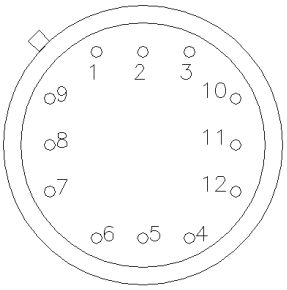
PCI-2TE Series
IR Photoconductor

2-12µm Spectrally Tailored IR Photoconductors
Themoelectrically Cooled, Optically Immersed

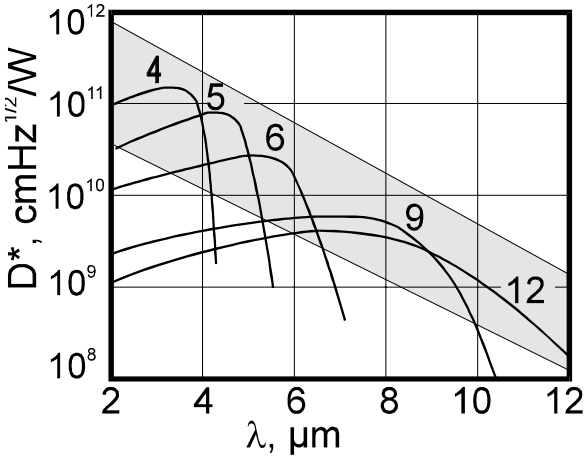
FEATURES

- high performance in the 2-12µm range *without* LN_2-cooling!
- fast response
- convenient to use
- wide dynamic range
- compact, rugged and reliable
- low cost

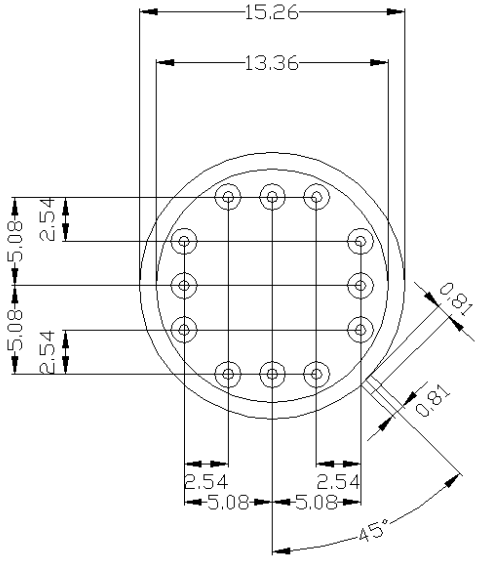


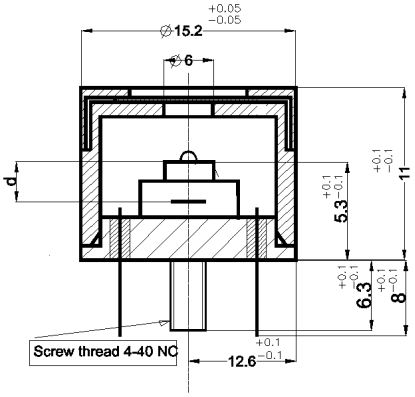
1 – Detector (+)
2 – TE Cooler (+)
3 – Detector (–)
4 – Thermistor
5 – TE Cooler (–)
6 – Thermistor
7 – Not in use
8 – Ground
(BOLT–DOWN ONLY)
9 – Ground
(ALL OTHER)
10– Not in use
11– Not in use
12– Not in use

SPECTRAL RESPONSE



Typical spectral detectivities of PCI-2TE-series photoconductors at 100 kHz. 1/f noise is a consideration below 10 kHz.





PCI-L-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.

Boston Electronics Corporation, 91 Boylston Street, Brookline MA 02445
(800)347-5445 or (617)566-3821 * fax (617)731-0935 * boselec@boselec.com * www.boselec.com

DESCRIPTION

PCI-2TE-n series photodetectors (where n is wavelength λ_{op}, in micrometers, for which the detector is optimized) are two-stage TE-cooled IR photoconductors which have been optically immersed on high refractive index CdZnTe hyperhemispherical lenses. These devices can be optimized for maximum performance anywhere from 2 to 12 μm. High performance and stability are achieved by using newly developed variable gap semiconductor Hg-Cd-Zn-Te as well as graded composition and doping level profiles and optimized surface processing.

