

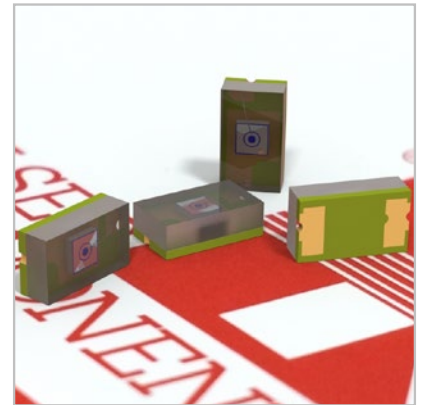
Low-Cost Silicon Avalanche Photodiode SAH-Series (NIR-Enhanced)

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

Parameter	Condition	SAH230X			Min	Typ	Max	Units
		Min	Typ	Max				
Diameter			230			500		μm
Wavelength range*		400		1000	400		1000	nm
Peak sensitivity			880			880		nm
Voltage breakdown temp coefficient	$I_d = 10 \mu\text{A}$		0.5			0.5		$\text{V}/^\circ\text{C}$
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

Measured Characteristics

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

$T_A = 25 \text{ }^\circ\text{C}$ unless indicated otherwise

$V_{\text{OP}}@M = 100, \lambda = 905 \text{ nm}$

Absolute Maximum Ratings

Parameter		SAH230X		SAH500X		Units
		Min	Max	Min	Max	
Storage temperature		-55	100	-55	100	°C
Operating temperature		-40	85	-40	85	
Soldering (15 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

