

# Si APD

S12426 series

## Low bias operation, high-speed Si APD for 900 nm

This Si APD is suitable for detecting light in the 900 nm band, which is increasingly used in optical rangefinders. The S12426 series deliver faster response and lower bias operation than our existing Si APD (S9251 series).

### Features

- Peak sensitivity wavelength: 840 nm (M=100)
- Low bias operation: Breakdown voltage=200 V max.
- High-speed response: Cutoff frequency=650 MHz typ. (S12426-02, λ=900 nm, M=100)

### Applications

- Optical rangefinders

### Structure

Parameter	Symbol	S12426-02	S12426-05	Unit
Photosensitive area size*1	A	φ0.2	φ0.5	mm
Effective photosensitive area	-	0.03	0.19	mm <sup>2</sup>
Package	-	TO-18		-
Window material	-	Borosilicate glass		-

\*1: Photosensitive area in which a typical gain can be obtained

### Absolute maximum ratings

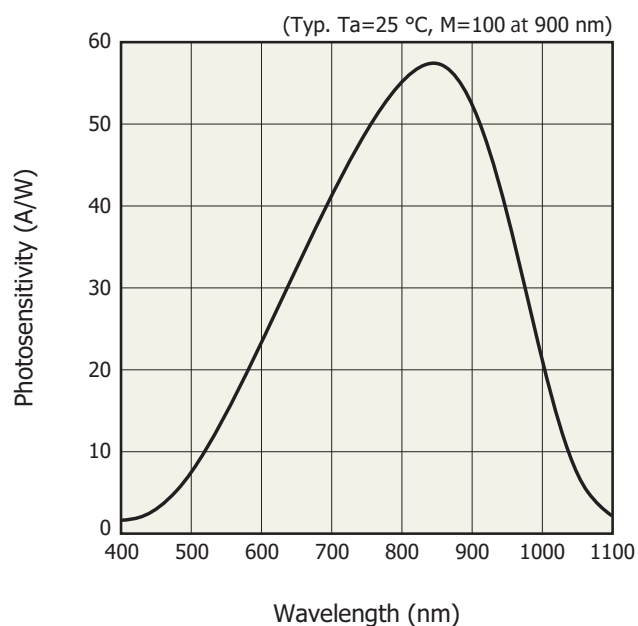
Parameter	Symbol	Value	Unit
Operating temperature	Topr	-20 to +85	°C
Storage temperature	Tstg	-55 to +125	°C
Reverse current (DC)	I <sub>rmax</sub>	0.2	mA
Forward current	I <sub>fmax</sub>	10	mA
Soldering conditions	-	260 °C or less, within 10 s	-

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)

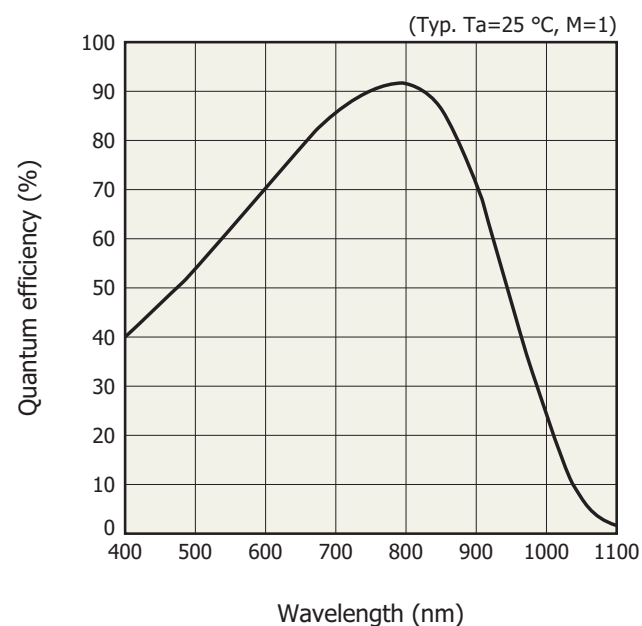
Parameter	Symbol	Condition	S12426-02			S12426-05			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	
Spectral response range	$\lambda$		400 to 1100			400 to 1100			nm
Peak sensitivity wavelength	$\lambda_p$	M=100	-	840	-	-	840	-	nm
Photosensitivity	S	$\lambda=900$ nm, M=1	-	0.52	-	-	0.52	-	A/W
Quantum efficiency	QE	$\lambda=900$ nm, M=1	-	70	-	-	70	-	%
Breakdown voltage	V <sub>BR</sub>	I <sub>D</sub> =100 $\mu$ A	120	160	200	120	160	200	V
Temp. coefficient of V <sub>BR</sub>	$\Delta T_{VBR}$		-	1.1	-	-	1.1	-	V/°C
Dark current	I <sub>D</sub>	M=100	-	0.1	1	-	0.2	2	nA
Temp. coefficient of I <sub>D</sub>	$\Delta T_{ID}$	$\lambda=900$ nm, M=100	-	1.1	-	-	1.1	-	times/°C
Cutoff frequency	f <sub>c</sub>	M=100, R <sub>L</sub> =50 $\Omega$ $\lambda=900$ nm, -3 dB	-	650	-	-	600	-	MHz
Rise time	t <sub>r</sub>	M=100, R <sub>L</sub> =50 $\Omega$ $\lambda=900$ nm, 10% to 90%	-	0.55	-	-	0.6	-	ns
Terminal capacitance	C <sub>t</sub>	M=100, f=1 MHz	-	0.5	-	-	1.1	-	pF
Excess noise figure	x	M=100, $\lambda=900$ nm	-	0.3	-	-	0.3	-	-
Gain	M	$\lambda=900$ nm	-	100	-	-	100	-	-

