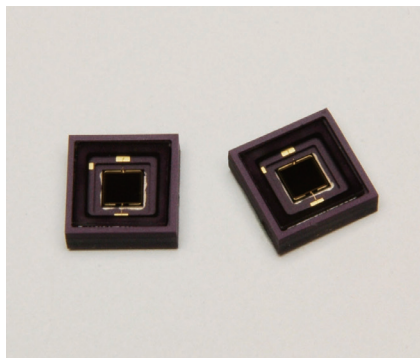


Two-color detector



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 ($\lambda_c=1.7 \mu\text{m}$)	2.4 × 2.4	mm
		InGaAs ($\lambda_c=2.55 \mu\text{m}$)	$\phi 1.0$	

Absolute maximum ratings

Parameter	Symbol	Condition	Value	Unit
Reverse voltage	V _{R max}	InGaAs ($\lambda_c=1.7 \mu\text{m}$), T _a =25 °C	2	V
		InGaAs ($\lambda_c=2.55 \mu\text{m}$), T _a =25 °C	1	
Operating temperature	T _{opr}	No condensation*1	-20 to +70	°C
Storage temperature	T _{stg}	No condensation*1	-20 to +85	°C

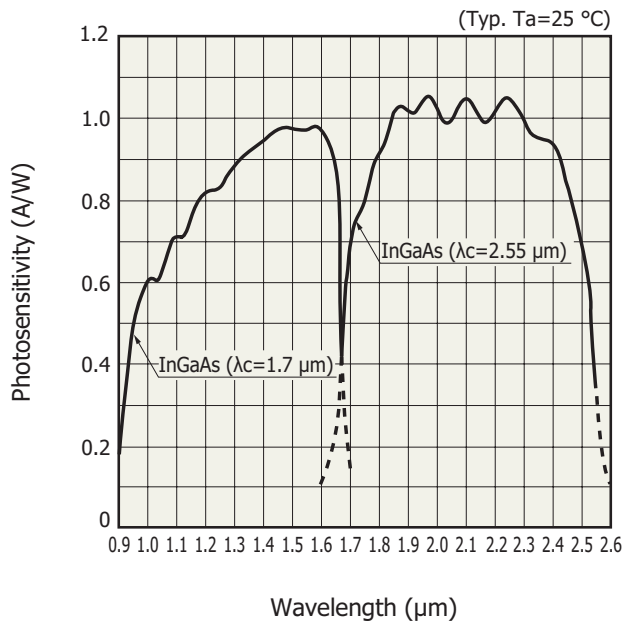
*1: When there is a temperature difference between a product and the surrounding area in high humidity environment, dew condensation may occur on the product surface. Dew condensation on the product may cause deterioration in characteristics and reliability.

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)

