

## Extended InGaAs Photodiodes IG26-Series

### Description

The IG26X-series is a panchromatic PIN photodiode with a nominal wavelength cut-off at 2.6  $\mu\text{m}$ . This series has been designed for demanding spectroscopic and radiometric applications. It offers excellent shunt resistance in combination with superior responsivity over a wide range.

### Features

- 50 % cut-off wavelength  $\geq 2.45 \mu\text{m}$
- Typical peak responsivity: 1.45 A/W
- Excellent temperature stability
- Reduced edge effect

### Applications

- Spectrophotometer
- Diode laser monitoring
- Non-contact temperature measurement
- Flame control
- Moisture monitoring

### Versions

- Uncooled  
TO-can, SMD, chip only, ceramic substrate, digital module
- Cooled  
TE1, TE2, TE3



## Optical Characteristics, Specifications @ 25°C

Part Number	Diameter [μm]	50% Cut off Wavelength <sup>a</sup> [μm]	Peak Wave-length <sup>a</sup> [μm]	Peak Responsivity <sup>a,b</sup> [A/W]		Responsivity @ 900 nm <sup>a,b</sup> [A/W]		Responsivity @ 1600 nm <sup>a,b</sup> [A/W]		Responsivity @ 1900 nm <sup>a,b</sup> [A/W]	
				Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.
IG26X250S4i	250	≥2.45	2.25+/- 0.1	1.28	1.45	0.30	0.42	0.7	1.0	1.08	1.36
IG26X1000S4i	1000										
IG26X1300S4i	1300										
IG26X2000G1i	2000										
IG26X3000G1i	3000										

<sup>a</sup> Parameter tested on batch level at T = 25°C.

<sup>b</sup> Responsivity measured at 0 V Bias.

## Electro-Optical Characteristics, Specifications @ 25°C

Part Number	Diameter [μm]	Shunt Impedance @ V <sub>R</sub> = 10 mV <sup>b</sup> [kOhm]		Dark Current @ V <sub>R</sub> = 0.25 V <sup>b</sup> [μA]		Peak D* <sup>a</sup> [cm Hz <sup>1/2</sup> /W]	Peak NEP <sup>a</sup> [W/Hz <sup>1/2</sup> ]	Capacitance @ V <sub>R</sub> = 0 V <sup>a</sup> [pF]	Forward Voltage [V]
		Min.	Typ.	Typ.	Max.				
IG26X250S4i	250	25	60	3	10	6.0E+10	3.8E-13	35	0.48
IG26X1000S4i	1000	2.5	7	15	100	8.0E+10	1.0E-12	580	
IG26X1300S4i	1300	0.9	2.2	30	300	5.9E+10	1.9E-12	1035	
IG26X2000G1i	2000	0.5	1.7	70	400	7.5E+10	2.4E-12	1925	
IG26X3000G1i	3000	0.2	0.7	120	1000	7.1E+10	3.7E-12	3200	

<sup>a</sup> Parameter tested on batch level

<sup>b</sup> Parameter 100% tested

## Thermoelectrically Cooled InGaAs Detectors

Part Number	Diameter [ $\mu\text{m}$ ]	Operating Temperature [ $^{\circ}\text{C}$ ]	Shunt Impedance @ $V_R = 10 \text{ mV}^b$ [kOhm]		Peak $D^* \text{ }^a$ [cm Hz $^{1/2}$ /W]	Peak NEP $^a$ [W/Hz $^{1/2}$ ]	Capacitance @ $V_R = 0 \text{ V}^a$ [pF]
			Min.	Typ.	Typ.	Typ.	Typ.
IG26X250T7	250	-20	300	625	1.9E+11	1.2E-13	35
IG26X1000T7	1000		80	140	3.6E+11	2.4E-13	580
IG26X1300T7	1300		15	44.5	2.6E+11	4.3E-13	1035
IG26X2000T7	2000		13	33	3.5E+11	5.0E-13	1925
IG26X3000T7	3000		3.5	9.2	2.8E+11	9.6E-13	3200
IG26X250T9	250	-40	1000	2000	4.0E+11	5.6E-14	35
IG26X1000T9	1000		300	590	7.4E+11	1.2E-13	580
IG26X1300T9	1300		65	195	5.5E+11	2.0E-13	1035
IG26X2000T9	2000		60	135	7.1E+11	2.5E-13	1925
IG26X3000T9	3000		15	32	5.2E+11	5.1E-13	3200

