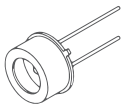
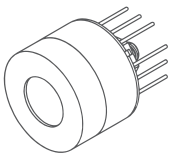
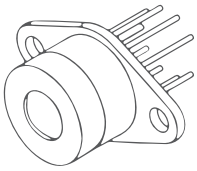
PV-4 SERIES

HgCdTe room temperature and thermoelectrically cooled photovoltaic infrared detectors


TO39


2TE-TO8


2TE-TO66

FEATURES

- Spectral range: 2.3 to 4.4 µm
- Back-side illuminated
- No minimum order quantity required

RELATED PRODUCT

- **LabM-I-4** detection module (p. 98)

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)

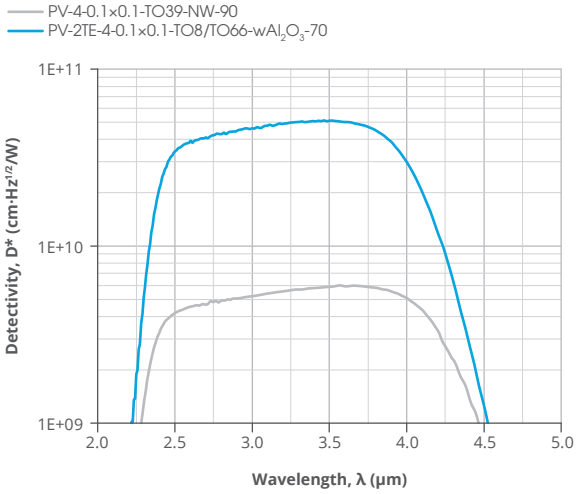
SERIES DESCRIPTION

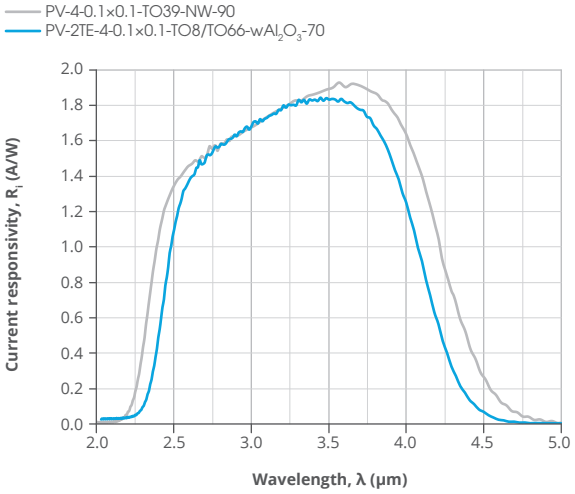
Detector symbol	Cooling (p. 191)	Temperature sensor (p. 192)	Active area, A, mm×mm	Optical immersion	Package	Acceptance angle, Φ, deg.	Window (p. 193)
PV-4-0.1×0.1-TO39-NW-90	no	n/a	0.1×0.1	no	TO39 (3 pins)	~90	no
PV-2TE-4-0.1×0.1-TO8-wAl_2O_3-70	2TE T_{chip}≅230K	thermistor			TO8	~70	wAl_2O_3 (3 deg. wedged sapphire)
PV-2TE-4-0.1×0.1-TO66-wAl_2O_3-70					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	
	$\lambda_{cut\text{-}on}$	λ_{peak}	λ_{spec}	$\lambda_{cut\text{-}off}$	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.
PV-4-0.1×0.1-TO39-NW-90	2.3	3.5±0.1	4.0	4.3	6.0×10^9	3.0×10^9	4.0×10^9	1.95	1.0	1.3	150	800	2 000
PV-2TE-4-0.1×0.1-TO8-wAl_2O_3-70				4.4	5.0×10^{10}	2.0×10^{10}	3.0×10^{10}				100	30 000	100 000
PV-2TE-4-0.1×0.1-TO66-wAl_2O_3-70													

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





MECHANICAL LAYOUT AND PINOUT

- TO39 (3 pins) package (without window) – Technical drawing (p. 197)
- 2TE-TO8 package – Technical drawing (p. 203)
- 2TE-TO66 package – Technical drawing (p. 205)

RECOMMENDED AMPLIFIERS

Detector symbol	Amplifier type
PV-4-0.1×0.1-TO39-NW-90	SIP-TO39 series (p. 138)
PV-2TE-4-0.1×0.1-TO8-wAl$_2$O$_3$-70	AIP series (p. 126), PIP series (p. 129), MIP series (p. 132), SIP-TO8 series (p. 135), FIP series*) (p. 141)

*) 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	100	W/cm^2
	Single pulses <1 μs duration	1	MW/cm^2
Maximum bias voltage, $V_{b\,max}$		-800	mV
Maximum TEC voltage, $V_{TEC\,max}$	2TE	1.3	V
Maximum TEC current, $I_{TEC\,max}$	2TE	1.2	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.