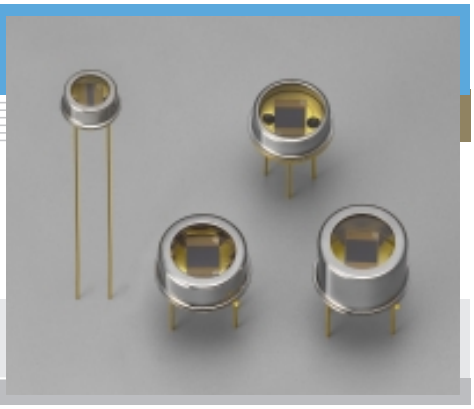
PbS photoconductive detector
P2532-01, P2682-01

Infrared detectors utilizing photoconductive effects



Features

- Room temperature operation
  Makes PbS cells useful in a wide range of applications including radiation thermometers and flame monitors
- High sensitivity
- Large active area
- Low price
- Lower temperature detection limit: 100 ˚C
- Thermoelectrically cooled types
  Cooling a PbS cell increases sensitivity and improves S/N, so cooled types are widely used in precision photometry such as in analytical instruments.

Applications

- Radiation thermometers
- Flame monitors
- Water content analyzers
- Food ingredient analysis
- Spectrophotometers

Accessories (Optional)

Heatsink for one-stage TE-cooled type	A3179
Heatsink for two-stage TE-cooled type	A3179-01
Temperature controller for TE-cooled type	C1103-04
Preamplifier for PbS/PbSe photoconductive detector	C3757-02
Power supply for amplifier	C3871
Infrared detector module with preamp Cooled type	P4638

■ Specification / Absolute maximum ratings

Type No.	Dimensional outline/ Window material *1	Package	Cooling	Active area (mm)	Thermistor resistance (kΩ)	Absolute maximum ratings				
						Thermistor power dissipation (mW)	TE-cooler current dissipation (A)	Supply voltage (V)	Operating temperature Topr (°C)	Storage temperature Tstg (°C)
P2532-01	①/S	TO-8	One-stage TE-cooled	4 × 5	9	0.2	1.5	100	-30 to +50	-55 to +50
P2682-01	②/S		Two-stage TE-cooled				1.0			

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

Type No.	Measurement condition Element temperature (°C)	Peak sensitivity wavelength λp (μm)	Cut-off wavelength λc (μm)	Photo sensitivity *2 S λ=λp Vs=15 V		D* (500, 600, 1)		D* (λp, 600, 1) (cm·Hz$^{1/2}$/W)	Rise time tr 0 to 63 % Max. (μs)	Dark resistance Rd (MΩ)
				Min. (V/W)	Typ. (V/W)	Min. (cm·Hz$^{1/2}$/W)	Typ. (cm·Hz$^{1/2}$/W)			
P2532-01	-10	2.4	3.1	3 × 10^4	8 × 10^4	5 × 10^8	1 × 10^9	1 × 10^{11}	600	0.5 to 10
P2682-01	-20	2.5	3.2	6 × 10^4	1.6 × 10^5	8 × 10^8	2 × 10^9	2 × 10^{11}		0.8 to 10

*1: Window material S: sapphire glass
*2: Chopping frequency: 600 Hz, load resistance: nearly equal to detector element dark resistance

