



Datasheet

HSA-X-S-1G4-SI

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.

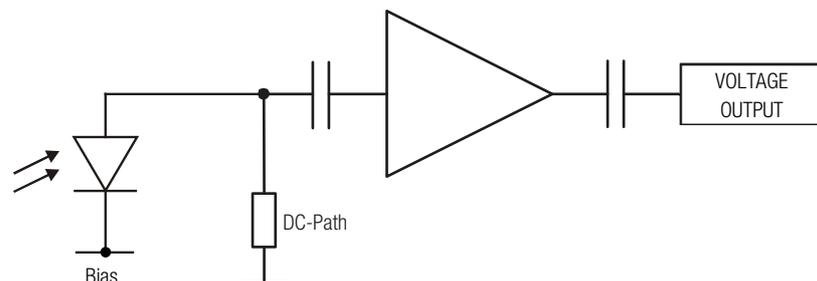
Features

- **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**

Applications

- **Spectroscopy**
- **Ultra-fast pulse and transient measurements**
- **Optical triggering**
- **Optical front-end for oscilloscopes and ultra-fast A/D converters**

Block Diagram



BS01-HSA-X-S_R01

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)

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
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
HSPR-X-I-2G-IN-FC	InGaAs-PIN, integrated ball lens, 900 – 1700 nm, inverting output, FC fiber connector (fix/permanent)

Available Accessories

PRA-FC
PRA-FCA
PRA-FSMA



Fiber-adapter with external 1.035"-40 thread (suitable for FST models only).

PS-15-25-L

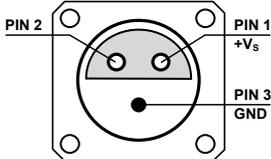


Power supply
Input: 100 – 240 VAC
Output: \pm 15 VDC

Specifications

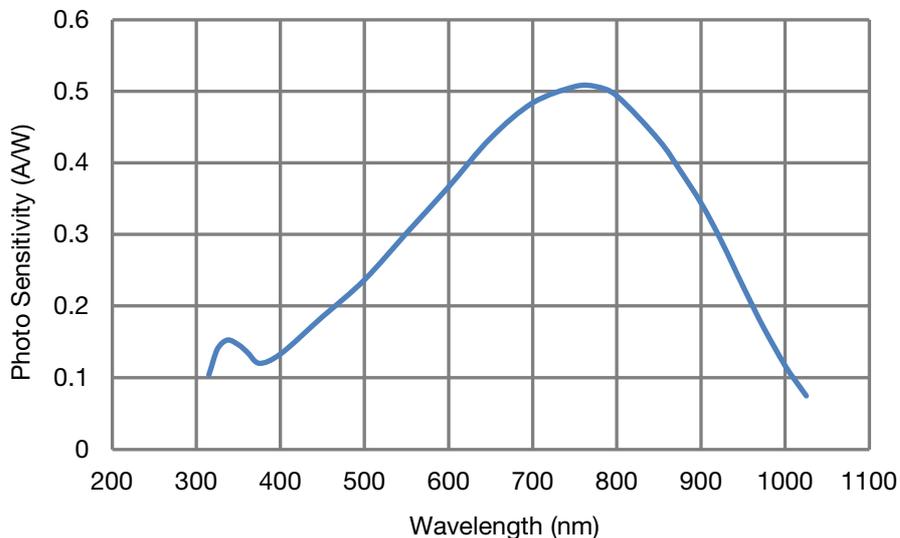
Test conditions	$V_S = +15$ V, $T_A = 25$ °C, output load impedance 50 Ω , warm-up 20 minutes (min. 10 minutes recommended)
Gain	<p>Transimpedance gain: 5.0×10^3 V/A (@ output load 50 Ω)</p> <p>Conversion gain: 2.55×10^3 V/W typ. (@ 760 nm, output load 50 Ω)</p>
Frequency Response	<p>Lower cut-off frequency (–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

