

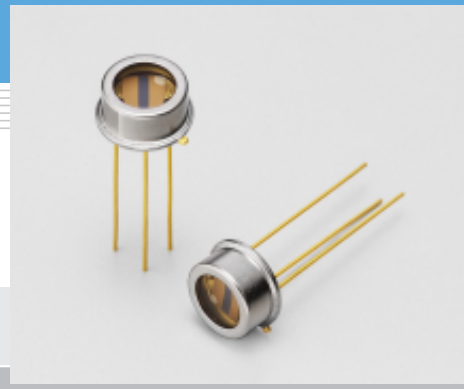
**NEW**

INFRARED DETECTOR

# PbS photoconductive detector

## P9217

### Infrared detectors utilizing photoconductive effects



P9217 is a PbS photoconductive detector with greatly improved stability and resistance to high temperatures when compared to conventional types.

#### Features

- Resistance to high temperatures, stability
- Lower temperature detection limit: 100 °C approx.

#### Applications

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

#### Accessories (Optional)

- Pre-amplifier for PbS/PbSe photoconductive detector C3757-02
- Power supply for amplifier C3871

#### ■ Specification

Parameter	Specification	Unit
Window material	Borosilicate glass	-
Package	TO-5	-
Cooling	Non-cooled	-
Active area	1 × 5	mm

#### ■ Absolute maximum ratings

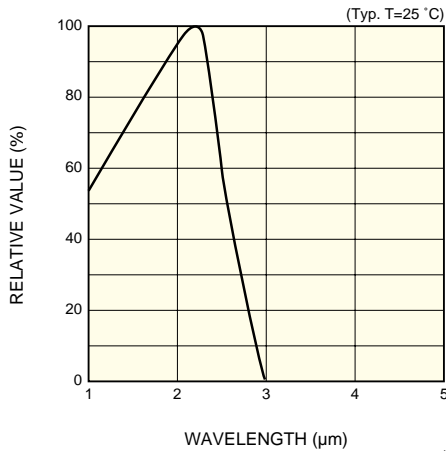
Parameter	Symbol	Value	Unit
Supply voltage	-	100	V
Operating temperature	T <sub>opr</sub>	-30 to +65	°C
Storage temperature	T <sub>stg</sub>	-55 to +65	°C

#### ■ Electrical and optical characteristics (T=25 °C)

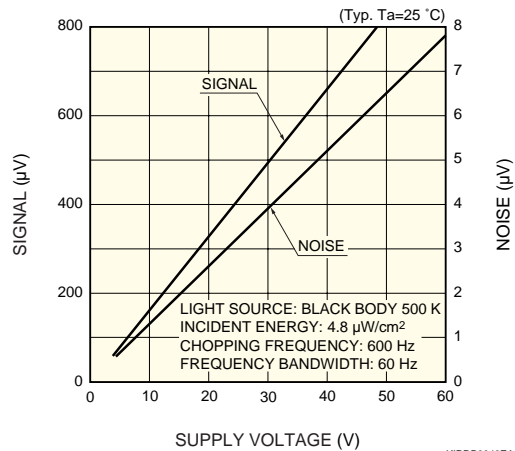
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak sensitivity wavelength	$\lambda_p$		-	2.2	-	$\mu\text{m}$
Cut-off wavelength	$\lambda_c$		-	2.9	-	$\mu\text{m}$
Photo sensitivity* <sup>1</sup>	S	$\lambda = \lambda_p, V_s = 15 \text{ V}$	$4 \times 10^4$	$1 \times 10^5$	-	V/W
Detectivity	D*	(500, 600, 1)	$5 \times 10^8$	$1 \times 10^9$	-	$\text{cm} \cdot \text{Hz}^{1/2}/\text{W}$
		( $\lambda_p$ , 600, 1)	-	$1 \times 10^{11}$	-	
Rise time	t <sub>r</sub>	0 to 63 %	-	-	250	$\mu\text{s}$
Dark resistance	R <sub>d</sub>		0.05	-	1	M $\Omega$

\*1: Chopping frequency: 600 Hz, load resistance: nearly equal to detector element dark resistance.

