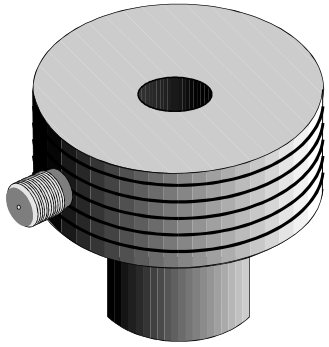
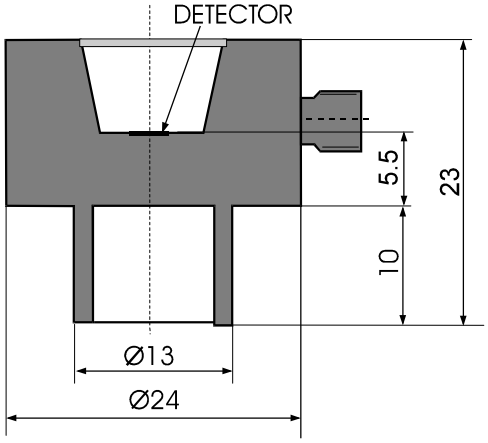
PEM-L Series
Photovoltaic CO_2 Laser Detector

FAST CO_2 LASER DETECTORS
2-12 µm PHOTOVOLTAIC
ROOM TEMPERATURE

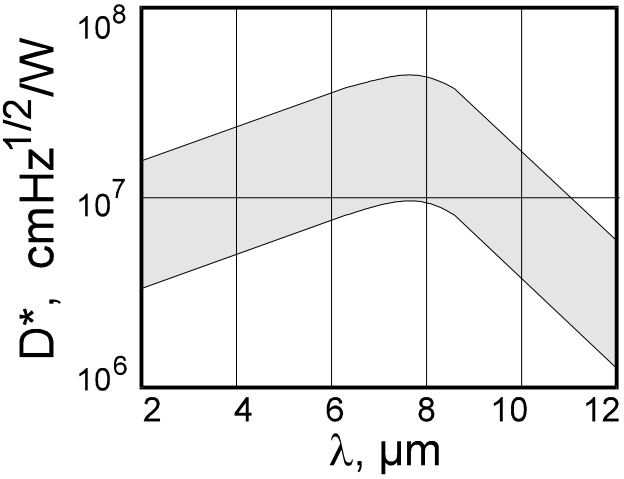


FEATURES

- Ambient temperature operation
- No bias required
- Wide spectral range (<2-12 µm)
- D*(10.6 µm) >4x10^6 cmHz$^{1/2}$/W
- Response time of <0.5 nsec
- No flicker (*1/f*) noise
- Operation from DC to >800MHz
- Lightweight, rugged and reliable
- Very convenient to use



SPECTRAL RESPONSE



Typical spectral detectivity of PEM-L detectors as a function of wavelength. Spectral detectivities can be tailored upon request within the range indicated.

Devices are mounted in specialized packages with SMA connectors designed for wide bandwidth applications. A permanent magnet bias circuit is incorporated in the package. A BaF_2 window is supplied as a standard.

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DESCRIPTION

PEM-L series detectors operate on the photoelectromagnetic effect, and produce photovoltage in response to incoming photons. The devices are optimized for performance at 10.6 µm but are useful at other wavelengths also. Recent improvements include the newly developed quaternary semiconductor (HgCdZnTe) with selected composition and doping profiles, and use of miniature rare-earth permanent magnets to produce very strong magnetic fields. The PEM-L series detectors offer both sensitivity and speed against laser sources. Measured performance data are provided with each detector.

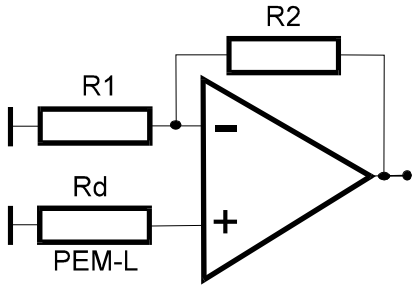
PEM-L detectors are well suited for heterodyne detection of 10.6 µm radiation due to their very short response time and to their perfect match to fast electronics. Exhibiting no *1/f* (flicker) noise, they can also be used for detection of CW and low frequency modulated radiation in the whole 2-12 µm spectral range.

SPECIFICATIONS

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

Characteristics	Units	PEM-L-3
Spectral range	µm	2 - 12
Response time	nsec	<0.5
Detectivity (peak)	$cmHz^{1/2}/W$	$>8x10^6$
Detectivity (10.6 µm)	$cmHz^{1/2}/W$	$>4x10^6$
Responsivity-Width product (10.6 µm)	Vxmm/W	>0.04
Element Area	mm^2	0.05x0.05, 0.1x0.1, 0.2×0.2; 0.5×0.5; 1×1; 2×2
Field of View	deg	>60
Resistivity	Ω	40 - 80
Max. signal per unit length Single Pulses, τ<1 µsec CW	V/mm	 >0.60 >0.008

TYPICAL OPERATING CIRCUIT



CAUTION

- CW optical power must not exceed $100W/cm^2$!
- Pulses shorter than 1µs must not exceed $1MW/cm^2$!
- Avoid biasing!

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.