

**I-CUBE**X

• *Sensors & Interfaces* •

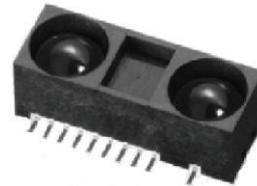
*Software* •

*Support*

# GP2Y0A60SZ0F

# GP2Y0A60SZLF

Distance Measuring Sensor Unit  
Measuring distance : 10 to 150 cm  
Analog output type



## ■Description

**GP2Y0A60SZ0F/GP2Y0A60SZLF** is a distance measuring sensor unit, composed of an integrated combination of PSD (position sensitive detector), IR-LED (infrared emitting diode) and signal processing circuit.

The variety of the reflectivity of the object, the environmental temperature and the operating duration are not influenced easily to the distance detection because of adopting the triangulation method.

This device outputs the voltage corresponding to the detection distance. So this sensor can also be used as a proximity sensor.

## ■Features

1. Distance measuring sensor is united with PSD, infrared LED and signal processing circuit
2. Distance measuring range : 10 to 150 cm
3. Compact size (22.0 × 8.0 × 7.2mm)
4. Long distance measuring type  
(No external control signal required)
5. Analog output type

## ■Agency approvals/Compliance

1. Compliant with RoHS directive (2002/95/EC)

## ■Applications

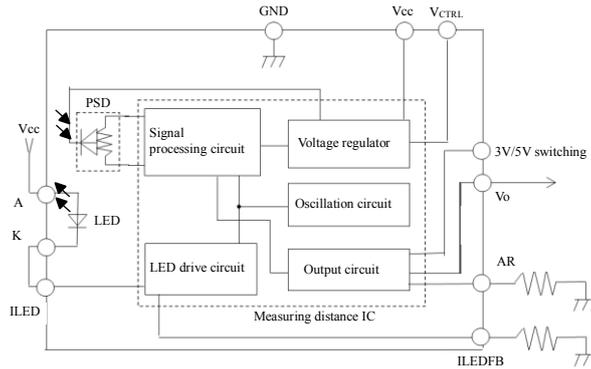
1. Touch-less switch  
(Sanitary equipment, Control of illumination, etc)
2. Sensor for energy saving  
(ATM, Copier, Vending machine, Laptop computer, LCD monitor, etc)
3. Amusement equipment  
(Robot, Arcade game machine, etc)

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Sheet No.: OP13005EN

■ Schematic



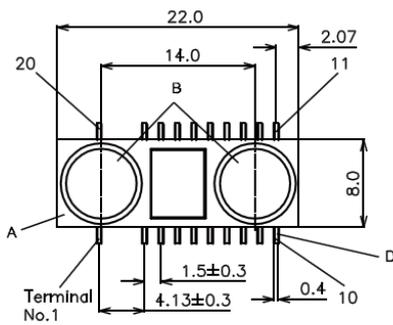
- Showing main terminal
- Please use an electric source with an output current of 400mA or more because LED pulse current is more than 300mA.

■ Outline

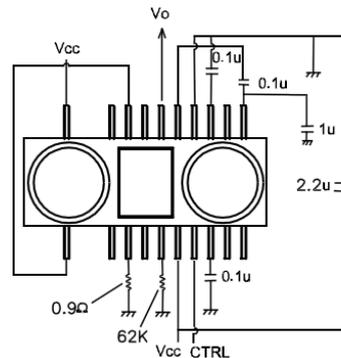
GP2Y0A60SZ0F

(Drawing No.CY14442J02)

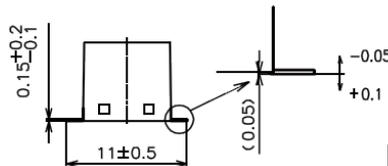
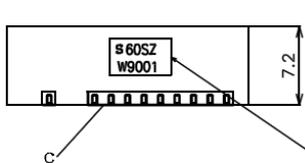
Scale : 2/1 Unit : mm



Connention Diagram



Above connection is the case of Vcc = 3V.  
In the case of Vcc=5V, terminal No.4 is connected to GND.



