Opto-Electronic Components

2.7.2018

Single Photon Counting Avalanche Photodiode

TGA-284 TO-Style 1000nm – 1600nm

Description

TGA-284 is an avalanche photodetector designed specifically for single photon counting applications.
The device is intended for use at voltage biases above the breakdown voltage (in Geiger-mode) so that a single photon incident on the detector will give rise to a macroscopic current pulse.
PGA-284 is fiber pigtailed TO package.

Features

* Designed specifically for single photon counting
* Optimized for 1.0um to 1.6um wavelenghts

Applications

* Quantum optics/ Quantum computing
* Spectroscopy and fluorescence measurements
* 3D Lidar

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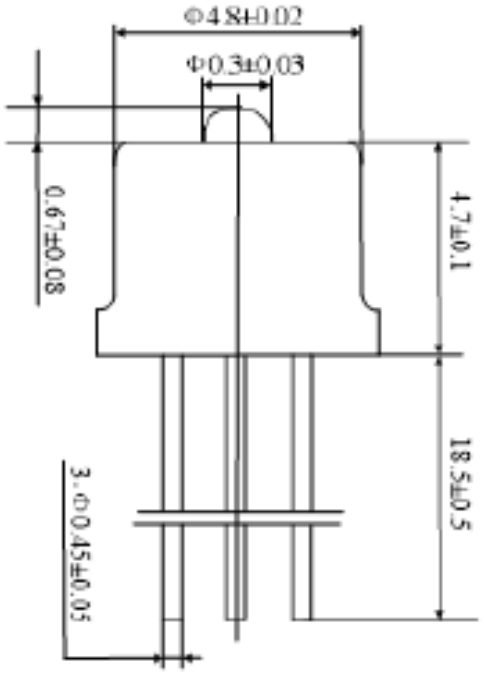
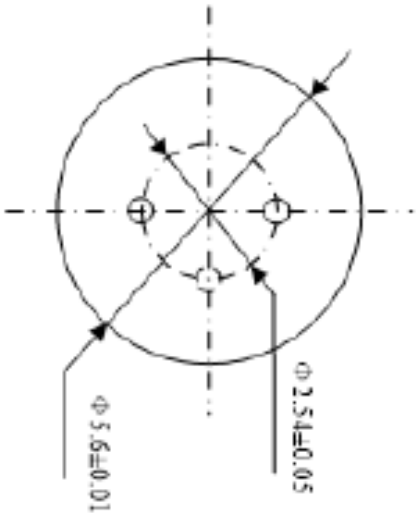
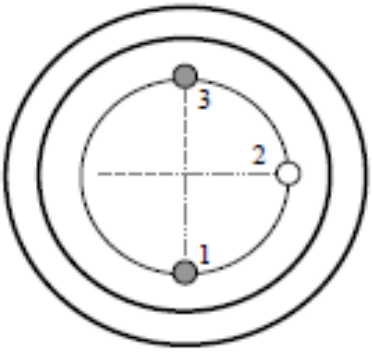
Package Drawing







1:Anode 2: Case (Ground) 3:Cathode

NOTES:

All dimension are in millimeters.

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Absolute Maximum Ratings

Parameter	Conditions	Min.	Max.	Units
Forward current	Continuous bias		1	mA
Forward voltage	Continuous bias		1	V
Reverse current	Continuous bias		1	mA
Reverse voltage	Continuous bias		-(Vbr+5)	V
	Pulse bias(Gated operation)		-(Vbr+10)	
Optical Power	Continuous bias		1	mW
Storage temperature		-55	85	C

Opto-Electronic Characteristics

Linear Mode Parameters（@Tc=22±3℃）						
Parameters	Sym.	Test conditions	Min	Typ	Max	Unit
Response Spectrum	λ	—	1000~1650			nm
Responsivity	Re	λ=1.55μm，$V_R=V_{BR}$-2V，ϕ_e=1μw	10		14	A/W
Reverse breakdown voltage	V_{BR}	I_D=10μA，Tc=22℃	65		75	V
Operating voltage temperature coefficient	γ	Tc=-60~+30℃，I_D=10μA		0.1		V/℃
Dark current	I_D	ϕ_e=0μw，$V_R=V_{BR}$-2V			3.0	nA
Total capacitance	C_{tot}	1MHz，$V_R=V_{BR}$-2V			0.2	pF

