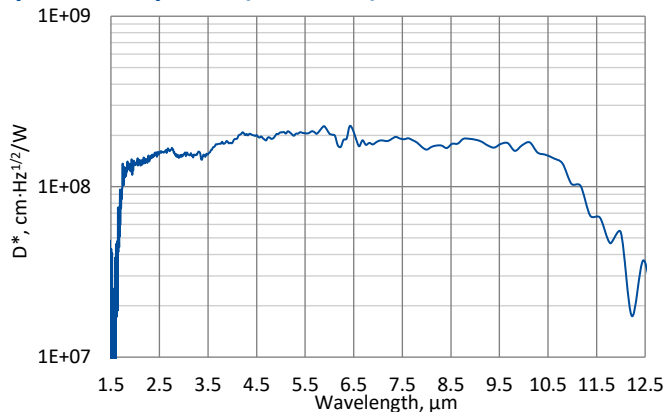


## PCAS-2TE-11-0.1×0.1-TO8-wZnSeAR-70 – ENGINEERING SAMPLE

### Type II superlattice, two-stage thermoelectrically cooled, photoconductive detector

**PCAS-2TE-11-0.1×0.1-TO8-wZnSeAR-70** is a Type II superlattice two-stage thermoelectrically cooled IR photoconductor, with excellent parameters. 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 window (wZnSeAR) prevents unwanted interference effects. For detection of CW radiation, using of optical chopper system is recommended. This detector does not contain mercury or cadmium and is compliant with the RoHS Directive.

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



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



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

Parameter	Detector type	
	PCAS-2TE-11-0.1×0.1-TO8-wZnSeAR-70	
Active element material	epitaxial superlattice heterostructure	
Cut-on wavelength $\lambda_{\text{cut-on}}$ (10%), $\mu\text{m}$	1.6±0.2	
Peak wavelength $\lambda_{\text{peak}}$ , $\mu\text{m}$	6.0±0.3	
Cut-off wavelength $\lambda_{\text{cut-off}}$ (10%), $\mu\text{m}$	12.0±0.3	
Detectivity $D^*(\lambda_{\text{peak}}, 100 \text{ kHz})$ , $\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	~1.9×10 <sup>8</sup>	
Current responsivity $R_i(\lambda_{\text{peak}})$ , A/W	~1.5	
Time constant $\tau$ , ns	~7	
Resistance $R$ , $\Omega$	~55	
Bias voltage $V_b$ , V	typ. 0.5	
1/f noise corner frequency $f_c$ , Hz	typ. 100k	
Active element temperature $T_{\text{det}}$ , K	~230	
Active area $A$ , mm×mm	0.1×0.1	
Package	TO8	
Acceptance angle $\Phi$	~70°	
Window	wZnSeAR	

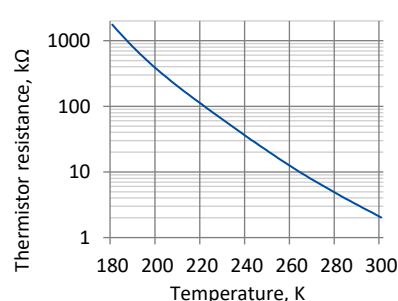
#### Features

- Wide spectral range from 1.6 to 12.0  $\mu\text{m}$
- High responsivity
- Excellent linearity
- Environmentally friendly

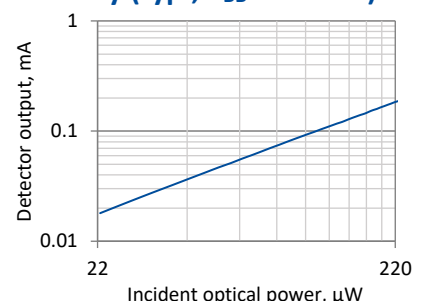
#### Two-stage thermoelectric cooler parameters

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

#### Thermistor characteristics

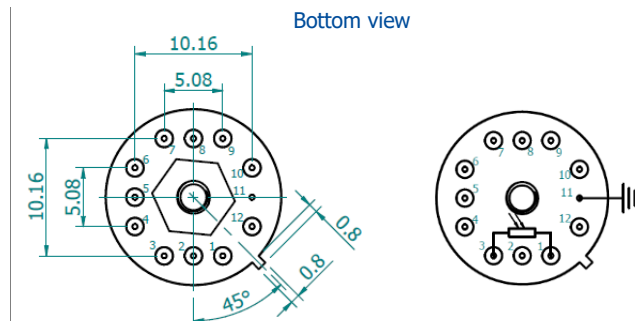
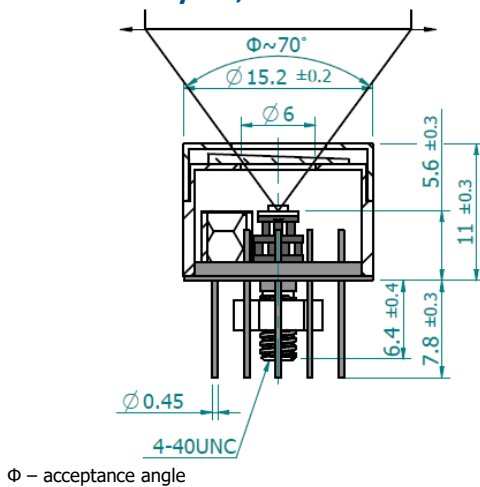


#### Linearity (typ., $T_{\text{BB}} = 1273 \text{ K}$ )



$T_{\text{BB}}$  – black body temperature

### Mechanical layout, mm



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

### Dedicated preamplifiers



„all-in-one“ AIP



programmable PIP



standard MIP



small SIP-TO8

### Precautions for use and storage

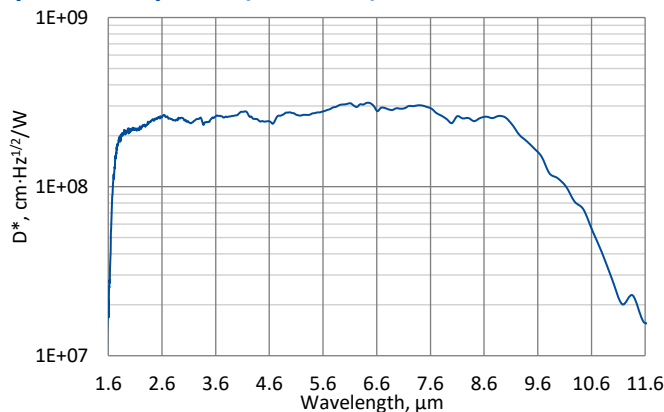
- Heatsink with thermal resistance of ~2 K/W is necessary to dissipate heat generated by 2TE cooler.
- Operation in 10% to 80% humidity and -20°C to 30°C ambient temperature.
- Beam power limitations:
  - irradiance with CW or single pulse longer than 1 μs irradiance on the apparent optical active area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

