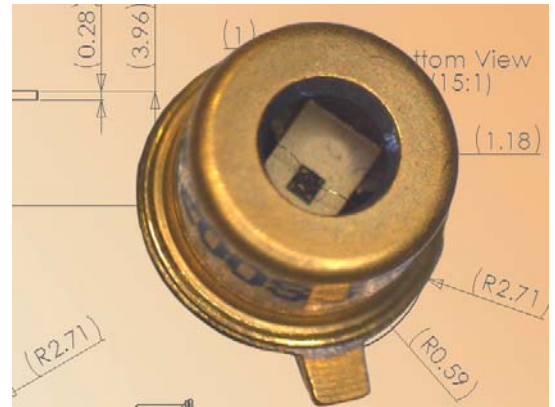


# InGaAs Avalanche Photodiode IAE-Series



## DESCRIPTION

The IAE-series avalanche photodiode is a large area InGaAs APD with high responsivity and extremely fast rise and fall times throughout the 1000 to 1650 nm wavelength range. The peak responsivity at 1550 nm is ideally suited to eye-safe rangefinding applications, free space optical communications, OTDR and high resolution Optical Coherence Tomography. The chip is hermetically sealed in a modified TO-46 package or mounted on a ceramic submount.



## FEATURES

- 80 or 200  $\mu\text{m}$  active area
- Typical bandwidth over 400 MHz
- Over 70% QE from 1000 to 1650 nm
- Low dark current & noise
- Modified TO-46 or ceramic submount

## APPLICATIONS

- Rangefinding
- Optical Communication Systems
- Optical Coherence Tomography
- Low-light-level detection

## GENERIC CHARACTERISTICS AT T= 21°C

	IAE080X				IAE200X			
	Min	Typ	Max	Units	Min	Typ	Max	Units
Wavelength Range	1000		1650	nm	1000		1650	nm
Peak Sensitivity		1550		nm		1550		nm



## ABSOLUTE MAXIMUM RATINGS

	IAE080X				IAE200X			
	Min	Typ	Max	Units	Min	Typ	Max	Units
Storage Temperature	-55		125	°C	-55		125	°C
Operating Temperature*	-40		85	°C	-40		85	°C
Optical Power (cw) (beam spot > 50 µm diameter)			1	mW			1	mW
Reverse Current			0.5	mA			0.5	mA
Reverse Voltage			$V_b$	V			$V_b$	V
Forward Current			1	mA			1	mA
Soldering (for 5 sec.)			200	°C			200	°C

\* Extended operating temperature range possible for special design considerations

( $T_c = 21^\circ\text{C}$ ,  $V_{op} = V_{br} - 1\text{V}$ ,  $\lambda = 1550\text{ nm}$ )

	IAE080X				IAE200X			
	Min	Typ	Max	Units	Min	Typ	Max	Units
Diameter		80		µm		200		µm
Breakdown Voltage, $V_b$ ( $I_d = 10\ \mu\text{A}$ )	40		80	Volt	40		80	Volt
Peak Responsivity	8	10		A/W	8	10		A/W
V breakdown Temp Coefficient		0.1		V/°C		0.1		V/°C
Dark Current		3	12	nA		10	40	nA
Noise Current		0.2	0.4	pA/sqrt Hz		0.4	0.8	pA/sqrt Hz
Capacitance		0.8	1.0	pF		2.0	2.5	pF
Bandwidth		1000		MHz		400		MHz



Fig.1: Spectral Response (M=10 @ 1550 nm)

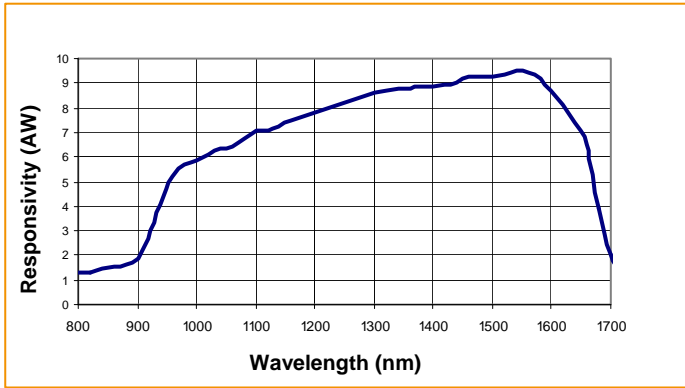


Fig.2: Effective Quantum Efficiency vs. Wavelength (M= 10 @ 1550 nm)

