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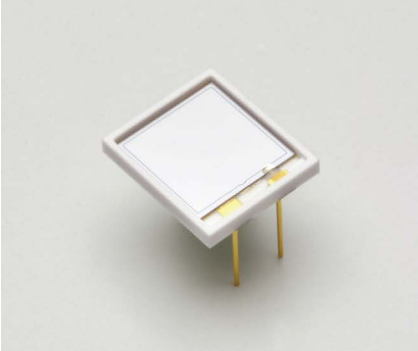
Si PIN photodiode



S13993

Large-area Si PIN photodiode for direct radiation detection

The S13993 is an unsealed type large-area Si PIN photodiode for direct radiation detection. Since the photosensitive area is coated with Al, there is no sensitivity in the ultraviolet to near infrared region.

Features

- **High quantum efficiency**
- **High energy resolution**
- **Low capacitance**

Applications

- **Direct X-ray detection**
- **Radiation detection (gamma-rays, beta-rays, charged particles, etc.)**

Structure

Parameter	Specification	Unit
Photosensitive area	10 × 10	mm
Depletion layer thickness	0.3	mm
Package	Ceramic	-
Window material	None	-

Absolute maximum ratings (Ta=25 °C)

Parameter	Symbol	Condition	Value	Unit
Reverse voltage	V_R		100	V
Operating temperature	Topr	No dew condensation*1	-20 to +60	°C
Storage temperature	Tstg	No dew condensation*1	-20 to +80	°C

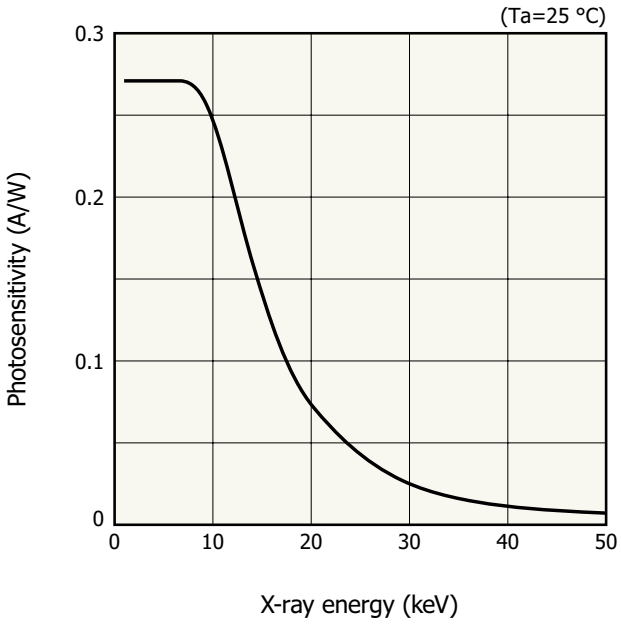
*1: When there is a temperature difference between a product and the surrounding area in high humidity environments, dew condensation may occur on the product surface. Dew condensation on the product may cause deterioration in characteristics and relaiability.
Note: Exceeding the absolute maximum ratings 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)

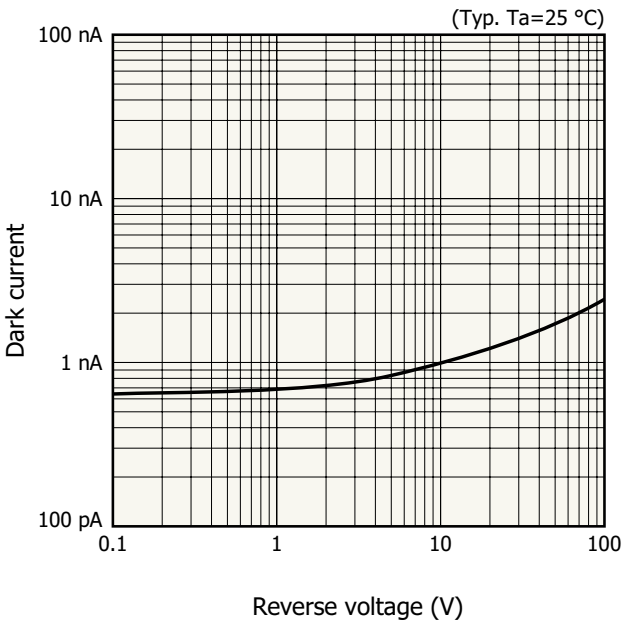
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
X-ray energy	-		-	-	50	keV
Dark current	I_D	V_R=70 V	-	2	6	nA
Temperature coefficient of I_D	I_{CID}	V_R=70 V	-	1.12	-	times/°C
Cutoff frequency*2	fc	V_R=70 V, R_L=50 Ω λ=780 nm, -3 dB	-	40	-	MHz
Terminal capacitance	Ct	V_R=70 V, f=10 kHz	-	40	60	pF

