# GP2Y0A21YK/ GP2Y0D21YK

## General Purpose Type Distance Measuring Sensors

### ■ 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 80cm
   Distance judgement type : **GP2Y0D21YK**
   Judgement distance : 24cm
   (Adjustable within the range of 10 to 80cm [Optionally available])
3. External control circuit is unnecessary
4. Low cost

### ■ Applications

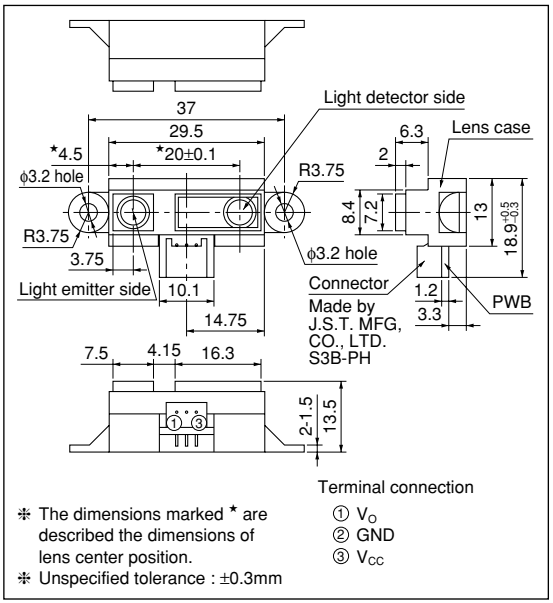
1. TVs
2. Personal computers
3. Cars
4. Copiers

### ■ Absolute Maximum Ratings ($T_a$=25°C, $V_{CC}$=5V)

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Supply voltage | $V_{CC}$ | −0.3 to +7 | V |
| Output terminal voltage | $V_O$ | −0.3 to $V_{CC}$ +0.3 | V |
| Operating temperature | $T_{opr}$ | −10 to +60 | °C |
| Storage temperature | $T_{stg}$ | −40 to +70 | °C |

### ■ Outline Dimensions

(Unit : mm)




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

## ■ Recommended Operating Conditions

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Operating supply voltage | $V_{CC}$ | 4.5 to +5.5 | V |

## ■ Electro-optical Characteristics

($T_a$=25°C, $V_{CC}$=5V)

| Parameter | | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|---|---|---|---|---|---|---|---|
| Distance measuring range | | ΔL | *1 *3 | 10 | – | 80 | cm |
| Output terminal voltage | GP2Y0A21YK | $V_O$ | L=80cm *1 | 0.25 | 0.4 | 0.55 | V |
| | GP2Y0D21YK | $V_{OH}$ | Output voltage at High *1 | $V_{CC}$ −0.3 | – | – | V |
| | | $V_{OL}$ | Output voltage at Low *1 | – | – | 0.6 | V |
| Difference of output voltage | GP2Y0A21YK | $\Delta V_O$ | Output change at L=80cm to 10cm *1 | 1.65 | 1.9 | 2.15 | V |
| Distance characteristics of output | GP2Y0D21YK | $V_O$ | *1 *4 *2 | 21 | 24 | 27 | cm |
| Average Dissipation current | | $I_{CC}$ | L=80cm *1 | – | 30 | 40 | mA |

Note) L : Distance to reflective object

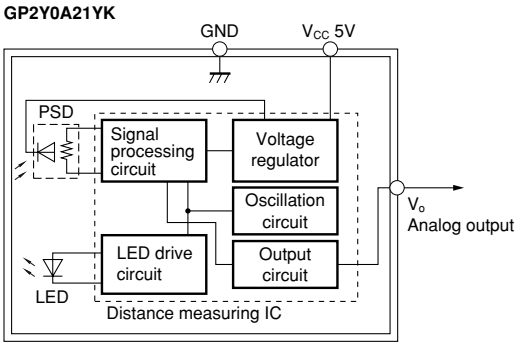
*1 Using reflective object : White paper (Made by Kodak Co. Ltd. gray cards R-27 · white face, reflective ratio ; 90%)

*2 We ship the device after the following adjustment : Output switching distance L=24cm±3cm must be measured by the sensor

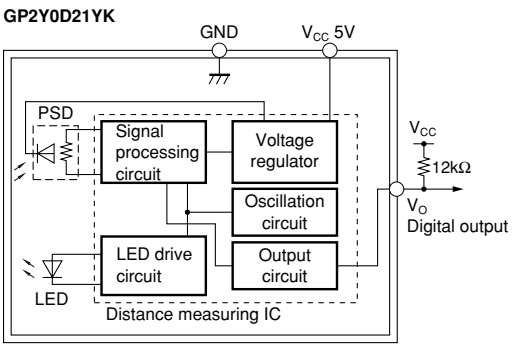
*3 Distance measuring range of the optical sensor system

