

Standard InGaAs Photodiodes IG17-Series

Description

The IG17-series is a panchromatic PIN photodiode with a nominal wavelength cut-off at 1.7 μm . 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 $\geq 1.65 \mu\text{m}$
- Typical peak responsivity: 1.05 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 ^a [μm]	Peak Wave-length ^a [μm]	Peak Responsivity ^{a,b} [A/W]		Responsivity @ 900 nm ^{a,b} [A/W]		Responsivity @ 1300 nm ^{a,b} [A/W]		Responsivity @ 1500 nm ^{a,b} [A/W]	
			Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.
IG17X250S4i	250	≥1.65 ± 0.1	1.55	0.9	1.05	0.44	0.55	0.77	0.91	0.8	1.0
IG17X1000S4i	1000										
IG17X1300S4i	1300										
IG17X2000G1i	2000										
IG17X3000G1i	3000										

^a Parameter tested on batch level at T = 25°C.

^b Responsivity measured at 0 V Bias.

Electro-Optical Characteristics, Specifications @ 25°C

Part Number	Diameter [μm]	Shunt Impedance @ V _R = 10 mV ^b [MΩ]		Dark Current @ V _R = 5 V ^b [nA]		Peak D* ^a [cm Hz ^{1/2} /W]	Peak NEP ^a [W/Hz ^{1/2}]	Capacitance @ V _R = 0 V ^a [pF]	Forward Voltage [V]
		Min.	Typ.	Typ.	Max.	Typ.	Typ.	Typ.	Typ.
IG17X250S4i	250	150	830	0.4	1	5.2E+12	4.2E-15	15	0.73
IG17X1000S4i	1000	15	75	2	10	6.3E+12	1.4E-14	215	
IG17X1300S4i	1300	10	40	5	50	6.0E+12	1.9E-14	305	
IG17X2000G1i	2000	4	25	10	40	7.3E+12	2.4E-14	700	
IG17X3000G1i	3000	3	15	20	100	8.4E+12	3.2E-14	1550	

^a Parameter tested on batch level

^b Parameter 100% tested

Thermoelectrically Cooled InGaAs Detectors

Part Number	Diameter [μm]	Operating Temperature [°C]	Shunt Impedance @ $V_R = 10 \text{ mV}^b$ [MΩ]		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.
IG17X1000T7	1000	-20	750	2750	4.1E+13	2.1E-15	215
IG17X1300T7	1300		360	1500	4.0E+13	2.9E-15	305
IG17X2000T7	2000		180	530	3.6E+13	4.9E-15	700
IG17X3000T7	3000		65	295	4.1E+13	6.6E-15	1550
IG17X1000T9	1000	-40	5000	19000	1.1E+14	7.9E-16	215
IG17X1300T9	1300		2000	10000	1.1E+13	1.1E-15	305
IG17X2000T9	2000		1100	4000	1.0E+13	1.7E-15	700
IG17X3000T9	3000		200	400	4.9E+13	5.5E-15	1550

^a Parameter tested on batch level^b Parameter 100% tested

Absolute Maximum Ratings

	Min.	Max.
Storage Temperature [°C]	-55	+125°
Operating Temperature [°C]	-40	+85
Reverse Bias, cw [V]	-	10
Forward Current, cw [mA]	-	1
Soldering Temperature, 5 sec. [°C]	-	260
ESD Damage Threshold, Human Body Model Class 1A*, [V]	250	<500
TE Cooler Voltage [V]	-	3.7
TE Cooler Current [A]	-	1.1

