

InAs photovoltaic detectors



P10090 series

P7163

Low noise, high reliability infrared detectors (for 3 μm band)

InAs photovoltaic detectors have high sensitivity in the infrared region around 3 μm as with PbS photoconductive detectors, and also feature low noise, high speed and high reliability. P10090 series is a new family of InAs photovoltaic detectors that deliver even lower noise than our conventional products (P8079 series).

Various types are available, including non-cooled type, thermoelectrically cooled type (P10090 series), and liquid nitrogen cooled type (P7163) that delivers high performance.

Features

- Low noise
- High reliability
- High detectivity (D*)
- Available in multi-element arrays (custom product)

Applications

- Gas analysis
- Laser detection
- Infrared spectrophotometry
- Radiation thermometer

Accessories (Optional)

- Heatsink for one-stage TE-cooled type A3179
- Heatsink for two-stage TE-cooled type A3179-01
- Temperature controller C1103-04
- Infrared detector module with preamp P4631-02
- Amplifiers for InAs photovoltaic detector (P10090 series: C4159-06, P7163: P4159-05)

Specifications/Absolute maximum ratings

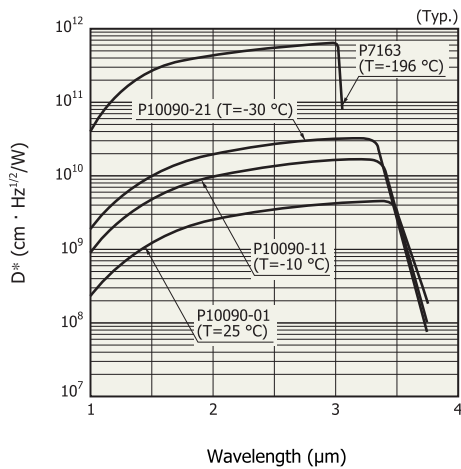
Type No.	Dimensional outline/ Window material *1	Package	Cooling	Active area (mm)	Absolute maximum ratings			
					Thermistor power dissipation (mW)	Reverse voltage V _R (V)	Operating temperature T _{opr} (°C)	Storage temperature T _{stg} (°C)
P10090-01	①/S	TO-5	Non-cooled	φ1	-	0.5	-40 to +60	-40 to +80
P10090-11	②/S	TO-8	One-stage TE-cooled		0.2			
P10090-21			Two-stage TE-cooled		-			
P7163	③/S	Metal dewar	LN ₂	φ1	-	-	-	-55 to +60

*1: S=Sapphire glass

Electrical and optical characteristics (Typ. unless otherwise noted)

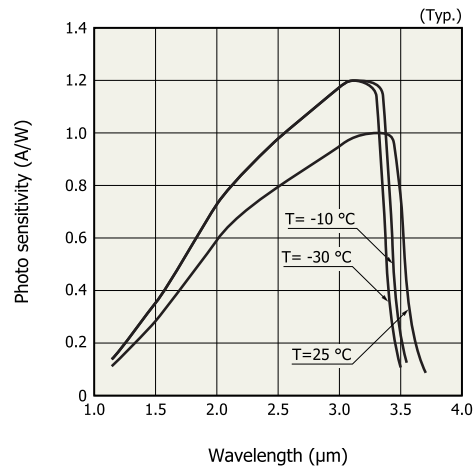
Type No.	Measurement-condition	Peak sensitivity wavelength λ_p	Cut-off wavelength λ_c	Photo sensitivity S $\lambda = \lambda_p$	Shunt resistance Rsh		D* ($\lambda_p, 600, 1$)		NEP $\lambda = \lambda_p$	Rise time tr $V_R=0 V$ $R_L=50 \Omega$ 0 to 63 %
	Element temperature T				Min. (Ω)	Typ. (Ω)	Min. ($cm \cdot Hz^{1/2}/W$)	Typ. ($cm \cdot Hz^{1/2}/W$)		
P10090-01	25	3.35	3.65	1.0	40	70	3.0×10^9	4.5×10^9	1.5×10^{-11}	0.70
P10090-11	-10	3.30	3.55	1.2	250	400	1.0×10^{10}	1.6×10^{10}	5.3×10^{-12}	0.45
P10090-21	-30	3.25	3.45		1000	1300	2.0×10^{10}	3.2×10^{10}	2.8×10^{-12}	0.30
P7163	-196	3.00	3.1	1.3	1×10^5	1×10^6	3.5×10^{11}	6.0×10^{11}	1.5×10^{-13}	0.10

Spectral response (D*)



