

Datasheet

HCA-S-200M-IN

**200 MHz Photoreceiver
with InGaAs PIN Photodiode**



The picture shows the HCA-S-200M-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 • Spectral range 900 ... 1700 nm • Bandwidth DC ... 200 MHz • Amplifier transimpedance (gain) 2.0×10^4 V/A • Max. conversion gain 1.9×10^4 V/W @ 1550 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>Test conditions</td> <td colspan="2">$V_s = \pm 15$ V, $T_A = 25$ °C, system impedance = 50 Ω</td> </tr> <tr> <td rowspan="2">Gain</td> <td>Amplifier transimpedance</td> <td>2.0×10^4 V/A (@ 50 Ω load)</td> </tr> <tr> <td>Max. conversion gain</td> <td>1.9×10^4 V/W (@ 1550 nm)</td> </tr> <tr> <td rowspan="3">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 (± 15 %)</td> </tr> <tr> <td>Rise/fall time (10 % - 90 %)</td> <td>1.8 ns</td> </tr> <tr> <td rowspan="3">Detector</td> <td>Detector material</td> <td>InGaAs PIN photodiode</td> </tr> <tr> <td>Active area</td> <td>\varnothing 300 μm (free space "-FS" version only)</td> </tr> <tr> <td>Spectral response</td> <td>900 ... 1700 nm</td> </tr> <tr> <td rowspan="3">Input</td> <td>Input offset compensation range</td> <td>± 100 μA adjustable by offset potentiometer</td> </tr> <tr> <td>Optical saturation power</td> <td>60 μW (for linear amplification, @ 1550 nm)</td> </tr> <tr> <td>NEP</td> <td>5.2 pW/\sqrtHz (@ 1550 nm, 10 MHz)</td> </tr> </table>	Test conditions	$V_s = \pm 15$ V, $T_A = 25$ °C, system impedance = 50 Ω		Gain	Amplifier transimpedance	2.0×10^4 V/A (@ 50 Ω load)	Max. conversion gain	1.9×10^4 V/W (@ 1550 nm)	Frequency Response	Lower cut-off frequency	DC	Upper cut-off frequency (-3 dB)	200 MHz (± 15 %)	Rise/fall time (10 % - 90 %)	1.8 ns	Detector	Detector material	InGaAs PIN photodiode	Active area	\varnothing 300 μ m (free space "-FS" version only)	Spectral response	900 ... 1700 nm	Input	Input offset compensation range	± 100 μ A adjustable by offset potentiometer	Optical saturation power	60 μ W (for linear amplification, @ 1550 nm)	NEP	5.2 pW/ \sqrt Hz (@ 1550 nm, 10 MHz)
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SOPHISTICATED TOOLS FOR SIGNAL RECOVERY



DE-HCA-S-200M-IN_R12/MN/JM/19FEB2019

01/24 / V5 / KC-IF / femto/photoreceiver/hcas-200m-in

Datasheet

HCA-S-200M-IN

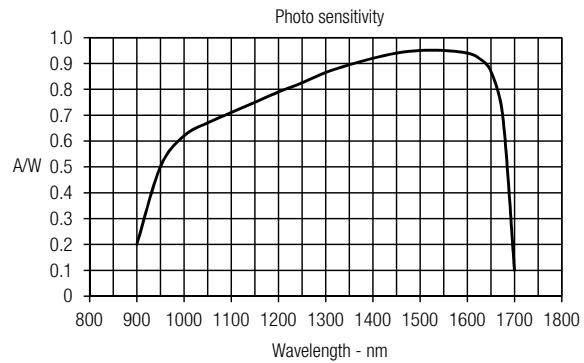
**200 MHz Photoreceiver
with InGaAs PIN Photodiode**

Specifications (continued)

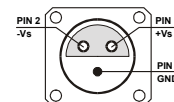
Output	Output voltage range	±1.2 V (@ 50 Ω load) for linear amplification and low harmonic distortion
	Max. output voltage range	±1.7 V (@ 50 Ω load)
	Output impedance	50 Ω (designed for 50 Ω load)
	Output noise	typ. 30 mV _{pp} or 4.5 mV _{RMS} (@ 50 Ω load, no signal on detector)
Power Supply	Supply voltage	±15 V
	Supply current	±60 mA typ. (depends on operating conditions, recommended power supply capability min. ±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

Spectral Response



Connectors	Input	HCA-S-200M-IN-FS 25 mm round flange for free space applications HCA-S-200M-IN-FC FC fiber optic receptacle
	Output	BNC jack (female)
	Power supply	Lemo® series 1S, 3-pin fixed socket (Mating plug type: FFA.1S.303.CLAC52) Pin 1: +15 V Pin 2: -15 V Pin 3: GND



