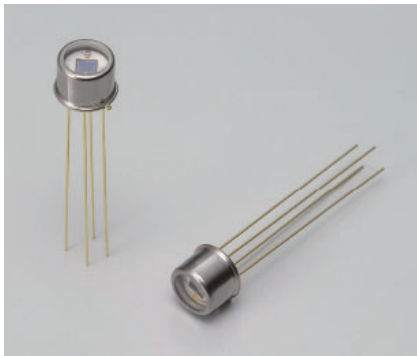


# Two-color detector

K11908-010K



**Two InGaAs PIN PD with different spectral response are arranged one above the other to cover a broad wavelength range**

The K11908-010K incorporates an InGaAs PIN photodiode (cutoff wavelength:  $\lambda_c=1.7 \mu\text{m}$ ) mounted over a long wavelength type InGaAs PIN photodiode ( $\lambda_c=2.55 \mu\text{m}$ ), along the same optical axis. The spectral response covered from  $0.9 \mu\text{m}$  to  $2.55 \mu\text{m}$  as wide range and delivers low noise.

## Features

- InGaAs ( $\lambda_c=1.7 \mu\text{m}$ ) mounted over InGaAs ( $\lambda_c=2.55 \mu\text{m}$ ) along the same optical axis
- Wide spectral response range: 0.9 to 2.55  $\mu\text{m}$
- Low noise, low dark current

## Applications

- Radiation thermometer
- Spectroscopy
- Optical measurement equipment

## Structure

Parameter	Symbol	Condition	Specification	Unit
Window material	-		Borosilicate glass	-
Package	-		4-pin TO-5	-
Photosensitive area	-	InGaAs ( $\lambda_c=1.7 \mu\text{m}$ )	$2.4 \times 2.4$	mm
		InGaAs ( $\lambda_c=2.55 \mu\text{m}$ )	$\phi 1.0$	

## Absolute maximum ratings

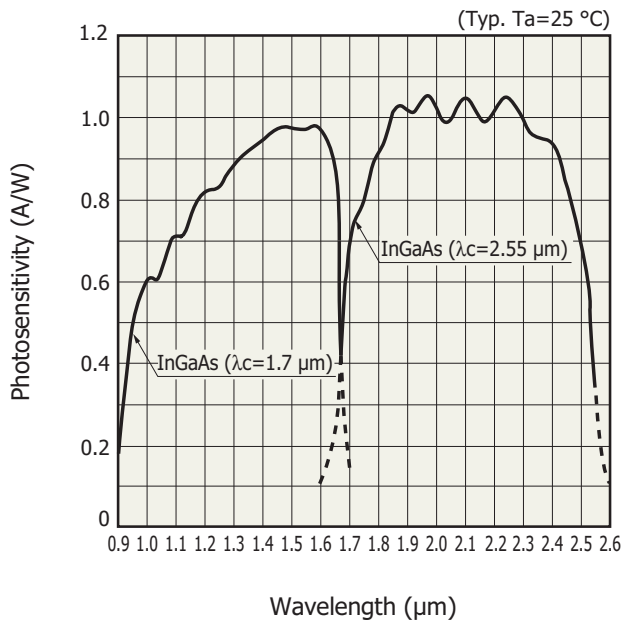
Parameter	Symbol	Condition	Value	Unit
Reverse voltage	$V_R \text{ max}$	InGaAs ( $\lambda_c=1.7 \mu\text{m}$ ), $T_a=25 \text{ }^\circ\text{C}$	2	V
		InGaAs ( $\lambda_c=2.55 \mu\text{m}$ ), $T_a=25 \text{ }^\circ\text{C}$	1	
Operating temperature	$T_{opr}$		-40 to +70	$^\circ\text{C}$
Storage temperature	$T_{stg}$		-55 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 (Ta=25 °C)**