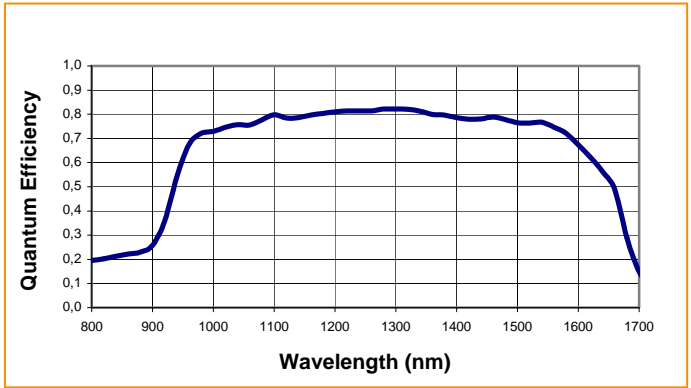


Fig. 3: Typical Dark Current Characteristics (25 degrees C)

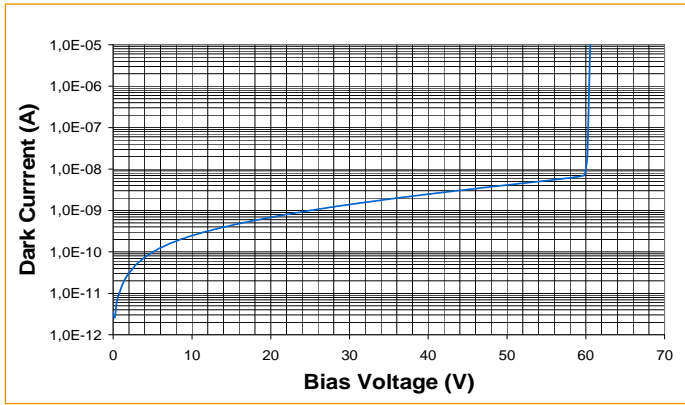


Fig. 4: Gain-Voltage Characteristics (25 degrees C)