*ANSI/ ESD STN5. 1-2007

Fig. 1: Spectral Response

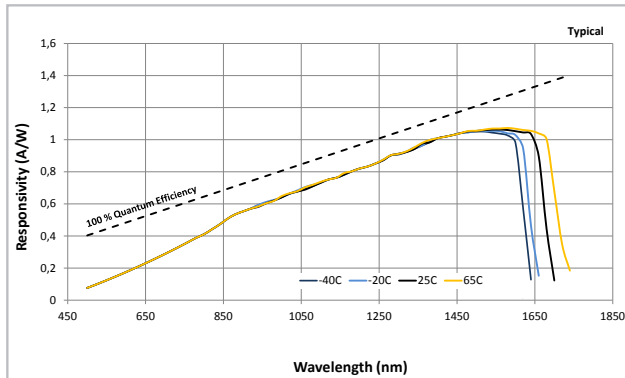


Fig. 2: Dark Current vs. Reverse Voltage

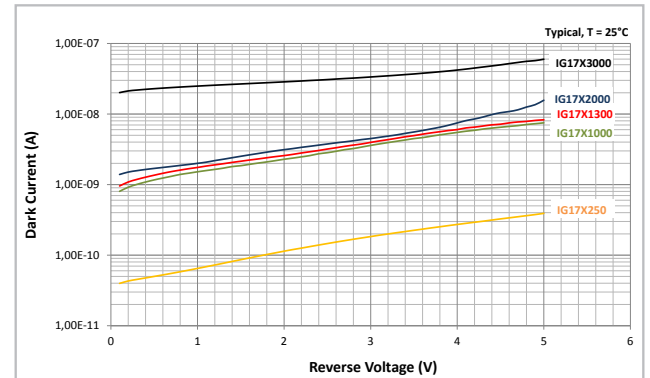


Fig. 3: Shunt vs. Temperature

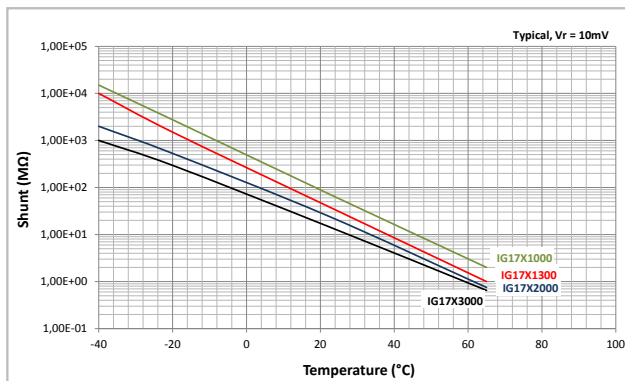


Fig. 4: Detectivity vs. Shunt x Area

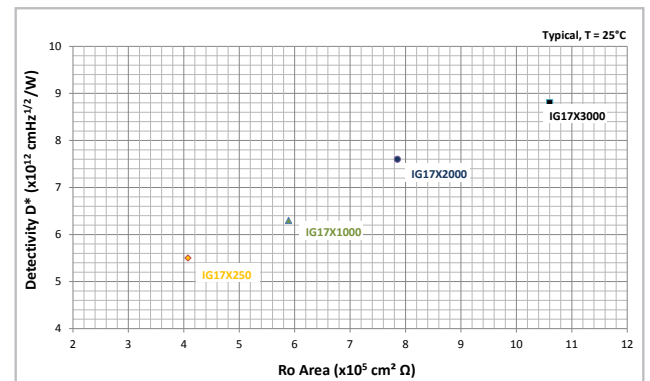


Fig. 5: Capacitance vs. Reverse Voltage

