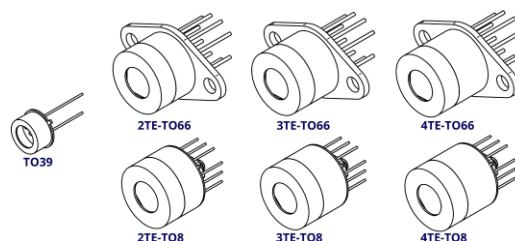


PVI-5 DETECTOR SERIES

DATASHEET

HgCdTe room temperature and thermoelectrically cooled photovoltaic optically immersed infrared detectors



FEATURES

- Spectral range: 2.7 to 5.6 μm
- Back-side illuminated
- Unique immersion lens technology applied
- No minimum order quantity required
- Detector PVI-5-1x1-TO39-NW-36 is a Selected product

RELATED PRODUCTS

- LabM-I-5 detection module
- PVIA-5-1x1-TO39-NW-36 RoHS-compliant detector
- PVMA-1TE-5-1x1-TO39-pSiAR-70 RoHS-compliant detector
- AMS3140-01 RoHS-compliant detection module

APPLICATIONS

- Contactless temperature measurement: railway transport, industrial and laboratory processes monitoring
- Flame and explosion detection
- Threat warning systems
- Heat-seeking, thermal signature detection
- Dentistry
- Gas detection, monitoring and analysis: CH_4 , C_2H_2 , CH_2O , HCl , NH_3 , SO_2 , C_2H_6 , CO , CO_2 , NO_x
- Breath analysis: C_2H_6 , CH_2O , NH_3 , NO , OCS
- Gas leak detection
- Combustion process control
- Non-destructive material testing

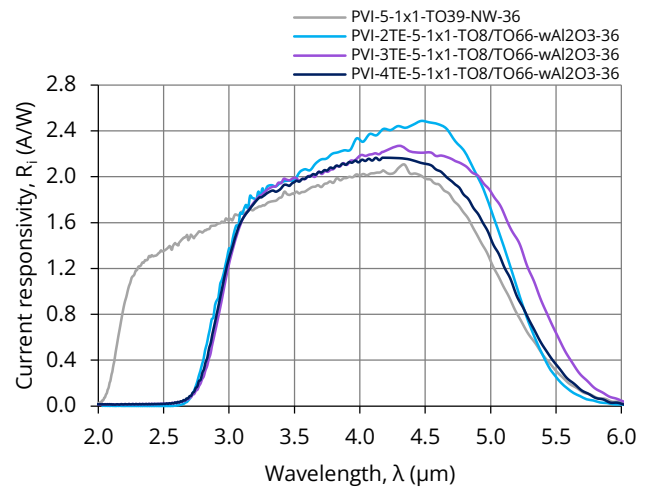
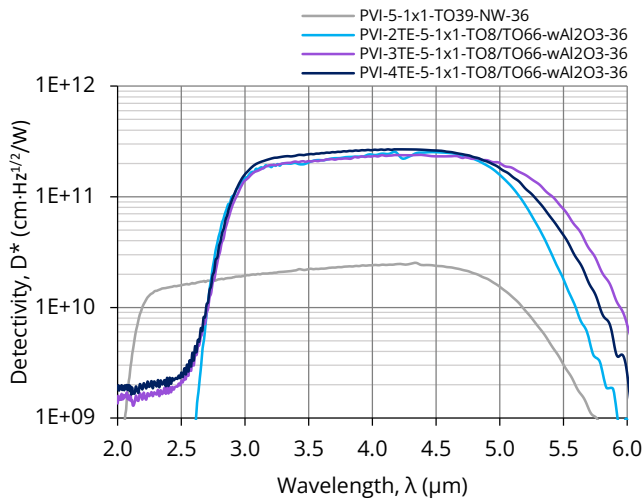
SERIES DESCRIPTION

Detector symbol	Cooling	Temperature sensor	Optical area, A_o , mm \times mm	Optical immersion	Package	Acceptance angle, Φ , deg.	Window
PVI-5-1x1-TO39-NW-36	no	n/a	1 \times 1	hyperhemisphere	TO39 (3 pins)	~36	no
PVI-2TE-5-1x1-TO8-wAl ₂ O ₃ -36	2TE	thermistor			2TE-TO8		wAl ₂ O ₃ (3 deg. wedged sapphire)
PVI-2TE-5-1x1-TO66-wAl ₂ O ₃ -36	$T_{\text{chip}} \cong 230\text{K}$				2TE-TO66		
PVI-3TE-5-1x1-TO8-wAl ₂ O ₃ -36	3TE				3TE-TO8		
PVI-3TE-5-1x1-TO66-wAl ₂ O ₃ -36	$T_{\text{chip}} \cong 210\text{K}$				3TE-TO66		
PVI-4TE-5-1x1-TO8-wAl ₂ O ₃ -36	4TE				4TE-TO8		
PVI-4TE-5-1x1-TO66-wAl ₂ O ₃ -36	$T_{\text{chip}} \cong 198\text{K}$				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}	$\lambda_{\text{cut-off}}$	$D^*(\lambda_{\text{peak}}, 20\text{kHz})$		$R(\lambda_{\text{peak}})$	$R(\lambda_{\text{spec}})$		τ	R_d		
	μm	μm	μm	μm	$\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$		A/W	A/W		ns	Ω		
	Typ.	Typ.	Typ.	Typ.	Typ.	Min.	Typ.	Typ.	Min.	Typ.	Typ.	Min.	Typ.
PVI-5-1x1-TO39-NW-36	2.0	4.4 \pm 0.2	5.0	5.4	2.5×10^{10}	1.0×10^{10}	1.5×10^{10}	2.0	1.0	1.2	120	100	250
PVI-2TE-5-1x1-TO8-wAl ₂ O ₃ -36	2.7			5.6	1.8×10^{11}	8.0×10^{10}	1.2×10^{11}	2.1	1.2	1.5	80	2 000	5 000
PVI-2TE-5-1x1-TO66-wAl ₂ O ₃ -36				5.5	2.3×10^{11}	9.0×10^{10}	1.5×10^{11}					4 000	15 000
PVI-3TE-5-1x1-TO8-wAl ₂ O ₃ -36				5.2	2.5×10^{11}	1.0×10^{11}	1.5×10^{11}					10 000	50 000
PVI-3TE-5-1x1-TO66-wAl ₂ O ₃ -36													
PVI-4TE-5-1x1-TO8-wAl ₂ O ₃ -36													
PVI-4TE-5-1x1-TO66-wAl ₂ O ₃ -36													

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-5-1x1-TO39-NW-36	SIP-TO39 series
PVI-2TE-5-1x1-TO8-wAl ₂ O ₃ -36	AIP series PIP series
PVI-3TE-5-1x1-TO8-wAl ₂ O ₃ -36	MIP series SIP-TO8 series
PVI-4TE-5-1x1-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.