

INFRARED DETECTOR

InAs photovoltaic detector

P10090 series

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 and high reliability. P10090 series is a new family of InAs photovoltaic detectors that deliver even higher sensitivity than our conventional products (P8079 series).

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 P4631-01
- Amplifiers for InAs photovoltaic detector (custom-made product)

Specifications/Absolute maximum ratings

Type No.	Dimensional outline/ Window material *	Package	Cooling	Active area (mm)	Absolute maximum ratings			
					Thermistor power dissipation (mW)	Reverse voltage VR (V)	Operating temperature Topr (°C)	Storage temperature Tstg (°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					

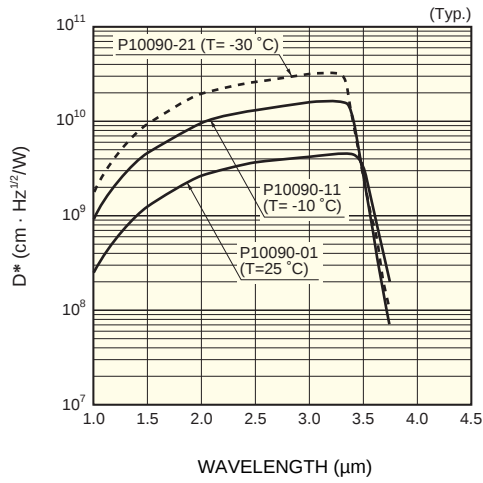
* Window material S: sapphire glass

Electrical and optical characteristics (Typ. unless otherwise noted)

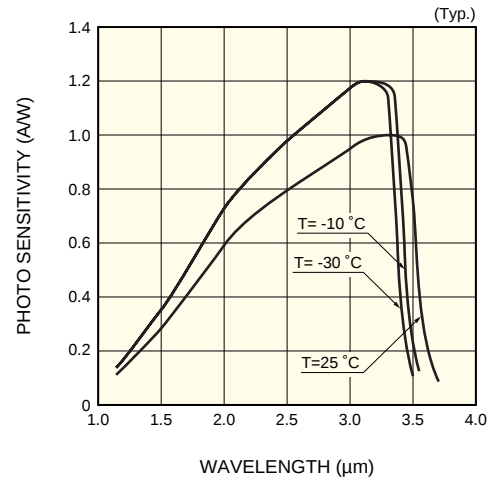
Type No.	Measurement condition	Peak sensitivity wavelength λ_p	Cut-off wavelength λ_c	Photo sensitivity S $\lambda = \lambda_p$	Shunt resistance R_{sh}		D^* (λ_p , 600, 1)		NEP $\lambda = \lambda_p$	Rise time t_r $V_R = 0 \text{ V}$ $R_L = 50 \Omega$ 0 to 63 %
	Element temperature T									
	($^{\circ}\text{C}$)	(μm)	(μm)	(A/W)	Min. (Ω)	Typ. (Ω)	Min. ($\text{cm} \cdot \text{Hz}^{1/2}/\text{W}$)	Typ. ($\text{cm} \cdot \text{Hz}^{1/2}/\text{W}$)	($\text{W}/\text{Hz}^{1/2}$)	(μs)
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

InAs photovoltaic detector P10090 series

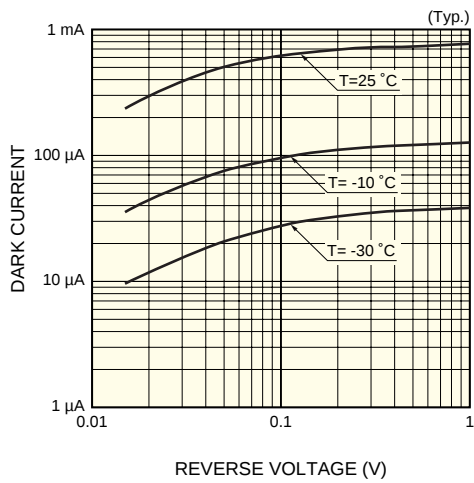
■ Spectral response (D^*)



