

200 MHz Photoreceiver with InGaAs PIN Photodiode



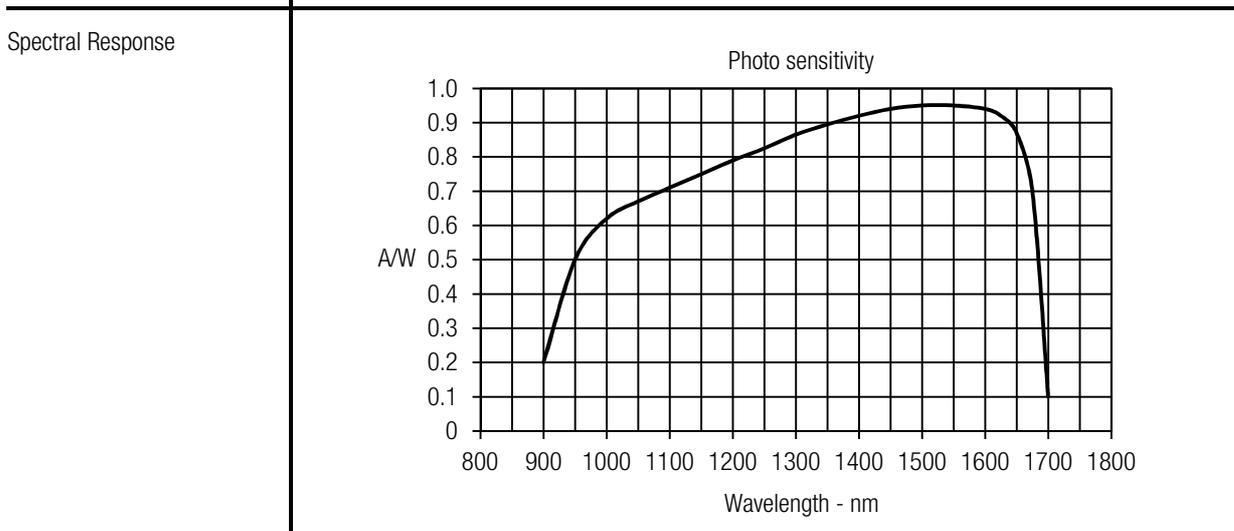
The picture shows the HCA-S-200M-IN-FS with free space input. The photoreceiver will be delivered without post holder and post.

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)
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)																												

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 $-40 \dots +100$ °C Operating temperature $0 \dots +60$ °C

Absolute Maximum Ratings	Optical input power 10 mW Power supply voltage ± 22 V
--------------------------	---



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
------------	---

200 MHz Photoreceiver with InGaAs PIN Photodiode

Typical Performance Characteristics

Frequency response

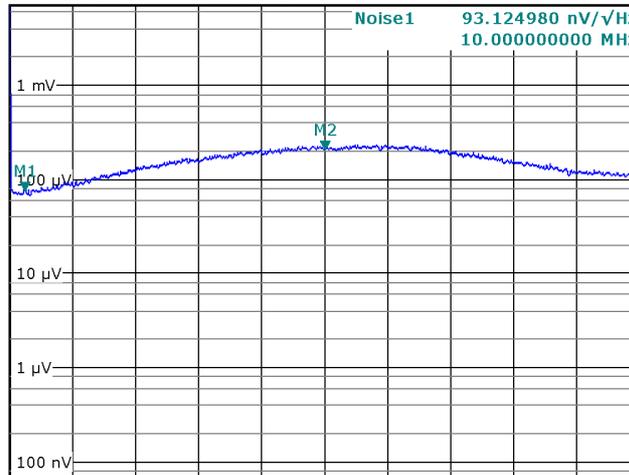
Offs 4.90 dB * RBW 1 MHz
 Att 0 dB * VBW 1 MHz
 Ref -15.10 dBm SWT 2.5ms M1[1] -3.26 dB
 200.000000000 MHz



Start 10.0 MHz Stop 400.0 MHz

Noise spectrum

Att 0 dB * RBW 1 MHz
 Ref 7.07 mV * VBW 1 kHz
 Ref 7.07 mV SWT 800ms Noise2 274.681387 nV/√Hz
 200.000000000 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.