Materials

A Case	Carbonic ABS (Conductive resin)
B Lens	Acrylic acid resin(Visible light cut type)
C Device coating	PPS (color : Black)
D Terminal	42ALLOY (Pd-Au plating)

Stamp (Example)

SHARP : [ S ]  
 S 6QSZ GP 2Y 0A60SZ 0F  
 : F 60SZJ  
 W9 0 0 1  
 Lot No.  
 Month ( 1 to 9,0,N,D )  
 ( DIN standart symbol )  
 Year ( DIN standard symbol )  
 DIN standard year production  
 ( It repeats itself by a period for 20 years  
 except for G,I,0,Q,Y and Z. )

Years	Symbol
2008	W
2009	X
2010	A
2011	B
1	I
2025	T
2026	U

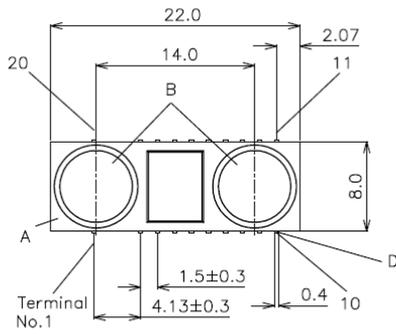
No.	terminal name
1	cathode
2	NC
3	ILEDFB
4	Vcc SHIFT
5	AR
6	Vcc
7	CTRL
8	CH1
9	NC
10	NC
11	REG
12	NC
13	CH2
14	GND
15	CINT
16	Vo
17	NC
18	ILED
19	NC
20	anode

1. Unspecified tolerances shall be  $\pm 0.3$ mm.
2. ( ) : Reference Value
3. Dimension of terminal position is at the root of terminal.
4. Parallelism of terminal is 0.15.

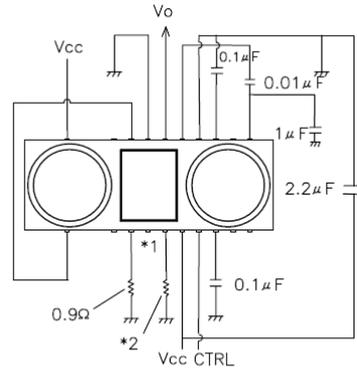
GP2Y0A60SZLF

(Drawing No.CY14591i02)

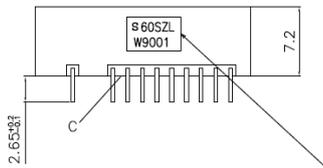
Scale : 2/1 Unit : mm



Connection diagram



- \*1) Above connection is the case of Vcc = 3V. In the case of Vcc=5V, terminal No.4 is connected to GND.
- \*2) The AR terminal connects 36kΩ.



Material	
A Case	Carbonic ABS (Color : Black)
B Lens	Acrylic acid resin (Visible light cut type)
C Device coating	PPS (Color : Black)
D Lead pin	42ALLOY (Pd-Au plating)

Stamp (Example)  
 SHARP : [ S ]  
 S 60SZL GP2Y0A60SZLF  
 : F60SZLJ  
 W9 0 0 1  
 LOT No.  
 Month ( I t o 9, 0, N, D )  
 ( D I N Standard symbol )  
 Year ( D I N Standard symbol )  
 D I N Standard year production  
 ( Remove G, I, O, Q, Y, Z )  
 ( It repeats itself by a period for 20 years )

terminal No.	terminal Name
1	cathode
2	GND
3	I LEDFB
4	3V/5V switching
5	AR
6	Vcc
7	CTRL
8	CH1
9	NC
10	REG
11	REG
12	NC
13	CH2
14	GND
15	CINT
16	Vo
17	T
18	I LED
19	GND
20	anode

Year	Symbol
2008	W
2009	X
2010	A
2011	B
...	...
2025	T
2026	U

Terminals No.2, 14, 19 are connected in device. Thus GP2Y0A60SZLF operates by connection of arbitrary one terminal to GND.

Terminals No.10, 11 are connected in device. Thus GP2Y0A60SZLF operates by connection of either terminal.

(Note1) Unspecified tolerances shall be ±0.2mm.

(Note2) ( ) : Reference value

(Note3) lead terminal size is a root size of the lead.