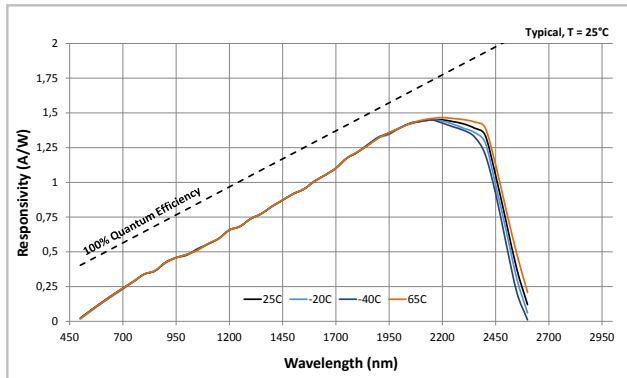
<sup>a</sup> Parameter tested on batch level<sup>b</sup> Parameter 100% tested

## Absolute Maximum Ratings

	Min.	Max.
Storage Temperature [ $^{\circ}\text{C}$ ]	-55	+125 $^{\circ}$
Operating Temperature [ $^{\circ}\text{C}$ ]	-40	+85
Reverse Bias, cw [V]	-	1
Forward Current, cw [mA]	-	1
Soldering Temperature, 5 sec. [ $^{\circ}\text{C}$ ]	-	260
ESD Damage Threshold, Human Body Model Class 0*, [V]	0	<250
TE Cooler Voltage [V]	-	3.7
TE Cooler Current [A]	-	1.1