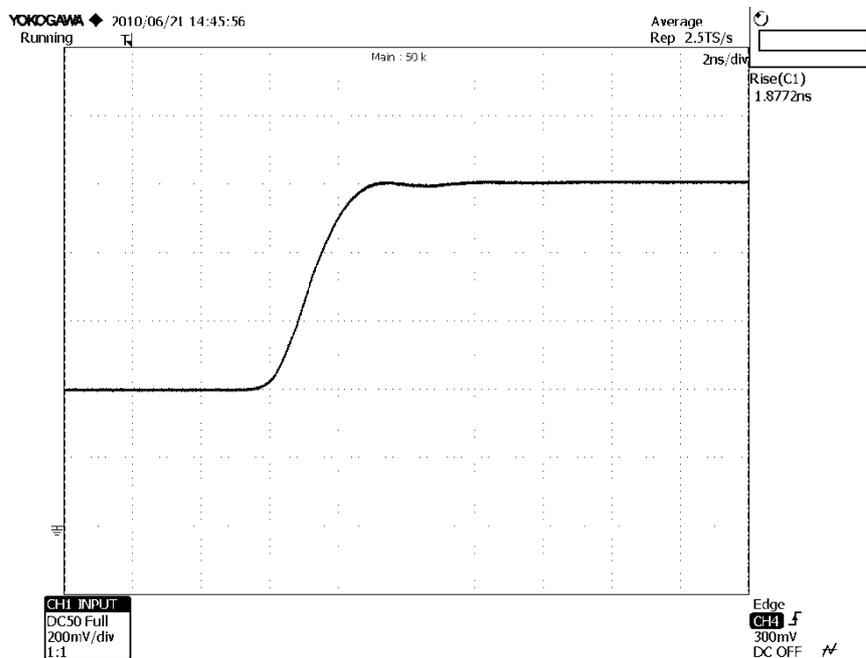
Conversion gain (V/W) = amplifier gain (20,000 V/A) x photo sensitivity (A/W).

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)

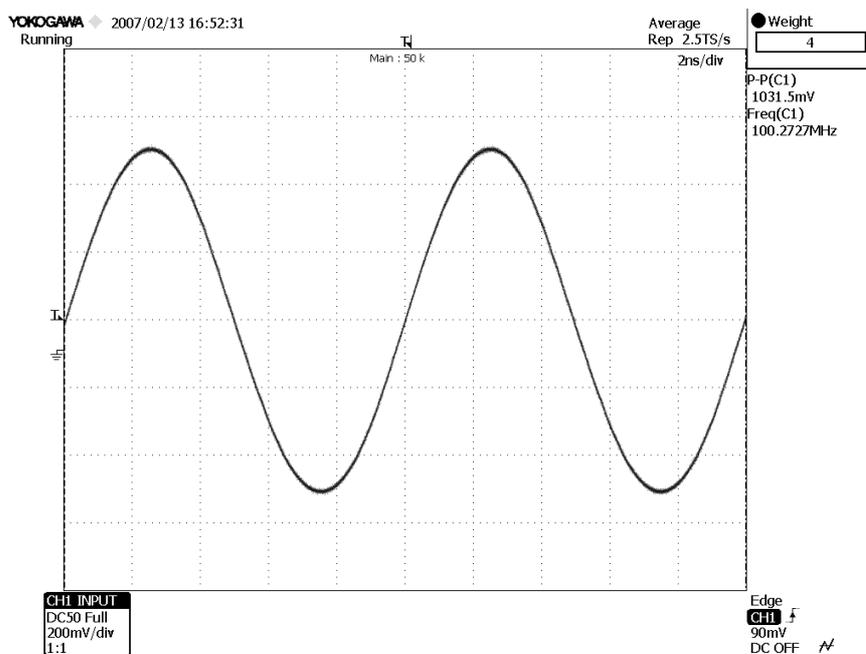
200 MHz Photoreceiver with InGaAs PIN Photodiode

