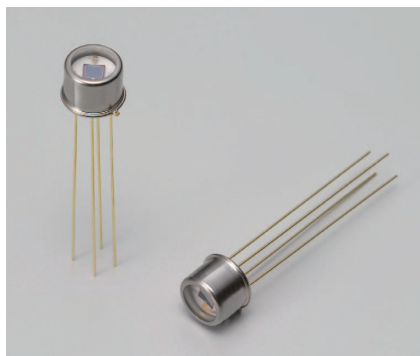


Two-color detector

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 ($\lambda_c=1.7 \mu\text{m}$)	2.4×2.4	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 dew condensation*1	-40 to +70	$^\circ\text{C}$
Storage temperature	T_{stg}	No dew condensation*1	-55 to +85	$^\circ\text{C}$

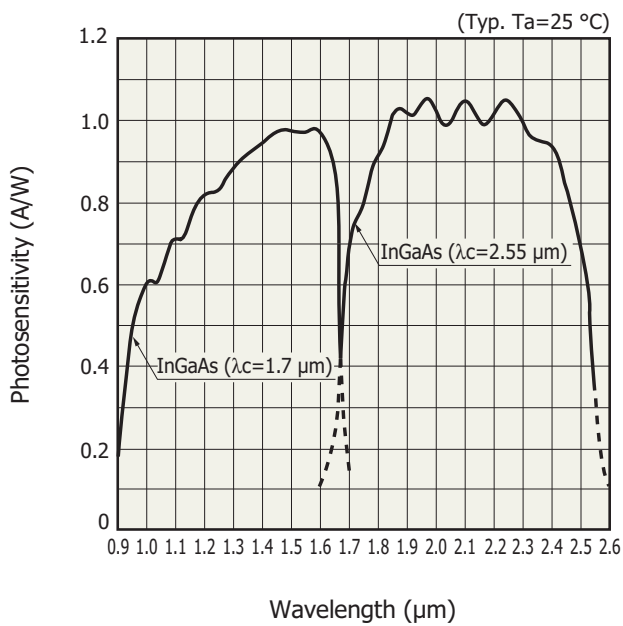
*1: When there is a temperature difference between a product and the surrounding area in high humidity environment, dew condensation may occur on the product surface. Dew condensation on the product may cause deterioration in characteristics and reliability.

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)

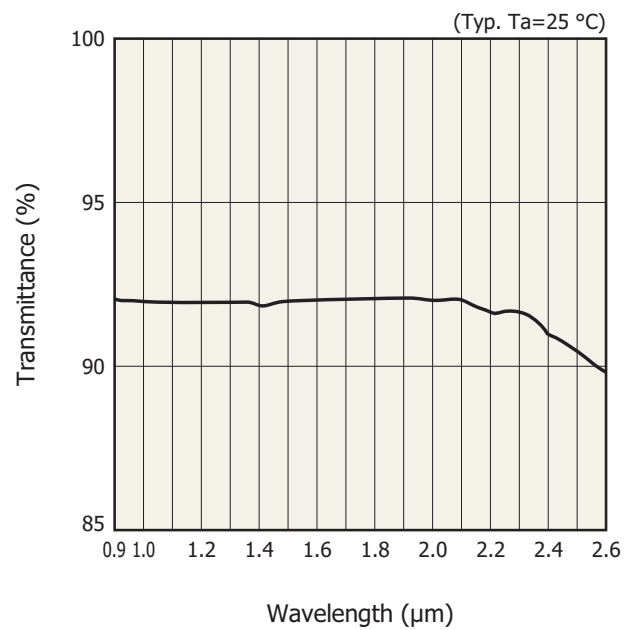
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Spectral response range	λ	InGaAs ($\lambda_c=1.7 \mu\text{m}$)	-	0.9 to 1.7	-	μm
		InGaAs ($\lambda_c=2.55 \mu\text{m}$)	-	1.7 to 2.55	-	
Peak sensitivity wavelength	λ_p	InGaAs ($\lambda_c=1.7 \mu\text{m}$)	-	1.55	-	μm
		InGaAs ($\lambda_c=2.55 \mu\text{m}$)	-	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 ($\lambda_c=1.7 \mu\text{m}$), $V_R=1 \text{ V}$	-	5	40	nA
		InGaAs ($\lambda_c=2.55 \mu\text{m}$), $V_R=0.5 \text{ V}$	-	3	30	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	-	$\text{k}\Omega$
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



