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GP2D06/GP2D07

Paper Size Sensor System Employing Optical Distance Measuring Method

■ Features

1. High sensitive detection because of less influence on the color (reflectivity) of reflective objects thanks to position sensitive detector (PSD).
2. 1-beam type : **GP2D06**
3-beam type : **GP2D07**
3. 8-bit serial output
4. Realizes 2 type detecting system
A/B size detection
Both A/B size and inch size detection

■ Applications

1. Copiers

■ Absolute Maximum Ratings

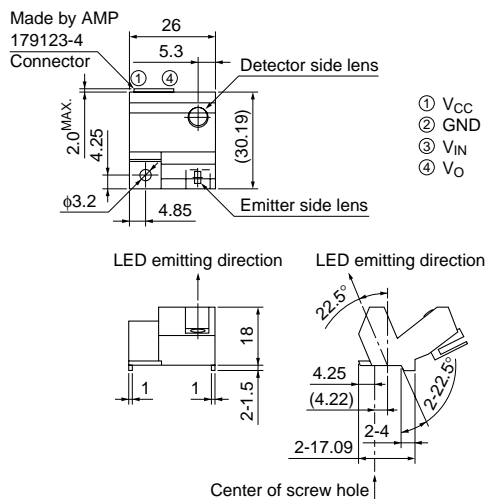
(Ta=25°C, V_{CC}=25V)

Parameter	Symbol	Rating	Unit
Supply voltage	V _{CC}	-0.3 to +10	V
Input terminal voltage 1	V _{in}	-0.3 to +3	V
Input terminal voltage 2	GP2D06	-	V
	GP2D07		
Output terminal voltage	V _O	-0.3 to +10	V
Operating temperature	T _{opr}	-10 to +60	°C
Storage temperature	T _{stg}	-40 to +70	°C
Operating Supply voltage	V _{CC}	4.5 to 5.5	V

■ Outline Dimensions

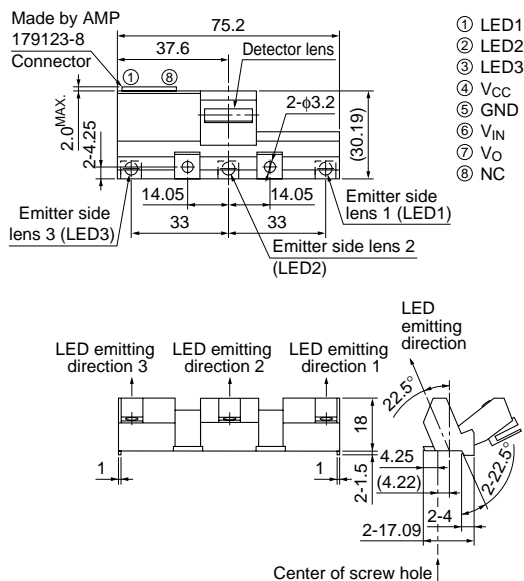
(Unit : mm)

GP2D06



※ Unspecified tolerance : ±0.3mm

GP2D07



※ Unspecified tolerance : ±0.3mm

※ () : Reference dimensions

■ Electro-optical Characteristics

(Ta=25°C, Vcc=5V)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Recommended detection height		H		50	60	70	mm
Output data		D	H=60mm L=0mm ^{*1 *2}	110	160	210	DEC
Distance characteristics of output data	GP2D06	ΔD_L	H=60mm displacement ^{*1 *2}	70	90	110	DEC
	GP2D07		Output change at L=50mm→0mm	65	85	105	
Output displacement of paper tolerance	GP2D06	ΔD_{X1}	Output difference of output between paper output and X1=8mm output. H=60mm L=0mm ^{*1 *2 *3}	30	—	—	DEC
	GP2D07		Output difference of output between paper output and X1=9mm output. H=60mm L=0mm ^{*1 *2 *3}				
	GP2D06	ΔD_{X2}	Output difference of output between paper output and X2=2mm output. H=60mm L=0mm ^{*1 *2 *3}	—	—	30	DEC
	GP2D07		Output difference of output between paper output and X2=3mm output. H=60mm L=0mm ^{*1 *2 *3}				
Output displacement on low reflection ratio paper		ΔD_P	Output displacement when 60% of the luminosity go down. H=60mm L=0mm ^{*1 *4}	—	0	30	DEC
Dissipation current		I _{CC}	At smoothing (including LED current)	—	33	48	mA

Note) DEC : Decimal number of sensor output (8bit serial).

D, ΔD_L and ΔD_P shall be specified at LED1 : ON or LED2 : ON or LED3 : ON (**GP2D07**).

