

## Single Photon Counting Avalanched Photodiode

### PGA-284



### Description

OTRON PGA-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.

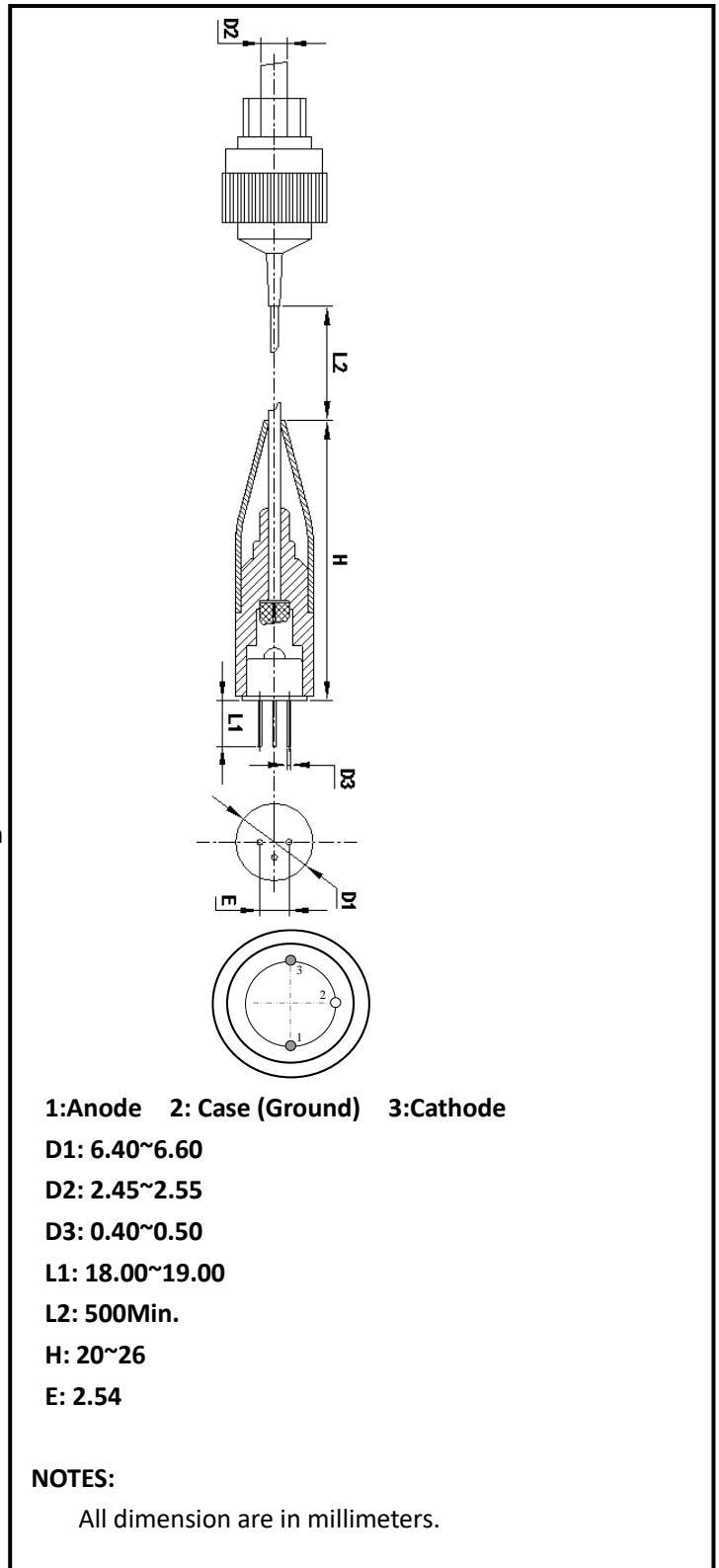
PGA-284 is fiber pigtailed TO package.

### Features

- \* Designed specifically for single photon counting app.
- \* Optimized for 1.0um to 1.6um wavelengths

### Applications

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



Information in this technical datasheet is believed to be correct and reliable. However, no responsibility is assumed for possible inaccuracies or omission. Specifications are subject change without notice

## 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 °C )						
Parameters	Sym.	Test conditions	Min	Ty p	Max	Uni t
Response Spectrum	$\lambda$	—	1000~1650			nm
Responsivity	Re	$\lambda=1.55\mu\text{m}, V_R=V_{BR}-2V, \phi_e=1\mu\text{W}$	10		14	A/W
Reverse breakdown voltage	$V_{BR}$	$I_D=10\mu\text{A}, T_c=22^\circ\text{C}$	65		75	V
Operating voltage temperature coefficient	$\gamma$	$T_c=-60\sim+30^\circ\text{C}, I_D=10\mu\text{A}$		0.1		V/°C
Dark current	$I_D$	$\phi_e=0\mu\text{W}, V_R=V_{BR}-2V$			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)	$f_{gate}=50\text{kHz}, T_{gate}=10\text{ns}, \text{SPDE}=10\%$		10	kHz
Detection Efficiency,(SPDE)	$f_{gate}=f_{pulse}=50\text{kHz}, T_{gate}=10\text{ns}, \text{DCR}=10\text{kHz}$ $\lambda=1.55\mu\text{m}, 0.1 \text{ photon per pulse}$	10		%
Afterpulsing(APP)	@2us, $f_{pulse}=50\text{kHz}, T_{gate}=10\text{ns},$ SPDE=10%, $\lambda=1.55\mu\text{m}, 0.1 \text{ photon per pulse}$		2	%