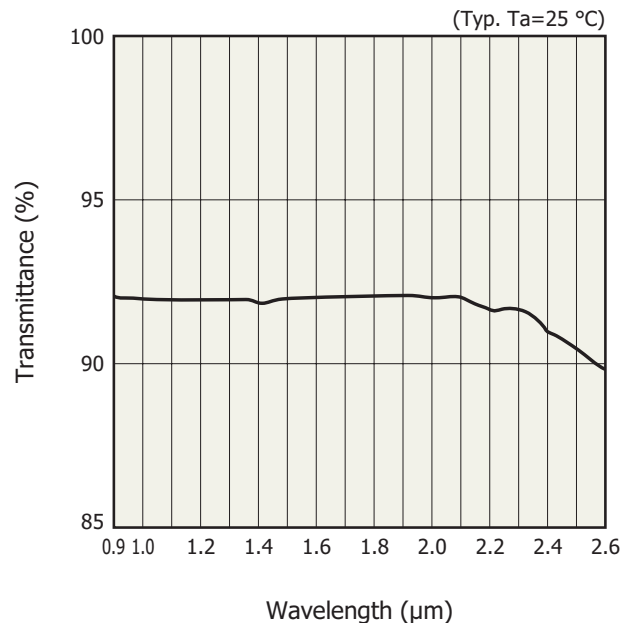
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Spectral response range	λ	InGaAs ($\lambda_c=1.7 \mu\text{m}$)	-	0.9 to 1.7	-	μm
		InGaAs ($\lambda_c=2.55 \mu\text{m}$)	-	1.7 to 2.55	-	
Peak sensitivity wavelength	λ_p	InGaAs ($\lambda_c=1.7 \mu\text{m}$)	-	1.55	-	μm
		InGaAs ($\lambda_c=2.55 \mu\text{m}$)	-	2.1	-	
Photosensitivity	S	InGaAs ($\lambda_c=1.7 \mu\text{m}$), $\lambda=\lambda_p$	0.85	0.95	-	A/W
		InGaAs ($\lambda_c=2.55 \mu\text{m}$), $\lambda=\lambda_p$	0.7	1.0	-	
Dark current	I _D	InGaAs ($\lambda_c=1.7 \mu\text{m}$), V _R =10 mV	-	1	10	nA
		InGaAs ($\lambda_c=2.55 \mu\text{m}$), V _R =10 mV	-	0.7	3.5	μA
Cutoff frequency	f _c	InGaAs ($\lambda_c=1.7 \mu\text{m}$), -3 dB V _R =0 V, R _L =50 Ω	1	2	-	MHz
		InGaAs ($\lambda_c=2.55 \mu\text{m}$), -3 dB V _R =0 V, R _L =50 Ω	2	6	-	
Terminal capacitance	C _t	InGaAs ($\lambda_c=1.7 \mu\text{m}$), V _R =0 V, f=1 MHz	-	1.5	2.5	nF
		InGaAs ($\lambda_c=2.55 \mu\text{m}$), V _R =0 V, f=1 MHz	-	0.5	1	
Shunt resistance	R _{sh}	InGaAs ($\lambda_c=1.7 \mu\text{m}$), V _R =10 mV	1	10	-	M Ω
		InGaAs ($\lambda_c=2.55 \mu\text{m}$), V _R =10 mV	2.8	14	-	k Ω
Detectivity	D*	InGaAs ($\lambda_c=1.7 \mu\text{m}$), $\lambda=\lambda_p$	1×10^{12}	5×10^{12}	-	cm $\cdot\text{Hz}^{1/2}/\text{W}$
		InGaAs ($\lambda_c=2.55 \mu\text{m}$), $\lambda=\lambda_p$	2×10^{10}	7×10^{10}	-	

