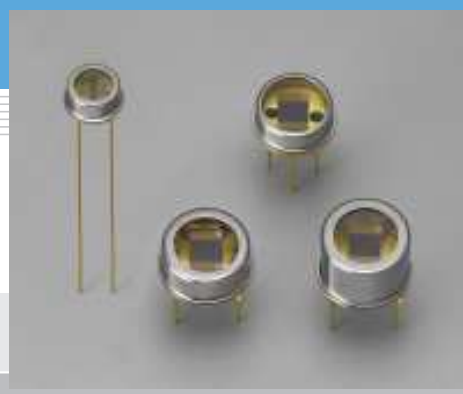


PbS photoconductive detector P2532-01, P2682-01

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
- 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			

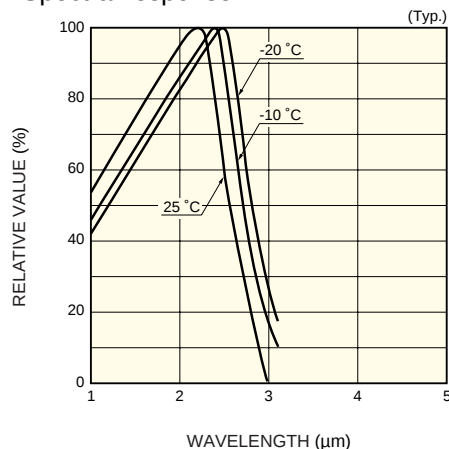
■ Electrical and optical characteristics (Typ. unless otherwise noted)

Type No.	Measurement condition	Peak sensitivity wavelength λ_p	Cut-off wavelength λ_c	Photo sensitivity *2 S $\lambda = \lambda_p$ $V_s = 15 \text{ V}$		D^* (500, 600, 1)		D^* (λ_p , 600, 1)	Rise time t_r 0 to 63 %	Dark resistance R_d
	Element temperature			Min.	Typ.	Min.	Typ.		Max.	
	(°C)	(μm)	(μm)	(V/W)	(V/W)	(cm·Hz ^{1/2} /W)	(cm·Hz ^{1/2} /W)	(cm·Hz ^{1/2} /W)	(μs)	(MΩ)
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

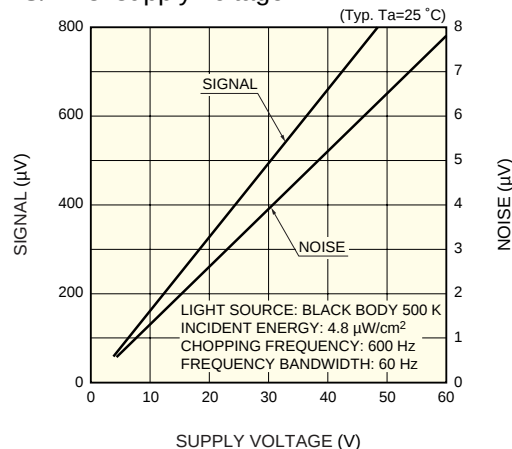
*1: Window material S: sapphire glass

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

Spectral response

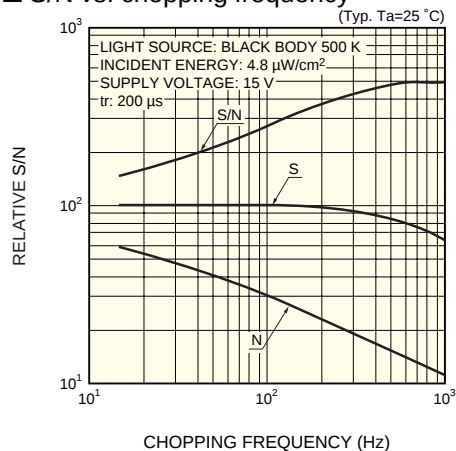


S/N vs. supply voltage



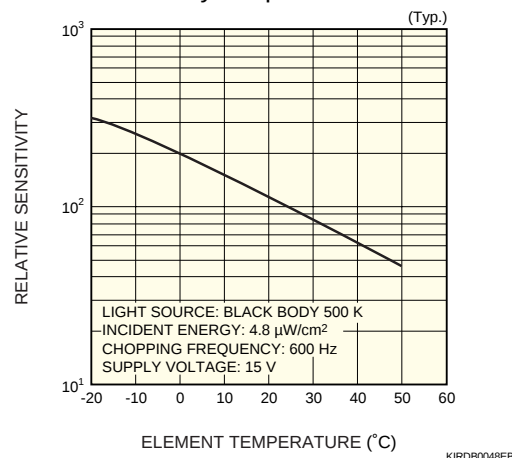
If voltage of higher than 60 V is applied, the noise increases exponentially, degrading the S/N. The device should be operated at 60 V or less.

