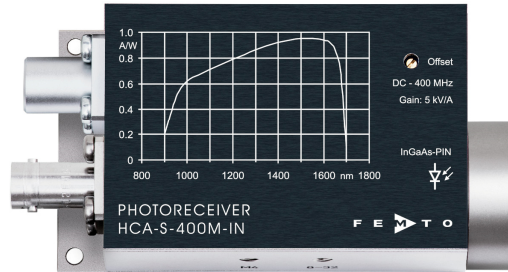


400 MHz Photoreceiver with InGaAs-PIN Photodiode







The picture shows model HCA-S-400M-IN-FST

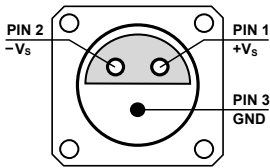
<p>Features</p>	<ul style="list-style-type: none"> • InGaAs-PIN photodiode • Bandwidth DC – 400 MHz • Amplifier transimpedance gain 5.0×10^3 V/A • Max. conversion gain 4.8×10^3 V/W @ 1550 nm • Spectral range 900 – 1700 nm • Free-space input 1.035"-40 threaded • Fiber optic input available as permanently mounted FC-input • UNC 8-32 and M4 tapped holes for mounting on standard posts with metric and imperial thread
<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>Block Diagram</p>	
<p>Intended Use</p>	<p>The HCA-S-400M-IN photoreceiver consists of an InGaAs photodiode and a subsequent low-noise fixed gain transimpedance amplifier. It is designed for fast conversion of small optical signals into equivalent output voltages. Operation is mostly self-explanatory. If in doubt, consult this document or contact support@femto.de.</p> <p>For safe operation, please refer to the damage thresholds specified in the "Absolute Maximum Ratings", "Temperature Range" and "Power Supply" sections of this document.</p> <p>The operating environment must be free of smoke, dust, grease, oil, condensing moisture, and other contaminants that could affect the operation or performance.</p>

BS01-HCA-S_R02

400 MHz Photoreceiver with InGaAs-PIN Photodiode

<p>Available Versions</p>	<p>HCA-S-400M-IN-FST</p> 	<p>1.035"-40 threaded flange with internally threaded coupler ring (outer diameter 30 mm) for free space applications, compatible with many optical standard accessories</p>
	<p>HCA-S-400M-IN-FC</p> 	<p>Fix/permanent FC fiber connector for high coupling efficiency and excellent conversion gain accuracy</p>
<p>Related Models</p>	<p>HCA-S-400M-SI-FST</p>	<p>Si-PIN, Ø 0.8 mm, 320 – 1000 nm free space input, 1.035"-40 threaded flange</p>
	<p>HCA-S-400M-SI-FC</p>	<p>Si-PIN, Ø 0.8 mm, 320 – 1000 nm FC fiber connector (fix/permanent)</p>
<p>Available Accessories</p>	<p>PRA-PAP</p> 	<p>Alternative mounting option: Post adapter plate, easy to mount on FEMTO photoreceiver series OE, FWPR, PWPR, HCA-S and LCA-S.</p>
	<p>PS-15-25-L</p> 	<p>Power Supply Input: 100 – 240 VAC Output: ±15 VDC</p>
<p>Specifications</p>	<p>Test conditions</p> <p>Gain</p> <p>Transimpedance gain</p> <p>Gain accuracy</p> <p>Conversion gain</p> <p>Frequency Response</p> <p>Lower cut-off frequency</p> <p>Upper cut-off frequency (–3 dB)</p> <p>Gain flatness</p> <p>Time Response</p> <p>Rise/fall time (10 % – 90 %)</p> <p>Input</p> <p>Noise equivalent power (NEP)</p> <p>Optical saturation power</p> <p>Input offset compensation range</p>	<p>$V_S = \pm 15 \text{ V}$, $T_A = 25 \text{ }^\circ\text{C}$, output load impedance $50 \text{ }\Omega$, warm-up 20 minutes (min. 10 minutes recommended)</p> <p>$5.0 \times 10^3 \text{ V/A}$ (@ output load $50 \text{ }\Omega$)</p> <p>$\pm 1 \%$ (electrical)</p> <p>$4.8 \times 10^3 \text{ V/W typ.}$ (@ 1550 nm, output load $50 \text{ }\Omega$)</p> <p>DC</p> <p>400 MHz ($\pm 15 \%$)</p> <p>$\pm 1 \text{ dB}$</p> <p>1.0 ns</p> <p>24 pW/$\sqrt{\text{Hz}}$ (@ 1550 nm, 100 MHz)</p> <p>200 μW (for linear amplification, @ 1550 nm)</p> <p>$\pm 200 \text{ }\mu\text{A}$, adjustable by offset potentiometer</p>

