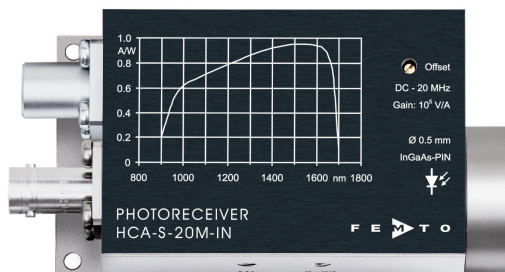


20 MHz Photoreceiver with InGaAs-PIN Photodiode



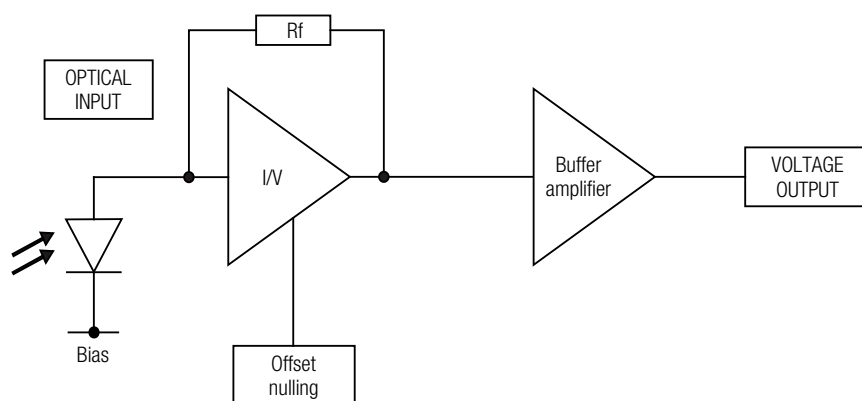
Features

- **InGaAs-PIN photodiode**
- **Bandwidth DC – 20 MHz**
- **Amplifier transimpedance gain 1.0×10^5 V/A**
- **Max. conversion gain 9.5×10^4 V/W @ 1550 nm**
- **Spectral range 900 – 1700 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

- **NIR 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-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.

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 InGaAs-PIN Photodiode

Available Versions

HCA-S-20M-IN-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

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

Specifications

Test conditions

$V_S = \pm 15$ V, $T_A = 25$ °C, output load impedance 50 Ω , warm-up 20 minutes (min. 10 minutes recommended)

Gain

Transimpedance gain
Gain accuracy
Conversion gain

1.0×10^5 V/A (@ output load 50 Ω)
 ± 1 % (electrical)
 9.5×10^4 V/W typ. (@ 1550 nm, output load 50 Ω)

Frequency Response

Lower cut-off frequency
Upper cut-off frequency (-3 dB)

DC
20 MHz (± 15 %)

Time Response

Rise/fall time (10 % – 90 %)

18 ns (± 15 %)

Input

Noise equivalent power (NEP)
Optical saturation power
Input offset compensation range

3.5 pW/ $\sqrt{\text{Hz}}$ (@ 1550 nm, 1 MHz)
20 μW (for linear amplification, @ 1550 nm)
 ± 6.5 μA , adjustable by offset potentiometer

Detector

Detector
Active area
Spectral range
Max. sensitivity

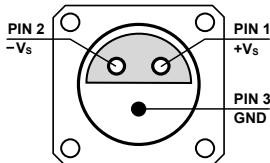
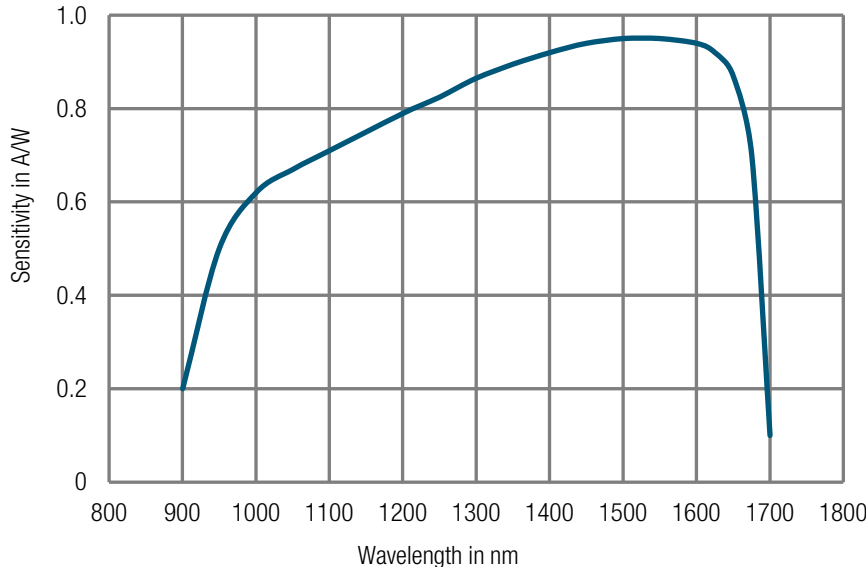
InGaAs-PIN photodiode
 $\varnothing 0.5$ mm
900 – 1700 nm
0.95 A/W typ. (@ 1550 nm)

