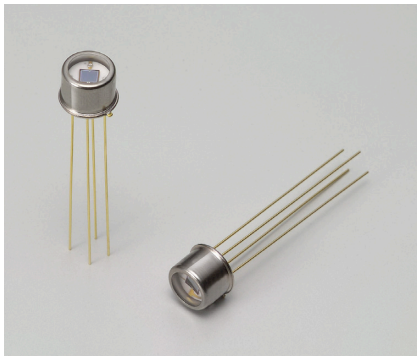


# Two-color detectors

K1713-05/-08/-09



## Wide spectral response range from UV to IR

The K1713 series incorporates an infrared-transmitting Si photodiode mounted over an InGaAs PIN photodiode, along the same optical axis.

### Features

- Wide spectral response range
- Allows same optical path design
- 4-pin TO-5 package

### Applications

- Spectrophotometers
- Laser monitors

### Structure / Absolute maximum ratings

Type no.	Package	Cooling	Detector element	Photosensitive area (mm)	Absolute maximum ratings		
					Reverse voltage $V_R$ (V)	Operating temperature* <sup>1</sup> $T_{opr}$ (°C)	Storage temperature* <sup>1</sup> $T_{stg}$ (°C)
K1713-05	TO-5	No-cooled	Si	2.4 × 2.4	5	-40 to +70	-55 to +85
			InGaAs	φ0.5	20		
K1713-08			Si	2.4 × 2.4	5		
			InGaAs	φ1	2		
K1713-09			Si	2.4 × 2.4	5		
			InGaAs	φ1	10		

\*1: No dew condensation

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 may cause deterioration in characteristics and reliability.

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. $T_a=25\text{ °C}$ , unless otherwise noted)

Type no.	Detector element	Spectral response range (μm)	Peak sensitivity wavelength $\lambda_p$ (μm)	Photo sensitivity $S$ $\lambda=\lambda_p$ (A/W)	Dark current $I_D$ $V_R=10\text{ mV}$		Shunt Resistance $R_{sh}$ (MΩ)	$D^*$ $\lambda=\lambda_p$ (cm · Hz <sup>1/2</sup> /W)	Rise time $t_r$ $V_R=0\text{ V}$ $R_L=1\text{ k}\Omega$ 10 to 90% (ns)	Terminal capacitance $C_t$ $V_R=5\text{ V}$ $f=1\text{ MHz}$ (pF)
					Typ. (nA)	Max. (nA)				
K1713-05	Si	0.32 to 1.7	0.94	0.45	30 (pA)	100 (pA)	300	$1.4 \times 10^{13}$	200* <sup>4</sup>	60* <sup>6</sup>
	InGaAs		1.55	0.55	0.5* <sup>2</sup>	2.5* <sup>2</sup>	300	$3.5 \times 10^{12}$	1.5* <sup>5</sup>	12
K1713-08	Si	0.32 to 2.6	0.94	0.45	30 (pA)	100 (pA)	300	$1.4 \times 10^{13}$	200* <sup>4</sup>	60* <sup>6</sup>
	InGaAs		2.30	0.60	15 (μA)* <sup>3</sup>	75 (μA)* <sup>3</sup>	3 (kΩ)	$2.3 \times 10^{10}$	23* <sup>7</sup>	200* <sup>3</sup>
K1713-09	Si	0.32 to 1.7	0.94	0.45	30 (pA)	100 (pA)	300	$1.4 \times 10^{13}$	200* <sup>4</sup>	60* <sup>6</sup>
	InGaAs		1.55	0.55	1* <sup>2</sup>	5* <sup>2</sup>	100	$3.5 \times 10^{12}$	7* <sup>5</sup>	90