400 MHz Photoreceiver with InGaAs-PIN Photodiode

Specifications (continued)		
Detector	Detector Active area (FST version) Active area (FC version)	InGaAs-PIN photodiode Ø 0.3 mm integrated ball lens suitable for fibers up to 62.5 µm core diameter
	Spectral range Max. sensitivity	900 – 1700 nm 0.95 A/W typ. (@ 1550 nm)
Output	Output voltage range Max. output voltage range Output impedance Output noise	±1.0 V (@ 50 Ω output load) for linear operation and low harmonic distortion ±1.5 V (@ 50 Ω output load) 50 Ω (terminate with 50 Ω load) 3 mV RMS (20 mV peak-peak) typ. (@ 50 Ω load, no signal on detector, measurement bandwidth 1.5 GHz)
Optical Input Connector	Material FST flange Material FST coupler ring Material FC receptacle	1.4305 stainless steel, nickel-plated 1.4305 stainless steel, glass bead blasted nickel silver
Power Supply	Supply voltage Supply current	±15 V (±14.5 V ... ±16.5 V) ±55 mA (depends on operating conditions, recommended power supply capability min. ±150 mA)
Case	Weight Material	209 g (0.46 lbs) HCA-S-400M-IN-FST incl. coupler ring 188 g (0.41 lbs) HCA-S-400M-IN-FC AlMg4.5Mn, nickel-plated
Temperature Range	Storage temperature Operating temperature	-30 °C ... +85 °C 0 °C ... +60 °C
Absolute Maximum Ratings	Optical input power (CW) Power supply voltage	10 mW ±20 V
Connectors	Input Output Power supply	HCA-S-400M-IN-FST 1.035"-40 threaded flange for free space applications and for use with various types of optical standard accessories HCA-S-400M-IN-FC FC fiber optic connector (fix/permanent, FC/PC and FC/APC compatible) BNC jack (female) 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
Scope of Delivery	HCA-S-400M-IN, internally threaded coupler ring (FST version only), LEMO® 3-pin connector, datasheet, transport package	

400 MHz Photoreceiver with InGaAs-PIN Photodiode

Ordering Information

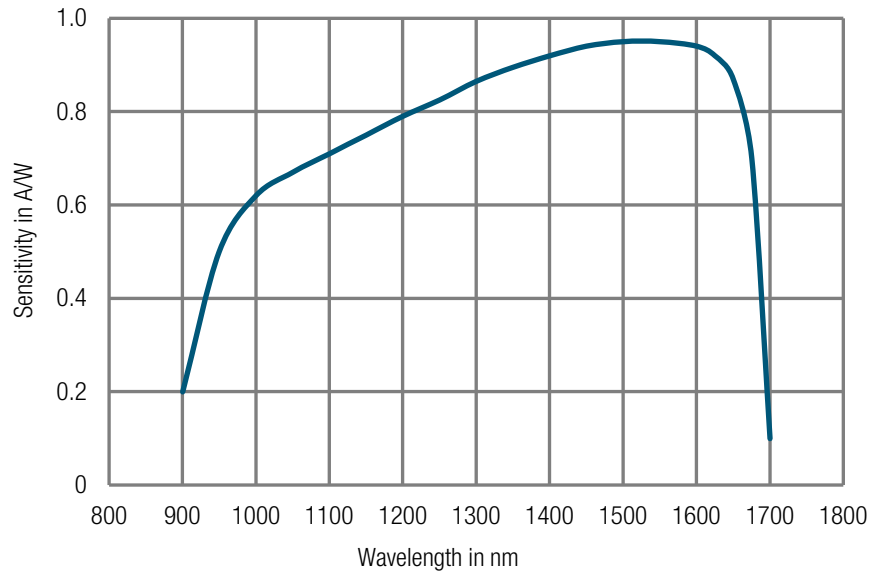
HCA-S-400M-IN-FST

1.035"-40 threaded flange for free space applications and for use with various types of optical standard accessories.

