SPD5522 InGaAs Geiger-mode

Avalanche Photodiode



Description

The SPD5522 is an InGaAs avalanche photodiode device. Based on the high gain characteristics of the Geiger mode, the product multiplies the detected photon Geiger into a macroscopic current; it is designed for single-photon detection applications.The SPD5522 adopts a TO coaxial pigtail packaging structure, and the incident light interface is a single/multimode optical fiber with an FC/UPC connector (0.9mm tight-buffered protective tube).

Key Parameter

Main optoelectronic indicators

Linear mode parameters

Characteristic parameters	Test conditions (unless otherwise specified, TC = 25 ± 5 ° C)	Min.	Max.	Unit
Effective detection surface diameter d	-	25	-	μm
Spectral response range	-	950	1650	nm
Reverse breakdown voltage VBR	IR=10 μA，Φe=0	60	85	V
Responsivity Re	Φe=1μW，VR=(VBR-1)V，λ=1550 nm±50 nm	8	-	A/W
Dark current ID	VDC =(VBR-1) V，Φe=0	-	1	nA
Capacitance Ctot	VDC =(VBR-1) V，f=1MHz	-	0.6	pF
Breakdown voltage temperature coefficient η	TC=-45～+30℃，IR =10μA，φe=0	0.10	0.15	V/℃

Geiger mode parameters

Characteristic parameters	Test conditions	Min.	Max.	Unit
Single photon detection efficiency PDE	TA = -40±5℃，fg = 10 MHz，fP = 100 kHz，DCR = 10 kHz，λ = 1.55μm	15	-	%
Dark count rate DCR	TA = -40±5℃，fg = 10 MHz，fP = 100 kHz，SPDE = 15%，λ = 1.55μm	-	10	kHz
After pulse probability APP (2 uS)	TA = -40±5℃，fg = 10 MHz，fP = 100 kHz，SPDE = 15%，Δt=1us，λ = 1.55μm	-	2	%
Time jitter TJ	SPDE=15%	-	800	ps

Note: λ Is the wavelength of incident light, TA is the test temperature, μ is the average number of photons per pulse, fg is the gate signal frequency, and fp is the optical pulse signal frequency.

Absolute Maximum Ratings and Recommended Operating Conditions

No.		Parameters	Rated value
Absolute Maximum Ratings	1	Storage temperature TSTG	-50℃～+85℃
	2	Working environment temperature Tc	-50℃～60℃
	3	Soldering temperature Tstd (time)	260℃（10s）
	4	Reverse DC bias voltage VDC	VBR+5V
	5	Input optical power φe (continuous)	1mW
	6	Forward current IF (continuous)	200μA
	7	Electrostatic discharge sensitivity ESD	≥300V
	8	Pigtail pulling strength	3.0N

No.		Parameters	Rated value
Recommended working conditions	1	APD chip operating temperature Tth	-50℃～-30℃
	2	Reverse DC bias voltage VDC	VBR+1V～VBR+5V

