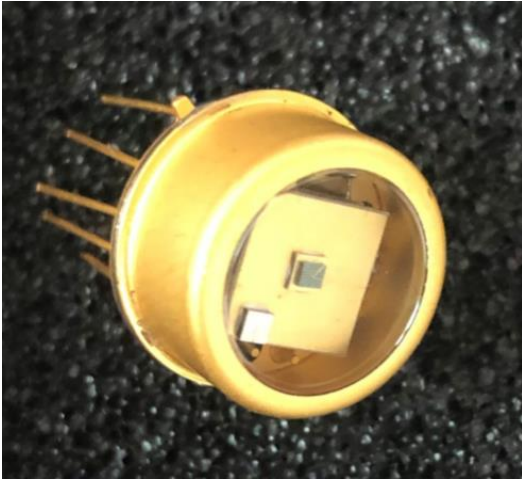


## Silicon Geiger APD



### Description

The OSPAD050-TEC is an Si avalanche photodetector Designed specifically for single photon counting app.

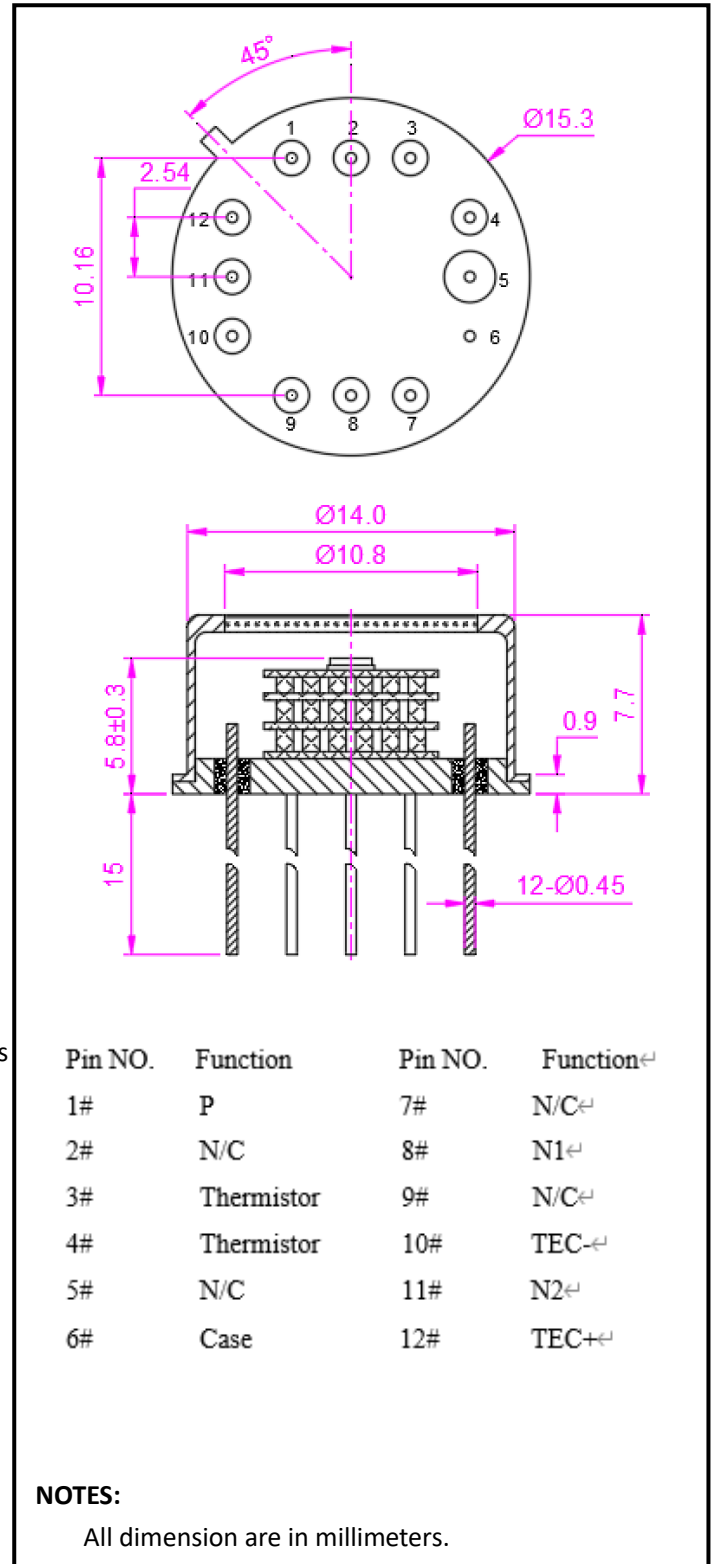
This device is intended for use at voltage biases Above the breakdown voltage so that a single photon Incident on the detector will give rise to a macroscopic Current Pulse. Combined with appropriate pulse detection Circuitry, this device allows for the detection of single photons In the wavelength range from 0.4 to 1.1 $\mu$ m.

