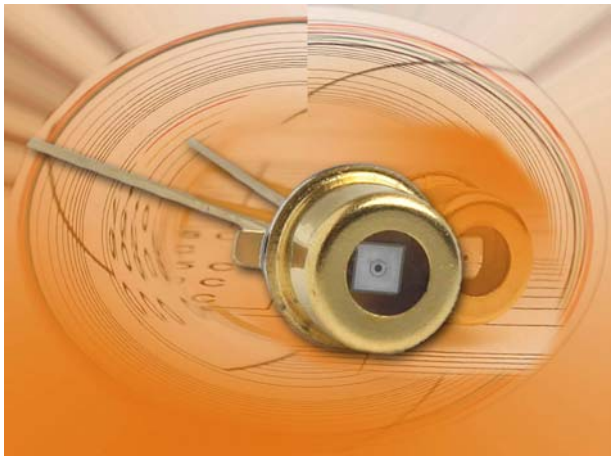
Silicon Avalanche Photodiode SAR-/SARP-Series



DESCRIPTION

The SAR500-Series is based on a “reach-through” structure for excellent quantum efficiency and high speed. The peak sensitivity in the NIR region enables rangefinding applications with pulsed laser diodes. The APD is hermetically sealed in a modified TO-46 package, optional with integrated 905 nm filter.

The SARP500-Series is an optimized version of the SAR500 with extremely low noise and dark current and is suitable for detection of very low light levels. The SARP500 is also available in a hermetically sealed TO-37 with thermoelectrical cooler. This enables the APD to be used in a variety of demanding applications including spectroscopy, fluorescence detection, LIDAR and medical applications.

FEATURES

- Very High Quantum Efficiency
- Low Noise, High Speed
- Multiplication gain, M>200 available
- 500 µm Diameter Active Area
- Gradual Multiplication Curve
- Wide Operating Temperature Range

APPLICATIONS

- Rangefinding /LIDAR
- Optical Communication Systems
- Laser Scanners
- Spectroscopy
- Fluorescence
- Medical

GENERIC CHARACTERISTICS AT T= 25°C

	SAR500X/SARP500X			
	Min	Typ	Max	Units
Wavelength Range	400		1100	nm
Peak Sensitivity		905		nm

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ABSOLUTE MAXIMUM RATINGS

	SAR500X/SARP500X			
	Min	Typ	Max	Units
Storage Temperature	-55		100	°C
Operating Temperature*	-30		75	°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 (1sec Duration)			50	mA
Max. Total Power Dissipation			60	mW
Soldering (for 5 sec.)			200	°C

** Extended operating temperature range possible for special design considerations*

ELECTRICAL CHARACTERISTICS

	SAR500X			SARP500X			
	Min	Typ	Max	Min	Typ	Max	Units
Diameter		500			500		µm
Breakdown Voltage @ Id= 10 µA	170	270	350	170	270	350	Volt
Responsivity @ λ (peak) & M= 100	50	60		50	60		A/W
V_{br} Temperature Coefficient		1	2		1	2	V/°C
Dark Current @ M=100		1.5	3		0.5	1	nA
Noise Current @ M=100	0.2		1		0.1	0.2	pA/sqrtHz
Capacitance @ M=100		1.5	3		1.5	3	pF
Rise Time @ M=100		450			450		psec

