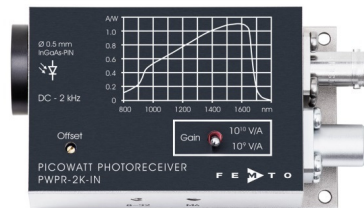


Datasheet

PWPR-2K-IN

Ultra-Low Noise 2 kHz Photoreceiver  
with InGaAs-PIN Photodiode



The picture shows model PWPR-2K-IN-FS.

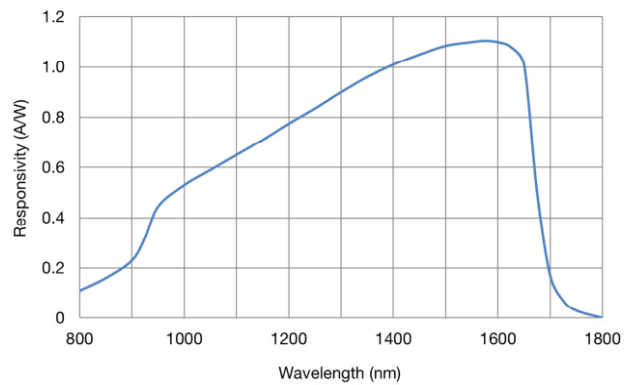
Features

- InGaAs-PIN detector, 0.5 mm active diameter
- Spectral range 900 - 1700 nm
- Ultra-low noise, NEP 10 fW/√Hz
- Bandwidth DC to 2 kHz
- Transimpedance gain switchable  $1.0 \times 10^9$  V/A,  $1.0 \times 10^{10}$  V/A
- 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

Applications

- Spectroscopy, reflection and transmission measurements
- Highly sensitive optoelectronic measurements
- Applications utilizing optical chopper modulation
- Optical front-end for oscilloscopes, A/D converters and lock-in amplifiers

Spectral Response



SOPHISTICATED TOOLS FOR SIGNAL RECOVERY



DE-PWPR-2K-IN\_R2/KJ,TH,JM/29NOV2017

**Datasheet**

**PWPR-2K-IN**

**Ultra-Low Noise 2 kHz Photoreceiver  
with InGaAs-PIN Photodiode**

Available Versions

PWPR-2K-IN-FST

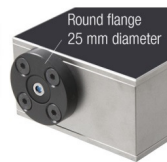


Internal threaded coupler ring with 30 mm outer diameter (included)

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 and PRA-FSMA  
(Coupling efficiency will depend on fiber type.  
With the relative large 0.5 mm dia. photodiode installed in the PWPR-2K-IN 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.)

