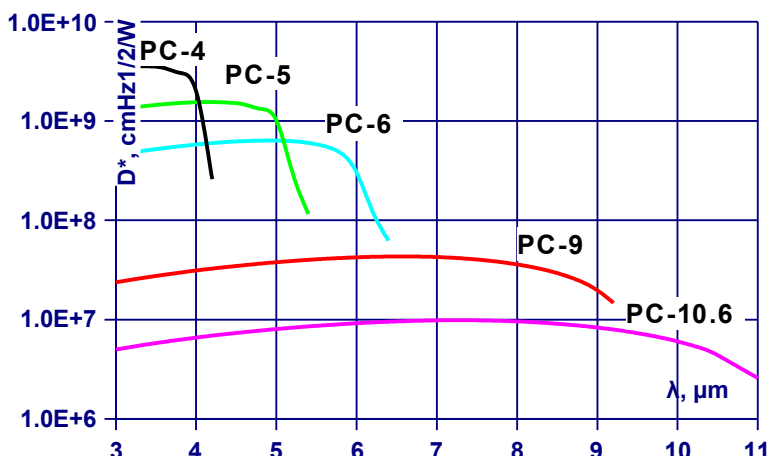
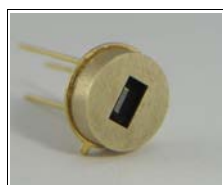


SERIES PC

2-12 μm IR PHOTOCONDUCTORS



FEATURES

- Ambient temperature operation
- $D^*(10.6 \mu\text{m})$ up to $6 \cdot 10^7 \text{ cmHz}^{1/2}/\text{W}$
- Response time of 1 ns or less
- Wide dynamic range
- Perfect match to fast electronics
- Convenient to use
- Low cost
- Prompt delivery
- Custom design upon request

DESCRIPTION

The PC-n series (where n is wavelength λ_{op} , in micrometers, for which the detector is optimized) are high speed, ambient temperature photoconductive mode IR photodetectors. These devices can be optimized for the maximum performance anywhere from 2 to 12 μm . High performance and stability were achieved by using variable gap semiconductors (HgCdTe), optimized composition and doping profiles, and improved surface processing. They are housed in rugged packages of reduced size and weight. Performance data are provided with each detector. The detectors are well suited for heterodyne detection the radiation at high frequencies due to a very short response time and to the perfect match to fast electronics.

Custom devices with quadrant cells, multielement arrays, specialized packages, connectors, windows and optical filters are available on request.

SPECIFICATION

@ 20°C

CHARACTERISTICS	UNITS	PC-4	PC-5	PC-6	PC-9	PC-10.6
λ_{op}	μm	4	5	6	9	10.6
Detectivity: at λ_{peak} , 20kHz at λ_{op} , 20kHz	$\text{cmHz}^{1/2}/\text{W}$	$>4 \times 10^9$ $>2 \times 10^9$	$>2 \times 10^9$ $>1 \times 10^9$	$>6 \times 10^8$ $>3 \times 10^8$	$>6 \times 10^7$ $>2 \times 10^7$	$>1 \times 10^7$ $>4 \times 10^6$
Responsivity-Width product @ λ_{op}	Vmm/W	>100	>40	>6	>0.4	>0.05
Response Time	ns	<1000	<500	<200	<2	<1
1/f Corner Frequency	kHz	1 to 10	1 to 10	1 to 10	1 to 10	1 to 20
Active Area, (length × width)	mm × mm	0.05×0.05; 0.1×0.1; 0.25×0.25; 0.5×0.5; 1×1; 2×2; 3×3; 4×4				
Bias current-Width Ratio*	mA/mm	1 to 10	1 to 10	1 to 10	1 to 10	1 to 20
Sheet Resistivity	Ω/square	300 to 1000	200 to 400	100 to 300	50 to 150	40 to 120
Acceptance angle, F#*	deg	60, 0.5				

* Data sheet states minimum D^* values for each detector model. Higher performance detectors can be provided upon request. See application notes for more details.



