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ELECTRONIC COMPONENTS GROUP

SHARP CORPORATION

SPECIFICATION

DEVICE SPECIFICATION FOR

OPIC SENSOR FOR REMOTE CONTROL

MODEL No.   IS1U60L

☐ CUSTOMER'S APPROVAL

DATE _____

BY _____

PRESENTED BY   K. Sakamoto

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Department General Manager of
Engineering Dept., II
Opto-Electronic Devices Div.
ELECOM Group
SHARP CORPORATION

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1. Application

   This specification applies to the outline and characteristics of OPIC sensor for remote control, Model No. IS1U60L.

2. Outline

   Refer to the attached drawing No. CY3941i02.

3. Ratings and characteristics

   Refer to the attached sheet, Page 3 ∿ 5.

4. Reliability

   Refer to the attached sheet, Page 7.

5. Incoming inspection

   Refer to the attached sheet, Page 8.

6. Supplement

   This product is not designed as electromagnetic and ionized-particle radiation resistant.

7. Notes

   (1) When using a light emitting unit (remote control transmitter), it shall be considered the performances, characteristics and operating condition of the light emitting element and the characteristics of this OPIC sensor for remote control.

   (2) If the surface of detector is smeared with dust or dirt, it may cause faulty operation. Caution shall be taken to avoid this. And do not touch the detector surface.

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(3) Cleaning conditions

Solvent cleaning: Solvent temperature 45°C or less
Immersion 3 min. or less

Ultrasonic cleaning: Affection to device by ultrasonic cleaning
has different affection by cleaning bath
size, ultrasonic power output, cleaning time,
PWB size or device mounting condition etc.
If user carries out ultrasonic cleaning,
user should select fit condition that
doesn't occur defect.

The cleaning shall be carried out with solvent below.

Solvent: Ethyl alcohol, Methyl alcohol, Freon TE·TF
Isopropyl alcohol, Daiflon-solvent S3-E

Please refrain from using fron type solvent to clean devices
as much as possible since it is internationally restricted to
protect the ozonosphere.
Before you use alternative solvent you are requested to confirm
that it does not damage package resin.

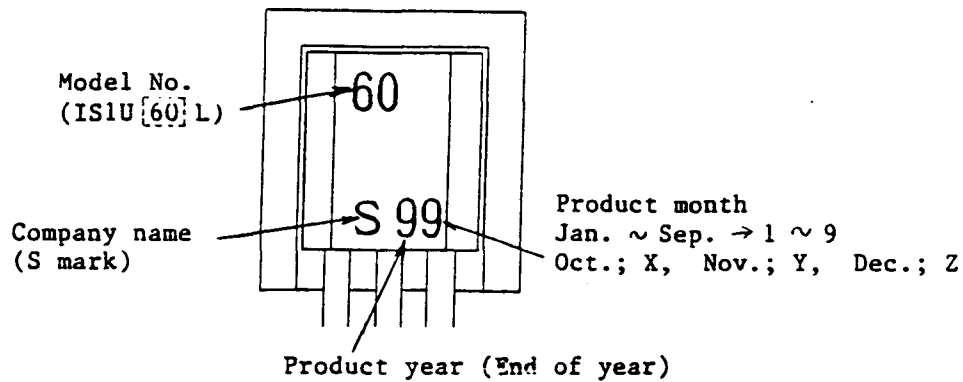(4) In order to prevent static destruction of integrated circuit,
human body and soldering iron, tec. shall be grounded.

8. Others

Any doubt as to this specification shall be determined in good faith
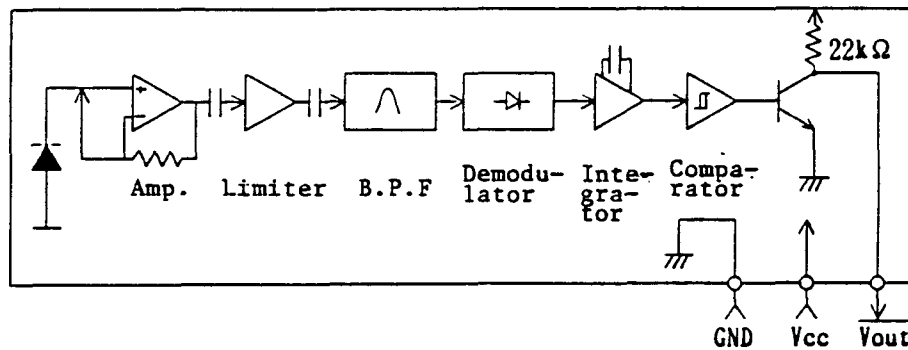upon mutual consultation of the both parties.

