

InAsSb photovoltaic detector

P11120-201



High-speed response and high sensitivity in the 5 μm spectral band
Thermoelectrically cooled infrared detector with no liquid nitrogen required

The P11120-201 is an infrared detector that provides high sensitivity in the 5 μm spectral band due to our unique crystal growth technology. The InAsSb photovoltaic detector has a PN junction that ensures high-speed response and high reliability. Typical applications include gas analysis such as CO₂, SO_x, CO and NO_x. Unlike the P11120-901 metal dewar type detector, the P11120-201 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
- Environment-friendly due to use of InAsSb
- Suitable for detecting infrared rays emitted from QCL

Applications

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

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	Sapphire	-
Package	TO-8	-
Cooling	Two-stage TE-cooled	-
Photosensitive area	$\phi 1.0$	mm

Absolute maximum ratings

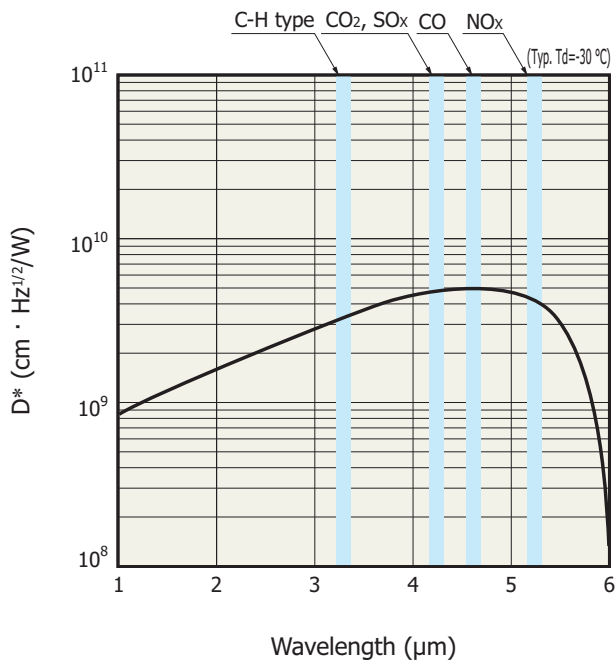
Parameter	Symbol	Value	Unit
Thermistor power dissipation	-	0.2	mW
Reverse voltage	V _R	0.1	V
Operating temperature	T _{opr}	-40 to +60	°C
Storage temperature	T _{stg}	-55 to +60	°C

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)

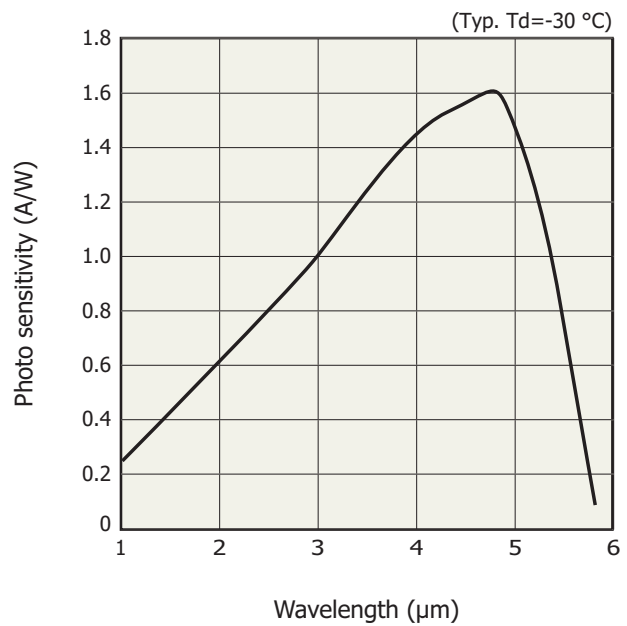
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak sensitivity wavelength	λ_p		4.0	4.9	-	μm
Cutoff wavelength	λ_c		5.6	5.9	-	μm
Photo sensitivity	S	$\lambda = \lambda_p$	0.8	1.6	-	A/W
Shunt resistance	Rsh	$V_R = 10 \text{ mV}$	10	13	-	Ω
Detectivity	D^*	$(\lambda_p, 600, 1)$	3.5×10^9	5.0×10^9	-	$\text{cm} \cdot \text{Hz}^{1/2} / \text{W}$
Noise equivalent power	NEP	$\lambda = \lambda_p$	-	1.8×10^{-11}	2.5×10^{-11}	$\text{W} / \text{Hz}^{1/2}$
Rise time	tr	$V_R = 0 \text{ V}, R_L = 50 \Omega$ 0 to 63%	-	0.4	-	μs

