**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
     - Detecting distance: 10 to 80 cm
     - Distance judgement type: GP2Y0D21YK
     - Judgement distance: 24 cm
     - (Adjustable within the range of 10 to 80 cm [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, $V_{CC}=5$V)

<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>$^\circ$C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>$T_{st}$</td>
<td>$-40$ to $+70$</td>
<td>$^\circ$C</td>
</tr>
</tbody>
</table>

**General Purpose Type Distance Measuring Sensors**

- **Outline Dimensions** (Unit: mm)

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

**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><em>(T=25℃, VCC=5V)</em></td>
<td>10</td>
<td>–</td>
<td>80</td>
<td>cm</td>
</tr>
<tr>
<td>Output terminal voltage</td>
<td>V0</td>
<td></td>
<td>0.25</td>
<td>0.4</td>
<td>0.55</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td>V0H</td>
<td>Output voltage at High <em>(T=25℃, VCC=5V)</em></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td>V0L</td>
<td>Output voltage at Low <em>(T=25℃, VCC=5V)</em></td>
<td>0.6</td>
<td>–</td>
<td>–</td>
<td>V</td>
</tr>
<tr>
<td>Difference of output voltage</td>
<td>ΔV0</td>
<td><em>(T=25℃, VCC=5V)</em></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>V0</td>
<td><em>(L=80cm to 10cm)</em></td>
<td>21</td>
<td>24</td>
<td>27</td>
<td>cm</td>
</tr>
<tr>
<td>Average Dissipation current</td>
<td>ICC</td>
<td><em>(T=25℃, VCC=5V)</em></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 R-27, white face, reflective ratio: 90%)

*2 We ship the device after the following adjustment: Output switching distance L=24±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**

![Internal Block Diagram](image1.png)

**Fig.2 Internal Block Diagram**

![Internal Block Diagram](image2.png)

**Fig.3 Timing Chart**

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

- **GP2Y0D21YK**
  - Output Switching Point Distance \( L = 24 \pm 3 \text{ cm} \)

Fig. 5 Analog Output Voltage vs. Distance to Reflective Object

- **GP2Y0A21YK**
  - **White paper** (Reflective ratio: 90%)
  - **Gray paper** (Reflective ratio: 18%)
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- Audio visual equipment
- Consumer electronics

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

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