■ Spectral response

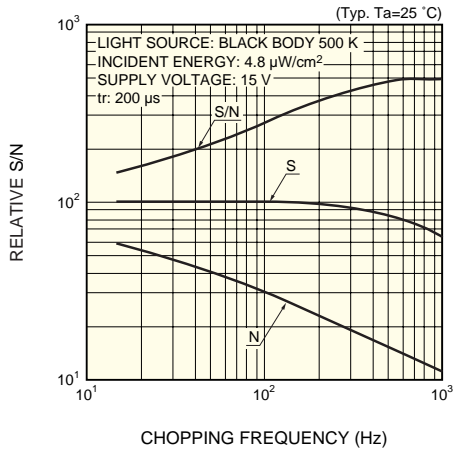


■ S/N vs. supply voltage



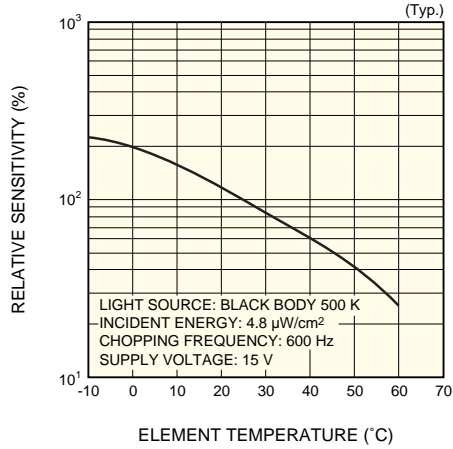
If voltage of higher than 60 V is applied, the noise increases exponentially, degrading the S/N. The device should be operated at 60 V or less.

■ S/N vs. chopping frequency



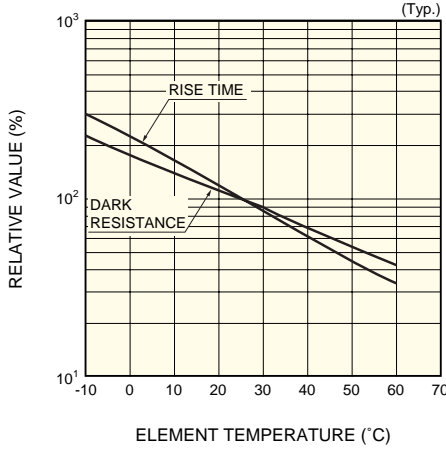
Increasing the chopping frequency reduces the 1/f noise and results in an S/N improvement. The S/N can also be improved by narrowing the noise bandwidth using a lock-in amplifier.

■ Photo sensitivity temperature characteristic

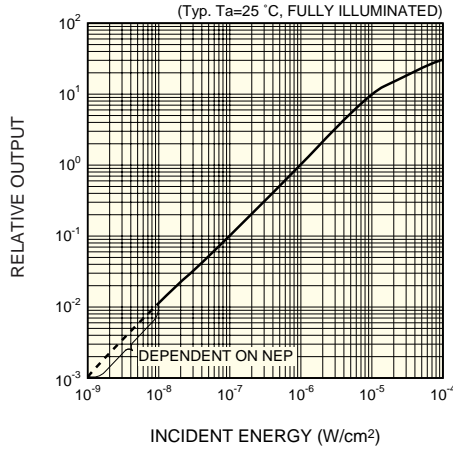


Cooling the device enhances its sensitivity, but the sensitivity also depends on the load resistance in the circuit.

■ Dark resistance, rise time temperature characteristics

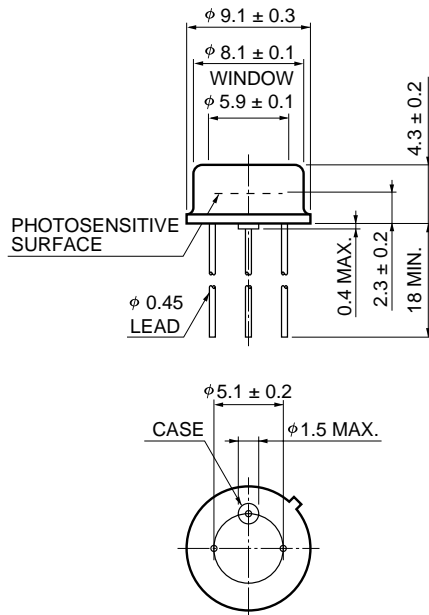


■ Photo sensitivity linearity



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

■ Dimensional outline (unit: mm)



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