

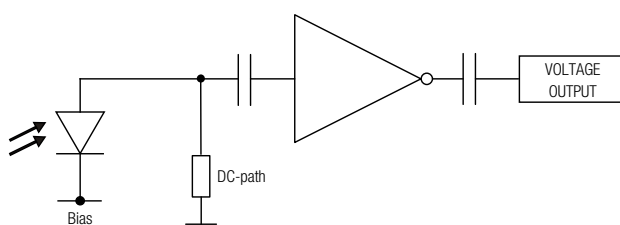
Datasheet

HSPR-X-I-2G-IN

Ultra High Speed Photoreceiver with InGaAs-PIN Photodiode



The picture shows model HSPR-X-I-2G-IN-FST.

Features	• InGaAs-PIN photodiode • Bandwidth 10 kHz – 2 GHz • Amplifier transimpedance gain 5.0×10^3 V/A (inverting) • Max. conversion gain 4.75×10^3 V/W @ 1550 nm • Spectral range 900 – 1700 nm • Free-space input 1.035"-40 threaded • Fiber optic input available as permanently mounted FC-input • 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-HSPR-I_R01
Intended Use	The HSPR-X-I-2G-IN photoreceiver consists of an InGaAs photodiode and a subsequent low-noise fixed gain amplifier. It is designed for ultra-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.

SOPHISTICATED TOOLS FOR SIGNAL RECOVERY

F E M T O

HSPR-X-I-2G-IN_R3/TH_JMa/06MAY2024

Datasheet

HSPR-X-I-2G-IN

Ultra High Speed Photoreceiver with InGaAs-PIN Photodiode

Available Versions

HSPR-X-I-2G-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 and for use with various types of fiber connector adapters.

HSPR-X-I-2G-IN-FC



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

Related Models

HSA-X-S-1G4-SI-FST

Si-PIN, Ø 0.4 mm, 320 – 1000 nm, 1.4 GHz, free space input, 1.035"-40 threaded flange

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

Si-PIN, integrated ball lens, 320 – 1000 nm, 1.4 GHz, FC fiber connector (fix/permanent)

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

Si-PIN, Ø 0.4 mm, 320 – 1000 nm, 1.4 GHz, inverting output, free space input, 1.035"-40 threaded flange

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

Si-PIN, integrated ball lens, 320 – 1000 nm, 1.4 GHz, inverting output, FC fiber connector (fix/permanent)

HSA-X-S-2G-IN-FST

InGaAs-PIN, Ø 0.1 mm, 900 – 1700 nm, 2 GHz, free space input, 1.035"-40 threaded flange

HSA-X-S-2G-IN-FC

InGaAs-PIN, integrated ball lens, 900 – 1700 nm, 2 GHz, FC fiber connector (fix/permanent)

Available Accessories

PS-15-25-L



Power Supply
Input: 100 – 240 VAC
Output: ±15 VDC

Specifications

Test conditions

$V_s = +15\text{ V}$, $T_A = 25\text{ °C}$, output load impedance $50\ \Omega$, warm-up 20 minutes (min. 10 minutes recommended)

Gain

Transimpedance gain

$5.0 \times 10^3\text{ V/A}$ (inverting, @ output load $50\ \Omega$)

Conversion gain

$4.75 \times 10^3\text{ V/W typ.}$ (@ 1550 nm, output load $50\ \Omega$)

Frequency Response

Lower cut-off frequency (–3 dB)

10 kHz

Upper cut-off frequency (–3 dB)

2 GHz ($\pm 15\%$)

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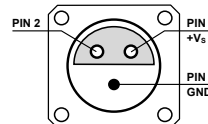
Ultra High Speed Photoreceiver with InGaAs-PIN Photodiode

Specifications (continued)

Time Response	Rise/fall time (10 % – 90 %)	180 ps ($\pm 15\%$)
Input	Noise equivalent power (NEP) Optical saturation power	11 pW/ $\sqrt{\text{Hz}}$ (@ 1550 nm, 100 MHz) 210 μW AC (for linear amplification, @ 1550 nm) 10 mW CW (to prevent saturation, @ 1550 nm)
Detector	Detector Active area (FST version) Active area (FC version) Spectral range Max. sensitivity	InGaAs-PIN photodiode $\varnothing$ 100 μm integrated ball lens, suitable for fibers up to 62.5 μm core diameter 900 – 1700 nm 0.95 A/W typ. (@ 1550 nm)
Output	Output voltage range Output reflection S22 Output impedance Output noise	2.0 V peak-peak (@ 50 Ω output load) for linear operation and low harmonic distortion -15.5 dB (@ $f < 2.5$ GHz) 50 Ω (terminate with 50 Ω load) 2.5 mV RMS (17 mV peak-peak) typ. (@ 50 Ω load, no signal on detector, measurement bandwidth 4 GHz)
Optical Input Connector	Material FST flange Material FST coupler ring Material FC receptacle	1.4305 stainless steel, nickel-plated 1.4305 stainless steel, glass bead blasted nickel silver
Power Supply	Supply voltage Supply current	+15 V 150 mA (depends on operating conditions, recommended power supply capability min. 200 mA)
Case	Weight Material	133 g (0.29 lbs) HSPR-X-I-2G-IN-FST incl. coupler ring 110 g (0.24 lbs) HSPR-X-I-2G-IN-FC 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) 18.5 V
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Connectors	Input	HSPR-X-I-2G-IN-FST	1.035"-40 threaded flange for free space applications and for use with various types of optical standard accessories
		HSPR-X-I-2G-IN-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)	



