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SHARP

ELECTRONIC COMPONENTS GROUP

SHARP CORPORATION

SPECIF ICATION

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REPRESENTATIVE DIVISION

OPTO-ELECTRONIC DEVICES DIV.

DEVICE SPECIFICATION FOR

Light emitting diode Lamp

MODEL No.

LT3U76TR

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2. Please obey the instructions ❑ entioned below for actual use of this device. SHARP takes no responsibility for damage caused by improper use of the devices.

(1) This device is designed for general electronic equipment. Main uses of this device are as follows;

[• OA equipment ● Telecommunication equipment (Terminal)
• Measuring equipment •AV equipment •Home appliance, etc.]

(2) Please take proper steps in order to maintain reliability and safety, in case this device is used for the uses ❑ entioned below which require high reliability.

[. Unit concerning control and safety of a vehicle (air plane, train, automobile etc.)
• Traffic signal • Gas leak detection breaker • Fire box and burglar alarm box
• Other safety equipment, etc.]

(3) Please do not use for the uses mentioned below which require extremely high reliability.

[• Space equipment . Telecommunication equipment (Trunk)
• Nuclear control equipment "Medical equipment etc.]

Contact a SHARP representative of sales office in advance when you intend to use SHARP devices for any applications other than those applications for general electronic equipment recommend by SHARP at (l).

CUSTOMER'S APPROVAL

DATE

B Y

DATE PRESENTED Jul 24. 1996

B Y M. Abe

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

1. Application

This specification applies to the outline and characteristics of Light emitting diode Model No. LT3U76TR. This model is designed for every kind of indicators lamp used GaAlAs/GaAlAs Red LED chip.

2. Outline and pin connections

Refer to the attached sheet, Page 2. to 3.

3. Ratings and characteristics

Refer to the attached sheet, Page 4. to 5.

4. Reliability

Refer to the attached sheet, Page 6.

5. Incoming inspection

Refer to the attached sheet, Page 7. to 8

6. Addition article

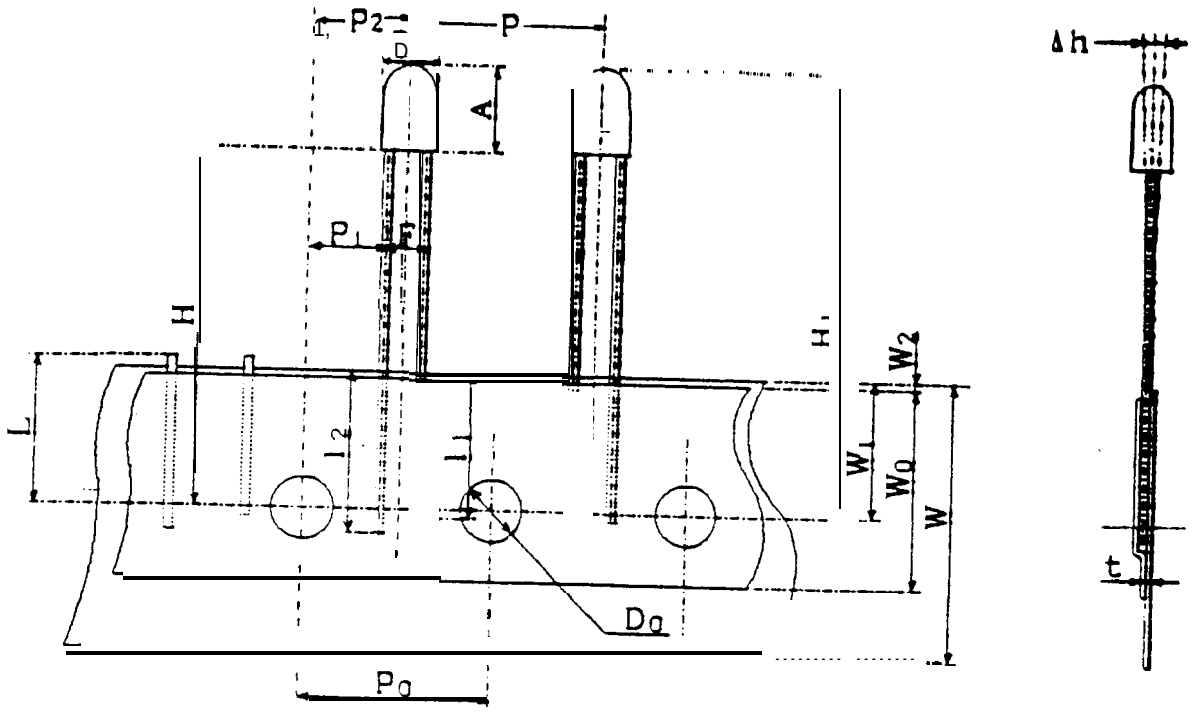
Refer to the attached sheet, Page 9. to 12

7. Notes

Refer to the attached sheet, Page 13. to 14.