\*2:  $V_R=5\text{ V}$

\*3:  $V_R=1\text{ V}$

\*4:  $\lambda=655\text{ nm}$

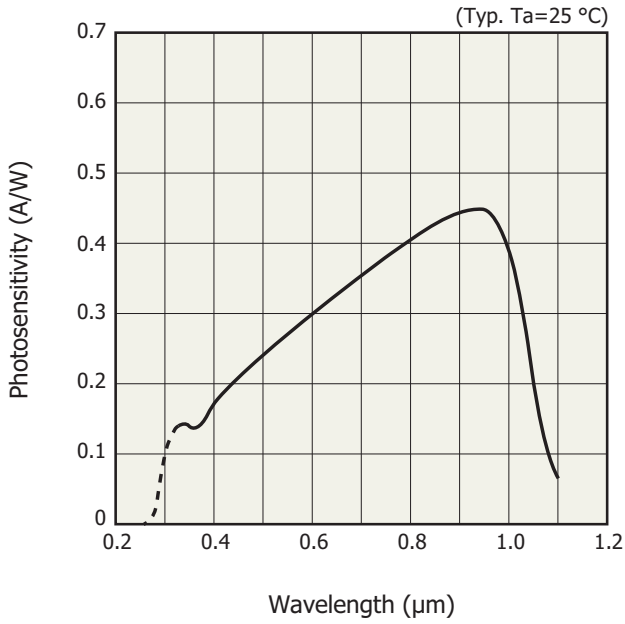
\*5:  $V_R=5\text{ V}$ ,  $R_L=50\ \Omega$

\*6:  $V_R=0\text{ V}$ ,  $f=10\text{ kHz}$

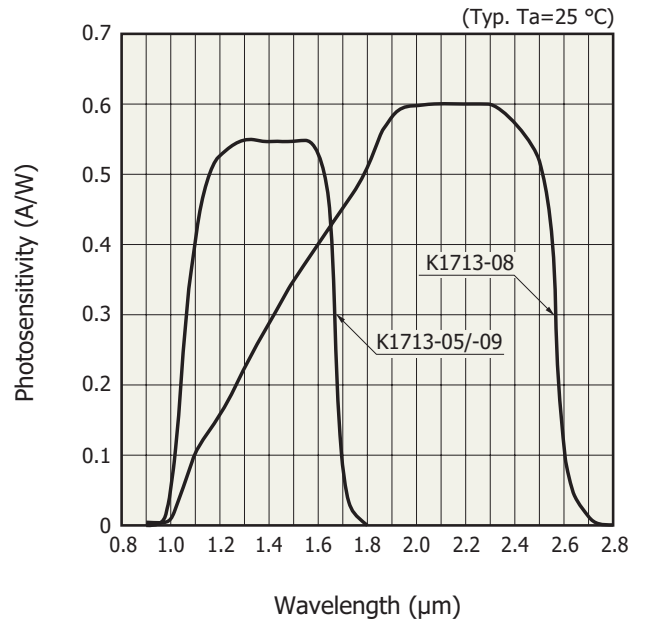
\*7:  $V_R=1\text{ V}$ ,  $R_L=50\ \Omega$

