APD1064T Avalanche Photodetector

1. Overview

Avalanche Photodetectors (APDs) are designed to deliver higher sensitivity and lower noise than standard PIN photodetectors, making them ideal for low optical power applications. In addition to standard APDs, we also offer versions with variable gain (i.e., M-factor).

In general, avalanche photodiodes use an internal gain mechanism to increase sensitivity. A high reverse bias voltage is applied to create a strong electric field. When an incident photon generates an electron-hole pair, the electric field accelerates the electrons, causing secondary electrons via impact ionization. The resulting electron avalanche produces a gain factor of several hundred times, denoted as the multiplication factor **M**. M is a function of reverse bias voltage and temperature: it increases as temperature decreases and decreases as temperature rises. Similarly, M increases with higher reverse bias voltage and decreases with lower reverse bias voltage.

The APD1064T integrates a thermistor to adjust the bias voltage, compensating for temperature-induced changes in the M-factor.

2. Features

- Temperature compensation
- Enhanced response at 1064 nm
- Optional FC flange
- High sensitivity
- Compatible with 30 mm optical cage systems

3. Applications

- Atmospheric detection
- LiDAR
- Cloud layer analysis
- Sandstorm monitoring

4. Specifications

Model	APD1064A-10M-T	APD1064A-50M-T	APD1064A-200M-T
Material	Si	Si	Si
Wavelength Range	400–1100 nm	400–1100 nm	400–1100 nm
Active Area Diameter	0.8 mm	0.8 mm	0.8 mm
Responsivity @ M=1	0.36 A/W @ 1064 nm	0.36 A/W @ 1064 nm	0.36 A/W @ 1064 nm
Bandwidth a	DC–10 MHz	DC–50 MHz	DC–200 MHz
Rise Time a	40 ns	8 ns	2 ns
Gain bc	3.0×10^7 V/W	6.0×10^6 V/W	1.6×10^6 V/W
Saturation Optical Power c	0.12 μW	0.56 μW	1.9 μW
Noise Voltage a	18 mVpp	18 mVpp	18 mVpp
Max Output Voltage b	3.2 V	3.2 V	3.2 V
Noise Equivalent Power	0.07 pW/√Hz	0.12 pW/√Hz	0.16 pW/√Hz
Operating Voltage	9 V	9 V	9 V
Operating Current	<200 mA	<200 mA	<200 mA
Output Impedance	50 Ω	50 Ω	50 Ω
Output Coupling	DC	DC	DC
Output Connector	SMA female	SMA female	SMA female
Operating Temperature	−10 ~ 65 ℃	−10 ~ 65 ℃	−10 ~ 65 ℃
Storage Temperature	−40 ~ 85 ℃	−40 ~ 85 ℃	−40 ~ 85 ℃

Remarks:

