

# InAs, InSb Photovoltaic Detectors

## Photovoltaic Detectors with High-speed Response and Low Noise

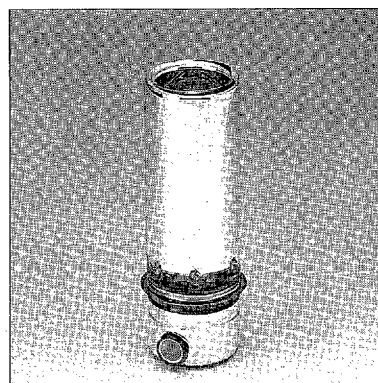
InAs detectors cover a wavelength range equivalent to that of PbS cells, and InSb detectors cover a range equivalent to PbSe cells. However, InAs and InSb detectors have higher response speed and lower noise than those of PbS and PbSe cells.

### Long Cooling Hold Time: 8 hours

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

### Integral Detector/Preamplifier Devices Available

A glass dewar type detector and a preamplifier are integrated into a compact cylindrical case for facilitating high precision measurement. For more details, see page 27.



### ● SPECIFICATIONS (Common)

Package	Glass dewar
Window Material	Sapphire glass
Maximum Reverse Voltage	0.5 V
Operating Temperature	-20 to +60°C
Storage Temperature	-20 to +60°C

### ● ACCESSORIES (Optional)

Preamplifier for InSb detectors : C4159-01  
Housing for glass dewar devices : A3262-02  
Preamplifier for InAs may be available, please consult our sales office.

(Typical data unless otherwise specified)

Type No.	Outline No. (P.35)	Active Area (mm)	Element Temperature (°C)	Peak Wave-length $\lambda_p$ ( $\mu\text{m}$ )	Cutoff Wave-length $\lambda_c$ ( $\mu\text{m}$ )	Photo Sensitivity S at $\lambda_p$ (A/W)	Shunt Resistance Rsh ( $\Omega$ )	D* (500, 1200, 1)		D* ( $\lambda_p$ , 1200, 1)	NEP at $\lambda_p$ (W/Hz <sup>1/2</sup> )	Rise Time tr 0 to 63% ( $\mu\text{s}$ )	Terminal Capacitance Ct (pF)
								Min.	Typ.				
								(cm <sup>2</sup> ·Hz <sup>1/2</sup> /W)	(cm <sup>2</sup> ·Hz <sup>1/2</sup> /W)	(cm <sup>2</sup> ·Hz <sup>1/2</sup> /W)	(W/Hz <sup>1/2</sup> )		

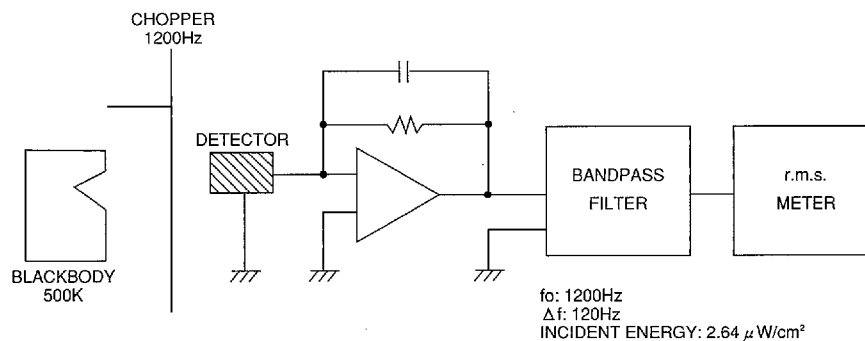
### Glass Dewar Type InAs Detector (FOV 60°)

P5171	14	1 dia.	-196	3.0	3.1	1	$1 \times 10^5$	$6 \times 10^9$	$1 \times 10^{10}$	$6 \times 10^{11}$	$2 \times 10^{-13}$	1	150
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### Glass Dewar Type InSb Detectors (FOV 60°)

