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/-31 is a custom product)
- **Infrared detector modules with preamp**
  P4631-10 (P3257-31)

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)	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	-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		-		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					6		
P2750-06				0.25 × 0.25				3		

Note: Exceeding 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.)

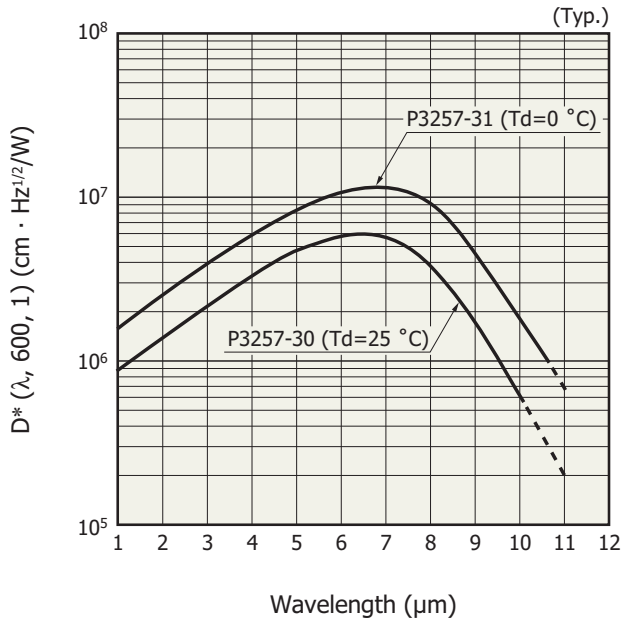
Electrical and optical characteristics (Typ. unless otherwise noted)

Type no.	Measurement condition Element temperature Td (°C)	Peak sensitivity wavelength λp (μm)	Cutoff wavelength λc (μm)	Photo-sensitivity*3 S λ=λp*4 (V/W)	D* (500, 1200, 1)*5 Min. (cm · Hz$^{1/2}$/W)	D* (500, 1200, 1)*5 Typ. (cm · Hz$^{1/2}$/W)	D* (λp, 1200, 1)*4 (cm · Hz$^{1/2}$/W)	Noise equivalent power NEP λ=λp*4 Typ. (W · Hz$^{1/2}$)	Noise equivalent power NEP λ=λp*4 Max. (W · Hz$^{1/2}$)	Rise time tr 0 to 63% (μs)	Dark resistance Rd (Ω)
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
P3257-31	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
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
P2750-06				3×10^{3}				5.0×10^{-13}	5.0×10^{-13}		

*3: Photosensitivity changes with the bias current. The values in the above table are measured with the optimum bias current.
*4: P3257-30/-31: (10.6 μm, 600, 1)
*5: P3257-30/-31: (800, 600, 1)

Spectral response

P3257-30/-31



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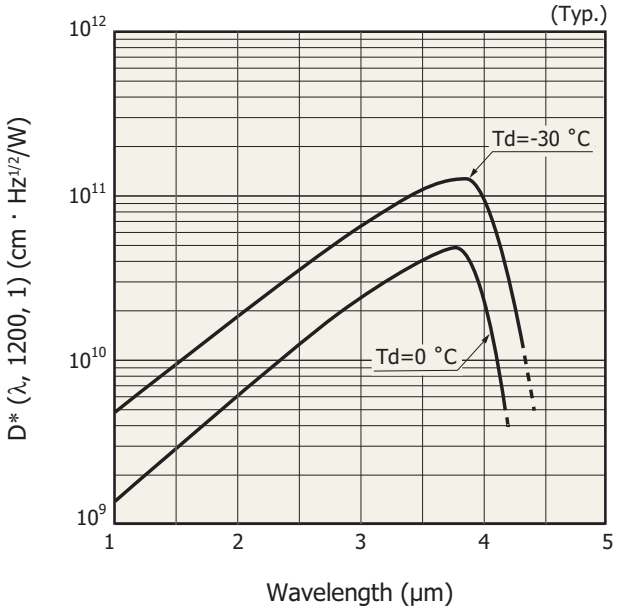
P3981/-01



