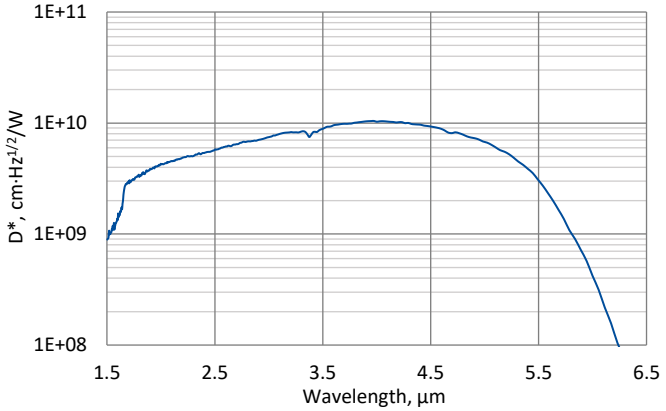
PVAS-2TE-5-0.1×0.1-TO8-wAl_2O_3-70 – ENGINEERING SAMPLE

Type II superlattice, two-stage thermoelectrically cooled, photovoltaic detector

PVAS-2TE-5-0.1×0.1-TO8-wAl_2O_3-70 is a Type II superlattice two-stage thermoelectrically cooled IR photovoltaic detector, with excellent parameters. 3° wedged sapphire window (wAl_2O_3) prevents unwanted interference effects. This detector does not contain mercury or cadmium and is compliant with the RoHS Directive.

Spectral response (T_a = 20°C, V_b = 0 mV)



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

Specification (T_a = 20°C, V_b = 0 mV)

Parameter	Detector type
	PVAS-2TE-5-0.1×0.1-TO8-wAl_2O_3-70
Active element material	epitaxial superlattice heterostructure
Cut-on wavelength $\lambda_{cut\text{-}on}$ (10%), µm	1.7±0.2
Peak wavelength λ_{peak}, µm	4.0±0.3
Cut-off wavelength $\lambda_{cut\text{-}off}$ (10%), µm	5.8±0.2
Detectivity D*(λ_{peak}), cm·$Hz^{1/2}$/W	~9.0×10^9
Current responsivity $R_i(\lambda_{peak})$, A/W	~1.4
Time constant τ, ns	~4
Resistance R, Ω	~5k
Active element temperature T_{det}, K	~230
Active area A, mm×mm	0.1×0.1
Package	TO8
Acceptance angle Φ	~70°
Window	wAl_2O_3

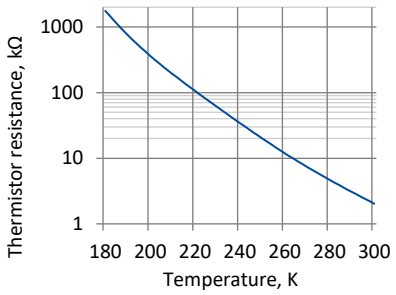
Features

- Wide spectral range from 1.7 to 5.8 µm
- High responsivity
- Excellent linearity
- No bias required
- No 1/f noise
- Environmentally friendly

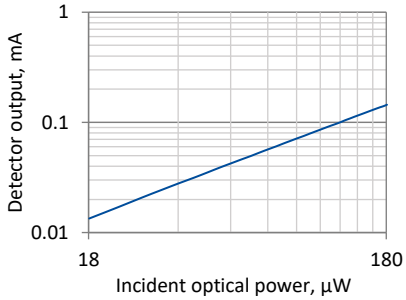
Two-stage thermoelectric cooler parameters

Parameter	Value
T_{det}, K	~230
V_{max}, V	1.3
I_{max}, A	1.2
Q_{max}, W	0.36

Thermistor characteristics

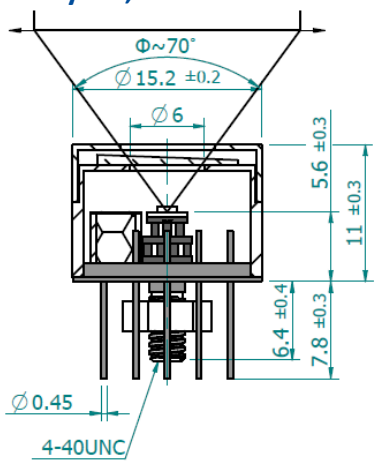


Linearity (typ., T_{BB} = 1273 K)



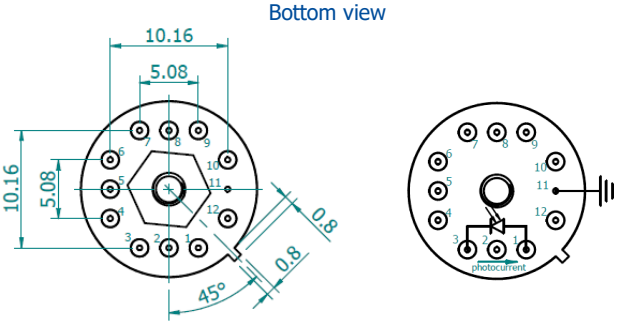
T_{BB} – black body temperature

Mechanical layout, mm



Φ – acceptance angle

Bottom view



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^2,
  - irradiance of the pulse shorter than 1 µs must not exceed 1 MW/cm^2.
- Storage in dark place with 10% to 90% humidity and -20°C to 50°C ambient temperature.