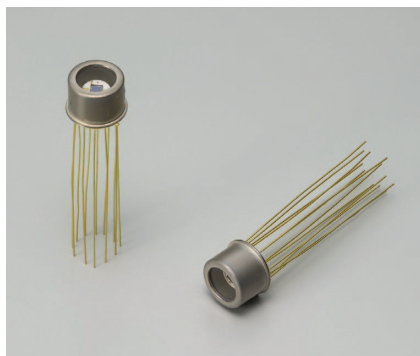


Two-color detectors



K3413-05/-08/-09

Sensors with a wide spectral response range from UV to IR

The K3413-05/-08/-09 are hybrid detectors containing an infrared-transmitting Si photodiode mounted over an InGaAs PIN photodiode, along the same optical axis. This structure delivers a wide spectral response range from 0.32 μm to nearly 2.6 μm . The built-in thermoelectric cooler maintains a constant temperature during operation, allowing precision measurement with an improved S/N.

Features

- Wide spectral response range
- Si photodiode and InGaAs PIN photodiode are arranged along the same optical axis.
- One-stage thermoelectrically cooled type

Applications

- Spectrophotometers
- Laser monitors
- Flame monitors
- Radiation thermometers

Structure/Absolute maximum ratings

Type No.	Package	Cooling	Detector element	Photosensitive area (mm)	Absolute maximum ratings				
					Thermistor allowable dissipation (mW)	TE-cooler allowable current (A)	Reverse voltage VR (V)	Operating temperature Topr (°C)	Storage temperature Tstg (°C)
K3413-05	TO-8	One-stage TE-cooled	Si	2.4 × 2.4	0.2	1.5	5	-40 to +70	-55 to +85
K3413-08			InGaAs	φ0.5			20		
			Si	2.4 × 2.4			5		
K3413-09			InGaAs	φ1			2		
			Si	2.4 × 2.4			5		
			InGaAs	φ1			10		

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 (Typ. Ta=25 °C, unless otherwise noted)

Type No.	Detector element	Measurement condition	Spectral response range (μm)	Peak sensitivity wavelength λp (μm)	Photo-sensitivity S λ=λp (A/W)	Dark current Id VR=10 mV		Shunt Resistance Rsh (MΩ)	D* λ=λp (cm · Hz ^{1/2} /W)	Rise time tr VR=0 V RL=1 kΩ 10 to 90 % (ns)	Terminal capacitance Ct VR=5 V f=1 MHz (pF)
		Element temperature T (°C)				Typ. (pA)	Max. (pA)				
K3413-05	Si	25	0.32 to 1.67	0.94	0.45	50	100	200	1.4 × 10 ¹³	200 ^{*3}	60 ^{*5}
	InGaAs	-10	1.67	1.55	0.55	50 ^{*1}	250 ^{*1}	3000	1.2 × 10 ¹³	1.5 ^{*4}	12
K3413-08	Si	25	0.32 to 2.57	0.94	0.45	50	100	200	1.4 × 10 ¹³	200 ^{*3}	60 ^{*5}
	InGaAs	-10	2.57	2.30	0.60	1.5 (μA) ^{*2}	7.5 (μA) ^{*2}	0.03	7.4 × 10 ¹⁰	23 ^{*4}	200 ^{*2}
K3413-09	Si	25	0.32 to 1.67	0.94	0.45	50	100	200	1.4 × 10 ¹³	200 ^{*3}	60 ^{*5}
	InGaAs	-10	1.67	1.55	0.55	70 ^{*2}	350 ^{*2}	1500	1.2 × 10 ¹³	7 ^{*4}	90

