HAMAMATSU
PHOTON IS OUR BUSINESS

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 CO_2, SOx, CO and NOx. 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**
- **RoHS compliant**

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**
Amplifier for infrared detector	**C4159-07**
Infrared detector module with preamp	**C12494-210S**

Structure

Parameter	Specification	Unit
Window material	Sapphire	-
Package	TO-8	-
Cooling	Two-stage TE-cooled	-
Photosensitive area	ϕ1.0	mm

Absolute maximum ratings

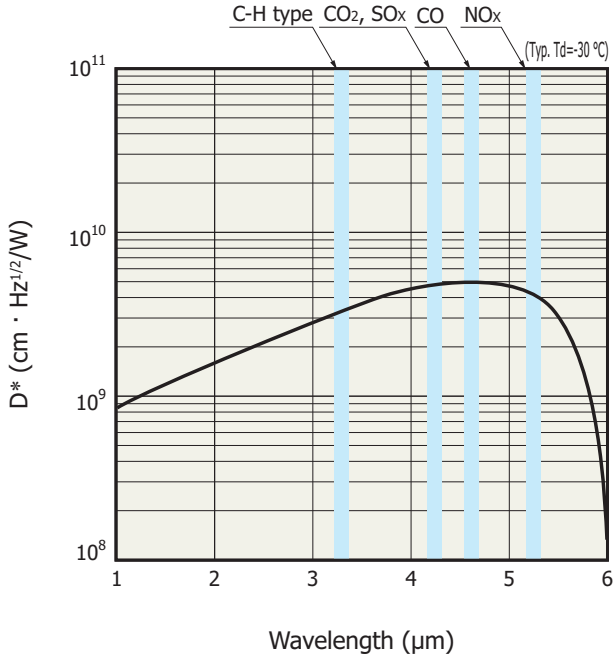
Parameter	Symbol	Value	Unit
Thermistor power dissipation	-	0.2	mW
Reverse voltage	V_R	0.1	V
Operating temperature	Topr	-40 to +60	°C
Storage temperature	Tstg	-55 to +60	°C

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	λp		4.0	4.9	-	μm
Cutoff wavelength	λc		5.6	5.9	-	μm
Photo sensitivity	S	λ=λp	0.8	1.6	-	A/W
Shunt resistance	Rsh	V_R=10 mV	10	13	-	Ω
Detectivity	D*	(λp, 1200, 1)	3.5×10^9	5.0×10^9	-	cm·Hz$^{1/2}$/W
Noise equivalent power	NEP	λ=λp	-	1.8×10^{-11}	2.5×10^{-11}	W/Hz$^{1/2}$
Rise time	tr	V_R=0 V, R_L=50 Ω 0 to 63%	-	0.4	-	μs

Spectral response (D*)



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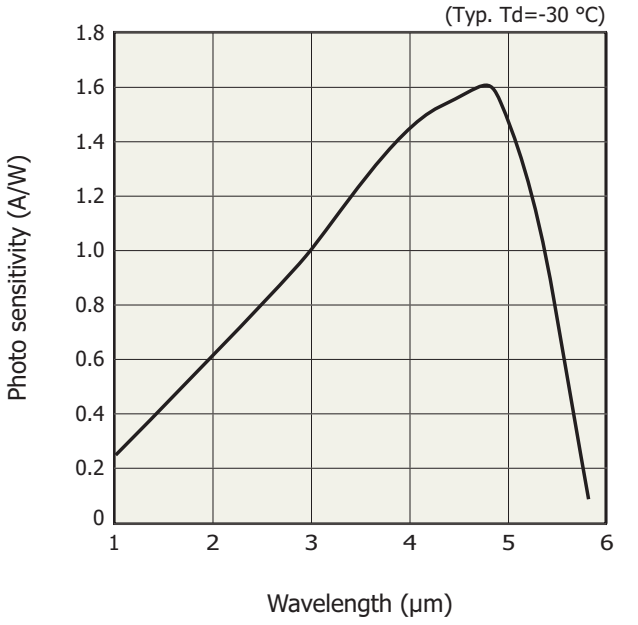
Spectral response