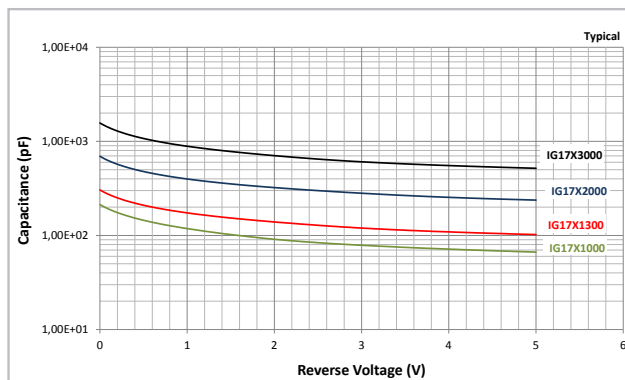


Fig. 6: Responsivity Temperature Coefficient I

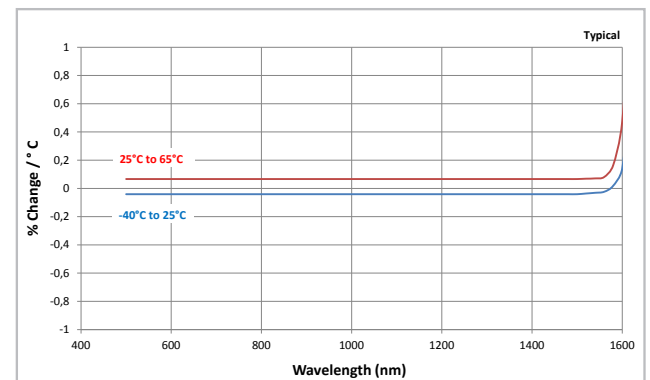


Fig. 7: Responsivity Temperature Coefficient II

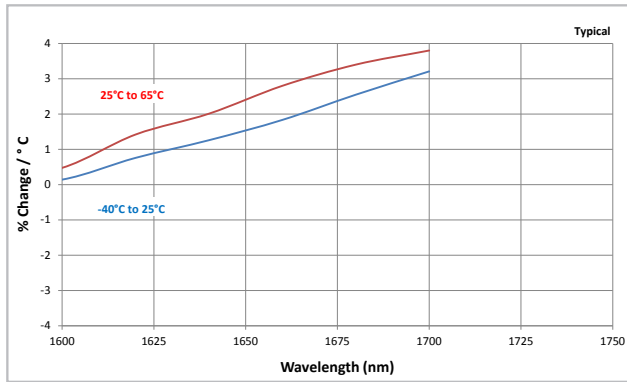


Fig. 8: Sample Pulse Response

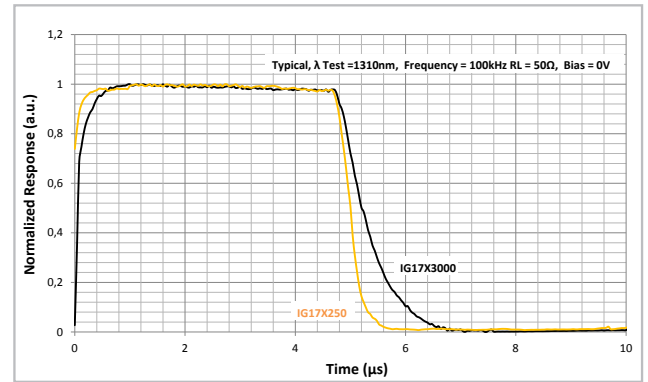


Fig. 9: TEC Voltage vs. Temperature

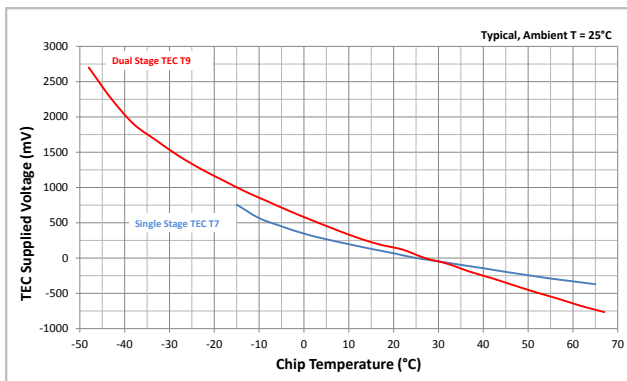


