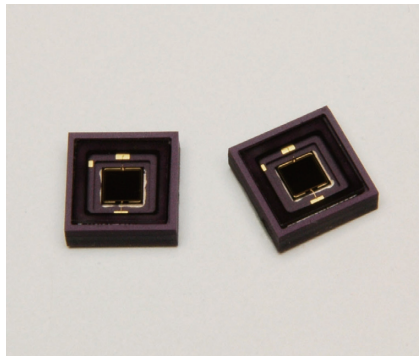


Two-color detector



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

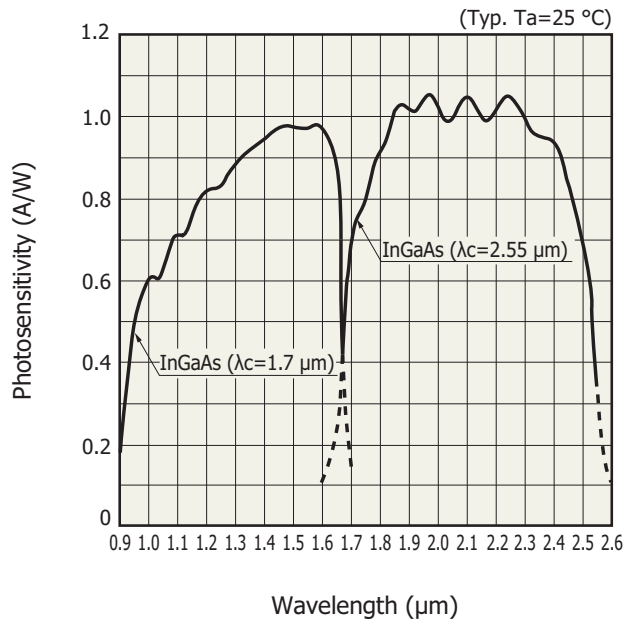
Parameter	Symbol	Condition	Value	Unit
Reverse voltage	$V_R \text{ max}$	InGaAs ($\lambda_c=1.7 \mu\text{m}$), $T_a=25 \text{ }^\circ\text{C}$	2	V
		InGaAs ($\lambda_c=2.55 \mu\text{m}$), $T_a=25 \text{ }^\circ\text{C}$	1	
Operating temperature	T_{opr}	No condensation	-20 to +70	$^\circ\text{C}$
Storage temperature	T_{stg}	No condensation	-20 to +85	$^\circ\text{C}$

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.

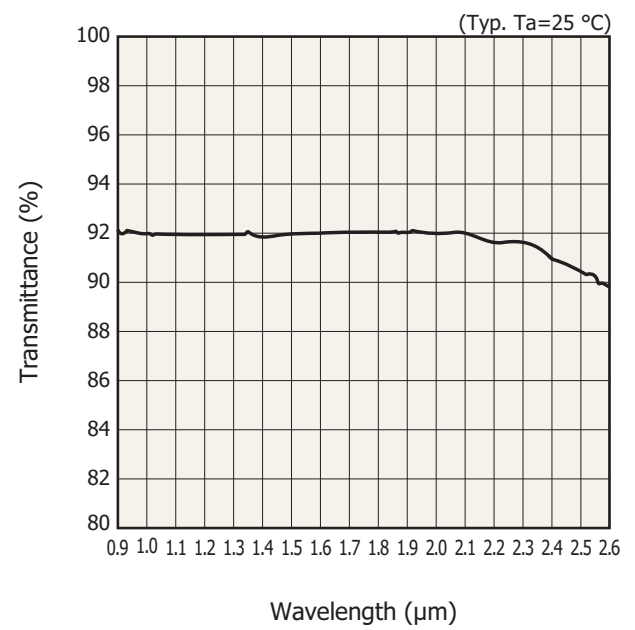
Electrical and optical characteristics ($T_a=25 \text{ }^\circ\text{C}$)

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 ($\lambda_c=1.7 \mu\text{m}$), $V_R=10 \text{ mV}$	-	1	10	nA
		InGaAs ($\lambda_c=2.55 \mu\text{m}$), $V_R=10 \text{ mV}$	-	0.7	3.5	μA
Cutoff frequency	f_c	InGaAs ($\lambda_c=1.7 \mu\text{m}$), -3 dB $V_R=0 \text{ V}$, $R_L=50 \Omega$	1	2	-	MHz
		InGaAs ($\lambda_c=2.55 \mu\text{m}$), -3 dB $V_R=0 \text{ V}$, $R_L=50 \Omega$	2	6	-	
Terminal capacitance	C_t	InGaAs ($\lambda_c=1.7 \mu\text{m}$), $V_R=0 \text{ V}$, $f=1 \text{ MHz}$	-	1.5	2.5	nF
		InGaAs ($\lambda_c=2.55 \mu\text{m}$), $V_R=0 \text{ V}$, $f=1 \text{ MHz}$	-	0.5	1	
Shunt resistance	Rsh	InGaAs ($\lambda_c=1.7 \mu\text{m}$), $V_R=10 \text{ mV}$	1	10	-	$\text{M}\Omega$
		InGaAs ($\lambda_c=2.55 \mu\text{m}$), $V_R=10 \text{ mV}$	2.8	14	-	k Ω
Detectivity	D^*	InGaAs ($\lambda_c=1.7 \mu\text{m}$), $\lambda=\lambda_p$	1×10^{12}	5×10^{12}	-	$\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$
		InGaAs ($\lambda_c=2.55 \mu\text{m}$), $\lambda=\lambda_p$	2×10^{10}	7×10^{10}	-	