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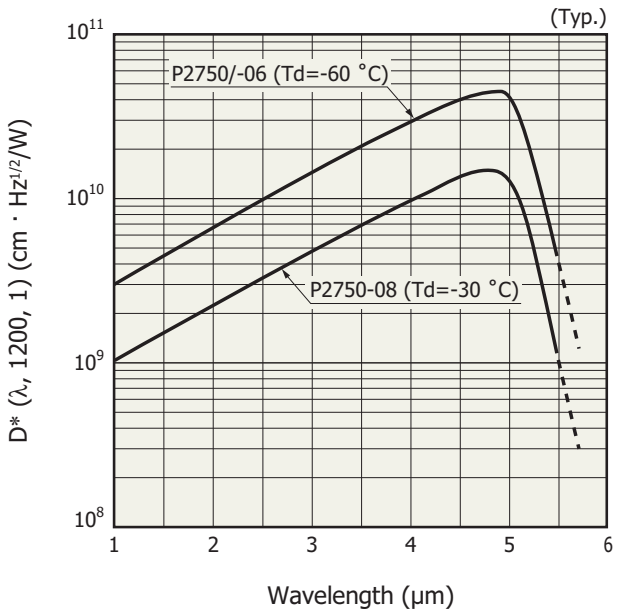
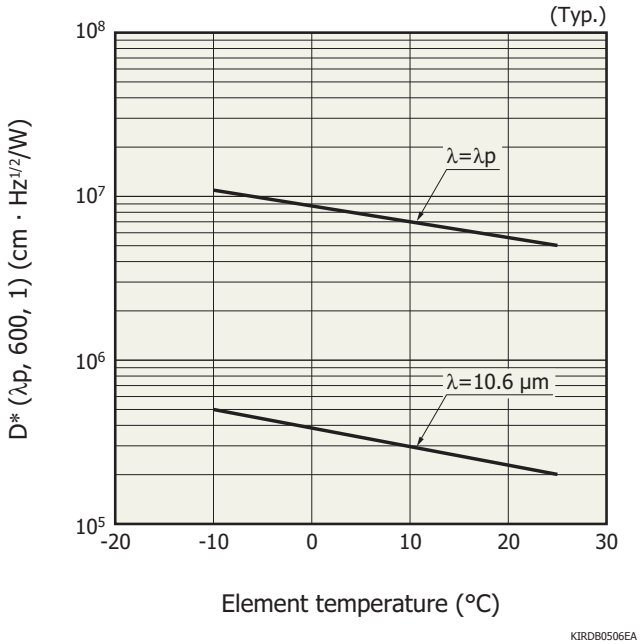
P2750/-06/-08

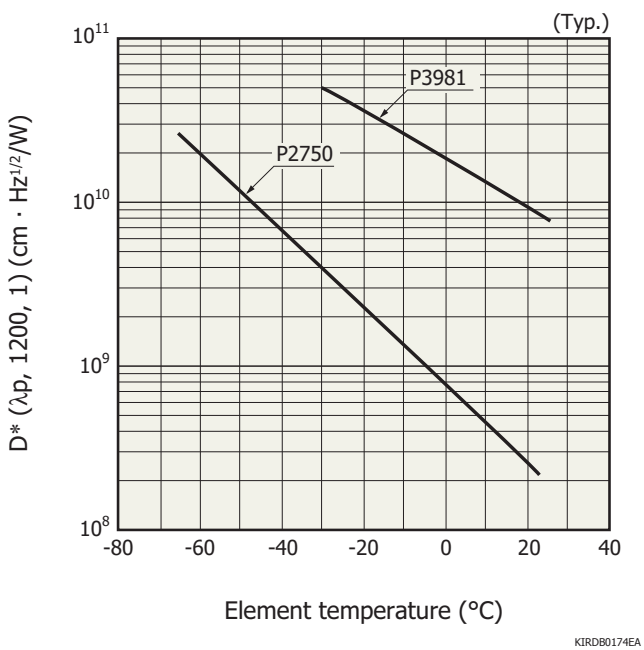


D* vs. element temperature

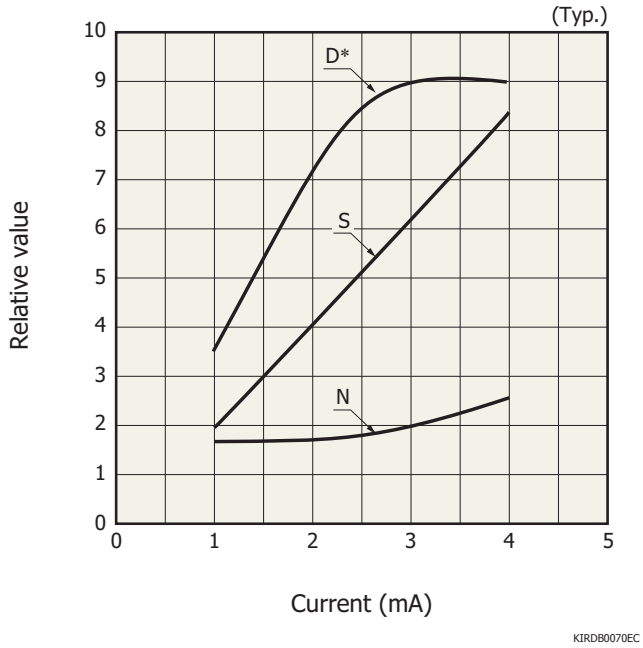
P3257-30/-31



P3981, P2750



S/N vs. bias current (P2750)