**Spectral response**

Si photodiode

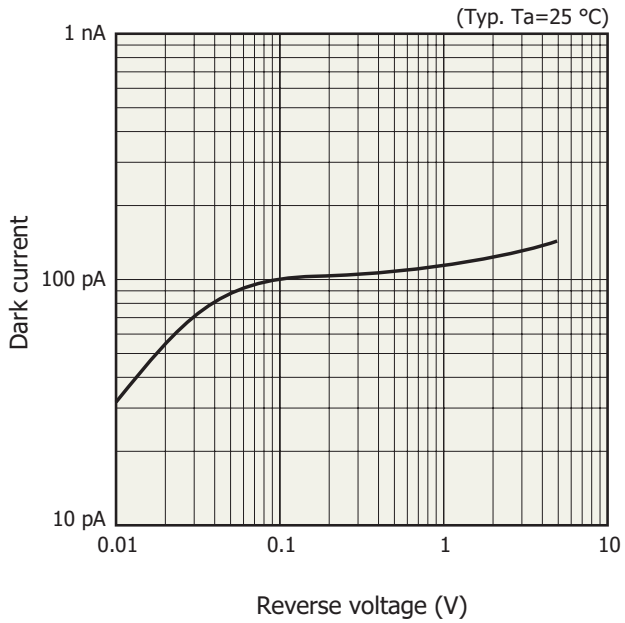


InGaAs PIN photodiode

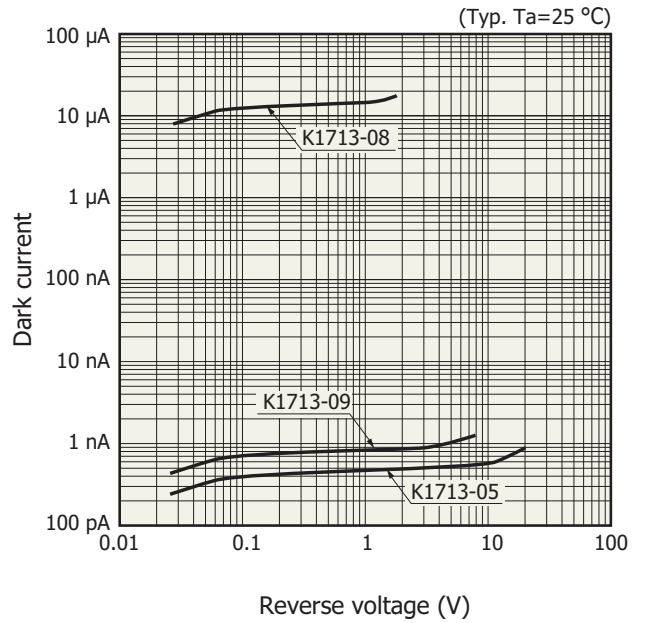


**Dark current vs. reverse voltage**

Si photodiode

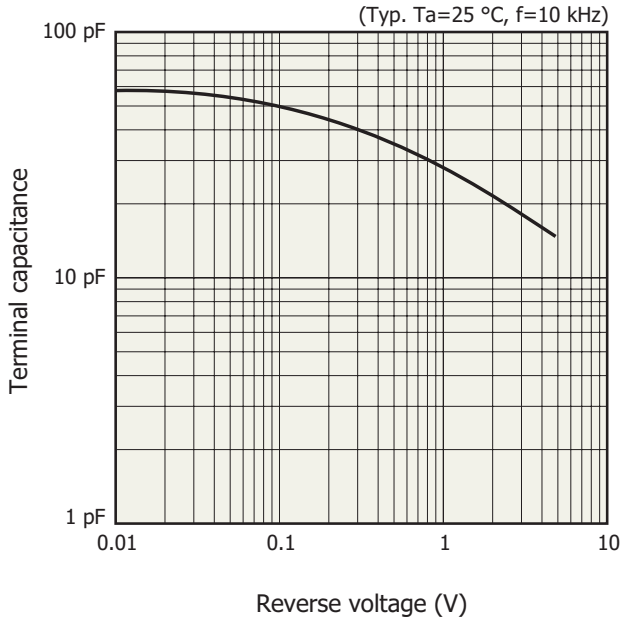


InGaAs PIN photodiode



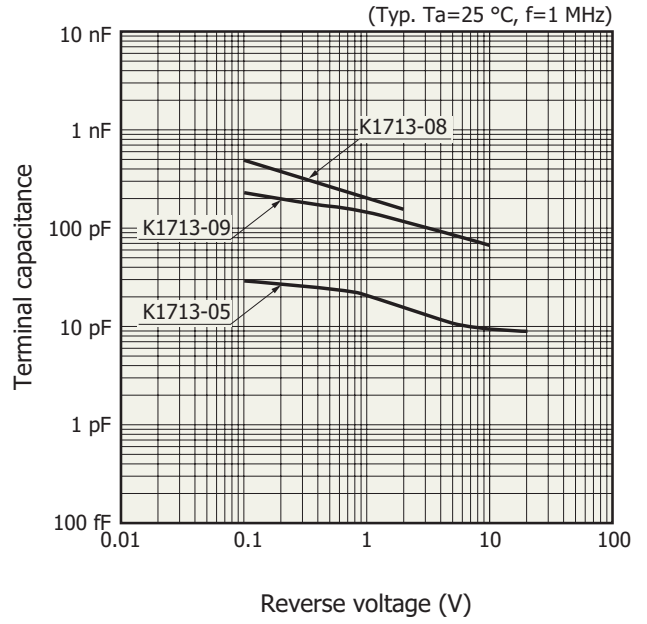
Terminal capacitance vs. reverse voltage

