



Electro Optical Components, Inc.

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Photoconductive detectors' optically immersed PCI

PCI series features room temperature and TE cooled IR photoconductive detectors, optically immersed (achieved by using high refractive index micro lenses) in order to improve performance of the devices, different acceptance angle and saturation level. The devices are optimized for the maximum performance at λ_{opt} . Cut-on wavelength is limited by GaAs transmittance ($\sim 0.9 \mu m$). Bias is needed to operate photocurrent. Performance at low frequencies (< 20 kHz) is reduced due to $1/f$ noise. The highest performance and stability are achieved by application of variable gap HgCdTe semiconductor, optimized doping and sophisticated surface processing.

Detector type	Cooling, operating temperature T [K]	Optimal wavelength ¹⁾ λ_{opt} [μm]	Detectivity ²⁾ $D^* \left[\frac{cm \cdot \sqrt{Hz}}{W} \right]$		Current responsivity length product @ λ_{opt} $R_c \cdot L \left[\frac{A \cdot mm}{W} \right]$	Time constant τ [ns]	1/f noise corner frequency f_c [kHz]	Bias voltage length ratio $\frac{V_c \cdot L}{I} \left[\frac{V}{mm} \right]$	Sheet resistance R_{sq} [Ω]	Acceptance angle \varnothing [$^\circ$], $\frac{1}{2NA}$	Optical area ³⁾ [$mm \times mm$]	Package	Window ⁴⁾
			@ λ_{peak} 20kHz	@ λ_{opt} 20kHz									
PCI	uncooled, ~ 300	4	$\geq 1.0 \times 10^{10}$	$\geq 6.0 \times 10^9$	≥ 0.6	≤ 12000	≤ 20	≤ 4.8	≤ 2000	$\sim 36, 1.62$	0.25×0.25 0.5×0.5 1×1	BNC, TO39	no window
		5	$\geq 6.0 \times 10^9$	$\geq 4.0 \times 10^9$	≥ 0.5	≤ 5000		≤ 4.8	≤ 1200				
		6	$\geq 2.5 \times 10^9$	$\geq 1.0 \times 10^9$	≥ 0.2	≤ 500		≤ 4.8	≤ 600				
		9	$\geq 5.0 \times 10^8$	$\geq 1.0 \times 10^8$	≥ 0.02	≤ 10		≤ 4.8	≤ 300				
		10.6	$\geq 1.0 \times 10^8$	$\geq 8.0 \times 10^7$	≥ 0.008	≤ 3		≤ 4.8	≤ 240				
	two-stage TE-cooled (2TE), ~ 230	4	$\geq 6.0 \times 10^{10}$	$\geq 4.0 \times 10^{10}$	≥ 4.0	≤ 30000		≤ 3.8	≤ 3000				
		5	$\geq 4.0 \times 10^{10}$	$\geq 2.0 \times 10^{10}$	≥ 3.0	≤ 20000		≤ 3.8	≤ 2000				
		6	$\geq 2.0 \times 10^{10}$	$\geq 1.0 \times 10^{10}$	≥ 1.5	≤ 4000		≤ 3.8	≤ 800				
		9	$\geq 8.0 \times 10^9$	$\geq 4.0 \times 10^9$	≥ 0.225	≤ 40		≤ 3.0	≤ 400				
		10.6	$\geq 2.8 \times 10^9$	$\geq 1.0 \times 10^9$	≥ 0.1	≤ 10		≤ 3.0	≤ 300				
		12	$\geq 1.0 \times 10^9$	$\geq 4.5 \times 10^8$	≥ 0.05	≤ 3		≤ 2.0	≤ 200				
	three-stage TE-cooled (3TE), ~ 210	9	$\geq 1.0 \times 10^{10}$	$\geq 6.2 \times 10^9$	≥ 0.7	≤ 60		≤ 2.0	≤ 240				
		10.6	$\geq 4.5 \times 10^9$	$\geq 2.5 \times 10^9$	≥ 0.17	≤ 20		≤ 2.4	≤ 400				
		12	$\geq 1.8 \times 10^9$	$\geq 9.0 \times 10^8$	≥ 0.07	≤ 5		≤ 1.8	≤ 300				
		13	$\geq 9.0 \times 10^8$	$\geq 4.5 \times 10^8$	≥ 0.03	≤ 4		≤ 1.8	≤ 300				
	four-stage TE-cooled (4TE), ~ 195	9	$\geq 1.25 \times 10^{10}$	$\geq 1.0 \times 10^{10}$	≥ 0.9	≤ 80		≤ 3.0	≤ 500				
		10.6	$\geq 4.0 \times 10^9$	$\geq 3.0 \times 10^9$	≥ 0.2	≤ 30		≤ 2.4	≤ 400				
		12	$\geq 3.0 \times 10^9$	$\geq 2.0 \times 10^9$	≥ 0.09	≤ 7		≤ 2.4	≤ 400				
		13	$\geq 2.0 \times 10^9$	$\geq 1.0 \times 10^9$	≥ 0.05	≤ 6		≤ 2.4	≤ 400				
		14	$\geq 5.0 \times 10^8$	$\geq 3.0 \times 10^8$	≥ 0.03	≤ 5		≤ 1.8	≤ 300				
												TO8, TO66	wedged Al_2O_3
													wedged ZnSe AR coated
													wedged ZnSe AR coated
													wedged ZnSe AR coated

