HAMAMATSU
PHOTON IS OUR BUSINESS

MCT photoconductive detectors

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 datasheet are also available with different spectral response, photosensitive area size and number of element.
- **Easy-to-use infrared detector modules with preamp available**

Applications

- **Radiation thermometer**
- **Gas analyzer**
- **Infrared spectrophotometers**
- **FTIR**
- **CO_2 laser monitor**

Options (sold separately)

- **Heatsink for one-stage/two-stage TE-cooler** **A3179-01**
  (Heatsink for P3981-01 is a custom product.)
- **Heatsink for three-stage TE-cooler** **A3179-04**
- **Temperature controller** **C1103-05 (-25 to -75 °C)**
  C1103-07 (20 to -30 °C)
- **Preamp** **C5185-03 (P3981/P2750 series)**
  (Preamp for P3257-30/-101 is a custom product)
- **Infrared detector modules with preamp** **C12495-111L (P3257-101)**

Structure / Absolute maximum ratings

Type no.	Dimensional outline/ Window material*1	Package	Cooling	Photosensitive area (mm)	Absolute maximum ratings						
					Incident light level	Thermistor power dissipation (mW)	TE-cooler allowable current (A)	TE-cooler allowable voltage (V)	Allowable current (mA)	Operating temperature Topr (°C)	Storage temperature Tstg (°C)
P3257-30	(1)/Se	with BNC connector	Non-cooled	1 × 1	*2	-	-	-	50	-40 to +60*3	-55 to +60
P3257-101	(2)/Ge	TO-8	One-stage TE-cooled			0.2	1.5	0.9	50	-40 to +60	
P3981	(2)/S	TO-8	Two-stage TE-cooled		-		1.0	1.3	3		
P3981-01	(3)/S	TO-66							3		
P2750-08	(2)/S	TO-8							6		
P2750	(4)/S	TO-3	Three-stage TE-cooled						6	-40 to +60	

Note: 0Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.
*1: S=Sapphire glass, Se=ZnSe
*2: CW: 50 W/cm^2, pulse: 50 kW/cm^2 (Pulse width is 1 µs or less and average power is 50 J/cm^2 or less.)
*3: No condensation

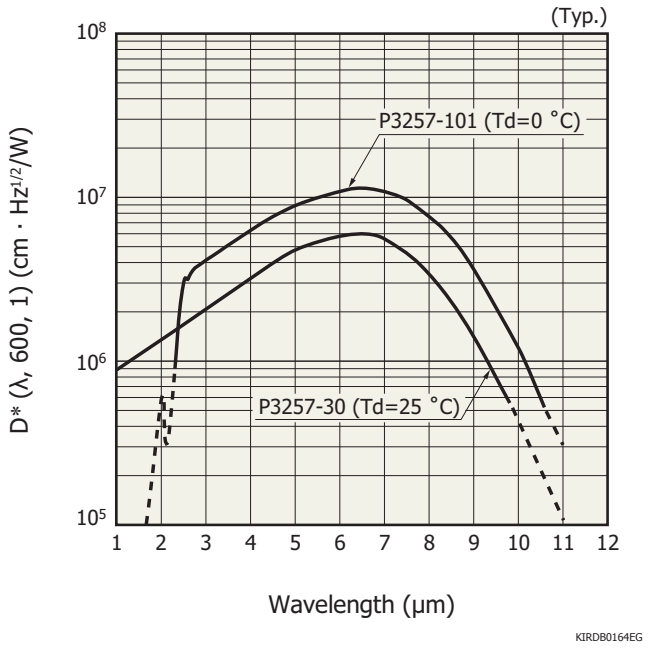
Electrical and optical characteristics (Typ. unless otherwise noted)