## PCAS-2TE-9-0.1x0.1-TO8-wZnSeAR-70 – ENGINEERING SAMPLE

### Type II superlattice, two-stage thermoelectrically cooled, photoconductive detector

**PCAS-2TE-9-0.1x0.1-TO8-wZnSeAR-70** is a Type II superlattice two-stage thermoelectrically cooled IR photoconductor, with excellent parameters. 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 window (wZnSeAR) prevents unwanted interference effects. For detection of CW radiation, using of optical chopper system is recommended. This detector does not contain mercury or cadmium and is compliant with the RoHS Directive.

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



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

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

Parameter	Detector type
	PCAS-2TE-9-0.1x0.1-TO8-wZnSeAR-70
Active element material	epitaxial superlattice heterostructure
Cut-on wavelength $\lambda_{\text{cut-on}}$ (10%), $\mu\text{m}$	1.6±0.2
Peak wavelength $\lambda_{\text{peak}}$ , $\mu\text{m}$	6.2±0.3
Cut-off wavelength $\lambda_{\text{cut-off}}$ (10%), $\mu\text{m}$	11.0±0.3
Detectivity $D^*(\lambda_{\text{peak}}, 20 \text{ kHz})$ , $\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	~2.8×10 <sup>8</sup>
Current responsivity $R_i(\lambda_{\text{peak}})$ , A/W	~2.8
Time constant $\tau$ , ns	~12
Resistance $R$ , $\Omega$	~95
Bias voltage $V_b$ , V	typ. 0.5
1/f noise corner frequency $f_c$ , Hz	typ. 20k
Active element temperature $T_{\text{det}}$ , K	~230
Active area $A$ , mm×mm	0.1×0.1
Package	TO8
Acceptance angle $\Phi$	~70°
Window	wZnSeAR

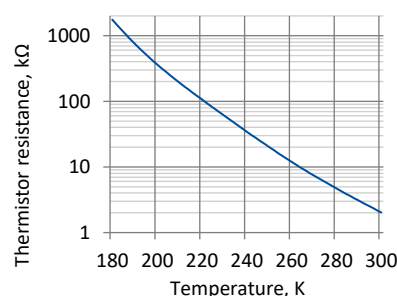
#### Features

- Wide spectral range from 1.6 to 11.0  $\mu\text{m}$
- High responsivity
- Excellent linearity
- Environmentally friendly

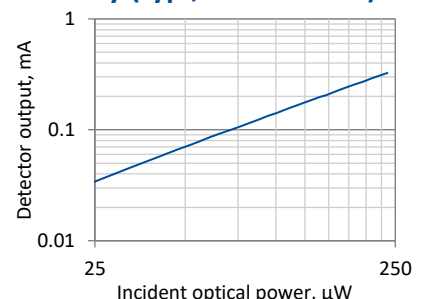
#### Two-stage thermoelectric cooler parameters

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

#### Thermistor characteristics



#### Linearity (typ., $T_{\text{BB}} = 1273 \text{ K}$ )



$T_{\text{BB}}$  – black body temperature

Distributor

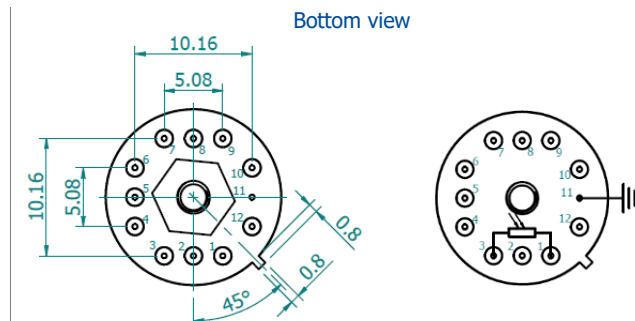
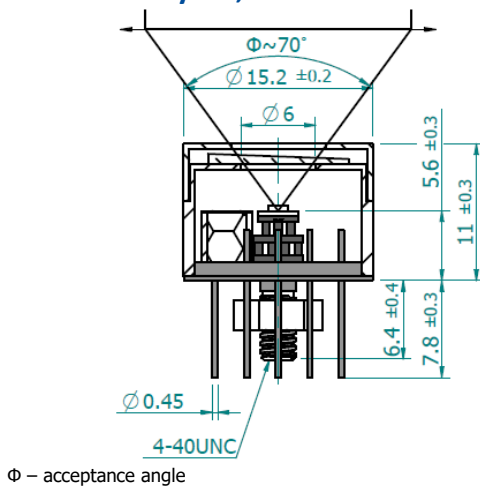


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### Mechanical layout, mm



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

### Dedicated preamplifiers



„all-in-one“ AIP



programmable PIP



standard MIP



small SIP-TO8

### Precautions for use and storage

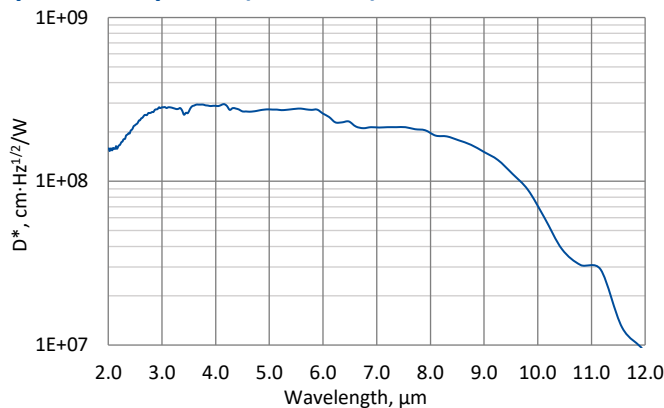
- Heatsink with thermal resistance of  $\sim 2$  K/W is necessary to dissipate heat generated by 2TE cooler.
- Operation in 10% to 80% humidity and  $-20^{\circ}\text{C}$  to  $30^{\circ}\text{C}$  ambient temperature.
- Beam power limitations:
  - irradiance with CW or single pulse longer than  $1\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

