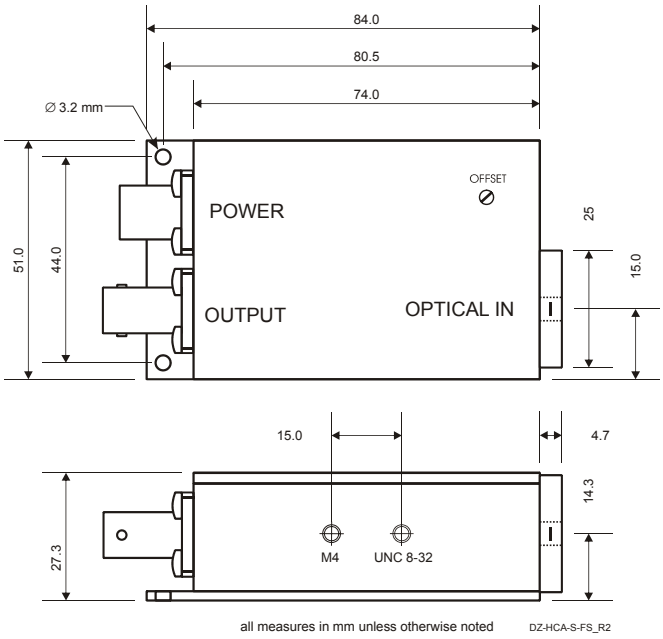


200 MHz Photoreceiver with Si PIN Photodiode

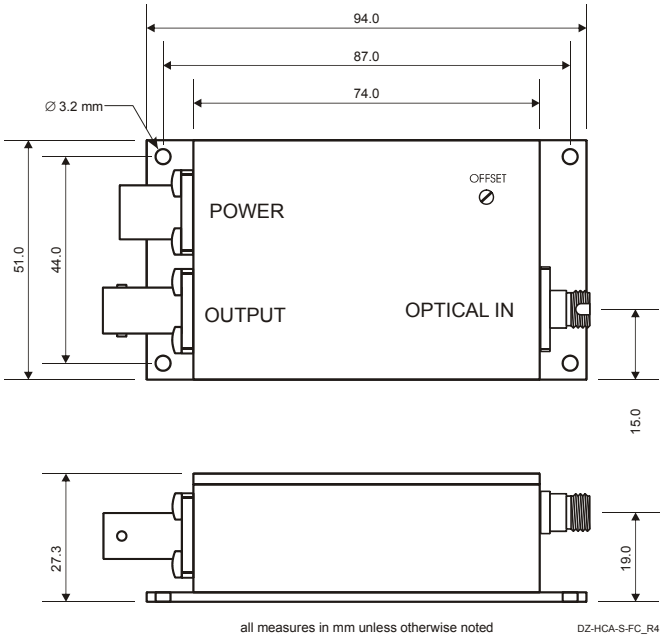
Available Models	HCA-S-200M-SI-FS	free space input
	HCA-S-200M-SI-FC	FC fiber optic receptacle
	HCA-S-200M-SI-SMA	SMA fiber optic receptacle
	HCA-S	customized versions available on request

Dimensions

HCA-S-200M-SI-FS



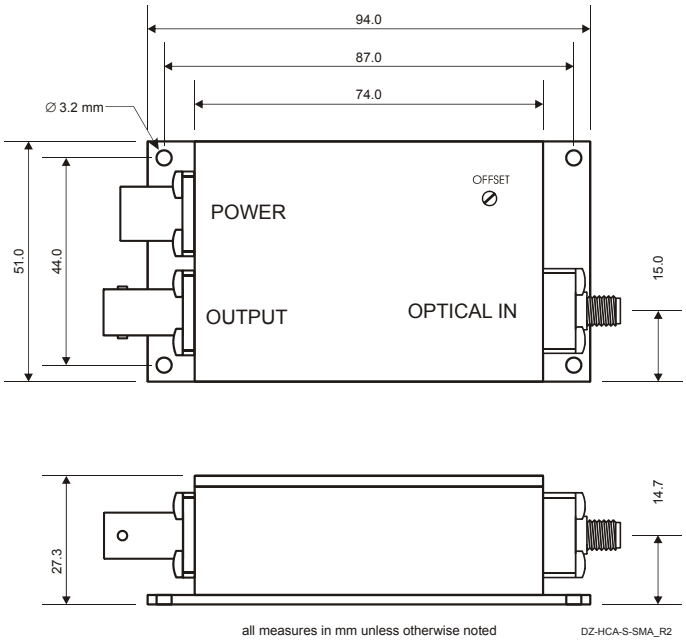
HCA-S-200M-SI-FC



200 MHz Photoreceiver with Si PIN Photodiode

Dimensions (continued)

HCA-S-200M-SI-SMA



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