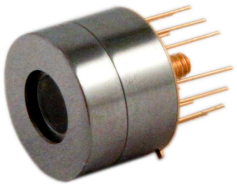
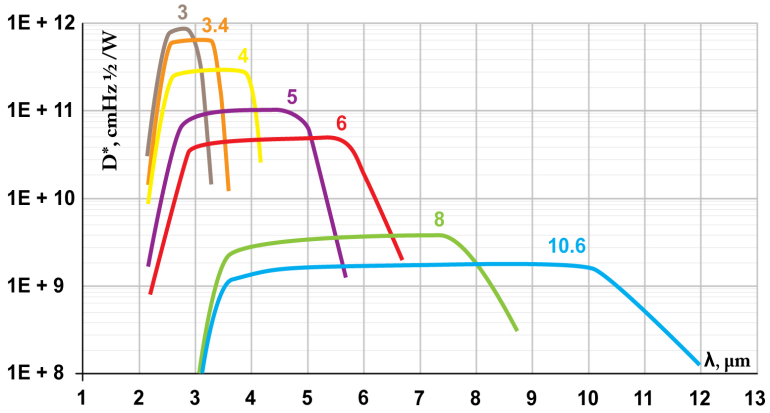
PVI-2TE Series

2 – 12 µm IR PHOTOVOLTAIC DETECTORS THERMOELECTRICALLY COOLED OPTICALLY IMMERSED





Example of D vs Wavelength λ for PVI-2TE Series HgCdTe Detectors. Spectral Characteristics of individual detectors may vary from those shown on the chart.*

Features

- High performance in the 2 to 12 µm spectral range
- Fast response
- No flicker noise
- Convenient to use
- Wide dynamic range
- Compact, rugged and reliable
- Low cost
- Prompt delivery
- Custom design upon request

Description

The **PVI-2TE-λ_{opt}** photodetectors series (λ_{opt} - optimal wavelength in micrometers) feature IR photovoltaic detector on two-stage thermoelectrical cooler, optically immersed to high refractive index GaAs hyperhemispherical (standard) or hemispherical or any intermediate lens (as option) for 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 **HgCdTe** semiconductor, optimized doping and sophisticated surface processing. Custom devices with quadrant cells, multielement arrays, different windows, lenses and optical filters are available upon request.

Standard detectors are available in **TO8** packages with wedged **BaF_2** windows. Other packages, windows and connectors are also available.

IR Detector Specification @20°C

Parameter	Symbol	Unit	PVI-2TE-3	PVI-2TE-3.4	PVI-2TE-4	PVI-2TE-5	PVI-2TE-6	PVI-2TE-8	PVI-2TE-10.6
Optimal Wavelength	λ_{opt}	µm	3	3.4	4	5	6	8	10.6
Detectivity*): @ λ_{peak} @ λ_{opt}	**D***	$\frac{cm\cdot\sqrt{Hz}}{W}$	$\geq 8.0\times10^{11}$ $\geq 5.5\times10^{11}$	$\geq 6.0\times10^{11}$ $\geq 3.0\times10^{11}$	$\geq 3.0\times10^{11}$ $\geq 2.0\times10^{11}$	$\geq 1.0\times10^{11}$ $\geq 6.0\times10^{10}$	$\geq 5.0\times10^{10}$ $\geq 2.0\times10^{10}$	$\geq 4.0\times10^{9}$ $\geq 2.0\times10^{9}$	$\geq 2.0\times10^{9}$ $\geq 1.0\times10^{9}$
Current Responsivity	R_i	$\frac{A}{W}$	≥0.5	≥0.8	≥1	≥1.3	≥1.5	≥0.8	≥0.4
Time Constant	τ	ns	≤280	≤200	≤100	≤80	≤50	≤30	≤10
Time Constant**	τ	ns	≤3	≤2	≤1	≤0.7	≤0.5	≤0.4	≤0.4
Resistance – Optical Area Product	**R·A**	**Ω·cm²**	≥15000	≥300	≥200	≥10	≥2	≥0.002	≥0.01
Operating Temperature	**T**	**K**	~230						
Acceptance Angle, F/#	**Φ, -**	**deg, -**	36, 1.62						

*) *Data Sheet states minimum guaranteed D* values for each detector model. Higher performance detectors can be provided upon request.*

**) *Response which may be achieved at reverse bias (selected detectors upon request). Devices with faster response are availabe upon special request.*

Type	Optical Area*) [mm×mm]									
	0.025×0.025	0.05×0.05	0.1×0.1	0.2×0.2	0.25×0.25	0.5×0.5	1×1	2×2	3×3	4×4
PVI-2TE-3					O	X	X	O		
PVI-2TE-3.4					O	X	X	O		
PVI-2TE-4					O	X	X	O		
PVI-2TE-5					O	X	X	O		
PVI-2TE-6					O	X	X			
PVI-2TE-8				X	X	X**)	P			
PVI-2TE-10.6				X	X	X**)	P			

*) *Circular shaped Optical Area (Diameter [mm]) can be provided upon request.*

**) *Custom detectors may require reverse bias in order to increase Dynamic Resistance to improve frequency response.*

X – standard detectors

P – default with reverse bias

O – detectors available upon request; parameters may vary from these in Data Sheet