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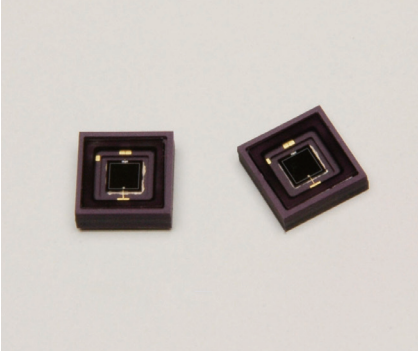
Two-color detector



K12728-010K

Wide spectral response range: 0.32 to 1.7 µm, Compact ceramic package

The K12728-010K is a two-color detector in a compact ceramic package, covering a wide spectral response range. Like the current K1713-09, it incorporates an infrared-transmitting Si photodiode mounted over an InGaAs PIN photodiode, along the same optical axis. It features low noise and low dark current and supports reflow soldering.

Features

- **Wide spectral response range**
- **Compact, low noise, low dark current**
- **Supports reflow soldering**

Applications

- **Spectrophotometers**
- **Radiation thermometers**

Structure

Parameter	Symbol	Condition	Specification	Unit
Window material	-		Borosilicate glass	-
Package	-		Ceramic	-
Photosensitive area	-	Si	2.4 × 2.4	mm
		InGaAs	ϕ1.0	

Absolute maximum ratings

Parameter	Symbol	Condition	Value	Unit
Reverse voltage	V_R max	Si, Ta=25 °C	5	V
		InGaAs, Ta=25 °C	10	
Operating temperature	Topr	No condensation*1	-20 to +70	°C
Storage temperature	Tstg	No condensation*1	-20 to +85	°C

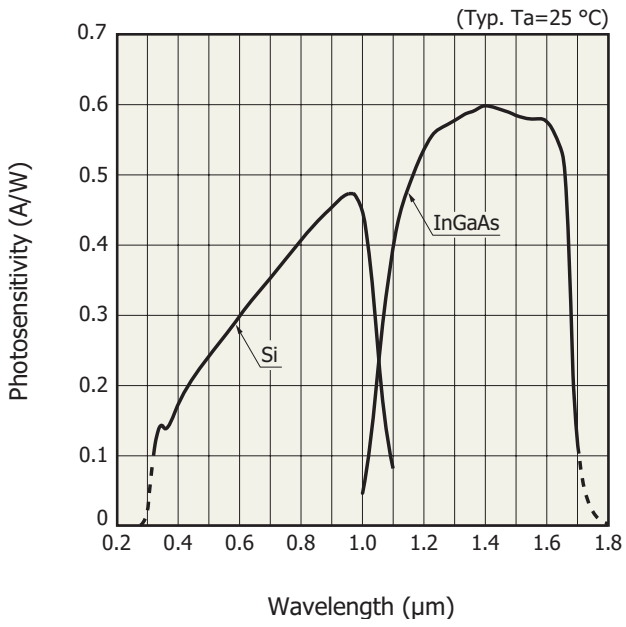
*1: When there is a temperature difference between a product and the surrounding area in high humidity environment, dew condensation may occur on the product surface. Dew condensation on the product may cause deterioration in characteristics and reliability.

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.

