

Datasheet

HSA-X-S-2G-IN

Ultra High-Speed Photoreceiver
with InGaAs-PIN Photodiode



The picture shows the HSA-X-S-2G-IN-FS with free space input.
The photoreceiver will be delivered without post holder and post.

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|-------------------------------|---|--|--|--|------|--------------------------|--|-----------------|---|--------------------|---------------------------------|--------|---------------------------------|---------------------|------------------------------|----------------------|----------------|-------------------|-----------------------|-------------|---------------------------------------|--|----------------|-----------------|-------------------------------|---|-------|-----|--|
| 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 • 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)</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>200 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>16 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) | 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 | 200 μ W AC (for linear amplification, @ 1550 nm) 10 mW CW (to prevent saturation, @ 1550 nm) | Noise | NEP | 16 pW/ \sqrt Hz (@ 1550 nm, 100 MHz) |
| 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) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 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 | 200 μ W AC (for linear amplification, @ 1550 nm) 10 mW CW (to prevent saturation, @ 1550 nm) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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SOPHISTICATED TOOLS FOR SIGNAL RECOVERY



DE-HSA-X-S-2G-IN_R11/LK/JM/25NOV2015

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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 2.5 : 1 (@ f < 2.5 GHz)
 Output return loss 7.3 dB (@ f < 2.5 GHz)
 Max. output voltage 1.9 V_{FP} (@ 50 Ω load, for linear amplification)
 Output noise typ. 3.6 mV_{RMS} or 24 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, 130 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

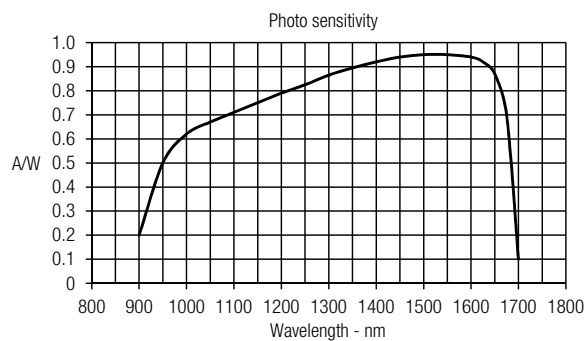
Temperature Range

Storage temperature -40 ... +100 °C
 Operating temperature 0 ... +60 °C

Absolute Maximum Ratings

Power supply voltage ±20 V
 Optical input power 12 mW (averaged)

Spectral Response

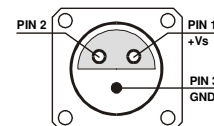


Connectors

Input HSA-X-S-2G-IN-FS 25 mm round flange for free space applications
 HSA-X-S-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



