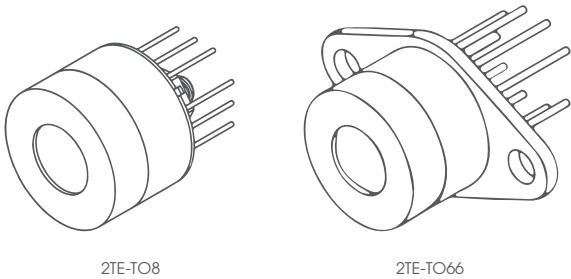


# PVM-8 SERIES

**HgCdTe thermoelectrically cooled photovoltaic multi-junction infrared detectors**



## FEATURES

- Spectral range: 2.0 to 10.0  $\mu\text{m}$
- Large active areas
- Back-side illuminated
- No minimum order quantity required

## APPLICATIONS

- Gas detection, monitoring and analysis:  $\text{CH}_4$ ,  $\text{H}_2\text{S}$ ,  $\text{NO}_2$ ,  $\text{SO}_x$
- FTIR spectroscopy

## SERIES DESCRIPTION

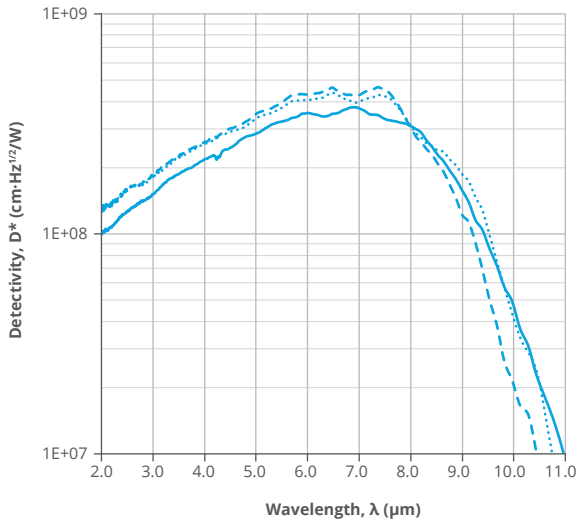
| Detector symbol               | Cooling (p. 191)                             | Temperature sensor (p. 192) | Active area, A, mm×mm | Optical immersion | Package | Acceptance angle, $\Phi$ , deg. | Window (p. 193)                                            |
|-------------------------------|----------------------------------------------|-----------------------------|-----------------------|-------------------|---------|---------------------------------|------------------------------------------------------------|
| PVM-2TE-8-1×1-TO8-wZnSeAR-70  | 2TE<br>$T_{\text{chip}} \approx 230\text{K}$ | thermistor                  | 1×1                   | no                | TO8     | ~70                             | wZnSeAR<br>(3 deg. zinc selenide, anti-reflection coating) |
| PVM-2TE-8-1×1-TO66-wZnSeAR-70 |                                              |                             |                       |                   | TO66    |                                 |                                                            |
| PVM-2TE-8-2×2-TO8-wZnSeAR-70  |                                              |                             | 2×2                   |                   | TO8     |                                 |                                                            |
| PVM-2TE-8-2×2-TO66-wZnSeAR-70 |                                              |                             |                       |                   | TO66    |                                 |                                                            |
| PVM-2TE-8-3×3-TO8-wZnSeAR-70  |                                              |                             | 3×3                   |                   | TO8     |                                 |                                                            |
| PVM-2TE-8-3×3-TO66-wZnSeAR-70 |                                              |                             |                       |                   | TO66    |                                 |                                                            |

