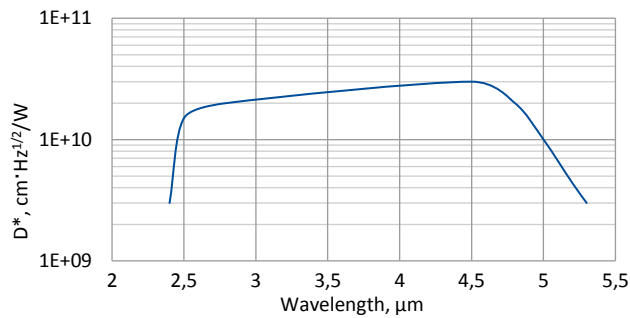


1.2 PVI-5-1×1-TO39-NW-36

1.2.1 2.4 – 5.5 μm HgCdTe ambient temperature, optically immersed photovoltaic detector

PVI-5-1×1-TO39-NW-36 is an uncooled IR photovoltaic detector based on sophisticated HgCdTe heterostructure for the best performance and stability. The device is optimized for maximum performance at 5 μm. The detector element is monolithically integrated with hyper-hemispherical GaAs microlens to improve the performance of the device. Reverse bias may significantly increase response speed and dynamic range. It also results in improved performance at high frequencies, but 1/f noise that appears in biased devices may reduce performance at low frequencies.

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-5-1x1-TO39-NW-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	4.2±0.5
Optimum wavelength λ_{opt} , μm	5.0
Cut-off wavelength $\lambda_{\text{cut-off}}$ (10%), μm	5.5±0.3
Detectivity $D^*(\lambda_{\text{peak}})$, cm·Hz ^{1/2} /W	≥3.0×10 ¹⁰
Detectivity $D^*(\lambda_{\text{opt}})$, cm·Hz ^{1/2} /W	≥1.0×10 ¹⁰
Current responsivity $R_i(\lambda_{\text{peak}})$, A/W	≥2.0
Current responsivity $R_i(\lambda_{\text{opt}})$, A/W	≥1.0
Time constant τ , ns	≤150
Resistance R, Ω	≥100
Optical area A_{ov} , mm×mm	1×1
Package	TO39
Acceptance angle Φ	~36°
Window	none

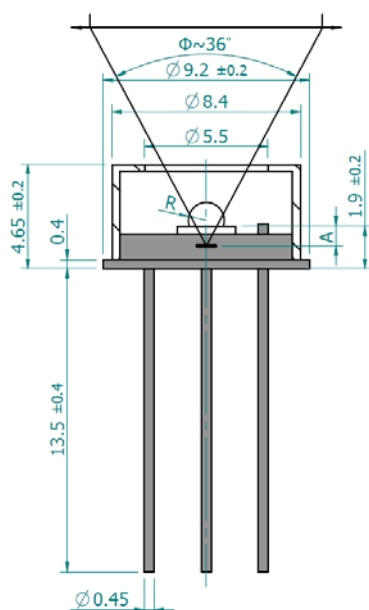
Features

- Wide dynamic range
- Convenient to use
- Very small size
- Cost-effective solution
- Quantity discounted price
- Fast delivery

Applications

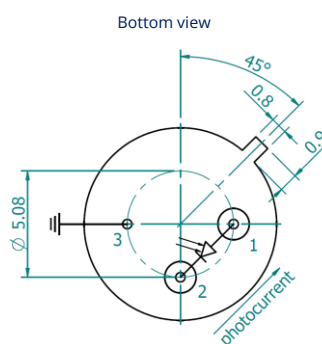
- Contactless temperature measurements (railway transport, industrial and laboratory processes monitoring)
- Flame and explosion detection
- Threat warning systems
- Gas detection, monitoring, and analysis (CO, CO₂, NO_x)
- Breath analysis
- Solids analysis
- Leakage control in gas pipelines
- Combustion process control

Mechanical layout, mm



Parameter	Value
Immersion microlens shape	hyperhemisphere
Optical area A_o , mm×mm	1×1
R , mm	0.8
A , mm	2.4±0.2

Φ – acceptance angle, R – hyperhemisphere microlens radius, A – distance from the bottom of hyperhemisphere microlens to the focal plane



Function	Pin number
Detector	1, 2
Reverse bias (optional)	1(-), 2(+)
Chassis ground	3

Precautions for use and storage

- Standard ohmmeter may overbias and damage the detector. The bias of 10 mV can be used for resistance measurements.
- 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 μ s irradiance on the apparent optical active area must not exceed 2.5 W/cm²,
 - irradiance of the pulse shorter than 1 μ s must not exceed 10 kW/cm².
- Storage in a dark place with 10% to 90% humidity and -20°C to 50°C ambient temperature.