

InAsSb photovoltaic detector

P16112-011MA

P16612-011CA/CN

P16849-013CN

High sensitivity and high-speed IR detectors (up to 5 μm band)

These are infrared detectors that have 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. Windowless types that customers can attach a filter on are also available. These products are environmentally friendly infrared detectors and do not use lead, mercury, or cadmium, which are substances restricted by the RoHS directive. These products replace conventional products containing 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 (CH_4 , CO_2 , CO , etc.)
- Radiation thermometers
- Flame detection (CO_2 resonance radiation)

Structure

Type no.	Number of elements	Photosensitive area (mm)	Window material	Package	Cooling	Field of view FOV (degrees)
P16112-011MA	1	0.7 × 0.7	Si with AR coating	TO-46	Non-cooled	87
P16612-011CA				Ceramic		86
P16612-011CN			None			86
P16849-013CN	2					86

Absolute maximum ratings ($T_a=25\text{ }^\circ\text{C}$, unless otherwise noted)

Type no.	Reverse voltage V_R (V)	Operating temperature*1 T_{opr} ($^\circ\text{C}$)	Storage temperature*1 T_{stg} ($^\circ\text{C}$)	Incident light level (W/mm^2)	Soldering temperature T_{sol} ($^\circ\text{C}$)
P16112-011MA	1	-40 to +85	-40 to +85	1	-
P16612-011CA					240 (twice)*2
P16612-011CN					
P16849-013CN					

*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.

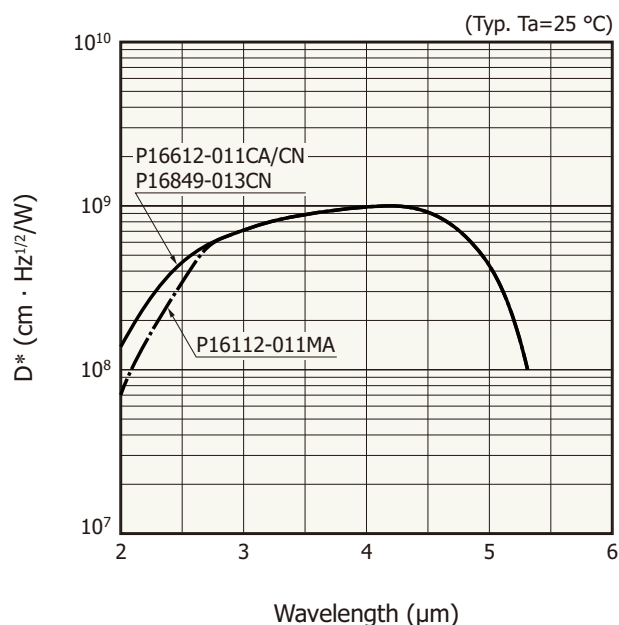
*2: Reflow soldering, JEDEC J-STD-020 MLS 2, see P.7

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)

