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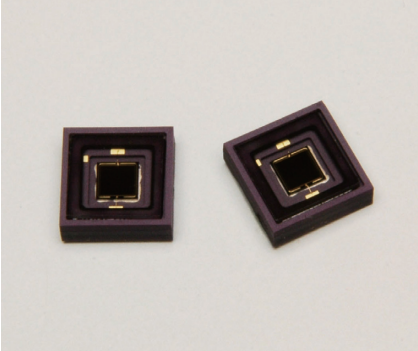
Two-color detector



K12729-010K

Wide spectral response range: 0.9 to 2.55 µm
Compact ceramic package

The K12729-010K is a two-color detector in a compact ceramic package, covering a wide spectral response range. Like the current K11908-010K, it incorporates two InGaAs PIN photodiodes with different spectral response, 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	-	InGaAs (λc=1.7 µm)	2.4 × 2.4	mm
		InGaAs (λc=2.55 µm)	ϕ1.0	

Absolute maximum ratings

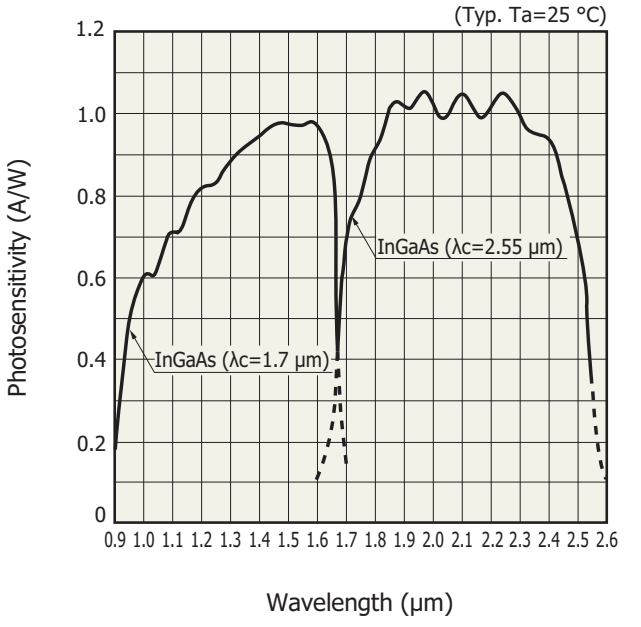
Parameter	Symbol	Condition	Value	Unit
Reverse voltage	VR max	InGaAs (λc=1.7 µm), Ta=25 °C	2	V
		InGaAs (λc=2.55 µm), Ta=25 °C	1	
Operating temperature	Topr	No condensation	-20 to +70	°C
Storage temperature	Tstg	No condensation	-20 to +85	°C

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)

