INFRARED DETECTORS AND MODULES – CONFIGURABLE LINE

VIGO offers various types of infrared detectors based on Mercury Cadmium Telluride, Indum Arsenide and Indium Arsenide Antimonide featuring different parameters.

Main features

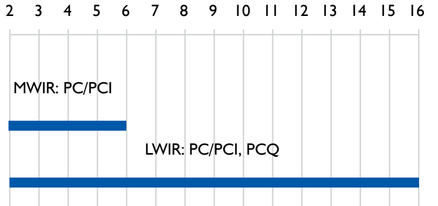
- Optimized at any wavelength from 2 – 14 μm spectral range
- With or without immersion technology
- Uncooled or thermoelectrically cooled
- Different sizes of active/optical area
- Different packages
- Different infrared windows
- Different acceptance angle
- Wide range of dedicated preamplifiers and accessories

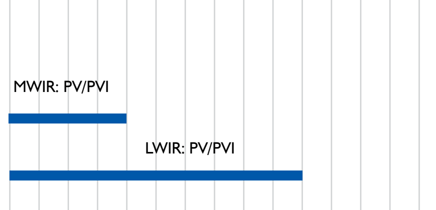
How to choose an infrared detector?

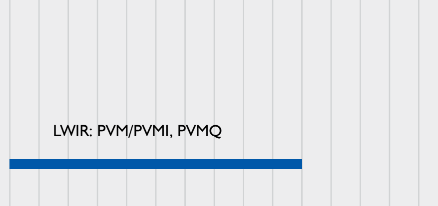
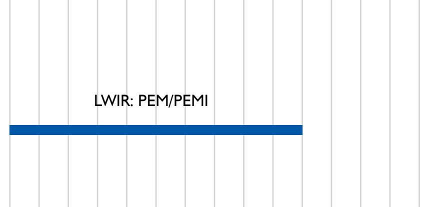
For making a detector selection, following points should be taken into consideration:

- wavelength or wavelength range,
- detectivity,
- speed of response.

VIGO detectors are optimized for various wavelengths. Depending on the required parameters a proper detector type should be selected.

Detector series	Spectral response range, μm	Features
HgCdTe (MCT) **photoconductive detectors**	 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 MWIR: PC/PCI LWIR: PC/PCI, PCQ	› Broad 1 – 16 μm spectral range › Active area from 25×25 μm^2 to 4×4 mm^2 › High detectivity › Low speed › Long lifetime and MTBF › Stability and reliability › 1/f noise › Uncooled and TE cooled › Immersion microlens technology available

HgCdTe (MCT)
photovoltaic detectors
	 MWIR: PV/PVI
	LWIR: PV/PVI
		› Near BLIP detection in 3 – 6 μm range
		› < 10x gap to BLIP for > 7 μm
		› No bias required
		› No 1/f noise
		› Bandwidth:
		  › tens of MHz (without reverse bias)
		  › ≥ 1GHz (with reverse bias)
		› LWIR devices limited to small areas
		› Uncooled and TE cooled
		› Immersion microlens technology available

HgCdTe (MCT) **photovoltaic multiple junction detectors**	 LWIR: PVM/PVMI, PVMQ	› Wide 2 – 12 μm spectral range › Large active areas up to 4×4 mm^2 › No bias required › No 1/f noise › Short time constant ≤ 1.5 ns › Operation from DC to high frequency › Sensitive to IR radiation polarisation › Uncooled and TE cooled › Immersion microlens technology available
HgCdTe (MCT) **photoelectromagnetic detectors**	 LWIR: PEM/PEMI	› Wide 2 – 12 μm spectral range › Room temperature operation › No bias required › No 1/f noise › Large active area up to 2×2 mm^2 › Short time constant ≤1.2 ns › Sensitive to IR radiation polarisation › Immersion microlens technology available
InAs and InAsSb **photovoltaic detectors**	 MWIR: PVA/PVIA	› Spectral range 2 – 5.5 μm › Temperature stable up to 300°C › Mechanically durable › Complying with the RoHS Directive › No bias required › No 1/f noise › Sensitive to IR radiation polarisation › Uncooled and TE cooled › Immersion microlens technology available

Detector code

Different information such as detector type, optical immersion, number of stages thermoelectric cooler, the wavelength a detector is optimized for, size of active/optical area, package type, window type and acceptance angle combine to create VIGO System's detector code.

Detector type	**Immersion**	**—**	**Cooling**	**—**	**Optimal wavelength**	**—**	**Active/optical area**	**—**	**Package**	**—**	**Window**	**—**	**Acceptance angle**

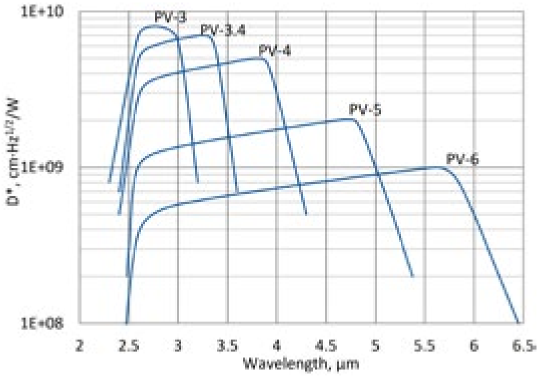
Please see particular detector series datasheets to get available options of each detector type.

PV series

2.5 – 6.5 µm HgCdTe ambient temperature photovoltaic detectors

PV series features uncooled IR photovoltaic detectors based on sophisticated HgCdTe heterostructures for the best performance and stability. The devices are optimized for the maximum performance at λ_{opt}. Cut on wavelength can be optimized upon request. Reverse bias may significantly increase response speed and dynamic range. It also results in improved performance at high frequencies, but 1/f noise that appears in biased devices may reduce performance at low frequencies.

Spectral response (T_a = 20°C, V_b = 0 mV)



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

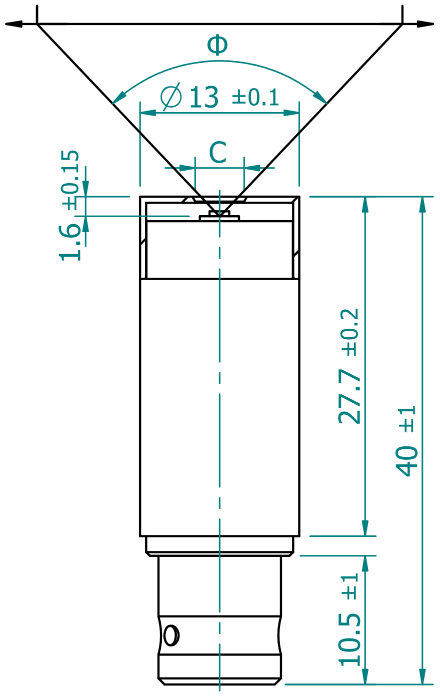
BNC **TO39**

Specification (T_a = 20°C, V_b = 0 mV)

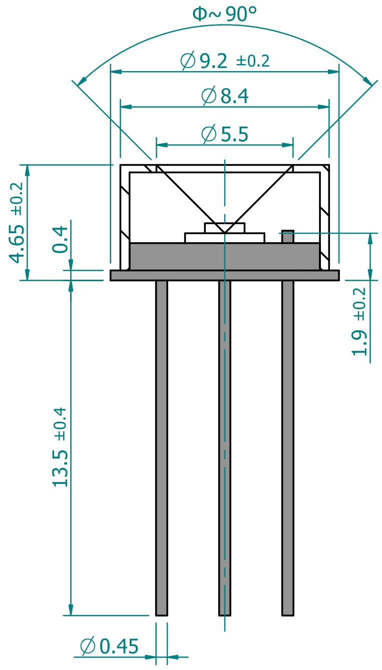
Parameter	Detector type									
	PV-3		PV-3.4		PV-4		PV-5		PV-6	
Active element material	epitaxial HgCdTe heterostructure									
Optimal wavelength λ_{opt}, µm	3.0		3.4		4.0		5.0		6.0	
Detectivity D*(λ_{peak}, 20kHz), cm·Hz$^{1/2}$/W	≥8.0×10^9		≥7.0×10^9		≥5.0×10^9		≥2.0×10^9		≥1.0×10^9	
Detectivity D*(λ_{opt}, 20kHz), cm·Hz$^{1/2}$/W	≥6.5×10^9		≥5.0×10^9		≥3.0×10^9		≥1.0×10^9		≥5.0×10^8	
Current responsivity $R_i(\lambda_{opt})$, A/W	≥0.5		≥0.8		≥1.0		≥1.0		≥1.0	
Time constant τ, ns	≤350		≤260		≤150		≤120		≤80	
Resistance-active area product R·A, Ω·cm^2	≥1		≥0.5		≥0.1		≥0.01		≥0.002	
Active area A, mm×mm	0.05×0.05, 0.1×0.1									
Package	TO39	BNC	TO39	BNC	TO39	BNC	TO39	BNC	TO39	BNC
Acceptance angle Φ	~90°	~102°	~90°	~102°	~90°	~102°	~90°	~102°	~90°	~102°
Window	none									

Mechanical layout, mm

BNC package



TO39 package

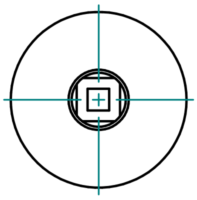


Φ – *acceptance angle*

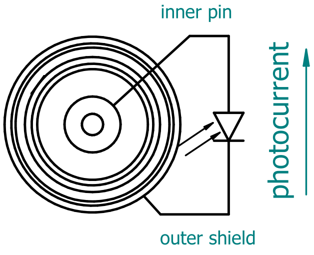
Parameter	Value
Active area, mm×mm	0.05×0.05 – 0.1×0.1
C, mm	Ø4
Acceptance angle Φ	~102°

C – aperture

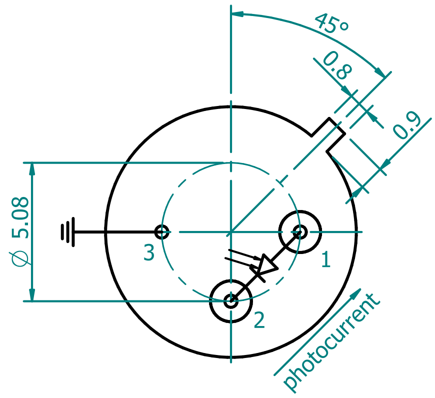
Top view



Bottom view



Bottom view



Function	Pin number
Detector	1, 2
Chassis ground	3

Dedicated preamplifiers

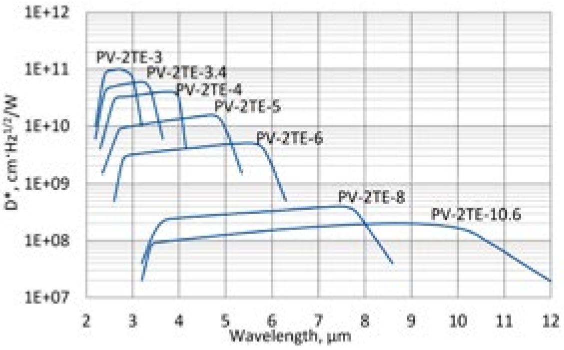
small SIP-TO39

PV-2TE series

2 – 12 µm HgCdTe two-stage thermoelectrically cooled photovoltaic detectors

PV-2TE series features two-stage thermoelectrically cooled IR photovoltaic detectors based on sophisticated HgCdTe heterostructures for the best performance and stability. The devices are optimized for the maximum performance at λ_{opt}. Cut on wavelength can be optimized upon request. Reverse bias may significantly increase response speed and dynamic range. It also results in improved performance at high frequencies, but 1/f noise that appears in biased devices may reduce performance at low frequencies. 3° wedged sapphire (wAl_2O_3) or zinc selenide anti-reflection coated (wZnSeAR) window prevents unwanted interference effects.

Spectral response (T_a = 20°C, V_b = 0 mV)



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

2TE-TO66 **2TE-TO8**

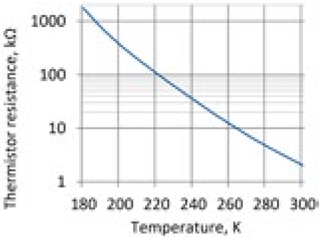
Specification (T_a = 20°C)

Parameter	Detector type						
	PV-2TE-3	PV-2TE-3.4	PV-2TE-4	PV-2TE-5	PV-2TE-6	PV-2TE-8	PV-2TE-10.6
Active element material	epitaxial HgCdTe heterostructure						
Optimal wavelength λ_{opt}, µm	3.0	3.4	4.0	5.0	6.0	8.0	10.6
Detectivity D*(λ_{peak}, 20kHz), cm·Hz$^{1/2}$/W	≥1.0×10^{11}	≥6.0×10^{10}	≥4.0×10^{10}	≥1.5×10^{10}	≥5.0×10^{9}	≥4.0×10^{8}	≥2.0×10^{8}
Detectivity D*(λ_{opt}, 20kHz), cm·Hz$^{1/2}$/W	≥7.0×10^{10}	≥4.0×10^{10}	≥3.0×10^{10}	≥9.0×10^{9}	≥2.0×10^{9}	≥2.0×10^{8}	≥1.0×10^{8}
Current responsivity $R_i(\lambda_{opt})$, A/W	≥0.5	≥0.8	≥1.0	≥1.3	≥1.5	≥0.8	≥0.4
Time constant τ, ns	≤280	≤200	≤100	≤80	≤50	≤45	≤10
Resistance-active area product R·A, Ω·cm^2	≥150	≥3	≥2	≥0.1	≥0.02	≥0.0002	≥0.0001
Active element temperature T_{det}, K	~230						
Active area A, mm×mm	0.05×0.05, 0.1×0.1						0.05×0.05
Package	TO8, TO66						
Acceptance angle Φ	~70°						
Window	wAl_2O_3				wZnSeAR		

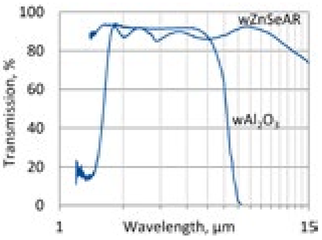
Two-stage thermoelectric cooler parameters

Parameter	Value
T_{det}, K	~230
V_{max}, V	1.3
I_{max}, A	1.2
Q_{max}, W	0.36

Thermistor characteristics

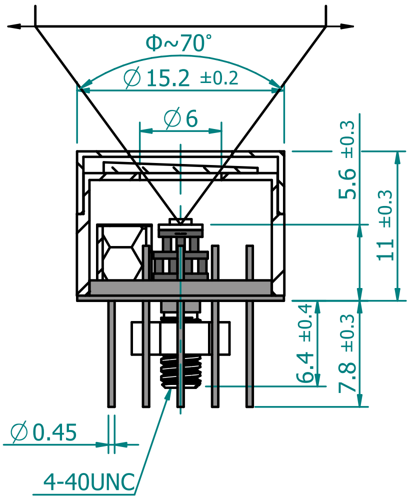


Spectral transmission of wAl_2O_3 and wZnSeAR windows (typical example)



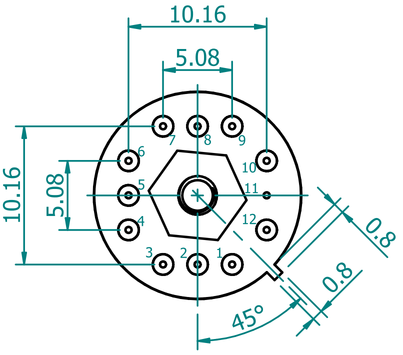
Mechanical layout, mm

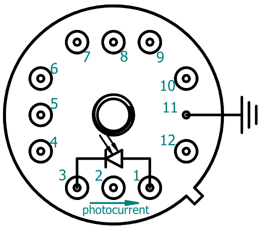
2TE-TO8 package



Φ – *acceptance angle*

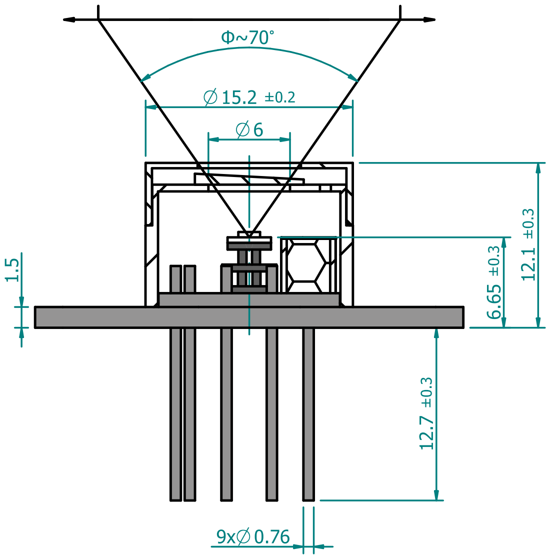
Bottom view





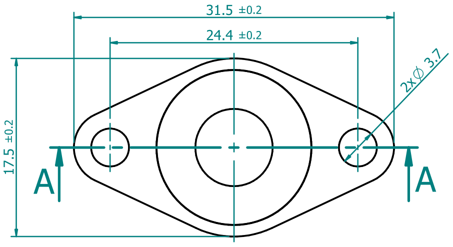
Function	Pin number
Detector	1, 3
Reverse bias (optional)	1(–), 3(+)
Thermistor	7, 9
TE cooler supply	2(+), 8(–)
Chassis ground	11
Not used	4, 5, 6, 10, 12

2TE-TO66 package

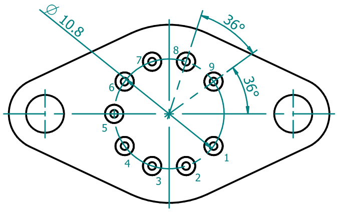


Φ – *acceptance angle*

Top view



Bottom view



Function	Pin number
Detector	7, 8
Reverse bias (optional)	7(+), 8(–)
Thermistor	5, 6
TE cooler supply	1(+), 9(–)
Not used	2, 3, 4

Dedicated preamplifiers


„all-in-one” AIP


programmable PIP


standard MIP


small SIP-TO8

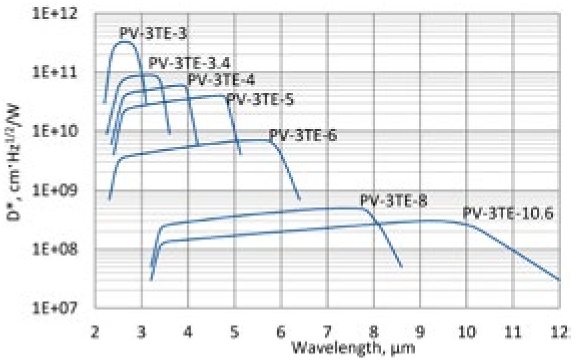

fast FIP

PV-3TE series

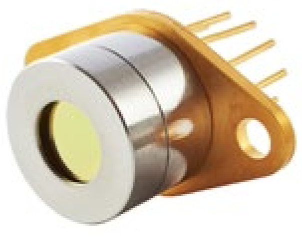
2 – 12 µm HgCdTe three-stage thermoelectrically cooled photovoltaic detectors

PV-3TE series features three-stage thermoelectrically cooled IR photovoltaic detectors based on sophisticated HgCdTe heterostructures for the best performance and stability. The devices are optimized for the maximum performance at λ_{opt}. Cut on wavelength can be optimized upon request. Reverse bias may significantly increase response speed and dynamic range. It also results in improved performance at high frequencies, but 1/f noise that appears in biased devices may reduce performance at low frequencies. 3° wedged sapphire (wAl_2O_3) or zinc selenide anti-reflection coated (wZnSeAR) window prevents unwanted interference effects.

Spectral response (T_a = 20°C, V_b = 0 mV)



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



2TE-TO66

2TE-TO8

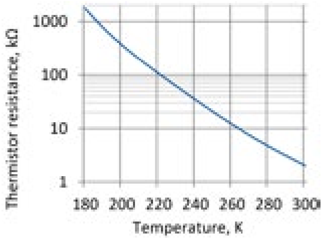
Specification (T_a = 20°C)

Parameter	Detector type						
	PV-3TE-3	PV-3TE-3.4	PV-3TE-4	PV-3TE-5	PV-3TE-6	PV-3TE-8	PV-3TE-10.6
Active element material	epitaxial HgCdTe heterostructure						
Optimal wavelength λ_{opt}, µm	3.0	3.4	4.0	5.0	6.0	8.0	10.6
Detectivity D*(λ_{peak}, 20kHz), cm·$Hz^{1/2}$/W	$\geq 3.0\times10^{11}$	$\geq 9.0\times10^{10}$	$\geq 6.0\times10^{10}$	$\geq 4.0\times10^{10}$	$\geq 7.0\times10^{9}$	$\geq 5.0\times10^{8}$	$\geq 3.0\times10^{8}$
Detectivity D*(λ_{opt}, 20kHz), cm·$Hz^{1/2}$/W	$\geq 1.0\times10^{11}$	$\geq 7.0\times10^{10}$	$\geq 4.0\times10^{10}$	$\geq 1.0\times10^{10}$	$\geq 4.0\times10^{9}$	$\geq 3.0\times10^{8}$	$\geq 1.5\times10^{8}$
Current responsivity $R_i(\lambda_{opt})$, A/W	≥0.5	≥0.8	≥1.0	≥1.3	≥1.5	≥1.0	≥0.7
Time constant τ, ns	≤280	≤200	≤100	≤80	≤50	≤45	≤10
Resistance-active area product R·A, Ω·cm^2	≥240	≥15	≥6	≥0.3	≥0.025	≥0.0004	≥0.0002
Active element temperature T_{det}, K	~210						
Active area A, mm×mm	0.05×0.05, 0.1×0.1						0.05×0.05
Package	TO8, TO66						
Acceptance angle Φ	~70°						
Window	wAl_2O_3				wZnSeAR		

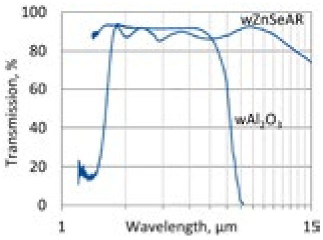
Three-stage thermoelectric cooler parameters

Parameter	Value
T_{det}, K	~210
V_{max}, V	3.6
I_{max}, A	0.45
Q_{max}, W	0.27

Thermistor characteristics

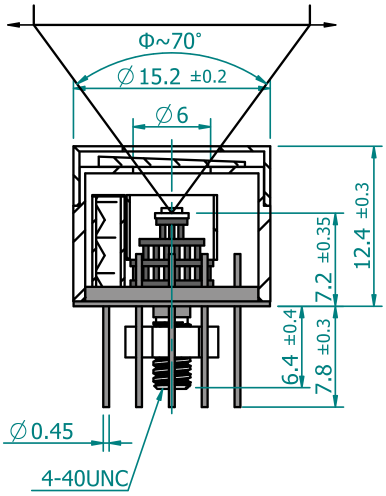


Spectral transmission of wAl_2O_3 and wZnSeAR windows (typical example)