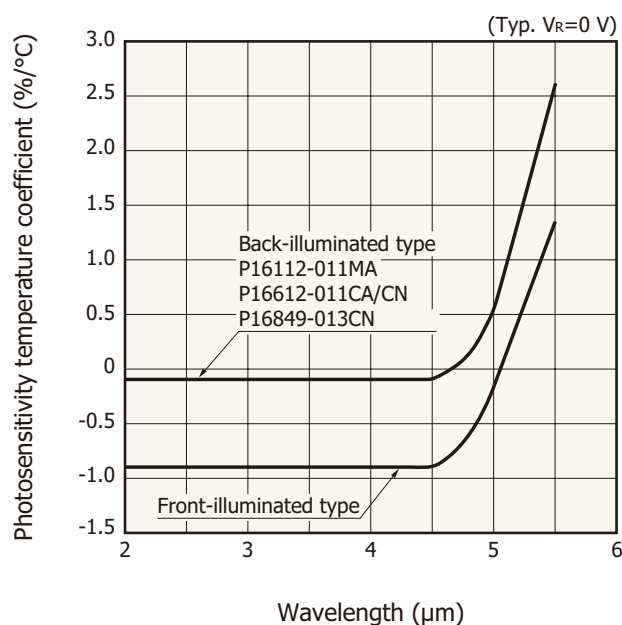
Type no.	Peak sensitivity wavelength λ_p (μm)	Cutoff wavelength λ_c (μm)	Photosensitivity S $\lambda=\lambda_p$ (mA/W)	Shunt resistance R_{sh} $V_R=10\text{ mV}$ (k Ω)	Detectivity D^* ($\lambda_p, 1200, 1$)		Noise equivalent power NEP $\lambda=\lambda_p$		Rise time t_r $V_R=0\text{ V}$ $R_L=50\text{ }\Omega$ 10 to 90% (ns)	Terminal capacitance C_t $V_R=0\text{ V}$ $f=1\text{ MHz}$ (pF)
					Min. ($\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$)	Typ. ($\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$)	Typ. ($\text{W}/\text{Hz}^{1/2}$)	Max. ($\text{W}/\text{Hz}^{1/2}$)		
P16112-011MA	4.1	5.3	4.5	180	7.4×10^8	1.0×10^9	4.3×10^{-11}	6.5×10^{-11}	15	0.5
P16612-011CA										
P16612-011CN										
P16849-013CN										

Spectral response (D^*)



