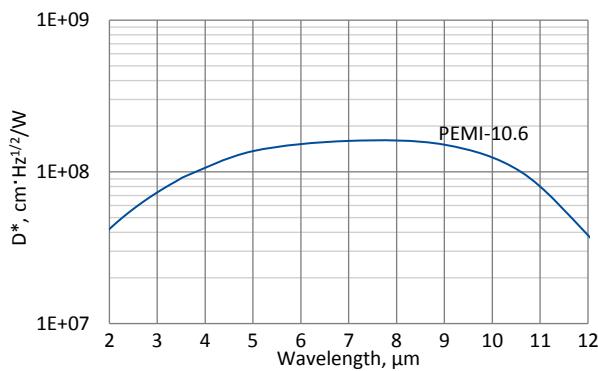


## 2.24 PEMI series

### 2.24.1 2.0 – 12.0 $\mu\text{m}$ HgCdTe ambient temperature, optically immersed photoelectromagnetic detectors

**PEMI series** features uncooled HgCdTe photovoltaic optically immersed IR detectors based on photoelectromagnetic effect in the semiconductor – spatial separation of optically generated electrons and holes in the magnetic field. The devices are designed for the maximum performance at 10.6  $\mu\text{m}$  and especially useful as large optical area detectors to detect CW and low frequency modulated radiation. These devices are mounted in specialized packages with incorporated magnetic circuit inside. 3° wedged zinc selenide anti-reflection coating (wZnSeAR) window prevents unwanted interference effects and protects against pollution.

#### Spectral response ( $T_a = 20^\circ\text{C}$ )

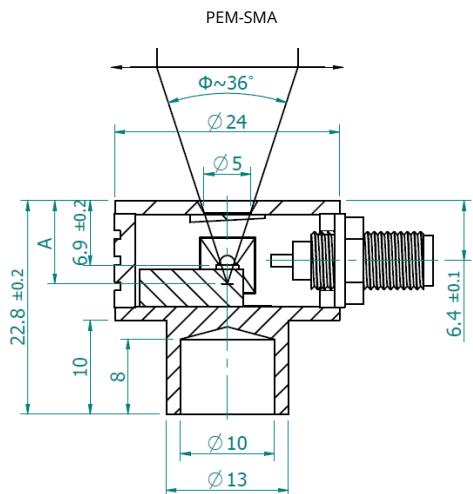


Exemplary spectral detectivity, the spectral response of delivered devices may differ.

#### Specification ( $T_a = 20^\circ\text{C}$ )

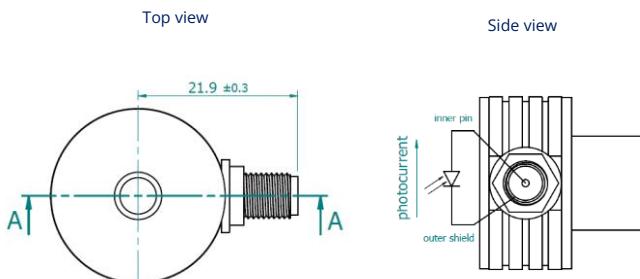
Parameter	Detector type
	PEMI-10.6
Active element material	epitaxial HgCdTe heterostructure
Optimum wavelength $\lambda_{\text{opt}}$ , $\mu\text{m}$	10.6
Detectivity $D^*(\lambda_{\text{peak}})$ , $\text{cm} \cdot \text{Hz}^{1/2} / \text{W}$	$\geq 1.6 \times 10^8$
Detectivity $D^*(\lambda_{\text{opt}})$ , $\text{cm} \cdot \text{Hz}^{1/2} / \text{W}$	$\geq 1.0 \times 10^8$
Current responsivity-optical area length product $R_i(\lambda_{\text{opt}}) \cdot L$ , $\text{A} \cdot \text{mm} / \text{W}$	$\geq 0.01$
Time constant $\tau$ , ns	$\leq 1.2$
Resistance $R$ , $\Omega$	40 to 100
Optical area $A_o$ , mm $\times$ mm	1×1, 2×2
Package	PEM-SMA, PEM-T08
Acceptance angle $\Phi$	~36°
Window	wZnSeAR

### Mechanical layout, mm

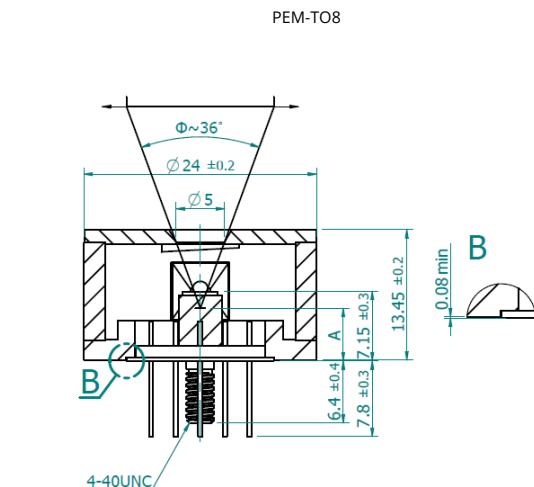
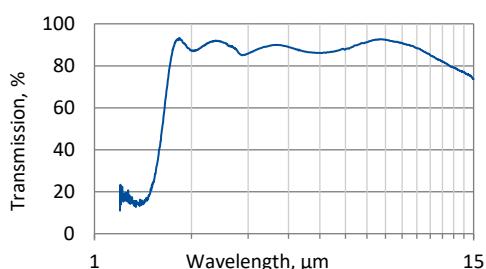


Parameter	Value	
Immersion microlens shape	hyperhemisphere	
Optical area $A_o$ , mm $\times$ mm	1 $\times$ 1	2 $\times$ 2
R, mm	0.8	1.25
A, mm	$9.3 \pm 0.4$	$10.65 \pm 0.40$

$\Phi$  – acceptance angle, R – hyperhemisphere microlens radius, A – distance from the top of PEM-SMA lid to the focal plane

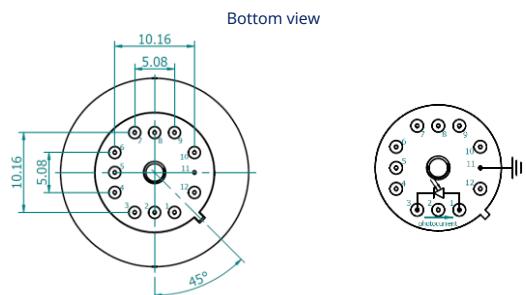


### Spectral transmission of wZnSeAR window (typical example)



Parameter	Value	
Immersion microlens shape	hyperhemisphere	
Optical area $A_o$ , mm $\times$ mm	1 $\times$ 1	2 $\times$ 2
R, mm	0.8	1.25
A, mm	$4.75 \pm 0.30$	$3.4 \pm 0.4$

$\Phi$  – acceptance angle, R – hyperhemisphere microlens radius, A – distance from the bottom of PEM-T08 header to the focal plane



Function	Pin number
Detector	1, 3
Chassis ground	11
Not used	2, 4, 5, 6, 7, 8, 9, 10, 12

### Dedicated preamplifier



standard MIP