Type no.	Measurement condition Element temperature Td (°C)	Peak sensitivity wavelength λp (μm)	Cutoff wavelength λc (μm)	Photo-sensitivity*4 S λ=λp*5 (V/W)	Detectivity D* (500, 1200, 1)*6 Min. (cm · Hz$^{1/2}$/W)	Detectivity D* (500, 1200, 1)*6 Typ. (cm · Hz$^{1/2}$/W)	Detectivity D* (λp, 1200, 1)*5 (cm · Hz$^{1/2}$/W)	Noise equivalent power NEP λ=λp*5 Typ. (W · Hz$^{1/2}$)	Noise equivalent power NEP λ=λp*5 Max. (W · Hz$^{1/2}$)	Rise time tr 0 to 63% (μs)	Dark resistance Rd (Ω)	Thermistor resistance 25 °C (kΩ)
P3257-30	25	6.5	10.0	2×10^{-3}	5.0×10^{5}	3.0×10^{6}	2.0×10^{5}	5.0×10^{-7}	3.0×10^{-6}	1 (ns)	30	-
P3257-101	0	7.0	10.6	5×10^{-3}	1.0×10^{6}	6.0×10^{6}	5.0×10^{5}	2.0×10^{-7}	1.2×10^{-6}	1 (ns)	35	1.3
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}	7.7×10^{-12}	10	600	
P3981-01												
P2750-08		4.8	5.4	3×10^{2}	3.0×10^{8}	3.0×10^{9}	1.5×10^{10}	6.7×10^{-12}	6.7×10^{-11}	2	160	
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}	2.0×10^{-11}	3	200	

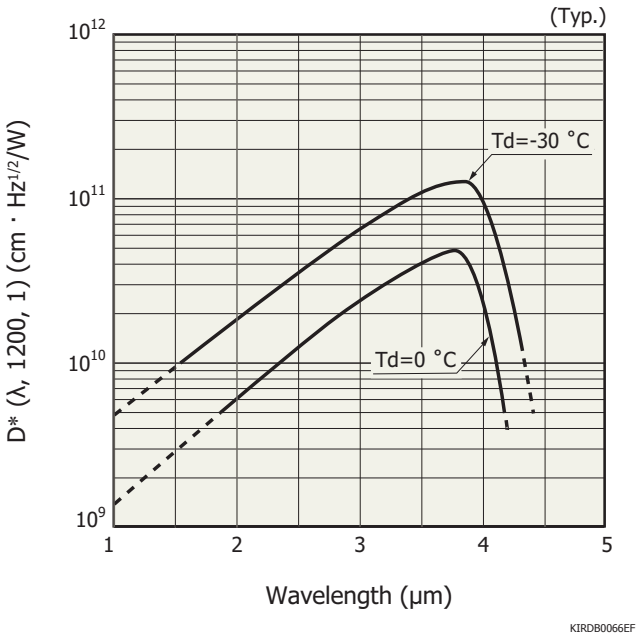
*4: Photosensitivity changes with the bias current. The values in the above table are measured with the optimum bias current.
*5: P3257-30/-101: λ=10.6 μm
*6: P3257-30/-101: (800, 600, 1)

