

Datasheet

HSPR-X-I-2G-IN

Ultra High-Speed Photoreceiver
with InGaAs-PIN Photodiode



The picture shows the HSPR-X-I-2G-IN-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 ... 2 GHz • InGaAs-PIN detector • Spectral range 900 ... 1700 nm • Amplifier transimpedance (gain) 5×10^3 V/A (inverting) • Conversion gain 4.75×10^3 V/W @ 1550 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>4.75×10^3 V/W (typ. @ 1550 nm)</td> </tr> <tr> <td rowspan="3">Frequency Response</td> <td>Lower cut-off frequency (-3 dB)</td> <td>10 kHz</td> </tr> <tr> <td>Upper cut-off frequency (-3 dB)</td> <td>2 GHz (± 15 %)</td> </tr> <tr> <td>Rise/fall time (10 % - 90 %)</td> <td>180 ps (± 15 %)</td> </tr> <tr> <td rowspan="4">Input/Detector</td> <td>Detector material</td> <td>InGaAs-PIN photodiode</td> </tr> <tr> <td rowspan="2">Active area</td> <td>FS-version: $\varnothing 100$ μm</td> </tr> <tr> <td>FC-version: integrated ball lens, suitable for fibers up to 62.5 μm core diameter</td> </tr> <tr> <td>Spectral range</td> <td>900 ... 1700 nm</td> </tr> <tr> <td>Max. optical peak input power</td> <td>210 μW AC (for linear amplification, @ 1550 nm) 10 mW CW (to prevent saturation, @ 1550 nm)</td> </tr> <tr> <td>Noise</td> <td>NEP</td> <td>11 pW/\sqrtHz (@ 1550 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	4.75×10^3 V/W (typ. @ 1550 nm)	Frequency Response	Lower cut-off frequency (-3 dB)	10 kHz	Upper cut-off frequency (-3 dB)	2 GHz (± 15 %)	Rise/fall time (10 % - 90 %)	180 ps (± 15 %)	Input/Detector	Detector material	InGaAs-PIN photodiode	Active area	FS-version: $\varnothing 100$ μ m	FC-version: integrated ball lens, suitable for fibers up to 62.5 μ m core diameter	Spectral range	900 ... 1700 nm	Max. optical peak input power	210 μ W AC (for linear amplification, @ 1550 nm) 10 mW CW (to prevent saturation, @ 1550 nm)	Noise	NEP	11 pW/ \sqrt Hz (@ 1550 nm, 100 MHz)
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SOPHISTICATED TOOLS FOR SIGNAL RECOVERY



DE-HSPR-X-I-2G-IN_R1/TH_JM/14FEB2018

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**Ultra High-Speed Photoreceiver
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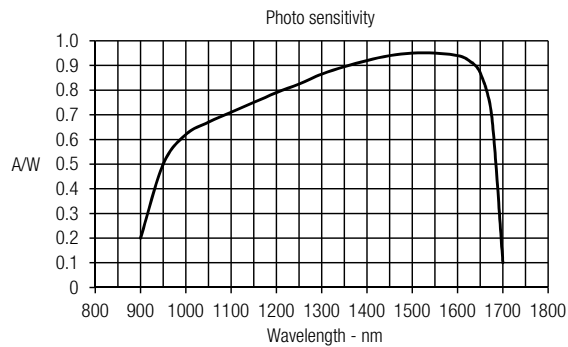
Specifications (continued)

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 _{FP}	(@ 50 Ω load, for linear amplification)
	Output noise	typ. 2.5 mV _{RMS} or 17 mV _{FP} *	(measurement BW: 4 GHz)
* The peak-to-peak output noise is derived from the RMS noise as follows: V _{FP} = V _{RMS} × 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

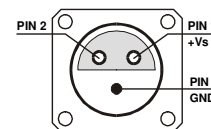
Power supply voltage	±18.5 V
Optical input power	12 mW (averaged)

Spectral Response



Connectors

Input	HSPR-X-I-2G-IN-FS	25 mm round flange for free space applications
	HSPR-X-I-2G-IN-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:	+15 V
	Pin 2:	NC
	Pin 3:	GND