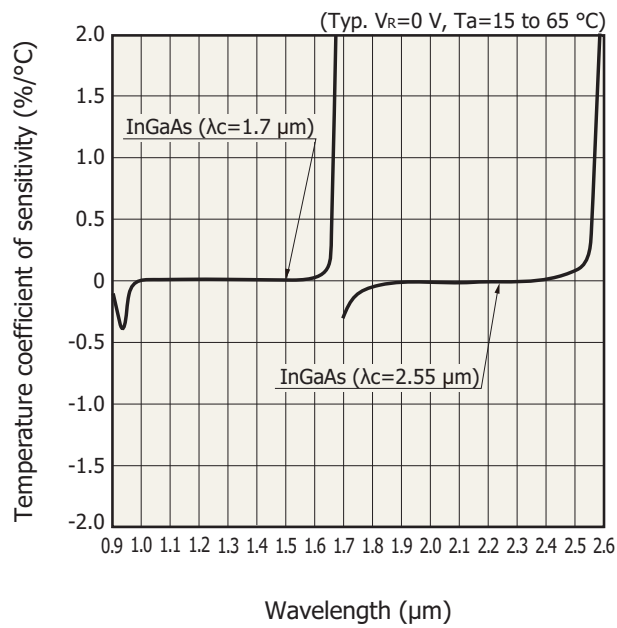
Spectral response



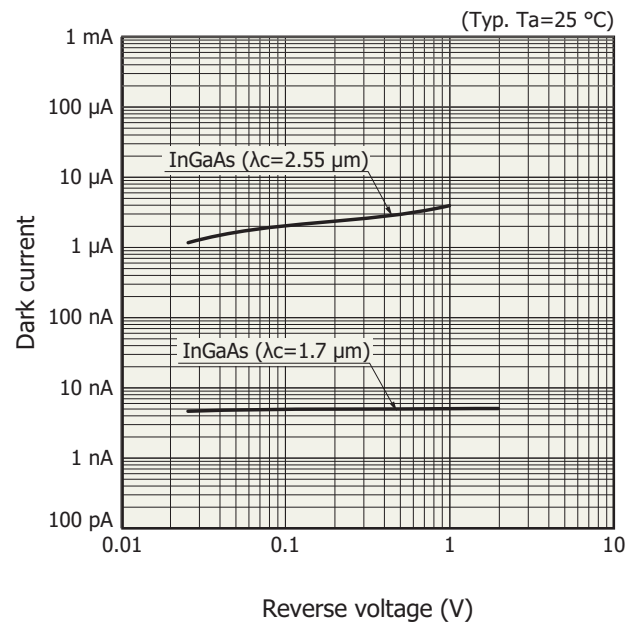
Spectral transmittance of window material



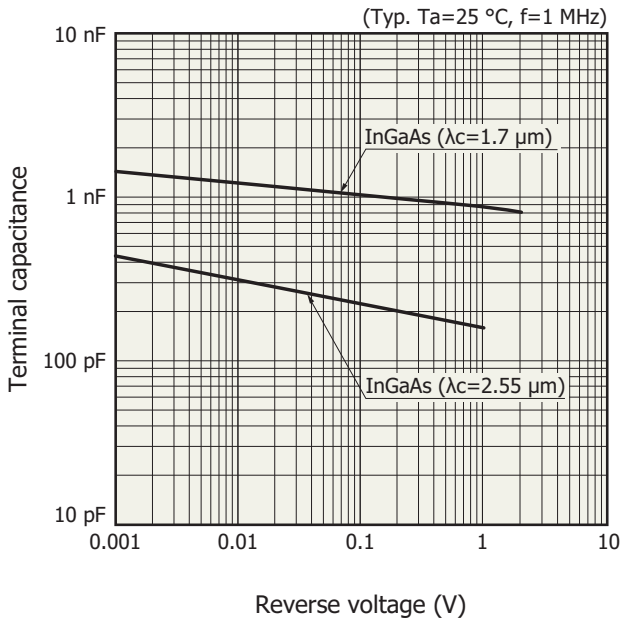
Temperature characteristics of sensitivity