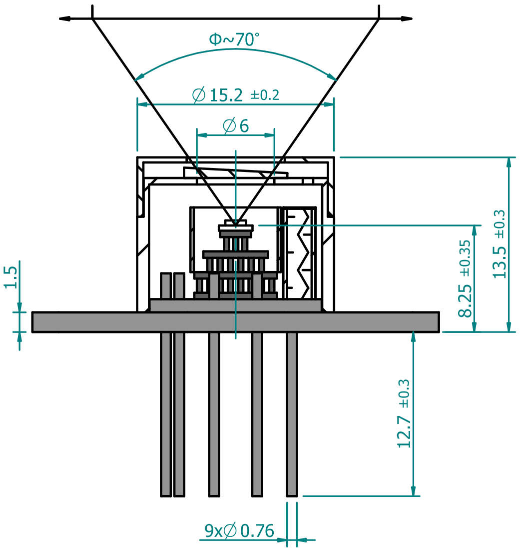
Mechanical layout, mm

3TE-TO8 package



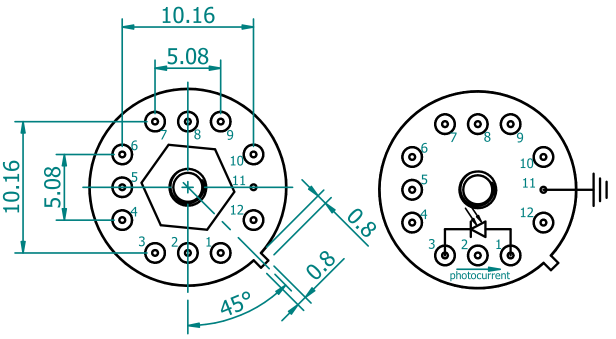
Φ – *acceptance angle*

3TE-TO66 package



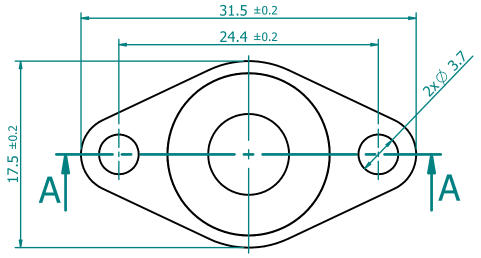
Φ – *acceptance angle*

Bottom view

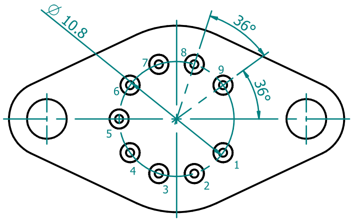


Function	Pin number
Detector	1, 3
Reverse bias (optional)	1(–), 3(+)
Thermistor	7, 9
TE cooler supply	2(+), 8(–)
Chassis ground	11
Not used	4, 5, 6, 10, 12

Top view



Bottom view



Function	Pin number
Detector	7, 8
Reverse bias (optional)	7(+), 8(–)
Thermistor	5, 6
TE cooler supply	1(+), 9(–)
Not used	2, 3, 4

Dedicated preamplifiers


„all-in-one" AIP


programmable PIP


standard MIP


small SIP-TO8

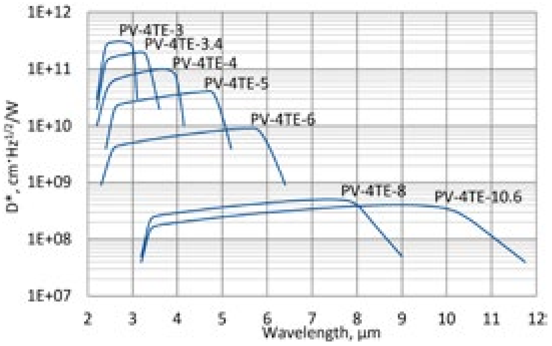

fast FIP

PV-4TE series

2 – 12 µm HgCdTe three-stage thermoelectrically cooled photovoltaic detectors

PV-4TE series features four-stage thermoelectrically cooled IR photovoltaic detectors based on sophisticated HgCdTe heterostructures for the best performance and stability. The devices are optimized for the maximum performance at λ_{opt}. Cut on wavelength can be optimized upon request. Reverse bias may significantly increase response speed and dynamic range. It also results in improved performance at high frequencies, but 1/f noise that appears in biased devices may reduce performance at low frequencies. 3° wedged sapphire (wAl_2O_3) or zinc selenide anti-reflection coated (wZnSeAR) window prevents unwanted interference effects.

Spectral response (T_a = 20°C, V_b = 0 mV)



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

4TE-TO66

2TE-TO8

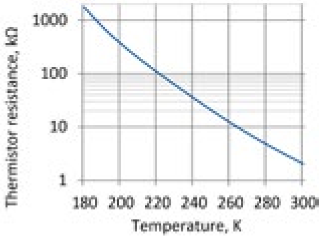
Specification (T_a = 20°C)

Parameter	Detector type						
	PV-4TE-3	PV-4TE-3.4	PV-4TE-4	PV-4TE-5	PV-4TE-6	PV-4TE-8	PV-4TE-10.6
Active element material	epitaxial HgCdTe heterostructure						
Optimal wavelength λ_{opt}, µm	3.0	3.4	4.0	5.0	6.0	8.0	10.6
Detectivity D*(λ_{peak}, 20kHz), cm·Hz$^{1/2}$/W	≥3.0×10^{11}	≥2.0×10^{11}	≥1.0×10^{11}	≥4.0×10^{10}	≥9.0×10^{9}	≥5.0×10^{8}	≥4.0×10^{8}
Detectivity D*(λ_{opt}, 20kHz), cm·Hz$^{1/2}$/W	≥1.5×10^{11}	≥1.0×10^{11}	≥6.0×10^{10}	≥1.5×10^{10}	≥5.0×10^{9}	≥4.0×10^{8}	≥2.0×10^{8}
Current responsivity $R_i(\lambda_{opt})$, A/W	≥0.5	≥0.8	≥1.0	≥1.3	≥1.5	≥1.5	≥0.5
Time constant τ, ns	≤280	≤200	≤100	≤80	≤50	≤45	≤25
Resistance-active area product R·A, Ω·cm^2	≥300	≥20	≥8	≥0.4	≥0.03	≥0.0006	≥0.0005
Active element temperature T_{det}, K	~195						
Active area A, mm×mm	0.05×0.05, 0.1×0.1						
Package	TO8, TO66						
Acceptance angle Φ	~70°						
Window	wAl_2O_3				wZnSeAR		

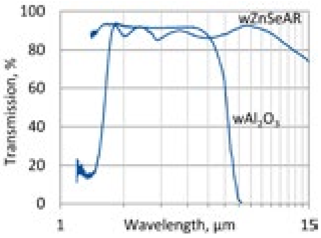
Three-stage thermoelectric cooler parameters

Parameter	Value
T_{det}, K	~195
V_{max}, V	8.3
I_{max}, A	0.4
Q_{max}, W	0.28

Thermistor characteristics

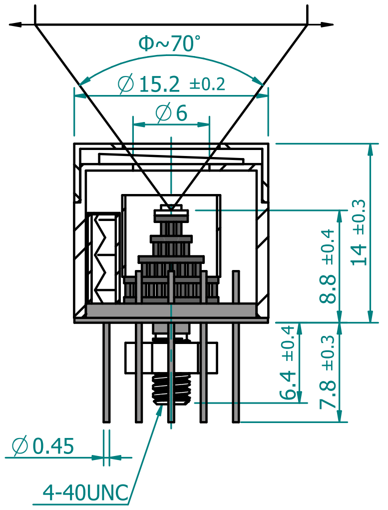


Spectral transmission of wAl_2O_3 and wZnSeAR windows (typical example)



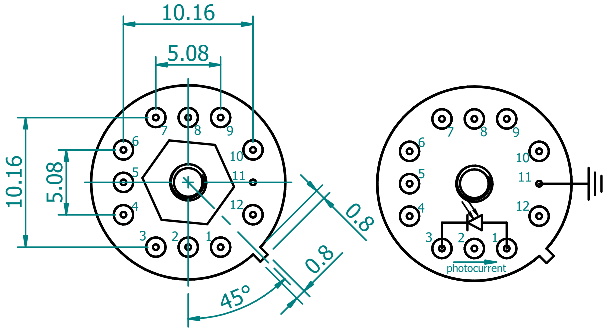
Mechanical layout, mm

4TE-TO8 package



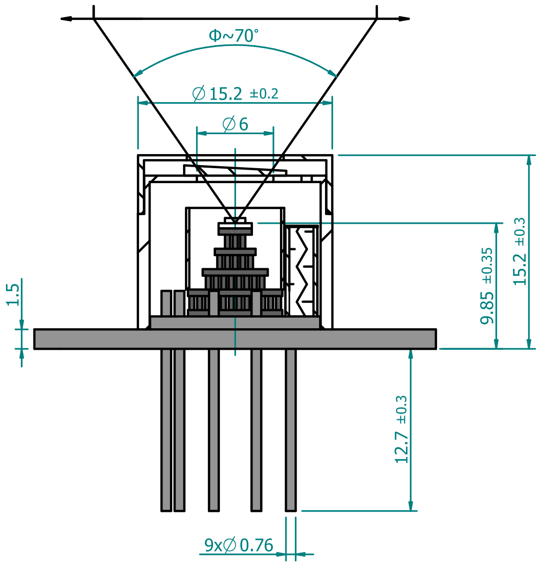
Φ – *acceptance angle*

Bottom view



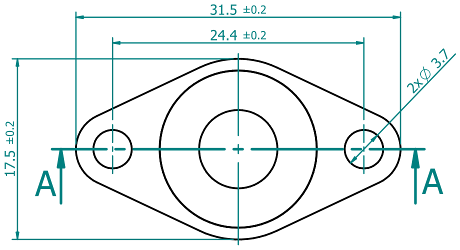
Function	Pin number
Detector	1, 3
Reverse bias (optional)	1(–), 3(+)
Thermistor	7, 9
TE cooler supply	2(+), 8(–)
Chassis ground	11
Not used	4, 5, 6, 10, 12

4TE-TO66 package

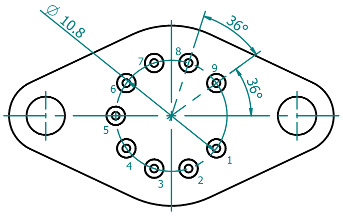


Φ – *acceptance angle*

Top view



Bottom view



Function	Pin number
Detector	7, 8
Reverse bias (optional)	7(+), 8(–)
Thermistor	5, 6
TE cooler supply	1(+), 9(–)
Not used	2, 3, 4

Dedicated preamplifiers


„all-in-one" AIP


programmable PIP


standard MIP


small SIP-TO8

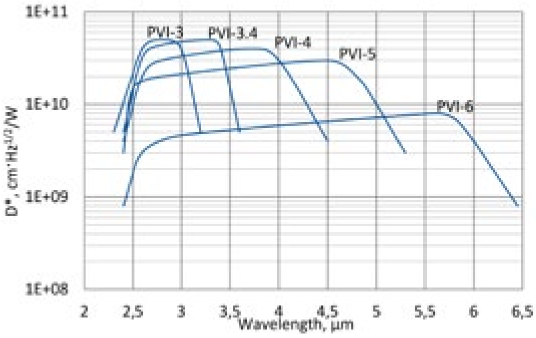

fast FIP

PVI series

2.5 – 6.5 µm HgCdTe ambient temperature, optically immersed photovoltaic detectors

PVI series features uncooled IR photovoltaic detectors detectors based on sophisticated HgCdTe heterostructures for the best performance and stability, optically immersed in order to improve parameters of the devices. The detectors are optimized for the maximum performance at λ_{opt}. Cut-on wavelength can be optimized upon request. Reverse bias may significantly increase speed of response and dynamic range. It results also in improved performance at high frequencies, but 1/f noise that appears in biased devices may reduce performance at low frequencies.

Spectral response (T_a = 20°C, V_b = 0 mV)



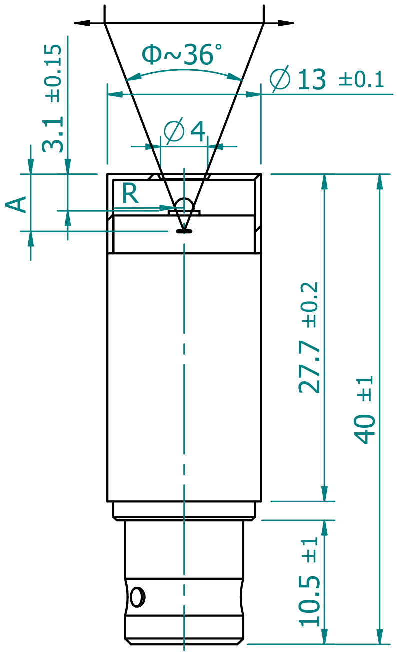
Exemplary spectral detectivity, the spectral response of delivered devices may differ.

Specification (T_a = 20°C, V_b = 0 mV)

Parameter	Detector type				
	PVI-3	PVI-3.4	PVI-4	PVI-5	PVI-6
Active element material	epitaxial HgCdTe heterostructure				
Optimal wavelength λ_{opt}, µm	3.0	3.4	4.0	5.0	6.0
Detectivity D*(λ_{peak}, 20kHz), cm·Hz$^{1/2}$/W	≥5.0×10^{10}	≥5.0×10^{10}	≥3.0×10^{10}	≥1.5×10^{10}	≥8.0×10^{9}
Detectivity D*(λ_{opt}, 20kHz), cm·Hz$^{1/2}$/W	≥5.0×10^{10}	≥4.5×10^{10}	≥2.0×10^{10}	≥9.0×10^{9}	≥4.0×10^{9}
Current responsivity $R_i(\lambda_{opt})$, A/W	≥0.5	≥0.8	≥1.0		
Time constant τ, ns	≤350	≤260	≤150	≤120	≤80
Resistance-active area product R·A, Ω·cm^2	≥100	≥50	≥6	≥1	≥0.2
Optical area A_O, mm×mm	0.5×0.5, 1×1				
Package	TO39, BNC				
Acceptance angle Φ	~36°				
Window	none				

Mechanical layout, mm

BNC package



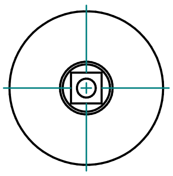
Parameter	Value	
Immersion microlens shape	hyperhemisphere	
Optical area A_o, mm×mm	0.5×0.5	1×1
R, mm	0.5	0.8
A, mm	4.6±0.3	5.5±0.3

Φ – acceptance angle

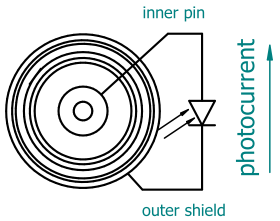
R – hyperhemisphere microlens radius

A – distance from the top of BNC package to the focal plane

Top view



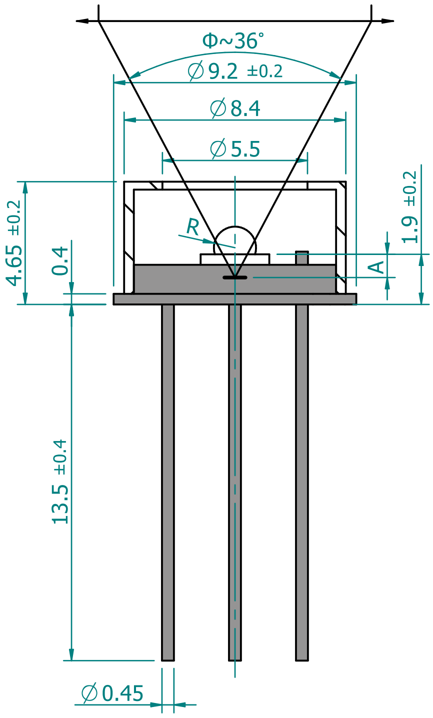
Bottom view



Dedicated preamplifiers

small SIP-TO39

TO39 package



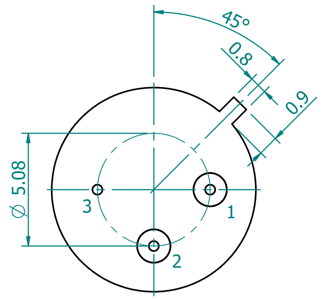
Parameter	Value	
Immersion microlens shape	hyperhemisphere	
Optical area A_o, mm×mm	0.5×0.5	1×1
R, mm	0.5	0.8
A, mm	1.5±0.2	2.4±0.2

Φ – acceptance angle

R – hyperhemisphere microlens radius

A – distance from the bottom of hyperhemisphere microlens to the focal plane

Bottom view



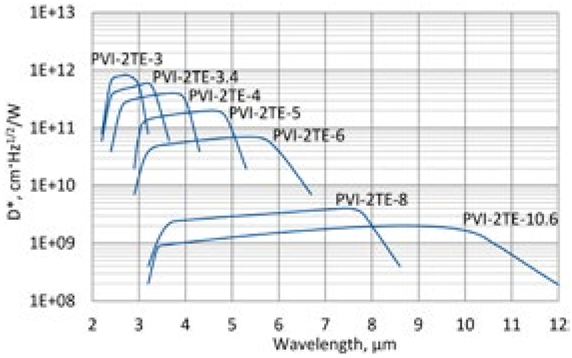
Function	Pin number
Detector	1, 2
Reverse bias (optional)	1(–), 2(+)
Chassis ground	3

PVI-2TE series

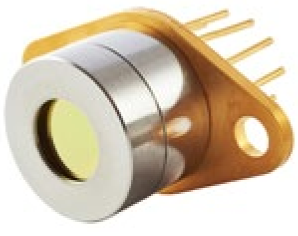
2 – 12 µm HgCdTe two-stage thermoelectrically cooled, optically immersed photovoltaic detectors

PVI-2TE series features two-stage thermoelectrically cooled IR photovoltaic detectors based on sophisticated HgCdTe heterostructures for the best performance and stability, optically immersed in order to improve parameters of the devices. The detectors are optimized for the maximum performance at λ_{opt}. Cut-on wavelength can be optimized upon request. Reverse bias may significantly increase speed of response and dynamic range. It results also in improved performance at high frequencies, but 1/f noise that appears in biased devices may reduce performance at low frequencies. 3° wedged sapphire (wAl_2O_3) or zinc selenide anti-reflection coated (wZnSeAR) window prevents unwanted interference effects.

Spectral response (T_a = 20°C, V_b = 0 mV)



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



2TE-TO66

2TE-TO8

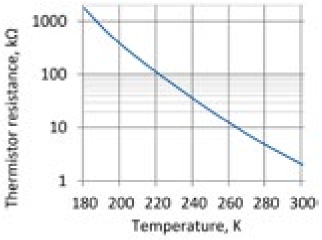
Specification (T_a = 20°C ,V_b = 0 V)

Parameter	Detector type						
	PVI-2TE-3	PVI-2TE-3.4	PVI-2TE-4	PVI-2TE-5	PVI-2TE-6	PVI-2TE-8	PVI-2TE-10.6
Active element material	epitaxial HgCdTe heterostructure						
Optimal wavelength λ_{opt}, µm	3.0	3.4	4.0	5.0	6.0	8.0	10.6
Detectivity D*(λ_{peak}, 20kHz), cm·Hz$^{1/2}$/W	≥8.0×10^{11}	≥6.0×10^{11}	≥4.0×10^{11}	≥2.0×10^{11}	≥7.0×10^{10}	≥4.0×10^{9}	≥2.0×10^{9}
Detectivity D*(λ_{opt}, 20kHz), cm·Hz$^{1/2}$/W	≥5.5×10^{11}	≥3.0×10^{11}	≥3.0×10^{11}	≥9.0×10^{10}	≥4.0×10^{10}	≥2.0×10^{9}	≥1.0×10^{9}
Current responsivity $R_i(\lambda_{opt})$, A/W	≥0.5	≥0.8	≥1.3	≥1.3	≥1.5	≥0.8	≥0.4
Time constant τ, ns	≤280	≤200	≤100	≤80	≤50	≤45	≤10
Resistance-optical area product $R \cdot A_O$, Ω·cm²	≥15000	≥300	≥200	≥10	≥2	≥0.02	≥0.01
Active element temperature T_{det}, K	~230						
Optical area A_O, mm×mm	0.5×0.5, 1×1						0.5×0.5
Package	TO8, TO66						
Acceptance angle Φ	~36°						
Window	wAl_2O_3				wZnSeAR		

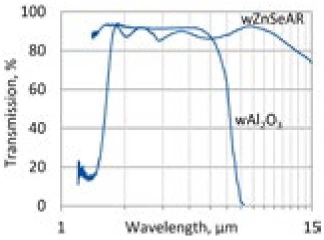
Two-stage thermoelectric cooler parameters

Parameter	Value
T_{det}, K	~230
V_{max}, V	1.3
I_{max}, A	1.2
Q_{max}, W	0.36

Thermistor characteristics

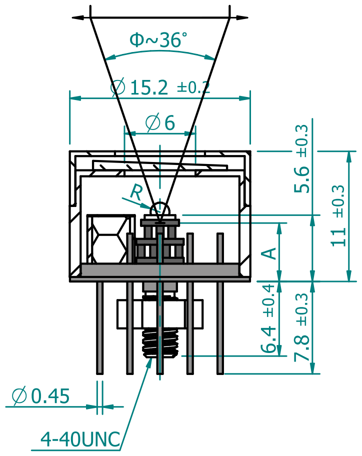


Spectral transmission of wAl_2O_3 and wZnSeAR windows (typical example)



Mechanical layout, mm

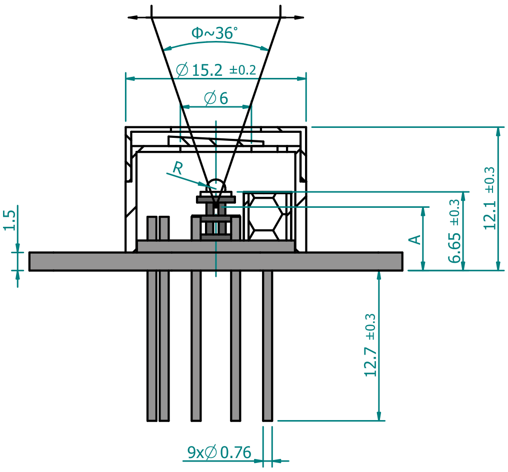
2TE-TO8 package



Parameter	Value	
Immersion microlens shape	hyperhemisphere	
Optical area A_o, mm×mm	0.5×0.5	1×1
R, mm	0.5	0.8
A, mm	4.1±0.3	3.2±0.3

Φ – acceptance angle
R – hyperhemisphere microlens radius
A – distance from the bottom of 2TE-TO8 header to the focal plane

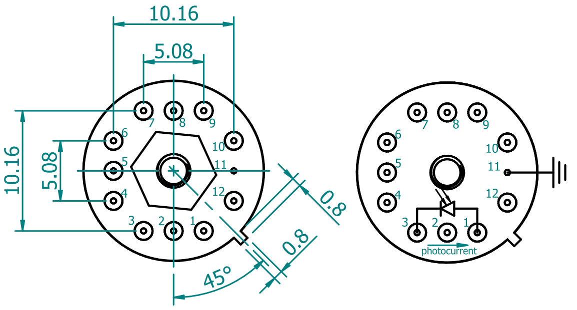
2TE-TO66 package



Parameter	Value	
Immersion microlens shape	hyperhemisphere	
Optical area A_o, mm×mm	0.5×0.5	1×1
R, mm	0.5	0.8
A, mm	5.15±0.30	3.2±0.3

Φ – acceptance angle
R – hyperhemisphere microlens radius
A – distance from the bottom of 2TE-TO66 header to the focal plane

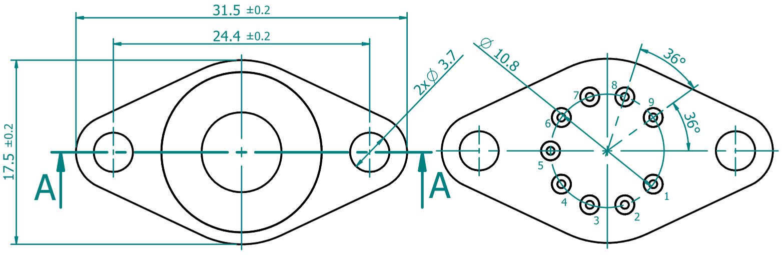
Bottom view



Function	Pin number
Detector	1, 3
Reverse bias (optional)	1(–), 3(+)
Thermistor	7, 9
TE cooler supply	2(+), 8(–)
Chassis ground	11
Not used	4, 5, 6, 10, 12

Top view

Bottom view



Function	Pin number
Detector	7, 8
Reverse bias (optional)	7(+), 8(–)
Thermistor	5, 6
TE cooler supply	1(+), 9(–)
Not used	2, 3, 4

Dedicated preamplifiers


„all-in-one” AIP


programmable PIP


standard MIP


small SIP-TO8

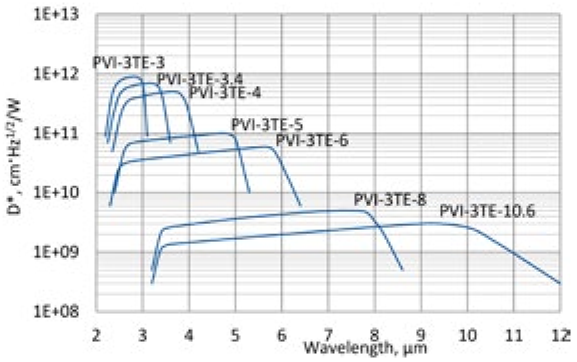

fast FIP

PVI-3TE series

2 – 12 µm HgCdTe three-stage thermoelectrically cooled, optically immersed photovoltaic detectors

PVI-3TE series features three-stage thermoelectrically cooled IR photovoltaic detectors based on sophisticated HgCdTe heterostructures for the best performance and stability, optically immersed in order to improve parameters of the devices. The detectors are optimized for the maximum performance at λ_{opt}. Cut-on wavelength can be optimized upon request. Reverse bias may significantly increase speed of response and dynamic range. It results also in improved performance at high frequencies, but 1/f noise that appears in biased devices may reduce performance at low frequencies. 3° wedged sapphire (wAl_2O_3) or zinc selenide anti-reflection coated (wZnSeAR) window prevents unwanted interference effects.

