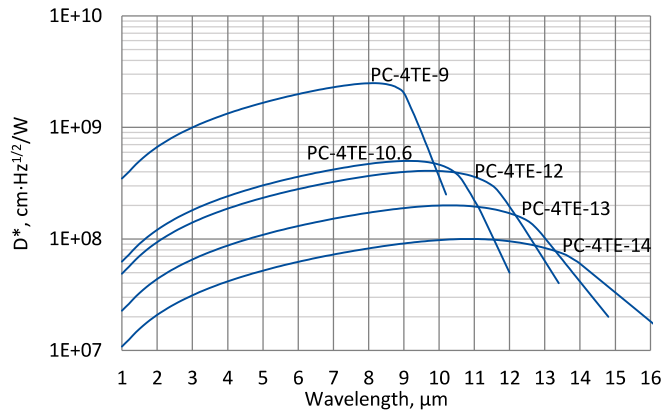


## PC-4TE series

### 1 – 16 μm HgCdTe four-stage thermoelectrically cooled photoconductive detectors

**PC-4TE series** features four-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  $\lambda_{opt}$ . 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.

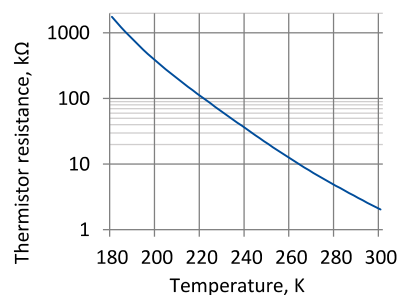
#### Specification ( $T_a = 20^\circ\text{C}$ )

Parameter	Detector type				
	PC-4TE-9	PC-4TE-10.6	PC-4TE-12	PC-4TE-13	PC-4TE-14
Active element material	epitaxial HgCdTe heterostructure				
Optimal wavelength $\lambda_{opt}$ , μm	9.0	10.6	12.0	13.0	14.0
Detectivity $D^*(\lambda_{peak}, 20\text{kHz})$ , $\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	$\geq 2.5 \times 10^9$	$\geq 5.0 \times 10^8$	$\geq 4.0 \times 10^8$	$\geq 2.0 \times 10^8$	$\geq 1.0 \times 10^8$
Detectivity $D^*(\lambda_{opt}, 20\text{kHz})$ , $\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	$\geq 2.0 \times 10^9$	$\geq 3.5 \times 10^8$	$\geq 2.0 \times 10^8$	$\geq 1.0 \times 10^8$	$\geq 6.0 \times 10^7$
Current responsivity-active area length product $R_i(\lambda_{opt}) \cdot L$ , $\text{A}\cdot\text{mm}/\text{W}$	$\geq 0.1$	$\geq 0.03$	$\geq 0.015$	$\geq 0.01$	$\geq 0.007$
Time constant $\tau$ , ns	$\leq 80$	$\leq 30$	$\leq 7$	$\leq 6$	$\leq 5$
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	$\leq 3.8$		$\leq 3.0$		$\leq 2.25$
Resistance $R$ , $\Omega$	$\leq 500$		$\leq 400$		$\leq 300$
Active element temperature $T_{det}$ , K	$\sim 195$				
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 $\Phi$	$\sim 70^\circ$				
Window	wZnSeAR				

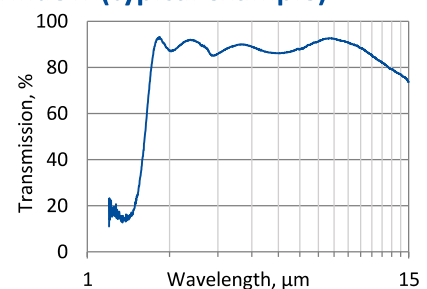
#### Four-stage thermoelectric cooler parameters

Parameter	Value
$T_{det}$ , K	$\sim 195$
$V_{max}$ , V	8.3
$I_{max}$ , A	0.4
$Q_{max}$ , W	0.28

#### Thermistor characteristics

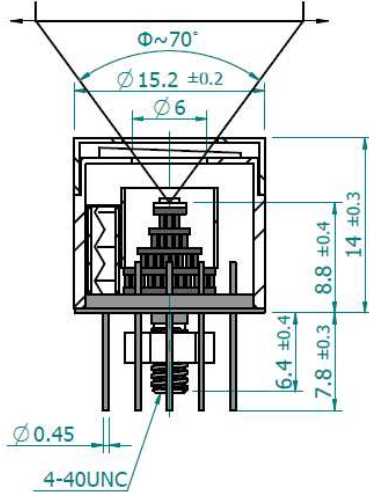


#### Spectral transmission of wZnSeAR window (typical example)



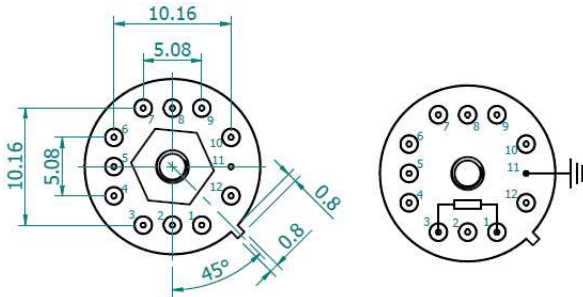
### Mechanical layout, mm

#### 4TE-TO8 package



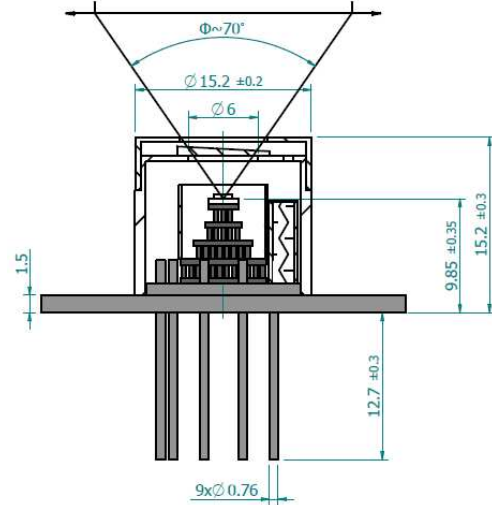
Φ – acceptance angle

Bottom view



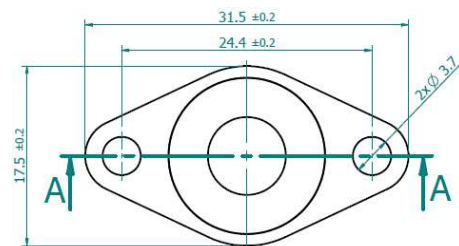
Function	Pin number
Detector	1, 3
Thermistor	7, 9
TE cooler supply	2(+), 8(-)
Chassis ground	11
Not used	4, 5, 6, 10, 12

#### 4TE-TO66 package

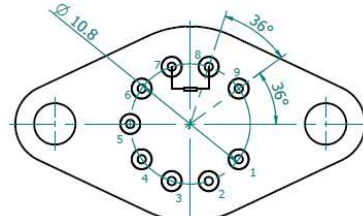


Φ – acceptance angle

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