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

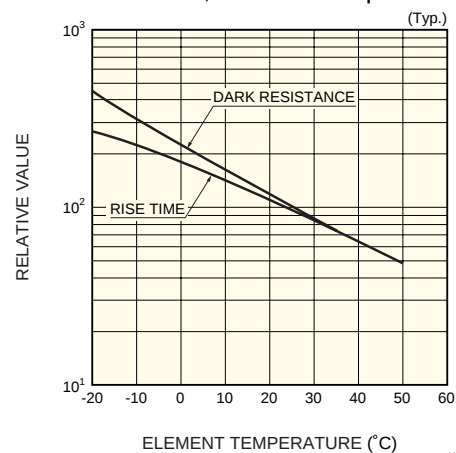
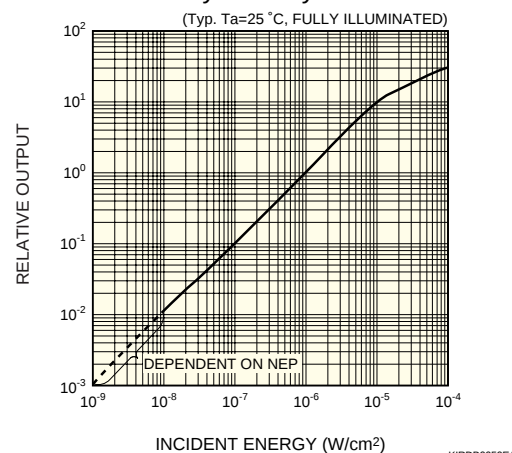
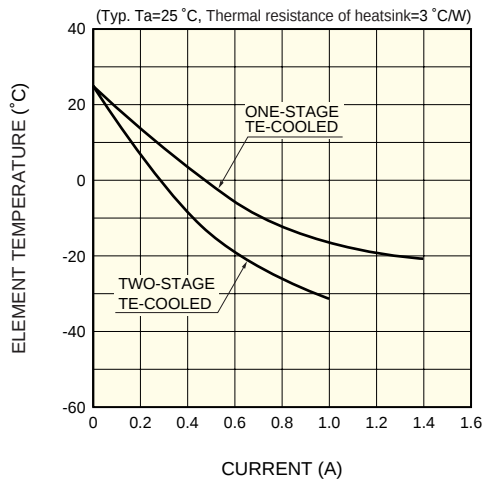


Photo sensitivity linearity

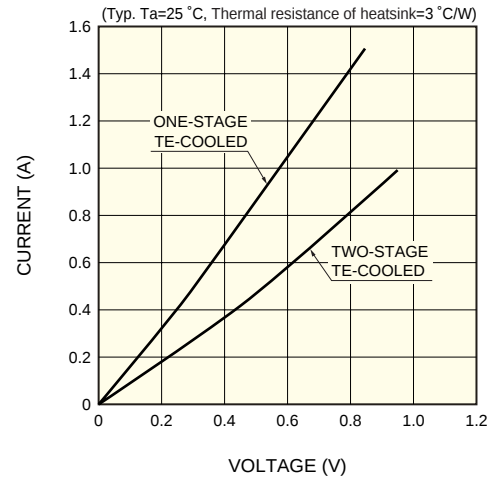


By making the incident light spot smaller than the active area, the upper limit of the linearity becomes lower.