HCA-S-400M-IN-FC

FC fiber optic connector (fix/permanent, FC/PC and FC/APC compatible).

Spectral Response

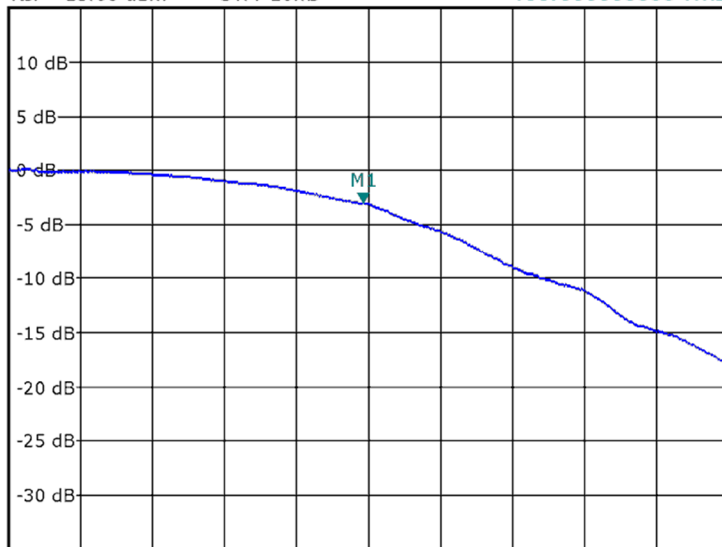


DB-Sens-HCA-S-400M-IN_R01

Typical Performance Characteristics

Frequency response

Offs 5.00 dB * RBW 300 kHz
 Att 0 dB VBW 1 MHz M1[1] -3.06 dB
 Ref -15.00 dBm SWT 10ms 400.00000000 MHz