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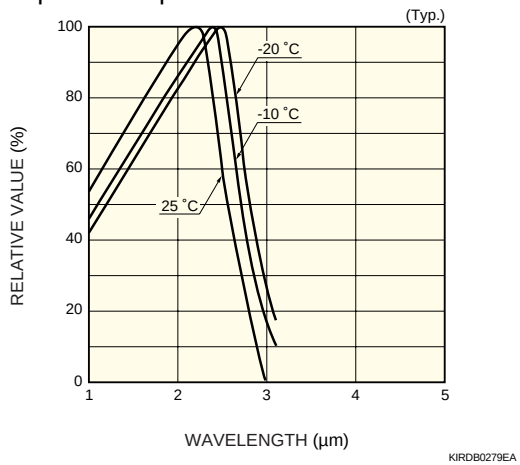
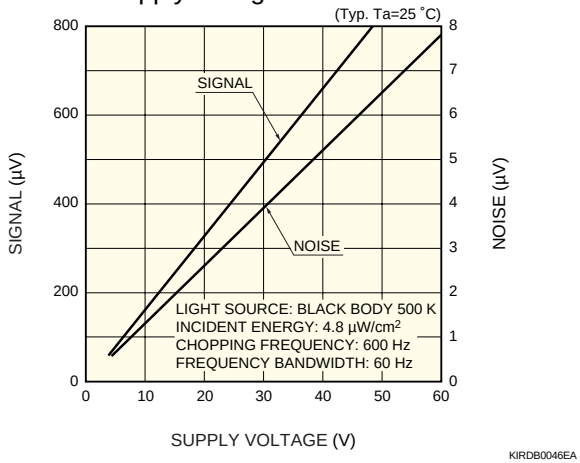
■ Spectral response

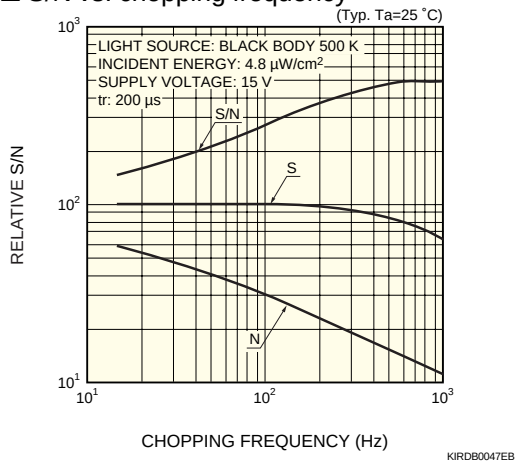


■ S/N vs. supply voltage



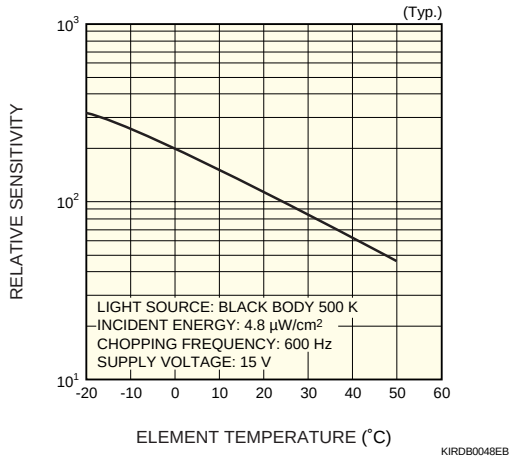
If voltage of higher than 60 V is applied, the noise increases exponentially, degrading the S/N. The device should be operated at 60 V or less.

■ S/N vs. chopping frequency



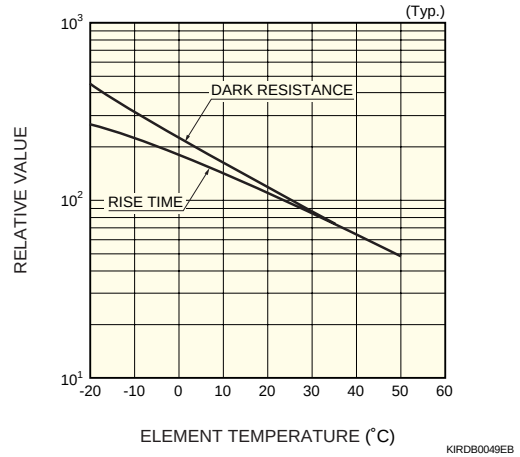
Increasing the chopping frequency reduces the 1/f noise and results in an S/N improvement. The S/N can also be improved by narrowing the noise bandwidth using a lock-in amplifier.

