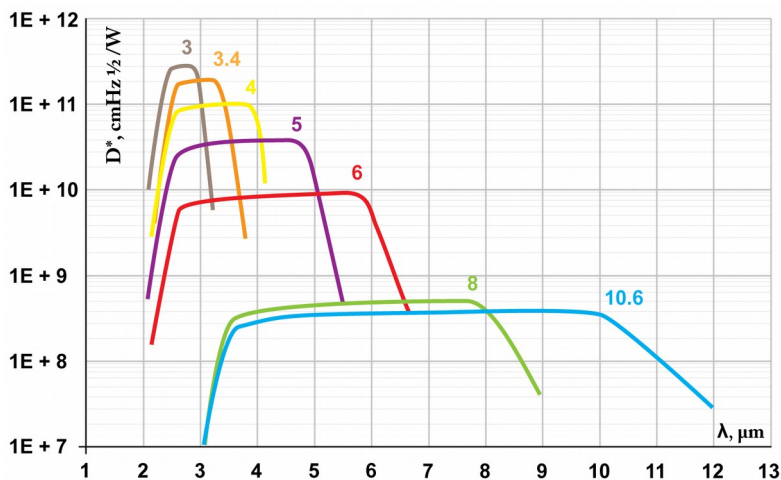
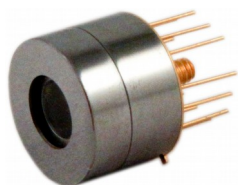


# PV-4TE Series

# 2 – 12 μm IR PHOTOVOLTAIC DETECTORS THERMOELECTRICALLY COOLED



Example of  $D^*$  vs Wavelength  $\lambda$  for PV-4TE 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 **PV-4TE- $\lambda_{opt}$**  photodetectors series ( $\lambda_{opt}$  - optimal wavelength in micrometers) feature IR photovoltaic detector on four-stage thermoelectrical cooler. 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. 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 **wAl2O3** or **wZnSeAR** windows. Other packages, windows and connectors are also available.

## IR Detector Specification @20°C

Parameter	Symbol	Unit	PV-4TE-3	PV-4TE-3.4	PV-4TE-4	PV-4TE-5	PV-4TE-6	PV-4TE-8	PV-4TE-10.6
Optimal Wavelength <sup>1)</sup>	$\lambda_{opt}$	μm	3	3.4	4	5	6	8	10.6
Detectivity <sup>2)</sup> : @ $\lambda_{peak}$ @ $\lambda_{opt}$	$D^*$	$\frac{cm \cdot \sqrt{Hz}}{W}$	$\geq 3.0 \times 10^{11}$ $\geq 1.5 \times 10^{11}$	$\geq 2.0 \times 10^{11}$ $\geq 1.0 \times 10^{11}$	$\geq 1.0 \times 10^{11}$ $\geq 6.0 \times 10^{10}$	$\geq 4.0 \times 10^{10}$ $\geq 1.5 \times 10^{10}$	$\geq 9.0 \times 10^9$ $\geq 5.0 \times 10^9$	$\geq 5.0 \times 10^8$ $\geq 4.0 \times 10^8$	$\geq 4.0 \times 10^8$ $\geq 2.0 \times 10^8$
Current Responsivity	$R_i$	$\frac{A}{W}$	$\geq 0.5$	$\geq 0.8$	$\geq 1$	$\geq 1.3$	$\geq 1.5$	$\geq 1.5$	$\geq 0.7$
Time Constant	$\tau$	ns	$\leq 280$	$\leq 200$	$\leq 100$	$\leq 80$	$\leq 50$	$\leq 30$	$\leq 10$
Time Constant <sup>3)</sup>	$\tau$	ns	$\leq 3$	$\leq 2$	$\leq 1$	$\leq 0.7$	$\leq 0.5$	$\leq 0.4$	$\leq 0.4$
Resistance – Optical Area Product	$R \cdot A$	$\Omega \cdot cm^2$	$\geq 300$	$\geq 20$	$\geq 8$	$\geq 0.4$	$\geq 0.03$	$\geq 0.0006$	$\geq 0.0005$
Operating Temperature	$T$	K	~195						
Acceptance Angle, F/#	$\Phi, -$	deg, -	70, 0.87						

<sup>1)</sup> Other Optimal Wavelengths available upon request.

<sup>2)</sup> Data Sheet states minimum guaranteed  $D^*$  values for each detector model. Higher performance detectors can be provided upon request.

<sup>3)</sup> Response which may be achieved at reverse bias (selected detectors upon request). Devices with faster response are available upon *special request*.

Type	Optical Area <sup>1)</sup> [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
PV-4TE-3	O	X	X	O		O	O			
PV-4TE-3.4	O	X	X	O		O	O			
PV-4TE-4	O	X	X	O		O	O			
PV-4TE-5	O	X	X	O		O	O			
PV-4TE-6	O	X	X	O		O	O			
PV-4TE-8	X	X <sup>2)</sup>	P							
PV-4TE-10.6	X	X <sup>2)</sup>	P							

<sup>1)</sup> Circular shaped Optical Area (Diameter [mm]) can be provided upon request.

<sup>2)</sup> 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