# GP2D02

# Compact, High Sensitive Distance Measuring Sensor

## ■ Features

1. Impervious to color and reflectivity of reflective object
2. High precision distance measurement output for direct connection to microcomputer
3. Low dissipation current at OFF-state
   (dissipation current at OFF-state : TYP. 3 μA)
4. Capable of changing of distance measuring range through change the optical portion (lens)
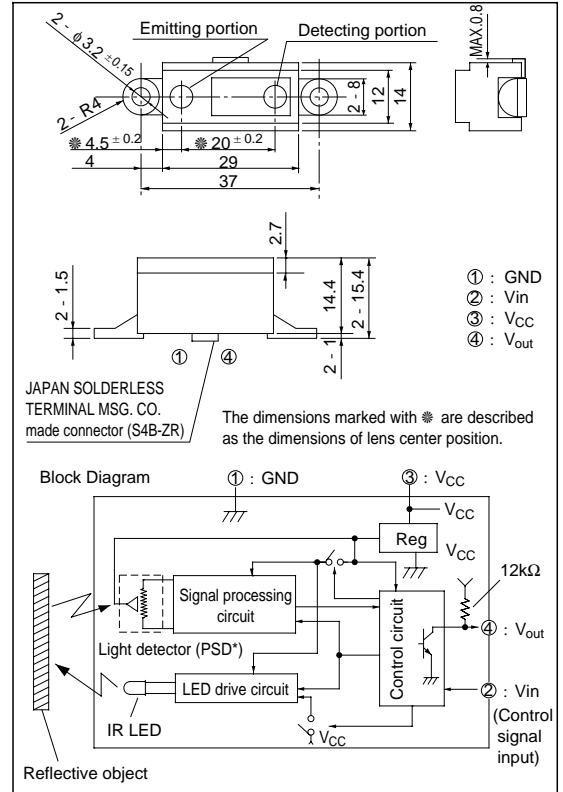
## ■ Applications

1. Sanitary sensors
2. Human body sensors for consumer products such as electric fans and air conditioners
3. Garage sensors
   * PSD : Position Sensitive Detector

## ■ Outline Dimensions (Unit : mm)



① : GND
② : Vin
③ : V_CC
④ : V_out

JAPAN SOLDERLESS TERMINAL MSG. CO. made connector (S4B-ZR)

The dimensions marked with ❋ are described as the dimensions of lens center position.

Block Diagram



## ■ Absolute Maximum Ratings (Ta=25˚C, V_CC=5V)

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Supply voltage | $V_{CC}$ | - 0.3 to + 10 | V |
| [*1]Input terminal voltage | $V_{in}$ | - 0.3 to + 3 | V |
| Output terminal voltage | $BV_O$ | - 0.3 to + 10 | V |
| Operating temperature | $T_{opr}$ | - 10 to + 60 | ˚C |
| Storage temperature | $T_{stg}$ | - 40 to + 70 | ˚C |

*1 Open drain operation input

## ■ Operating Supply Voltage

| Symbol | Rating | Unit |
|---|---|---|
| $V_{CC}$ | 4.4 to 7 | V |

## ■ Electro-optical Characteristics

(Ta=25˚C,Vcc=5V)

| Parameter | | Symbol | Conditions | | MIN. | TYP. | MAX. | Unit |
|---|---|---|---|---|---|---|---|---|
| Distance measuring range | | ΔL | *1 | | 10 | - | 80 | cm |
| Output terminal voltage | | $V_{OH}$ | Output voltage at High | L= 20cm | $V_{CC}$ - 0.3 | - | - | V |
| | | $V_{OL}$ | Output voltage at Low | *1 | - | - | 0.3 | V |
| Distance characteristics of output | | D | L= 80cm, *1 | | - | 75 | - | DEC |
| | | ΔD | Output change at L=80 cm to 20 cm, *1 | | 48 | 58 | 68 | DEC |
| Dissipation current | at operating | $I_{CC}$ | L= 20cm, *1, *2 | | - | 22 | 35 | mA |
| | at OFF-state | $I_{off}$ | L= 20cm, *1 | | - | 3 | 8 | μA |
| Vin terminal current | | $I_{vin}$ | Vin = 0V | | - | - 170 | - 280 | μA |

Note) L : Distance to reflective object

　　　DEC : Decimalized value of sensor output (8-bit serial)

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

*2 Average dissipation current value during distance measuring operation when detecting of input signal, Vin as shown in the timing chart
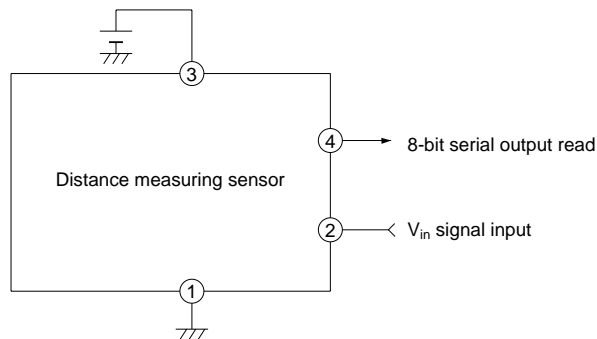
*3 Vin terminal : Open drain drive input.

