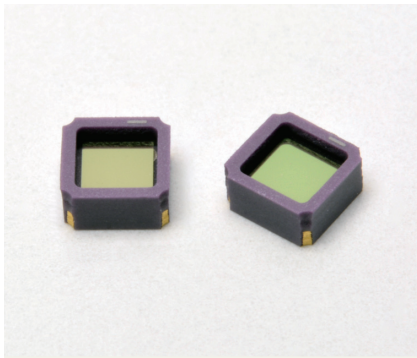


InAsSb photovoltaic detector



P16612-011CA

Back-illuminated type infrared detector up to 5 μm band

The P16612-011CA is an infrared detector that has high sensitivity in the spectral band up to 5 μm . This high sensitivity has been achieved due to Hamamatsu's unique crystal growth technology and process technology. By using a back-illuminated structure, we greatly improved the sensitivity temperature coefficient compared to the front-illuminated type (P13243-013CA). This product is an environmentally friendly infrared detector and does not use lead, mercury, or cadmium, which are substances restricted by the RoHS directive. It is a replacement for conventional products that contain these substances.

Features

- High sensitivity
- High-speed response
- High shunt resistance
- Compact, surface mount type ceramic package
- Compatible with lead-free solder reflow
- RoHS compliant (lead, mercury, cadmium free)

Applications

- Gas detection (CH₄, CO₂, CO, etc.)
- Radiation thermometers
- Flame detection (CO₂ resonance radiation)

Option (sold separately)

- Amplifier for infrared detector **C4159-01**

Structure

Parameter	Specification	Unit
Window material	Si with AR coating	-
Package	Ceramic	-
Photosensitive area	0.7 × 0.7	mm
Field of view	86	degree

Absolute maximum rating

Parameter	Symbol	Value	Unit
Reverse voltage	VR	1	V
Operating temperature*1	T _{opr}	-40 to +85	°C
Storage temperature*1	T _{stg}	-40 to +85	°C
Soldering temperature	T _{sol}	240 (once)*2	°C

*1: No dew condensation

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

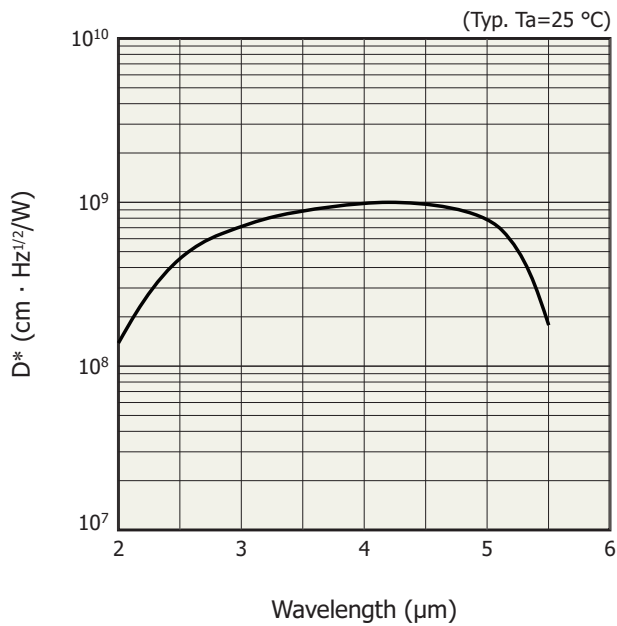
*2: Reflow soldering, JEDEC J-STD-020 MLS 2, see P.5

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)