Spectral response (T_a = 20°C, V_b = 0 mV)



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

3TE-TO66

3TE-TO8

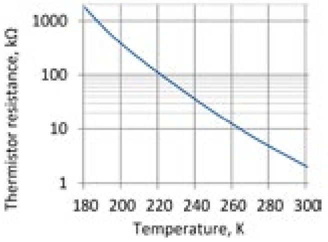
Specification (T_a = 20°C ,V_b = 0 V)

Parameter	Detector type						
	PVI-3TE-3	PVI-3TE-3.4	PVI-3TE-4	PVI-3TE-5	PVI-3TE-6	PVI-3TE-8	PVI-3TE-10.6
Active element material	epitaxial HgCdTe heterostructure						
Optimal wavelength λ_{opt}, µm	3.0	3.4	4.0	5.0	6.0	8.0	10.6
Detectivity D*(λ_{peak}, 20kHz), cm·Hz$^{1/2}$/W	≥9.0×10^{11}	≥7.0×10^{11}	≥5.0×10^{11}	≥1.0×10^{11}	≥6.0×10^{10}	≥5.0×10^{9}	≥3.0×10^{9}
Detectivity D*(λ_{opt}, 20kHz), cm·Hz$^{1/2}$/W	≥7.0×10^{11}	≥5.0×10^{11}	≥3.0×10^{11}	≥8.0×10^{10}	≥3.0×10^{10}	≥3.0×10^{9}	≥1.5×10^{9}
Current responsivity $R_i(\lambda_{opt})$, A/W	≥0.5	≥0.8	≥1.0	≥1.3	≥1.5	≥1.0	≥0.7
Time constant τ, ns	≤280	≤200	≤100	≤80	≤50	≤45	≤10
Resistance-optical area product $R \cdot A_O$, Ω·cm²	≥24000	≥1500	≥600	≥30	≥2.5	≥0.04	≥0.02
Active element temperature T_{det}, K	~210						
Optical area A_O, mm×mm	0.5×0.5, 1×1						0.5×0.5
Package	TO8, TO66						
Acceptance angle Φ	~36°						
Window	wAl_2O_3				wZnSeAR		

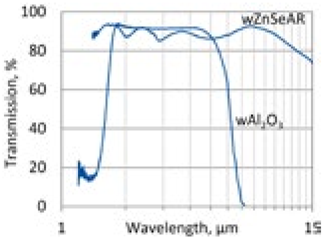
Three-stage thermoelectric cooler parameters

Parameter	Value
T_{det}, K	~210
V_{max}, V	3.6
I_{max}, A	0.45
Q_{max}, W	0.27

Thermistor characteristics

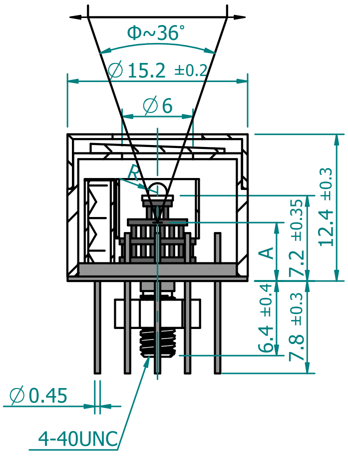


Spectral transmission of wAl_2O_3 and wZnSeAR windows (typical example)



Mechanical layout, mm

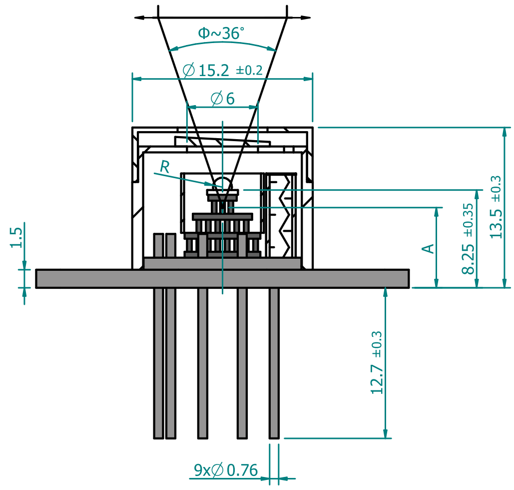
3TE-TO8 package



Parameter	Value	
Immersion microlens shape	hyperhemisphere	
Optical area A_o, mm×mm	0.5×0.5	1×1
R, mm	0.5	0.8
A, mm	5.7±0.35	4.8±0.35

Φ – acceptance angle
R – hyperhemisphere microlens radius
A – distance from the bottom of 3TE-TO8 header to the focal plane

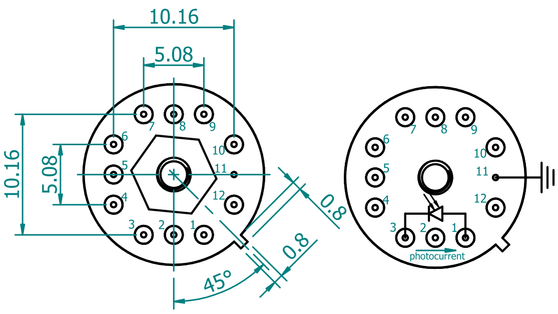
3TE-TO66 package



Parameter	Value	
Immersion microlens shape	hyperhemisphere	
Optical area A_o, mm×mm	0.5×0.5	1×1
R, mm	0.5	0.8
A, mm	6.75±0.35	5.85±0.35

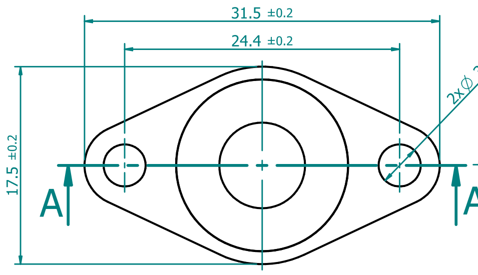
Φ – acceptance angle
R – hyperhemisphere microlens radius
A – distance from the bottom of 3TE-TO66 header to the focal plane

Bottom view

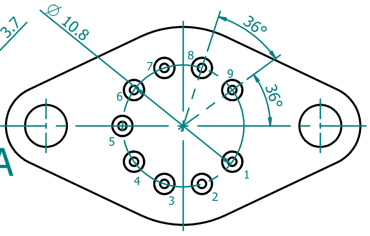


Function	Pin number
Detector	1, 3
Reverse bias (optional)	1(–), 3(+)
Thermistor	7, 9
TE cooler supply	2(+), 8(–)
Chassis ground	11
Not used	4, 5, 6, 10, 12

Top view



Bottom view



Function	Pin number
Detector	7, 8
Reverse bias (optional)	7(+), 8(–)
Thermistor	5, 6
TE cooler supply	1(+), 9(–)
Not used	2, 3, 4

Dedicated preamplifiers


„all-in-one” AIP


programmable PIP


standard MIP


small SIP-TO8

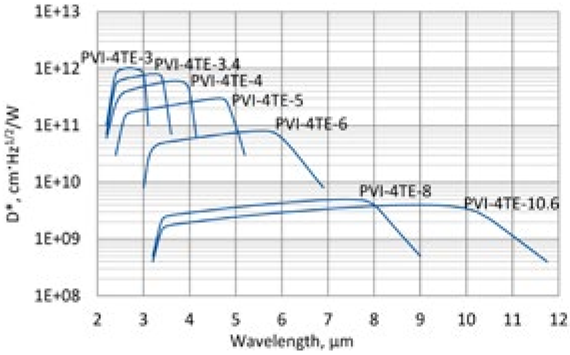

fast FIP

PVI-4TE series

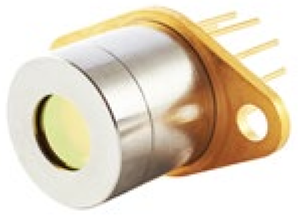
2 – 12 *µ*m HgCdTe four-stage thermoelectrically cooled, optically immersed photovoltaic detectors

PVI-4TE series features four-stage thermoelectrically cooled IR photovoltaic detectors based on sophisticated HgCdTe heterostructures for the best performance and stability, optically immersed in order to improve parameters of the devices. The detectors are optimized for the maximum performance at λ_{opt}. Cut-on wavelength can be optimized upon request. Reverse bias may significantly increase speed of response and dynamic range. It results also in improved performance at high frequencies, but 1/f noise that appears in biased devices may reduce performance at low frequencies. 3° wedged sapphire (wAl_2O_3) or zinc selenide anti-reflection coated (wZnSeAR) window prevents unwanted interference effects.

Spectral response (T_a = 20°C, V_b = 0 mV)



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



4TE-TO66

4TE-TO8

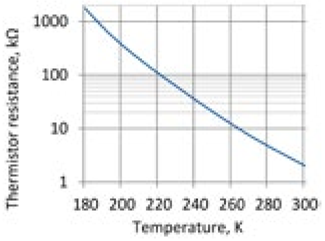
Specification (T_a = 20°C ,V_b = 0 V)

Parameter	Detector type						
	PVI-4TE-3	PVI-4TE-3.4	PVI-4TE-4	PVI-4TE-5	PVI-4TE-6	PVI-4TE-8	PVI-4TE-10.6
Active element material	epitaxial HgCdTe heterostructure						
Optimal wavelength λ_{opt}, µm	3.0	3.4	4.0	5.0	6.0	8.0	10.6
Detectivity D*(λ_{peak}, 20kHz), cm·Hz$^{1/2}$/W	≥1.0×10^{12}	≥8.0×10^{11}	≥6.0×10^{11}	≥3.0×10^{11}	≥8.0×10^{10}	≥5.0×10^{9}	≥4.0×10^{9}
Detectivity D*(λ_{opt}, 20kHz), cm·Hz$^{1/2}$/W	≥8.0×10^{11}	≥7.0×10^{11}	≥4.0×10^{11}	≥1.0×10^{11}	≥6.0×10^{10}	≥4.0×10^{9}	≥2.0×10^{9}
Current responsivity $R_i(\lambda_{opt})$, A/W	≥0.5	≥0.8	≥1.0	≥1.3	≥1.5	≥0.5	
Time constant τ, ns	≤280	≤200	≤100	≤80	≤50	≤45	≤25
Resistance-optical area product R·A_O, Ω·cm²	≥30000	≥2000	≥800	≥40	≥3	≥0.06	≥0.05
Active element temperature T_{det}, K	~195						
Optical area A_O, mm×mm	0.5×0.5, 1×1						
Package	TO8, TO66						
Acceptance angle Φ	~36°						
Window	wAl_2O_3				wZnSeAR		

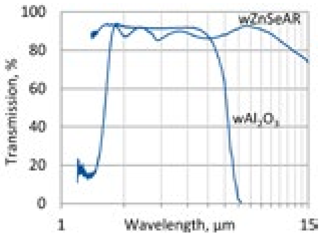
Four-stage thermoelectric cooler parameters

Parameter	Value
T_{det}, K	~195
V_{max}, V	8.3
I_{max}, A	0.4
Q_{max}, W	0.28

Thermistor characteristics

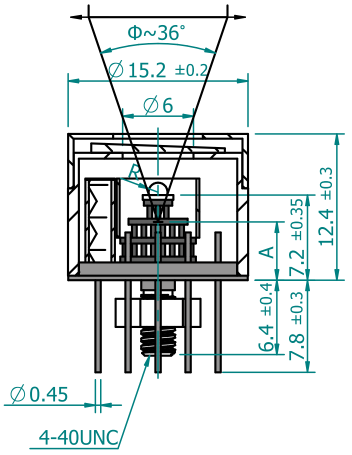


Spectral transmission of wAl_2O_3 and wZnSeAR windows (typical example)



Mechanical layout, mm

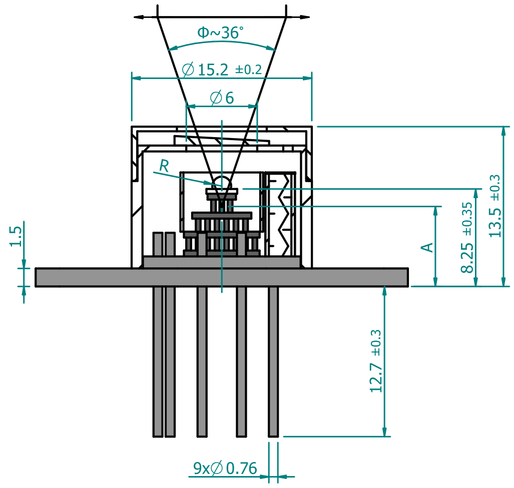
4TE-TO8 package



Parameter	Value	
Immersion microlens shape	hyperhemisphere	
Optical area A_O, mm×mm	0.5×0.5	1×1
R, mm	0.5	0.8
A, mm	7.3±0.4	6.4±0.4

Φ – acceptance angle
R – hyperhemisphere microlens radius
A – distance from the bottom of 4TE-TO8 header to the focal plane

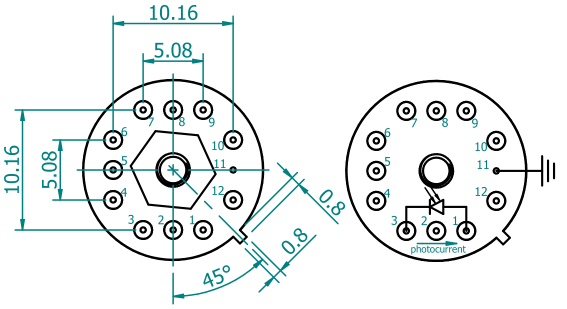
4TE-TO66 package



Parameter	Value	
Immersion microlens shape	hyperhemisphere	
Optical area A_O, mm×mm	0.5×0.5	1×1
R, mm	0.5	0.8
A, mm	8.35±0.40	7.45±0.40

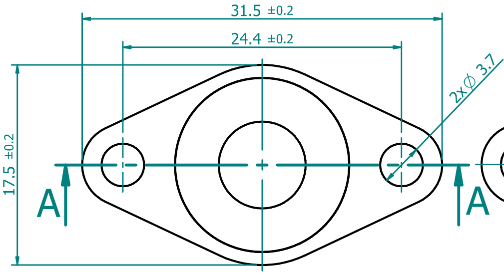
Φ – acceptance angle
R – hyperhemisphere microlens radius
A – distance from the bottom of 4TE-TO66 header to the focal plane

Bottom view

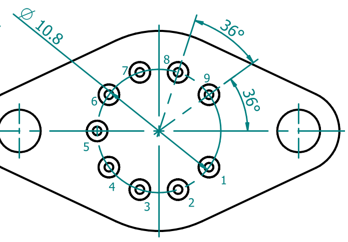


Function	Pin number
Detector	1, 3
Reverse bias (optional)	1(–), 3(+)
Thermistor	7, 9
TE cooler supply	2(+), 8(–)
Chassis ground	11
Not used	4, 5, 6, 10, 12

Top view



Bottom view



Function	Pin number
Detector	7, 8
Reverse bias (optional)	7(+), 8(–)
Thermistor	5, 6
TE cooler supply	1(+), 9(–)
Not used	2, 3, 4

Dedicated preamplifiers


„all-in-one" AIP


programmable PIP


standard MIP


small SIP-TO8


fast FIP

PVM series

2 – 13 μm HgCdTe ambient temperature photovoltaic multiple junction detectors

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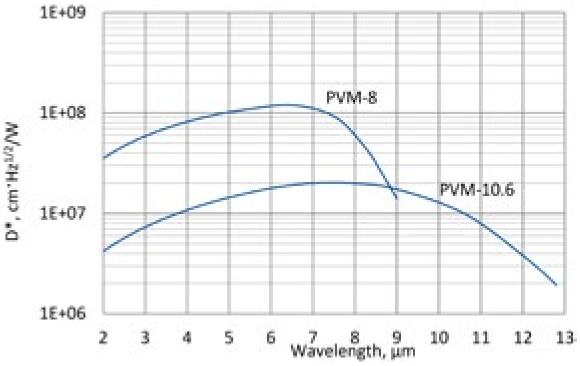
PVM series features uncooled IR photovoltaic multiple junction detectors based on sophisticated HgCdTe heterostructures for the best performance and stability. The detectors are optimized for the maximum performance at λ_{opt}. They are especially useful as large active area detectors operating within 2 to 13 μm spectral range.

Spectral response (T_a = 20°C)



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

BNC **TO39**

Specification (T_a = 20°C)

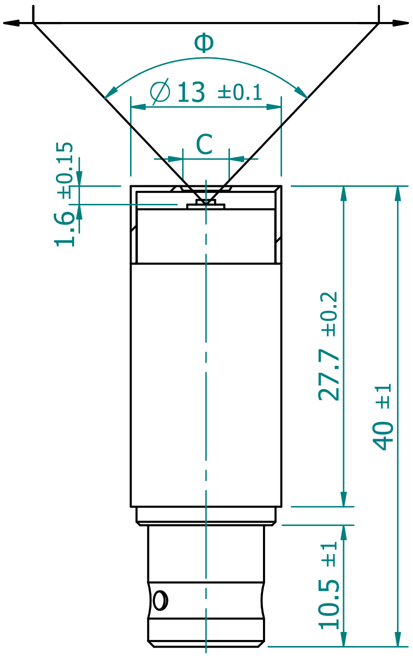
Parameter	Detector type			
	PVM-8		PVM-10.6	
Active element material	epitaxial HgCdTe heterostructure			
Optimal wavelength λ_{opt}, µm	8.0		10.6	
Detectivity D*(λ_{peak}, 20kHz), cm·Hz$^{1/2}$/W	≥1.2×10^8		≥2.0×10^7	
Detectivity D*(λ_{opt}, 20kHz), cm·Hz$^{1/2}$/W	≥6.0×10^7		≥1.0×10^7	
Current responsivity-active area length product $R_i(\lambda_{opt})\cdot L$, A·mm/W	≥0.008		≥0.002	
Time constant τ, ns	≤4		≤1.5	
Resistance R, Ω	50 to 300		20 to 150	
Active area A, mm×mm	1×1, 2×2, 3×3, 4×4			
Package	TO39	BNC	TO39	BNC
Acceptance angle Φ	~90°	~102°*), ~124°**)	~90°	~102°*), ~124°**)
Window	none			

*) *Aperture C = Ø4 mm.*

**) *Aperture C = Ø6 mm.*

Mechanical layout, mm

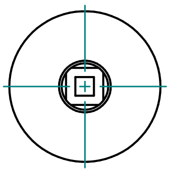
BNC package



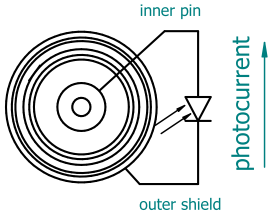
Parameter	Value	
Active area, mm×mm	1×1, 2×2	3×3, 4×4
C, mm	Ø4	Ø6
Acceptance angle Φ	~102°	~124°

C - aperture

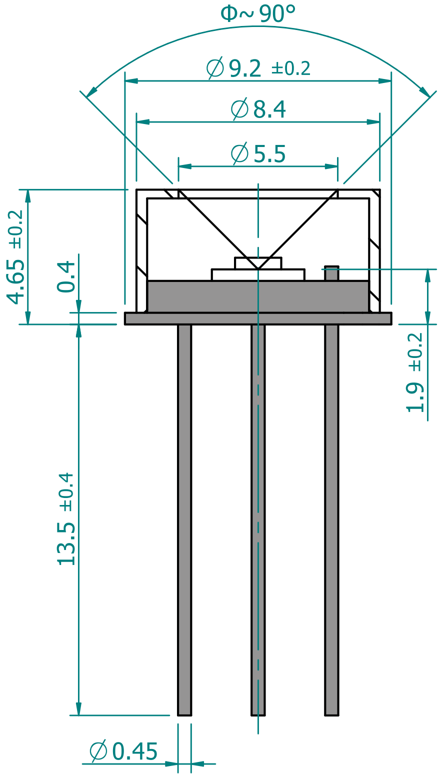
Top view



Bottom view

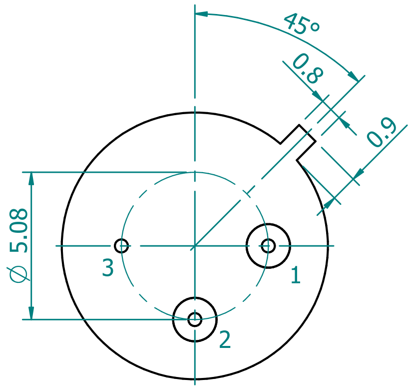


TO39 package



Φ *– acceptance angle*

Bottom view



Function	Pin number
Detector	1, 2
Chassis ground	3

Dedicated preamplifiers

small SIP-TO39

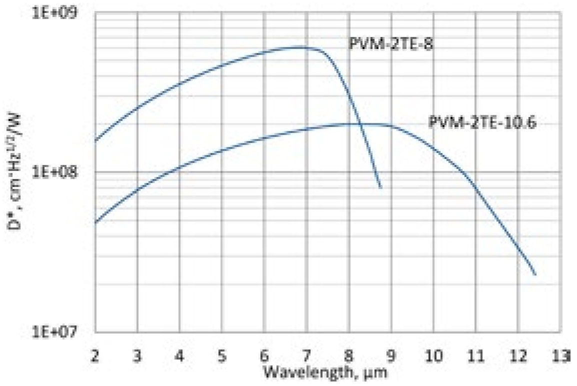
PVM-2TE series

2 – 12 µm HgCdTe two-stage thermoelectrically cooled photovoltaic multiple junction detectors

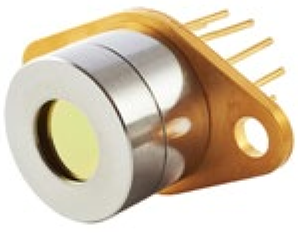
---

PVM-2TE series features two-stage thermoelectrically cooled IR photovoltaic multiple junction detectors based on sophisticated HgCdTe heterostructures for the best performance and stability. The detectors are optimized for the maximum performance at λ_{opt}. They are especially useful as large active area detectors operating within 2 to 12 µm spectral range. 3° wedged zinc selenide anti-reflection coated (wZnSeAR) window prevents unwanted interference effects.