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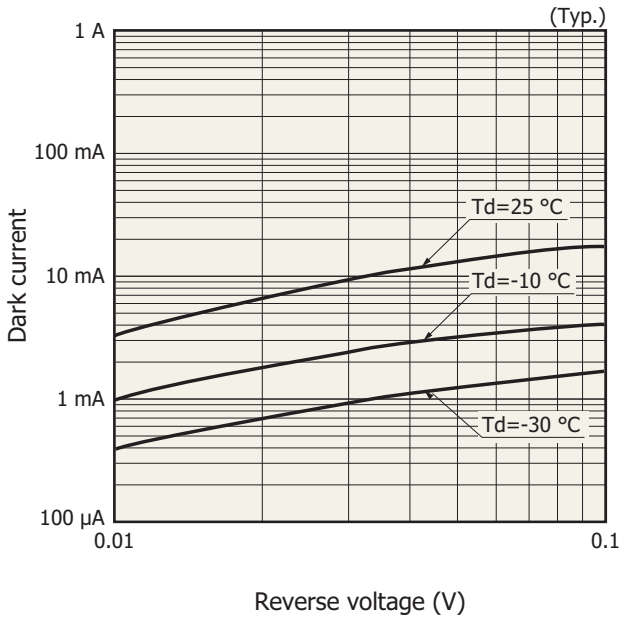
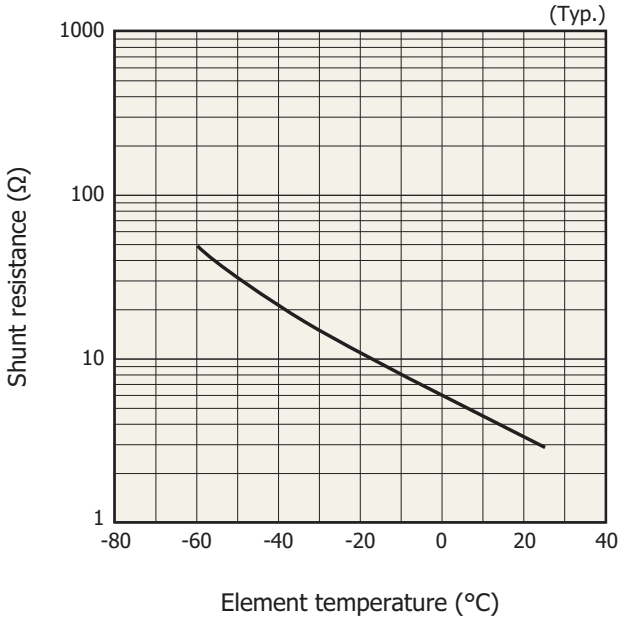
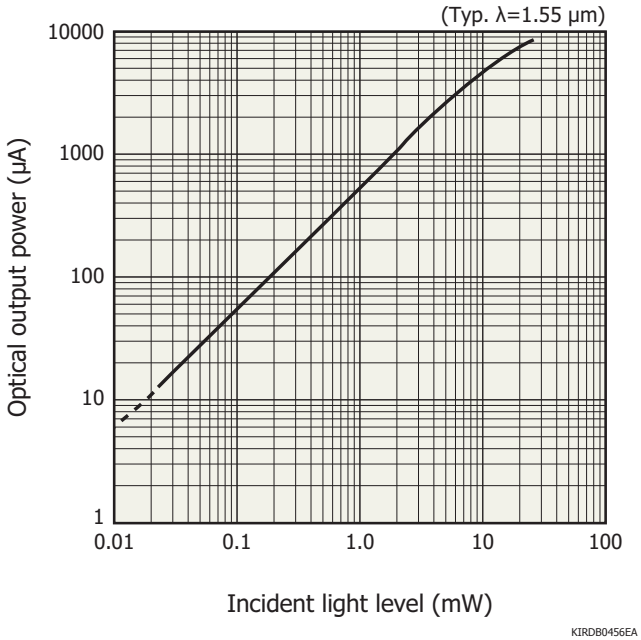
Dark current vs. reverse voltage



