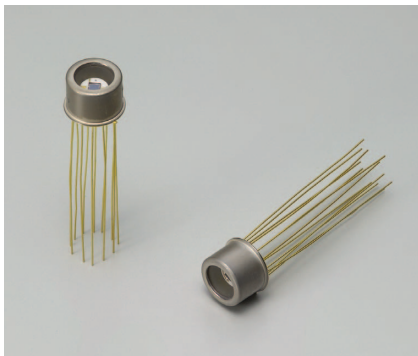


Two-color detectors



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

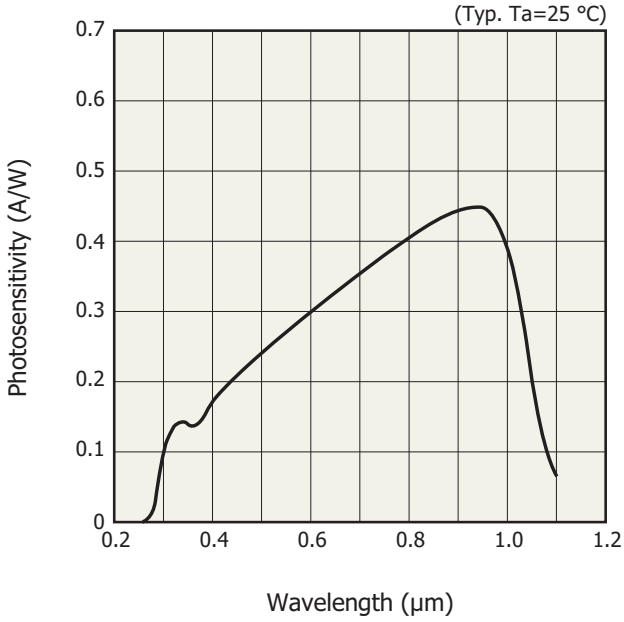
*3: λ=655 nm

*4: VR=5 V, RL=50 Ω

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

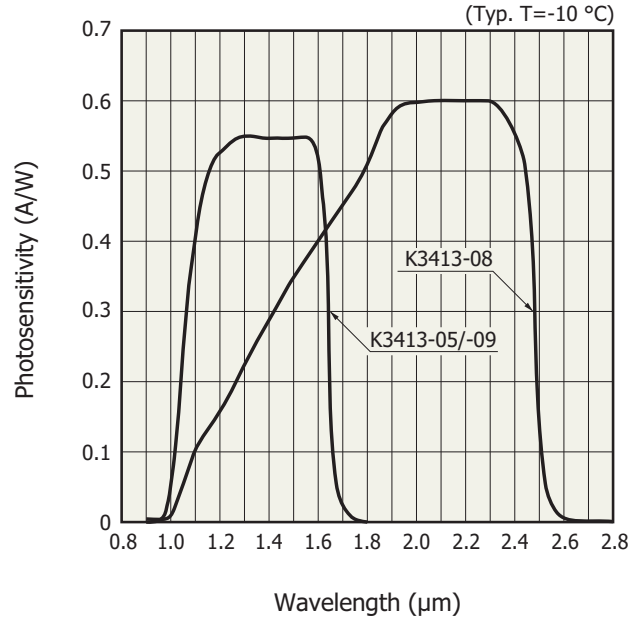
Spectral response

Si photodiode



KIRDB0199EA

