

Femtowatt Photoreceiver with InGaAs PIN Photodiode



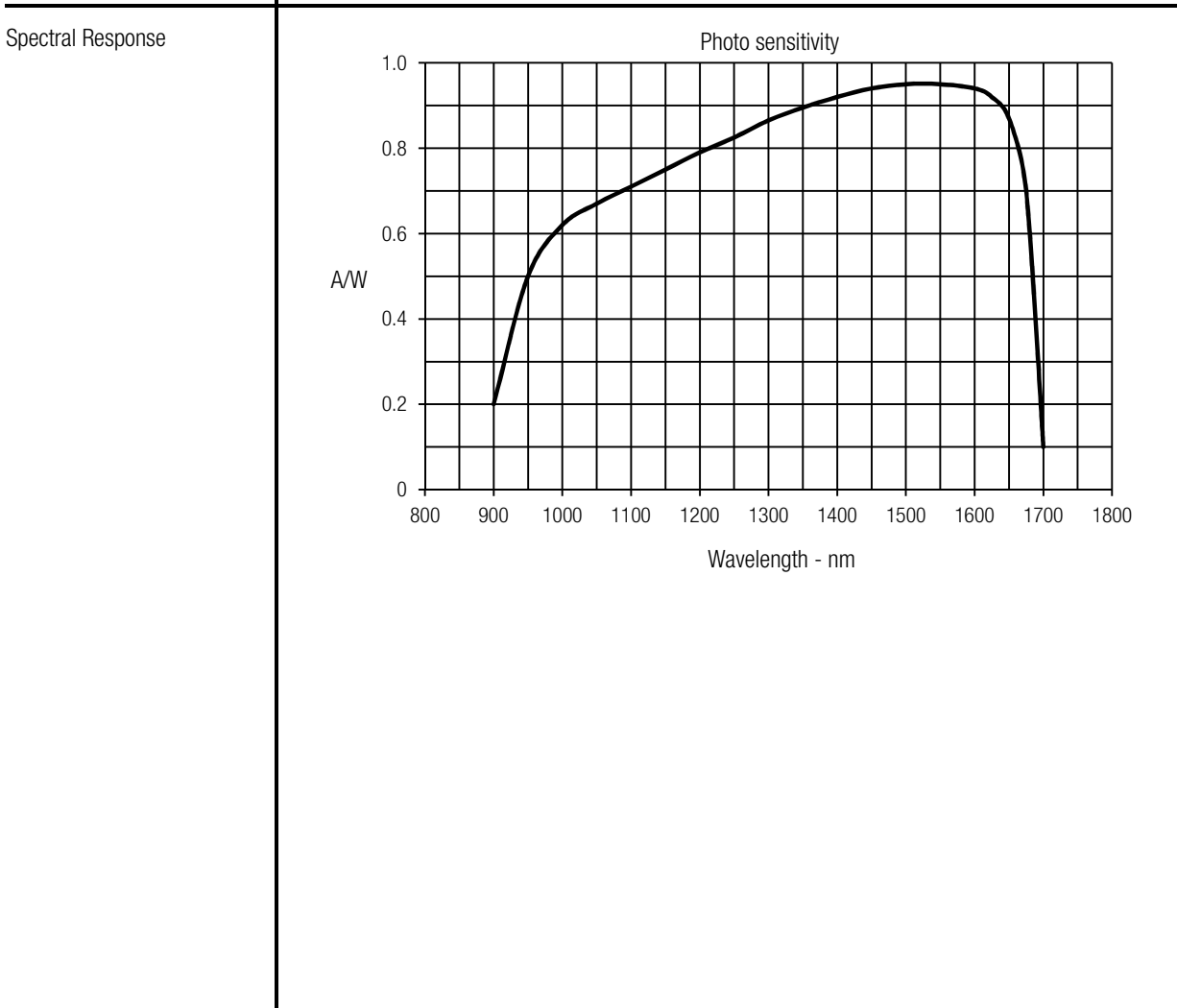
The photoreceiver will be delivered without post holder and post.

