

S12426 series

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

The S12426 series Si APDs are designed to provide a peak sensitivity wavelength in the 900 nm band where optical rangefinders are increasingly used. The S12426 series deliver faster response and lower bias operation than our existing Si APD (S9251 series).

**Features**

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

**Applications**

- **Optical rangefinders**

**Structure**

Parameter	Symbol	S12426-02	S12426-05	Unit
Photosensitive area size*1	A	$\phi 0.2$	$\phi 0.5$	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**

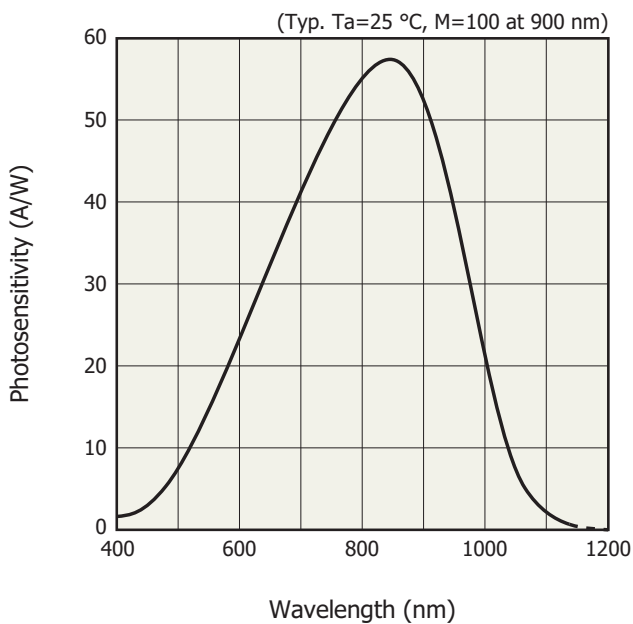
Parameter	Symbol	Value	Unit
Operating temperature	T <sub>opr</sub>	-20 to +85	°C
Storage temperature	T <sub>stg</sub>	-55 to +125	°C
Reverse current (DC)	I <sub>rmax</sub>	0.2	mA
Forward current	I <sub>fmax</sub>	10	mA
Soldering conditions	-	260 °C or less, within 10 s	-

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.

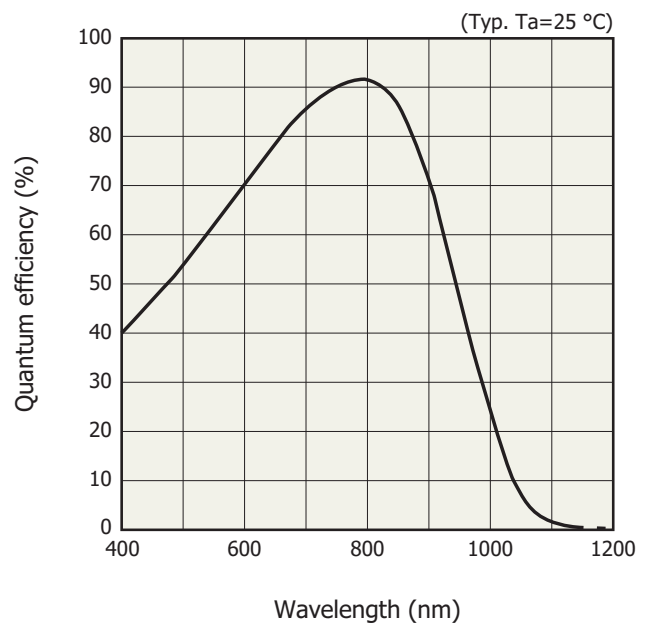
### Electrical and optical characteristics (Ta=25 °C)

Parameter	Symbol	Condition	S12426-02			S12426-05			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	
Spectral response range	$\lambda$		400 to 1150			400 to 1150			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	-	-

