



# InSb photovoltaic detectors

P5968/P4247 series

## High-speed response, low-noise photovoltaic detectors

The P5968/P4247 series are photovoltaic detectors having high sensitivity in the so-called atmospheric window at 3 to 5  $\mu\text{m}$ . Custom devices are also available to meet your special request.

### Features

- **Cooling hold time: 8 hours**  
Repumpable metal dewars (liquid nitrogen cooling) allow 8-hour hold time.
- **Built-in preamp type available**  
Built-in preamp allows high precision photometry.  
P7751-01 (Uses P5968-060.)  
P7751-02 (Uses P5968-200.)

### Applications

- Thermometers (radiometers)
- Thermal imaging
- Remote sensing
- Gas analysis
- FTIR
- Spectrophotometry

### Accessories (sold separately)

- **Amplifier for InSb photovoltaic detector**  
C4159-01 (photosensitive area: smaller than  $\phi 1 \text{ mm}$ )  
C4159-04 (photosensitive area:  $\phi 2 \text{ mm}$ )  
[Custom amplifier is also available for use with P5968-300 ( $\phi 3 \text{ mm}$  type).]

### Structure/Absolute maximum ratings

Type no.	Dimensional outline/ Window material *1	Package	Cooling	Active area (mm)	Number of element	Absolute maximum ratings		
						Reverse voltage $V_R$ (V)	Operating temperature $T_{opr}$ (°C)	Storage temperature $T_{stg}$ (°C)
P5968-060	①/Si	Metal dewar	Liquid nitrogen	$\phi 0.6$	1	0.5	-40 to +60	-55 to +60
P5968-100				$\phi 1$	1			
P5968-200				$\phi 2$	1			
P5968-300				$\phi 3$	1			
P4247-16	②/Si			$0.25 \times 1.4^{*2}$	$1 \times 16$			
P4247-44				$0.45 \times 0.45^{*3}$	$4 \times 4$			

\*1: Window material Si=silicon (with AR coated)

\*2: Size per 1 element (16 element array)

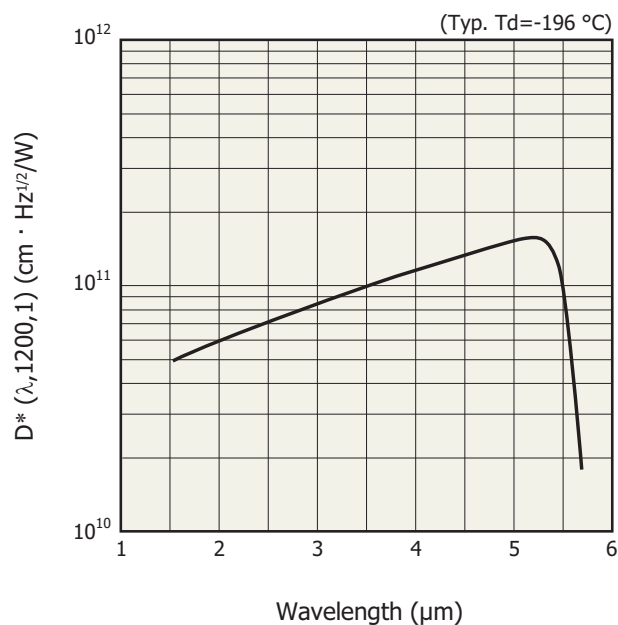
\*3: Size per 1 element ( $4 \times 4$  element array)

Note: Absolute maximum ratings are the values that must not be exceeded at any time. If even one of the absolute maximum ratings is exceeded even for a moment, the product quality may be impaired. Always be sure to use the product within the absolute maximum ratings.