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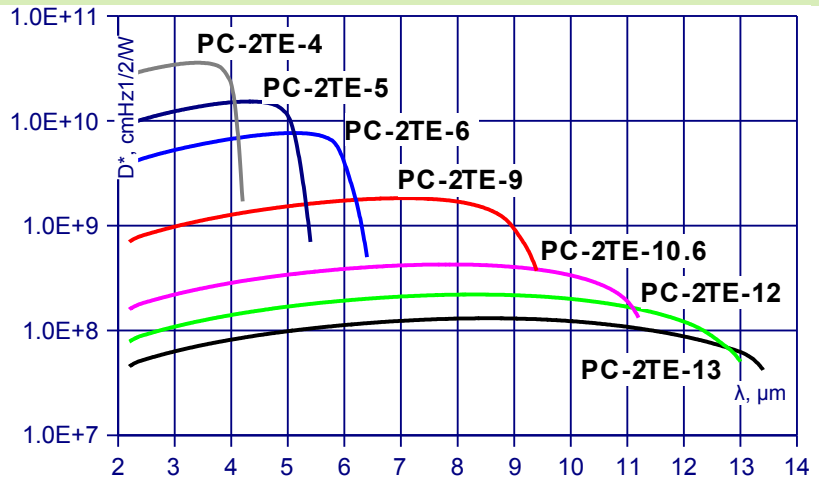
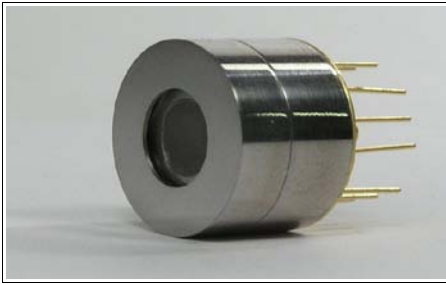
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AP, 16.12.05

SERIES PC-2TE

2-12 μm IR PHOTOCONDUCTORS THERMOELECTRICALLY COOLED



FEATURES

- High performance in the 2-14 μm range without LN-cooling
- Fast response
- Convenient to use
- Wide dynamic range
- Compact, rugged and reliable
- Low cost
- Prompt delivery
- Custom design upon request

DESCRIPTION

The PC-2TE-n (where n is wavelength λ_{op} , in micrometers, to which the detector is optimized) series photodetectors are two-stage TE-cooled IR photoconductive detectors, which have been optically immersed to high refractive index GaAs (or CdZnTe) hyperhemispherical (standard) or hemispherical (option) lenses. These devices can be optimized for the maximum performance anywhere within 2 to 14 μm range. High performance and stability were achieved by using a variable gap (Hg,Cd,Zn)Te semiconductors, optimized doping and improved surface processing. Custom devices with quadrant cells, multielement arrays, various immersion lenses, windows and optical filters are available on request.

Standard detectors are available in modified TO-8 packages with BaF₂ windows. Other packages, windows and connectors are available upon request. See application notes for more details.