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Fig.1: Spectral Response

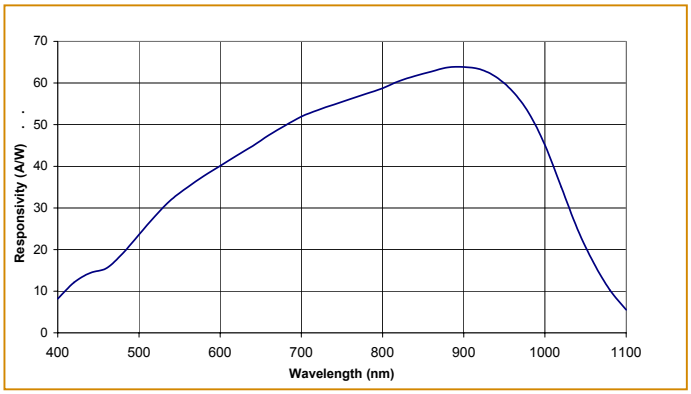


Fig.2: Quantum Efficiency vs. Wavelength

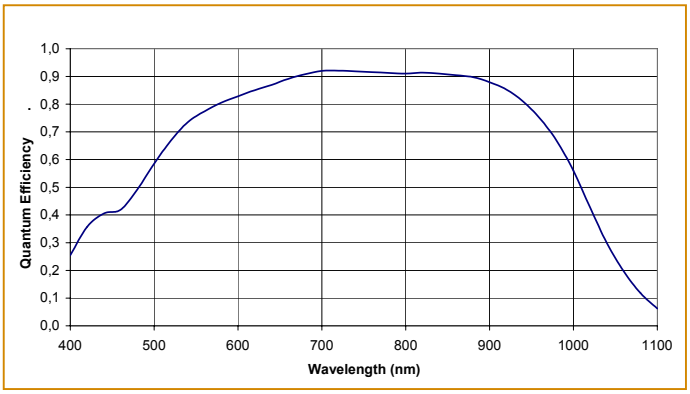


Fig. 3: Typical Dark Current Characteristics

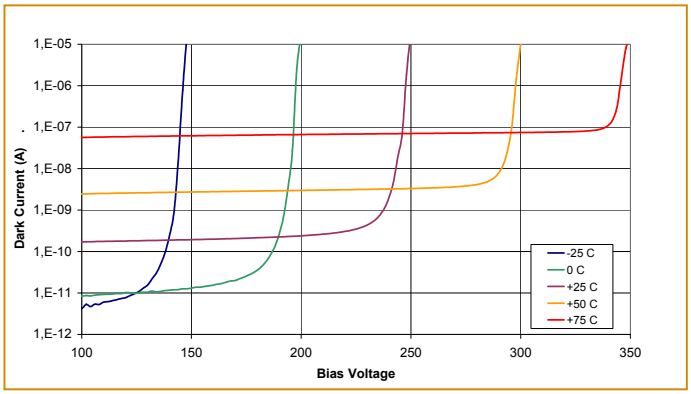


Fig. 4: Gain – Voltage Characteristics

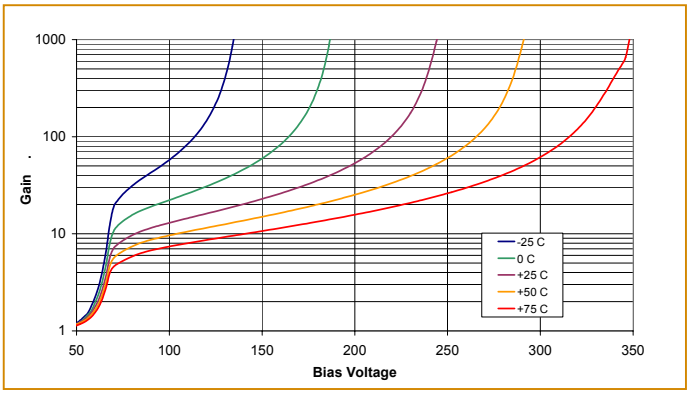


Fig. 5: Capacitance vs. Reverse Voltage

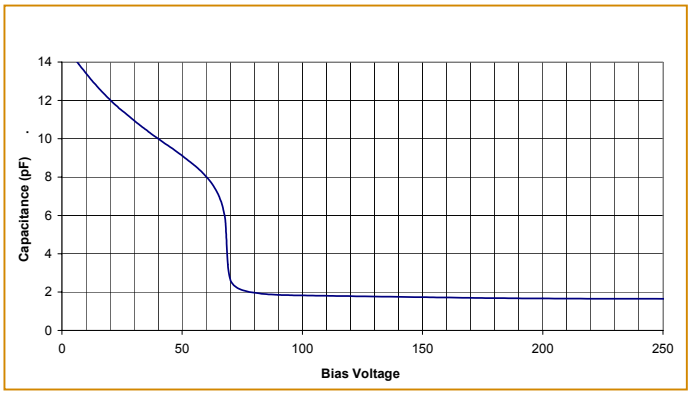
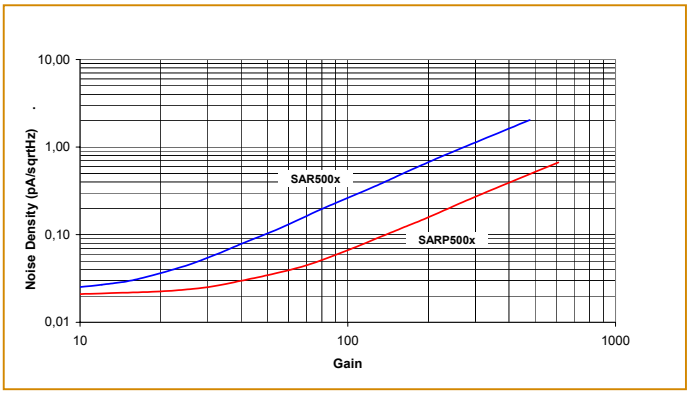