Spectral response (D^*)



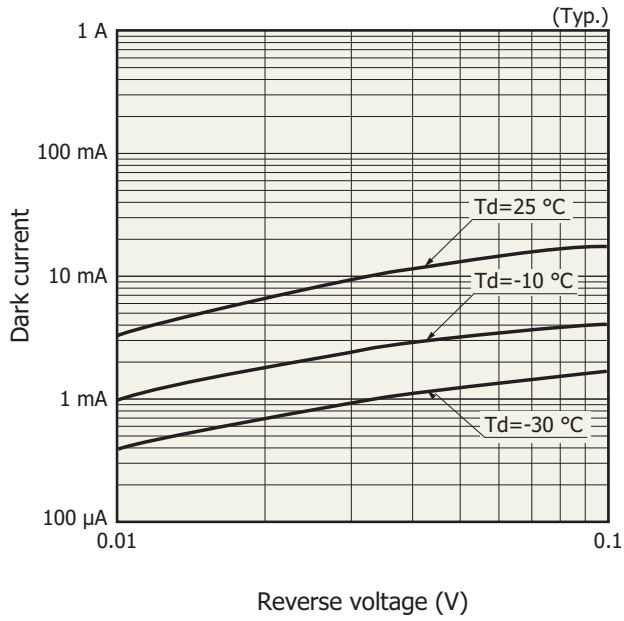
KIRDB0452EA

Spectral response



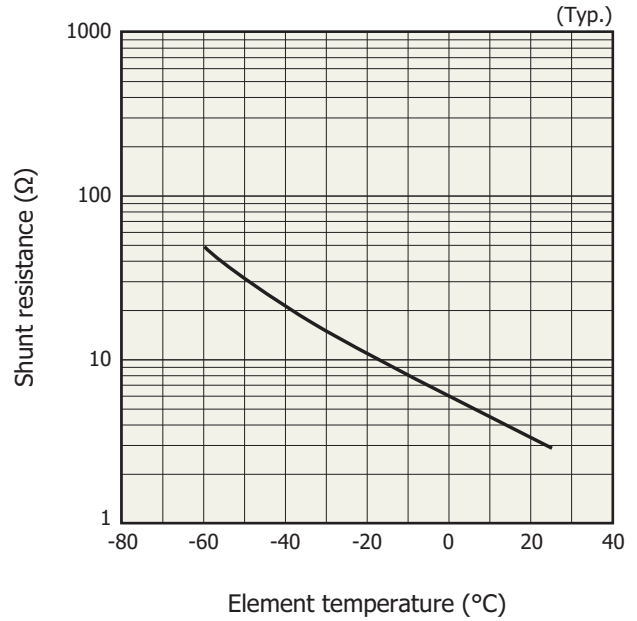
KIRDB0453EA

Dark current vs. reverse voltage



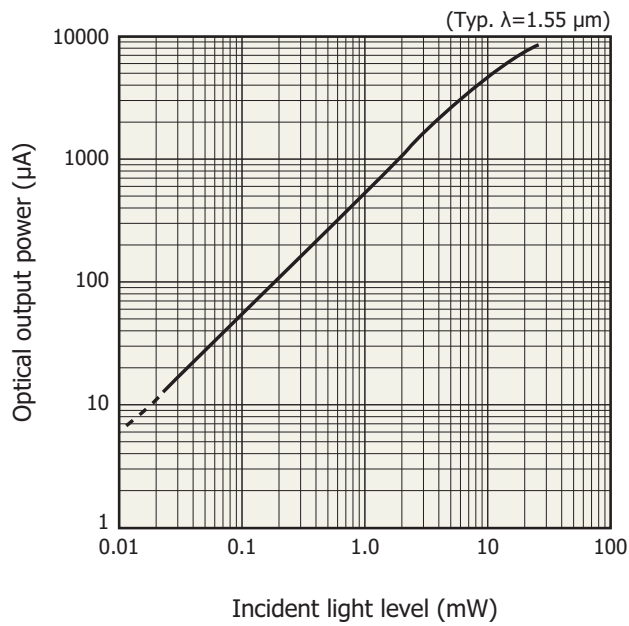
KIRDB0454EA

Shunt resistance vs. element temperature



KIRDB0455EA

Linearity

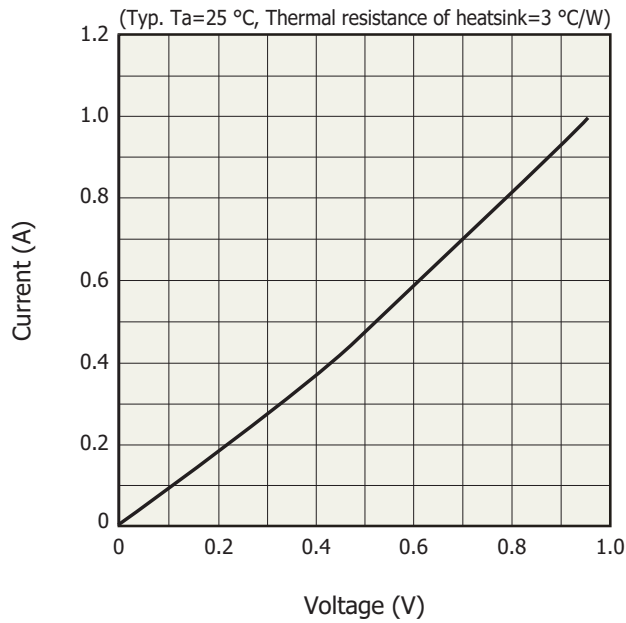


