

Femtowatt Photoreceiver with Si Photodiode



The picture shows model FWPR-20-SI-FS.
The photoreceiver will be delivered without post holder and post.

<p>Features</p>	<ul style="list-style-type: none"> • Si photodiode, 1.1 × 1.1 mm² active area • Ultra low noise, NEP 0.7 fW/√Hz • Amplifier transimpedance gain 1 × 10¹² V/A • Max. conversion gain 0.6 × 10¹² V/W @ 960 nm • Wavelength range 320 – 1100 nm • Free-space input 1.035"-40 threaded, alternatively 25 mm diameter unthreaded • Easily convertible to fiber optic input (FC and FSMA) with optionally available screw-on adapters • UNC 8-32 and M4 tapped holes for mounting on standard posts with metric and imperial thread
<p>Applications</p>	<ul style="list-style-type: none"> • Fluorescence measurements • Spectroscopy • Electrophoresis • Replacement for photomultiplier tubes (PMTs) and avalanche photodiodes (APDs)
<p>Block Diagram</p>	

BS01-FWPR_R03

Femtowatt Photoreceiver with Si Photodiode

Available Versions

FWPR-20-SI-FST

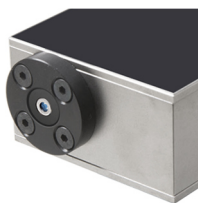


Picture shows 1.035"-40 threaded flange with internally threaded coupler ring (outer diameter 30 mm)

1.035"-40 threaded flange for free space applications, compatible with many optical standard accessories and for use with various types of fiber connector adapters.

Optionally available:
Fiber adapters PRA-FC, PRA-FCA and PRA-FSMA.
Coupling efficiency will depend on fiber type.
With the relative large $1.1 \times 1.1 \text{ mm}^2$ photodiode installed in the FWPR-20-SI input coupling is not critical. However, standard SM 9/125 fibers (PC or APC) with low numerical aperture (NA) are recommended for ensuring near 100% coupling efficiency.

FWPR-20-SI-FS



Picture shows round flange with 25 mm diameter

25 mm dia. unthreaded flange for free space applications. Compatible with many optical standard accessories.

Related Models

FWPR-20-IN-FST

InGaAs-PIN, $\varnothing 500 \mu\text{m}$, 900 - 1700 nm free space input, 1.035"-40 threaded flange

FWPR-20-IN-FS

InGaAs-PIN, $\varnothing 500 \mu\text{m}$, 900 - 1700 nm free space input, 25 mm dia. unthreaded flange

Available Accessories

PRA-FC
PRA-FCA
PRA-FSMA



Fiber-adapter with external 1.035"-40 thread (suitable for FST models only).

PRA-PAP



Alternative mounting option:
Post adapter plate, easy to mount on FEMTO photoreceiver series OE, FWPR, PWPR, HCA-S and LCA-S.