\*ANSI/ ESD STN5. 1-2007

Fig. 1: Spectral Response



Spectral Response Zoom

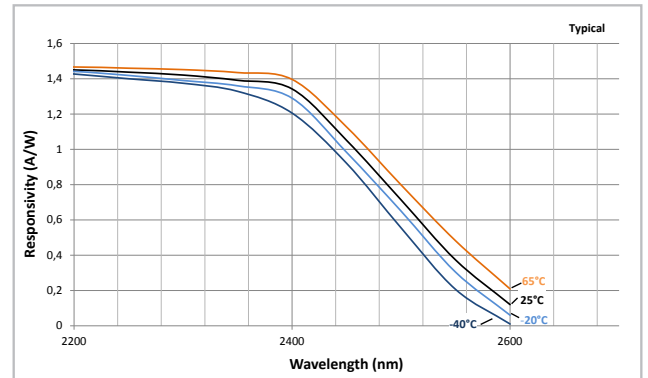


Fig. 2: Dark Current vs. Reverse Voltage

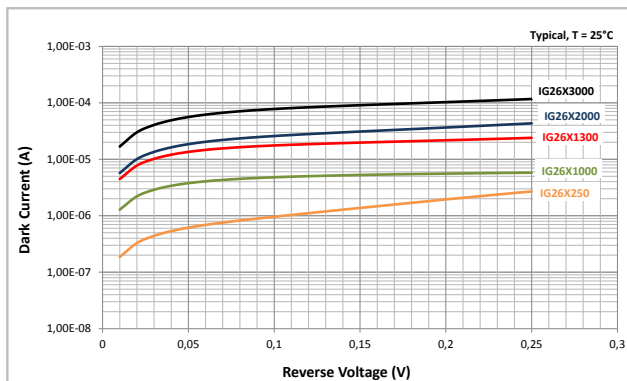


Fig. 3: Shunt Resistance vs. Temperature

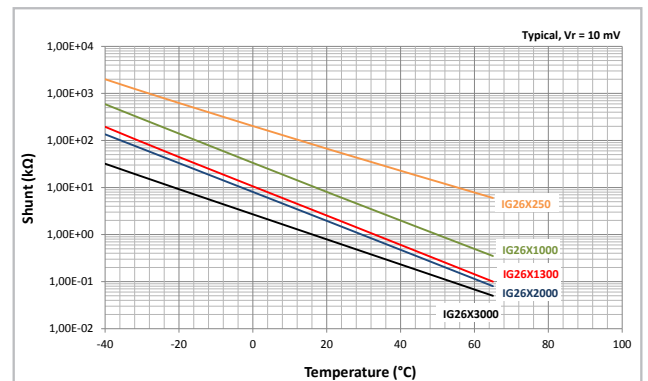


Fig. 4: Detectivity vs. Shunt x Area

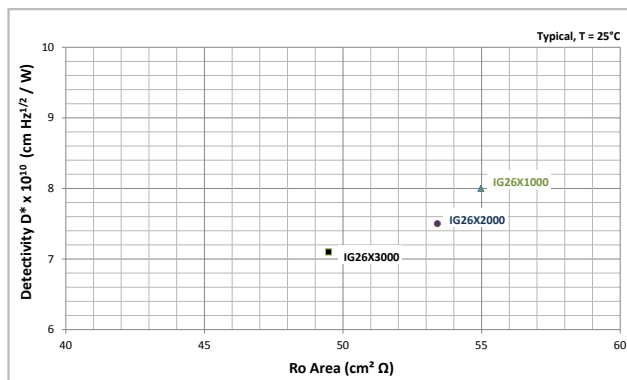


Fig. 5: Capacitance vs. Reverse Voltage

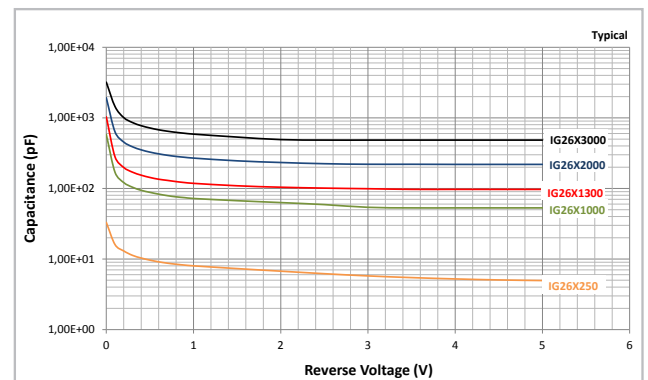


Fig. 6: Responsivity Temperature Coefficient I

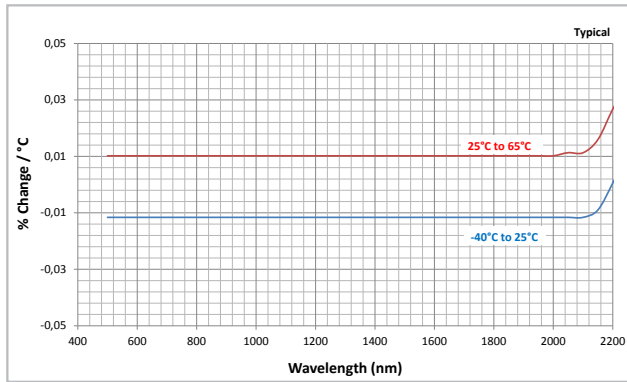


Fig. 7: Responsivity Temperature Coefficient II

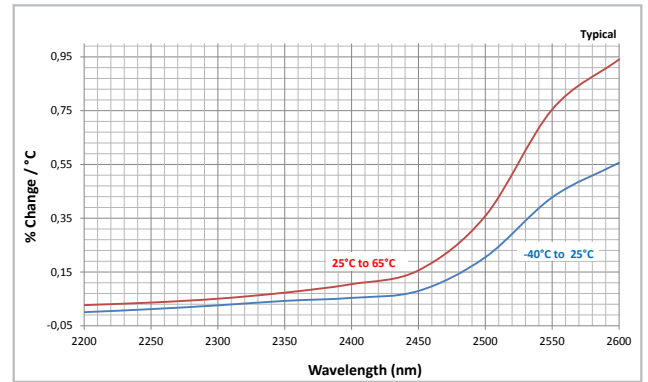


Fig. 8: Sample Pulse Response

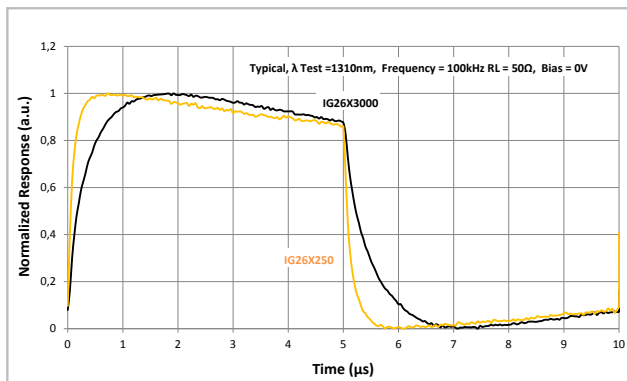


Fig. 9: TEC Voltage vs. Temperature