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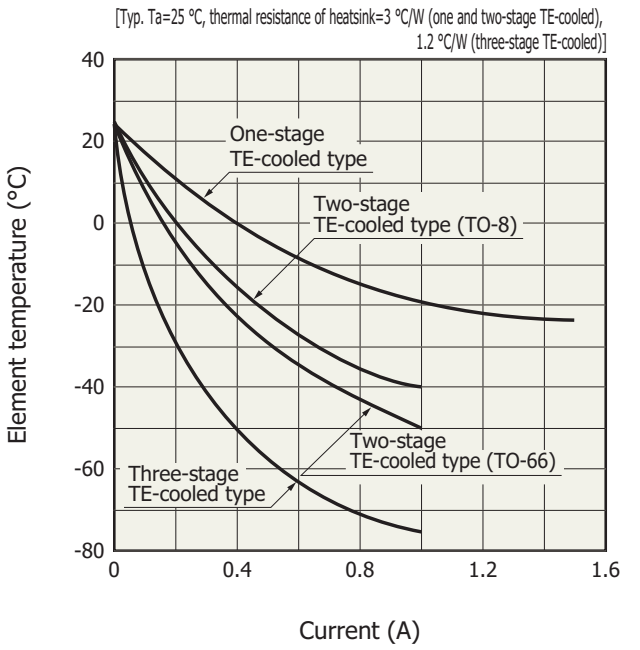
The detector must be operated in a range where the D* becomes max.

Cooling characteristics of TE-cooler



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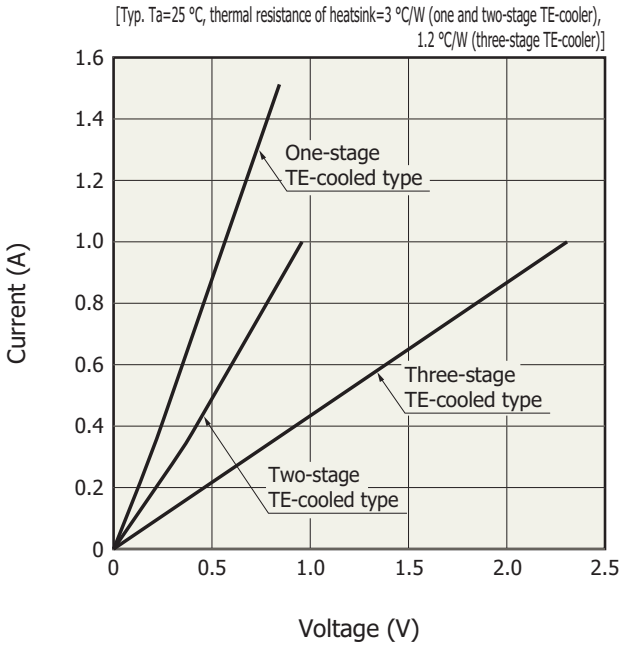
Current vs. voltage of TE-cooler



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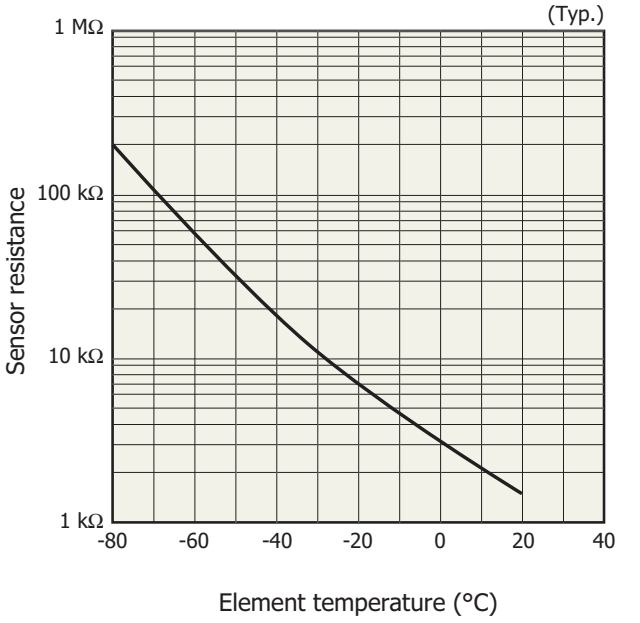
Thermistor temperature characteristics