Fig. 10: TEC Current vs. Temperature

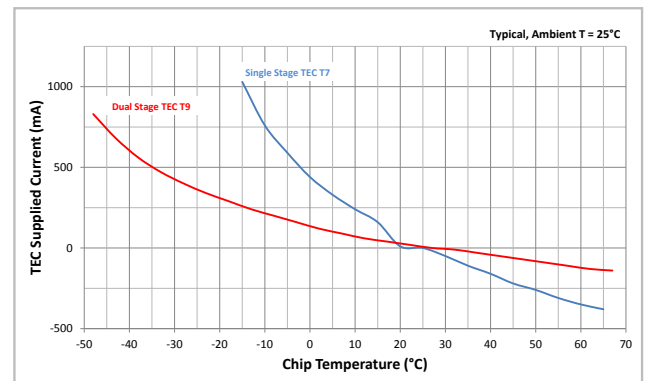


Fig. 11: TEC Power vs. Temperature

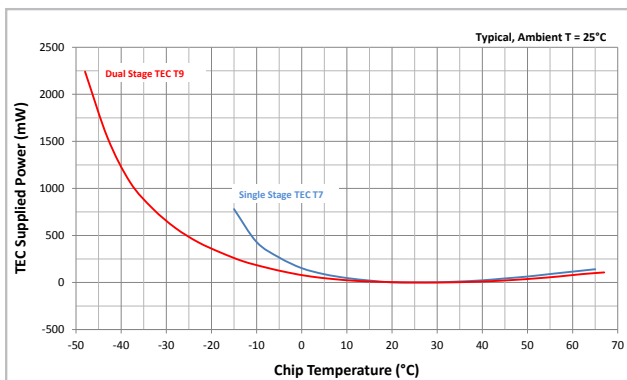


Fig. 12: T9 Thermistor Temperature Characteristics

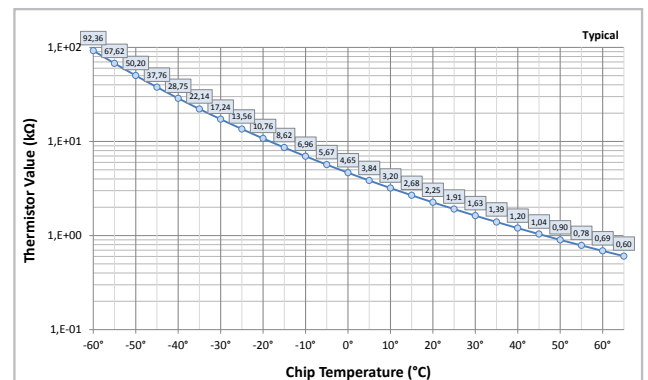


Fig. 13: T7 Thermistor Temperature Characteristics

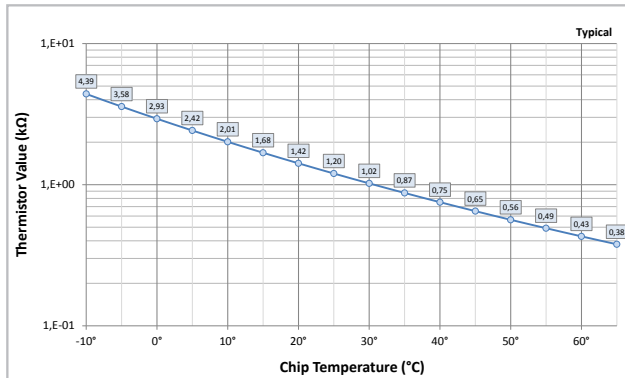
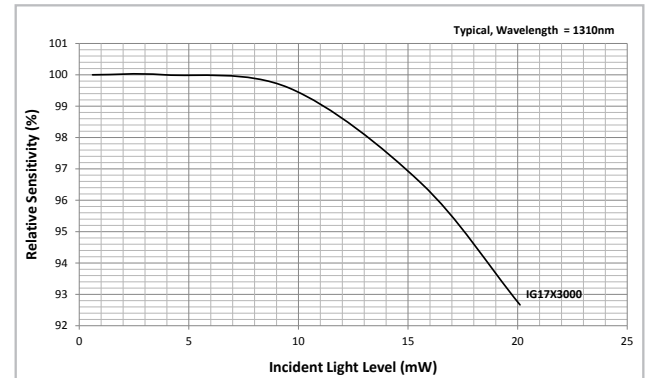