## ■ Absolute maximum ratings

(Ta=25°C)

Parameter	Symbol	Ratings	Unit	Remark
Supply voltage	Vcc	-0.3 to +5.5	V	-
Output terminal voltage	Vo	-0.3 to Vcc+0.3	V	-
Input terminal voltage 1	-	-0.3 to V <sub>REG</sub> +0.3	V	Terminal (NC, CH1, CH2, CINT, AR, T)
Input terminal voltage 2	-	-0.3 to Vcc+0.3	V	Terminal (CTRL)
Operating temperature	Topr	-10 to +60	°C	-
Storage temperature	Tstg	-40 to +70	°C	-
Soldering temperature	Tsol	260	°C	5s or less/time up 2 times

## ■ Recommended operating conditions

Parameter	Symbol	Rating	Unit	Remark
Supply voltage	Vcc	4.5 to 5.5	V	5V
Supply voltage	Vcc	2.7 to 3.6	V	3V
High level input voltage	V <sub>CTRLH</sub>	2.3 to Vcc	V	Operating
Low level input voltage	V <sub>CTRL</sub> L	MAX 0.2	V	Stand-by state

## ■ Electro-optical Characteristics

(Ta=25°C, Vcc=3V)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Measuring distance range	$\Delta L$	(Note 1)	10	-	150	cm
Output terminal voltage	Vo	L=150cm (Note 1)	0.05	0.35	0.65	V
Output voltage difference	$\Delta V_o$	Output change at L change (10cm → 150cm) (Note 1)	1.35	1.60	1.85	V
Average supply current	Icc1	Vcc=3V, V <sub>CTRL</sub> =3V	-	33	50	mA
Stand-by supply current	Icc2	Vcc=3V, V <sub>CTRL</sub> =0V	-	-	5	μA

(Ta=25°C, Vcc=5V)

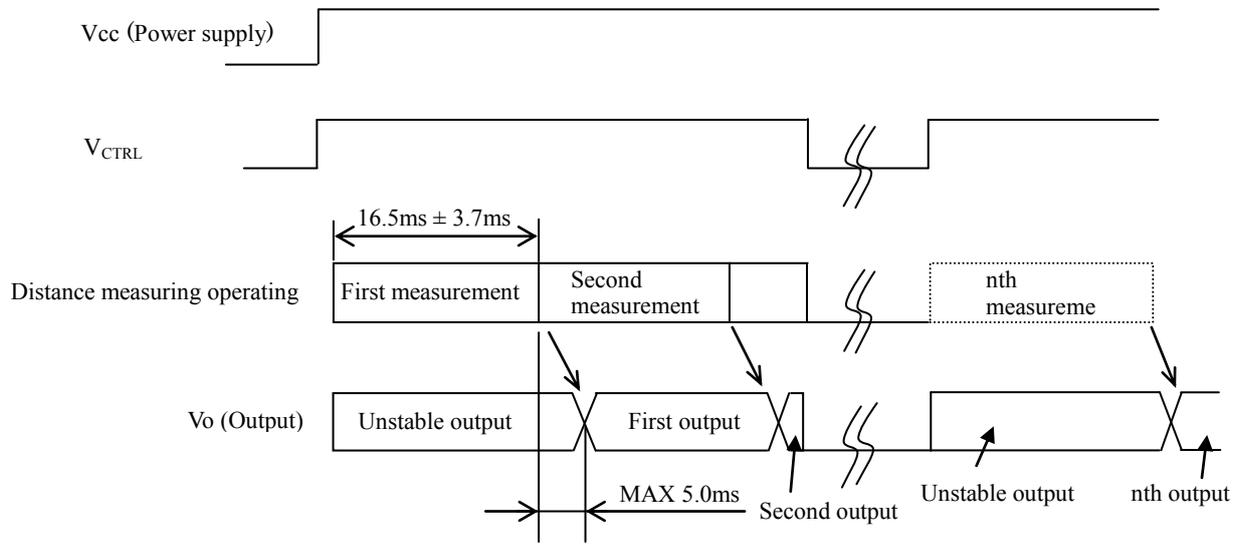
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Measuring distance range	$\Delta L$	(Note 1)	10	-	150	cm
Output terminal voltage	Vo	L=150cm (Note 1)	0.15	0.65	1.15	V
Output voltage difference	$\Delta V_o$	Output change at L change (10cm → 150cm) (Note 1)	2.75	3.00	3.25	V
Average supply current	Icc1	Vcc=5V, V <sub>CTRL</sub> =5V	-	33	50	mA
Stand-by supply current	Icc2	Vcc=5V, V <sub>CTRL</sub> =0V	-	-	5	μA

