GP2D12/GP2D15

Features
1. Less influence on the color of reflective objects, reflectivity
2. Line-up of distance output/distance judgement type
   - Distance output type (analog voltage): **GP2D12**
   - Detecting distance: 10 to 80cm
   - Distance judgement type: **GP2D15**
   - Judgement distance: 24cm
     (Adjustable within the range of 10 to 80cm)
3. External control circuit is unnecessary
4. Low cost

Applications
1. TVs
2. Personal computers
3. Cars
4. Copiers

Absolute Maximum Ratings
(Ta=25°C, Vcc=5V)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Rating</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>Vcc</td>
<td>−0.3 to +7</td>
<td>V</td>
</tr>
<tr>
<td>Output terminal voltage</td>
<td>Vo</td>
<td>−0.3 to Vcc +0.3</td>
<td>V</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>Toff</td>
<td>−10 to +60</td>
<td>°C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>Tst</td>
<td>−40 to +70</td>
<td>°C</td>
</tr>
</tbody>
</table>

Outline Dimensions
(Unit: mm)

The dimensions marked * are described the dimensions of lens center position.
Unspecified tolerance: ±0.3mm

Terminal connection

Made by J.S.T. MFG. CO., LTD.

S3B-PH

Internet address for Electronic Components Group: http://www.sharp.co.jp/ecg/

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■ 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>Vcc</td>
<td>4.5 to +5.5</td>
<td>V</td>
</tr>
</tbody>
</table>

■ 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>ΔL</td>
<td>&quot;1&quot; &quot;3&quot;</td>
<td>10</td>
<td>–</td>
<td>80</td>
<td>cm</td>
</tr>
<tr>
<td>Output terminal voltage</td>
<td>V0</td>
<td>L=80cm &quot;1&quot;</td>
<td>0.25</td>
<td>0.4</td>
<td>0.55</td>
<td>V</td>
</tr>
<tr>
<td>GP2D15</td>
<td>V0H</td>
<td>Output voltage at High &quot;1&quot;</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>V</td>
</tr>
<tr>
<td>GP2D12</td>
<td>V0L</td>
<td>Output voltage at Low &quot;1&quot;</td>
<td>Vcc</td>
<td>–</td>
<td>–</td>
<td>V</td>
</tr>
<tr>
<td>Difference of output voltage</td>
<td>ΔV0</td>
<td>Output change at L=80cm to 10cm &quot;1&quot;</td>
<td>1.75</td>
<td>2.0</td>
<td>2.25</td>
<td>V</td>
</tr>
<tr>
<td>Distance-characteristics of output</td>
<td>V0L</td>
<td>&quot;2&quot; &quot;4&quot;</td>
<td>21</td>
<td>24</td>
<td>27</td>
<td>cm</td>
</tr>
<tr>
<td>GP2D15</td>
<td>V0H</td>
<td>&quot;2&quot; &quot;4&quot;</td>
<td>–</td>
<td>33</td>
<td>50</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 card R-27, white face, reflective ratio: 90%).
3: Distance measuring range of the optical sensor system.
4: Output switching has a hysteresis width. The distance specified by V0 should be the one with which the output L switches to the output H.

*1 Using reflective object: White paper (Made by Kodak Co., Ltd. gray card R-27, white face, reflective ratio: 90%).
*2 We ship the device after the following adjustment: Output switching distance L=24cm±3cm must be measured by the sensor.
*3 Distance measuring range of the optical sensor system.
*4 Output switching has a hysteresis width. The distance specified by V0 should be the one with which the output L switches to the output H.

Fig.1 Internal Block Diagram

Fig.2 Internal Block Diagram

Fig.3 Timing Chart

Vcc (Power supply)
Fig.4 Distance Characteristics

Fig.5 Analog Output Voltage vs. Surface Illuminance of Reflective Object

Fig.6 Analog Output Voltage vs. Distance to Reflective Object

Fig.7 Analog Output Voltage vs. Ambient Temperature

Fig.8 Analog Output Voltage vs. Detection Distance
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   — Industrial control
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   — Consumer electronics
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   — Alarm equipment
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