Spectral response (T_a = 20°C)



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



2TE-TO66

2TE-TO8

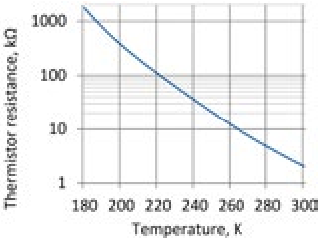
Specification (T_a = 20°C)

Parameter	Detector type	
	PVM-2TE-8	PVM-2TE-10.6
Active element material	epitaxial HgCdTe heterostructure	
Optimal wavelength λ_{opt}, µm	8.0	10.6
Detectivity D*(λ_{peak}, 20kHz), cm·Hz$^{1/2}$/W	≥6.0×10^8	≥2.0×10^8
Detectivity D*(λ_{opt}, 20kHz), cm·Hz$^{1/2}$/W	≥3.0×10^8	≥1.0×10^8
Current responsivity-active area length product $R_i(\lambda_{opt})$·L, A·mm/W	≥0.015	≥0.01
Time constant τ, ns	≤4	≤4
Resistance R, Ω	150 to 1200	90 to 350
Active element temperature T_{det}, K	~230	
Active area A, mm×mm	1×1, 2×2, 3×3	
Package	TO8, TO66	
Acceptance angle Φ	~70°	
Window	wZnSeAR	

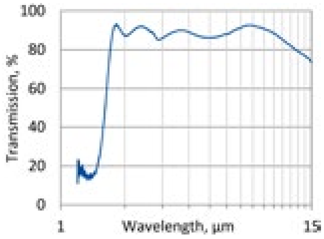
Two-stage thermoelectric cooler parameters

Parameter	Value
T_{det}, K	~230
V_{max}, V	1.3
I_{max}, A	1.2
Q_{max}, W	0.36

Thermistor characteristics

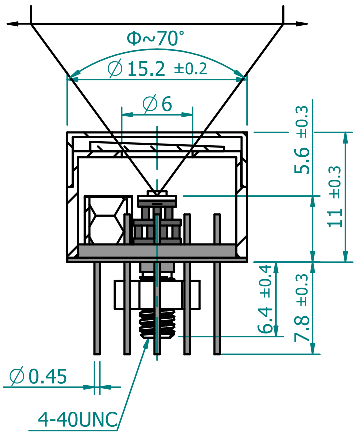


Spectral transmission of wZnSeAR windows (typical example)



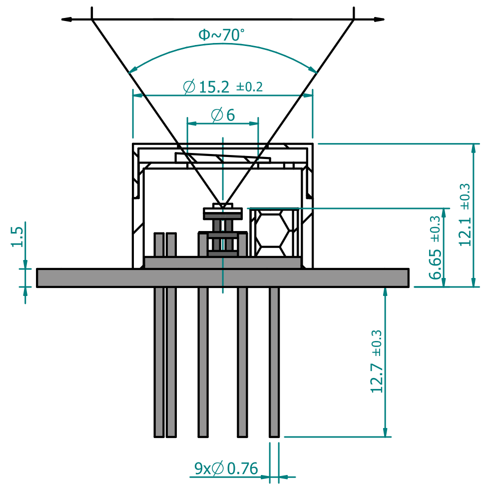
Mechanical layout, mm

2TE-TO8 package



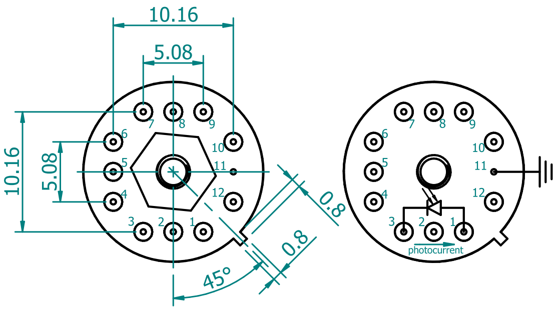
Φ – *acceptance angle*

2TE-TO66 package

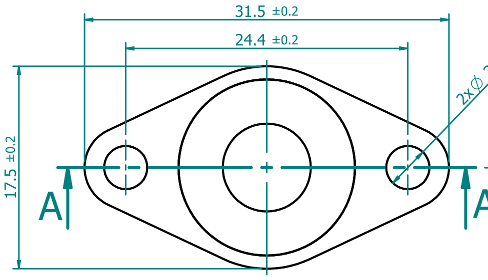


Φ – *acceptance angle*

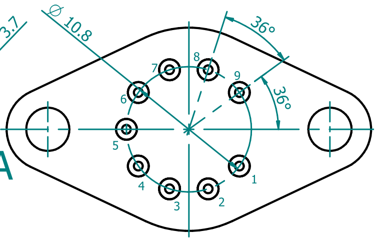
Bottom view



Top view



Bottom view



Function	Pin number
Detector	1, 3
Thermistor	7, 9
TE cooler supply	2(+), 8(–)
Chassis ground	11
Not used	4, 5, 6, 10, 12

Function	Pin number
Detector	7, 8
Thermistor	5, 6
TE cooler supply	1(+), 9(–)
Not used	2, 3, 4

Dedicated preamplifiers

„all-in-one" AIP

programmable PIP

standard MIP

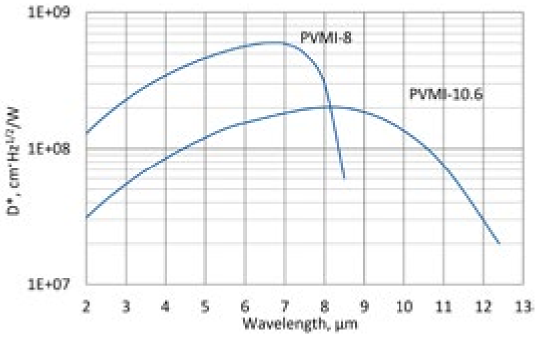
small SIP-TO8

PVMI series

2 – 12 µm HgCdTe ambient temperature, optically immersed photovoltaic multiple junction detectors

PVMI series features uncooled IR photovoltaic multiple junction detectors based on sophisticated HgCdTe heterostructures for the best performance and stability, optically immersed in order to improve parameters of the devices. The detectors are optimized for the maximum performance at λ_{opt}. They are especially useful as large optical area detectors operating within 2 to 12 µm spectral range.

Spectral response (T_a = 20°C)



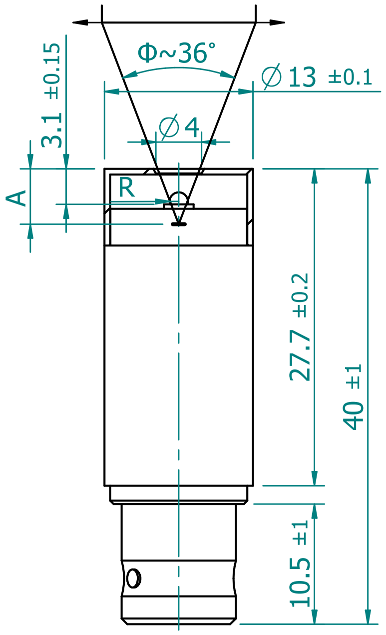
Exemplary spectral detectivity, the spectral response of delivered devices may differ.

Specification (T_a = 20°C)

Parameter	Detector type	
	PVMI-2TE-8	PVMI-2TE-10.6
Active element material	epitaxial HgCdTe heterostructure	
Optimal wavelength λ_{opt}, µm	8.0	10.6
Detectivity D*(λ_{peak}, 20kHz), cm·Hz$^{1/2}$/W	≥6.0×10^{8}	≥2.0×10^{8}
Detectivity D*(λ_{opt}, 20kHz), cm·Hz$^{1/2}$/W	≥3.0×10^{8}	≥1.0×10^{8}
Current responsivity-optical area length product $R_i(\lambda_{opt})$·LO, A·mm/W	≥0.04	≥0.01
Time constant τ, ns	≤4	≤1.5
Resistance R, Ω	50 to 300	20 to 150
Optical area A_O, mm×mm	1×1	1×1, 2×2
Package	TO39, BNC	
Acceptance angle Φ	~36°	
Window	none	

Mechanical layout, mm

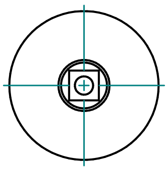
BNC package



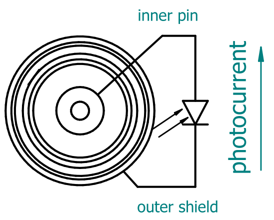
Parameter	Value	
Immersion microlens shape	hyperhemisphere	
Optical area A_o, mm×mm	1×1	2×2
R, mm	0.8	1.25
A, mm	5.5±0.3	6.85±0.30

Φ – acceptance angle
R – hyperhemisphere microlens radius
A – distance from the top of BNC package to the focal plane

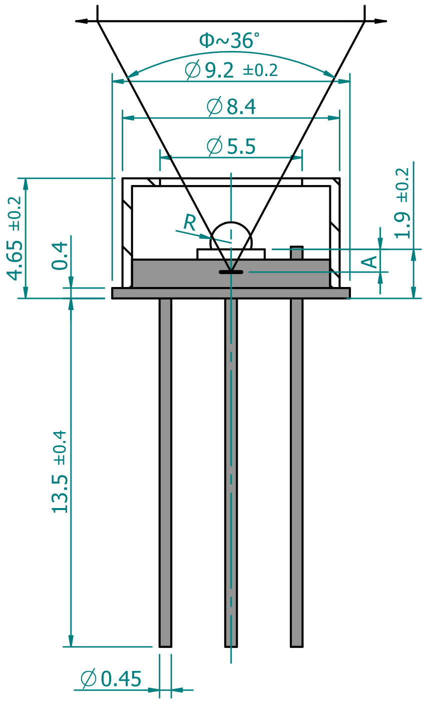
Top view



Bottom view



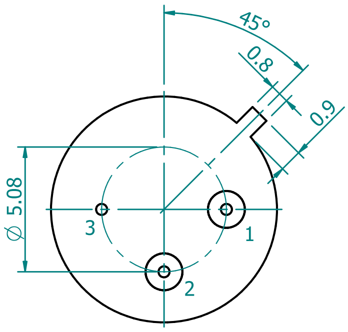
TO39 package



Parameter	Value	
Immersion microlens shape	hyperhemisphere	
Optical area A_o, mm×mm	1×1	2×2
R, mm	0.8	1.25
A, mm	2.4±0.2	3.75±0.20

Φ – acceptance angle
R – hyperhemisphere microlens radius
A – distance from the bottom of hyperhemisphere microlens to the focal plane

Bottom view



Function	Pin number
Detector	1, 2
Chassis ground	3

Dedicated preamplifiers

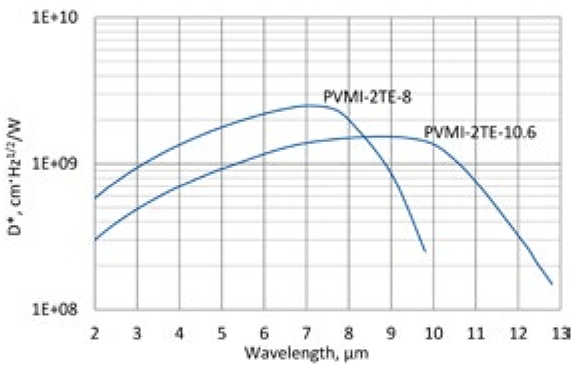
small SIP-TO39

PVMI-2TE series

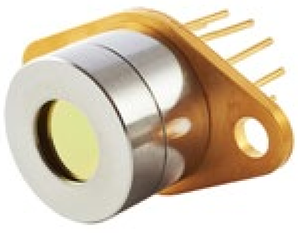
2 – 13 μm HgCdTe two-stage thermoelectrically cooled, optically immersed photovoltaic multiple junction detectors

PVMI-2TE series features two-stage thermoelectrically cooled IR photovoltaic multiple junction detectors based on sophisticated HgCdTe heterostructures for the best performance and stability, optically immersed in order to improve parameters of the devices. The detectors are optimized for the maximum performance at λ_{opt}. They are especially useful as large optical area detectors operating within 2 to 12 μm spectral range. 3° wedged zinc selenide anti-reflection coated (wZnSeAR) window prevents unwanted interference effects.

Spectral response (T_a = 20°C)



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



2TE-TO66

2TE-TO8

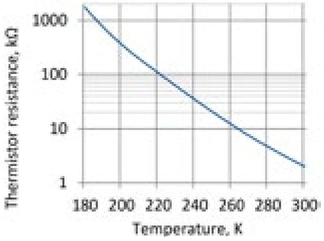
Specification (T_a = 20°C ,V_b = 0 V)

Parameter	Detector type	
	PVI-4TE-3	PVI-4TE-3.4
Active element material	epitaxial HgCdTe heterostructure	
Optimal wavelength λ_{opt}, µm	8.0	10.6
Detectivity D*(λ_{peak}, 20kHz), cm·Hz$^{1/2}$/W	≥2.5×10^9	≥1.5×10^9
Detectivity D*(λ_{opt}, 20kHz), cm·Hz$^{1/2}$/W	≥2.0×10^9	≥1.0×10^9
Current responsivity $R_i(\lambda_{opt})$, A/W	≥0.1	
Time constant τ, ns	≤4	≤3
Resistance R, Ω	150 to 1000	90 to 350
Active element temperature T_{det}, K	~230	
Optical area A_o, mm×mm	1×1	
Package	TO8, TO66	
Acceptance angle Φ	~36°	
Window	wZnSeAR	

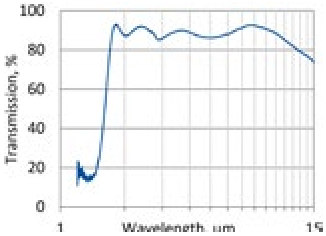
Two-stage thermoelectric cooler parameters

Parameter	Value
T_{det}, K	~230
V_{max}, V	1.3
I_{max}, A	1.2
Q_{max}, W	0.36

Thermistor characteristics

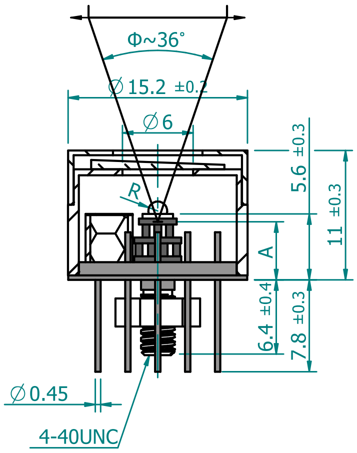


Spectral transmission of wZnSeAR window (typical example)



Mechanical layout, mm

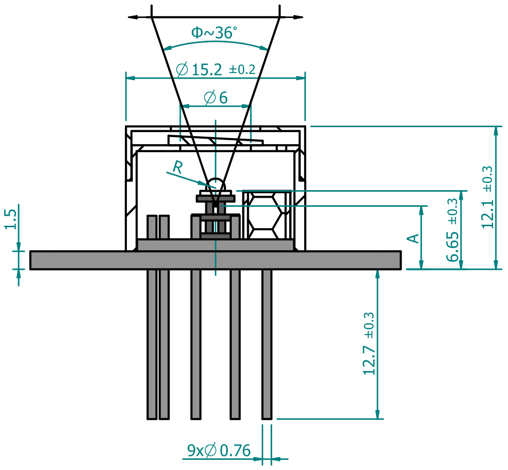
2TE-TO8 package



Parameter	Value
Immersion microlens shape	hyperhemisphere
Optical area A_o, mm×mm	0.5×0.5
R, mm	0.5
A, mm	7.3±0.4

Φ – acceptance angle
R – hyperhemisphere microlens radius
A – distance from the bottom of 2TE-TO8 header to the focal plane

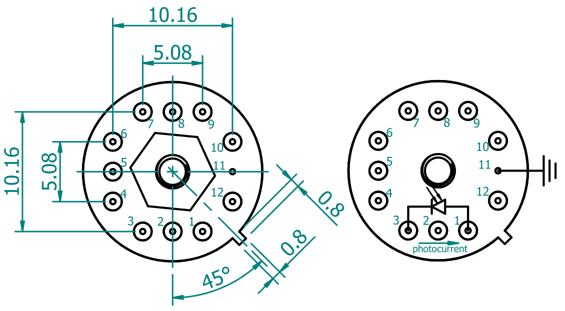
2TE-TO66 package



Parameter	Value
Immersion microlens shape	hyperhemisphere
Optical area A_o, mm×mm	1×1
R, mm	0.8
A, mm	3.2±0.3

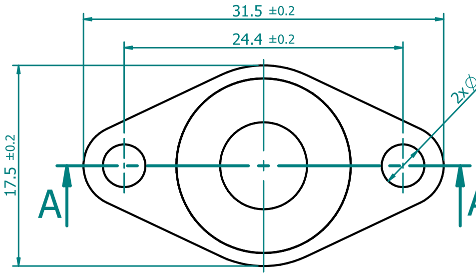
Φ – acceptance angle
R – hyperhemisphere microlens radius
A – distance from the bottom of 2TE-TO8 header to the focal plane

Bottom view

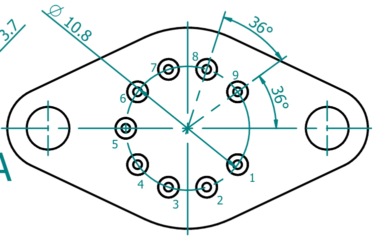


Function	Pin number
Detector	1, 3
Thermistor	7, 9
TE cooler supply	2(+), 8(–)
Chassis ground	11
Not used	4, 5, 6, 10, 12

Top view



Bottom view



Function	Pin number
Detector	7, 8
Thermistor	5, 6
TE cooler supply	1(+), 9(–)
Not used	2, 3, 4

Dedicated preamplifiers


„all-in-one" AIP


programmable PIP


standard MIP

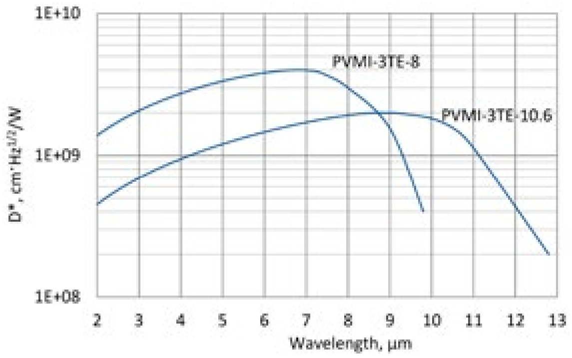

small SIP-TO8

PVMI-3TE series

2 – 13 μm HgCdTe three-stage thermoelectrically cooled, optically immersed photovoltaic multiple junction detectors

PVMI-3TE series features three-stage thermoelectrically cooled IR photovoltaic multiple junction detectors based on sophisticated HgCdTe heterostructures for the best performance and stability, optically immersed in order to improve parameters of the devices. The detectors are optimized for the maximum performance at λ_{opt}. They are especially useful as large optical area detectors operating within 2 to 12 μm spectral range. 3° wedged zinc selenide anti-reflection coated (wZnSeAR) window prevents unwanted interference effects.

Spectral response (T_a = 20°C)



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

3TE-TO66

3TE-TO8

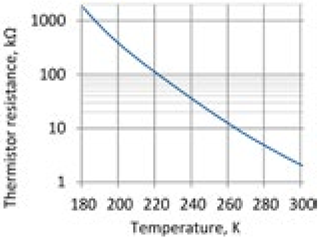
Specification (T_a = 20°C)

Parameter	Detector type	
	PVMI-3TE-8	PVMI-3TE-10.6
Active element material	epitaxial HgCdTe heterostructure	
Optimal wavelength λ_{opt}, µm	8.0	10.6
Detectivity D*(λ_{peak}, 20kHz), cm·Hz$^{1/2}$/W	≥4.0×10^9	≥2.0×10^9
Detectivity D*(λ_{opt}, 20kHz), cm·Hz$^{1/2}$/W	≥3.0×10^9	≥1.5×10^9
Current responsivity $R_i(\lambda_{opt})$, A/W	≥0.15	≥0.10
Time constant τ, ns	≤4	≤3
Resistance R, Ω	200 to 1500	100 to 400
Active element temperature T_{det}, K	~210	
Optical area A_O, mm×mm	1×1	
Package	TO8, TO66	
Acceptance angle Φ	~36°	
Window	wZnSeAR	

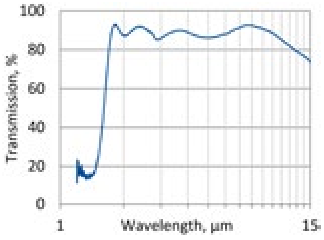
Three-stage thermoelectric cooler parameters

Parameter	Value
T_{det}, K	~210
V_{max}, V	3.6
I_{max}, A	0.45
Q_{max}, W	0.27

Thermistor characteristics

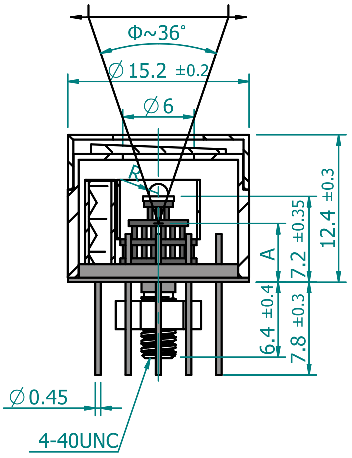


Spectral transmission of wZnSeAR window (typical example)



Mechanical layout, mm

3TE-TO8 package



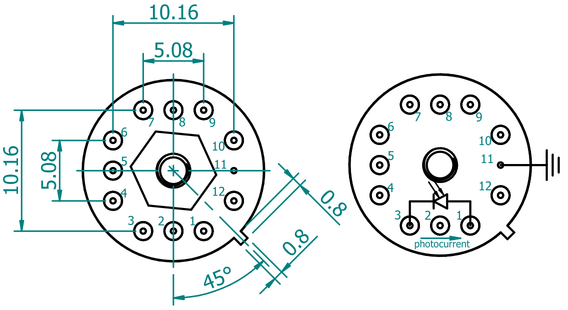
Parameter	Value
Immersion microlens shape	hyperhemisphere
Optical area A_O, mm×mm	1×1
R, mm	0.8
A, mm	4.8±0.35

Φ – acceptance angle

R – hyperhemisphere microlens radius

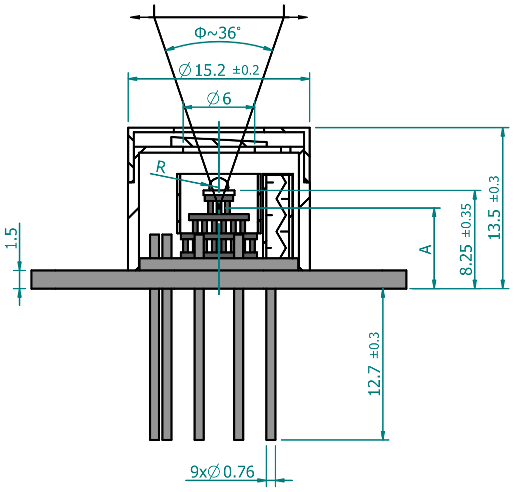
A – distance from the bottom of 3TE-TO8 header to the focal plane

Bottom view



Function	Pin number
Detector	1, 3
Thermistor	7, 9
TE cooler supply	2(+), 8(–)
Chassis ground	11
Not used	4, 5, 6, 10, 12

3TE-TO66 package



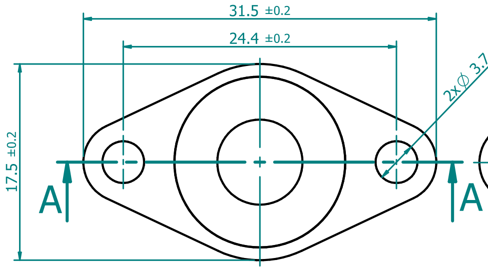
Parameter	Value
Immersion microlens shape	hyperhemisphere
Optical area A_O, mm×mm	1×1
R, mm	0.8
A, mm	5.85±0.35

Φ – acceptance angle

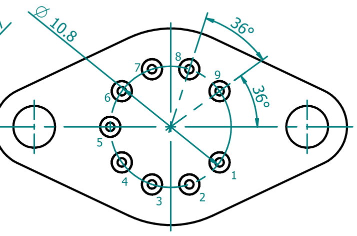
R – hyperhemisphere microlens radius

A – distance from the bottom of 3TE-TO8 header to the focal plane

Top view



Bottom view



Function	Pin number
Detector	7, 8
Thermistor	5, 6
TE cooler supply	1(+), 9(–)
Not used	2, 3, 4

Dedicated preamplifiers


„all-in-one" AIP


programmable PIP


standard MIP

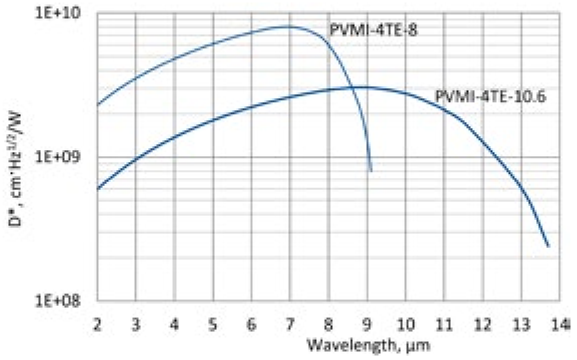

small SIP-TO8

PVMI-4TE series

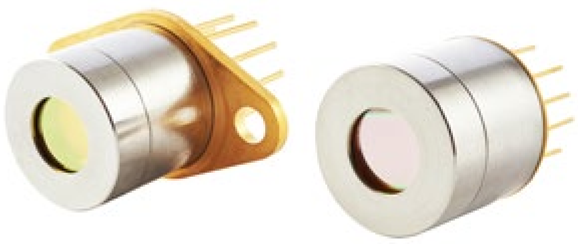
2 – 13 µm HgCdTe four-stage thermoelectrically cooled, optically immersed photovoltaic multiple junction detectors

PVMI-4TE series features four-stage thermoelectrically cooled IR photovoltaic multiple junction detectors based on sophisticated HgCdTe heterostructures for the best performance and stability, optically immersed in order to improve parameters of the devices. The detectors are optimized for the maximum performance at λ_{opt}. They are especially useful as large optical area detectors operating within 2 to 13 µm spectral range. 3° wedged zinc selenide anti-reflection coated (wZnSeAR) window prevents unwanted interference effects.