## PCAS-2TE-9-1x1AR-TO8-wZnSeAR-70 – ENGINEERING SAMPLE

### Type II superlattice, two-stage thermoelectrically cooled, photoconductive detector

**PCAS-2TE-9-1x1AR-TO8-wZnSeAR-70** is a Type II superlattice two-stage thermoelectrically cooled IR photoconductor, with excellent parameters. Photoconductive detector should operate in optimum bias voltage and current readout mode. Performance at low frequencies is reduced due to 1/f noise. Anti-reflection coated applied to active element (1x1AR) and 3° wedged zinc selenide window (wZnSeAR) prevents unwanted interference effects. For detection of CW radiation, using of optical chopper system is recommended. This detector does not contain mercury or cadmium and is compliant with the RoHS Directive.

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



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

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

Parameter	Detector type
	PCAS-2TE-9-1x1AR-TO8-wZnSeAR-70
Active element material	epitaxial superlattice heterostructure
Cut-on wavelength $\lambda_{\text{cut-on}}$ (10%), $\mu\text{m}$	$\leq 2.0$
Peak wavelength $\lambda_{\text{peak}}$ , $\mu\text{m}$	$4.0 \pm 0.5$
Cut-off wavelength $\lambda_{\text{cut-off}}$ (10%), $\mu\text{m}$	$11.0 \pm 0.5$
Detectivity $D^*(\lambda_{\text{peak}}, 300 \text{ kHz})$ , $\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	$\sim 2.6 \times 10^8$
Current responsivity $R_i(\lambda_{\text{peak}})$ , A/W	$\sim 0.04$
Time constant $\tau$ , ns	$\sim 17$
Resistance $R$ , $\Omega$	$\sim 70$
Bias voltage $V_b$ , V	typ. 0.6
1/f noise corner frequency $f_c$ , Hz	typ. 300k
Active element temperature $T_{\text{det}}$ , K	$\sim 230$
Active area $A$ , $\text{mm}\times\text{mm}$	1x1AR
Package	TO8
Acceptance angle $\Phi$	$\sim 70^\circ$
Window	wZnSeAR

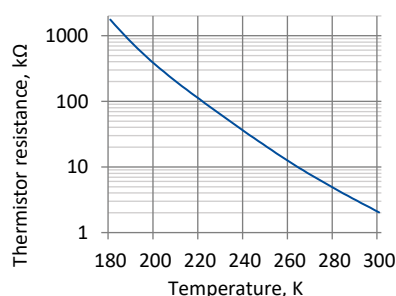
#### Features

- Wide spectral range from 2.0 to 11.0  $\mu\text{m}$
- High responsivity
- Excellent linearity
- Environmentally friendly

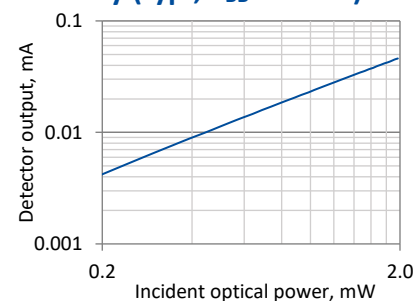
#### Two-stage thermoelectric cooler parameters

Parameter	Value
$T_{\text{det}}$ , K	$\sim 230$
$V_{\text{max}}$ , V	1.3
$I_{\text{max}}$ , A	1.2
$Q_{\text{max}}$ , W	0.36

#### Thermistor characteristics



#### Linearity (typ., $T_{\text{BB}} = 873 \text{ K}$ )



$T_{\text{BB}}$  – black body temperature

Distributor

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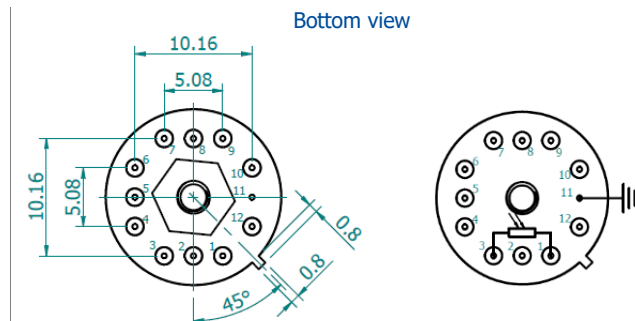
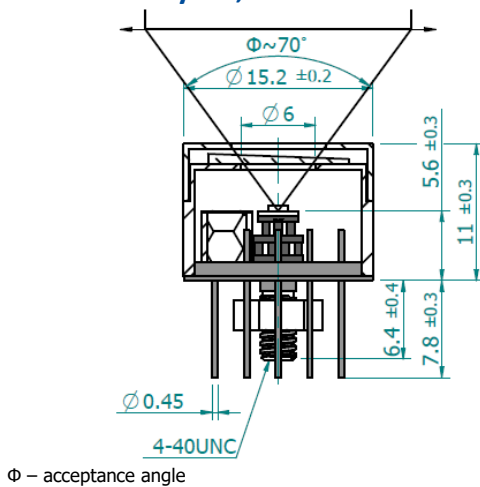
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### Mechanical layout, mm



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

### Dedicated preamplifiers



„all-in-one“ AIP



programmable PIP



standard MIP



small SIP-TO8

### Precautions for use and storage

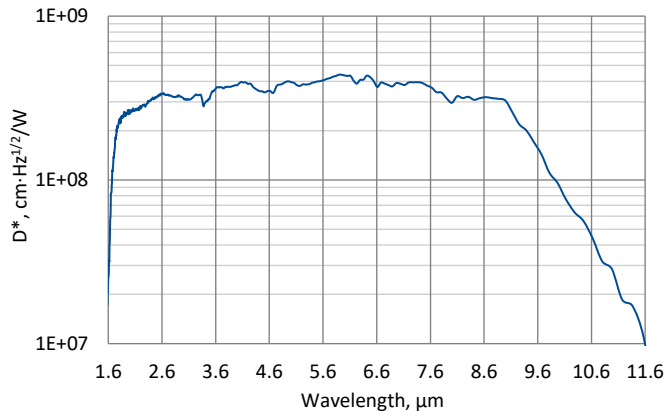
- Heatsink with thermal resistance of ~2 K/W is necessary to dissipate heat generated by 2TE cooler.
- Operation in 10% to 80% humidity and -20°C to 30°C ambient temperature.
- Beam power limitations:
  - irradiance with CW or single pulse longer than 1 μs irradiance on the apparent optical active area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