Spectral response

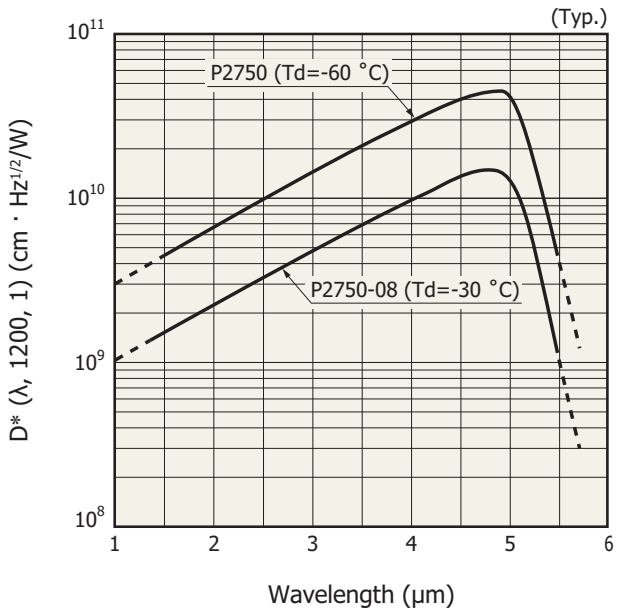
P3257-30/-101



P3981/-01

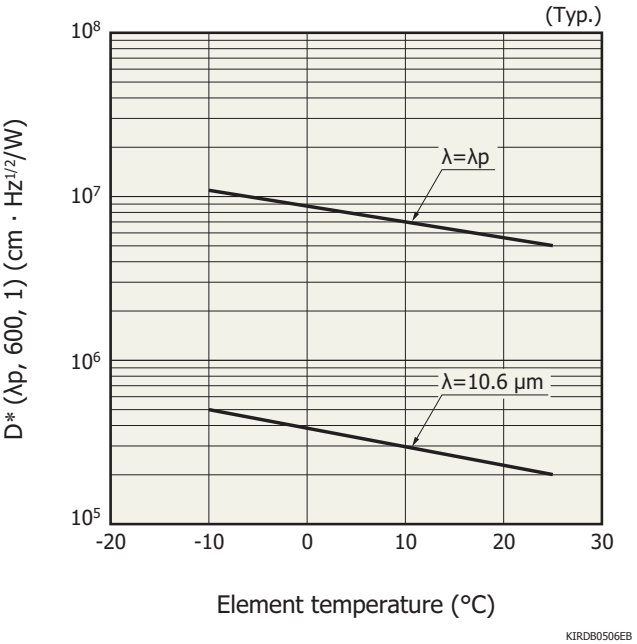


P2750/-08

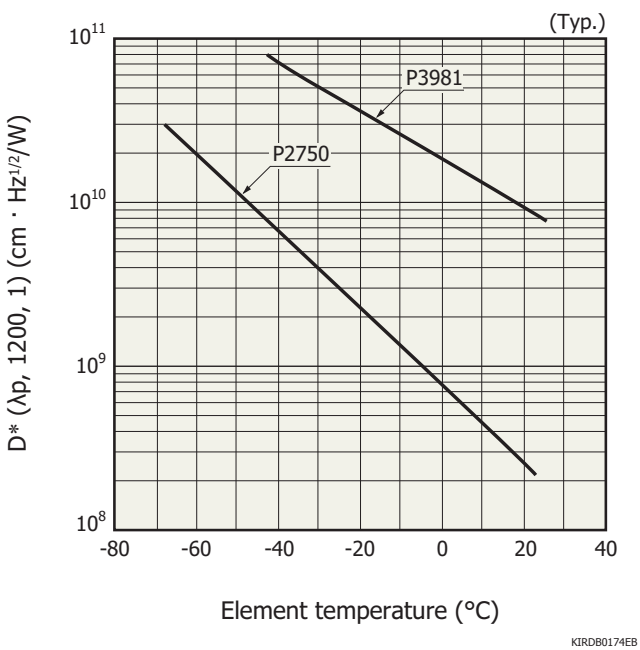


D* vs. element temperature

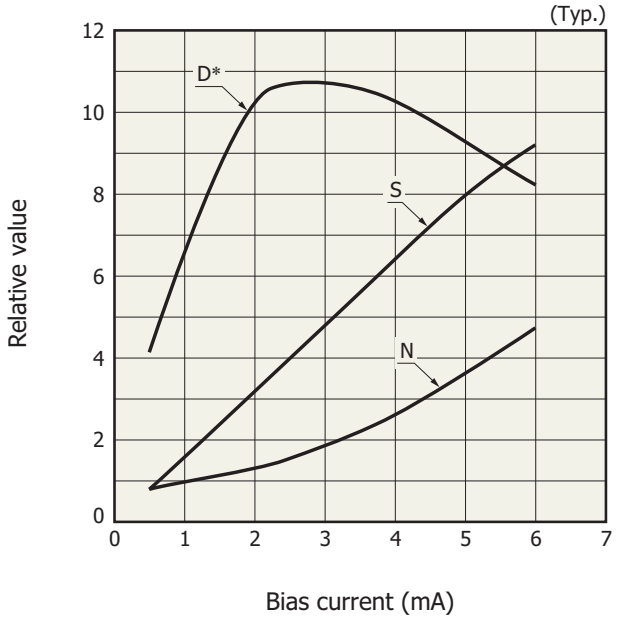
P3257-30/-101



P3981, P2750



S/N vs. bias current (P2750)



