

400 MHz Photoreceiver with Si-PIN Photodiode



The picture shows model HCA-S-400M-SI-FS.
The photoreceiver will be delivered without post holder and post.

<p>Features</p>	<ul style="list-style-type: none"> • Si-PIN photodiode, 0.8 mm active diameter • Bandwidth DC – 400 MHz • Amplifier transimpedance gain 5.0×10^3 V/A • Max. conversion gain 2.7×10^3 V/W @ 800 nm • Spectral range 320 – 1000 nm • Free-space input 1.035"-40 threaded, alternatively 25 mm diameter unthreaded • Easily convertible to fiber optic input (FC and FSMA) with optionally available screw-on adapters • Fiber optic input also available as permanently mounted FC- or FSMA-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>	

BS01-HCA-S_R02

400 MHz Photoreceiver with Si-PIN Photodiode

Available Versions

HCA-S-400M-SI-FST

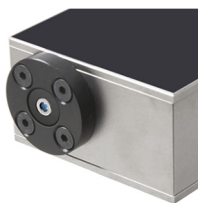


Picture shows 1.035"-40 threaded flange with internally threaded coupler ring (outer diameter 30 mm)

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

Optionally available:
Fiber adapters PRA-FC, PRA-FCA and PRA-FSMA.
The coupling efficiency will depend on fiber type. With the relative large 0.8 mm dia. photodiode installed in the HCA-S-400M-SI input coupling is not critical. However, standard SM 9/125 fibers (PC or APC) with low numerical aperture (NA) are recommended for ensuring near 100% coupling efficiency.

HCA-S-400M-SI-FS



Picture shows unthreaded flange with 25 mm diameter

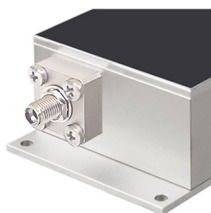
25 mm dia. unthreaded flange for free space applications. Compatible with many optical standard accessories.

HCA-S-400M-SI-FC








Fix/permanent FC fiber connector for high coupling efficiency and excellent conversion gain accuracy.

HCA-S-400M-SI-SMA



Fix/permanent FSMA fiber connector for high coupling efficiency and excellent conversion gain accuracy.

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Related Models	<p>HCA-S-400M-IN-FST InGaAs-PIN, Ø 0.3 mm, 900 - 1700 nm free space input, 1.035"-40 threaded flange</p> <p>HCA-S-400M-IN-FS InGaAs-PIN, Ø 0.3 mm, 900 - 1700 nm free space input, 25 mm dia. unthreaded flange</p> <p>HCA-S-400M-IN-FC InGaAs-PIN, integrated ball lens, 900 - 1700 nm FC fiber connector (fix/permanent)</p>
Available Accessories	<p>PRA-FC  PRA-FCA  PRA-FSMA  Fiber-adapter with external 1.035"-40 thread (suitable for FST models only).</p> <p>PRA-PAP  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  Power supply Input: 100 – 240 VAC Output: ±15 VDC</p>
Specifications	<p>Test conditions $V_S = \pm 15 \text{ V}$, $T_A = 25 \text{ }^\circ\text{C}$, output load impedance $50 \text{ } \Omega$, warm-up 20 minutes (min. 10 minutes recommended)</p> <p>Gain Transimpedance gain $5.0 \times 10^3 \text{ V/A}$ (@ output load $50 \text{ } \Omega$) Gain accuracy $\pm 1 \%$ (electrical) Conversion gain $2.7 \times 10^3 \text{ V/W typ.}$ (@ 800 nm, output load $50 \text{ } \Omega$)</p> <p>Frequency Response Lower cut-off frequency DC Upper cut-off frequency (–3 dB) 400 MHz ($\pm 10 \%$) Gain flatness $\pm 1 \text{ dB}$</p> <p>Time Response Rise/fall time (10 % – 90 %) 1.0 ns</p> <p>Input Noise equivalent power (NEP) $40 \text{ pW}/\sqrt{\text{Hz}}$ (@ 800 nm, 100 MHz) Optical saturation power $400 \text{ } \mu\text{W}$ (for linear amplification, @ 800 nm) Input offset compensation range $\pm 200 \text{ } \mu\text{A}$, adjustable by offset potentiometer</p> <p>Detector Detector Si-PIN photodiode Active area $\text{Ø } 0.8 \text{ mm}$ Spectral range 320 – 1000 nm Max. sensitivity 0.55 A/W typ. (@ 800 nm)</p>

