PbSe near-infrared detector
Single-Pixel thin-film encapsulated

Features
- Bondable electrode for COB mounting
- High durability for rugged operation
- Suitable for automated wire-bonding
- Room temperature operation

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>PbSe010010BC</td>
<td>1 x 1</td>
<td>4.5 \times 10^4</td>
</tr>
<tr>
<td>PbSe020020BC</td>
<td>2 x 2</td>
<td>4 \times 10^4</td>
</tr>
<tr>
<td>PbSe030030BC</td>
<td>3 x 3</td>
<td>1.5 \times 10^4</td>
</tr>
<tr>
<td>PbSe060060BC</td>
<td>6 x 6</td>
<td>8 \times 10^3</td>
</tr>
</tbody>
</table>

- Measured with 500 K blackbody
- Measured in a voltage divider circuit with 50 V/mm
- Photo responsivity and detectivity are measured with constant load resistance \(R_L = 1 \, M\Omega\) 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^½/W]</th>
<th>Time constant [µs]</th>
<th>Dark resistance (R_0) [MΩ]</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>3.8</td>
<td>4.5</td>
<td>1.8 \times 10^{10}</td>
<td>1.2 \times 10^{10}</td>
<td>4</td>
</tr>
</tbody>
</table>

Die attach
- Use clean, soft rubber tip for pick and place handling
- UV-curing is not suitable due to permanent damage by UV light exposure
- Element temperature should never exceed +90°C

Wire-bonding
- Electrodes are optimized for room temperature Al-wire-bonding
- Element temperature should never exceed +90°C
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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
- Active area is scratch sensitive, protect top surface from any mechanical contact
- Ensure dust-free environment for device handling
- Operating temperature: -30°C to +90°C

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

Exemplary mechanical outlines (dimensions in mm)

Exemplary mechanical outlines (dimensions in mm)

Schematic

1. Electrode 1
2. Electrode 2
3. Bondable surface
4. Photoresistor $R_0$
Exemplary circuit

![Exemplary circuit diagram](image)

- \(V_B\): Bias voltage
- \(V_D\): Output voltage
- \(R_D\): Dark resistance of the detector
- \(R_L\): Load resistor
- \(C_F\): Filter capacitor
- \(R_F\): Filter resistor
- \(R_F\): Feedback resistor
- \(R_I\): Gain resistor

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.