GP2D05

■ Features

1. Distance measuring type object sensor
   (Distance measuring range: Optional distance can be set as threshold level by means of built-in VR)
2. Impervious to color and reflectivity of reflective object
3. High precision distance measurement through output of continuous measurement average value
4. Low dissipation current at OFF-state
   (dissipation current at OFF-state: TYP. 3 µA)

■ Applications

1. Sanitary sensors (human body detection)
2. OA equipment (paper detection)
3. Game equipment
4. For consumer products (human body detection)

■ Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Rating</th>
<th>Unit</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>V_{CC}</td>
<td>-0.3 to +10 V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input terminal voltage</td>
<td>V_{in}</td>
<td>-0.3 to +3 V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output terminal voltage</td>
<td>B_{V_{O}}</td>
<td>-0.3 to +10 V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>T_{opr}</td>
<td>10 to +60°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage temperature</td>
<td>T_{stg}</td>
<td>20 to +70°C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Ta=25°C, V_{CC}=5V)

■ Operating Supply Voltage

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Rating</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating supply voltage</td>
<td>4.4 to 7 V</td>
<td></td>
</tr>
</tbody>
</table>

*In the absence of confirmation by device specification sheets, SHARP takes no responsibility for any defects that occur in equipment using any of SHARP’s devices, shown in catalogs, data books, etc. Contact SHARP in order to obtain the latest version of the device specification sheets before using any SHARP’s device.*
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>Δ L</td>
<td>*1,*3</td>
<td>10</td>
<td>-</td>
<td>80</td>
<td>cm</td>
</tr>
<tr>
<td>Output terminal voltage</td>
<td>V_{OH}</td>
<td>Output voltage at High. *1</td>
<td>V_{CC-0.3}</td>
<td>-</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td>V_{OL}</td>
<td>Output voltage at Low. *1</td>
<td>-</td>
<td>-</td>
<td>0.3</td>
<td>V</td>
</tr>
<tr>
<td>Distance characteristics of output</td>
<td>V_{O}</td>
<td>*1,*2</td>
<td>-</td>
<td>24</td>
<td>-</td>
<td>cm</td>
</tr>
<tr>
<td>Average dissipation current</td>
<td>I_{CC}</td>
<td>*4</td>
<td>-</td>
<td>10</td>
<td>22</td>
<td>mA</td>
</tr>
<tr>
<td>Dissipation current at OFF-state</td>
<td>I_{ccoff}</td>
<td>*5</td>
<td>-</td>
<td>3</td>
<td>8</td>
<td>μA</td>
</tr>
<tr>
<td>Vin terminal current</td>
<td>I_{vin}</td>
<td>Vin = 0V</td>
<td>-</td>
<td>-</td>
<td>160</td>
<td>-</td>
</tr>
</tbody>
</table>

L : Distance to reflective object

*1 Reflective object : White paper (reflectivity : 90%)

*2 Adjustment shall be available with the VR built in the sensor so that the output switching distance may be L=24 cm.

*3 Distance measuring range on conditions after adjustment of the output switching distance to L=24

*4 Average dissipation current measured on the conditions shown below

*5 Dissipation current when Vin terminal is in High (current OFF) state.

*6 Vin terminal : Open drain drive input.

Conditions : Vin terminal current at Vin OFF-state >=2.6V

Vin terminal current at Vin ON-state <= 0.2V

Timing Chart

Distance measuring operation start

Control signal (V_{in})

Output (Vo)

Current [ON]

Current [OFF]

1ms or More

1ms or more

MAX. 56ms

TYP. 28ms
Setting shall be available to optional distance within the measuring range (ΔL: 10 to 80 cm).

Fig. 1 Distance Measuring Output vs. Distance to Reflective Object

Fig. 2 Detection Distance vs. Sensing Range

Test Method for Sensing Range Characteristics

Reflective object
White paper: KODAK made gray chart R-27,
white surface (reflectivity: 90%)
Gray paper: KODAK made gray chart R-27,
gray surface (reflectivity: 18%)

White paper: KODAK made gray chart R-27,
white surface (reflectivity: 90%)
Gray paper: KODAK made gray chart R-27,
gray surface (reflectivity: 18%)

Fig. 3 Detection Distance vs. Illuminance

Test Method for Anti External Disturbing Light Characteristics

Reflective object
KODAK made white paper (reflectivity: 90%)