

# InAsSb photovoltaic detector

P12691-201G



**High-speed response and high sensitivity in the 8 μm spectral band**  
**Thermoelectrically cooled infrared detector with no liquid nitrogen required**

The P12691-201G is an infrared detector that provides high sensitivity in the 8 μm spectral band by employing our unique crystal growth technology, back-illuminated structure and integrating a lens. The InAsSb photovoltaic detector has a PN junction that ensures high-speed response and high reliability. Typical applications include gas analysis such as NO, NO<sub>2</sub>, SO<sub>2</sub>, and H<sub>2</sub>S. The P12691-201G is easy to use as it uses a compact package (TO-8) not requiring liquid nitrogen.

## Features

- High-speed response
- High sensitivity
- High reliability
- Compact, thermoelectrically cooled TO-8 package
- RoHS compliant
- Can be assembled in a module with QCL

## Applications

- Gas analysis
- Radiation thermometers
- Thermal imaging
- Remote sensing
- FTIR
- Spectrophotometers

## Options (sold separately)

- Heatsink for two-stage TE-cooled type **A3179-01**
- Temperature controller **C1103-04**
- Infrared detector module with preamp **C4159-07**

## Structure

Parameter	Specification	Unit
Window material	Ge with AR coating	-
Package	TO-8	-
Cooling	Two-stage TE cooler	-
Photosensitive area	φ1.0	mm

## Absolute maximum ratings

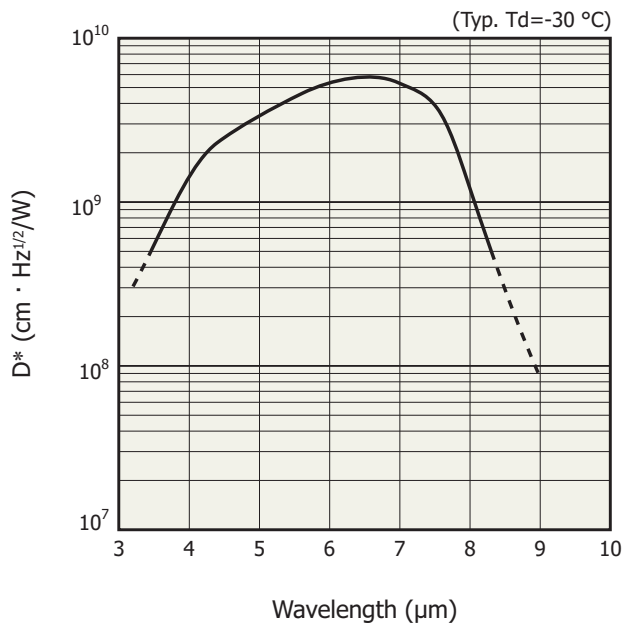
Parameter	Symbol	Value	Unit
Thermistor power dissipation	Pd_th	0.2	mW
TE-cooler allowable current	ITE max.	1	A
Reverse voltage	VR	0.1	V
Operating temperature	Topr	-40 to +60	°C
Storage temperature	Tstg	-55 to +60	°C

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 (Td=-30 °C)**

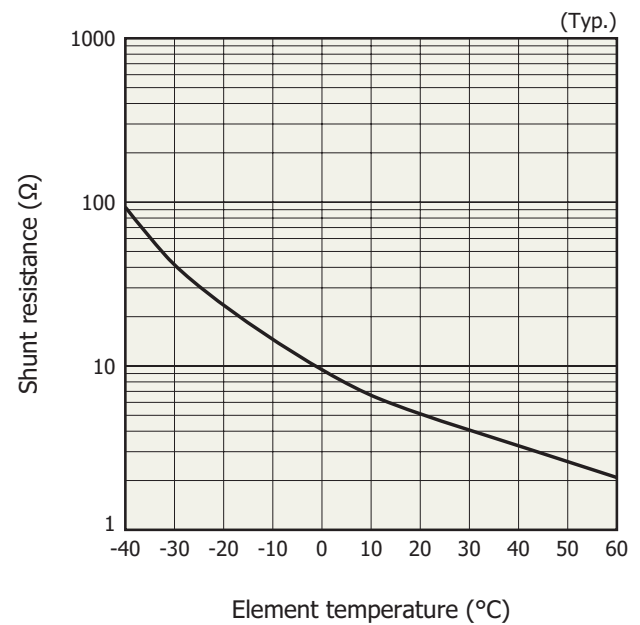
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak sensitivity wavelength	$\lambda_p$		-	6.7	-	$\mu\text{m}$
Cutoff wavelength	$\lambda_c$		8.2	8.3	-	$\mu\text{m}$
Photosensitivity	S	$\lambda=\lambda_p$	0.8	1.2	-	A/W
Shunt resistance	Rsh	$V_R=10\text{ mV}$	13	40	-	$\Omega$
Detectivity	$D^*$	$(\lambda_p, 1200, 1)$	$4.0 \times 10^9$	$6.0 \times 10^9$	-	$\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$
Noise equivalent power	NEP	$\lambda=\lambda_p$	-	$1.5 \times 10^{-11}$	$2.3 \times 10^{-11}$	$\text{W}/\text{Hz}^{1/2}$
Rise time	tr	$V_R=0\text{ V}, R_L=50\ \Omega$ 0 to 63%	-	-	10	ns

