

## 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  $\lambda_{opt}$ . 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 HgCdTe semiconductor, optimized doping and sophisticated surface processing.



Detector type	Cooling, operating temperature $T [K]$	Optimal wavelength <sup>*)</sup> $\lambda_{opt} [\mu m]$	Detectivity <sup>**)</sup> $D^* \left[ \frac{cm \cdot \sqrt{Hz}}{W} \right]$		Current responsivity $@\lambda_{opt}$ $\left[ \frac{A}{W} \right]$ $R_i$	Time constant $\tau [ns]$	Resistance optical area product $R \cdot A [\Omega \cdot cm^2]$	Acceptance angle $\varnothing [^\circ]_{\pm 2\sigma}$	Optical area <sup>***)</sup> $[mm \times mm]$	Package	Window <sup>****)</sup>
			@ $\lambda_{peak}$	@ $\lambda_{opt}$							
PVI	uncooled, ~300	3	$\geq 5.0 \times 10^{10}$	$\geq 5.0 \times 10^{10}$	$\geq 0.5$	$\leq 350$	$\geq 100$	~36, 1.62	0.5x0.5 1x1	BNC, TO39	no window
		3.4	$\geq 5.0 \times 10^{10}$	$\geq 4.5 \times 10^{10}$	$\geq 0.8$	$\leq 260$	$\geq 50$				
		4	$\geq 3.0 \times 10^{10}$	$\geq 2.0 \times 10^{10}$	$\geq 1$	$\leq 150$	$\geq 6$				
		5	$\geq 1.5 \times 10^{10}$	$\geq 9.0 \times 10^9$	$\geq 1$	$\leq 120$	$\geq 1$				
		6	$\geq 8.0 \times 10^9$	$\geq 4.0 \times 10^9$	$\geq 1$	$\leq 80$	$\geq 0.2$				
	two-stage TE-cooled (2TE), ~230	3	$\geq 8.0 \times 10^{11}$	$\geq 5.5 \times 10^{11}$	$\geq 0.5$	$\leq 280$	$\geq 15000$		0.5x0.5 1x1	TO8, TO66	wedged Al <sub>2</sub> O <sub>3</sub>
		3.4	$\geq 6.0 \times 10^{11}$	$\geq 3.0 \times 10^{11}$	$\geq 0.8$	$\leq 200$	$\geq 300$				
		4	$\geq 3.0 \times 10^{11}$	$\geq 2.0 \times 10^{11}$	$\geq 1.0$	$\leq 100$	$\geq 200$				
		5	$\geq 1.0 \times 10^{11}$	$\geq 6.0 \times 10^{10}$	$\geq 1.3$	$\leq 80$	$\geq 10$				
		6	$\geq 5.0 \times 10^{10}$	$\geq 2.0 \times 10^{10}$	$\geq 1.5$	$\leq 50$	$\geq 2$				
		8	$\geq 4.0 \times 10^9$	$\geq 2.0 \times 10^9$	$\geq 0.8$	$\leq 30$ $\leq 45$	$\geq 0.02$				
	three-stage TE-cooled (3TE), ~210	3	$\geq 9.0 \times 10^{11}$	$\geq 7.0 \times 10^{11}$	$\geq 0.5$	$\leq 280$	$\geq 24000$		0.5x0.5 1x1	TO8, TO66	wedged Al <sub>2</sub> O <sub>3</sub>
		3.4	$\geq 7.0 \times 10^{11}$	$\geq 5.0 \times 10^{11}$	$\geq 0.8$	$\leq 200$	$\geq 1500$				
		4	$\geq 5.0 \times 10^{11}$	$\geq 3.0 \times 10^{11}$	$\geq 1.0$	$\leq 100$	$\geq 600$				
		5	$\geq 1.0 \times 10^{11}$	$\geq 8.0 \times 10^{10}$	$\geq 1.3$	$\leq 80$	$\geq 30$				
		6	$\geq 6.0 \times 10^{10}$	$\geq 3.0 \times 10^{10}$	$\geq 1.5$	$\leq 50$	$\geq 2.5$				
		8	$\geq 5.0 \times 10^9$	$\geq 3.0 \times 10^9$	$\geq 1.0$	$\leq 30$ $\leq 45$	$\geq 0.04$				
	four-stage TE-cooled (4TE), ~195	3	$\geq 1.0 \times 10^{12}$	$\geq 8.0 \times 10^{11}$	$\geq 0.5$	$\leq 280$	$\geq 30000$		0.5x0.5 1x1	TO8, TO66	wedged Al <sub>2</sub> O <sub>3</sub>
		3.4	$\geq 8.0 \times 10^{11}$	$\geq 7.0 \times 10^{11}$	$\geq 0.8$	$\leq 200$	$\geq 2000$				
		4	$\geq 6.0 \times 10^{11}$	$\geq 4.0 \times 10^{11}$	$\geq 1.0$	$\leq 100$	$\geq 800$				
		5	$\geq 3.0 \times 10^{11}$	$\geq 1.0 \times 10^{11}$	$\geq 1.3$	$\leq 80$	$\geq 40$				
		6	$\geq 6.0 \times 10^{10}$	$\geq 4.0 \times 10^{10}$	$\geq 1.5$	$\leq 50$	$\geq 3$				
		8	$\geq 5.0 \times 10^9$	$\geq 4.0 \times 10^9$	$\geq 1.5$	$\leq 30$ $\leq 45$	$\geq 0.06$				
		10.6	$\geq 4.0 \times 10^9$	$\geq 2.0 \times 10^9$	$\geq 0.7$ $\geq 0.5$	$\leq 10$ $\leq 25$	$\geq 0.05$				
							0.3x0.3 0.5x0.5	wedged ZnSe			
							1x1	AR coated			
							0.3x0.3 0.5x0.5	wedged ZnSe			
							1x1	AR coated			