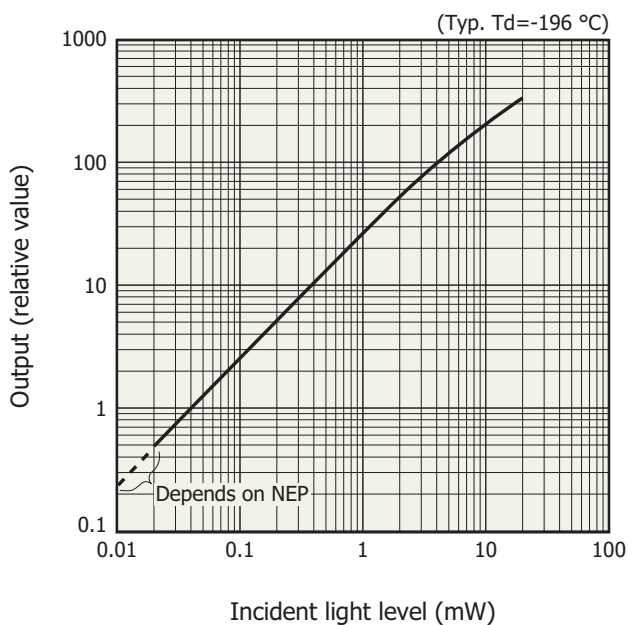
### Electrical and optical characteristics (Typ. unless otherwise noted)

Type no.	Measurement condition Element temperature $T_d$	Peak sensitivity wavelength $\lambda_p$	Cutoff wavelength $\lambda_c$	Photo sensitivity $S_{\lambda=\lambda_p}$	Shunt resistance $R_{sh}$	$D^*$ (500 K, 1200, 1)		$D^*$ ( $\lambda_p$ , 1200, 1)	NEP $\lambda=\lambda_p$	Rise time $t_r$ $V_R=0$ V $R_L=50 \Omega$ 0 to 63 %	Terminal capacitance $C_t$ $V_R=0$ V $f=1$ MHz
	(°C)	( $\mu\text{m}$ )	( $\mu\text{m}$ )	(A/W)	( $\Omega$ )	Min. ( $\text{cm} \cdot \text{Hz}^{1/2}/\text{W}$ )	Typ. ( $\text{cm} \cdot \text{Hz}^{1/2}/\text{W}$ )	( $\text{cm} \cdot \text{Hz}^{1/2}/\text{W}$ )	(W/Hz $^{1/2}$ )	(ns)	(pF)
P5968-060	-196	5.3	5.5	2.5	$1 \times 10^7$	$2 \times 10^{10}$	$3 \times 10^{10}$	$1.6 \times 10^{11}$	$3.3 \times 10^{-13}$	30	30
P5968-100					$1 \times 10^6$				$5.5 \times 10^{-13}$	70	100
P5968-200					$1 \times 10^5$				$1.1 \times 10^{-12}$	150	200
P5968-300					$5 \times 10^4$				$1.6 \times 10^{-12}$	600	900
P4247-16					$1 \times 10^7$				$6.5 \times 10^{-13}$	70	100
P4247-44					$1 \times 10^7$				$5.0 \times 10^{-13}$	60	60

