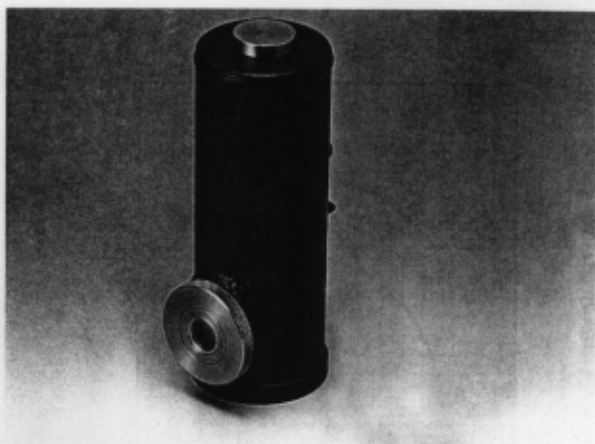


InAs/InSb Photovoltaic Detectors

Spectral Response Range: InAs 1 to 3.1 μm , InSb 1 to 5.5 μm

Photovoltaic detectors with high-speed response and low noise



InAs detectors cover a wavelength range equivalent to that of PbS detectors, and that of PbSe detectors is covered by InSb detectors. However, InAs and InSb detectors have higher response speed and lower noise than those of PbS and PbSe detectors.

■Long cooling hold time: 8 hours

A large capacity metal dewar (cooled by liquid nitrogen) is used for standard detector package. It allows for 8-hour continuous cooling. Metal dewar types can be re-evacuated when necessary.

■Integral detector/preamplifier devices available

A dewar type detector and a preamplifier are integrated into a case for facilitating high precision measurement.

For more details, see page 27.

■ACCESSORIES (Optional)

Preamplifier for InSb detectors C4159-01

Preamplifier for InAs may be available, please consult our sales office.

■SPECIFICATIONS (Common)

Package	Metal dewar
Window Material	Sapphire glass
Maximum Reverse Voltage	0.5 V
Operating Temperature	-40 to +60 °C
Storage Temperature	-55 to +60 °C

(Unless otherwise noted, Typ.)

Type No.	Outline No.	Active Area	Element Temperature	Peak Sensitivity Wavelength λ_p	Cut-off Wavelength λ_c	Photo Sensitivity S $\lambda=\lambda_p$	Shunt Resistance Rsh	D* (500, 1200, 1)		D* ($\lambda_p, 1200, 1$)	NEP $\lambda=\lambda_p$	Rise Time t_r	Terminal Capacitance Ct
								Min.	Typ.				
	(P. 35)	(mm)	(°C)	(μm)	(μm)	(A/W)	(Ω)	($\text{cm} \cdot \text{Hz}^{1/2}/\text{W}$)	($\text{cm} \cdot \text{Hz}^{1/2}/\text{W}$)	($\text{cm} \cdot \text{Hz}^{1/2}/\text{W}$)	(W/Hz ^{1/2})	$V_R=0 \text{ V}$ $R_L=50 \Omega$ 0 to 63 %	(pF)

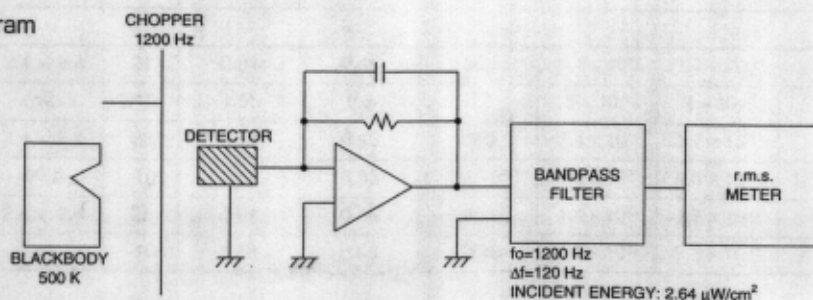
■Metal Dewar Type InAs Detector (FOV: 60 °)

P7163	⑬	$\phi 1$	-196	3.0	3.1	1	1×10^5	6×10^9	1×10^{10}	6×10^{11}	2×10^{-13}	150	150
-------	---	----------	------	-----	-----	---	-----------------	-----------------	--------------------	--------------------	---------------------	-----	-----

