

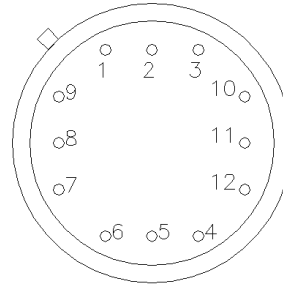


PDI-2TE Series Photovoltaic IR Detectors

2-12 μm IR PHOTOVOLTAIC DETECTORS THERMOELECTRICALLY COOLED, OPTICALLY IMMERSED

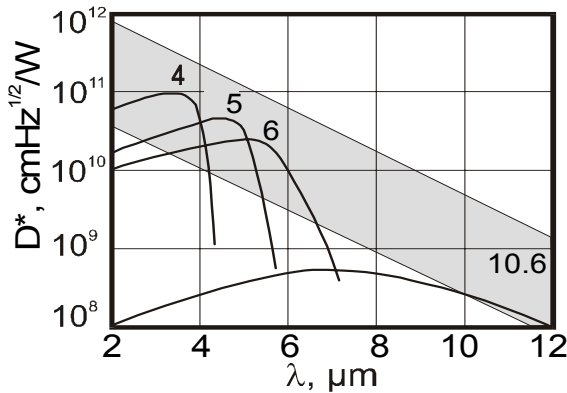
FEATURES

- High performance in the 2-12 μm range without LN-cooling!
- Fast response
- No $1/f$ flicker noise
- Convenient
- Wide dynamic range
- compact, rugged and reliable

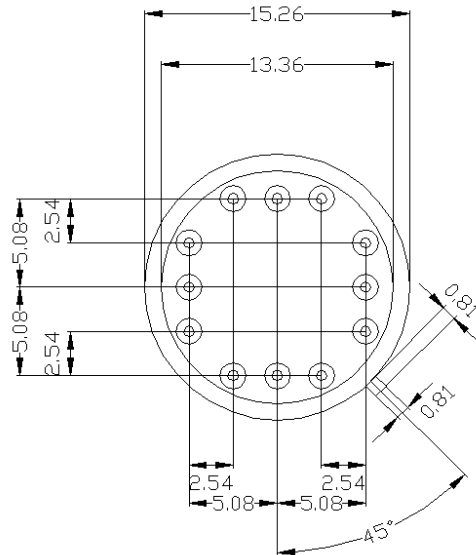


- 1 - Detector (+)
- 2 - TE Cooler (+)
- 3 - Detector (-)
- 4 - Thermistor
- 5 - TE Cooler (-)
- 6 - Thermistor
- 7 - Not in use
- 8 - Ground
- 9 - Ground (BOLT-DOWN ONLY)
- 10 - Not in use (ALL OTHER)
- 11 - Not in use
- 12 - Not in use

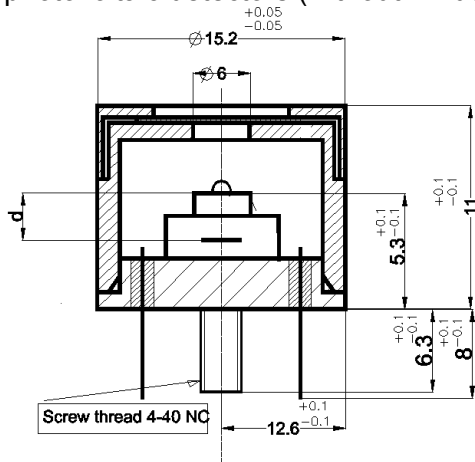
SPECTRAL RESPONSE



Typical spectral detectivities of PDI-2TE photovoltaic detectors (without windows).



PDI-2TE photodetectors incorporate industry standard two-stage low-power thermoelectric coolers and are packaged in modified TO-8-style cans. For proper operation, the units **must** be mounted on an appropriate heat sink to dissipate the heat generated by TE cooler.



