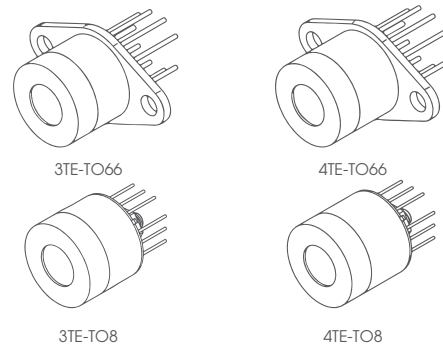


# PVI-10.6 SERIES

## HgCdTe thermoelectrically cooled photovoltaic optically immersed infrared detectors



### FEATURES

- Spectral range: 3.0 to 12.0  $\mu\text{m}$
- Back-side illuminated
- Unique immersion lens technology applied
- No minimum order quantity required

### RELATED PRODUCTS

- **LabM-I-10.6** detection module (p. 107)
- **UM-I-10.6** detection module (p. 113)
- **microM-10.6** detection module (p. 110)
- **PVIA-10.6-1 x 1-TO39-NW-36**  
RoHS-compliant detector (p. 22)
- **PVIA-4TE-10.6-1 x 1-TO8-wZnSeAR-36**  
RoHS-compliant detector (p. 22)

### APPLICATIONS

- Gas detection, monitoring and analysis:  $\text{SO}_2$ ,  $\text{NH}_3$ ,  $\text{SF}_6$
- CBRN threats detection
- $\text{CO}_2$  laser measurements: power monitoring and control, beam profiling and positioning, calibration
- Free-space optical communication
- FTIR spectroscopy
- Medical bacteria identification
- Dentistry
- Glucose sensing

### 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)
PVI-3TE-10.6-0.5 $\times$ 0.5-TO8-wZnSeAR-36	3TE $T_{\text{chip}} \approx 210\text{K}$	thermistor	0.5 $\times$ 0.5	hyperhemisphere	TO8	~36	wZnSeAR (3 deg. zinc selenide, anti-reflection coating)
PVI-3TE-10.6-0.5 $\times$ 0.5-TO66-wZnSeAR-36					TO66		
PVI-4TE-10.6-0.5 $\times$ 0.5-TO8-wZnSeAR-36	TO8						
PVI-4TE-10.6-0.5 $\times$ 0.5-TO66-wZnSeAR-36	TO66						
PVI-4TE-10.6-1 $\times$ 1-TO8-wZnSeAR-36	4TE $T_{\text{chip}} \approx 198\text{K}$		1 $\times$ 1		TO8		
PVI-4TE-10.6-1 $\times$ 1-TO66-wZnSeAR-36			TO66				

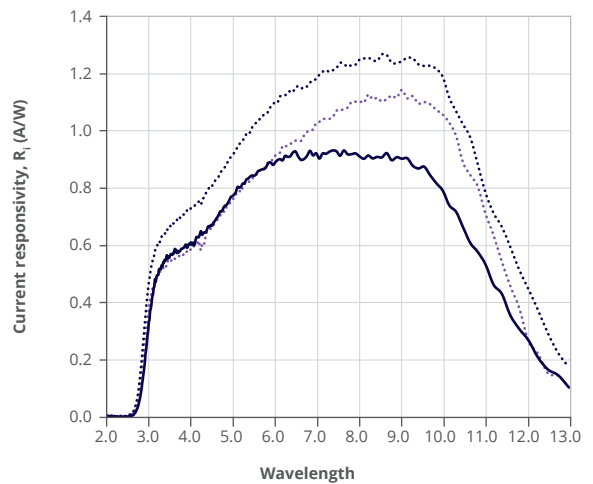
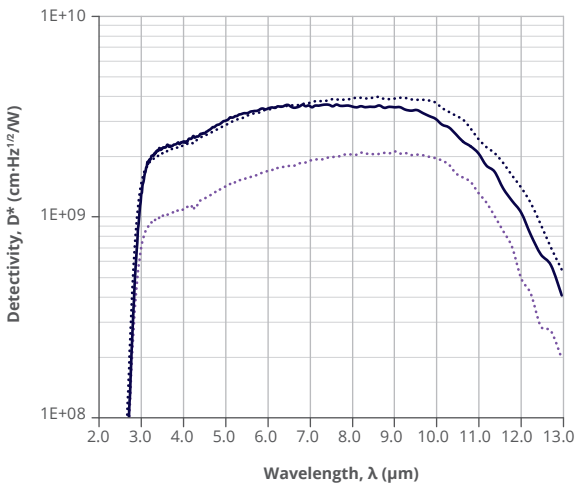
SPECIFICATION ( $T_{amb} = 293\text{ K}$ ,  $V_b = 0\text{ V}$ )

