PbSe near-infrared detector
Single-Pixel double encapsulated TO-package

Features
- Double encapsulation (thin-film + TO package)
- High durability for rugged operation
- Room temperature operation
- Sapphire window

Applications
- Flame monitoring
- Flame and spark detection
- Gas detection and analysis
- Spectroscopy
- Temperature measurement
- Moisture measurement

Electrical and optical characteristics

<table>
<thead>
<tr>
<th>Type No.</th>
<th>Active area [mm x mm]</th>
<th>Peak responsivity S [V/W]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Typ.</td>
</tr>
<tr>
<td>PbSe010010T05</td>
<td>1 x 1</td>
<td>$4.5 \cdot 10^4$</td>
</tr>
<tr>
<td>PbSe020020T05</td>
<td>2 x 2</td>
<td>$4 \cdot 10^4$</td>
</tr>
<tr>
<td>PbSe030030T05</td>
<td>3 x 3</td>
<td>$1.5 \cdot 10^4$</td>
</tr>
<tr>
<td>PbSe060060T08</td>
<td>6 x 6</td>
<td>$8 \cdot 10^3$</td>
</tr>
</tbody>
</table>

- Measured with 500K blackbody
- Measured in a voltage divider circuit with 50 V/mm
- Photo responsivity and detectivity are measured with constant load resistance ($R_L = 1 \text{ M} \Omega$) and calculated for matched resistance

<table>
<thead>
<tr>
<th>Element temperature [°C]</th>
<th>Peak wavelength $\lambda_p$ [µm]</th>
<th>20% cut-off wavelength $\lambda_C$ [µm]</th>
<th>Peak $D^*$ (620 Hz, 1 Hz) [cm·Hz$^{1/2}$/W]</th>
<th>Time constant [µs]</th>
<th>Dark resistance $R_D$ [MΩ]</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>3.8</td>
<td>4.5</td>
<td>$1.8 \cdot 10^{10}$</td>
<td>1.2 $\cdot 10^{10}$</td>
<td>4</td>
</tr>
</tbody>
</table>

Storage
- Storage temperature: -55°C to +90°C
- Exposure to UV light results in permanent damage
- Prolonged exposure to visible light results in temporary low dark resistance

Handling
- Ensure dust-free environment for device handling
- Operating temperature: -30°C to +90°C
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Options

- Custom windows and filters
- 1-stage or 2-stage Thermoelectric cooler (TEC) including thermistor
- Built-in internal LED for illumination and detection
- Custom packages upon request
- Evaluation Kit available

TO5 exemplary package outlines (mm)

PbSe020020TO5

Bottom view

Side view

Top view

Schematic
TO8 exemplary package outlines (mm)

PbSe060060TO8

Bottom view

Side view

Top view

Schematic

1. Electrode 1
2. Electrode 2
Exemplary circuit

Regulatory

For the use of Hertzstück™ PbS and PbSe infrared photodetectors in medical devices, monitoring and control instruments and consumer applications RoHS exemptions apply.

For automotive applications Hertzstück™ PbS and PbSe infrared photodetectors fall under ELV exemption.