High Speed Photodiode with Ball Lens

InGaAs 800-1700 nm, Silicon 400-1000 nm

DATASHEET

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This photodiode is ideal for measuring both pulsed and CW fiber light sources, by converting the optical power to an electrical current. The Photodiode is a three pin device with a TO-46 package size. This specific photodiode has a ball shape lens, which is a great optical component for improving signal coupling between fibers. The photodiode anode produces a current, which is a function of the incident light power and the wavelength. The responsivity $\Re$ (λ) can be read from the plot on the following page to estimate the amount of photocurrent to expect. This can be converted to a voltage by placing a load resistor (R_L) from the photodiode anode to the circuit ground. The output voltage is derived as:

$$V_o = P \times \Re \times R_L$$

The bandwidth, f_{BW}, and the rise time response, t_R, are determined from the diode capacitance, C_J, and the load resistance, R_L, as shown below. The diode capacitance can be lowered by placing a bias voltage from the photodiode cathode to the circuit ground.

$$f_{BW} = \frac{1}{(2\pi)R_L C_J},\ t_R = \frac{0.35}{f_{BW}}$$

Features

- Low Noise
- High Sensitivity
- TO-46 package size

Applications

- OEM
- Lab user
- Instruments

Specifications

Parameter		Min	Typical	Max	Unit
Wavelength Range	InGaAs	800	1550	1700	nm
	Silicon	400	650	1000	
Responsivity			1.003		A/W
Rise/Fall Time [1] (R_L=50 Ω, 5 V)			0.30 / 0.30		ns
NEP (1550 nm, 20 V)			4.5- x 10^{-15}		W/√Hz
Dark Current (5 V)			0.05	2.00	nA
Bias Voltage (Reverse)				20	V
Reverse Current				2	mA
Capacitance (5 V)			2.0		pF
Optical Power Damage Threshold			18		mW
Active Area Diameter			Ø0.12		mm
Coupling Lens			Ø0.06" Ball Lens		
Package			TO-46		
Operating Temperature		-40		75	°C
Storage Temperature		-55		125	°C

Notes:

[1]. Rise and Fall times are measured between 10% to 90% of the step height in accordance with Manufacture specification sheet.

Note: The specifications provided are for general applications with a cost-effective approach. If you need to narrow or expand the tolerance, coverage, limit, or qualifications, please [click this link]:

Rev 04/24/25

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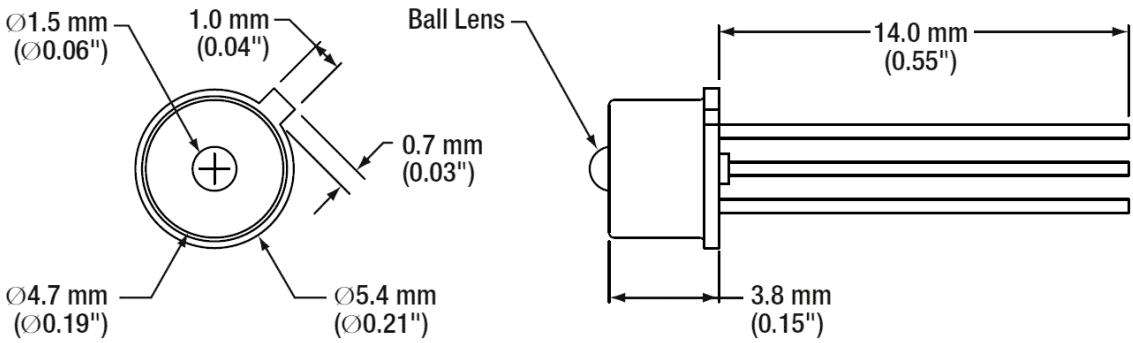
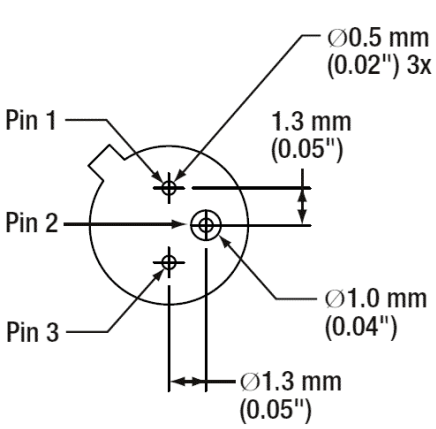
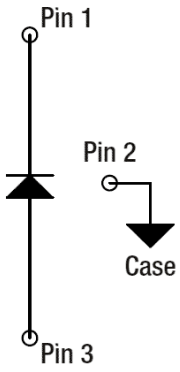
Mechanical Dimensions







Pin Circle Diameter = 2.5 mm (0.10")