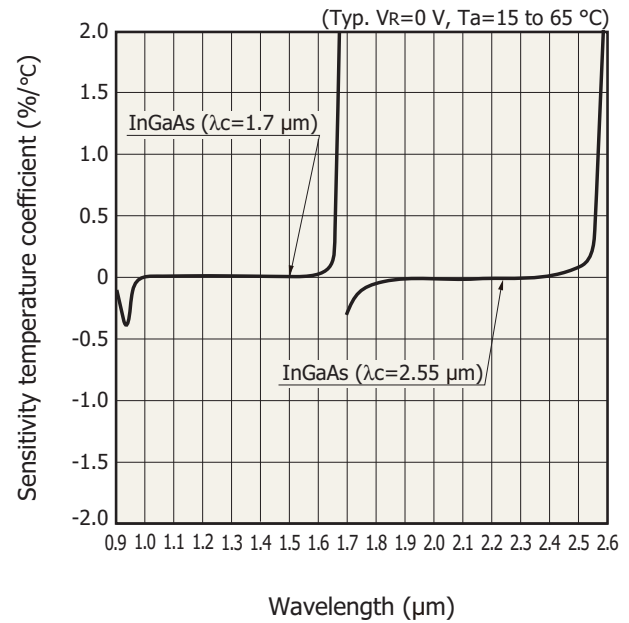
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Spectral response range	$\lambda$	InGaAs ( $\lambda_c=1.7 \mu\text{m}$ )	-	0.9 to 1.7	-	$\mu\text{m}$
		InGaAs ( $\lambda_c=2.55 \mu\text{m}$ )	-	1.7 to 2.55	-	
Peak sensitivity wavelength	$\lambda_p$	InGaAs ( $\lambda_c=1.7 \mu\text{m}$ )	-	1.55	-	$\mu\text{m}$
		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 <sub>D</sub>	InGaAs ( $\lambda_c=1.7 \mu\text{m}$ ), V <sub>R</sub> =1 V	-	5	40	nA
		InGaAs ( $\lambda_c=2.55 \mu\text{m}$ ), V <sub>R</sub> =0.5 V	-	3	30	$\mu\text{A}$
Cutoff frequency	f <sub>c</sub>	InGaAs ( $\lambda_c=1.7 \mu\text{m}$ ), -3 dB V <sub>R</sub> =0 V, R <sub>L</sub> =50 $\Omega$	1	2	-	MHz
		InGaAs ( $\lambda_c=2.55 \mu\text{m}$ ), -3 dB V <sub>R</sub> =0 V, R <sub>L</sub> =50 $\Omega$	2	6	-	
Terminal capacitance	C <sub>t</sub>	InGaAs ( $\lambda_c=1.7 \mu\text{m}$ ), V <sub>R</sub> =0 V f=1 MHz	-	1.5	2.5	nF
		InGaAs ( $\lambda_c=2.55 \mu\text{m}$ ), V <sub>R</sub> =0 V f=1 MHz	-	0.5	1	
Shunt resistance	R <sub>sh</sub>	InGaAs ( $\lambda_c=1.7 \mu\text{m}$ ), V <sub>R</sub> =10 mV	1	10	-	M $\Omega$
		InGaAs ( $\lambda_c=2.55 \mu\text{m}$ ), V <sub>R</sub> =10 mV	2.8	14	-	k $\Omega$
Detectivity	D*	InGaAs ( $\lambda_c=1.7 \mu\text{m}$ ), $\lambda=\lambda_p$	$1 \times 10^{12}$	$5 \times 10^{12}$	-	cm $\cdot\text{Hz}^{1/2}/\text{W}$
		InGaAs ( $\lambda_c=2.55 \mu\text{m}$ ), $\lambda=\lambda_p$	$2 \times 10^{10}$	$7 \times 10^{10}$	-	