*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

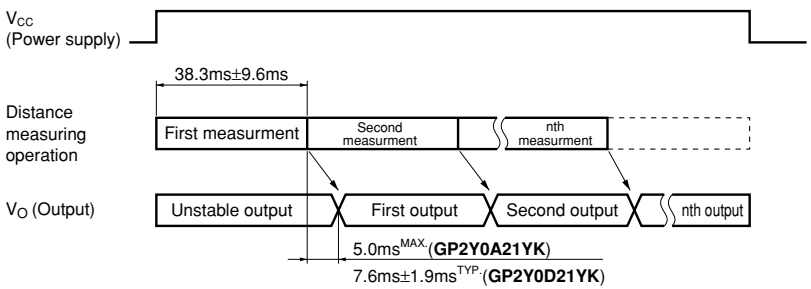
## Fig.1 Internal Block Diagram



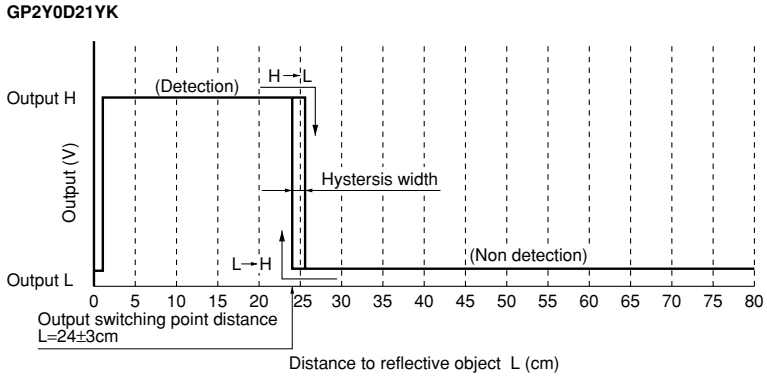

## Fig.2 Internal Block Diagram



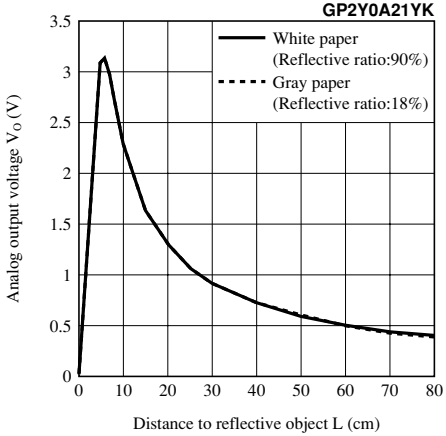

## Fig.3 Timing Chart



## Fig.4 Distance Characteristics




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



## NOTICE

- The circuit application examples in this publication are provided to explain representative applications of SHARP devices and are not intended to guarantee any circuit design or license any intellectual property rights. SHARP takes no responsibility for any problems related to any intellectual property right of a third party resulting from the use of SHARP's devices.
- Contact SHARP in order to obtain the latest device specification sheets before using any SHARP device. SHARP reserves the right to make changes in the specifications, characteristics, data, materials, structure, and other contents described herein at any time without notice in order to improve design or reliability. Manufacturing locations are also subject to change without notice.
- Observe the following points when using any devices in this publication. SHARP takes no responsibility for damage caused by improper use of the devices which does not meet the conditions and absolute maximum ratings to be used specified in the relevant specification sheet nor meet the following conditions:

  (i) The devices in this publication are designed for use in general electronic equipment designs such as:
  --- Personal computers
  --- 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:
  --- Transportation control and safety equipment (i.e., aircraft, trains, automobiles, etc.)
  --- Traffic signals
  --- Gas leakage sensor breakers
  --- Alarm equipment
  --- Various safety devices, etc.

  (iii) SHARP devices shall not be used for or in connection with equipment that requires an extremely high level of reliability and safety such as:
  --- Space applications
  --- Telecommunication equipment [trunk lines]
  --- Nuclear power control equipment
  --- Medical and other life support equipment (e.g., scuba).

- Contact a SHARP representative in advance when intending to use SHARP devices for any "specific" applications other than those recommended by SHARP or when it is unclear which category mentioned above controls the intended use.
- If the SHARP devices listed in this publication fall within the scope of strategic products described in the Foreign Exchange and Foreign Trade Control Law of Japan, it is necessary to obtain approval to export such SHARP devices.
- 
- Contact and consult with a SHARP representative if there are any questions about the contents of this publication.