DET30 Bias Photodetector

1. Overview

The DET30 is a ready-to-use high-speed photodetector for use with FC-connected fiber optic cables in optical systems. The unit consists of a circuit board, detector, RF connector, and 12V bias battery packaged in a compact aluminum enclosure.The FC flange facilitates coupling to a fiber optic light source, and an SMA connector is used at the output to reduce size and maximize frequency response up to a maximum bandwidth of 5 GHz.The detector is available in two spectral ranges, 400-1000 nm and 1000-1700 nm. 1700nm.

2. Features

- Four models cover the wavelength range 400-1700nm
- Bandwidth from 1 to 5 GHz
- Rise times from 80ps to 350ps
- Connects to singlemode (SM) or multimode (MM) fiber
- FC fiber input connector
- SMA output connector

3. Applications

- Oscilloscope Light Probes
- Laser Pulse Width Measurement

4. Specifications

Items	DET30A-1G	DET30A-2G	DET30C-2G	DET30C-5G
Materials	Si		InGaAs	
Wavelength	400-1000nm		1000-1700nm	
Active Area	200um	70um	70um	40um
Responsivity	0.46A/W @850nm		0.90A/W @1550nm	
Bandwidth[ab]	DC-1GHz	DC-2GHz	DC-2GHz	DC-5GHz
Rise time[ab]	350ps	185ps	180ps	80ps
Damage threshold	5mW	5mW	5mW	4mW
Bias voltage	10V	10V	5V	5V
Output Impedance	50Ω			
Output coupling mode	DC			
output connector	SMA female			
Operating voltage	-10~65℃			
Operating	-40~85℃			

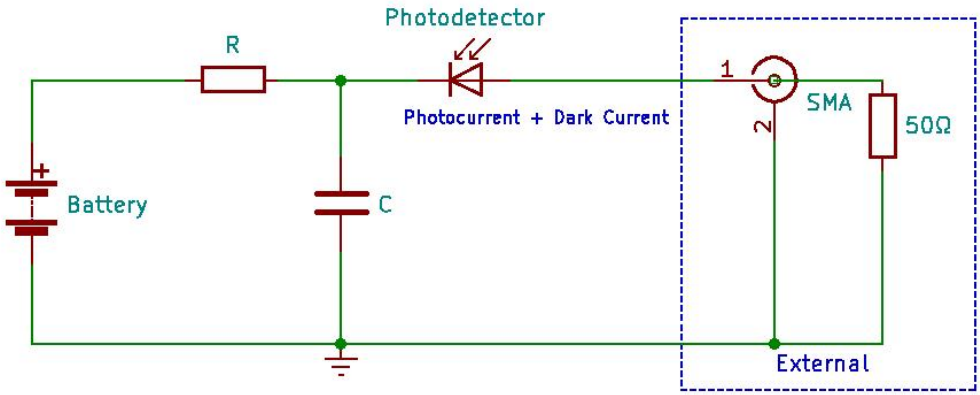
temperature	

Remarks:

a For 50Ω loads

b Low battery voltage will result in slower rise time and lower bandwidth

5. Schematic Block Diagram



6. Operating Procedures

- Adjust the voltage grid of the oscilloscope to 10mV/div and set the input impedance of the oscilloscope to 50Ω;
- Connect the output of the detector to the input of the oscilloscope with a coaxial cable;
- Ensure that the power received by the detector is within the saturation power, and then turn on the light source to be measured and align it with the photosensitive area;
- Observe the waveform of the oscilloscope.

Note: We use a load resistor R to convert the photocurrent I to a voltage V for viewing on an oscilloscope: V = I x R

Load resistance affects response speed, and for maximum bandwidth we recommend using a 50 ohm coaxial cable with a 50 ohm terminating resistor at the other end of the cable for impedance matching. If bandwidth is not important, the amount of voltage in a given light can be increased by gaining the load resistor. The length of the coaxial cable can have a profound effect on the response, so it is recommended to keep the cable as short as possible.

7. Battery life

Battery life is directly related to the amount of light power detected. Most battery manufacturers define battery life in mAh (milliampere hours). For example, the DET30 detector contains a battery that is 40 mAh. this means that it is capable of operating for 40 hours at 1.0 mA current. The following example illustrates how to determine the lifetime of this battery based on the optical power.

