

200 MHz Photoreceiver with Si-PIN Photodiode



The picture shows model HCA-S-200M-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 – 200 MHz • Amplifier transimpedance gain 2.0×10^4 V/A • Max. conversion gain 1.1×10^4 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

200 MHz Photoreceiver with Si-PIN Photodiode

Available Versions

HCA-S-200M-SI-FST

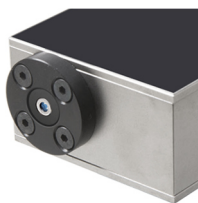


Picture shows 1.035"-40 threaded flange with internally threaded coupler ring (outer diameter 30 mm)

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-200M-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-200M-SI-FS



Picture shows unthreaded flange with 25 mm diameter

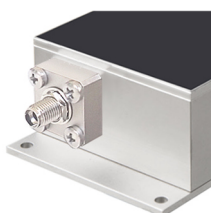
25 mm dia. unthreaded flange for free space applications. Compatible with many optical standard accessories.

HCA-S-200M-SI-FC








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

HCA-S-200M-SI-SMA

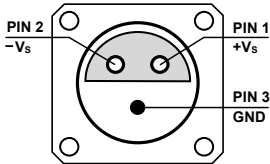


Fix/permanent FSMA fiber connector for high coupling efficiency and excellent conversion gain accuracy.

200 MHz Photoreceiver with Si-PIN Photodiode

Related Models	<p>HCA-S-200M-IN-FST InGaAs-PIN, Ø 0.3 mm, 900 - 1700 nm free space input, 1.035"-40 threaded flange</p> <p>HCA-S-200M-IN-FS InGaAs-PIN, Ø 0.3 mm, 900 - 1700 nm free space input, 25 mm dia. unthreaded flange</p> <p>HCA-S-200M-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 $2.0 \times 10^4 \text{ V/A}$ (@ output load $50 \text{ } \Omega$) Gain accuracy $\pm 1 \%$ (electrical) Conversion gain $1.1 \times 10^4 \text{ V/W typ.}$ (@ 800 nm, output load $50 \text{ } \Omega$)</p> <p>Frequency Response Lower cut-off frequency DC Upper cut-off frequency (–3 dB) 200 MHz ($\pm 10 \%$) Gain flatness $\pm 1 \text{ dB}$</p> <p>Time Response Rise/fall time (10 % – 90 %) 1.8 ns</p> <p>Input Noise equivalent power (NEP) $9.4 \text{ pW}/\sqrt{\text{Hz}}$ (@ 800 nm, 10 MHz) Optical saturation power $110 \text{ } \mu\text{W}$ (for linear amplification, @ 800 nm) Input offset compensation range $\pm 100 \text{ } \mu\text{A}$, 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>