Typical characteristic curve

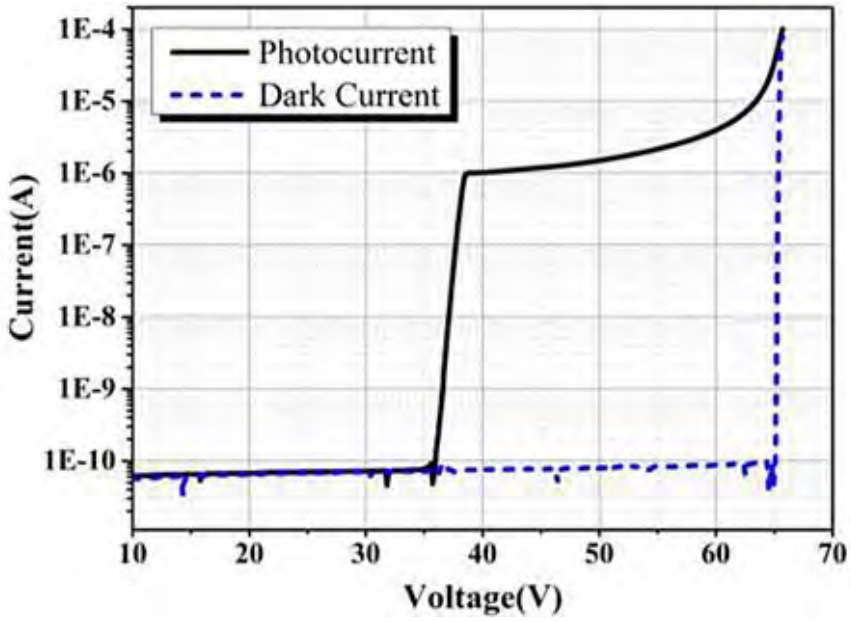


Figure 1 Photocurrent and dark current curves

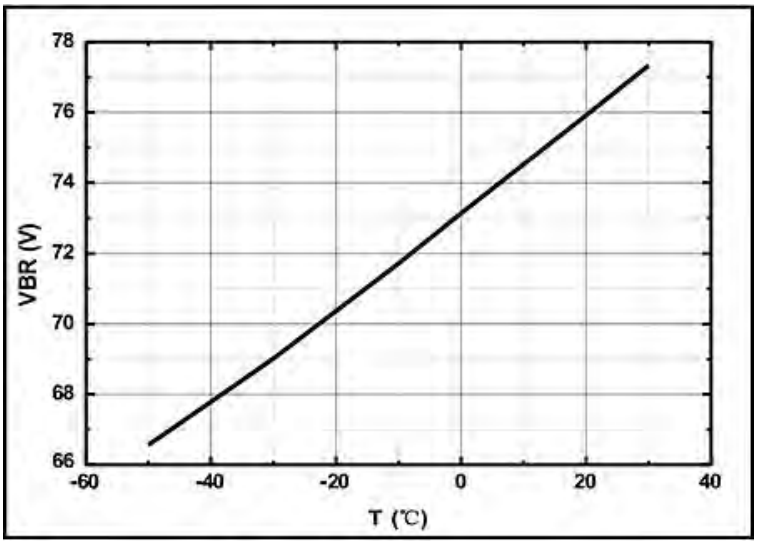
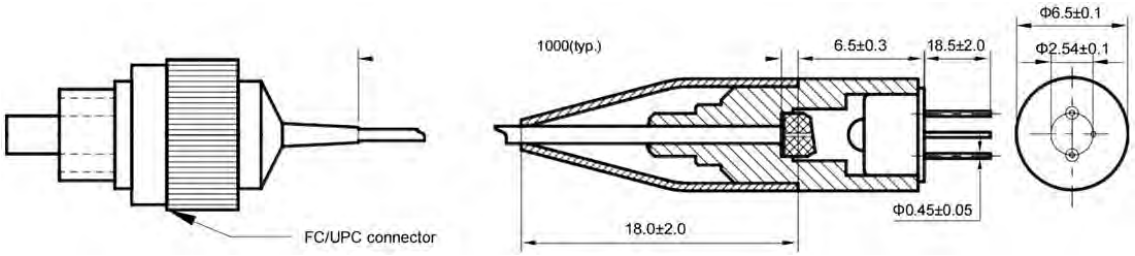
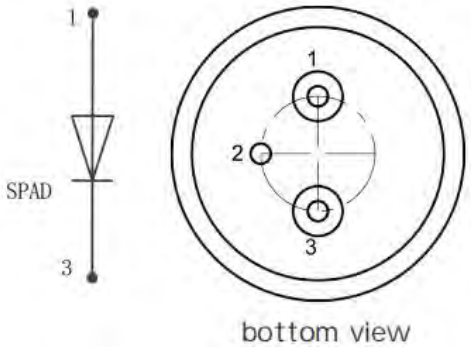


Figure 2 Breakdown voltage temperature coefficient

Dimensions and Pin definitions

Package, dimensions, equivalent circuit and pin definition (unit: mm)

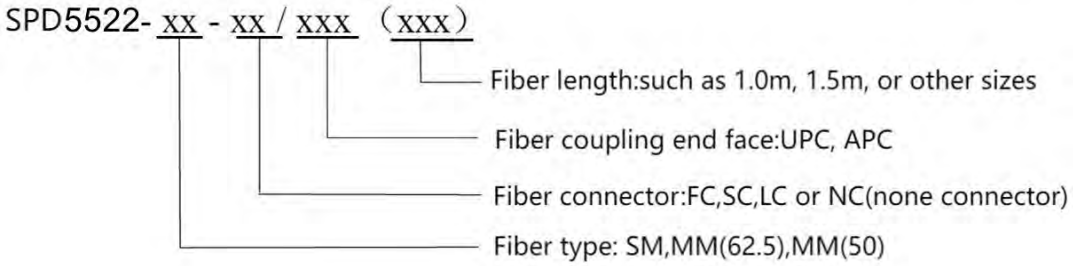




PIN#	Sym.	Description
1	P	P（Anode）
2	G	Case Ground
3	N	N (Cathode)

Ordering Info

If there are no special requirements, the fiber interface of the SPD5522 device is G657A2 single-mode fiber (0.9mm tight-fitting protective tube), FC/UPC connector, and fiber length 1.0m, that is, the detailed order PN# is SPD5522.



Notes

● The product is an electrostatic sensitive device, and ESD protection must be taken during storage and use.

● The bending radius of the product fiber is not less than 30mm. Avoid fiber breakage and contamination or damage to the connector during storage and use.

● The product requires external refrigeration. The clamping carrier used for refrigeration needs to be made of a material with good thermal conductivity, keep the cavity wall at one end of the device lead and the contact surface of the clamping carrier tightly matched, and apply thermal conductive material on the contact surface of the two.

● The product should be stored in a clean environment with ventilation and no corrosive gas at a temperature of -10~+40℃ and a relative humidity of no more than 80%.