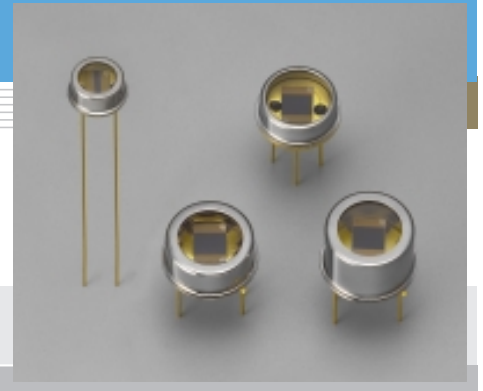


# PbS photoconductive detector P2532-01, P2682-01

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			

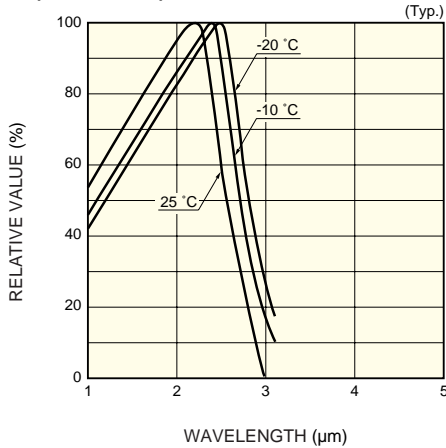
### ■ Electrical and optical characteristics (Typ. unless otherwise noted)

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

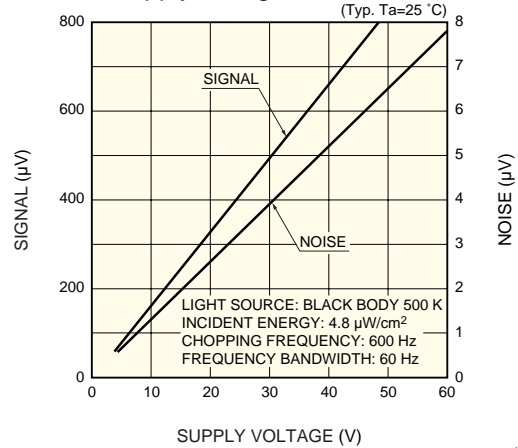
\*1: Window material S: sapphire glass

\*2: Chopping frequency: 600 Hz, load resistance: nearly equal to detector element dark resistance

■ Spectral response

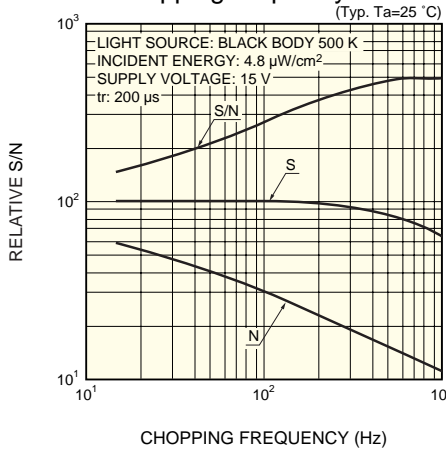


■ S/N vs. supply voltage



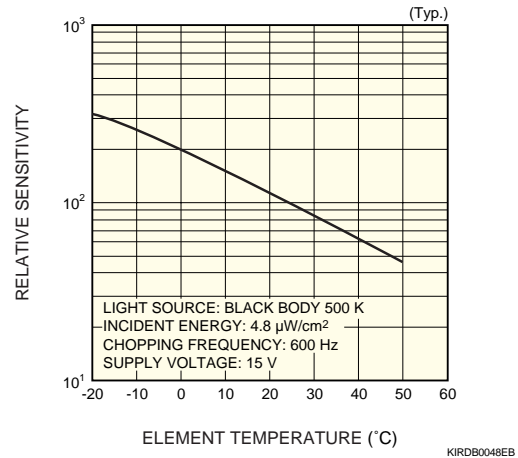
If voltage of higher than 60 V is applied, the noise increases exponentially, degrading the S/N. The device should be operated at 60 V or less.