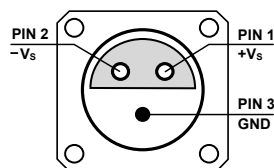
400 MHz Photoreceiver with Si-PIN Photodiode

Specifications (continued)

Output	Output voltage range	±1.0 V (@ 50 Ω output load) for linear operation and low harmonic distortion
	Max. output voltage range	±1.5 V (@ 50 Ω load)
	Output impedance	50 Ω (terminate with 50 Ω load)
	Output noise	3 mV _{RMS} (20 mV _{PP}) typ. (@ 50 Ω load, no signal on detector, measurement bandwidth 1.5 GHz)
Input Flange	Material	1.4305 stainless steel, nickel-plated (FST flange) AlMg4.5Mn, nickel-plated (FS flange)
Coupler Ring (FST version only)	Material	1.4305 stainless steel, glass bead blasted
Power Supply	Supply voltage	±15 V (±14.5 V ... ±16.5 V)
	Supply current	±55 mA (depends on operating conditions, recommended power supply capability min. ±150 mA)
Case	Weight	209 g (0.46 lbs) HCA-S-400M-SI-FST incl. coupler ring 196 g (0.43 lbs) HCA-S-400M-SI-FS 188 g (0.41 lbs) HCA-S-400M-SI-FC 200 g (0.44 lbs) HCA-S-400M-SI-SMA
	Material	AlMg4.5Mn, nickel-plated
Temperature Range	Storage temperature	-30 °C ... +85 °C
	Operating temperature	0 °C ... +60 °C

Absolute Maximum Ratings	Optical input power (CW)	20 mW
	Power supply voltage	±20 V

Connectors	Input	HCA-S-400M-SI-FST	1.035"-40 threaded flange for free space applications and for use with various types of optical standard accessories
		HCA-S-400M-SI-FS	25 mm dia. unthreaded flange for free space applications
		HCA-S-400M-SI-FC	FC fiber optic connector (fix/permanent, FC/PC and FC/APC compatible)
		HCA-S-400M-SI-SMA	FSMA fiber optic connector (fix/permanent)
	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

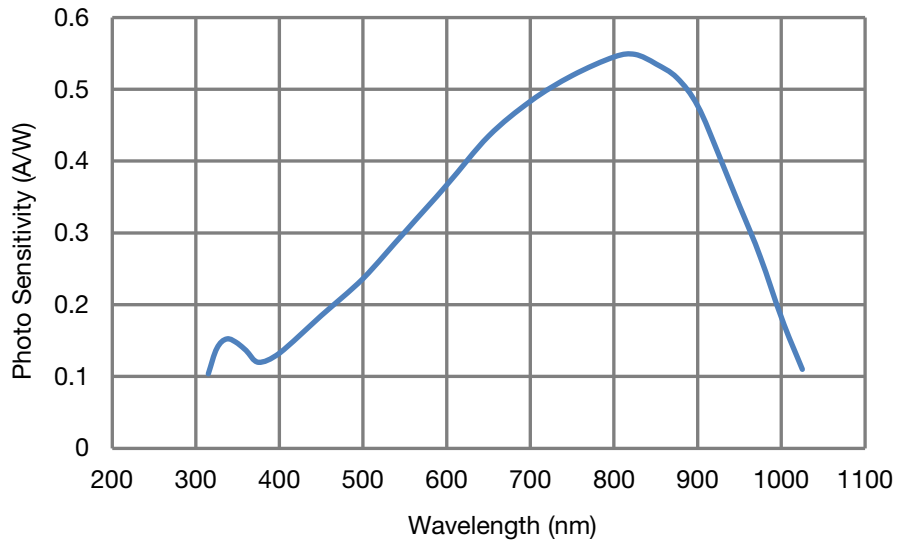
Scope of Delivery	HCA-S-400M-SI, internally threaded coupler ring (FST version only), LEMO® 3-pin connector, datasheet, transport package
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400 MHz Photoreceiver with Si-PIN Photodiode

