

S14124-20

High-sensitivity Si APD for detection of light with a wavelength of 266 nm

The S14124-20 is an improved Si APD from the S8664 series for highly sensitive detection of light with a wavelength of 266 nm used in semiconductor inspection and laser processing equipment. We have achieved a quantum efficiency of 87% at $\lambda=266$ nm.

Features

- High sensitivity: QE=87% ($\lambda=266$ nm)
- Low capacitance
- Low noise
- High gain

Applications

- Semiconductor inspection system
- Laser processing equipment
- Photomask defect inspection system

Structure

Parameter	Symbol	Specification	Unit
Photosensitive area	A	$\phi 2.0$	mm
Package	-	TO-8	-
Window material	-	AR-coated quartz	-

Absolute maximum ratings (Ta=25 °C)

Parameter	Symbol	Condition	Value	Unit
Forward current	IF max		10	mA
Reverse current (DC)	IR max		200	μ A
Operating temperature	Topr	No dew condensation*1	-20 to +60	°C
Storage temperature	Tstg	No dew condensation*1	-55 to +100	°C
Soldering conditions	-		260 °C or less, within 10 s	-

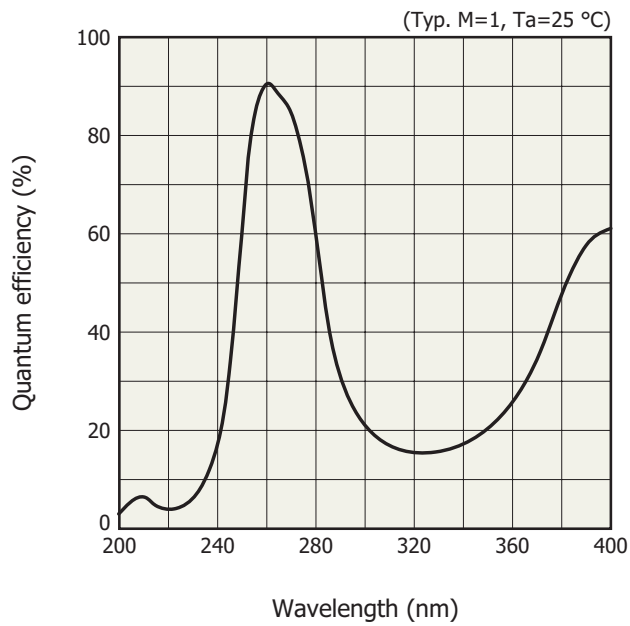
*1: When there is a temperature difference between a product and the surrounding area in high humidity environment, dew condensation may occur on the product surface. Dew condensation on the product may cause deterioration in characteristics and reliability.

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.

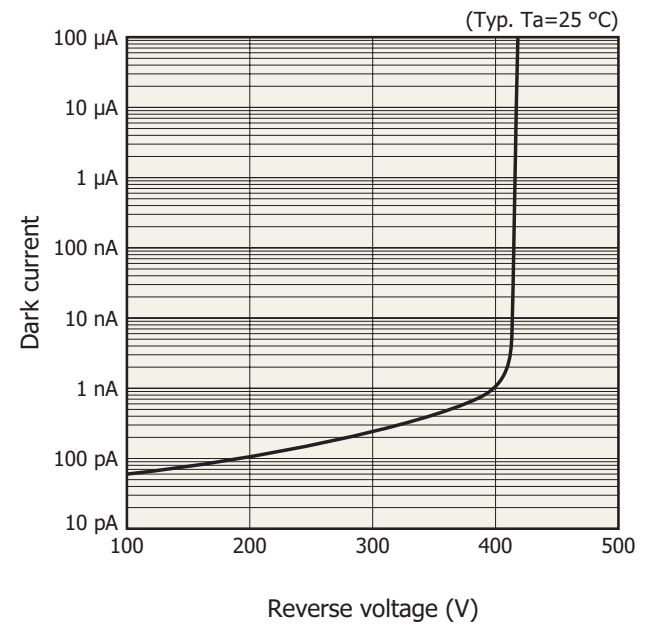
Electrical and optical characteristics (Ta=25 °C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak sensitivity wavelength	λ_p	M=50	-	600	-	nm
Quantum efficiency	QE	M=1, $\lambda=266$ nm	70	87	-	%
Breakdown voltage	VBR	ID=10 μ A	360	400	500	V
Temperature coefficient of breakdown voltage	$\Delta T V_{BR}$			0.78		V/°C
Dark current	ID	M=50	-	3	10	nA
Temperature coefficient of dark current	$\Delta T I_D$			1.1		times/°C
Cutoff frequency	fc	M=50, $\lambda=266$ nm RL=50 Ω , -3 dB	-	250	-	MHz
Terminal capacitance	Ct	M=50, f=1 MHz	-	11	-	pF
Excess noise index	x	M=50, $\lambda=266$ nm	-	0.2	-	-
Gain	M	$\lambda=266$ nm	-	50 to 400	-	-