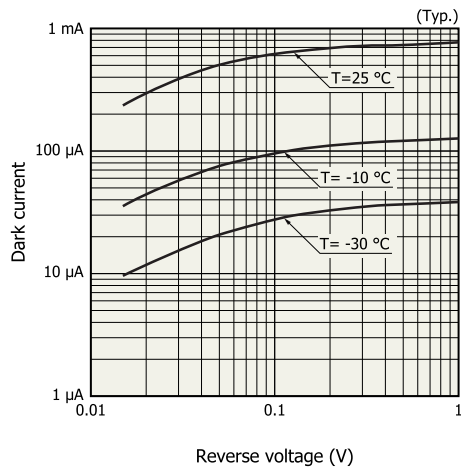
KIRD80356EC

Spectral response



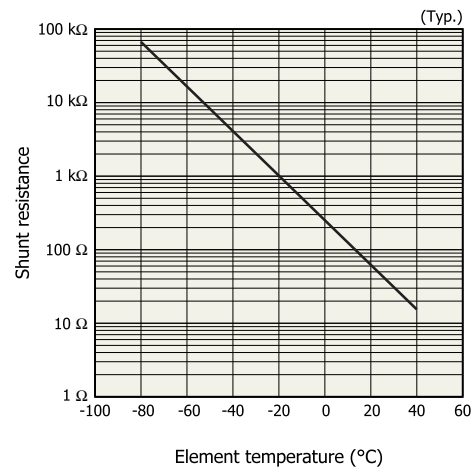
KIRD80381EA

Dark current vs. reverse voltage



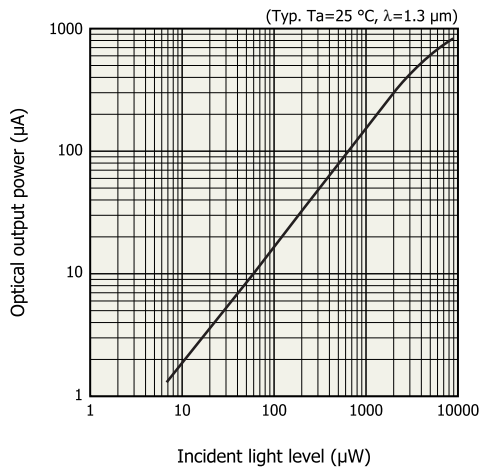
KIRD80382EA

Shunt resistance vs. element temperature (P10090 series)



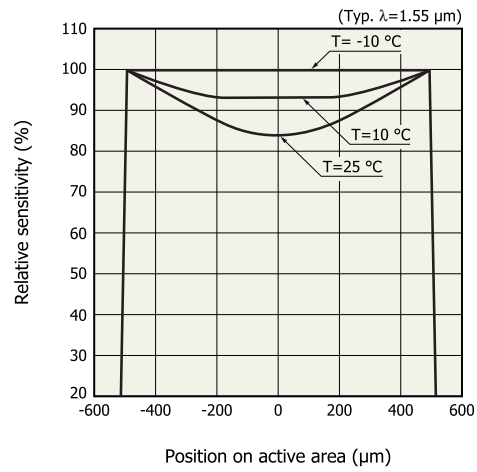
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Linearity



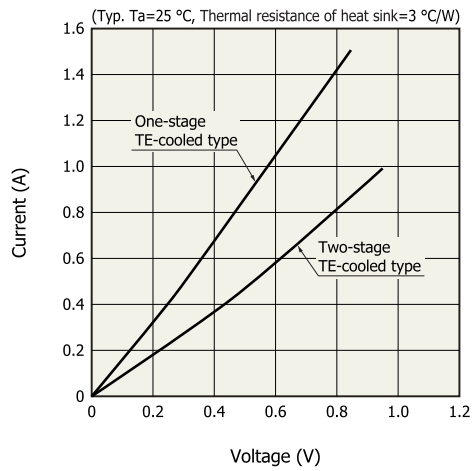
KIRDB0384EA

Sensitivity uniformity



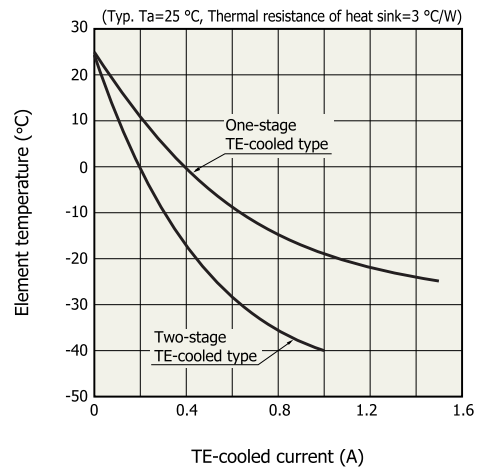
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Current vs. voltage of TE-cooled type