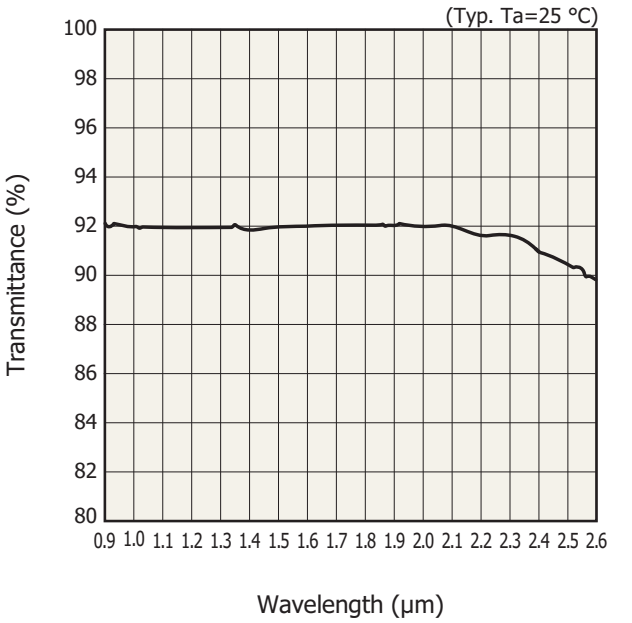
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Spectral response range	λ	InGaAs (λc=1.7 µm)	-	0.9 to 1.7	-	µm
		InGaAs (λc=2.55 µm)	-	1.7 to 2.55	-	
Peak sensitivity wavelength	λp	InGaAs (λc=1.7 µm)	-	1.55	-	µm
		InGaAs (λc=2.55 µm)	-	2.1	-	
Photosensitivity	S	InGaAs (λc=1.7 µm), λ=λp	0.85	0.95	-	A/W
		InGaAs (λc=2.55 µm), λ=λp	0.7	1.0	-	
Dark current	ID	InGaAs (λc=1.7 µm), VR=10 mV	-	1	10	nA
		InGaAs (λc=2.55 µm), VR=10 mV	-	0.7	3.5	µA
Cutoff frequency	fc	InGaAs (λc=1.7 µm), -3 dB VR=0 V, RL=50 Ω	1	2	-	MHz
		InGaAs (λc=2.55 µm), -3 dB VR=0 V, RL=50 Ω	2	6	-	
Terminal capacitance	Ct	InGaAs (λc=1.7 µm), VR=0 V, f=1 MHz	-	1.5	2.5	nF
		InGaAs (λc=2.55 µm), VR=0 V, f=1 MHz	-	0.5	1	
Shunt resistance	Rsh	InGaAs (λc=1.7 µm), VR=10 mV	1	10	-	MΩ
		InGaAs (λc=2.55 µm), VR=10 mV	2.8	14	-	kΩ
Detectivity	D*	InGaAs (λc=1.7 µm), λ=λp	1×10^{12}	5×10^{12}	-	cm·Hz$^{1/2}$/W
		InGaAs (λc=2.55 µm), λ=λp	2×10^{10}	7×10^{10}	-	

Spectral response



KIRDB0479EB

Spectral transmittance of window material



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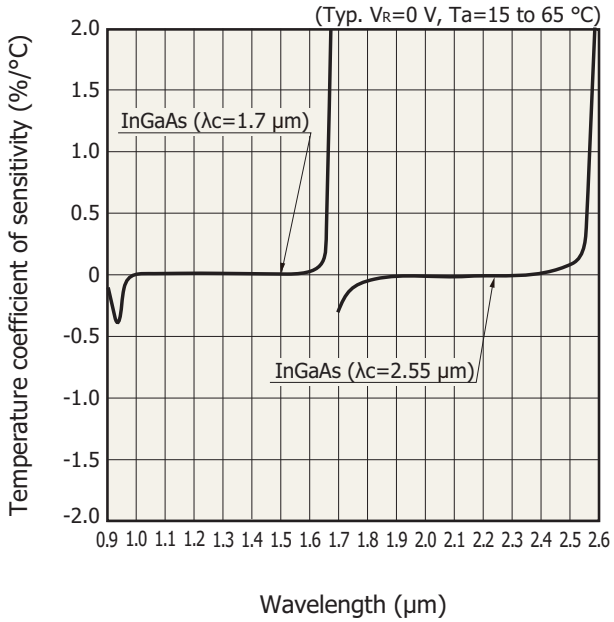
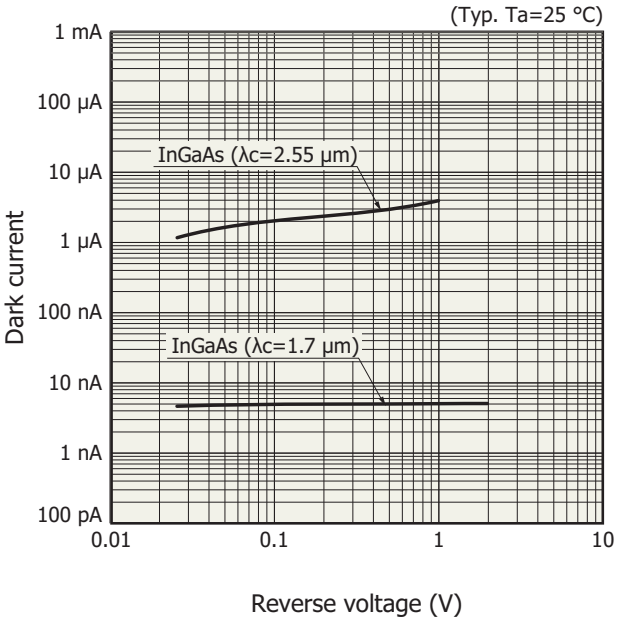
Temperature characteristics of sensitivity



