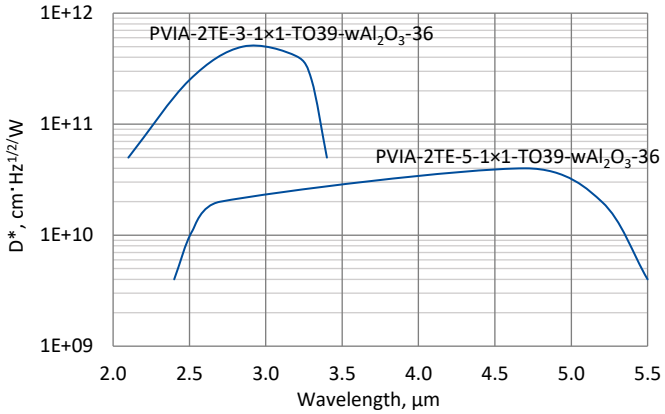
PVIA-2TE series

2.0 – 5.5 µm InAs and InAsSb two-stage thermoelectrically cooled, optically immersed photovoltaic detectors

PVIA-2TE series features two-stage thermoelectrically cooled IR photovoltaic detectors based on $InAs_{1-x}Sb_x$ alloys, optically immersed in order to improve performance of the devices. They do not contain mercury or cadmium and are complying with the RoHS Directive. 3° wedged sapphire (wAl_2O_3) window prevents unwanted interference effects.

Spectral response (T_a = 20°C, V_b = 0 mV)



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

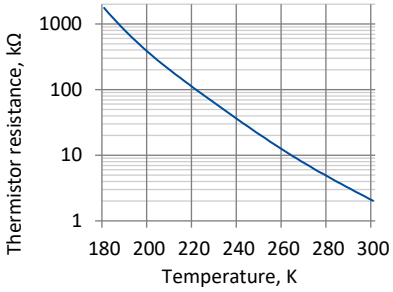
Specification (T_a = 20°C, V_b = 0 mV)

Parameter	Detector type	
	PVIA-2TE-3-1×1-TO8-wAl_2O_3-36	PVIA-2TE-5-1×1-TO8-wAl_2O_3-36
Active element material	epitaxial InAs heterostructure	epitaxial InAsSb heterostructure
Cut-on wavelength $\lambda_{cut\text{-}on}$ (10 %), µm	2.1±0.2	2.4±0.2
Peak wavelength λ_{peak}, µm	2.9±0.3	4.7±0.3
Cut-off wavelength $\lambda_{cut\text{-}off}$ (10 %), µm	3.4±0.2	5.5±0.2
Detectivity D* (λ_{peak}), cm·Hz$^{1/2}$/W	≥5.0×10^{11}	≥4.0×10^{10}
Current responsivity R_i (λ_{peak}), A/W	≥1.1	≥1.2
Time constant τ, ns	≤15	≤5
Resistance R, Ω	≥200k	≥1.0k
Active element temperature T_{det}, K	~230	
Optical area A_O, mm×mm	1×1	
Package	TO8	
Acceptance angle Φ	~36°	
Window	wAl_2O_3	

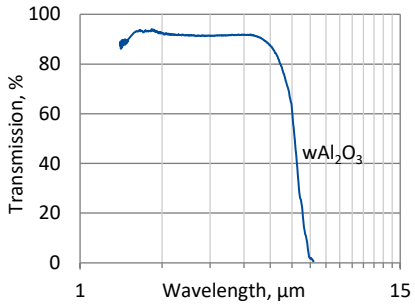
Two-stage thermoelectric cooler parameters

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 wAl_2O_3 window (typical example)



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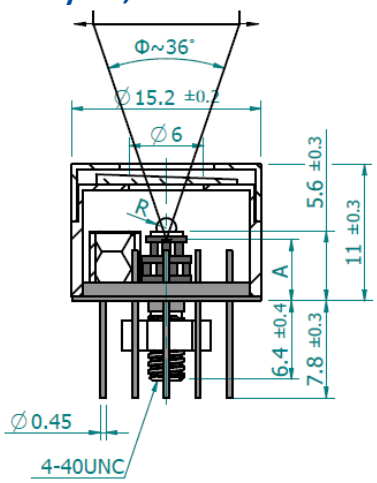
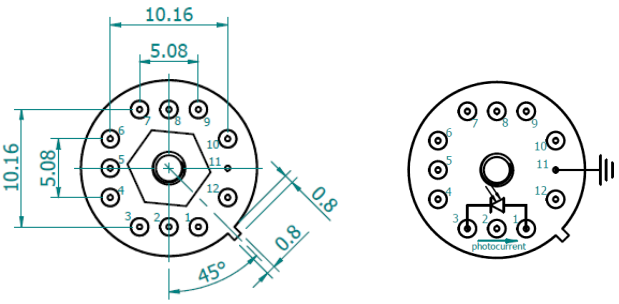
Mechanical layout, mm



Parameter	Value
Immersion microlens shape	hyperhemisphere
Optical area A_O, 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

Bottom view



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

Dedicated preamplifiers

„all-in-one" AIP

programmable PIP

standard MIP

small SIP-TO8

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