

PVIA-4TE-10.6-1×1-TO8-wZnSeAR-36

**PRELIMINARY
DATASHEET**

**InAs/InAsSb superlattice
four-stage TE cooled
optically immersed
photovoltaic infrared detector**



FEATURES

- Spectral range: 2.2 to 11.3 μm
- III-V material compliant with the RoHS Directive
- Unique optical immersion technology applied
- Back-side illuminated
- Long term stability
- Fast response
- No minimum order quantity required

APPLICATIONS

- CO₂ laser (10.6 μm) measurements
- Laser power monitoring and control
- Laser beam profiling and positioning
- Laser calibration
- Semiconductor manufacturing
- Glucose monitoring
- Detection of hazardous chemicals in the air

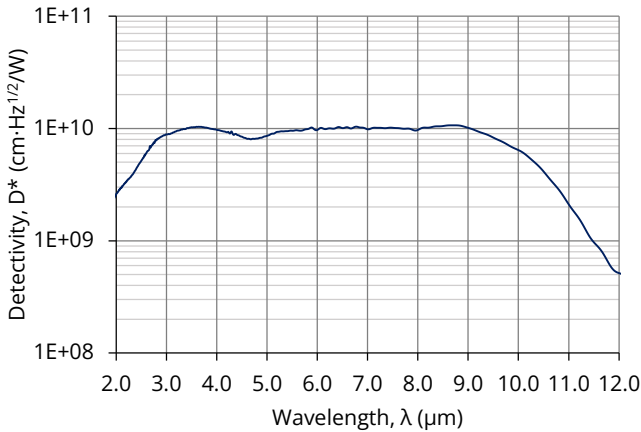
DETECTOR CONFIGURATION

Detector symbol	PVIA-4TE-10.6-1×1-TO8-wZnSeAR-36
Detector type	photovoltaic
Active element material	epitaxial InAs/InAsSb superlattice heterostructure
Optical area, A _o	1 mm × 1 mm
Immersion	hyperhemisphere
Cooling	4TE
Temperature sensor	thermistor
Detector package	TO8
Acceptance angle, Φ	~36 deg.
Window	wZnSeAR (3 deg. wedged zinc selenide, anti-reflection coating)

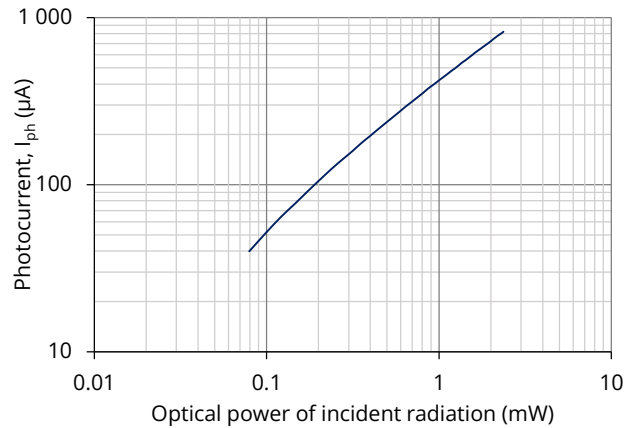
SPECIFICATION (T_{amb} = 293 K, T_{chip} = 200 K, V_b = 0 V, unless otherwise noted)

Parameter	Test conditions/remarks	Value			Unit
		Min.	Typ.	Max.	
Active element temperature, T _{chip}		-	200	-	K
Cut-on wavelength, $\lambda_{\text{cut-on}}$ (10%)	At 10% of peak responsivity	-	1.8	2.1	μm
Peak wavelength, λ_{peak}		-	6.7	-	μm
Cut-off wavelength, $\lambda_{\text{cut-off}}$ (10%)	At 10% of peak responsivity	10.8	11.3	-	μm
Detectivity, D*	At λ_{peak} , f = 20 kHz	8.0×10^9	1.0×10^{10}	-	$\text{cm} \cdot \text{Hz}^{1/2} / \text{W}$
Current responsivity, R _i	At λ_{peak}	0.45	0.55	-	A/W
Time constant, τ		-	3	5	ns
Resistance, R		350	500	-	Ω

