GP2D12/GP2D15

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) : **GP2D12**

   Detecting distance : 10 to 80cm

   Distance judgement type : **GP2D15**

   Judgement distance : 24cm

                   (Adjustable within the range of 10 to 80cm)
3. External control circuit is unnecessary
4. Low cost

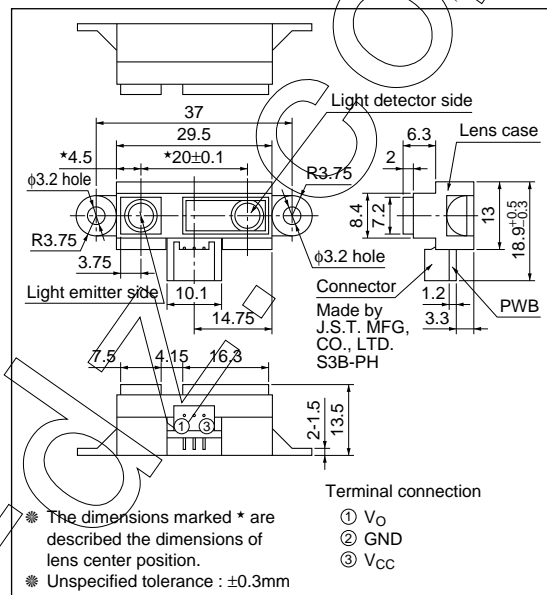## ■ Applications

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

■ Absolute Maximum Ratings

(Ta=25°C, Vcc=5V)

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

■ Outline Dimensions

(Unit : mm)

Light detector side

Lens case

37

29.5

*20±0.1

R3.75

6.3

2

*4.5

φ3.2 hole

8.4

7.2

13

18.9$^{+0.5}_{-0.3}$

R3.75

3.75

φ3.2 hole

Light emitter side

10.1

Connector

Made by J.S.T. MFG, CO., LTD. S3B-PH

1.2

3.3

PWB

14.75

7.5

4.15

16.3

2-1.5

13.5

① ③

Terminal connection

① V_O

② GND

③ V_{CC}

※ 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

(Ta=25°C, Vcc=5V)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Distance measuring range		ΔL	[1] [3]	10	–	80	cm
Output terminal voltage	**GP2D12**	V_O	L=80cm [1]	0.25	0.4	0.55	V
	GP2D15	V_{OH}	Output voltage at High [1]	Vcc −0.3	–	–	V
		V_{OL}	Output voltage at Low [1]	–	–	0.6	V
Difference of output voltage	**GP2D12**	ΔV_O	Output change at L=80cm to 10cm [1]	1.75	2.0	2.25	V
Distance characteristics of output	**GP2D15**	V_O	[1] [2] [4]	21	24	27	cm
Average Dissipation current		I_{CC}	L=80cm [1]	–	33	50	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.
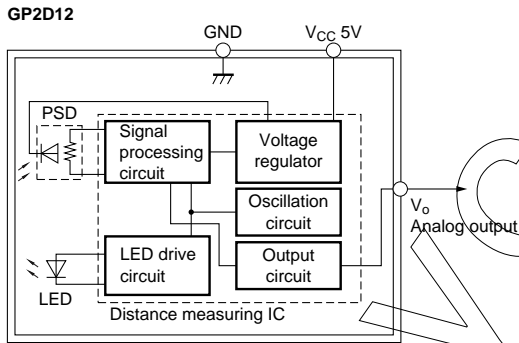
Fig.1 Internal Block Diagram
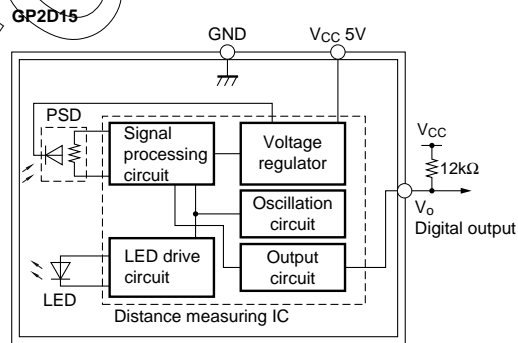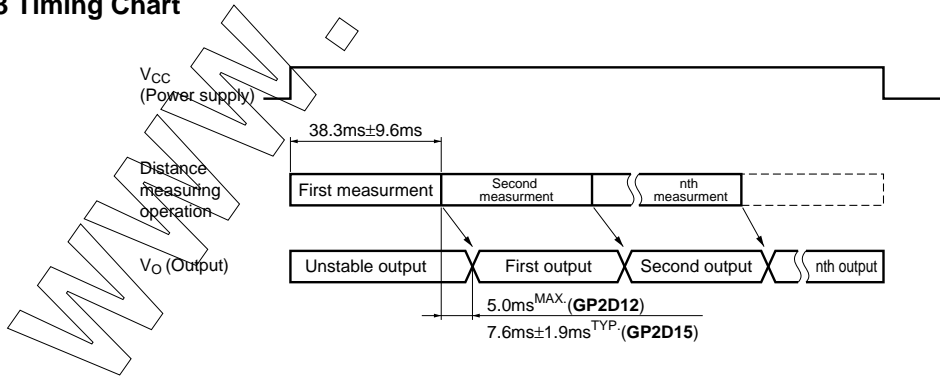