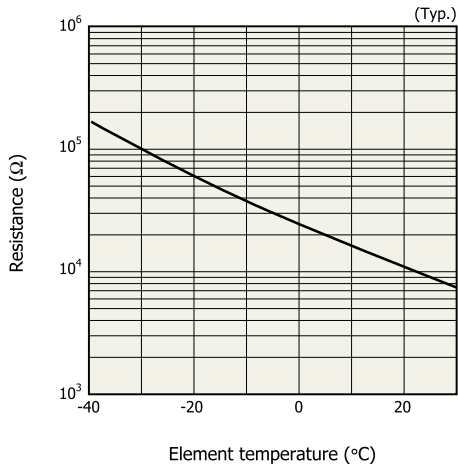
KIRDB0115EB

Cooling characteristics of TE-cooled type



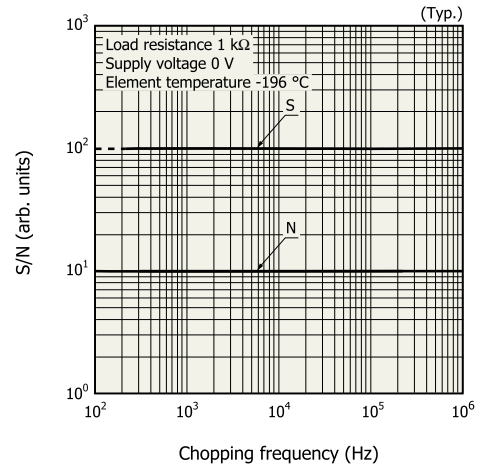
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Thermistor temperature characteristic



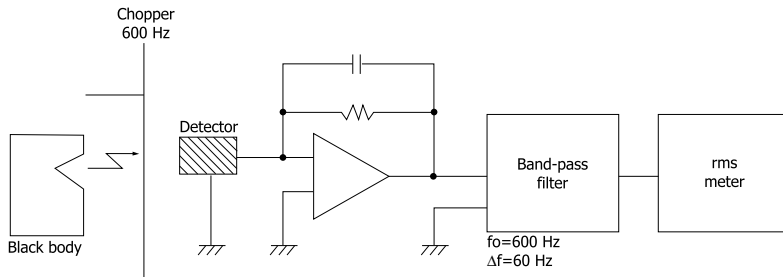
KIRDB0116EA

S/N vs. chopping frequency (P7163)



KIRDB0064ED

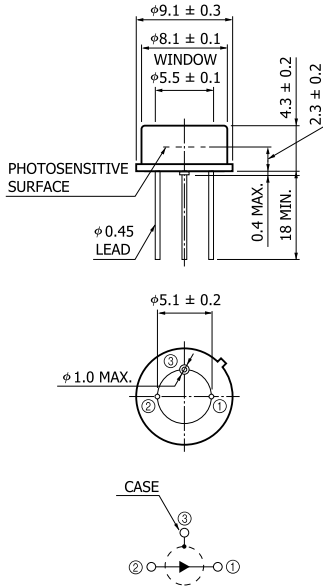
Measurement circuit



KIRDC0075EA

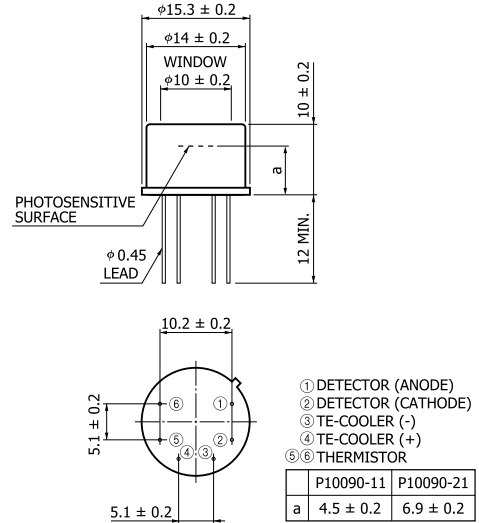
Dimensional outlines (unit: mm)

① P10090-01



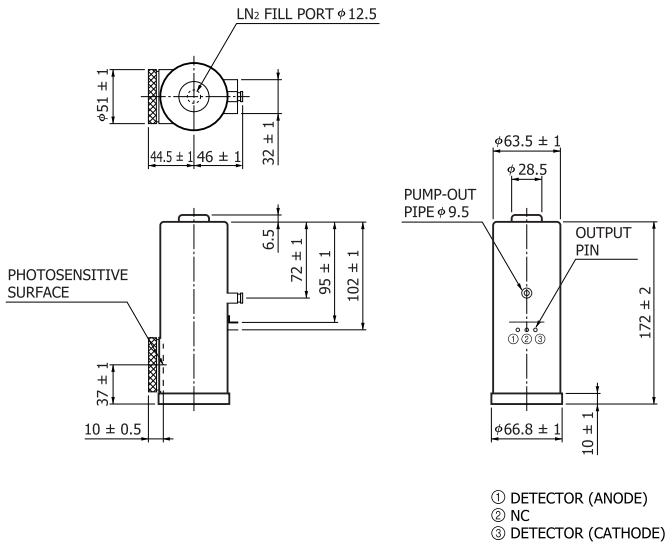
KIRDA0119EA

② P10090-11/-21



KIRDA0191EA

③ P7163



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