KIRDB0495EB

Dark current vs. reverse voltage



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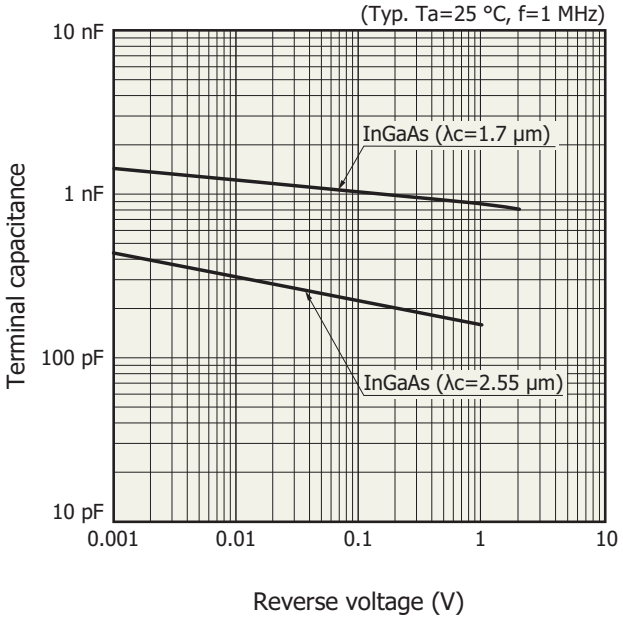
Terminal capacitance vs. reverse voltage



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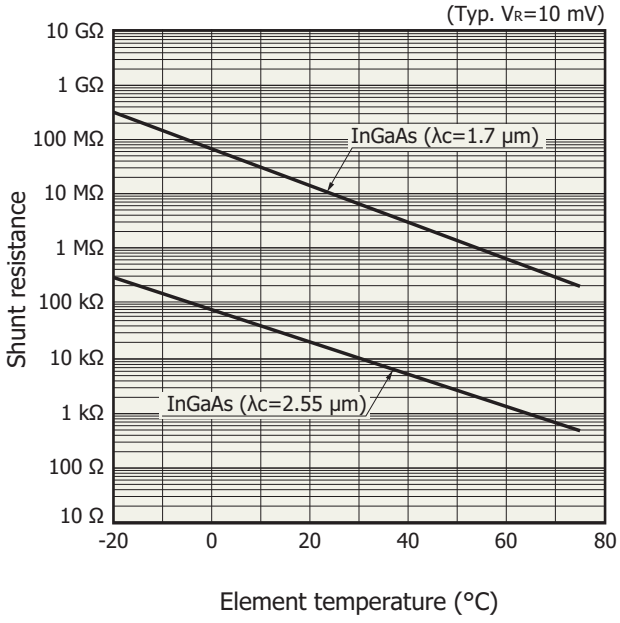
Shunt resistance vs. element temperature



