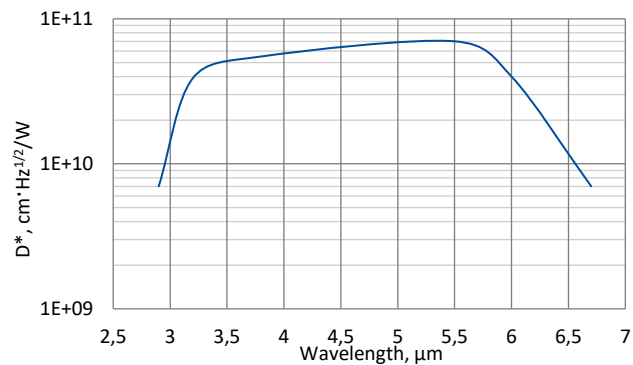


1.3 PVI-2TE-6-1×1-TO8-wZnSeAR-36

1.3.1 3.0 – 6.7 μm HgCdTe two stage thermoelectrically cooled, optically immersed photovoltaic detector

PVI-2TE-6-1×1-TO8-wZnSeAR-36 is a two-stage thermoelectrically cooled IR photovoltaic detector based on sophisticated HgCdTe heterostructure for the best performance and stability. The device is optimized for maximum performance at 6 μm . The detector element is monolithically integrated with hyperhemispherical GaAs microlens to improve the 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 ($T_a = 20^\circ\text{C}$, $V_b = 0\text{ mV}$)



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

Specification ($T_a = 20^\circ\text{C}$, $V_b = 0\text{ mV}$)

Parameter	Detector type
	PVI-2TE-6-1×1-TO8-wZnSeAR-36
Active element material	epitaxial HgCdTe heterostructure
Cut-on wavelength $\lambda_{\text{cut-on}}$ (10%), μm	2.4 ± 0.5
Peak wavelength λ_{peak} , μm	5.2 ± 0.5
Optimum wavelength λ_{opt} , μm	6.0
Cut-off wavelength $\lambda_{\text{cut-off}}$ (10%), μm	6.7 ± 0.3
Detectivity $D^*(\lambda_{\text{peak}})$, $\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	$\geq 7.0 \times 10^{10}$
Detectivity $D^*(\lambda_{\text{opt}})$, $\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	$\geq 4.0 \times 10^{10}$
Current responsivity $R_i(\lambda_{\text{peak}})$, A/W	≥ 2.7
Current responsivity $R_i(\lambda_{\text{opt}})$, 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	$\sim 36^\circ$
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

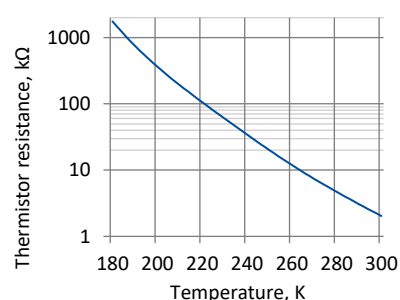
Related product

- UM-I-6 detection module

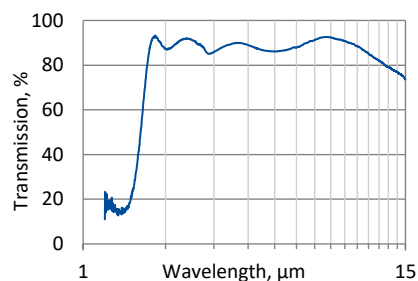
Two-stage thermoelectric cooler parameters

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

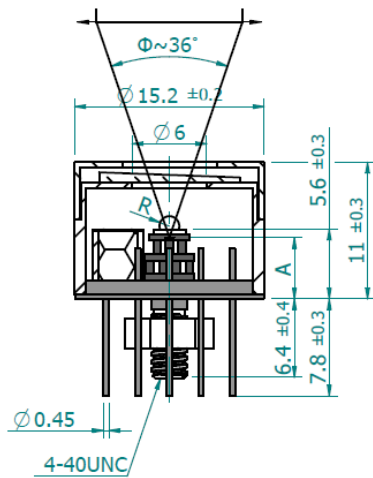
Thermistor characteristics



Spectral transmission of wZnSeAR window (typical example)

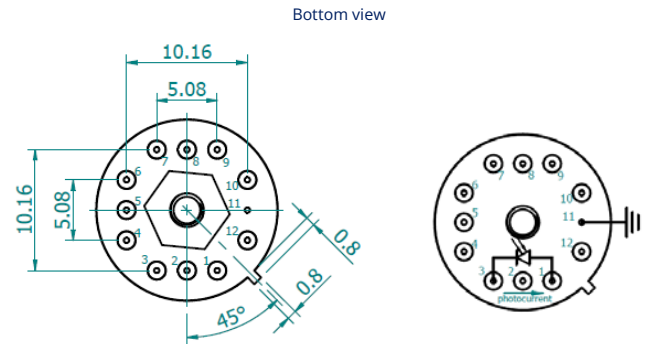


Mechanical layout, mm



Parameter	Value
Immersion microlens shape	hyperhemisphere
Optical area A_{ov} , 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



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. The bias of 10 mV can be used for resistance measurements.
- Heatsink with a 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/cm²,
 - irradiance of the pulse shorter than 1 μs must not exceed 10 kW/cm².
- Storage in a dark place with 10% to 90% humidity and -20°C to 50°C ambient temperature.