Silicon Avalanche Photodiode SARF-Series

Description

The SARF-Series is based on a "reach-through" structure for excellent quantum efficiency and high speed, and has been optimised for 905 nm range finding applications. The device is ideal for low-gain applications with high levels of background light, particularly where temperature compensation is not possible. A variety of package options is available.

Features

- Very high quantum efficiency
- Very low noise
- Integrated bandpass filter available
- Gradual multiplication curve
- Wide operating temperature range

Applications

- Rangefinding
- LIDAR
- Laser scanners
- Speed guns

Generic Characteristics at T= 25 °C

	SARF			
	Min	Typ	Max	Units
Wavelength range	400		1100	nm
Wavelength range (with filter)	870		940	nm
Peak sensitivity		905		nm
Diameter		500		µm

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Absolute Maximum Ratings

	SARF500		
	Min	Max	Units
Storage temperature	-55	100	°C
Operating temperature	-40	85	°C
Reverse current Peak value (CW operation)		200	µA
Reverse current Peak value (1 sec duration)		1	mA
Forward current I_F at 25 °C Average value (CW operation)		5	mA
Forward current I_F at 25 °C Peak value (1 sec duration)		50	mA
Max. total power dissipation		60	mW
Soldering (for 15 sec.)		260	°C

Electrical Characteristics @ V_{OP}= 160 Volts, Ta = 25 °C

	SARF500			
	Min	Typ	Max	Units
Gain	7.5	15		
Breakdown voltage @ Id= 10 µA	300	400		V
Responsivity @ 905 nm	5	10		A/W
V_{br} temperature coefficient		1	3.2	V/°C
Dark current		1.0	10	nA
Noise current		0.05		pA/√Hz
Capacitance		1.0		pF
Rise time		3		nsec

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Fig. 1: Spectral Response (with Filter, Gain = 18)

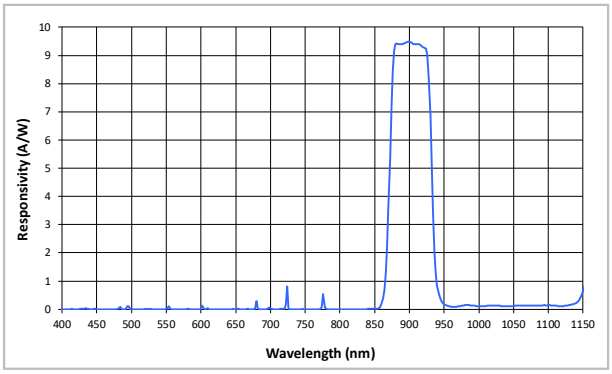


Fig. 2: Quantum Efficiency vs. Wavelength (no Filter)