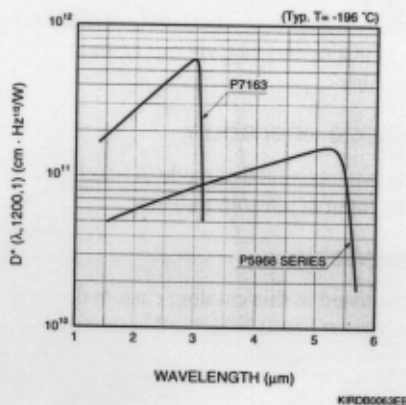
■Metal Dewar Type InSb Detectors (FOV 60 °)

P5968-060	⑬	$\phi 0.6$	-196	5.3	5.5	2	1×10^7	2×10^{10}	3×10^{10}	1.5×10^{11}	4×10^{-13}	30	30
P5968-100		$\phi 1$	-196	5.3	5.5	2	1×10^8	2×10^{10}	3×10^{10}	1.5×10^{11}	6×10^{-13}	70	70
P5968-200		$\phi 2$	-196	5.3	5.5	2	1×10^8	2×10^{10}	3×10^{10}	1.5×10^{11}	1×10^{-12}	150	150

■Measuring Block Diagram

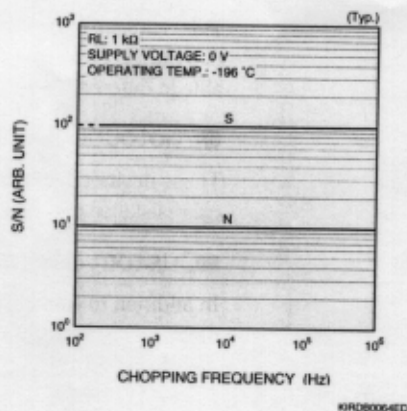


■ Spectral Response



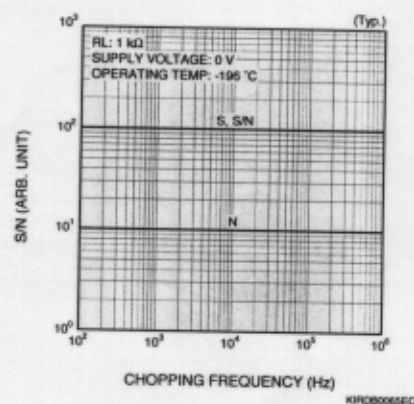
■ S/N vs. Chopping Frequency

A) InAs



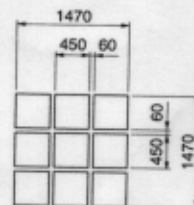
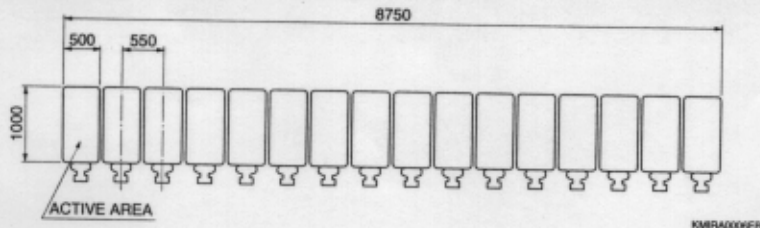
■ S/N vs. Chopping Frequency

B) InSb



■ Multielement Detector Options (Reference Examples; Unit: μm)

InSb detectors of custom-designed multielement arrays are also available on request. For the number of elements, element size and packaging, please consult us with your specific needs.



Precautions for Use

(1) Pouring Liquid Nitrogen

When visible or UV light other than infrared light to be measured enters an InSb detector, an electric charge may accumulate on the detector surface, causing an increase in the dark current. This increases the noise level, inviting degradation of the S/N. When using an InSb detector, before pouring liquid nitrogen, put a cover (e.g. affix black tapes doubly) on the input window so that the visible light (room illumination) and the UV light cannot fall on the detector. If the detector is exposed to the visible light or the UV light after the dewar has been filled with liquid nitrogen and the dark current is increased, remove the liquid nitrogen to raise the detector temperature back to room temperature. Then carry out the above procedure again. The dark current will decrease to the original value.

When filling the dewar with liquid nitrogen, use the following procedure: First pour 20 to 30 cc into the dewar and wait for a while until the whitish vapor (made by the ebullient liquid nitrogen) settles. Then pour another 20 to 30 cc into the dewar and wait for a while again. The remainder of filling may be done in one step. (Sudden filling from the beginning can cause the liquid nitrogen to overflow or splash.)

(2) Handling

Refer to "Precautions for Handling Dewar Type Detectors" on page 51.