SPECIFICATION*

@ 20°C

CHARACTERISTICS	UNITS	PC-2TE-4	PC-2TE-5	PC-2TE-6	PC-2TE-9	PC-2TE-10.6	PC-2TE-12	PC-2TE-13
λ_{op}	μm	4	5	6	9	10.6	12	13
Detectivity:	cmHz ^{1/2} /W							
at λ_{peak} , 20kHz		>4x10 ¹⁰	>2x10 ¹⁰	>6x10 ⁹	>2x10 ⁹	>5x10 ⁸	>4x10 ⁸	>3x10 ⁸
at λ_{op} , 20kHz		>2x10 ¹⁰	1x10 ¹⁰	>3x10 ⁹	>8x10 ^{8*}	>2.5x10 ^{8**}	>1.5x10 ^{8**}	>6x10 ^{8**}
Responsivity-Width product @ λ_{op} 1x1 mm	V/W	>1000	>500	>70	>5	>3	>1	>0.5
Response Time	ns	<4000	<2000	<1000	<20	<10	<2	<2
1/f Corner Frequency	kHz	1 to 10	1 to 10	1 to 10	1 to 10	1 to 20	1 to 20	1 to 20
Active Area, (length × width)	mm×mm	0.05×0.05; 0.1×0.1; 0.25×0.25; 0.5×0.5; 1×1; 2×2 – customer choice						
Bias current-Width Ratio*	mA/mm	1 to 2	2 to 4	4 to 8	4 to 10	5 to 15	5 to 15	5 to 15
Sheet Resistivity	Ω/sqr	600 to 1500	300 to 500	200 to 400	80 to 200	50 to 150	50 to 150	50 to 150
Acceptance angle, F#	deg	60, 0.5						

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

** For devices with active area below 0.5×0.5



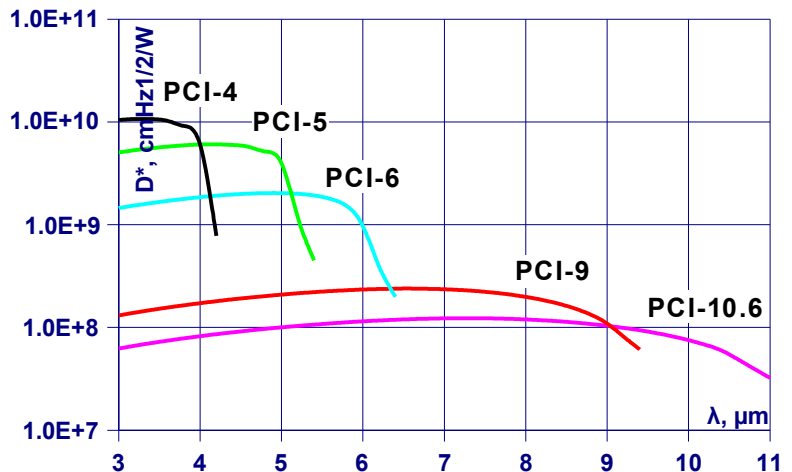
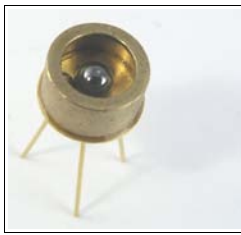
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FEATURES

- Ambient temperature operation!
- D^* (10.6 μm) up to $3 \cdot 10^8$ cmHz^{1/2}/W
- Response time of 1 ns or less
- Wide dynamic range
- Perfect match to fast electronics
- Convenient to use
- Low cost
- Prompt delivery
- Custom design upon request

DESCRIPTION

The PCI-*n* series photodetectors (where *n* is wavelength λ_{op} , in micrometers, for which the detector is optimized) are uncooled IR photoconductors, which have been optically immersed to high refractive index GaAs (or CdZnTe) hyperhemispherical (standard) or hemispherical (optional) lenses. These devices can be optimized for maximum performance anywhere within the 2 to 12 μm range. High performance and stability are achieved by using improved variable gap semiconductors (HgCdTe), optimized composition and doping profiles and improved surface processing. Custom devices with quadrant cells, multielement arrays, specialized packages, connectors, windows and optical filters are available on request.