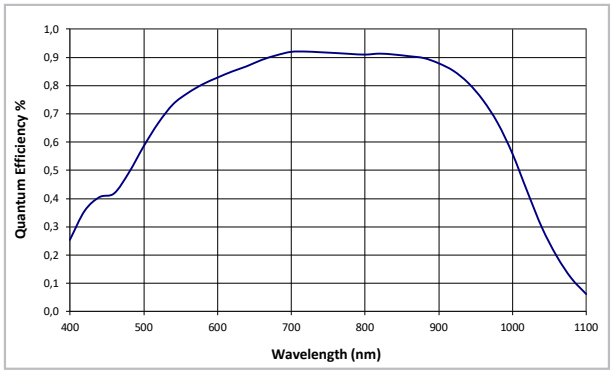


Fig. 3: Typica Dark Current Characteristics, 25 °C

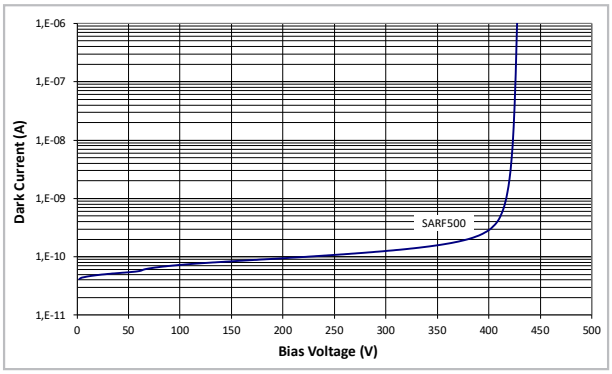


Fig. 4: Gain - Voltage Characteristics @ 905 nm

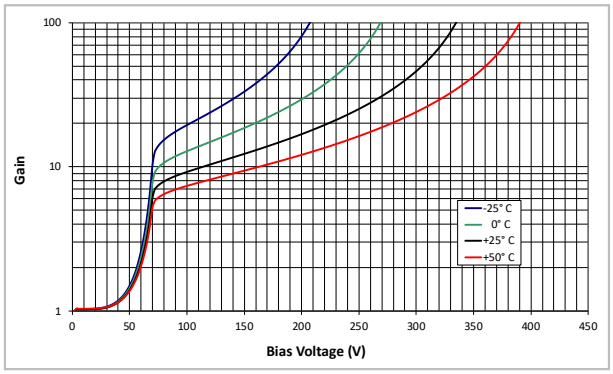


Fig. 5: Capacitance vs. Reverse Voltage

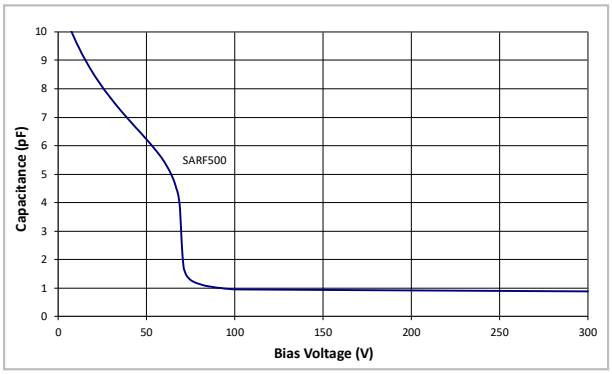
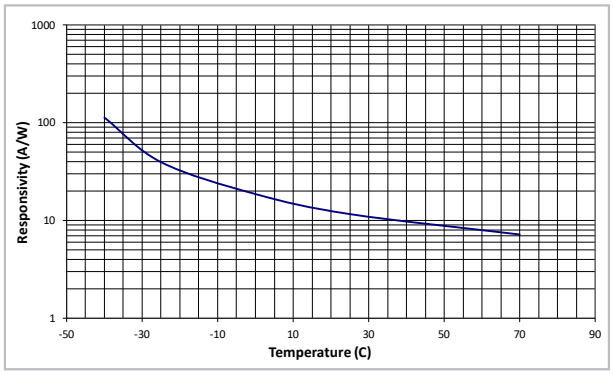


Fig. 6: Response vs. Temp. at VOP = 160 V @ 905 nm



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SARF-Series

Product Number Designations

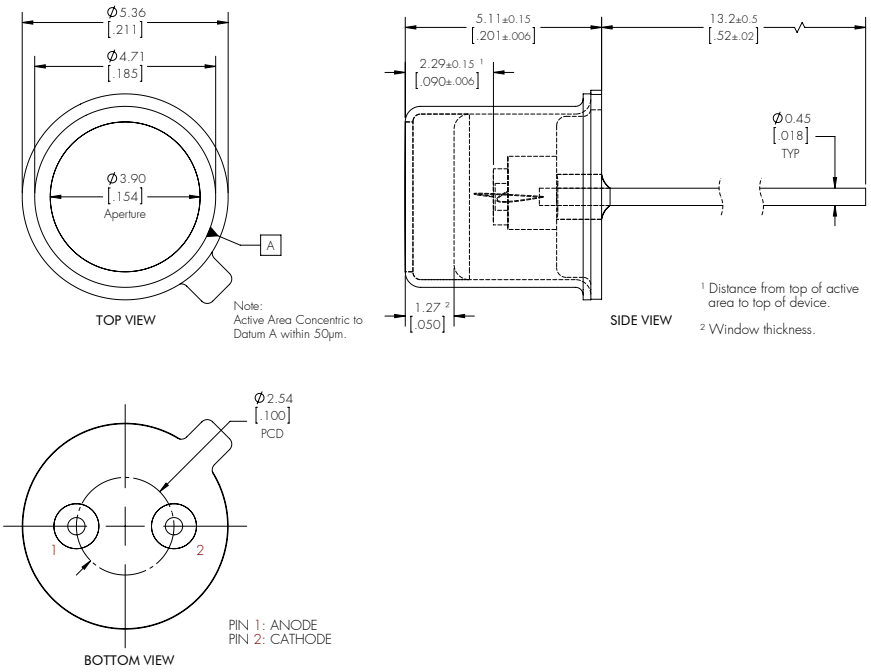
S	A	R	F	X	X	X	X	X

Diameter
500 = 500 µm

Package Style
F2 = TO-46 (2 pin, with filter)
F3 = TO-46 (3 pin, with filter)
M8F = SMD (with filter)
S2 = TO-46 (2 pin)
S3 = TO-46 (3 pin)
T6 = TO-37 (TEC)