200 MHz Photoreceiver with Si-PIN Photodiode

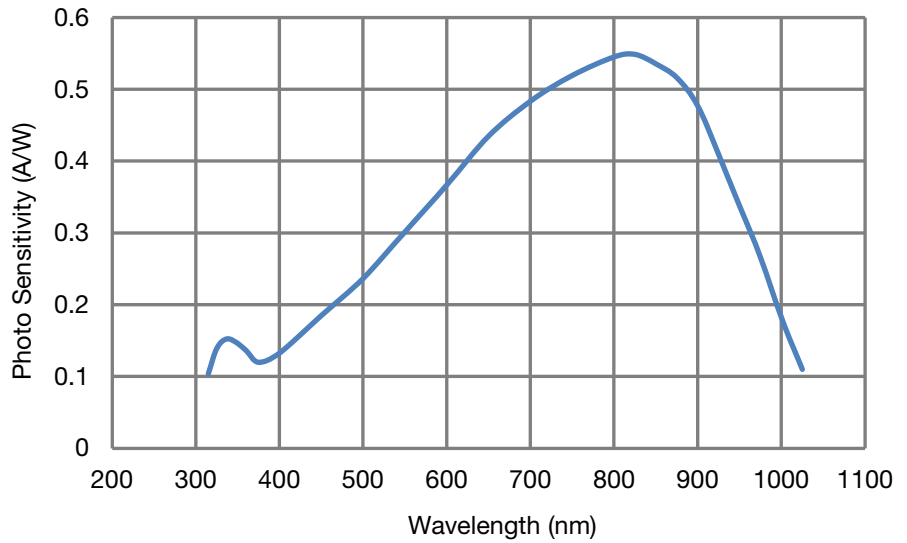
Specifications (continued)			
Output	Output voltage range	±1.2 V (@ 50 Ω output load) for linear operation and low harmonic distortion	
	Max. output voltage range	±1.7 V (@ 50 Ω load)	
	Output impedance	50 Ω (terminate with 50 Ω load)	
	Output noise	3 mV _{RMS} (20 mV _{PP}) typ. (@ 50 Ω load, no signal on detector, measurement bandwidth 500 MHz)	
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	±50 mA (depends on operating conditions, recommended power supply capability min. ±150 mA)	
Case	Weight	209 g (0.46 lbs) HCA-S-200M-SI-FST incl. coupler ring 196 g (0.43 lbs) HCA-S-200M-SI-FS 188 g (0.41 lbs) HCA-S-200M-SI-FC 200 g (0.44 lbs) HCA-S-200M-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-200M-SI-FST	1.035"-40 threaded flange for free space applications and for use with various types of optical standard accessories
		HCA-S-200M-SI-FS	25 mm dia. unthreaded flange for free space applications
		HCA-S-200M-SI-FC	FC fiber optic connector (fix/permanent, FC/PC and FC/APC compatible)
		HCA-S-200M-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-200M-SI, internally threaded coupler ring (FST version only), LEMO® 3-pin connector, datasheet, transport package		

200 MHz Photoreceiver with Si-PIN Photodiode

Ordering Information

HCA-S-200M-SI-FST	1.035"-40 threaded flange for free space applications and for use with various types of optical standard accessories.
HCA-S-200M-SI-FS	25 mm dia. unthreaded flange for free space applications.
HCA-S-200M-SI-FC	FC fiber optic connector (fix/permanent, FC/PC and FC/APC compatible).
HCA-S-200M-SI-SMA	FSMA fiber optic connector (fix/permanent).

Spectral Responsivity

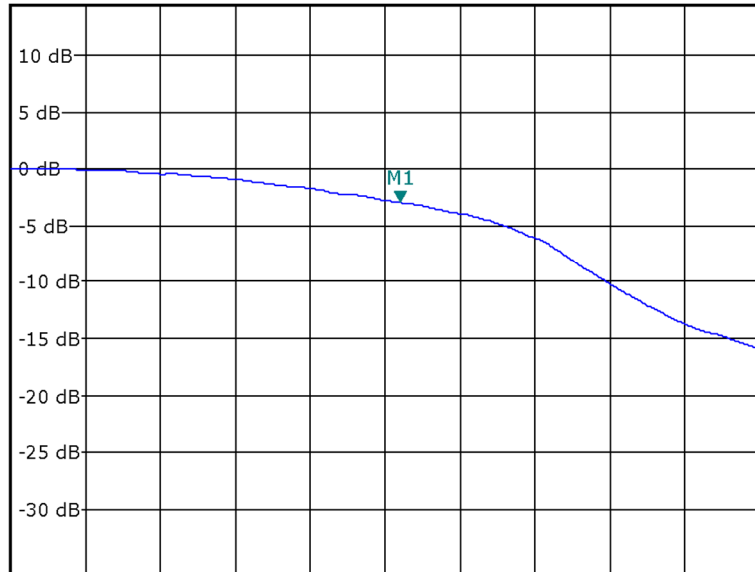


DB-Sens-HCA-S-200M-SI_R01

Typical Performance Characteristics

Frequency response

Offs -34.1 dB RBW 3 MHz
 Att 5 dB * VBW 10 kHz M1[1] -2.95 dB
 Ref -53.1 dBm SWT 65ms 217.92000000 MHz



Start 20.0 MHz Stop 400.0 MHz

PD-HCA-S-200M-SI-bw_R01

200 MHz Photoreceiver with Si-PIN Photodiode

Typical Performance Characteristics (continued)