Ordering Information

HCA-S-400M-SI-FST	1.035"-40 threaded flange for free space applications and for use with various types of optical standard accessories.
HCA-S-400M-SI-FS	25 mm dia. unthreaded flange for free space applications.
HCA-S-400M-SI-FC	FC fiber optic connector (fix/permanent, FC/PC and FC/APC compatible).
HCA-S-400M-SI-SMA	FSMA fiber optic connector (fix/permanent).

Spectral Responsivity

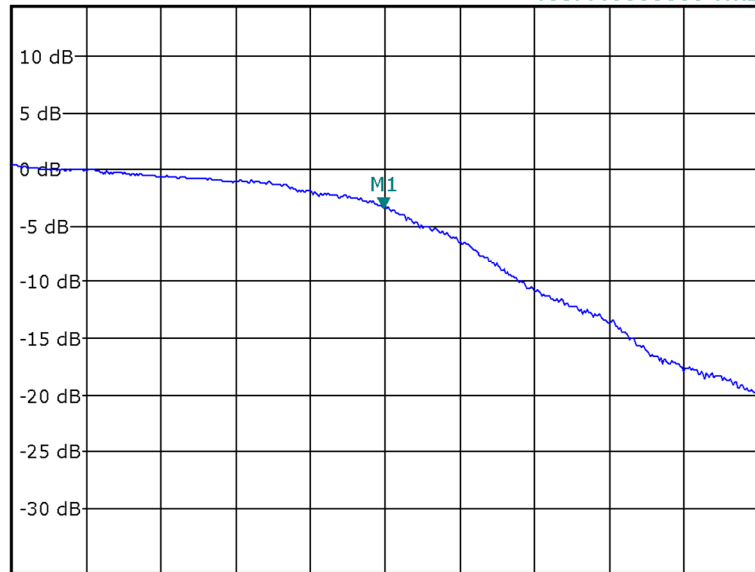


DB-Sens-HCA-S-400M-SI_R01

Typical Performance Characteristics

Frequency response

Att 0 dB RBW 3 MHz
 Ref -20.0 dBm * VBW 1 MHz M1[1] -3.36 dB
 SWT 2.5ms 408.440000000 MHz