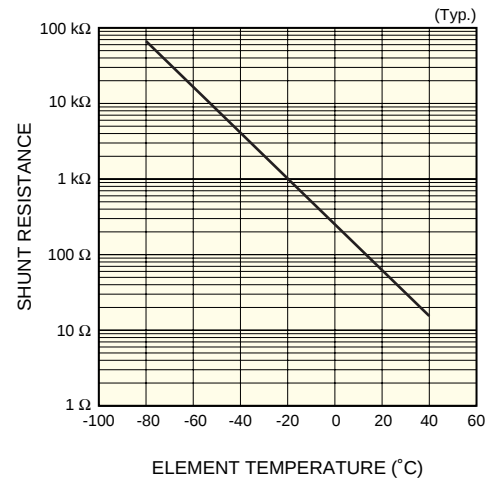
■ Spectral response



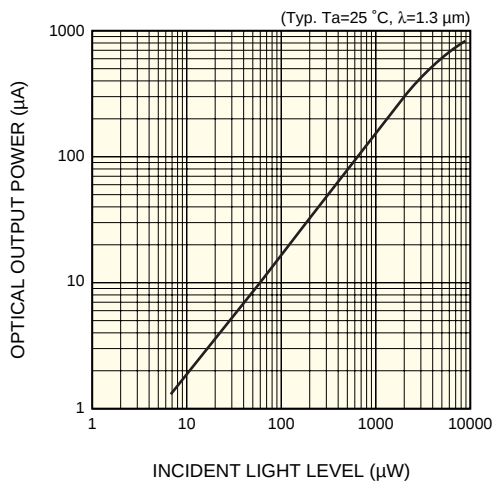
■ Dark current vs. reverse voltage



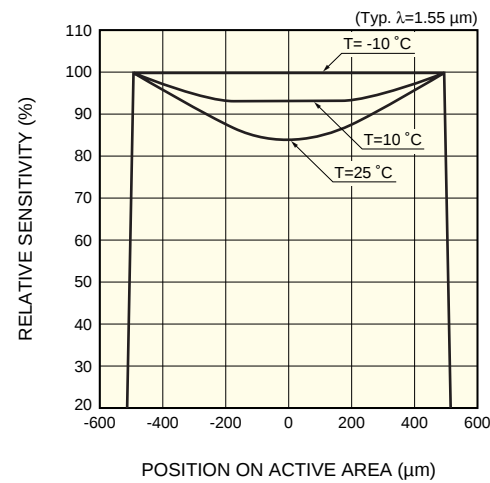
■ Shunt resistance vs. element temperature



■ Linearity

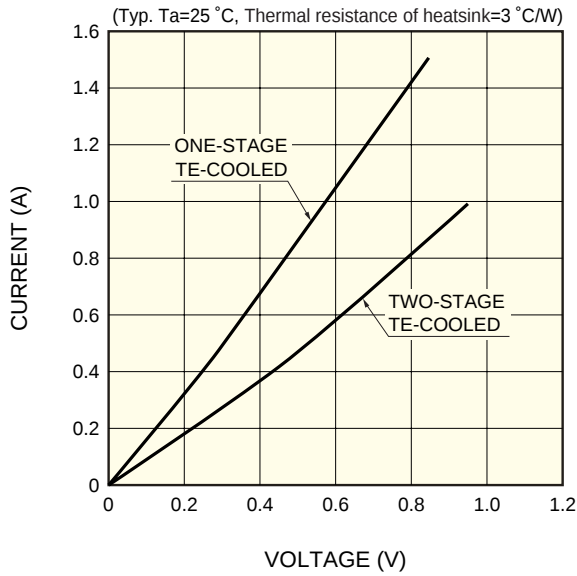


■ Sensitivity uniformity



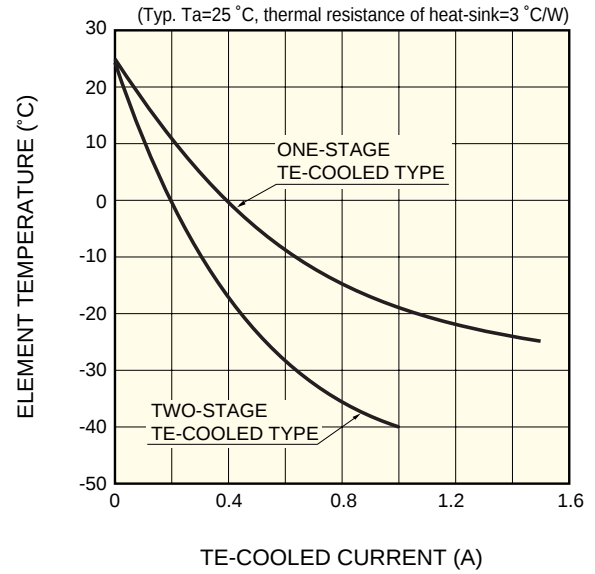
InAs photovoltaic detector P10090 series

