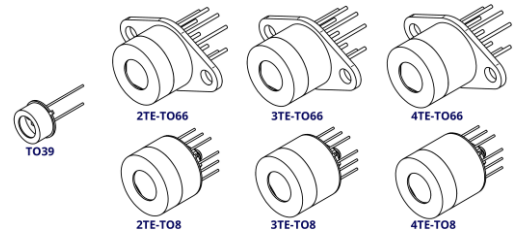


PVI-4 DETECTOR SERIES

DATASHEET

HgCdTe room temperature and thermoelectrically cooled photovoltaic optically immersed infrared detectors



FEATURES

- Spectral range: 2.3 to 4.4 μm
- Back-side illuminated
- Unique optical immersion lens technology applied
- No minimum order quantity required
- Detector PVI-4-1x1-TO39-NW-36 is a Selected product

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)

RELATED PRODUCT

- [LabM-I-4 detection module](#)

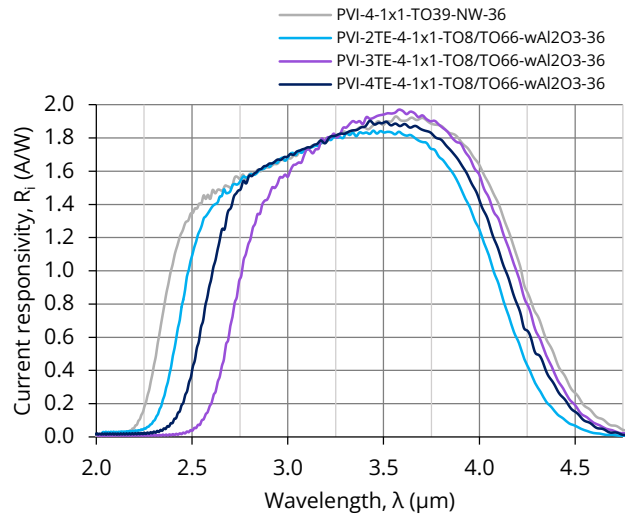
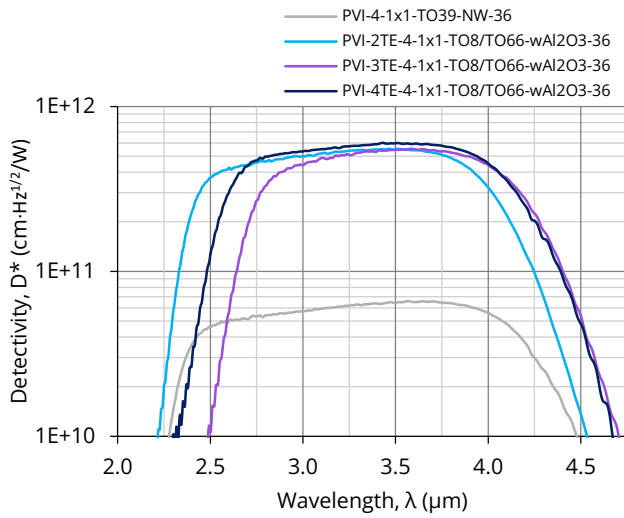
SERIES DESCRIPTION

Detector symbol	Cooling	Temperature sensor	Optical area, A_o , mm \times mm	Optical immersion	Package	Acceptance angle, Φ , deg.	Window
PVI-4-1x1-TO39-NW-36	no	n/a	1 \times 1	hyperhemisphere	TO39 (3 pin)	~36	no
PVI-2TE-4-1x1-TO8-wAl ₂ O ₃ -36	2TE	thermistor			2TE-TO8		wAl ₂ O ₃ (3 deg. wedged sapphire)
PVI-2TE-4-1x1-TO66-wAl ₂ O ₃ -36	T _{chip} \cong 230K				2TE-TO66		
PVI-3TE-4-1x1-TO8-wAl ₂ O ₃ -36	3TE				3TE-TO8		
PVI-3TE-4-1x1-TO66-wAl ₂ O ₃ -36	T _{chip} \cong 210K				3TE-TO66		
PVI-4TE-4-1x1-TO8-wAl ₂ O ₃ -36	4TE				4TE-TO8		
PVI-4TE-4-1x1-TO66-wAl ₂ O ₃ -36	T _{chip} \cong 198K				4TE-TO66		