<sup>\*)</sup> Other optimal wavelengths available upon request.

<sup>\*\*)</sup> Data sheet states minimum guaranteed D\* values for each detector model. Higher performance detectors can be provided upon request.

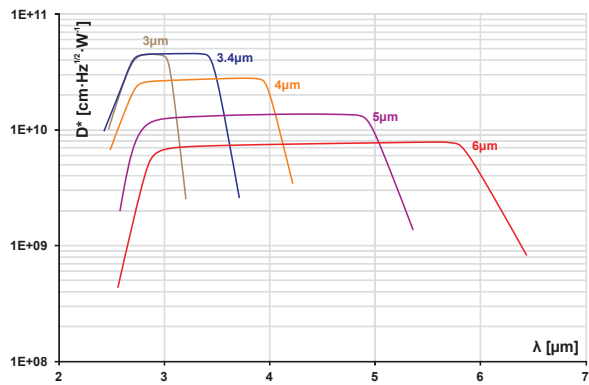
<sup>\*\*\*)</sup> Other optical areas available upon request.

<sup>\*\*\*\*)</sup> Other windows available upon request.

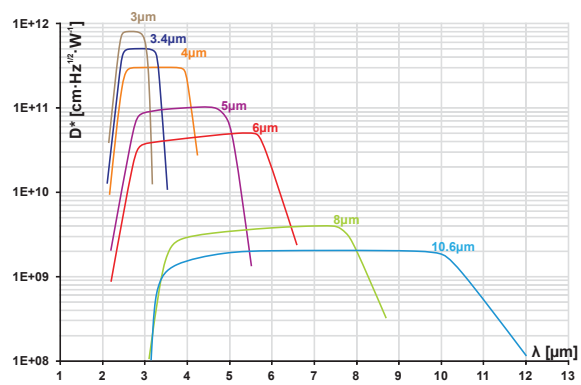
<sup>1)</sup> Optical area available only for uncooled detectors

# Spectral characteristics<sup>\*)</sup>

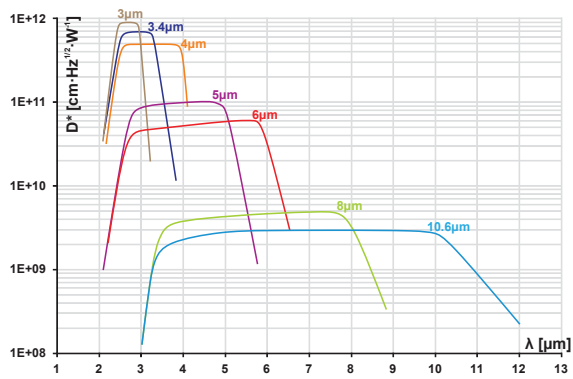
PVI



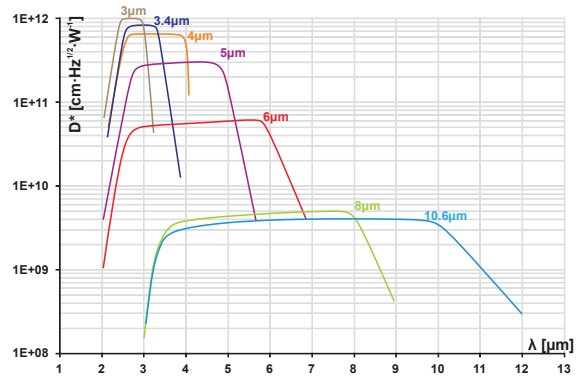
PVI-2TE



PVI-3TE



PVI-4TE



<sup>\*)</sup>Example of  $D^*$  vs wavelength  $\lambda$  for HgCdTe detectors. Spectral characteristics of individual detectors may vary from those shown on the chart.