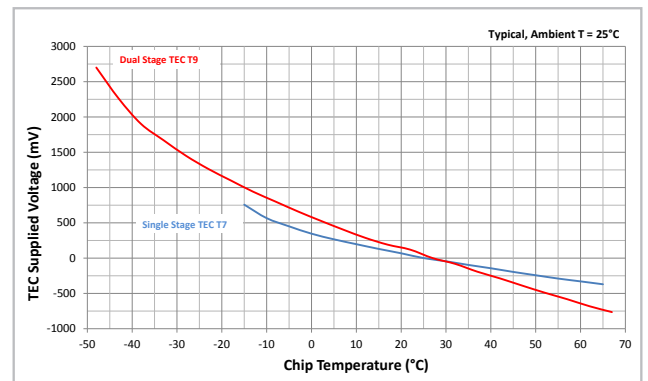


Fig. 10: TEC Current vs. Temperature

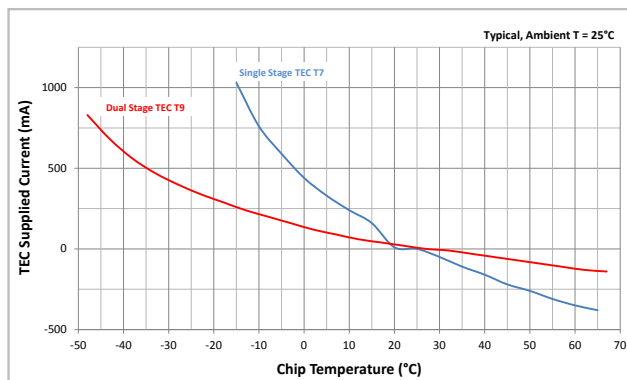


Fig. 11: TEC Power vs. Temperature

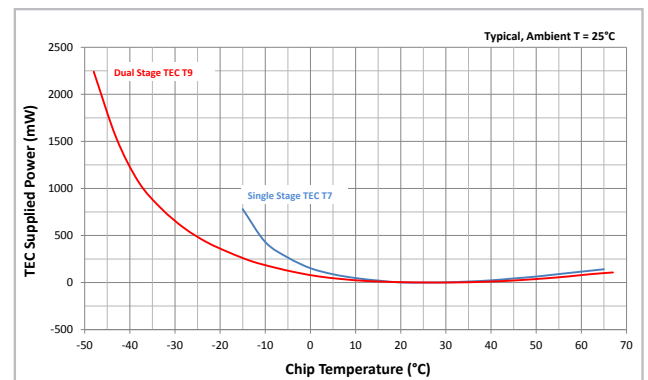


Fig. 12: T9 Thermistor Temperature Characteristics

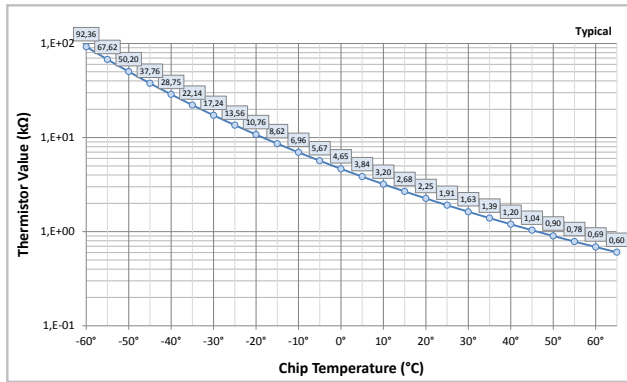


Fig. 13: T7 Thermistor Temperature Characteristics

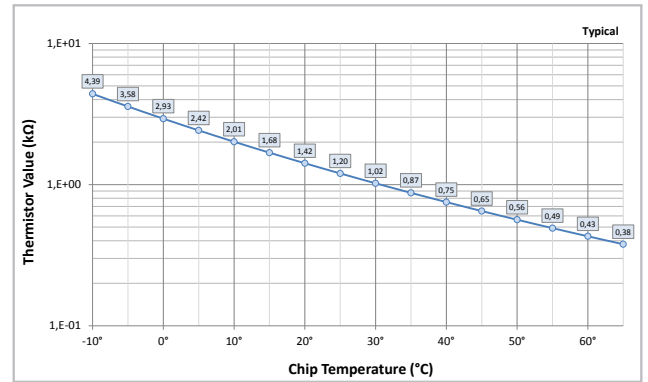


Fig. 14: Linearity



## Nomenclature

I	G	2	6	X
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## Type

Extended InGaAs  
PIN Photodiode

	2	5	0
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## Diameter

250 = 250  $\mu$ m

1000 = 1 mm

1300 = 1.3 mm

2000 = 2 mm

3000 = 3 mm

S	4	i	