Detector symbol	Cut-on wavelength (10%)	Peak wavelength	Specific wavelength	Cut-off wavelength (10%)	Detectivity		Current responsivity		Time constant	Dynamic resistance		
	$\lambda_{cut-on}$	$\lambda_{peak}$	$\lambda_{spec}$	$\lambda_{cut-off}$	$D^*(\lambda_{peak}, 20\text{kHz})$	$D^*(\lambda_{spec}, 20\text{kHz})$	$R_i(\lambda_{peak})$	$R_i(\lambda_{spec})$	$\tau$	$R_d$		
	$\mu\text{m}$	$\mu\text{m}$	$\mu\text{m}$	$\mu\text{m}$	$\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	$\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	$\text{A}/\text{W}$	$\text{A}/\text{W}$	$\text{ns}$	$\Omega$		
	Typ.	Typ.	Typ.	Typ.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	
PVI-3TE-10.6-0.5x0.5-TO8-wZnSeAR-36					$2.0 \times 10^9$	$1.5 \times 10^9$	0.9	0.7	0.9	10		
PVI-3TE-10.6-0.5x0.5-TO66-wZnSeAR-36										20	50	
PVI-4TE-10.6-0.5x0.5-TO8-wZnSeAR-36									1.0			
PVI-4TE-10.6-0.5x0.5-TO66-wZnSeAR-36	3.0	$8.0 \pm 1.0$	10.6	12.0	$4.0 \times 10^9$	$2.0 \times 10^9$	1.0	0.5		25		
PVI-4TE-10.6-1x1-TO8-wZnSeAR-36												
PVI-4TE-10.6-1x1-TO66-wZnSeAR-36									0.7		5	20

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

- ..... PVI-3TE-10.6-0.5x0.5-TO8/TO66-wZnSeAR-36
- ..... PVI-4TE-10.6-0.5x0.5-TO8/TO66-wZnSeAR-36
- PVI-4TE-10.6-1x1-TO8/TO66-wZnSeAR-36

- ..... PVI-3TE-10.6-0.5x0.5-TO8/TO66-wZnSeAR-36
- ..... PVI-4TE-10.6-0.5x0.5-TO8/TO66-wZnSeAR-36
- PVI-4TE-10.6-1x1-TO8/TO66-wZnSeAR-36



## MECHANICAL LAYOUT AND PINOUT

- 3TE-TO8 package  
– Technical drawing (p. 207)
- 3TE-TO66 package  
– Technical drawing (p. 208)
- 4TE-TO8 package  
– Technical drawing (p. 210)
- 4TE-TO66 package  
– Technical drawing (p. 212)

## RECOMMENDED AMPLIFIERS

Detector symbol	Amplifier type
PVI-3TE-10.6-0.5×0.5-TO8-wZnSeAR-36	AIP series (p. 126) PIP series (p. 129) MIP series (p. 132) SIP-TO8 series <sup>1</sup> (p. 135) FIP series <sup>1</sup> (p. 141)
PVI-4TE-10.6-0.5×0.5-TO8-wZnSeAR-36	
PVI-4TE-10.6-1×1-TO8-wZnSeAR-36	

<sup>1</sup> 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	$\leq 300$	$^{\circ}\text{C}$
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, $V_{b,max}$		-800	mV
Maximum TEC voltage, $V_{TEC,max}$	3TE	3.6	V
	4TE	8.3	
Maximum TEC current, $I_{TEC,max}$	3TE	0.45	A
	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.