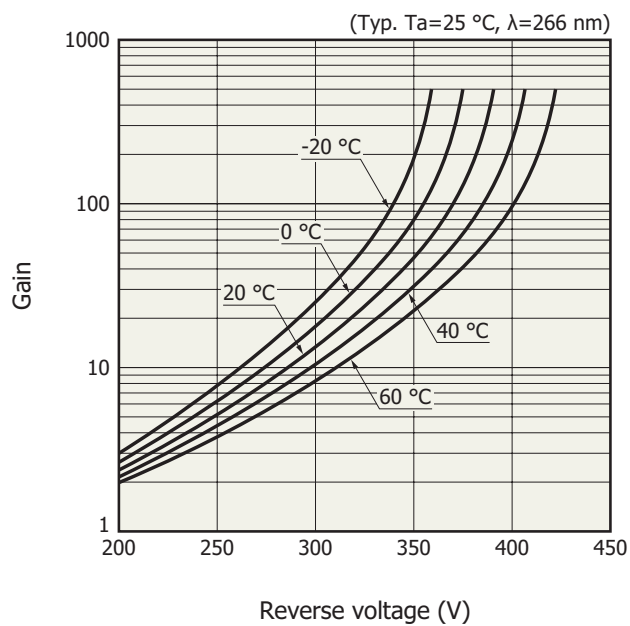
Quantum efficiency vs. wavelength



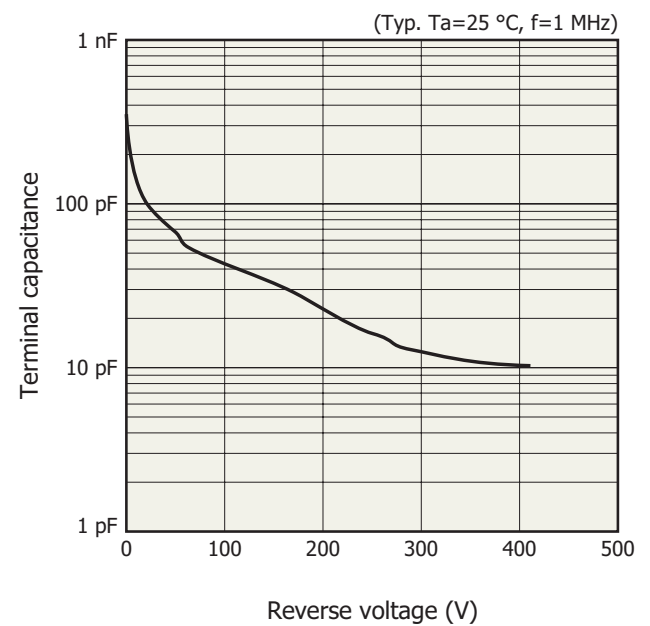
Dark current vs. reverse voltage



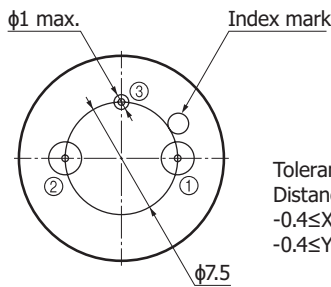
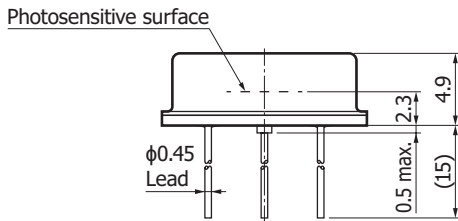
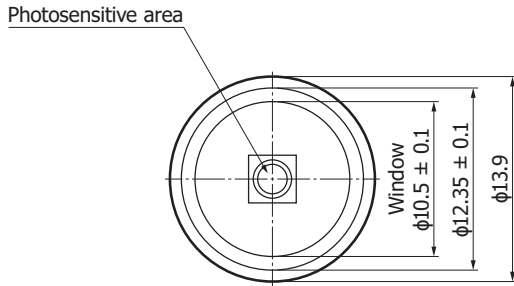
Gain vs. reverse voltage



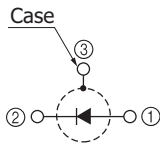
Terminal capacitance vs. reverse voltage



Dimensional outline (unit: mm)



Tolerance unless otherwise noted: ± 0.2
 Distance from photosensitive area center to cap center
 $-0.4 \leq X \leq +0.4$
 $-0.4 \leq Y \leq +0.4$



KAPDA0216EA

Related information

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

Precautions

- Disclaimer
- Metal, ceramic, plastic package products

Information described in this material is current as of March 2022

Product specifications are subject to change without prior notice due to improvements or other reasons. This document has been carefully prepared and the information contained is believed to be accurate. In rare cases, however, there may be inaccuracies such as text errors. Before using these products, always contact us for the delivery specification sheet to check the latest specifications.

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