Photovoltaic detectors optically immersed PVI

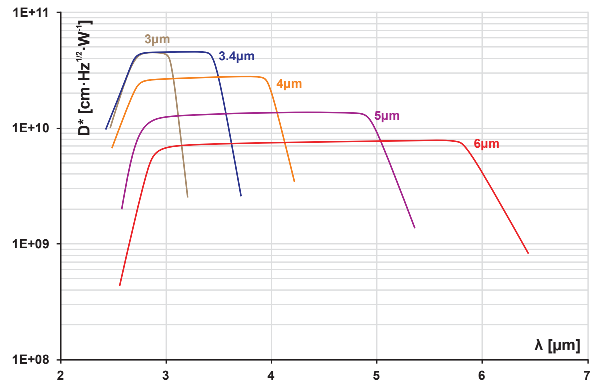
PVI series features room temperature and TE cooled IR photovoltaic detectors, optically immersed (achieved by using high refractive index micro lenses) in order to improve performance of the devices, different acceptance angle and saturation level. The devices are optimized for the maximum performance at λ_{opt}. Cut-on wavelength can be optimized upon request. Reverse bias may significantly increase speed of response and dynamic range. It results also in improved performance at high frequencies, but 1/f noise that appears in biased devices may reduce performance at low frequencies. Highest performance and stability are achieved by application of variable gap HgCdTesemiconductor, optimized doping and sophisticated surface processing.

Detector type	Cooling, operating temperature $T[K]$	Optimal wavelength*) λ_{opt} $[\mu m]$	Detectivity**) $D^*\left[\frac{cm\cdot\sqrt{Hz}}{W}\right]$ @λ_{peak}	Detectivity**) $D^*\left[\frac{cm\cdot\sqrt{Hz}}{W}\right]$ @λ_{opt}	Current responsivity @λ_{opt} $R_i\left[\frac{A}{W}\right]$	Time constant $\tau[ns]$	Resistance optical area product $R\cdot A[\Omega\cdot cm^2]$	Acceptance angle $\varnothing[°], \frac{1}{2NA}$	Optical area***) $[mm\times mm]$	Package	Window****)
PVI	uncooled, ~300	3	≥5.0×10¹⁰	≥5.0×10¹⁰	≥0.5	≤350	≥100	~36, 1.62	0.5×0.5 1×1	BNC, TO39	no window
		3.4	≥5.0×10¹⁰	≥4.5×10¹⁰	≥0.8	≤260	≥50				
		4	≥3.0×10¹⁰	≥2.0×10¹⁰	≥1	≤150	≥6				
		5	≥1.5×10¹⁰	≥9.0×10⁹	≥1	≤120	≥1				
		6	≥8.0×10⁹	≥4.0×10⁹	≥1	≤80	≥0.2				
	two-stage TE-cooled (2TE), ~230	3	≥8.0×10¹¹	≥5.5×10¹¹	≥0.5	≤280	≥15000		0.5×0.5 1×1	TO8, TO66	wedged Al_2O_3
		3.4	≥6.0×10¹¹	≥3.0×10¹¹	≥0.8	≤200	≥300				
		4	≥3.0×10¹¹	≥2.0×10¹¹	≥1.0	≤100	≥200				
		5	≥1.0×10¹¹	≥6.0×10¹⁰	≥1.3	≤80	≥10				
		6	≥5.0×10¹⁰	≥2.0×10¹⁰	≥1.5	≤50	≥2				wedged ZnSe AR coated
		8	≥4.0×10⁹	≥2.0×10⁹	≥0.8	≤30	≥0.02		0.3×0.3 0.5×0.5		
						≤45			1×1		
		10.6	≥2.0×10⁹	≥1.0×10⁹	≥0.4	≤10	≥0.01		0.3×0.3 0.5×0.5		
	three-stage TE-cooled (3TE), ~210	3	≥9.0×10¹¹	≥7.0×10¹¹	≥0.5	≤280	≥24000		0.5×0.5 1×1		wedged Al_2O_3
		3.4	≥7.0×10¹¹	≥5.0×10¹¹	≥0.8	≤200	≥1500				
		4	≥5.0×10¹¹	≥3.0×10¹¹	≥1.0	≤100	≥600				
		5	≥1.0×10¹¹	≥8.0×10¹⁰	≥1.3	≤80	≥30				
		6	≥6.0×10¹⁰	≥3.0×10¹⁰	≥1.5	≤50	≥2.5				wedged ZnSe AR coated
		8	≥5.0×10⁹	≥3.0×10⁹	≥1.0	≤30	≥0.04		0.3×0.3 0.5×0.5		
						≤45			1×1		
		10.6	≥3.0×10⁹	≥1.5×10⁹	≥0.7	≤10	≥0.02		0.3×0.3 0.5×0.5		
	four-stage TE-cooled (4TE), ~195	3	≥1.0×10¹²	≥8.0×10¹¹	≥0.5	≤280	≥30000		0.5×0.5 1×1		wedged Al_2O_3
		3.4	≥8.0×10¹¹	≥7.0×10¹¹	≥0.8	≤200	≥2000				
		4	≥6.0×10¹¹	≥4.0×10¹¹	≥1.0	≤100	≥800				
		5	≥3.0×10¹¹	≥1.0×10¹¹	≥1.3	≤80	≥40				
		6	≥6.0×10¹⁰	≥4.0×10¹⁰	≥1.5	≤50	≥3				wedged ZnSe AR coated
		8	≥5.0×10⁹	≥4.0×10⁹	≥1.5	≤30	≥0.06		0.3×0.3 0.5×0.5		
						≤45			1×1		
		10.6	≥4.0×10⁹	≥2.0×10⁹	≥0.7	≤10	≥0.05		0.3×0.3 0.5×0.5		
					≥0.5	≤25			1×1		