※L : Distance to reflective object

(Note 1) Using reflective object : White paper

(Made by Kodak Co., Ltd. gray cards R-27 • white face, reflective ratio ; 90%)

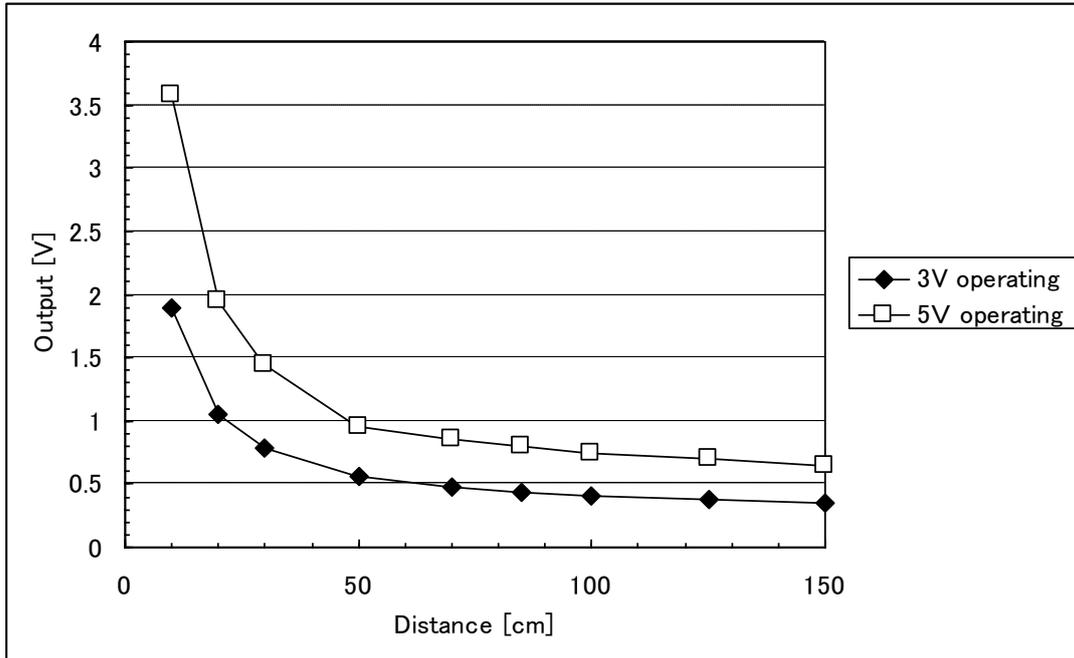
■ Timing Chart



■Supplements

- Example of output distance characteristics

White paper(Reflectance ratio 90%)



- This product shall not contain the following materials.  
Also, the following materials shall not be used in the production process for this product.  
Materials for ODS : CFCs, Halon, Carbon tetrachloride 1.1.1-Trichloroethane (Methyl chloroform)
- Product mass : Approx. 1.1g (TYP)
- This product does not contain the chemical materials regulated by RoHS directive.  
(Except for the NOT regulated by RoHS directive.)
- Compliance with each regulation
  - 1) The RoHS directive(2002/95/EC)  
This product complies with the RoHS directive(2002/95/EC) .  
Object substances: mercury, lead (except for lead in high melting temperature type solders and glass of electronic components), cadmium, hexavalent chromium, polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE)
  - 2) Content of six substances specified in Management Methods for Control of Pollution Caused by Electronic Information Products Regulation (Chinese : 电子信息产品污染控制管理办法).

