GP2Y0A02YK

Long Distance Measuring Sensor

Features
1. Less influence on the colors of reflected objects and their reflectivity, due to optical triangle measuring method
2. Distance output type
   (Detection range: 20 to 150cm)
3. An external control circuit is not necessary
   Output can be connected directly to a microcomputer

Applications
1. For detection of human body and various types of objects in home appliances, OA equipment, etc

Absolute Maximum Ratings (T_{RMS}=25^\circ 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>Output terminal voltage</td>
<td>V_{O}</td>
<td>-0.3 to V_{CC} +0.3</td>
<td>V</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>T_{op}</td>
<td>-10 to +60</td>
<td>°C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>T_{stg}</td>
<td>-40 to +70</td>
<td>°C</td>
</tr>
</tbody>
</table>

*1 Open collector output

Recommended 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>4.5 to 5.5</td>
<td>V</td>
</tr>
</tbody>
</table>

Applications
1. For detection of human body and various types of objects in home appliances, OA equipment, etc

Outline Dimensions

<table>
<thead>
<tr>
<th>Terminal connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 V_{O}</td>
</tr>
<tr>
<td>2 GND</td>
</tr>
<tr>
<td>3 V_{CC}</td>
</tr>
</tbody>
</table>

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## 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>Distance measuring range</td>
<td>∆L</td>
<td>*2 *3 L=150cm</td>
<td>20</td>
<td>–</td>
<td>150</td>
<td>cm</td>
</tr>
<tr>
<td>Output terminal voltage</td>
<td>V_O</td>
<td>*2 L=150cm</td>
<td>0.25</td>
<td>0.4</td>
<td>0.55</td>
<td>V</td>
</tr>
<tr>
<td>Difference of output voltage</td>
<td>∆V_O</td>
<td>*2 Output change at L=150cm to 20cm</td>
<td>1.8</td>
<td>2.05</td>
<td>2.3</td>
<td>V</td>
</tr>
<tr>
<td>Average dissipation current</td>
<td>I_CE</td>
<td>–</td>
<td>33</td>
<td>50</td>
<td>–</td>
<td>mA</td>
</tr>
</tbody>
</table>

Note) 1. Distance to reflective object  
*2 Using reflective object: White paper (Made by Kodak Co. Ltd. gray cards R-27, white face, reflective ratio:90%)  
*3 Distance measuring range of the optical sensor system

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**Fig.1 Internal Block Diagram**

- **Signal processing circuit**
- **Voltage regulator**
- **Oscillation circuit**
- **LED drive circuit**
- **Output circuit**
- **Distance measuring IC**

**GND**

- **VCC 5V**

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**Fig.2 Timing Chart**

- **VCC (Power supply)**
- **Distance measuring operation**
- **V_O (Output)**

- **First measurement**
- **Second measurement**
- **nth measurement**

- **Unstable output**
- **First output**
- **Second output**
- **nth output**

- **MAX. 5.0ms**
- **38.3ms±9.6ms**
Fig. 3 Analog Output Voltage vs. Distance to Reflective Object

- White Reflectivity: 90%
- Gray Reflectivity: 18%
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  --- Office automation equipment
  --- Telecommunication equipment [terminal]
  --- Test and measurement equipment
  --- Industrial control
  --- Audio visual equipment
  --- Consumer electronics

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  --- Alarm equipment
  --- Various safety devices, etc.

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