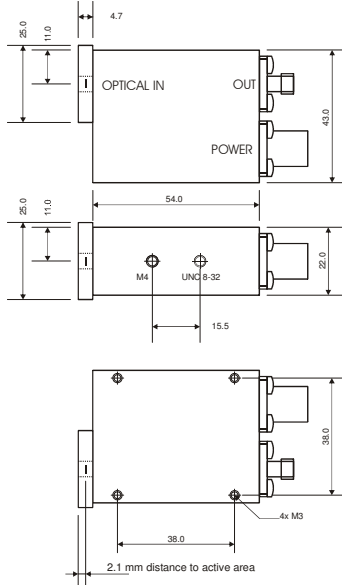
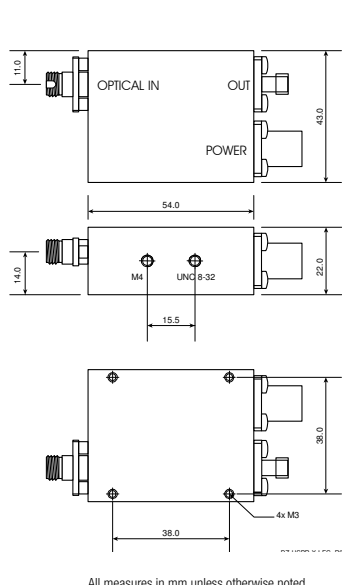
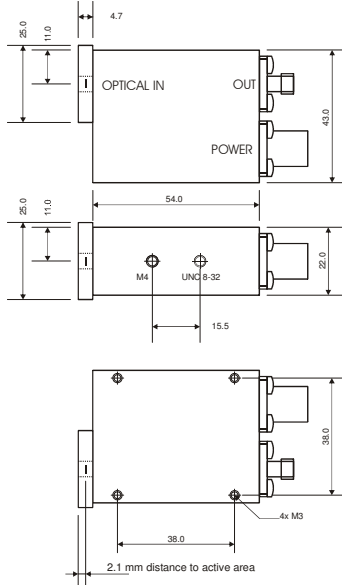
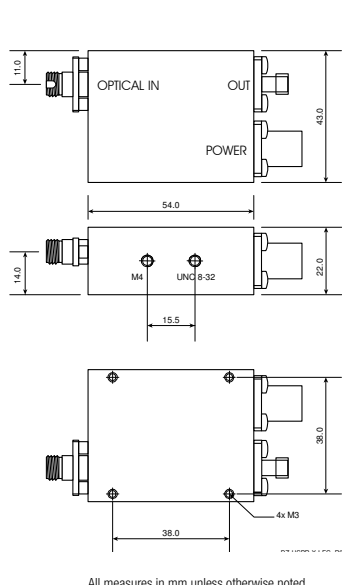
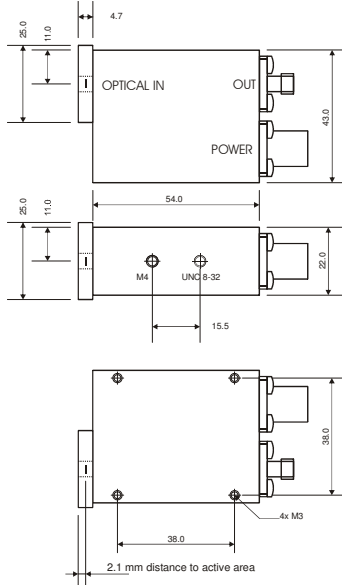
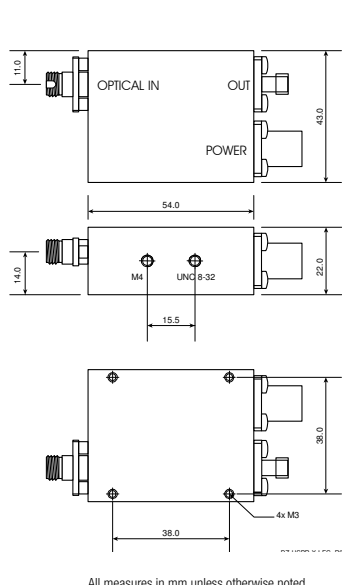
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F E M T O

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**Ultra High-Speed Photoreceiver
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Available Models	HSPR-X-I-2G-IN-FS free space input HSPR-X-I-2G-IN-FC fiber optic receptacle HSPR-X-S customized versions available on request		
Dimensions	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%; text-align: center; vertical-align: top;"> <p>HSPR-X-I-2G-IN-FS</p>  </td> <td style="width: 50%; text-align: center; vertical-align: top;"> <p>HSPR-X-I-2G-IN-FC</p>  </td> </tr> </table> <p style="text-align: right; font-size: small;">All measures in mm unless otherwise noted.</p>	<p>HSPR-X-I-2G-IN-FS</p> 	<p>HSPR-X-I-2G-IN-FC</p> 
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