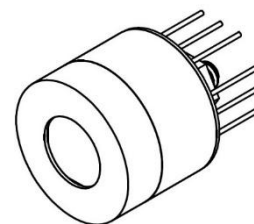


# PVA-3TE-5-AF1x1AR-TO8-wAl<sub>2</sub>O<sub>3</sub>AR-70

**PRELIMINARY  
DATASHEET**

**InAsSb three-stage thermoelectrically-cooled photovoltaic infrared detector with anti-fringing technology applied**



## FEATURES

- Suited for operation with tunable lasers (QCL, ICL)
- Significant reduction of interference effects within the 1.4 - 4.0  $\mu\text{m}$  spectral range
- Unique anti-fringing technology applied (with customization options to match individual system requirements)
- RoHS-compliant III-V material
- Back-side illuminated
- Large active area
- Anti-reflection coating on the active element
- Custom-designed wedged cap

## APPLICATIONS

- Gas detection, monitoring and analysis: CO, HF, NH<sub>3</sub>, C<sub>2</sub>H<sub>2</sub>, CH<sub>4</sub>, C<sub>2</sub>H<sub>6</sub>, HCl, H<sub>2</sub>CO, SO<sub>2</sub>, CO<sub>2</sub>, N<sub>2</sub>O, NO<sub>x</sub>
- Laser-based gas sensing: TDLAS, CRDS, CEAS
- Tunable laser control

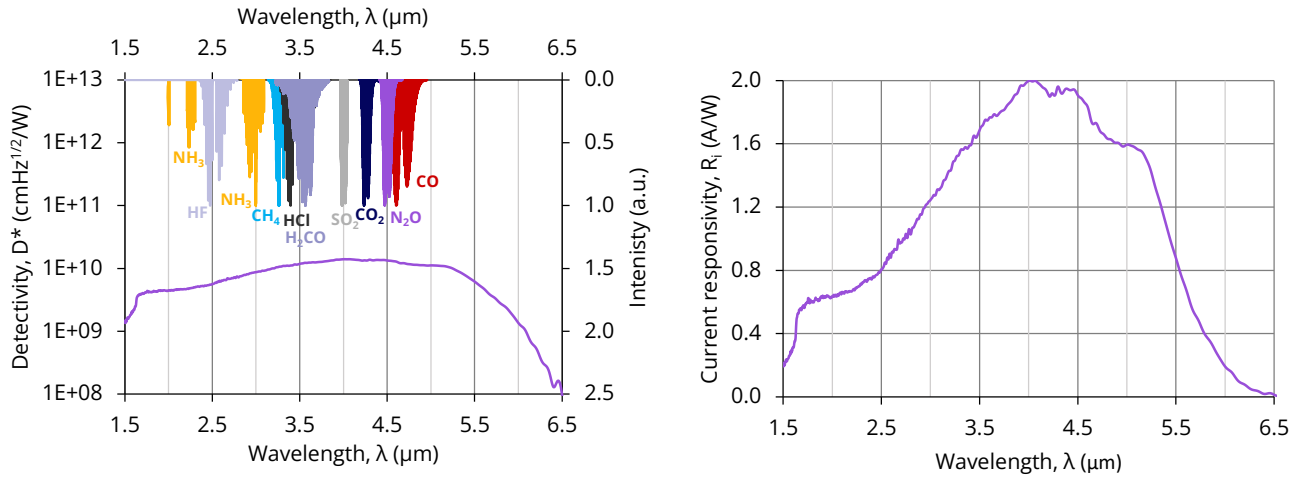
## DETECTOR CONFIGURATION

Detector symbol	Cooling	Temperature sensor	Active area, A, mm×mm	Optical immersion	Package	Acceptance angle, $\Phi$ , deg.	Window
PVA-3TE-5-AF1x1AR-TO8-wAl <sub>2</sub> O <sub>3</sub> AR-70	3TE ( $T_{\text{chip}} \cong 210\text{K}$ )	thermistor	1×1	no	3TE-TO8 (2 deg. wedged cap)	~70	wAl <sub>2</sub> O <sub>3</sub> AR (3 deg. wedged sapphire, anti-reflection coating)

## SPECIFICATION ( $T_{\text{amb}} = 293\text{ K}$ , $T_{\text{chip}} = 210\text{ K}$ , $V_b = 0\text{ V}$ )

Detector symbol	Cut-on wavelength (10%)	Peak wavelength	Cut-off wavelength (10%)	Detectivity	Current responsivity	Time constant	Dynamic resistance
	$\lambda_{\text{cut-on}}$	$\lambda_{\text{peak}}$	$\lambda_{\text{cut-off}}$	$D^*(\lambda_{\text{peak}}, 20\text{kHz})$	$R_i(\lambda_{\text{peak}})$	$\tau$	$R_d$
	$\mu\text{m}$	$\mu\text{m}$	$\mu\text{m}$	$\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	A/W	ns	$\Omega$
PVA-3TE-5-AF1x1AR-TO8-wAl <sub>2</sub> O <sub>3</sub> AR-70	Typ. 1.64	Typ. 4.0	Typ. 5.8	Typ. $1.4 \times 10^{10}$	Typ. 2.0	Typ. 124	Typ. 70

## SPECTRAL RESPONSE (Typ., T<sub>amb</sub> = 293 K, T<sub>chip</sub> = 210 K)



## MECHANICAL LAYOUT AND PINOUT

- [3TE-wTO8\(12p\)-wW, PV-AF detector technical drawing](#)

## RECOMMENDED AMPLIFIER

Detector symbol	Amplifier type
PVA-3TE-5-AF1x1AR-TO8- wAl <sub>2</sub> O <sub>3</sub> AR-70	<a href="#">AIP series</a>
	<a href="#">PIP series</a>
	<a href="#">MIP series</a>
	<a href="#">SIP-TO8 series</a>

## ABSOLUTE MAXIMUM RATINGS

Parameter	Test conditions, remarks	Value	Unit
Ambient operating temperature, T <sub>amb</sub>	Operation at T <sub>amb</sub> >30°C may increase the active element temperature and reduce the performance of the detector below specified parameters	-40 to 70	°C
Storage temperature, T <sub>stg</sub>		-40 to 85	°C
Soldering temperature	Within 5 s or less	≤370	°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 <sup>2</sup>
	Single pulses <1 μs duration	1	MW/cm <sup>2</sup>
Maximum bias voltage, V <sub>b max</sub>	No bias voltage needed	-	-
Maximum TEC voltage, V <sub>TEC max</sub>	3TE	3.6	V
Maximum TEC current, I <sub>TEC max</sub>	3TE	0.45	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.