PWPR-2K-IN-FS



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

PWPR-S

Customized versions available on request

Available Accessories

PRA-FSMA  
PRA-FC



Fiber-adapter with external 1.035"-40 thread



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: ±15 VDC

SOPHISTICATED TOOLS FOR SIGNAL RECOVERY



**Datasheet**

**PWPR-2K-IN**

**Ultra-Low Noise 2 kHz Photoreceiver  
with InGaAs-PIN 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	$1.0 \times 10^9\text{ V/A}$ , $1.0 \times 10^{10}\text{ V/A}$ (switchable) (@ output load $\geq 100\text{ k}\Omega$ )
	Gain accuracy	$\pm 1\%$ (electrical)
	Conversion gain	$1.1 \times 10^7\text{ V/W}$ , $1.1 \times 10^{10}\text{ V/W}$ typ. (switchable) (@ 1580 nm, output load $\geq 100\text{ k}\Omega$ )
Frequency Response	Lower cut-off frequency	DC
	Upper cut-off frequency (-3 dB)	2 kHz
	Rise/fall time (10% - 90%)	165 $\mu\text{s}$
Detector	Detector type	InGaAs-PIN photodiode
	Active area	$\varnothing 0.5\text{ mm}$
	Spectral range	900 - 1700 nm
	Max. sensitivity	$1.1\text{ A/W}$ @ 1580 nm typ.
Input	Input offset current (dark current)	0.6 pA typ.
	Input offset current drift	factor 2 / $10\text{ }^\circ\text{C}$
	Input offset compensation range	$\pm 120\text{ pA}$ (adjustable by offset potentiometer)
	Optical saturation power	9.1 nW (@ $10^9\text{ V/A}$ , 1580 nm) 0.91 nW (@ $10^{10}\text{ V/A}$ , 1580 nm)
	NEP	10 fW/ $\sqrt{\text{Hz}}$ (@ 1580 nm, 100 Hz)
Output	Output voltage range	$-1.2\text{ V} \dots +10\text{ V}$ (@ $\geq 100\text{ k}\Omega$ output load)
	Max. output current	30 mA (short-circuit proof)
	Output impedance	50 $\Omega$ (terminate with $\geq 100\text{ k}\Omega$ )
	Output noise	0.75 mV <sub>RMS</sub> (5 mV <sub>pp</sub> ) typ. @ $10^9\text{ V/A}$ , no signal on detector
Power Supply	Supply voltage	$\pm 15\text{ V}$ ( $\pm 14.5 \dots 16.5\text{ V}$ )
	Supply current	+32 mA / -25 mA (depends on operating conditions, recommended power supply capability minimum $\pm 100\text{ mA}$ )
Case	Weight	207 g (0.46 lbs) PWPR-2K-IN-FS 220 g (0.49 lbs) PWPR-2K-IN-FST incl. coupler ring
	Material	AlMg4.5Mn, nickel-plated
Temperature Range	Storage temperature	$-30\text{ }^\circ\text{C} \dots +85\text{ }^\circ\text{C}$
	Operating temperature	$0\text{ }^\circ\text{C} \dots +50\text{ }^\circ\text{C}$
Absolute Maximum Ratings	Optical input power (CW)	10 mW
	Power supply voltage	$\pm 20\text{ V}$

SOPHISTICATED TOOLS FOR SIGNAL RECOVERY



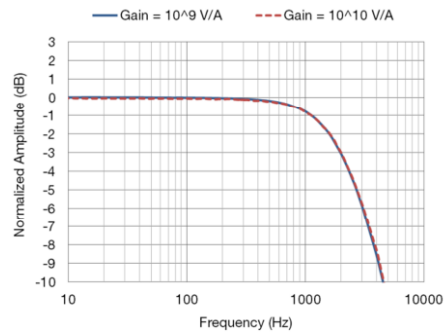
**Datasheet**

**PWPR-2K-IN**

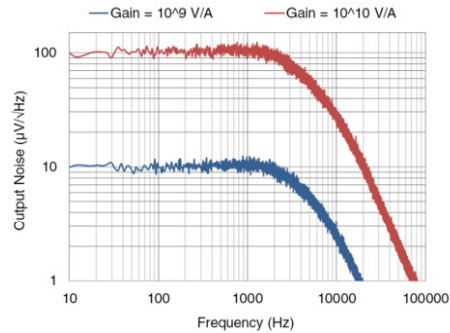
**Ultra-Low Noise 2 kHz Photoreceiver  
with InGaAs-PIN Photodiode**

Typical Performance  
Characteristics

Frequency Response



Output Noise



SOPHISTICATED TOOLS FOR SIGNAL RECOVERY



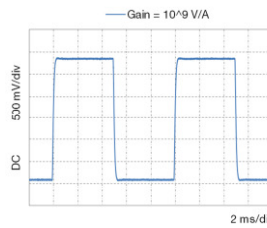
**Datasheet**

**PWPR-2K-IN**

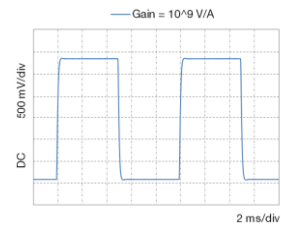
**Ultra-Low Noise 2 kHz Photoreceiver  
with InGaAs-PIN Photodiode**

Typical Performance  
Characteristics (continued)

