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HIGH-SPEED SILICON DETECTOR - DET1-SI

DESCRIPTION

Thorlab's DET1-SI is a ready-to-use high-speed photo detector. The unit comes complete with a photo diode and internal 22.5V bias battery enclosed in a ruggedized aluminum housing. An 8-32 tapped hole is provided on the base of the housing to mount the detector directly to a Thorlabs positioning device (1/2" post holder, mounting plates, etc.). The DET series of detectors covers a spectral range of 190 to 1800nm with rise times below 1ns.

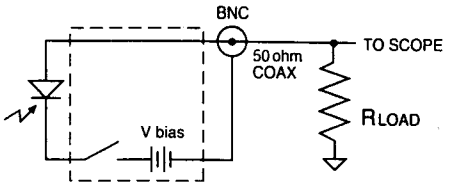
SPECIFICATIONS:

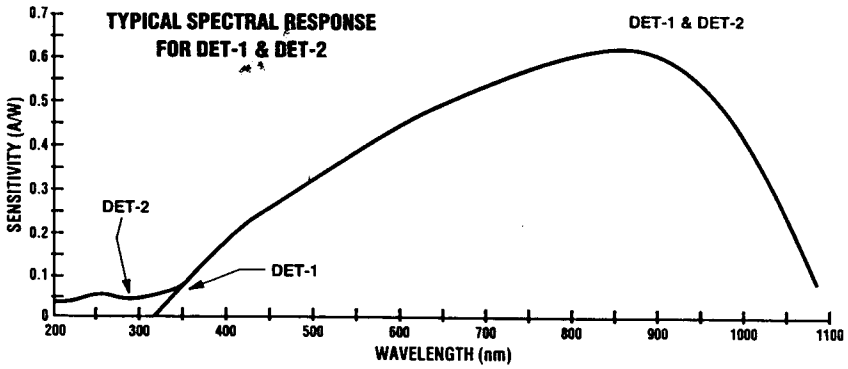
Detector:	Silicon PIN
Spectral Response:	400-1100nm
Peak Wavelength:	920nm ± 50nm
Rise/Fall Time[1]:	10ns
Diode Capacitance:	25pF
NEP:	1.2×10^{-14} W / √Hz
Dark Current:	20nA
Active Area:	13.7mm^2
	3.7mm x 3.7mm square
Linearity Limit:	1mW

Housing:	Black Anodized Aluminum
Size:	0.75" x 1.3" x 2"
Output:	BNC, DC-Coupled
Bias:	22.5V Battery
Mounting:	8-32 Tapped Hole
Diode Socket:	TO-5, Anode Marked
Damage Threshold:	100mW CW
	0.5 J / cm^2 (10 ns pulse)

Notes:

1. 50Ω Terminating Resistor





Thorlab's DET series are ideal for measuring both pulsed and CW light sources. Each DET includes a reverse-biased PIN photo diode, bias battery, and an ON/OFF switch packaged in a ruggedized housing. The BNC output signal is the direct photocurrent out of the photo diode anode and is a function of the incident light power and wavelength. The responsivity, $\Re(\lambda)$, can be read from Figure 1 to estimate the amount of the photocurrent to expect. Most users will wish to convert this photocurrent to a voltage for viewing on an oscilloscope or DVM. This is accomplished by adding an external load resistance, R_{LOAD}. The output voltage is derived as:

$$V_0 = P * \Re(\lambda) * R_{LOAD.}$$

The bandwidth, f_{BW}, and the rise-time response, T_R, are determined from the diode capacitance, C_J, and the load resistance, R_{LOAD}:

$$f_{BW} = 1 / (2\pi * R_{LOAD} * C_J), \; T_R = 0.35 / f_{BW}$$

For maximum bandwidth, we recommend using a 50Ω coax cable with a 50Ω terminating resistor at the end of the coax. This will also minimize ringing by matching the coax with its characteristic impedance. If bandwidth is not important, you can increase the amount of voltage for a given input light by increasing the R_{LOAD}.

Also Available: 1 ns Silicon, Germanium Detectors (800 - 1800nm), and amplified detectors.

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