GP2Y0A21YK/GP2Y0D21YK

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) : GP2Y0A21YK
   Distance judgement type : GP2Y0D21YK
   (Adjustable within the range of 10 to 80cm [Optionally available])
3. External control circuit is unnecessary
4. Low cost

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

Absolute Maximum Ratings \((T_a=25^\circ C, V_{CC}=5V)\)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Rating</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>(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_{opr})</td>
<td>-10 to +60</td>
<td>(^\circ C)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>(T_{stg})</td>
<td>-40 to +70</td>
<td>(^\circ C)</td>
</tr>
</tbody>
</table>

Outline Dimensions
(Unit : mm)

Notice
In the absence of confirmation by device specification sheets, SHARP takes no responsibility for any defects that may occur in equipment using any SHARP devices shown in catalogs, data books, etc. Contact SHARP in order to obtain the latest device specification sheets before using any SHARP device.

Internet
Internet address for Electronic Components Group http://sharp-world.com/ecg/
## 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;)</td>
<td>10</td>
<td></td>
<td>80</td>
<td>cm</td>
</tr>
<tr>
<td>Output terminal voltage</td>
<td>VO</td>
<td>L=80cm &quot;1)</td>
<td>0.25</td>
<td>0.4</td>
<td>0.55</td>
<td>V</td>
</tr>
<tr>
<td>Output terminal voltage</td>
<td>VDD</td>
<td>Output voltage at High &quot;1)</td>
<td>-</td>
<td>VCC-0.3</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td>Output terminal voltage</td>
<td>VDD</td>
<td>Output voltage at Low &quot;1)</td>
<td>-</td>
<td>-</td>
<td>0.6</td>
<td>V</td>
</tr>
<tr>
<td>Difference of output voltage</td>
<td>ΔVO</td>
<td>Output change at L=80cm to 10cm &quot;1)</td>
<td>1.65</td>
<td>1.9</td>
<td>2.15</td>
<td>V</td>
</tr>
<tr>
<td>Distance characteristics of output</td>
<td>VO</td>
<td>&quot;1) + &quot;2)</td>
<td>21</td>
<td>24</td>
<td>27</td>
<td>cm</td>
</tr>
<tr>
<td>Average Dissipation current</td>
<td>ICC</td>
<td>L=80cm &quot;1)</td>
<td>-</td>
<td>30</td>
<td>40</td>
<td>mA</td>
</tr>
</tbody>
</table>

Note) L : Distance to reflective object

*1 Using reflective object : White paper (Made by Kodak Co. Ltd. gray cards, 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 VO should be the one with which the output L switches to the output H

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Fig.1 Internal Block Diagram

![Internal Block Diagram for GP2Y0A21YK](image1)

Fig.2 Internal Block Diagram

![Internal Block Diagram for GP2Y0D21YK](image2)

Fig.3 Timing Chart

![Timing Chart](image3)
Fig. 4 Distance Characteristics

Fig. 5 Analog Output Voltage vs. Distance to Reflective Object
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      --- Office automation equipment
      --- Telecommunication equipment [terminal]
      --- Test and measurement equipment
      --- Industrial control
      --- Audio visual equipment
      --- Consumer electronics

  (ii) Measures such as fail-safe function and redundant design should be taken to ensure reliability and safety when SHARP devices are used for or in connection with equipment that requires higher reliability such as:
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      --- Traffic signals
      --- Gas leakage sensor breakers
      --- Alarm equipment
      --- Various safety devices, etc.

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