

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, NO₂, SO₂, and H₂S. 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

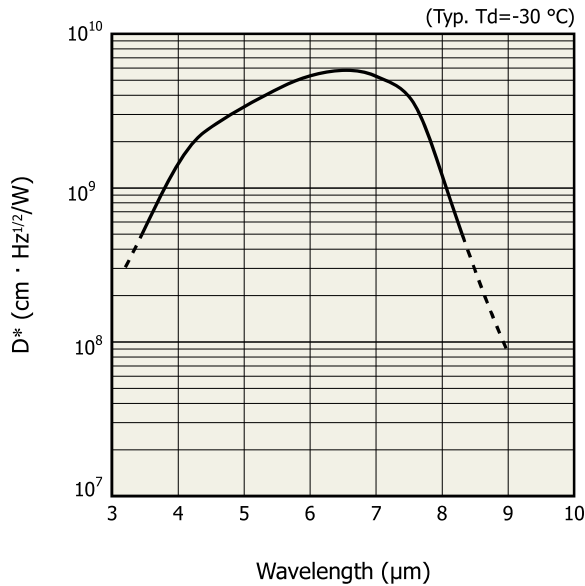
Parameter	Symbol	Value	Unit
Thermistor power dissipation	Pd_th	0.2	mW
TE-cooler allowable current	ITE max.	1	A
Reverse voltage	VR	0.1	V
Operating temperature	Topr	-40 to +60	°C
Storage temperature	Tstg	-55 to +60	°C

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.

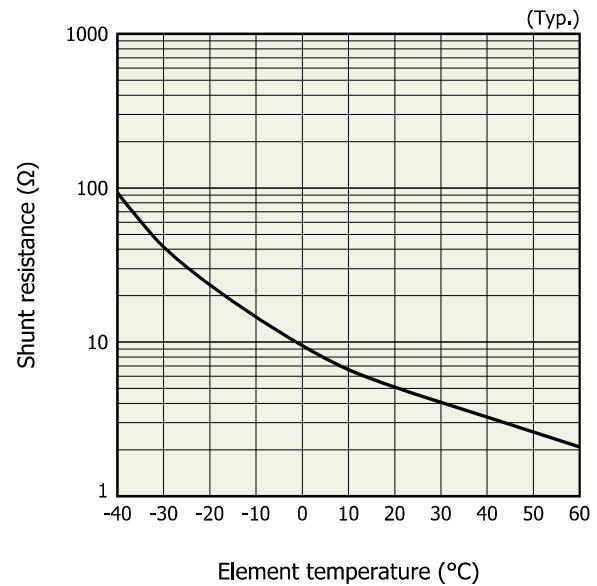
Electrical and optical characteristics (Td=-30 °C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak sensitivity wavelength	λ_p		-	6,7	-	μm
Cutoff wavelength	λ_c		8,2	8,3	-	μm
Photosensitivity	S	$\lambda = \lambda_p$	0,8	1,2	-	A/W
Shunt resistance	Rsh	$V_R = 10 \text{ mV}$	13	40	-	Ω
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

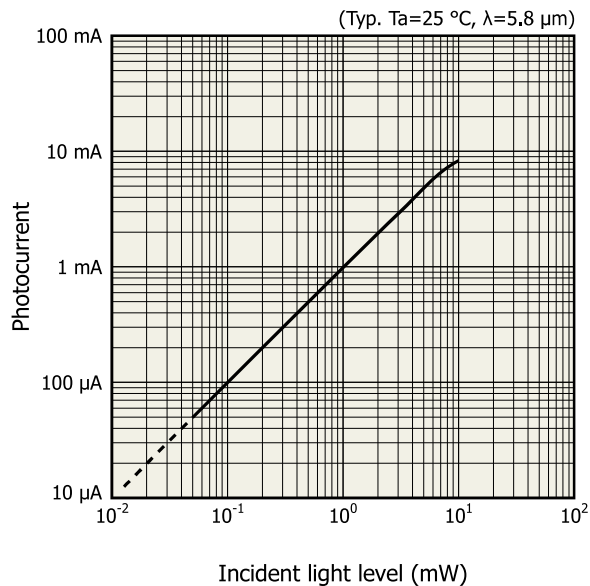
Spectral response (D*)



