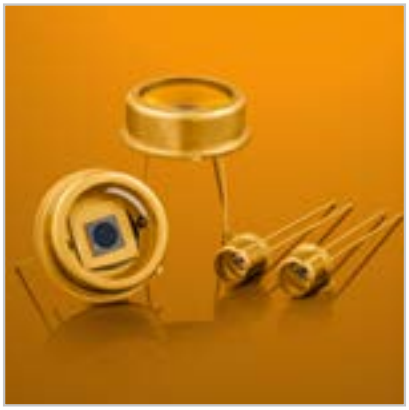
LASER COMPONENTS®

Silicon Avalanche Photodiode SAT-Series

Description



The SAT-Series is based on a "reach-through" structure for excellent quantum efficiency, high speed and targeted for the 1060 nm detection region. The chip is hermetically sealed in a modified TO-8 / TO-5 package.

This APD is also available in a hermetically sealed TO-37 with thermo-electrical cooler. This enables the APD to be used in a variety of demanding applications including LIDAR and medical applications.

Features

- Very high 1060 nm quantum efficiency
- Low noise, high speed
- Multiplication gain, M >100 available
- 800 µm or 3.0 mm diameter active area
- Gradual multiplication curve
- Wide operating temperature range

Applications

- Medical
- LIDAR

Generic Characteristics at t = 25 °C

	SAT-Series			
	Min	Typ	Max	Units
Wavelength range	700		1100	nm
Peak sensitivity		980		nm

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Absolute Maximum Ratings

	SAT800			SAT3000x			
	Min	Typ	Max	Min	Typ	Max	Units
Storage temperature	-55		100	-55		100	°C
Operating temperature	-40		85	-40		85	°C
Reverse current (CW)			200			200	µA
Reverse current (1 sec)			1			1	mA
Forward current (CW)			5			5	mA
Forward current (1 sec)			50			50	mA
Max. power dissipation			60			60	mW
Soldering (15 sec.)			260			260	°C

Electrical Characteristics @ M= 100, 25 °C

	SAT800			SAT3000			
	Min	Typ	Max	Min	Typ	Max	Units
Diameter		800			3000		µm
Breakdown voltage (Id = 10 µA)		400			400		Volt
Responsivity (M =100 & λ = 1064 nm)	20	25		30	34		A/W
Vbreakdown temp coefficient		2.5			2.5		V/°C
Dark current (M = 100)		1	10		5	20	nA
Noise current (M = 100)		0.5	1.5		1	3	pA/ sqrtHz
Capacitance (M = 100)		2			10		pF
Rise time (M = 100)		1			3		nsec

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SAT800X:

Fig. 1: Spectral Response

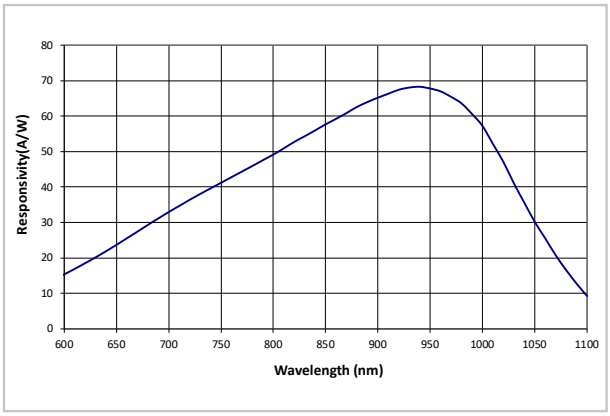


Fig. 2: Quantum Efficiency vs. Wavelength

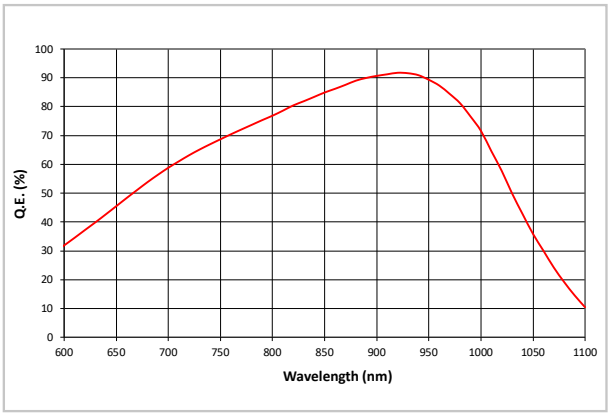


Fig. 3: Typical Dark Current Characteristics

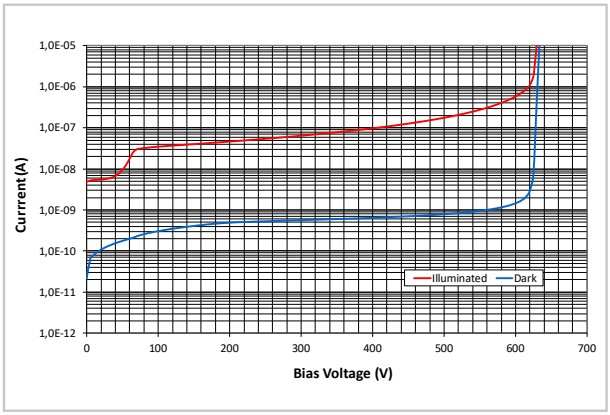


Fig. 4: Gain – Voltage Characteristics

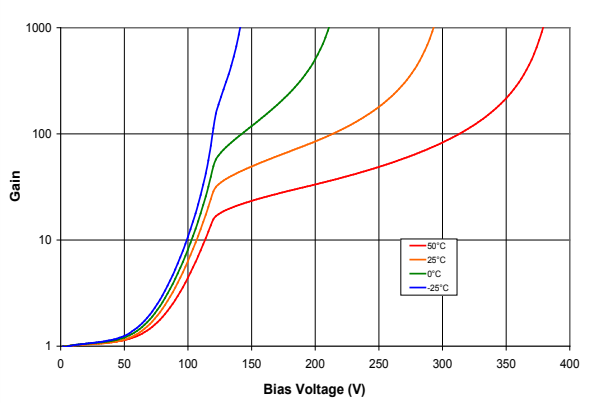


Fig. 5: Capacitance vs. Reverse Voltage

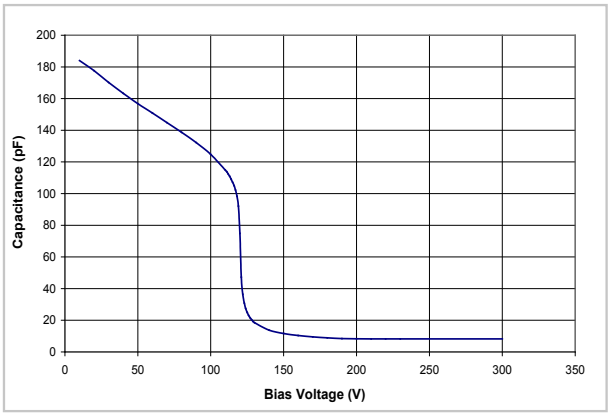
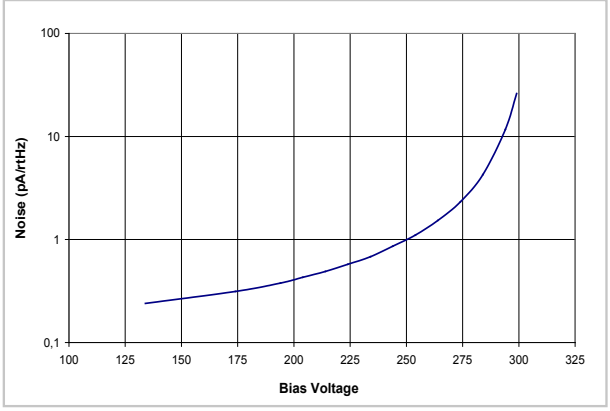


Fig. 6: Typical APD Noise as a Function of Bias Voltage



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SAT3000x:

Fig. 7: Spectral Response

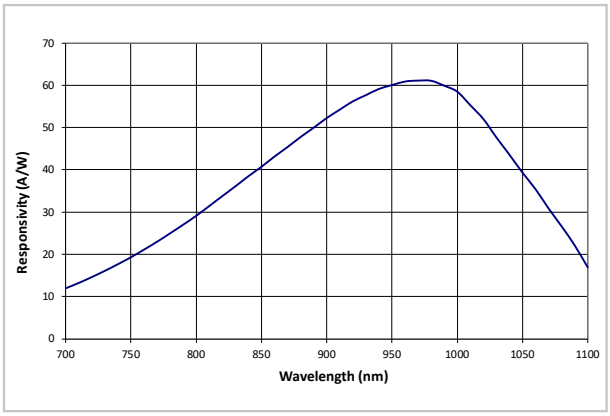


Fig. 8: Quantum Efficiency vs. Wavelength

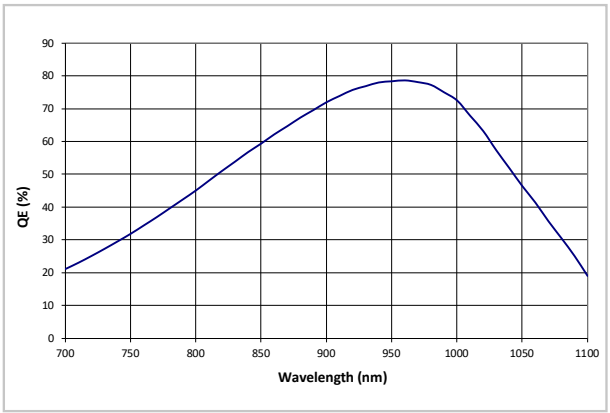


Fig. 9: Typical Dark Current Characteristics

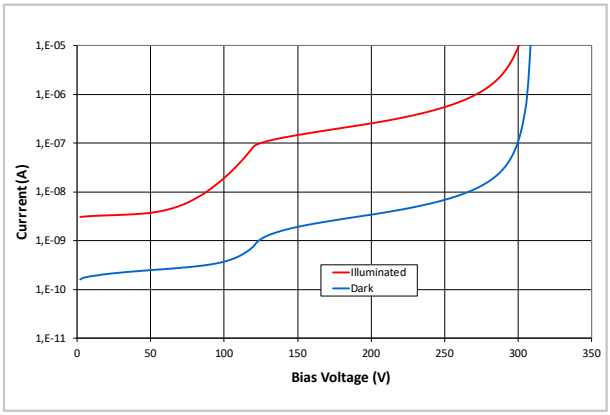


Fig. 10: Gain – Voltage Characteristics

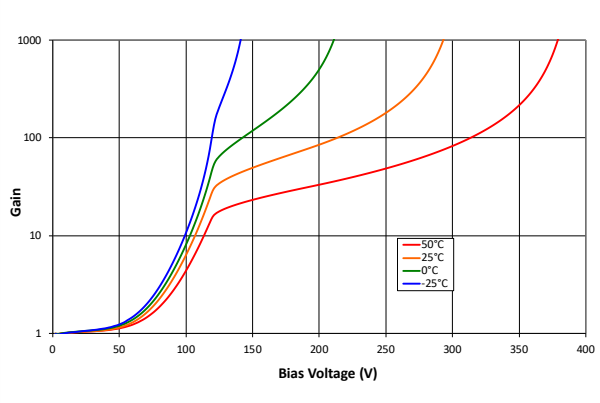


Fig. 11: Capacitance vs. Reverse Voltage

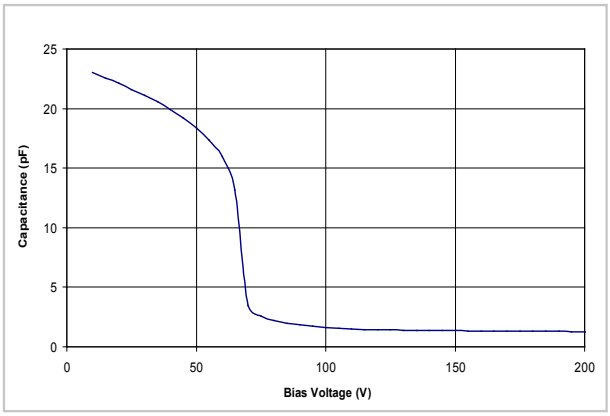
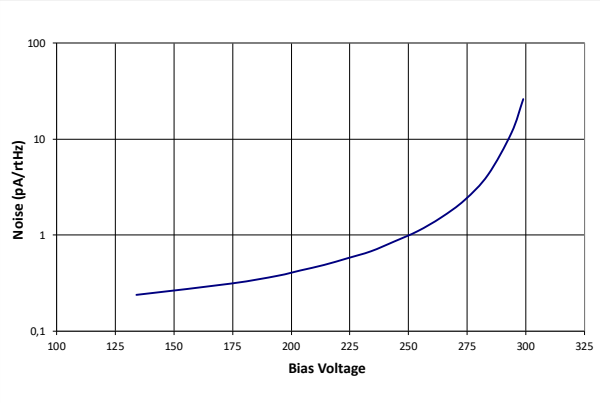


Fig. 12: Typical APD Noise as a Function of Bias Voltage



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Product Number Designations

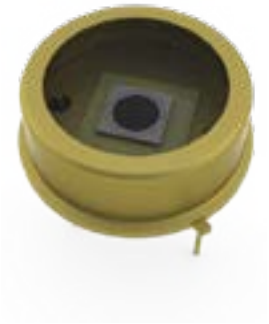
S	A	T						

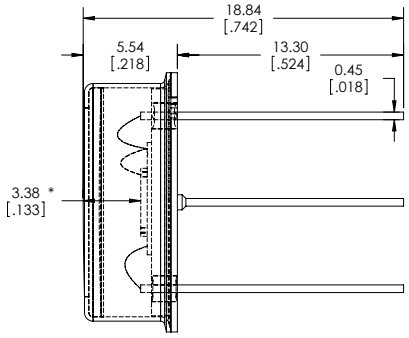
Diameter
800 = 800 µm
3000 = 3000 µm

Package Style
E1 = TO-8
G1 = TO-5
T6 = TO-37 (with TEC)

