SPD5526 InGaAs Geiger-mode Negative Feedback Avalanche Photodiode



Description

The SPD5526 is a photon-counting InGaAs avalanche photodiode device with a monolithically integrated negative feedback resistor.Based on the high gain characteristics of the Geiger mode, the product multiplies the detected photon Geiger into a macroscopic current; the negative feedback resistor performs dynamic voltage division to achieve self-quenching and self-recovery of the Geiger avalanche electric field in the avalanche photodiode.

The SPD5526 is packaged in a TO-coaxial housing with a fiber pigtail. The optical input interface is a single-mode or multi-mode fiber with an FC/UPC connector and a 0.9 mm tight-buffer protective tube.

Key Parameter

Main optoelectronic indicators

Linear mode parameters

Characteristic parameters	Test conditions (unless otherwise specified, TC = 25 ± 5 ° C)	Min.	Max.	Unit
Spectral response range	-	950	1650	nm
Reverse breakdown voltage VBR	ID=100nA	60	85	V
Responsivity Re	λ=1.55μm，VR=VBR-1V，φe=1μw	8	-	A/W
Dark current ID	VR=VBR-1Ⅴ，φe=0	-	1	nA
Capacitance Ctot	VR =VBR-1V，f=1MHz	-	0.6	pF
Integrated resistance value Rs	IF=200μA，φe=0	200±50		KΩ
Breakdown voltage temperature coefficient η	TC=-45～+30℃，IR =10μA，φe=0	0.10	0.15	V/℃

Geiger mode parameters

Characteristic parameters	Test conditions （TC=-40±3℃，fp=50KHz）	Min.	Max.	Unit
Single photon detection efficiency PDE	λ=1550nm	15	-	%
Dark count rate DCR	PDE=15%	-	10	kcps
After pulse probability APP	PDE=15%，λ=1550nm，Δt=1us	-	15	%
Pulse output amplitude Vout	PDE=15%，R=50Ω	0.5	-	mV

Note:λ is the wavelength of incident light, fp is the frequency of optical pulse signal, and R is the sampling resistor.