Spectral response (T_a = 20°C)



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



4TE-TO66 **4TE-TO8**

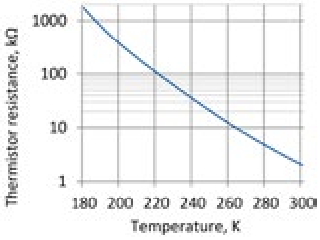
Specification (T_a = 20°C)

Parameter	Detector type	
	PVMI-4TE-8	PVMI-4TE-10.6
Active element material	epitaxial HgCdTe heterostructure	
Optimal wavelength λ_{opt}, µm	8.0	10.6
Detectivity D*(λ_{peak}, 20kHz), cm·Hz$^{1/2}$/W	≥8.0×10^{9}	≥3.0×10^{9}
Detectivity D*(λ_{opt}, 20kHz), cm·Hz$^{1/2}$/W	≥6.0×10^{9}	≥2.5×10^{9}
Current responsivity $R_i(\lambda_{opt})$, A/W	≥0.20	≥0.18
Time constant τ, ns	≤4	≤3
Resistance R, Ω	500 to 2500	120 to 500
Active element temperature T_{det}, K	~195	
Optical area A_O, mm×mm	1×1	
Package	TO8, TO66	
Acceptance angle Φ	~36°	
Window	wZnSeAR	

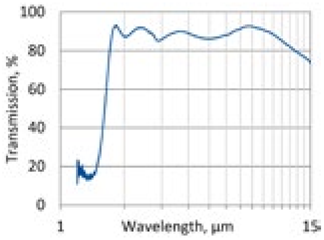
Four-stage thermoelectric cooler parameters

Parameter	Value
T_{det}, K	~195
V_{max}, V	8.3
I_{max}, A	0.4
Q_{max}, W	0.28

Thermistor characteristics

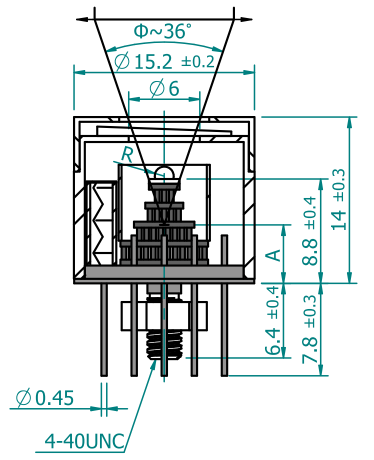


Spectral transmission of wZnSeAR window (typical example)



Mechanical layout, mm

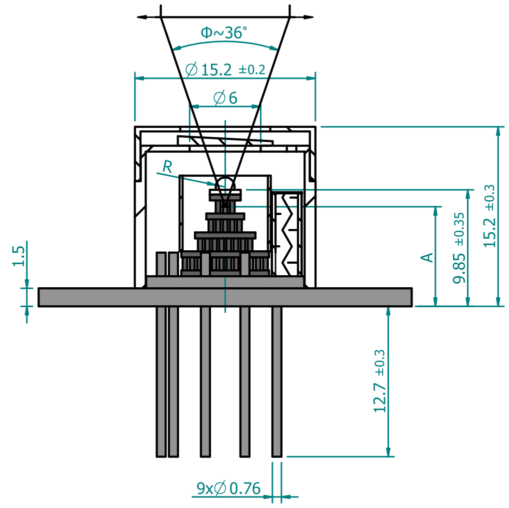
4TE-TO8 package



Parameter	Value
Immersion microlens shape	hyperhemisphere
Optical area A_O, mm×mm	1×1
R, mm	0.8
A, mm	6.4±0.4

Φ – acceptance angle
R – hyperhemisphere microlens radius
A – distance from the bottom of 4TE-TO8 header to the focal plane

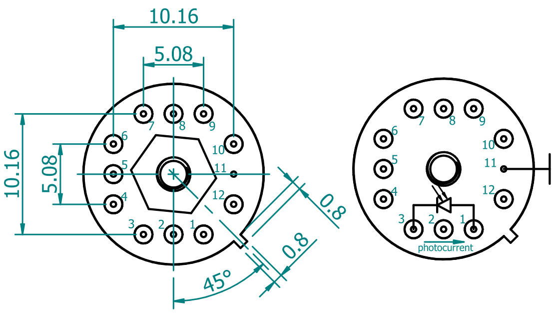
4TE-TO66 package



Parameter	Value
Immersion microlens shape	hyperhemisphere
Optical area A_O, mm×mm	1×1
R, mm	0.8
A, mm	7.45±0.40

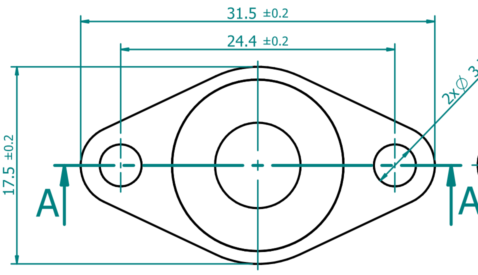
Φ – acceptance angle
R – hyperhemisphere microlens radius
A – distance from the bottom of 4TE-TO8 header to the focal plane

Bottom view

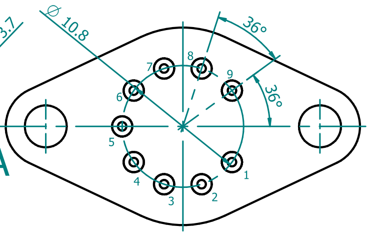


Function	Pin number
Detector	1, 3
Thermistor	7, 9
TE cooler supply	2(+), 8(–)
Chassis ground	11
Not used	4, 5, 6, 10, 12

Top view



Bottom view



Function	Pin number
Detector	7, 8
Thermistor	5, 6
TE cooler supply	1(+), 9(–)
Not used	2, 3, 4

Dedicated preamplifiers


„all-in-one" AIP


programmable PIP


standard MIP

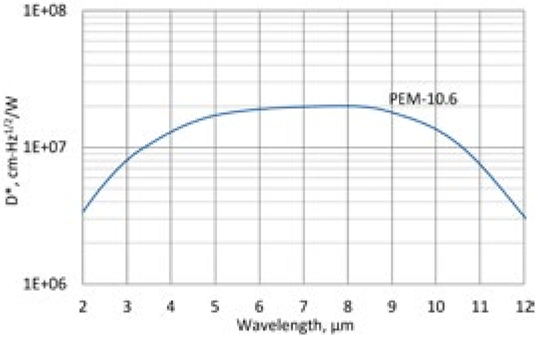

small SIP-TO8

PEM series

2 – 12 μm HgCdTe ambient temperature photoelectromagnetic detectors

PEM series features uncooled HgCdTe photovoltaic IR detectors based on photelectromagnetic 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 μm and especially useful as a large active 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 coated (wZnSeAR) window prevents unwanted interference effects and protects against pollution.

Spectral response (T_a = 20°C)



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

PEM-TO8

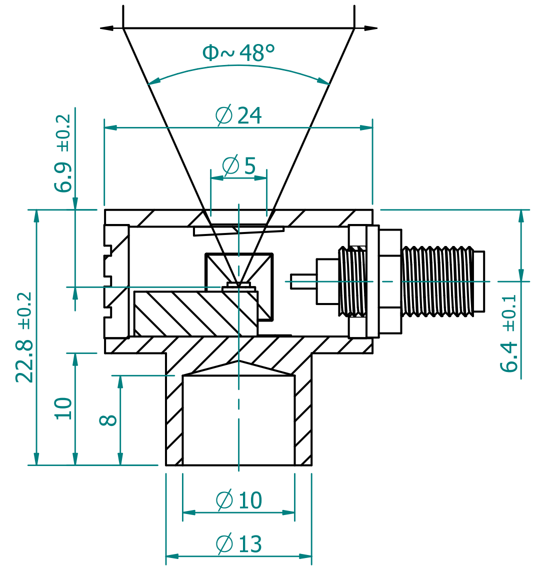
PEM-SMA

Specification (T_a = 20°C)

Parameter	Detector type	
	PEM-10.6	
Active element material	epitaxial HgCdTe heterostructure	
Optimal wavelength λ_{opt}, µm	10.6	
Detectivity D*(λ_{peak}, 20kHz), cm·Hz$^{1/2}$/W	≥2.0×10^{7}	
Detectivity D*(λ_{opt}, 20kHz), cm·Hz$^{1/2}$/W	≥1.0×10^{7}	
Current responsivity-optical area length product $R_i(\lambda_{opt})$·LO, A·mm/W	≥0.002	
Time constant τ, ns	≤1.2	
Resistance R, Ω	≥40	
Active area A, mm×mm	1×1, 2×2	
Package	PEM-SMA	PEM-TO8
Acceptance angle Φ	~48°	~52°
Window	wZnSeAR	

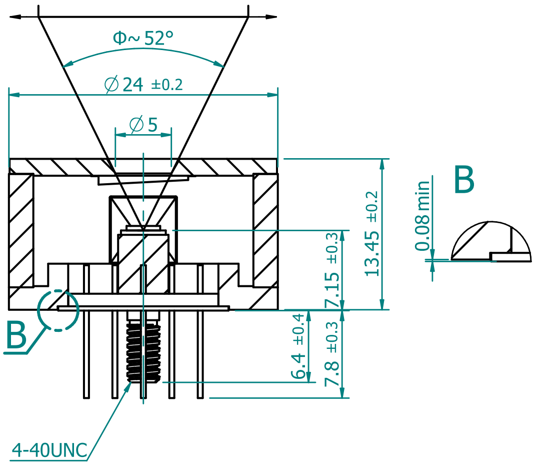
Mechanical layout, mm

PEM-SMA



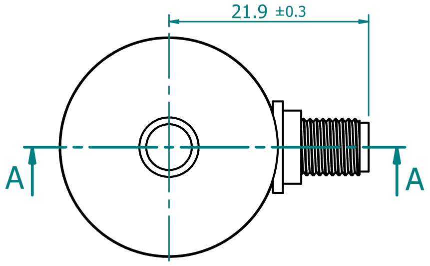
Φ – *acceptance angle*

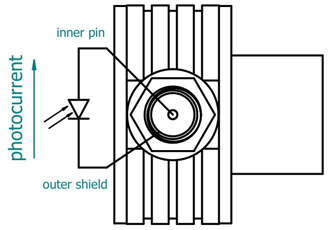
PEM-TO8



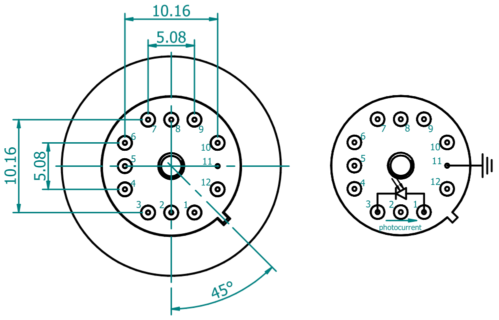
Φ – *acceptance angle*

Top view



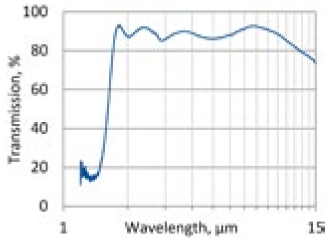


Bottom view



Function	Pin number
Detector	1, 3
Chassis ground	11
Not used	2, 4, 5, 6, 7, 8, 9, 10, 12
A, mm	3.75±0.20

Spectral transmission of wZnSeAR window (typical example)



Dedicated preamplifiers

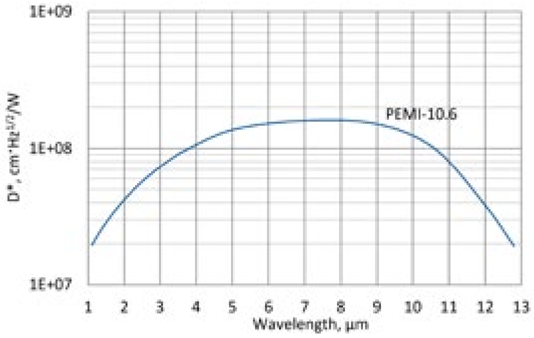
standard MIP

PEMI series

2 – 12 µm HgCdTe ambient temperature, optically immersed photoelectromagnetic detectors

PEMI series features uncooled HgCdTe photovoltaic optically immersed IR detectors based on photelectromagnetic 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 µm 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°C)



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

PEM-TO8

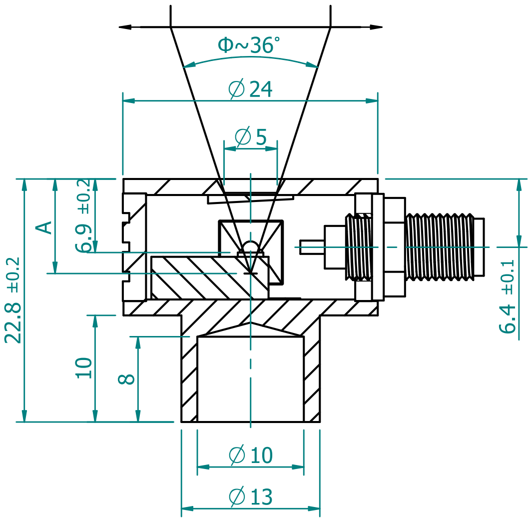
PEM-SMA

Specification (T_a = 20°C)

Parameter	Detector type
	PEMI-10.6
Active element material	epitaxial HgCdTe heterostructure
Optimal wavelength λ_{opt}, µm	10.6
Detectivity D*(λ_{peak}, 20kHz), cm·Hz$^{1/2}$/W	≥1.6×10^8
Detectivity D*(λ_{opt}, 20kHz), cm·Hz$^{1/2}$/W	≥1.0×10^8
Current responsivity-optical area length product $R_i(\lambda_{opt})$·LO, A·mm/W	≥0.01
Time constant τ, ns	≤1.2
Resistance R, Ω	40 to 100
Optical area A_o, mm×mm	1×1, 2×2
Package	PEM-SMA, PEM-TO8
Acceptance angle Φ	~36°
Window	wZnSeAR

Mechanical layout, mm

PEM-SMA



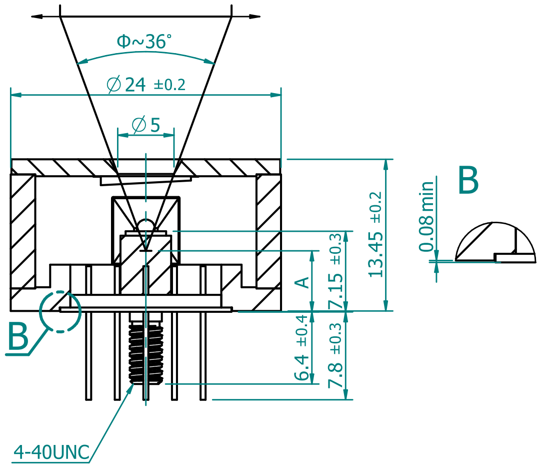
Parameter	Value	
Immersion microlens shape	hyperhemisphere	
Optical area A_o, mm×mm	1×1	2×2
R, mm	0.8	1.25
A, mm	9.3±0.4	10.65±0.40

Φ – acceptance angle

R – hyperhemisphere microlens radius

A – distance from the bottom of PEM-SMA header to the focal plane

PEM-TO8



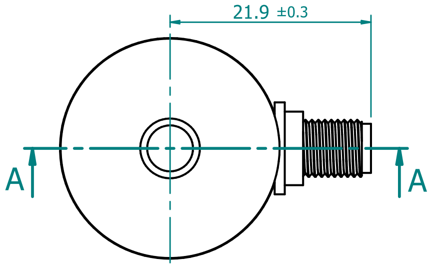
Parameter	Value	
Immersion microlens shape	hyperhemisphere	
Optical area A_o, mm×mm	1×1	2×2
R, mm	0.8	1.25
A, mm	4.75±0.30	3.4±0.4

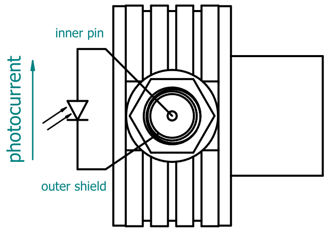
Φ – acceptance angle

R – hyperhemisphere microlens radius

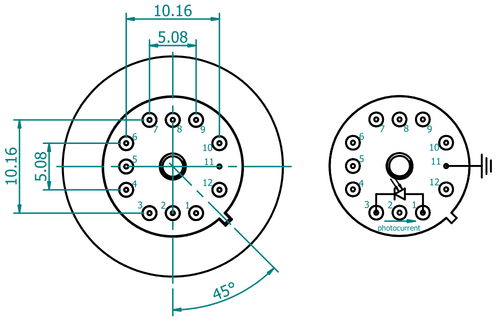
A – distance from the bottom of PEM-TO8 header to the focal plane

Top view



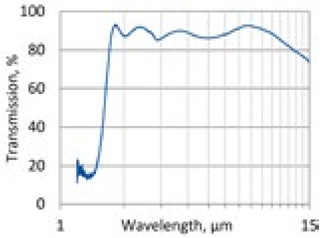


Bottom view



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

Spectral transmission of wZnSeAR window (typical example)



Dedicated preamplifiers

standard MIP

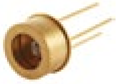
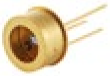
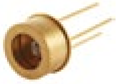
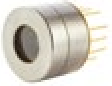
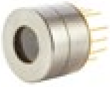
INFRARED DETECTORS AND DETECTION MODULES – SELECTED LINE

We present VIGO most popular infrared detectors and integrated detection modules. These devices are suitable for both laboratory research as well as tests, prototyping, R&D stage and in a variety of MWIR and LWIR industrial applications.

Main features

- High performance and reliability
- Very good repeatability in mass production
- Cost-effective sollutions
- Fast delivery

Selected infrared detectors

Photo	Detection module type	Photo	Detection module type
	PVI-4-1×1-TO39-NW-36		PVM-10.6-1×1-TO39-NW-90
	PVI-5-1×1-TO39-NW-36		PVM-2TE-10.6-1×1-TO8-wZnSeAR-70
	PVI-2TE-4-1×1-TO8-wAl$_2$O$_3$-36		PVMI-2TE-10.6-1×1-TO8-wZnSeAR-36
	PVI-2TE-5-1×1-TO8-wAl$_2$O$_3$-36		PVMI-4TE-10.6-1×1-TO8-wZnSeAR-36
	PVI-2TE-6-1×1-TO8-wZnSeAR-36		PEM-10.6-2×2-PEM-SMA-wZnSeAR-48
	PVI-4TE-6-1×1-TO8-wZnSeAR-36		PCI-3TE-12-1×1-TO8-wZnSeAR-36

Selected infrared detection modules

	Photo	Detection module type		Photo	Detection module type
UM series – universal		UM-I-6	LabM series – laboratory, programmable		LabM-I-6
		UM-10.6			LabM-I-10.6
		UM-I-10.6	UHSM series – ultra high-speed		UHSM-10.6
fast		microM-10.6			UHSM-I-10.6

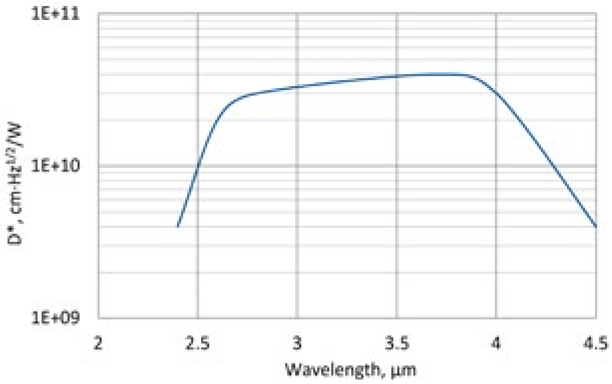
To get the information about specific parameters and applications of each detector and detection module type please see particular datsheets.

PVI-4-1×1-TO39-NW-36

2.4 – 4.5 µm HgCdTe ambient temperature, optically immersed photovoltaic detector

PVI-4-1×1-TO39-NW-36 is uncooled IR photovoltaic detector based on sophisticated HgCdTe heterostructure for the best performance and stability. The device is optimized for the maximum performance at 4 µm. Detector element is monolithically integrated with hyperhemispherical GaAs microlens in order to improve performance of the device. Reverse bias may significantly increase response speed and dynamic range. It also results in improved performance at high frequencies, but 1/f noise that appears in biased devices may reduce performance at low frequencies.