2. Outline and pin connections .

2–1, Taping specifications

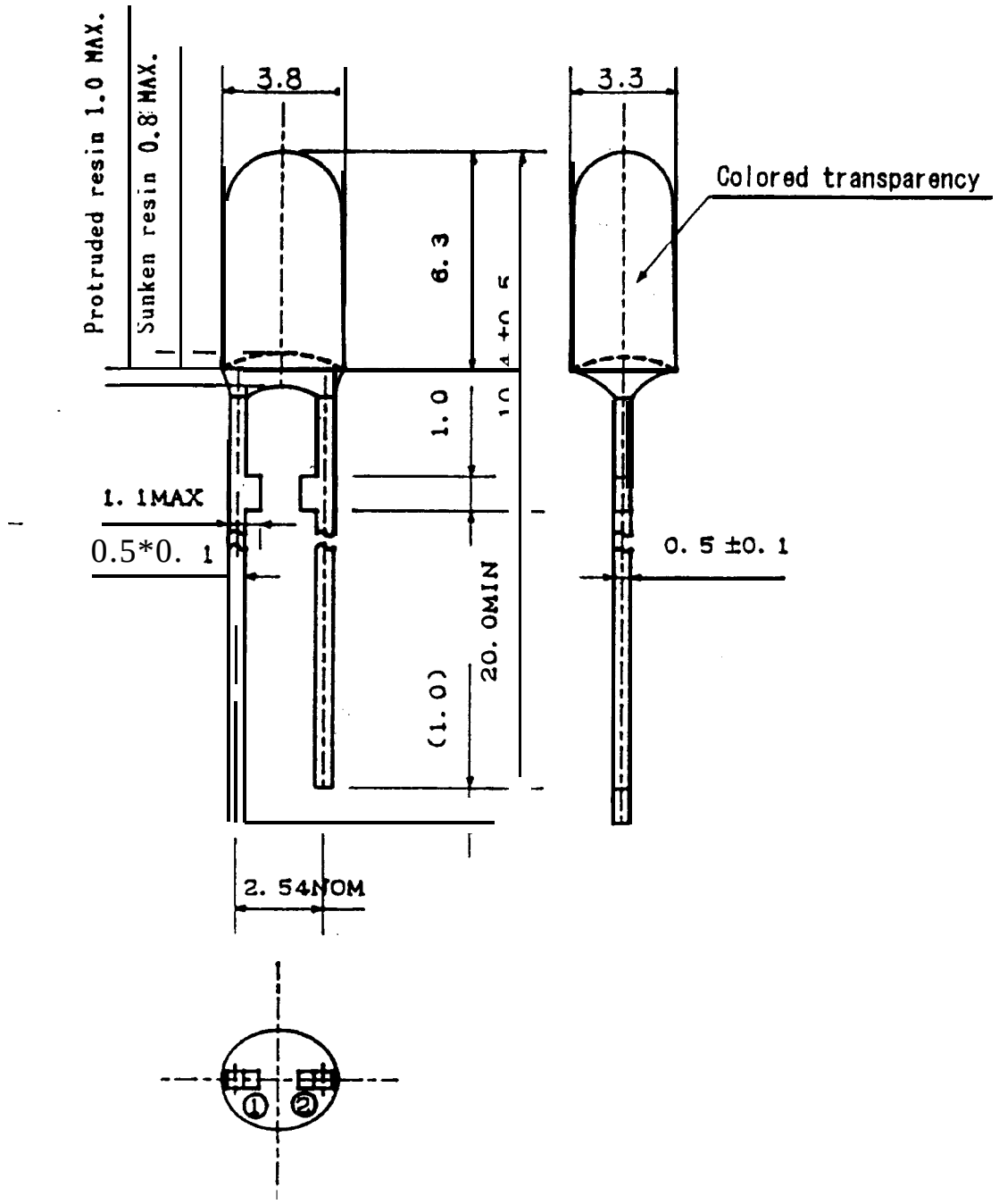


Parameter	Symbol	Dimension(mm)	Remark
Lamp diameter	D	3.8 ±0.15	
Lamp height	A	6.3 ±0.2	
Lead diameter	d	0.5 ±0.1	
Device spacing (Center to center)	P	12.7 ±1.0	
Hole pitch (Center to center)	P_0	12.7 ±0.3	a
Hole location	P_1	5.0820.7	
Hole location	P_2	6.35* 1.3	
Lead spacing(Center to center)	F	2.54NOM	b
Inclination	Δh	0 ±2.0	c
Tape width	w	18.0 ±1.0	
Adhesive tape width	W_0	13.0 ±0.3	
Hole center to tape edge	w_1	9.0 ±0.5	
Adhesive tape edge to tape edge	w*	1.0 or less	
Lamp bottom to hole center	H	19.5 ±1.0	
Total length	H_1	25.8 ±1.0	
Covered lead length	l_1	11.0 or more	
Covered lead length	l_2	12.0 or more	
Hole diameter	D_0	φ4.0 ±0.2	
Lead length after rejecting defective product	L	11.0 or less	
Tape thickness(total)	t	0.7 ±0.2	d

-Remarks-

a. Dimension allowance "a" must be 1mm or less per 20 pitches,
b. treasuring point shall be below the resin.
c. Measuring point shall be the lamp top,
d. The base sheet is 0.37±0.1 in thickness

※ Lamp specifications :See Pege 3



Pin connections

①. Anode

②. Cathode

APPLICABLE MODEL : GL3UR76T

(Note) Unspecified tel. to be ±0.2mm