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

Detector symbol	Cut-on wavelength (10%)		Peak wavelength	Specific wavelength	Cut-off wavelength (10%)		Detectivity			Current responsivity			Time constant	Dynamic resistance	
	$\lambda_{\text{cut-on}}$	λ_{peak}	λ_{spec}	$\lambda_{\text{cut-off}}$	$D^*(\lambda_{\text{peak}}, 20\text{kHz})$	$D^*(\lambda_{\text{spec}}, 20\text{kHz})$		$R(\lambda_{\text{peak}})$	$R(\lambda_{\text{spec}})$		τ	R_d			
	μm	μm	μm	μm	cm \cdot Hz ^{1/2} /W	cm \cdot Hz ^{1/2} /W		A/W	A/W		ns	Ω			
	Typ.	Typ.	Typ.	Typ.	Typ.	Min.	Typ.	Typ.	Min.	Typ.	Typ.	Min.	Typ.		
PVI-4-1x1-TO39-NW-36	2.3	3.5 \pm 0.1	4.0	4.4	6.0 \times 10 ¹⁰	3.0 \times 10 ¹⁰	4.0 \times 10 ¹⁰	1.8	1.0	1.3	150	800	2 000		
PVI-2TE-4-1x1-TO8-wAl ₂ O ₃ -36					5.0 \times 10 ¹¹	2.0 \times 10 ¹¹	3.0 \times 10 ¹¹					30 000	100 000		
PVI-2TE-4-1x1-TO66-wAl ₂ O ₃ -36					5.5 \times 10 ¹¹	3.0 \times 10 ¹¹	6.0 \times 10 ¹¹					4.0 \times 10 ¹¹	100	60 000	150 000
PVI-3TE-4-1x1-TO8-wAl ₂ O ₃ -36															
PVI-3TE-4-1x1-TO66-wAl ₂ O ₃ -36															
PVI-4TE-4-1x1-TO8-wAl ₂ O ₃ -36															
PVI-4TE-4-1x1-TO66-wAl ₂ O ₃ -36					3.6 \pm 0.15										

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



MECHANICAL LAYOUT AND PINOUT

- [TO39\(3p\)-NW, PVI detector technical drawing](#)
- [2TE-TO8\(12p\)-wW, PVI/PCI detector technical drawing](#)
- [2TE-TO66\(9p\)-wW, PVI/PCI detector technical drawing](#)
- [3TE-TO8\(12p\)-wW, PVI/PCI detector technical drawing](#)
- [3TE-TO66\(9p\)-wW, PVI/PCI detector technical drawing](#)
- [4TE-TO8\(12p\)-wW, PVI/PCI detector technical drawing](#)
- [4TE-TO66\(9p\)-wW, PVI/PCI detector technical drawing](#)

RECOMMENDED AMPLIFIERS

Detector symbol	Amplifier type
PVI-4-1x1-TO39-NW-36	SIP-TO39 series
PVI-2TE-4-1x1-TO8-wAl ₂ O ₃ -36	AIP series PIP series
PVI-3TE-4-1x1-TO8-wAl ₂ O ₃ -36	MIP series SIP-TO8 series
PVI-4TE-4-1x1-TO8-wAl ₂ O ₃ -36	FIP series^{*)}

^{*)} Only for biased detectors

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	-20 to 30	$^{\circ}\text{C}$
Storage temperature, T_{stg}		-20 to 50	$^{\circ}\text{C}$
Soldering temperature	Within 5 s or less	≤ 300	$^{\circ}\text{C}$
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, $V_{b\ max}$		-800	mV
Maximum TEC voltage, $V_{TEC\ max}$	2TE	1.0	V
	3TE	3.6	
	4TE	8.3	
Maximum TEC current, $I_{TEC\ max}$	2TE	1.2	A
	3TE	0.45	
	4TE	0.4	

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.