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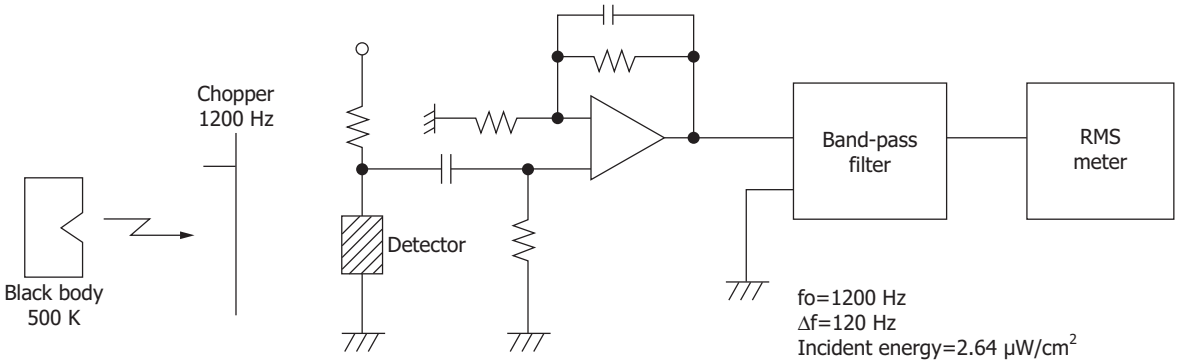
Measurement circuit



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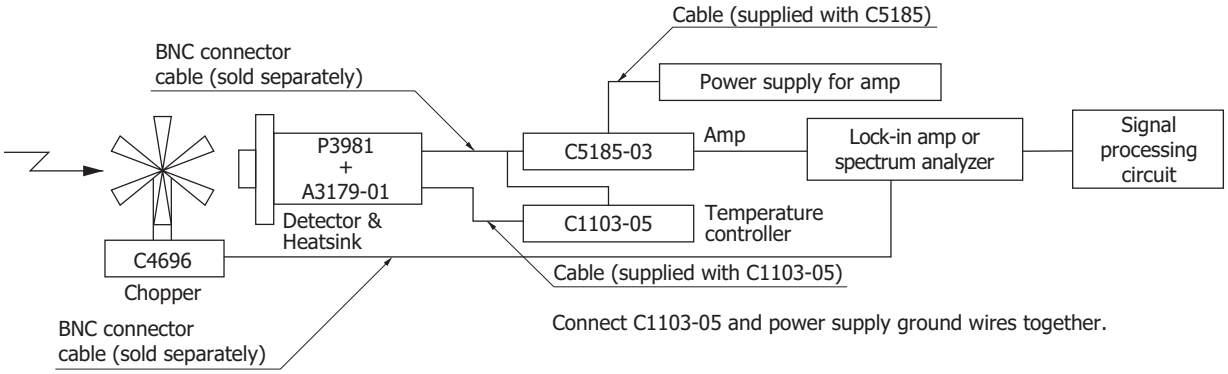
Connection example (P3981)



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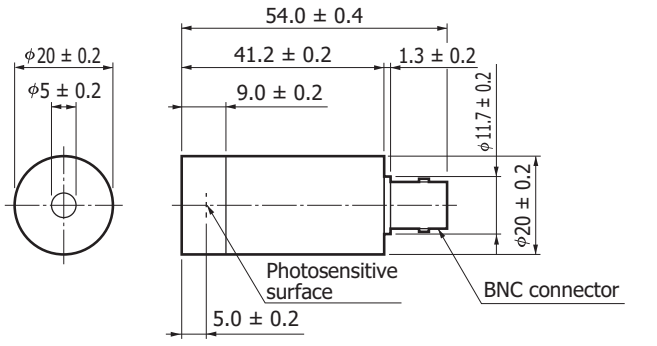
Dimensional outlines (unit: mm)

