

# PCI-3TE-12-1×1-TO8-wZnSeAR-36

## DATASHEET

### HgCdTe three-stage TE cooled optically immersed photoconductive infrared detector



#### FEATURES

- Spectral range: 2.0 to 13.8  $\mu\text{m}$
- Immersion microlens technology applied
- Long-term stability and reliability
- Quantity discounted price
- Fast delivery
- No minimum order quantity required

#### APPLICATIONS

- FTIR spectroscopy

#### DETECTOR CONFIGURATION

Detector symbol	PCI-3TE-12-1×1-TO8-wZnSeAR-36
Detector type	photoconductive
Active element material	epitaxial HgCdTe heterostructure
Optical area, $A_o$	1 mm × 1 mm
Immersion	hyperhemisphere
Cooling	3TE
Temperature sensor	<a href="#">thermistor</a>
Detector package	TO8
Acceptance angle, $\Phi$	~36 deg.
Window	wZnSeAR (3 deg. wedged zinc selenide, anti-reflection coating)

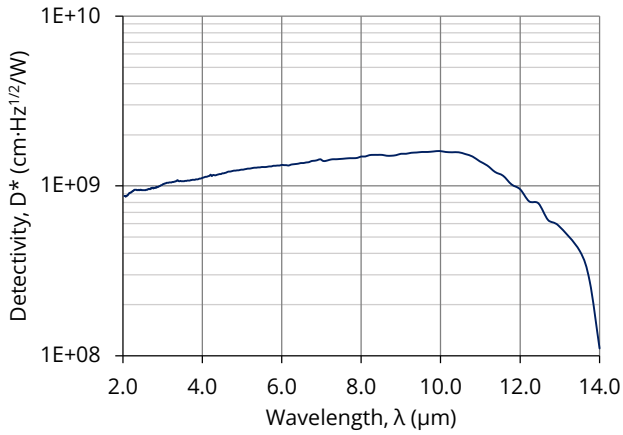
#### RELATED PRODUCT

[SM-I-12](#) detection module

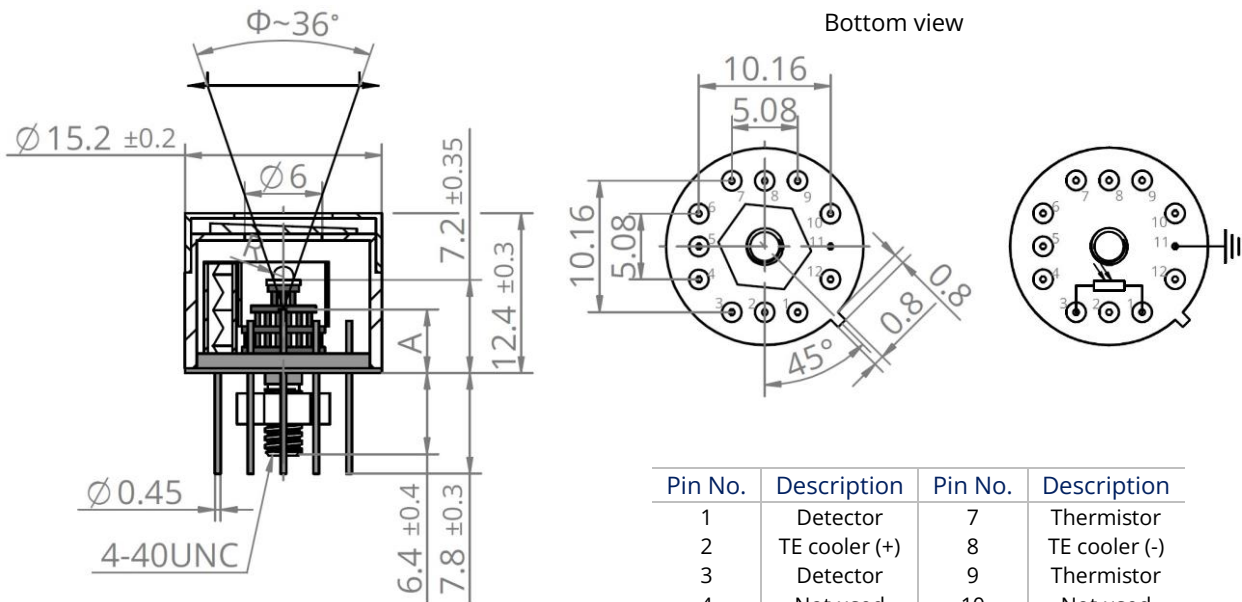
#### SPECIFICATION ( $T_{amb} = 293 \text{ K}$ , $T_{chip} = 210 \text{ K}$ , $V_b = 1.8 \text{ V}$ , unless otherwise noted)