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2.2 Mark diagram

Model No.
(IS1U〔60〕L)

60

S 99

Company name
(S mark)

Product month
Jan. ~ Sep. → 1 ~ 9
Oct.; X, Nov.; Y, Dec.; Z

Product year (End of year)

3. Ratings and characteristics

3.1 Schematic

Amp.   Limiter   B.P.F   Demodu-   Inte-   Compa-
                          lator   gra-   rator
                                   tor

22kΩ

GND   Vcc   Vout

3.2 Absolute maximum ratings

Parameter	Symbol	Rating	Unit
Supply voltage	V_{cc}	0 ~ 6.0	V
Operating temperature	T_{opr}	-10 ~ +60 *1	°C
Storage temperature	T_{stg}	-20 ~ +70	.°C
Soldering temperature	T_{sol}	260 *2	°C

*1) No dew formation

*2) For 5 sec. at the position of below from the resin edge.

Resin portion

3.1mm

Solderable
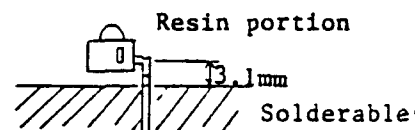
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3.3 Recommended operating conditions

Parameter	Symbol	Operating condition	Unit
Supply voltage	Vcc	4.7 ~ 5.3	V

3.4 Electrical characteristics

(Unspecified Ta=25°C, Vcc=5V)

Parameter	Symbol	MIN.	TYP.	MAX.	Unit	Remark
Current dissipation	Icc	-	2.8	4.5	mA	No input light Output terminal OPEN
High level output voltage	V_{OH}	Vcc-0.2	-	-	V	*2 Output terminal OPEN
Low level output voltage	V_{OL}	-	0.45	0.6	V	*2 Pull-up resistance 2.2kΩ
High level pulse width	T_1	400	-	800	μs	*2
Low leve pulse width	T_2	400	-	800	μs	*2
B.P.F. center frequency	f_0	-	38	-	kHz	

*2) The burst wave as shown
in the figure on the right
shall be transmitted by the
transmitter shown in Fig. 1.

Transmissive
signal
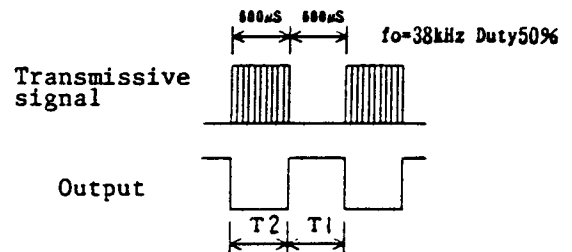
Output

3.5 Performance

The output signal of this OPIC sensor for remote control shall satisfy
the following requirements with the transmitter shown in Fig. 1
used in the standard optical system in Fig. 2.

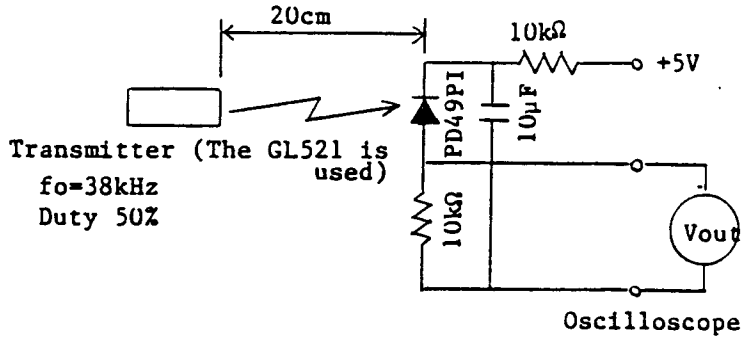### 3.5.1 Characteristics of linear reception distance

The output signal shall satisfy the electrical characteristic
requirements in para 3.4 at L=0.2 ~ 5m, (*3) Ee < 10ℓx, ϕ=0° in Fig. 2.

3.5.2 Characteristics of sensitivity angle reception distance

The output signal shall satisfy the electrical characteristic
requirements in para. 3.4 at L=0.2 ~ 3m, Ee < 10ℓx,
X direction $\phi \leq 30°$, Y direction $\theta = 0°$
And the output signal shall satisfy the electrical characteristic
requirements in para 3.4 at L=0.2 ~ 3m, Ee < 10ℓx,
X direction $\phi = 0°$, Y direction $\theta \leq 15°$

*3) It refers to detector face illuminance.

