PbS near-infrared detector
Line array module in PS28 package

Features

• Double encapsulation (thin-film and PS28 housing with 1-stage TE-cooler)
• Very high sensitivity
• Sapphire window

Applications

• NIR spectroscopy
• Fire and spark detection
• Flame and moisture monitoring

Array module specifications

<table>
<thead>
<tr>
<th>Type No.</th>
<th>Package</th>
<th>Number of pixels</th>
<th>Pixel pitch [µm]</th>
<th>Pixel width [µm]</th>
<th>Pixel height [µm]</th>
<th>Operating temperature [°C]</th>
</tr>
</thead>
<tbody>
<tr>
<td>PbS_Mod_256_0050_0040x0380</td>
<td>PS28</td>
<td>256</td>
<td>50</td>
<td>40 x</td>
<td>380</td>
<td>-30 to +70</td>
</tr>
</tbody>
</table>

- Pixel operability > 95%
- Array length: 12.8 mm (active area)
- Chip (Glass wafer) size: 15 x 2.5 mm

Electrical and optical characteristics per pixel

<table>
<thead>
<tr>
<th>Element temperature [°C]</th>
<th>Peak wavelength λP [µm]</th>
<th>20% cut-off wavelength λC [µm]</th>
<th>Peak D* (620 Hz, 1 Hz) [cm·Hz½/W]</th>
<th>Time constant [µs]</th>
<th>Dark resistance RD [MΩ]</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>2.7</td>
<td>2.9</td>
<td>1 · 10¹¹</td>
<td>0.5 · 10¹¹</td>
<td>200</td>
</tr>
</tbody>
</table>

*depends on pixel geometry
- 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 (RL = 1 MΩ) and calculated for matched resistance

1-stage TE-cooler specifications

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<tbody>
<tr>
<td>300</td>
<td>70</td>
<td>5.0</td>
<td>1.3</td>
<td>6.1</td>
<td>3.5</td>
</tr>
<tr>
<td>323</td>
<td>72</td>
<td>5.4</td>
<td>1.3</td>
<td>6.8</td>
<td>3.9</td>
</tr>
</tbody>
</table>
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Typical spectral response per pixel

Typical frequency response per pixel

Pin connections

Other functionalities

- Integration time range: 4.025 µs - 210 ms (digitally selectable in 3.2 µs steps)
- Frame rate: sample rates up to 1,000 frames per second (maximum frame rate is achieved at the minimum integration time)
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Mechanical outlines (dimensions in mm)

Storage
- Storage temperature: -30°C to +70°C
- Exposure to UV light results in permanent damage
- Prolonged exposure to visible light results in low dark resistance

Options
- Filter
- Variable pixel geometry
- Variable number of pixels
- Other packaging options

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.