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.

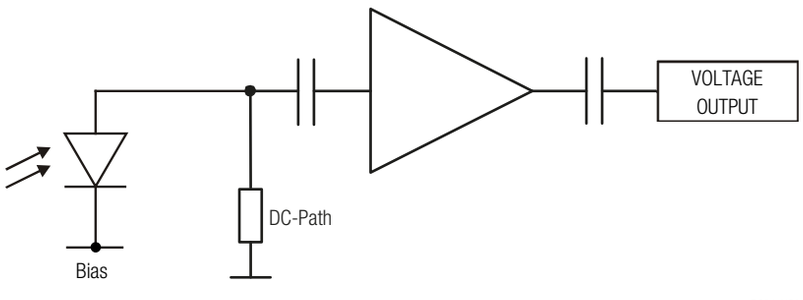
Features

- **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, ∅ 0.4 mm, 320 – 1000 nm, inverting output free space input, 1.035"-40 threaded flange
HSPR-X-I-1G4-SI-FS	Si-PIN, ∅ 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, ∅ 0.1 mm, 900 – 1700 nm free space input, 1.035"-40 threaded flange
HSA-X-2G-IN-FS	InGaAs-PIN, ∅ 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)

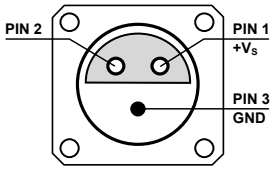
Ultra High Speed Photoreceiver with Si-PIN Photodiode

Related Models (continued)	HSPR-X-I-2G-IN-FST	InGaAs-PIN,∅ 0.1 mm, 900 – 1700 nm, inverting output free space input, 1.035"-40 threaded flange
	HSPR-X-I-2G-IN-FS	InGaAs-PIN, ∅ 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: ±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	Transimpedance gain	5.0×10^3 V/A (@ output load 50 Ω)
	Conversion gain	2.55×10^3 V/W typ. (@ 760 nm, output load 50 Ω)
Frequency Response	Lower cut-off frequency (–3 dB)	10 kHz
	Upper cut-off frequency (–3 dB)	1.4 GHz (±15%)
Time Response	Rise/fall time (10 % – 90 %)	250 ps (±15%)
Input	Noise equivalent power (NEP)	32 pW/√Hz (@ 760 nm, 100 MHz)
	Optical saturation power	370 µW AC (for linear amplification, @ 760 nm) 10 mW CW (to prevent saturation, @ 760 nm)
Detector	Detector	Si-PIN photodiode
	Active area (FS/FST version)	∅ 400 µm
	Active area (FC version)	integrated ball lens suitable for fibers up to 400 µm core diameter
	Spectral range	320 – 1000 nm
	Max. sensitivity	0.51 A/W typ. (@ 760 nm)
Output	Output voltage range	1.9 V_{PP} (@ 50 Ω output load) for linear operation and low harmonic distortion
	Output VSWR	2.5:1 (@ f < 2.5 GHz)
	Output return loss	7.3 dB (@ f < 2.5 GHz)
	Output impedance	50 Ω (terminate with 50 Ω load)
	Output noise	3.6 mV_{RMS} (24 mV_{PP}) typ. (@ 50 Ω load, no signal on detector, measurement bandwidth 4 GHz)

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)	