*1: VR=5 V

*2: VR=1 V

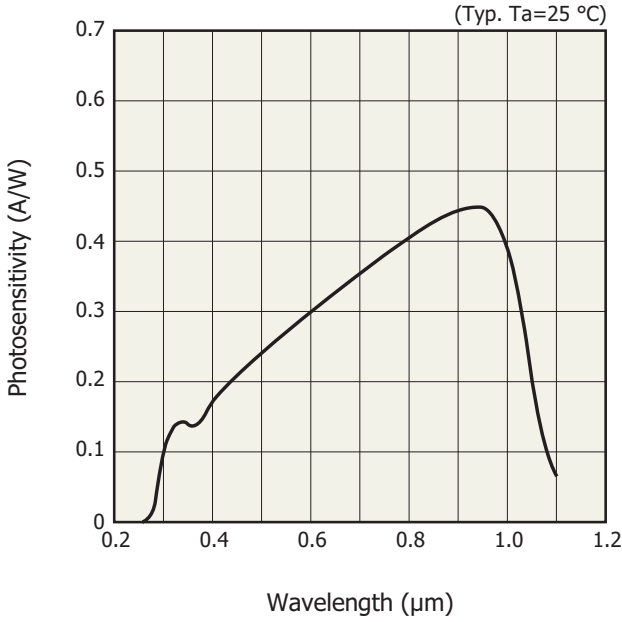
*3: λ=655 nm

*4: VR=5 V, RL=50 Ω

*5: VR=0 V, f=10 kHz

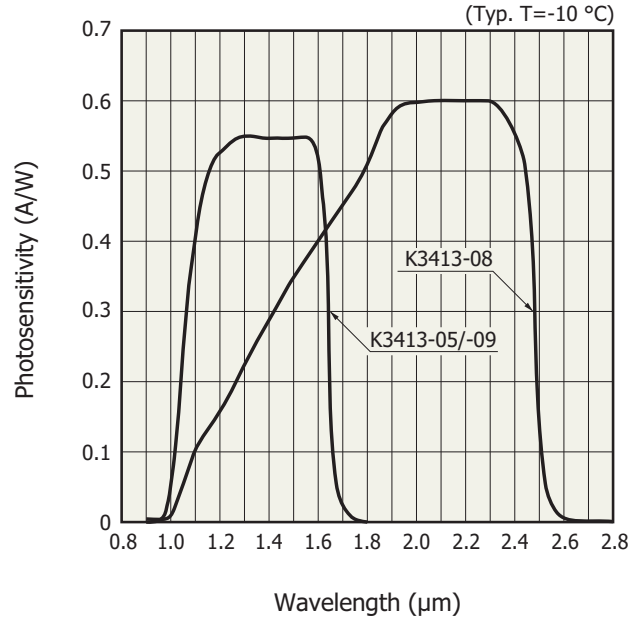
Spectral response

Si photodiode



KIRDB0199EA

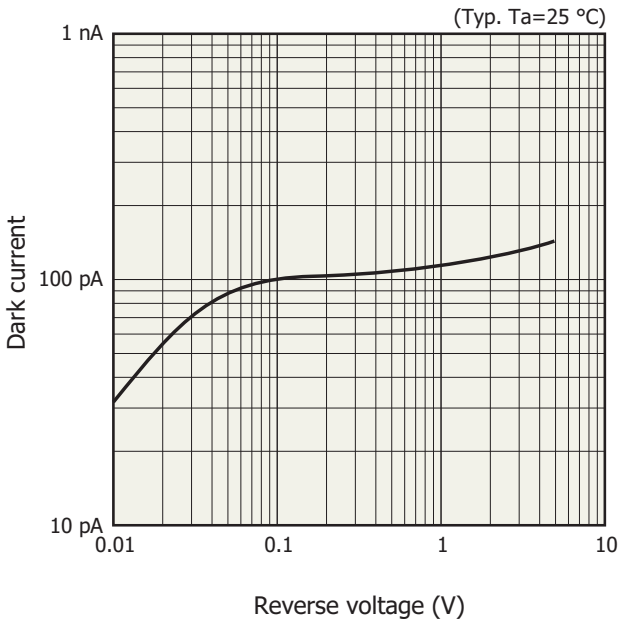
InGaAs PIN photodiode