GP2D12

Fig.2 Internal Block Diagram

GP2D15

Fig.3 Timing Chart

Fig.4 Distance Characteristics

GP2D15

Output H

(Detection)

H→L

Output (V)

Hystersis width

L→H

(Non detection)

Output L

Output switching point distance
L=24±3cm

Distance to reflective object L (cm)
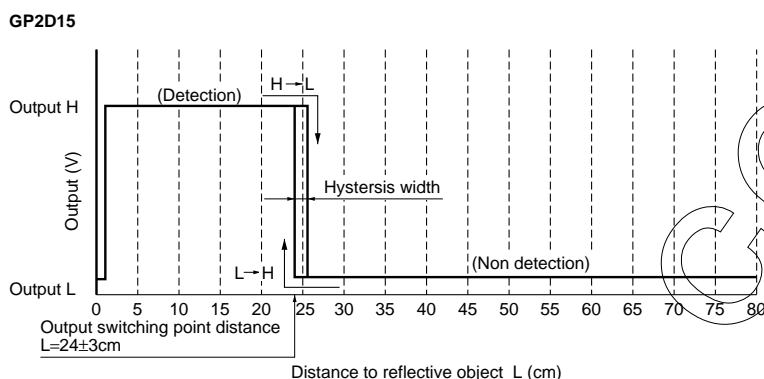
Fig.5 Analog Output Voltage vs. Surface Illuminance of Reflective Object

GP2D12

Analog output voltage V_O (V)

L=10cm

Reflective object
Kodak Co., Ltd.
gray cards R-27
(reflective ratio : 90%)

Light source
equivalent to
sun light

GP2D12

illuminance
meter

L=30cm

L=60cm

Surface illuminance of reflective object (lx)
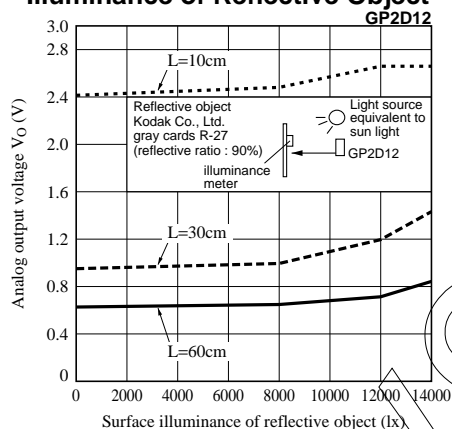
Fig.6 Analog Output Voltage vs.Distance to Reflective Object

GP2D12

Draft	Reflectivity
White	90%
Gray	18%

Analog output voltage V_O (V)

Gray

White

Distance to reflective object L (cm)
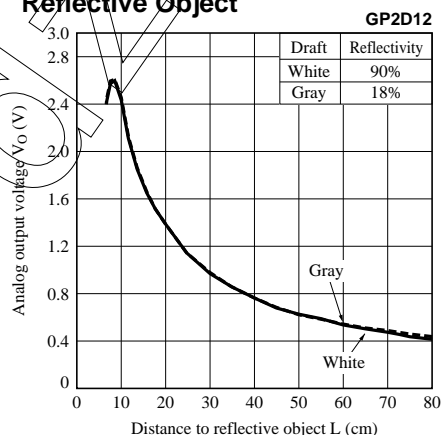
Fig.7 Analog Output Voltage vs.Ambient Temperature

GP2D12

Analog output voltage V_O (V)

L=10cm

L=15cm

L=20cm

L=50cm   L=40cm   L=30cm

L=60cm   L=70cm   L=80cm

Ambient temperature T_a (°C)
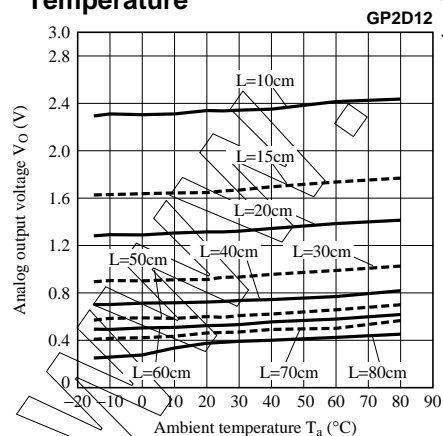
Fig.8 Analog Output Voltage vs.Detection Distance

GP2D12

Kodak Co., Ltd. gray cards R-27
(reflective ratio : 90%)
L(Distance to
reflective object)   X(Detection
distance)

Sensor
GP2D12   −X(Detection
distance)

Analog output voltage V_O (V)

L=10cm

L=20cm

L=30cm   L=40cm

L=80cm

Detection distance X (cm)
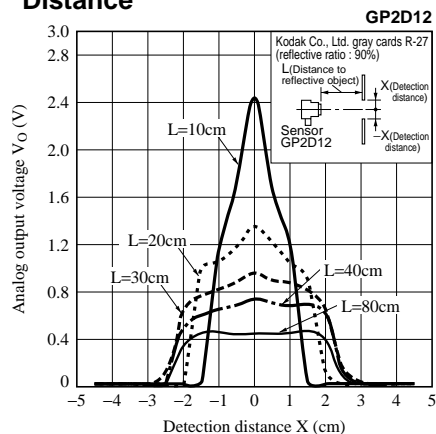
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