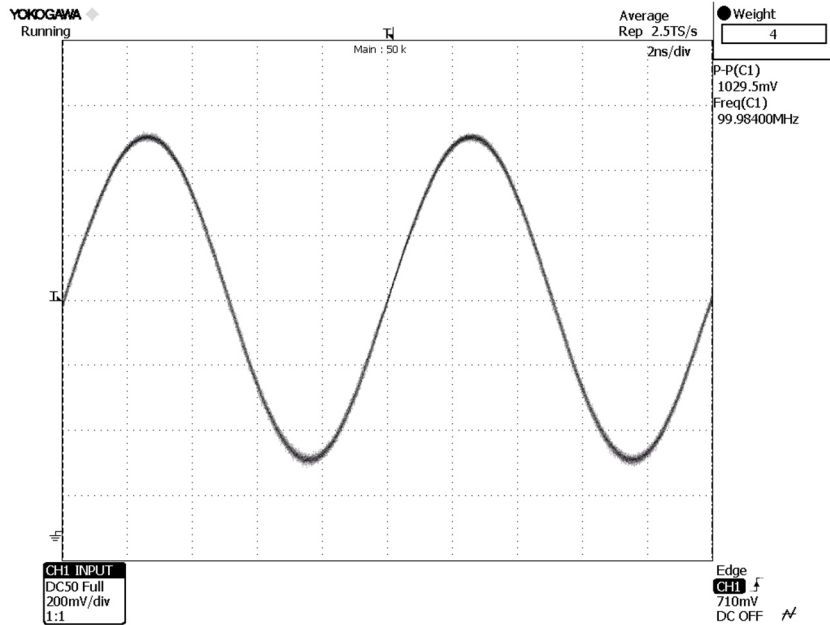
Start 20.0 MHz Stop 800.0 MHz

PD-HCA-S-400M-SI-bw_R01

400 MHz Photoreceiver with Si-PIN Photodiode

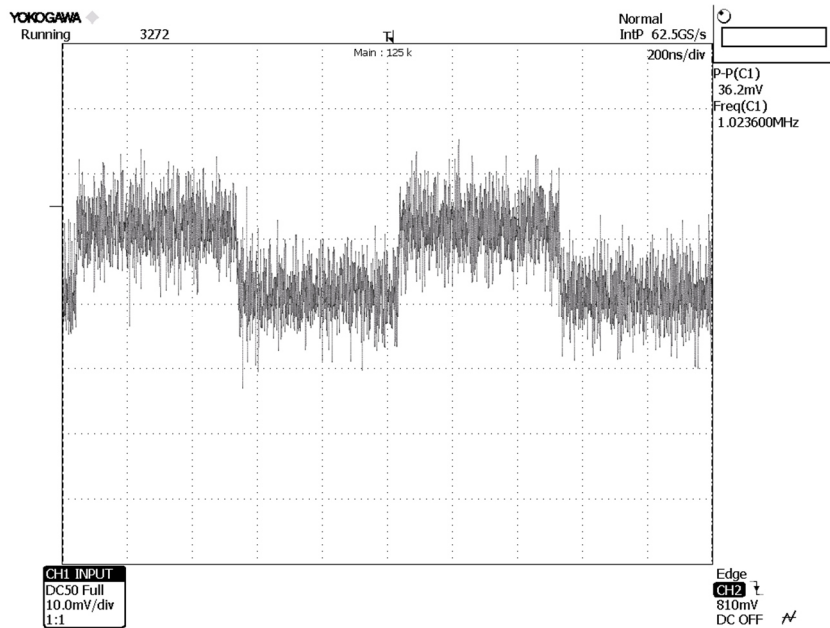
Typical Performance Characteristics (continued)

Large signal response
output signal for 100 MHz, 370 μ W modulated optical input signal
(with 4 times averaging)



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

Small signal response
output signal for 3.7 μ W modulated optical input signal, 1 MHz square wave, without averaging