KIRDB0212EA

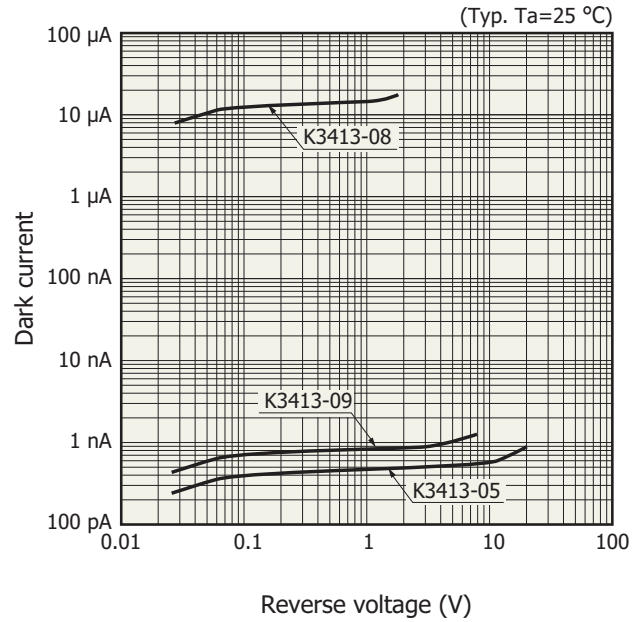
Dark current vs. reverse voltage

Si photodiode



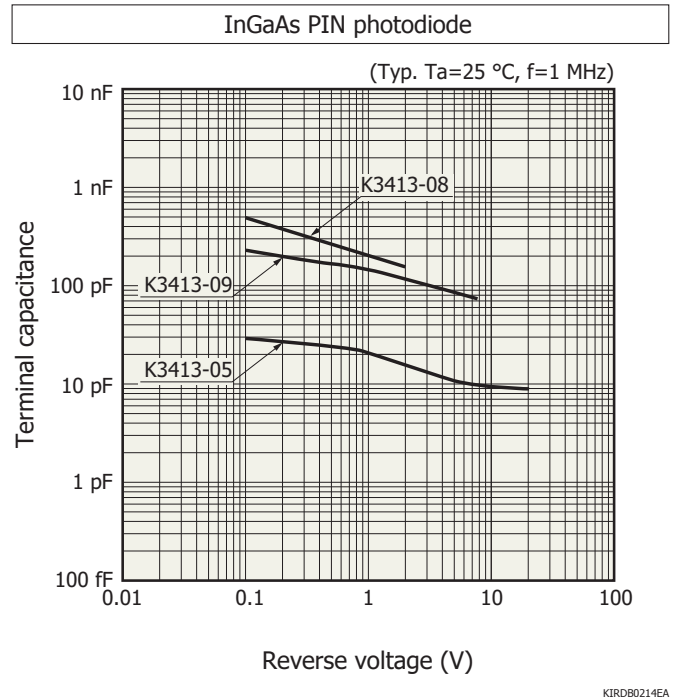
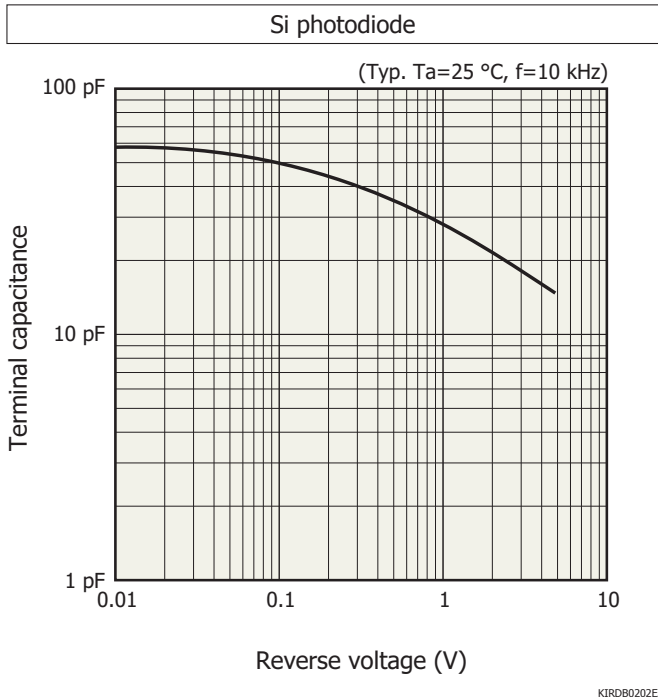
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InGaAs PIN photodiode