SPECIFICATION

@ 20°C

CHARACTERISTICS	UNITS	PCI-4	PCI-5	PCI-6	PCI-9	PCI-10.6
λ_{op}	μm	4	5	6	9	10.6
Detectivity: at λ_{peak} , 20kHz at λ_{op} , 20kHz	cmHz ^{1/2} /W	>1x10 ¹⁰ >6x10 ⁹	>7x10 ⁹ >4x10 ⁹	>2x10 ⁹ >1x10 ⁹	>3x10 ⁸ >1x10 ⁸	>2x10 ⁸ >5x10 ⁷
Responsivity- Width product @ λ_{op}	Vmm/W	>600	>300	>60	>3	>2
Response Time	ns	<1000	<500	<200	<2	<1
1/f Corner Frequency	kHz	1 to 10	1 to 10	1 to 10	1 to 10	1 to 20
Active Area, (length x width)	mm x mm	0.25x0.25; 0.5x0.5; 1x1; 2x2				
Bias current-Width Ratio	mA/mm	1 to 2	2 to 4	3 to 10	3 to 15	5 to 20
Sheet Resistivity	Ω/sqr	300 to 1000	200 to 400	100 to 300	50 to 150	40 to 120
Acceptance angle, F#	deg	35, 1.65				

* Data sheet states minimum D^* values for each detector model. Higher performance detectors can be provided upon request. See application notes for more details.



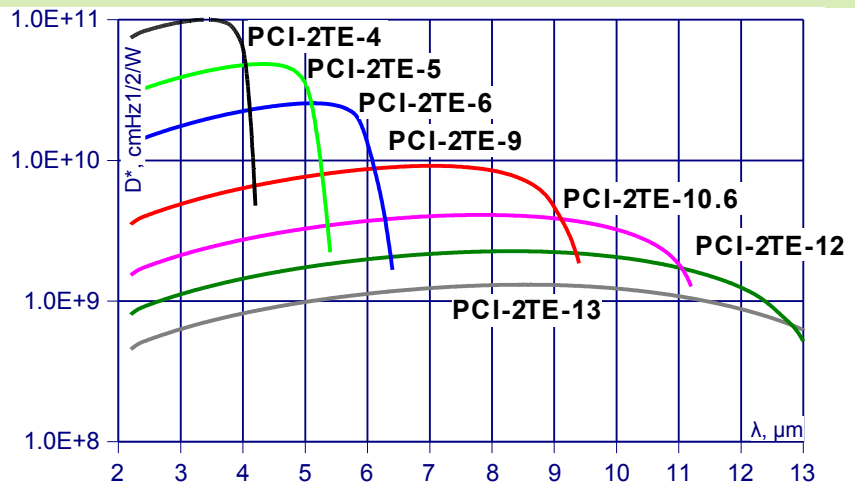
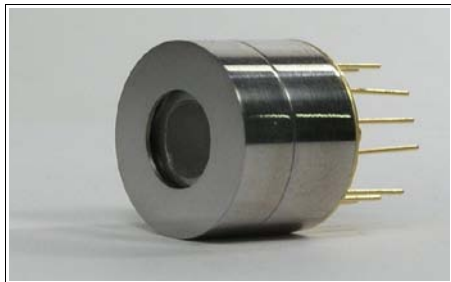
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PCI-2TE-series

2-12 μm IR PHOTOCONDUCTORS THERMOELECTRICALLY COOLED OPTICALLY IMMERSED



● FEATURES

- High performance in the 2-14 μm range without LN-cooling
- Fast response
- Convenient to use
- Wide dynamic range
- Compact, rugged and reliable
- Low cost
- Prompt delivery
- Custom design upon request

● DESCRIPTION

The PCI-2TE-n series photodetectors (where n is wavelength λ_{op} in micrometers at which the detector is optimized) are two-stage TE-cooled IR photoconductive detectors, which have been optically immersed to high refractive index GaAs (or CdZnTe) hyperhemispherical (standard) or hemispherical (optional) lenses. These devices can be optimized for the maximum performance anywhere within the 2 to 14 μm range. High performance and stability were achieved by using a variable bandgap (Hg,Cd)Te semiconductor, optimized doping and improved surface processing. Custom devices with quadrant cells, multielement arrays, various immersion lenses, windows and optical filters are available on request.

Standard detectors are available in modified TO-8 packages with BaF₂ windows. Other packages, windows and connectors are available upon request. See application notes for more details.

