

Ultra High Speed Photoreceiver with Si-PIN Photodiode



The picture shows model HSA-X-S-1G4-SI-FS.
The photoreceiver will be delivered without post holder and post.

<p>Features</p>	<ul style="list-style-type: none"> • Si-PIN photodiode • Bandwidth 10 kHz – 1.4 GHz • Amplifier transimpedance gain 5.0×10^3 V/A • Max. conversion gain 2.55×10^3 V/W @ 760 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 • 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 • Ultra-fast pulse and transient measurements • Optical triggering • Optical front-end for oscilloscopes and ultra-fast A/D converters
<p>Block Diagram</p>	<p style="text-align: right;">BS01-HSA-X-S_R01</p>

Ultra High Speed Photoreceiver with Si-PIN Photodiode

Available Versions

HSA-X-S-1G4-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 0.4 mm dia. photodiode installed in the HSA-X-S-1G4-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.

HSA-X-S-1G4-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.

HSA-X-S-1G4-SI-FC



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

Related Models

HSPR-X-I-1G4-SI-FST

Si-PIN, Ø 0.4 mm, 320 – 1000 nm, inverting output free space input, 1.035"-40 threaded flange

HSPR-X-I-1G4-SI-FS

Si-PIN, Ø 0.4 mm, 320 – 1000 nm, inverting output free space input, 25 mm dia. unthreaded flange

HSPR-X-I-1G4-SI-FC

Si-PIN, integrated ball lens, 320 – 1000 nm, inverting output, FC fiber connector (fix/permanent)

HSA-X-2G-IN-FST

InGaAs-PIN, Ø 0.1 mm, 900 – 1700 nm free space input, 1.035"-40 threaded flange





HSA-X-2G-IN-FS

InGaAs-PIN, Ø 0.1 mm, 900 – 1700 nm free space input, 25 mm dia. unthreaded flange

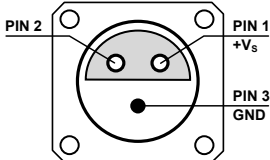
HSA-X-2G-IN-FC

InGaAs-PIN, integrated ball lens, 900 – 1700 nm FC fiber connector (fix/permanent)

