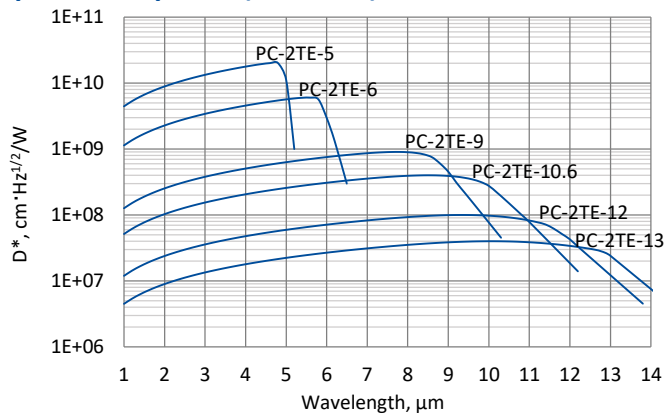


## PC-2TE series

### 1 – 14 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  $\lambda_{opt}$ . 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 sapphire (wAl<sub>2</sub>O<sub>3</sub>) or zinc selenide anti-reflection coated (wZnSeAR) window prevents unwanted interference effects.

#### Spectral response (T<sub>a</sub> = 20°C)



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

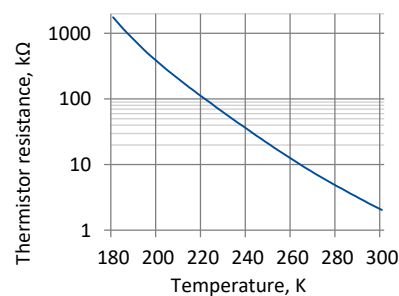
#### Specification (T<sub>a</sub> = 20°C)

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 $\lambda_{opt}$ , μm	5.0	6.0	9.0	10.6	12.0	13.0
Detectivity $D^*(\lambda_{opt}, 20\text{kHz})$ , cm·Hz <sup>1/2</sup> /W	$\geq 1.0 \times 10^{10}$	$\geq 3.0 \times 10^9$	$\geq 4.5 \times 10^8$	$\geq 1.4 \times 10^8$	$\geq 4.5 \times 10^7$	$\geq 2.3 \times 10^7$
Detectivity $D^*(\lambda_{peak}, 20\text{kHz})$ , cm·Hz <sup>1/2</sup> /W	$\geq 2.0 \times 10^{10}$	$\geq 6.0 \times 10^9$	$\geq 9.0 \times 10^8$	$\geq 4.0 \times 10^8$	$\geq 1.0 \times 10^8$	$\geq 4.0 \times 10^7$
Current responsivity-active area length product $R_i(\lambda_{opt}) \cdot L$ , A·mm/W	$\geq 0.5$	$\geq 0.18$	$\geq 0.025$	$\geq 0.01$	$\geq 0.005$	$\geq 0.002$
Time constant $\tau$ , ns	$\leq 20000$	$\leq 4000$	$\leq 40$	$\leq 10$	$\leq 3$	$\leq 2$
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	$\leq 2.0$	$\leq 3.2$	$\leq 2.0$	$\leq 2.25$	$\leq 1.5$	$\leq 1.8$
Resistance R, Ω	$\leq 1200$	$\leq 800$	$\leq 400$	$\leq 300$	$\leq 200$	$\leq 150$
Active element temperature T <sub>det</sub> , K	$\sim 230$					
Active area A, mm×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 $\Phi$	$\sim 70^\circ$					
Window	wAl <sub>2</sub> O <sub>3</sub>					wZnSeAR

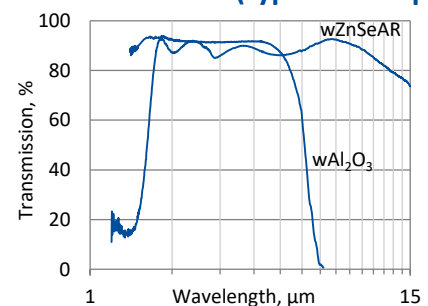
#### Two-stage thermoelectric cooler parameters

Parameter	Value
T <sub>det</sub> , K	$\sim 230$
V <sub>max</sub> , V	1.3
I <sub>max</sub> , A	1.2
Q <sub>max</sub> , W	0.36

#### Thermistor characteristics

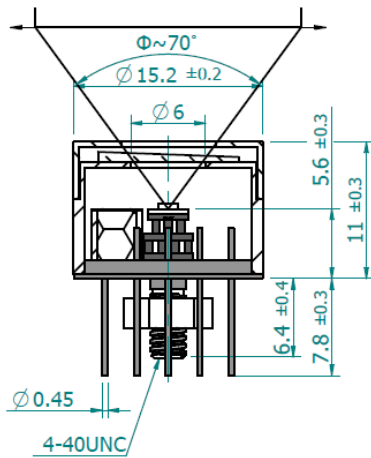


#### Spectral transmission of wAl<sub>2</sub>O<sub>3</sub> and wZnSeAR windows (typical example)



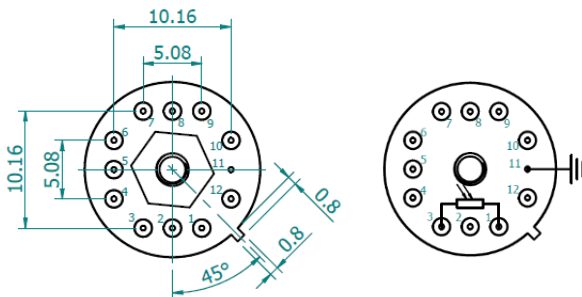
### Mechanical layout, mm

#### 2TE-T08 package



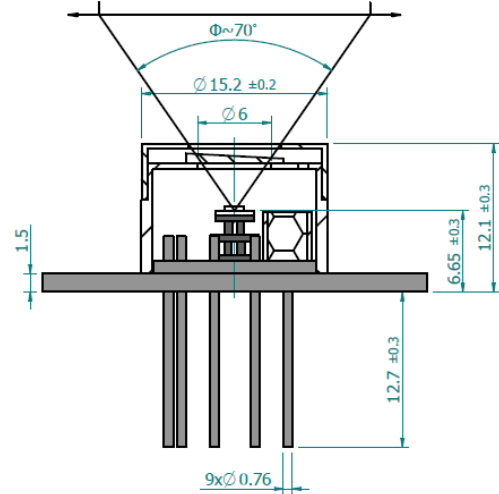
Φ – acceptance angle

Bottom view



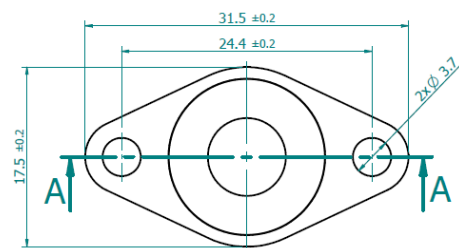
Function	Pin number
Detector	1, 3
Thermistor	7, 9
TE cooler supply	2(+), 8(-)
Chassis ground	11
Not used	4, 5, 6, 10, 12

#### 2TE-T066 package

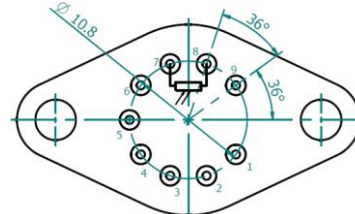


Φ – acceptance angle

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