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|-----------------------|---|--|--|--|------|--------------------------|--|----------------------|--|--------------------|-------------------------|----|---------------------------------|----------------------|----------------------------|----------------------|----------|-------------------|-----------------------|-------------|-----------------------------|-------------------|-----------------|-------|--------------------------|--|-----|------------------------------|
| <p>Features</p> | <ul style="list-style-type: none"> • InGaAs PIN photodiode, 0.5 mm active diameter • Ultra low noise, NEP 7.5 fW/√Hz • Amplifier transimpedance gain 1 x 10¹¹ V/A • Max. conversion gain 0.95 x 10¹¹ V/W @ 1550 nm • Wavelength range 900 ... 1700 nm | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Applications</p> | <ul style="list-style-type: none"> • Fluorescence measurements • NIR spectroscopy • Electrophoresis • Replacement for (liquid nitrogen) cooled Ge photodiodes and avalanche photodiodes (APDs) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Specifications</p> | <table border="0"> <tr> <td>Test conditions</td> <td colspan="2">$V_s = \pm 15\text{ V}$, $T_A = 25^\circ\text{C}$ Warm-up 20 minutes (min. 10 minutes recommended)</td> </tr> <tr> <td rowspan="2">Gain</td> <td>Amplifier transimpedance</td> <td>$1.0 \times 10^{11}\text{ V/A}$ (@ $\geq 100\text{ k}\Omega$ load)</td> </tr> <tr> <td>Max. conversion gain</td> <td>$0.95 \times 10^{11}\text{ V/W}$ (@ 1550 nm)</td> </tr> <tr> <td rowspan="3">Frequency Response</td> <td>Lower cut-off frequency</td> <td>DC</td> </tr> <tr> <td>Upper cut-off frequency (-3 dB)</td> <td>20 Hz ($\pm 20\%$)</td> </tr> <tr> <td>Rise/fall time (10% - 90%)</td> <td>18 ms ($\pm 20\%$)</td> </tr> <tr> <td rowspan="3">Detector</td> <td>Detector material</td> <td>InGaAs PIN photodiode</td> </tr> <tr> <td>Active area</td> <td>$\varnothing 0.5\text{ mm}$</td> </tr> <tr> <td>Spectral response</td> <td>900 ... 1700 nm</td> </tr> <tr> <td rowspan="2">Input</td> <td>Optical saturation power</td> <td>110 pW (for linear amplification, @ 1550 nm)</td> </tr> <tr> <td>NEP</td> <td>7.5 fW/√Hz (@ 1550 nm, 1 Hz)</td> </tr> </table> | Test conditions | $V_s = \pm 15\text{ V}$, $T_A = 25^\circ\text{C}$ Warm-up 20 minutes (min. 10 minutes recommended) | | Gain | Amplifier transimpedance | $1.0 \times 10^{11}\text{ V/A}$ (@ $\geq 100\text{ k}\Omega$ load) | Max. conversion gain | $0.95 \times 10^{11}\text{ V/W}$ (@ 1550 nm) | Frequency Response | Lower cut-off frequency | DC | Upper cut-off frequency (-3 dB) | 20 Hz ($\pm 20\%$) | Rise/fall time (10% - 90%) | 18 ms ($\pm 20\%$) | Detector | Detector material | InGaAs PIN photodiode | Active area | $\varnothing 0.5\text{ mm}$ | Spectral response | 900 ... 1700 nm | Input | Optical saturation power | 110 pW (for linear amplification, @ 1550 nm) | NEP | 7.5 fW/√Hz (@ 1550 nm, 1 Hz) |