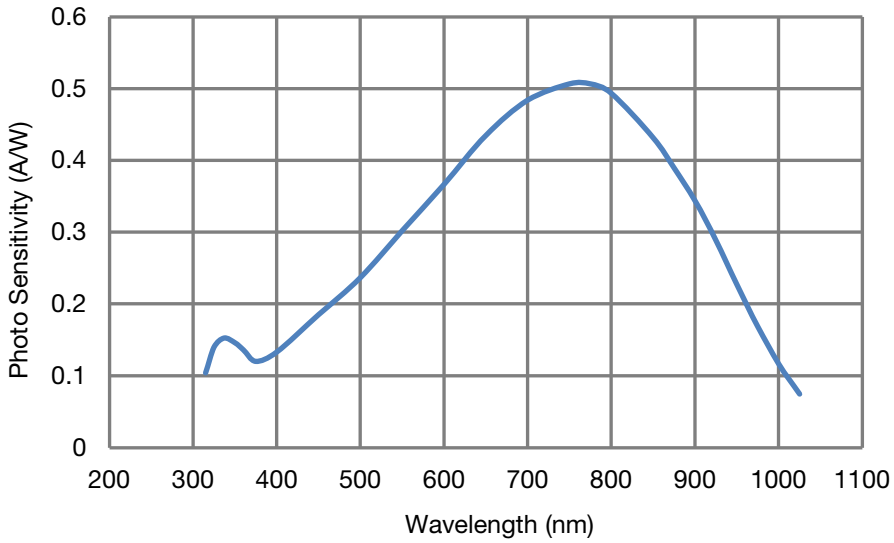
Pin 1: +15 V
Pin 2: NC
Pin 3: GND

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

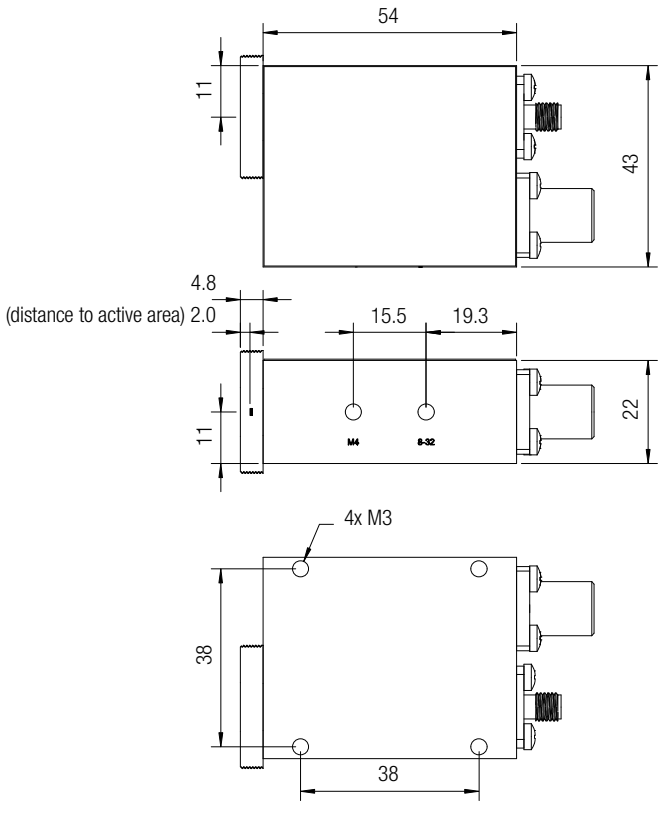
Spectral Responsivity



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

Dimensions

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



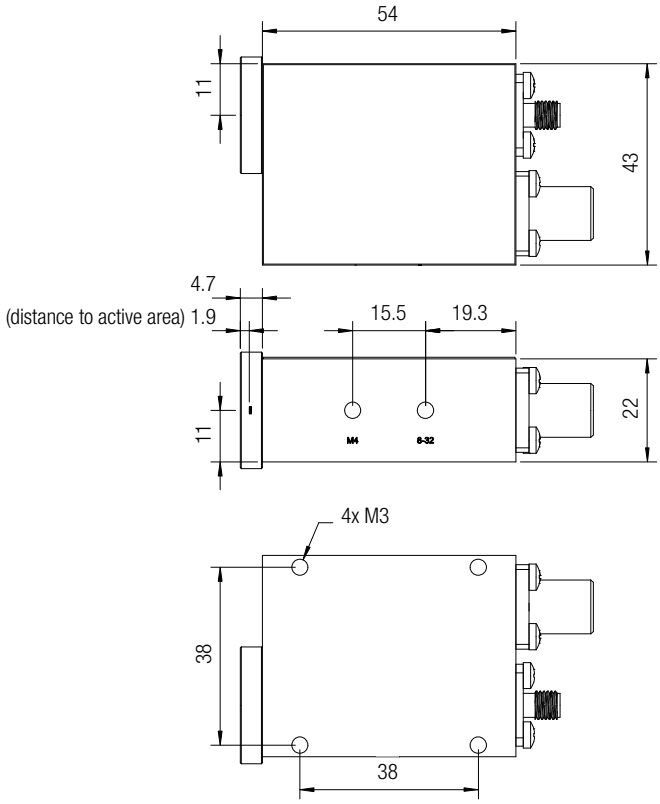
DZ-HSA-X-S-1G4-SI_FST_R1

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)



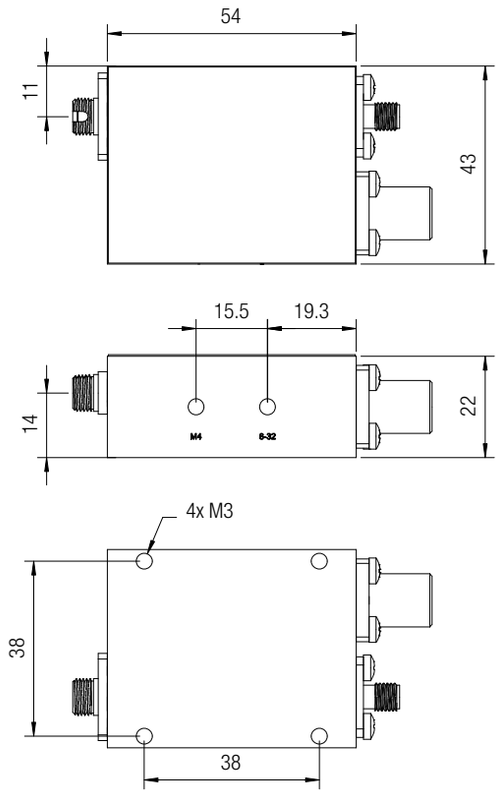
DZ-HSA-X-S-1G4-SI_FS_R1

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

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