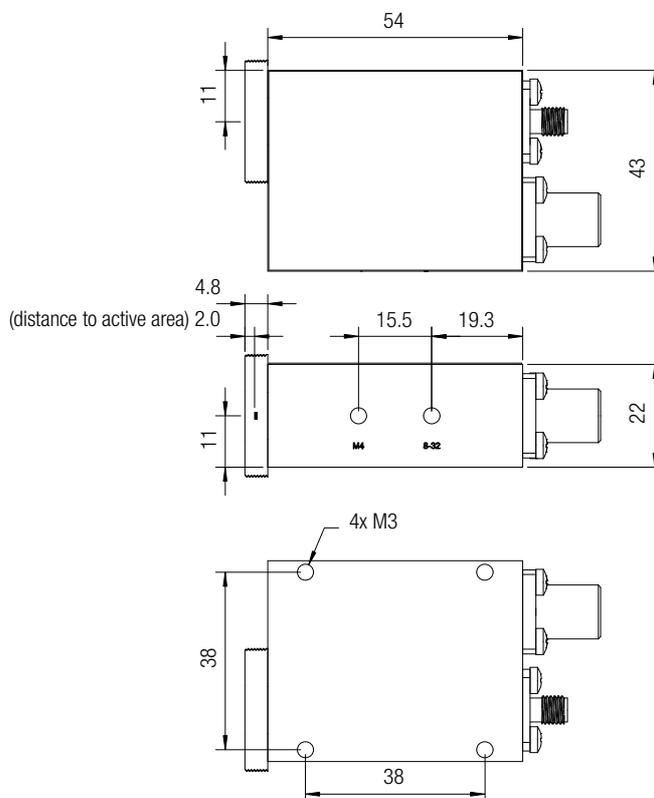
Spectral Responsivity



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

Dimensions

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



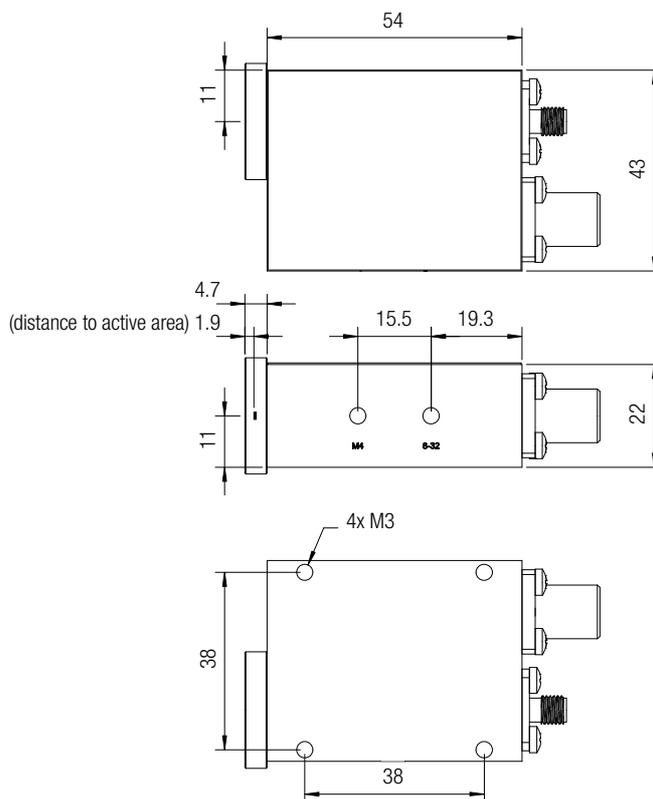
DZ-HSA-X-S-1G4-SI-FST_R1

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



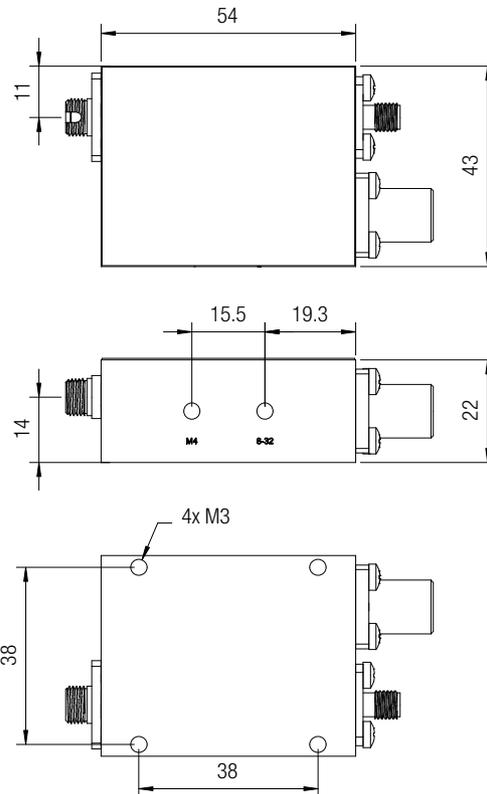
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HSA-X-S-1G4-SI

**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

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