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

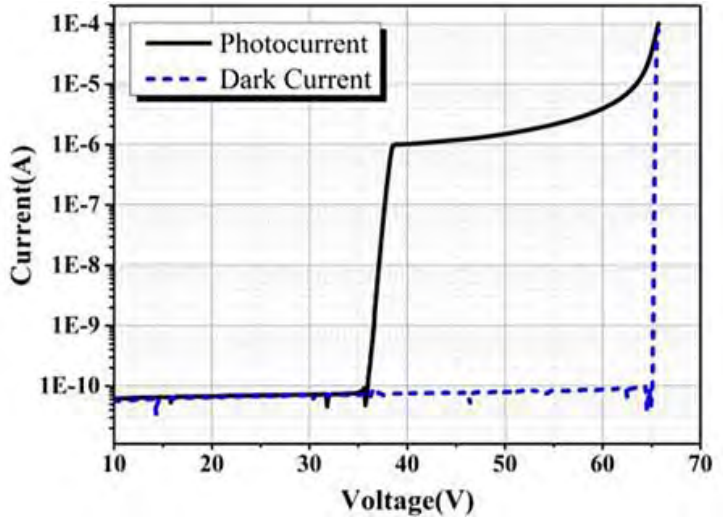


Figure 1 Photocurrent and dark current curves

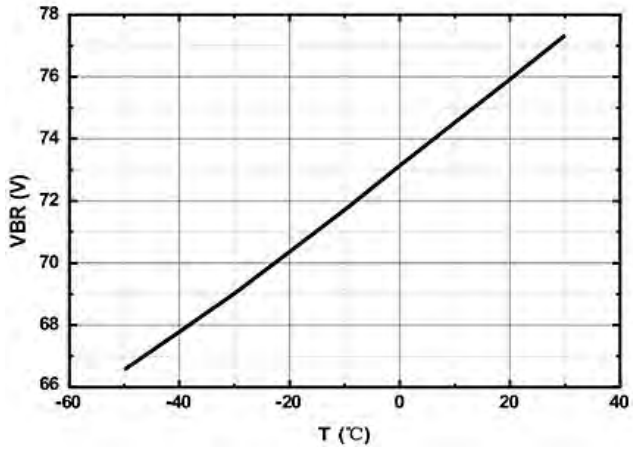
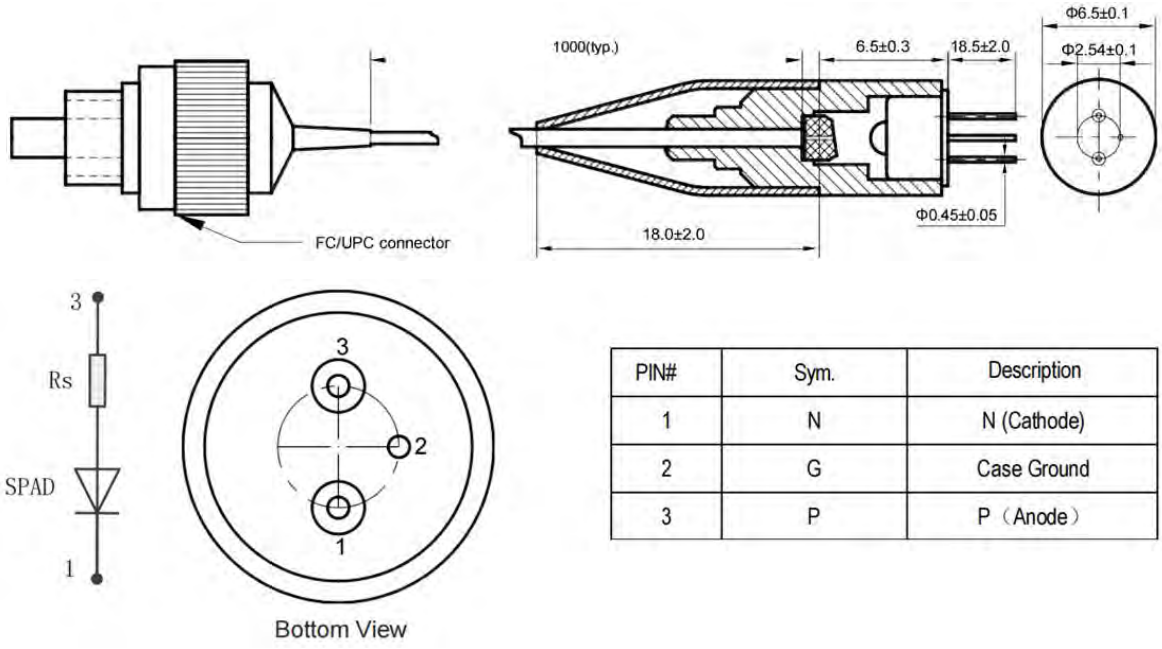


Figure 2 Breakdown voltage temperature coefficient

Dimensions and Pin definitions

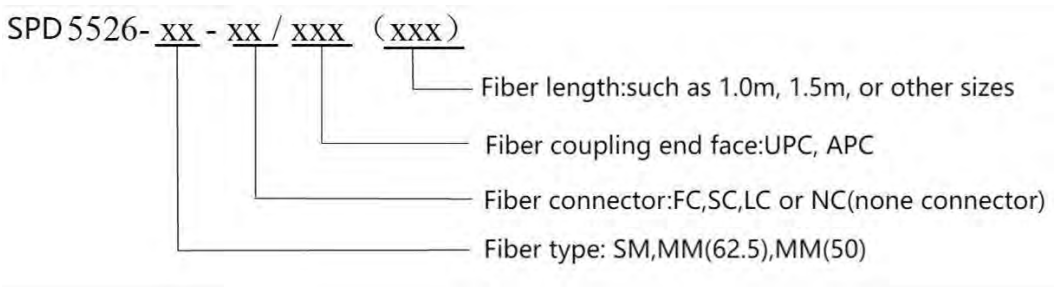
Package, dimensions, equivalent circuit and pin definition (unit: mm)



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

Ordering Info

If there are no special requirements, the optical fiber interface of the SPD5526 device is G657A2 single-mode optical fiber (0.9mm tight-buffered protective tube), FC/UPC connector, and the optical fiber length is 1.0m, that is, the detailed ordering model is SPD5526-SM-FC/UPC (1.0m).
If the fiber specifications, length, connectors, etc. required for the ordered product are inconsistent with this product, please follow the format as shown below.



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%.