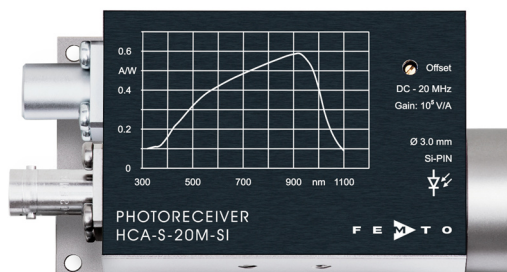


20 MHz Photoreceiver with Si-PIN Photodiode



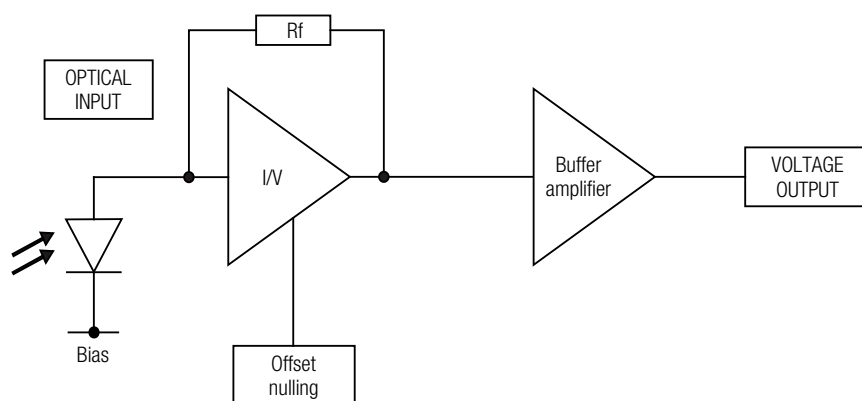
Features

- **Si-PIN photodiode**
- **Bandwidth DC – 20 MHz**
- **Amplifier transimpedance gain 1.0×10^5 V/A**
- **Max. conversion gain 5.9×10^4 V/W @ 920 nm**
- **Spectral range 320 – 1060 nm**
- **Free-space input 1.035"-40 threaded, easily convertible to fiber optic input (FC and FSMA) with optionally available screw-on adapters**
- **UNC 8-32 and M4 tapped holes for mounting on standard posts with metric and imperial thread**

Applications

- **Spectroscopy**
- **Fast pulse and transient measurements**
- **Optical triggering**
- **Optical front-end for oscilloscopes, A/D converters and HF lock-in amplifiers**

Block Diagram



BS01-HCA-S_R02

Intended Use

The HCA-S-20M-SI photoreceiver consists of an Si 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.

For safe operation, please refer to the damage thresholds specified in the "Absolute Maximum Ratings", "Temperature Range" and "Power Supply" sections of this document.

The operating environment must be free of smoke, dust, grease, oil, condensing moisture, and other contaminants that could affect the operation or performance.

20 MHz Photoreceiver with Si-PIN Photodiode

Available Versions	HCA-S-20M-SI-FST  1.035"-40 threaded flange with internally threaded coupler ring (outer diameter 30 mm) for free space applications, compatible with many optical standard accessories Optionally available: Fiber adapters PRA-FC, PRA-FCA and PRA-FSMA, with the relative large 3.0 mm dia. photodiode installed in the HCA-S-20M-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
Related Models	HCA-S-20M-BSI-FST HCA-S-20M-IN-FST Black silicon photodiode, 1 × 1 mm, 200 – 1100 nm, free space input, 1.035"-40 threaded flange InGaAs-PIN, Ø 0.5 mm, 900 - 1700 nm free space input, 1.035"-40 threaded flange
Available Accessories	PRA-FC PRA-FCA PRA-FSMA  Fiber-adapter with external 1.035"-40 thread (suitable for FST models only) PRA-PAP  Alternative mounting option: post adapter plate, easy to mount on FEMTO photoreceiver series OE, FWPR, PWPR, HCA-S and LCA-S PS-15-25-L  Power Supply input: 100 – 240 VAC output: ±15 VDC CAB-HF1  Double shielded high performance cables, minimizes ground related noise, designed for precise measurement of small signals