SPECIFICATIONS

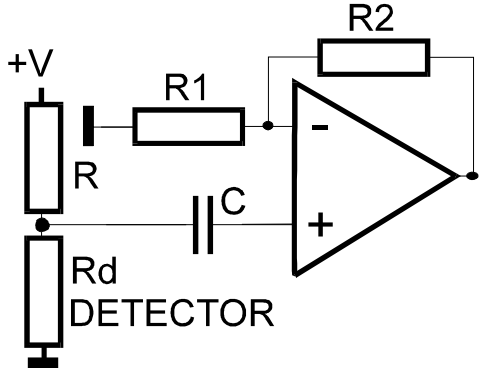
Specifications are subject to change without notice. Specifications measured @20°C, 1x1 active area.

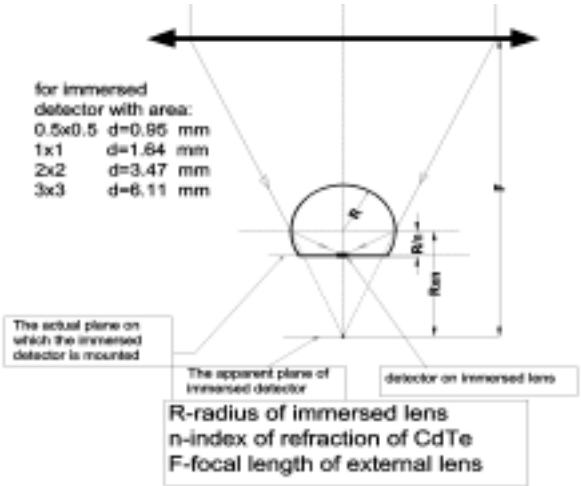
Characteristics	Units	PCI-2TE-4	PCI-2TE-5	PCI-2TE-6	PCI-2TE-9	PCI-2TE-12
Optimization Wavelength	μm	4	5	6	9	12
Detectivity at λ_p	$cmHz^{1/2}/W$	$>1\cdot10^{11}$	$>5\cdot10^{10}$	$>3\cdot10^{10}$	$>2\cdot10^{9}$	$>1\cdot10^{9}$
Detectivity at λ_{op}	$cmHz^{1/2}/W$	$>7\cdot10^{10}$	$>2\cdot10^{10}$	$>1\cdot10^{10}$	$>7\cdot10^{8}$	$>1\cdot10^{8}$
Responsivity × Width at λ_p	Vxmm/W	>1000	>900	>500	>150	>10
Responsivity × Width at λ_{op}	Vxmm/W	>500	>400	>100	>30	>1
Response Time	nsec	<3000	<1000	<100	<30	<10
1/f Corner Frequency	kHz	0.4 - 4	0.6 - 6	0.8 - 8	1 - 10	1 - 10
Sheet resistivity	Ω per ˜	300 – 400	180 - 300	150 - 200	80 - 160	50 - 80
Bias Current-Width Ratio*	mA/mm	1 - 8	2 - 10	2 - 12	3 - 15	4 - 25
Active Area, Length × Width	mm × mm	0.1×0.1; 0.25×0.25; 0.5×0.5; 1×1; 2×2				
Field of View	deg	42 (60)**				
Operating Temperature.	K	220-230				

*Recommended detector and cooler bias currents are specified with each detector.

**60° FOV available only for hemispherically immersed devices; D* reduced by a factor of 2.

TYPICAL OPERATING CIRCUIT





CAUTION

- CW optical power must not exceed 20 w/cm^2!
- Pulses shorter than 1 μs must not exceed 10 kw/cm^2!
- Avoid overbiasing of detector!
- Avoid overbiasing and opposite polarity biasing of te-cooler!

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