Start 10.0 MHz

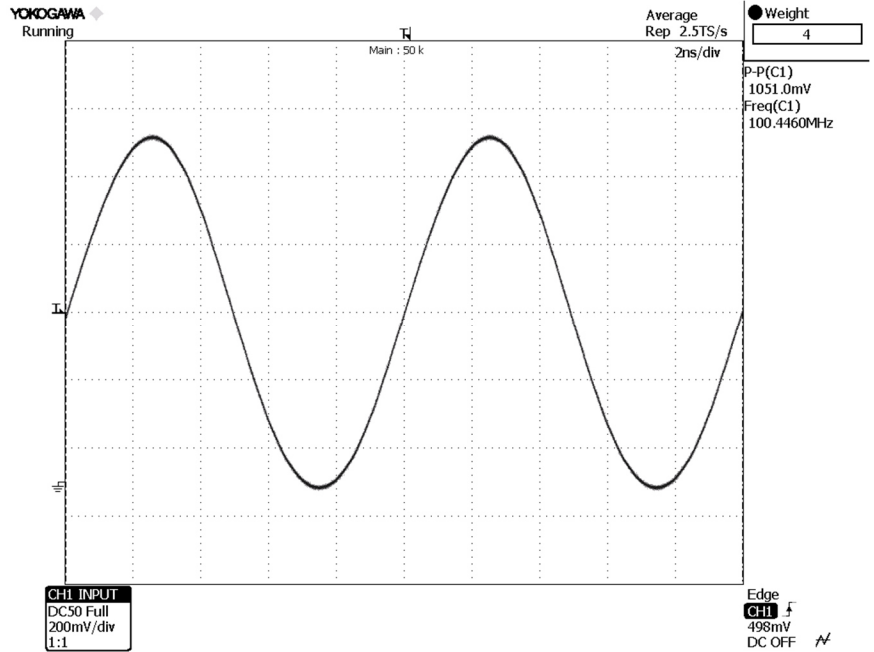
Stop 800.0 MHz

PD-HCA-S-400M-IN-bw_R01

400 MHz Photoreceiver with InGaAs-PIN Photodiode

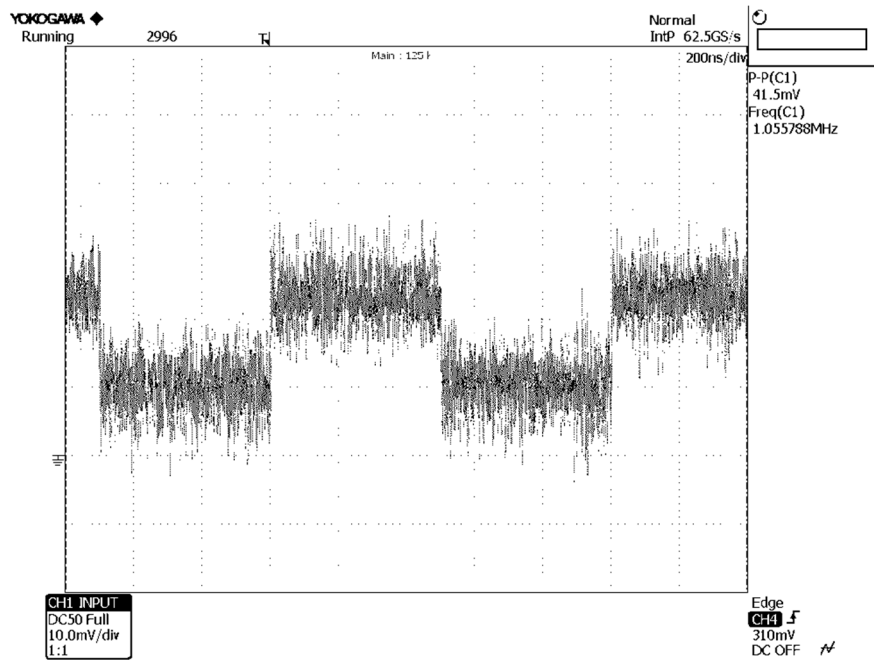
Typical Performance
Characteristics (continued)

Large signal response
output signal for 100 MHz, 210 μ W modulated optical input signal
(with 4 times averaging)



PD-HCA-S-400M-IN-large-sinus_R01

Small signal response
output signal for 3 μ W modulated optical input signal, 1 MHz square wave, without averaging

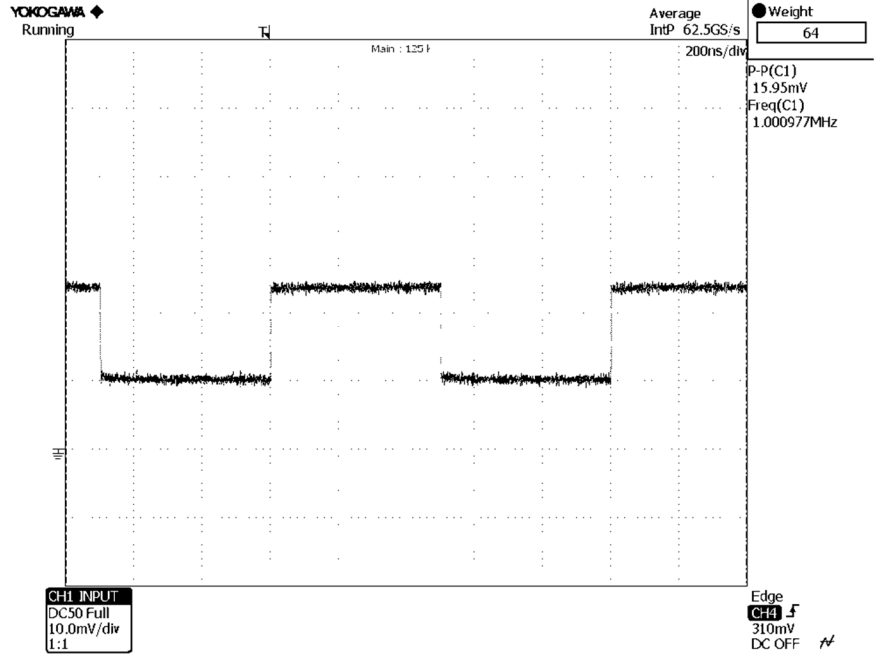


PD-HCA-S-400M-IN-noise-square_R01

400 MHz Photoreceiver with InGaAs-PIN Photodiode

Typical Performance
Characteristics (continued)

