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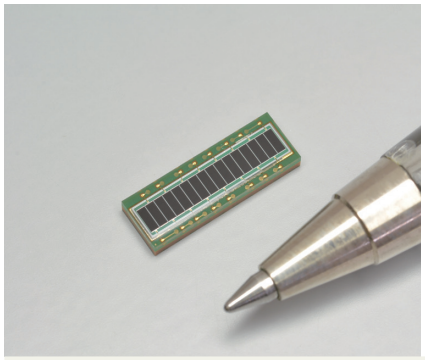
Si APD array

S15249



Surface mount type 16-element Si APD array

The S15249 is a surface mount type 16-element Si APD array with high sensitivity in the short wavelength range and low bias operation. This offers uniform gain and small crosstalk between elements.

Features

- **High sensitivity in the short wavelength range**
  QE=77% (λ=450 nm)
- **Low bias operation: Breakdown voltage=160 V typ.**
- **Gain variation between elements is small.**

Applications

- **Particle counters**
- **Flow cytometry**

Structure

Parameter	Specification	Unit
Photosensitive area (per element)	0.7 × 2.0	mm
Element pitch	0.76	mm
Number of elements	16	-
Package	Glass epoxy	-
Window material	Epoxy resin	-

Absolute maximum ratings (Ta=25 °C)

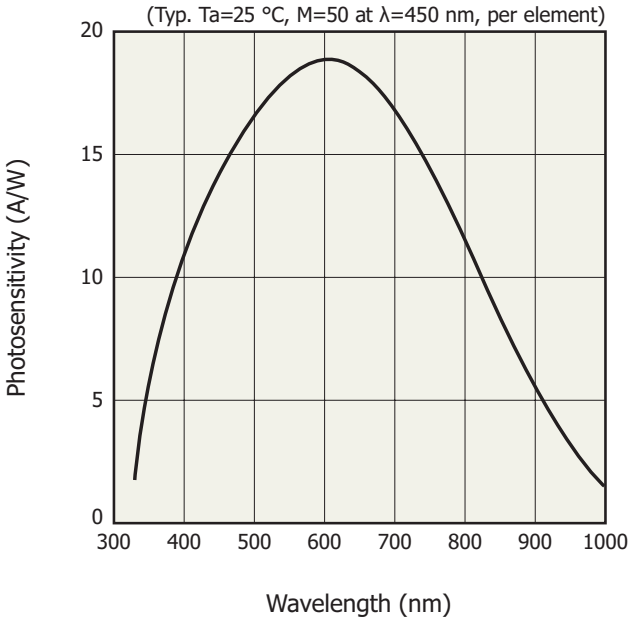
Parameter	Symbol	Condition	Value	Unit
Forward current	I_F max		10	mA
Reverse current (DC)	I_R max		200	μA
Operating temperature	Topr	No dew condensation*1	-20 to +60	°C
Storage temperature	Tstg	No dew condensation*1	-20 to +80	°C
Soldering temperature	Tsol		260 (once)*2	°C

*1: When there is a temperature difference between a product and the surrounding area in high humidity environments, dew condensation may occur on the product surface. Dew condensation on the product may cause deterioration in characteristics and reliability.
*2: Reflow soldering, JEDEC J-STD-020 MSL 5a, see P.4
Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

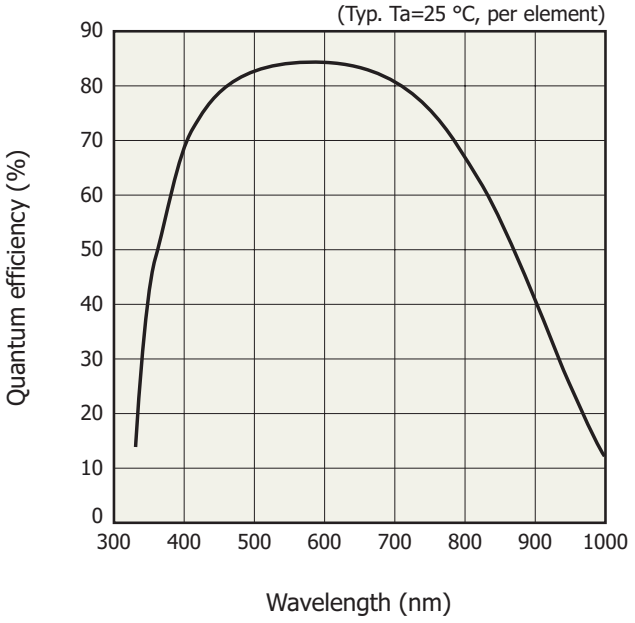
Electrical and optical characteristics (Ta=25 °C, per element)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Spectral response range	λ		-	350 to 1000	-	nm
Peak sensitivity wavelength	λp	M=50	-	620	-	nm
Photosensitivity	S	M=1, λ=450 nm	-	0.28	-	A/W
Quantum efficiency	QE	M=1, λ=450 nm	-	77	-	%
Breakdown voltage	V_{BR}	I_D=100 μA	-	160	200	V
Temperature coefficient of V_{BR}	ΔTV_{BR}		-	0.14	-	V/°C
Dark current	I_D	M=50	-	0.3	5	nA
Cutoff frequency	fc	M=50, λ=450 nm R_L=50 Ω, -3 dB	-	100	-	MHz
Terminal capacitance	Ct	M=50, f=100 kHz	-	25	-	pF
Excess noise figure	x	M=50, λ=450 nm	-	0.28	-	-
Gain	M	λ=450 nm	-	50	-	-
Gain uniformity between elements	Mv	M=50, λ=450 nm	-	±5	±10	%