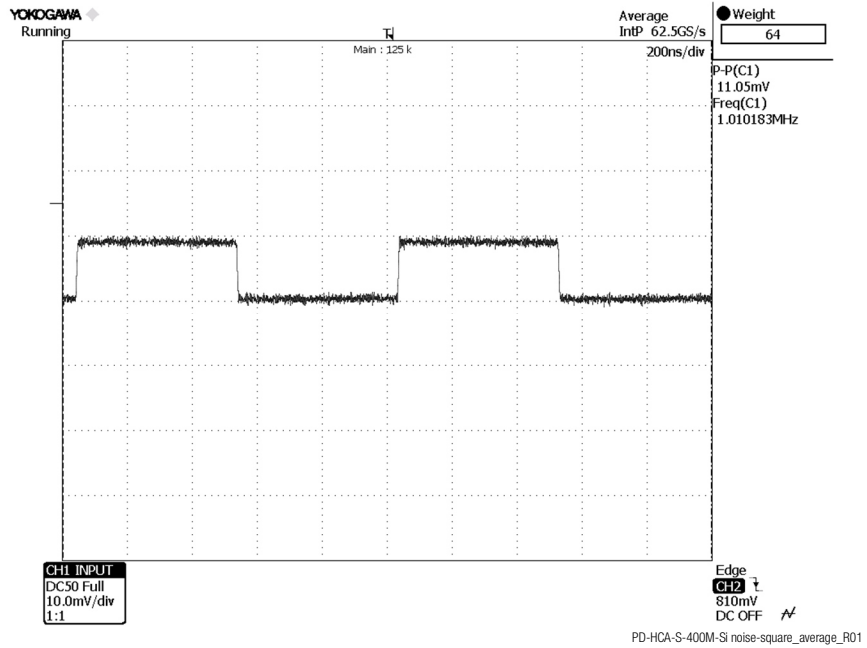


PD-HCA-S-400M-Si noise-square_R01

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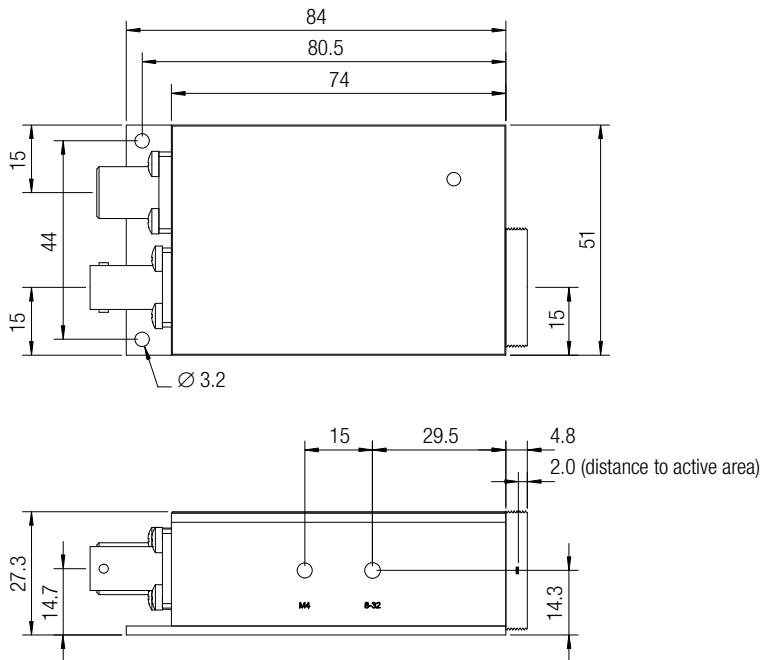
Typical Performance Characteristics (continued)

Small signal response output signal for 3.7 μ W modulated optical input signal, 1 MHz square wave, with 64 times averaging