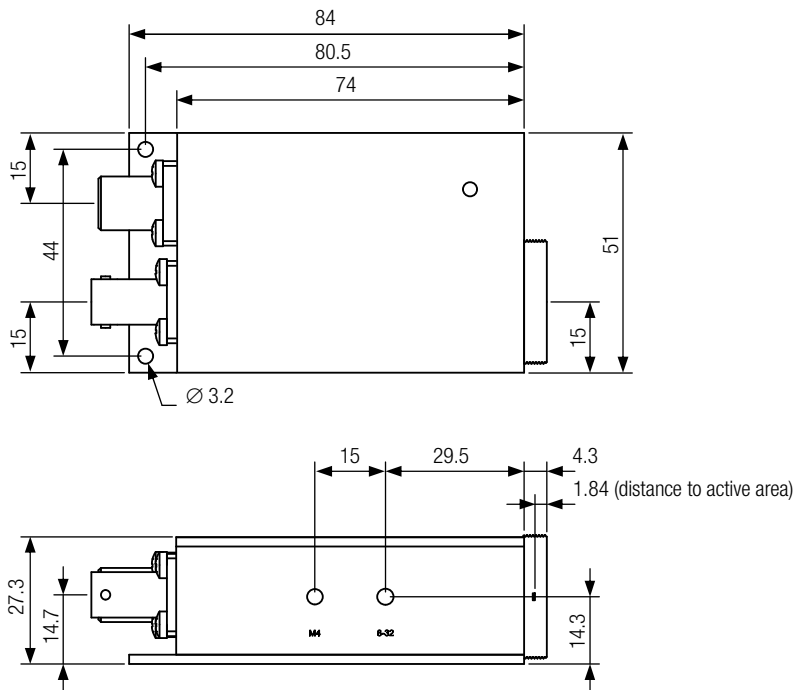
Small signal response
output signal for 3 μ W modulated optical input signal, 1 MHz square wave,
with 64 times averaging



PD-HCA-S-400M-IN-noise-square_average_R01

Dimensions

HCA-S-400M-IN-FST (1.035"-40 threaded free space input)



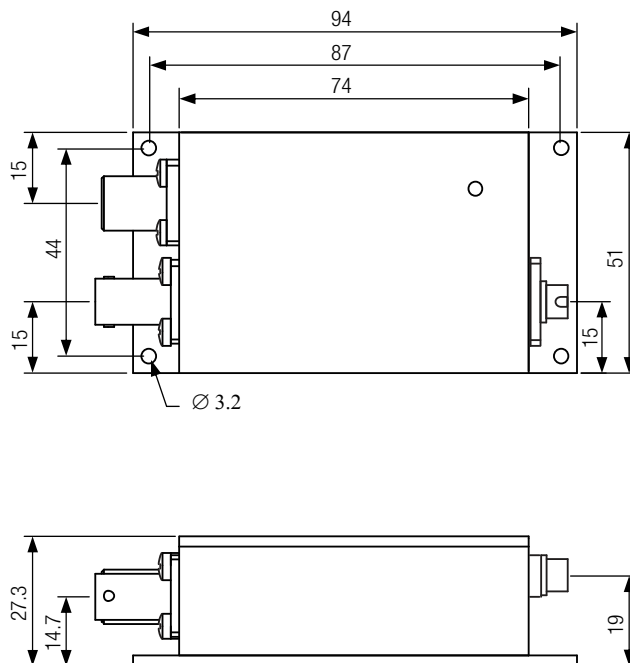
all dimensions in mm unless otherwise noted

DZ-HCA-S_FST_R1

400 MHz Photoreceiver with InGaAs-PIN Photodiode

Dimensions (continued)

HCA-S-400M-IN-FC (FC fiber optic connector)



DZ:HCA-S_FC_R1

all dimensions in mm unless otherwise noted

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