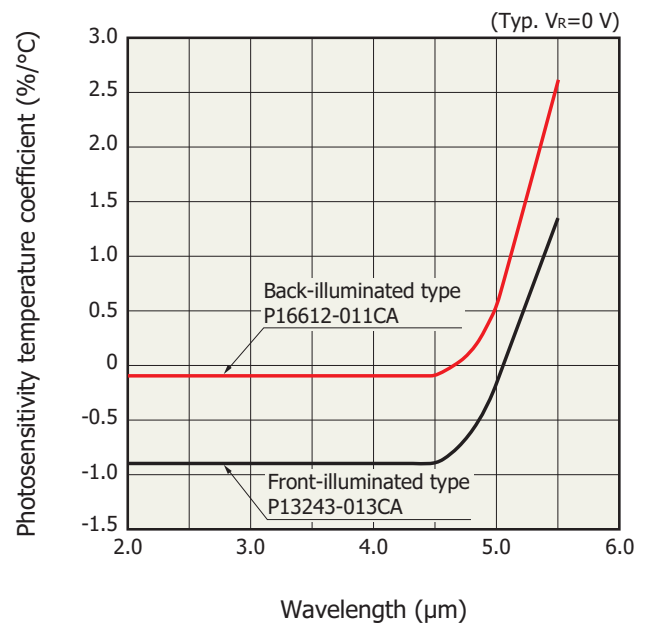
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Peak sensitivity wavelength	λ_p		-	4.1	-	μm
Cutoff wavelength	λ_c		5	5.3	-	μm
Photosensitivity	S	$\lambda=\lambda_p$	3.5	4.5	-	mA/W
Shunt resistance	Rsh	$V_R=10\text{ mV}$	80	180	-	$\text{k}\Omega$
Terminal capacitance	Ct	$V_R=0\text{ V}, f=1\text{ MHz}$	-	0.5	-	pF
Detectivity	D^*	$(\lambda_p, 1200, 1)$	7.4×10^8	1.0×10^9	-	$\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$
Noise equivalent power	NEP	$\lambda=\lambda_p$	-	4.3×10^{-11}	6.5×10^{-11}	$\text{W}/\text{Hz}^{1/2}$
Rise time	tr	$V_R=0\text{ V}, R_L=50\ \Omega,$ 10 to 90%	-	15	25	ns

Spectral response (D^*)