Fig. 6: Typical APD Noise Density as a Function of Gain



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Fig.7: Excess Noise Factor

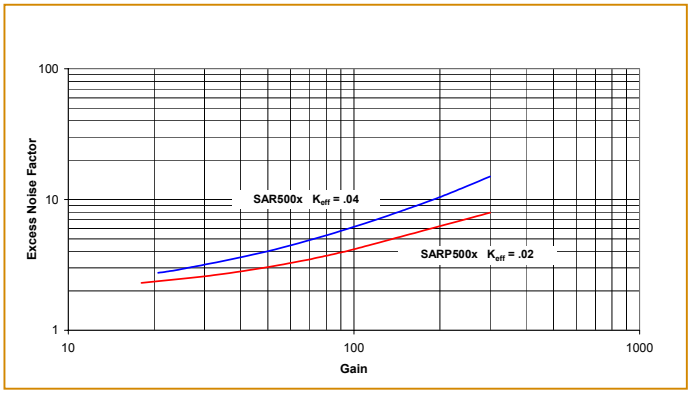
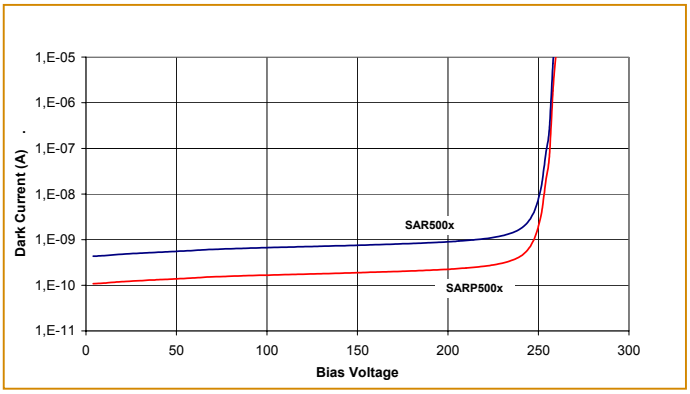
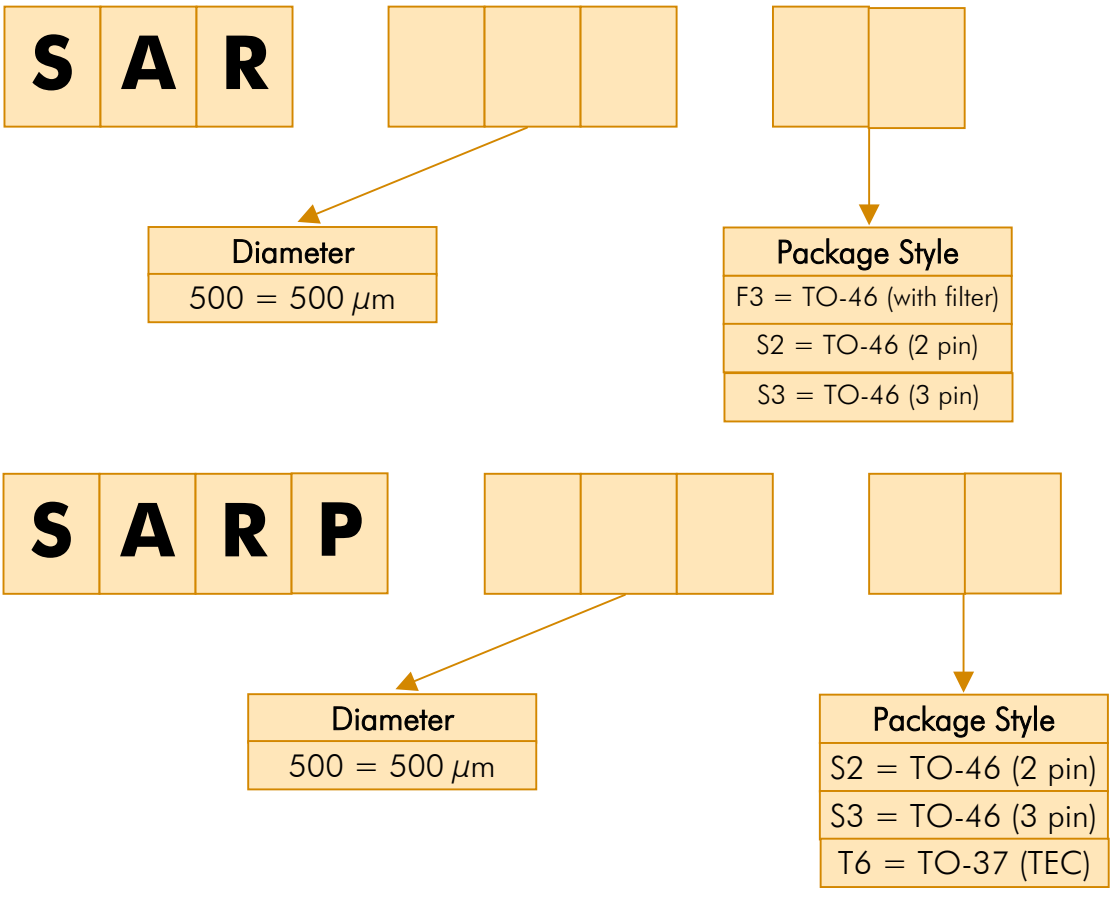