(Note) Cold rolled steel leads are plated with but the tie-bar cut portions have no plating do not solder this part of the product.

UNIT	MATERIAL	FINISH	DRAWING' No.
mm	Lead: (Fe) Cold rolled steel Package : Epoxy resin	Lead : Snplatedor wave soldering	5080704 1

3. Ratings and characteristics

3–1. Absolute maximum ratings (Ta = 25℃)

Parameter	Symbol	Value	Unit
Power dissipation	P	75	mW
Continuous forward current	IF	30	mA
Peak forward current (Note 1)	I_{FM}	50	
Derating factor		(DC) 0.40 / (Pulse) 0.67	mA/℃
Reverse voltage	V_R	4	V
Operating temperature	Topr	-25 ~ +85	℃
Storage temperature	Tstg	-25 ~ +100	
Soldering temperature (Note 2)	Tsol	260 (within 5 seconds)	

(Note 1) Duty ratio = 1/10, Pulse width = 0.1ms
(Note 2) At the position of 1.6mm from the bottom resin package

3–2. Electro-optical characteristics (Ta = 25℃)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward voltage	V_F	I_F = 20mA	–	1.85	2.5	V
Luminous intensity (Note 3)	Iv		100	200	-	mcd
Peak emission wavelength	λp		–	660	-	nm
Spectrum radiation bandwidth	△λ		–	20	-	
Reverse current	I_R	V_R = 3V	-	-	100	μA
Terminal capacitance	Ct	V = 0V, f = 1MHz	–	25	-	pF

(Note 3) Reference rank of the luminous intensity.

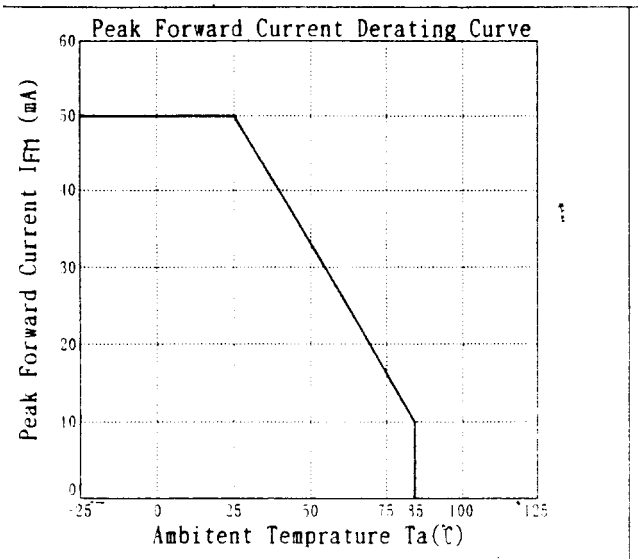
3-3. Rank of the luminous intensity. (Note 4)