Ultra High Speed Photoreceiver with Si-PIN Photodiode

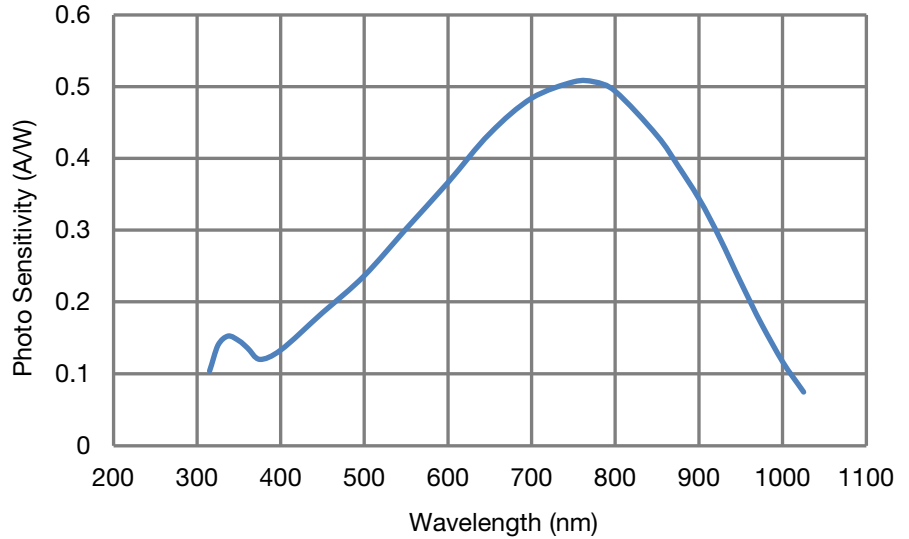
Related Models (continued)	<p>HSPR-X-I-2G-IN-FST InGaAs-PIN, \varnothing 0.1 mm, 900 – 1700 nm, inverting output free space input, 1.035"-40 threaded flange</p> <p>HSPR-X-I-2G-IN-FS InGaAs-PIN, \varnothing 0.1 mm, 900 – 1700 nm, inverting output free space input, 25 mm dia. unthreaded flange</p> <p>HSPR-X-I-2G-IN-FC InGaAs-PIN, integrated ball lens, 900 – 1700 nm, inverting output, FC fiber connector (fix/permanent)</p>														
Available Accessories	<p>PRA-FC  Fiber-adapter with external 1.035"-40 thread (suitable for FST models only).</p> <p>PRA-FCA </p> <p>PRA-FSMA </p> <p>PS-15-25-L  Power supply Input: 100 – 240 VAC Output: \pm15 VDC</p>														
Specifications	<table border="0"> <tr> <td style="vertical-align: top;">Test conditions</td> <td>$V_S = +15$ V, $T_A = 25$ °C, output load impedance 50 Ω, warm-up 20 minutes (min. 10 minutes recommended)</td> </tr> <tr> <td style="vertical-align: top;">Gain</td> <td> <p>Transimpedance gain 5.0×10^3 V/A (@ output load 50 Ω)</p> <p>Conversion gain 2.55×10^3 V/W typ. (@ 760 nm, output load 50 Ω)</p> </td> </tr> <tr> <td style="vertical-align: top;">Frequency Response</td> <td> <p>Lower cut-off frequency (–3 dB) 10 kHz</p> <p>Upper cut-off frequency (–3 dB) 1.4 GHz (\pm15%)</p> </td> </tr> <tr> <td style="vertical-align: top;">Time Response</td> <td>Rise/fall time (10 % – 90 %) 250 ps (\pm15%)</td> </tr> <tr> <td style="vertical-align: top;">Input</td> <td> <p>Noise equivalent power (NEP) 32 pW/\sqrtHz (@ 760 nm, 100 MHz)</p> <p>Optical saturation power 370 μW AC (for linear amplification, @ 760 nm) 10 mW CW (to prevent saturation, @ 760 nm)</p> </td> </tr> <tr> <td style="vertical-align: top;">Detector</td> <td> <p>Detector Si-PIN photodiode</p> <p>Active area (FS/FST version) \varnothing 400 μm</p> <p>Active area (FC version) integrated ball lens suitable for fibers up to 400 μm core diameter</p> <p>Spectral range 320 – 1000 nm</p> <p>Max. sensitivity 0.51 A/W typ. (@ 760 nm)</p> </td> </tr> <tr> <td style="vertical-align: top;">Output</td> <td> <p>Output voltage range 1.9 V_{PP} (@ 50 Ω output load) for linear operation and low harmonic distortion</p> <p>Output VSWR 2.5:1 (@ $f < 2.5$ GHz)</p> <p>Output return loss 7.3 dB (@ $f < 2.5$ GHz)</p> <p>Output impedance 50 Ω (terminate with 50 Ω load)</p> <p>Output noise 3.6 mV_{RMS} (24 mV_{PP}) typ. (@ 50 Ω load, no signal on detector, measurement bandwidth 4 GHz)</p> </td> </tr> </table>	Test conditions	$V_S = +15$ V, $T_A = 25$ °C, output load impedance 50 Ω , warm-up 20 minutes (min. 10 minutes recommended)	Gain	<p>Transimpedance gain 5.0×10^3 V/A (@ output load 50 Ω)</p> <p>Conversion gain 2.55×10^3 V/W typ. (@ 760 nm, output load 50 Ω)</p>	Frequency Response	<p>Lower cut-off frequency (–3 dB) 10 kHz</p> <p>Upper cut-off frequency (–3 dB) 1.4 GHz (\pm15%)</p>	Time Response	Rise/fall time (10 % – 90 %) 250 ps (\pm 15%)	Input	<p>Noise equivalent power (NEP) 32 pW/\sqrtHz (@ 760 nm, 100 MHz)</p> <p>Optical saturation power 370 μW AC (for linear amplification, @ 760 nm) 10 mW CW (to prevent saturation, @ 760 nm)</p>	Detector	<p>Detector Si-PIN photodiode</p> <p>Active area (FS/FST version) \varnothing 400 μm</p> <p>Active area (FC version) integrated ball lens suitable for fibers up to 400 μm core diameter</p> <p>Spectral range 320 – 1000 nm</p> <p>Max. sensitivity 0.51 A/W typ. (@ 760 nm)</p>	Output	<p>Output voltage range 1.9 V_{PP} (@ 50 Ω output load) for linear operation and low harmonic distortion</p> <p>Output VSWR 2.5:1 (@ $f < 2.5$ GHz)</p> <p>Output return loss 7.3 dB (@ $f < 2.5$ GHz)</p> <p>Output impedance 50 Ω (terminate with 50 Ω load)</p> <p>Output noise 3.6 mV_{RMS} (24 mV_{PP}) typ. (@ 50 Ω load, no signal on detector, measurement bandwidth 4 GHz)</p>
Test conditions	$V_S = +15$ V, $T_A = 25$ °C, output load impedance 50 Ω , warm-up 20 minutes (min. 10 minutes recommended)														
Gain	<p>Transimpedance gain 5.0×10^3 V/A (@ output load 50 Ω)</p> <p>Conversion gain 2.55×10^3 V/W typ. (@ 760 nm, output load 50 Ω)</p>														
Frequency Response	<p>Lower cut-off frequency (–3 dB) 10 kHz</p> <p>Upper cut-off frequency (–3 dB) 1.4 GHz (\pm15%)</p>														
Time Response	Rise/fall time (10 % – 90 %) 250 ps (\pm 15%)														
Input	<p>Noise equivalent power (NEP) 32 pW/\sqrtHz (@ 760 nm, 100 MHz)</p> <p>Optical saturation power 370 μW AC (for linear amplification, @ 760 nm) 10 mW CW (to prevent saturation, @ 760 nm)</p>														
Detector	<p>Detector Si-PIN photodiode</p> <p>Active area (FS/FST version) \varnothing 400 μm</p> <p>Active area (FC version) integrated ball lens suitable for fibers up to 400 μm core diameter</p> <p>Spectral range 320 – 1000 nm</p> <p>Max. sensitivity 0.51 A/W typ. (@ 760 nm)</p>														
Output	<p>Output voltage range 1.9 V_{PP} (@ 50 Ω output load) for linear operation and low harmonic distortion</p> <p>Output VSWR 2.5:1 (@ $f < 2.5$ GHz)</p> <p>Output return loss 7.3 dB (@ $f < 2.5$ GHz)</p> <p>Output impedance 50 Ω (terminate with 50 Ω load)</p> <p>Output noise 3.6 mV_{RMS} (24 mV_{PP}) typ. (@ 50 Ω load, no signal on detector, measurement bandwidth 4 GHz)</p>														