■ S/N vs. chopping frequency



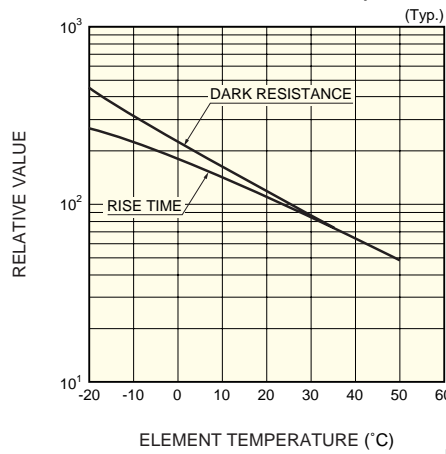
Increasing the chopping frequency reduces the  $1/f$  noise and results in an S/N improvement. The S/N can also be improved by narrowing the noise bandwidth using a lock-in amplifier.

■ Photo sensitivity temperature characteristic

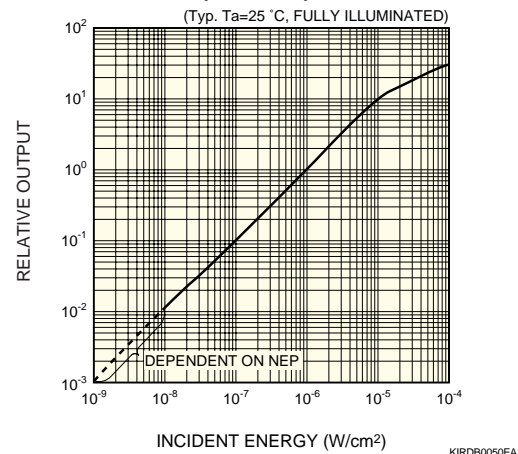


Cooling the device enhances its sensitivity, but the sensitivity also depends on the load resistance in the circuit.

■ Dark resistance, rise time temperature characteristics

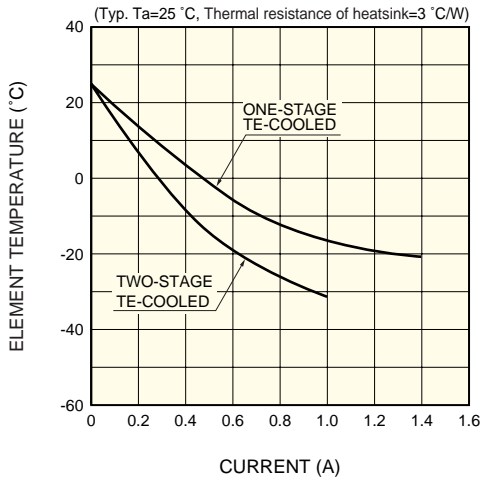


■ Photo sensitivity linearity



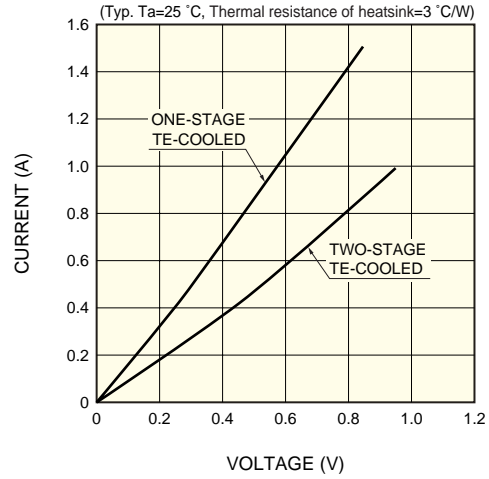
By making the incident light spot smaller than the active area, the upper limit of the linearity becomes lower.