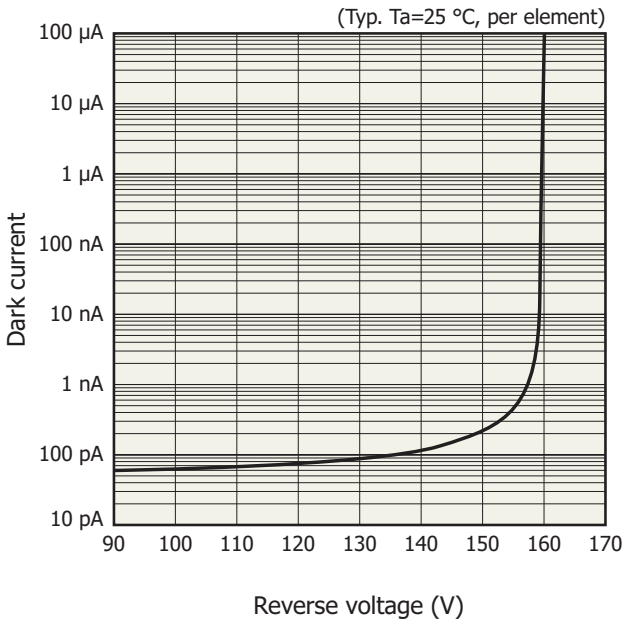
Spectral response



Quantum efficiency vs. wavelength



Dark current vs. reverse voltage



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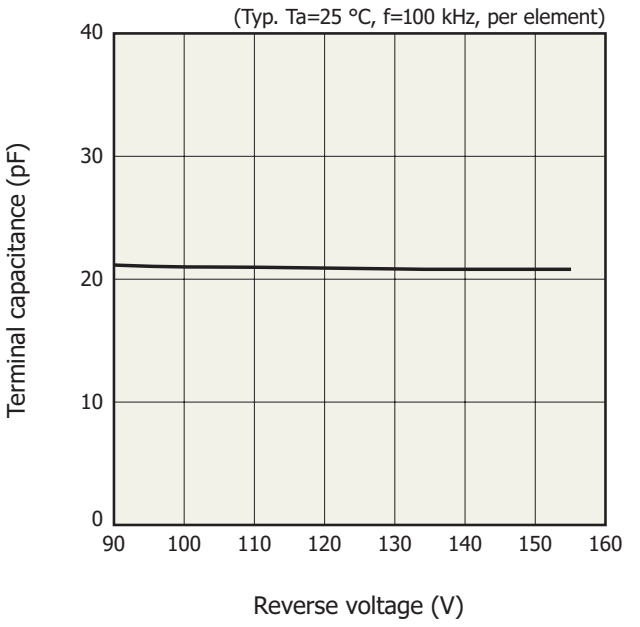
Terminal capacitance vs. reverse voltage



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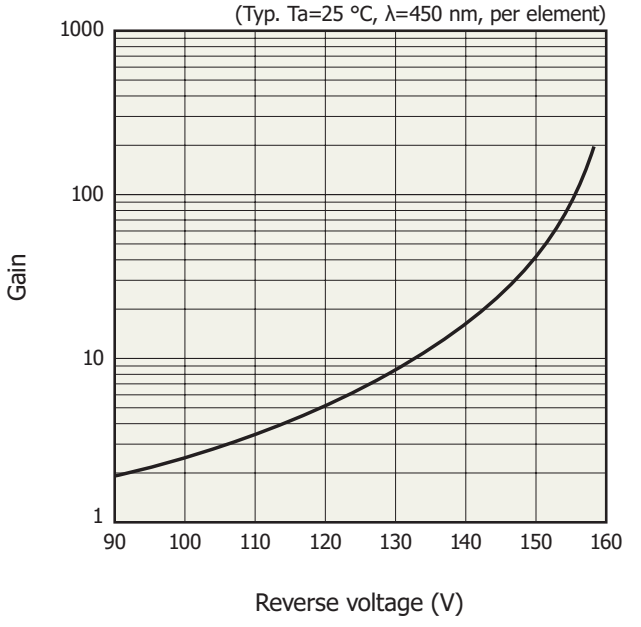
Gain vs. reverse voltage