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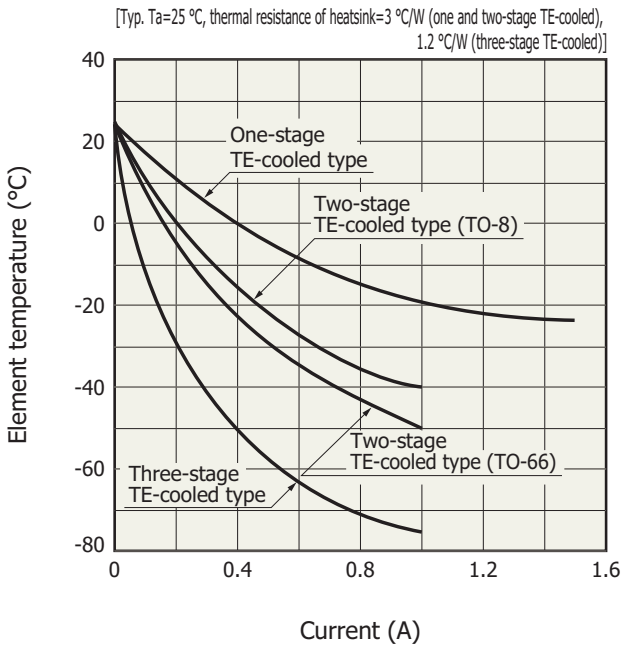
The detector must be operated in a range where the D* becomes max.

Cooling characteristics of TE-cooler



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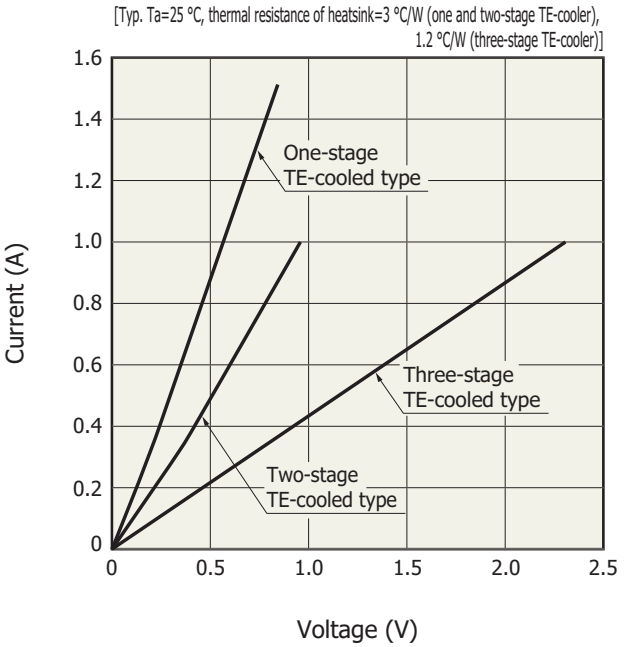
Current vs. voltage of TE-cooler



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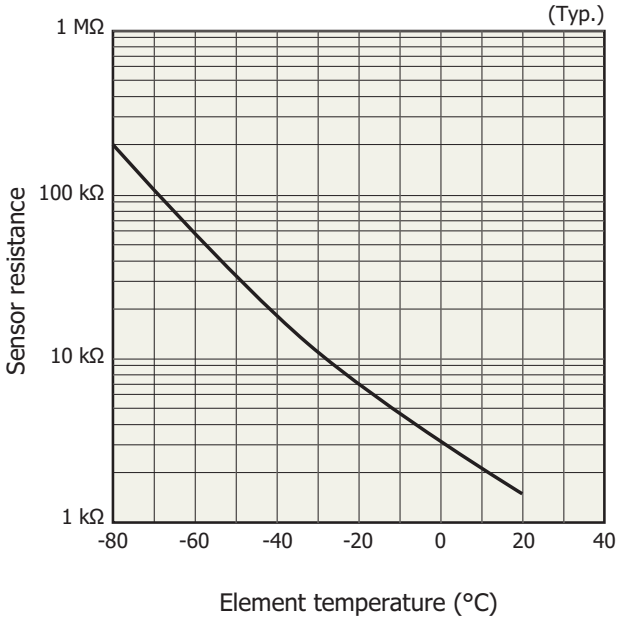
Thermistor temperature characteristics