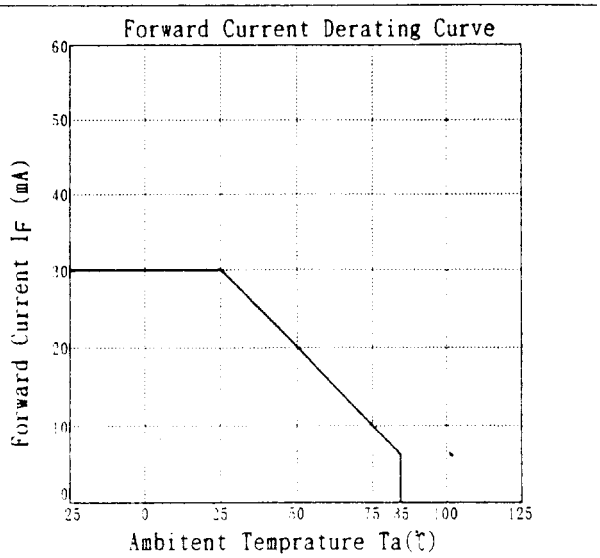
Rank	Luminous intensity	Unit	Conditions
A	100 ~ 271	mcd	I_F=20mA
B	200 ~ 543		
C	400 ~ (1086)		

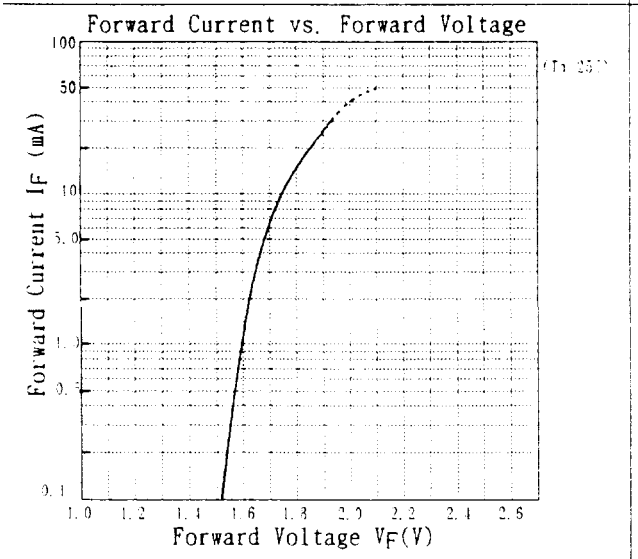
(Note 4) Tolerance ; ±15%

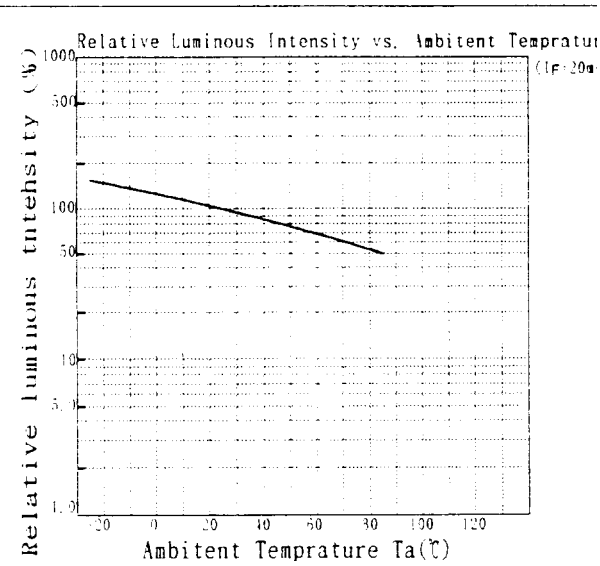
In regard to luminous intensity, the following ranking shall be carried out. However the quantity of each rank shall not be prescribed.
In case of the distribution of the luminous intensity shift to high, at that point new upper rank is prescribed and lower rank is delete.