## PCAS-3TE-9-0.1x0.1-TO8-wZnSeAR-70 – ENGINEERING SAMPLE

### Type II superlattice, three-stage thermoelectrically cooled, photoconductive detector

**PCAS-3TE-9-0.1x0.1-TO8-wZnSeAR-70** is a Type II superlattice three-stage thermoelectrically cooled IR photoconductor, with excellent parameters. 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 window (wZnSeAR) prevents unwanted interference effects. For detection of CW radiation, using of optical chopper system is recommended. This detector does not contain mercury or cadmium and is compliant with the RoHS Directive.

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



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

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

Parameter	Detector type
	PCAS-3TE-9-0.1x0.1-TO8-wZnSeAR-70
Active element material	epitaxial superlattice heterostructure
Cut-on wavelength $\lambda_{\text{cut-on}}$ (10%), $\mu\text{m}$	$1.6 \pm 0.2$
Peak wavelength $\lambda_{\text{peak}}$ , $\mu\text{m}$	$6.1 \pm 0.3$
Cut-off wavelength $\lambda_{\text{cut-off}}$ (10%), $\mu\text{m}$	$10.5 \pm 0.3$
Detectivity $D^*(\lambda_{\text{peak}}, 20 \text{ kHz})$ , $\text{cm} \cdot \text{Hz}^{1/2} / \text{W}$	$\sim 4.3 \times 10^8$
Current responsivity $R_i(\lambda_{\text{peak}})$ , $\text{A/W}$	$\sim 4.4$
Time constant $\tau$ , ns	$\sim 17$
Resistance $R$ , $\Omega$	$\sim 180$
Bias voltage $V_b$ , V	typ. 0.5
1/f noise corner frequency $f_c$ , Hz	typ. 20k
Active element temperature $T_{\text{det}}$ , K	$\sim 210$
Active area $A$ , $\text{mm} \times \text{mm}$	$0.1 \times 0.1$
Package	TO8
Acceptance angle $\Phi$	$\sim 70^\circ$
Window	wZnSeAR

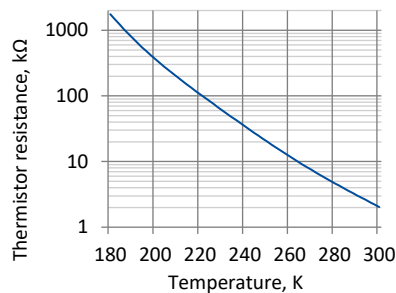
#### Features

- Wide spectral range from 1.6 to 10.5  $\mu\text{m}$
- High responsivity
- Excellent linearity
- Environmentally friendly

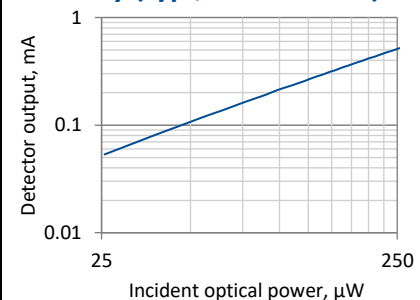
#### Three-stage thermoelectric cooler parameters

Parameter	Value
$T_{\text{det}}$ , K	$\sim 210$
$V_{\text{max}}$ , V	3.6
$I_{\text{max}}$ , A	0.45
$Q_{\text{max}}$ , W	0.27

#### Thermistor characteristics



#### Linearity (typ., $T_{\text{BB}} = 1273 \text{ K}$ )



$T_{\text{BB}}$  – black body temperature

Distributor

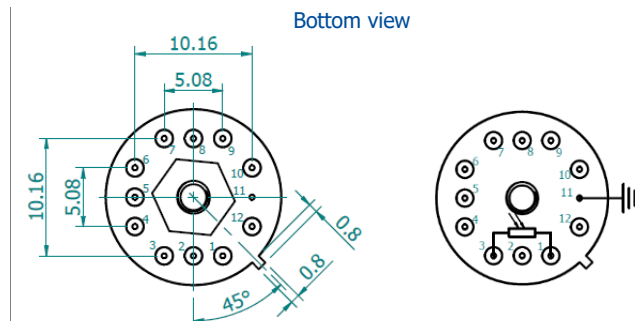
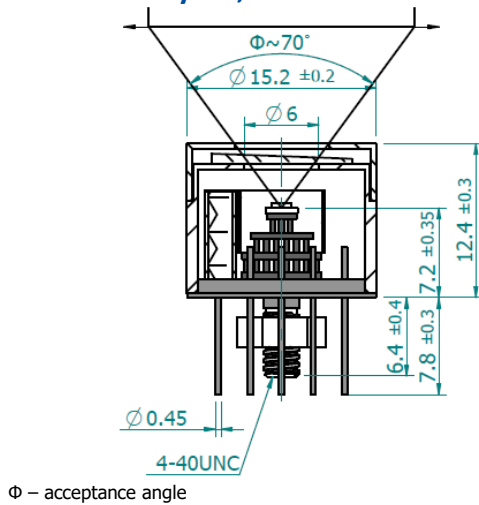


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### Mechanical layout, mm



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

### Dedicated preamplifiers



„all-in-one“ AIP



programmable PIP



standard MIP



small SIP-TO8

### Precautions for use and storage

- Heatsink with thermal resistance of ~2 K/W is necessary to dissipate heat generated 3TE 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<sup>2</sup>,
  - irradiance of the pulse shorter than 1 μs must not exceed 1 MW/cm<sup>2</sup>.
- Storage in dark place with 10% to 90% humidity and -20°C to 50°C ambient temperature.

