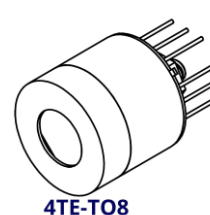


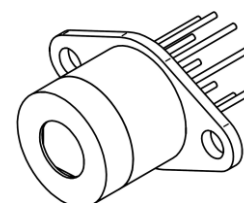
# PC-9 DETECTOR SERIES

# DATASHEET

## HgCdTe thermoelectrically cooled photoconductive infrared detectors



4TE-T08



4TE-T066

### FEATURES

- Spectral range: over 10.3  $\mu\text{m}$
- Large active area
- Front-side illuminated
- No minimum order quantity required

### APPLICATIONS

- Gas detection, monitoring and analysis:  $\text{SO}_2$ ,  $\text{NH}_3$
- FTIR spectroscopy

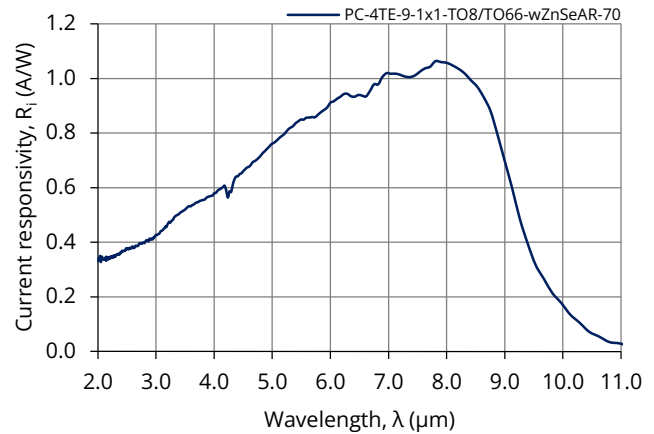
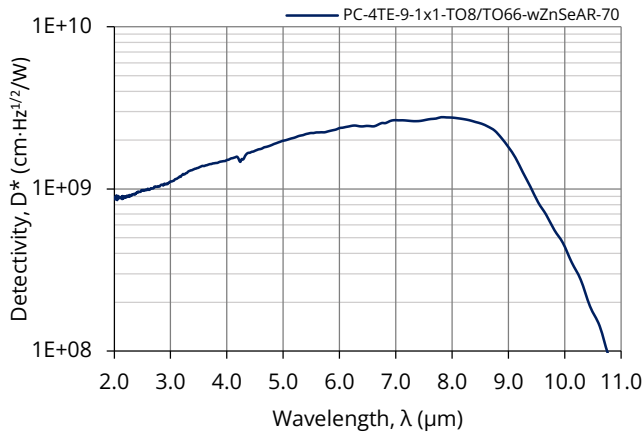
### SERIES DESCRIPTION

| Detector symbol              | Cooling                                    | Temperature sensor | Active area, A, mm $\times$ mm | Optical immersion | Package  | Acceptance angle, $\Phi$ , deg. | Window   |
|------------------------------|--|--------------------|--------------------------------|-------------------|----------|---------------------------------|--|
| PC-4TE-9-1x1-T08-wZnSeAR-70  | 4TE<br>$T_{\text{chip}} \cong 200\text{K}$ | thermistor         | 1 $\times$ 1                   | no                | 4TE-T08  | ~70                             | wZnSeAR<br>(3 deg. zinc selenide, anti-reflection coating) |
| PC-4TE-9-1x1-T066-wZnSeAR-70 |  |                    |                                |                   | 4TE-T066 |                                 |  |

### SPECIFICATION ( $T_{\text{amb}} = 293\text{ K}$ , $V_b = 0.3\text{ V}$ )

| Detector symbol   | Wavelength                                       |  |   | Detectivity  |   |   | Current responsivity                           |     |            | Time constant    | Resistance | Bias voltage | 1/f corner frequency |
|---|--|--|---|--|---|---|--|-----|------------|------------------|------------|--------------|----------------------|
|   | Peak wavelength                                  | Specific wavelength                              | Cut-off wavelength (10%)                            | D*   |   | R   |  |     | $\tau$     | R                | $V_b$      | $f_c$        |                      |
|   | $\lambda_{\text{peak}}$<br>$\mu\text{m}$<br>Typ. | $\lambda_{\text{spec}}$<br>$\mu\text{m}$<br>Typ. | $\lambda_{\text{cut-off}}$<br>$\mu\text{m}$<br>Typ. | $D^*(\lambda_{\text{peak}}, 20\text{kHz})$<br>$\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$<br>Typ. | $D^*(\lambda_{\text{spec}}, 20\text{kHz})$<br>$\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$<br>Min. Typ. | $R(\lambda_{\text{peak}})$<br>A/W<br>Typ. | $R(\lambda_{\text{spec}})$<br>A/W<br>Min. Typ. |     | ns<br>Typ. | $\Omega$<br>Max. | V<br>Typ.  | kHz<br>Typ.  |                      |
| PC-4TE-9-1x1-T08-wZnSeAR-70<br>PC-4TE-9-1x1-T066-wZnSeAR-70 | 7.6 $\pm$ 0.5                                    | 9.0  | 10.3  | 1.9 $\times$ 10 <sup>9</sup>   | 1.5 $\times$ 10 <sup>9</sup> 1.7 $\times$ 10 <sup>9</sup>   | 0.6                                       | 0.1  | 0.3 | 80         | 250              | 0.3        | 20           |                      |

## SPECTRAL RESPONSE (Typ., $T_{amb} = 293\text{ K}$ )



## MECHANICAL LAYOUT AND PINOUT

- [4TE-TO8\(12p\)-wW, PC detector technical drawing](#)
- [4TE-TO66\(9p\)-wW, PC detector technical drawing](#)

## RECOMMENDED AMPLIFIERS

| Detector symbol             | Amplifier type                 |
|-----------------------------|--------------------------------|
| PC-4TE-9-1x1-TO8-wZnSeAR-70 | <a href="#">AIP series</a>     |
|                             | <a href="#">PIP series</a>     |
|                             | <a href="#">MIP series</a>     |
|                             | <a href="#">SIP-TO8 series</a> |

## ABSOLUTE MAXIMUM RATINGS

| Parameter                                | Test conditions, remarks  | Value      | Unit                    |
|--|---|------------|-------------------------|
| Ambient operating temperature, $T_{amb}$ | Operation at $T_{amb} > 30^{\circ}\text{C}$ may increase the active element temperature and reduce the performance of the detector below specified parameters | -20 to 30  | $^{\circ}\text{C}$      |
| Storage temperature, $T_{stg}$           |   | -20 to 50  | $^{\circ}\text{C}$      |
| Soldering temperature                    | Within 5 s or less  | $\leq 300$ | $^{\circ}\text{C}$      |
| Storage humidity                         | No dew condensation   | 10 to 90   | %                       |
| Maximum incident optical power density   | Continuous wave (CW) or single pulses $> 1\ \mu\text{s}$ duration   | 100        | $\text{W}/\text{cm}^2$  |
|  | Single pulses $< 1\ \mu\text{s}$ duration   | 1          | $\text{MW}/\text{cm}^2$ |
| Maximum bias voltage, $V_{b,max}$        |   | 2.0        | V                       |
| Maximum TEC voltage, $V_{TEC,max}$       | 4TE   | 8.3        | V                       |
| Maximum TEC current, $I_{TEC,max}$       | 4TE   | 0.4        | A                       |

Stresses beyond those listed under absolute maximum ratings may cause permanent damage to the device. Constant or repeated exposure to absolute maximum rating conditions may affect the quality and reliability of the device.