

# 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

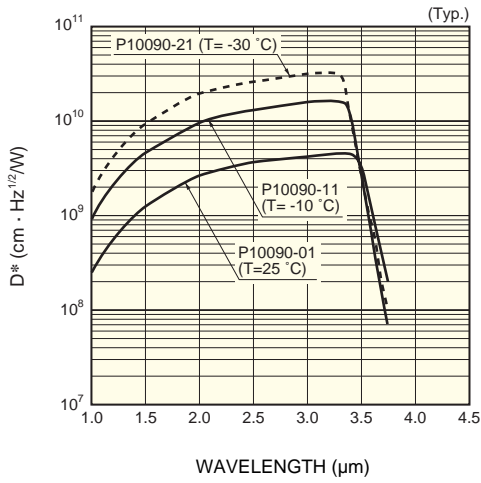
Type No.	Dimensional outline/ Window material *	Package	Cooling	Active area (mm)	Absolute maximum ratings			
					Thermistor power dissipation (mW)	Reverse voltage VR (V)	Operating temperature Topr (°C)	Storage temperature Tstg (°C)
P10090-01	①/S	TO-5	Non-cooled	φ1	-	0.5	-40 to +60	-40 to +80
P10090-11	②/S	TO-8	One-stage TE-cooled		0.2			
P10090-21			Two-stage TE-cooled					

\* Window material S: sapphire glass

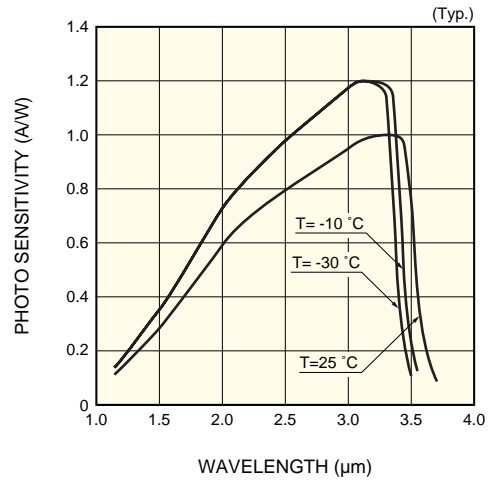
### ■ Electrical and optical characteristics (Typ. unless otherwise noted)

Type No.	Measurement condition Element temperature T (°C)	Peak sensitivity wavelength λp (μm)	Cut-off wavelength λc (μm)	Photo sensitivity S λ=λp (A/W)	Shunt resistance Rsh		D* (λp, 600, 1)		NEP λ=λp (W/Hz <sup>1/2</sup> )	Rise time tr VR=0 V RL=50 Ω 0 to 63 % (μs)
					Min. (Ω)	Typ. (Ω)	Min. (cm·Hz <sup>1/2</sup> /W)	Typ. (cm·Hz <sup>1/2</sup> /W)		
	P10090-01	25	3.35	3.65	1.0	40	70	3.0 × 10 <sup>9</sup>	4.5 × 10 <sup>9</sup>	1.5 × 10 <sup>-11</sup>
P10090-11	-10	3.30	3.55	1.2	250	400	1.0 × 10 <sup>10</sup>	1.6 × 10 <sup>10</sup>	5.3 × 10 <sup>-12</sup>	0.45
P10090-21	-30	3.25	3.45		1000	1300	2.0 × 10 <sup>10</sup>	3.2 × 10 <sup>10</sup>	2.8 × 10 <sup>-12</sup>	0.30

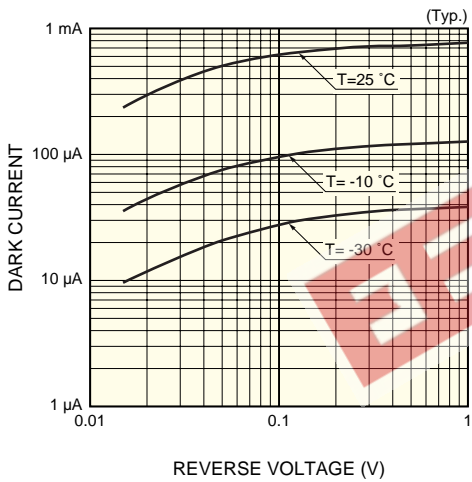
## ■ Spectral response ( $D^*$ )