DESCRIPTION

The PDI-2TE-n series (where n is wavelength λ_{op} , in micrometers, for which the detector is optimized) photodetectors are two-stage TE-cooled IR photovoltaic detectors, which have been optically immersed on high refractive index CdZnTe hemispherical or hyperhemispherical lenses. These devices can be optimized for the maximum performance anywhere from 2 to 12 μm . High performance and stability are achieved by using a variable gap semiconductor (Hg-Cd-Zn-Te) as well as graded composition and doping level profiles and optimization of surface processing. Custom devices with quadrant cells, arrays, specialized packages, connectors, windows and optical filters are available on request.

SPECIFICATIONS

Specifications are subject to change without notice. Specifications apply @20°C

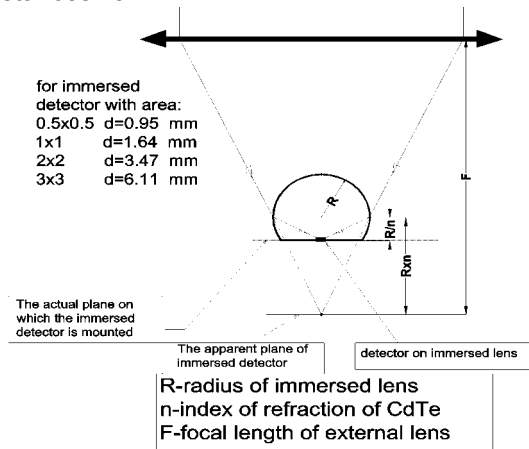
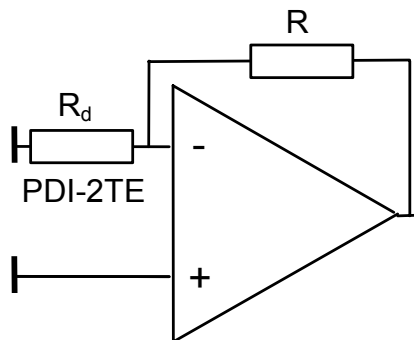
Characteristics	Units	PDI-2TE-4	PDI-2TE-5	PDI-2TE-6	PDI-2TE-8	PDI-2TE-10.6
λ_{op}	μm	4	5	6	8	10.6
Detectivity at λ_p at λ_{op}	$\text{cmHz}^{1/2}/\text{W}$	$\geq 1 \cdot 10^{11}$ $> 4 \cdot 10^{10}$	$\geq 5 \cdot 10^{10}$ $> 2 \cdot 10^{10}$	$\geq 3 \cdot 10^{10}$ $\geq 1 \cdot 10^{10}$	$\geq 3 \cdot 10^9$ $\geq 1 \cdot 10^9$	$\geq 6 \cdot 10^8$ $\geq 2 \cdot 10^8$
Responsivity ($1 \times 1 \text{mm}^2$)	V/W	≥ 900	≥ 290	≥ 50	≥ 7	≥ 1
Response Time	nsec	≤ 20	≤ 20	≤ 10	≤ 7	≤ 10
Resistance ($1 \times 1 \text{mm}^2$)	Ω	500- 9000	200-1500	40-400	40-300	30-200
Length x Width	mm x mm	0.25x0.25; 0.5x0.5; 1x1; 2x2; 3x3 (Customer choice)				
Field of View	deg	42 *				
Operating Temperature with detector base at 20C	K	220-240				

* $\geq 42^\circ$ FOV available only for hemispherically immersed devices with D* reduced by a factor of 3

** Recommended cooler current is specified with each detector.

***TE-cooled devices require heat sinks with thermal resistances $\leq 3\text{K/W}$

TYPICAL OPERATING CIRCUIT



CAUTION

- CW optical power must not exceed $20\text{W}/\text{cm}^2$!
- Pulses shorter than $1\mu\text{s}$ must not exceed $10\text{kW}/\text{cm}^2$!
- Do NOT apply bias voltage!

We supply compatible low-noise preamplifiers with bandwidths from DC to 200 MHz or, AC-coupled, to 500^+ MHz. These detectors require no bias voltage, exhibit no $1/f$ (flicker) noise, and thus have optimum performance from DC to very high frequencies.



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