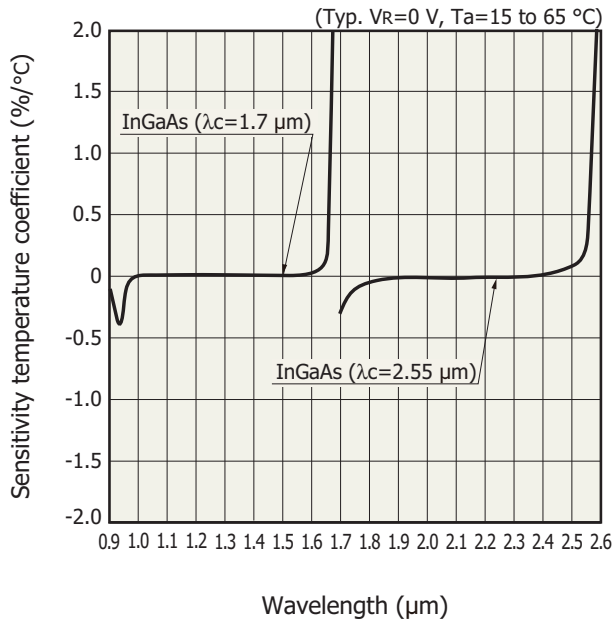
K1RD80479EA

Spectral transmittance characteristics of window material

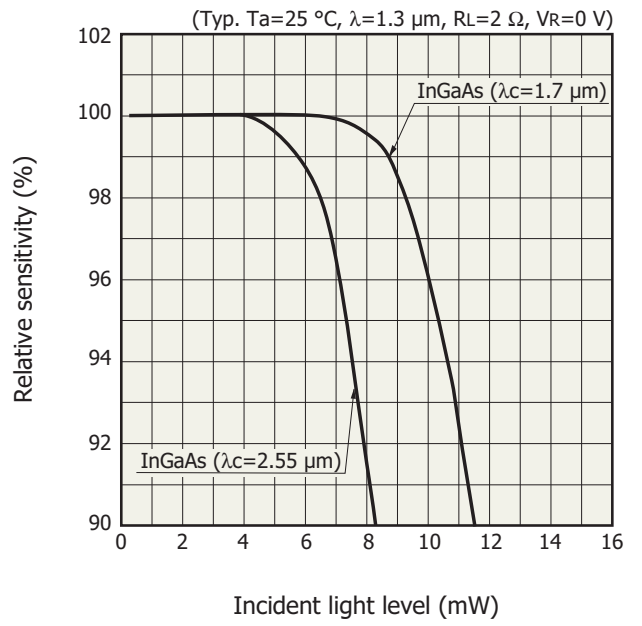


K1RD80606EB

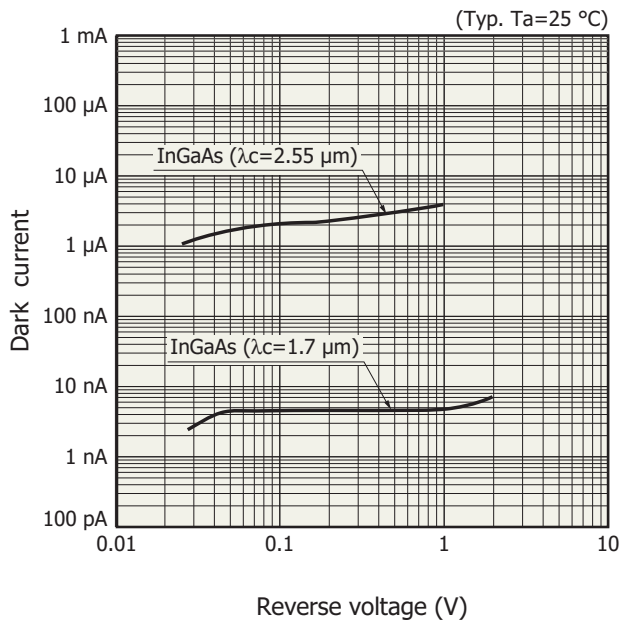
Sensitivity temperature characteristic



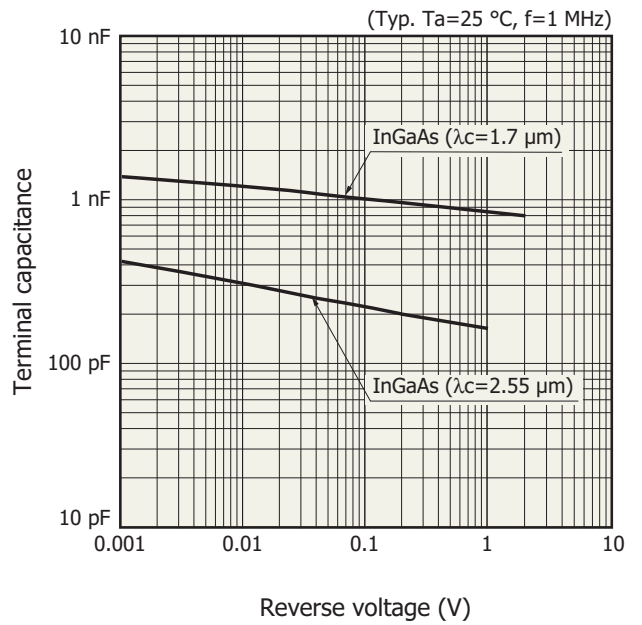
Linearity



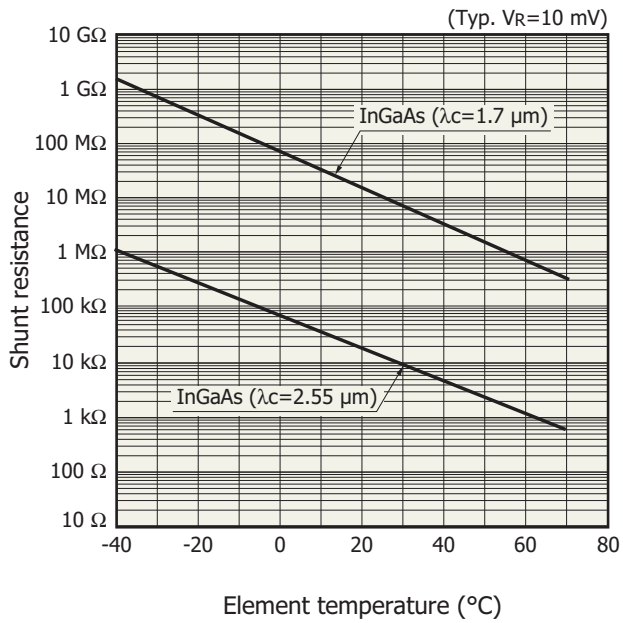
Dark current vs. reverse voltage



Terminal capacitance vs. reverse voltage

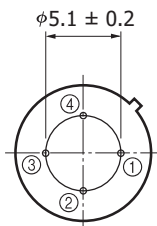
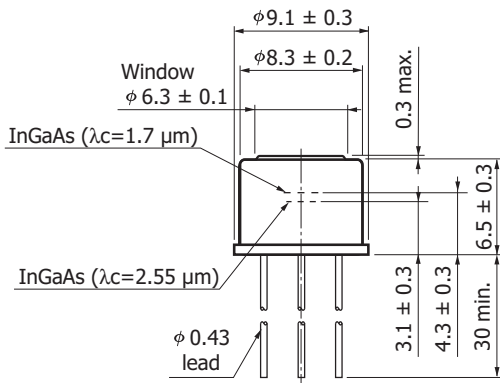


Shunt resistance vs. element temperature



KIRD80482EA

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

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.

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. Copying or reprinting the contents described in this material in whole or in part is prohibited without our prior permission.

HAMAMATSU

www.hamamatsu.com

HAMAMATSU PHOTONICS K.K., Solid State Division

1126-1 Ichino-cho, Higashi-ku, Hamamatsu City, 435-8558 Japan, Telephone: (81) 53-434-3311, Fax: (81) 53-434-5184

U.S.A.: Hamamatsu Corporation: 360 Foothill Road, Bridgewater, N.J. 08807, U.S.A., Telephone: (1) 908-231-0960, Fax: (1) 908-231-1218, E-mail: usa@hamamatsu.com