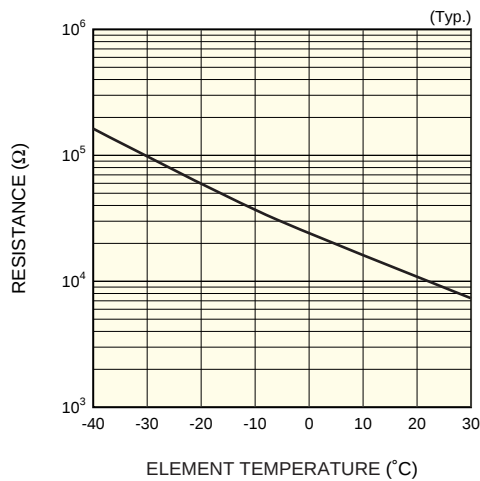
Cooling characteristics of TE-cooler



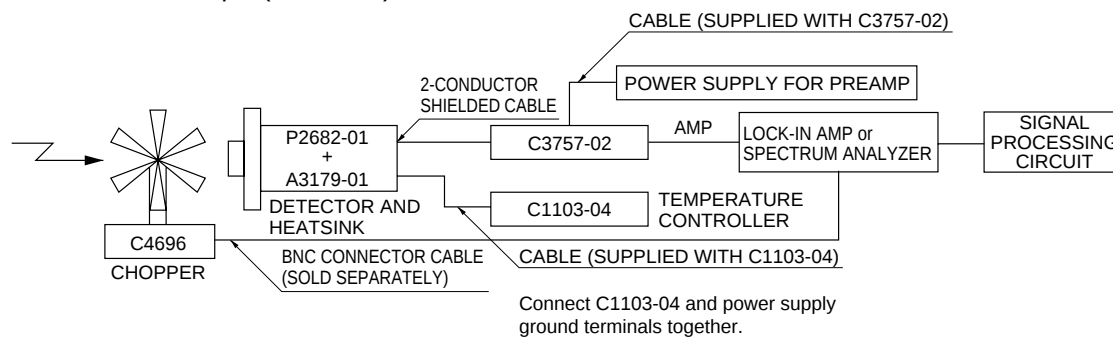
Current vs. voltage characteristics of TE-cooler



Thermistor temperature characteristic

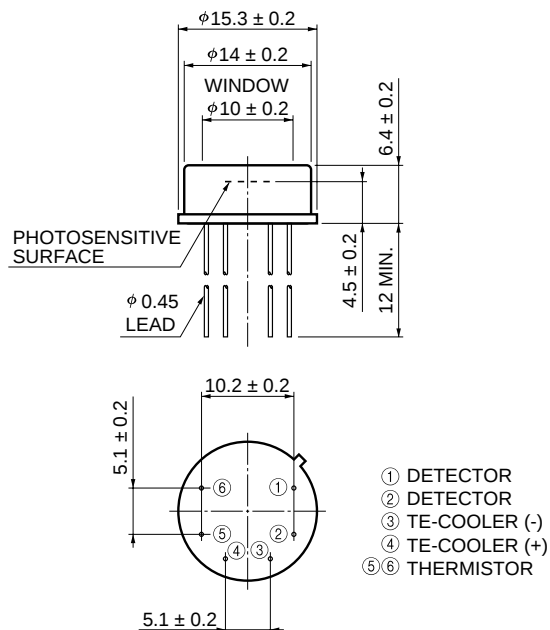


Connection example (P2682-01)



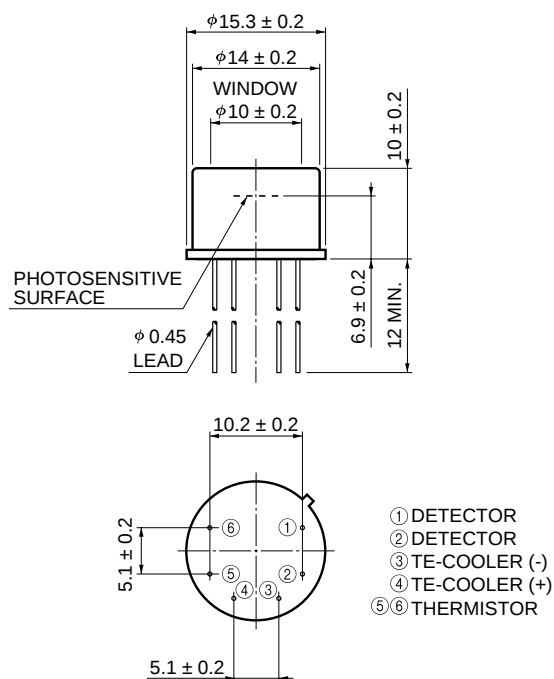
■ Dimensional outlines (unit: mm)

① P2532-01



KIRDA0116EA

② P2682-01



KIRDA0117EA