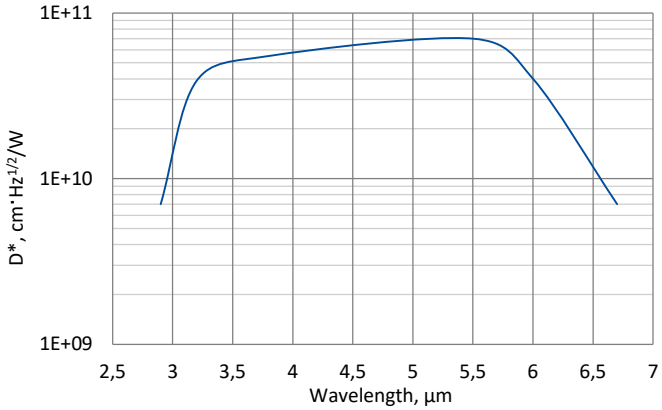
PVI-2TE-6-1×1-TO8-wZnSeAR-36

3.0 – 6.7 µm HgCdTe two-stage thermoelectrically cooled, optically immersed photovoltaic detector

PVI-2TE-6-1×1-TO8-wZnSeAR-36 is two-stage thermoelectrically cooled IR photovoltaic detector based on sophisticated HgCdTe heterostructure for the best performance and stability. The device is optimized for the maximum performance at 6 µm. Detector element is monolithically integrated with hyperhemispherical GaAs microlens in order to improve performance of the device. Reverse bias may significantly increase response speed and dynamic range. 3° wedged zinc selenide anti-reflection coated (wZnSeAR) window prevents unwanted interference effects.

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
	PVI-2TE-6-1×1-TO8-wZnSeAR-36
Active element material	epitaxial HgCdTe heterostructure
Cut-on wavelength $\lambda_{cut\text{-}on}$ (10%), µm	3.0±1.0
Peak wavelength λ_{peak}, µm	5.2±0.5
Optimum wavelength λ_{opt}, µm	6.0
Cut-off wavelength $\lambda_{cut\text{-}off}$ (10%), µm	6.7±0.3
Detectivity D*(λ_{peak}), cm·Hz$^{1/2}$/W	≥7.0×10^{10}
Detectivity D*(λ_{opt}), cm·Hz$^{1/2}$/W	≥4.0×10^{10}
Current responsivity R_i (λ_{peak}), A/W	≥2.7
Current responsivity R_i (λ_{opt}), A/W	≥1.5
Time constant τ, ns	≤50
Resistance R, Ω	≥200
Active element temperature T_{det}, K	~230
Optical area A_O, mm×mm	1×1
Package	TO8
Acceptance angle Φ	~36°
Window	wZnSeAR

Features

- High performance
- Wide dynamic range
- Versatility
- Quantity discounted price
- Fast delivery

Applications

- Gas detection, monitoring and analysis (CO, CO_2, NH_3, NO_x)
- Flue gas denitrification
- Fuel combustion monitoring at power plants and other industrial facilities
- Contactless temperature measurements

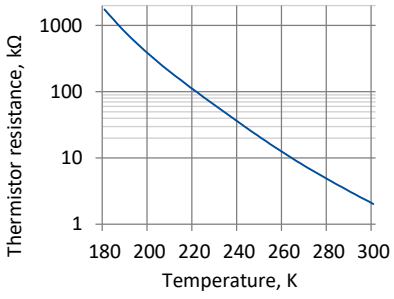
Related product

- UM-I-6 detection module

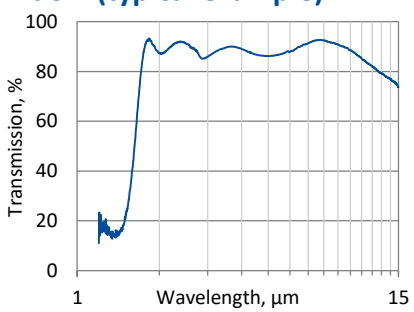
Two-stage thermoelectric cooler parameters

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

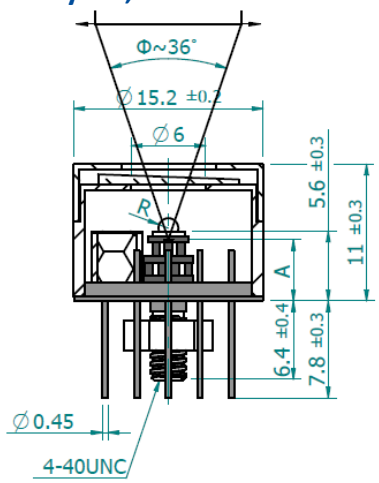
Thermistor characteristics



Spectral transmission of wZnSeAR window (typical example)



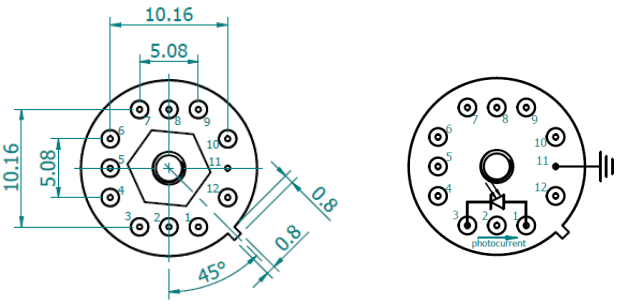
Mechanical layout, mm



Parameter	Value
Immersion microlens shape	hyperhemisphere
Optical area A_O, mm×mm	1×1
R, mm	0.8
A, mm	3.2±0.3

Φ – acceptance angle
R – hyperhemisphere microlens radius
A – distance from the bottom of the 2TE-TO8 header to the focal plane

Bottom view



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

Precautions for use and storage

- Standard ohmmeter may overbias and damage the detector. Bias of 10 mV can be used for resistance measurements.
- 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 for optically immersed detector:
  - irradiance with CW or single pulse longer than 1 µs irradiance on the apparent optical active area must not exceed 2.5 W/cm^2,
  - irradiance of the pulse shorter than 1 µs must not exceed 10 kW/cm^2.
- Storage in dark place with 10% to 90% humidity and -20°C to 50°C ambient temperature.

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