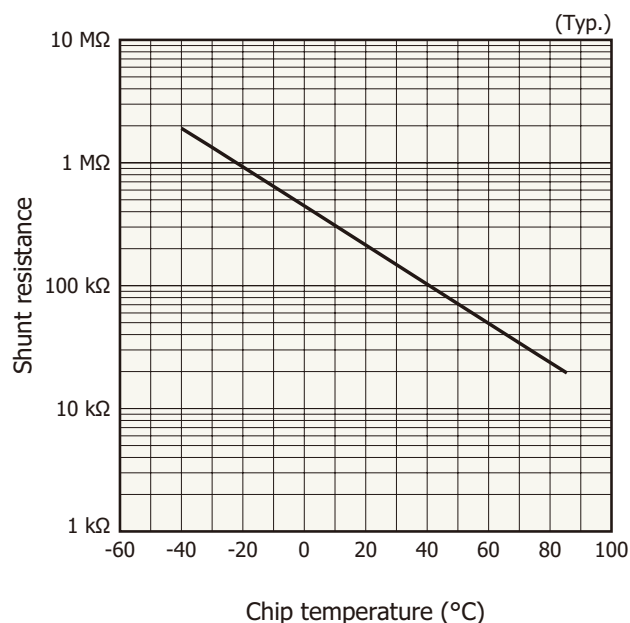
KIRD80715EC

Photosensitivity temperature characteristics



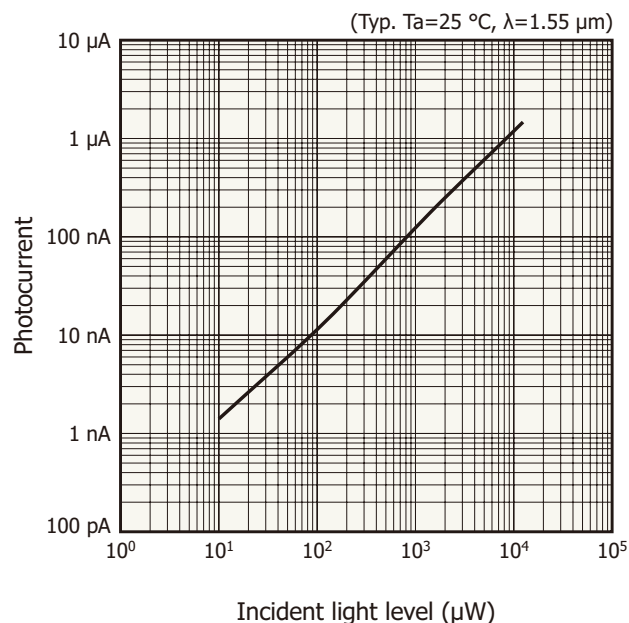
KIRD80716EB

Shunt resistance vs. chip temperature



KIRD80717EB

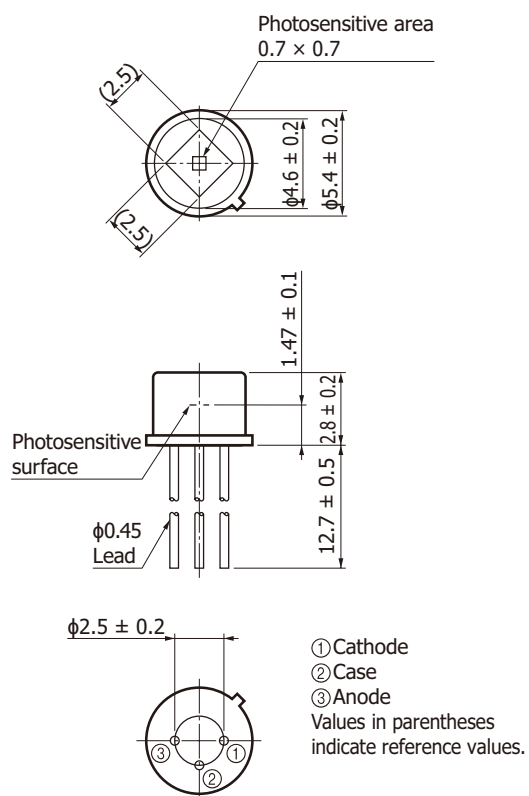
Linearity



KIRD80718EA

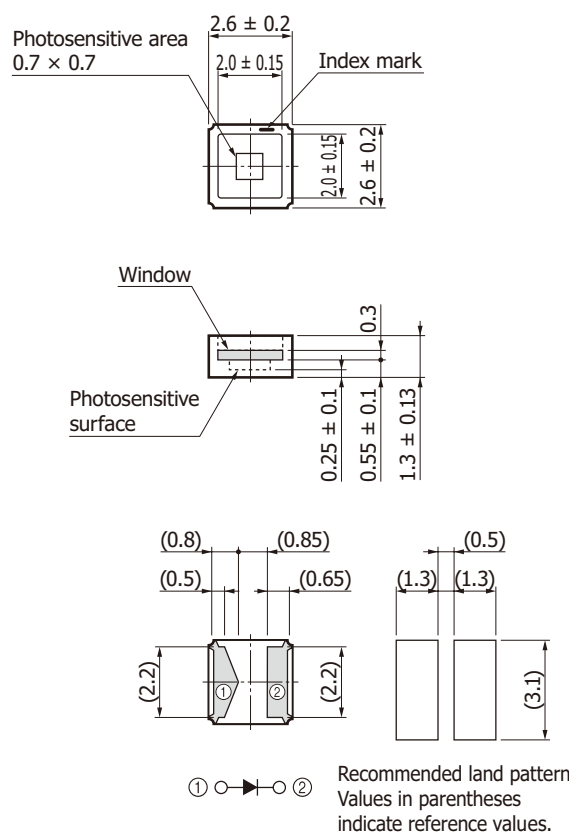
Dimensional outline (unit: mm)

P16112-011MA



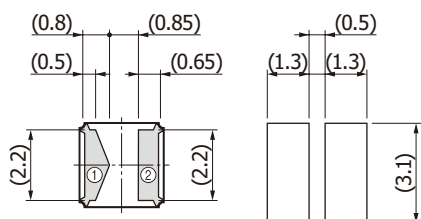
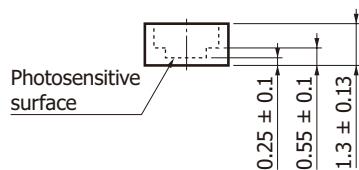
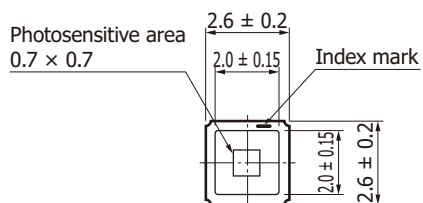
KIRDA0284EB