SPECIFICATION

@ 20°C

CHARACTERISTICS	UNITS	PCI-2TE-4	PCI-2TE-5	PCI-2TE-6	PCI-2TE-9	PCI-2TE-10.6	PCI-2TE-12	PCI-2TE-13
λ_{op}	μm	4	5	6	9	10.6	12	13
Detectivity: at λ_{peak} , 20kHz at λ_{op} , 20kHz	cmHz ^{1/2} /W	>1x10 ¹¹ >5x10 ¹⁰	>6x10 ¹⁰ >3x10 ¹⁰	>2x10 ¹⁰ >1x10 ¹⁰	>9x10 ⁹ >4x10 ⁹	>5x10 ⁹ >2.5x10 ⁹	>4x10 ⁹ >1.5x10 ⁹	>2x10 ⁹ >6x10 ⁸
Responsivity-Width product @λ_{op} 1x1 mm	Vmm/W	>6000	>3000	>600	>40	>25	>15	>5
Response Time	ns	<4000	<2000	<1000	<20	<10	<2	<2
1/f Corner Frequency	kHz	1 to 10	1 to 10	1 to 10	1 to 10	1 to 20	1 to 20	1 to 20
Active Area, (length x width)	mm x mm	0.25x0.25; 0.5x0.5; 1x1; 2x2;						
Bias current-Width Ratio*	mA/mm	0.05 to 0.3	0.1 to 0.5	0.3 to 0.8	2 to 5	5 to 20	5 to 20	5 to 20
Sheet Resistivity	Ω/sqr	600 to 1500	300 to 500	200 to 400	50 to 200	50 to 150	50 to 150	50 to 150
Acceptance angle, F#	deg	35, 1.65						

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



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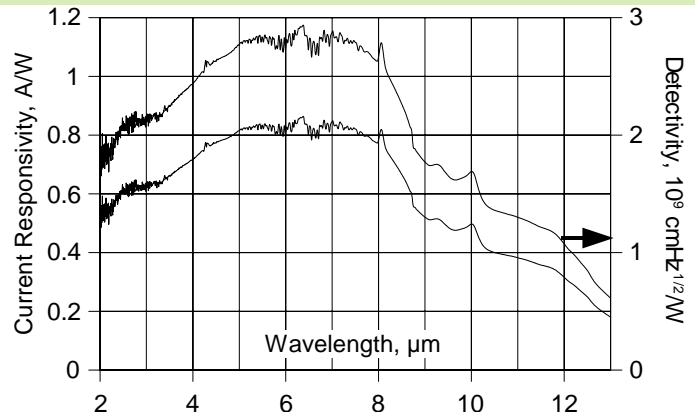
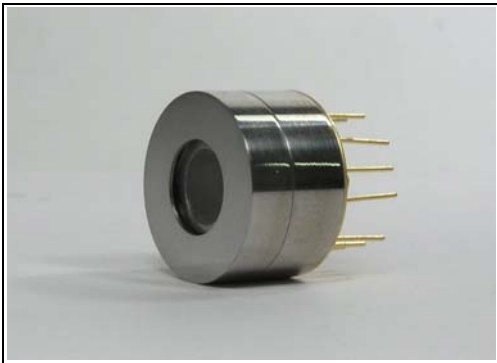
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AP, 29.12.05

PCI-2TE-13

FTIR Optimized 2-13 μm IR PHOTOCONDUCTOR THERMOELECTRICALLY COOLED OPTICALLY IMMERSED



DESCRIPTION The PCI-2TE-13 is a wide spectral band FTIR optimized photodetector. The device operates within the 1-13 μm range, with performance boosted at short wavelength. The responsivity is stabilized with built-in two-stage Peltier cooler. Performance of the devices has been improved with a new heterostructure design, optical resonance and hyperhemispherical optical immersion. Constant voltage bias and current readout should be used for the best sensitivity and linearity.