| Test conditions | $V_s = \pm 15\text{ V}$, $T_A = 25^\circ\text{C}$ Warm-up 20 minutes (min. 10 minutes recommended) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Gain | Amplifier transimpedance | $1.0 \times 10^{11}\text{ V/A}$ (@ $\geq 100\text{ k}\Omega$ load) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Max. conversion gain | $0.95 \times 10^{11}\text{ V/W}$ (@ 1550 nm) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Frequency Response | Lower cut-off frequency | DC | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Upper cut-off frequency (-3 dB) | 20 Hz ($\pm 20\%$) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Rise/fall time (10% - 90%) | 18 ms ($\pm 20\%$) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Detector | Detector material | InGaAs PIN photodiode | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Active area | $\varnothing 0.5\text{ mm}$ | | | | | | | | | | | | | | | | | | | | | | | | | | |
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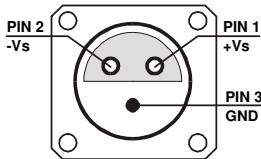
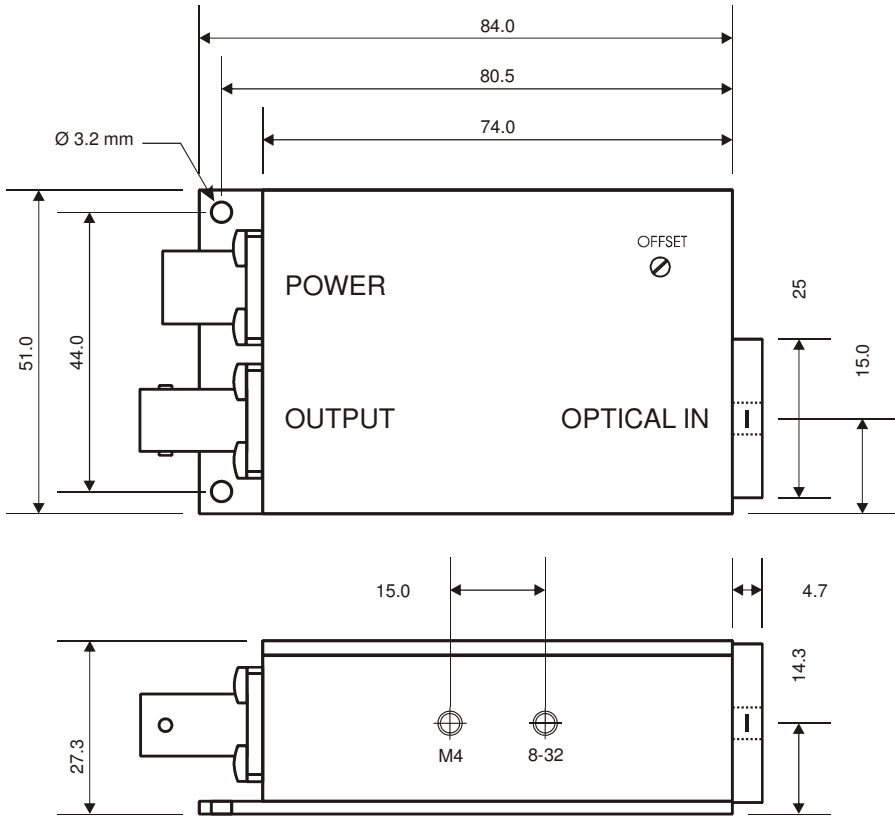
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| Specifications (continued) | |
| Output | Output voltage range ± 10 V (@ ≥ 100 k Ω load) Output impedance 50 Ω (designed for ≥ 100 k Ω load) Offset voltage 0 V, adjustable by offset potentiometer within ± 1.6 V Max. output current ± 25 mA Output noise ca. 20 mV _{pp} or 3 mV _{RMS} (@ ≥ 100 k Ω load, no signal on detector) |
| Power Supply | Supply voltage ± 15 V Supply current ± 15 mA typ. (depends on operating conditions, recommended power supply capability min. ± 50 mA) |
| Case | Weight 190 g (0.42 lbs) Material AlMg3/4.5Mn, nickel-plated |
| Temperature Range | Storage temperature -40 ... +100 °C Operating temperature 0 ... +60 °C |

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| Absolute Maximum Ratings | Optical input power 10 mW Power supply voltage ± 22 V |
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| <p>Connectors</p> | <p>Input 25 mm round flange for free space applications (fiber optic input available as customized unit)</p> <p>Output BNC jack (female)</p> <p>Power supply Lemo® series 1S, 3-pin fixed socket (Mating plug type: FFA.1S.303.CLAC52) Pin 1: +15V Pin 2: -15V Pin 3: GND</p>  |
| <p>Available Models</p> | <p>FWPR-20-IN-FS Free space input FWPR-S Customized version available on request</p> |
| <p>Dimensions</p> |  <p style="text-align: right;">all measures in mm unless otherwise noted</p> |

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