Package Drawings

Package F2 TO-46 (2 pin, with filter)



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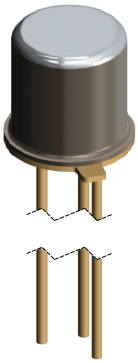
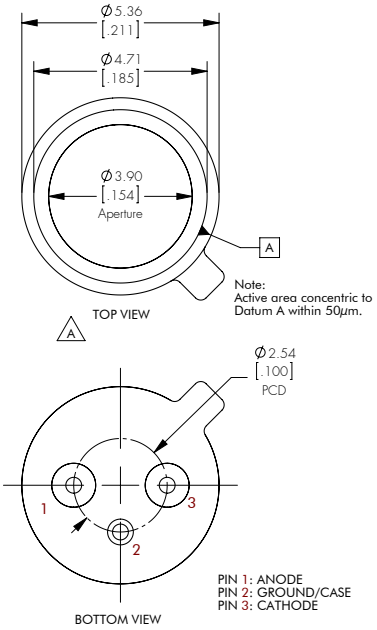
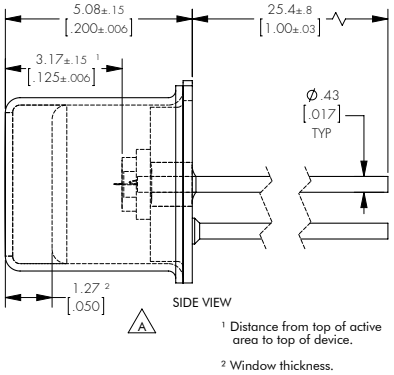
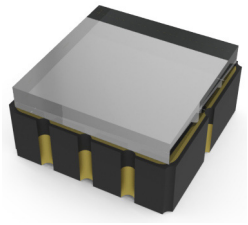
Package F3 TO-46 (3 pin, with filter)

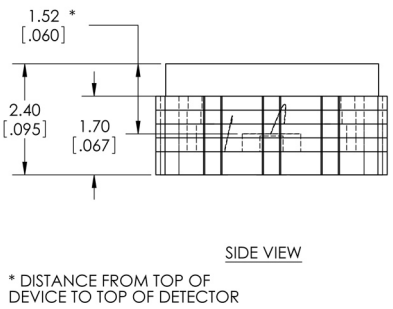


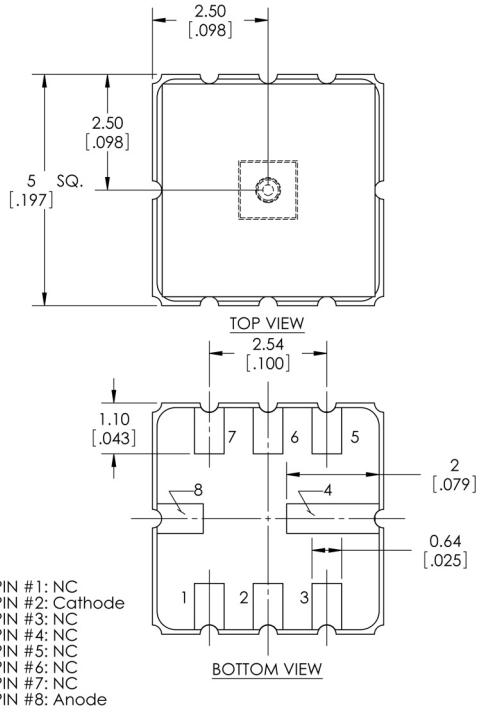




Package M8F SMD (with filter)







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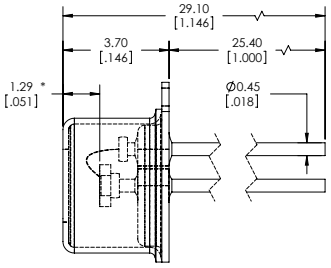
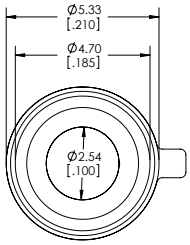
Package S2 TO-46 (2 pin)