### Spectral response



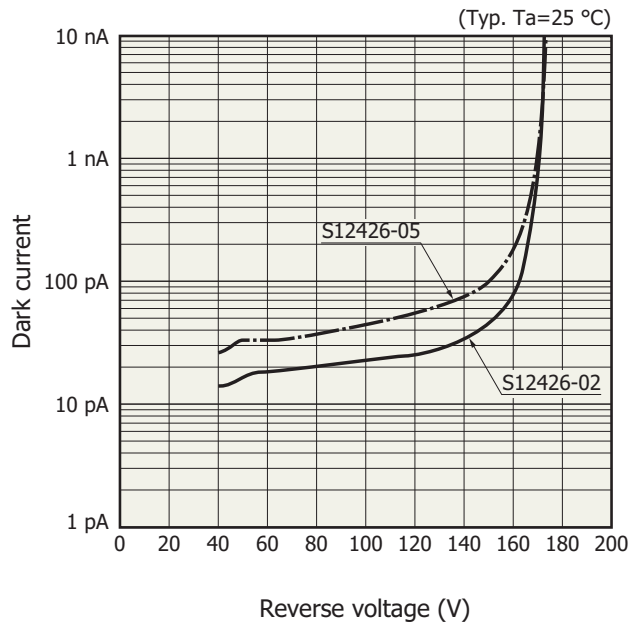
KAPD80269EB

### Quantum efficiency vs. wavelength

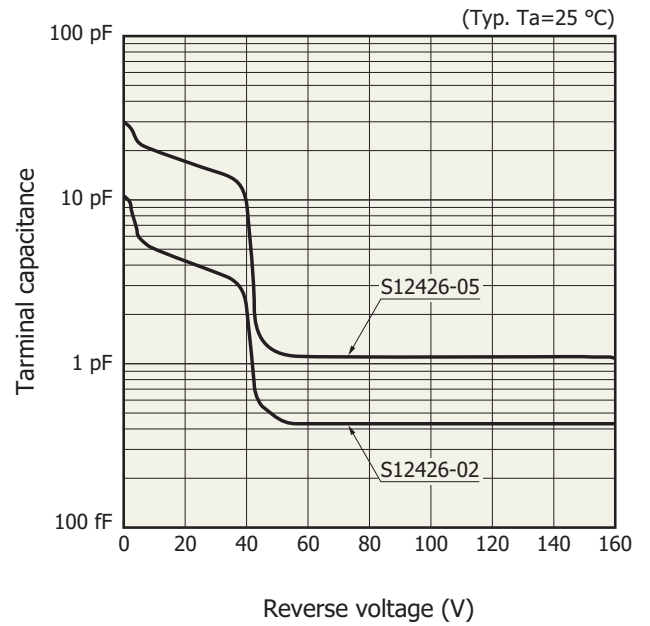


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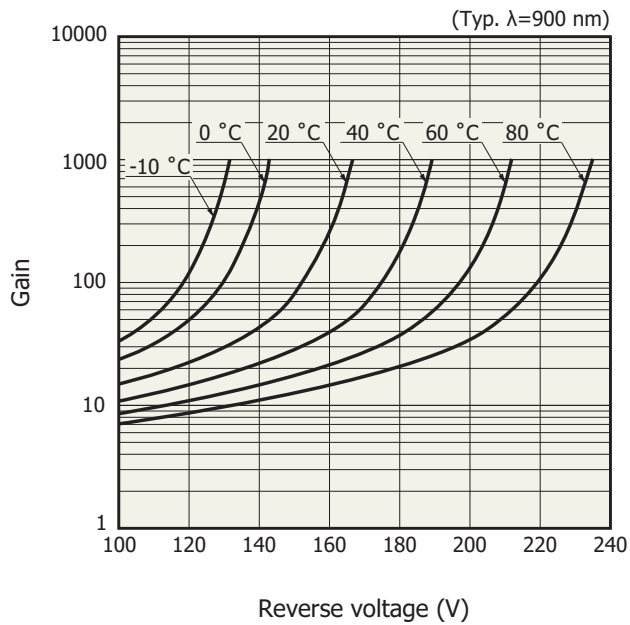
**Dark current vs. reverse voltage**



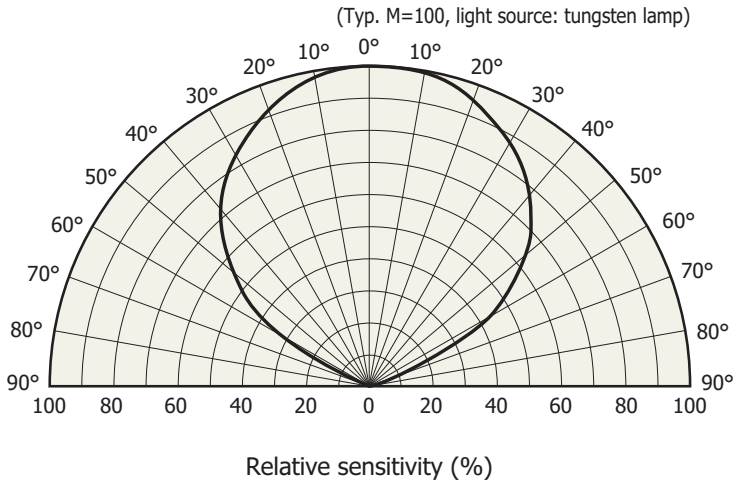
**Terminal capacitance vs. reverse voltage**



**Gain vs. reverse voltage**

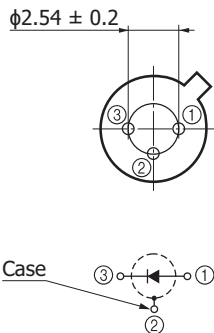
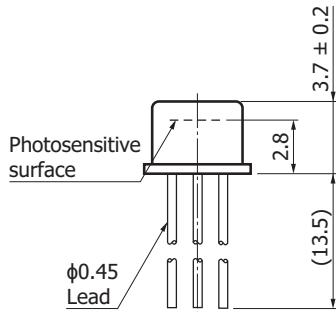
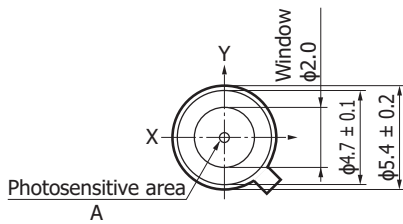


**Directivity**



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**Dimensional outline (unit: mm)**



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

Type no.	A
S12426-02	$\phi 0.2$
S12426-05	$\phi 0.5$

KAPDA0148EA

**Related information**

[www.hamamatsu.com/sp/ssd/doc\\_en.html](http://www.hamamatsu.com/sp/ssd/doc_en.html)

## ■ Precautions

- Notice
- Metal, ceramic, plastic package products

Information described in this material is current as of February 2019.

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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