ViGO SYSTEM

PC-3TE series

1.0 – 15.0 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°C)
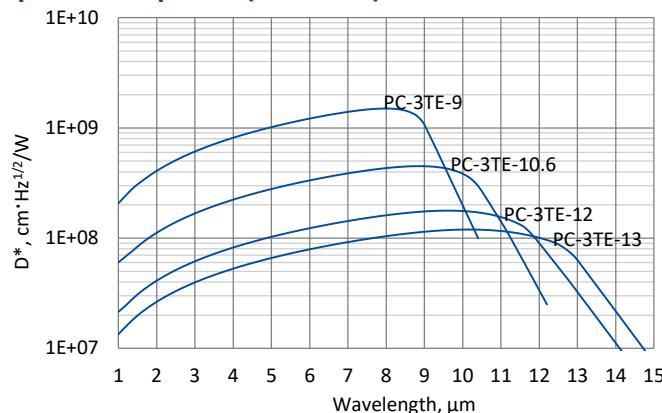
Exemplary spectral detectivity, the spectral response of delivered devices may differ.

3TE-TO66   3TE-TO8

Specification (T_a = 20°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*(λ_{peak}, 20kHz), cm·Hz$^{1/2}$/W	≥1.5×10^9	≥4.5×10^8	≥1.8×10^8	≥1.2×10^8
Detectivity D*(λ_{opt}, 20kHz), cm·Hz$^{1/2}$/W	≥1.0×10^9	≥2.5×10^8	≥9.0×10^7	≥6.0×10^7
Current responsivity-active area length product $R_i(\lambda_{opt})$·L, A·mm/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	≤10k	≤20k		
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×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	~70°			
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
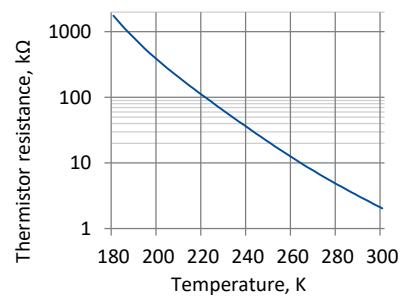

### Spectral transmission of wZnSeAR window (typical example)
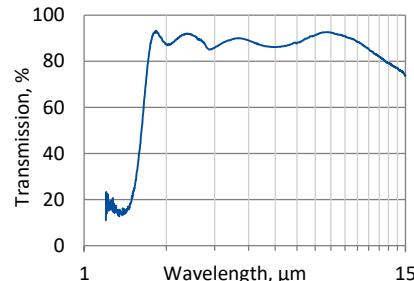
Mechanical layout, mm

3TE-TO8 package
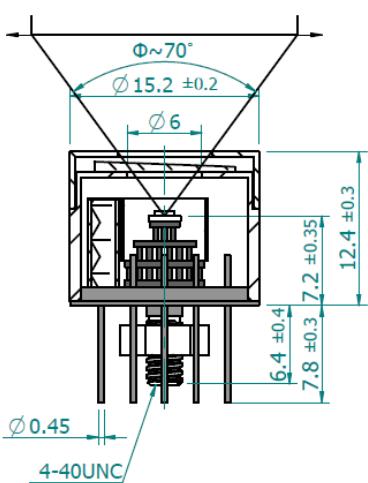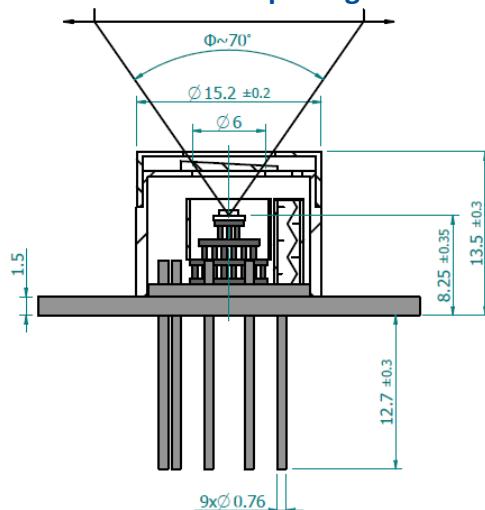
Φ – acceptance angle

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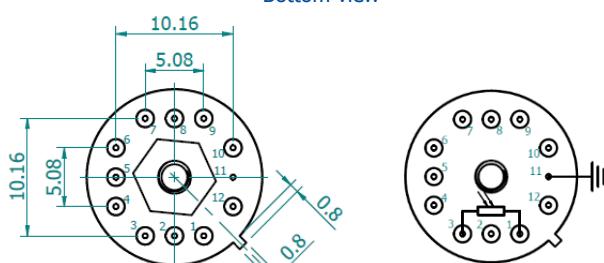
Function	Pin number
Detector	1, 3
Thermistor	7, 9
TE cooler supply	2(+), 8(−)
Chassis ground	11
Not used	4, 5, 6, 10, 12

3TE-TO66 package

Φ – acceptance angle

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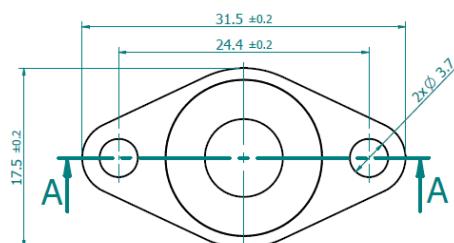
Bottom view
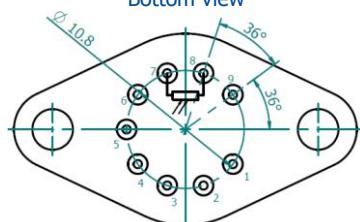
Function	Pin number
Detector	7, 8
Thermistor	5, 6
TE cooler supply	1(+), 9(−)
Not used	2, 3, 4

Dedicated preamplifiers

„all-in-one" AIP

programmable PIP

standard MIP

small SIP-TO8