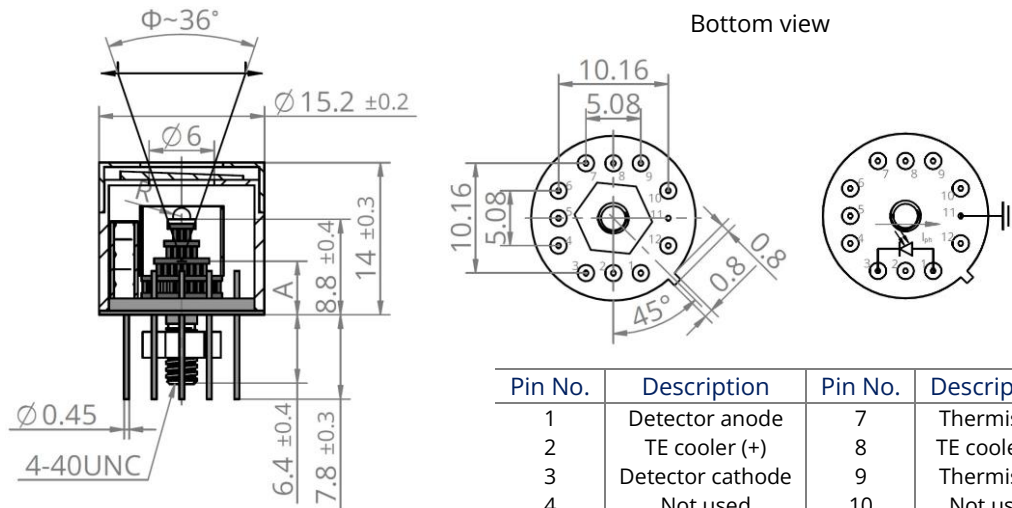
SPECTRAL RESPONSE (Typ., $T_{chip} = 200\text{ K}$)



LINEARITY (Typ., $T_{chip} = 293\text{ K}$, $\lambda = 4.55\ \mu\text{m}$)



MECHANICAL LAYOUT AND PINOUT (Unit: mm)



Pin No.	Description	Pin No.	Description
1	Detector anode	7	Thermistor
2	TE cooler (+)	8	TE cooler (-)
3	Detector cathode	9	Thermistor
4	Not used	10	Not used
5	Not used	11	Ground
6	Not used	12	Not used

Φ – acceptance angle

R = 0.8 mm (hyperhemisphere microlens radius)

A – distance from the bottom of the TO8 header to the focal plane

ABSOLUTE MAXIMUM RATINGS

Parameter	Test conditions/remarks	Value	Unit
Maximum incident optical power density	Continuous wave (CW) or single pulses $\geq 1\ \mu\text{s}$ duration Single pulses $< 1\ \mu\text{s}$ duration	2.5 10	W/cm^2 kW/cm^2
Maximum bias voltage, $V_{b\ \text{max}}$		-1.0	V
Soldering temperature	Within 5 s or less	≤ 370	$^{\circ}\text{C}$
Ambient operating temperature, T_{amb}	Operation at $T_{\text{amb}} > 30^{\circ}\text{C}$ may increase the active element temperature and reduce the performance of the detector below specified parameters	-40 to 85	$^{\circ}\text{C}$
Storage temperature, T_{stg}		-40 to 85	$^{\circ}\text{C}$
Storage humidity	No dew condensation	10 to 90	%
Maximum TE cooler current, $I_{\text{TEC max}}$		0.4	A
Maximum TE cooler voltage, $V_{\text{TEC max}}$		8.3	V

Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. Constant or repeated exposure to absolute maximum rating conditions may affect the quality and reliability of the device.