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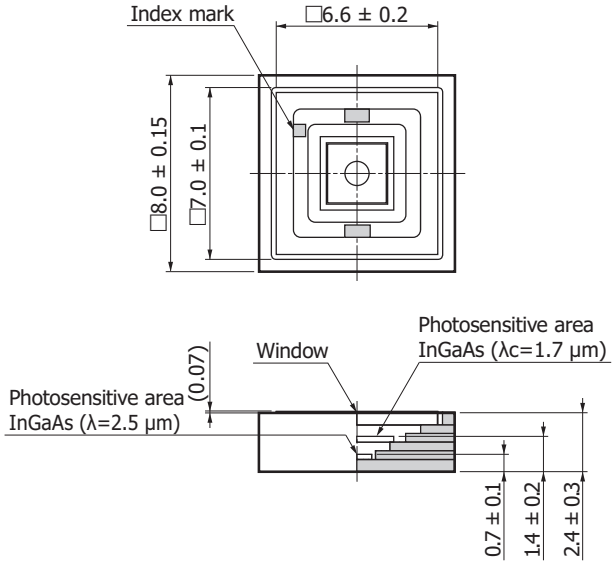
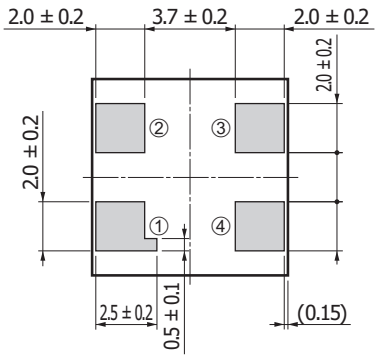
Dimensional outline (unit: mm)



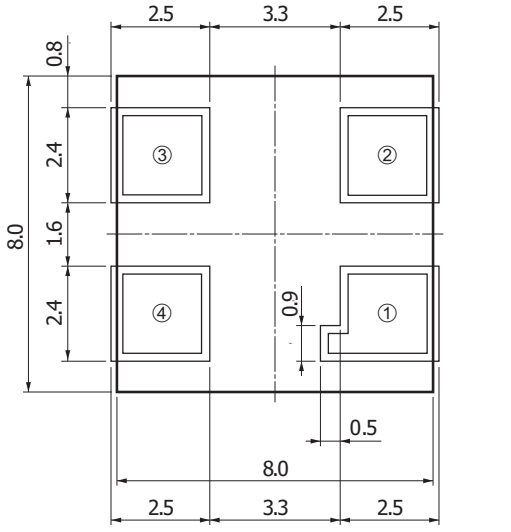


①Cathode
(InGaAs, λc=1.7 μm)
②Anode
(InGaAs, λc=1.7 μm)
③Cathode
(InGaAs, λc=2.55 μm)
④Anode
(InGaAs, λc=2.55 μm)

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

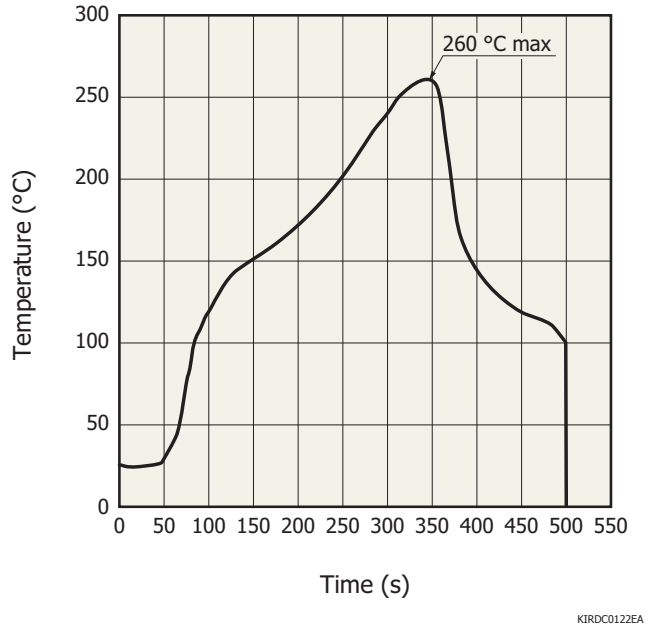
KIRDA0244EA

Recommended land mark pattern (unit: mm)



KIRDC0121EA

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



- 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
· Notice
· Metal, ceramic, plastic packages

■Technical information
· Infrared detector / Technical information

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