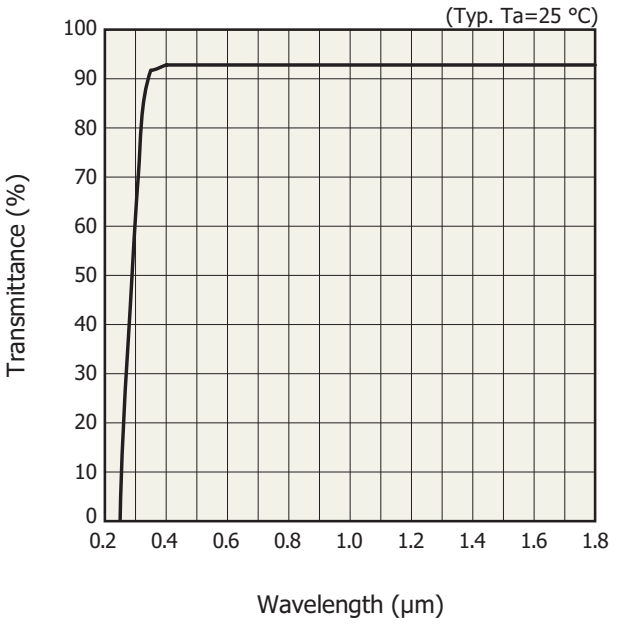
Electrical and optical characteristics (Ta=25 °C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Spectral response range	λ	Si	-	0.32 to 1.1	-	μm
		InGaAs	-	1.1 to 1.7	-	
Peak sensitivity wavelength	λp	Si	-	0.96	-	μm
		InGaAs	-	1.55	-	
Photosensitivity	S	Si, λ=λp	0.3	0.45	-	A/W
		InGaAs, λ=λp	0.3	0.55	-	
Dark current	I_D	Si, V_R=10 mV	-	30	100	pA
		InGaAs, V_R=10 mV	-	80	400	
Cutoff frequency	fc	Si, -3 dB, V_R=0 V, R_L=50 Ω	1	2	-	MHz
		InGaAs, -3 dB, V_R=0 V, R_L=50 Ω	5	10	-	
Terminal capacitance	Ct	Si, V_R=0 V, f=10 kHz	-	60	110	pF
		InGaAs, V_R=0 V, f=1 MHz	-	130	200	
Shunt resistance	Rsh	Si, V_R=10 mV	100	300	-	MΩ
		InGaAs, V_R=10 mV	25	125	-	MΩ
Detectivity	D*	Si, λ=λp	5×10^{12}	1.4×10^{13}	-	cm·Hz$^{1/2}$/W
		InGaAs, λ=λp	5×10^{11}	3.5×10^{12}	-	

