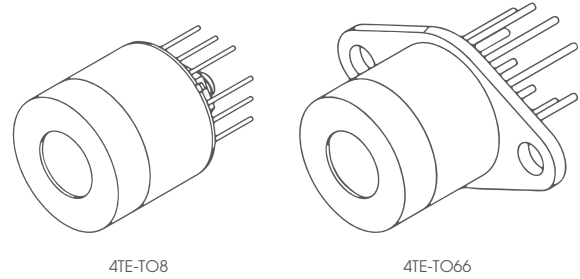


# PVMI-8 SERIES

**HgCdTe thermoelectrically cooled photovoltaic multi-junction optically immersed infrared detectors**



## FEATURES

- Spectral range: 2.0 to 9.8  $\mu\text{m}$
- Back-side illuminated
- Unique immersion lens technology applied
- No minimum order quantity required

## APPLICATIONS

- Gas detection, monitoring and analysis:  $\text{CH}_4$ ,  $\text{H}_2\text{S}$ ,  $\text{NO}_2$ ,  $\text{SO}_x$
- FTIR spectroscopy

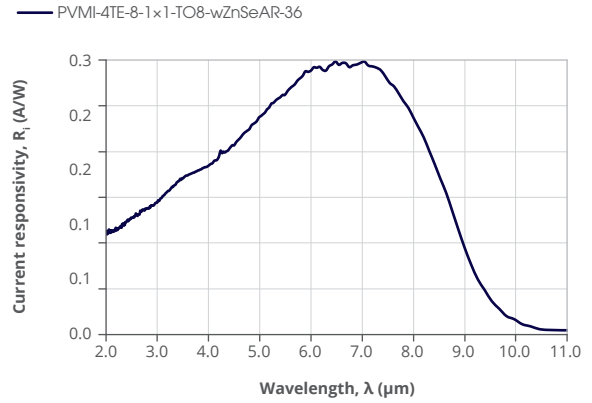
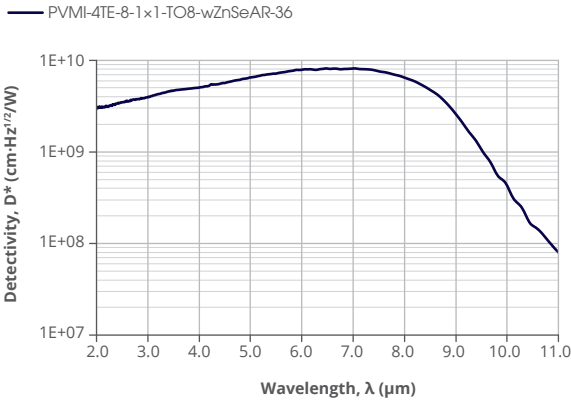
## SERIES DESCRIPTION

Detector symbol	Cooling (p. 191)	Temperature sensor (p. 192)	Optical area, $A_o$ , mm $\times$ mm	Optical immersion (p. 188)	Package	Acceptance angle, $\Phi$ , deg.	Window (p. 193)
PVMI-4TE-8-1 $\times$ 1-TO8-wZnSeAR-36	4TE $T_{\text{chip}} \approx 197\text{K}$	thermistor	1 $\times$ 1	hyperhemisphere	TO8	-36	wZnSeAR (3 deg. zinc selenide, anti-reflection coating)
PVMI-4TE-8-1 $\times$ 1-TO66-wZnSeAR-36					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		
	$\lambda_{\text{cut-on}}$	$\lambda_{\text{peak}}$	$\lambda_{\text{spec}}$	$\lambda_{\text{cut-off}}$	$D^*(\lambda_{\text{peak}})$ 20kHz	$D^*(\lambda_{\text{spec}})$ 20kHz	$R_i(\lambda_{\text{peak}})$		$R_i(\lambda_{\text{spec}})$	$\tau$	$R_d$		
	$\mu\text{m}$	$\mu\text{m}$	$\mu\text{m}$	$\mu\text{m}$	$\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	$\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	A/W		A/W	ns	$\Omega$		
	Typ.	Typ.	Typ.	Typ.	Typ.	Min.	Typ.	Min.	Typ.	Typ.	Min.	Typ.	
PVMI-4TE-8-1 $\times$ 1-TO8-wZnSeAR-36	2.0	7.0 $\pm$ 1.0	8.0	9.8	8.0 $\times$ 10 <sup>9</sup>	6.0 $\times$ 10 <sup>9</sup>	0.4		0.2	0.25	4	500	800
PVMI-4TE-8-1 $\times$ 1-TO66-wZnSeAR-36													

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



## MECHANICAL LAYOUT AND PINOUT

- 4TE-TO8 package  
– Technical drawing (p. 210)
- 4TE-TO66 package  
– Technical drawing (p. 212)

## RECOMMENDED AMPLIFIERS

Detector symbol	Amplifier type
PVMI-4TE-8-1x1-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	-20 to 30	$^{\circ}\text{C}$
Storage temperature, $T_{stg}$		-20 to 50	$^{\circ}\text{C}$
Soldering temperature	Within 5 s or less	$\leq 300$	$^{\circ}\text{C}$
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	$\text{W}/\text{cm}^2$
	Single pulses $< 1\ \mu\text{s}$ duration	10	$\text{kW}/\text{cm}^2$
Maximum bias voltage, $V_{b\ max}$	No bias voltage needed	-	-
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.