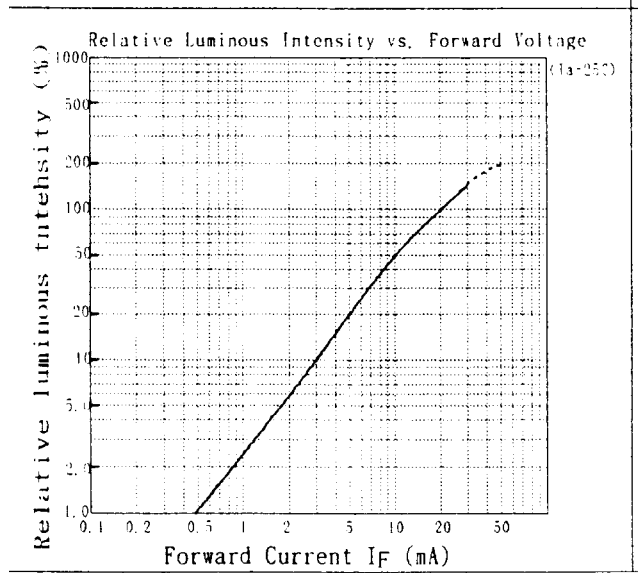
3 - 5 Characteristics Diagrams

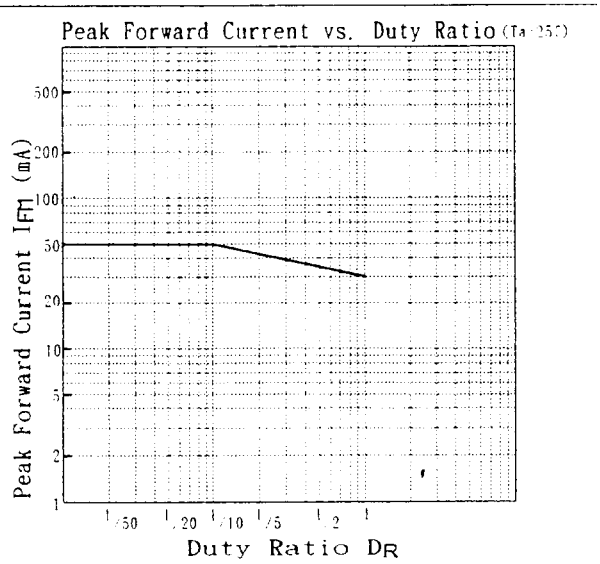












(Note)Above characteristic data are typical data and not a guaranted data.

4. Reliability

The reliability of products shal be satisfied with items below.

4-1. Test items and test conditions

Confidence level:90%

Test Items	Test Conditions	Samples	Defective	LTPD(%)
Soldrability	230±5℃, 5s Prior disposition:Dip in login flux.	11	0	20
Soldering heat	260±5℃, 5s	11	0	20.
Mechanical shock	15000m/s², 0.5ms 3 times/±X, ±Y, ±Z direction	11	0	20
Variable frequency vibration	200m/s², 100 to 2000 to 100Hz/sweep for 4mir 4 times/±X, ±Y, ±Z direction	11	0	20
Terminal strength (.Tension)	Weight: 10N, 5s/each terminal	11	0	20
Terminal strength (Bending)	Weight:5N, 0°→90°→0°→-90°→0°/each terminal	11	0	20
Temperature cycling	-25℃(30min)～100℃(30min), 30 cycles	22	0	10
High temp. and high humidity storage	60℃ 90%RH, 1000h	22	0	10
High temp. storage	100℃, 1000h	22	0	10
Low temp. storage	-25℃, 1000h	22	0	10
Operation life	25℃, I F MAX , 1000h	22	0	10
High temp. and high humidity operation life	60℃, 90%RH, IF=16mA, t=500h	22	0	10

4-2. Measurement items and failure judgement criteria

Measurement Items	Symbol	Failure Judgement Criteria
Forward voltage	V_F	U.S.L ×1.2
Reverse current	I_R	U.S.L ×2.0
Luminous intensity	Iv	Initial intensity×0.5

※Soldrability:Solder shall be adhere at the area of 95% or more of dipped portion.

※Terminal strength:Package is not destroyed, and terminal is not shakey.

- Measuring condition is in accordance with specification.
- U.S.L is shown by upper standard limit.
- I_F MAX is shown by foward current of adsolute maximum ratings.