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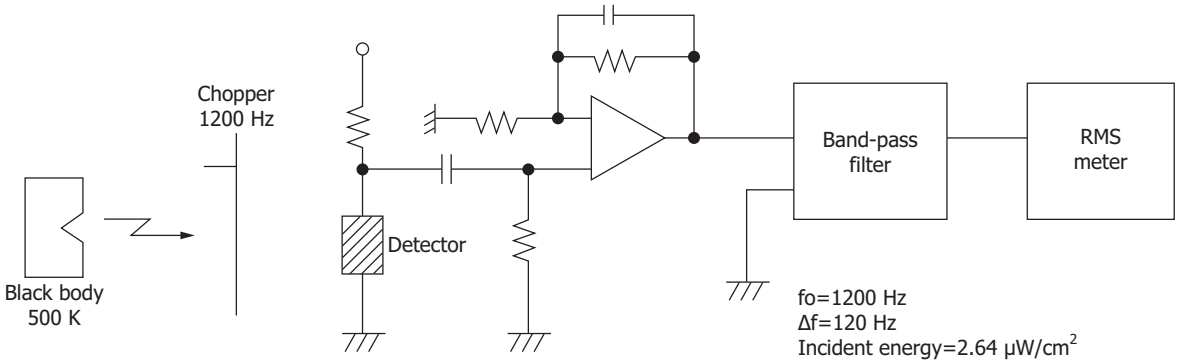
Measurement circuit



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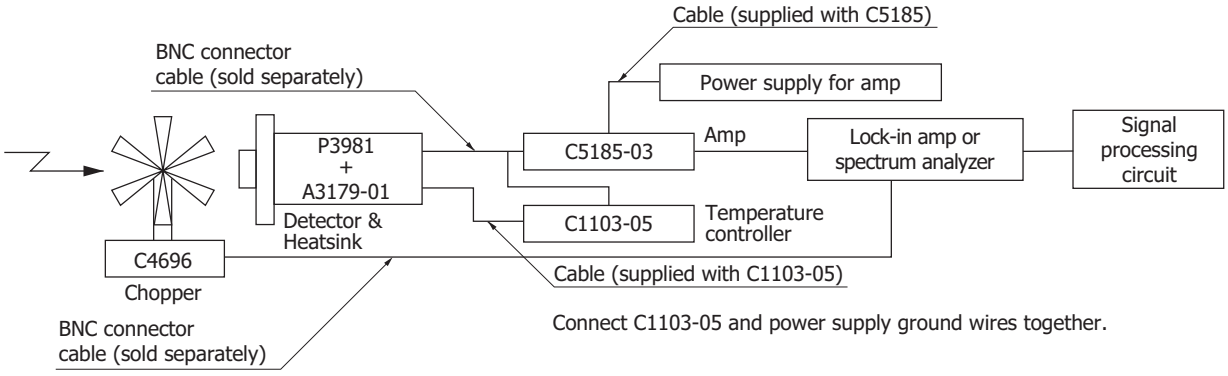
Connection example (P3981)



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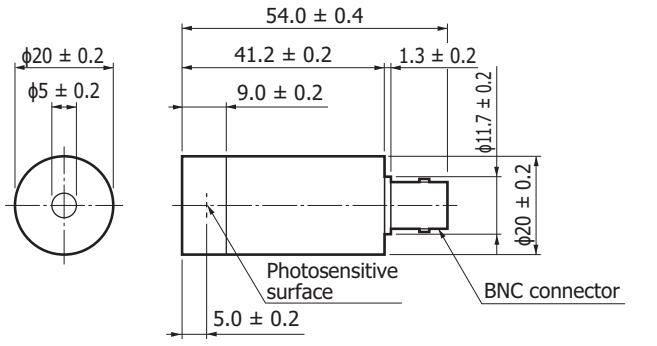
Dimensional outlines (unit: mm)

(1) P3257-30



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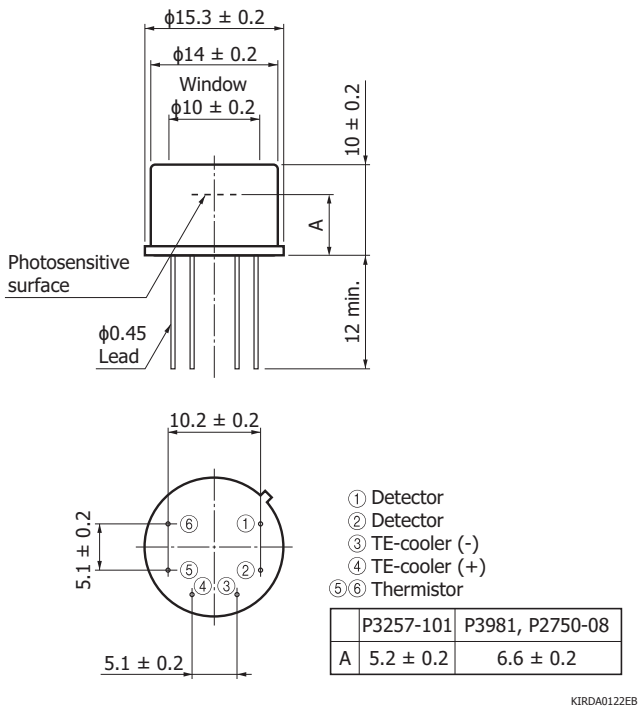
(2) P3257-101, P3981, P2750-08