Fig.8: Dark Current vs. Bias Voltage



PRODUCT NUMBER DESIGNATIONS

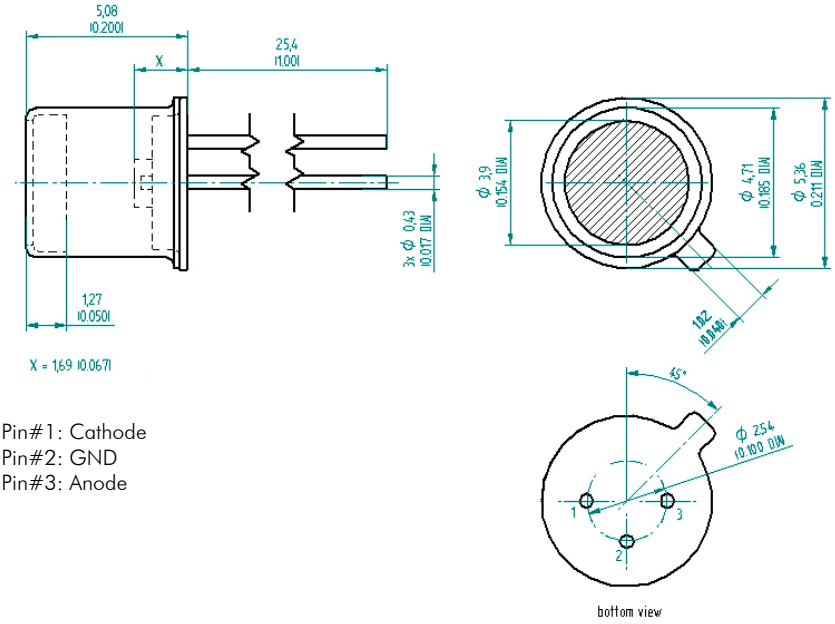


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PACKAGE DRAWINGS

Package F3 TO-46 (with filter)

