

MCT photoconductive detector P3257/P3981/P2750 series

Non-cooled type and TE-cooled type suitable for long, continuous operation



Features

- Choice of spectral response (up to 12 μm)
The band gap can be adjusted by controlling the composition ratio of HgTe and CdTe. Utilizing this fact, various types are available in different spectral characteristics.
- Photoconductive element that decreases its resistance by input of infrared light
- Custom devices available
Custom devices not listed in this catalog are also available with different spectral response, active area size and number of element.
- Easy-to-use infrared detector modules with preamp available

Applications

- Radiation thermometer
- Gas analyzer
- Infrared spectrophotometer
- FTIR
- CO₂ laser monitor

Accessories (Optional)

- Heatsink for two-stage TE-cooler A3179-01
(Can also be used with P3257-31)
- Heatsink for three-stage TE-cooler A3179-04
- Temperature controller C1103-05 (-25 to -75 °C)
C1103-07 (20 to -30 °C)
- Preamp C5185-01 (P3981/P2750 series)
(Preamp for P3257-30/-31 available upon request)
- Infrared detector modules with preamp
P4631-10 (P3257-31)
P4631 (P3981)
P4631-04 (P2750)

General ratings / Absolute maximum ratings

Type No.	Dimensional outline/ Window material *1	Package	Cooling	Active area (mm)	Absolute maximum ratings				
					Thermistor power dissipation (mW)	TE-cooler allowable current (A)	Allowable current (mA)	Operating temperature Topr (°C)	Storage temperature Tstg (°C)
P3257-30	①/Se	with BNC connector	Non-cooled	1 × 1 0.25 × 0.25	-	-	50	-40 to +60	-55 to +60
P3257-31	②/Se	TO-8	One-stage TE-cooled		0.2	1.5	50		
P3981	②/S	TO-8	Two-stage TE-cooled		0.2	1.0	3		
P3981-01	③/S	TO-66					3		
P2750-08	②/S	TO-8					6		
P2750	④/S	TO-3	Three-stage TE-cooled		0.25 × 0.25	0.2	1.0		
P2750-06				3					

*1: Window material S : Sapphire glass
Se: ZnSe

Electrical and optical characteristics (Typ. unless otherwise noted)

Type No.	Measurement condition Element temperature T (°C)	Peak sensitivity wavelength λ _p (μm)	Cut-off wavelength λ _c (μm)	Photo sensitivity S λ=λ _p *3 (V/W)	D* (500, 1200, 1) *4 (cm·Hz ^{1/2} /W)		D* (λ _p *3, 1200, 1) (cm·Hz ^{1/2} /W)	NEP λ=λ _p *3 (W/Hz ^{1/2})	Rise time tr 0 to 63 % (μs)	Dark resistance Rd (Ω)
					Min.	Typ.				
					(cm·Hz ^{1/2} /W)	(cm·Hz ^{1/2} /W)				
P3257-30	25	6.5	11.0	2 × 10 ⁻³	5.0 × 10 ⁵	3.0 × 10 ⁶	2.0 × 10 ⁵	5.0 × 10 ⁻⁷	1 (ns)	30
P3257-31	0	7.0	11.5	5 × 10 ⁻³	1.0 × 10 ⁶	6.0 × 10 ⁶	5.0 × 10 ⁵	2.0 × 10 ⁻⁷	1 (ns)	35
P3981	-30	3.6	4.3	1 × 10 ⁴	5.0 × 10 ⁸	5.0 × 10 ⁹	1.3 × 10 ¹¹	7.7 × 10 ⁻¹³	10	600
P3981-01										
P2750-08										
P2750	-60	4.8	5.5	2 × 10 ³	1.0 × 10 ⁹	9.0 × 10 ⁹	4.5 × 10 ¹⁰	2.2 × 10 ⁻¹²	3	200
P2750-06				3 × 10 ³				5.0 × 10 ⁻¹³		

*2: Photo sensitivity changes with the bias current. The values in the above table are measured with the optimum bias current.