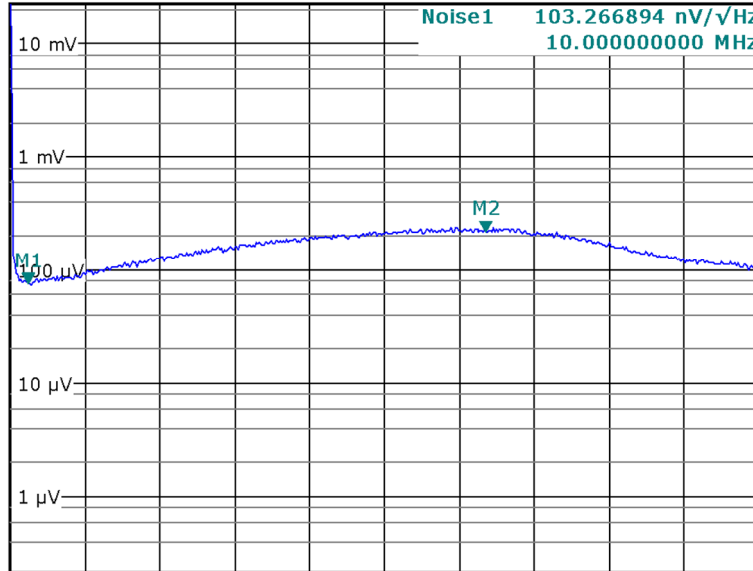
Noise spectrum

Att 0 dB
Ref 22.4 mV

* RBW 1 MHz
* VBW 1 kHz
SWT 800ms

Noise2 292.328379 nV/√Hz
254.40000000 MHz

Noise1 103.266894 nV/√Hz
10.00000000 MHz



Start 0.0 Hz Stop 400.0 MHz

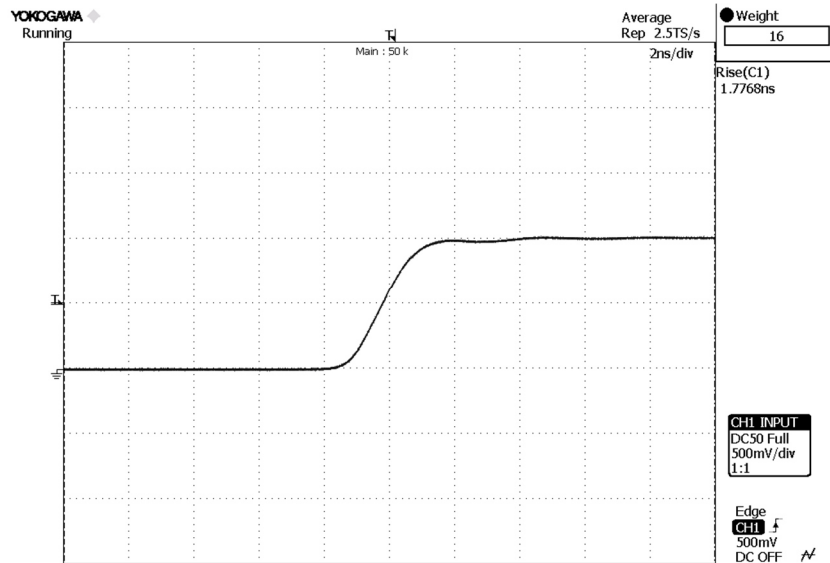
PD-HCA-S-200M-SI-noise-R01

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 (V/A) × photo sensitivity (A/W).

Marker	frequency	output noise	resulting input noise (NEP)
1	10 MHz	103 nV/√Hz	9.4 pW/√Hz (@ 800 nm)