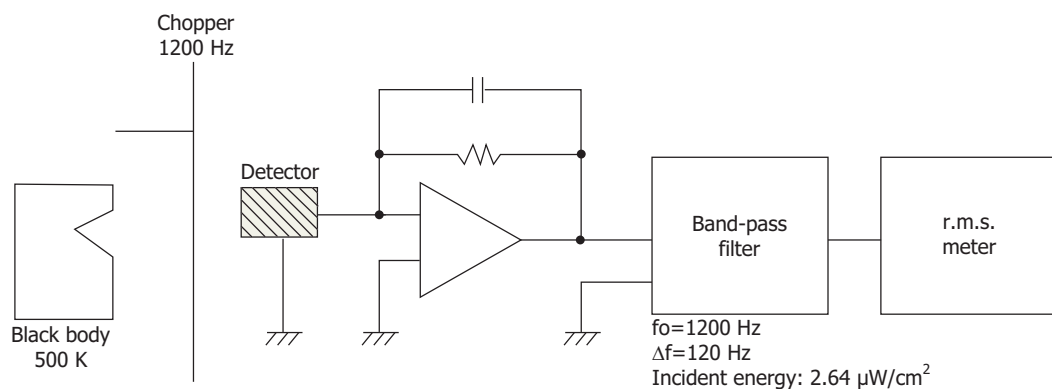
### Spectral response



### Linearity (P5968-100)

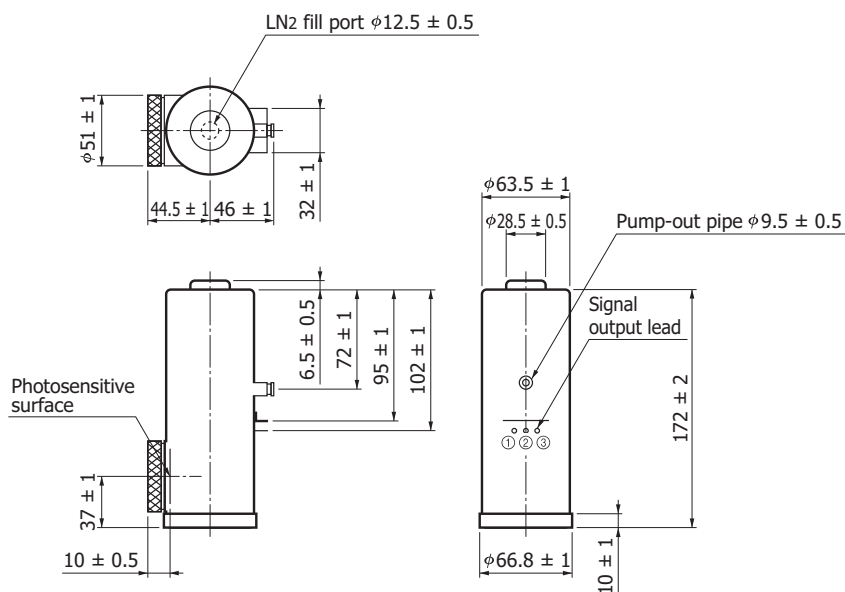


### Measurement circuit



## Dimensional outline (unit: mm)

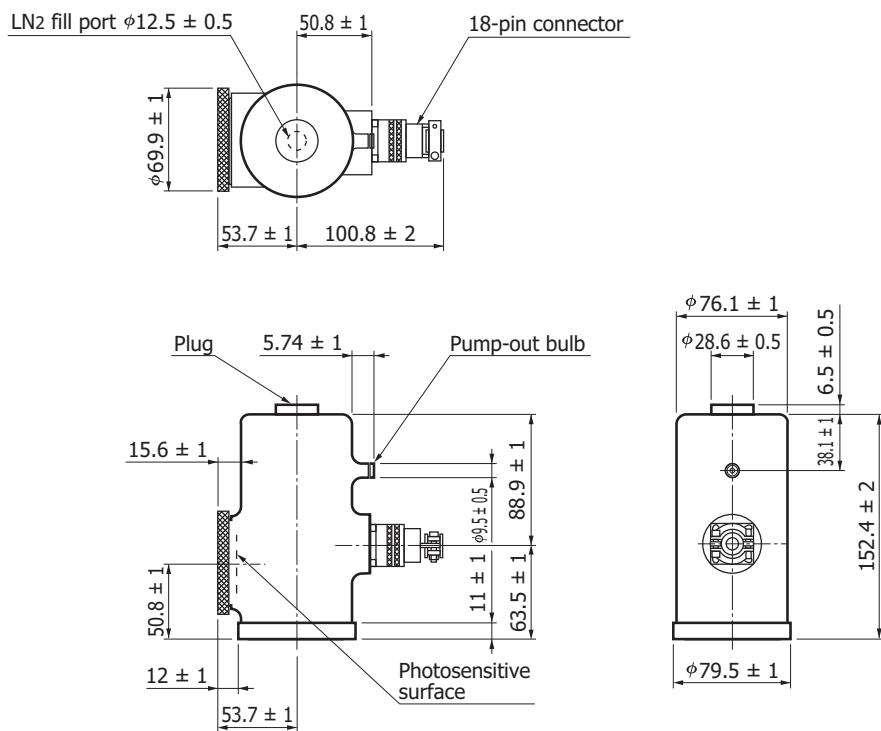
### ① P5968-060/-100/-200/-300



- ① Detector (anode)
- ② NC
- ③ Detector (cathode)