Dimensions

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



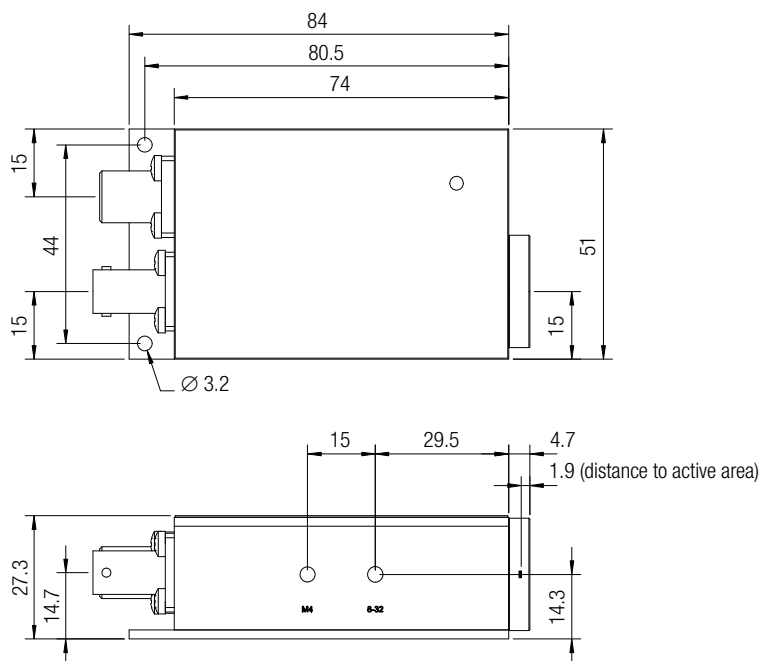
DZ-HCA-S-X00-SI_FST_R1

all dimensions in mm unless otherwise noted

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Dimensions (continued)

HCA-S-400M-SI-FS (25 mm dia. unthreaded free space input)



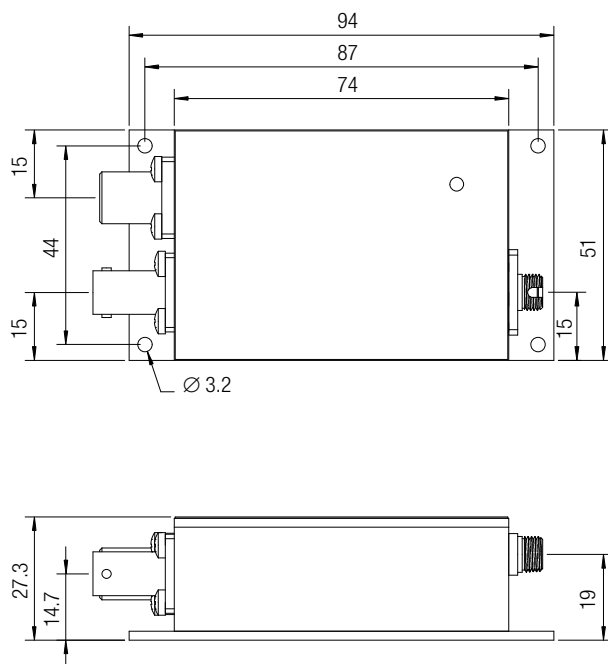
DZ-HCA-S-X00-SI_FS_R1

all dimensions in mm unless otherwise noted

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Dimensions (continued)

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



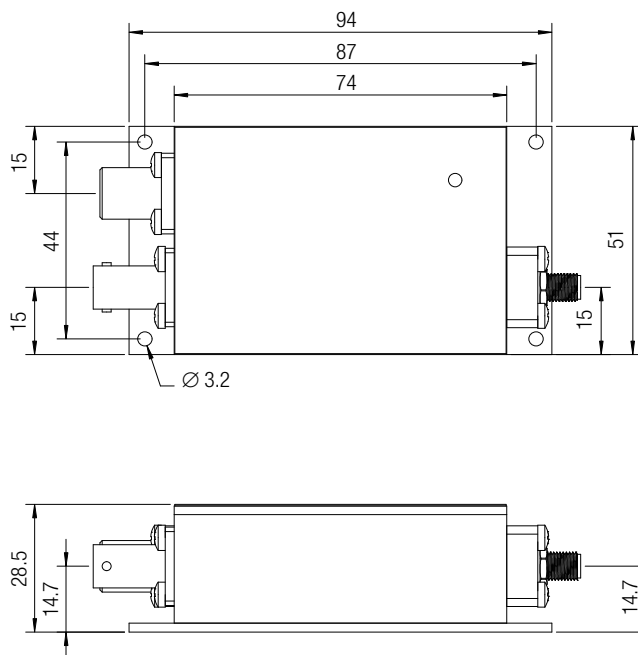
DZ-HCA-S-XX-XX_FC_R1

all dimensions in mm unless otherwise noted

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Dimensions (continued)

HCA-S-400M-SI-SMA (FSMA fiber optic connector)



DZ-HCA-S-XX-XX-SMA_R1

all dimensions in mm unless otherwise noted

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

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