

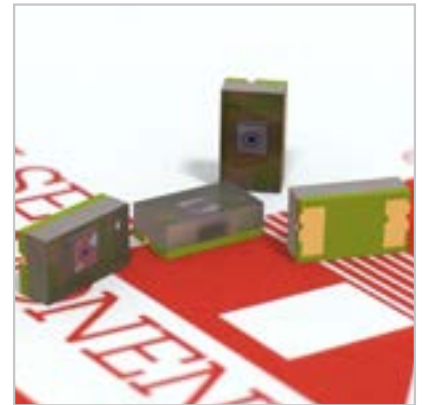
## Low-Cost Silicon Avalanche Photodiode SAHA-Series (NIR-Enhanced)

### Description

The SAHA230 and SAHA500 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  $\mu\text{m}$  and 500  $\mu\text{m}$  diameter active area
- Gradual multiplication curve
- Wide operating temperature range
- Miniature surface mount package
- Integrated bandpass filter available



### Applications

- LIDAR
- Rangefinding
- Optical communication systems

### Device Characteristics

Parameter	SAHA230X			SAHA500X			Units	
	Condition	Min	Typ	Max	Min	Typ		Max
Diameter			230			500	$\mu\text{m}$	
Wavelength range*		400		1000	400		1000	nm
Peak sensitivity			880			880	nm	
Voltage breakdown temp coefficient	$I_d = 10 \mu\text{A}$		0.8	1.5		0.8	1.5	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

## Measured Characteristics

Parameter	Condition	SAHA230X			SAHA500X			Units
		Min	Typ	Max	Min	Typ	Max	
Breakdown voltage	$I_{\text{DARK}} = 10 \mu\text{A}$		150	200		150	200	V
Responsivity	$V_{\text{OPi}}; 905 \text{ nm}$	45	50		45	50		A/W
Dark current	$V_{\text{OP}}$		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		SAHA230X		SAHA500X		Units
		Min	Max	Min	Max	
Storage temperature		-55	100	-55	100	$^\circ\text{C}$
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

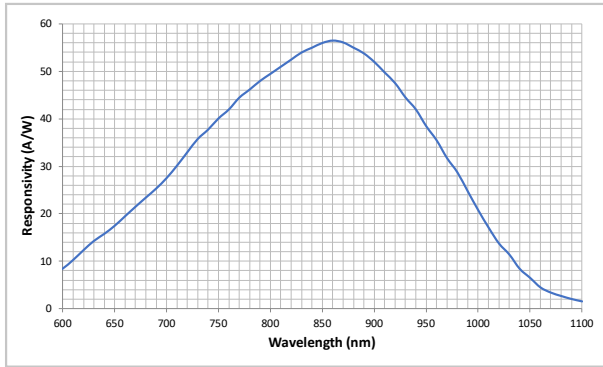


Fig. 2: Spectral Response @ M = 100 (filter version)