(1) P3257-30



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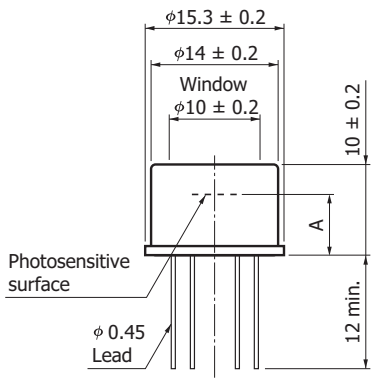
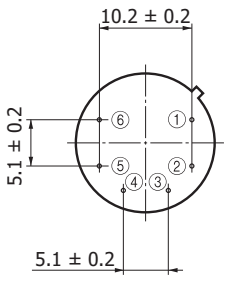
(2) P3257-31, P3981, P2750-08





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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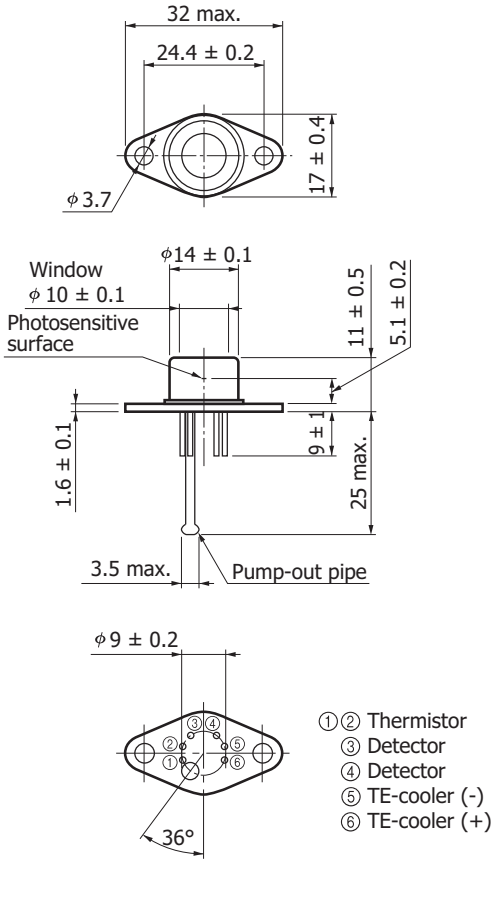
(3) P3981-01



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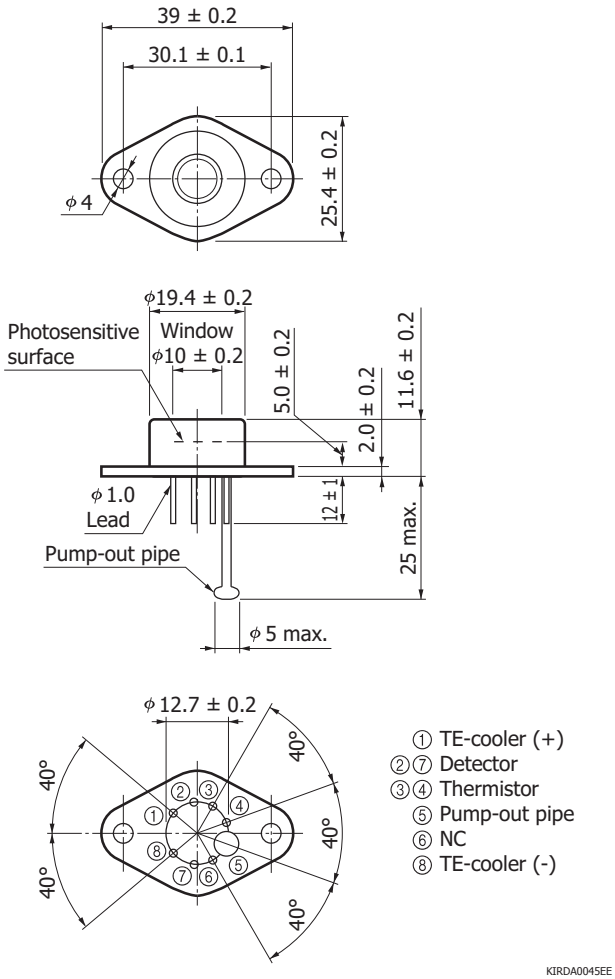
(4) P2750/-06



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Information described in this material is current as of November, 2012.
Product specifications are subject to change without prior notice due to improvements or other reasons. Before assembly into final products, please contact us for the delivery specification sheet to check the latest information.
Type numbers of products listed in the delivery specification sheets or supplied as samples may have a suffix "(X)" which means preliminary specifications or a suffix "(Z)" which means developmental specifications.
The product warranty is valid for one year after delivery and is limited to product repair or replacement for defects discovered and reported to us within that one year period. However, even if within the warranty period we accept absolutely no liability for any loss caused by natural disasters or improper product use.

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