## SPECIFICATION ( $T_{\text{amb}} = 293\text{ K}$ , $V_b = 0\text{ V}$ )

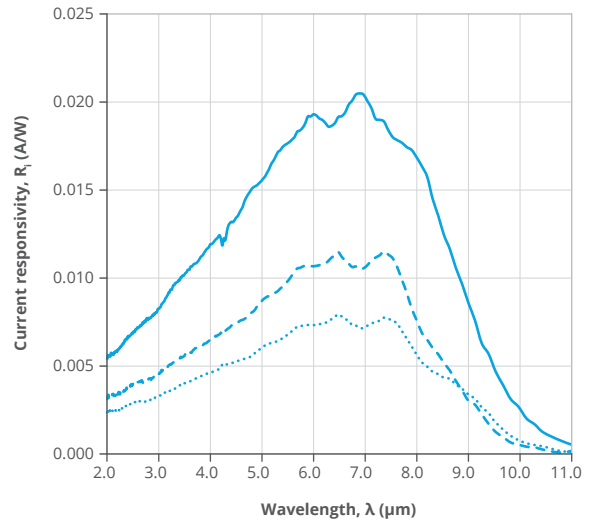
| Detector symbol               | Cut-on wavelength (10%)   | Peak wavelength         | Specific wavelength     | Cut-off wavelength (10%)   | Detectivity                                |                                            | Current responsivity         |                              |       | Time constant | Dynamic resistance |      |
|-------------------------------|---------------------------|-------------------------|-------------------------|----------------------------|--------------------------------------------|--------------------------------------------|------------------------------|------------------------------|-------|---------------|--------------------|------|
|                               | $\lambda_{\text{cut-on}}$ | $\lambda_{\text{peak}}$ | $\lambda_{\text{spec}}$ | $\lambda_{\text{cut-off}}$ | $D^*(\lambda_{\text{peak}}, 20\text{kHz})$ | $D^*(\lambda_{\text{spec}}, 20\text{kHz})$ | $R_i(\lambda_{\text{peak}})$ | $R_i(\lambda_{\text{spec}})$ |       | $\tau$        | $R_d$              |      |
|                               | $\mu\text{m}$             | $\mu\text{m}$           | $\mu\text{m}$           | $\mu\text{m}$              | $\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$   | $\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$   | A/W                          | A/W                          |       | ns            | $\Omega$           |      |
|                               | Typ.                      | Typ.                    | Typ.                    | Typ.                       | Typ.                                       | Min.                                       | Typ.                         | Min.                         | Typ.  | Typ.          | Min.               | Typ. |
| PVM-2TE-8-1×1-TO8-wZnSeAR-70  | 2.0                       | 7.0±1.0                 | 8.0                     | 10.0                       | 4.0×10 <sup>8</sup>                        | 3.0×10 <sup>8</sup>                        | 0.02                         | 0.015                        | 0.017 | 4             | 120                | 400  |
| PVM-2TE-8-1×1-TO66-wZnSeAR-70 |                           |                         |                         |                            |                                            |                                            |                              |                              |       |               |                    |      |
| PVM-2TE-8-2×2-TO8-wZnSeAR-70  |                           |                         |                         |                            |                                            |                                            | 0.01                         | 0.0075                       | 0.008 |               |                    |      |
| PVM-2TE-8-2×2-TO66-wZnSeAR-70 |                           |                         |                         |                            |                                            |                                            |                              |                              |       |               |                    |      |
| PVM-2TE-8-3×3-TO8-wZnSeAR-70  |                           |                         |                         |                            |                                            |                                            | 0.007                        | 0.005                        | 0.006 |               |                    |      |
| PVM-2TE-8-3×3-TO66-wZnSeAR-70 |                           |                         |                         |                            |                                            |                                            |                              |                              |       |               |                    |      |

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

— PVM-2TE-8-1×1-TO8/TO66-wZnSeAR-70  
 - - PVM-2TE-8-2×2-TO8/TO66-wZnSeAR-70  
 ..... PVM-2TE-8-3×3-TO8/TO66-wZnSeAR-70



— PVM-2TE-8-1×1-TO8/TO66-wZnSeAR-70  
 - - PVM-2TE-8-2×2-TO8/TO66-wZnSeAR-70  
 ..... PVM-2TE-8-3×3-TO8/TO66-wZnSeAR-70



## MECHANICAL LAYOUT AND PINOUT

- 2TE-TO8 package  
– Technical drawing (p. 203)
- 2TE-TO66 package  
– Technical drawing (p. 205)

## RECOMMENDED AMPLIFIERS

| Detector symbol              | Amplifier type                                                                               |
|------------------------------|----------------------------------------------------------------------------------------------|
| PVM-2TE-8-1×1-TO8-wZnSeAR-70 | AIP series (p. 126)<br>PIP series (p. 129)<br>MIP series (p. 132)<br>SIP-TO8 series (p. 135) |
| PVM-2TE-8-2×2-TO8-wZnSeAR-70 |                                                                                              |
| PVM-2TE-8-3×3-TO8-wZnSeAR-70 |                                                                                              |

## 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 $> 1\text{ }\mu\text{s}$ duration                                                                                       | 100        | $\text{W}/\text{cm}^2$  |
|                                           | Single pulses $< 1\text{ }\mu\text{s}$ duration                                                                                                               | 1          | $\text{MW}/\text{cm}^2$ |
| Maximum bias voltage, $V_{b\text{ max}}$  | No bias voltage needed                                                                                                                                        | -          | -                       |
| Maximum TEC voltage, $V_{TEC\text{ max}}$ | 2TE                                                                                                                                                           | 1.3        | V                       |
| Maximum TEC current, $I_{TEC\text{ max}}$ | 2TE                                                                                                                                                           | 1.2        | 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.