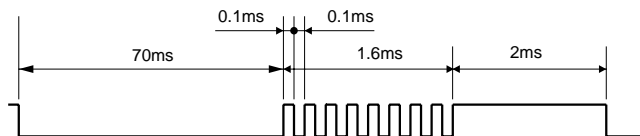　　Conditions : Vin terminal current at Vin OFF-state : -1μA

　　　　　　　　Vin terminal current at Vin ON-state : 0.3V

## ■ Test Circuit

1. Test circuit



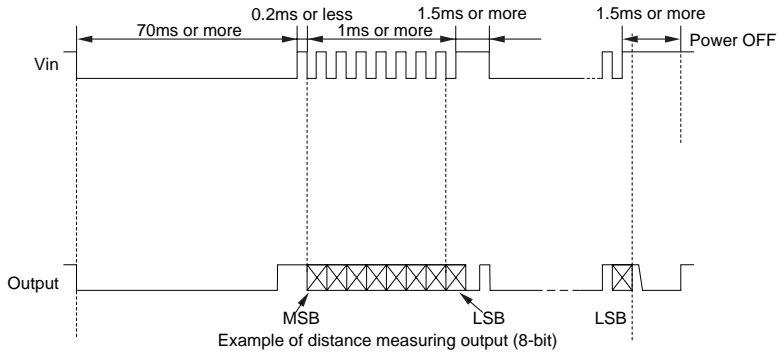2. Vin input signal for measurement

## ■ Timing Chart



Example of distance measuring output (8-bit)

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



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

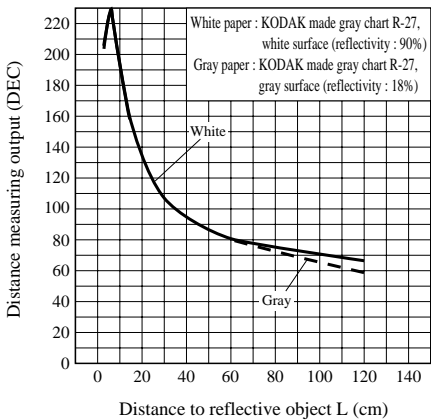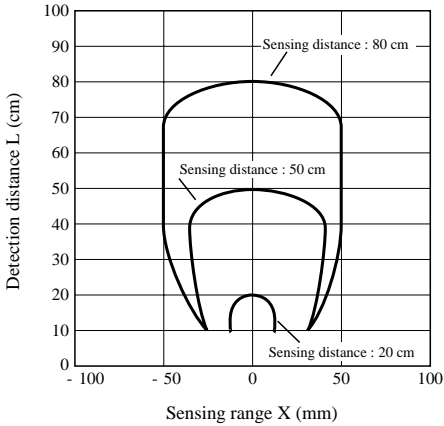Gray paper : KODAK made gray chart R-27, gray surface (reflectivity : 18%)

## Fig. 2 Detection Distance vs. Sensing Range



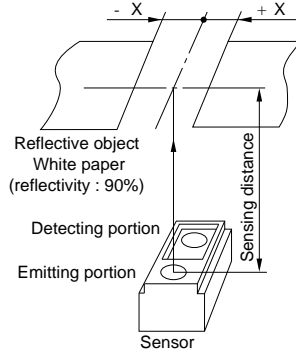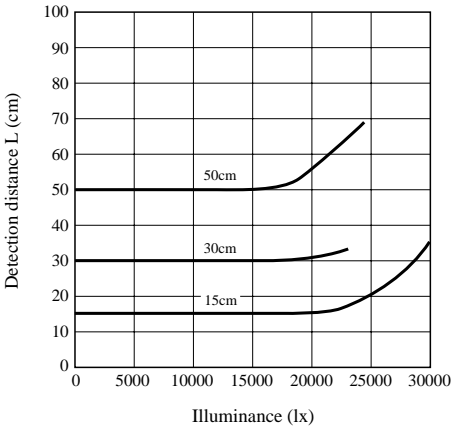## Test Method for Sensing Range Characteristics



## Fig. 3 Detection Distance vs. Illuminance



## Test Method for Anti External Disturbing Light Characteristics