Step Signal Response @ 2500 pW (p-p, 1550 nm)

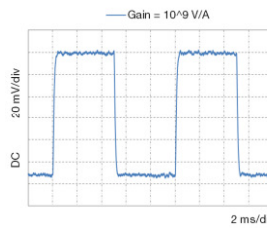


acquisition without averaging

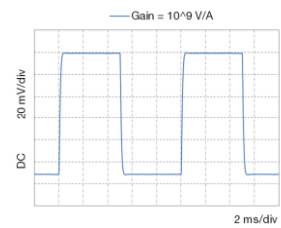


acquisition with 64x averaging

Step Signal Response @ 100 pW (p-p, 1550 nm)

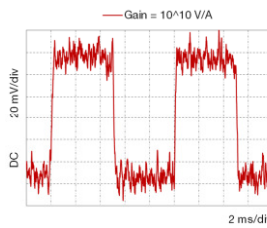


acquisition without averaging

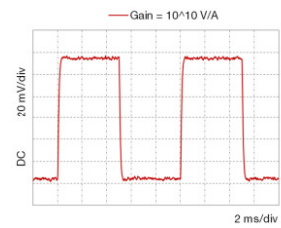


acquisition with 64x averaging

Step Signal Response @ 10 pW (p-p, 1550 nm)



acquisition without averaging



acquisition with 64x averaging

SOPHISTICATED TOOLS FOR SIGNAL RECOVERY

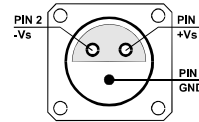


**Datasheet**

**PWPR-2K-IN**

**Ultra-Low Noise 2 kHz Photoreceiver  
with InGaAs-PIN Photodiode**

Connectors	Input	PWPR-2K-IN-FS	25 mm dia. unthreaded flange for free space applications
		PWPR-2K-IN-FST	1.035"-40 threaded flange for free space applications and for use with fiber connector adapters PRA-FC and PRA-FSMA
	Output	fixed fiber optic input	available as customized unit
	Power supply		BNC jack (female) 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	PWPR-2K-IN, internally threaded coupler ring ("FST" version only), Lemo® 3-pin connector, datasheet, transport package
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SOPHISTICATED TOOLS FOR SIGNAL RECOVERY



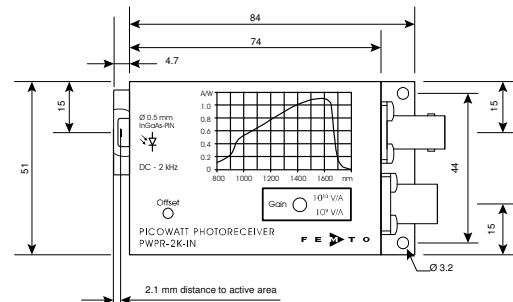
**Datasheet**

**PWPR-2K-IN**

**Ultra-Low Noise 2 kHz Photoreceiver  
with InGaAs-PIN Photodiode**

Dimensions

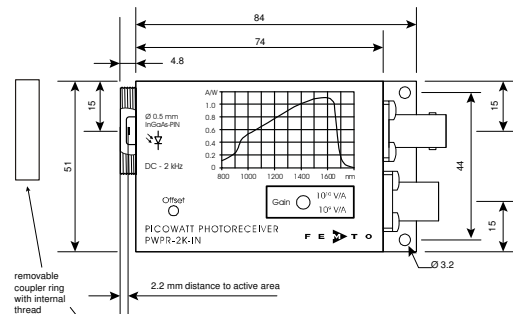
PWPR-2K-IN-FS (25 mm dia. unthreaded free space input)



all measures in mm unless otherwise noted

DZ-PWPR-2K-IN-FS\_R0

PWPR-2K-IN-FST (1.035"-40 threaded free space input)



all measures in mm unless otherwise noted

DZ-PWPR-2K-IN-FST\_R0

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SOPHISTICATED TOOLS FOR SIGNAL RECOVERY