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

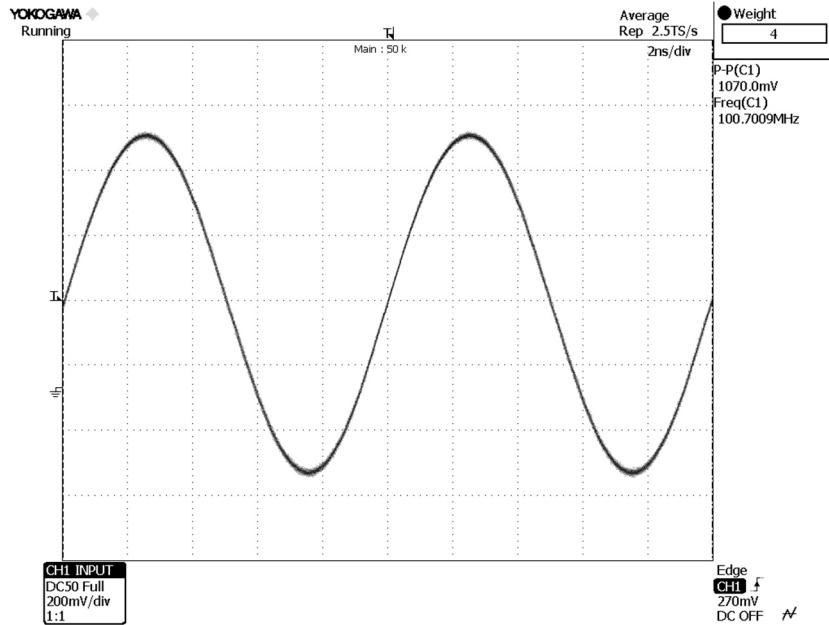


PD-HCA-S-200M-SI-pulse-2ns_R01

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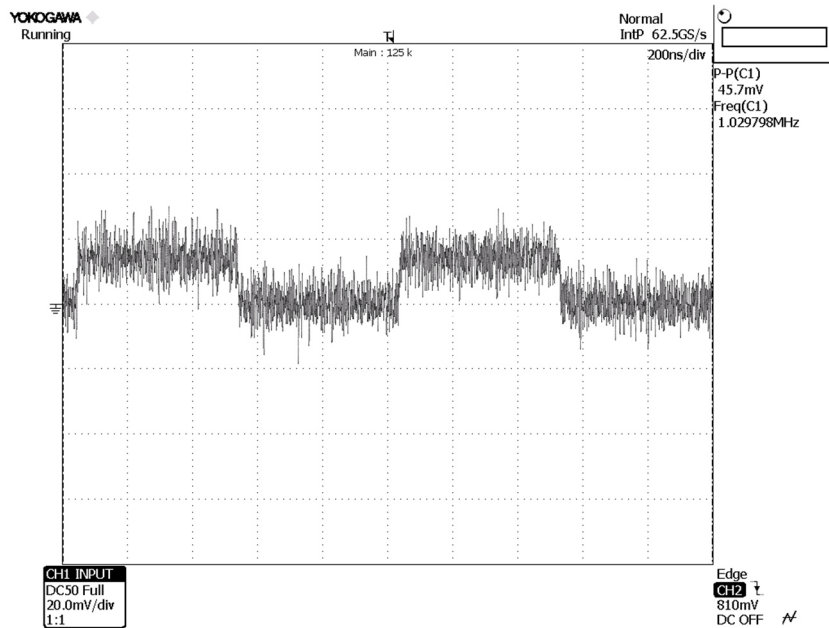
Typical Performance Characteristics (continued)

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



PD-HCA-S-200M-Si-large-sinus_R01

Small signal response
output signal for 1.5 μ W modulated optical input signal, 1 MHz square wave, without averaging

