GP2Y1010AU

Compact Dust Sensor for Air Conditioners

■ Features
1. Compact, thin type (46x30x17.6mm)
2. Low dissipation current (I CC: MAX. 20mA)
3. Single-shot detection of house dust

■ Applications
1. Air conditioners
2. Air cleaner

■ Absolute Maximum Ratings (T a=25°C)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Rating</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>V CC</td>
<td>−0.3 to +7</td>
<td>V</td>
</tr>
<tr>
<td>*1 Input terminal voltage</td>
<td>V LED</td>
<td>−0.3 to V CC</td>
<td>V</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>T opr</td>
<td>−10 to +65</td>
<td>°C</td>
</tr>
<tr>
<td>Soldering temperature</td>
<td>T sol</td>
<td>−20 to +80</td>
<td>°C</td>
</tr>
</tbody>
</table>

*1 Open drain drive input

■ Recommend Operating Conditions

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Rating</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Supply voltage</td>
<td>V CC</td>
<td>5±0.5</td>
<td>V</td>
</tr>
</tbody>
</table>

■ Outline Dimensions

[Unit: mm]

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Internet: Internet address for Electronic Components Group http://sharp-world.com/ecg/
### Electro-optical Characteristics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Conditions</th>
<th>MIN.</th>
<th>TYP.</th>
<th>MAX.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detecting sensitivity</td>
<td>( K )</td>
<td>(^{1<em>2</em>3*4} )</td>
<td>0.35</td>
<td>0.5</td>
<td>0.65</td>
<td>V/(0.1mg/m(^3))</td>
</tr>
<tr>
<td>Output voltage (no dust)</td>
<td>( V_{OC} )</td>
<td>(^{2<em>3</em>4} )</td>
<td>0</td>
<td>0.9</td>
<td>1.5</td>
<td>V</td>
</tr>
<tr>
<td>Output voltage range</td>
<td>( V_{OH} )</td>
<td>(^{2<em>3</em>4} ) RL=4.7kΩ</td>
<td>3.4</td>
<td>3.4</td>
<td>–</td>
<td>V</td>
</tr>
<tr>
<td>LED terminal current</td>
<td>( I_{LED} )</td>
<td>(^{2<em>3</em>4} ) LED terminal=0V</td>
<td>–</td>
<td>10</td>
<td>20</td>
<td>mA</td>
</tr>
<tr>
<td>Dissipation current</td>
<td>( I_{CC} )</td>
<td>(^{2*4} ) RL=∞</td>
<td>–</td>
<td>11</td>
<td>20</td>
<td>mA</td>
</tr>
</tbody>
</table>

*1 Dust density shall be measured the density of Mild seven by using a digital dust indicator (P-5L2 made by SIBATA SCIENTIFIC TECHNOLOGY LTD.)
*2 Input condition for LED input terminal (pulse driving condition) is shown in Fig.1
*3 Refer to Fig.1
*4 Refer to Fig.2

**Fig.1 Input Condition for LED Input Terminal**

![Fig.1 Input Condition for LED Input Terminal](image)

**Fig.2 Sampling Timing of Output Pulse**

![Fig.2 Sampling Timing of Output Pulse](image)

**Recommended Input Condition for LED Input Terminal**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Recommendation</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulse cycle</td>
<td>( T )</td>
<td>10±1</td>
<td>ms</td>
</tr>
<tr>
<td>Pulse width</td>
<td>( P_w )</td>
<td>0.32±0.02</td>
<td>ms</td>
</tr>
</tbody>
</table>
Fig.3 Internal Block Diagram
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      --- Test and measurement equipment
      --- Industrial control
      --- Audio visual equipment
      --- Consumer electronics

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      --- Traffic signals
      --- Gas leakage sensor breakers
      --- Alarm equipment
      --- Various safety devices, etc.

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