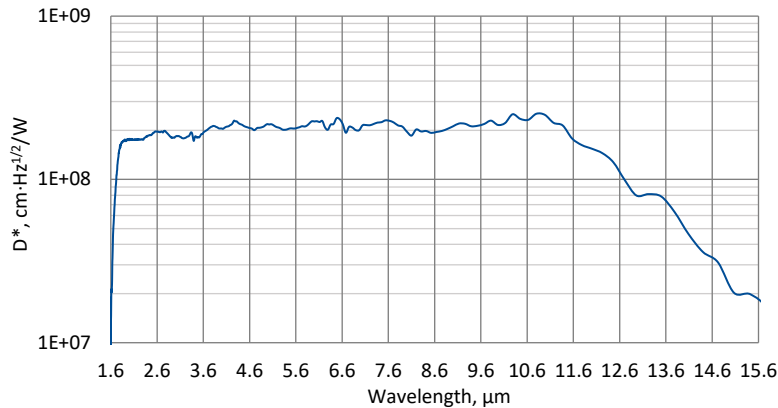


## PCAS-3TE-12-0.1x0.1-TO8-wZnSeAR-70 – ENGINEERING SAMPLE

### Type II superlattice, three-stage thermoelectrically cooled, photoconductive detector

**PCAS-3TE-12-0.1x0.1-TO8-wZnSeAR-70** is a Type II superlattice three-stage thermoelectrically cooled IR photoconductor, with excellent parameters. 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 window (wZnSeAR) prevents unwanted interference effects. For detection of CW radiation, using of optical chopper system is recommended. This detector does not contain mercury or cadmium and is compliant with the RoHS Directive.

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



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

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

Parameter	Detector type
	PCAS-3TE-12-0.1x0.1-TO8-wZnSeAR-70
Active element material	epitaxial superlattice heterostructure
Cut-on wavelength $\lambda_{\text{cut-on}}$ (10%), $\mu\text{m}$	1.6±0.2
Peak wavelength $\lambda_{\text{peak}}$ , $\mu\text{m}$	10.5±0.3
Cut-off wavelength $\lambda_{\text{cut-off}}$ (10%), $\mu\text{m}$	14.4±0.3
Detectivity $D^*(\lambda_{\text{peak}}, 20 \text{ kHz})$ , $\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	~2.5×10 <sup>8</sup>
Current responsivity $R_i(\lambda_{\text{peak}})$ , A/W	~1.5
Time constant $\tau$ , ns	~4
Resistance $R$ , $\Omega$	~45
Bias voltage $V_b$ , V	typ. 0.5
1/f noise corner frequency $f_c$ , Hz	typ. 20k
Active element temperature $T_{\text{det}}$ , K	~210
Active area $A$ , mm×mm	0.1×0.1
Package	TO8
Acceptance angle $\Phi$	~70°
Window	wZnSeAR

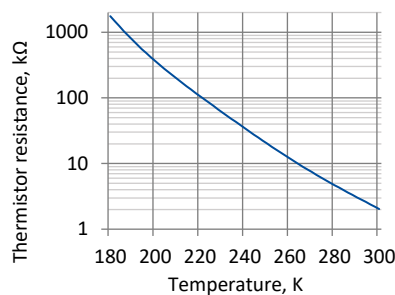
#### Features

- Very wide spectral range from 1.6 to 14.4  $\mu\text{m}$
- High responsivity
- Excellent linearity
- Environmentally friendly

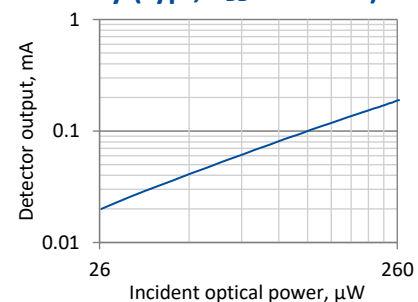
#### Three-stage thermoelectric cooler parameters

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

#### Thermistor characteristics



#### Linearity (typ., $T_{\text{BB}} = 1273 \text{ K}$ )



$T_{\text{BB}}$  – black body temperature

Distributor

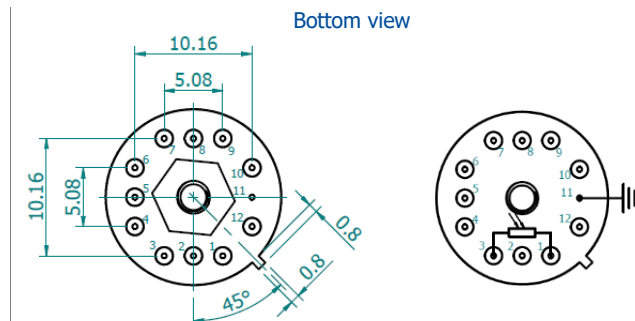
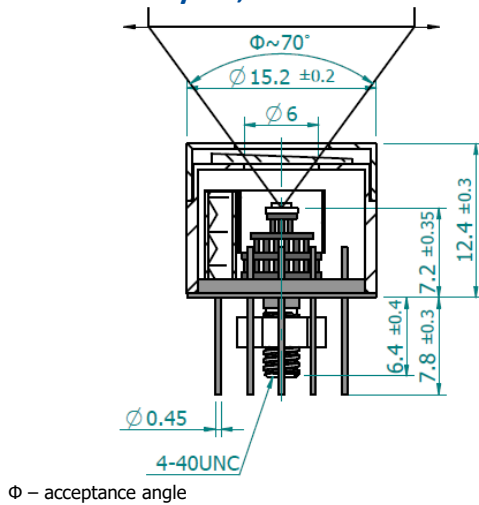