20 MHz Photoreceiver with Si-PIN Photodiode

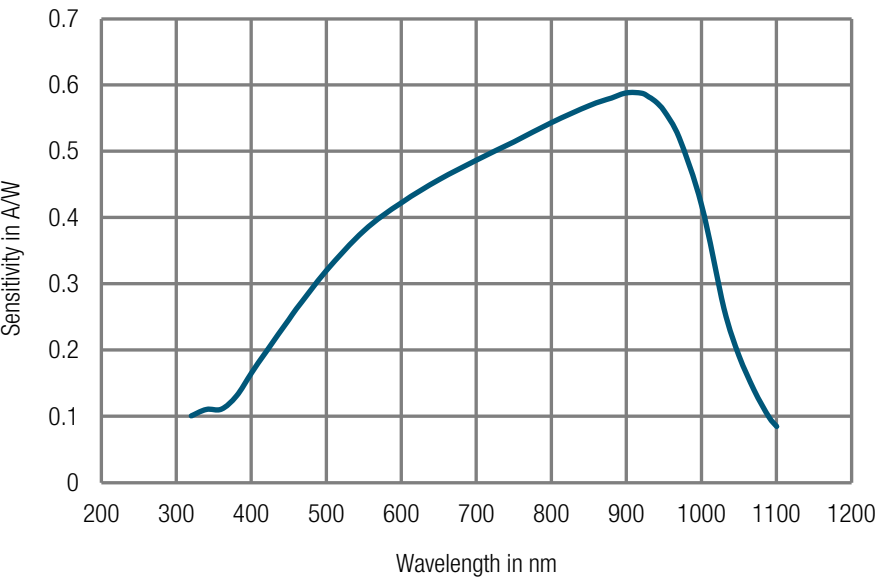
Specifications	Test conditions	$V_s = \pm 15\text{ V}$, $T_A = 25\text{ }^\circ\text{C}$, output load impedance $50\text{ }\Omega$, warm-up 20 minutes (min. 10 minutes recommended)
Gain	Transimpedance gain Gain accuracy Conversion gain	$1.0 \times 10^5\text{ V/A}$ (@ output load $50\text{ }\Omega$) $\pm 1\text{ }\%$ (electrical) $5.9 \times 10^4\text{ V/W typ.}$ (@ 920 nm , output load $50\text{ }\Omega$)
Frequency Response	Lower cut-off frequency Upper cut-off frequency (-3 dB)	DC $20\text{ MHz } (\pm 15\text{ }\%)$
Time Response	Rise/fall time ($10\text{ }\% - 90\text{ }\%$)	$19\text{ ns } (\pm 15\text{ }\%)$
Input	Noise equivalent power (NEP) Optical saturation power Input offset compensation range	$4.5\text{ pW}/\sqrt{\text{Hz}}$ (@ 920 nm , 1 MHz) $30\text{ }\mu\text{W}$ (for linear amplification, @ 920 nm) $\pm 8.0\text{ }\mu\text{A}$, adjustable by offset potentiometer
Detector	Detector Active area Spectral range Max. sensitivity	Si-PIN photodiode $\varnothing 3\text{ mm}$ $320 - 1060\text{ nm}$ 0.6 A/W typ. (@ 920 nm)
Output	Output voltage range Max. output voltage range Output impedance Output noise	$\pm 1.5\text{ V}$ (@ $50\text{ }\Omega$ output load) for linear operation and low harmonic distortion $\pm 2\text{ V}$ (@ $50\text{ }\Omega$ output load) $50\text{ }\Omega$ (terminate with $50\text{ }\Omega$ load) 3.0 mV RMS (19.5 mV peak-peak) typ. (@ $50\text{ }\Omega$ load, no signal on detector, measurement bandwidth 200 MHz)
Optical Input Connector	Material FST flange Material FST coupler ring	$1.4305\text{ stainless steel, nickel-plated}$ $1.4305\text{ stainless steel, glass bead blasted}$
Power Supply	Supply voltage Supply current	$\pm 15\text{ V } (\pm 14.5\text{ V} \dots \pm 16.5\text{ V})$ $\pm 50\text{ mA}$ (depends on operating conditions, recommended power supply capability min. $\pm 150\text{ mA}$)
Case	Weight Material	$209\text{ g } (0.46\text{ lbs})$ including coupler ring AlMg4.5Mn, nickel-plated
Temperature Range	Storage temperature Operating temperature	$-30\text{ }^\circ\text{C} \dots +85\text{ }^\circ\text{C}$ $0\text{ }^\circ\text{C} \dots +60\text{ }^\circ\text{C}$
Absolute Maximum Ratings	Optical input power (CW) Power supply voltage	6 mW $\pm 20\text{ V}$
Connectors	Input Output Power supply	$1.035\text{'-40 threaded flange}$ for free space applications and for use with various types of optical standard accessories BNC jack (female) LEMO® series 1S, 3-pin fixed socket (mating plug type: FFA.1S.303.CLAC52)
PIN 2 -Vs PIN 1 +Vs Pin 1: +15 V		

20 MHz Photoreceiver
with Si-PIN Photodiode

Scope of Delivery

HCA-S-20M-SI, internally threaded coupler ring, LEMO® 3-pin connector, datasheet, transport package

Spectral Response

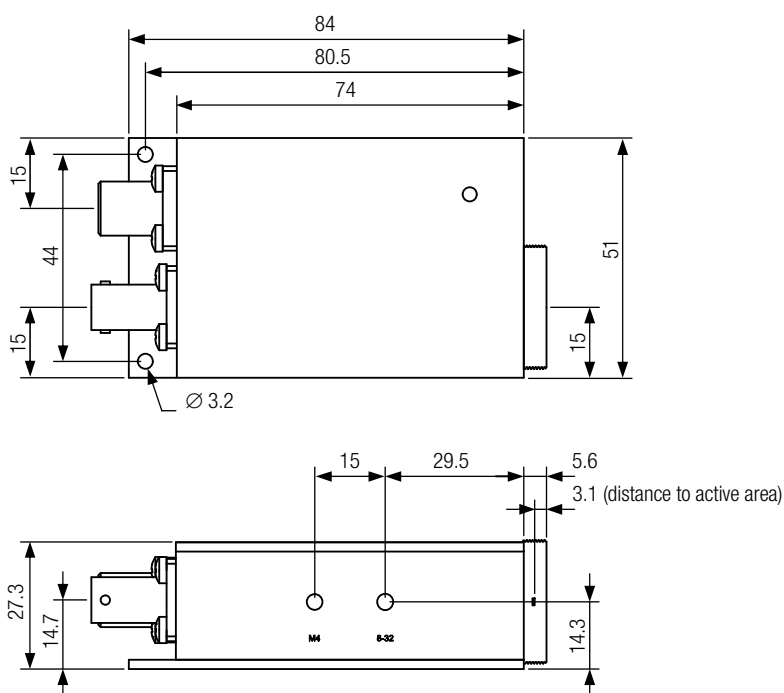


DB-Sens-HCA-S-20M-SI_R01

20 MHz Photoreceiver with Si-PIN Photodiode

Dimensions

HCA-S-20M-SI-FST



DZ-HCA-S_FST_R1

all dimensions in mm unless otherwise noted

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