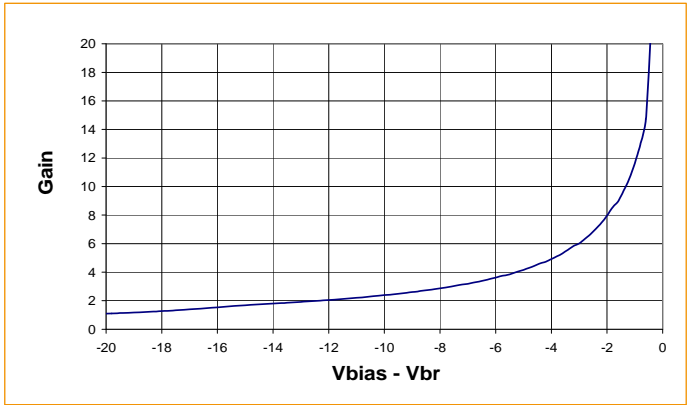


Fig. 5: Typical APD Noise Density as a Function of Gain

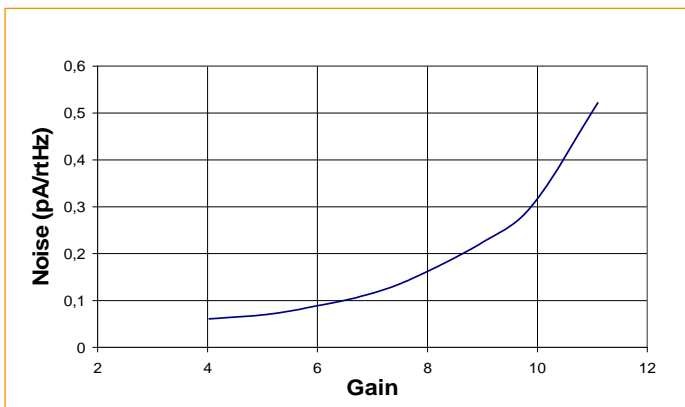


Fig. 6: Capacitance vs. Reverse Voltage

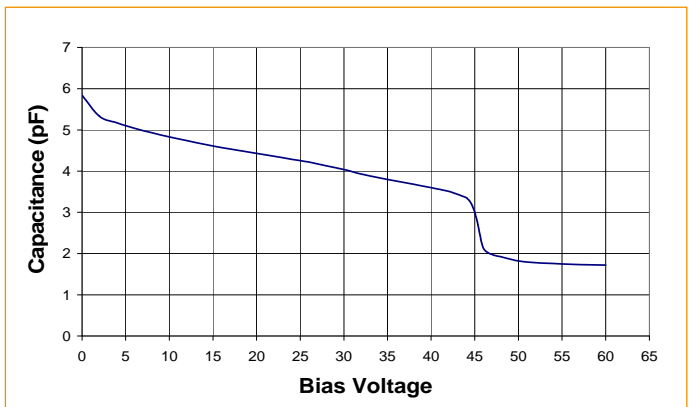
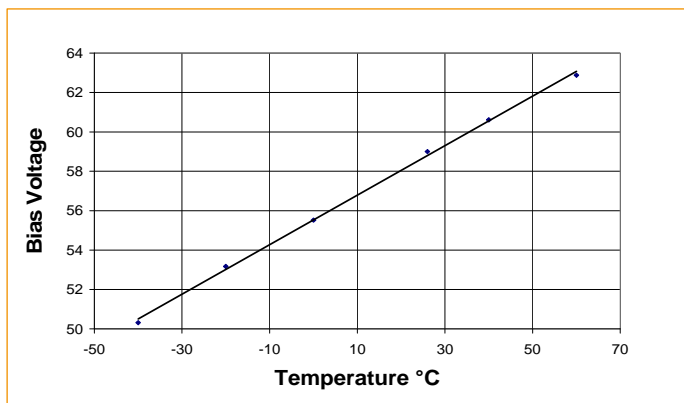
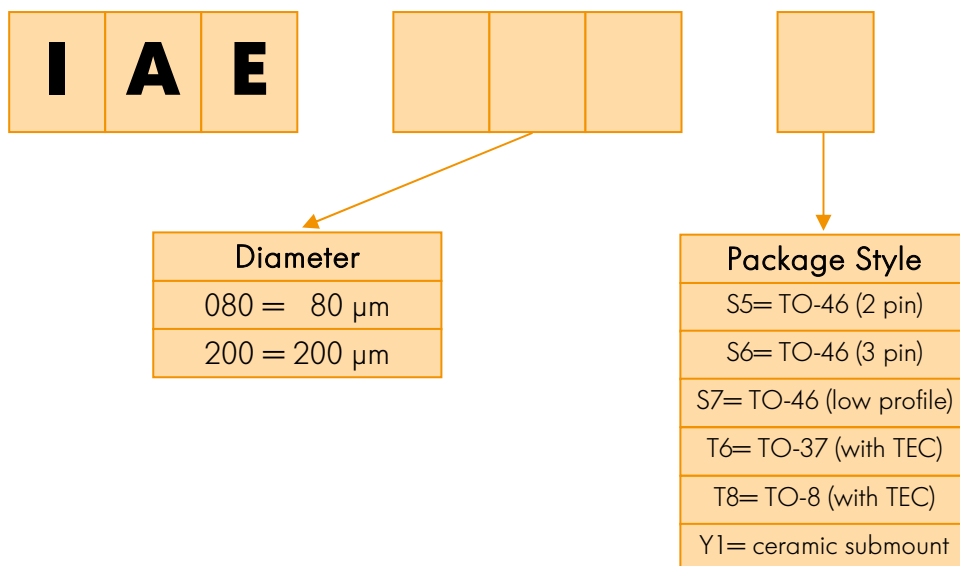


Fig. 7: Bias Voltage vs. Temperature  
(M= 10 @ 1550 nm)