Shunt resistance vs. element temperature



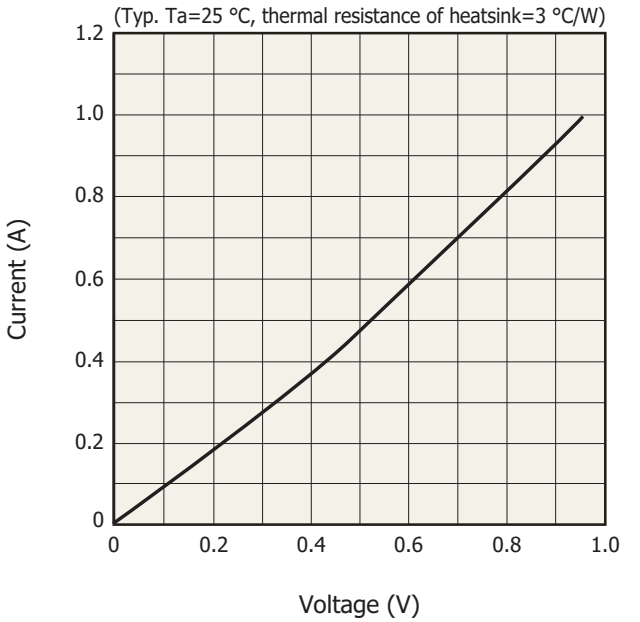
Linearity



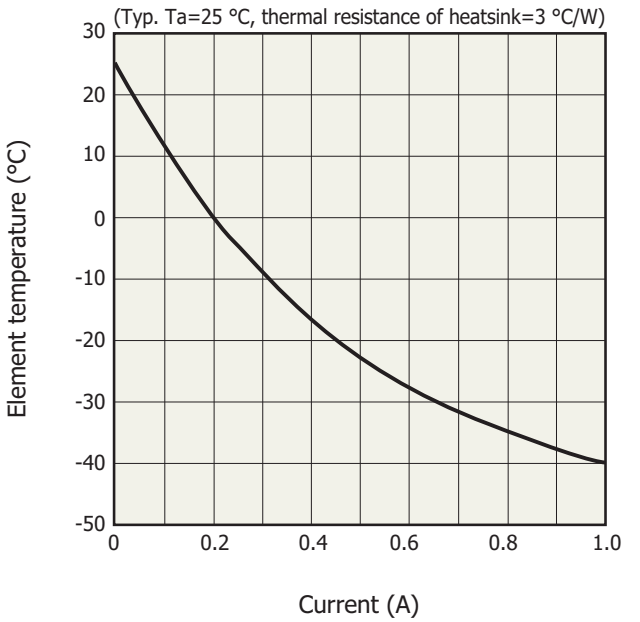
Specifications of two-stage TE-cooler (Ta=25 °C)