■ Photo sensitivity temperature characteristic

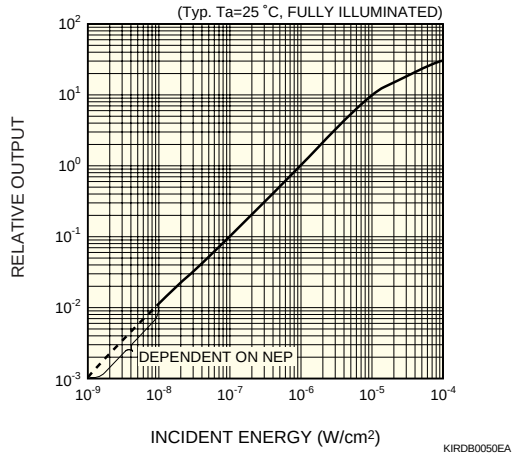


Cooling the device enhances its sensitivity, but the sensitivity also depends on the load resistance in the circuit.

■ Dark resistance, rise time temperature characteristics

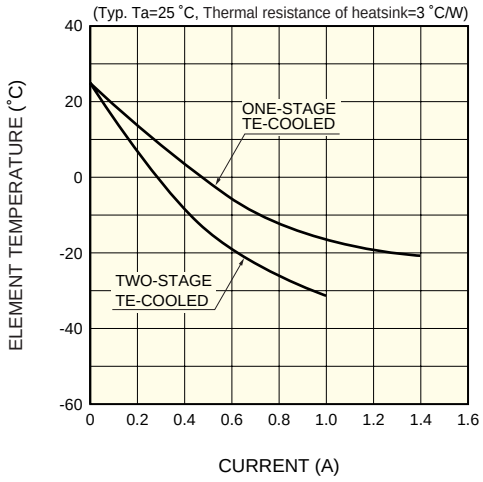


■ Photo sensitivity linearity



By making the incident light spot smaller than the active area, the upper limit of the linearity becomes lower.

■ Cooling characteristics of TE-cooler



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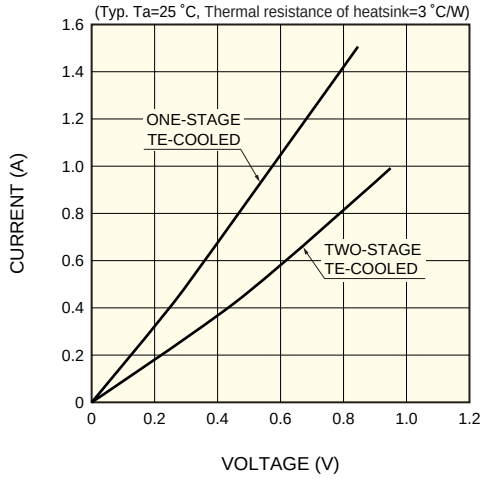
■ Current vs. voltage characteristics of TE-cooler



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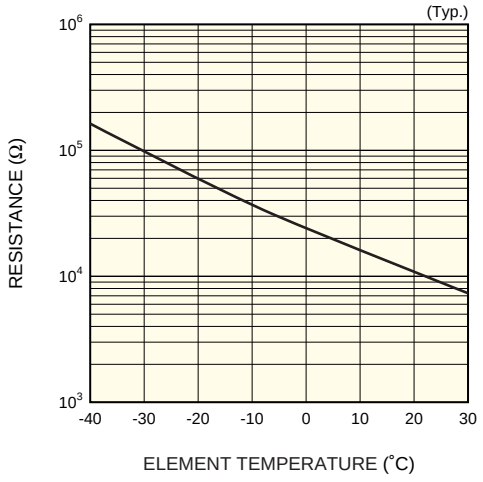
■ Thermistor temperature characteristic