Spectral response



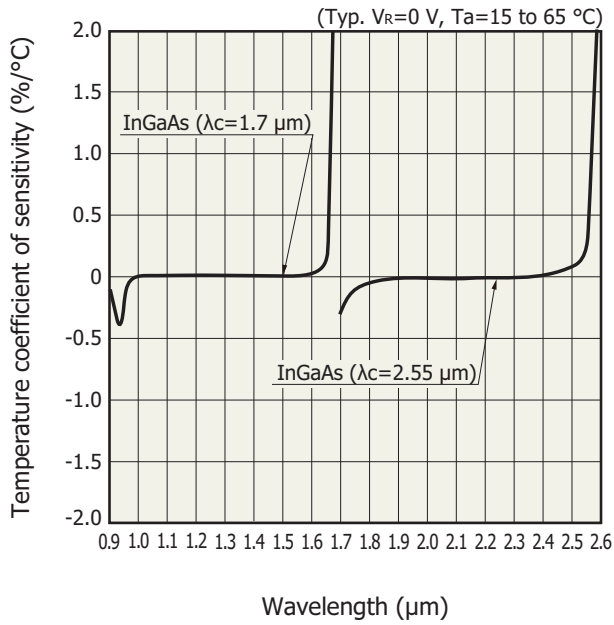
K1RD80479EB

Spectral transmittance of window material



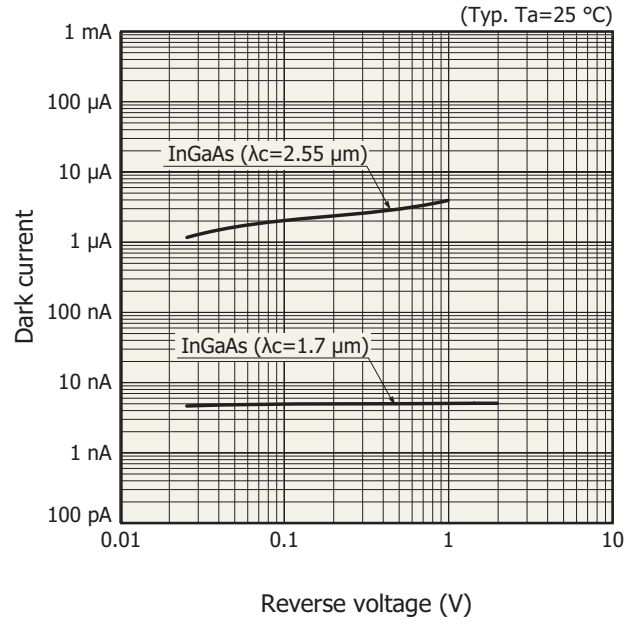
K1RD80606EB

Temperature characteristics of sensitivity



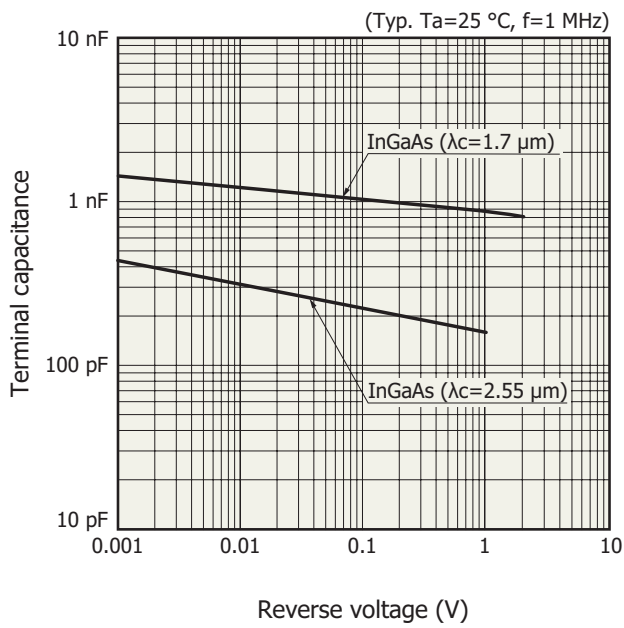
K1RDB0495EB

Dark current vs. reverse voltage



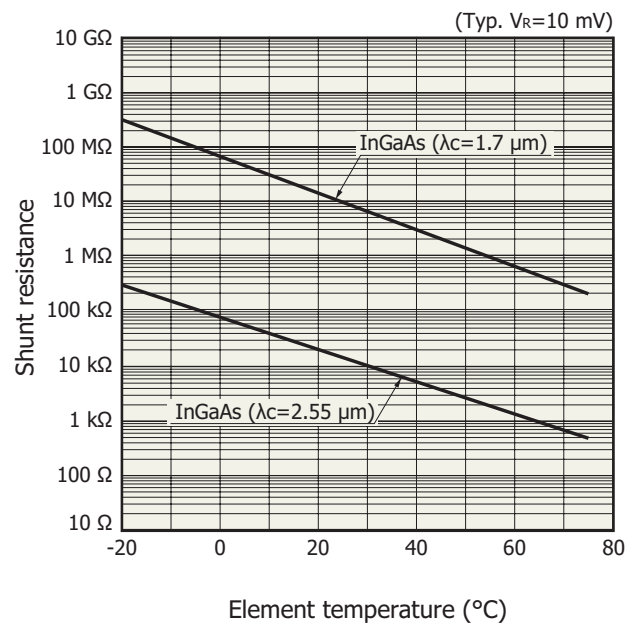
K1RDB0603EA

Terminal capacitance vs. reverse voltage



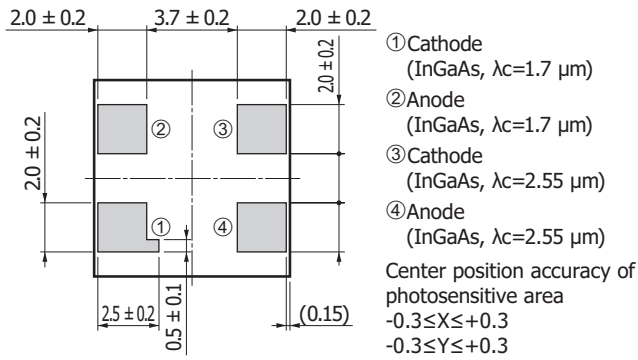
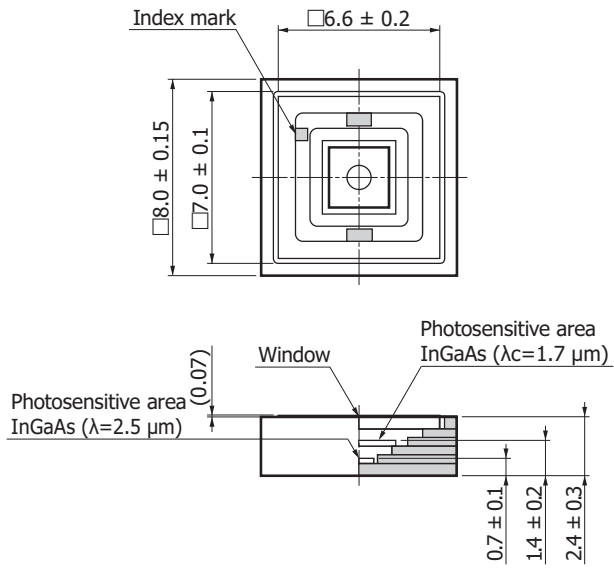
K1RDB0604EA

Shunt resistance vs. element temperature