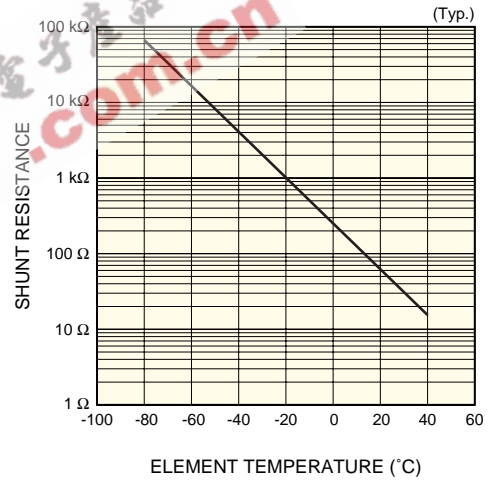
## ■ Spectral response



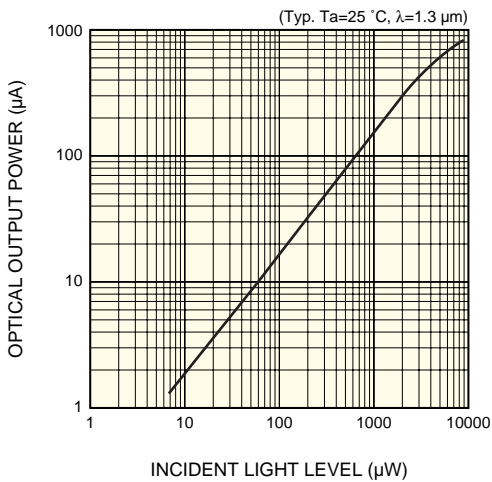
## ■ Dark current vs. reverse voltage



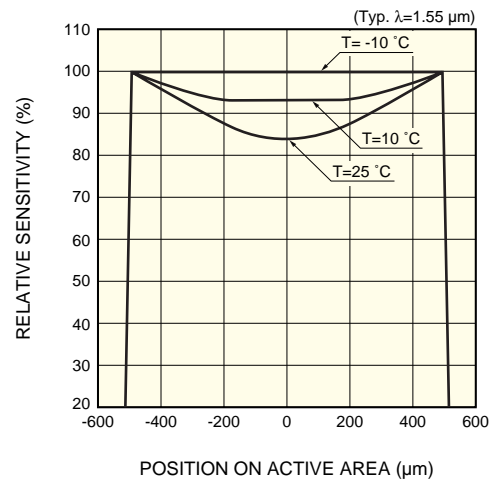
## ■ Shunt resistance vs. element temperature