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## Package Style

S4i - TO-46, isolated

S4ix - TO-46, no window

G1i - TO-5, isolated

G1ix - TO-5, no window

T7 - TO-37, single stage TEC

T9 - TO-66, dual stage TEC

C - Chip

M9 - 8 pad surface mount device

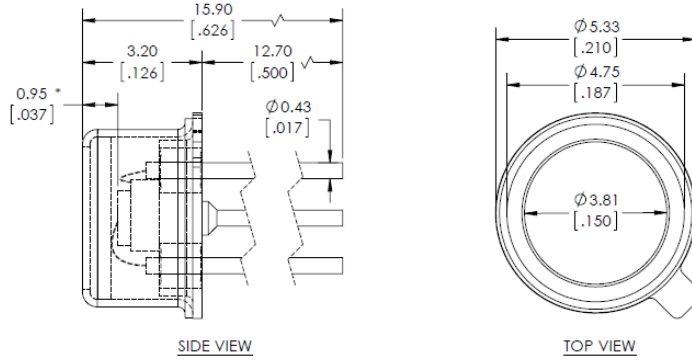
Y3 - 2 pad ceramic substrate

Standard window: Borosilicate glass

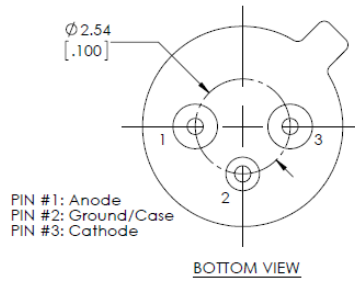
Custom option: AR/AR, 1275-2500 nm, R (avg) < 1%

Package Drawings

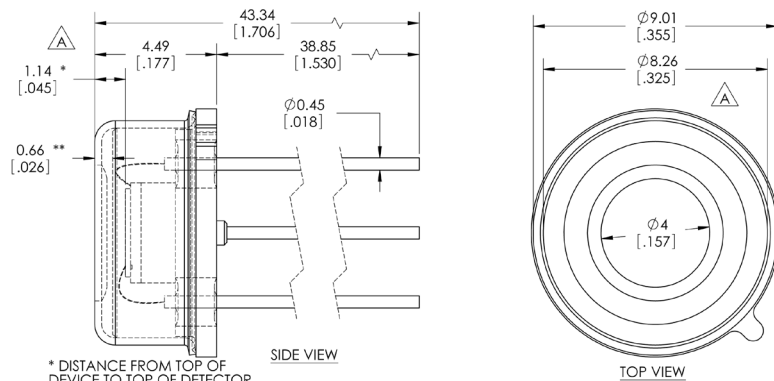
S4i



\* DISTANCE FROM TOP OF DEVICE TO TOP OF ACTIVE AREA

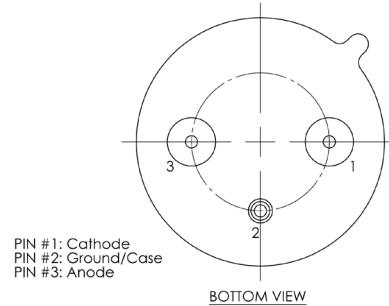


G1i



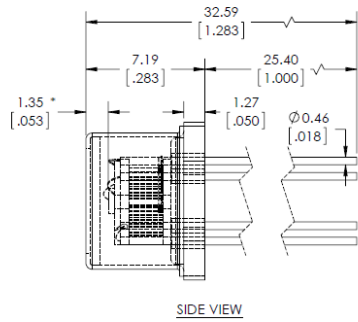
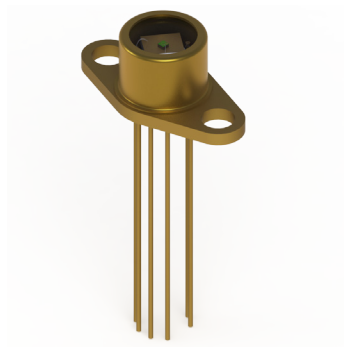
\* DISTANCE FROM TOP OF DEVICE TO TOP OF DETECTOR