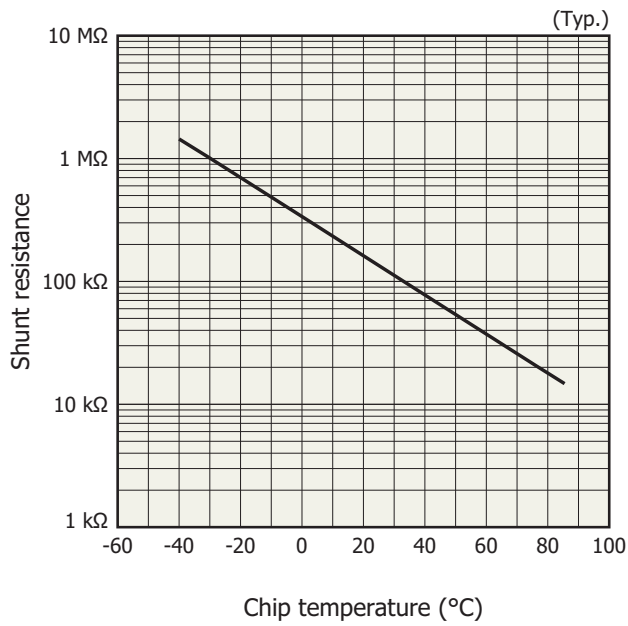
KIRD80715EA

Photosensitivity temperature characteristics



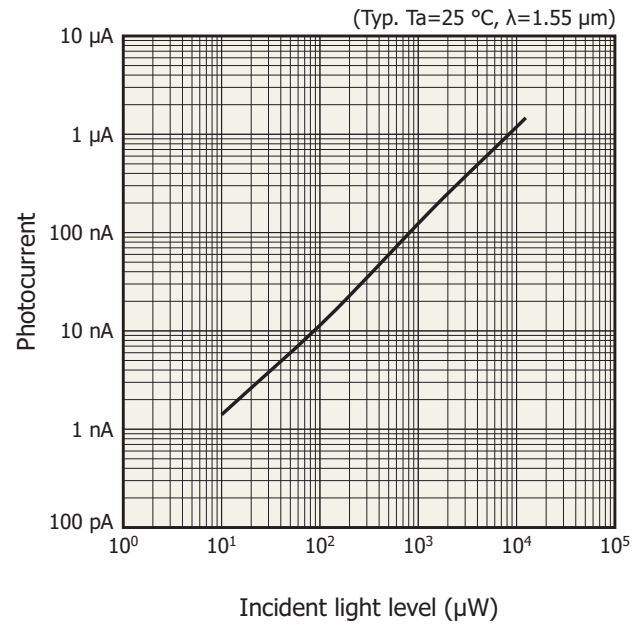
KIRD80716EA

Shunt resistance vs. chip temperature



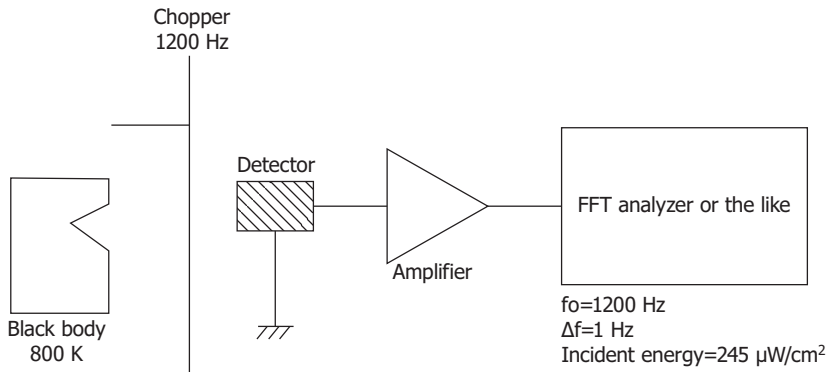
KIRD80717EA

Linearity



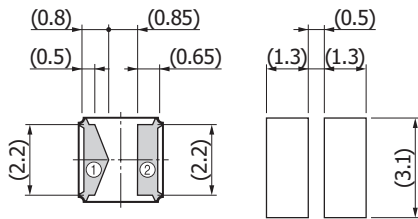
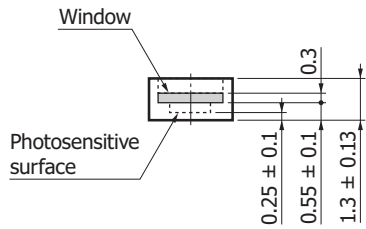
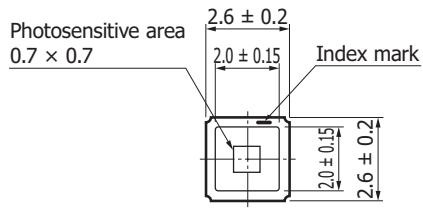
KIRD80718EA

Block diagram for characteristic measurement



KIRDC0125EA

Dimensional outline (unit: mm)



① ○ ▶ ○ ② Recommended land pattern
 Values in parentheses indicate reference values

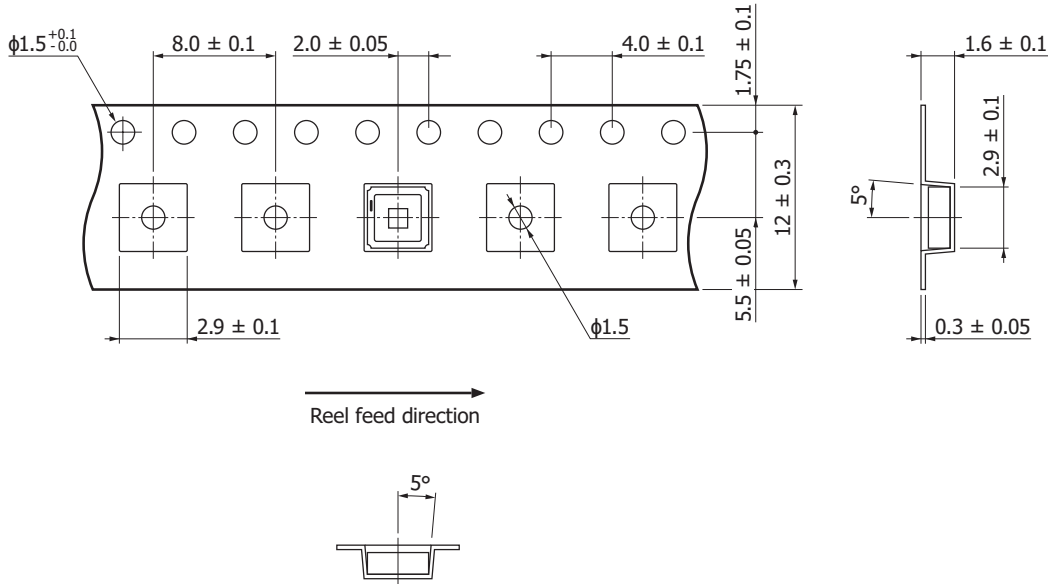
KTRDA0281EA

Standard packing specifications

■ Reel (conforms to JEITA ET-7200)