Fig. 1: Spectral Response @ M = 100

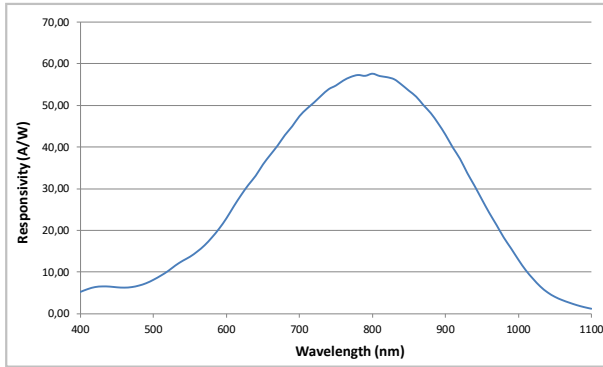


Fig. 2: Current vs. Voltage @ 905 nm

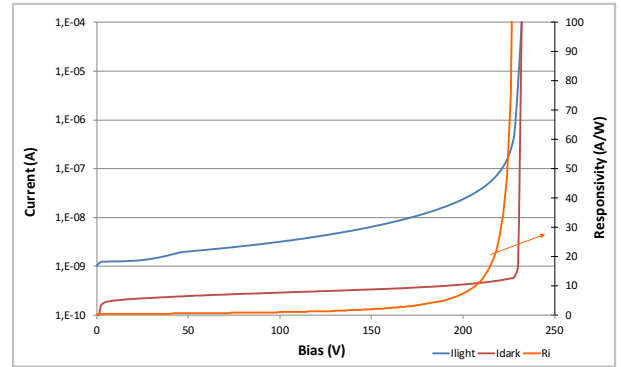


Fig. 3: Noise vs. Bias

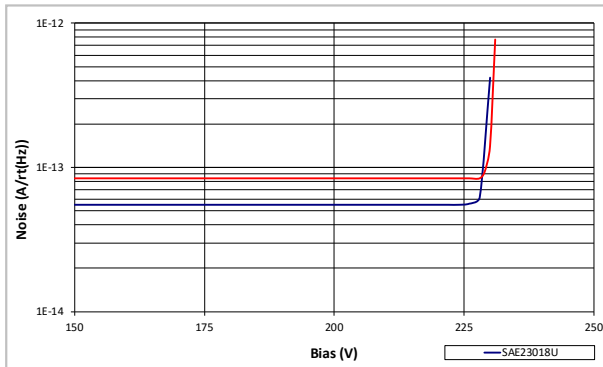


Fig. 4: Capacitance vs. Reverse Voltage

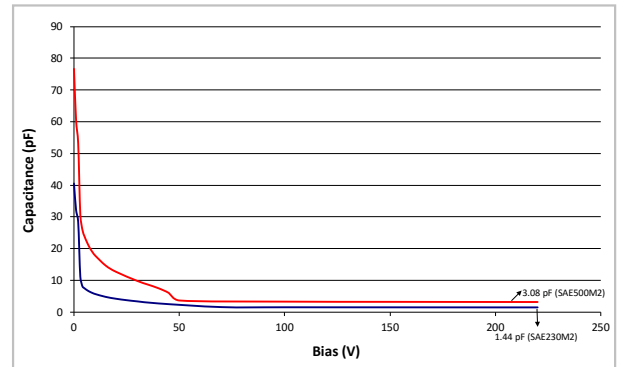
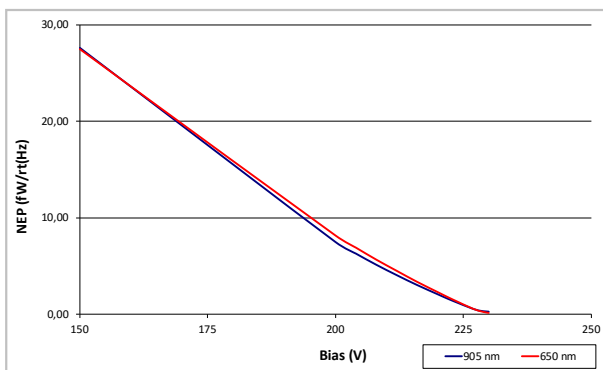
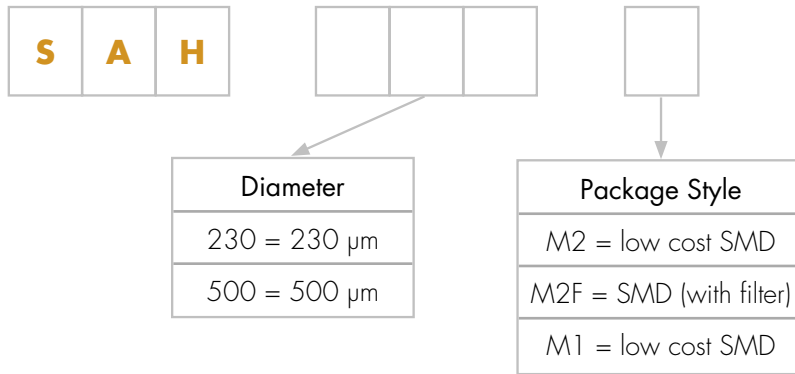


Fig. 5: NEP vs. Bias

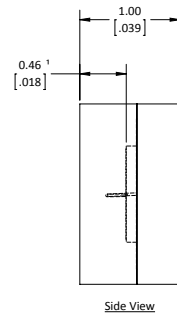
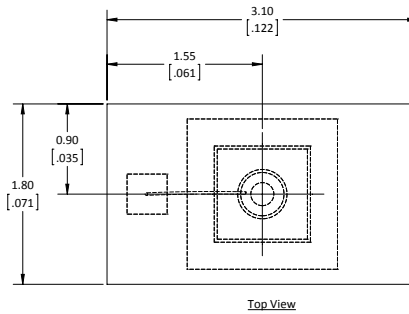
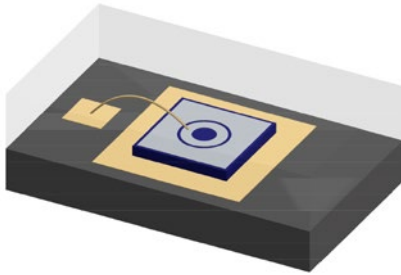


Product Number Designations

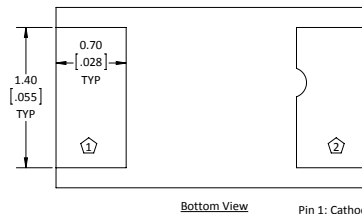


Package Drawing

M2

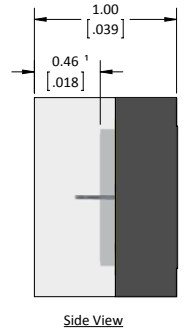
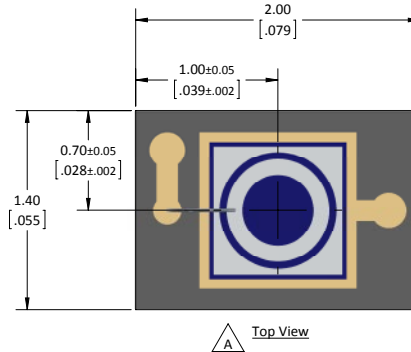
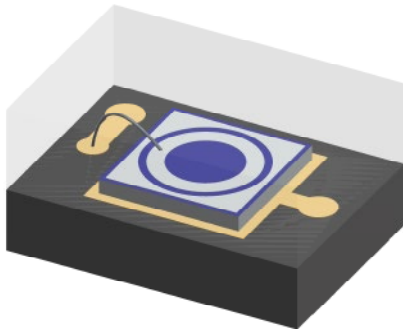


¹ Distance from top of active area to top of device.

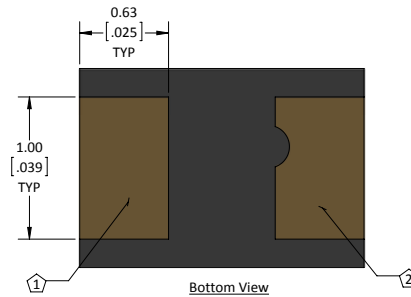


Pin 1: Cathode
Pin 2: Anode

M1



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



Pad 1: Cathode
Pad 2: Anode

Product Changes

LASER COMPONENTS reserves the right to make changes to the product(s) or information contained herein without notice.

No liability is assumed as a result of their use or application.

Ordering Information

Products can be ordered directly from LASER COMPONENTS or its representatives. For a complete listing of representatives, visit our website at www.lasercomponents.com

Custom designed products are available on request.