Typical Performance
Characteristics
(continued)

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



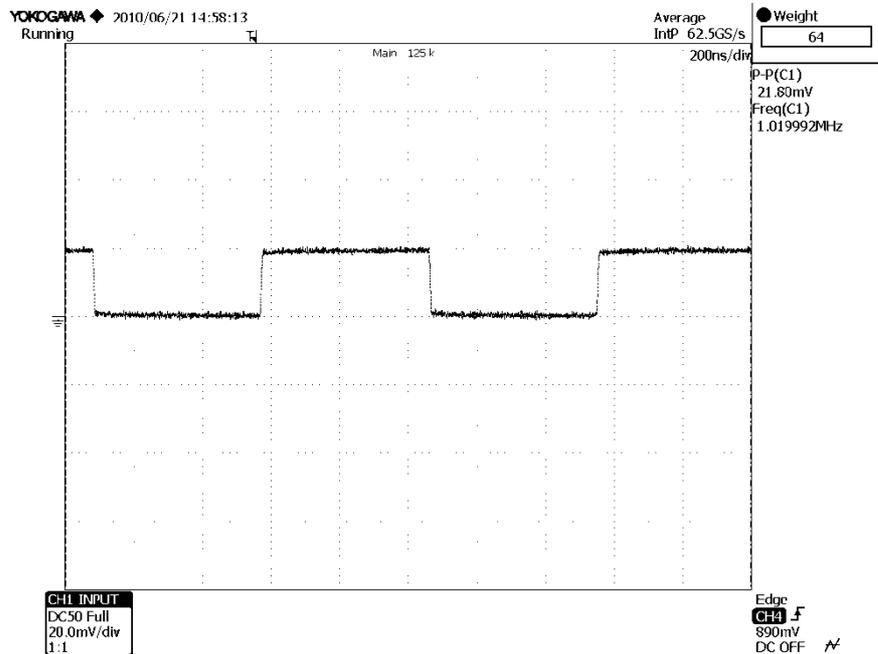
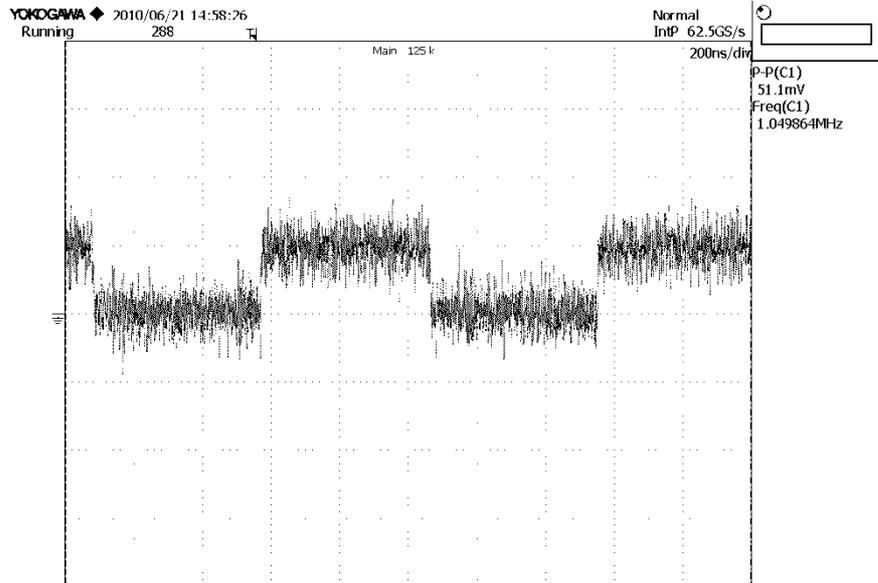
Large signal response
output signal for 100 MHz, 55 μ W modulated optical input signal
(with 4 times averaging)