Ultra High Speed Photoreceiver with Si-PIN Photodiode

Specifications (continued)			
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 Supply current	+15 V 130 mA (depends on operating conditions, recommended power supply capability min. 200 mA)	
Case	Weight	133 g (0.29 lbs) HSA-X-S-1G4-SI-FST incl. coupler ring 120 g (0.26 lbs) HSA-X-S-1G4-SI-FS 110 g (0.24 lbs) HSA-X-S-1G4-SI-FC	
	Material	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	12 mW (averaged) 20 V	
Connectors	Input	HSA-X-S-1G4-SI-FST	1.035"-40 threaded flange for free space applications and for use with various types of optical standard accessories
		HSA-X-S-1G4-SI-FS	25 mm dia. unthreaded flange for free space applications
		HSA-X-S-1G4-SI-FC	FC fiber optic connector (fix/permanent, FC/PC and FC/APC compatible)
	Output	SMA jack (female)	
	Power supply	LEMO® series 1S, 3-pin fixed socket (mating plug type: FFA.1S.303.CLAC52)	
			
		Pin 1: +15 V Pin 2: NC Pin 3: GND	
Scope of Delivery	HSA-X-S-1G4-SI, internally threaded coupler ring (FST version only), LEMO® 3-pin connector, datasheet, transport package		
Ordering Information	HSA-X-S-1G4-SI-FST	1.035"-40 threaded flange for free space applications and for use with various types of optical standard accessories.	
	HSA-X-S-1G4-SI-FS	25 mm dia. unthreaded flange for free space applications.	
	HSA-X-S-1G4-SI-FC	FC fiber optic connector (fix/permanent, FC/PC and FC/APC compatible).	

Ultra High Speed Photoreceiver with Si-PIN Photodiode

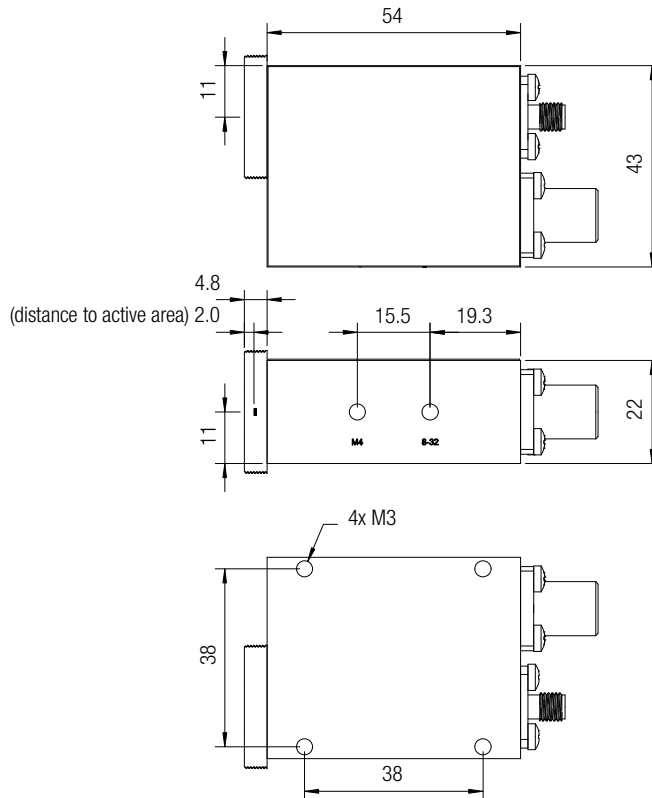
Spectral Responsivity



DB-Sens-HSA-X-S-1G4-SI_R01

Dimensions

HSA-X-S-1G4-SI-FST (1.035"-40 threaded free space input)