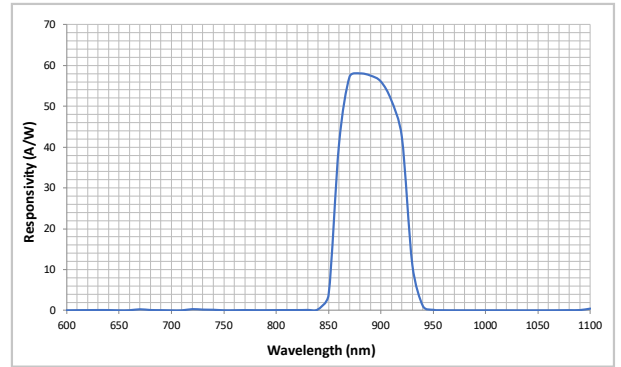


Fig. 3a: Noise vs. Bias SAHA230

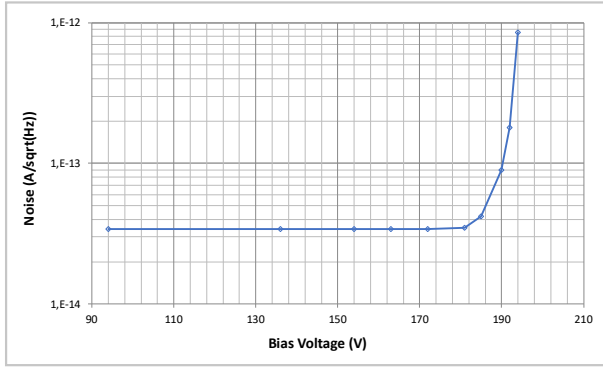


Fig. 3b: Noise vs. Bias SAHA500

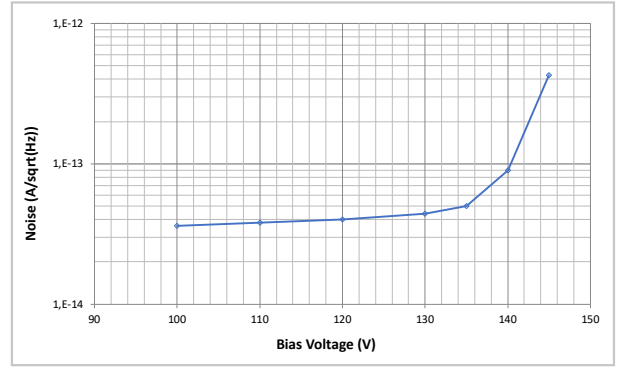


Fig. 4a: Capacitance vs. Reverse Voltage SAHA230

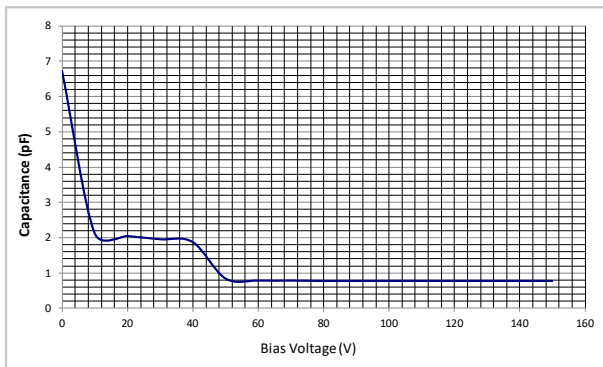


Fig. 4b: Capacitance vs. Reverse Voltage SAHA500

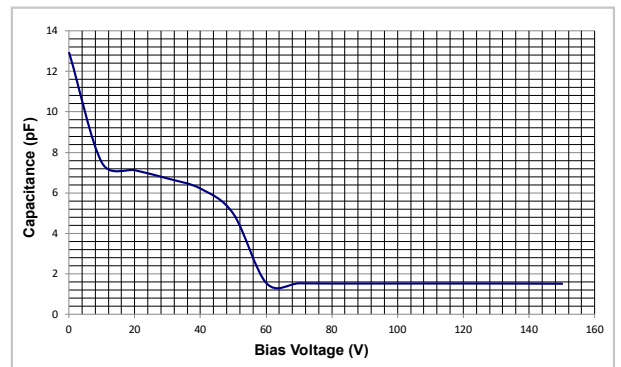


Fig. 5a: NEP vs. Bias Voltage SAHA230

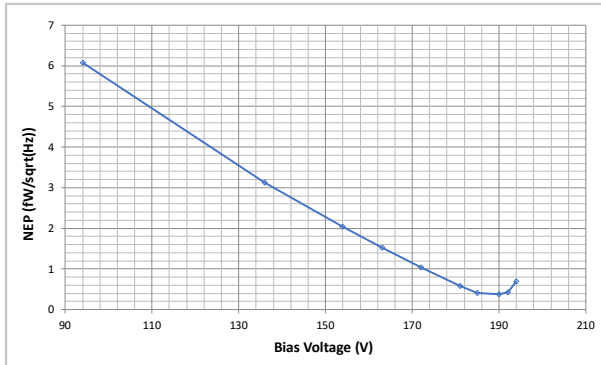


Fig. 5b: NEP vs. Bias Voltage SAHA500

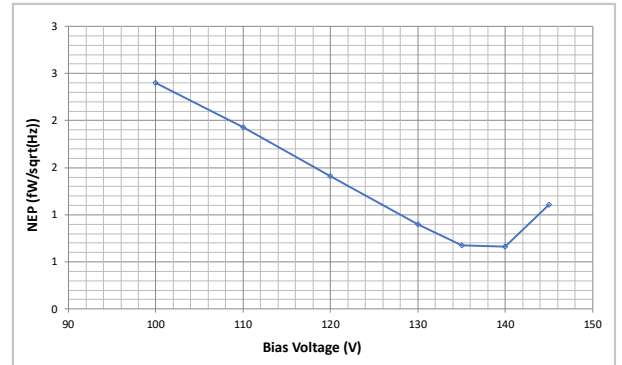
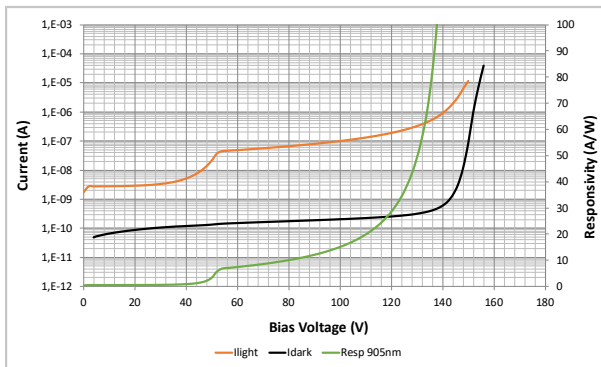
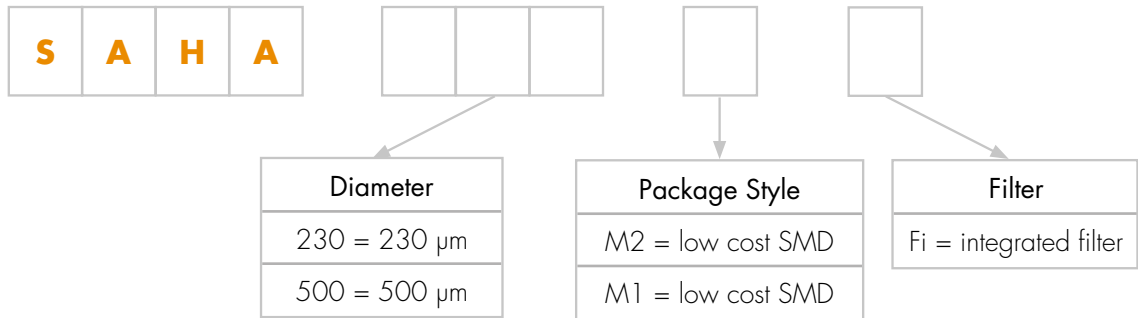


