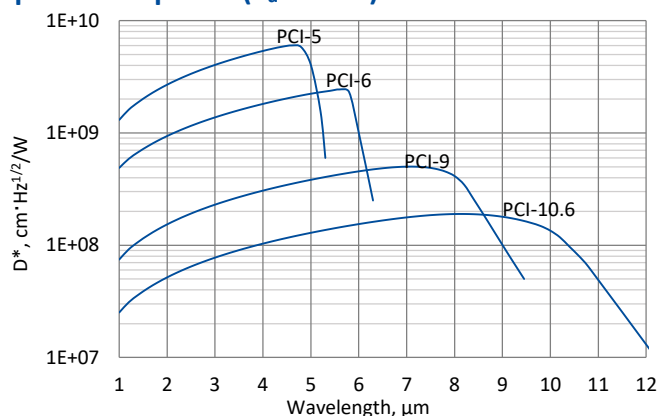


PCI series

1 – 12 μm HgCdTe ambient temperature, optically immersed photoconductive detectors

PCI series features uncooled IR photoconductive detectors based on sophisticated HgCdTe heterostructures for the best performance and stability, optically immersed in order to improve parameters of the devices. The detectors are optimized for the maximum performance at λ_{opt} . Cut-on wavelength is limited by GaAs transmittance ($\sim 0.9 \mu\text{m}$). 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.

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



BNC

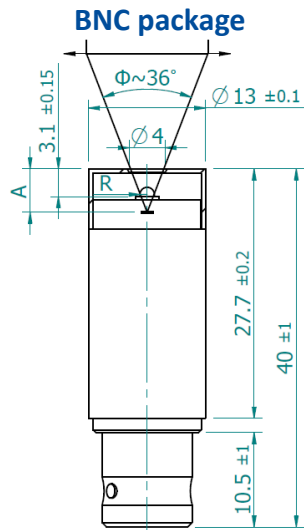
TO39

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

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

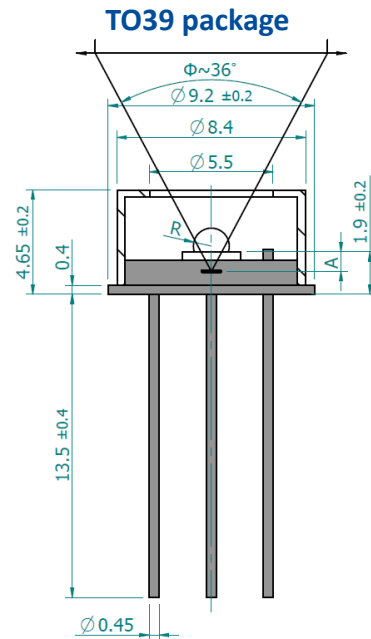
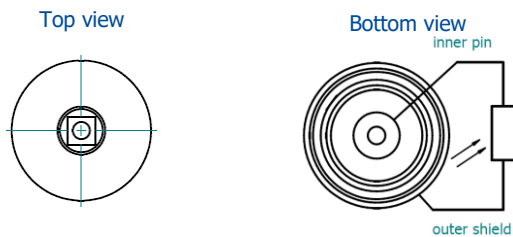
Parameter	Detector type			
	PCI-5	PCI-6	PCI-9	PCI-10.6
Active element material	epitaxial HgCdTe heterostructure			
Optimal wavelength λ_{opt} , μm	5.0	6.0	9.0	10.6
Detectivity $D^*(\lambda_{peak}, 20\text{kHz})$, $\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	$\geq 6.0 \times 10^9$	$\geq 2.5 \times 10^9$	$\geq 5.0 \times 10^8$	$\geq 1.0 \times 10^8$
Detectivity $D^*(\lambda_{opt}, 20\text{kHz})$, $\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	$\geq 4.0 \times 10^9$	$\geq 1.0 \times 10^9$	$\geq 1.0 \times 10^8$	$\geq 8.0 \times 10^7$
Current responsivity-optical area length product $R_i(\lambda_{opt}) \cdot L_o$, $\text{A}\cdot\text{mm}/\text{W}$	≥ 0.5	≥ 0.2	≥ 0.02	≥ 0.008
Time constant τ , ns	≤ 5000	≤ 500	≤ 10	≤ 3
$1/f$ noise corner frequency f_c , Hz		$\leq 10\text{k}$		$\leq 20\text{k}$
Bias voltage-optical area length ratio V_b/L_o , V/mm	≤ 0.45	≤ 0.4	≤ 0.36	≤ 0.3
Resistance R , Ω	≤ 1200	≤ 600	≤ 300	≤ 120
Optical area A_o , mm \times mm	0.5 \times 0.5, 1 \times 1, 2 \times 2			
Package	TO39, BNC			
Acceptance angle Φ	$\sim 36^\circ$			
Window	none			

Mechanical layout, mm



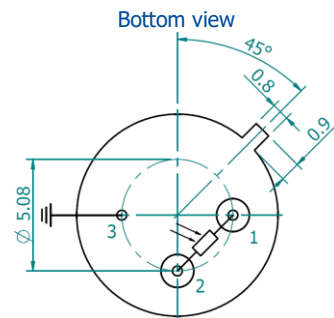
Parameter	Value		
Immersion microlens shape	hyperhemisphere		
Optical area A_0 , mm×mm	0.5×0.5	1×1	2×2
R, mm	0.5	0.8	1.25
A, mm	4.6±0.3	5.5±0.3	6.85±0.30

Φ – acceptance angle
 R – hyperhemisphere microlens radius
 A – distance from the top of BNC package to the focal plane



Parameter	Value		
Immersion microlens shape	hyperhemisphere		
Optical area A_0 , mm×mm	0.5×0.5	1×1	2×2
R, mm	0.5	0.8	1.25
A, mm	1.5±0.2	2.4±0.2	3.75±0.20

Φ – acceptance angle
 R – hyperhemisphere microlens radius
 A – distance from the bottom of hyperhemisphere microlens to the focal plane



Function	Pin number
Detector	1, 2
Chassis ground	3

Dedicated preamplifier



small SIP-TO39