P16612-011CA



KIRDA0281EA

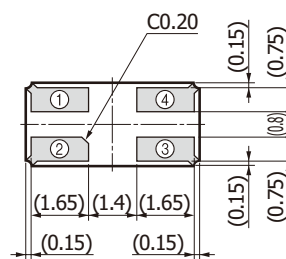
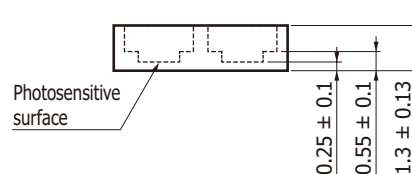
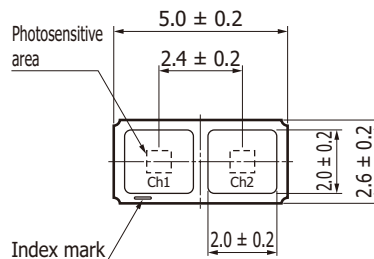
P16612-011CN



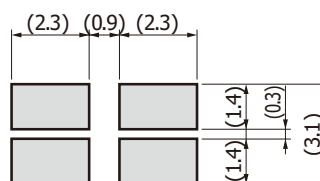
Recommended land pattern
Values in parentheses
indicate reference values.

KIRDA0285EB

P16849-013CN



- ① Cathode (Ch1)
 - ② Anode (Ch1)
 - ③ Anode (Ch2)
 - ④ Cathode (Ch2)
- Values in parentheses
indicate reference values.



Recommended land pattern

KIRDA0286EA

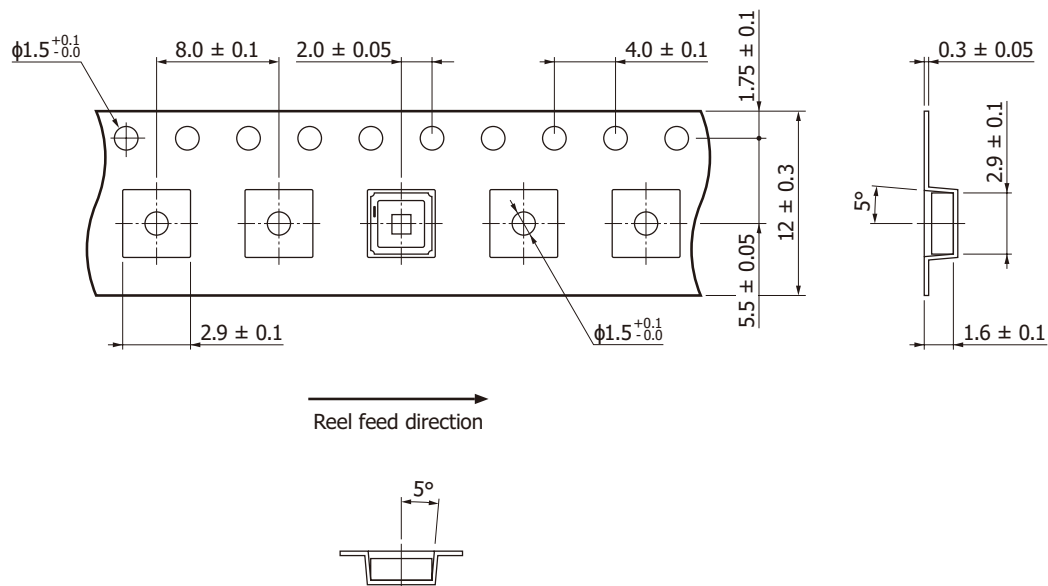
Standard packing specifications

P16612-011CA/CN

■ 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)