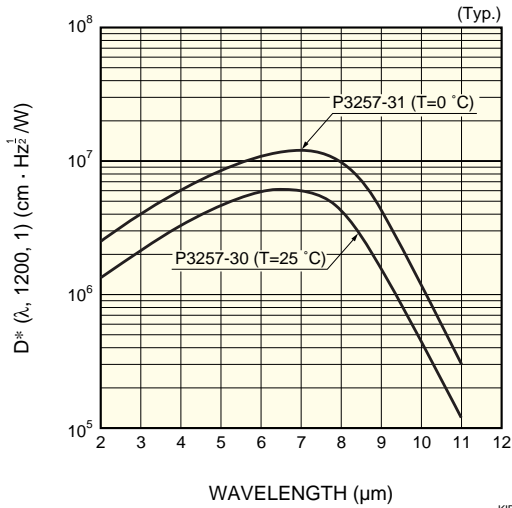
*3: P3257-30/-31: λ=10.6 μm

*4: P3257-30/-31: (800, 1200, 1)

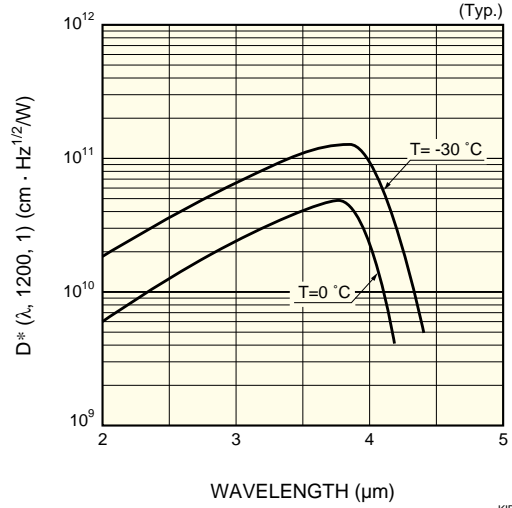


■ Spectral response

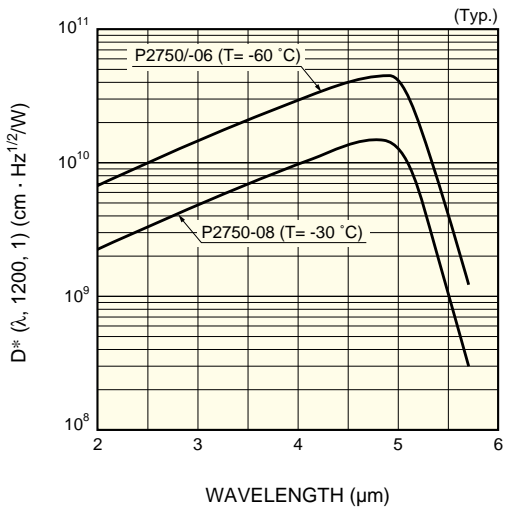
P3257-30/-31



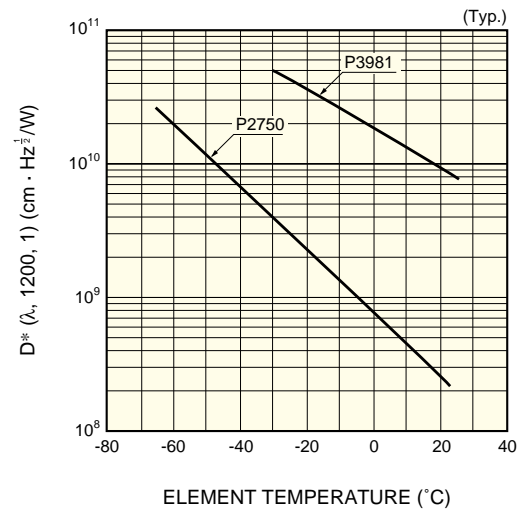
P3981/-01



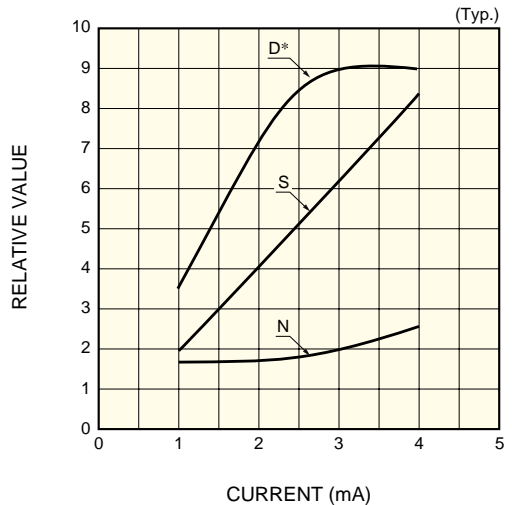
P2750/-06/-08



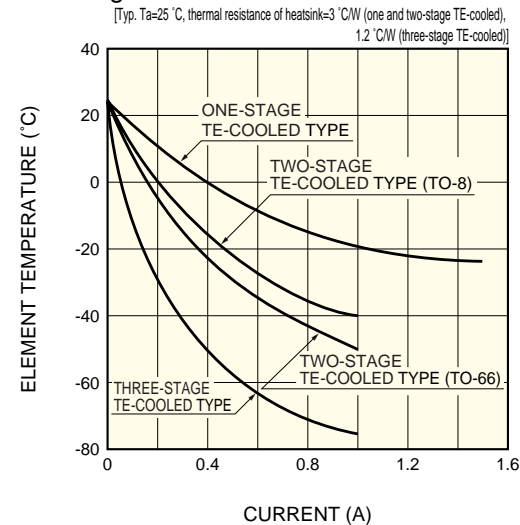
■ D^* vs. element temperature



■ S/N vs. bias current (P2750)

