First Sensor

**Part Description AD230-9 SMD**

**Order # 3001415**

### Features
- APD with 0.04 mm² active area
- Slow multiplication curve
- QE > 80% @ 750 nm-910 nm
- Fast rise time, low noise
- Optimum gain: 50-60

### Description
Circular active area APD chip with NIR enhanced sensitivity. Ceramic carrier type non hermetic SMD package with clear glass. Reflow solderable.

### Application
- Laser range finder
- High speed photometry
- High speed optical communications
- Medical equipment

### RoHS
2011/65/EU

### Absolute maximum ratings

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Min</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>T_STG</td>
<td>Storage temp</td>
<td>-40</td>
<td>100</td>
<td>°C</td>
</tr>
<tr>
<td>T_OP</td>
<td>Operating temp</td>
<td>-20</td>
<td>70</td>
<td>°C</td>
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<tr>
<td>M_max</td>
<td>Gain (I_[P0] = 1 nA)</td>
<td>200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I_PEAK</td>
<td>Peak DC current</td>
<td>0.25</td>
<td>mA</td>
<td></td>
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</tbody>
</table>

### Spectral response (M = 100)

![Spectral response graph](image)

### Electro-optical characteristics @ 23 °C

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Characteristic</th>
<th>Test Condition</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Active area</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>μm</td>
</tr>
<tr>
<td></td>
<td>Active area</td>
<td>diameter 230</td>
<td></td>
<td></td>
<td></td>
<td>μm</td>
</tr>
<tr>
<td>I_D</td>
<td>Dark current</td>
<td>M = 100</td>
<td>0.5</td>
<td>1.0</td>
<td>nA</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Capacitance</td>
<td>M = 100</td>
<td>0.3</td>
<td></td>
<td>pF</td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>Responsivity</td>
<td>M = 100; λ = 905 nm</td>
<td>52</td>
<td>58</td>
<td>60</td>
<td>A/W</td>
</tr>
<tr>
<td>t_R</td>
<td>Rise time</td>
<td>M = 100; λ = 905 nm; R_L = 50 Ω</td>
<td>0.5</td>
<td></td>
<td>ns</td>
<td></td>
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<tr>
<td>f_CUT</td>
<td>Cut-off frequency</td>
<td>-3dB</td>
<td>0.6</td>
<td></td>
<td>GHz</td>
<td></td>
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<tr>
<td>V_BR</td>
<td>Breakdown voltage</td>
<td>I_B = 2 μA</td>
<td>160</td>
<td>200</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Temperature coefficient</td>
<td>Change of V_BR with temperature</td>
<td></td>
<td>1.25</td>
<td>1.55</td>
<td>V/K</td>
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<tr>
<td></td>
<td>Excess noise factor</td>
<td>M = 100</td>
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<td></td>
<td>2.5</td>
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<td>Excess noise index</td>
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<td></td>
<td>0.2</td>
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</table>
Quantum efficiency (23 °C)  Capacitance as function of reverse bias (23 °C)

![Graph of Quantum Efficiency](image)

![Graph of Capacitance](image)

Multiplication as function of bias (23 °C)  Dark current as function of bias (23 °C)

![Graph of Multiplication](image)

![Graph of Dark Current](image)

**Application hints:**

- Current should be limited by a protecting resistor or current limiting - IC inside the power supply
- For low light level applications blocking of ambient light should be used
- For high gain applications bias voltage should be temperature compensated
- Please consider basic ESD protection while handling
- Use low noise read-out - IC
- For further questions please refer to document "Instructions for handling and processing"
- Optimum gain: 50-60

![Application Diagram](image)
Technical Drawing, Package: LCC6.1
Package dimension, large quantities on reel

Pocket location
M = 11.81 mm ± 0.13 mm
M1 = 11.81 mm ± 0.13 mm
M2 = 8.64 mm ± 0.13 mm
M3 = 8.64 mm ± 0.13 mm
Array = 10 x 10 (100)

Pocket details
X = 4.60 mm ± 0.13 mm
Y = 3.71 mm ± 0.13 mm
Z = 2.16 mm ± 0.13 mm
A = 5° ± 0.5°, no cross slots

Overall tray size
Size = 101.60 mm ± 0.13 mm
Height = 8.00 mm ± 0.13 mm
Flatness = 0.51 mm

Disclaimer: Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.