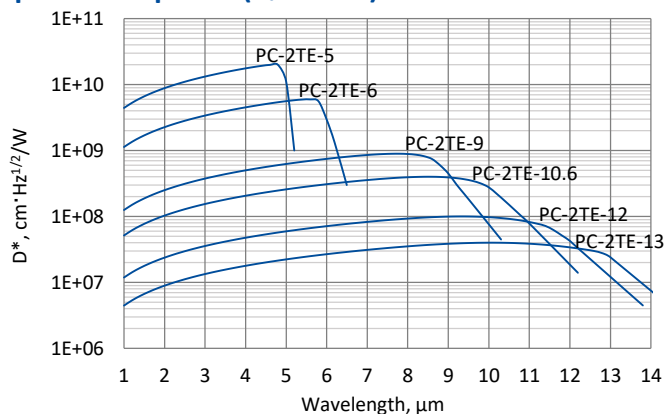


PC-2TE series

1.0 – 14.0 μm HgCdTe two-stage thermoelectrically cooled photoconductive detectors

PC-2TE series features two-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 sapphire (wAl₂O₃) or 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.

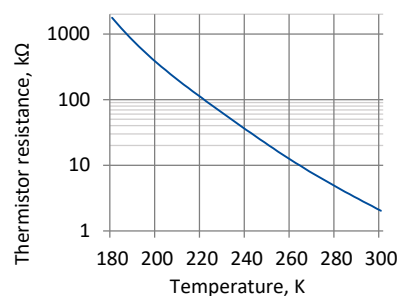
Specification ($T_a = 20^\circ\text{C}$)

Parameter	Detector type					
	PC-2TE-5	PC-2TE-6	PC-2TE-9	PC-2TE-10.6	PC-2TE-12	PC-2TE-13
Active element material	epitaxial HgCdTe heterostructure					
Optimal wavelength λ_{opt} , μm	5.0	6.0	9.0	10.6	12.0	13.0
Detectivity $D^*(\lambda_{peak}, 20\text{kHz})$, $\text{cm} \cdot \text{Hz}^{1/2} / \text{W}$	$\geq 2.0 \times 10^{10}$	$\geq 6.0 \times 10^9$	$\geq 9.0 \times 10^8$	$\geq 4.0 \times 10^8$	$\geq 1.0 \times 10^8$	$\geq 4.0 \times 10^7$
Detectivity $D^*(\lambda_{opt}, 20\text{kHz})$, $\text{cm} \cdot \text{Hz}^{1/2} / \text{W}$	$\geq 1.0 \times 10^{10}$	$\geq 3.0 \times 10^9$	$\geq 4.5 \times 10^8$	$\geq 1.4 \times 10^8$	$\geq 4.5 \times 10^7$	$\geq 2.3 \times 10^7$
Current responsivity-active area length product $R_i(\lambda_{opt}) \cdot L$, $\text{A} \cdot \text{mm} / \text{W}$	≥ 0.5	≥ 0.18	≥ 0.025	≥ 0.01	≥ 0.005	≥ 0.002
Time constant τ , ns	≤ 20000	≤ 4000	≤ 40	≤ 10	≤ 3	≤ 2
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	≤ 3.2	≤ 2.0	≤ 2.25	≤ 1.5	≤ 1.8
Resistance R , Ω	≤ 1200	≤ 800	≤ 400	≤ 300	≤ 200	≤ 150
Active element temperature T_{det} , K	~ 230					
Active area A , $\text{mm} \times \text{mm}$	0.05×0.05, 0.1×0.1, 0.25×0.25, 0.5×0.5, 1×1, 2×2					
Package	TO8, TO66					
Acceptance angle Φ	$\sim 70^\circ$					
Window	wAl ₂ O ₃	wZnSeAR				

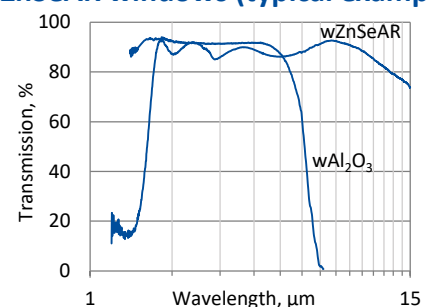
Two-stage thermoelectric cooler parameters

Parameter	Value
T_{det} , K	~ 230
V_{max} , V	1.3
I_{max} , A	1.2
Q_{max} , W	0.36

Thermistor characteristics

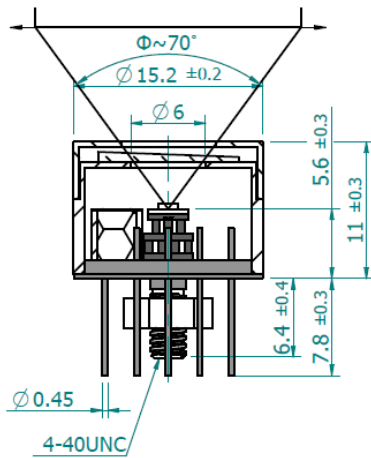


Spectral transmission of wAl₂O₃ and wZnSeAR windows (typical example)



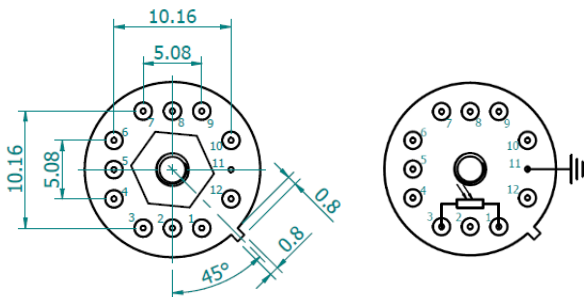
Mechanical layout, mm

2TE-T08 package



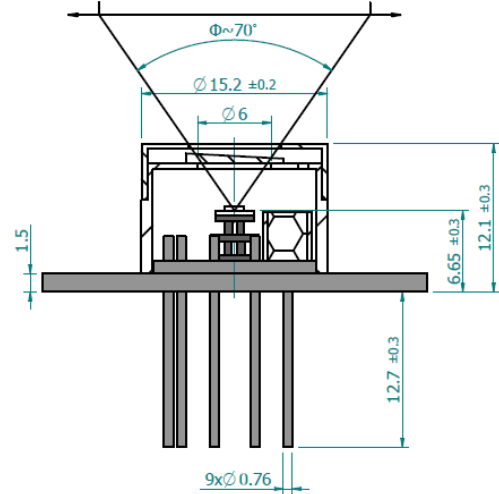
Φ – acceptance angle

Bottom view



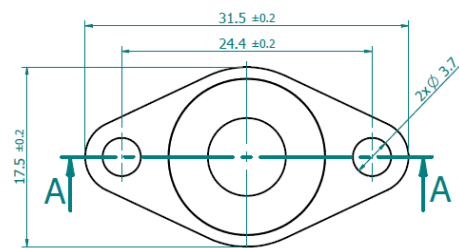
Function	Pin number
Detector	1, 3
Thermistor	7, 9
TE cooler supply	2(+), 8(-)
Chassis ground	11
Not used	4, 5, 6, 10, 12

2TE-T066 package

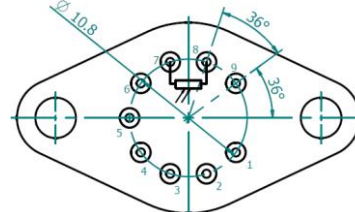


Φ – acceptance angle

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-T08