**Spectral response ( $D^*$ )**



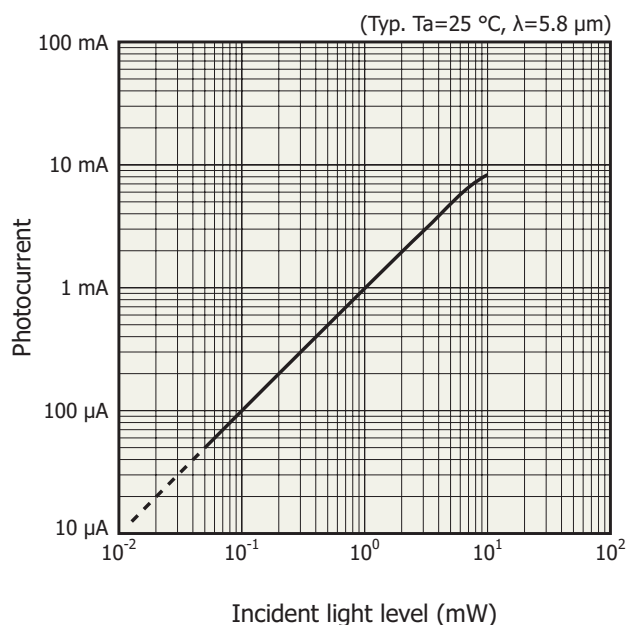
KIRDB0592EA

**Shunt resistance vs. element temperature**



KIRDB0647EA

**Linearity**

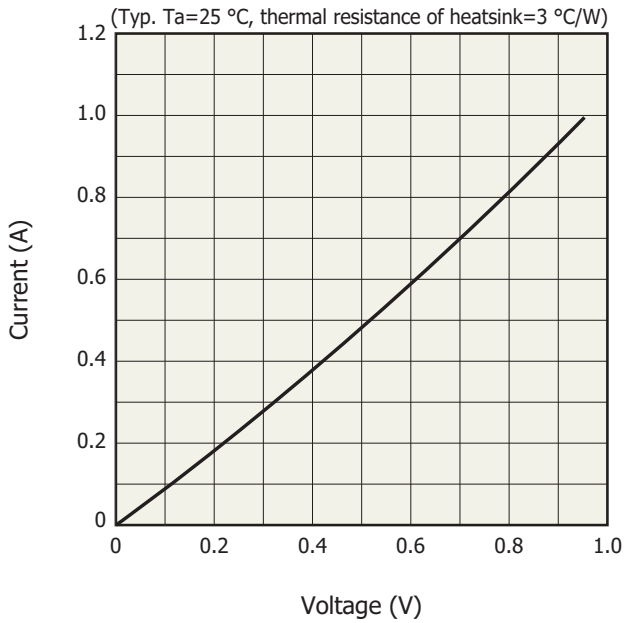


KIRDB0667EA

▣ Specifications of two-stage TE-cooler (Ta=25 °C)

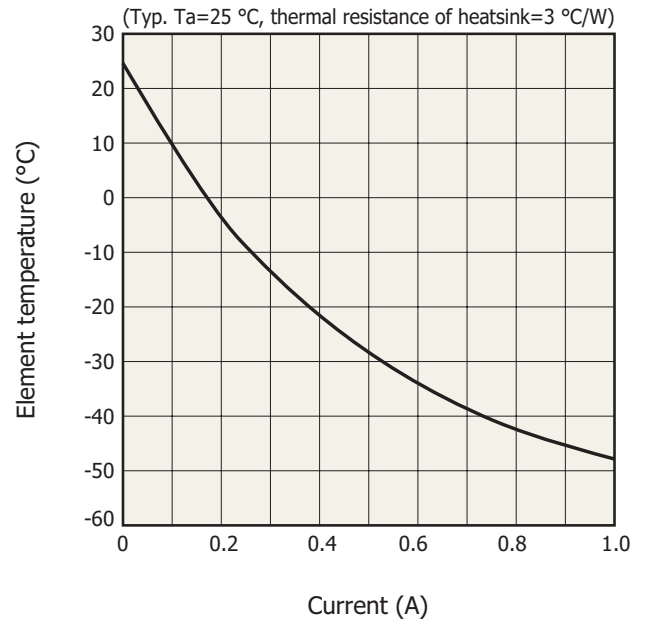
Parameter	Symbol	Min.	Typ.	Max.	Unit
TE cooler allowable current	ITE max.	-	-	1.0	A
TE cooler allowable voltage	VTE max.	-	-	0.95	V
Thermistor resistance	Rth	8.1	9.0	9.9	kΩ
Thermistor power dissipation	Pd_th	-	-	0.2	mW

