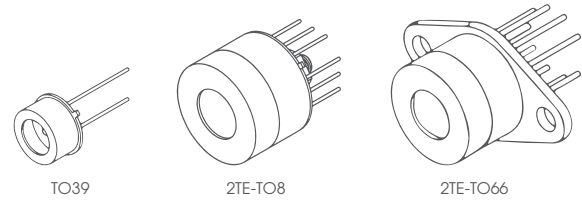


PV-5 SERIES

HgCdTe room temperature and thermoelectrically cooled photovoltaic infrared detectors



FEATURES

- Spectral range: 2.0 to 5.6 μm
- Back-side illuminated
- No minimum order quantity required

RELATED PRODUCTS

- **LabM-I-5** detection module (p. 101)
- **PVIA-5-1x1-TO39-NW-36** RoHS-compliant detector (p. 16)
- **PVMA-1TE-5-1x1-TO39-pSiAR-70** RoHS-compliant detector (p. 18)
- **AMS3140-01** RoHS-compliant detection module (p. 86)

APPLICATIONS

- Contactless temperature measurement: railway transport, industrial and laboratory processes monitoring
- Flame and explosion detection
- Threat warning systems
- Heat-seeking, thermal signature detection
- Dentistry
- Gas detection, monitoring and analysis: CH_4 , C_2H_2 , CH_2O , HCl , NH_3 , SO_2 , C_2H_6 , CO , CO_2 , NO_x
- Breath analysis: C_2H_6 , CH_2O , NH_3 , NO , OCS
- Gas leak detection
- Combustion process control
- Non-destructive material testing

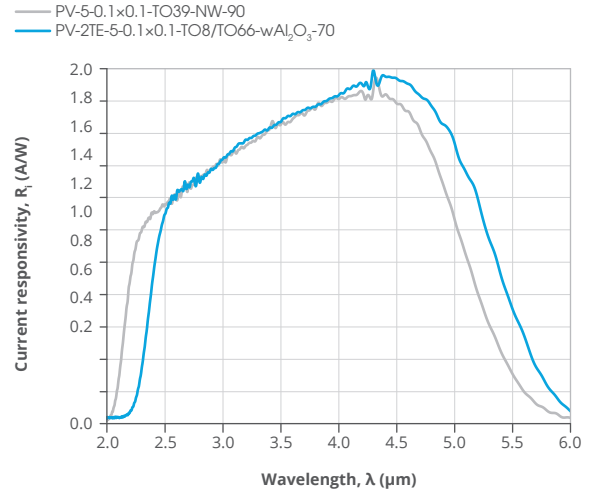
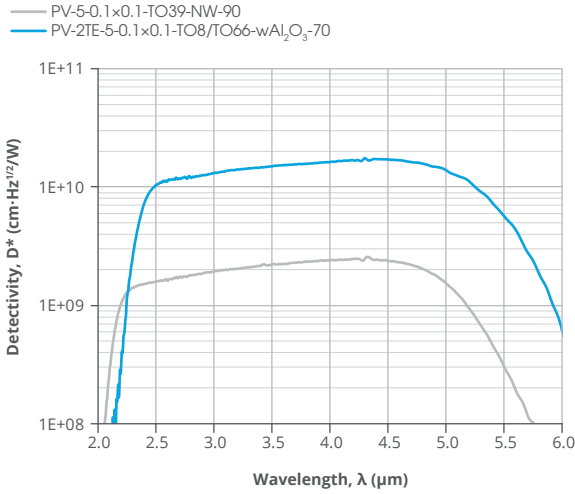
SERIES DESCRIPTION

| Detector symbol | Cooling (p. 191) | Temperature sensor (p. 192) | Active area, A, mm \times mm | Optical immersion | Package | Acceptance angle, Φ , deg. | Window (p. 193) |
|--|----------------------------------|-----------------------------|--------------------------------|-------------------|---------------|---------------------------------|---|
| PV-5-0.1 \times 0.1-TO39-NW-90 | no | n/a | 0.1 \times 0.1 | no | TO39 (3 pins) | \sim 90 | no |
| PV-2TE-5-0.1 \times 0.1-TO8-wAl ₂ O ₃ -70 | 2TE | thermistor | | | 2TE-T08 | \sim 70 | wAl ₂ O ₃ (3 deg. wedged sapphire) |
| PV-2TE-5-0.1 \times 0.1-TO66-wAl ₂ O ₃ -70 | T _{chip} \approx 230K | | | | 2TE-T066 | | |

SPECIFICATION (T_{amb} = 293 K, V_b = 0 V)

| Detector symbol | Wavelength | | | | Detectivity | | | Current responsivity | | | Time constant | Dynamic resistance | |
|--|---------------------------|-------------------------|-------------------------|----------------------------|--------------------------------------|---------------------------------|--------------------------------------|----------------------|------------------------------|------------------------------|---------------|--------------------|-------|
| | Cut-on wavelength (10%) | Peak wavelength | Specific wavelength | Cut-off wavelength (10%) | D*(λ_{peak} , 20kHz) | | D*(λ_{spec} , 20kHz) | | R(λ_{peak}) | R(λ_{spec}) | τ | R _d | |
| | $\lambda_{\text{cut-on}}$ | λ_{peak} | λ_{spec} | $\lambda_{\text{cut-off}}$ | cm \cdot Hz ^{1/2} /W | cm \cdot Hz ^{1/2} /W | A/W | A/W | ns | Ω | | | |
| | μm | μm | μm | μm | Typ. | Min. | Typ. | Typ. | Min. | Typ. | Typ. | Min. | Typ. |
| PV-5-0.1 \times 0.1-TO39-NW-90 | 2.0 | 4.4 \pm 0.2 | 5.0 | 5.4 | 2.5 \times 10 ⁹ | 1.0 \times 10 ⁹ | 1.5 \times 10 ⁹ | 2.0 | 1.0 | 1.2 | 120 | 100 | 250 |
| PV-2TE-5-0.1 \times 0.1-TO8-wAl ₂ O ₃ -36 | 2.3 | | | 5.6 | 1.7 \times 10 ¹⁰ | 9.0 \times 10 ⁹ | 1.2 \times 10 ¹⁰ | 2.1 | 1.2 | 1.5 | 80 | 2 000 | 5 000 |
| PV-2TE-5-0.1 \times 0.1-TO66-wAl ₂ O ₃ -36 | | | | | | | | | | | | | |

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



MECHANICAL LAYOUT AND PINOUT

- TO39 (3 pins) package (without window)
 - Technical drawing (p. 197)
- 2TE-TO8 package
 - Technical drawing (p. 203)
- 2TE-TO66 package
 - Technical drawing (p. 205)

RECOMMENDED AMPLIFIERS

| Detector symbol | Amplifier type |
|--|---|
| PV-5-0.1x0.1-TO39-NW-90 | SIP-TO39 series (p. 138) |
| PV-2TE-5-0.1x0.1-TO8-wAl ₂ O ₃ -70 | AIP series (p. 126), PIP series (p. 129), MIP series (p. 132), SIP-TO8 series (p. 135), FIP series ^{*)} (p. 141) |

^{*)} Only for biased detectors

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 | ≤ 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 | W/cm^2 |
| | Single pulses $< 1\ \mu\text{s}$ duration | 1 | MW/cm^2 |
| Maximum bias voltage, $V_{b\ max}$ | | -800 | mV |
| Maximum TEC voltage, $V_{TEC\ max}$ | 2TE | 1.3 | V |
| Maximum TEC current, $I_{TEC\ max}$ | 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.