Shunt resistance vs. element temperature



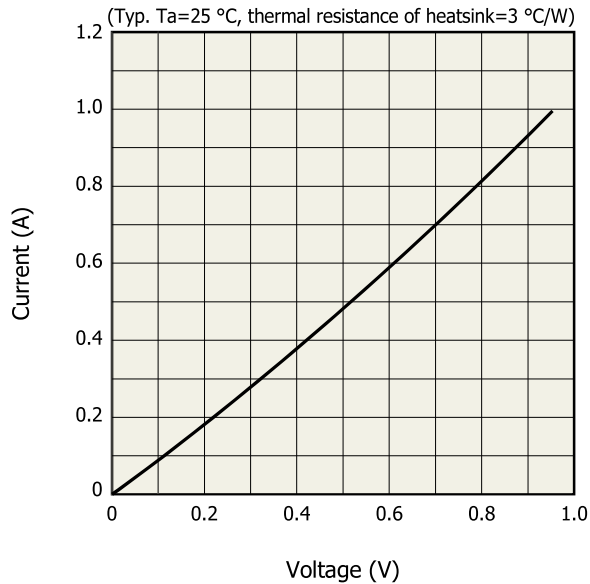
Linearity



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

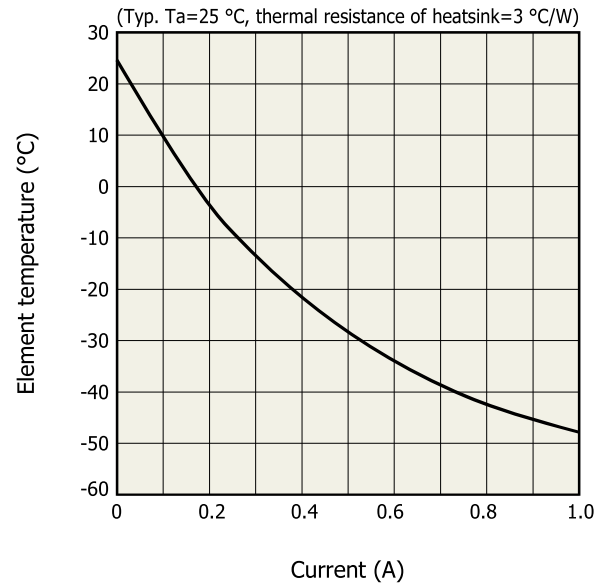
Parameter	Symbol	Min.	Typ.	Max.	Unit
TE cooler allowable current	ITE max.	-	-	1.0	A
TE cooler allowable voltage	VTE max.	-	-	0.95	V
Thermistor resistance	Rth	8.1	9.0	9.9	kΩ
Thermistor power dissipation	Pd_th	-	-	0.2	mW

▣ Current vs. voltage characteristics of TE-cooler



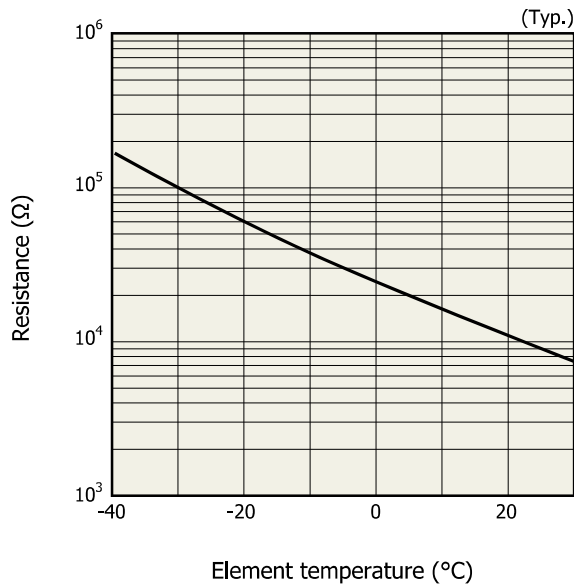
KIRDB0596EB

▣ Cooling characteristics of TE-cooler



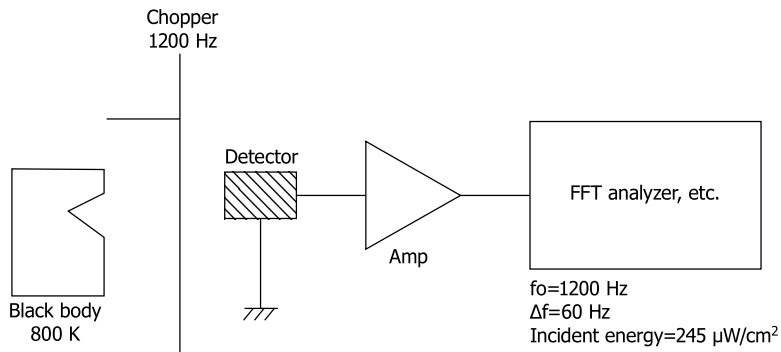
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▣ Thermistor temperature characteristics



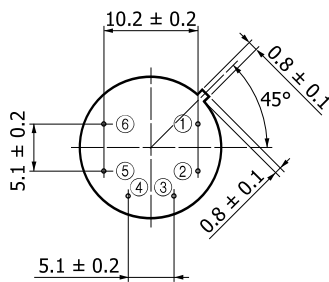
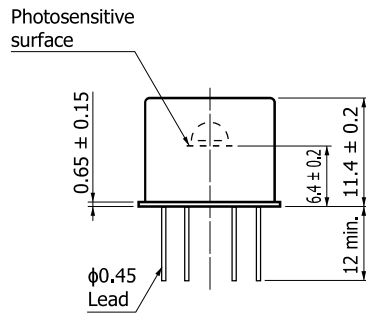
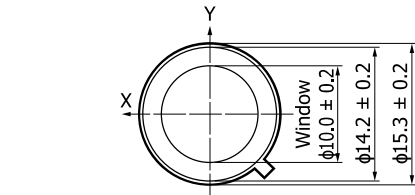
KIRDB0116EA

Measurement circuit example



KIROC0125EA

Dimensional outline (unit: mm)



- 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

■ Precautions

- Notice
- Metal, ceramic, plastic products

■ Technical information

- Infrared detector / Technical information



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

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