Dark current vs. reverse voltage

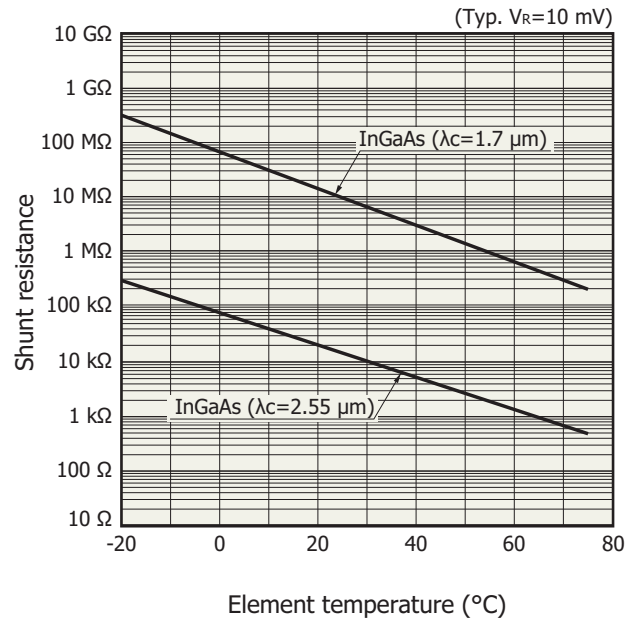


Terminal capacitance vs. reverse voltage



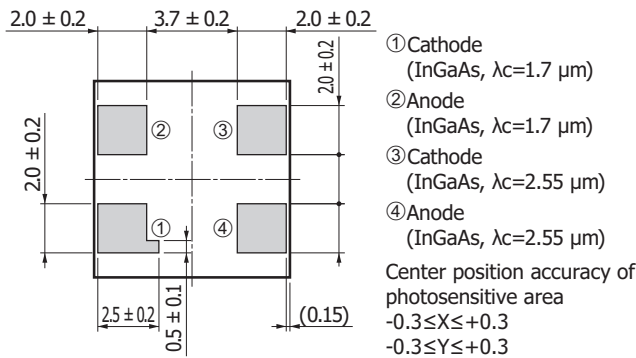
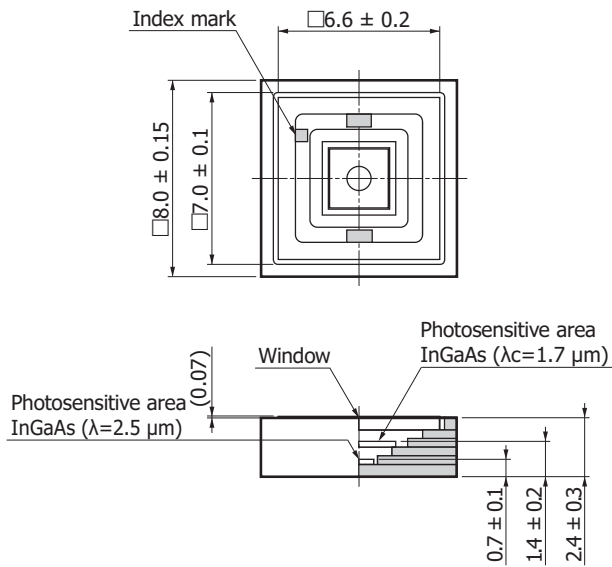
KIRD0604EA

Shunt resistance vs. element temperature



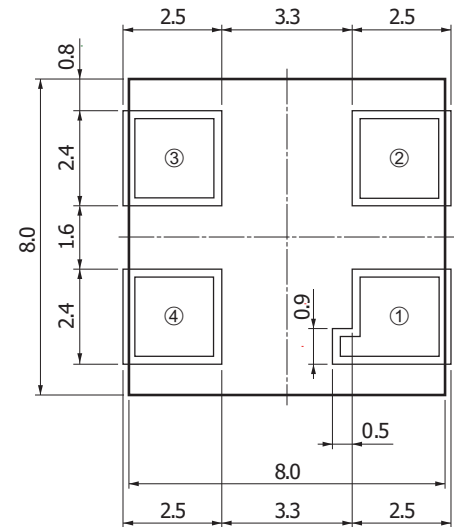
KIRD0605EA

Dimensional outline (unit: mm)

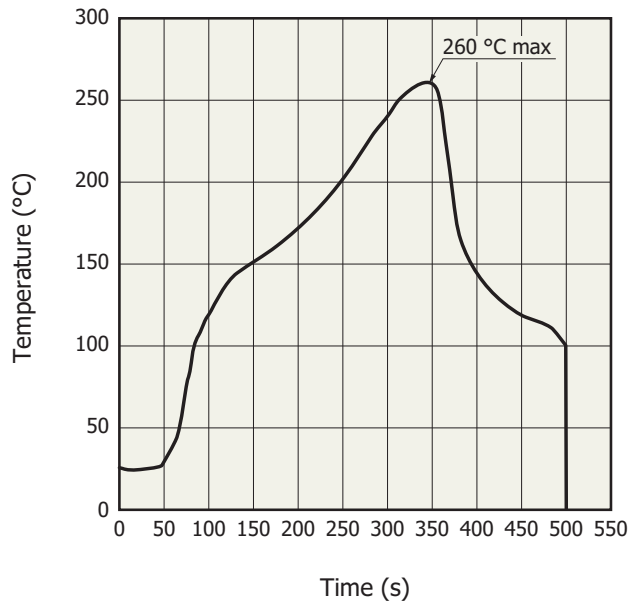


KIRDA0244EA

Recommended land mark pattern (unit: mm)



KIRD0121EA

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

K1RDC0122EA

- 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

Information described in this material is current as of August, 2014.

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