Parameter	Test conditions/remarks	Value			Unit
		Min.	Typ.	Max.	
Active element temperature, $T_{chip}$		-	210	-	K
Cut-on wavelength, $\lambda_{cut-on}$ (10%)	At 10% of peak responsivity	-	-	2.0	$\mu\text{m}$
Peak wavelength, $\lambda_{peak}$		9.2	10.0	10.2	$\mu\text{m}$
Optimum wavelength, $\lambda_{opt}$		-	12.0	-	$\mu\text{m}$
Cut-off wavelength, $\lambda_{cut-off}$ (10%)	At 10% of peak responsivity	13.8	-	-	$\mu\text{m}$
Detectivity, $D^*$	At $\lambda_{peak}$ , $f = 20 \text{ kHz}$	$1.6 \times 10^9$	-	-	$\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$
	At $\lambda_{opt}$ , $f = 20 \text{ kHz}$	$9.0 \times 10^8$	-	-	$\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$
Current responsivity, $R_i$	At $\lambda_{peak}$	0.11	-	-	A/W
	At $\lambda_{opt}$	0.07	-	-	A/W
Time constant, $\tau$		-	-	5	ns
Resistance, $R$		-	-	300	$\Omega$
Bias voltage, $V_b$		-	-	1.8	V
1/f noise corner frequency, $f_c$		-	-	20	kHz

SPECTRAL RESPONSE (Typ.,  $T_{amb} = 293\text{ K}$ ,  $T_{chip} = 210\text{ K}$ )



MECHANICAL LAYOUT AND PINOUT (Unit: mm)



Pin No.	Description	Pin No.	Description
1	Detector	7	Thermistor
2	TE cooler (+)	8	TE cooler (-)
3	Detector	9	Thermistor
4	Not used	10	Not used
5	Not used	11	Ground
6	Not used	12	Not used

Φ – acceptance angle

R = 0.8 mm (hyperhemisphere microlens radius)

A = 4.8 mm ± 0.35 mm (distance from the bottom of the 3TE-TO8 header to the focal plane)

## ABSOLUTE MAXIMUM RATINGS

Parameter	Test conditions/remarks	Value	Unit
Maximum incident optical power density	Continuous wave (CW) or single pulses $\geq 1 \mu\text{s}$ duration	2.5	W/cm <sup>2</sup>
	Single pulses $< 1 \mu\text{s}$ duration	10	kW/cm <sup>2</sup>
Soldering temperature	Within 5 s or less	$\leq 370$	°C
Ambient operating temperature $T_{\text{amb}}$		-20 to 30	°C
Storage temperature $T_{\text{stg}}$	Operation at $T_{\text{amb}} > 30^\circ\text{C}$ may increase the active element temperature and reduce the performance of the detector below specified parameters	-20 to 50	°C
Storage humidity	No dew condensation	10 to 90	%
Maximum TE cooler current, $I_{\text{TEC max}}$		0.45	A
Maximum TE cooler voltage, $V_{\text{TEC max}}$		3.6	V

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.