a ： For 50 ohm loads

b ： For high resistance loads

c ： 1064nm

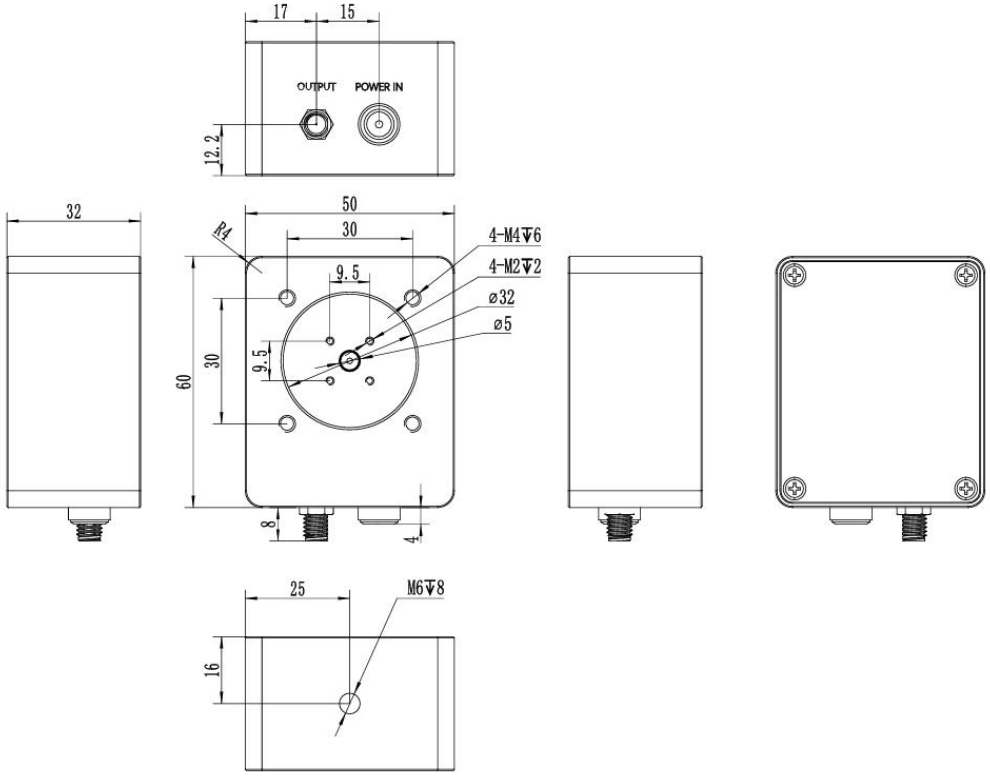
5.Model Designation

Format: Series–Bandwidth–T–SM1–ADJ

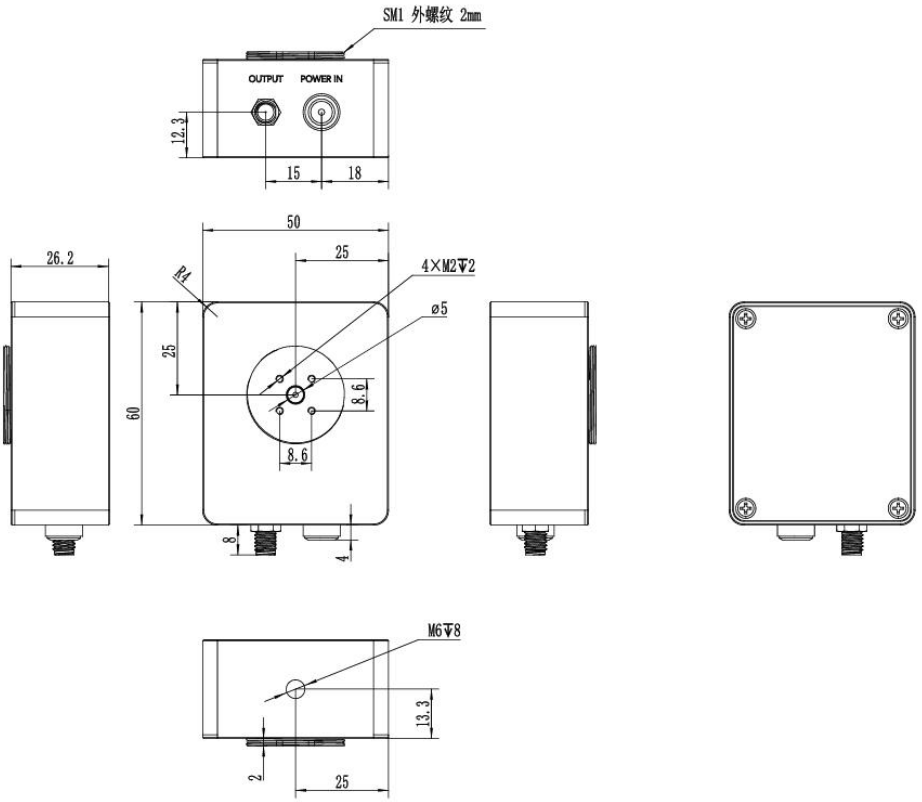
Examples:

- **APD1064A-50M-T**: 30 mm cage system structure (default).
- **APD1064A-50M-T-SM1**: SM1 external thread structure.
- **APD1064A-50M-T-SM1-ADJ**: SM1 external thread with adjustable gain.