\*\* DISTANCE FROM TOP OF DEVICE TO BOTTOM OF WINDOW





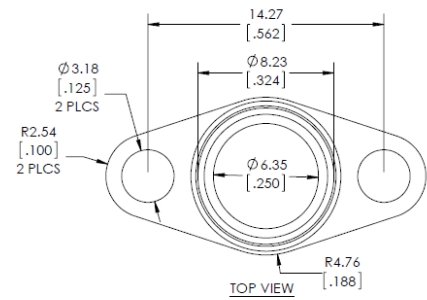
T7



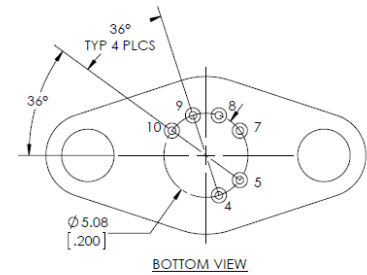
SIDE VIEW

\* DISTANCE FROM TOP OF DEVICE TO TOP OF ACTIVE AREA

\*\* DISTANCE FROM TOP OF DEVICE TO TOP OF WINDOW



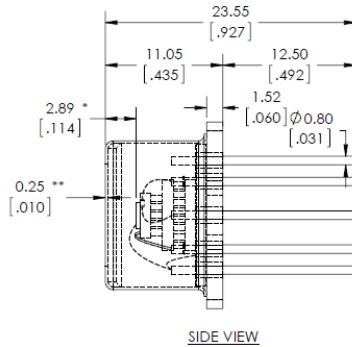
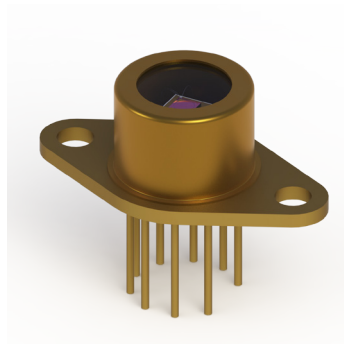
TOP VIEW



BOTTOM VIEW

PIN #4: Thermistor  
PIN #5: Thermistor  
PIN #7: TEC +  
PIN #8: TEC -  
PIN #9: Anode  
PIN #10: Cathode

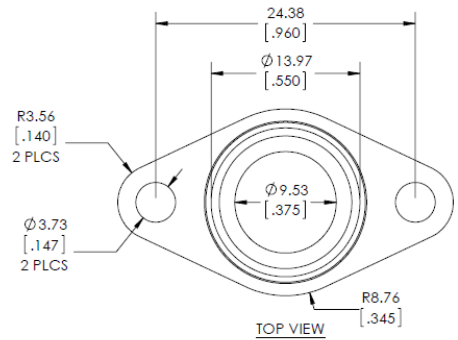
T9



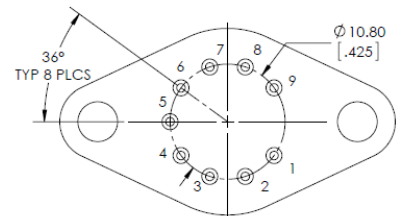
SIDE VIEW

\* DISTANCE FROM TOP OF DEVICE TO TOP OF ACTIVE AREA

\*\* DISTANCE FROM TOP OF DEVICE TO TOP OF WINDOW



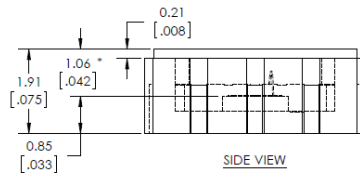
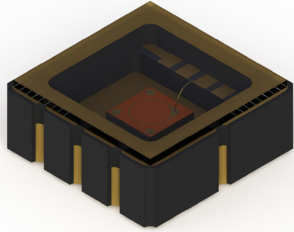
TOP VIEW



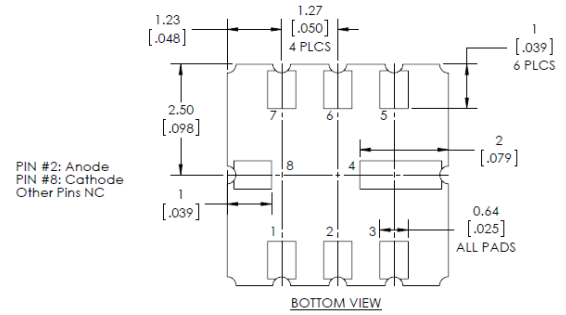
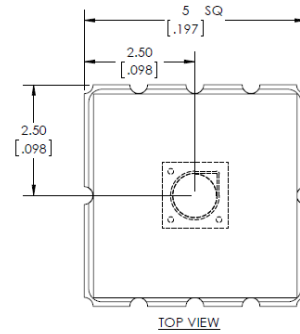
BOTTOM VIEW