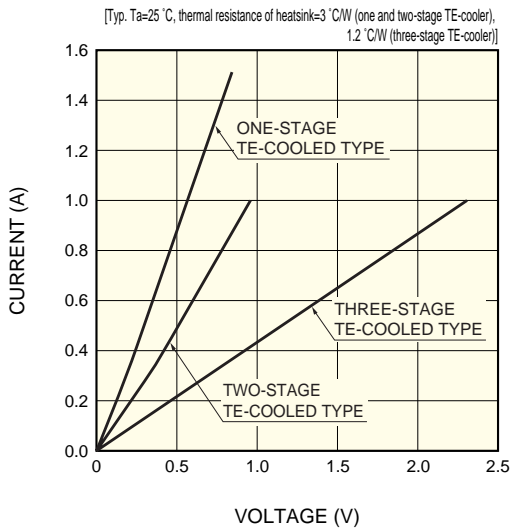


■ Cooling characteristics of TE-cooler

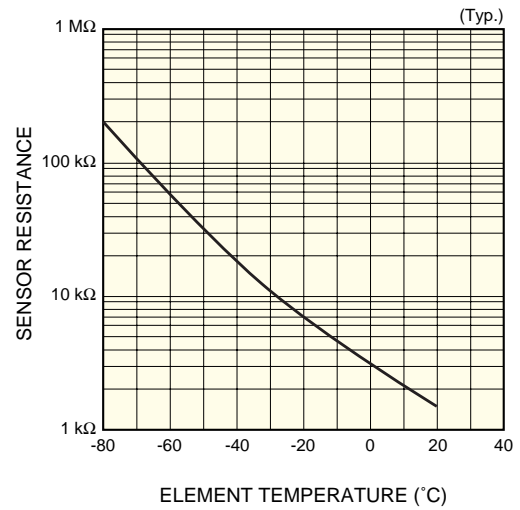


The detector must be operated in a range where the D^* becomes Max.