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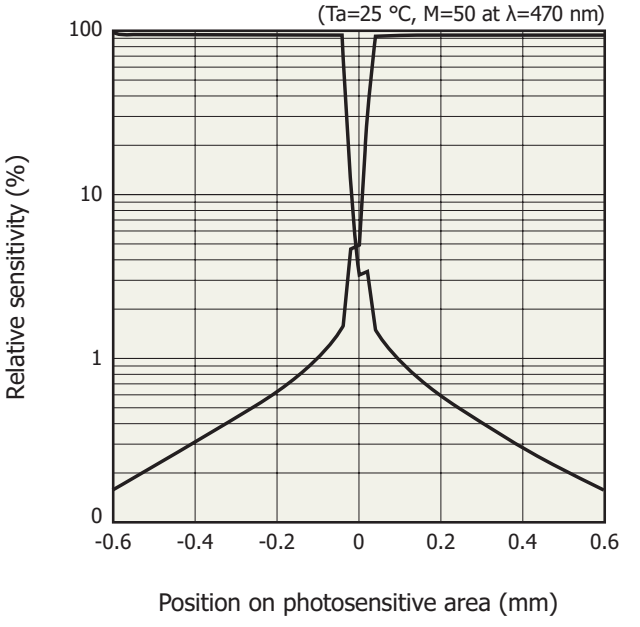
Crosstalk (typical example)



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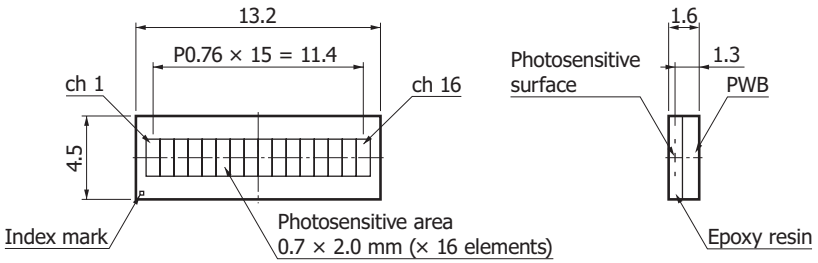
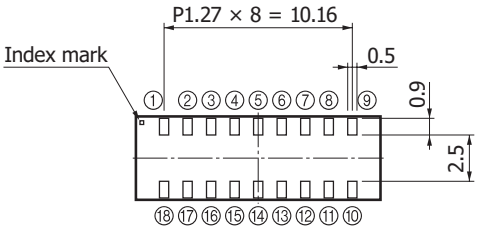
Dimensional outline (unit: mm)





Pad no.	ch no.	Pad no.	ch no.
①	1	⑩	16
②	3	⑪	14
③	5	⑫	12
④	7	⑬	10
⑤	9	⑭	8
⑥	11	⑮	6
⑦	13	⑯	4
⑧	15	⑰	2
⑨	Cathode common	⑱	NC

Tolerance unless otherwise noted: ±0.2

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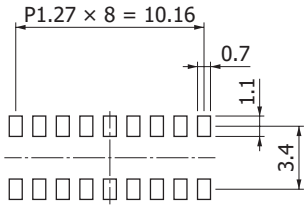
Recommended land pattern (unit: mm)



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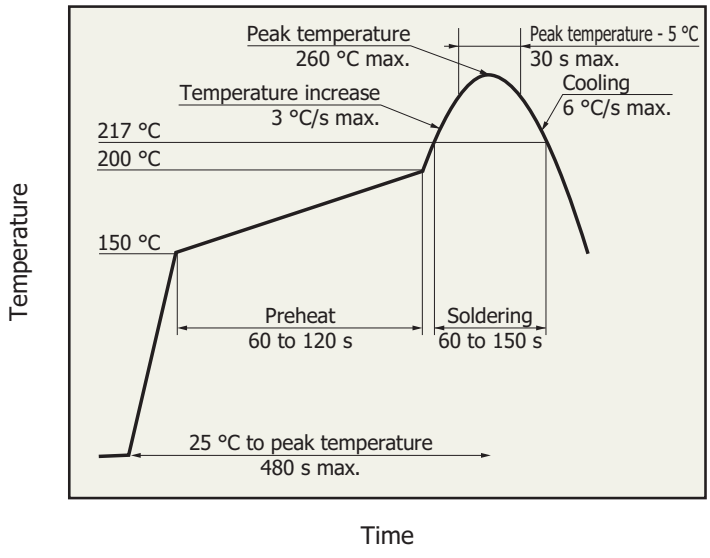
Recommended reflow soldering conditions



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- After unpacking, store the device in an environment at a temperature range of 5 to 30 °C and a humidity of 60% or less, and perform reflow soldering within 24 hours.
- The effect that the product receives during reflow soldering varies depending on the circuit board and reflow oven that are used. When you set reflow soldering conditions, check that problems do not occur in the product by testing out the conditions in advance.

Baking

If more than 3 months have passed in the unopened state or storage conditions are exceeded after opening the package, baking is required to remove moisture before reflow soldering. For the baking methode, refer to the precautions "Surface mount type products".

■ Recommended baking conditions

· Temperature: 120 °C、3 hours、up to twice

Note: Before setting the baking conditions, perform experiments to confirm that no problems occur with the products.

Related information

www.hamamatsu.com/sp/ssd/doc_en.html

■ Precautions

· Disclaimer

· Surface mount type products

■ Technical information

· Si APD / Technical note

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