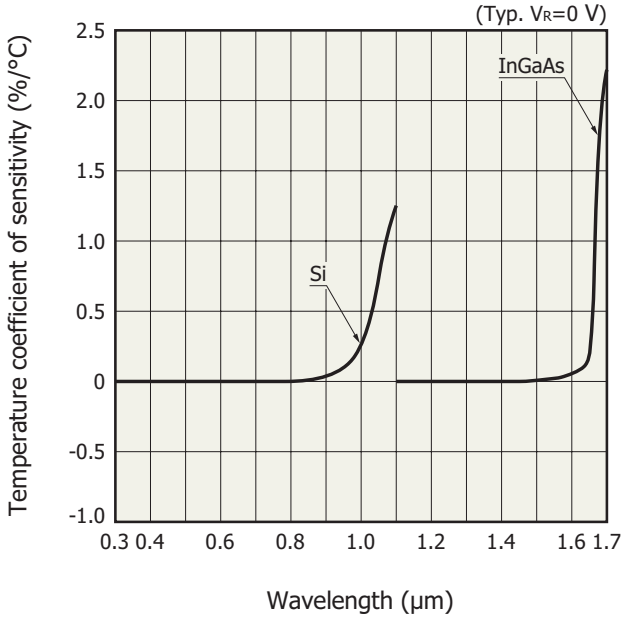
Spectral response



Spectral transmittance of window material

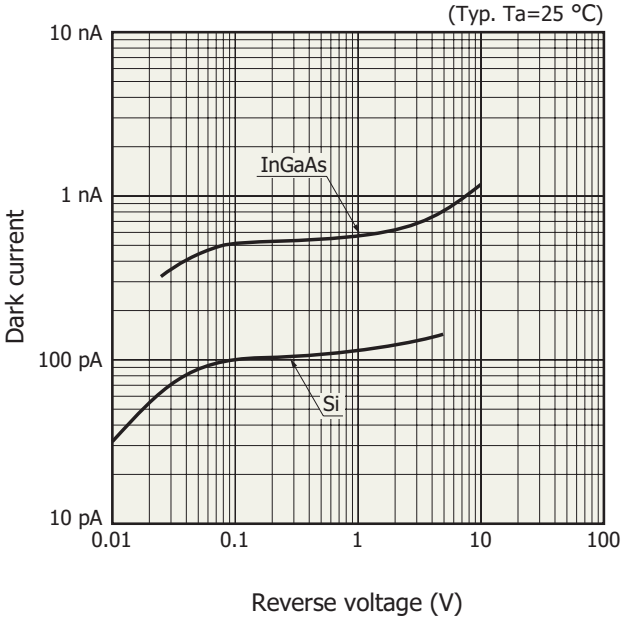


Photosensitivity temperature characteristics



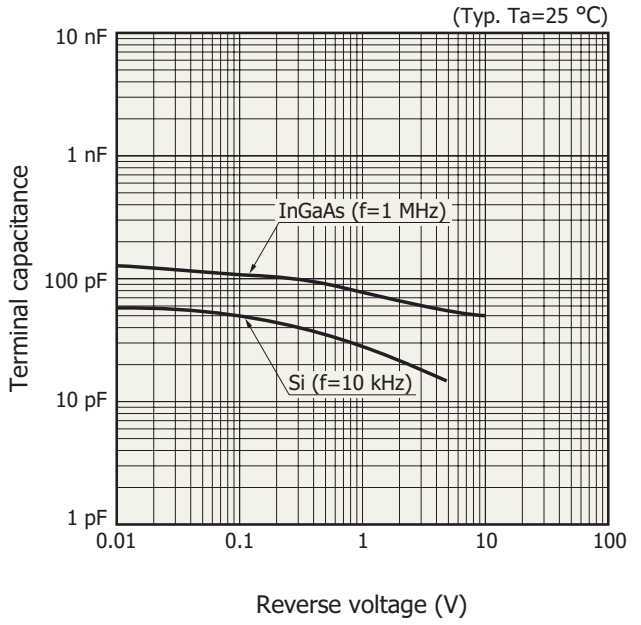
KIRDB0645EA

Dark current vs. reverse voltage



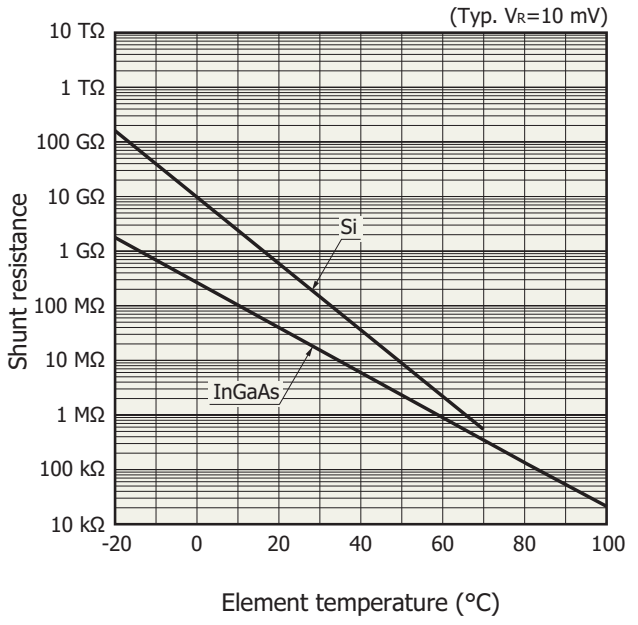
KIRDB0600EA

Terminal capacitance vs. reverse voltage



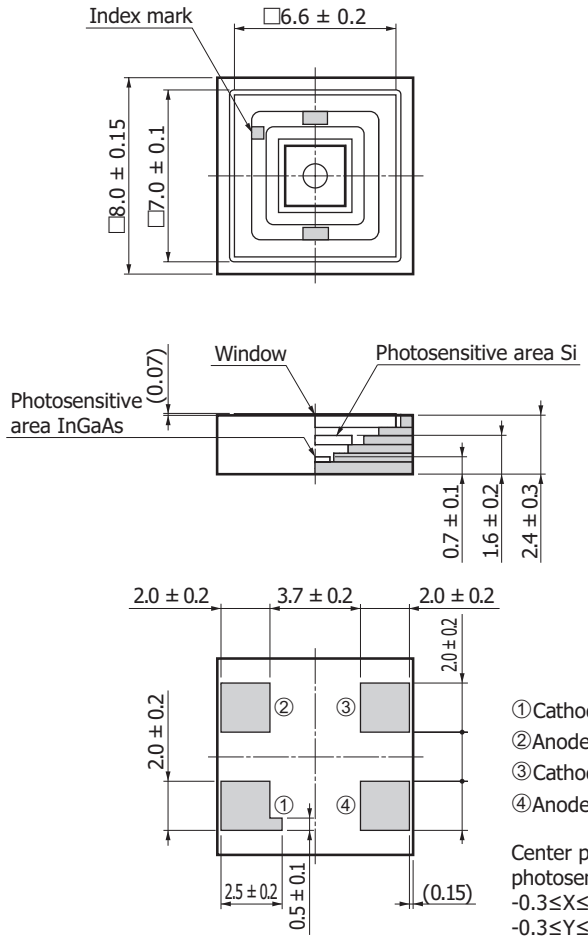
KIRDB0601EA

Shunt resistance vs. element temperature



KIRDB0602EA

Dimensional outline (unit: mm)

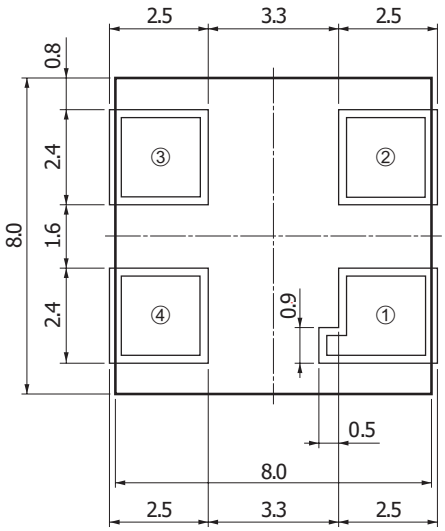


①Cathode (Si)
②Anode (Si)
③Cathode (InGaAs)
④Anode (InGaAs)

Center position accuracy of photosensitive area
-0.3≤X≤+0.3
-0.3≤Y≤+0.3

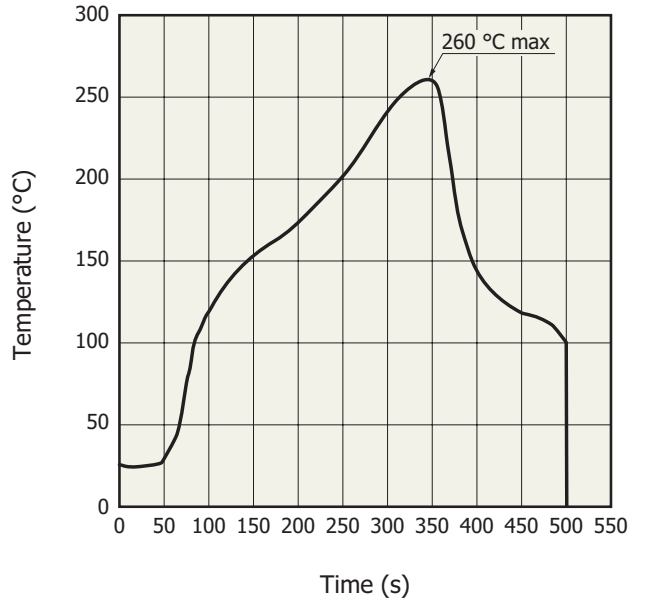
KIRDA0243EA

Recommended land mark pattern (unit: mm)



KIRDC0119EA

Measured example of temperature profile with our hot-air reflow oven for product testing



KIRDC0120EA

· After unpacking, store the device in an environment at a temperature range of 5 to 30 °C and a humidity of 60% or less, and perform reflow soldering within 4 weeks.
· The thermal stress applied to the device during reflow soldering varies depending on the circuit board and the reflow oven that is used.
· When setting the reflow conditions, verify that the reliability of the device is not compromised by the reflow soldering process.

Related information

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

■ Precautions
· Disclaimer
· Safety consideration
· Metal, ceramic, plastic package products

■ Technical information
· Infrared detectors

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