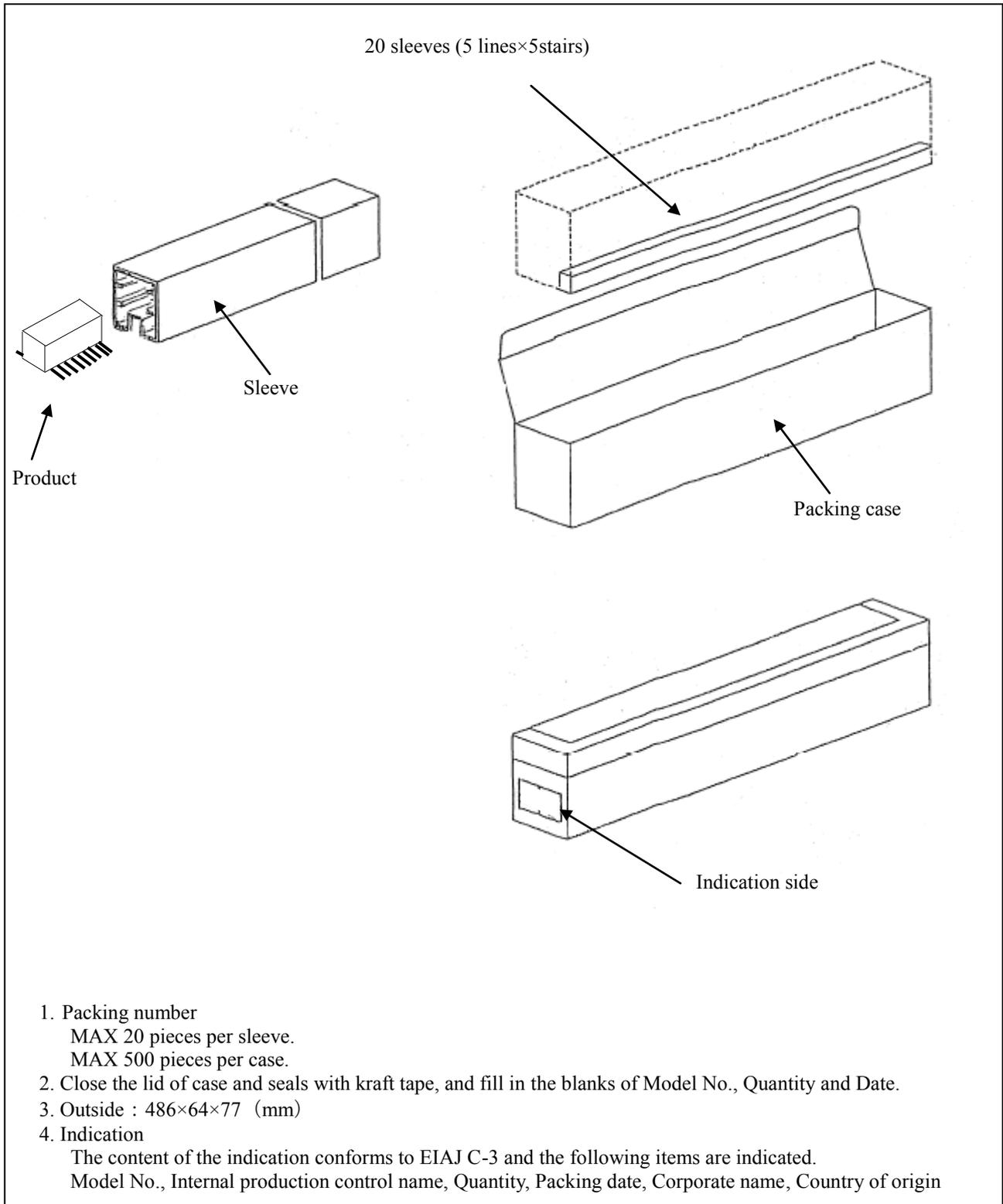
Category	Toxic and hazardous substances					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent chromium (Cr <sup>6+</sup> )	Polybrominated biphenyls (PBB)	Polybrominated diphenyl ethers (PBDE)
Distance measuring sensor	✓	✓	✓	✓	✓	✓

✓ : indicates that the content of the toxic and hazardous substance in all the homogeneous materials of the part is below the concentration limit requirement as described in SJ/T 11363-2006 standard .