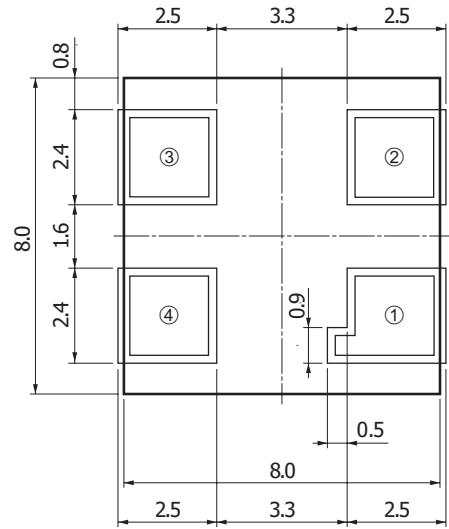


K1RDB0605EA

Dimensional outline (unit: mm)



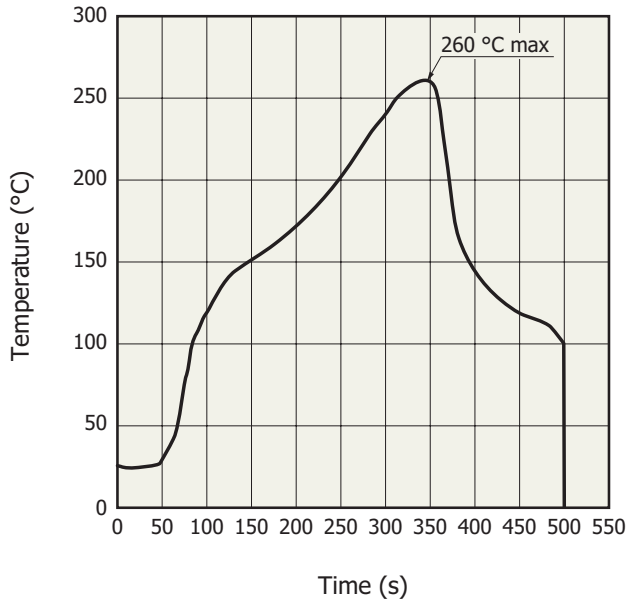
Recommended land mark pattern (unit: mm)



KIRDC0121EA

KIRDA0244EA

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



KIRDC0122EA

- 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

Information described in this material is current as of December 2017.

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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