200 MHz Photoreceiver with InGaAs PIN Photodiode

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

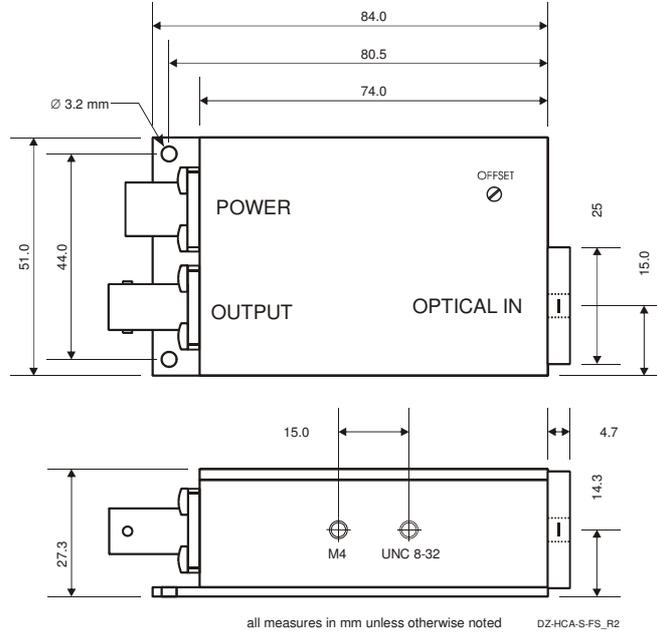
HCA-S-200M-IN-FS
HCA-S-200M-IN-FC
HCA-S

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

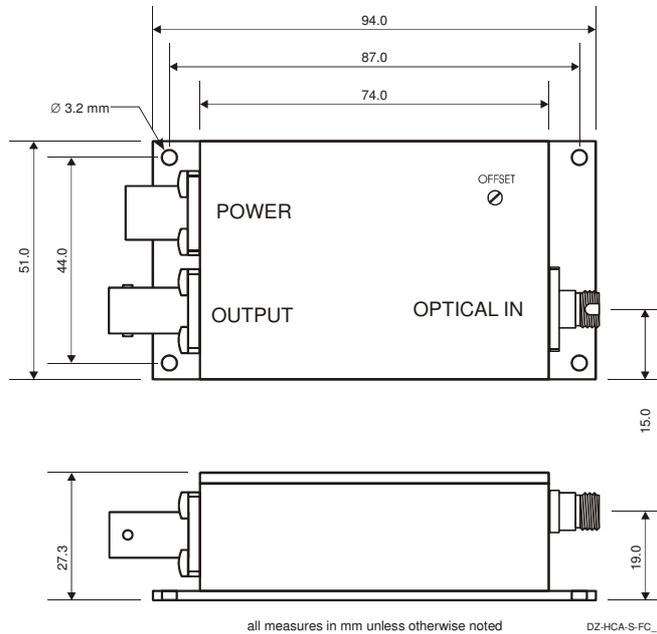
200 MHz Photoreceiver with InGaAs PIN Photodiode

Dimensions

HCA-S-200M-IN-FS



HCA-S-200M-IN-FC



FEMTO Messtechnik GmbH
Klosterstr. 64
10179 Berlin · Germany
Phone: +49 30 280 4711-0
Fax: +49 30 280 4711-11
Email: info@femto.de
www.femto.de

Specifications are subject to change without notice. Information provided herein is believed to be accurate and reliable. However, no responsibility is assumed by FEMTO Messtechnik GmbH for its use, nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of FEMTO Messtechnik GmbH. Product names mentioned may also be trademarks used here for identification purposes only.

© by FEMTO Messtechnik GmbH · Printed in Germany