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▣ Specifications of two-stage TE-cooler (Ta=25 °C)

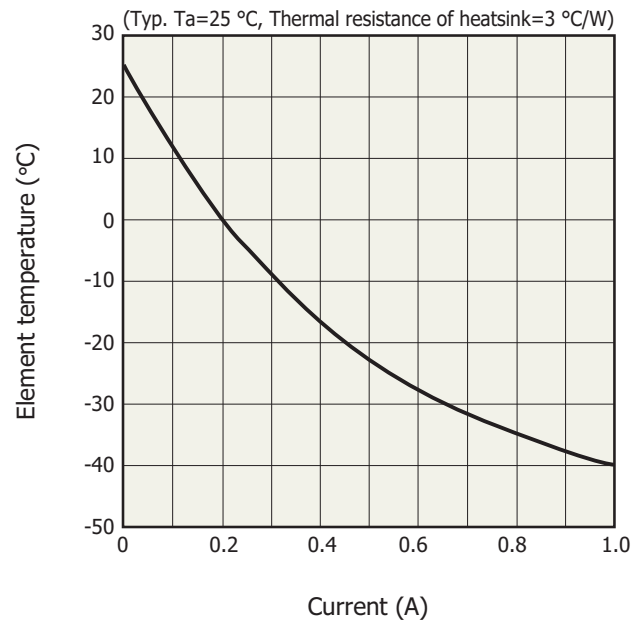
Parameter	Symbol	Min.	Typ.	Max.	Unit
Allowable current	Ic	-	-	1.0	A
Allowable voltage	Vc	-	-	0.95	V
Thermistor resistance	Rth	8.1	9.0	9.9	kΩ
Thermistor power dissipation	Pth	-	-	0.2	mW