In this example, we incident a light source with an average power of 1 mW and a wavelength of 1550 nm onto an InGaAs detector. The response of the biased detector at this wavelength is 0.90 A/W and the photocurrent can be calculated according to the following equation:

I = 0.90A/W x 1mW = 0.9mA

The nominal battery life is 40 mAh, so the battery will continue to operate for:

T = 40mAh / 0.9mA = 44hr

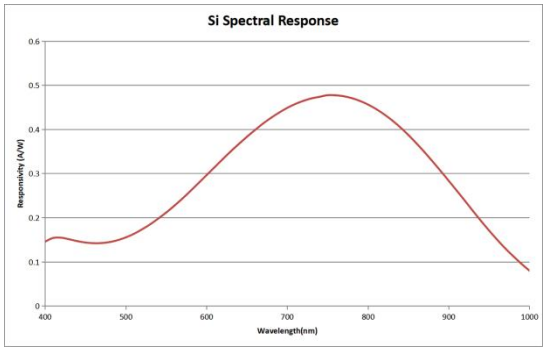
When using the recommended 50 ohm termination resistor, the voltage corresponding to 1 mW of light is:

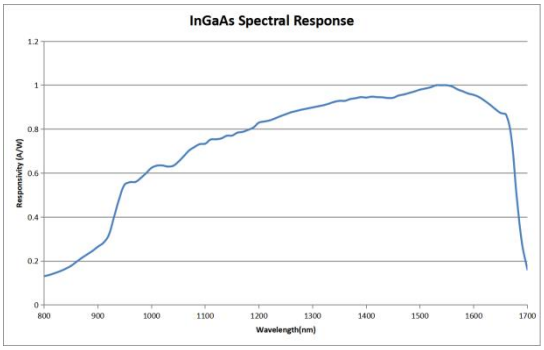
V = I x R = 0.9mA x 50 = 45mV

8. Replacement of batteries

The detector is powered by an A23 12V battery, first turn the battery cover counterclockwise to remove it, when installing a new battery, you need to pay attention to the positive and negative terminals of the battery, the negative terminal is the spring end of the battery cover. Remove the battery if it is not used for a long time.

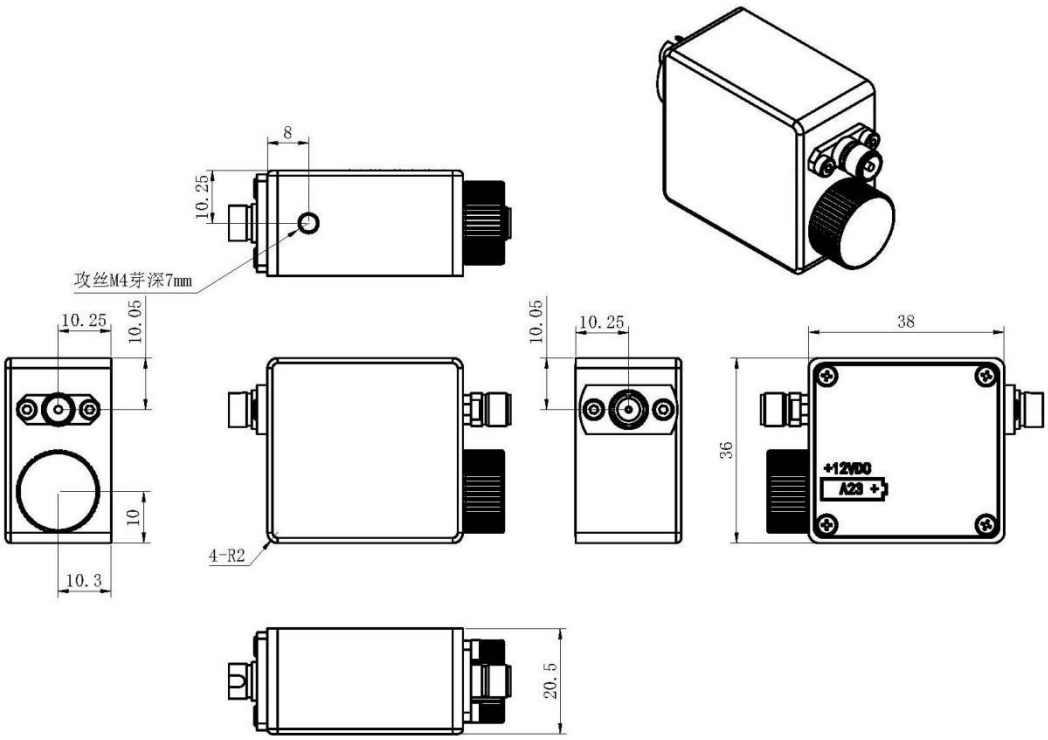
9. Response curve





Note: Response curves are typical values for reference only.

10. Mechanical dimensions


8
10.25
攻丝M4牙深7mm
10.25
10.05
10
10.3
4-R2
10.05
10.25
38
36
+12V/00
A23
20.5