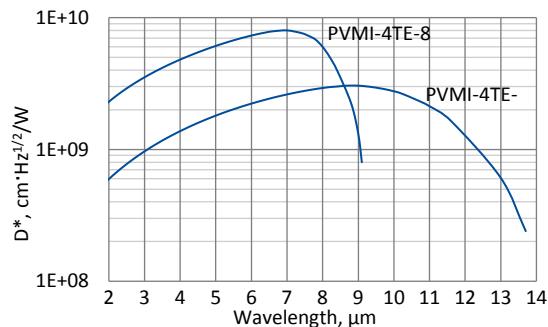


2.22 PVMI-4TE series

2.22.1 2.0 – 13.0 μm HgCdTe four-stage thermoelectrically cooled, optically immersed photovoltaic multiple junction detectors

PVMI-4TE series features four-stage thermoelectrically cooled IR photovoltaic multiple junction detectors based on sophisticated HgCdTe heterostructures for the best performance and stability, optically immersed in order to improve parameters of the devices. The detectors are optimized for the maximum performance at λ_{opt} . They are especially useful as large optical area detectors operating within 2.0 to 13.0 μm spectral range. 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.

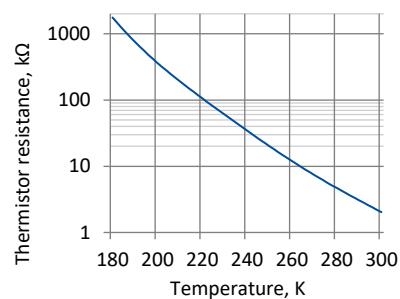
Specification ($T_a = 20^\circ\text{C}$)

Parameter	Detector type	
	PVMI-4TE-8	PVMI-4TE-10.6
Active element material	epitaxial HgCdTe heterostructure	
Optimal wavelength λ_{opt} , μm	8.0	10.6
Detectivity $D^*(\lambda_{\text{peak}})$, $\text{cm} \cdot \text{Hz}^{1/2} / \text{W}$	$\geq 8.0 \times 10^9$	$\geq 3.0 \times 10^9$
Detectivity $D^*(\lambda_{\text{opt}})$, $\text{cm} \cdot \text{Hz}^{1/2} / \text{W}$	$\geq 6.0 \times 10^9$	$\geq 2.5 \times 10^9$
Current responsivity $R_i(\lambda_{\text{opt}})$, A/W	≥ 0.20	≥ 0.18
Time constant τ , ns	≤ 4	≤ 3
Resistance R , Ω	500 to 2500	120 to 500
Active element temperature T_{det} , K	~ 195	
Optical area A_o , mm \times mm	1x1	
Package	TO8, TO66	
Acceptance angle Φ	$\sim 36^\circ$	
Window	wZnSeAR	

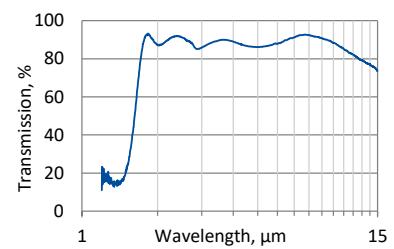
Four-stage thermoelectric cooler parameters

Parameter	Value
T _{dev} , K	~195
V _{max} , V	8.3
I _{max} , A	0.4
Q _{max} , W	0.28

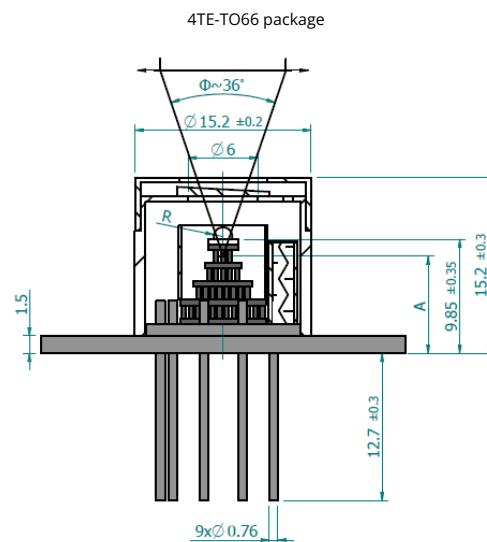
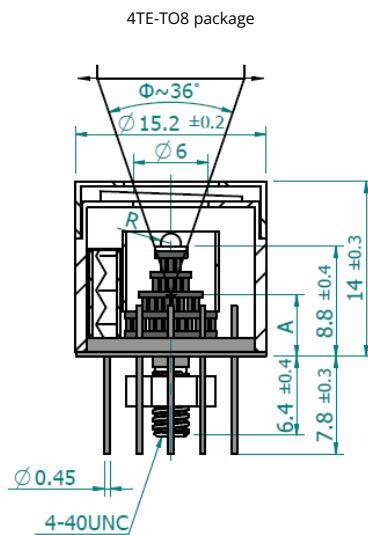
Thermistor characteristics



Spectral transmission of wZnSeAR window (typical example)



Mechanical layout, mm

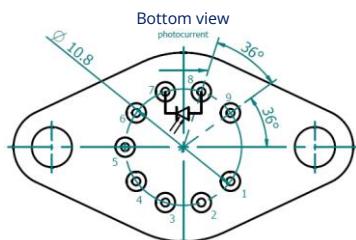
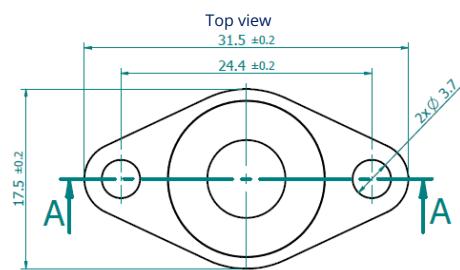
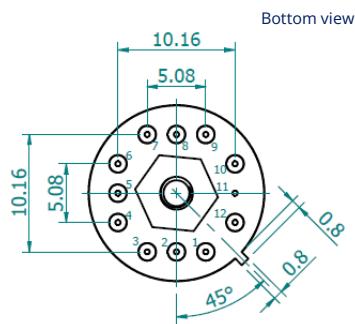


Parameter	Value
Immersion microlens shape	hyperhemisphere
Optical area A _o , mm×mm	1×1
R, mm	0.8
A, mm	6.4±0.4

Φ – acceptance angle, R – hyperhemisphere microlens radius, A – distance from the bottom of 4TE-T08 header to the focal plane

Parameter	Value
Immersion microlens shape	hyperhemisphere
Optical area A _o , mm×mm	1×1
R, mm	0.8
A, mm	7.45±0.40

Φ – acceptance angle, R – hyperhemisphere microlens radius, A – distance from the bottom of 4TE-T066 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

Function	Pin number
Detector	7, 8
Thermistor	5, 6
TE cooler supply	1(+), 9(-)
Not used	2, 3, 4

Dedicated preamplifier



„all-in-one“ AIP



programmable PIP



standard MIP



small SIP-T08