Package Drawings

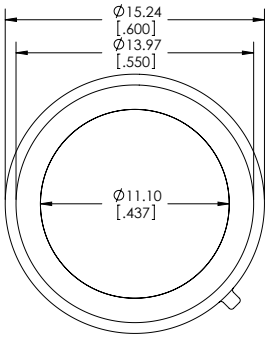
Package E1 TO-8





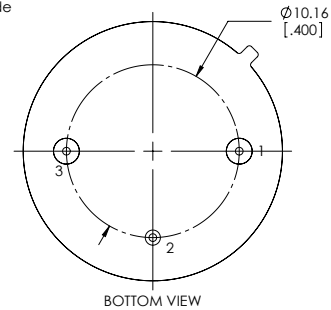
SIDE VIEW

* DISTANCE FROM TOP OF DEVICE TO TOP OF DETECTOR



TOP VIEW

PIN #1: Cathode
PIN #2: Ground/Case
PIN #3: Anode



BOTTOM VIEW

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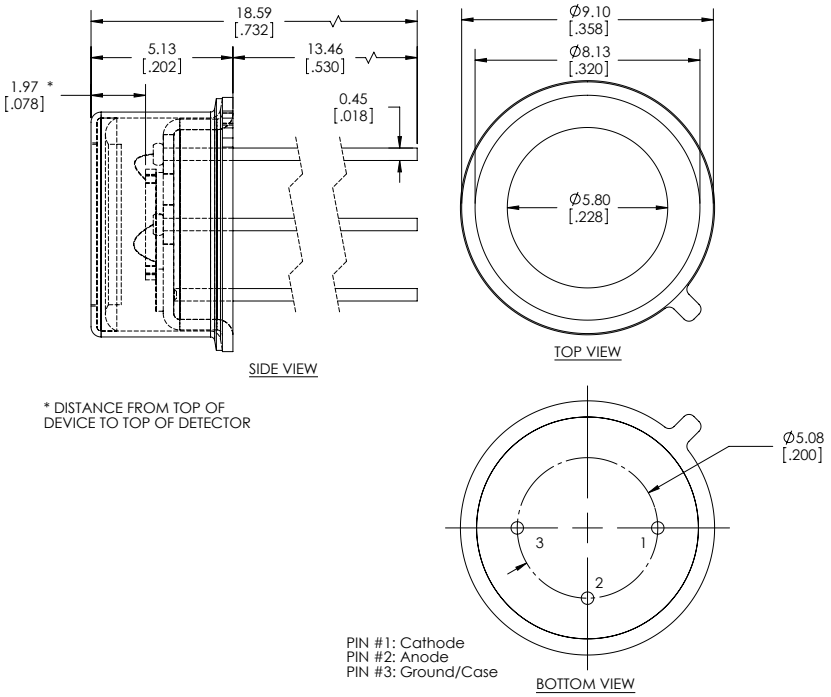
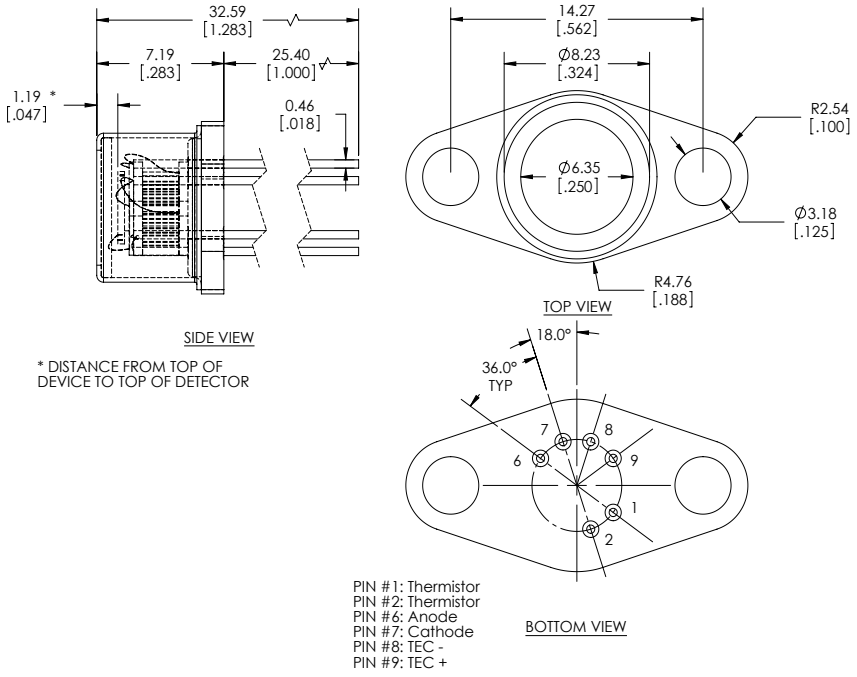
Package G1 TO-5



Package T6 TO-37 (with TEC)



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