PS-15-25-L



Power supply,
Input: 100 – 240 VAC,
Output: $\pm 15 \text{ VDC}$

Femtowatt Photoreceiver with Si Photodiode

Specifications	Test conditions	$V_S = \pm 15\text{ V}$, $T_A = 25\text{ }^\circ\text{C}$, output load impedance $1\text{ M}\Omega$, warm-up 20 minutes (min. 10 minutes recommended)
Gain	Transimpedance gain Gain accuracy Conversion gain	$1.0 \times 10^{12}\text{ V/A}$ (@ output load $\geq 100\text{ k}\Omega$) $\pm 1\%$ (electrical) $0.6 \times 10^{12}\text{ V/W typ.}$ (@ 960 nm , output load $\geq 100\text{ k}\Omega$)
Frequency Response	Lower cut-off frequency Upper cut-off frequency (-3 dB)	DC 20 Hz ($\pm 20\%$)
Time Response	Rise/fall time (10% - 90%)	18 ms ($\pm 20\%$)
Input	Noise equivalent power (NEP) Optical saturation power	$0.7\text{ fW}/\sqrt{\text{Hz}}$ (@ 960 nm , 1 Hz) 18 pW (for linear amplification, @ 960 nm)
Detector	Detector Active area Spectral range Sensitivity	Si photodiode $1.1 \times 1.1\text{ mm}^2$ 320 - 1100 nm 0.6 A/W typ. (@ 960 nm)
Output	Output voltage range Offset voltage compensation Output impedance Max. output current Output noise	$-1.6\text{ V} \dots +10\text{ V}$ (@ $\geq 100\text{ k}\Omega$ output load) $\pm 1.6\text{ V typ.}$ (adjustable by offset potentiometer) $50\ \Omega$ (terminate with $\geq 100\text{ k}\Omega$ load) 25 mA (short-circuit proof) 6 mV_{RMS} (40 mV_{PP}) typ. (@ $\geq 100\text{ k}\Omega$ load, no signal on detector, measurement bandwidth 8 kHz)
Input Flange	Material	1.4305 stainless steel, nickel-plated (FST flange) AlMg4.5Mn, nickel-plated (FS flange)
Coupler Ring (FST version only)	Material	1.4305 stainless steel, glass bead blasted
Power Supply	Supply voltage Supply current	$\pm 15\text{ V}$ ($\pm 14.5\text{ V} \dots \pm 16.5\text{ V}$) $\pm 15\text{ mA}$ (depends on operating conditions, recommended power supply capability min. $\pm 50\text{ mA}$)
Case	Weight Material	203 g (0.45 lbs) FWPR-20-SI-FST incl. coupler ring 190 g (0.42 lbs) FWPR-20-SI-FS AlMg3/4.5Mn, nickel-plated
Temperature Range	Storage temperature Operating temperature	$-30\text{ }^\circ\text{C} \dots +85\text{ }^\circ\text{C}$ $0\text{ }^\circ\text{C} \dots +60\text{ }^\circ\text{C}$

Absolute Maximum Ratings	Max. CW power (averaged) Power supply voltage	10 mW $\pm 20\text{ V}$
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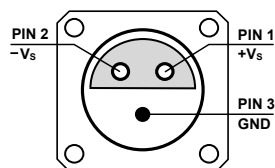
Connectors

Input FWPR-20-SI-FST 1.035"-40 threaded flange for free space applications and for use with various types of optical standard accessories

FWPR-20-SI-FS 25 mm dia. unthreaded flange for free space applications

Output BNC jack (female)

Power supply LEMO® series 1S, 3-pin fixed socket (mating plug type: FFA.1S.303.CLAC52)



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

Scope of Delivery

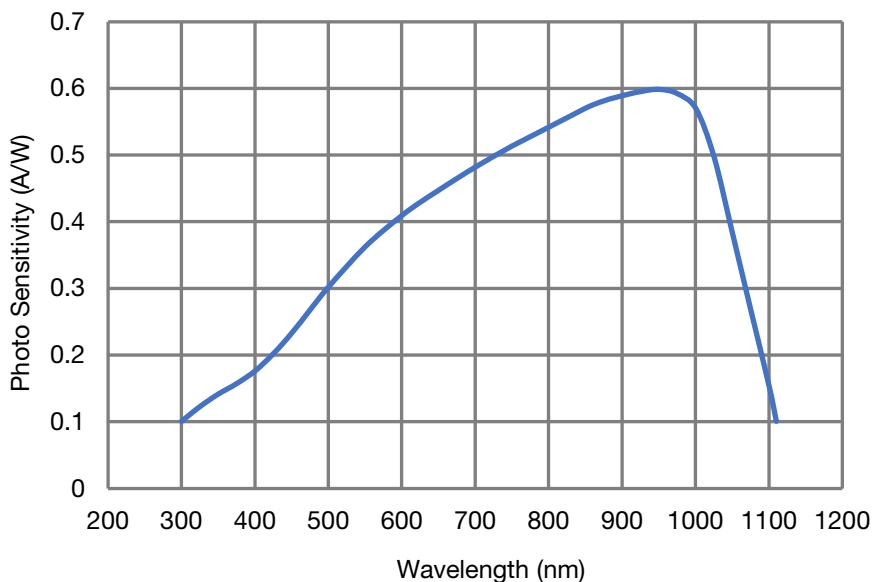
FWPR-20-SI, internally threaded coupler ring (FST version only), LEMO® 3-pin connector, datasheet, transport package

Ordering Information

FWPR-20-SI-FST 1.035"-40 threaded flange for free space applications and for use with various types of optical standard accessories.