Fig. 14: Linearity



Nomenclature

I G 1 7 X

Type

Standard InGaAs
PIN Photodiode

2 5 0

Diameter

250 = 250 μm
1000 = 1 mm
1300 = 1.3 mm
2000 = 2 mm
3000 = 3 mm

S 4 i

Package Style

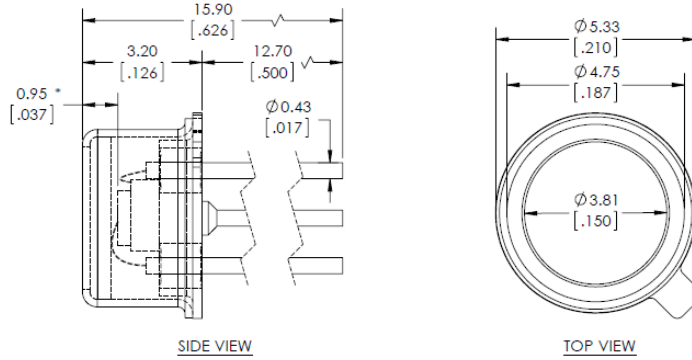
S4i - TO-46, isolated
S4ix - TO-46, no window
G1i - TO-5, isolated
G1ix - TO-5, no window
T7 - TO-37, single stage TEC
T9 - TO-66, dual stage TEC
C - Chip
M9 - 8 pad surface mount device
Y3 - 2 pad ceramic substrate

Standard window: Borosilicate glass

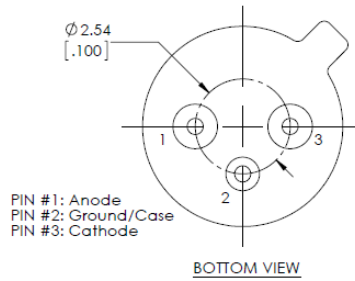
Custom option: AR/AR, 1275-2500 nm, R (avg) < 1%