Outer diameter	Hub diameter	Tape width	Material	Electrostatic characteristics
φ180 mm	φ60 mm	12 mm	PS	Conductive

■ Embossed tape (unit: mm, material: PS, conductive)



KLEDC0143EA

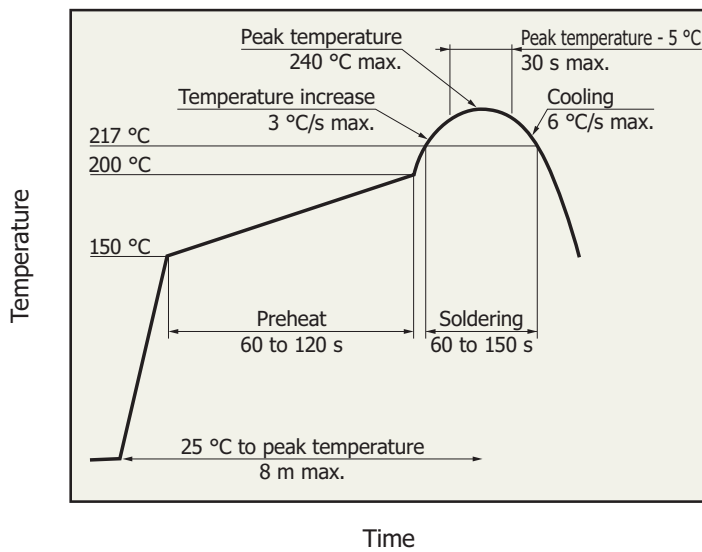
■ Packing quantity

500 pcs/reel

■ Packing state

Reel and desiccant in moisture-proof packaging (vacuum-sealed)

Recommended reflow soldering conditions

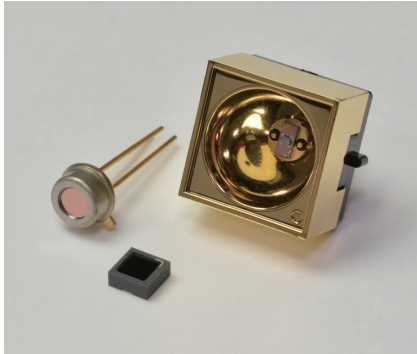


KSPD0418EA

- After unpacking, keep it in an environment at 5 to 30 °C and a humidity of 60% or less, and perform soldering within 1 year.
- The effect that the product receives during reflow soldering varies depending on the circuit board and reflow oven that are used. When you set reflow soldering conditions, check that problems do not occur in the product by testing out the conditions in advance.

Related products

Mid infrared LEDs L15893/L15894/L15895 series



Hamamatsu's unique crystal growth and process technologies enable mid infrared LEDs with peak emission wavelengths of 3.3 μm , 3.9 μm , and 4.3 μm .

Type no.	Package
L15893-0330C, L15894-0390C, L15895-0430C	Ceramic
L15893-0330M, L15894-0390M, L15895-0430M	TO-46
L15893-0330ML, L15894-0390ML, L15895-0430ML	TO-46 with reflector

Related information

www.hamamatsu.com/sp/ssd/doc_en.html

Precautions

- Disclaimer
- Compound opto-semiconductors (photosensors, light emitters)

Technical information

- Compound semiconductor photosensors / Technical note

The content of this document is current as of December 2021.

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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, 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, UK, 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, 20044 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.: 1201 Tower B, Jiaming Center, 27 Dongsanhuan Beilu, Chaoyang District, 100020 Beijing, P.R.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)3-659-0080, Fax: (886)3-659-0081, E-mail: info@hamamatsu.com.tw