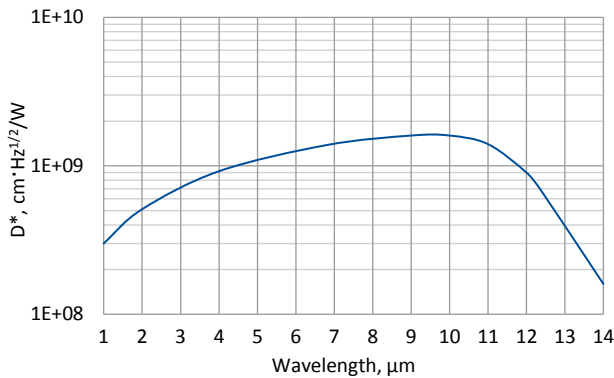


1.5 PCI-3TE-12-1×1-TO8-wZnSeAR-36

1.5.1 1.0 – 14.0 μm HgCdTe three stage thermoelectrically cooled, optically immersed photoconductive detector

PCI-3TE-12-1×1-TO8-wZnSeAR-36 is a three-stage thermoelectrically cooled IR photoconductor, based on sophisticated HgCdTe heterostructure for the best performance and stability. The device is optimized for the maximum performance at 12 μm. Detector element is monolithically integrated with hyperhemispherical GaAs microlens in order to improve performance of the device. Photoconductive detector should operate in optimum bias voltage and current readout mode. Performance at low frequencies is reduced due to 1/f noise. 3° wedged zinc selenide anti-reflection coated (wZnSeAR) window prevents unwanted interference effects.

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
	PCI-3TE-12-1×1-TO8-wZnSeAR-36
Active element material	epitaxial HgCdTe heterostructure
Cut-on wavelength $\lambda_{\text{cut-on}}$ (10%), μm	≤2.0
Peak wavelength λ_{peak} , μm	10.0±0.2
Optimum wavelength λ_{opt} , μm	12.0
Cut-off wavelength $\lambda_{\text{cut-off}}$ (10%), μm	14.0±0.2
Detectivity $D^*(\lambda_{\text{peak}})$, cm·Hz ^{1/2} /W	≥1.6×10 ⁹
Detectivity $D^*(\lambda_{\text{opt}})$, cm·Hz ^{1/2} /W	≥9.0×10 ⁸
Current responsivity $R_i(\lambda_{\text{peak}})$, A/W	≥0.11
Current responsivity $R_i(\lambda_{\text{opt}})$, A/W	≥0.07
Time constant τ , ns	≤5
Resistance R , Ω	≤300
Bias voltage V_b , V	≤1.8
1/f noise corner frequency f_c , kHz	≤20
Active element temperature T_{det} , K	~210
Optical area A_o , mm×mm	1×1
Package	TO8
Acceptance angle Φ	~36°
Window	wZnSeAR

Features

- Wide spectral range from 1.0 to 14.0 μm
- High responsivity
- Large dynamic range
- Excellent long term stability and reliability
- Quantity discounted price
- Fast delivery

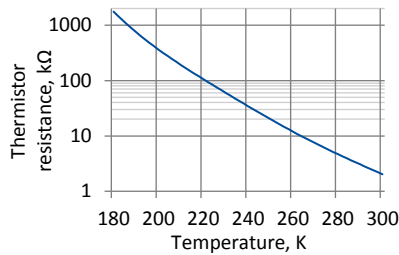
Applications

- FTIR spectroscopy and spectrometry

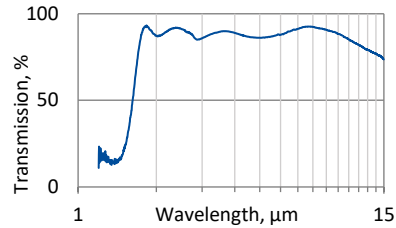
Three-stage thermoelectric cooler parameters

Parameter	Value
T_{det} , K	~210
V_{max} , V	3.6
I_{max} , A	0.45
Q_{max} , W	0.27

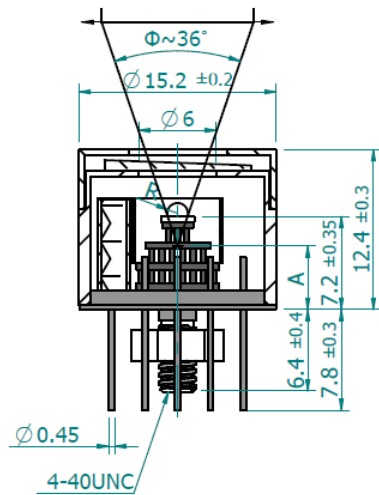
Thermistor characteristics



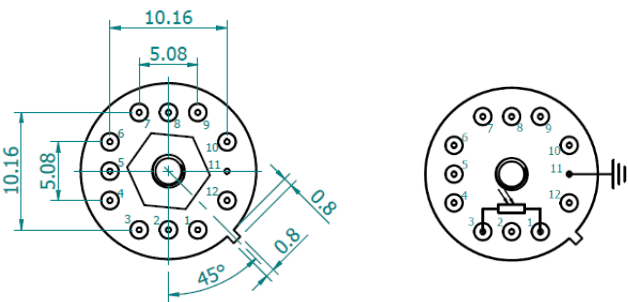
Spectral transmission of wZnSeAR window (typical example)



Mechanical layout, mm



Bottom view



Parameter	Value
Immersion microlens shape	hyperhemisphere
Optical area A_{ov} , mm×mm	1×1
R, mm	0.8
A, mm	4.8±0.35

Φ – acceptance angle, R – hyperhemisphere microlens radius, A – distance from the bottom of the 3TE-TO8 header to the focal plane

Function	Pin number
Detector	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

- Heatsink with thermal resistance of ~2 K/W is necessary to dissipate heat generated by 3TE 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 dark place with 10% to 90% humidity and -20°C to 50°C ambient temperature.