Output

Output voltage range
Max. output voltage range
Output impedance
Output noise

± 1.5 V (@ 50 Ω output load)
for linear operation and low harmonic distortion
 ± 2 V (@ 50 Ω output load)
50 Ω (terminate with 50 Ω load)
2.5 mV RMS (16.5 mV peak-peak) typ. (@ 50 Ω load, no signal on detector, measurement bandwidth 200 MHz)

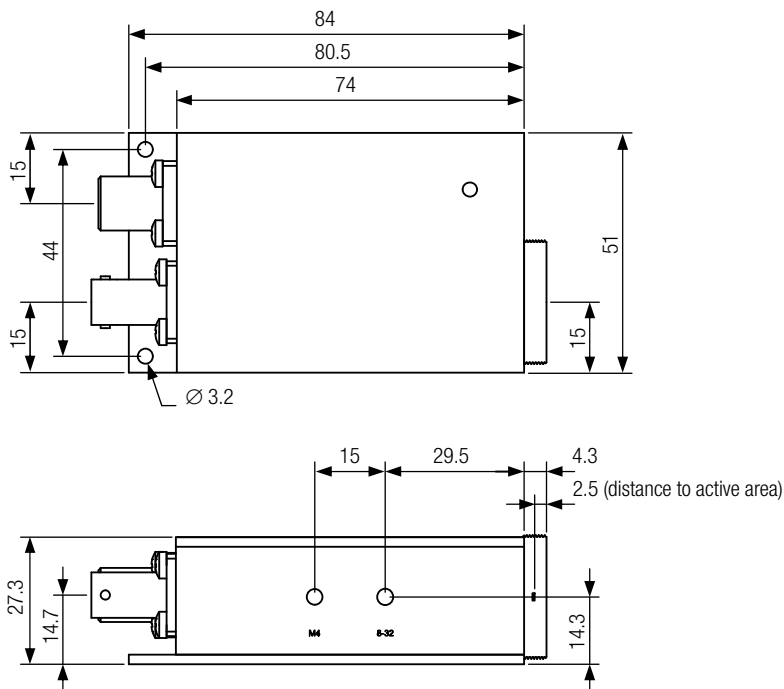
20 MHz Photoreceiver
with InGaAs-PIN Photodiode

Specifications (continued)																								
Optical Input Connector	Material FST flange Material FST coupler ring	1.4305 stainless steel, nickel-plated 1.4305 stainless steel, glass bead blasted																						
Power Supply	Supply voltage Supply current	$\pm 15\text{ V}$ ($\pm 14.5\text{ V} \dots \pm 16.5\text{ V}$) $\pm 60\text{ mA}$ (depends on operating conditions, recommended power supply capability min. $\pm 150\text{ mA}$)																						
Case	Weight Material	209 g (0.46 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	10 mW $\pm 20\text{ V}$																						
Connectors	Input Output Power supply	1.035"-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 1: +15 V Pin 2: -15 V Pin 3: GND																						
Scope of Delivery	HCA-S-20M-IN, internally threaded coupler ring, LEMO® 3-pin connector, datasheet, transport package																							
Spectral Response	 <table><caption>Approximate data points from the Spectral Response graph</caption><tr><th>Wavelength (nm)</th><th>Sensitivity (A/W)</th></tr><tr><td>900</td><td>0.20</td></tr><tr><td>1000</td><td>0.60</td></tr><tr><td>1100</td><td>0.70</td></tr><tr><td>1200</td><td>0.80</td></tr><tr><td>1300</td><td>0.88</td></tr><tr><td>1400</td><td>0.92</td></tr><tr><td>1500</td><td>0.95</td></tr><tr><td>1600</td><td>0.94</td></tr><tr><td>1650</td><td>0.85</td></tr><tr><td>1700</td><td>0.10</td></tr></table> DB-Sens-HCA-S-20M-IN_R01		Wavelength (nm)	Sensitivity (A/W)	900	0.20	1000	0.60	1100	0.70	1200	0.80	1300	0.88	1400	0.92	1500	0.95	1600	0.94	1650	0.85	1700	0.10
Wavelength (nm)	Sensitivity (A/W)																							
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1700	0.10																							

20 MHz Photoreceiver with InGaAs-PIN Photodiode

Dimensions

HCA-S-20M-IN-FST



DZ-HCA-S_FST_R1

all dimensions in mm unless otherwise noted

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