5. Quality level

5-1 Applied standard: 1S0 2859-1

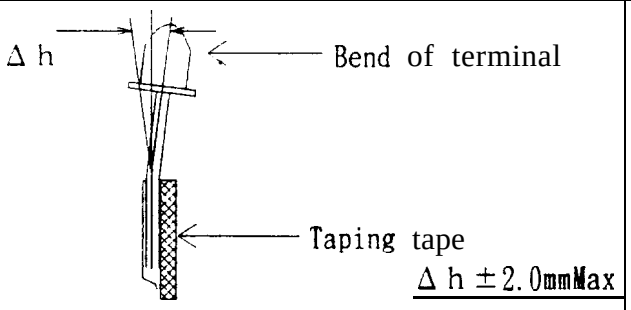
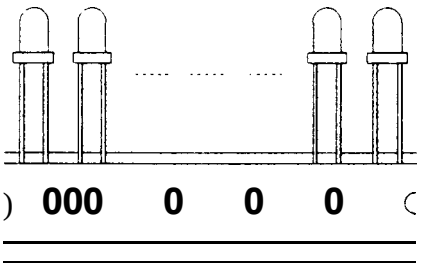
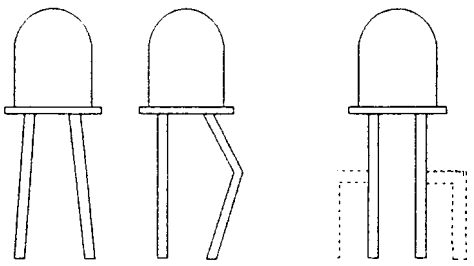
5–2 Sampling method and level: A single sampling plan, normal inspection level Ⅱ

: AQL Major defect: 0.065%

Minor defect: 0.4%

Finely defect: 1.0%

5 – 3 Test item, judgement criterion and rank of defect

No.	Test items	judgement criterion	Rank of defect
1	Taping dimension	Not satisfy taping specification	Major defect
2	Bend of terminal		Major defect
3	Reverse position polarity	Reverse position taping of LED lamps	Major defect
4	Cutting of tape	(1) Cutting of tape (2) Crack exceed 1/2 of tape width	Major defect
5	Fall out of Lamp	(1) Fall out of lamp (2) Wobble lamp	Major defect
6	Missing lamps	Over continuously four lamps vacancy 	Major defect
7	Transformation of terminal	Inferior transformation of terminal  Expanse Transformation not forming	Major defect

No.	Test items	judgement level	Rank of defect
8	Label	Wrong label of lamp type	Major defect
9	Mixture of wrong type	Wrong type lamp intermix	Major defect
10	Wrong indication	Wrong indication of type, rank, and polarity	Major defect
11	Form of packaging	Different	Major defect
12	Disconnection	Not emit-light	Major defect
13	Short	Not emit light	Major defect
14	Position of cutting off rim	Different from dimension	Major defect
15	Reverse terminal	Different from dimension	Major defect
16	Luminous color	Different from provided color	Major defect
17	Outline dimension	Not satisfy outline specification	Minor defect
18	Characteristic	Over the limit value of specification at VF, IR and Iv.	Minor defect
19	Chip off the rim	Exceed 0.2mm	Finely defect
20	Foreign substance	White point: Exceed 0.3mm Black point: Exceed 0.3mm String form: Exceed 3.0mm (on top view)	Finely defect
21	Scratch	Exceed 0.3mm or 0.1mm×1.0mm	Finely defect
22	Void	Exceed 0.3mm(on top view)	Finely defect
23	Unbalanced center	Exceed 0.25mm from package center	Finely defect
24	Burr	Exceed 0.2mm against provided dimension	Finely defect
25	Insertion position of terminal	Insertion position of terminal	Finely defect

6. Added articles

6–1. Packing Specification

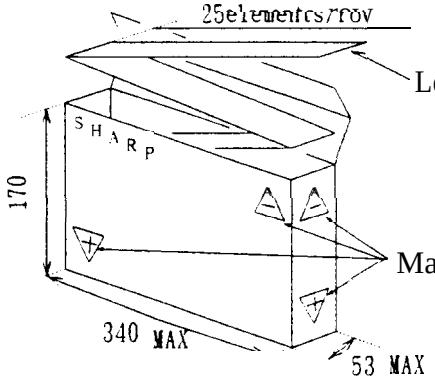
6-1-1 Packing form

Box type

a) Folding type of a radial-type taping dimension separately discussed) to a length of 25 elements per row.

b) Leave a space equal to 3 or more elements at both ends of the tape. Model No. aluminous intensity rank and polarity are printed.

c) Distinguish cathode draw-out method from anode draw-out method, according to light-emitting diode polarity. The former corresponds to the upper lid opening method and the latter corresponds to the lower lower opening method.