Spectral response (T_a = 20°C, V_b = 0 mV)



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

Specification (T_a = 20°C, V_b = 0 mV)

Parameter	Detector type PVI-4-1×1-TO39-NW-36
Active element material	epitaxial HgCdTe heterostructure
Cut-on wavelength λ_{cut-on} (10%), µm	2.4±0.5
Peak wavelength λ_{peak}, µm	3.4±0.5
Optimum wavelength λ_{opt}, µm	4.0
Cut-off wavelength $\lambda_{cut-off}$ (10%), µm	4.5±0.3
Detectivity $D^*(\lambda_{peak})$, cm·Hz$^{1/2}$/W	≥4.0×10^{10}
Detectivity $D^*(\lambda_{opt})$, cm·Hz$^{1/2}$/W	≥3.0×10^{10}
Current responsivity $R_i(\lambda_{peak})$, A/W	≥2.0
Current responsivity $R_i(\lambda_{opt})$, A/W	≥1.0
Time constant τ, ns	≤150
Resistance R, Ω	≥600
Optical area A_O, mm×mm	1×1
Package	TO39
Acceptance angle Φ	~36°
Window	none

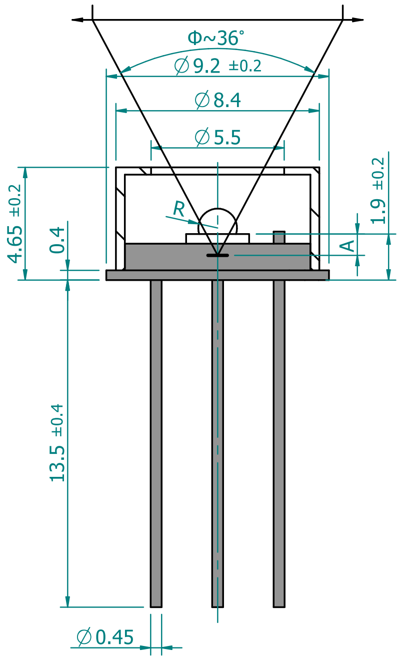
Features

- Wide dynamic range
- Convenient to use
- Very small size
- Cost-effective solution
- Quantity discounted price
- Fast delivery

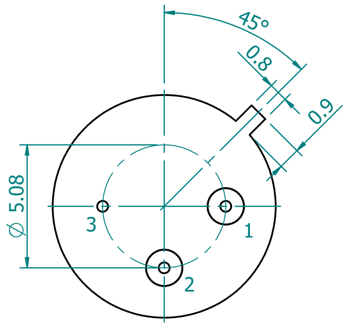
Applications

- Gas detection, monitoring and analysis (CH_4, C_2H_2, CH_2O, HCl, NH_3, SO_2, C_2H_6)
- Breath analysis
- Explosion prevention
- Flue gas denitrification
- Emission control (exhaust fumes, greenhouse gases)

Mechanical layout, mm



Bottom view



Parameter	Value
Immersion microlens shape	hyperhemisphere
Optical area A_o, mm×mm	1×1
R, mm	0.8
A, mm	2.4±0.2

Function	Pin number
Detector	1, 2
Reverse bias (optional)	1(–), 2(+)
Chassis ground	3

Φ – acceptance angle

R – hyperhemisphere microlens radius

A – distance from the bottom of hyperhemisphere microlens to the focal plane

Precautions for use and storage

- Standard ohmmeter may overbias and damage the detector. Bias of 10 mV can be used for resistance measurements.
- Operation in 10% to 80% humidity and -20°C to 30°C ambient temperature.
- Beam power limitations for optically immersed detector:
  - irradiance with CW or single pulse longer than 1 μs irradiance on the apparent optical active area must not exceed 2.5 W/cm^2,
  - irradiance of the pulse shorter than 1 μs must not exceed 10 kW/cm^2.
- Storage in dark place with 10% to 90% humidity and -20°C to 50°C ambient temperature.

PVI-5-1×1-TO39-NW-36

2.4 – 5.5 µm HgCdTe ambient temperature, optically immersed photovoltaic detector

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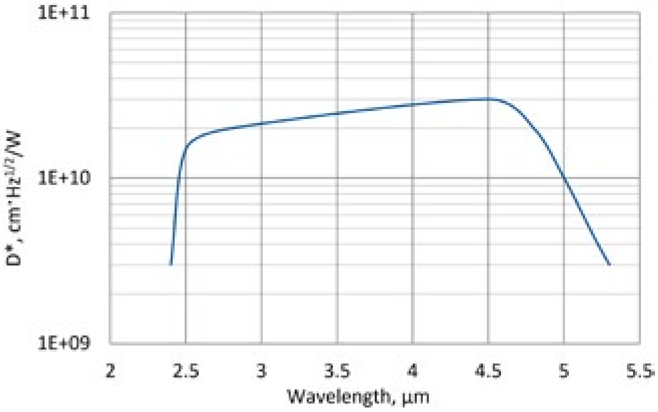
PVI-5-1×1-TO39-NW-36 is uncooled IR photovoltaic detector based on sophisticated HgCdTe heterostructure for the best performance and stability. The device is optimized for the maximum performance at 5 µm. Detector element is monolithically integrated with hyperhemispherical GaAs microlens in order to improve performance of the device. Reverse bias may significantly increase response speed and dynamic range. It also results in improved performance at high frequencies, but 1/f noise that appears in biased devices may reduce performance at low frequencies.

Spectral response (T_a = 20°C, V_b = 0 mV)



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

Specification (T_a = 20°C, V_b = 0 mV)

Parameter	Detector type PVI-5-1×1-TO39-NW-36
Active element material	epitaxial HgCdTe heterostructure
Cut-on wavelength $\lambda_{cut\text{-}on}$ (10%), µm	2.4±0.5
Peak wavelength λ_{peak}, µm	4.2±0.5
Optimum wavelength λ_{opt}, µm	5.0
Cut-off wavelength $\lambda_{cut\text{-}off}$ (10%), µm	5.5±0.3
Detectivity $D^*(\lambda_{peak})$, cm·Hz$^{1/2}$/W	$\geq 3.0\times10^{10}$
Detectivity $D^*(\lambda_{opt})$, cm·Hz$^{1/2}$/W	$\geq 1.0\times10^{10}$
Current responsivity $R_i(\lambda_{peak})$, A/W	≥2.0
Current responsivity $R_i(\lambda_{opt})$, A/W	≥1.0
Time constant τ, ns	≤150
Resistance R, Ω	≥100
Optical area A_O, mm×mm	1×1
Package	TO39
Acceptance angle Φ	~36°
Window	none

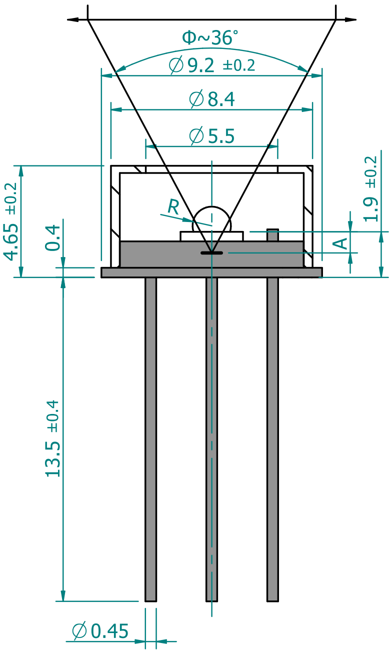
Features

- Wide dynamic range
- Convenient to use
- Very small size
- Cost-effective solution
- Quantity discounted price
- Fast delivery

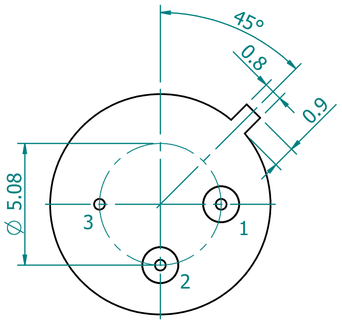
Applications

- Contactless temperature measurements (railway transport, industrial and laboratory processes monitoring)
- Flame and explosion detection
- Threat warning systems
- Gas detection, monitoring and analysis (CO, CO_2, NO_x)
- Breath analysis
- Solids analysis
- Leakage control in gas pipelines
- Combustion process control

Mechanical layout, mm



Bottom view



Parameter	Value
Immersion microlens shape	hyperhemisphere
Optical area A_o, mm×mm	1×1
R, mm	0.8
A, mm	2.4±0.2

Function	Pin number
Detector	1, 2
Reverse bias (optional)	1(–), 2(+)
Chassis ground	3

Φ – acceptance angle

R – hyperhemisphere microlens radius

A – distance from the bottom of hyperhemisphere microlens to the focal plane

Precautions for use and storage

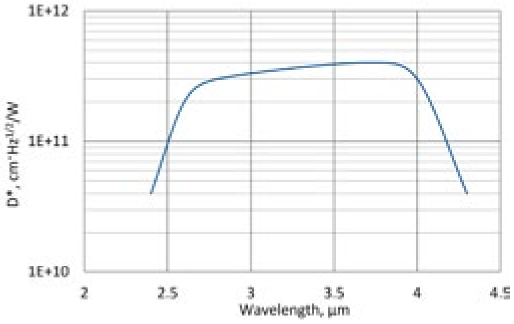
- Standard ohmmeter may overbias and damage the detector. Bias of 10 mV can be used for resistance measurements.
- Operation in 10% to 80% humidity and -20°C to 30°C ambient temperature.
- Beam power limitations for optically immersed detector:
  - irradiance with CW or single pulse longer than 1 µs irradiance on the apparent optical active area must not exceed 2.5 W/cm^2,
  - irradiance of the pulse shorter than 1 µs must not exceed 10 kW/cm^2.
- Storage in dark place with 10% to 90% humidity and -20°C to 50°C ambient temperature.

PVI-2TE-4-1×1-TO8-wAl_2O_3-36

2.4 – 4.3 µm HgCdTe two-stage thermoelectrically cooled, optically immersed photovoltaic detector

PVI-2TE-4-1×1-TO8-wAl_2O_3-36 is two-stage thermoelectrically cooled IR photovoltaic detector based on sophisticated HgCdTe heterostructure for the best performance and stability. The device is optimized for the maximum performance at 4 µm. Detector element is monolithically integrated with hyperhemispherical GaAs microlens in order to improve performance of the device. Reverse bias may significantly increase response speed and dynamic range. It also results in improved performance at high frequencies, but 1/f noise that appears in biased devices may reduce performance at low frequencies. 3° wedged sapphire (wAl_2O_3) window prevents unwanted interference effects.

Spectral response (T_a = 20°C, V_b = 0 mV)



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

Specification (T_a = 20°C, V_b = 0 mV)

Parameter	Detector type PVI-2TE-4-1×1-TO8-wAl_2O_3-36
Active element material	epitaxial HgCdTe heterostructure
Cut-on wavelength λ_{cut-on} (10%), µm	2.4±0.5
Peak wavelength λ_{peak}, µm	3.5±0.5
Optimum wavelength λ_{opt}, µm	4.0
Cut-off wavelength $\lambda_{cut-off}$ (10%), µm	4.3±0.3
Detectivity D*(λ_{peak}), cm·Hz1/2/W	$\geq 4.0\times10^{11}$
Detectivity D*(λ_{opt}), cm·Hz1/2/W	$\geq 3.0\times10^{11}$
Current responsivity $R_i(\lambda_{peak})$, A/W	≥2.0
Current responsivity $R_i(\lambda_{opt})$, A/W	≥1.3
Time constant τ, ns	≤100
Resistance R, Ω	≥20000
Active element temperature T_{det}, K	~230
Optical area A_O, mm×mm	1×1
Package	TO8
Acceptance angle Φ	~36°
Window	wAl_2O_3

Features

- High performance
- D* better by one order of magnitude compared with the same type uncooled detector
- Wide dynamic range
- Quantity discounted price
- Fast delivery

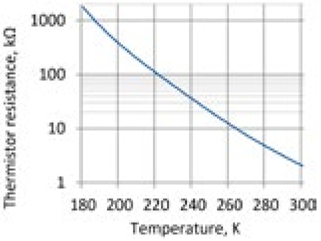
Applications

- Gas detection, monitoring and analysis (CH_4, C_2H_2, CH_2O, HCl, NH_3, SO_2, C_2H_6)
- Breath analysis
- Explosion prevention
- Flue gas denitrification
- Emission control (exhaust fumes, greenhouse gases)

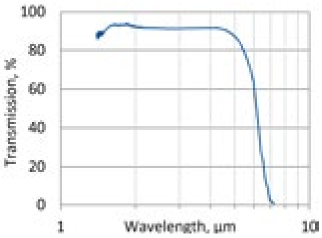
Two-stage thermoelectric cooler parameters

Parameter	Value
T_{det}, K	~230
V_{max}, V	1.3
I_{max}, A	1.2
Q_{max}, W	0.36

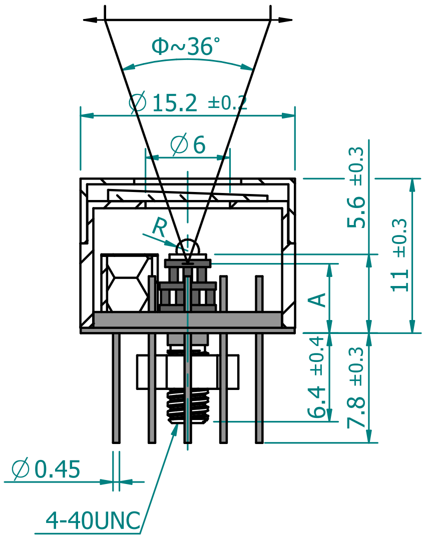
Thermistor characteristics



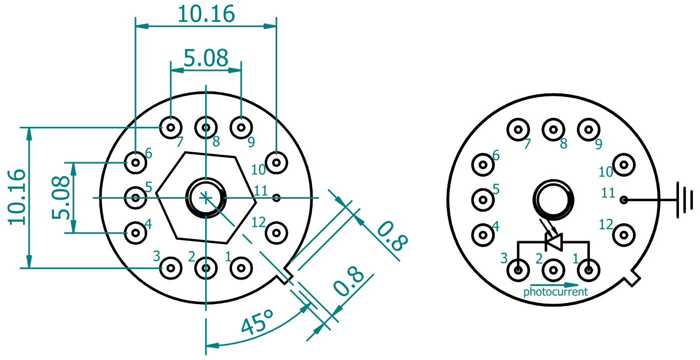
Spectral transmission of wAl_2O_3 window (typical example)



Mechanical layout, mm



Bottom view



Parameter	Value
Immersion microlens shape	hyperhemisphere
Optical area A_o, mm×mm	1×1
R, mm	0.8
A, mm	3.2±0.3

Φ – acceptance angle

R – hyperhemisphere microlens radius

A – distance from the bottom of the 2TE-TO8 header to the focal plane

Function	Pin number
Detector	1, 3
Reverse bias (optional)	1(–), 3(+)
Thermistor	7, 9
TE cooler supply	2(+), 8(–)
Chassis ground	11
Not used	4, 5, 6, 10, 12

Precautions for use and storage

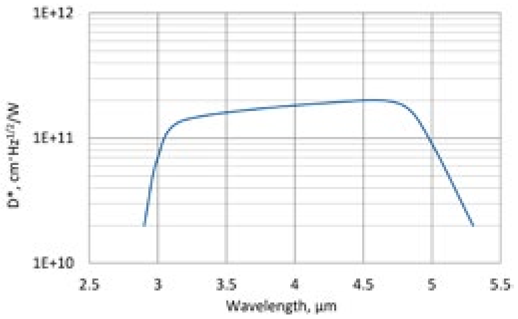
- Standard ohmmeter may overbias and damage the detector. Bias of 10 mV can be used for resistance measurements.
- Heatsink with thermal resistance of ~2 K/W is necessary to dissipate heat generated by 2TE cooler.
- Operation in 10% to 80% humidity and -20°C to 30°C ambient temperature.
- Beam power limitations for optically immersed detector:
  - irradiance with CW or single pulse longer than 1 μs irradiance on the apparent optical active area must not exceed 2.5 W/cm^2,
  - irradiance of the pulse shorter than 1 μs must not exceed 10 kW/cm^2.
- Storage in dark place with 10% to 90% humidity and -20°C to 50°C ambient temperature.

PVI-2TE-5-1×1-TO8-wAl_2O_3-36

2.9 – 5.5 µm HgCdTe two-stage thermoelectrically cooled, optically immersed photovoltaic detector

PVI-2TE-5-1×1-TO8-wAl_2O_3-36 is two-stage thermoelectrically cooled IR photovoltaic detector based on sophisticated HgCdTe heterostructure for the best performance and stability. The device is optimized for the maximum performance at 5 µm. Detector element is monolithically integrated with hyperhemispherical GaAs microlens in order to improve performance of the device. Reverse bias may significantly increase response speed and dynamic range. It also results in improved performance at high frequencies, but 1/f noise that appears in biased devices may reduce performance at low frequencies. 3° wedged sapphire (wAl_2O_3) window prevents unwanted interference effects.

Spectral response (T_a = 20°C, V_b = 0 mV)



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

Specification (T_a = 20°C, V_b = 0 mV)

Parameter	Detector type PVI-2TE-5-1×1-TO8-wAl_2O_3-36
Active element material	epitaxial HgCdTe heterostructure
Cut-on wavelength λ_{cut-on} (10%), µm	2.9±1.0
Peak wavelength λ_{peak}, µm	4.2±0.5
Optimum wavelength λ_{opt}, µm	5.0
Cut-off wavelength $\lambda_{cut-off}$ (10%), µm	5.5±0.3
Detectivity D*(λ_{peak}), cm·Hz$^{1/2}$/W	≥2.0×10^{11}
Detectivity D*(λ_{opt}), cm·Hz$^{1/2}$/W	≥9.0×10^{10}
Current responsivity $R_i(\lambda_{peak})$, A/W	≥2.0
Current responsivity $R_i(\lambda_{opt})$, A/W	≥1.3
Time constant τ, ns	≤80
Resistance R, Ω	≥1000
Active element temperature T_{det}, K	~230
Optical area A_O, mm×mm	1×1
Package	TO8
Acceptance angle Φ	~36°
Window	wAl_2O_3

Features

- High performance
- D* better by one order of magnitude compared with the same type uncooled detector
- Wide dynamic range
- Quantity discounted price
- Fast delivery

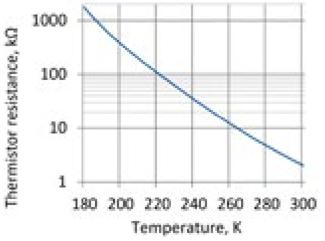
Applications

- Contactless temperature measurements (railway transport, industrial and laboratory processes monitoring)
- Flame and explosion detection
- Threat warning systems
- Gas detection, monitoring and analysis (CO, CO_2, NO_x)
- In-vivo alcohol detection
- Breath analysis
- Solids analysis
- Leakage control in gas pipelines
- Combustion process control

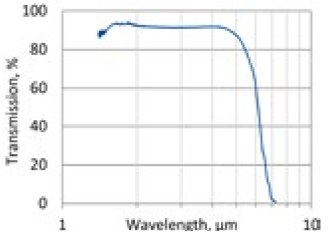
Two-stage thermoelectric cooler parameters

Parameter	Value
T_{det}, K	~230
V_{max}, V	1.3
I_{max}, A	1.2
Q_{max}, W	0.36

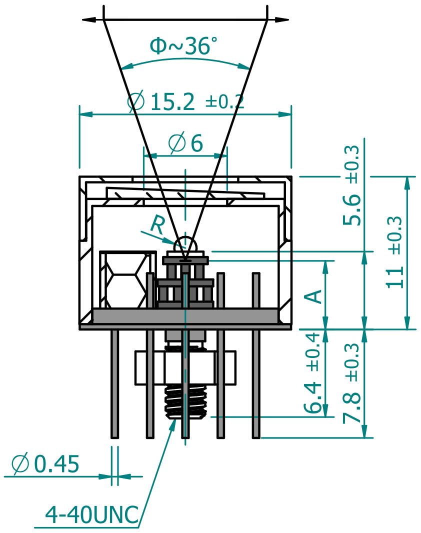
Thermistor characteristics



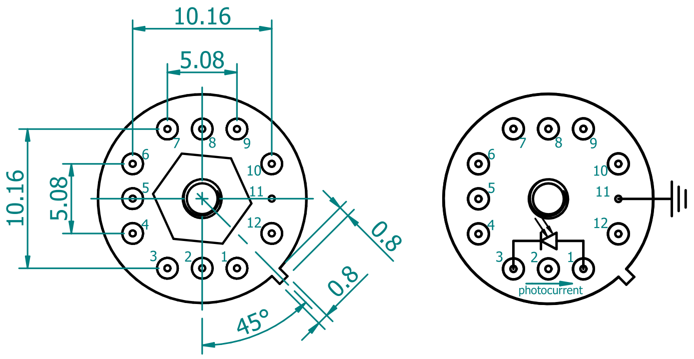
Spectral transmission of wAl_2O_3 window (typical example)



Mechanical layout, mm



Bottom view



Parameter	Value
Immersion microlens shape	hyperhemisphere
Optical area A_o, mm×mm	1×1
R, mm	0.8
A, mm	3.2±0.3

Φ – acceptance angle

R – hyperhemisphere microlens radius

A – distance from the bottom of the 2TE-TO8 header to the focal plane

Function	Pin number
Detector	1, 3
Reverse bias (optional)	1(–), 3(+)
Thermistor	7, 9
TE cooler supply	2(+), 8(–)
Chassis ground	11
Not used	4, 5, 6, 10, 12

Precautions for use and storage

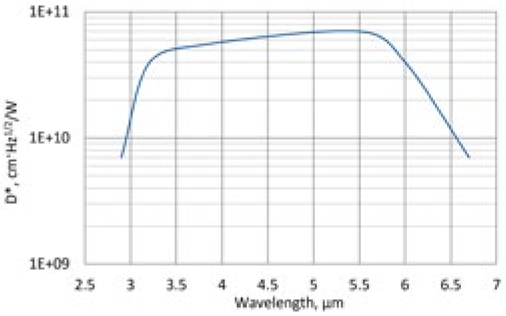
- Standard ohmmeter may overbias and damage the detector. Bias of 10 mV can be used for resistance measurements.
- Heatsink with thermal resistance of ~2 K/W is necessary to dissipate heat generated by 2TE cooler.
- Operation in 10% to 80% humidity and -20°C to 30°C ambient temperature.
- Beam power limitations for optically immersed detector:
  - irradiance with CW or single pulse longer than 1 μs irradiance on the apparent optical active area must not exceed 2.5 W/cm^2,
  - irradiance of the pulse shorter than 1 μs must not exceed 10 kW/cm^2.
- Storage in dark place with 10% to 90% humidity and -20°C to 50°C ambient temperature.

PVI-2TE-6-1×1-TO8-wZnSeAR-36

3.0 – 6.7 µm HgCdTe two-stage thermoelectrically cooled, optically immersed photovoltaic detector

PVI-2TE-6-1×1-TO8-wZnSeAR-36 is two-stage thermoelectrically cooled IR photovoltaic detector based on sophisticated HgCdTe heterostructure for the best performance and stability. The device is optimized for the maximum performance at 6 µm. Detector element is monolithically integrated with hyperhemispherical GaAs microlens in order to improve performance of the device. Reverse bias may significantly increase response speed and dynamic range. 3° wedged zinc selenide anti-reflection coated (wZnSeAR) window prevents unwanted interference effects.

