APD1064 Avalanche Photodetector

1. Overview

Avalanche Photodetectors (APDs) are designed to provide greater sensitivity and lower noise than standard PIN detectors and are well suited for low optical power level applications. We offer versions with variable gain (i.e. M-factor) in addition to the standard APD.

In general, avalanche photodiodes utilize an internal gain mechanism to increase sensitivity. A high reverse bias voltage is applied to the diode to create a strong electric field. When an incident photon creates an electron-hole pair, the electric field accelerates the electron, resulting in the creation of secondary electrons from collisional ionization. The resulting avalanche of electrons will produce a gain factor of several hundred times, denoted by the multiplication factor M, which is a function of reverse bias and temperature. In general, the M factor increases with decreasing temperature and decreases with increasing temperature. Similarly, the M factor will increase as the reverse bias voltage increases and decrease as the reverse bias voltage decreases.

The APD1064 has an integrated thermistor that adjusts the bias voltage to compensate for the effect that temperature changes have on the M-factor.

2. Features

- Temperature Compensation
- 1064nm enhancement
- Optional FC flange
- High sensitivity
- 30mm optical cage system

3. Applications

- Bulk Detection
- Lidar
- Cloud Analysis
- Dust Storm Monitoring

4. Specifications

Items	APD1064A-10M	APD1064A-50M	APD1064A-200M
Materials	Si		
Wavelength	400-1100nm		
Photosensitive diameter	0.8mm		
Responsivity @M=1	0.36A/W @ 1064nm		
Bandwidth[a]	DC-10MHz	DC-50MHz	DC-200MHz
Rise time[a]	40ns	8ns	2ns
Gain[bc]	9.7×10^{6}V/W	1.9×10^{6}V/W	8×10^{5}V/W

Saturated Optical power[c]	0.32uW	1.7uW	3.8uW
Noise voltage[a]	18mVpp	18mVpp	18mVpp
Maximum Output Voltage[b]	3.2V	3.2V	3.2V
NEP	0.12pW/ √ Hz	0.23pW/ √ Hz	0.3pW/ √ Hz
Operating voltage	9-12V		
Operating Current	<200mA		
Output Impedance	50Ω		
Output coupling mode	DC		
Output connector	SMA female		
Operating temperature	-10~65℃		
Storage temperature	-40~85℃		

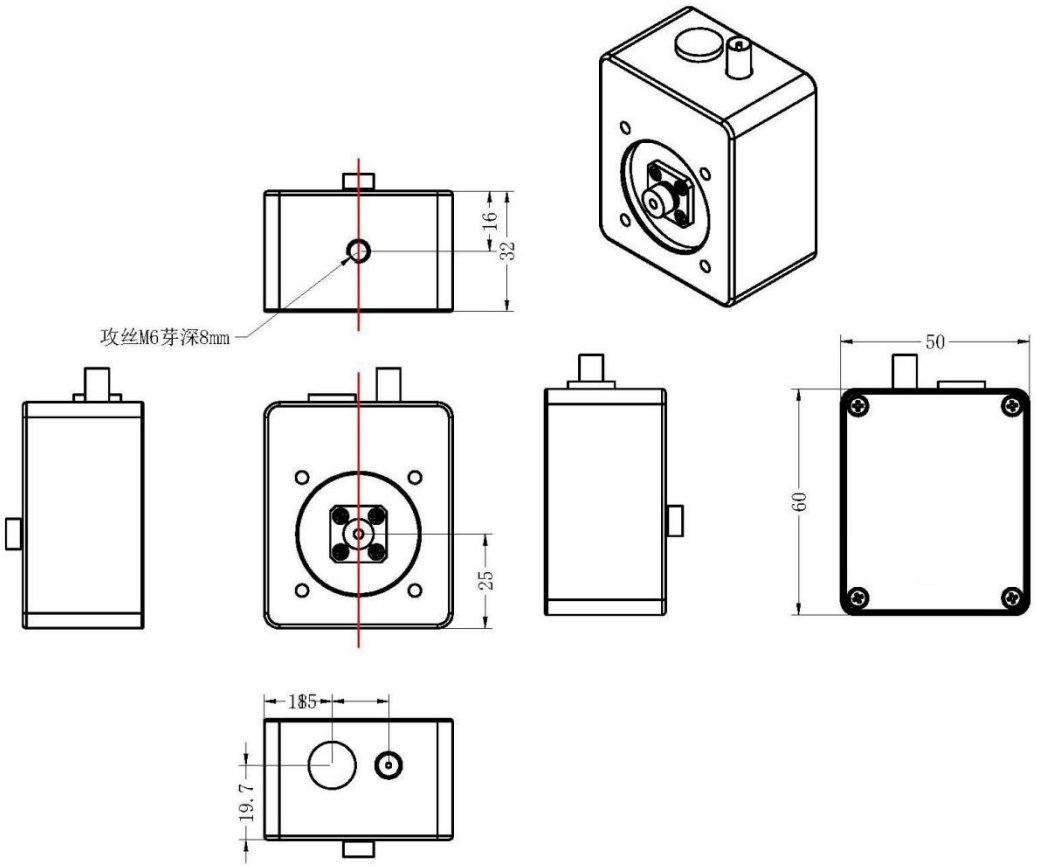
Remarks:

a ： For 50 ohm loads

b ： For high resistance loads

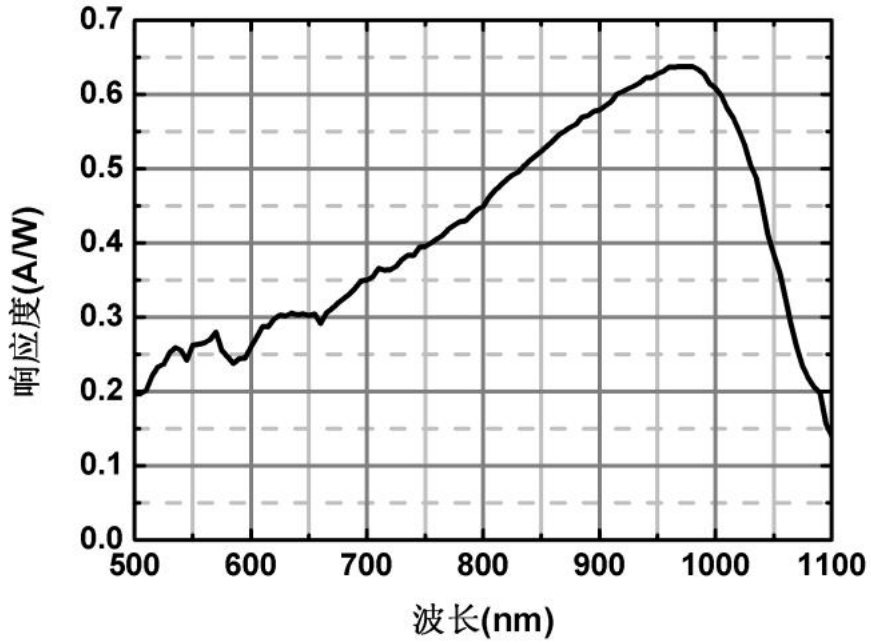
c ： 1064nm

5. Mechanical dimensions



Note: FC flange is optional

6. Response curve



Note: Response curves are typical values for reference only.