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20cm

Transmitter (The GL521 is used)
  fo=38kHz
  Duty 50%

PD49PI

10kΩ   +5V

10μF

10kΩ

Vout

Oscilloscope

In the figure above, the transmitter shall be set as the output Vout will be 40mVpp. Note that the PD49PI in this application is the one with short-circuit current Isc=2.6μA measured at Ev=100ℓx. (Ev is the illuminance by CIE standard light source A (tungsten lamp)).
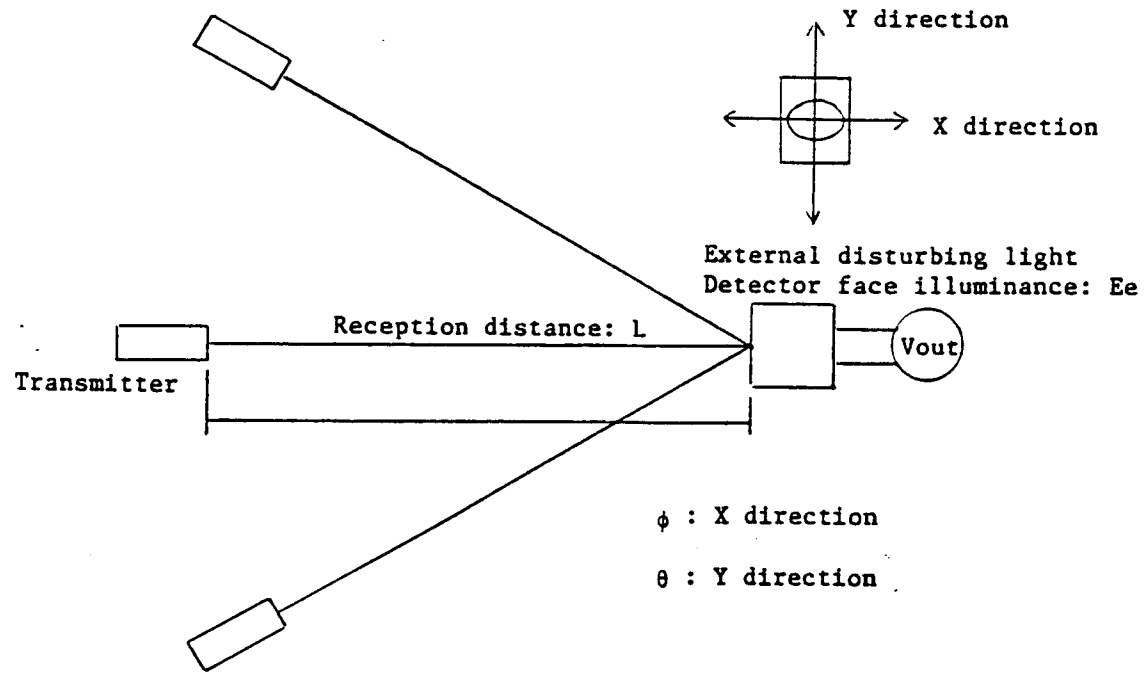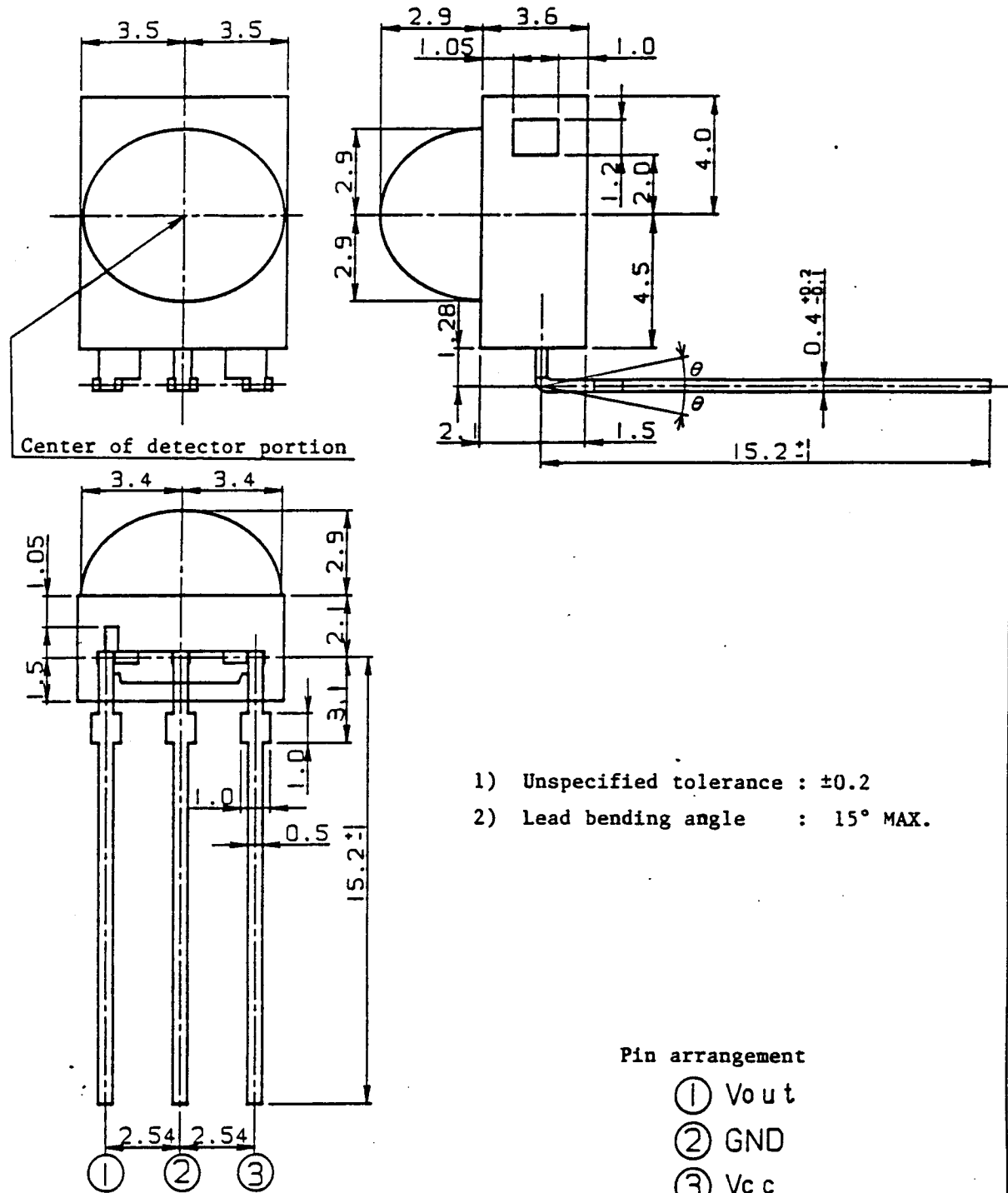
fig. 1 Transmitter