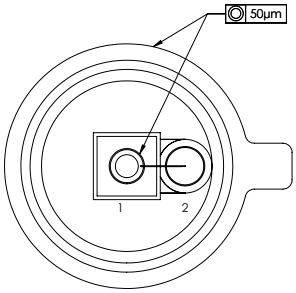


SIDE VIEW

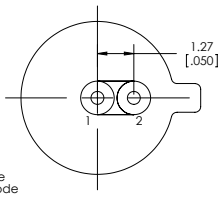
* DISTANCE FROM TOP OF DEVICE TO TOP OF DETECTOR



TOP VIEW



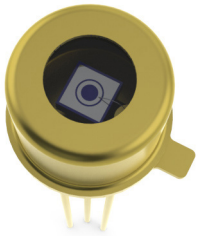
BONDING DIAGRAM

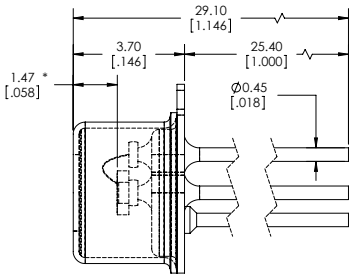


PIN #1: Anode
PIN #2: Cathode

BOTTOM VIEW

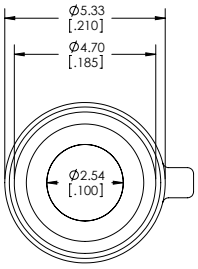
Package S3 TO-46 (3 pin)



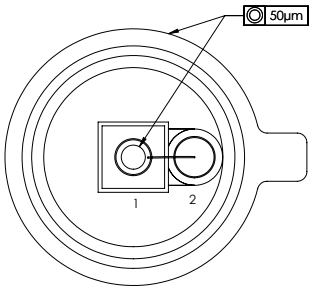


SIDE VIEW

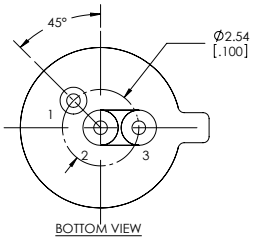
* DISTANCE FROM TOP OF DEVICE TO TOP OF DETECTOR



TOP VIEW



BONDING DIAGRAM



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BOTTOM VIEW

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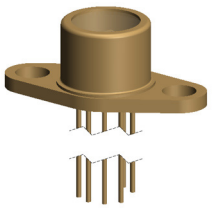
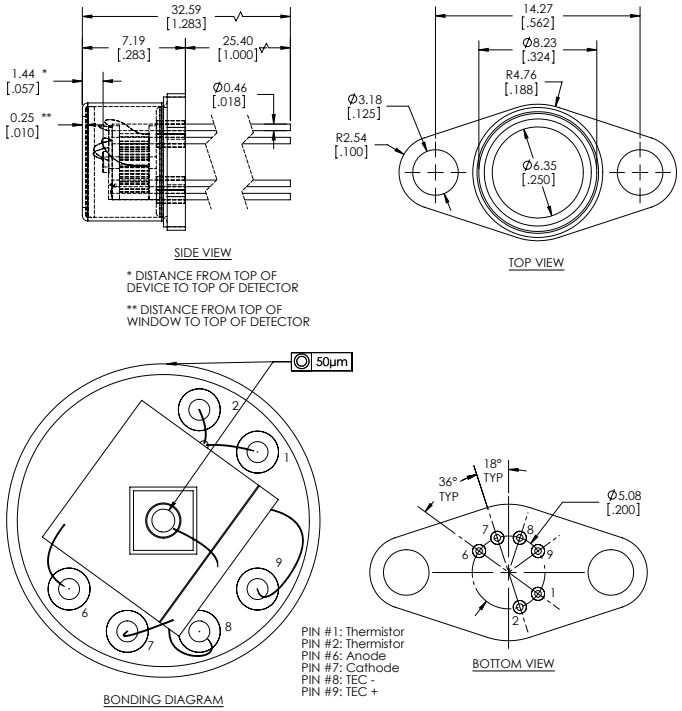
Package T6 TO-37 (TEC)





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