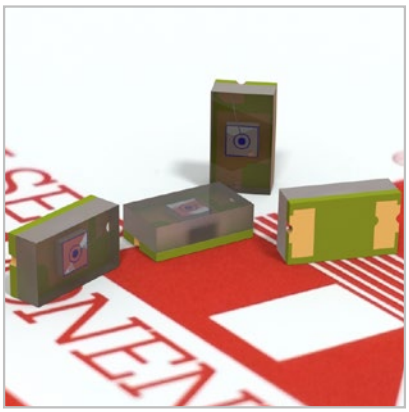
Low-Cost Silicon Avalanche Photodiode SAH-Series (NIR-Enhanced)

Description

The SAH230MX and SAH500MX are low-cost, general purpose silicon APDs in a miniature SMD package. Responsivity is optimised for 850 nm and 905 nm rangefinders.



Features

- High quantum efficiency
- Low noise, high speed
- Multiplication gain, M >100 available
- 230 µm and 500 µm diameter active area
- Gradual multiplication curve
- Wide operating temperature range
- Miniature surface mount package
- Integrated bandpass filter available

Applications

- Rangefinding
- Optical communication systems

Device Characteristics

		SAH230X						
Parameter	Condition	Min	Typ	Max	Min	Typ	Max	Units
Diameter			230			500		µm
Wavelength range*		400		1000	400		1000	nm
Peak sensitivity			880			880		nm
Voltage breakdown temp coefficient	Id = 10 µA		0.5			0.5		V/°C
Capacitance	V_{OP}		1			2		pF
Rise/fall time	10–90%; V_{OP}		250			300		psec
Noise current	V_{OP}		200			200		fA/rtHZ

*wavelength range is 860 nm – 920 nm for version with bandpass filter

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Measured Characteristics

		SAH230X						
Parameter	Condition	Min	Typ	Max	Min	Typ	Max	Units
Breakdown voltage	I_{DARK} = 10 µA		150	200		150	200	V
Responsivity	V_{OP}; 905 nm	45	50		45	50		A/W
Dark current	V_{OP}		1	5		5	10	nA

T_A = 25 °C unless indicated otherwise
V_{OP}@ M = 100, λ = 905 nm

Absolute Maximum Ratings

		SAH230X		SAH500X		
Parameter		Min	Max	Min	Max	Units
Storage temperature		–55	100	–55	100	°C
Operating temperature		–40	85	–40	85	
Soldering (1.5 s)			260		260	
Reverse current peak	cw op.		0.2		0.2	mA
	1 s op.		1		1	
Forward current avg	cw op.		5		5	
	1 s op.		50		50	
Max total power dissipation			60		60	mW

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Fig. 1: Spectral Response @ M = 100