**Spectral response**



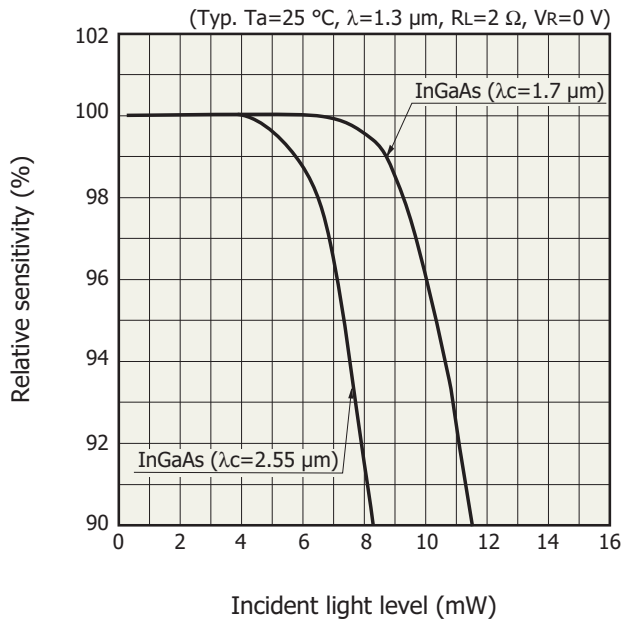
KIRDB0479EA

**Sensitivity temperature characteristic**

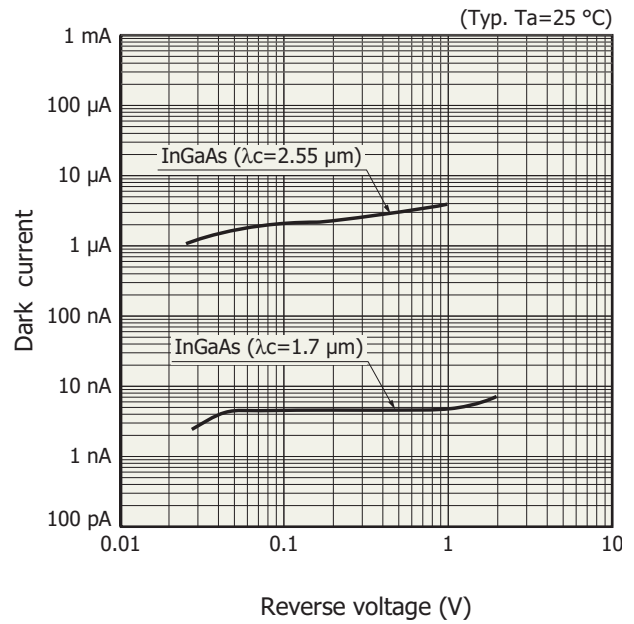


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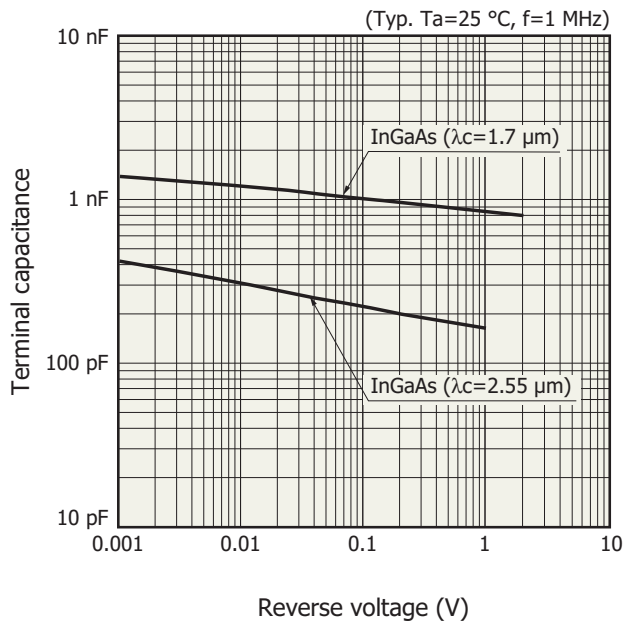
**Linearity**



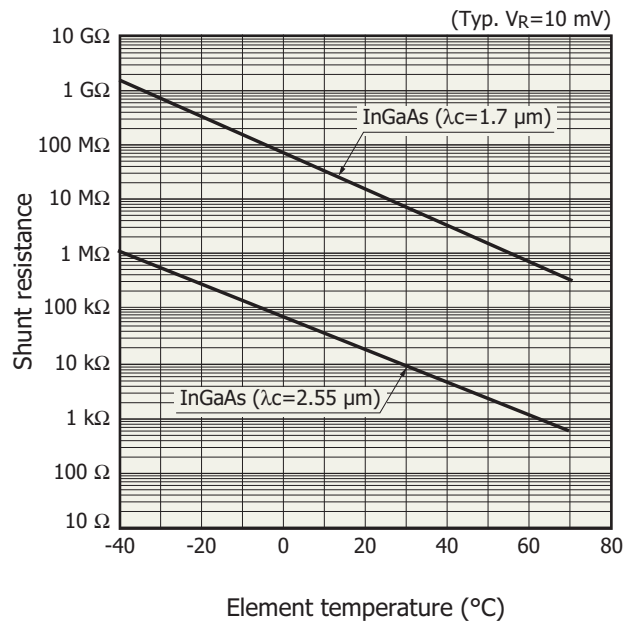
**Dark current vs. reverse voltage**



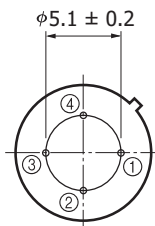
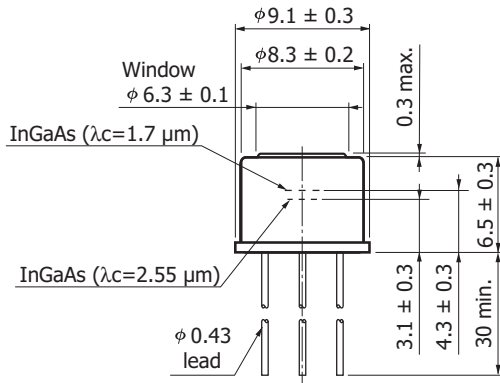
**Terminal capacitance vs. reverse voltage**



**Shunt resistance vs. element temperature**



**Dimensional outline (unit: mm)**



- ① InGaAs ( $\lambda_c=1.7 \mu\text{m}$ ) cathode
- ② InGaAs ( $\lambda_c=1.7 \mu\text{m}$ ) anode
- ③ InGaAs ( $\lambda_c=2.55 \mu\text{m}$ ) cathode
- ④ InGaAs ( $\lambda_c=2.55 \mu\text{m}$ ) anode

KIRDA0218EA

Information described in this material is current as of May, 2012.

Product specifications are subject to change without prior notice due to improvements or other reasons. Before assembly into final products, please contact us for the delivery specification sheet to check the latest information.

The product warranty is valid for one year after delivery and is limited to product repair or replacement for defects discovered and reported to us within that one year period. However, even if within the warranty period we accept absolutely no liability for any loss caused by natural disasters or improper product use.

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