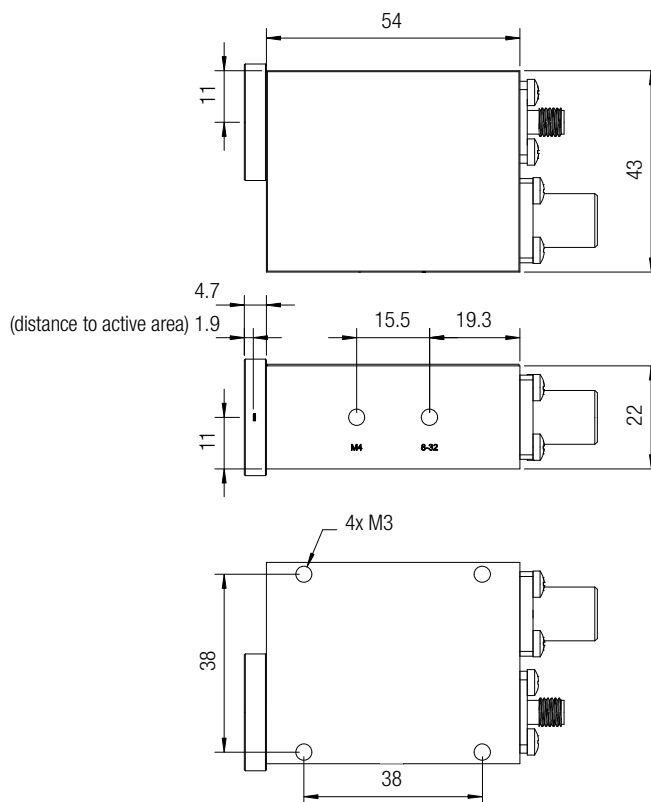
DZ-HSA-X-S-1G4-SI_FST_R1

all dimensions in mm unless otherwise noted

Ultra High Speed Photoreceiver with Si-PIN Photodiode

Dimensions (continued)

HSA-X-S-1G4-SI-FS (25 mm dia. unthreaded free space input)



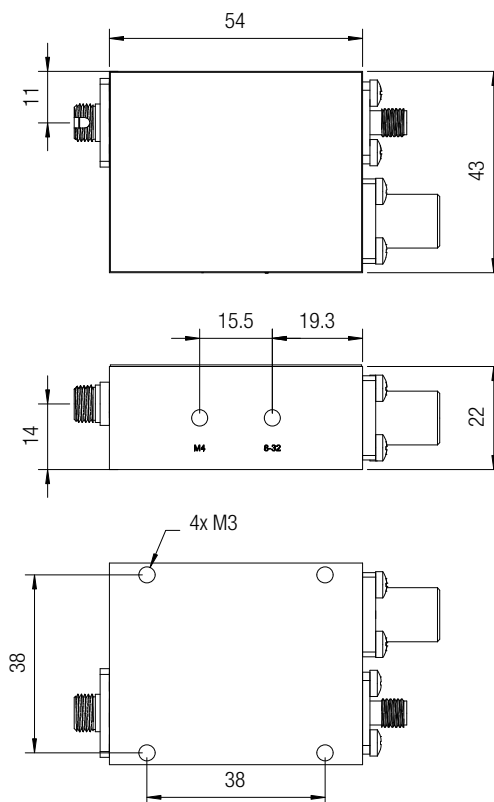
DZ-HSA-X-S-1G4-SI_FS_R1

all dimensions in mm unless otherwise noted

Ultra High Speed Photoreceiver with Si-PIN Photodiode

Dimensions (continued)

HSA-X-S-1G4-SI-FC (FC fiber optic connector)



DZ-HSA-X-S-1G4-SI_FC_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

Specifications are subject to change without notice. Information provided herein is believed to be accurate and reliable. However, no responsibility is assumed by FEMTO Messtechnik GmbH for its use, nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of FEMTO Messtechnik GmbH. Product names mentioned may also be trademarks used here for identification purposes only.

© by FEMTO Messtechnik GmbH · Printed in Germany