Parameter	Test conditions	TGA-284		Unit
		Min	Max	
Dark Count Rate, (DCR)	f_{gate}=50kHz，T_{gate}=10ns，SPDE=10%		10	kHz
Detection Efficiency,(SPDE)	$f_{gate}=f_{pulse}$=50kHz，T_{gate}=10ns, DCR=10kHz λ=1.55μm, 0.1 photon per pulse	10		%
Afterpulsing(APP)	@2us, f_{pulse}=50kHz，T_{gate}=10ns, SPDE=10%, λ=1.55μm, 0.1 photon per pulse		2	%

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* Operating temperature TA= -35℃ for Geiger mode
* Vob (over bias voltage): 1.0~2.0V
* Vdc (DC working voltage):(Vbr-1V)~(Vbr-2V)

Typical Characteristics Curve

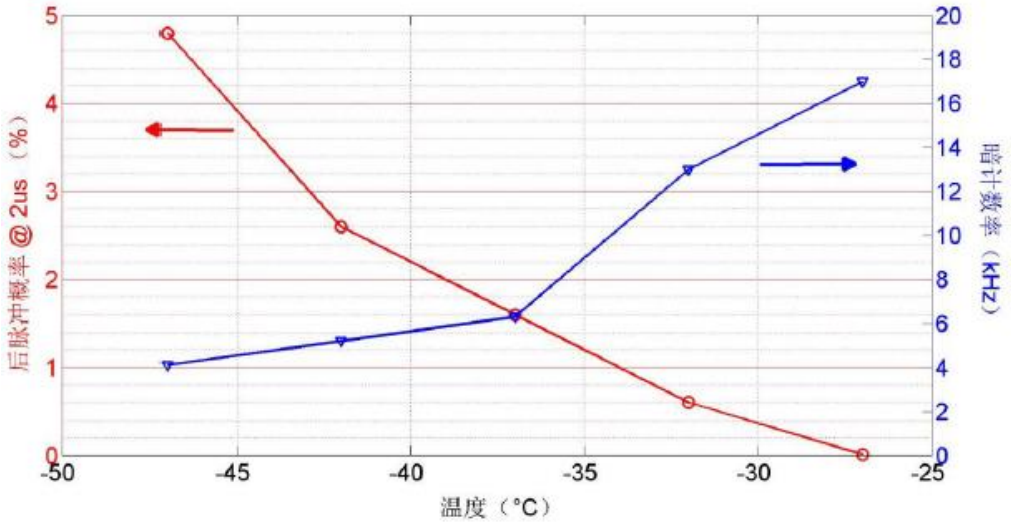

Fig. 1 DCR and APP vs Tempearture when PDE=10%

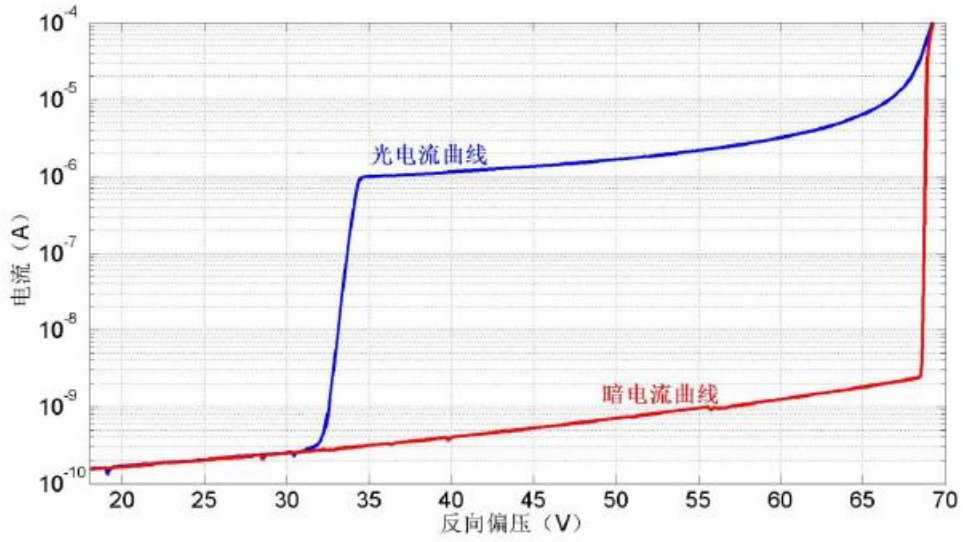

Fig.2 Photocurrent and dark current vs reverse voltages

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