Single Photon Counting Avalanched Photodiode TGA-284

Description

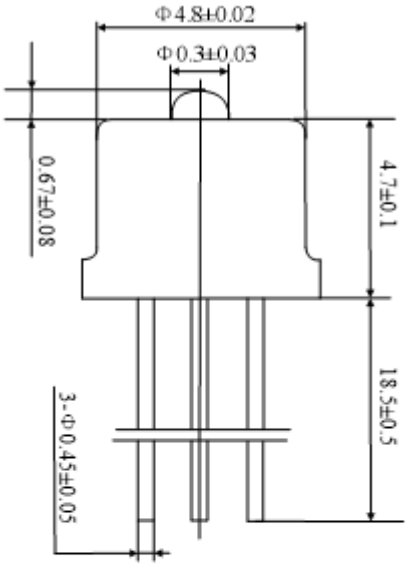
OTRON TGA-284 is avalanche photodetector designed Specifically for single photon counting applications. The device is intended for use at voltage biases above the Breakdown voltage(in Geiger-mode) so that a single photon Incident on the detector will give rise to a macroscopic Current pulse.

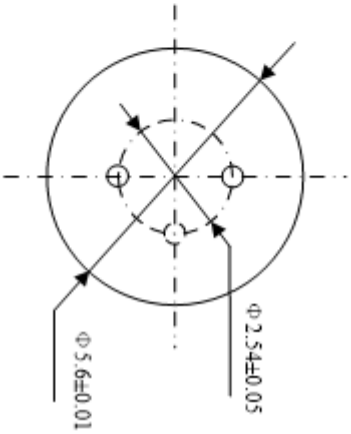
Features

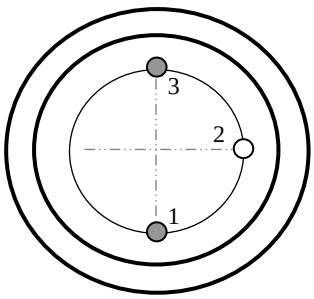
* Designed specifically for single photon counting app.
*Optimized for 1.0um to 1.6um wavelenghts

Applications

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







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

The 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	%

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

The typical characteristical curve:

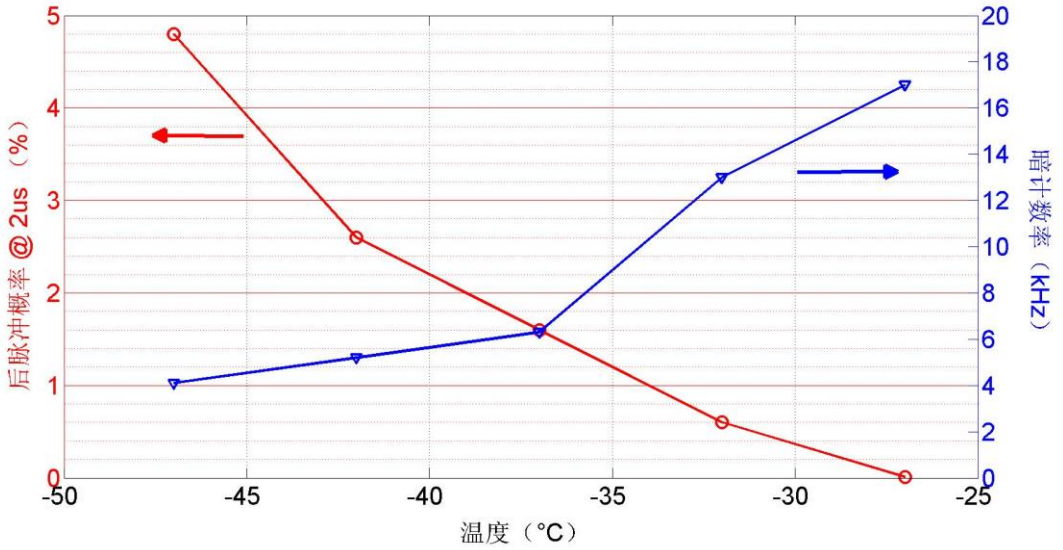

Fig. 1 DCR and APP vs Tempearture when PDE=10%

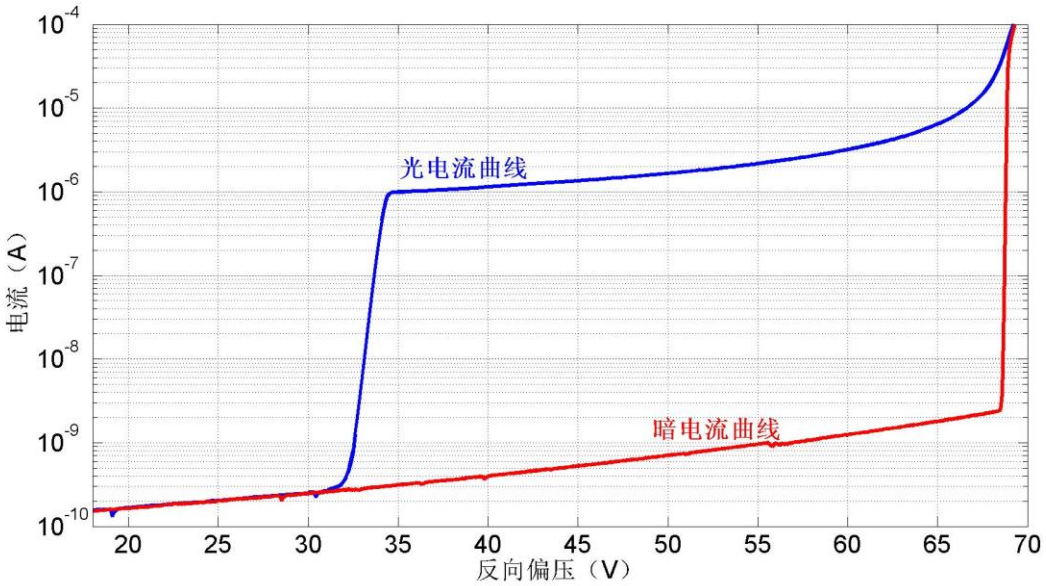

Fig.2 Photocurrent and dark current vs reverse voltages