### Features

- \* Integrated 3-stage TE cooler allowa operation at -50°C Without external cooling
- \*  $\Phi$ 50 $\mu$ m pixel size

### Application

- \* Quantum optics
- \* Quantum computing
- \* Very low light sensing



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



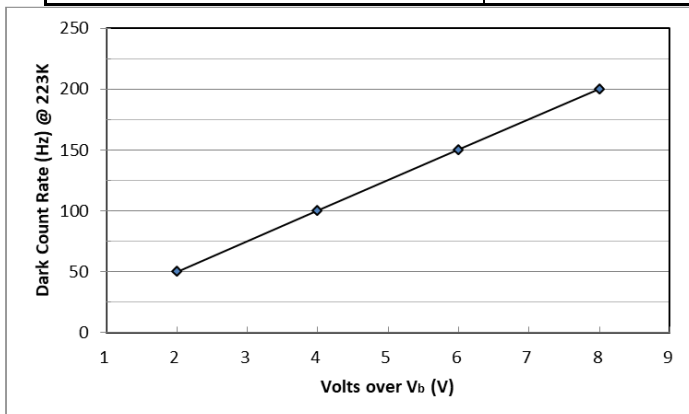
## Absolute Maximum Ratings

	Conditions	Max	Units
Forward Current	Continuous bias	+1	mA
Forward Voltage	Continuous bias	+1	V
Optical Power	Continuous wave (CW)	1	mW
Reverse Current	Continuous bias	-1	mA
Reverse Voltage	Continuous bias	-(Vb+5)	V
Reverse Voltage	Pulsed (gated operation)	-(Vb+10)	V

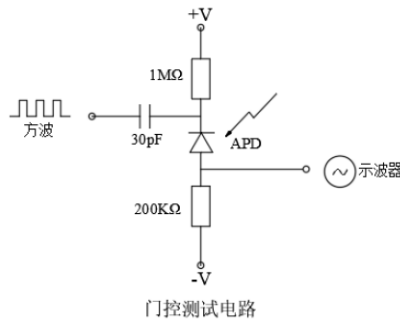
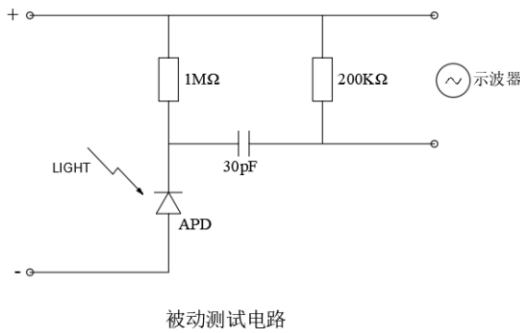
## Performance Specifications

Parameter	Condition	Min.	Typ.	Max.	Units
Linear Mode parameters (295K, all voltage and currents are reverse biased, 25°C)					
Breakdown Voltage, $V_b$ @ -40°C	$I_d=10\mu A$		54		V
Temperature dependence of $U_{bias}$	Between 300K and 225K, linear approximation		0.1		V/K
Capacitor, C	M=10, 1 MHz		0.25		pF
Geiger Mode Parameters (-40°C, all voltage and currents are reversed biased)					
Dark Count Rate, DCR	At 20% detection efficiency			5	KHz
Detection Efficiency, DE	At max DCR	10			%

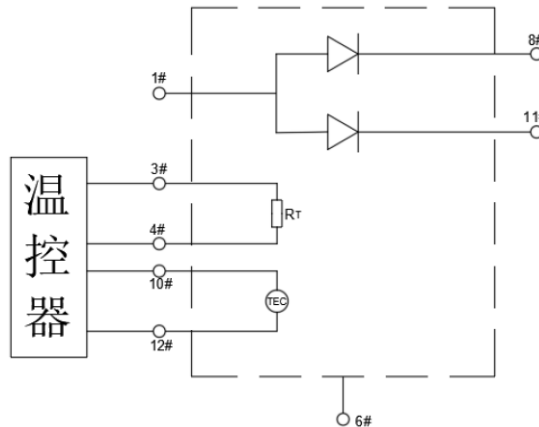
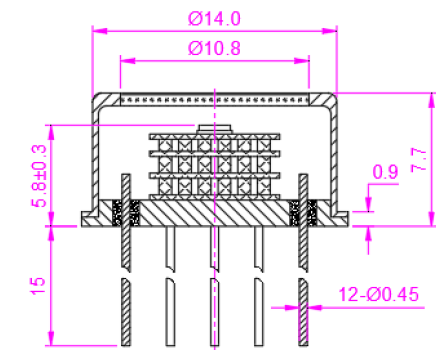
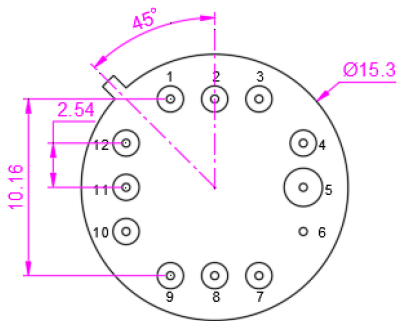
Wavelength/nm	Detection Efficiency	
	type	Units
532	30	%
850	20	%
905	15	%
1064	1.5	%



## Typical Application Circuit



## Outline Drawing



Pin NO.	Function	Pin NO.	Function
1#	P	7#	N/C
2#	N/C	8#	N1
3#	Thermistor	9#	N/C
4#	Thermistor	10#	TEC-

## TEC Specifications

Parameter	Condition	Max.	Units
TEC Voltage		8	V
TEC Current		0.7	A
TEC delta T	<25°C	80	°C

Thermistor = 2.0 KΩ (R1) at 300K(T1); B=3200.

$$R = R1 \times E^{B \times (\frac{1}{T} - \frac{1}{T1})}$$