SPECIFICATION*

@ 20°C

Wavelength	μm	2	4	6	8	10	12	13
Detectivity, 20kHz	cmHz ^{1/2} /W	>1.8x10 ⁹	>2.4x10 ⁹	>2.9x10 ⁹	>2.6x10 ⁹	>1.6x10 ⁹	>1x10 ⁹	>0.6x10 ⁹
Current responsivity at 5 mA bias	A/W	>0.5	>0.7	>0.8	>0.8	>0.45	>0.3	>0.15

Other parameters: response time <10 ns, 1/f noise knee frequency 1÷20 kHz, active area 0.25x0.25; 0.5x0.5; 1x1; 2x2 mm, bias field 5-10 V/cm, sheet resistivity 50-100 ohm, acceptance angle 35 deg, minimum f/# 1.6

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

* Detector size 1x1mm²

See application notes for more details.

ACCESSORIES



Stand Alone Preamplifier/Supply



Integrated Preamplifier/Supply/Peltier Controller



Thermoelectric Cooler Controller



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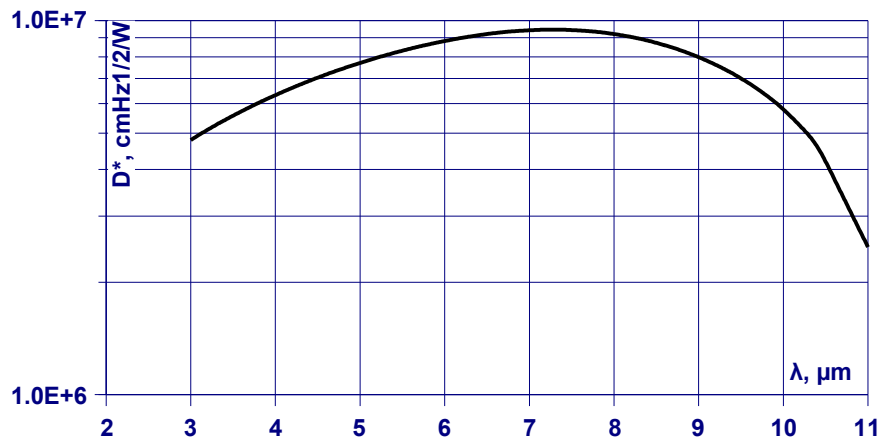
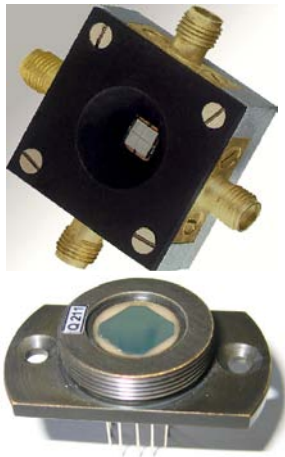
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A.P.28.12.05

SERIES PCQ

2-12 μm IR PHOTOCONDUCTORS QUADRANT GEOMETRY



FEATURES

- Ambient temperature operation!
- D^* (10.6 μm) up to $6 \cdot 10^7 \text{ cmHz}^{1/2}/\text{W}$
- Response time of 1 ns or less
- Wide dynamic range
- Perfect match to fast electronics
- Convenient to use
- Low cost
- Prompt delivery
- Custom design upon request

DESCRIPTION

The PCQ series detectors are quadrant, high speed, ambient temperature photoconductive mode IR photodetectors. These devices are optimized for the maximum performance at 10.6 μm . High performance and stability are achieved by using an improved variable gap semiconductors (HgCdTe), optimized composition and doping profiles and improved surface processing. The detectors are well suited for pulsed or modulated CO_2 laser application over an extremely wide frequency band due to a very short response time and to their excellent match to fast electronics.

Custom devices such as single elements of various sizes, connectors, windows and optical filters are available on request. Optically immersed devices with performance improved by a factor of 7 are available upon request.

