



Datasheet

HSPR-X-I-1G4-SI

Ultra High-Speed Photoreceiver with Si-PIN Photodiode



The picture shows the HSPR-X-I-1G4-SI-FS with free space input. The photoreceiver will be delivered without post holder and post.

Features	<ul style="list-style-type: none"> • Bandwidth 10 kHz ... 1.4 GHz • Si-PIN detector • Spectral range 320 ... 1000 nm • Amplifier transimpedance (gain) 5×10^3 V/A (inverting) • Conversion gain 2.55×10^3 V/W @ 760 nm 																													
Applications	<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 																													
Specifications	<table border="0"> <tr> <td>Test conditions</td> <td colspan="2">$V_s = +15$ V, $T_A = 25$ °C, system impedance = 50 Ω</td> </tr> <tr> <td rowspan="2">Gain</td> <td>Amplifier transimpedance</td> <td>5×10^3 V/A (@ 50 Ω load, inverting)</td> </tr> <tr> <td>Conversion gain</td> <td>2.55×10^3 V/W (typ. @ 760 nm)</td> </tr> <tr> <td rowspan="3">Frequency Response</td> <td>Lower cut-off frequency (-3 dB)</td> <td>10 kHz (± 25 %)</td> </tr> <tr> <td>Upper cut-off frequency (-3 dB)</td> <td>1.4 GHz (± 15 %)</td> </tr> <tr> <td>Rise/fall time (10 % - 90 %)</td> <td>250 ps (± 15 %)</td> </tr> <tr> <td rowspan="4">Input/Detector</td> <td>Detector material</td> <td>Si-PIN photodiode</td> </tr> <tr> <td rowspan="2">Active area</td> <td>FS-version: \varnothing 400 μm</td> </tr> <tr> <td>FC-version: integrated ball lens, suitable for fibers up to 400 μm core diameter</td> </tr> <tr> <td>Spectral range</td> <td>320 ... 1000 nm</td> </tr> <tr> <td rowspan="2">Max. optical peak input power</td> <td>390 μW AC (for linear amplification, @ 760 nm)</td> </tr> <tr> <td>10 mW CW (to prevent saturation, @ 760 nm)</td> </tr> <tr> <td>Noise</td> <td>Min. NEP</td> <td>19 pW/\sqrtHz (@ 760 nm, 100 MHz)</td> </tr> </table>	Test conditions	$V_s = +15$ V, $T_A = 25$ °C, system impedance = 50 Ω		Gain	Amplifier transimpedance	5×10^3 V/A (@ 50 Ω load, inverting)	Conversion gain	2.55×10^3 V/W (typ. @ 760 nm)	Frequency Response	Lower cut-off frequency (-3 dB)	10 kHz (± 25 %)	Upper cut-off frequency (-3 dB)	1.4 GHz (± 15 %)	Rise/fall time (10 % - 90 %)	250 ps (± 15 %)	Input/Detector	Detector material	Si-PIN photodiode	Active area	FS-version: \varnothing 400 μ m	FC-version: integrated ball lens, suitable for fibers up to 400 μ m core diameter	Spectral range	320 ... 1000 nm	Max. optical peak input power	390 μ W AC (for linear amplification, @ 760 nm)	10 mW CW (to prevent saturation, @ 760 nm)	Noise	Min. NEP	19 pW/ \sqrt Hz (@ 760 nm, 100 MHz)
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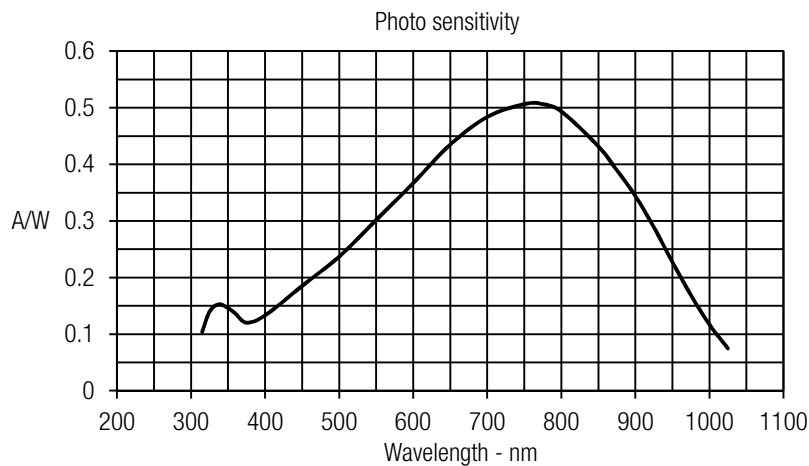
Specifications (continued)