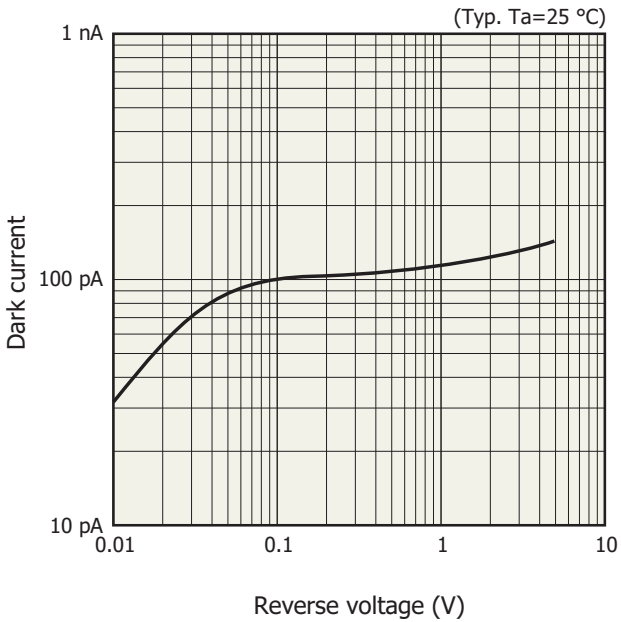
InGaAs PIN photodiode



KIRDB0212EA

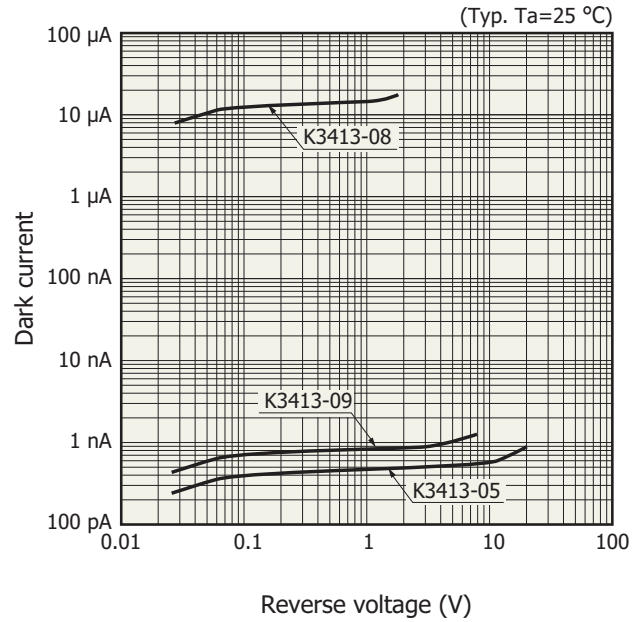
Dark current vs. reverse voltage

Si photodiode



KIRDB0200EA

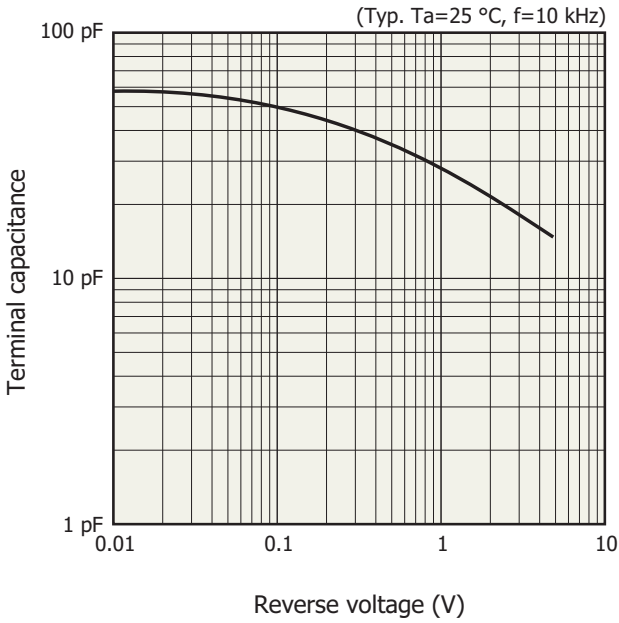
InGaAs PIN photodiode



KIRDB0213EA

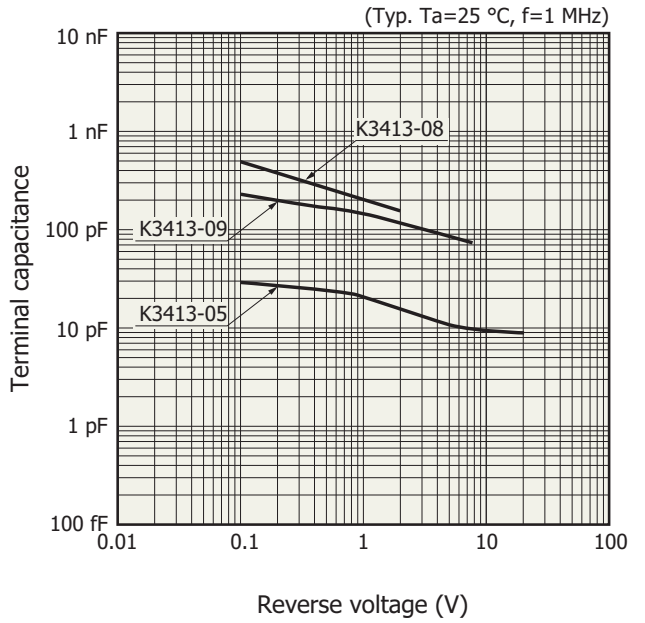
Terminal capacitance vs. reverse voltage

