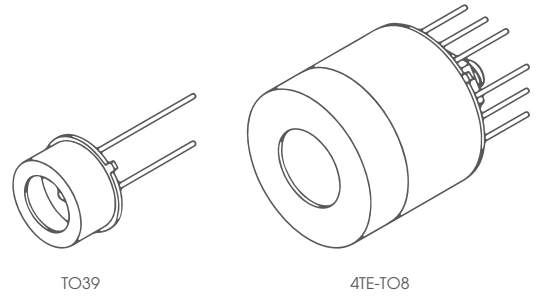


PVIA-10.6 SERIES

InAs/InAsSb superlattice room temperature and thermoelectrically cooled optically immersed photovoltaic infrared detectors



FEATURES

- Spectral range: 2.0 to 13.6 μm
- RoHS-compliant III-V material
- Unique optical immersion technology applied
- Back-side illuminated
- Long term stability
- Fast response
- No minimum order quantity required

APPLICATIONS

- FTIR spectroscopy
- Gas detection, monitoring and analysis: C_2H_6
- Toxic gas detection
- Gas leak detection

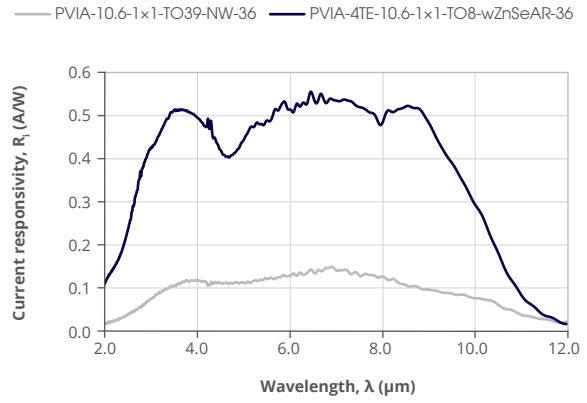
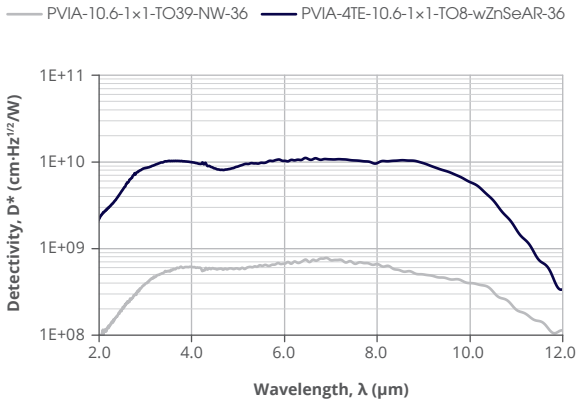
DETECTOR CONFIGURATION

Detector symbol	Cooling (p. 191)	Temperature sensor (p. 192)	Optical area, A_o , mm \times mm	Optical immersion (p. 188)	Package	Acceptance angle, Φ , deg.	Window (p. 193)
PVIA-10.6-1 \times 1-TO39-NW-36	no	n/a	1 \times 1	hyperhemisphere	TO39 (3 pins)	~36	no
PVIA-4TE-10.6-1 \times 1-TO8-wZnSeAR-36	4TE ($T_{\text{chip}} \approx 200\text{K}$)	thermistor			TO8		wZnSeAR (3 deg. wedged zinc selenide, anti-reflection coating)

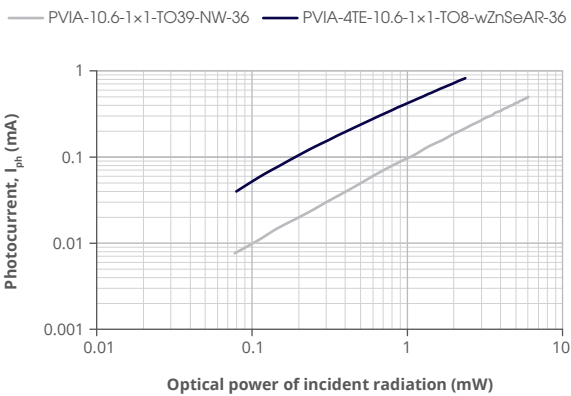
SPECIFICATION ($T_{\text{amb}} = 293 \text{ K}$, $V_b = 0 \text{ V}$)

Detector symbol	Cut-on wavelength (10%)		Peak wavelength	Cut-off wavelength (10%)		Detectivity		Current responsivity		Time constant		Dynamic resistance	
	$\lambda_{\text{cut-on}}$	λ_{peak}	$\lambda_{\text{cut-off}}$	$D^*(\lambda_{\text{peak}})$		$R_i(\lambda_{\text{peak}})$		τ		R_d			
	μm	μm	μm	$\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$		A/W		ns		Ω			
	Typ.	Typ.	Typ.	Min.	Typ.	Min.	Typ.	Typ.	Max.	Min.	Typ.		
PVIA-10.6-1 \times 1-TO39-NW-36	1.8	7.1	12.0	5.0×10^8	7.7×10^8	0.09	0.14	1.65	5	30	51		
PVIA-4TE-10.6-1 \times 1-TO8-wZnSeAR-36	1.8	6.7	11.3	8.0×10^9	1.0×10^{10}	0.45	0.55	3	5	350	500		

SPECTRAL RESPONSE (Typ., $T_{amb} = 293\text{ K}$)



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



MECHANICAL LAYOUT AND PINOUT

- TO39 (3 pins) package (without window) – Technical drawing (p. 198)
- 4TE-TO8 package – Technical drawing (p. 210)

RECOMMENDED AMPLIFIERS

Detector symbol	Amplifier type
PVIA-10.6-1x1-TO39-NW-36	SIP-TO39 series (p. 138)
PVIA-4TE-10.6-1x1-TO8-wZnSeAR-36	AIP series (p. 126), PIP series (p. 129), MIP series (p. 132), SIP-TO8 series (p. 135)

ABSOLUTE MAXIMUM RATINGS

Parameter	Test conditions/remarks	Value	Unit
Ambient operating temperature, T_{amb}	Operation at $T_{amb} > 30^\circ\text{C}$ may increase the active element temperature and reduce the performance of the detector below specified parameters	-40 to 70	$^\circ\text{C}$
Storage temperature, T_{stg}		-40 to 85	$^\circ\text{C}$
Soldering temperature	Within 5 s or less	≤ 370	$^\circ\text{C}$
Storage humidity	No dew condensation	10 to 90	%
Maximum incident optical power density	Continuous wave (CW) or single pulses $> 1\ \mu\text{s}$ duration	2.5	W/cm^2
	Single pulses $< 1\ \mu\text{s}$ duration	10	kW/cm^2
Maximum bias voltage, $V_{b\ max}$		-1.5	V
Maximum TEC voltage, $V_{TEC\ max}$	4TE	8.3	V
Maximum TEC current, $I_{TEC\ max}$	4TE	0.4	A

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.