Output	Output impedance 50 Ω (designed for 50 Ω load) Output VSWR 1.4 : 1 (@ f < 2.5 GHz) Output return loss 15.5 dB (@ f < 2.5 GHz) Max. output voltage 2.0 V _{pp} (@ 50 Ω load, for linear amplification) Output noise typ. 2.5 mV _{RMS} or 17 mV _{pp} * (measurement BW: 4 GHz)
	* The peak-to-peak output noise is derived from the RMS noise as follows: V _{pp} = V _{RMS} x 6.6 (99.9% of the time the output noise voltage will be within the specified peak-to-peak value.)
Power Supply	Supply voltage +15 V, 150 mA typ. (depends on operating conditions, recommended power supply capability minimum 200 mA)
Case	Weight 100 g (0.23 lbs) Material AlMg4.5Mn, nickel-plated
Temperature Range	Storage temperature -40 ... +100 °C Operating temperature 0 ... +60 °C

Absolute Maximum Ratings

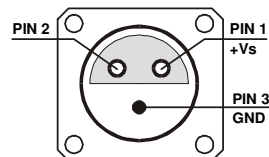
Power supply voltage	±18.5 V
Optical input power	12 mW (averaged)

Spectral Response



Connectors

Input	HSPR-X-I-1G4-SI-FS 25 mm round flange for free space applications HSPR-X-I-1G4-SI-FC FC fiber optic receptacle
Output	SMA jack (female)
Power supply	Lemo® series 1S, 3-pin fixed socket (mating plug type: FFA.1S.303.CLAC52) Pin 1: +15V Pin 2: NC Pin 3: GND



Ultra High-Speed Photoreceiver with Si-PIN Photodiode

Available Models	HSPR-X-I-1G4-SI-FS free space input HSPR-X-I-1G4-SI-FC fiber optic receptacle HSPR-X-S customized versions available on request		
Dimensions	<table border="0" style="width: 100%; text-align: center;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>HSPR-X-I-1G4-SI-FS</p> <p>Technical drawings of the HSPR-X-I-1G4-SI-FS model. Front view shows a width of 54.0 mm and a height of 43.0 mm. The optical input is 4.7 mm wide. Side view shows a depth of 25.0 mm and a mounting hole offset of 11.0 mm. Top view shows a 38.0 mm distance from the left edge to the center of the mounting holes, with a 1.9 mm distance to the active area. Mounting holes are M4 and UNC 8-32. The rear panel has 4x M3 holes.</p> </td> <td style="width: 50%; vertical-align: top;"> <p>HSPR-X-I-1G4-SI-FC</p> <p>Technical drawings of the HSPR-X-I-1G4-SI-FC model. Front view shows a width of 54.0 mm and a height of 43.0 mm. Side view shows a depth of 14.0 mm and a mounting hole offset of 11.0 mm. Top view shows a 38.0 mm distance from the left edge to the center of the mounting holes. Mounting holes are M4 and UNC 8-32. The rear panel has 4x M3 holes.</p> </td> </tr> </table> <p style="text-align: right;">All measures in mm unless otherwise noted</p>	<p>HSPR-X-I-1G4-SI-FS</p> <p>Technical drawings of the HSPR-X-I-1G4-SI-FS model. Front view shows a width of 54.0 mm and a height of 43.0 mm. The optical input is 4.7 mm wide. Side view shows a depth of 25.0 mm and a mounting hole offset of 11.0 mm. Top view shows a 38.0 mm distance from the left edge to the center of the mounting holes, with a 1.9 mm distance to the active area. Mounting holes are M4 and UNC 8-32. The rear panel has 4x M3 holes.</p>	<p>HSPR-X-I-1G4-SI-FC</p> <p>Technical drawings of the HSPR-X-I-1G4-SI-FC model. Front view shows a width of 54.0 mm and a height of 43.0 mm. Side view shows a depth of 14.0 mm and a mounting hole offset of 11.0 mm. Top view shows a 38.0 mm distance from the left edge to the center of the mounting holes. Mounting holes are M4 and UNC 8-32. The rear panel has 4x M3 holes.</p>
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