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### Mechanical layout, mm



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

### Dedicated preamplifiers



„all-in-one“ AIP



programmable PIP



standard MIP



small SIP-TO8

### Precautions for use and storage

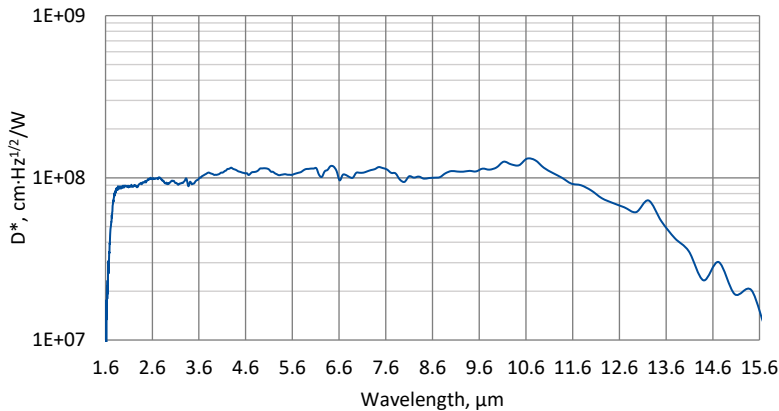
- Heatsink with thermal resistance of ~2 K/W is necessary to dissipate heat generated 3TE cooler.
- Operation in 10% to 80% humidity and -20°C to 30°C ambient temperature.
- Beam power limitations:
  - irradiance with CW or single pulse longer than 1 μs irradiance on the apparent optical active area must not exceed 100 W/cm<sup>2</sup>,
  - irradiance of the pulse shorter than 1 μs must not exceed 1 MW/cm<sup>2</sup>.
- Storage in dark place with 10% to 90% humidity and -20°C to 50°C ambient temperature.

## PCAS-2TE-13-0.1x0.1-TO8-wZnSeAR-70 – ENGINEERING SAMPLE

### Type II superlattice, two-stage thermoelectrically cooled, photoconductive detector

**PCAS-2TE-13-0.1x0.1-TO8-wZnSeAR-70** is a Type II superlattice two-stage thermoelectrically cooled IR photoconductor, with excellent parameters. 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 window (wZnSeAR) prevents unwanted interference effects. For detection of CW radiation, using of optical chopper system is recommended. This detector does not contain mercury or cadmium and is compliant with the RoHS Directive.

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



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



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

Parameter	Detector type
	PCAS-2TE-13-0.1x0.1-TO8-wZnSeAR-70
Active element material	epitaxial superlattice heterostructure
Cut-on wavelength $\lambda_{\text{cut-on}}$ (10%), $\mu\text{m}$	$1.6 \pm 0.2$
Peak wavelength $\lambda_{\text{peak}}$ , $\mu\text{m}$	$10.7 \pm 0.3$
Cut-off wavelength $\lambda_{\text{cut-off}}$ (10%), $\mu\text{m}$	$15.0 \pm 0.3$
Detectivity $D^*(\lambda_{\text{peak}}, 20 \text{ kHz})$ , $\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	$\sim 1.2 \times 10^8$
Current responsivity $R_i(\lambda_{\text{peak}})$ , A/W	$\sim 0.7$
Time constant $\tau$ , ns	$\sim 3$
Resistance $R$ , $\Omega$	$\sim 28$
Bias voltage $V_b$ , V	typ. 0.5
1/f noise corner frequency $f_c$ , Hz	typ. 20k
Active element temperature $T_{\text{det}}$ , K	$\sim 230$
Active area $A$ , $\text{mm}\times\text{mm}$	$0.1 \times 0.1$
Package	TO8
Acceptance angle $\Phi$	$\sim 70^\circ$
Window	wZnSeAR

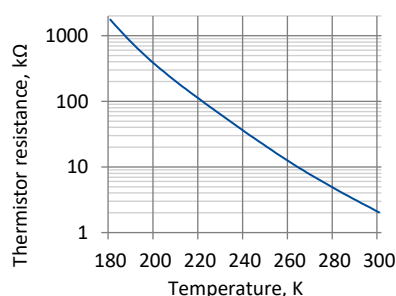
#### Features

- Wide spectral range from 1.6 to 15.0  $\mu\text{m}$
- High responsivity
- Excellent linearity
- Environmentally friendly

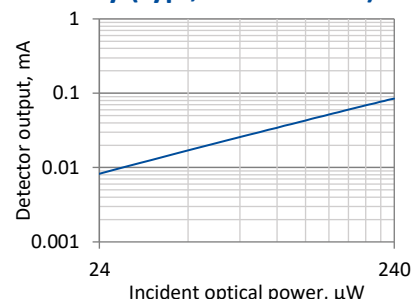
#### Two-stage thermoelectric cooler parameters

Parameter	Value
$T_{\text{det}}$ , K	$\sim 230$
$V_{\text{max}}$ , V	1.3
$I_{\text{max}}$ , A	1.2
$Q_{\text{max}}$ , W	0.36

#### Thermistor characteristics



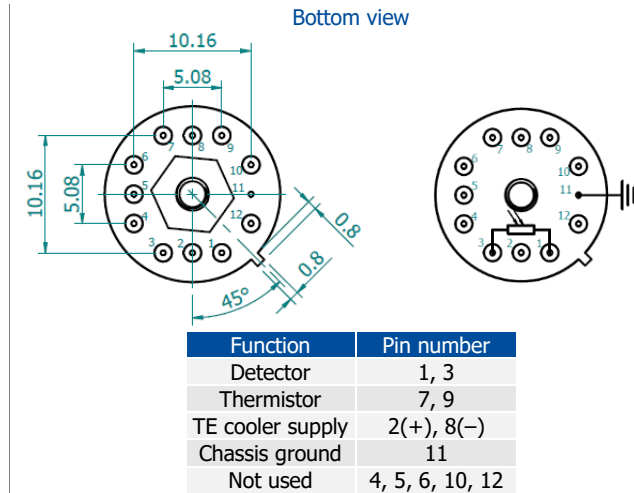
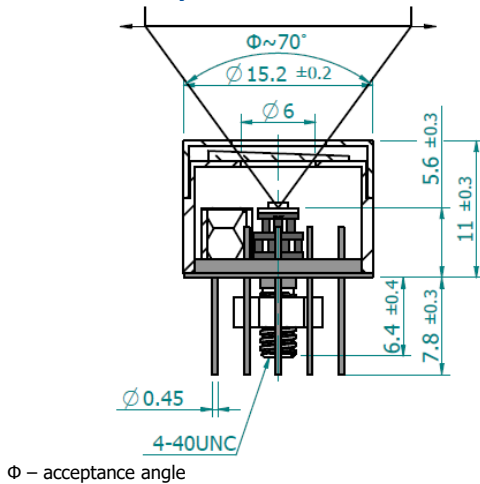
#### Linearity (typ., $T_{\text{BB}} = 1273 \text{ K}$ )