▣ Current vs. voltage of TE-cooled type



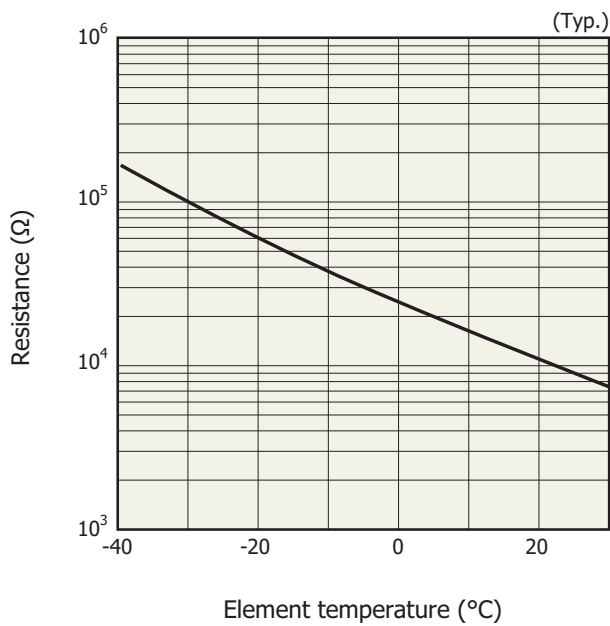
KIRDB0459EA

▣ Cooling characteristics of TE-cooled type



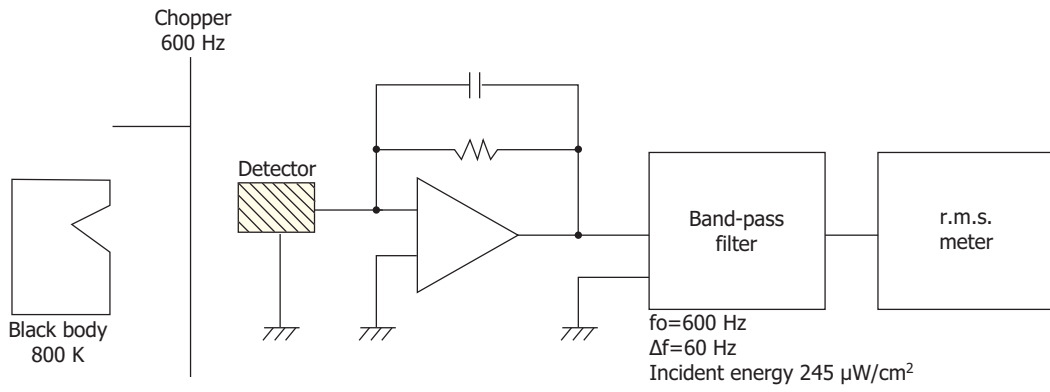
KIRDB0464EA

▣ Thermistor temperature characteristic



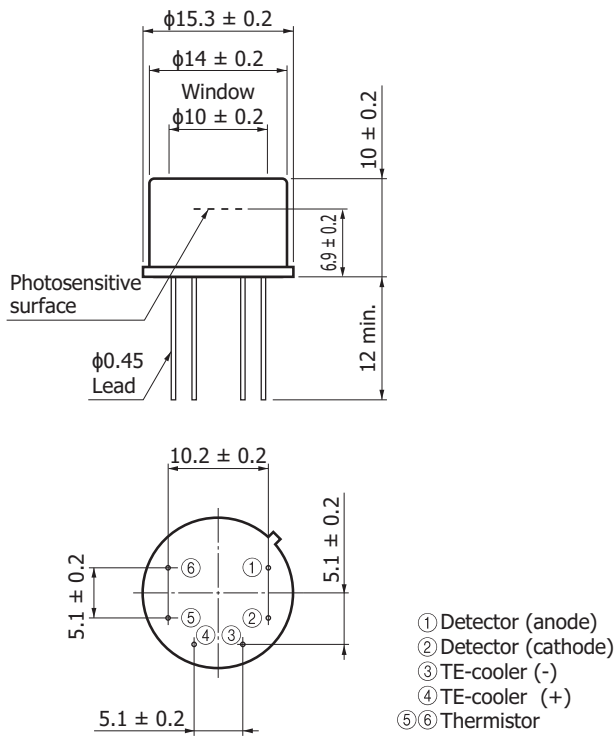
KIRDB0116EA

Measurement circuit example



KIRDC0094EA

Dimensional outline (unit: mm)



KIRDA0212EA

Related information

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

■ Precautions

- Disclaimer
- Metal, ceramic, plastic products

■ Technical information

- Infrared detectors

Information described in this material is current as of May, 2015.

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