■ Cooling characteristics of TE-cooler



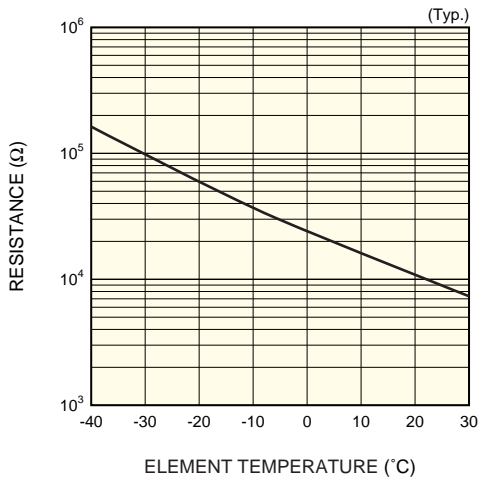
KIRDB0171EA

■ Current vs. voltage characteristics of TE-cooler



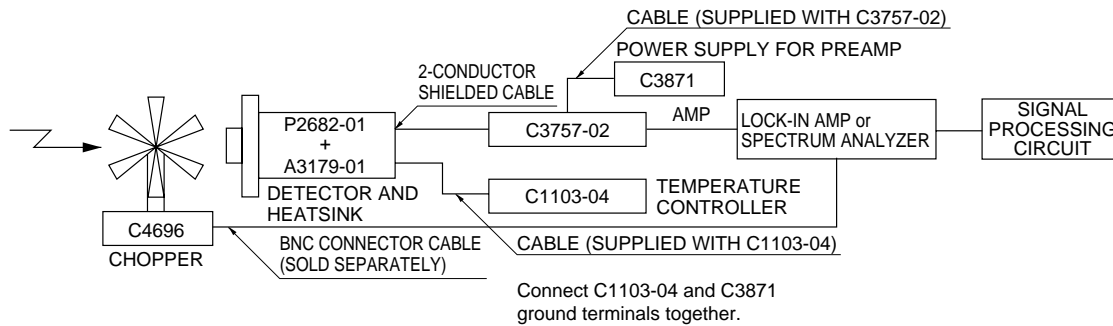
KIRDB0115EB

■ Thermistor temperature characteristic



KIRDB0116EA

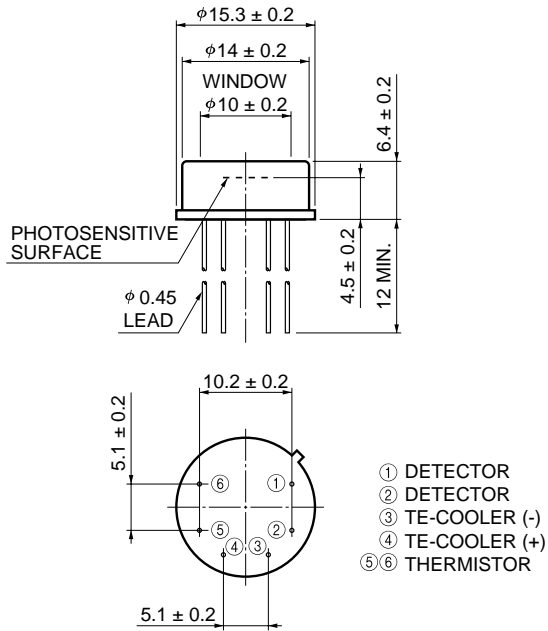
■ Connection example (P2682-01)



KIRDC0003EA

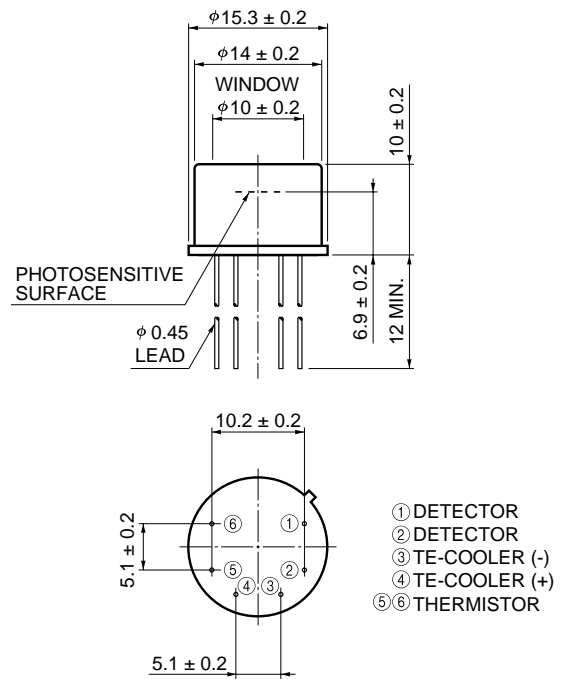
■ Dimensional outlines (unit: mm)

① P2532-01



KIRDA0116EA

② P2682-01



KIRDA0117EA