

# PVA-3-1×1-TO39-NW-90 PRELIMINARY DATASHEET

## InAs room temperature photovoltaic infrared detector



### FEATURES

- Spectral range: 2.3 to 3.5  $\mu\text{m}$
- III-V material compliant with the RoHS Directive
- High ambient operating and storage temperature
- Back-side illuminated
- No minimum order quantity required

### APPLICATIONS

Gas detection ( $\text{CO}$ ,  $\text{CO}_2$ ,  $\text{HF}$ ,  $\text{NH}_3$ ,  $\text{C}_2\text{H}_2$ ,  $\text{CH}_4$ ,  $\text{C}_2\text{H}_6$ ,  $\text{HCl}$ ,  $\text{NO}_x$ )

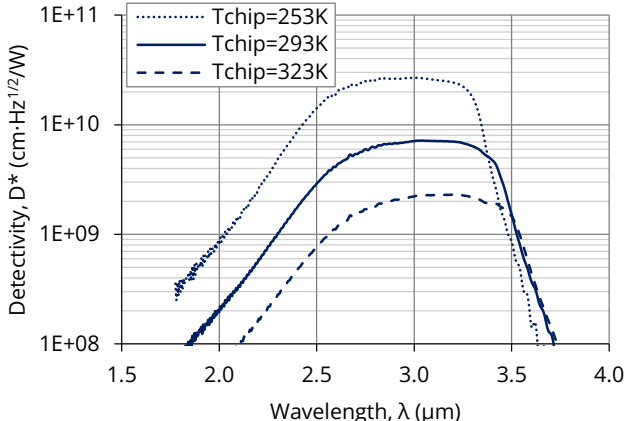
### DETECTOR CONFIGURATION

Detector symbol	PVA-3-1×1-TO39-NW-90
Detector type	photovoltaic
Active element material	epitaxial InAs heterostructure
Active area, A	1 mm × 1 mm
Immersion	no
Cooling	no
Detector package	TO39
Acceptance angle, $\Phi$	~90 deg.
Window	no

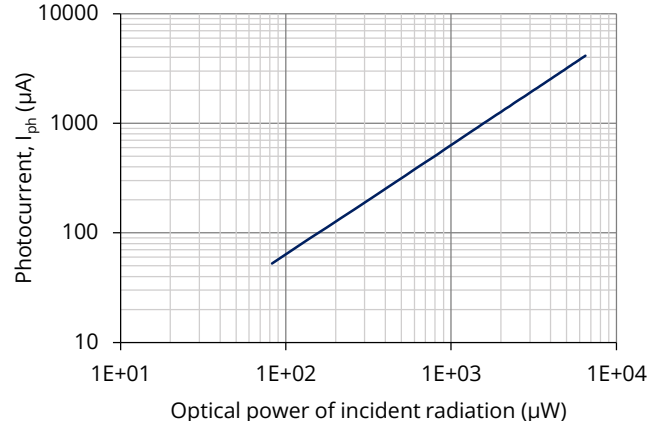
### SPECIFICATION ( $T_{\text{chip}} = 293 \text{ K}$ , $V_b = 0 \text{ V}$ , unless otherwise noted)

Parameter	Test conditions/remarks	Value			Unit
		Min.	Typ.	Max.	
Active element temperature, $T_{\text{chip}}$	$T_{\text{amb}}$	-	293	-	K
Cut-on wavelength, $\lambda_{\text{cut-on}}$ (10%)	At 10% of peak responsivity	-	2.3	-	$\mu\text{m}$
Peak wavelength, $\lambda_{\text{peak}}$		-	3.1	-	$\mu\text{m}$
Cut-off wavelength, $\lambda_{\text{cut-off}}$ (10%)	At 10% of peak responsivity	-	3.5	-	$\mu\text{m}$
Detectivity, $D^*$	At $\lambda_{\text{peak}}$ , $f = 20 \text{ kHz}$	$5.0 \times 10^9$	$7.0 \times 10^9$	-	$\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$
Current responsivity, $R_i$	At $\lambda_{\text{peak}}$	0.7	0.9	-	A/W
Time constant, $\tau$		-	35	40	ns
Resistance, R		55	75	-	$\Omega$

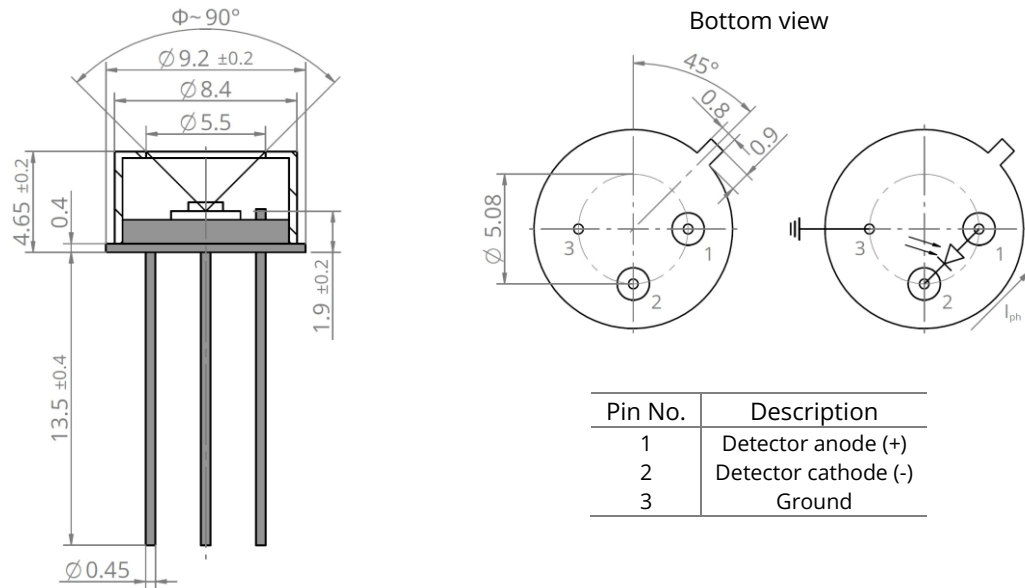
### SPECTRAL RESPONSE (Typ.)



### LINEARITY (Typ., $T_{\text{chip}} = 293 \text{ K}$ , $\lambda = 3.06 \mu\text{m}$ )



### MECHANICAL LAYOUT AND PINOUT (Unit: mm)



Pin No.	Description
1	Detector anode (+)
2	Detector cathode (-)
3	Ground

$\Phi$  – acceptance angle

### ABSOLUTE MAXIMUM RATINGS

Parameter	Test conditions/remarks	Value	Unit
Maximum incident optical power density	Continuous wave (CW) or single pulses >1 $\mu$ s duration	100	W/cm <sup>2</sup>
	Single pulses <1 $\mu$ s duration	1	MW/cm <sup>2</sup>
Maximum bias voltage $V_{b \max}$		-1	V
Soldering temperature	Within 5 s or less	$\leq 370$	$^{\circ}$ C
Ambient operating temperature $T_{amb}$	Detector parameters depend on $T_{amb}$	-20 to 70	$^{\circ}$ C
Storage temperature $T_{stg}$		-20 to 85	$^{\circ}$ C
Storage humidity	No dew condensation	10 to 90	%

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.

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