Spectral response (T_a = 20°C, V_b = 0 mV)



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

Specification (T_a = 20°C, V_b = 0 mV)

Parameter	Detector type PVI-2TE-6-1×1-TO8-wZnSeAR-36
Active element material	epitaxial HgCdTe heterostructure
Cut-on wavelength λ_{cut-on} (10%), µm	3.0±1.0
Peak wavelength λ_{peak}, µm	5.2±0.5
Optimum wavelength λ_{opt}, µm	6.0
Cut-off wavelength $\lambda_{cut-off}$ (10%), µm	6.7±0.3
Detectivity D*(λ_{peak}), cm·Hz1/2/W	≥7.0×10^{10}
Detectivity D*(λ_{opt}), cm·Hz1/2/W	≥4.0×10^{10}
Current responsivity Ri (λ_{peak}), A/W	≥2.7
Current responsivity Ri (λ_{opt}), A/W	≥1.5
Time constant τ, ns	≤50
Resistance R, Ω	≥200
Active element temperature T_{det}, K	~230
Optical area A_O, mm×mm	1×1
Package	TO8
Acceptance angle Φ	~36°
Window	wZnSeAR

Features

- High performance
- Wide dynamic range
- Versatility
- Quantity discounted price
- Fast delivery

Applications

- Applications
- Gas detection, monitoring and analysis (CO, CO_2, NH_3, NO_x)
- Flue gas denitrification
- Fuel combustion monitoring at power plants and other industrial facilities
- Contactless temperature measurements

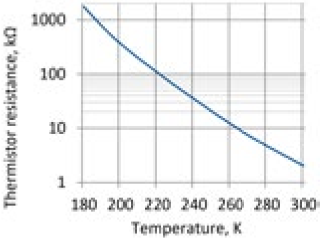
Related product

- UM-I-6 detection module

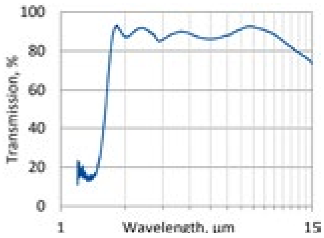
Two-stage thermoelectric cooler parameters

Parameter	Value
T_{det}, K	~230
V_{max}, V	1.3
I_{max}, A	1.2
Q_{max}, W	0.36

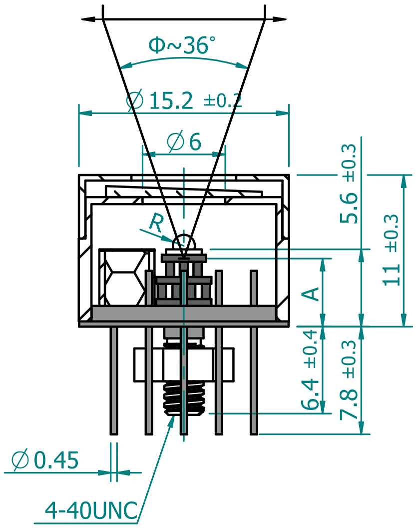
Thermistor characteristics



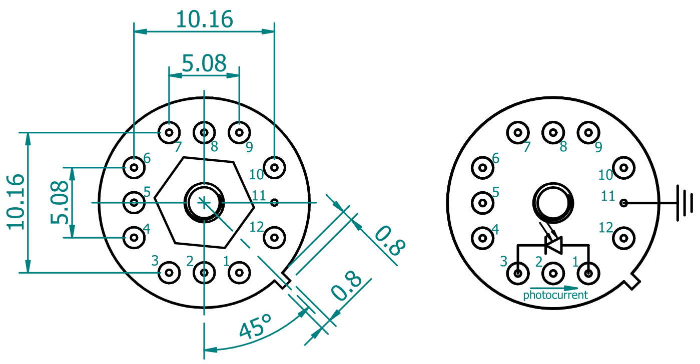
Spectral transmission of wZnSeAR window (typical example)



Mechanical layout, mm



Bottom view



Parameter	Value
Immersion microlens shape	hyperhemisphere
Optical area A_O, mm×mm	1×1
R, mm	0.8
A, mm	3.2±0.3

Φ – acceptance angle

R – hyperhemisphere microlens radius

A – distance from the bottom of the 2TE-TO8 header to the focal plane

Function	Pin number
Detector	1, 3
Reverse bias (optional)	1(–), 3(+)
Thermistor	7, 9
TE cooler supply	2(+), 8(–)
Chassis ground	11
Not used	4, 5, 6, 10, 12

Precautions for use and storage

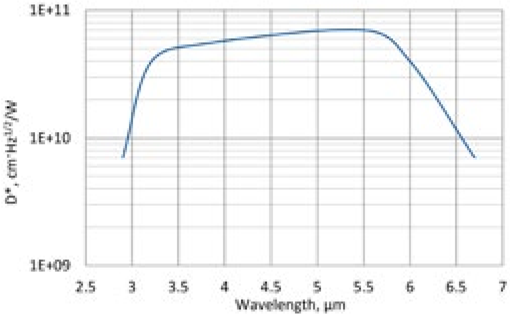
- Standard ohmmeter may overbias and damage the detector. Bias of 10 mV can be used for resistance measurements.
- Heatsink with thermal resistance of ~2 K/W is necessary to dissipate heat generated by 2TE cooler.
- Operation in 10% to 80% humidity and -20°C to 30°C ambient temperature.
- Beam power limitations for optically immersed detector:
  - irradiance with CW or single pulse longer than 1 μs irradiance on the apparent optical active area must not exceed 2.5 W/cm^2,
  - irradiance of the pulse shorter than 1 μs must not exceed 10 kW/cm^2.
- Storage in dark place with 10% to 90% humidity and -20°C to 50°C ambient temperature.

PVI-4TE-6-1×1-TO8-wZnSeAR-36

3.0 – 6.9 µm HgCdTe four-stage thermoelectrically cooled, optically immersed photovoltaic detector

PVI-4TE-6-1×1-TO8-wZnSeAR-36 is four-stage thermoelectrically cooled IR photovoltaic detector based on sophisticated HgCdTe heterostructure for the best performance and stability. The device is optimized for the maximum performance at 6 µm. Detector element is monolithically integrated with hyperhemispherical GaAs microlens in order to improve performance of the device. Reverse bias may significantly increase response speed and dynamic range. It also results in improved performance at high frequencies, but 1/f noise that appears in biased devices may reduce performance at low frequencies. 3° wedged zinc selenide anti-reflection coated (wZnSeAR) window prevents unwanted interference effects.

Spectral response (T_a = 20°C, V_b = 0 mV)



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

Specification (T_a = 20°C, V_b = 0 mV)

Parameter	Detector type PVI-4TE-6-1×1-TO8-wZnSeAR-36
Active element material	epitaxial HgCdTe heterostructure
Cut-on wavelength λ_{cut-on} (10%), µm	3.0±1.0
Peak wavelength λ_{peak}, µm	5.5±0.5
Optimum wavelength λ_{opt}, µm	6.0
Cut-off wavelength $\lambda_{cut-off}$ (10%), µm	6.9±0.3
Detectivity $D^*(\lambda_{peak})$, cm·Hz$^{1/2}$/W	≥8.0×10^{10}
Detectivity $D^*(\lambda_{opt})$, cm·Hz$^{1/2}$/W	≥6.0×10^{10}
Current responsivity $R_i(\lambda_{peak})$, A/W	≥2.7
Current responsivity $R_i(\lambda_{opt})$, A/W	≥1.5
Time constant τ, ns	≤50
Resistance R, Ω	≥300
Active element temperature T_{det}, K	~195
Optical area A_O, mm×mm	1×1
Package	TO8
Acceptance angle Φ	~36°
Window	wZnSeAR

Features

- Very high performance
- Wide dynamic range
- Versatility
- Quantity discounted price
- Fast delivery

Applications

- Gas detection, monitoring and analysis (CO, CO_2, NH_3, NO_x)
- Flue gas denitrification
- Fuel combustion monitoring at power plants and other industrial facilities
- Contactless temperature measurements

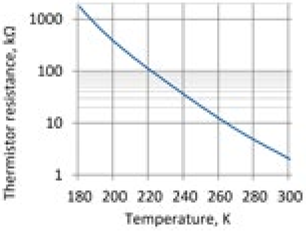
Related product

- LabM-I-6 detection module

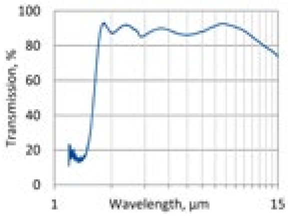
Two-stage thermoelectric cooler parameters

Parameter	Value
T_{det}, K	~195
V_{max}, V	8.3
I_{max}, A	0.4
Q_{max}, W	0.28

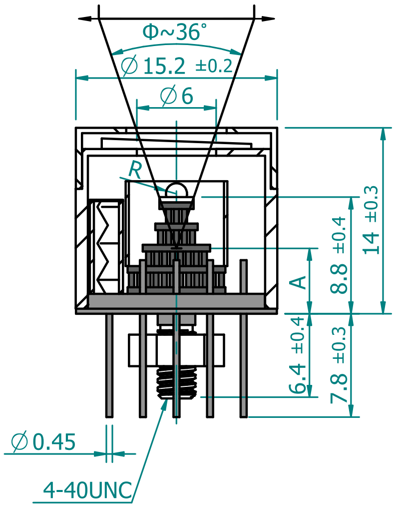
Thermistor characteristics



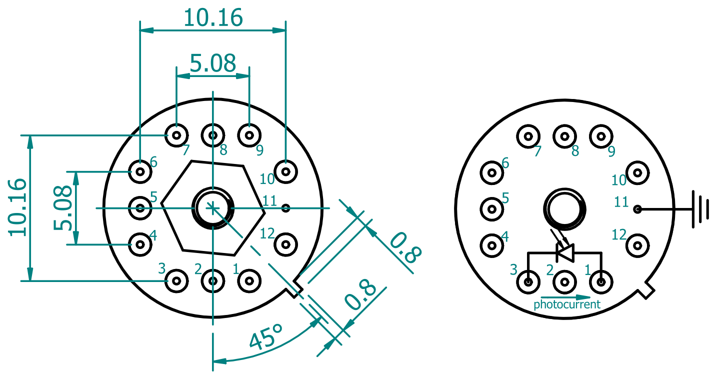
Spectral transmission of wZnSeAR window (typical example)



Mechanical layout, mm



Bottom view



Parameter	Value
Immersion microlens shape	hyperhemisphere
Optical area A_o, mm×mm	1×1
R, mm	0.8
A, mm	6.4±0.4

Φ – acceptance angle

R – hyperhemisphere microlens radius

A – distance from the bottom of the 4TE-TO8 header to the focal plane

Function	Pin number
Detector	1, 3
Reverse bias (optional)	1(–), 3(+)
Thermistor	7, 9
TE cooler supply	2(+), 8(–)
Chassis ground	11
Not used	4, 5, 6, 10, 12

Precautions for use and storage

- Standard ohmmeter may overbias and damage the detector. Bias of 10 mV can be used for resistance measurements.
- Heatsink with thermal resistance of ~1 K/W is necessary to dissipate heat generated by 4TE cooler.
- Operation in 10% to 80% humidity and -20°C to 30°C ambient temperature.
- Beam power limitations for optically immersed detector:
  - irradiance with CW or single pulse longer than 1 μs irradiance on the apparent optical active area must not exceed 2.5 W/cm^2,
  - irradiance of the pulse shorter than 1 μs must not exceed 10 kW/cm^2.
- Storage in dark place with 10% to 90% humidity and -20°C to 50°C ambient temperature.

PVM-10.6-1×1-TO39-NW-90

2 – 12 µm HgCdTe ambient temperature photovoltaic multiple junction detector

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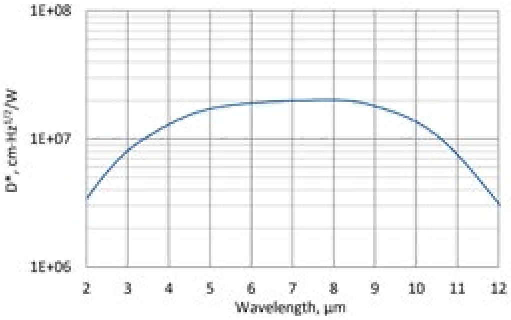
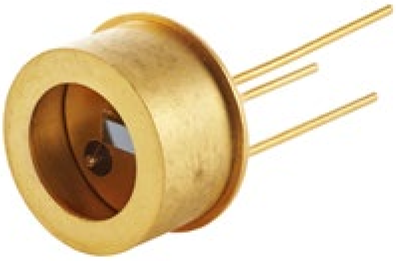
PVM-10.6-1x1-TO39-NW-90 is uncooled IR photovoltaic multiple junction detector based on sophisticated HgCdTe heterostructure for the best performance and stability. The device is designed for the maximum performance at 10.6 µm and especially useful as a large active area detector to detect CW and low frequency modulated radiation.

Spectral response (T_a = 20°C)



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



Specification (T_a = 20°C, V_b = 0 mV)

Parameter	Detector type PVM-10.6-1×1-TO39-NW-90
Active element material	epitaxial HgCdTe heterostructure
Cut-on wavelength λ_{cut-on} (10%), µm	≤2.0
Peak wavelength λ_{peak}, µm	8.5±1.5
Optimum wavelength λ_{opt}, µm	10.6
Cut-off wavelength $\lambda_{cut-off}$ (10%), µm	≥12.0
Detectivity $D^*(\lambda_{peak})$, cm·Hz$^{1/2}$/W	≥2.0×10^7
Detectivity $D^*(\lambda_{opt})$, cm·Hz$^{1/2}$/W	≥1.0×10^7
Current responsivity $R_i(\lambda_{peak})$, A/W	≥0.004
Current responsivity $R_i(\lambda_{opt})$, A/W	≥0.002
Time constant τ, ns	≤1.5
Resistance R, Ω	≥30
Active area A, mm×mm	1×1
Package	TO39
Acceptance angle Φ	~90°
Window	none

Features

- Wide spectral range from 2 to 12 µm
- Large active area 1×1 mm^2
- No bias required
- No flicker noise
- Short time constant ≤ 1.5 ns
- Operation from DC to high frequency
- Sensitive to IR radiation polarisation
- Very small size
- Convenient to use
- Versatility
- Cost-effective solution
- Quantity discounted price
- Fast delivery

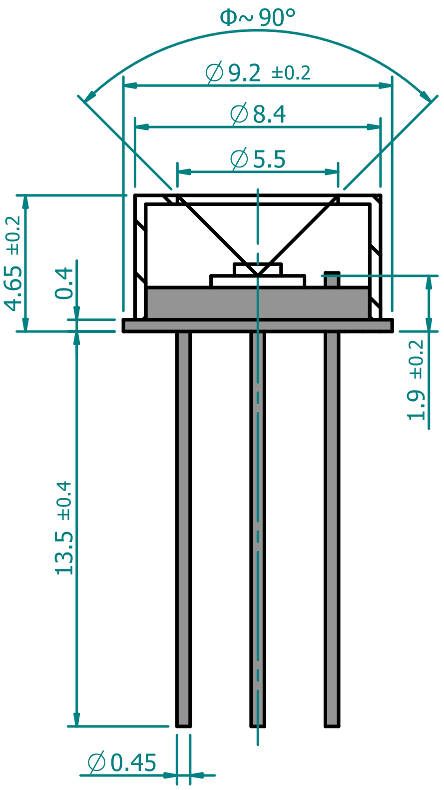
Applications

- CO_2 laser (10.6 µm) measurements
- Laser power monitoring and control
- Laser beam profiling and positioning
- Laser calibration
- Dentistry

Related product

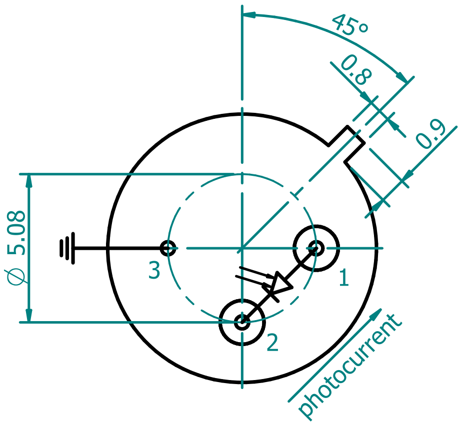
- microM-10.6 detection module

Mechanical layout, mm



Φ – *acceptance angle*

Bottom view



Function	Pin number
Detector	1, 2
Chassis ground	3

Precautions for use and storage

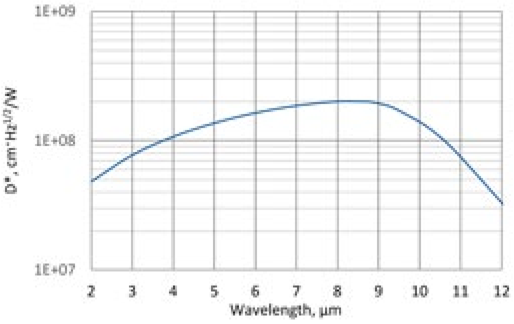
- Operation in 10% to 80% humidity and -20°C to 30°C ambient temperature.
- Beam power limitations:
  - irradiance with CW or single pulse longer than 1 μs irradiance on the apparent optical active area must not exceed 100 W/cm²,
  - irradiance of the pulse shorter than 1 μs must not exceed 1 MW/cm².
- Storage in dark place with 10% to 90% humidity and -20°C to 50°C ambient temperature.

PVM-2TE-10.6-1×1-TO8-wZnSeAR-70

2 – 12 µm HgCdTe two-stage thermoelectrically cooled photovoltaic multiple junction detector

PVM-2TE-10.6-1×1-TO8-wZnSeAR-70 is two-stage thermoelectrically cooled IR photovoltaic multiple junction detector based on sophisticated HgCdTe heterostructure for the best performance and stability. The device is designed for the maximum performance at 10.6 µm and especially useful as a large active area detector to detect CW and low frequency modulated radiation. 3° wedged zinc selenide anti-reflection coated (wZnSeAR) window prevents unwanted interference effects.

Spectral response (T_a = 20°C)



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

Specification (T_a = 20°C)

Parameter	Detector type PVM-2TE-10.6-1×1-TO8-wZnSeAR-70
Active element material	epitaxial HgCdTe heterostructure
Cut-on wavelength λ_{cut-on} (10%), µm	≤2.0
Peak wavelength λ_{peak}, µm	8.5±2.0
Optimum wavelength λ_{opt}, µm	10.6
Cut-off wavelength $\lambda_{cut-off}$ (10%), µm	≥12.0
Detectivity $D^*(\lambda_{peak})$, $cm\cdot Hz^{1/2}/W$	$\geq 2.0\times10^8$
Detectivity $D^*(\lambda_{opt})$, $cm\cdot Hz^{1/2}/W$	$\geq 1.0\times10^8$
Current responsivity $R_i(\lambda_{peak})$, A/W	≥0.015
Current responsivity $R_i(\lambda_{opt})$, A/W	≥0.01
Time constant τ, ns	≤4
Resistance R, Ω	≥90
Active element temperature T_{det}, K	~230
Active area A, mm×mm	1×1
Package	TO8
Acceptance angle Φ	~70°
Window	wZnSeAR

Features

- Wide spectral range from 2 to 12 µm
- Large active area 1×1 mm^2
- No bias required
- No flicker noise
- Operation from DC to high frequency
- Sensitive to IR radiation polarisation
- Versatility
- Quantity discounted price
- Fast delivery

Applications

- CO_2 laser (10.6 µm) measurements
- Laser power monitoring and control
- Laser beam profiling and positioning
- Laser calibration
- Dentistry

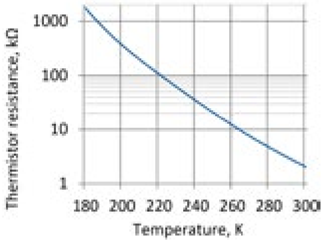
Related product

- UM-10.6 detection module

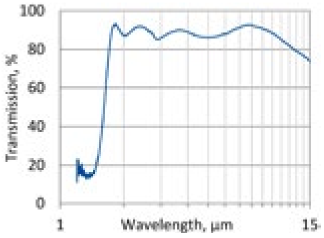
Two-stage thermoelectric cooler parameters

Parameter	Value
T_{det}, K	~230
V_{max}, V	1.3
I_{max}, A	1.2
Q_{max}, W	0.36

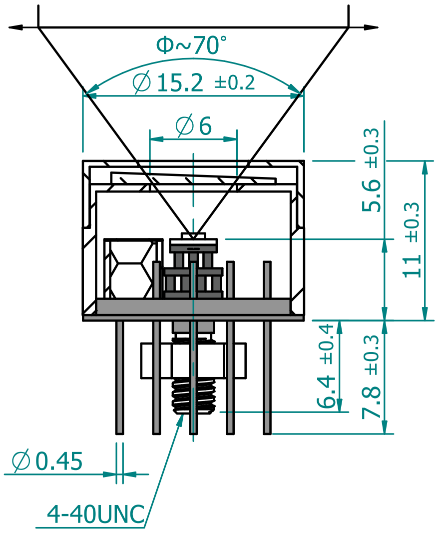
Thermistor characteristics



Spectral transmission of wZnSeAR window (typical example)

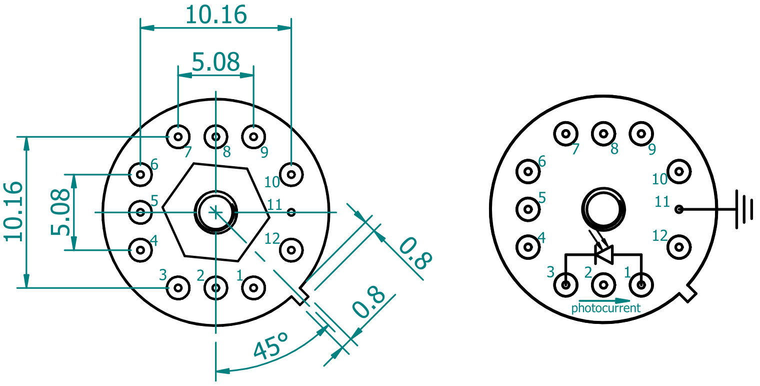


Mechanical layout, mm



Φ – *acceptance angle*

Bottom view



Function	Pin number
Detector	1, 3
Thermistor	7, 9
TE cooler supply	2(+), 8(–)
Chassis ground	11
Not used	4, 5, 6, 10, 12

Precautions for use and storage

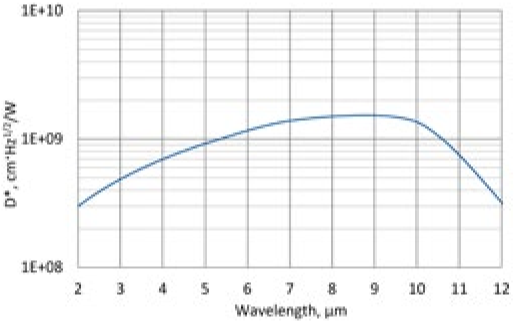
- Heatsink with thermal resistance of ~2 K/W is necessary to dissipate heat generated by 2TE cooler.
- Operation in 10% to 80% humidity and -20°C to 30°C ambient temperature.
- Beam power limitations:
  - irradiance with CW or single pulse longer than 1 μs irradiance on the apparent optical active area must not exceed 100 W/cm^2,
  - irradiance of the pulse shorter than 1 μs must not exceed 1 MW/cm^2.
- Storage in dark place with 10% to 90% humidity and -20°C to 50°C ambient temperature.

