InGaAsP/InP single photon detector module



Description

GSPD series single photon detector modules are based on InGaAsP/InP single photon avalanche detector design. It adopts the form of metal shell envelope and can be used for three-dimensional laser radar imaging detection, active laser ranging, Time coherent single photon detection, biomedical transient fluorescence spectroscopy detection and other fields.

Key Parameter

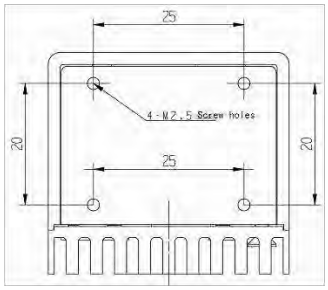
Main parameters of the detector

Indicator name	Typ
Response spectral range(μm)	0.95 ±0.05~1.25 ±0.05
Effective photosensitive surface diameter(μm)	40
dead time(μs)	0.05 - 100
Dead time adjustment accuracy(ns)	5
Optical coupling method	space light
Maximum single photon detection efficiency(%)	40@1064nm
dark count rate(Hz)	~ 800@10% detection efficiency, -40℃, 1μs dead time
Time resolution(ps)	< 200@20% detection efficiency
Built-in TCSPC time resolution	36ps or 48ps and its integer square value (configurable)
operating mode	Free running / external or internal gated (configurable)
Working temperature(℃)	0~40
Dimensions(mm)	40(L)×40(W)×36.5(H)

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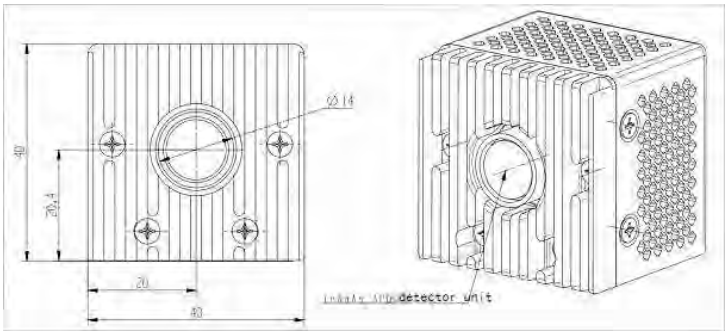
Mechanical parameters

The detector module adopts a metal shell envelope with an outer envelope size of 40mm (L) × 40mm(W)×36.5mm (H). The mechanical mounting holes are located on the bottom of the detector module and are four M2.5 screw holes.



Optical parameters

The front end of the detector module uses a TO8 sapphire optical window. The diameter of the light-passing area of the sapphire light window is φ9mm and the thickness is 0.5mm. The overall relative position and structural dimensions of the optical window and module are as follows As shown in the figure.



Electrical properties

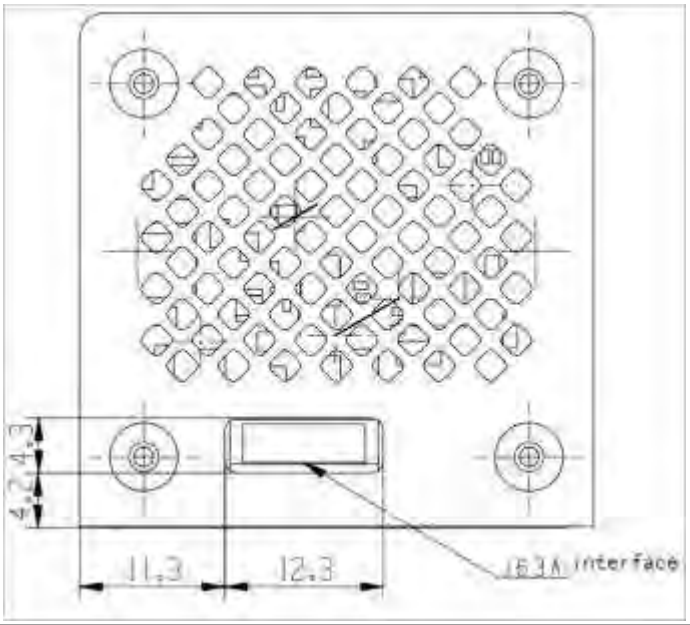
The electrical interface adopts the military standard J63A interface, which is used for power, data, communication control, and trigger control.

Interface parameters	Illustrate	Note
Avalanche pulse output signal level	1MΩ load: LVTTL 3.3V 50Ω load: high level ≥1.5V, low level ≤0.4V	Pulse direction configurable, leading edge valid
Avalanche pulse output signal width	12.5ns to 15ns	
Input/output gate voltage	LVTTL 3.3V	
External input gate minimum pulse width	10ns	
Control protocol	3.3VUART，115200bps，No checksum	
Built-in TCSPC Communication protocols and interfaces	4 Byte binary output 3.3VUART / SPI / LVDS，Max100 Mbps	
Laser enable trigger Trigger In	LVTTL 3.3V，pulse width≥50ns，rising edge ≤200ps，Jitter≤100ps	When used as a laser timing synchronization signal, the rising edge is valid. When used as a gate control, the high level is valid.
Power supply	DC 5~12V，Max1A	Related to cooling temperature

Dimensions and Pin definitions

Pin description

Power supply, communication control, data transmission interface: J63A-2G2-015, see the figure The serial numbers and definitions are shown in the table below.



Serial number	Definition
1	Control communication origin Tx, LVTTL, UART 115200, 8-bit data, no check
2	Control communication receiving end Rx, UART 115200, 8-bit data, no check
3	communication place
4	TDC data communication origin Tx, LVTTL, protocol and rate to be determined/can be reconfigured as needed
5	Communication/Configurable as needed
6	communication place
7	Communication/Configurable as needed
8	Communication/Configurable as needed
9	communication place
10	Gating/sync signal input
11	Digital avalanche pulse signal output
12	Power ground (same as 14)
13	Power supply positive (same as 15)， 5 ~ 12V
14	Power ground (same as 12)
15	Power supply positive (same as 13)， 5 ~ 12V