■ Current vs. voltage of TE-cooled type



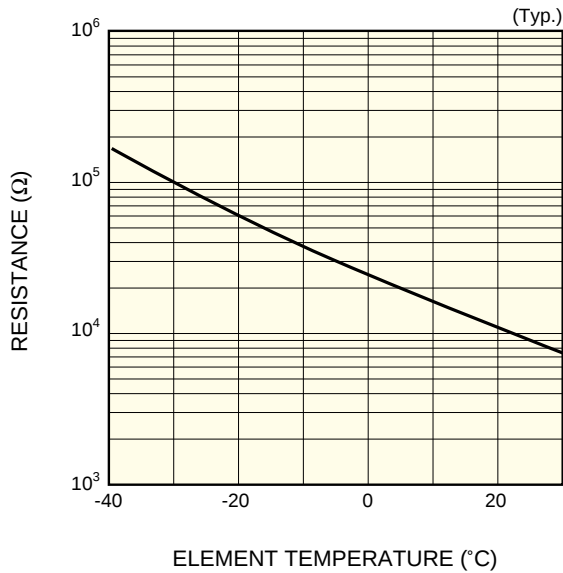
KIRDB0115EB

■ Cooling characteristics of TE-cooled type



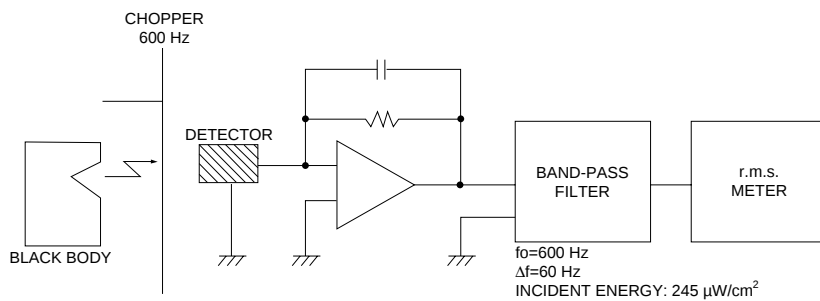
KIRDB0181EA

■ Thermistor temperature characteristic



KIRDB0116EA

■ Measurement circuit

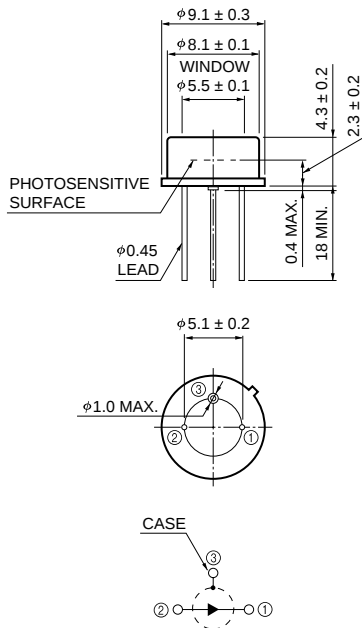


KIRDC0075EA

InAs photovoltaic detector P10090 series

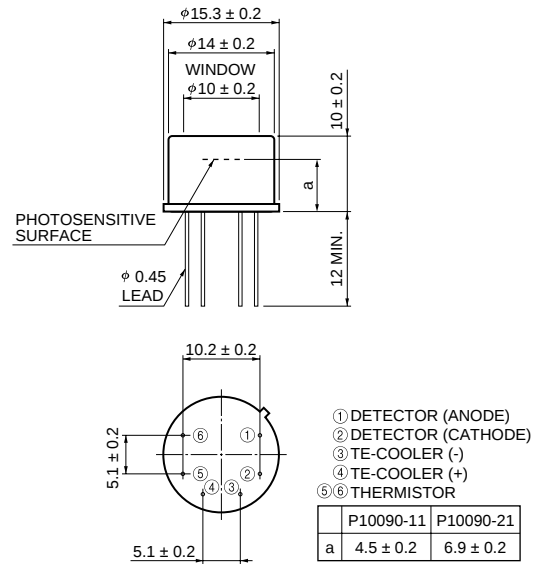
■ Dimensional outlines (unit: mm)

① P10090-01



KIRDA0119EA

② P10090-11/-21



KIRDA0191EA