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

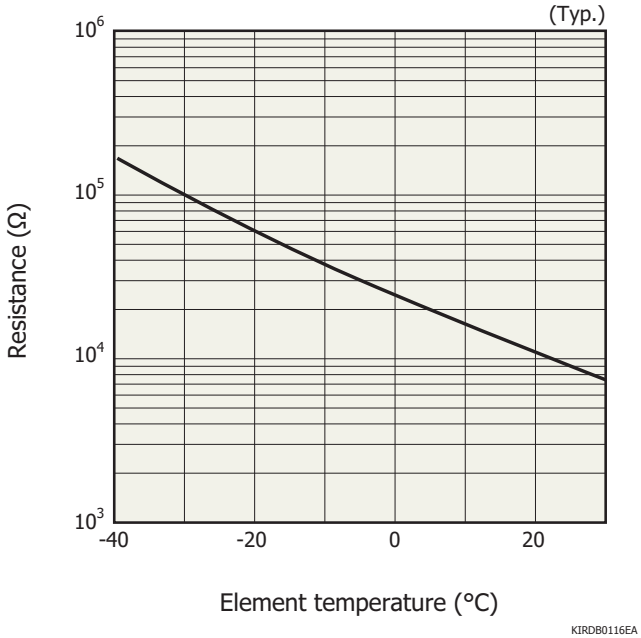
Current vs. voltage of TE-cooled type



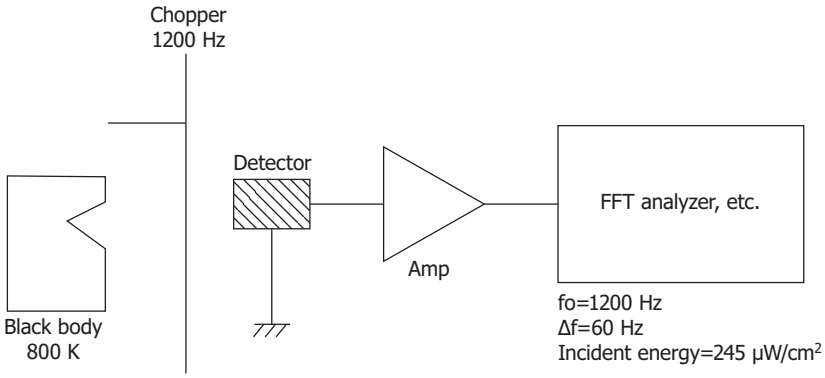
Cooling characteristics of TE-cooled type



Thermistor temperature characteristic



Measurement circuit example



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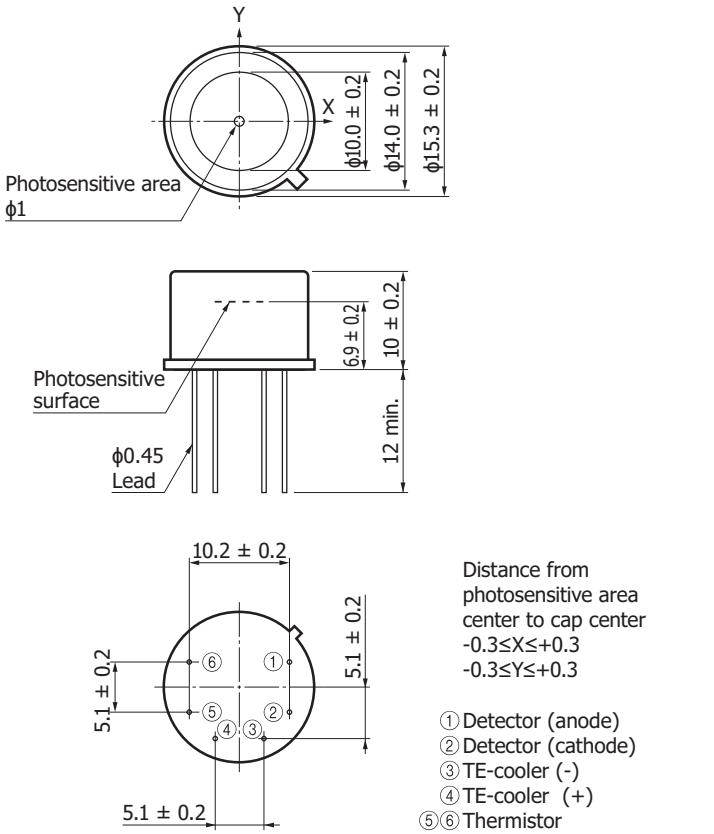
Dimensional outline (unit: mm)



Distance from
photosensitive area
center to cap center
-0.3≤X≤+0.3
-0.3≤Y≤+0.3

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

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Related information

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

■ Precautions
- Dislaimer
- Metal, ceramic, plastic products

Information described in this material is current as of November 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.
The product warranty is valid for one year after delivery and is limited to product repair or replacement for defects discovered and reported to us within that one year period. However, even if within the warranty period we accept absolutely no liability for any loss caused by natural disasters or improper product use.
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