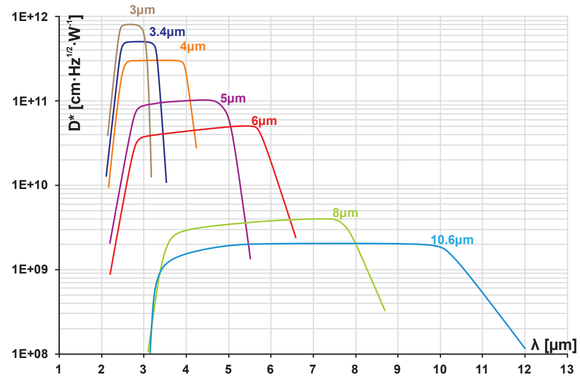
*) *Other optimal wavelengths available upon request.*
**) *Data sheet states minimum guaranteed D* values for each detector model. Higher performance detectors can be provided upon request.*
***) *Other optical areas available upon request.*
****) *Other windows available upon request.*
1) *Optical area available only for uncooled detectors*

Spectral characteristics*)

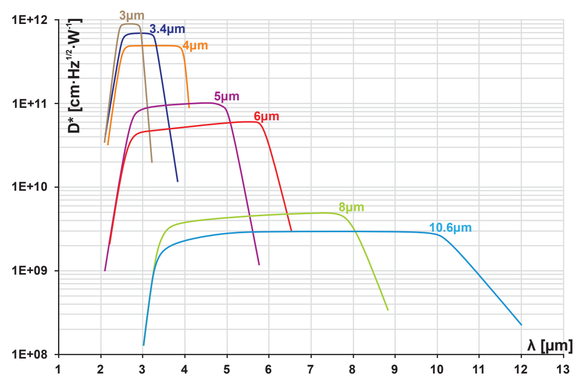
PVI



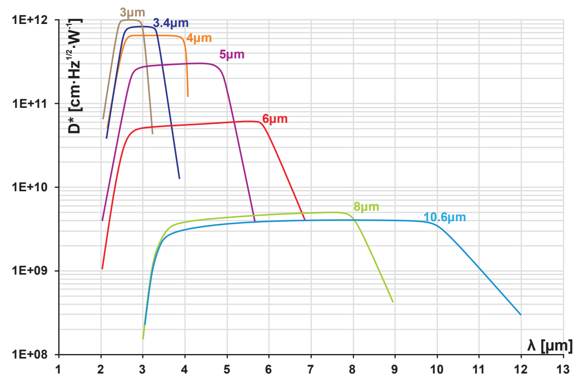
PVI-2TE



PVI-3TE



PVI-4TE



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

Detector code

Different information such as detector type, optical immersion, number of stages TE-cooler, wavelength a detector is optimized for, dimensions of optical area, package type, window type and FOV combine, to create VIGO detector code.

Code description of uncooled detector

PC - 10 6 - 1x1 - BNC - NoWindow - 102

PC	10 6	1x1	BNC	NoWindow	102
VIGO detector type	Optimal wavelength	Optical area	Detector package	Window (without window)	FOV

Code sescription of cooled detector

PVI - 2TE - 5 - 1x1 - TO8 - wAl2O3 - 35

PVI	2TE	5	1x1	TO8	wAl2O3	35
VIGO detector type (I - optical immersion)	Cooling	Optimal wavelength	Optical area	Detector package	Window	FOV

Please see data sheets to get possibile option of each type detector.