Y direction

X direction

External disturbing light
Detector face illuminance: Ee

Reception distance: L

Transmitter

Vout

φ : X direction

θ : Y direction

Fig. 2 Standard optical system

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Center of detector portion

1) Unspecified tolerance : ±0.2
2) Lead bending angle   : 15° MAX.

Pin arrangement

① Vout

② GND

③ Vcc

適 用 機 種 APPLICATABLE MODEL	IS1U60L	尺 度 SCALE	5/1	単 位 UNIT	1 = 1/1 mm	⚠				
						⚠				
						改訂日 DATE	改訂記事 REVISE		担当 CHARGE	
板厚 THICKNESS	員数 PIECES	材質 MATERIAL		仕 上 FINISH		名 称 NAME	IS1U60L Outline Dimension			
		NME		Soldering dip						
日付 DATE	Nov. 13, 1989					コード CODE				
設計 DESIGN	製図 DRAW	検図 CHECK	検図 CHECK	承認 APPROVE	シャープ株式会社 電子部品事業本部 Opto-Electronic Devices Div. SHARP CORPORATION	図 番 DRAWING №.	C Y 3 9 4 1 i 0 2			

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4. Reliability

The reliability of products shall be satisfied with items listed below.

Reliability level : 90%
LTPD : 10%/20%

Test items	Test conditions	Judgement Criteria	Samples (n) Defective(C)
Terminal strength (Tension)	Weight: 500g 30 sec./each terminal	U × 1.2 or more	n=11, C=0
Terminal strength (Bending)	Weight: 250g 0° → -90° → -0° 2 times/each terminal		n=11, C=0
Shock	Acceleration: 100G, 6ms, 3 directions/3 times	L × 0.8 or less	n=11, C=0
Variable frequenc vibration	Frequency range: 10 ∿ 55Hz/sweep 1 min. Overall amplitude: 1.5mm X,Y,Z/2H. each		n=11, C=0
* High temp. and high humidity storage	Ta=40°C, 90%RH, t=240H.		n=22, C=0
* High temp. storage	Ta=70°C, t=240H.	U: Upper specification limit	n=22, C=0
* Low temp. storage	Ta=-20°C t=240H.		n=22, C=0
* Temperature cycling	1 cycle -20°C ∿ +70°C (30min) (30min) 20 cycle test	L: Lower specification limit	n=22, C=0
* Operation life (high temp.)	Ta=60°C, Vcc=5V t=240H.		n=22, C=0
Soldering heat	260±5°C 5 sec.		n=22, C=0
Solderability	230±5°C Immersed in the soldering tank 5±0.5 sec.	*2	n=11, C=0

*2 Solder shall adhere at the area of 95% or more of immersed portion.

In the test * mark above, the sample to be tested shall be left at normal temperature and humidity for 2 hours after it is taken out of the stat. (No dew point)

Resin portion
3.1mm
Solderable