\*Operating temperature  $T_A = -35^\circ\text{C}$  for Geiger mode    \* Vob (over bias voltage): 1.0~2.0V    \* Vdc (DC working voltage): (Vbr-1V)~(Vbr-2V)

The typical characteristical curve:

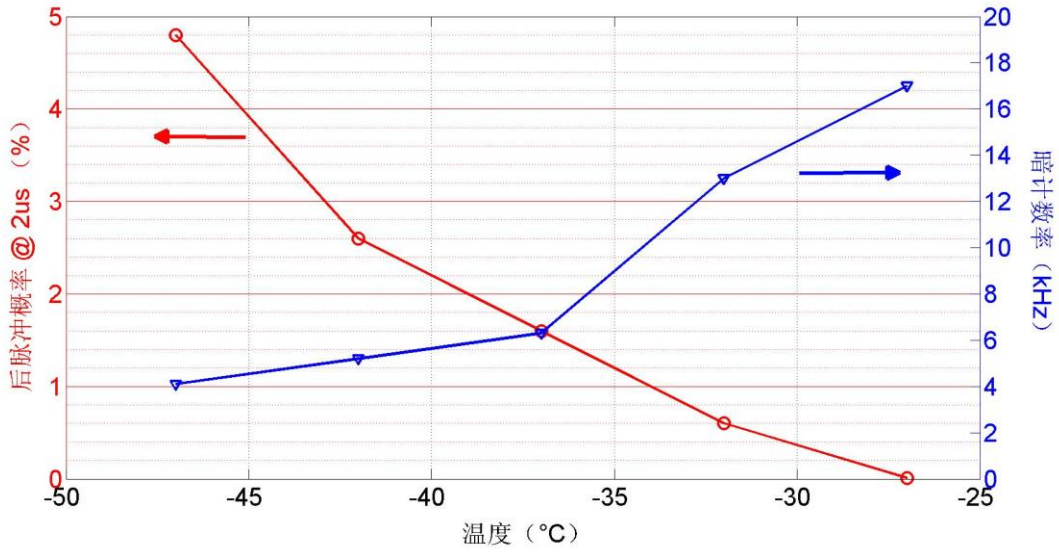


Fig. 1 DCR and APP vs Temperature when PDE=10%

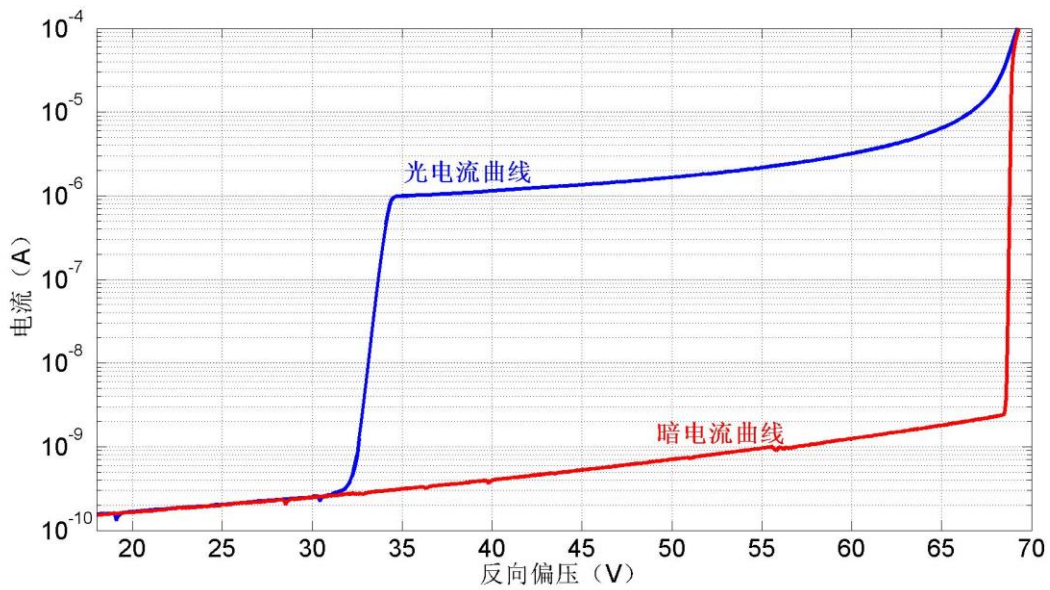


Fig.2 Photocurrent and dark current vs reverse voltages

Information in this technical datasheet is believed to be correct and reliable. However, no responsibility is assumed for possible inaccuracies or omission. Specifications are subject change without notice

OTRON ELECTRONIC TECHNOLOGY CO., LTD

TEL:+86-21-54971821

FAX:+86-21-54971823

EMAL: [frank.shuai@e-otron.com](mailto:frank.shuai@e-otron.com)

<http://www.e-otron.com>