²⁾ Other optimal wavelengths available upon request.
³⁾ Data sheet states minimum guaranteed D^* values for each detector model. Higher performance detectors can be provided upon request.

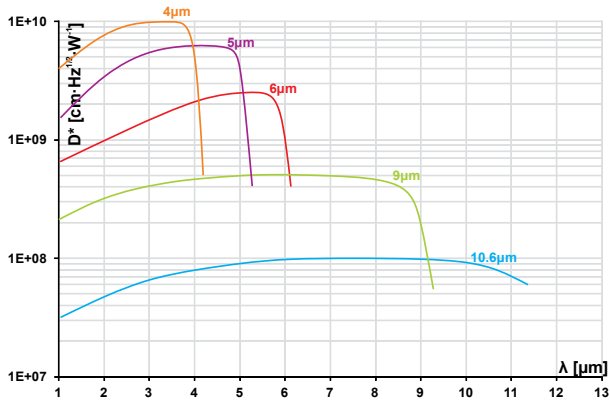
⁴⁾ Other optical areas available upon request.

⁵⁾ Other windows available upon request.

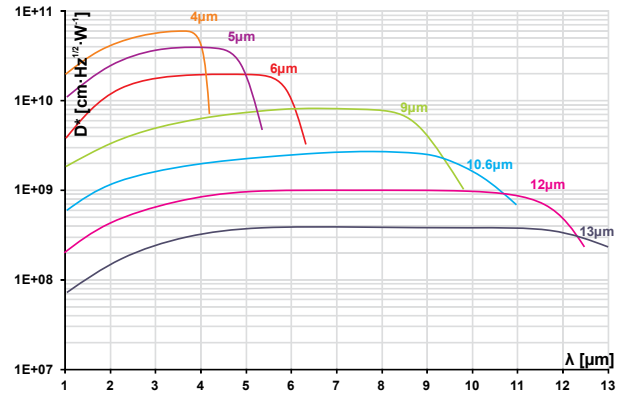
¹⁾ Optical area available only for uncooled detectors

Spectral characteristics^{*)}

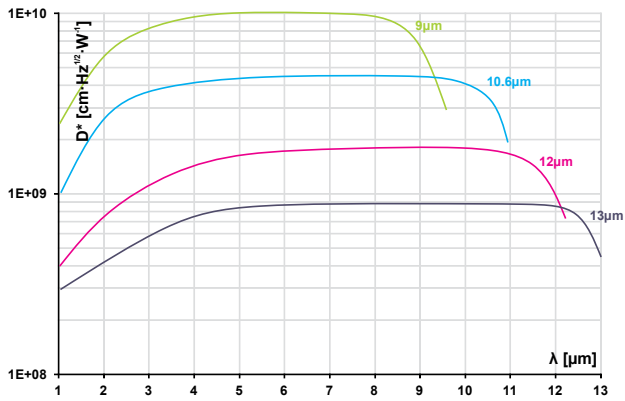
PCI



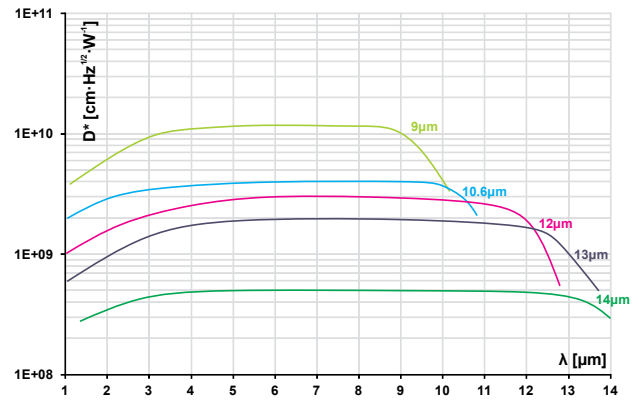
PCI-2TE



PCI-3TE



PCI-4TE



^{*)}Example of D^* vs wavelength λ for HgCdTe detectors. Spectral characteristics of individual detectors may vary from those shown in the chart.