FWPR-20-SI-FS 25 mm dia. unthreaded flange for free space applications.

Spectral Responsivity

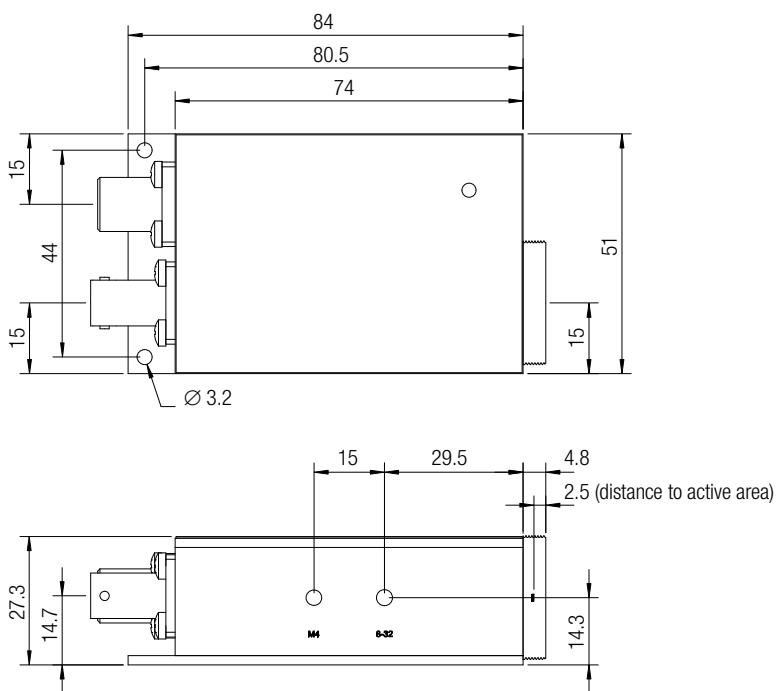


DB-Sens-FWPR-20-SI_R01

Femtowatt Photoreceiver with Si Photodiode

Dimensions

FWPR-20-SI-FST (1.035"-40 threaded free space input)



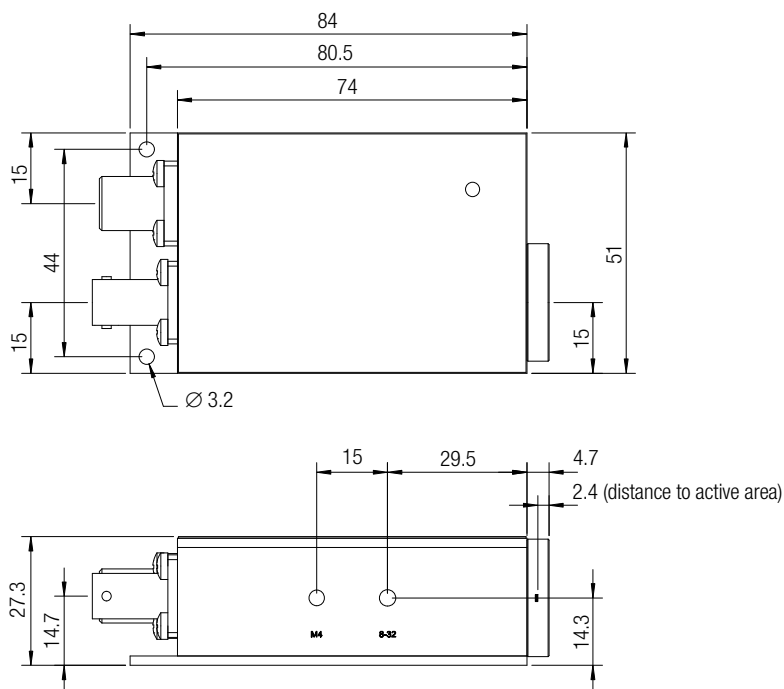
FWPR-20-SI-FST_R1

all dimensions in mm unless otherwise noted

Femtowatt Photoreceiver with Si Photodiode

Dimensions (continued)

FWPR-20-SI-FS (25 mm dia. unthreaded free space input)



FWPR-20-SI-FS_R1

all dimensions in mm unless otherwise noted

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