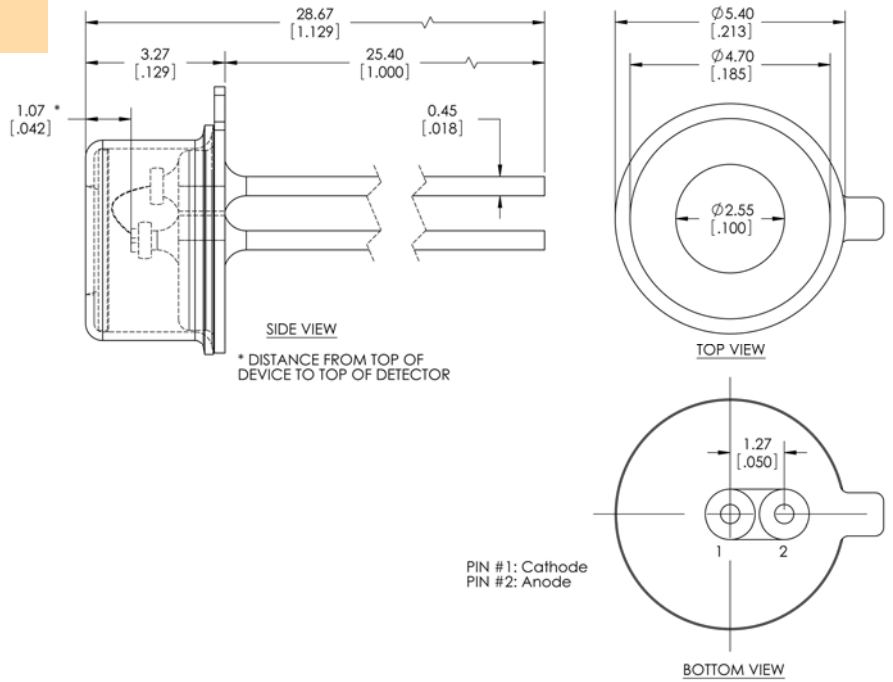


## PRODUCT NUMBER DESIGNATIONS

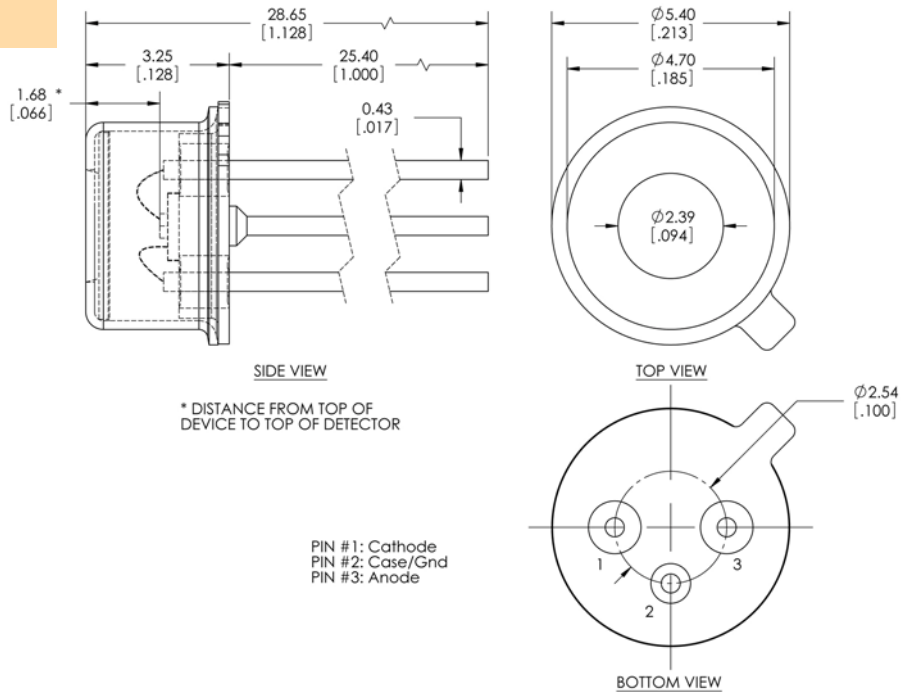


PACKAGE DRAWINGS

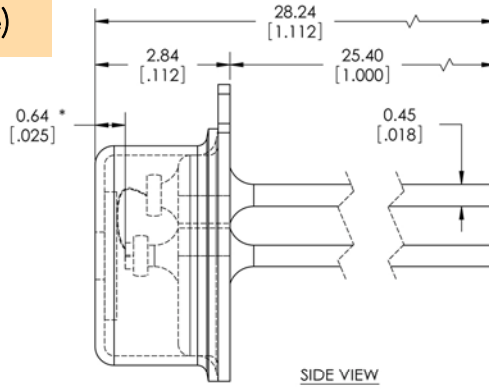
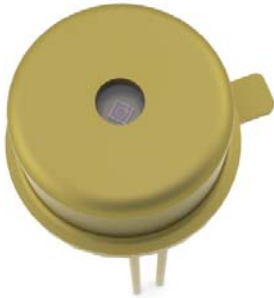
Package S5 TO-46 (2 pin)



