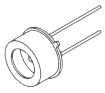
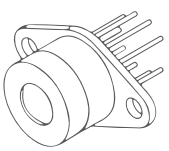
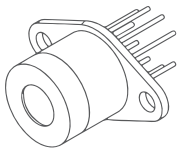
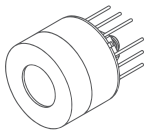
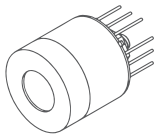
PVI-3 SERIES


TO39


2TE-TO66


4TE-TO66


2TE-TO8


4TE-TO8

HgCdTe room temperature and thermoelectrically cooled photovoltaic optically immersed infrared detectors

FEATURES

- Spectral range: 2.2 to 3.35 µm
- Back-side illuminated
- Unique immersion lens technology applied
- No minimum order quantity required

APPLICATIONS

- Gas detection, monitoring and analysis: H_2O, HF, CH_4, C_2H_2, C_2H_4, C_2H_6, NH_3
- Combustion process control
- Green energy
- Medical laser control

RELATED PRODUCTS

- **PVA-3-1×1-TO39-NW-90** RoHS-compliant detector (p. 12)
- **PVA-3-d1.2-SMD** RoHS-compliant detector series (p. 14)

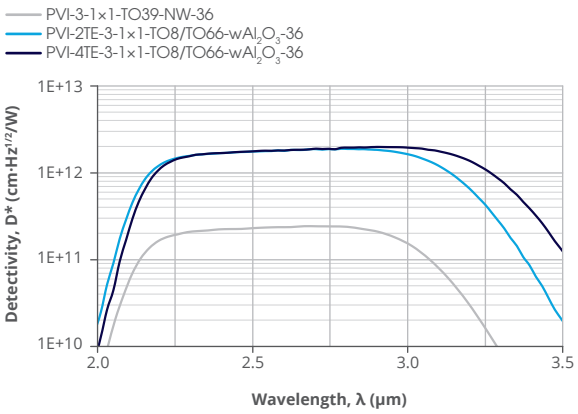
SERIES DESCRIPTION

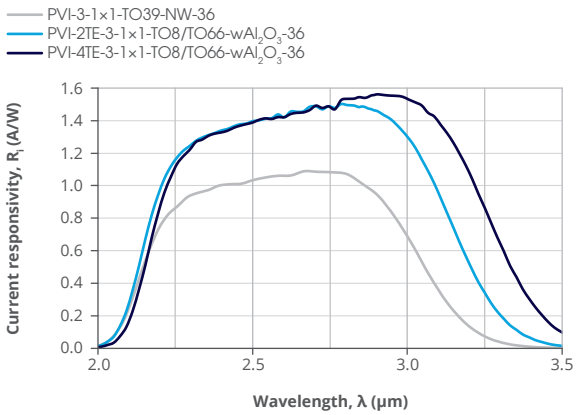
Detector symbol	Cooling (p. 191)	Temperature sensor (p. 192)	Optical area, A_o, mm×mm	Optical immersion (p. 188)	Package	Acceptance angle, Φ, deg.	Window (p. 193)
PVI-3-1×1-TO39-NW-36	no	n/a	1×1	hyperhemi-sphere	TO39 (3 pins)	~36	no
PVI-2TE-3-1×1-TO8-wAl$_2$O$_3$-36	2TE T_{chip}≅230K	thermistor			TO8		wAl_2O_3 (3 deg. wedged sapphire)
PVI-2TE-3-1×1-TO66-wAl$_2$O$_3$-36					TO66		
PVI-4TE-3-1×1-TO8-wAl$_2$O$_3$-36	4TE T_{chip}≅198K				TO8		
PVI-4TE-3-1×1-TO66-wAl$_2$O$_3$-36					TO66		

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

Detector symbol	Cut-on wavelength (10%)	Peak wavelength	Specific wavelength	Cut-off wavelength (10%)	Detectivity			Current responsivity			Time constant	Dynamic resistance	
	λ_{cut-on}	λ_{peak}	λ_{spec}	$\lambda_{cut-off}$	D*(λ_{peak}, 20kHz)	D*(λ_{spec}, 20kHz)		$R_i(\lambda_{peak})$	$R_i(\lambda_{spec})$		τ	R_d	
	µm	µm	µm	µm	cm·Hz$^{1/2}$/W	cm·Hz$^{1/2}$/W		A/W	A/W		ns	Ω	
	Typ.	Typ.	Typ.	Typ.	Typ.	Min.	Typ.	Typ.	Min.	Typ.	Typ.	Min.	Typ.
PVI-3-1×1-TO39-NW-36	2.2	2.7±0.2	3.0	3.15	2.0×10^{11}	8.0×10^{10}	1.5×10^{11}	1.4	0.5	0.8	350	10 000	50 000
PVI-2TE-3-1×1-TO8-wAl$_2$O$_3$-36		2.8±0.2		3.25	1.5×10^{12}	5.5×10^{11}	1.0×10^{12}				280	1 500 000	5 000 000
PVI-2TE-3-1×1-TO66-wAl$_2$O$_3$-36													
PVI-4TE-3-1×1-TO8-wAl$_2$O$_3$-36				3.35	2.0×10^{12}	8.0×10^{11}	1.2×10^{12}					3 000 000	6 000 000
PVI-4TE-3-1×1-TO66-wAl$_2$O$_3$-36													

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





MECHANICAL LAYOUT AND PINOUT

- TO39 (3 pins) package (without the window)
  – Technical drawing (p. 198)
- 2TE-TO8 package
  – Technical drawing (p. 204)
- 2TE-TO66 package
  – Technical drawing (p. 206)
- 4TE-TO8 package
  – Technical drawing (p. 210)
- 4TE-TO66 package
  – Technical drawing (p. 212)

RECOMMENDED AMPLIFIERS

Detector symbol	Amplifier type
PVI-3-1×1-TO39-NW-36	SIP-TO39 series (p. 138)
PVI-2TE-3-1×1-TO8-wAl$_2$O$_3$-36	AIP series (p. 126), PIP series (p. 129), MIP series (p. 132), SIP-TO8 series (p. 135), FIP series*) (p. 141)
PVI-4TE-3-1×1-TO8-wAl$_2$O$_3$-36	

*) Only for biased detectors

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	-20 to 30	°C
Storage temperature, T_{stg}		-20 to 50	°C
Soldering temperature	Within 5 s or less	≤300	°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, $V_{b\,max}$		-800	mV
Maximum TEC voltage, $V_{TEC\,max}$	2TE	1.3	V
	4TE	8.3	
Maximum TEC current, $I_{TEC\,max}$	2TE	1.2	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.