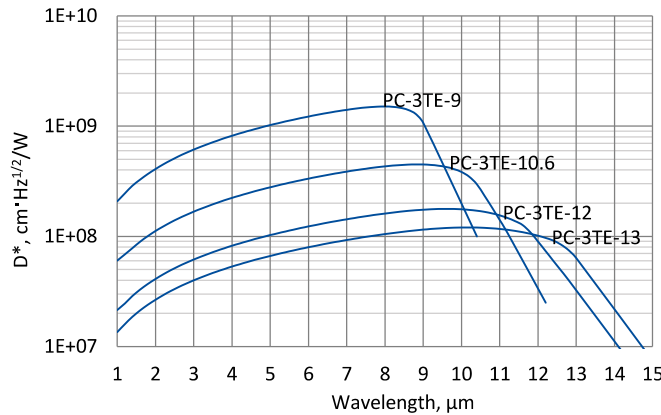


PC-3TE series

1 – 15 μm HgCdTe three-stage thermoelectrically cooled photoconductive detectors

PC-3TE series features three-stage thermoelectrically cooled IR photoconductive detectors based on sophisticated HgCdTe heterostructures for the best performance and stability. The devices are optimized for the maximum performance at λ_{opt} . The devices should operate in optimum bias voltage and current readout mode. Performance at low frequencies is reduced due to 1/f noise. The 1/f noise corner frequency increases with the cut-off wavelength. 3° wedged zinc selenide anti-reflection coated (wZnSeAR) window prevents unwanted interference effects.

Spectral response ($T_a = 20^\circ\text{C}$)



Exemplary spectral detectivity, the spectral response of delivered devices may differ.

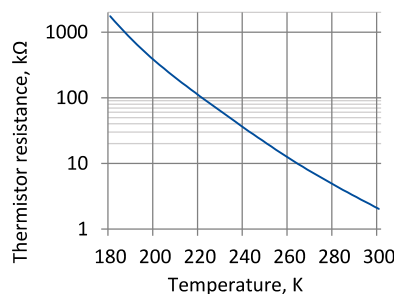
Specification ($T_a = 20^\circ\text{C}$)

Parameter	Detector type			
	PC-3TE-9	PC-3TE-10.6	PC-3TE-12	PC-3TE-13
Active element material	epitaxial HgCdTe heterostructure			
Optimal wavelength λ_{opt} , μm	9.0	10.6	12.0	13.0
Detectivity $D^*(\lambda_{opt}, 20\text{kHz})$, $\text{cm}^2\cdot\text{Hz}^{1/2}/\text{W}$	$\geq 1.0 \times 10^9$	$\geq 2.5 \times 10^8$	$\geq 9.0 \times 10^7$	$\geq 6.0 \times 10^7$
Detectivity $D^*(\lambda_{peak}, 20\text{kHz})$, $\text{cm}^2\cdot\text{Hz}^{1/2}/\text{W}$	$\geq 1.5 \times 10^9$	$\geq 4.5 \times 10^8$	$\geq 1.8 \times 10^8$	$\geq 1.2 \times 10^8$
Current responsivity-active area length product $R_i(\lambda_{opt}) \cdot L$, $\text{A} \cdot \text{mm}/\text{W}$	≥ 0.075	≥ 0.02	≥ 0.01	≥ 0.007
Time constant τ , ns	≤ 60	≤ 20	≤ 5	≤ 4
1/f noise corner frequency f_c , Hz	$\leq 10\text{k}$		$\leq 20\text{k}$	
Bias voltage-active area length ratio V_b/L , V/mm	≤ 2.0		≤ 1.5	
Resistance R, Ω	≤ 400		≤ 300	
Active element temperature T_{det} , K	~ 210			
Active area A, mm \times mm	0.05 \times 0.05, 0.1 \times 0.1, 0.25 \times 0.25, 0.5 \times 0.5, 1 \times 1, 2 \times 2			
Package	TO8, TO66			
Acceptance angle Φ	$\sim 70^\circ$			
Window	wZnSeAR			

