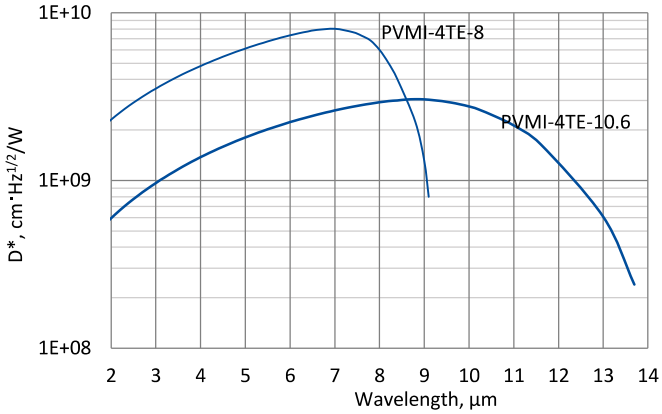
PVMI-4TE series

2 – 13 µm HgCdTe four-stage thermoelectrically cooled, optically immersed photovoltaic multiple junction detectors

PVMI-3TE 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 to 13 µm spectral range. 3° wedged zinc selenide anti-reflection coated (wZnSeAR) window prevents unwanted interference effects.

Spectral response (T_a = 20°C)



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

4TE-TO66 4TE-TO8

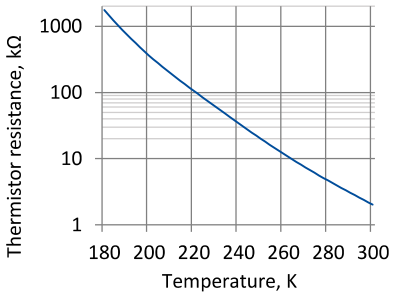
Specification (T_a = 20°C)

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*(λ_{peak}), cm·Hz$^{1/2}$/W	≥8.0×10^9	≥3.0×10^9
Detectivity D*(λ_{opt}), cm·Hz$^{1/2}$/W	≥6.0×10^9	≥2.5×10^9
Current responsivity R_i(λ_{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×mm	1×1	
Package	TO8, TO66	
Acceptance angle Φ	~36°	
Window	wZnSeAR	

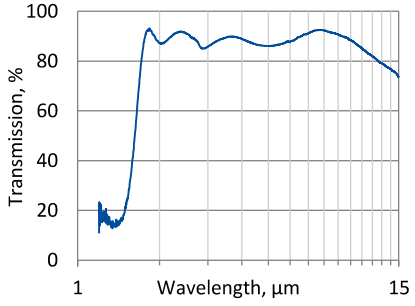
Four-stage thermoelectric cooler parameters

Parameter	Value
T_{det}, K	~195
V_{max}, V	8.3
I_{max}, A	0.4
Q_{max}, W	0.28

Thermistor characteristics

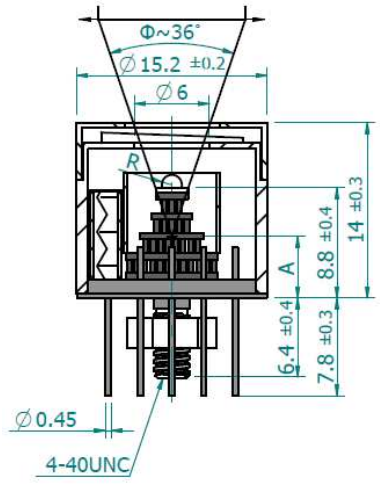


Spectral transmission of wZnSeAR window (typical example)



Mechanical layout, mm

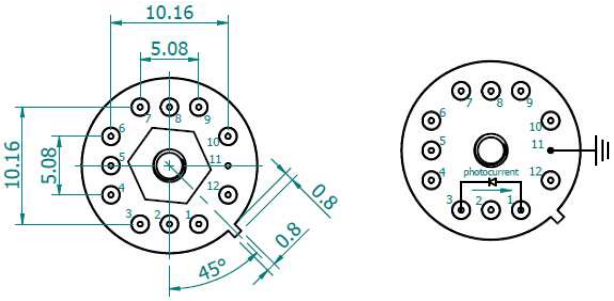
4TE-TO8 package



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

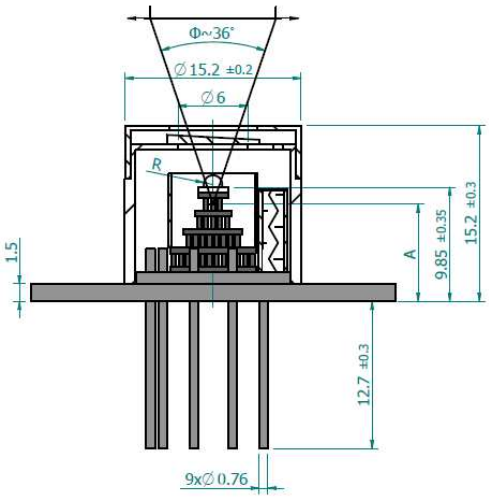
Φ – acceptance angle
R – hyperhemisphere microlens radius
A – distance from the bottom of 4TE-TO8 header to the focal plane

Bottom view



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

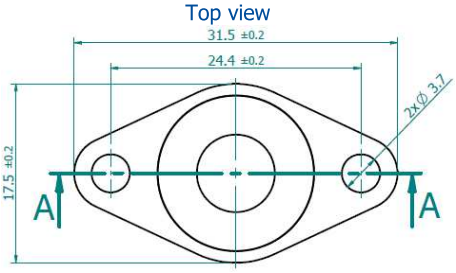
4TE-TO66 package



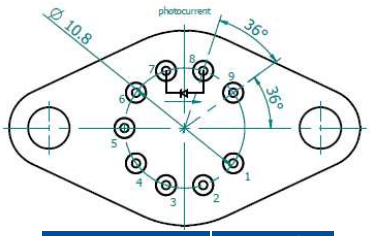
Parameter	Value
Immersion microlens shape	hyperhemisphere
Optical area A_O, mm×mm	1×1
R, mm	0.8
A, mm	7.45±0.40

Φ – acceptance angle
R – hyperhemisphere microlens radius
A – distance from the bottom of 4TE-TO66 header to the focal plane

Top view



Bottom view



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

Dedicated preamplifiers

„all-in-one" AIP

programmable PIP

standard MIP

small SIP-TO8