$T_{\text{BB}}$  – black body temperature



### Mechanical layout, mm



### Dedicated preamplifiers



standard MIP



small SIP-TO8

### Precautions for use and storage

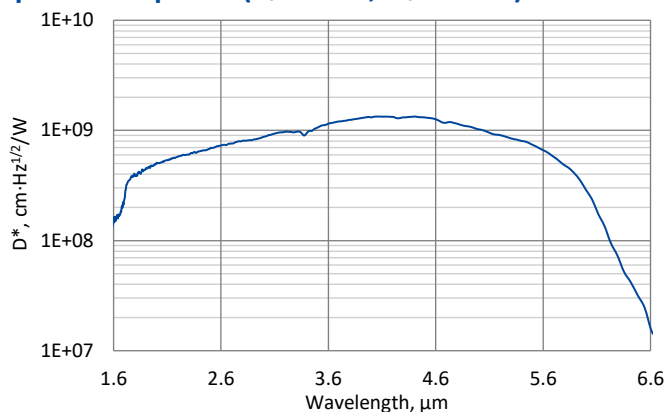
- Heatsink with thermal resistance of  $\sim 2$  K/W is necessary to dissipate heat generated by 2TE cooler.
- Operation in 10% to 80% humidity and  $-20^{\circ}\text{C}$  to  $30^{\circ}\text{C}$  ambient temperature.
- Beam power limitations:
  - irradiance with CW or single pulse longer than  $1 \mu\text{s}$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

## PVAS-5-0.1x0.1-TO39-NW-90 – ENGINEERING SAMPLE

### Type II superlattice, ambient temperature, photovoltaic detector

**PVAS-5-0.1x0.1-TO39-NW-90** is a Type II superlattice uncooled IR photovoltaic detector, with excellent parameters. This detector does not contain mercury or cadmium and is compliant with the RoHS Directive.

#### Spectral response ( $T_a = 20^\circ\text{C}$ , $V_b = 0\text{ mV}$ )



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

#### Specification ( $T_a = 20^\circ\text{C}$ , $V_b = 0\text{ mV}$ )

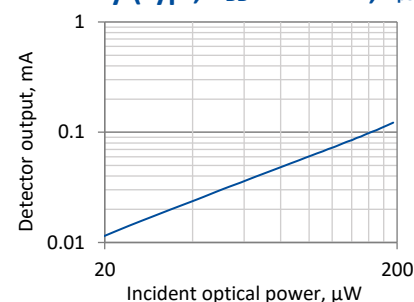
Parameter	Detector type
	PVAS-5-0.1x0.1-TO39-NW-90
Active element material	epitaxial superlattice heterostructure
Cut-on wavelength $\lambda_{\text{cut-on}}$ (10%), $\mu\text{m}$	$1.6 \pm 0.2$
Peak wavelength $\lambda_{\text{peak}}$ , $\mu\text{m}$	$4.2 \pm 0.3$
Cut-off wavelength $\lambda_{\text{cut-off}}$ (10%), $\mu\text{m}$	$6.2 \pm 0.2$
Detectivity $D^*(\lambda_{\text{peak}})$ , $\text{cm} \cdot \text{Hz}^{1/2} / \text{W}$	$\sim 1.2 \times 10^9$
Current responsivity $R_i(\lambda_{\text{peak}})$ , $\text{A/W}$	$\sim 1.2$
Time constant $\tau$ , ns	$\sim 11$
Resistance $R$ , $\Omega$	$\sim 170$
Active area $A$ , $\text{mm} \times \text{mm}$	$0.1 \times 0.1$
Package	TO39
Acceptance angle $\Phi$	$\sim 90^\circ$
Window	none

#### Features

- Spectral range from 1.6 to 6.2  $\mu\text{m}$
- High responsivity
- Excellent linearity
- No bias required
- No 1/f noise
- Environmentally friendly

#### Normalized responsivity change vs. ambient temperature

#### Linearity (typ., $T_{\text{BB}} = 1273\text{ K}$ , $\lambda_{\text{peak}}$ )



$T_{\text{BB}}$  – black body temperature

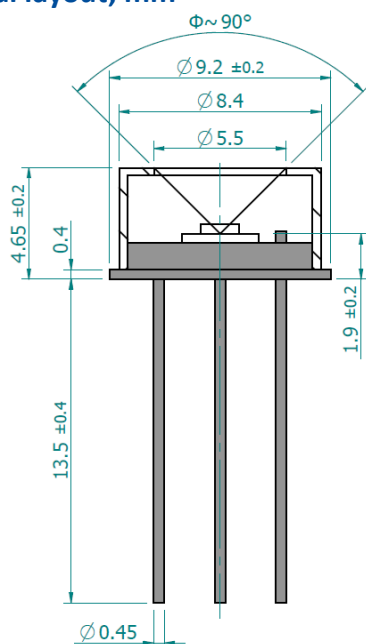
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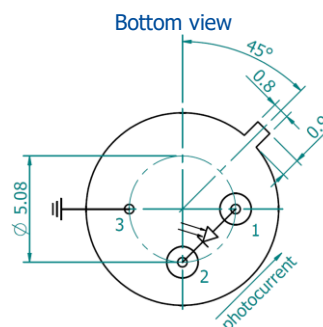
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## Mechanical layout, mm



$\Phi$  – acceptance angle



Function	Pin number
Detector	1, 2
Chassis ground	3

## Dedicated preamplifier



small SIP-TO39

## Precautions for use and storage

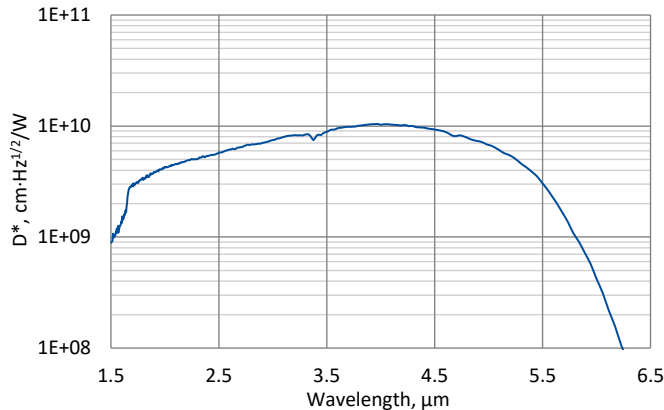
- Operation in 10% to 80% humidity and  $-20^\circ\text{C}$  to  $30^\circ\text{C}$  ambient temperature.
- Beam power limitations:
  - irradiance with CW or single pulse longer than  $1 \mu\text{s}$  irradiance on the apparent optical active area must not exceed  $100 \text{ W/cm}^2$ ,
  - irradiance of the pulse shorter than  $1 \mu\text{s}$  must not exceed  $1 \text{ MW/cm}^2$ .
- Storage in dark place with 10% to 90% humidity and  $-20^\circ\text{C}$  to  $50^\circ\text{C}$  ambient temperature.