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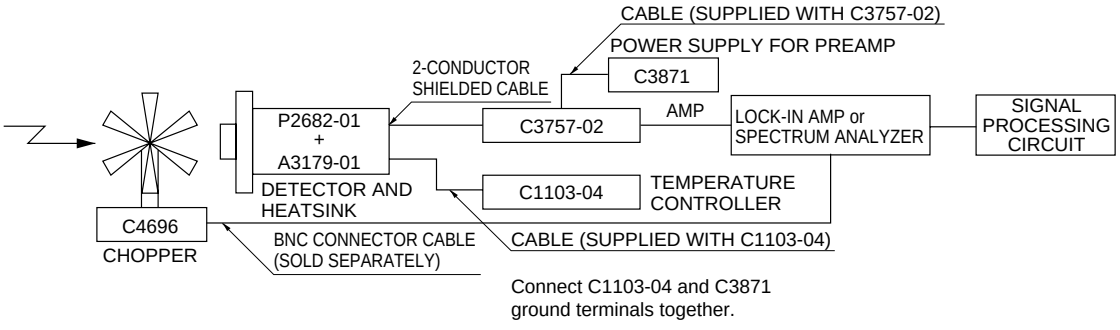
■ Connection example (P2682-01)



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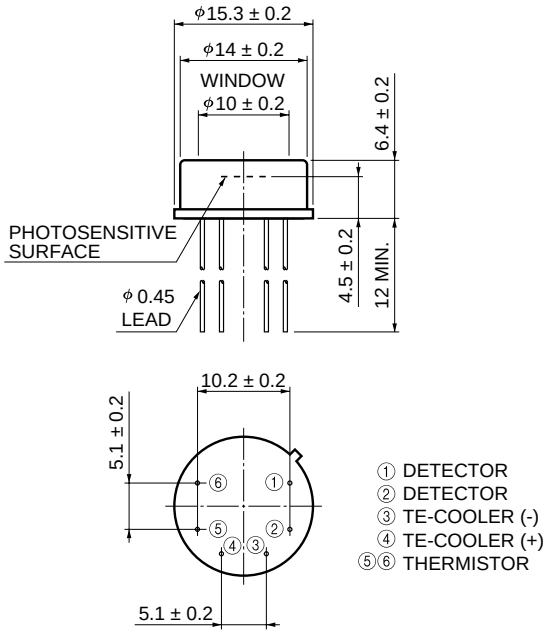
■ Dimensional outlines (unit: mm)

① P2532-01



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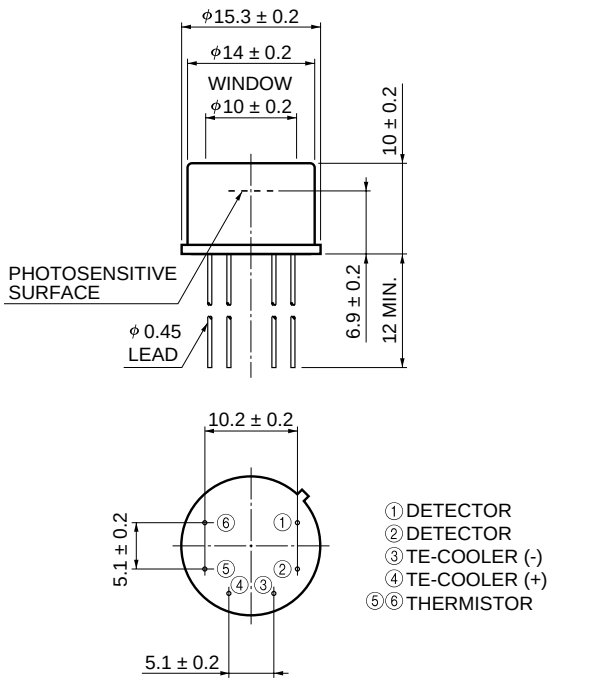
② P2682-01



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Cat. No. KIRD1019E06
Sep. 2003 DN