

PV-2TE-5-0.33x0.33AR-TO8-wAl₂O₃AR-70

PRELIMINARY DATASHEET

HgCdTe thermoelectrically cooled photovoltaic infrared detector

FEATURES

- Suited for operation with tunable lasers (QCL, ICL)
- Spectral range: 3.0 to 5.7 μm
- Excellent linearity
- Back-side illuminated
- Anti-reflection coating on the active element
- No minimum order quantity required

APPLICATIONS

- Gas detection, monitoring and analysis: CH₄, C₂H₂, CH₂O, HCl, NH₃, SO₂, C₂H₆, CO, CO₂, N₂O, NO_x
- Laser-based gas sensing: TDLAS, CRDS, CEAS
- Tunable laser control
- Threat warning systems
- Dentistry
- Breath analysis: C₂H₆, CH₂O, NH₃, NO, OCS
- Gas leak detection
- Combustion process control

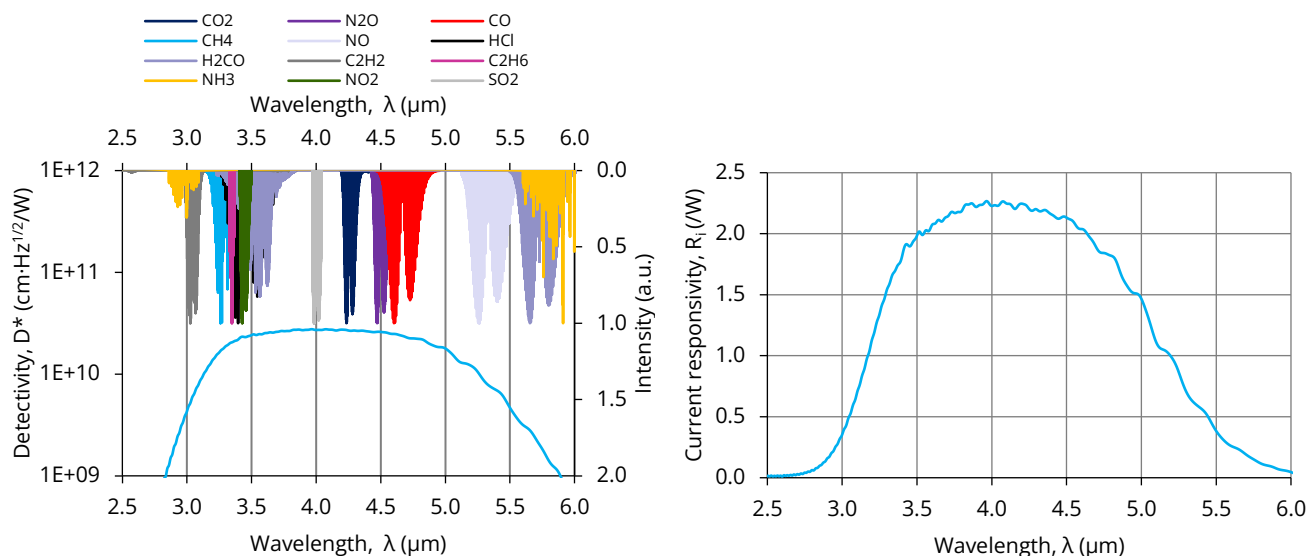
DETECTOR DESCRIPTION

Detector symbol	Cooling	Temperature sensor	Active area, A, mm×mm	Optical immersion	Package	Acceptance angle, Φ , deg.	Window
PV-2TE-5-0.33x0.33AR-TO8-wAl ₂ O ₃ AR-70	2TE $T_{\text{chip}} \approx 230 \text{ K}$	thermistor	0.33×0.33	no	2TE-TO8	~70	wAl ₂ O ₃ AR (3 deg. wedged sapphire, anti-reflection coating)

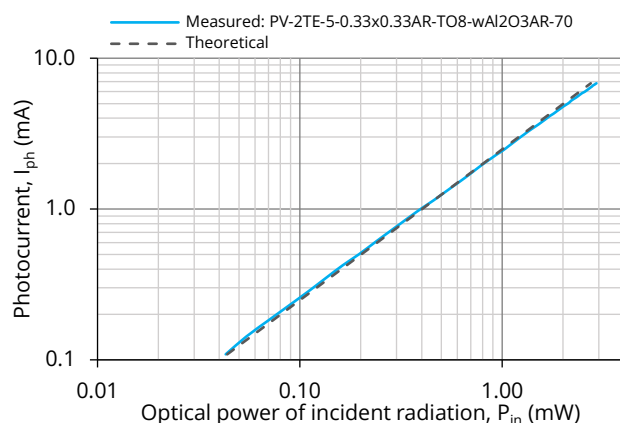
SPECIFICATION ($T_{\text{amb}} = 293 \text{ K}$, $T_{\text{chip}} = 230 \text{ K}$, $V_b = 0 \text{ V}$)

Detector symbol	Cut-on wavelength (10%)	Peak wavelength	Specific wavelength	Cut-off wavelength (10%)	Detectivity		Current responsivity		Time constant	Dynamic resistance	Power at 5% deviation from linearity
	$\lambda_{\text{cut-on}}$	λ_{peak}	λ_{spec}	$\lambda_{\text{cut-off}}$	$D^*(\lambda_{\text{peak}}, 20\text{kHz})$	$D^*(\lambda_{\text{spec}}, 20\text{kHz})$	$R_i(\lambda_{\text{peak}})$	$R_i(\lambda_{\text{spec}})$	τ	R_d	$P_{\text{dev}=5\%}$ (4.55 μm)
	μm	μm	μm	μm	$\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	$\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	A/W	A/W	ns	k Ω	mW
	Typ.	Typ.	Typ.	Typ.	Typ.	Typ.	Typ.	Typ.	Typ.	Typ.	Typ.
PV-2TE-5-0.33x0.33AR-TO8-wAl ₂ O ₃ AR-70	3.0	4.0	5.0	5.7	2.7×10^{10}	1.4×10^{10}	2.0	1.0	50	2.0	3.0

SPECTRAL RESPONSE (Typ., $T_{\text{amb}} = 293 \text{ K}$, $T_{\text{chip}} = 230 \text{ K}$)



LINEARITY (Typ., $T_{\text{amb}} = 293 \text{ K}$, $T_{\text{chip}} = 230 \text{ K}$, $\lambda = 4.55 \mu\text{m}$)



MECHANICAL LAYOUT AND PINOUT

- [2TE-TO8\(12p\)-wW, PV-AR detector technical drawing](#)

RECOMMENDED AMPLIFIERS

Detector symbol	Amplifier type
PV-2TE-5-0.33x0.33AR-TO8-wAl ₂ O ₃ AR-70	AIP series
	PIP series
	MIP series
	SIP-TO8 series

ABSOLUTE MAXIMUM RATINGS

Parameter	Test conditions, remarks	Value	Unit
Ambient operating temperature, T_{amb}	Operation at $T_{\text{amb}} > 30^\circ\text{C}$ may increase the active element temperature and reduce the performance of the detector below the 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	100	W/cm^2
	Single pulses $< 1 \mu\text{s}$ duration	1	MW/cm^2
Maximum bias voltage, $V_{\text{b max}}$		-800	mV
Maximum TEC voltage, $V_{\text{TEC max}}$	2TE	1.0	V
Maximum TEC current, $I_{\text{TEC max}}$	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.