PVMI-2TE-10.6-1×1-TO8-wZnSeAR-36

2 – 12 µm HgCdTe two-stage thermoelectrically cooled, optically immersed photovoltaic multiple junction detector

PVMI-2TE-10.6-1×1-TO8-wZnSeAR-36 is two-stage thermoelectrically cooled IR photovoltaic multiple junction detector based on sophisticated HgCdTe heterostructure for the best performance and stability. The device is designed for the maximum performance at 10.6 µm. Detector element is monolithically integrated with hyperhemispherical GaAs microlens in order to improve performance of the device. 3° wedged zinc selenide anti-reflection coated (wZnSeAR) window prevents unwanted interference effects.

Spectral response (T_a = 20°C)



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

Specification (T_a = 20°C)

Parameter	Detector type PVMI-2TE-10.6-1×1-TO8-wZnSeAR-36
Active element material	epitaxial HgCdTe heterostructure
Cut-on wavelength λ_{cut-on} (10%), µm	≤2.0
Peak wavelength λ_{peak}, µm	8.5±1.5
Optimum wavelength λ_{opt}, µm	10.6
Cut-off wavelength $\lambda_{cut-off}$ (10%), µm	≥12.0
Detectivity $D^*(\lambda_{peak})$, cm·Hz$^{1/2}$/W	≥1.5×10^9
Detectivity $D^*(\lambda_{opt})$, cm·Hz$^{1/2}$/W	≥1.0×10^9
Current responsivity $R_i(\lambda_{peak})$, A/W	≥0.15
Current responsivity $R_i(\lambda_{opt})$, A/W	≥0.1
Time constant τ, ns	≤3
Resistance R, Ω	≥90
Active element temperature T_{det}, K	~230
Optical area A_O, mm×mm	1×1
Package	TO8
Acceptance angle Φ	~36°
Window	wZnSeAR

Features

- Wide spectral range from 2 to 12 µm
- No bias required
- No flicker noise
- Operation from DC to high frequency
- Sensitive to IR radiation polarisation
- Versatility
- Quantity discounted price
- Fast delivery

Applications

- CO_2 laser (10.6 µm) measurements
- Laser power monitoring and control
- Laser beam profiling and positioning
- Laser calibration
- Dentistry

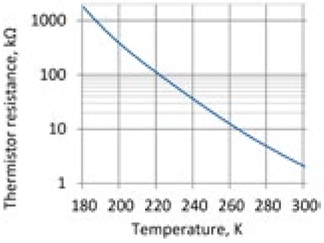
Related product

- UM-I-10.6 detection module

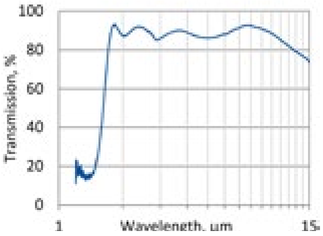
Two-stage thermoelectric cooler parameters

Parameter	Value
T_{det}, K	~230
V_{max}, V	1.3
I_{max}, A	1.2
Q_{max}, W	0.36

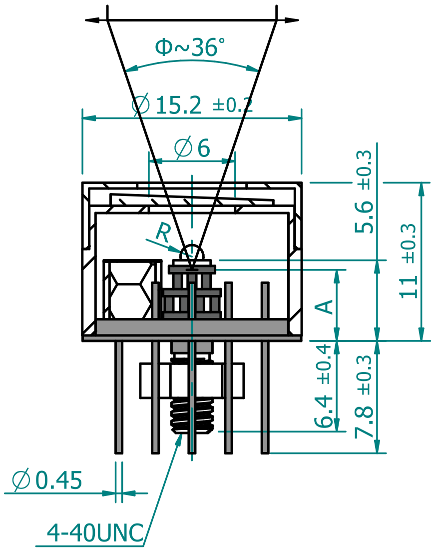
Thermistor characteristics



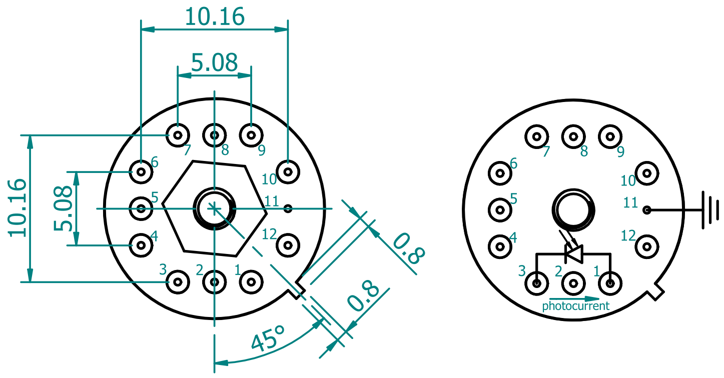
Spectral transmission of wZnSeAR window (typical example)



Mechanical layout, mm



Bottom view



Parameter	Value
Immersion microlens shape	hyperhemisphere
Optical area A_o, mm×mm	1×1
R, mm	0.8
A, mm	3.2±0.3

Φ – acceptance angle

R – hyperhemisphere microlens radius

A – distance from the bottom of the 2TE-TO8 header to the focal plane

Function	Pin number
Detector	1, 3
Thermistor	7, 9
TE cooler supply	2(+), 8(–)
Chassis ground	11
Not used	4, 5, 6, 10, 12

Precautions for use and storage

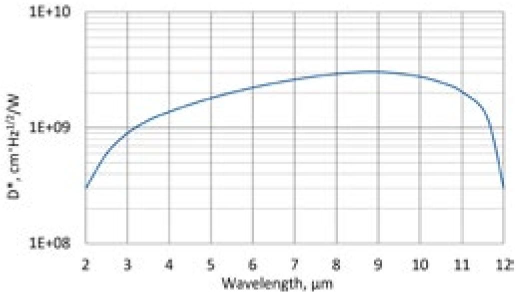
- Heatsink with thermal resistance of ~2 K/W is necessary to dissipate heat generated by 2TE cooler.
- Operation in 10% to 80% humidity and -20°C to 30°C ambient temperature.
- Beam power limitations for optically immersed detector:
  - irradiance with CW or single pulse longer than 1 μs irradiance on the apparent optical active area must not exceed 2.5 W/cm^2,
  - irradiance of the pulse shorter than 1 μs must not exceed 10 kW/cm^2.
- Storage in dark place with 10% to 90% humidity and -20°C to 50°C ambient temperature.

PVMI-4TE-10.6-1×1-TO8-wZnSeAR-36

2 – 12 µm HgCdTe four-stage thermoelectrically cooled, optically immersed photovoltaic multiple junction detector

PVMI-4TE-10.6-1×1-TO8-wZnSeAR-36 is four-stage thermoelectrically cooled IR photovoltaic multiple junction detector based on sophisticated HgCdTe heterostructure for the best performance and stability. The device is designed for the maximum performance at 10.6 µm. Detector element is monolithically integrated with hyperhemispherical GaAs microlens in order to improve performance of the device. 3° wedged zinc selenide anti-reflection coated (wZnSeAR) window prevents unwanted interference effects.

Spectral response (T_a = 20°C)



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

Specification (T_a = 20°C)

Parameter	Detector type PVMI-4TE-10.6-1×1-TO8-wZnSeAR-36
Active element material	epitaxial HgCdTe heterostructure
Cut-on wavelength λ_{cut-on} (10%), µm	≤2.0
Peak wavelength λ_{peak}, µm	8.5±2.0
Optimum wavelength λ_{opt}, µm	10.6
Cut-off wavelength $\lambda_{cut-off}$ (10%), µm	≥12.0
Detectivity D*(λ_{peak}), cm·Hz$^{1/2}$/W	≥3.0×10^{9}
Detectivity D*(λ_{opt}), cm·Hz$^{1/2}$/W	≥2.5×10^{9}
Current responsivity $R_i(\lambda_{peak})$, A/W	≥0.25
Current responsivity $R_i(\lambda_{opt})$, A/W	≥0.18
Time constant τ, ns	≤3
Resistance R, Ω	≥120
Active element temperature T_{det}, K	~195
Optical area A_O, mm×mm	1×1
Package	TO8
Acceptance angle Φ	~36°
Window	wZnSeAR

Features

- High performance
- Wide spectral range from 2 to 12 µm
- No bias required
- No flicker noise
- Operation from DC to high frequency
- Sensitive to IR radiation polarisation
- Versatility
- Quantity discounted price
- Fast delivery

Applications

- CO_2 laser (10.6 µm) measurements
- Laser power monitoring and control
- Laser beam profiling and positioning
- Laser calibration
- Semiconductor manufacturing
- Glucose monitoring
- Detection of hazardous chemicals (i.e. ammonia) in the air

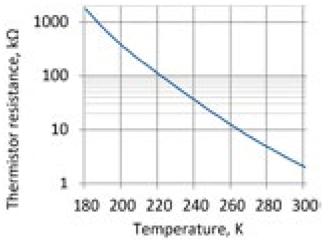
Related product

- LabM-I-10.6 detection module

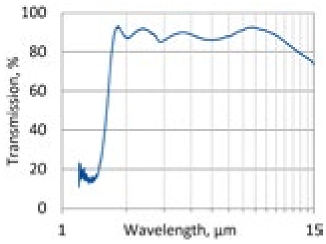
Four-stage thermoelectric cooler parameters

Parameter	Value
T_{det}, K	~195
V_{max}, V	8.3
I_{max}, A	0.4
Q_{max}, W	0.28

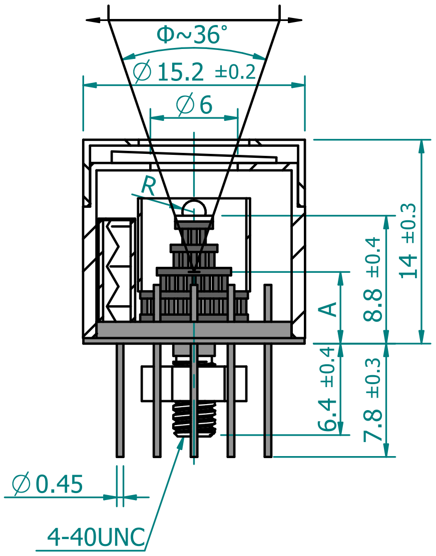
Thermistor characteristics



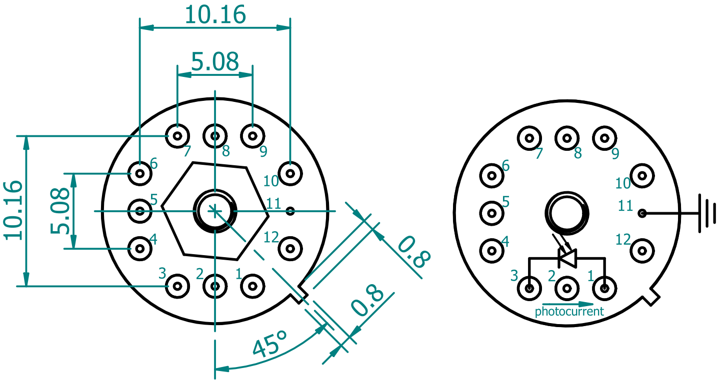
Spectral transmission of wZnSeAR window (typical example)



Mechanical layout, mm



Bottom view



Parameter	Value
Immersion microlens shape	hyperhemisphere
Optical area A_o, mm×mm	1×1
R, mm	0.8
A, mm	6.4±0.4

Φ – acceptance angle

R – hyperhemisphere microlens radius

A – distance from the bottom of the 4TE-TO8 header to the focal plane

Function	Pin number
Detector	1, 3
Thermistor	7, 9
TE cooler supply	2(+), 8(–)
Chassis ground	11
Not used	4, 5, 6, 10, 12

Precautions for use and storage

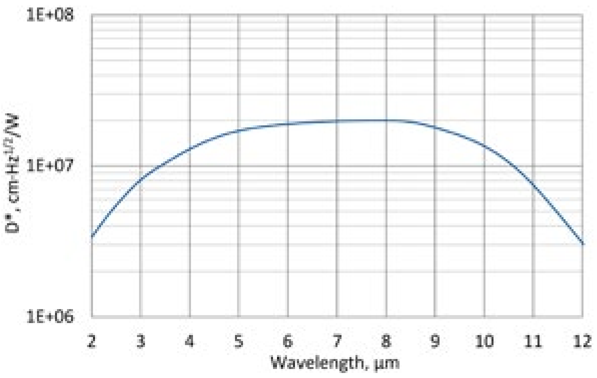
- Heatsink with thermal resistance of ~1 K/W is necessary to dissipate heat generated by 4TE cooler.
- Operation in 10% to 80% humidity and -20°C to 30°C ambient temperature.
- Beam power limitations for optically immersed detector:
  - irradiance with CW or single pulse longer than 1 µs irradiance on the apparent optical active area must not exceed 2.5 W/cm^2,
  - irradiance of the pulse shorter than 1 µs must not exceed 10 kW/cm^2.
- Storage in dark place with 10% to 90% humidity and -20°C to 50°C ambient temperature.

PEM-10.6-2×2-PEM-SMA-wZnSeAR-48

2 – 12 µm HgCdTe ambient temperature photoelectromagnetic detector

PEM-10.6-2×2-PEM-SMA-wZnSeAR-48 is uncooled IR photovoltaic multiple junction HgCdTe detector based on photoelectromagnetic effect in the semiconductor – spatial separation of optically generated electrons and holes in the magnetic field. This device is designed for the maximum performance at 10.6 µm and especially useful as a large active area detector to detect CW and low frequency modulated radiation. This device is mounted in specialized package with incorporated magnetic circuit inside and SMA signal output connector. 3° wedged zinc selenide anti-reflection coated window prevents unwanted interference effects and protects against pollution.

Spectral response (T_a = 20°C)



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

Specification (T_a = 20°C)

Parameter	Detector type PEM-10.6-2×2-PEM-SMA-wZnSeAR-48
Active element material	epitaxial HgCdTe heterostructure
Cut-on wavelength λ_{cut-on} (10%), µm	≤2.0
Peak wavelength λ_{peak}, µm	8.5±1.5
Optimum wavelength λ_{opt}, µm	10.6
Cut-off wavelength $\lambda_{cut-off}$ (10%), µm	≥12.0
Detectivity D*(λ_{peak}), cm·Hz1/2/W	≥2.0×10^7
Detectivity D*(λ_{opt}), cm·Hz1/2/W	≥1.0×10^7
Current responsivity R_i(λ_{peak}), A/W	≥0.002
Current responsivity R_i(λ_{opt}), A/W	≥0.001
Time constant τ, ns	≤1.2
Resistance R, Ω	≥40
Active area A, mm×mm	2×2
Package	PEM with SMA connector
Acceptance angle Φ	~48°
Window	wedged zinc selenide AR coated (wZnSeAR)

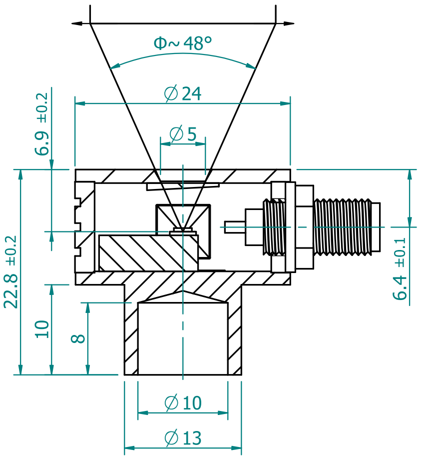
Features

- Wide spectral range from 2 to 12 µm
- Large active area 2×2 mm^2
- Wide dynamic range
- No bias required
- No flicker noise
- Short time constant ≤ 1.2 ns
- Radiation polarisation sensitive
- Convenient to use
- Quantity discounted price
- Fast delivery

Applications

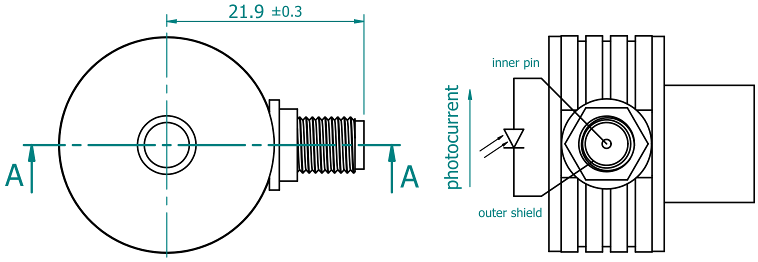
- CO_2 laser (10.6 µm) measurements
- Laser power monitoring and control
- Laser beam profiling and positioning
- Laser calibration

Mechanical layout, mm

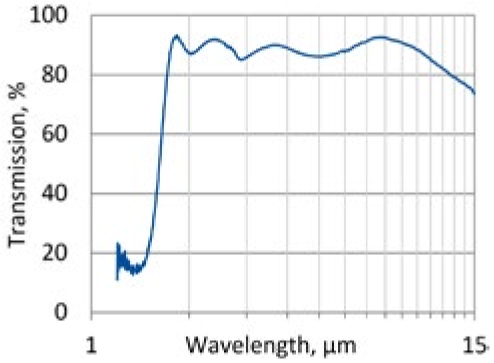


Φ – *acceptance angle*

Top view



Spectral transmission of wZnSeAR window (typical example)



Included accessories

- SMA-BNC cable

Precautions for use and storage

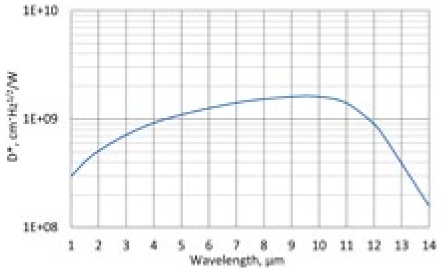
- Operation in 10% to 80% humidity and -20°C to 30°C ambient temperature.
- Beam power limitations:
  - irradiance with CW or single pulse longer than 1 µs irradiance on the apparent optical active area must not exceed 100 W/cm²,
  - irradiance of the pulse shorter than 1 µs must not exceed 1 MW/cm².
- Storage in dark place with 10% to 90% humidity and -20°C to 50°C ambient temperature.

PCI-3TE-12-1×1-TO8-wZnSeAR-36

2 – 14 µm HgCdTe three-stage thermoelectrically cooled, optically immersed photoconductive detector

PCI-3TE-12-1×1-TO8-wZnSeAR-36 is a three-stage thermoelectrically cooled IR photoconductor, based on sophisticated HgCdTe heterostructure for the best performance and stability. The device is optimized for the maximum performance at 12 µm. Detector element is monolithically integrated with hyperhemispherical GaAs microlens in order to improve performance of the device. Photoconductive detector should operate in optimum bias voltage and current readout mode. Performance at low frequencies is reduced due to 1/f noise. 3° wedged zinc selenide anti-reflection coated (wZnSeAR) window prevents unwanted interference effects.

Spectral response (T_a = 20°C)



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

Specification (T_a = 20°C)

Parameter	Detector type PCI-3TE-12-1×1-TO8-wZnSeAR-36
Active element material	epitaxial HgCdTe heterostructure
Cut-on wavelength λ_{cut-on} (10%), µm	≤2.0
Peak wavelength λ_{peak}, µm	10.0±0.2
Optimum wavelength λ_{opt}, µm	12.0
Cut-off wavelength $\lambda_{cut-off}$ (10%), µm	14.0±0.2
Detectivity $D^*(\lambda_{peak})$, cm·Hz$^{1/2}$/W	≥1.6×10^9
Detectivity $D^*(\lambda_{opt})$, cm·Hz$^{1/2}$/W	≥9.0×10^8
Current responsivity $R_i(\lambda_{peak})$, A/W	≥0.11
Current responsivity $R_i(\lambda_{opt})$, A/W	≥0.07
Time constant τ, ns	≤5
Resistance R, Ω	≤300
Bias voltage Vb, V	≤1.8
1/f noise corner frequency f_c, kHz	≤20
Active element temperature T_{det}, K	~210
Optical area A_O, mm×mm	1×1
Package	TO8
Acceptance angle Φ	~36°
Window	wZnSeAR

Features

- Wide spectral range from 1 to 14 µm
- High responsivity
- Large dynamic range
- Excellent long term stability and reliability
- Quantity discounted price
- Fast delivery

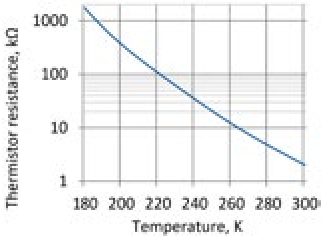
Applications

- FTIR spectroscopy and spectrometry

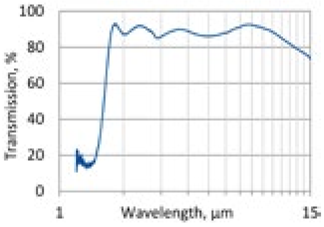
Four-stage thermoelectric cooler parameters

Parameter	Value
T_{det}, K	~210
V_{max}, V	3.6
I_{max}, A	0.45
Q_{max}, W	0.27

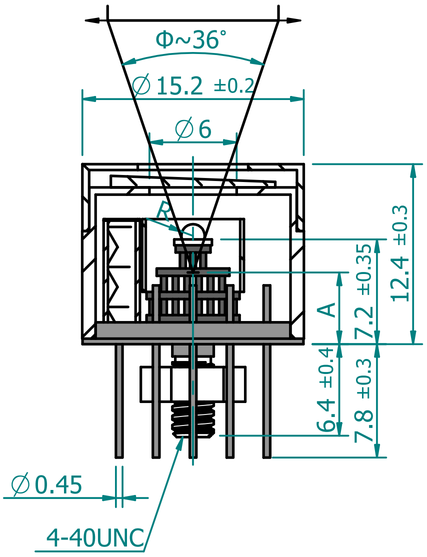
Thermistor characteristics



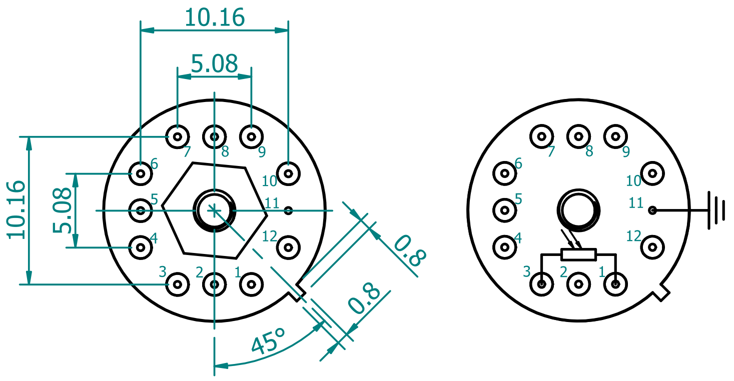
Spectral transmission of wZnSeAR window (typical example)



Mechanical layout, mm



Bottom view



Parameter	Value
Immersion microlens shape	hyperhemisphere
Optical area A_o, mm×mm	1×1
R, mm	0.8
A, mm	4.8±0.35

Φ – acceptance angle

R – hyperhemisphere microlens radius

A – distance from the bottom of the 3TE-TO8 header to the focal plane

Function	Pin number
Detector	1, 3
Thermistor	7, 9
TE cooler supply	2(+), 8(–)
Chassis ground	11
Not used	4, 5, 6, 10, 12

Precautions for use and storage

- Heatsink with thermal resistance of ~2 K/W is necessary to dissipate heat generated by 3TE cooler.
- Operation in 10% to 80% humidity and -20°C to 30°C ambient temperature.
- Beam power limitations for optically immersed detector:
  - irradiance with CW or single pulse longer than 1 µs irradiance on the apparent optical active area must not exceed 2.5 W/cm^2,
  - irradiance of the pulse shorter than 1 µs must not exceed 10 kW/cm^2.
- Storage in dark place with 10% to 90% humidity and -20°C to 50°C ambient temperature.