## PVAS-2TE-5-0.1x0.1-TO8-wAl<sub>2</sub>O<sub>3</sub>-70 – ENGINEERING SAMPLE

### Type II superlattice, two-stage thermoelectrically cooled, photovoltaic detector

**PVAS-2TE-5-0.1x0.1-TO8-wAl<sub>2</sub>O<sub>3</sub>-70** is a Type II superlattice two-stage thermoelectrically cooled IR photovoltaic detector, with excellent parameters. 3° wedged sapphire window (wAl<sub>2</sub>O<sub>3</sub>) prevents unwanted interference effects. This detector does not contain mercury or cadmium and is compliant with the RoHS Directive.

#### Spectral response ( $T_a = 20^\circ\text{C}$ , $V_b = 0\text{ mV}$ )



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

#### Specification ( $T_a = 20^\circ\text{C}$ , $V_b = 0\text{ mV}$ )

Parameter	Detector type
	PVAS-2TE-5-0.1x0.1-TO8-wAl <sub>2</sub> O <sub>3</sub> -70
Active element material	epitaxial superlattice heterostructure
Cut-on wavelength $\lambda_{\text{cut-on}}$ (10%), $\mu\text{m}$	1.7±0.2
Peak wavelength $\lambda_{\text{peak}}$ , $\mu\text{m}$	4.0±0.3
Cut-off wavelength $\lambda_{\text{cut-off}}$ (10%), $\mu\text{m}$	5.8±0.2
Detectivity $D^*(\lambda_{\text{peak}})$ , $\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$	~9.0×10 <sup>9</sup>
Current responsivity $R_i(\lambda_{\text{peak}})$ , A/W	~1.4
Time constant $\tau$ , ns	~4
Resistance $R$ , $\Omega$	~5k
Active element temperature $T_{\text{det}}$ , K	~230
Active area $A$ , mm×mm	0.1×0.1
Package	TO8
Acceptance angle $\Phi$	~70°
Window	wAl <sub>2</sub> O <sub>3</sub>

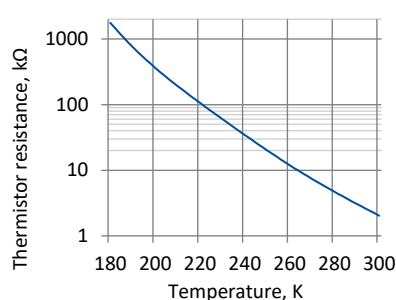
#### Features

- Wide spectral range from 1.7 to 5.8  $\mu\text{m}$
- High responsivity
- Excellent linearity
- No bias required
- No 1/f noise
- Environmentally friendly

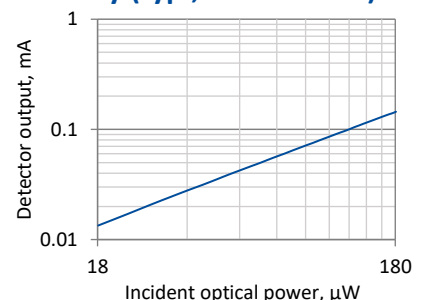
#### Two-stage thermoelectric cooler parameters

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

#### Thermistor characteristics

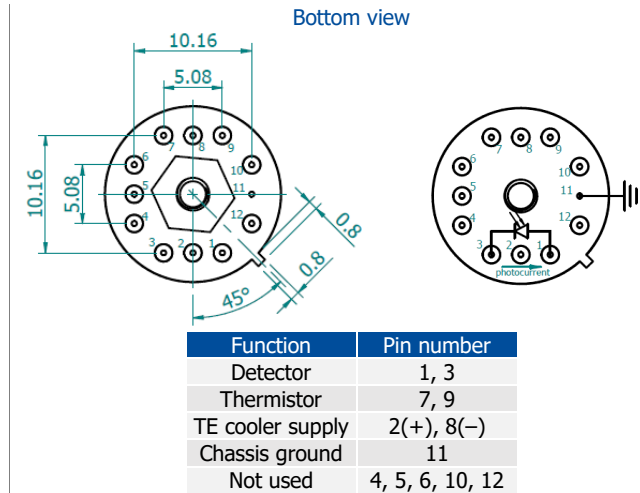
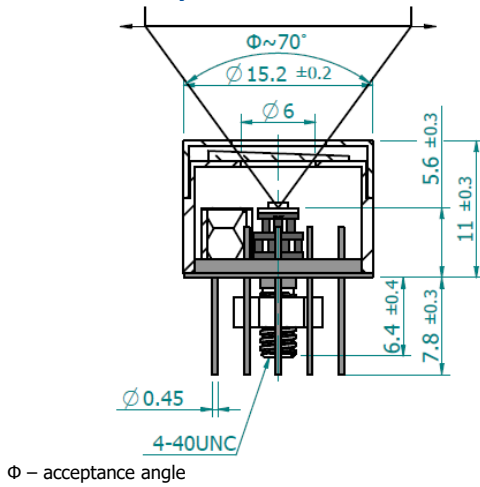


#### Linearity (typ., $T_{\text{BB}} = 1273\text{ K}$ )



$T_{\text{BB}}$  – black body temperature

### Mechanical layout, mm



### Dedicated preamplifiers



„all-in-one“ AIP



programmable PIP



standard MIP



small SIP-TO8

### 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<sup>2</sup>,
  - irradiance of the pulse shorter than 1 μs must not exceed 1 MW/cm<sup>2</sup>.
- Storage in dark place with 10% to 90% humidity and -20°C to 50°C ambient temperature.

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