*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

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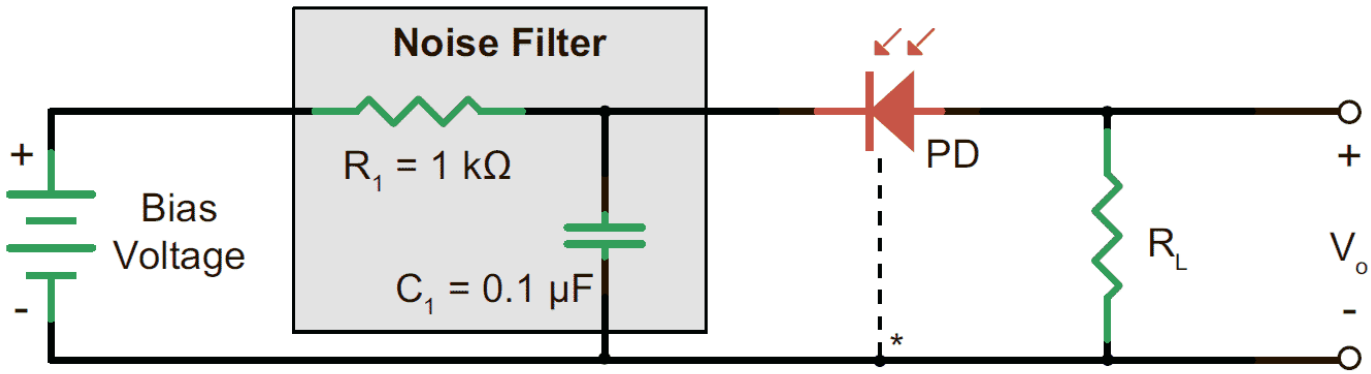
Recommended Circuit



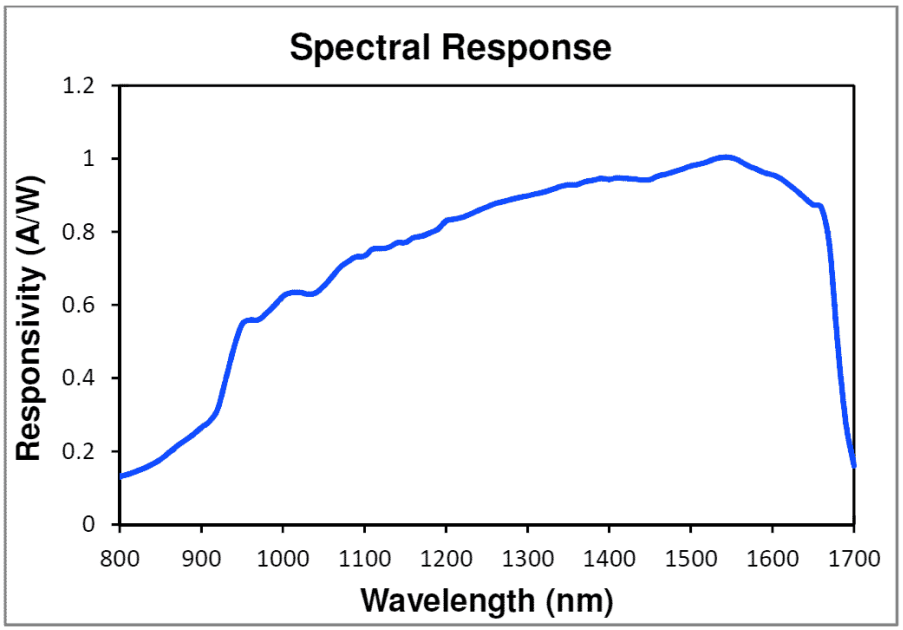
* Case ground for PD with a third lead.

Responsivity Graph

The responsivity of a photodiode is a measure of its sensitivity to light and is defined as the ratio of the photocurrent I_P to the incident light power P at a given wavelength:

$$R_\lambda = \frac{I_P}{P}$$

In other words, it is a measure of the effectiveness of the conversion of light power into electrical current. Responsivity constantly varies depending on the wavelength of the incident light, applied reverse bias, and temperature conditions.



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Ordering Information

	☐	☐	1	☐	☐	☐
Prefix	**Wavelength**	**Bandwidth**	**Model**	**TIA**	**Package**	**Receptacle**
BPIN-	850-1630nm = 1 400-1000nm = 2 Special = 0	0.1GHz (~100 µm) = 1 1.25 GHz(~30 µm) = 2 3 GHz(~30 µm) = 3 5 GHz (~20 µm) = 5 10GHz (~10 µm) = 6	Single mode = 1 Multimode[1] = 2	Non = 1 One Stage = 2 Two Stage = 3	Standard = 1 Special = 0	LC = 1 Special = 0

Application Notes