Germany: Hamamatsu Photonics Deutschland GmbH: Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49) 8152-375-0, Fax: (49) 8152-265-8, E-mail: info@hamamatsu.de

France: Hamamatsu Photonics France S.A.R.L.: 19, Rue du Saule Trapu, Parc du Moulin de Massy, 91882 Massy Cedex, France, Telephone: 33-(1) 69 53 71 00, Fax: 33-(1) 69 53 71 10, E-mail: infos@hamamatsu.fr

United Kingdom: Hamamatsu Photonics UK Limited: 2 Howard Court, 10 Tewin Road, Welwyn Garden City, Hertfordshire AL7 1BW, United Kingdom, Telephone: (44) 1707-294888, Fax: (44) 1707-325777, E-mail: info@hamamatsu.co.uk

North Europe: Hamamatsu Photonics Norden AB: Torshamnsgatan 35 16440 Kista, Sweden, Telephone: (46)8-509 031 00, Fax: (46)8-509 031 01, E-mail: info@hamamatsu.se

Italy: Hamamatsu Photonics Italia S.r.l.: Strada della Moia, 1 int. 6, 20020 Arese (Milano), Italy, Telephone: (39)02-93 58 17 33, Fax: (39)02-93 58 17 41, E-mail: info@hamamatsu.it

China: Hamamatsu Photonics (China) Co., Ltd.: B1201, Jiaming Center, No.27 Dongsanhuan Beilu, Chaoyang District, Beijing 100020, China, Telephone: (86) 10-6586-6006, Fax: (86) 10-6586-2866, E-mail: hpc@hamamatsu.com.cn

Taiwan: Hamamatsu Photonics Taiwan Co., Ltd.: 8F-3, No. 158, Section2, Gongdao 5th Road, East District, Hsinchu, 300, Taiwan R.O.C. Telephone: (886)03-659-0080, Fax: (886)03-659-0081, E-mail: info@hamamatsu.com.tw