	P3257-101	P3981, P2750-08
A	5.2 ± 0.2	6.6 ± 0.2

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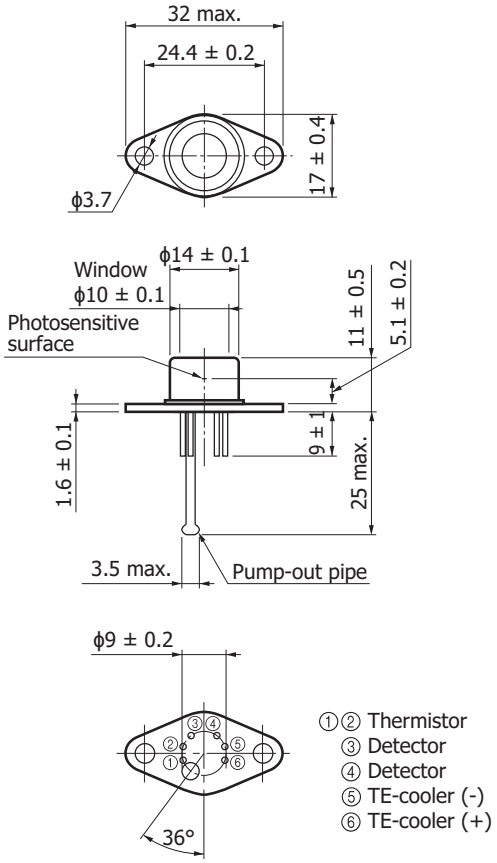
(3) P3981-01



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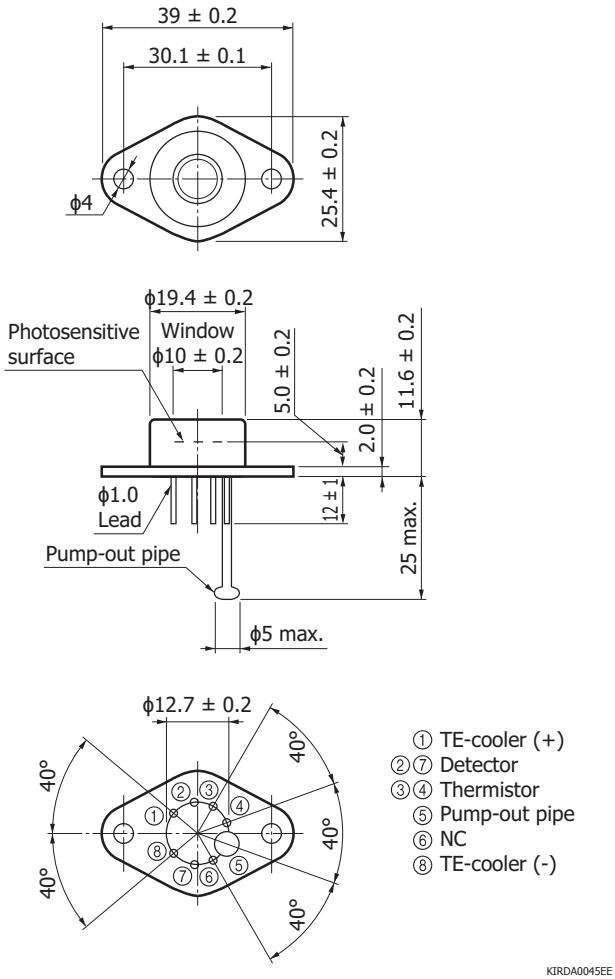
(4) P2750



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Related information

www.hamamatsu.com/sp/ssd/doc_en.html

■ Precautions
- Notice
- Metal, ceramic, Plastic products/Precautions

■ Technical information
- infrared detector/technical information

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