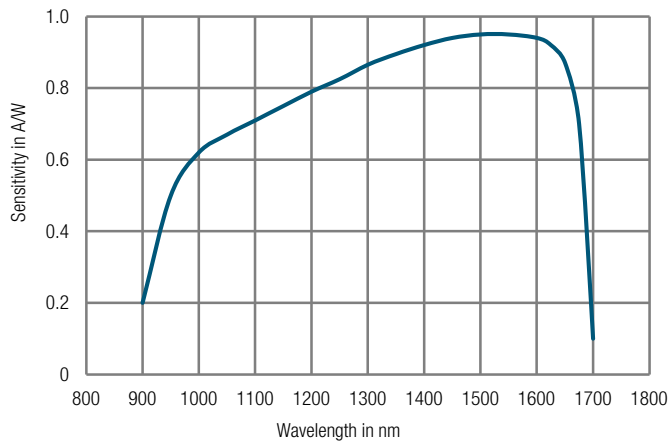
Pin 1: +15 V
Pin 2: NC
Pin 3: GND

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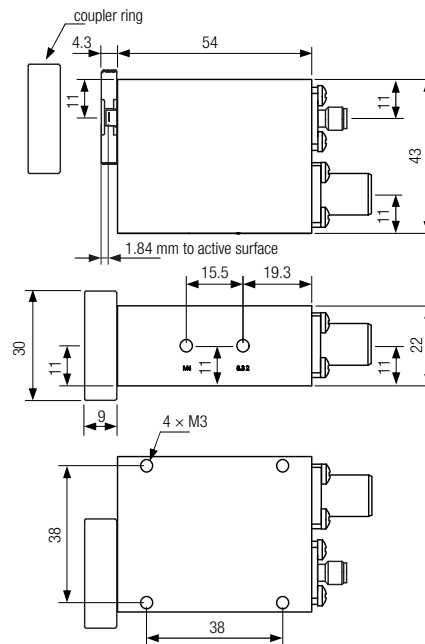
Scope of Delivery	HSPR-X-I-2G-IN, internally threaded coupler ring (FST version only), LEMO® 3-pin connector, datasheet, transport package	
Ordering Information	HSPR-X-I-2G-IN-FST	1.035"-40 threaded flange for free space applications and for use with various types of optical standard accessories.
	HSPR-X-I-2G-IN-FC	FC fiber optic connector (fix/permanent, FC/PC and FC/APC compatible).
Spectral Response	 DB-Sens-HSPR-X-I-2G-IN_R01	

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HSPR-X-I-2G-IN
**Ultra High Speed Photoreceiver
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Dimensions

HSPR-X-I-2G-IN-FST (1.035"-40 threaded free space input)



DZ-HS-FST_R1

all dimensions in mm unless otherwise noted

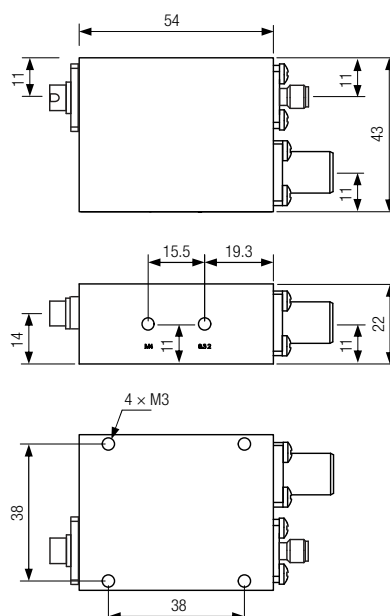
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HSPR-X-I-2G-IN_R3/TH, JMa/06MAY2024

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HSPR-X-I-2G-IN
**Ultra High Speed Photoreceiver
with InGaAs-PIN Photodiode**

Dimensions (continued)

HSPR-X-I-2G-IN-FC (FC fiber optic connector)



DZ-HS_FC_R1

all dimensions in mm unless otherwise noted

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