APD1008 Avalanche Photodetector

Module Introduction and Product Features

Fiberwdm's APD Avalanche Photodetector is fully domestically produced. Adopting an exclusive temperature compensation technical solution, it achieves high sensitivity. The detector maintains high stability, high gain, and low noise throughout the entire temperature range (-40°C to 80°C).

In addition to detectors with standard specifications, customized services are also provided. Various indicators of the detector (such as supply voltage, gain, bandwidth, etc.) can be adjusted according to customer needs to meet specific requirements.

Application Fields: Lidar, free-space optical communication, fiber optic sensing systems, optical detection systems, etc.

User Manual

2.1 Appearance and Interface Description

The appearance of the module is shown in the figure below:

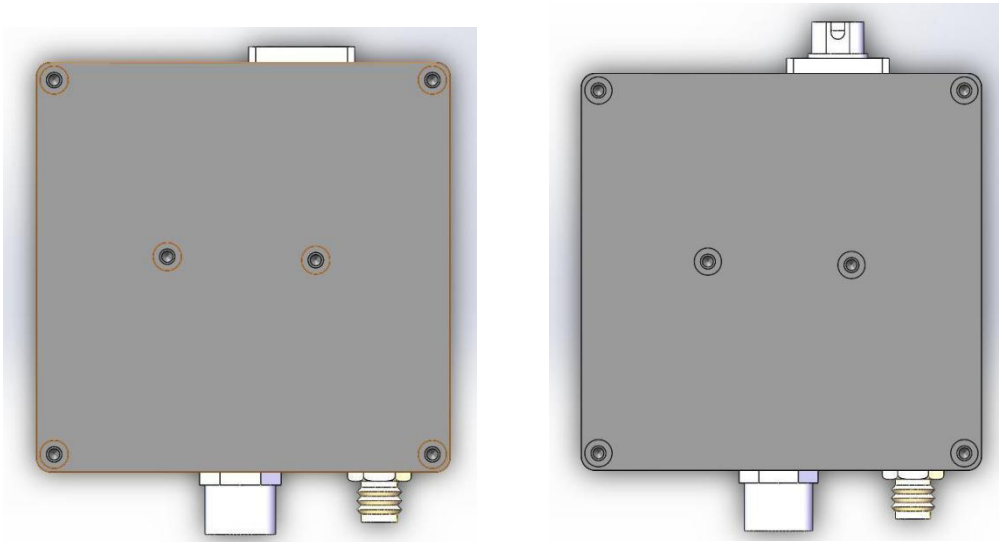

Figure 2-1 Appearance Diagram of the Detector Module (Left: FC Connector, Right: Free Space)

The upper interface is the optical input interface (FC/Free Space), the lower right is the power input interface (M8/or lead wire output), and the lower right is the signal output interface (SMA).

The output of the version with temperature compensation is at the GH1.25 terminal, which is defined as follows:

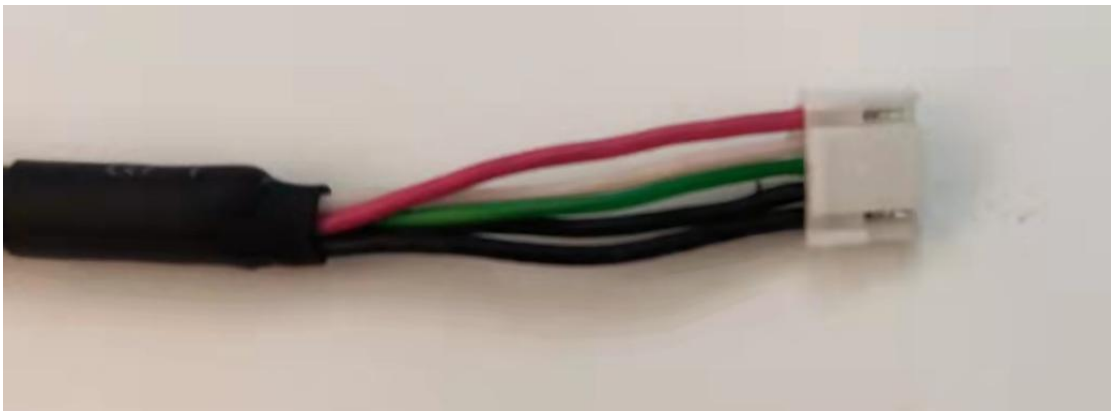

Figure 2-2 Matching Power Cable

The interface definition is as follows:

Color	Interface Definition
Red	+12V Input
Black	+12V_GND Input
Green	GND
Blue	Serial TTL_TX
Yellow	Serial TTL_RX

Electrical Specifications

The APD module is a single power supply product: connect the red wire to 12V, the black wire to ground, with a current of 300mA. The current of the detector module during normal operation is less than 100mA.

1. Output Interface: SMA (Female);
2. Output Impedance: 50Ω;
3. Maximum Output Voltage:
   Products below 500MHz: ±3.6V (@High Z), ±1.8V (@50Ω);
   Products above 1GHz (inclusive): ±1V (@50Ω).
4. Spectral Response Range: 900nm - 1700nm;
5. Detector Responsivity: >0.95A/W @1550nm;
6. The optical input amplitude should not exceed the saturation power.

Performance Parameters

Performance Test Description:

1. Due to the different conditions of the FC connectors of the test light sources, the insertion loss of each detector varies, and the test results of the detector response will have slight differences;
2. The transimpedance gain of the detector is calculated under the condition that the output load is high impedance. If the output load is 50Ω, the gain is reduced to half of the nominal value;
3. The measurement results of detector noise and rise time are obtained under the following conditions:
   a: Oscilloscope input impedance 50Ω;
   b: Oscilloscope bandwidth is full bandwidth (≥1GHz);
   c: Oscilloscope time division is set to 100ns/div (Note: Noise varies significantly with different time divisions);
4. Test ambient temperature: 23℃±5℃;
5. Test relative humidity: 35%±15%;
6. Test operating voltage: ±12V;

Typical Test Parameters of APD Detector (APD1008)

Model	APD1008
Wavelength Range	900-1700nm
3-dB Bandwidth	DC/AC-80MHz
Conversion Gain	600x103V/A
Overall output voltage noise	4mVRMS (typ) or 24mVpp
Rise time	1.9ns (typ)
Saturation Power	5uW（Maximum peak power）
Typical Max. Responsivity	9A/W @1550nm, M=10
Output Impedance	50Ω
Maxim Output	1.5V@50Ω
Incident Power (Max)	100uW
Detector Material/Type	InGaAs/APD
Detector Diameter	50μm with ball lens
Optical Input	FC/PC or FC/APC or Free Space
Electrical Output	SMA
Package Dimension	58mm×58mm×25mm
Power Supply Requirement	12 V/200 mA

Figure 3-1 Summary of Electrical Performance

Mechanical Dimensions

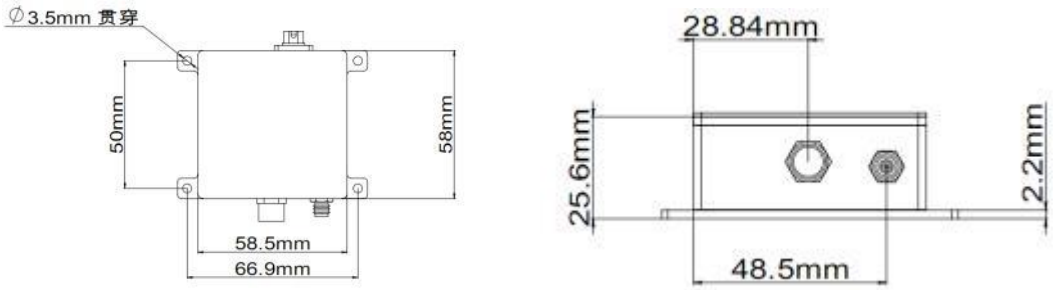

Figure 4-1 Mechanical dimension diagram of APD detector module