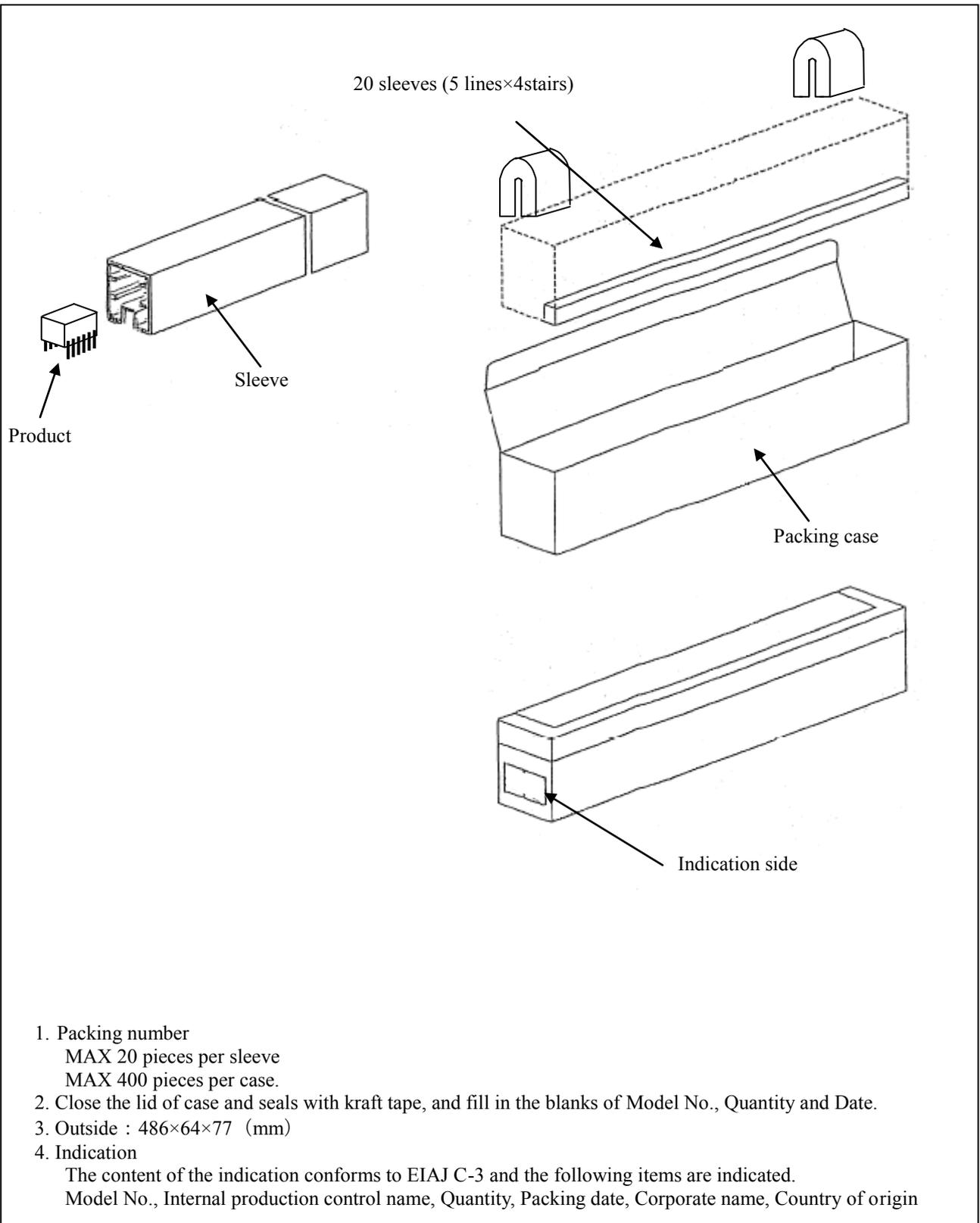


## ■ Packing specification

GP2Y0A60SZ0F



GP2Y0A60SZLF



1. Packing number  
 MAX 20 pieces per sleeve  
 MAX 400 pieces per case.
2. Close the lid of case and seals with kraft tape, and fill in the blanks of Model No., Quantity and Date.
3. Outside : 486×64×77 (mm)
4. Indication  
 The content of the indication conforms to EIAJ C-3 and the following items are indicated.  
 Model No., Internal production control name, Quantity, Packing date, Corporate name, Country of origin

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- 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.

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- Space applications
- Telecommunication equipment [trunk lines]
- Nuclear power control equipment
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