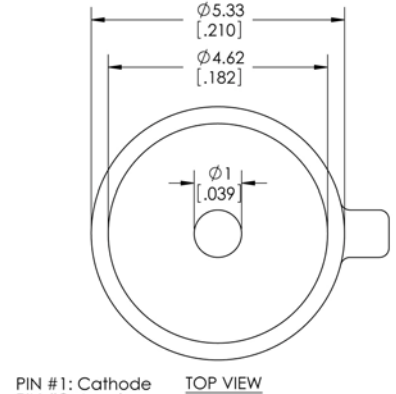
Package S6 TO-46 (3 pin)



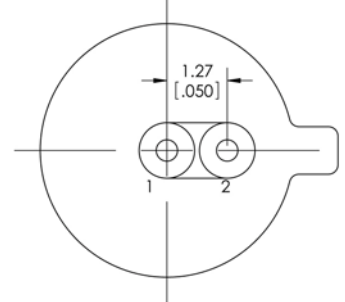
Package S7 TO-46 (low profile)



\* DISTANCE FROM TOP OF DEVICE TO TOP OF DETECTOR

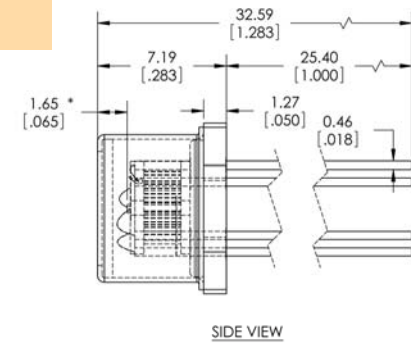
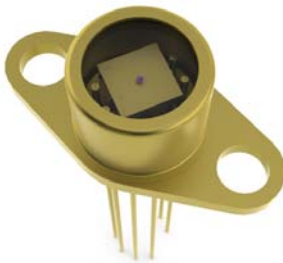


PIN #1: Cathode  
PIN #2: Anode

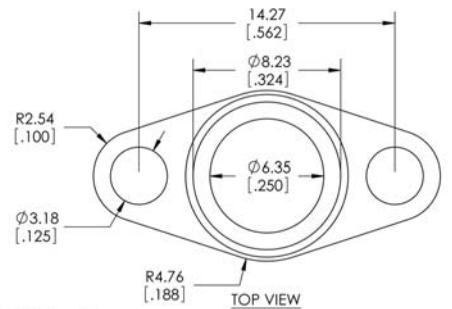


BOTTOM VIEW

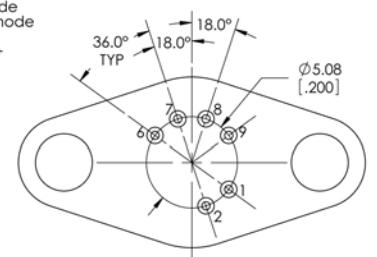
Package T6 TO-37 (with TEC)