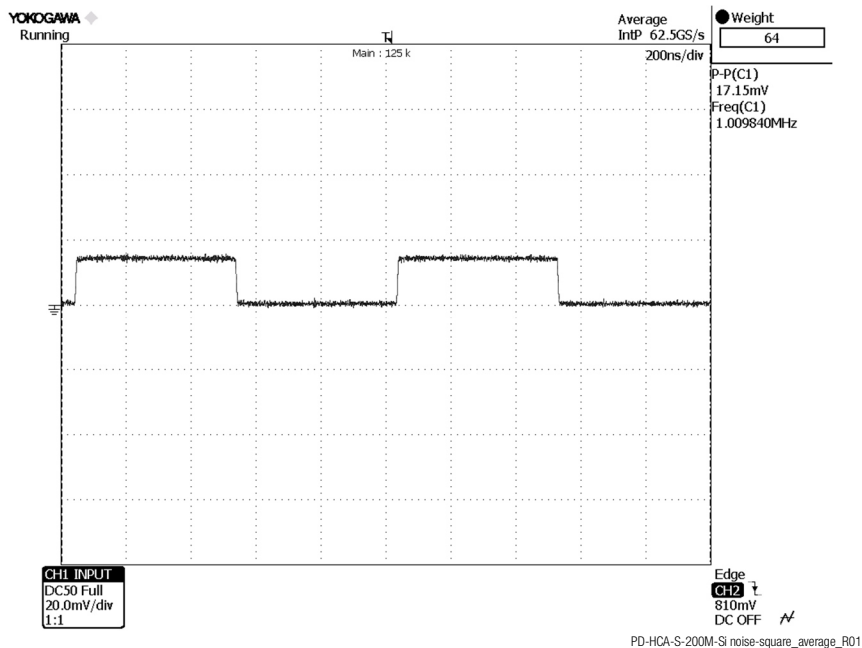


PD-HCA-S-200M-Si-noise-square_R01

200 MHz Photoreceiver with Si-PIN Photodiode

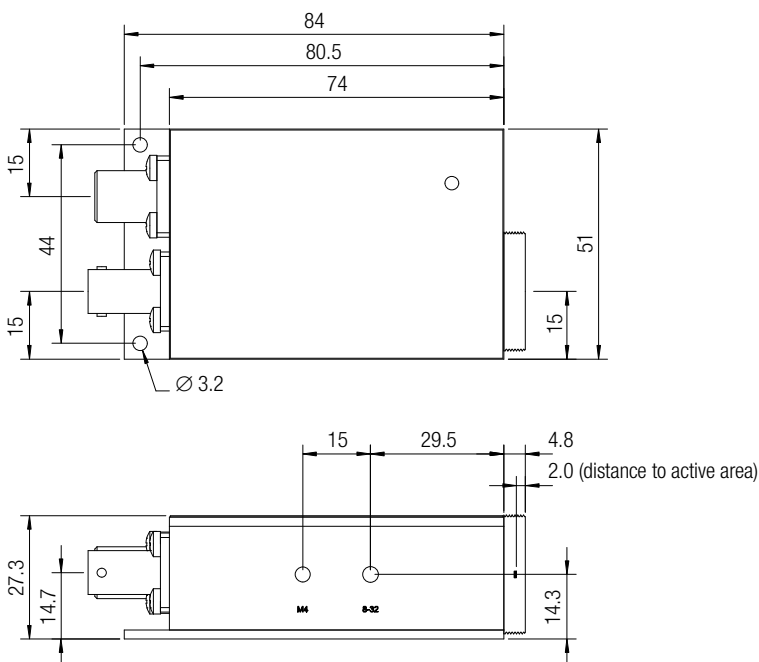
Typical Performance Characteristics (continued)

Small signal response output signal for 1.5 μ W modulated optical input signal, 1 MHz square wave, with 64 times averaging



Dimensions

HCA-S-200M-SI-FST (1.035"-40 threaded free space input)