Fig. 6: Current vs. Voltage @ 905 nm

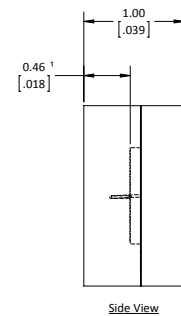
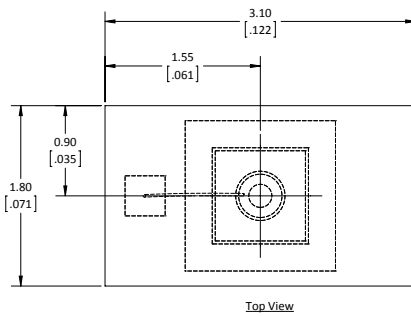
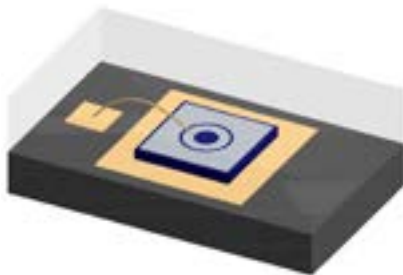


Product Number Designations

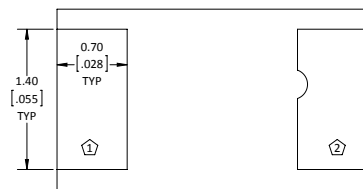


Package Drawing

M2

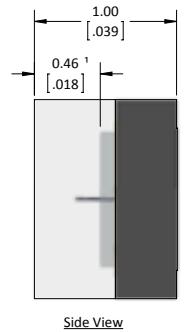
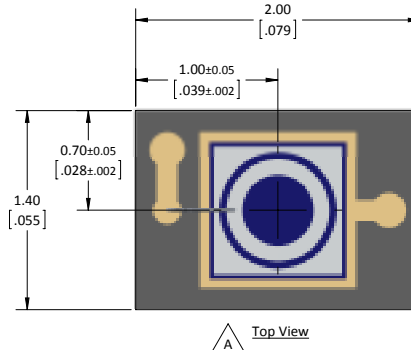
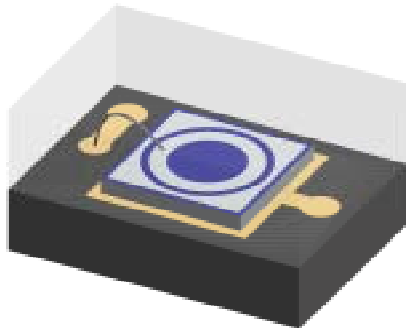


<sup>1</sup> Distance from top of active area to top of device.

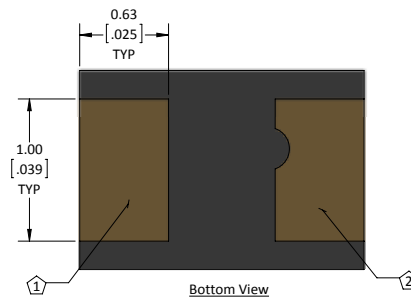


Pin 1: Cathode  
Pin 2: Anode

M1



<sup>1</sup> 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

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