PbS near-infrared detector
Single-Pixel double encapsulated in TO package

Features
- Double encapsulation (thin-film and TO package)
- High durability for rugged operation
- Very high sensitivity
- 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>
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<tr>
<td></td>
<td></td>
<td>Typ.</td>
</tr>
<tr>
<td>PbS005005TO5</td>
<td>0.5 x 0.5</td>
<td>16 \cdot 10^5</td>
</tr>
<tr>
<td>PbS010010TO5</td>
<td>1 x 1</td>
<td>8 \cdot 10^5</td>
</tr>
<tr>
<td>PbS020020TO5</td>
<td>2 x 2</td>
<td>4 \cdot 10^5</td>
</tr>
<tr>
<td>PbS030030TO5</td>
<td>3 x 3</td>
<td>3 \cdot 10^5</td>
</tr>
<tr>
<td>PbS060060TO8</td>
<td>6 x 6</td>
<td>1.4 \cdot 10^5</td>
</tr>
<tr>
<td>PbS010050TO5*</td>
<td>1 x 5</td>
<td>3.5 \cdot 10^5</td>
</tr>
</tbody>
</table>

* Dark resistance R_D [MΩ] = 0.05 \cdot 1

- Measured with 1550 nm LED, incident power 16 µW/cm²
- Measured in a voltage divider circuit with 50 V/mm
- Photo responsivity and detectivity are measured with constant load resistance (R_L = 1 MΩ) 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-Hz½/W]</th>
<th>Time constant [µs]</th>
<th>Dark resistance R_D [MΩ]</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>2.7</td>
<td>2.9</td>
<td>1.1 \cdot 10^{11}</td>
<td>200</td>
<td>0.3 - 3</td>
</tr>
</tbody>
</table>
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Typical spectral response

Typical frequency response

Typical resistance change over temperature

Storage
- Storage temperature: -55°C to +70°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 +70°C

Options
- Custom windows and filters available
- Custom packages upon request
- Evaluation Kit available

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TO5 mechanical outlines (dimensions in mm)

TO8 mechanical outlines (dimensions in mm)

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.