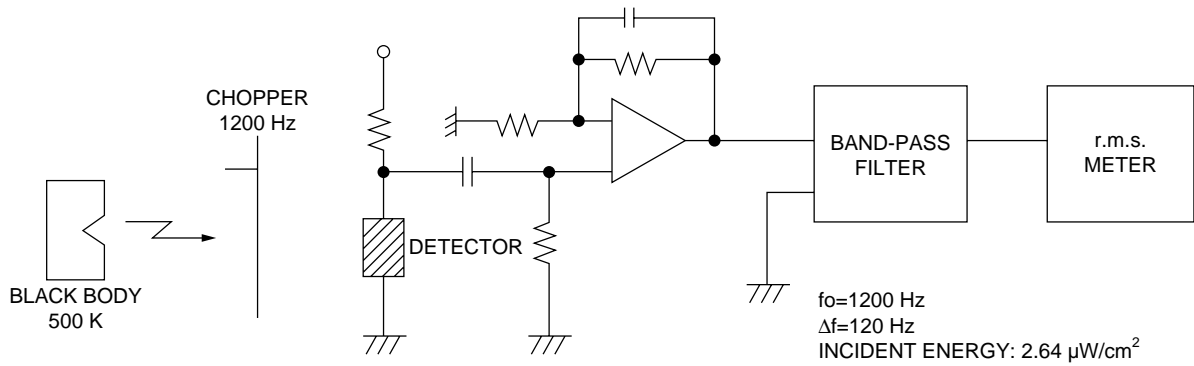
■ Current vs. voltage of TE-cooler



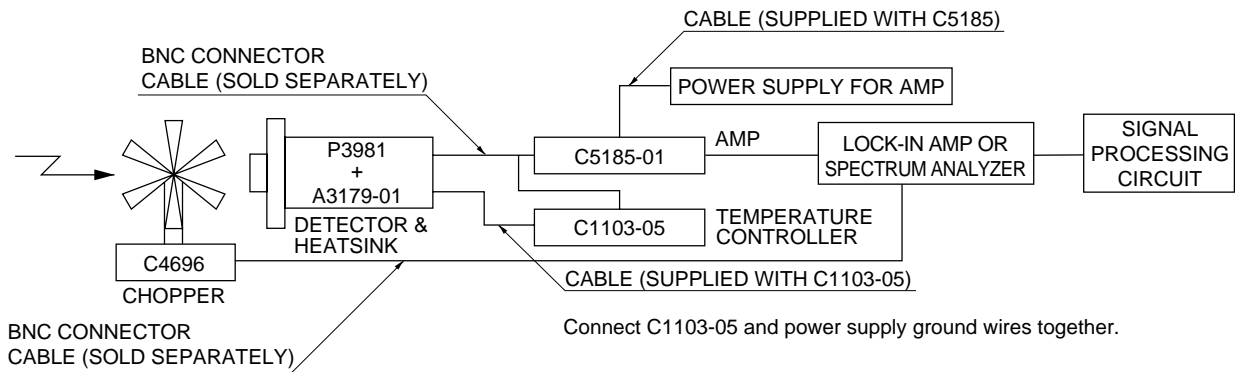
■ Thermistor temperature characteristic



■ Measurement circuit



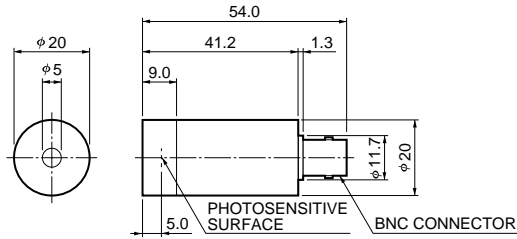
■ Connection example (P3981)



MCT photoconductive detector P3257/P3981/P2750 series

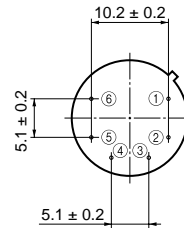
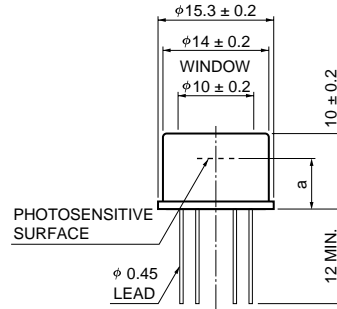
Dimensional outlines (unit: mm)

① P3257-30



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② P3257-31, P3981, P2750-08

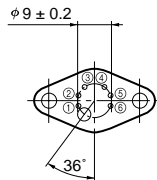
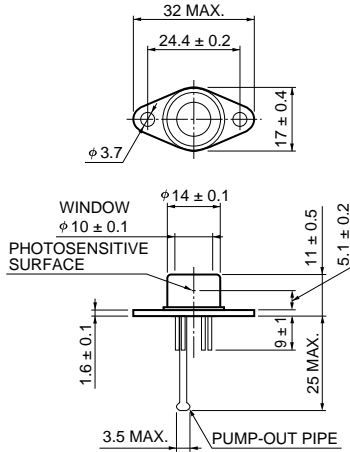


- ① DETECTOR
- ② DETECTOR
- ③ TE-COOLER (-)
- ④ TE-COOLER (+)
- ⑤⑥ THERMISTOR

	P3257-31	P3981, P2750-08
a	5.2 ± 0.2	6.6 ± 0.2

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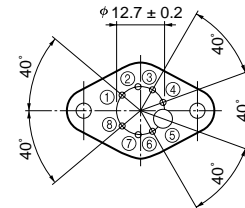
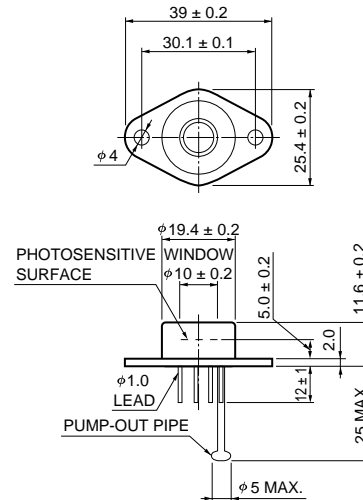
③ P3981-01



- ①② THERMISTOR
- ③ DETECTOR
- ④ DETECTOR
- ⑤ TE-COOLER (-)
- ⑥ TE-COOLER (+)

KIRDA0123EB

④ P2750-06



- ① TE-COOLER (+)
- ②⑦ DETECTOR
- ③④ THERMISTOR
- ⑤ PUMP-OUT PIPE
- ⑥ NC
- ⑧ TE-COOLER (-)

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