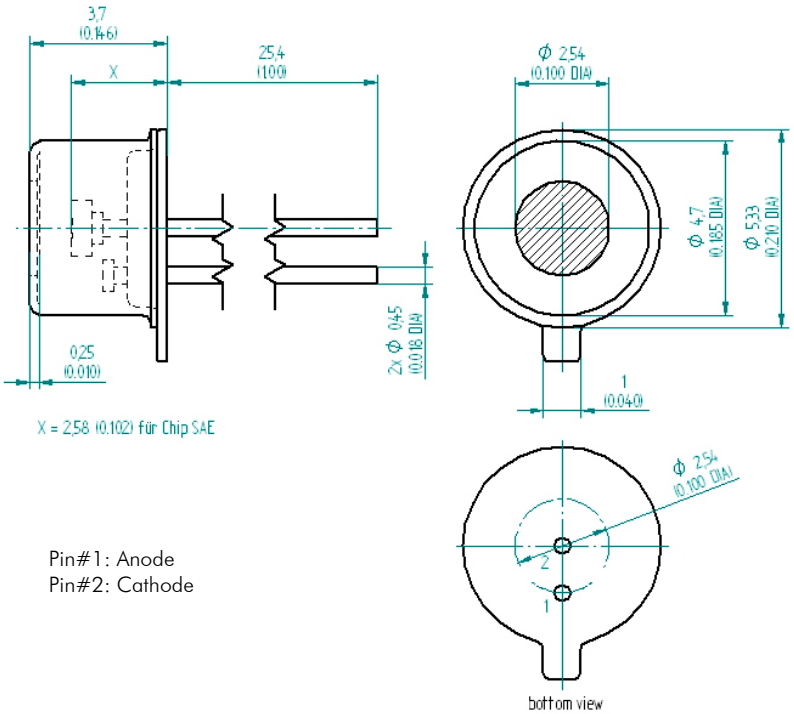




Pin#1: Cathode
Pin#2: GND
Pin#3: Anode

Package S2 TO-46 (2 pin)



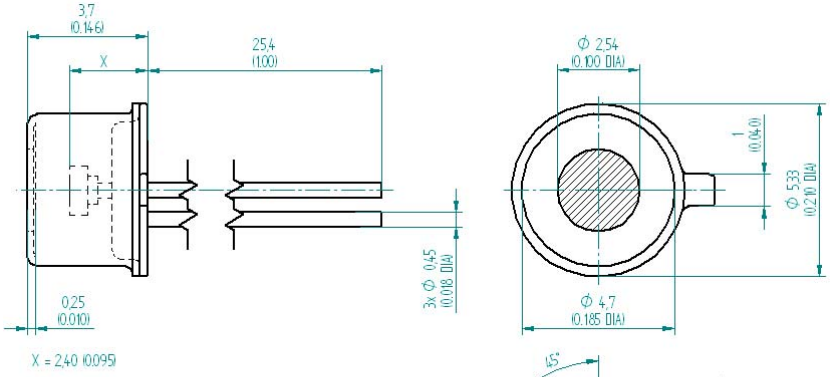


Pin#1: Anode
Pin#2: Cathode

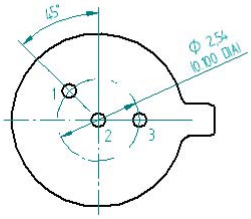
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Package S3 TO-46 (3 pin)





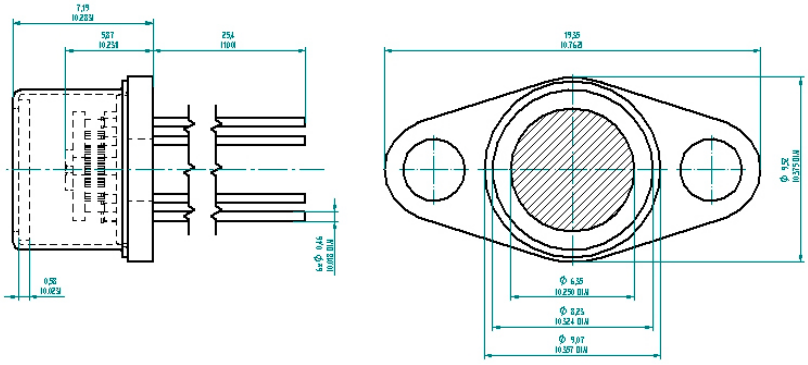
Pin#1: GND
Pin#2: Cathode
Pin#3: Anode



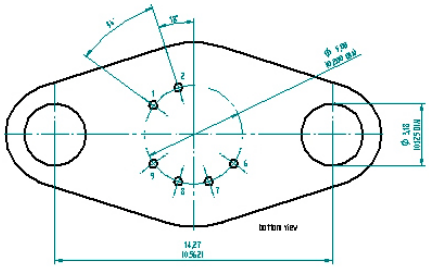
bottom view

Package T6 TO-37 (with TEC)





Pin#1: Thermistor
Pin#2: Thermistor
Pin#6: Anode
Pin#7: Cathode
Pin#8: TE- cooler (-)
Pin#9: TE- cooler (+)



PRODUCT CHANGES

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