Package Drawings

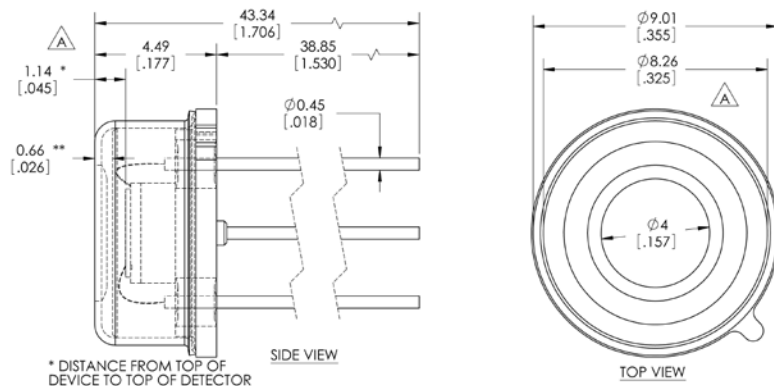
S4i



* DISTANCE FROM TOP OF DEVICE TO TOP OF ACTIVE AREA

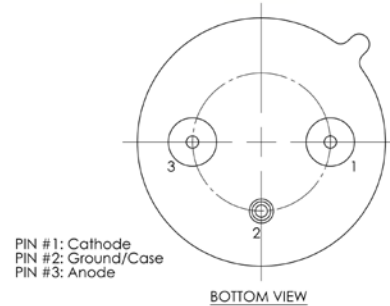


G1i

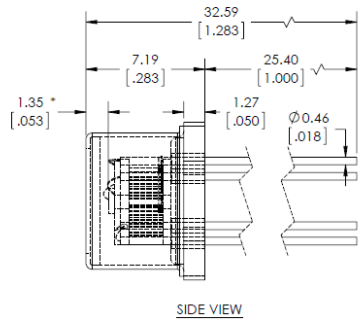


* DISTANCE FROM TOP OF DEVICE TO TOP OF DETECTOR

** DISTANCE FROM TOP OF DEVICE TO BOTTOM OF WINDOW

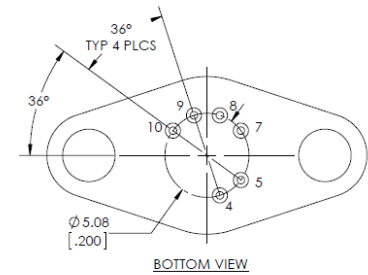
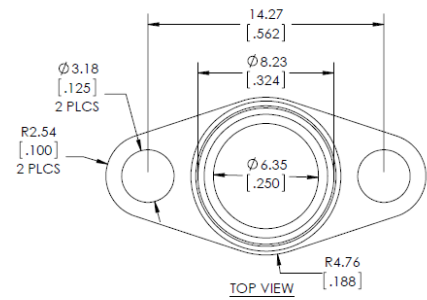


T7



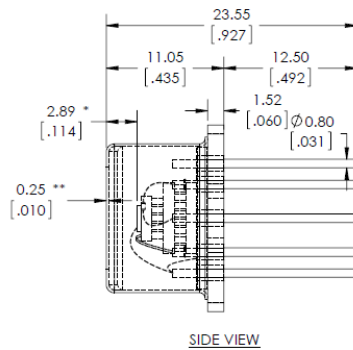
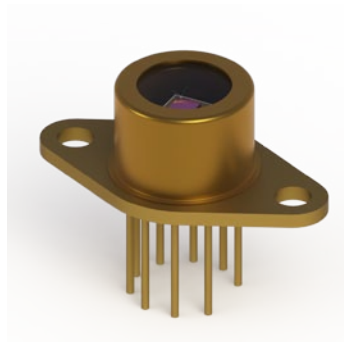
* DISTANCE FROM TOP OF DEVICE TO TOP OF ACTIVE AREA

** DISTANCE FROM TOP OF DEVICE TO TOP OF WINDOW



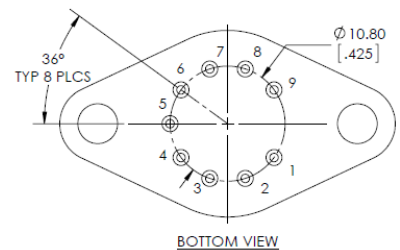
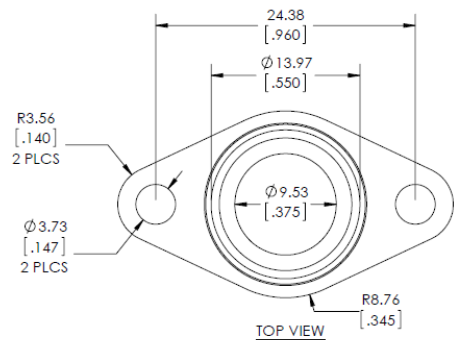
PIN #4: Thermistor
PIN #5: Thermistor
PIN #7: TEC +
PIN #8: TEC -
PIN #9: Anode
PIN #10: Cathode

T9



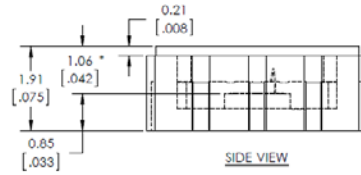
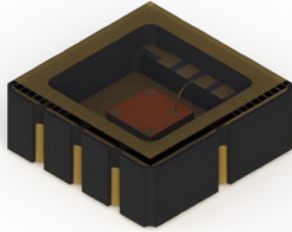
* DISTANCE FROM TOP OF DEVICE TO TOP OF ACTIVE AREA