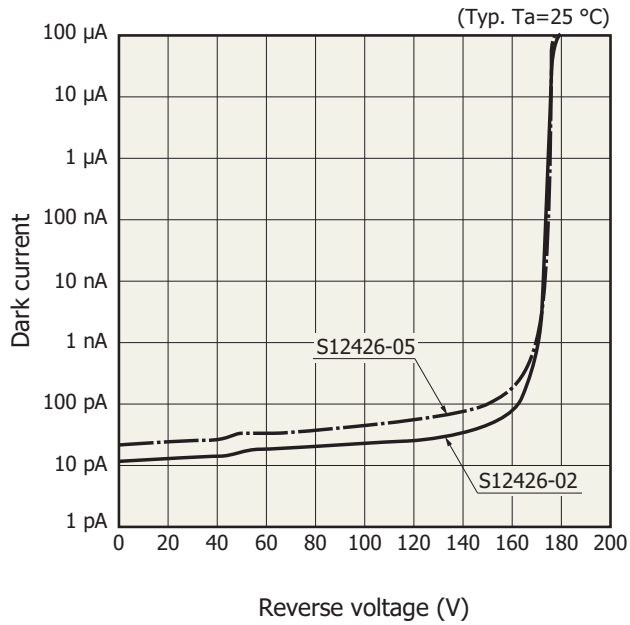
### Spectral response



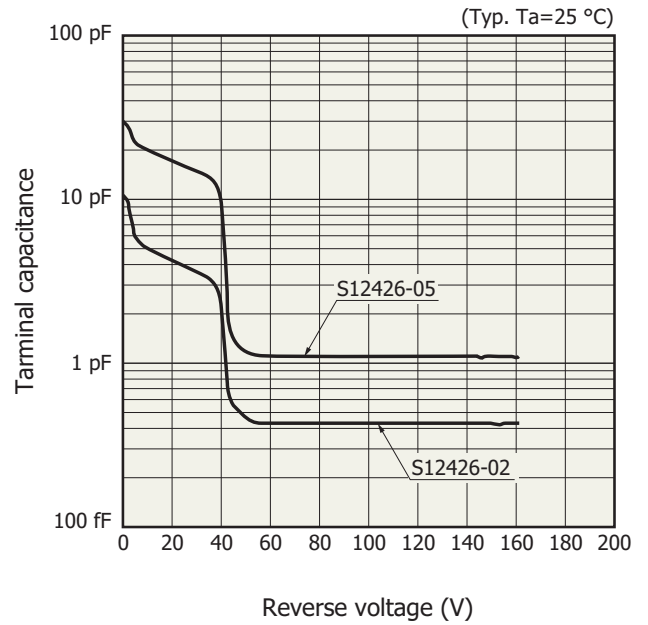
### Quantum efficiency vs. wavelength



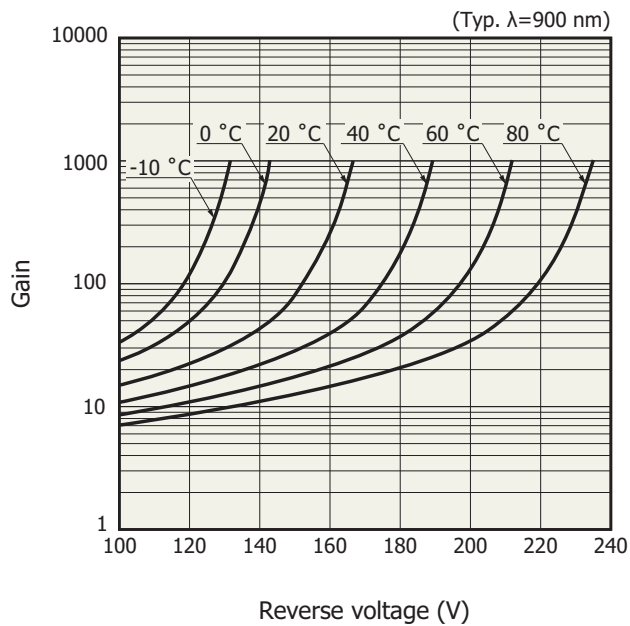
**Dark current vs. reverse voltage**



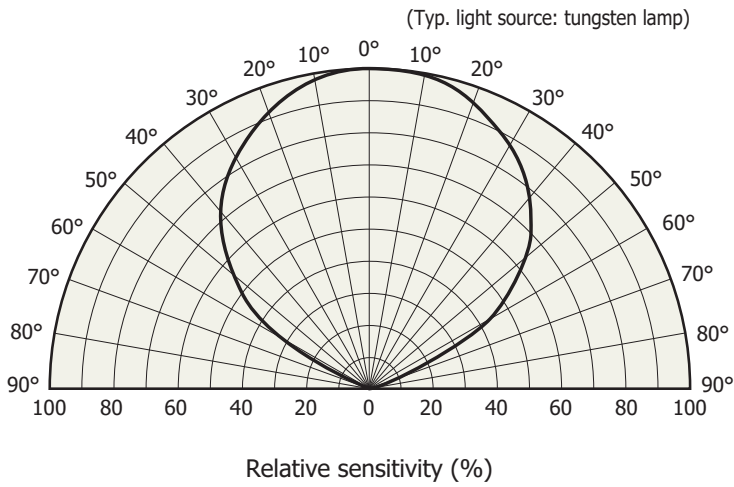
**Terminal capacitance vs. reverse voltage**



**Gain vs. reverse voltage**

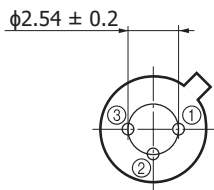
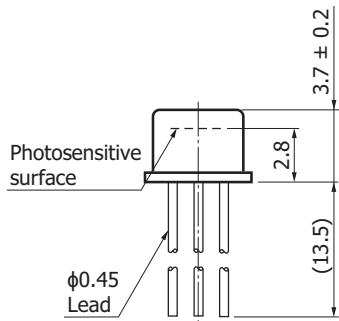
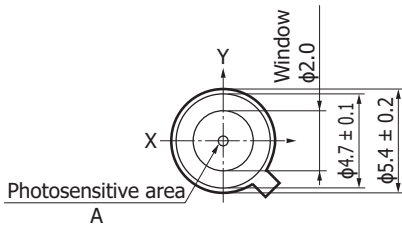


**Directivity**

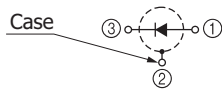


KAPDB0292EA

**Dimensional outline (unit: mm, tolerance unless otherwise noted: ±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

### ■ Technical information

- Si APD

Information described in this material is current as of September, 2014.

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# HAMAMATSU

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