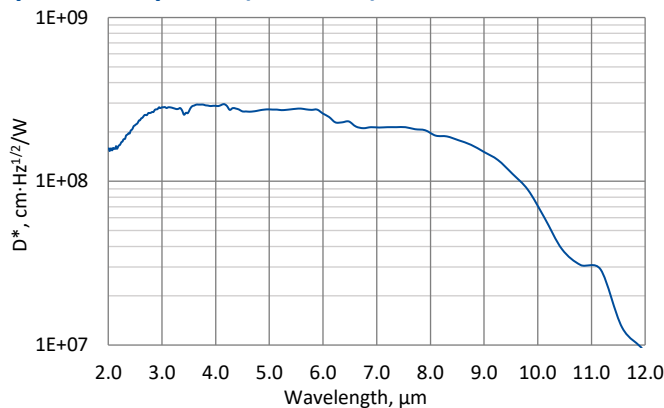


## PCAS-2TE-9-1×1AR-TO8-wZnSeAR-70 – ENGINEERING SAMPLE

### Type II superlattice, two-stage thermoelectrically cooled, photoconductive detector

**PCAS-2TE-9-1×1AR-TO8-wZnSeAR-70** is a Type II superlattice two-stage thermoelectrically cooled IR photoconductor, with excellent parameters. Photoconductive detector should operate in optimum bias voltage and current readout mode. Performance at low frequencies is reduced due to 1/f noise. Anti-reflection coated applied to active element (1×1AR) and 3° wedged zinc selenide window (wZnSeAR) prevents unwanted interference effects. For detection of CW radiation, using of optical chopper system is recommended. This detector does not contain mercury or cadmium and is compliant with the RoHS Directive.

#### Spectral response ( $T_a = 20^\circ\text{C}$ )



Exemplary spectral detectivity, the spectral response of delivered devices may differ.

#### Specification ( $T_a = 20^\circ\text{C}$ )

Parameter	Detector type
	PCAS-2TE-9-1×1AR-TO8-wZnSeAR-70
Active element material	epitaxial superlattice heterostructure
Cut-on wavelength $\lambda_{\text{cut-on}}$ (10%), $\mu\text{m}$	$\leq 2.0$
Peak wavelength $\lambda_{\text{peak}}$ , $\mu\text{m}$	$4.0 \pm 0.5$
Cut-off wavelength $\lambda_{\text{cut-off}}$ (10%), $\mu\text{m}$	$11.0 \pm 0.5$
Detectivity $D^*(\lambda_{\text{peak}}, 300 \text{ kHz})$ , $\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	$\sim 2.6 \times 10^8$
Current responsivity $R_i(\lambda_{\text{peak}})$ , A/W	$\sim 0.04$
Time constant $\tau$ , ns	$\sim 17$
Resistance $R$ , $\Omega$	$\sim 70$
Bias voltage $V_b$ , V	typ. 0.6
1/f noise corner frequency $f_c$ , Hz	typ. 300k
Active element temperature $T_{\text{det}}$ , K	$\sim 230$
Active area $A$ , mm×mm	1×1AR
Package	TO8
Acceptance angle $\Phi$	$\sim 70^\circ$
Window	wZnSeAR

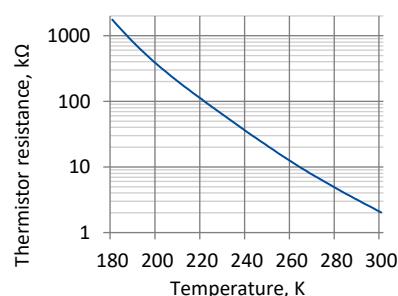
#### Features

- Wide spectral range from 2.0 to 11.0  $\mu\text{m}$
- High responsivity
- Excellent linearity
- Environmentally friendly

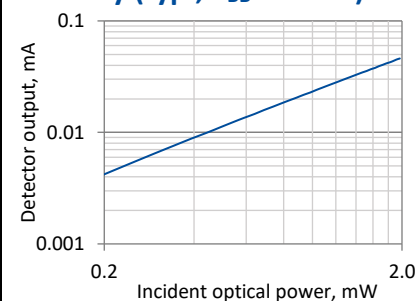
#### Two-stage thermoelectric cooler parameters

Parameter	Value
$T_{\text{det}}$ , K	$\sim 230$
$V_{\text{max}}$ , V	1.3
$I_{\text{max}}$ , A	1.2
$Q_{\text{max}}$ , W	0.36

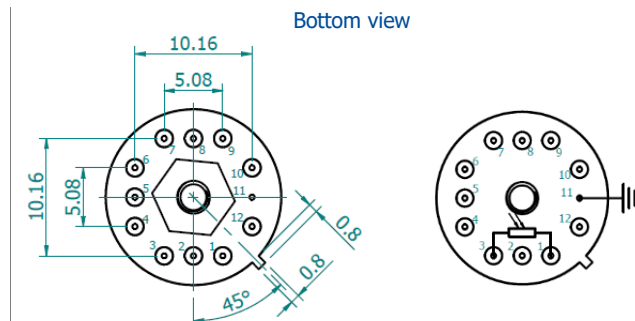
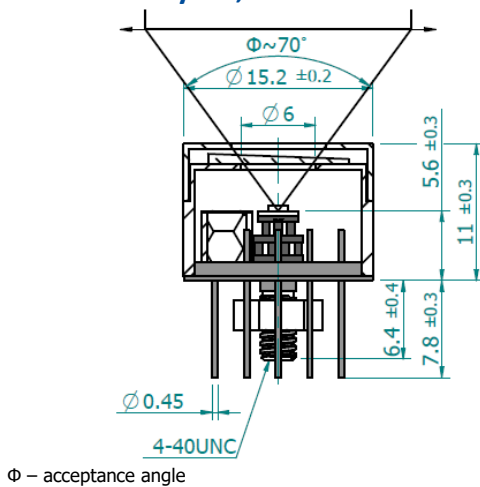
#### Thermistor characteristics



#### Linearity (typ., $T_{\text{BB}} = 873 \text{ K}$ )



### Mechanical layout, mm



Function	Pin number
Detector	1, 3
Thermistor	7, 9
TE cooler supply	2(+), 8(-)
Chassis ground	11
Not used	4, 5, 6, 10, 12

### Dedicated preamplifiers



„all-in-one“ AIP



programmable PIP



standard MIP



small SIP-TO8

### Precautions for use and storage

- Heatsink with thermal resistance of ~2 K/W is necessary to dissipate heat generated by 2TE cooler.
- Operation in 10% to 80% humidity and -20°C to 30°C ambient temperature.
- Beam power limitations:
  - irradiance with CW or single pulse longer than 1 μs irradiance on the apparent optical active area must not exceed 100 W/cm<sup>2</sup>,
  - irradiance of the pulse shorter than 1 μs must not exceed 1 MW/cm<sup>2</sup>.
- Storage in dark place with 10% to 90% humidity and -20°C to 50°C ambient temperature.