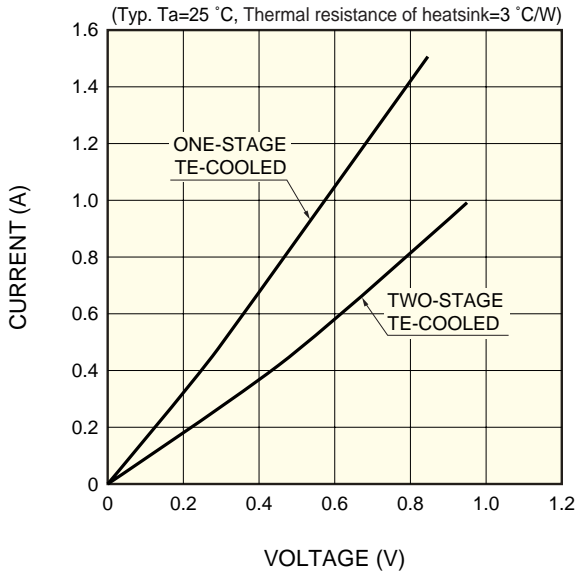
## ■ Linearity



## ■ Sensitivity uniformity

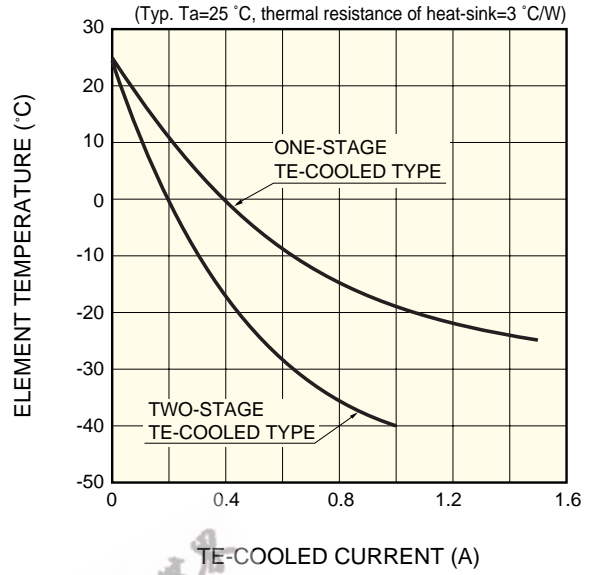


## ■ Current vs. voltage of TE-cooled type



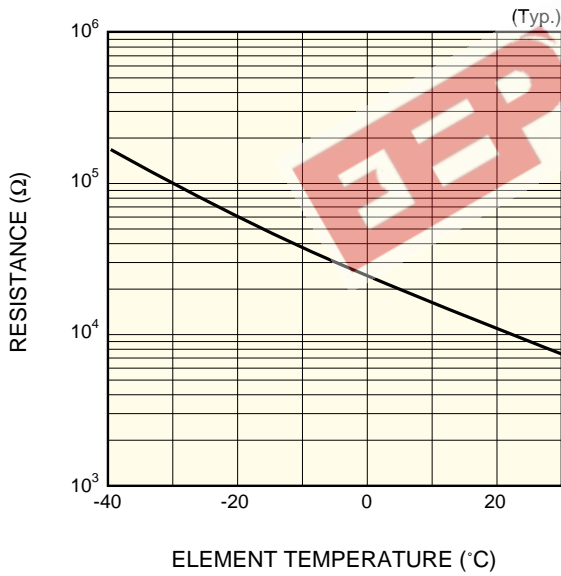
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## ■ Cooling characteristics of TE-cooled type



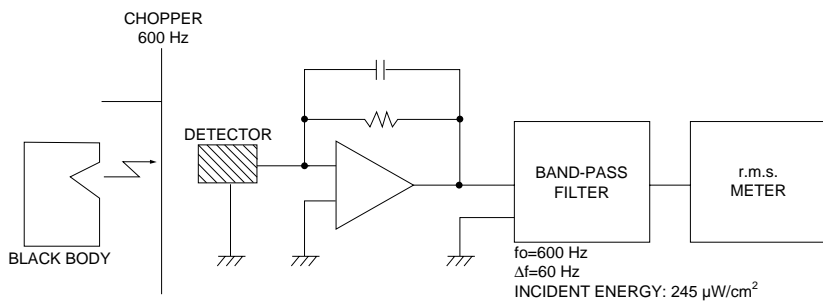
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## ■ Thermistor temperature characteristic



KIRDB0116EA

## ■ Measurement circuit

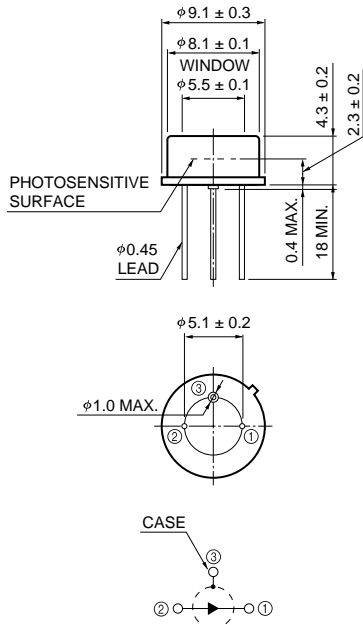


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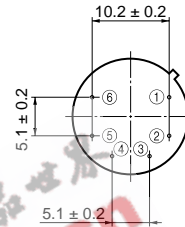
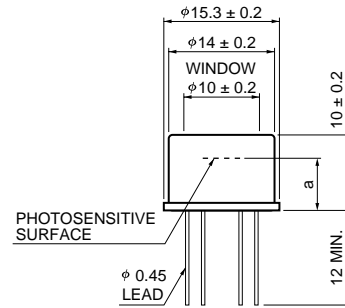
# InAs photovoltaic detector P10090 series

## Dimensional outlines (unit: mm)

① P10090-01



② P10090-11/-21



- ① DETECTOR (ANODE)
- ② DETECTOR (CATHODE)
- ③ TE-COOLER (-)
- ④ TE-COOLER (+)
- ⑤⑥ THERMISTOR

	P10090-11	P10090-21
a	4.5 ± 0.2	6.9 ± 0.2

KIRDA0119EA

KIRDA0191EA

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