KIRDA0190ED

### ② P4247 series

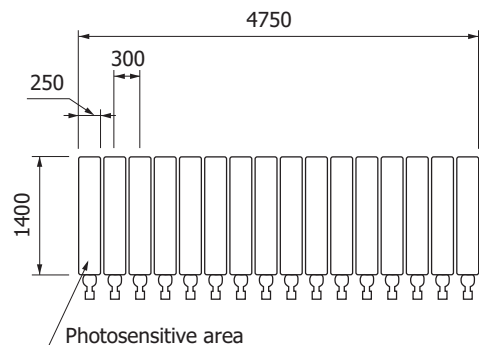


KIRDA0132EB

### Details of multi-element detectors (unit: $\mu\text{m}$ )

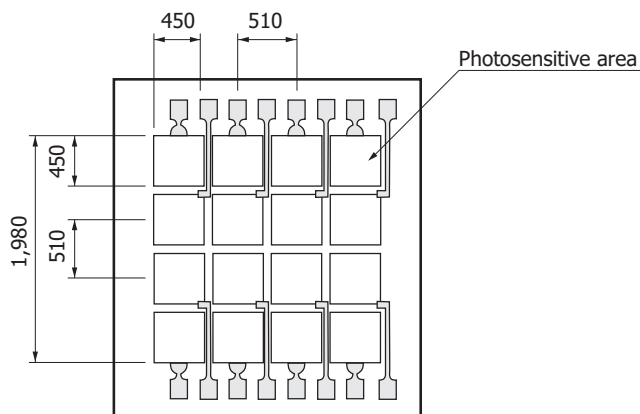
For custom devices with different number of elements, size and package, please consult our sales office.

P4247-16



KIRDA0006EA

P4247-44



KIRDA0146EA

Information described in this material is current as of December, 2011.

Product specifications are subject to change without prior notice due to improvements or other reasons. Before assembly into final products, please contact us for the delivery specification sheet to check the latest information.

Type numbers of products listed in the delivery specification sheets or supplied as samples may have a suffix "(X)" which means preliminary specifications or a suffix "(Z)" which means developmental 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.

Copying or reprinting the contents described in this material in whole or in part is prohibited without our prior permission.

# HAMAMATSU

[www.hamamatsu.com](http://www.hamamatsu.com)

HAMAMATSU PHOTONICS K.K., Solid State Division

1126-1 Ichino-cho, Higashi-ku, Hamamatsu City, 435-8558 Japan, Telephone: (81) 53-434-3311, Fax: (81) 53-434-5184

U.S.A.: Hamamatsu Corporation: 360 Foothill Road, P.O.Box 6910, Bridgewater, N.J. 08807-0910, U.S.A., Telephone: (1) 908-231-0960, Fax: (1) 908-231-1218

Germany: Hamamatsu Photonics Deutschland GmbH: Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49) 8152-375-0, Fax: (49) 8152-265-8

France: Hamamatsu Photonics France S.A.R.L.: 19, Rue du Saule Trapu, Parc du Moulin de Massy, 91882 Massy Cedex, France, Telephone: 33-(1) 69 53 71 00, Fax: 33-(1) 69 53 71 10

United Kingdom: Hamamatsu Photonics UK Limited: 2 Howard Court, 10 Tewin Road, Welwyn Garden City, Hertfordshire AL7 1BW, United Kingdom, Telephone: (44) 1707-294888, Fax: (44) 1707-325777

North Europe: Hamamatsu Photonics Norden AB: Smidesvägen 12, SE-171 41 Solna, Sweden, Telephone: (46) 8-509-031-00, Fax: (46) 8-509-031-01

Italy: Hamamatsu Photonics Italia S.R.L.: Strada della Moia, 1 int. 6, 20020 Arese, (Milano), Italy, Telephone: (39) 02-935-81-733, Fax: (39) 02-935-81-741