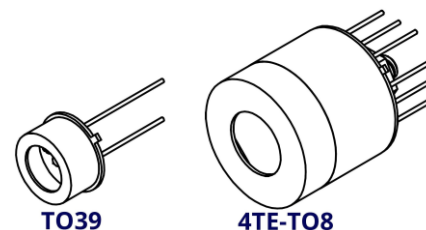


PVIA-10.6 SERIES

**PRELIMINARY
DATASHEET**

**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

- Gas detection, monitoring and analysis: SO_2 , NH_3 , SF_6
- CBRN threats detection
- CO_2 laser measurements (power monitoring and control, beam profiling and positioning, calibration)
- Free-space optical communication
- FTIR spectroscopy
- Medical bacteria identification
- Dentistry
- Glucose sensing

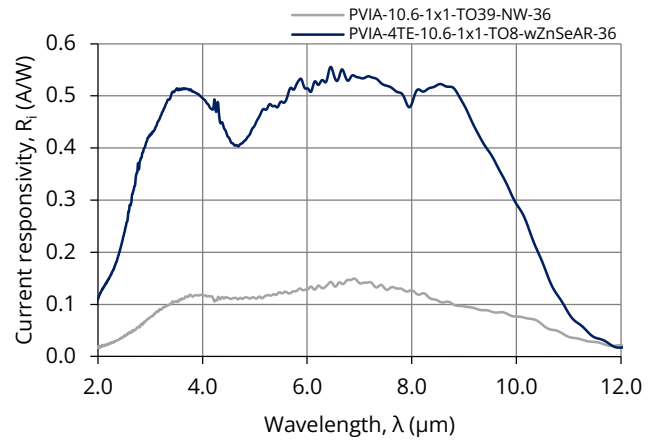
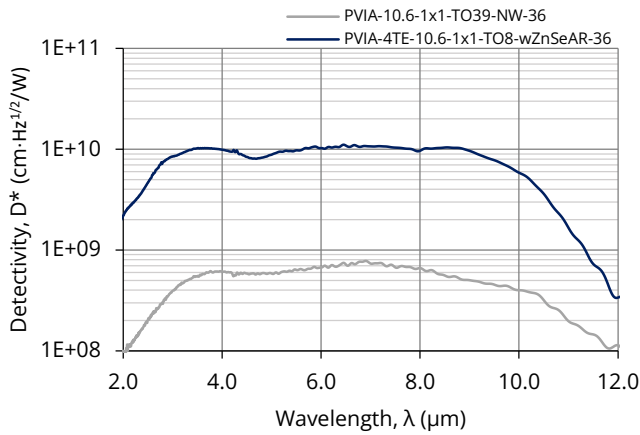
DETECTOR CONFIGURATION

Detector symbol	Cooling	Temperature sensor	Optical area, A_o , mm \times mm	Optical immersion	Package	Acceptance angle, Φ , deg.	Window
PVIA-10.6-1x1-TO39-NW-36	no	n/a	1 \times 1	hyperhemisphere	TO39 (3 pins)	~36	no
PVIA-4TE-10.6-1x1-TO8-wZnSeAR-36	4TE ($T_{\text{chip}} \cong 200\text{K}$)	thermistor			4TE-TO8		wZnSeAR (3 deg. wedged zinc selenide, anti-reflection coating)

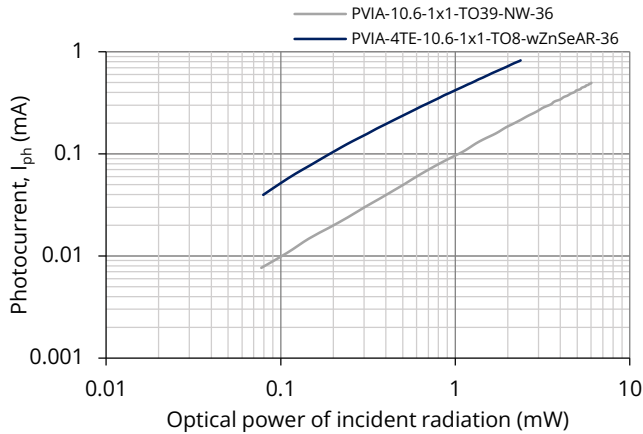
SPECIFICATION ($T_{\text{amb}} = 293\text{ K}$, $V_b = 0\text{ V}$)

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}	$\lambda_{\text{cut-off}}$		$D^*(\lambda_{\text{peak}}, 20\text{kHz})$		$R_i(\lambda_{\text{peak}})$		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-10.6-1x1-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-10.6-1x1-TO8-wZnSeAR-36		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 – Technical drawing
- 4TE-TO8 package – Technical drawing

RECOMMENDED AMPLIFIERS

Detector symbol	Preamplifier type
PVIA-10.6-1x1-TO39-NW-36	SIP-TO39 series
PVIA-4TE-10.6-1x1-TO8-wZnSeAR-36	AIP series
	PIP series
	MIP series
	SIP-TO8 series

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.