KLED00143EB

■ Packing quantity

500 pcs/reel

■ Packing state

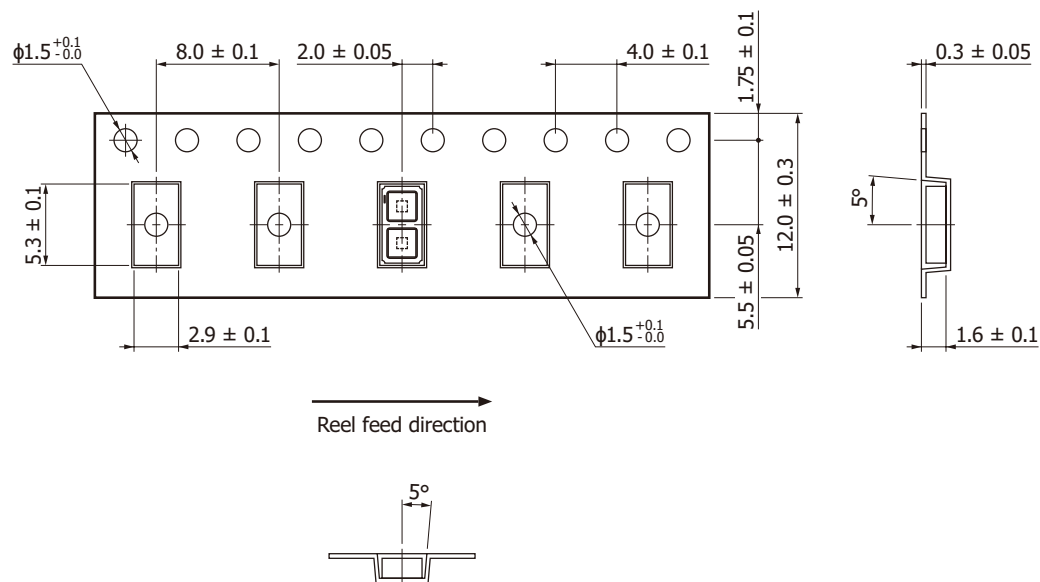
Reel and desiccant in moisture-proof packaging (vacuum-sealed)

P16849-013CN

■ Reel (conforms to JEITA ET-7200)

Outer diameter	Hub diameter	Tape width	Material	Electrostatic characteristics
$\phi 180$ mm	$\phi 60$ mm	12 mm	PS	Conductive

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



K1RDC0146EA

■ Packing quantity

100 pcs/reel

■ Packing state

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

Recommended soldering conditions

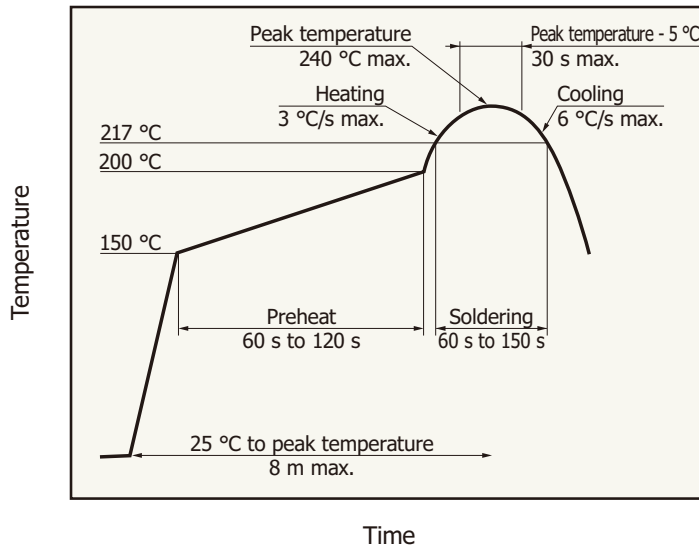
P16112-011MA

Solder temperature: 260 °C (5 s or less, once)

Solder the leads at a point at least 1 mm away from the package body.

Note: When you set soldering conditions, check that problems do not occur in the product by testing out the conditions in advance.

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- After unpacking, keep it in an environment at a temperature of 5 °C 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.

KSPD80418EB

Related products

- Amplifier for infrared detector C4159-01

Related information

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

■ Precautions

- Disclaimer
- Safety consideration / Opto-semiconductor products
- Precautions / Surface mount type products
- Precautions / Compound opto-semiconductors (photosensors, light emitters)

■ Catalogs

- Selection guide / Infrared detectors
- Technical note / Compound opto-semiconductor photosensors

Information described in this material is current as of July 2026.

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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