ΔD_{X1} , ΔD_{X2} shall be specified at LED1 : ON or LED2 : ON or LED3 : ON (**GP2D07**).

*1 H : Distance between the surface of the sensor and the upper side of paper setting up glass. (Refer to Fig.1,2 (1))

L : Distance between the upper side of paper setting up glass and the object (paper). (Refer to Fig.1, 2(1))

*2 Reflective object : White paper

(Made by Kodak Co. Ltd. gray chart R-27 · white surface, reflective ratio ; 90%)

*3 X1 : Distance between the edge of the object (paper) and the center position of the lens when the paper is undetectable. (Refer to Fig.1, 2(1))

X2 : Distance between the edge of the object (paper) and the center position of the lens when the paper is detectable. (Refer to Fig.1, 2(1))

ΔD_{X1} , ΔD_{X2} : (Refer to Fig.1, 2(2))

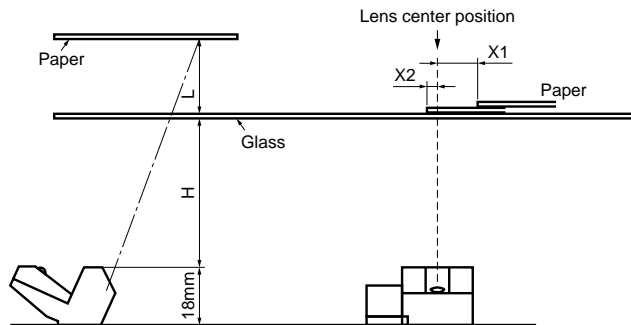
*4 Reflective object : Gray paper

Made by Kodak Co. Ltd. gray chart R-27 · Gray surface, reflective ratio ; 18%

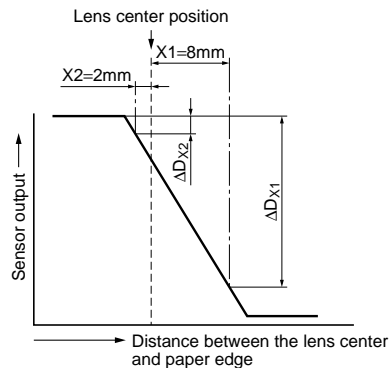
This is based on the output when no luminosity decreases by the reflective object (white paper).

Fig.1 The Relation To The Upper Side Of Paper

GP2D06



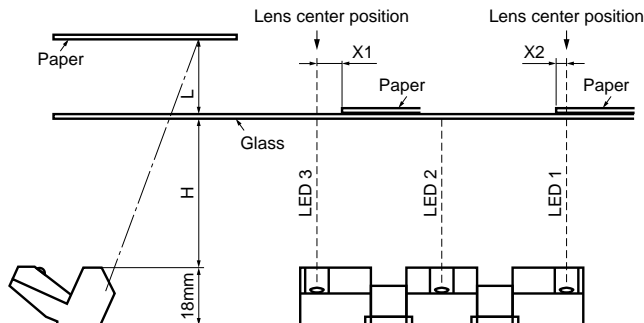
(1)



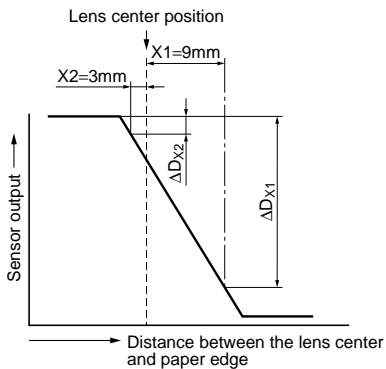
(2)

Fig.2 The Relation To The Upper Side Of Paper

GP2D07



(1)



(2)

Fig.3 Internal Block Diagram

GP2D06

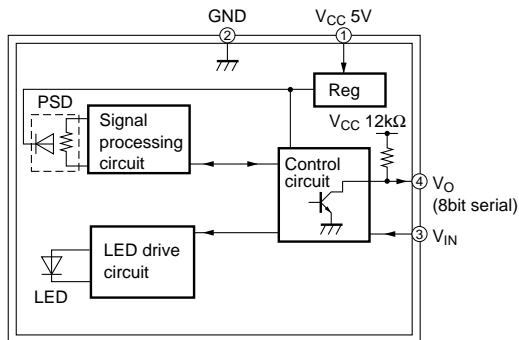
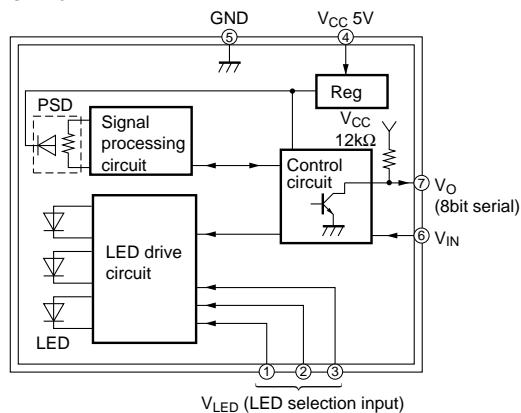