SPECIFICATION

@ 20°C

CHARACTERISTICS	UNITS	PCQ-10.6
λ_{op}	μm	10.6
Detectivity: at λ_{peak} , 100kHz at λ_{op} , 100kHz	$\text{cmHz}^{1/2}/\text{W}$	$>1 \times 10^7$ $>4 \times 10^6$
Responsivity- Width product @ λ_{op}	Vmm/W	>0.05
Response Time	ns	<1
1/f Corner Frequency	kHz	1 to 20
Single element Active Area, (length \times width)	mm \times mm	0.05 \times 0.05; 0.1 \times 0.1; 0.25 \times 0.25; 0.5 \times 0.5; 1 \times 1; 2 \times 2; 3 \times 3; 4 \times 4
Bias current- Width Ratio*	mA/mm	1 to 20
Sheet Resistivity	Ω/square	40 to 120
Acceptance angle, F#*	deg	60, 0.5

* Data sheet states minimum D^* values for each detector model. Higher performance detectors can be provided upon request. See application notes for more details.



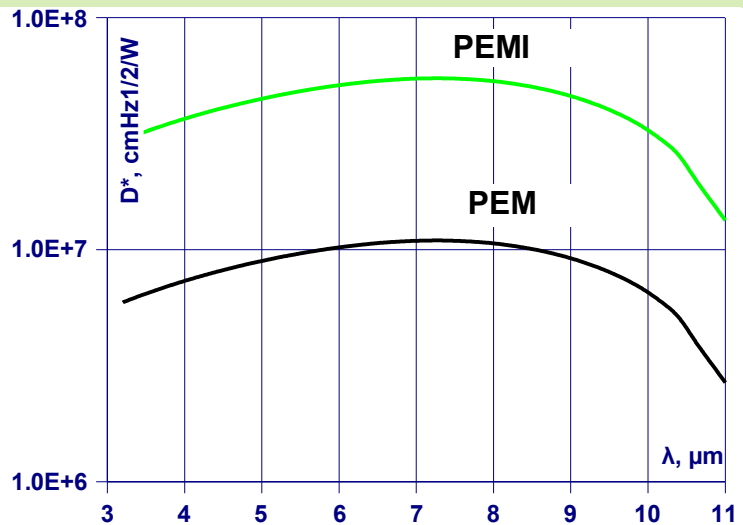
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PEM- and PEMI-Series

10.6 μm PHOTOELECTROMAGNETIC IR DETECTORS AMBIENT TEMPERATURE OPTICALLY IMMERSED or not



FEATURES

- Ambient temperature operation
- No bias required
- Wide spectral range (2-12 μm)
- $D^*(10.6 \mu\text{m})$ up to $2 \cdot 10^7 \text{ cmHz}^{1/2}/\text{W}$
- Response time of 1 ns or less
- No flicker (1/f) noise
- Operation from DC to HF
- Lightweight, rugged and reliable
- Convenient to use
- Low cost
- Custom design upon request

DESCRIPTION

The PEM- and PEMI-series detectors are photovoltaic and operate on the photoelectromagnetic effect. The devices are typically optimized for the best performance at 10.6 μm . PEMI-types are optically immersed on high refractive index GaAs hyperhemispherical (standard) or hemispherical (optional) lenses. The detector include an advanced semiconductor (Hg,Cd)Te with controlled composition and doping profiles, and miniature permanent magnets to produce very strong magnetic fields. PEM and PEMI detectors are exceptionally well suited for heterodyne detection of 10.6 μm radiation. Exhibiting no flicker (1/f) noise, and they can be used simultaneously for detection of CW and low frequency modulated radiation in the whole 2-12 μm spectral range. Custom detectors such as quadrant cells and multielement arrays, various specialized packages and connectors are available upon request.