PIN #1: TEC +  
PIN #2: Ground/Case  
PIN #3: Anode  
PIN #4: Cathode  
PIN #5: Thermistor  
PIN #6: Thermistor  
PIN #7: NC  
PIN #8: NC  
PIN #9: TEC -

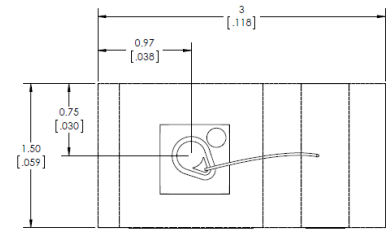
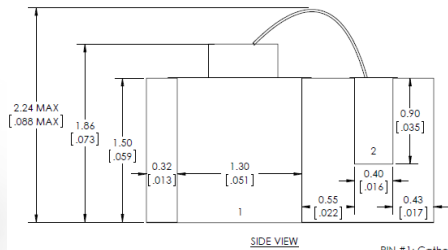
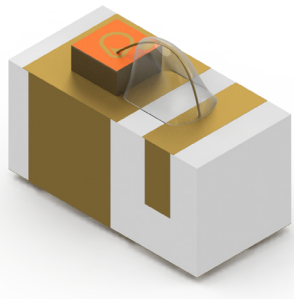
M9



\* DISTANCE FROM TOP OF DEVICE TO TOP OF ACTIVE AREA

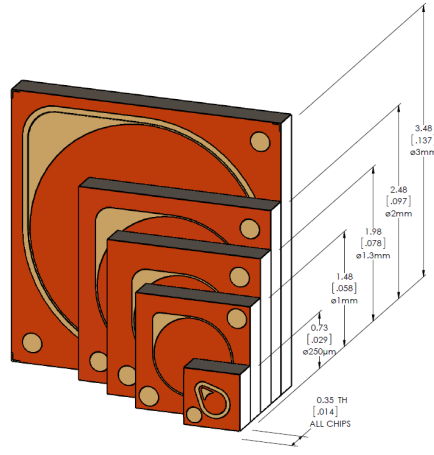


Y3

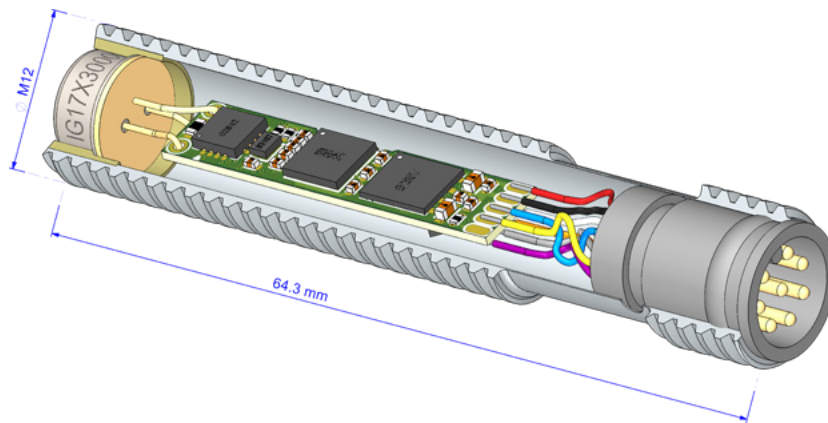


Up to 1mm Only

Chip



D- MAJOR-A: Digital Module, RS-232, Digital and Analog Output



Pin#	Signal Name	Electrical Data	Description
1	TempOut	0... 2500 mV	Analog temp output
2	SensorOut	0...3300 mV	Analog sensor output
3	+5 V	5 V ±10%	Power supply input
4	TxD	RS-232 levels	Serial data output
5	BSLprg	RS-232 levels	BSL programming signal
6	RxD	RS-232 levels	Serial data input
7	Reset	RS-232 levels	Reset input signal, low active
8	GND	0V	Ground signal

Please get in contact for more details of the MAJOR.

## Product Changes

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