WPGMFSSAJNNCNM

InGaAs Multi Cell Single Photon Avalanche Diode

Description

The Multi-Cell Single Photon Avalanche Diode (MCSPAD) is an InGaAs-based, highly sensitive device with a wide dynamic range, capable of detecting and counting from single photons to approximately 1000 photons per pulse (64cell : approximately 250 photons, 203cell : 800photons per pulse, 281cell : 1000 photons per pulse)

Features

- High gain (>10^5) and Large Active area size (0.130mm^2)
- Operate at Eye-safe SWIR (920 to 1700nm)
- Wide dynamic sensitivity from single photons up to approximately 1000 photons per pulse
- Built-in TEC for Low noise operation

Applications

- Single Photon Detector
- Single Photon LiDAR of SWIR range
- Photon Number Resolver
- Long Range LRF (Laser Range Finder)
- Gas Sensor and Bio-Medical Imaging

Absolute Maximum Ratings (T_C=25℃, *unless otherwise specified)*

Parameters	Symbol	Rating	Unit
Reverse voltage	V_R	-0.5 to V_{BR}	V
Operating temperature range (Ambient)	T_{OPR}	-40 to 60	℃
Storage temperature range (Ambient)	T_{STG}	-40 to 85	℃
PD Reverse current	I_{MAX}	1	㎂
PD Forward current	I_F	1	㎂
Operating Bias voltage (V_{BR} according to operating temperature)	V_{OP}	V_{BR}+5V	V
Optical Peak Power at Damaged (@ 500kHz pulsed)	D_L	110	W
ESD Threshold level on PD bias	E_{PD}	750	V
ESD Threshold level on TEC, Thermistor	E_T	3000	V

Electro-Optical Characteristics *(T_C=25℃, unless otherwise specified)*

Parameters	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Spectral range response	SR		920		1700	nm
Excess noise factor	F		T.B.D.			
Photon Detection Efficiency	PDE	λ=1550nm	20			%
Single electron response pulse width (FWMH)	FWMH			2		ns
Dark Count Rate	DCR	T_C=-20℃	0.1		2.0	Mcps
Breakdown voltage	V_{BR}	Linear fitted baseline and tangent drawn to ln(I), T_C=23±2℃	50	70	90	V
Operating bias	V_{OP}	T_C=-20℃		67		V
Temperature coefficient at V_{OP}	T_C	-40 to 60℃		0.11		V

TEC and Thermistor Characteristics *(T_C=25℃, unless otherwise specified)*

Type	Parameters	Value	Unit
TEC[1)]	△\T_{max}	133	K
	Q_{max}	1.0	W
	I_{max}	1.0	A
	U_{max}	13.4	V
	ACR	11.64	Ω
Thermistor	Temperature range	-40 to 125	℃
	Normal resistance	2.2k±3%	Ω
	Steinhart-Hart Equation Coefficient A	1.629E-3	·
	Steinhart-Hart Equation Coefficient B	2.241E-4	·
	Steinhart-Hart Equation Coefficient C	0.004E-7	·
	β Model Coefficient	4429.75	K

1) *TEC performance data are given for 323K @ N2*

Chip Dimension and Resistance *(T_C=25°C, unless otherwise specified)*

Parameters	Value	Unit
Total active area diameter	329 x 396	㎛
Cell active area diameter	15	㎛
Fill factor	75.3	%
Number of cells	64	EA
Quenching Resistor	1M	Ω

Typical Characteristics (T = 25 °C, unless otherwise specified)

Dark current(I_d) and Photo current(I_p)

T.B.D.

Temperature Coefficient

T.B.D.

PDE vs Bias (V)

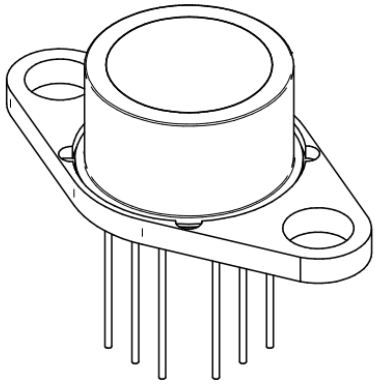
T.B.D.

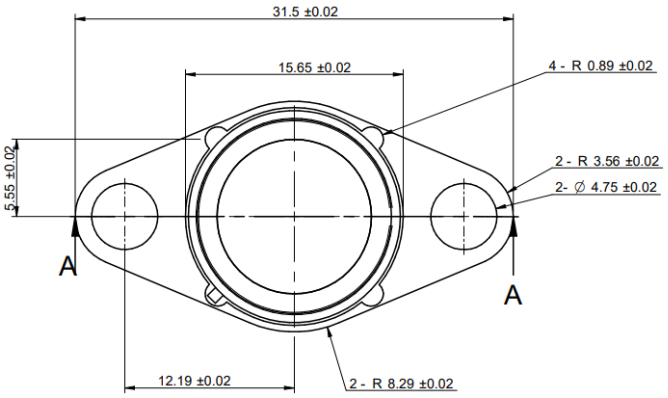
Dark Count Rate vs Bais (V)

T.B.D.

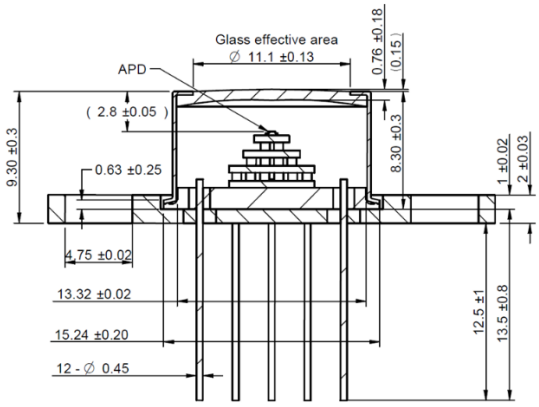
Mechanical Specifications

Dimension and PIN configuration (unit: mm)

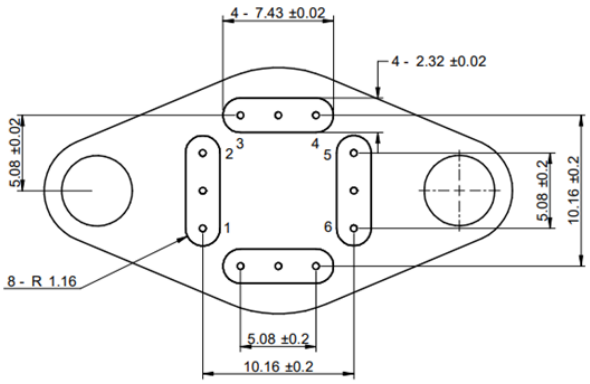




< TOP VIEW >



SECTION A-A



< BOTTOM VIEW >

No.	Symbol	Description (Bottom View)
1	TH	Thermistor
2	TH	Thermistor
3	A	Anode
4	C	Cathode
5	TEC	TEC (-)
6	TEC	TEC(+)

Precaution to use

The WPGMFSSAJNNCNM is sensitive to electrostatic discharge (ESD) and should be handled with appropriate caution.
Please use standard ESD protective equipment when handling this product.

Ordering information

Product Code	Description
WPGMFSSAJNNCNM	TO-8 Package, with Flange, Free space type

Specifications described here are subject to change without notice

Tel: +82-62-602-8100
www.wooriro.com
support@wooriro.com