▣ Current vs. voltage characteristics of TE-cooler



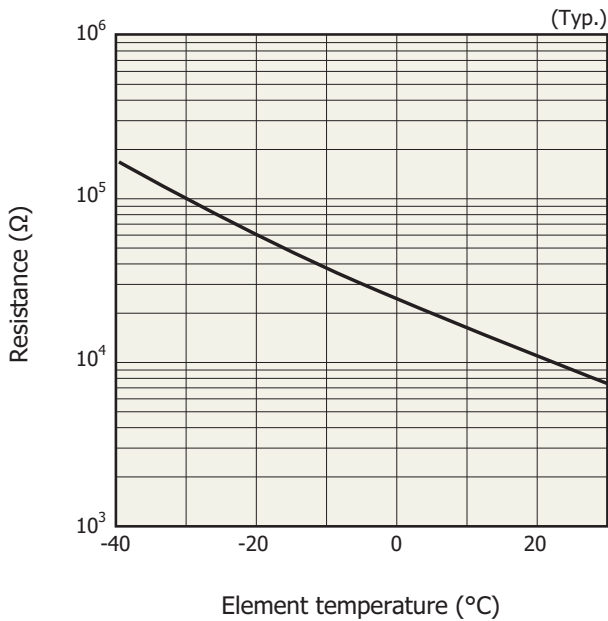
KIRD80596EB

▣ Cooling characteristics of TE-cooler



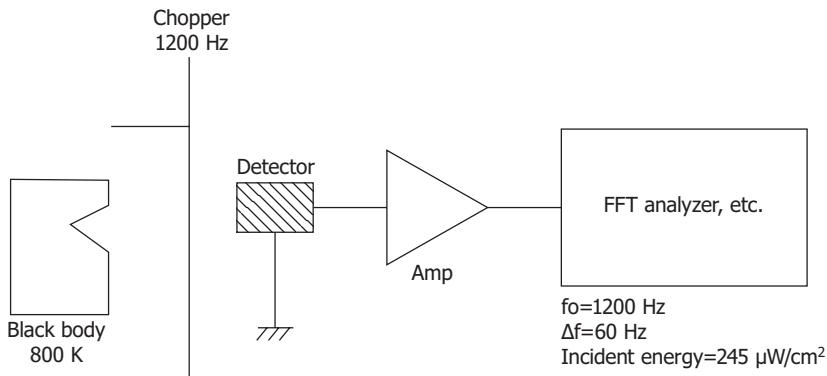
KIRD80668EA

▣ Thermistor temperature characteristics



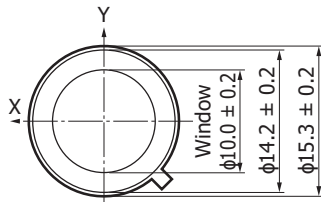
KIRD80116EA

**Measurement circuit example**

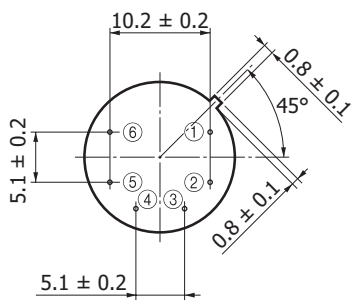
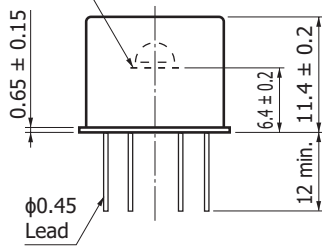


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**Dimensional outline (unit: mm)**



Photosensitive surface



- ① Detector (anode)
- ② Detector (cathode)
- ③ TE-cooler (-)
- ④ TE-cooler (+)
- ⑤⑥ Thermistor

KIRDA0242EA

## Related information

[www.hamamatsu.com/sp/ssd/doc\\_en.html](http://www.hamamatsu.com/sp/ssd/doc_en.html)

### ■ Precautions

- Notice
- Metal, ceramic, plastic products

### ■ Technical information

- Infrared detector / Technical information

Information described in this material is current as of August 2018.

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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