SOPHISTICATED TOOLS FOR SIGNAL RECOVERY



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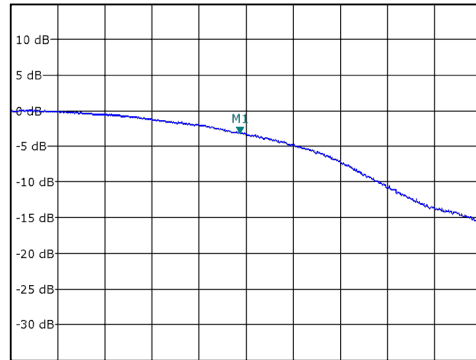
HCA-S-200M-IN

200 MHz Photoreceiver
with InGaAs PIN Photodiode

Typical Performance
Characteristics

Frequency response

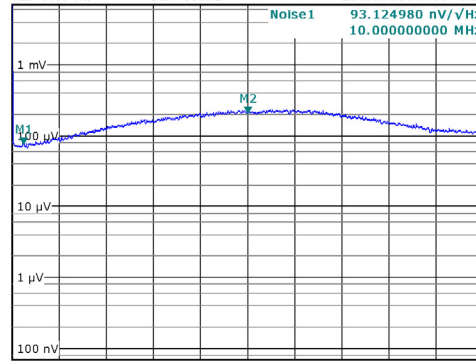
Offs 4.90 dB * RBW 1 MHz
Att 0 dB * VBW 1 MHz M1[1] -3.26 dB
Ref -15.10 dBm SWT 2.5ms 200.00000000 MHz



Start 10.0 MHz Stop 400.0 MHz

Noise spectrum

Att 0 dB * RBW 1 MHz
Ref 7.07 nV * VBW 1 kHz Noise2 274.681387 nV/√Hz
SWT 800ms 200.00000000 MHz
Noise1 93.124980 nV/√Hz
10.00000000 MHz



CF 200.0 MHz Span 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	93 nV/√Hz	4.9 pW/√Hz (@ 1550 nm)
2	200 MHz	275 nV/√Hz	15 pW/√Hz (@ 1550 nm)

SOPHISTICATED TOOLS FOR SIGNAL RECOVERY



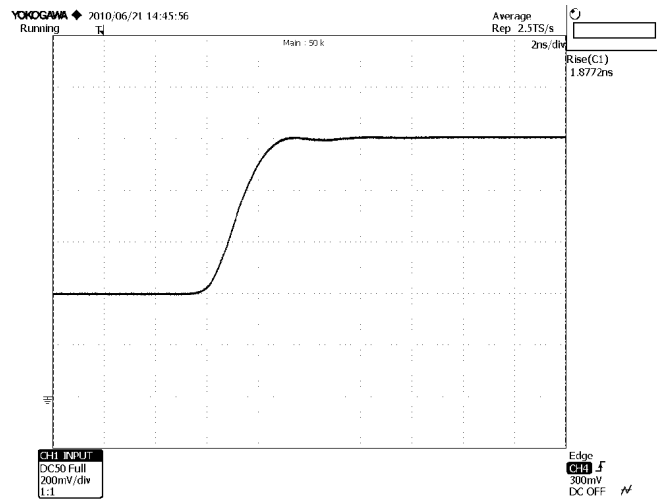
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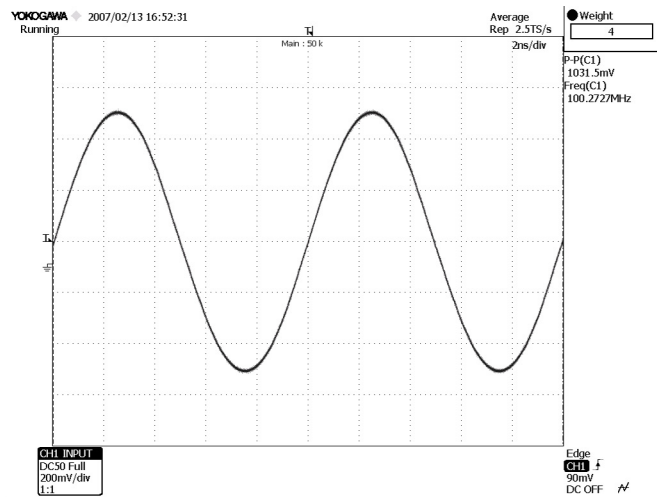
200 MHz Photoreceiver
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Typical Performance
Characteristics
(continued)