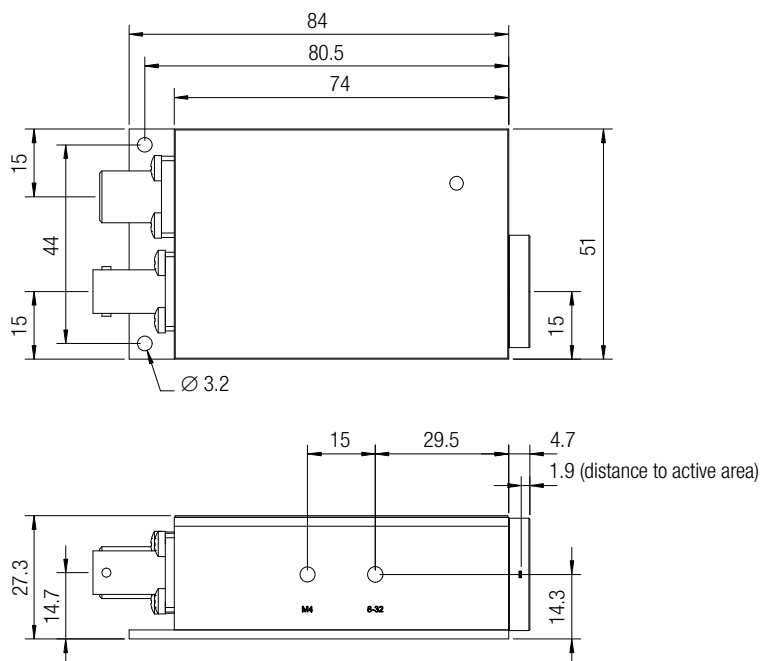


all dimensions in mm unless otherwise noted

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Dimensions (continued)

HCA-S-200M-SI-FS (25 mm dia. unthreaded free space input)



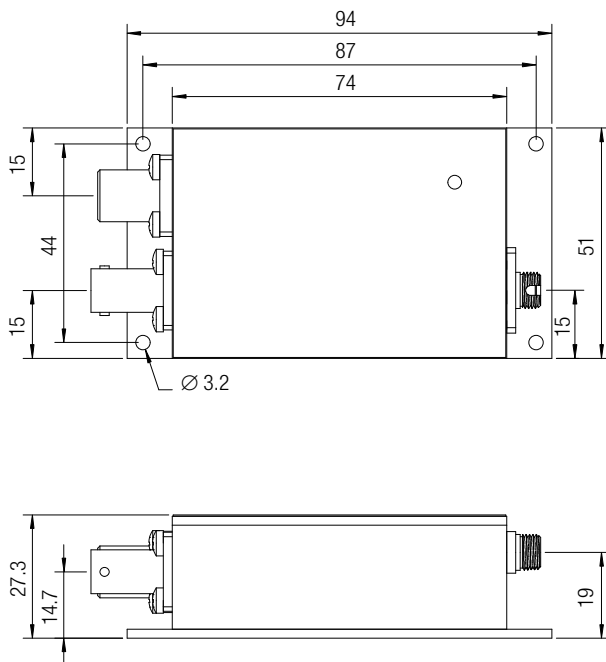
DZ-HCA-S-X00-SI_FS_R1

all dimensions in mm unless otherwise noted

200 MHz Photoreceiver with Si-PIN Photodiode

Dimensions (continued)

HCA-S-200M-SI-FC (FC fiber optic connector)



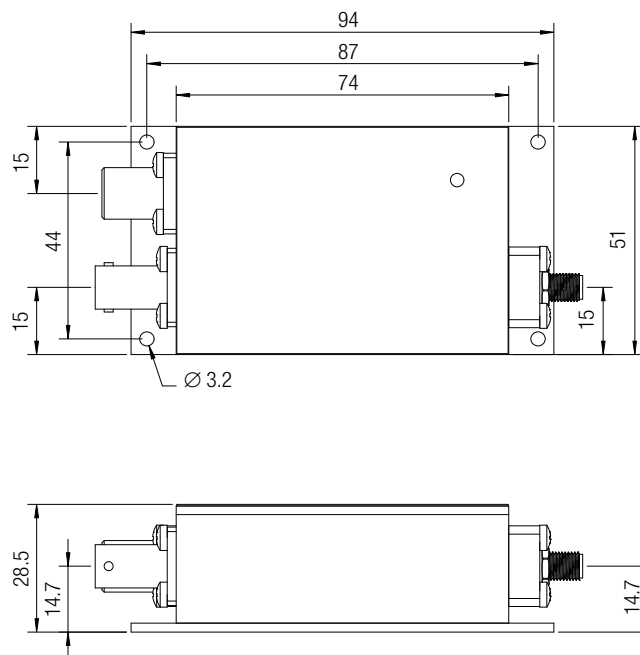
DZ-HCA-S-XX-XX_FC_R1

all dimensions in mm unless otherwise noted

200 MHz Photoreceiver with Si-PIN Photodiode

Dimensions (continued)

HCA-S-200M-SI-SMA (FSMA fiber optic connector)



DZ-HCA-S-XX-XX_SMA_R1

all dimensions in mm unless otherwise noted

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