\* DISTANCE FROM TOP OF DEVICE TO TOP OF DETECTOR



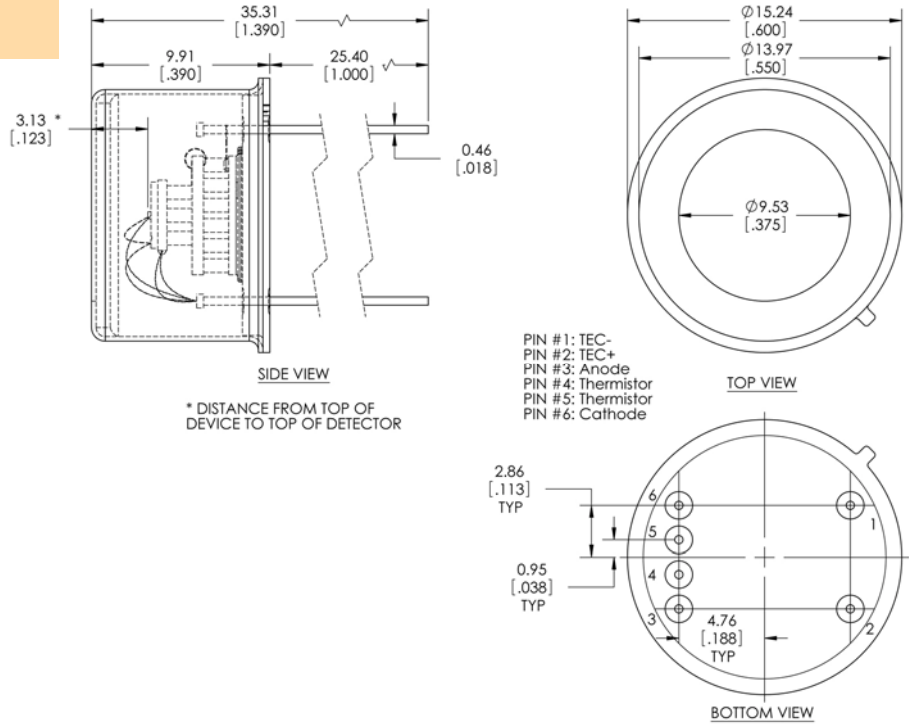
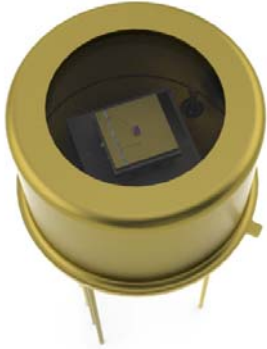
PIN #1: Thermistor  
PIN #2: Thermistor  
PIN #6: Anode  
PIN #7: Cathode  
PIN #8: TEC-  
PIN #9: TEC+



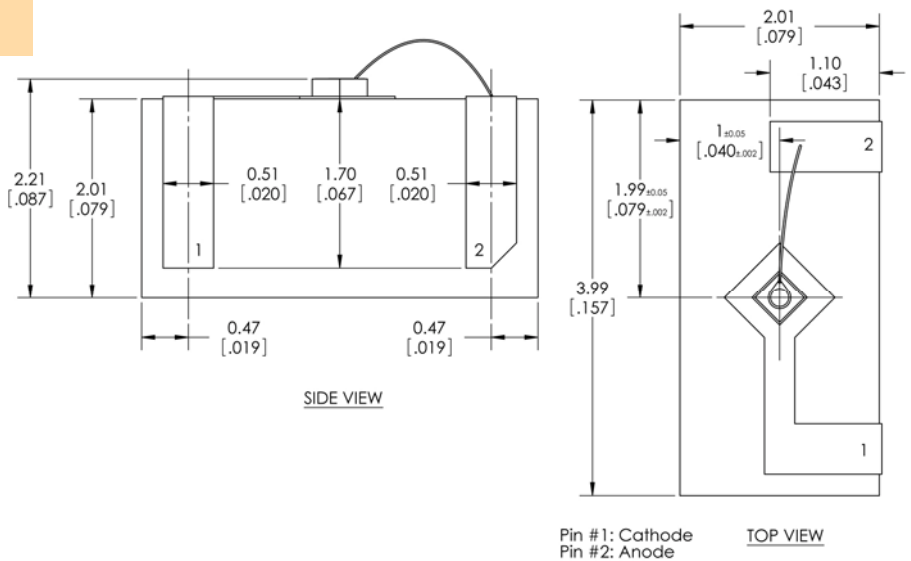
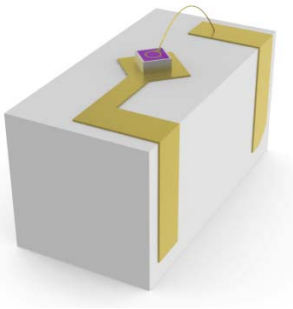
BOTTOM VIEW



Package T8 TO-8 (with TEC)



Package Y1 Ceramic Submount



PRODUCT CHANGES

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