Si photodiode



KIRD80202EA

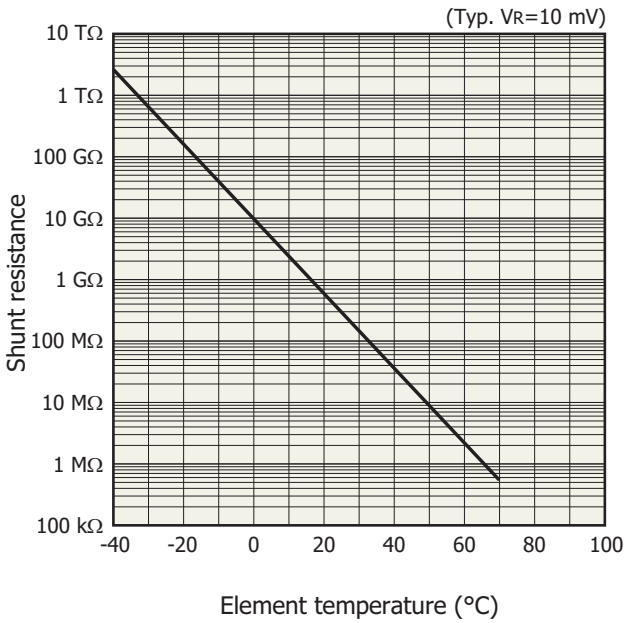
InGaAs PIN photodiode



KIRD80214EA

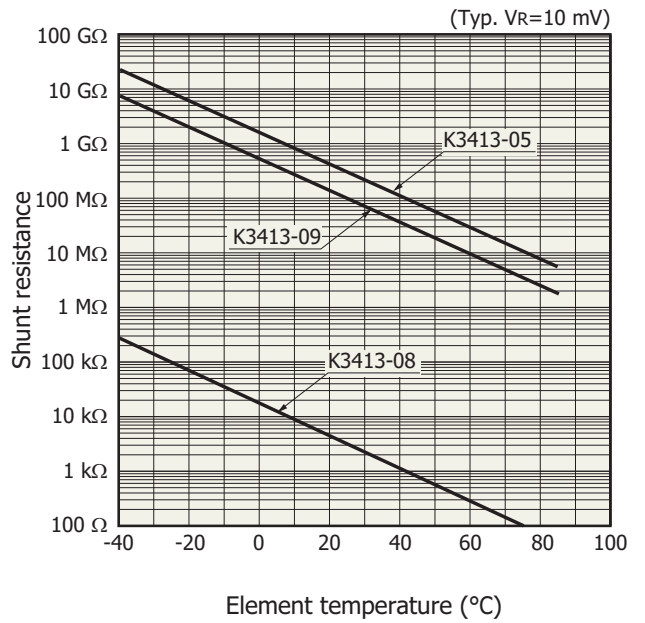
Shunt resistance vs. element temperature

Si photodiode



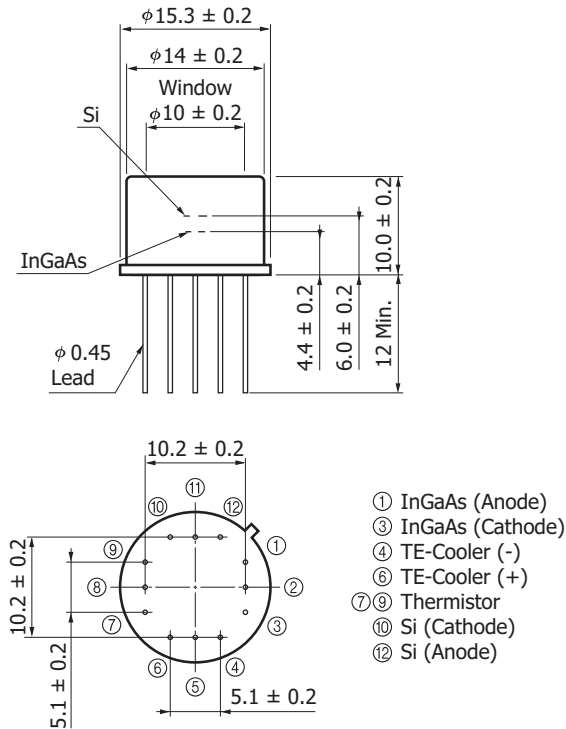
KIRD80204EA

InGaAs PIN photodiode



KIRD80215EA

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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