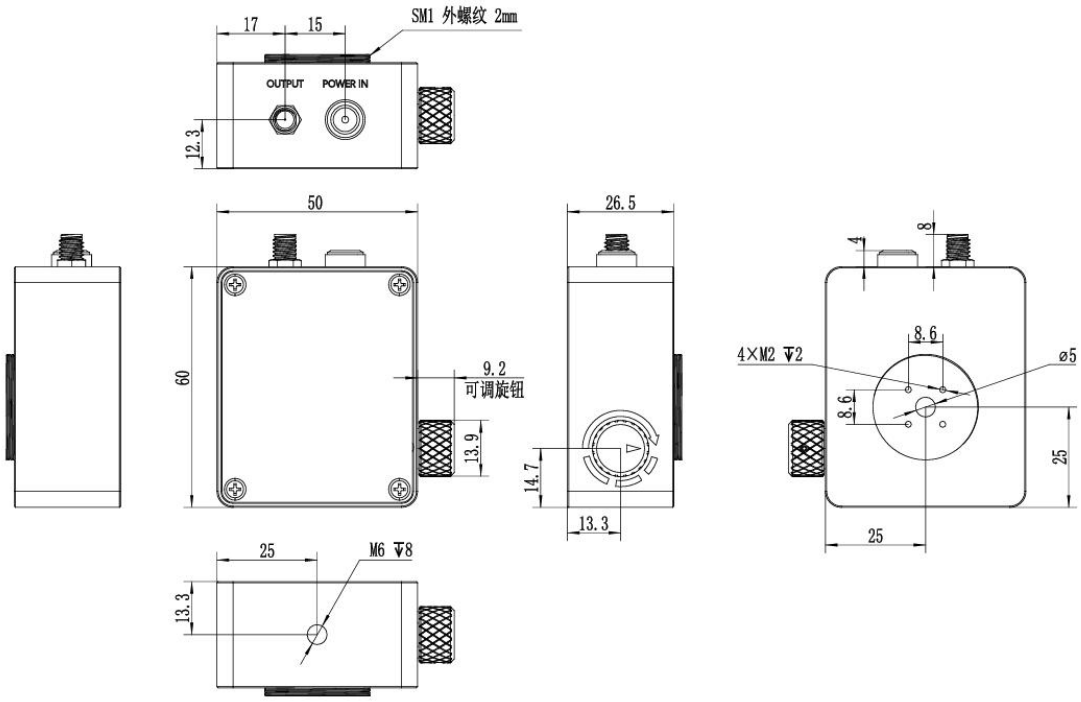
6.MechanicalDimensions



30 mm Cage Structure (Default)

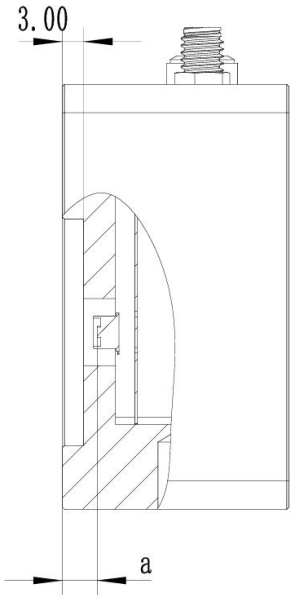


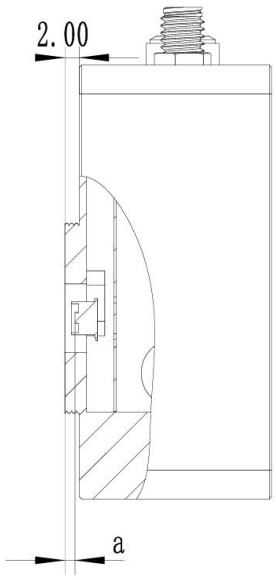
SM1 External Thread Structure (Optional)



SM1 External Thread with Adjustable Gain (Optional)

7. Photosensitive Distance Diagram

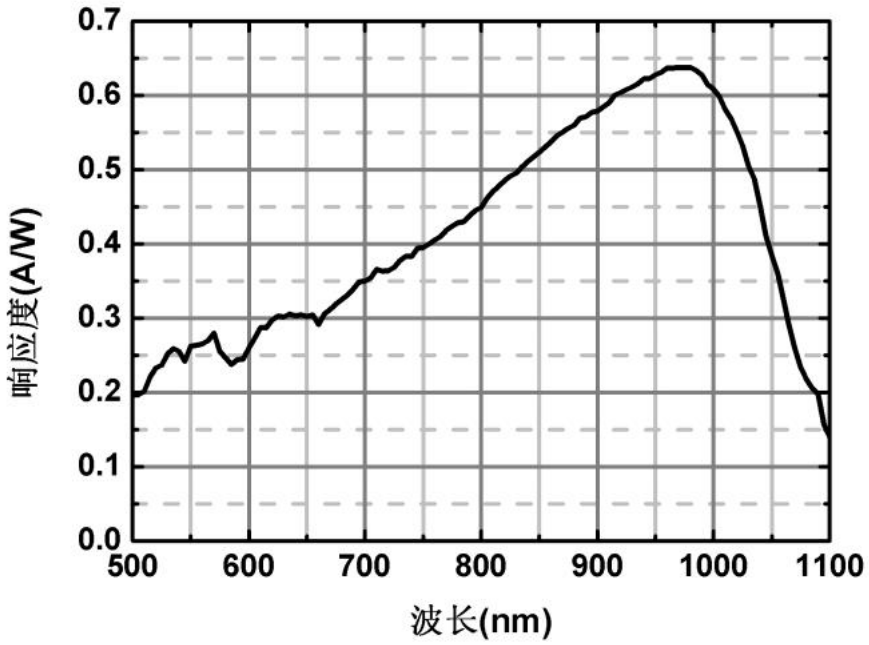




30 mm Cage Structure (Default) **SM1 External Thread Structure**

Structure	A Series	A Series SM1
Distance *a*	6.34 mm	2.34 mm

8.ResponseCurve



Typical spectral response curve over 400–1100 nm; optimized at 1064 nm. Values for reference only

9. Packing List

No.	Item	Qty	Unit	Remarks
1	Photodetector	1	Piece	—
2	Power Adapter	1	Piece	9 V
3	SMA-to-BNC RF Cable	1	Piece	—