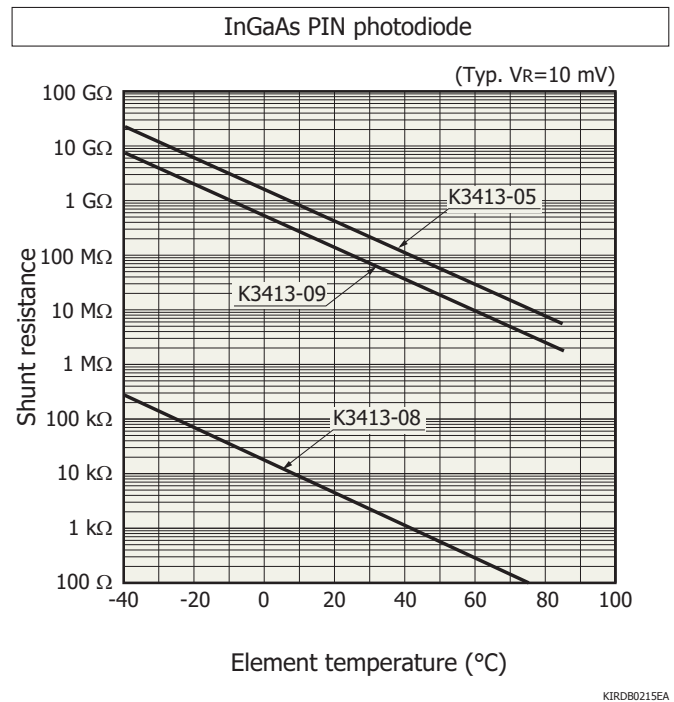
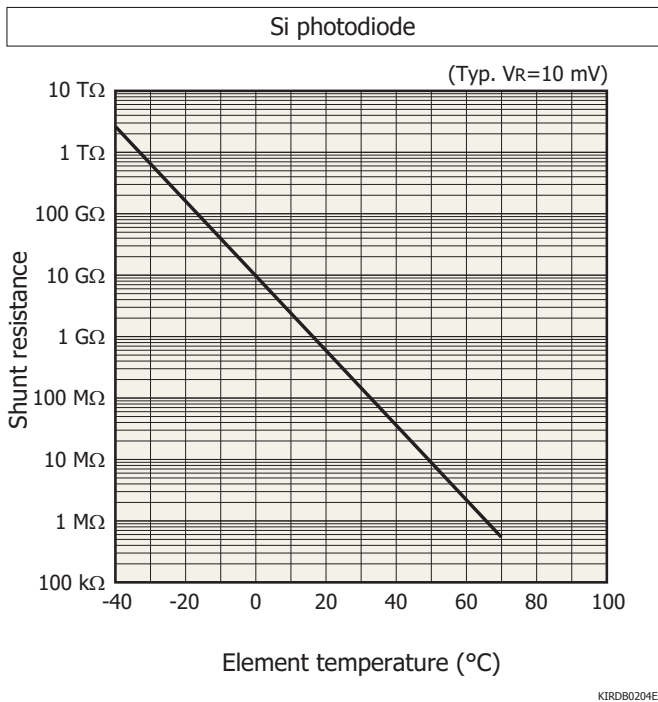


KIRDB0213EA

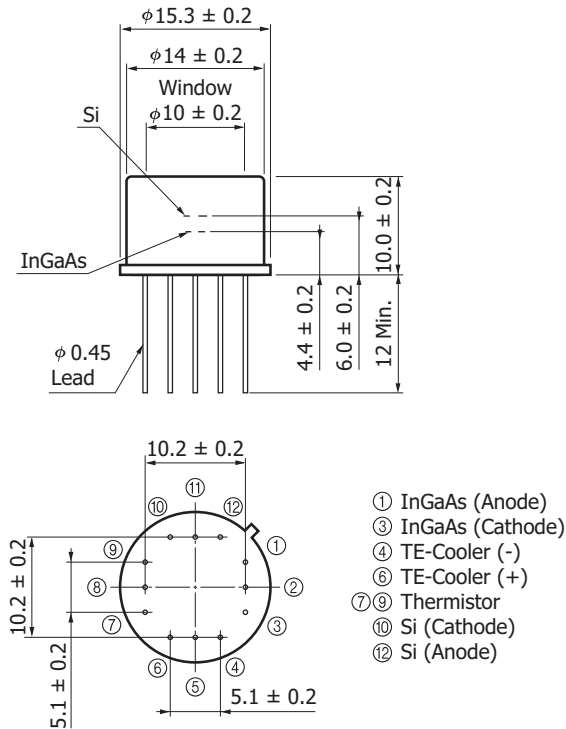
Terminal capacitance vs. reverse voltage



Shunt resistance vs. element temperature



Dimensional outline (unit: mm)



KIRDA0156EE

Related information

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

■ Precautions

- Disclaimer
- Metal, ceramic, plastic products

■ Technical information

- Infrared detectors

Information described in this material is current as of November, 2015.

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