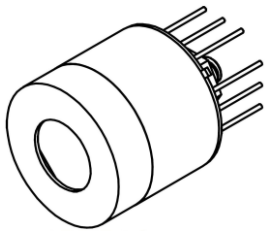
PVIA-4TE-4-1x1-TO8-wAl_2O_3-36

PRELIMINARY DATASHEET

InAsSb
four-stage thermoelectrically-cooled optically immersed photovoltaic infrared detector



FEATURES

- Spectral range: 2.0 to 4.7 µm
- RoHS-compliant III-V material
- High ambient operating and storage temperature
- Unique optical immersion technology applied
- Back-side illuminated
- No minimum order quantity required

APPLICATIONS

- Gas detection, monitoring and analysis: CH_4, C_2H_2, CH_2O, HCl, NH_3, SO_2, C_2H_6, CO_2
- Breath analysis: C_2H_6, CH_2O, NH_3
- Explosion prevention
- Exhaust gas denitrification
- Emission control (exhaust fumes, greenhouse gases)
- Contactless temperature measurements (metal industry)

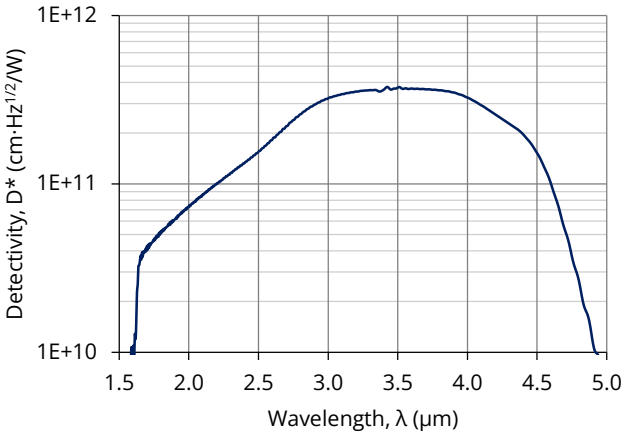
DETECTOR CONFIGURATION

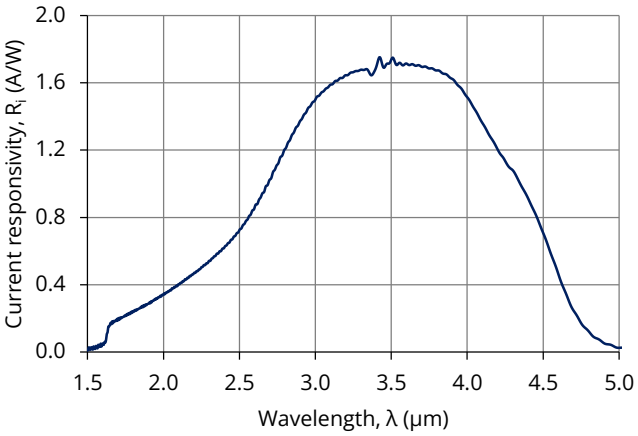
Detector symbol	Cooling	Temperature sensor	Optical area, A_o, mm×mm	Optical immersion	Package	Acceptance angle, Φ, deg.	Window
PVIA-4TE-4-1x1-TO8-wAl_2O_3-36	4TE (T_{chip}≅200K)	thermistor	1×1	hyperhemisphere	4TE-TO8	~36	wAl_2O_3 (3 deg. wedged sapphire)

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

Detector symbol	Cut-on wavelength (10%)	Peak wavelength	Cut-off wavelength (10%)	Detectivity		Current responsivity		Time constant		Dynamic resistance	
	$\lambda_{cut\text{-}on}$	λ_{peak}	$\lambda_{cut\text{-}off}$	D*(λ_{peak}, 20kHz)		$R_i(\lambda_{peak})$		τ		R_d	
	µm	µm	µm	cm·Hz$^{1/2}$/W		A/W		ns		kΩ	
	Typ.	Typ.	Typ.	Min.	Typ.	Min.	Typ.	Typ.	Max	Min.	Typ.
PVIA-4TE-4-1x1-TO8-wAl_2O_3-36	≤2.0	3.5	4.7	2.0×10^{11}	3.7×10^{11}	1.2	1.7	30	40	75	105

SPECTRAL RESPONSE (Typ., T_{amb} = 293 K, T_{chip} = 200 K)





MECHANICAL LAYOUT AND PINOUT

- 4TE-TO8(12p)-wW, PVI/PCI detector technical drawing

RECOMMENDED AMPLIFIER

Detector symbol	Preamplifier type
PVIA-4TE-4-1x1-TO8-wAl$_2$O$_3$-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°C may increase the active element temperature and reduce the performance of the detector below specified parameters	-40 to 70	°C
Storage temperature, T_{stg}		-40 to 85	°C
Soldering temperature	Within 5 s or less	≤370	°C
Storage humidity	No dew condensation	10 to 90	%
Maximum incident optical power density	Continuous wave (CW) or single pulses >1 μs duration	2.5	W/cm^2
	Single pulses <1 μs duration	10	kW/cm^2
Maximum bias voltage, $V_{b\,max}$		-1.0	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.