Pulse response to square wave input signal
(with 16 times averaging)



Large signal response
output signal for 100 MHz, 55 μ W modulated optical input signal
(with 4 times averaging)



SOPHISTICATED TOOLS FOR SIGNAL RECOVERY



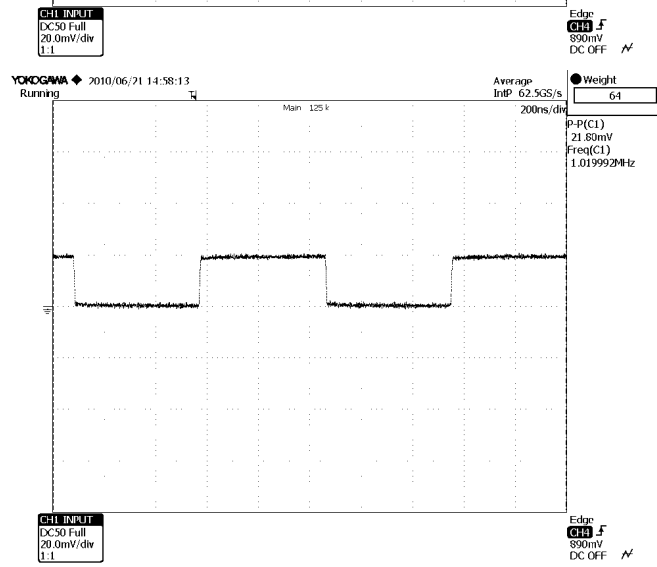
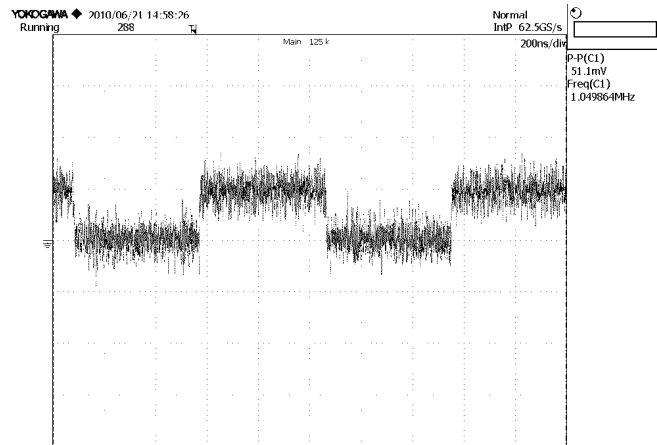
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HCA-S-200M-IN

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Typical Performance
Characteristics
(continued)

Small signal response
output signal for 1.2 μ W modulated optical input signal, 1 MHz square wave
(without (top) and with 64 times averaging (bottom))



Available Models

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

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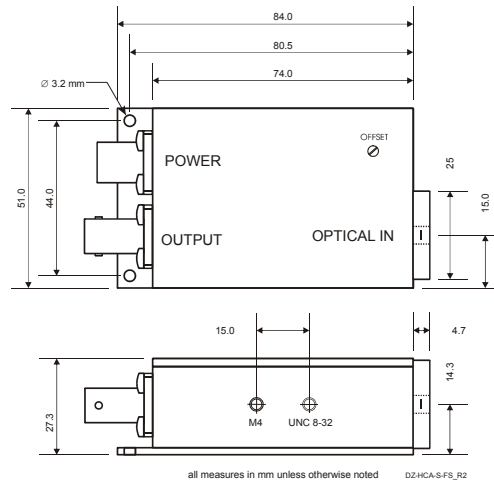
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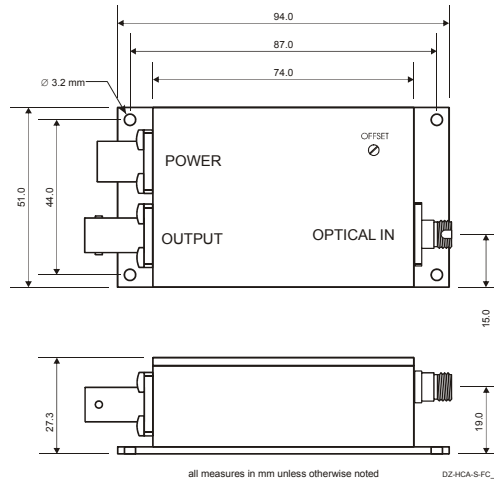
**200 MHz Photoreceiver
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Dimensions

HCA-S-200M-IN-FS



HCA-S-200M-IN-FC



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