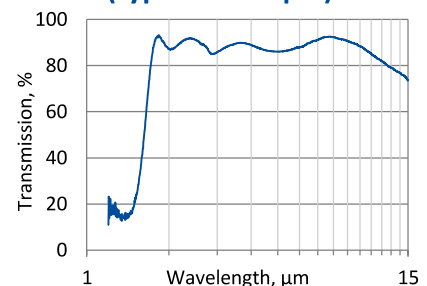
Three-stage thermoelectric cooler parameters

Parameter	Value
T_{det} , K	~ 210
V_{max} , V	3.6
I_{max} , A	0.45
Q_{max} , W	0.27

Thermistor characteristics

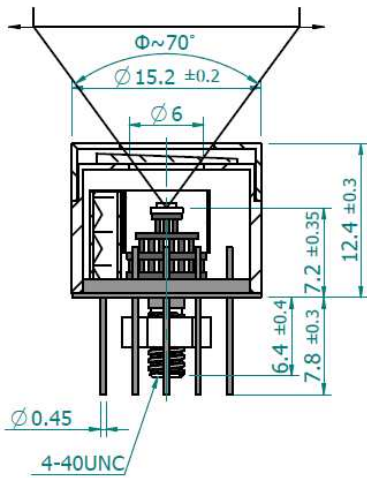


Spectral transmission of wZnSeAR window (typical example)



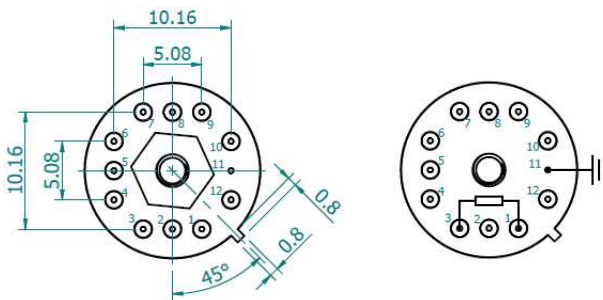
Mechanical layout, mm

3TE-TO8 package



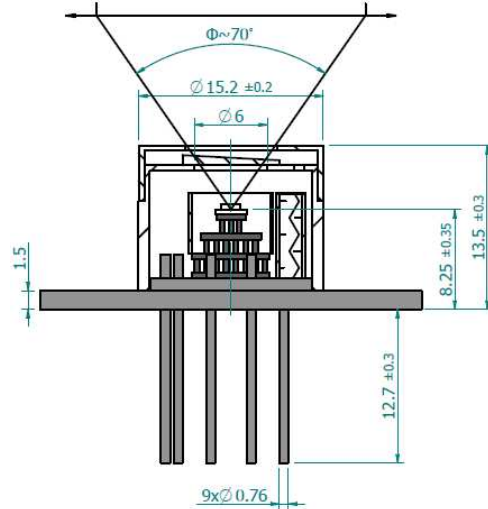
Φ – acceptance angle

Bottom view



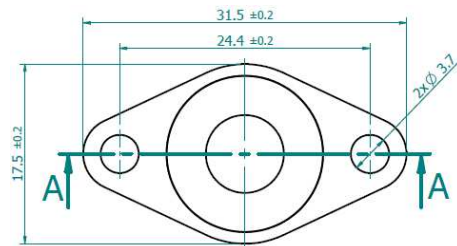
Function	Pin number
Detector	1, 3
Thermistor	7, 9
TE cooler supply	2(+), 8(-)
Chassis ground	11
Not used	4, 5, 6, 10, 12

3TE-TO66 package

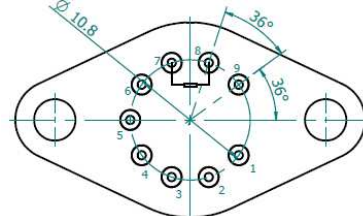


Φ – acceptance angle

Top view



Bottom view



Function	Pin number
Detector	7, 8
Thermistor	5, 6
TE cooler supply	1(+), 9(-)
Not used	2, 3, 4

Dedicated preamplifiers



„all-in-one“ AIP



programmable PIP



standard MIP



small SIP-TO8