SPECIFICATION*

@ 20°C

CHARACTERISTICS	UNITS	PEM-10.6	PEMI-10.6
λ_{op}	μm	10.6	10.6
Detectivity: at λ_{peak} at λ_{op}	$\text{cmHz}^{1/2}/\text{W}$	$\geq 1.5 \times 10^7$ $\geq 4 \times 10^6$	$\geq 8 \times 10^7$ $\geq 2 \times 10^7$
Responsivity	V/W	≥ 0.04	≥ 0.2
Response time	ns	≤ 1	≤ 1
Resistance	Ω	40 to 100	40 to 100
Optical area length*width	mm*mm	0.1*0.1; 0.25*0.25; 0.5*0.5; 1*1; 2*2	
Operating temperature	K	300	
Field of view, F/#	deg	60, 0.5	38, 1.65

* Data sheet states minimum D^* values for each detector model. Higher performance detectors can be provided upon request. See application notes for more details.



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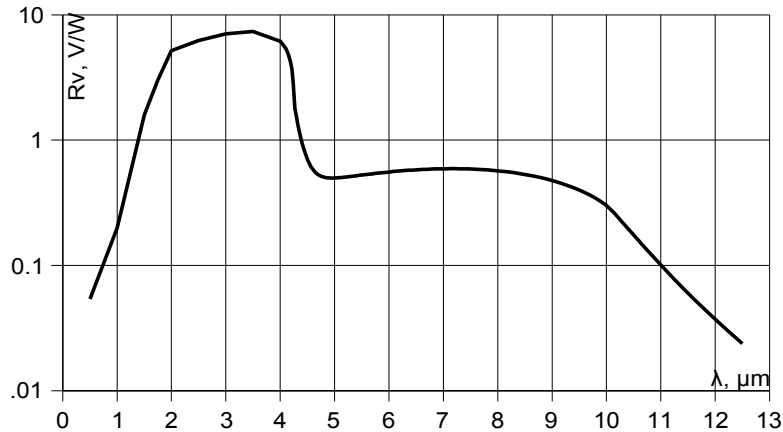
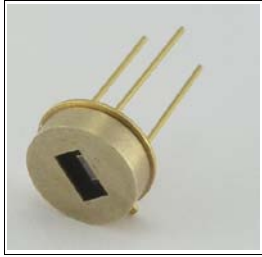
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MPC SERIES

MULTISPECTRAL IR PHOTOCONDUCTORS AMBIENT TEMPERATURE



FEATURES

- Wide spectral range (0.5-12 μm)
- $D^*(1.06 \mu\text{m})$ up to $1 \times 10^7 \text{ cmHz}^{1/2}/\text{W}$
- $D^*(10.6 \mu\text{m})$ up to $4 \times 10^6 \text{ cmHz}^{1/2}/\text{W}$
- Response time of 1 ns
- High output signal
- Perfect match to fast electronics
- Lightweight, rugged and reliable
- Convenient to use
- Low cost

DESCRIPTION

Spectral response optimized for maximum performance at two wavelengths 1.06 and 10.6 μm . Devices are typically mounted in modified TO-39-style packages with ZnSe windows or without any window. Specialized packages with other connectors and windows are available upon request.

SPECIFICATION*

@ 20°C

Wavelength,	μm	1.06	10.6
Detectivity, 20kHz	$\text{cmHz}^{1/2}/\text{W}$	$>1 \times 10^7$	$>4 \times 10^6$
Voltage responsivity-width product	$\text{V} \cdot \text{mm}/\text{W}$	>0.3	>0.05

Other parameters: response time (10.6 μm) $<1 \text{ ns}$, $1/f$ noise knee frequency 1 to 20 kHz, active area 0.25x0.25; 0.5x0.5; 1x1; 2x2 mm, bias field 0.8 to 1.6 V/cm, sheet resistivity 40 to 80 ohm

* Data sheet states minimum D^* values for each detector model. Higher performance detectors can be provided upon request.

ACCESSORIES

Stand Alone
Pre-amplifier/Supply



Integrated Pre-amplifier/Supply



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