P5172-060	14	0.6 dia.	-196	5.3	5.5	2	$1 \times 10^7$	$2 \times 10^{10}$	$3 \times 10^{10}$	$1.5 \times 10^{11}$	$4 \times 10^{-13}$	1	30
P5172-100		1 dia.	-196	5.3	5.5	2	$1 \times 10^6$	$2 \times 10^{10}$	$3 \times 10^{10}$	$1.5 \times 10^{11}$	$6 \times 10^{-13}$	1	70
P5172-200		2 dia.	-196	5.3	5.5	2	$1 \times 10^5$	$2 \times 10^{10}$	$3 \times 10^{10}$	$1.5 \times 10^{11}$	$1 \times 10^{-12}$	1	150

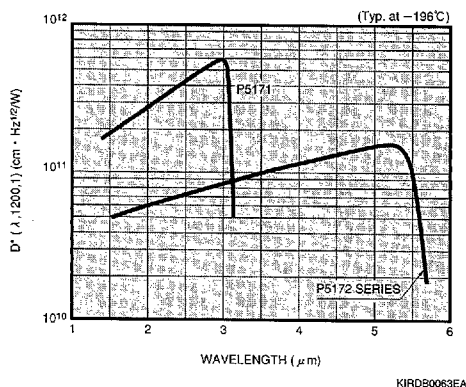
### ● Measuring Block Diagram



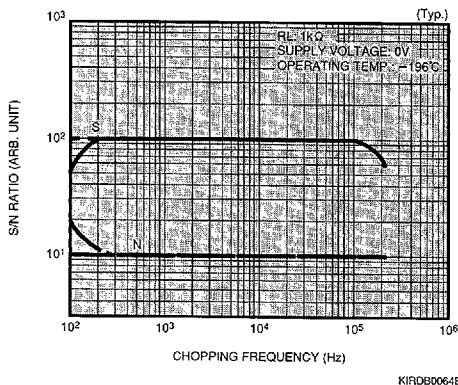
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# Spectral Response InAs : 1 to 3.1 $\mu\text{m}$ InSb : 1 to 5.5 $\mu\text{m}$

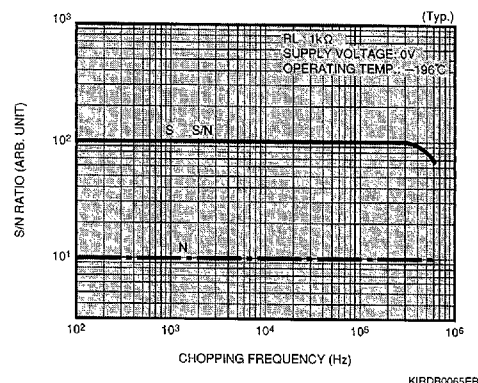
## ● Spectral Response



## ● S/N Ratio vs. Supply Voltage A) InAs

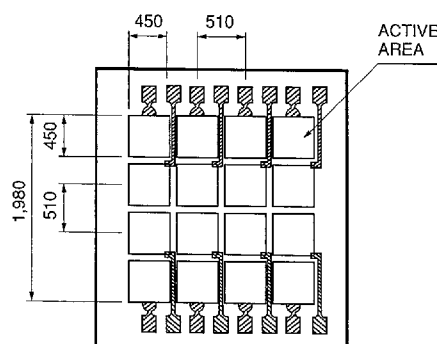
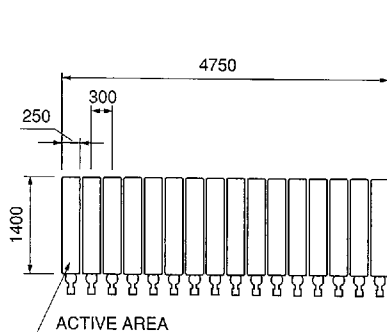


## B) InSb



## ● Details of Multielement Detectors (Reference Examples; Unit: $\mu\text{m}$ )

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



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## 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 ratio. When using an InSb detector, before pouring liquid nitrogen, put a cover (e.g. affix black tape double) on the input window so that visible light (room illumination) and UV light cannot fall on the detector. If the detector is exposed to visible light or 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.

Also, before pouring liquid nitrogen into the dewar, be sure to check that no water or moisture remains inside the dewar, as it may cause cracks in the glass dewar when frozen.

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.