** DISTANCE FROM TOP OF DEVICE TO TOP OF WINDOW

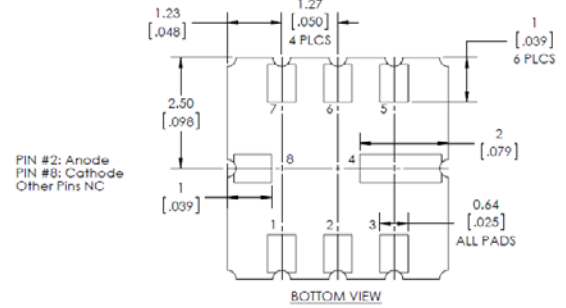
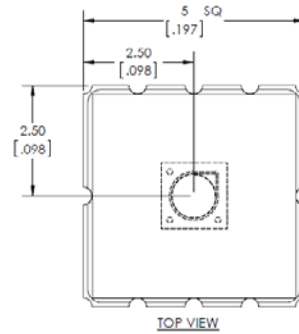


PIN #1: TEC +
PIN #2: Ground/Case
PIN #3: Anode
PIN #4: Cathode
PIN #5: Thermistor
PIN #6: Thermistor
PIN #7: NC
PIN #8: NC
PIN #9: TEC -

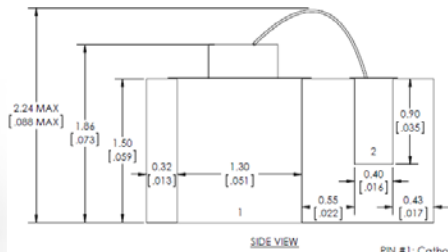
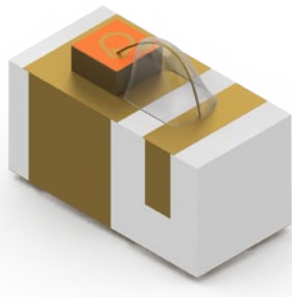
M9



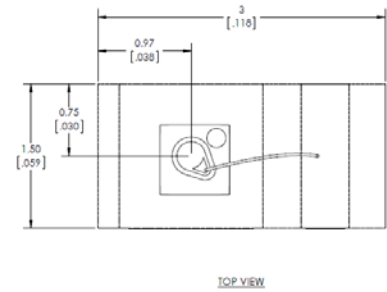
* DISTANCE FROM TOP OF DEVICE TO TOP OF ACTIVE AREA



Y3

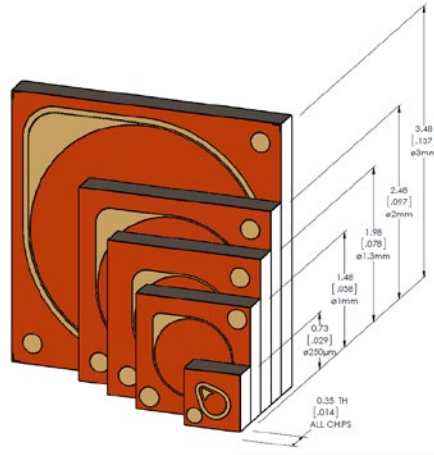


PIN #1: Cathode
PIN #2: Anode

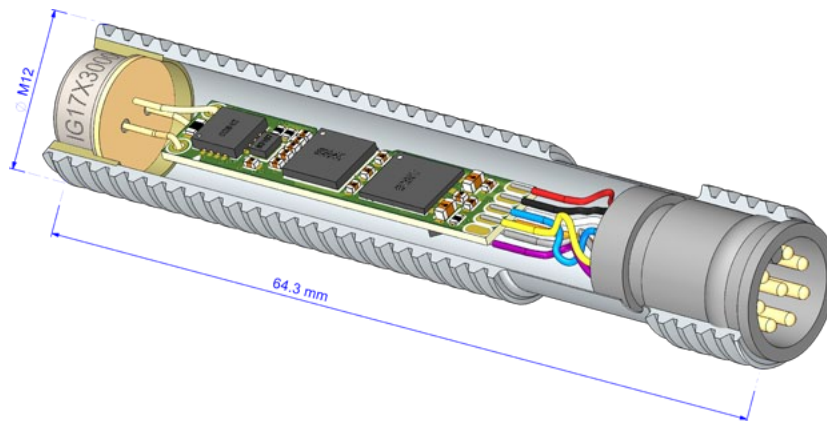


Up to 1mm Only

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.

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