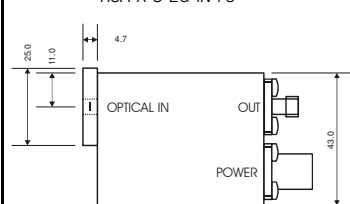
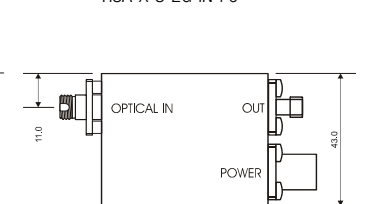
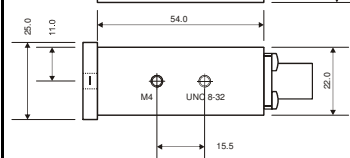
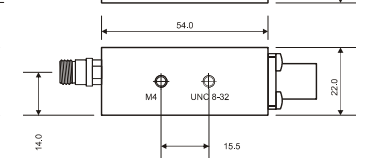
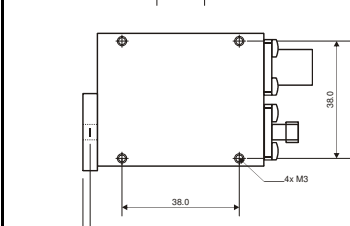
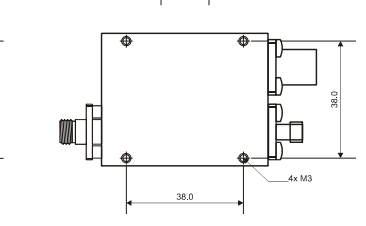
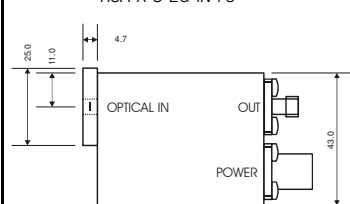
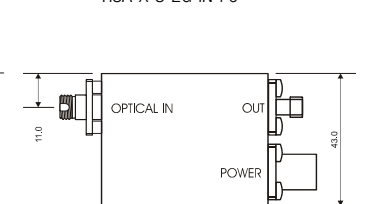
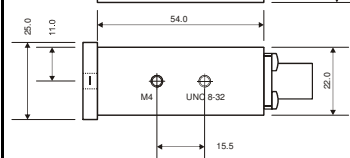
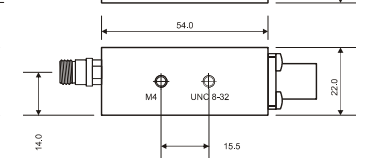
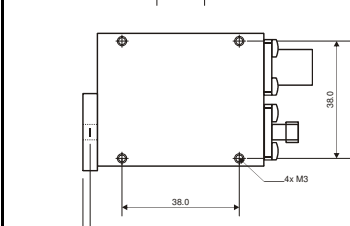
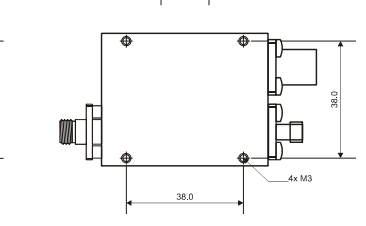
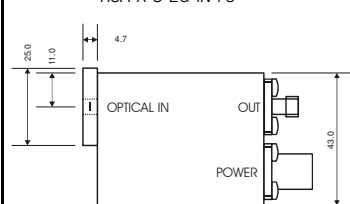
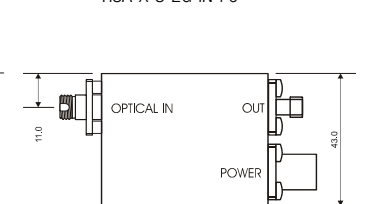
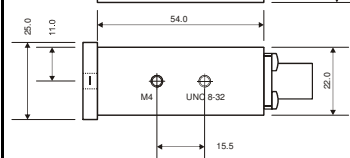
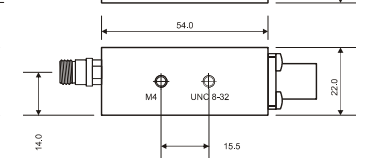
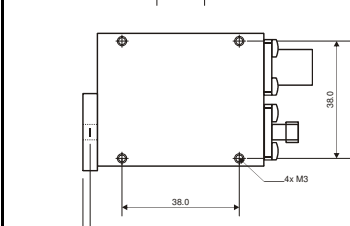
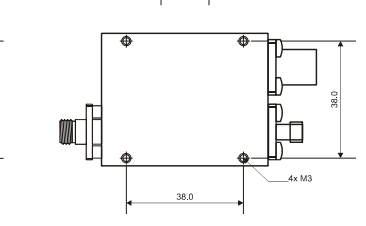
SOPHISTICATED TOOLS FOR SIGNAL RECOVERY



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**Ultra High-Speed Photoreceiver
with InGaAs-PIN Photodiode**

| Available Models | HSA-X-S-2G-IN-FS HSA-X-S-2G-IN-FC HSA-X-S | free space input fiber optic receptacle customized versions available on request | | | | | | | | |
|--|--|--|------------------|------------------|--|---|---|--|--|---|
| Dimensions | <table border="1"> <thead> <tr> <th data-bbox="705 672 1056 716">HSA-X-S-2G-IN-FS</th> <th data-bbox="1056 672 1423 716">HSA-X-S-2G-IN-FC</th> </tr> </thead> <tbody> <tr> <td data-bbox="705 716 1056 918">  </td> <td data-bbox="1056 716 1423 918">  </td> </tr> <tr> <td data-bbox="705 918 1056 1075">  </td> <td data-bbox="1056 918 1423 1075">  </td> </tr> <tr> <td data-bbox="705 1075 1056 1299">  </td> <td data-bbox="1056 1075 1423 1299">  </td> </tr> </tbody> </table> <p data-bbox="1136 1299 1372 1332">All measures in mm unless otherwise noted.</p> | | HSA-X-S-2G-IN-FS | HSA-X-S-2G-IN-FC |  |  |  |  |  |  |
| HSA-X-S-2G-IN-FS | HSA-X-S-2G-IN-FC | | | | | | | | | |
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