Si photodiode



KIRDB0202EA

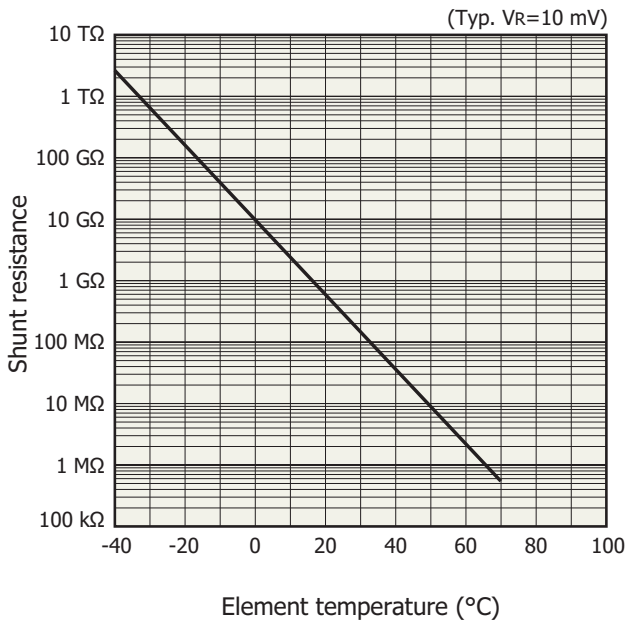
InGaAs PIN photodiode



KIRDB0203EA

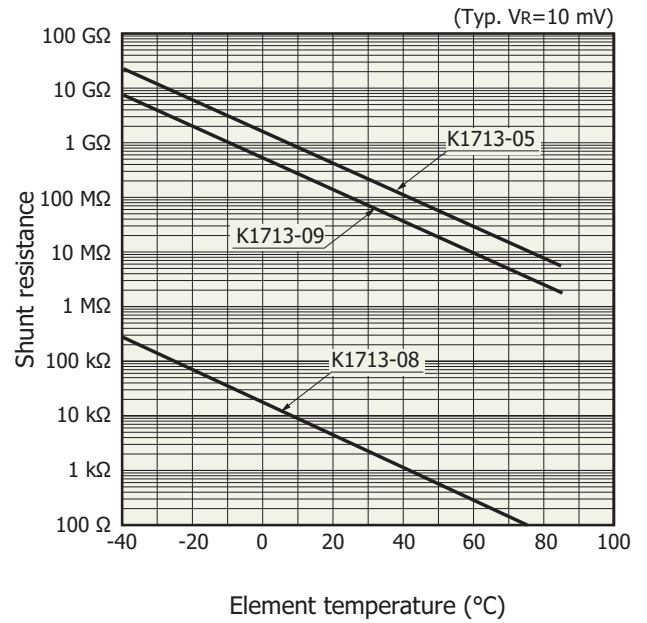
Shunt resistance vs. element temperature

Si photodiode



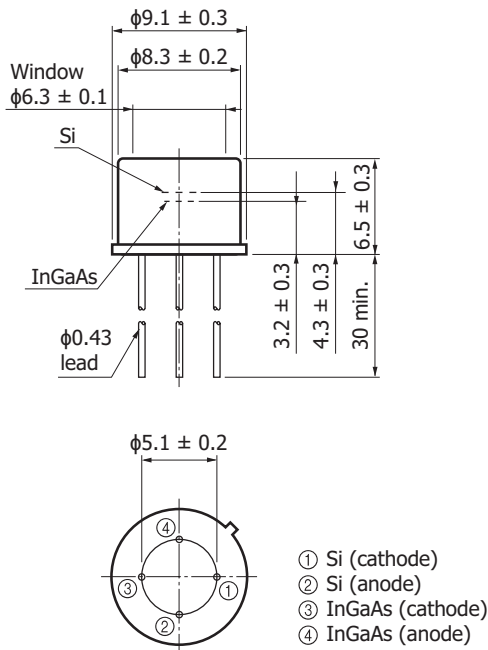
KIRDB0204EA

InGaAs PIN photodiode



KIRDB0205EA

### Dimensional outline (unit: mm)



KIRDA0147EB

### Related information

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

#### Precautions

- Disclaimer
- Safety consideration
- Compound opto-semiconductors (photosensors, light emitters)

#### Technical note

- Compound semiconductor photosensors

Information described in this material is current as of February, 2023.

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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