*2: Without Al coating on photosensitive area

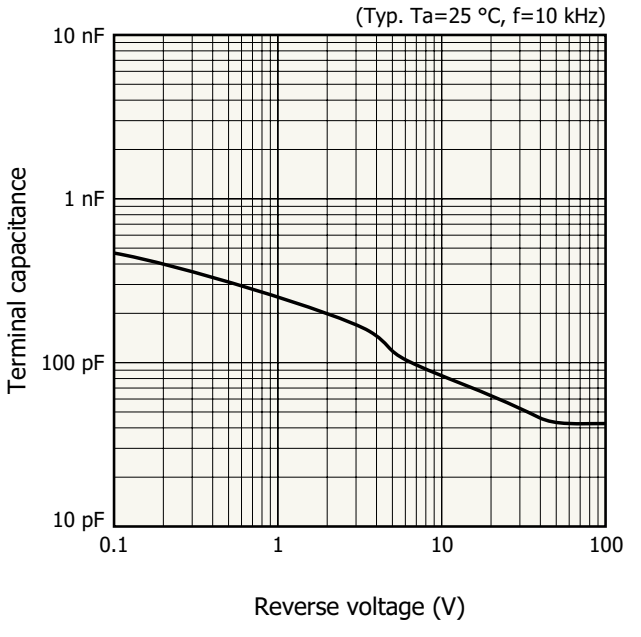
Photosensitivity vs. X-ray energy (theoretical value)



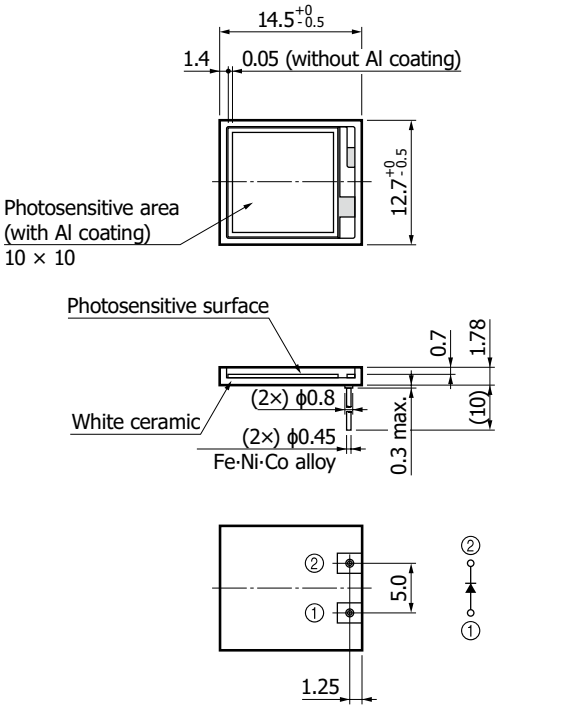
Dark current vs. reverse voltage



Terminal capacitance vs. reverse voltage



Dimensional outline (unit: mm)



Note: Al thickness on photosensitive surface
approx. 1 μm

KPINA0125EB

Related information

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

■ Precautions
· Disclaimer
· Precautions / Metal, ceramic, plastic package products
· Precautions / Unsealed products

■ Catalogs
· Selection guide / Si photodiodes
· Technical note / X-ray detectors

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