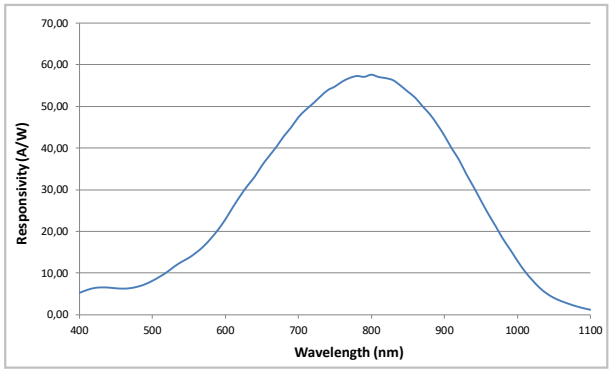


Fig. 2: Current vs. Voltage @ 905 nm

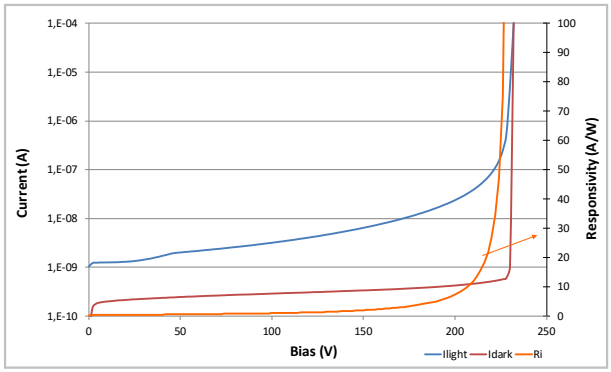


Fig. 3: Noise vs. Bias

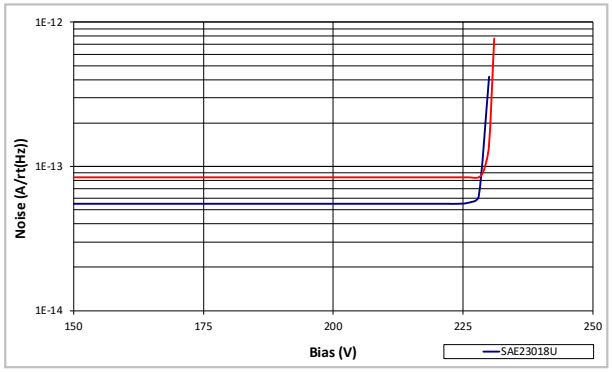


Fig. 4: Capacitance vs. Reverse Voltage

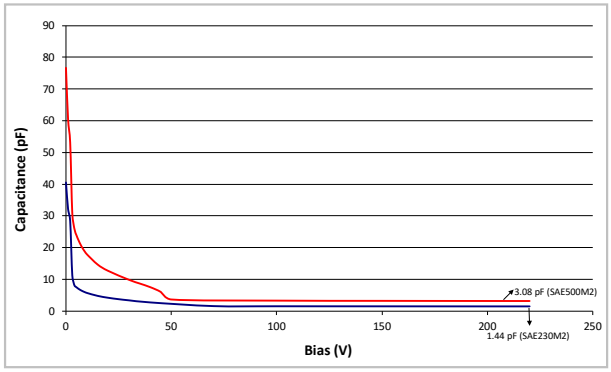
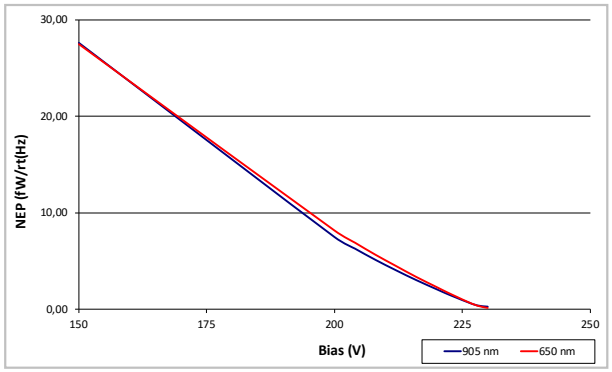


Fig. 5: NEP vs. Bias



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Product Number Designations

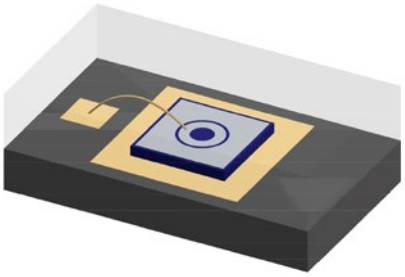
S	A	H				

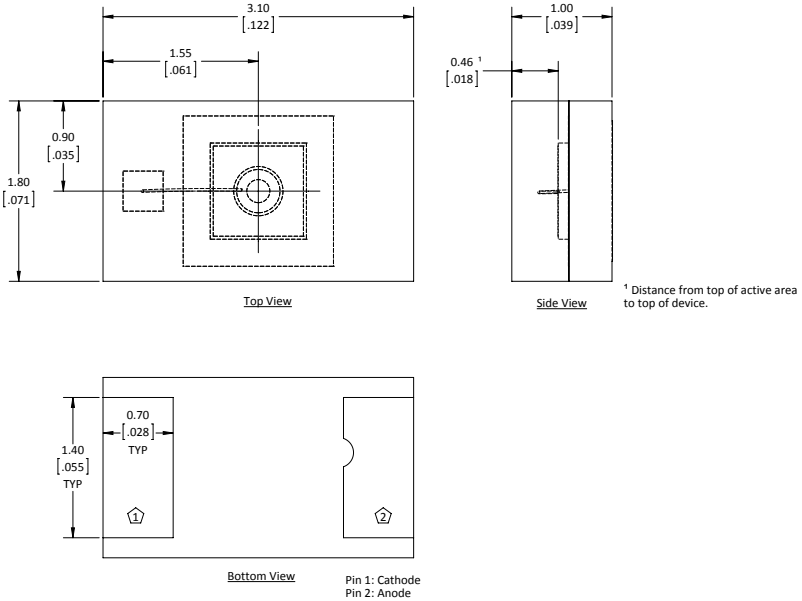
Diameter
230 = 230 µm
500 = 500 µm

Package Style
M2 = low cost SMD
M2F = SMD (with filter)
M1 = low cost SMD

Package Drawing

M2





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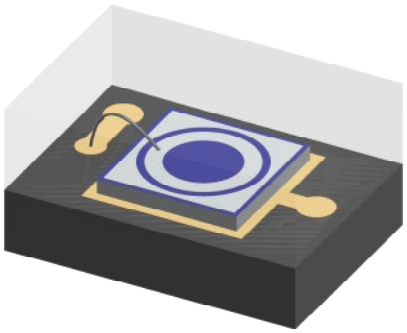
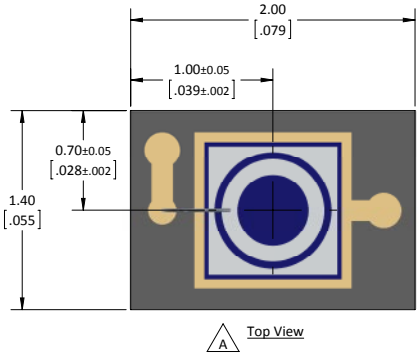
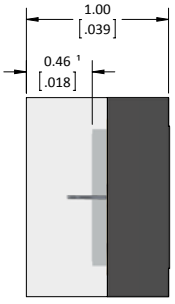
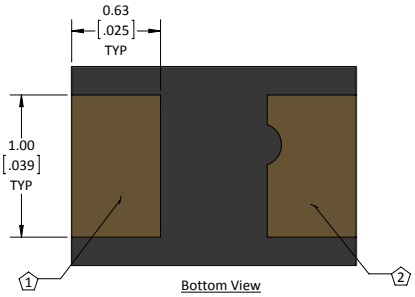
M1







¹ Distance from top of device to top of active area.



Pad 1: Cathode
Pad 2: Anode

Product Changes

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