Fig.4 Internal Block Diagram

GP2D07



The diagram shows the timing for the GP2D07 sensor. It includes signals for LED1, LED2, LED3, VIN, and VO. The measurement cycles are labeled as 'Measuring output of LED1 direction', 'Measuring output of LED2 direction', and 'Measuring output of LED3 direction'. Each cycle shows a sequence of LED pulses followed by a series of VIN pulses, and then a corresponding VO output pulse.

GP2D06/GP2D07

Timing diagram showing V_{IN} and V_O signals.

V_{IN} signal transitions from "Current OFF" to "Current ON".

During "Current ON", the output V_O shows a series of pulses representing distance measuring output. The output is labeled D_7 (MSB) and D_0 (LSB).

Timing parameters:

- Current OFF duration: 70ms MIN.
- Current ON pulse width: 1ms MIN.
- Current ON period: 0.2ms MAX.
- Output delay: 0.04ms MIN.
- Output pulse width: 1.5ms MIN.

Example of distance measuring output

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The diagram shows a digital signal V_{IN} with the following timing parameters:

- Low pulse width: 70ms
- Transition time (fall): 0.1ms
- High pulse width: 1.6ms
- Transition time (rise): 0.1ms
- High pulse width: 1.5ms

Fig.8 Example of Sensor Arrangement

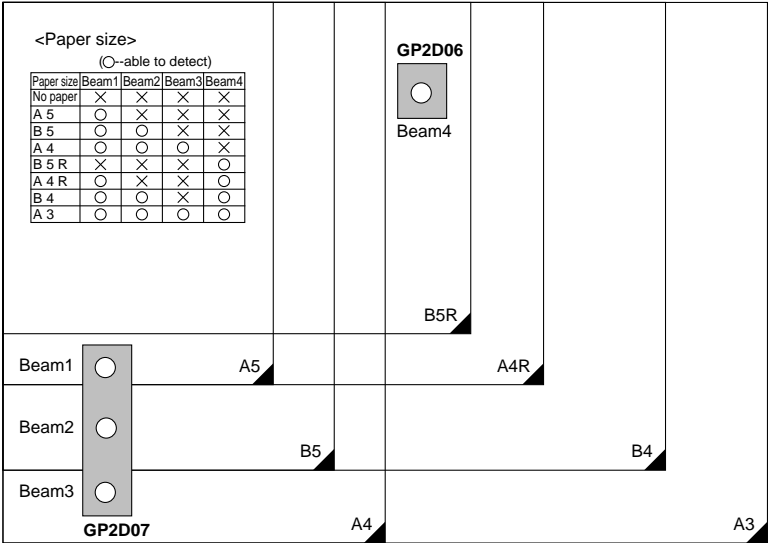


Fig.9 Example Of Output Distance Characteristics (H=60mm)

H : Distance between the surface of the sensor and the upper side of paper setting up glass

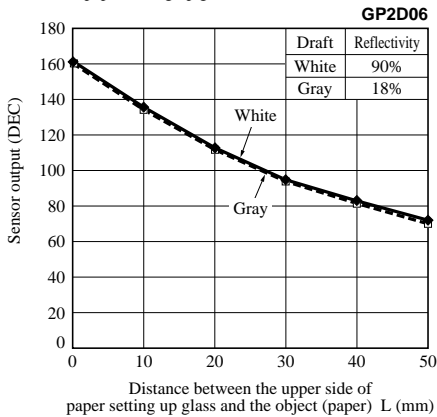
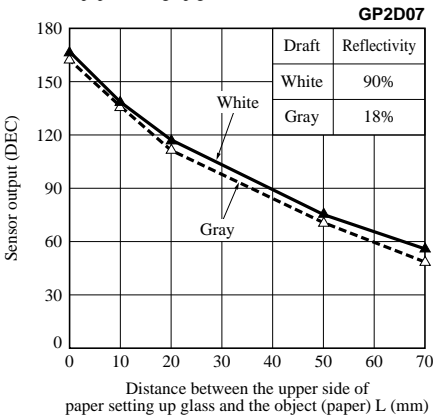


Fig.10 Example Of Output Distance Characteristics (H=60mm)

H : Distance between the surface of the sensor and the upper side of paper setting up glass



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