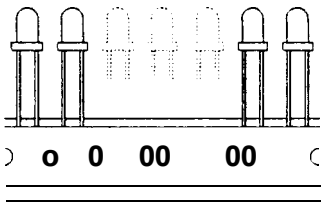
☆Insert cushion material between product and upper or lower lid of the case,

6-1-2 Packing quantity

2, 000 elements per case(standard)

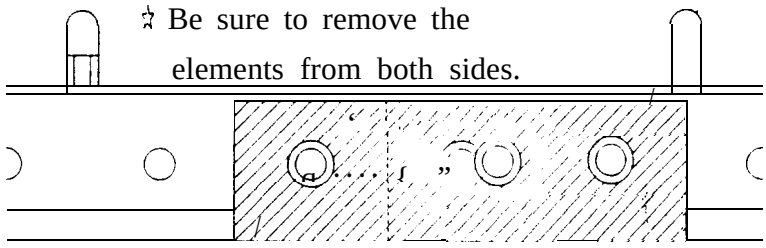
6-1-3 Missing elements

Three or less consecutive elements may be missing, as shown below,



6-1-4 Connecting

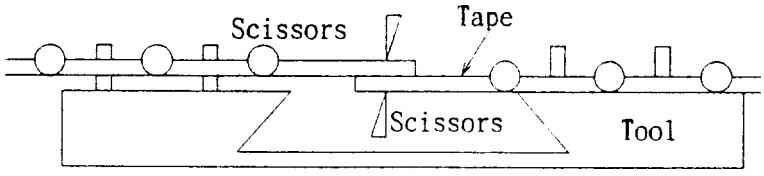
1) To connect the tapes **(case** of finishing or cutting the tape), cut the tape ends and connect them using connecting tape, as shown below.



2) Major points of connecting

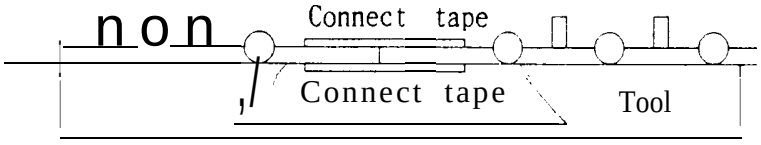
①Cutting the tape

Attach the tapes to tool, as shown below, and cut at the center between feed holes of both tapes using scissors.



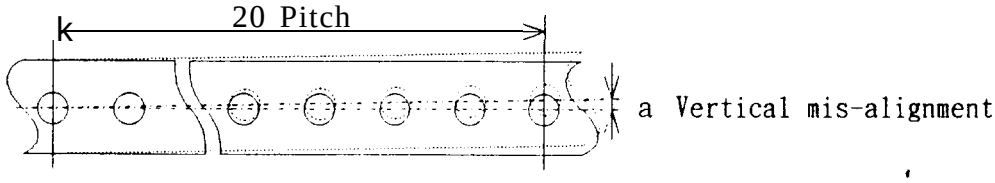
②Connecting the tape

After cutting, connect the tapes using the connecting tape under the condition of attaching them to the tool



3) Accuracy of connecting

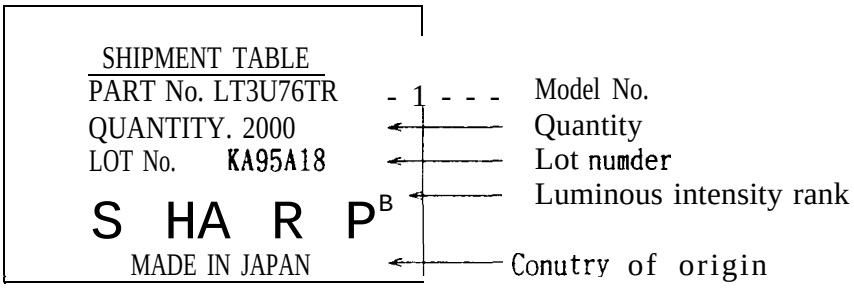
The connecting tape should not cover the feed holes(D_0). And total tape thickness(t) must be less than 1.5mm after connect dimension allowance-a" must be less than lmm per 20 pitches.



6-1-5 Indication method

.Indication on the package
Indication label is pasted on the side of the package.

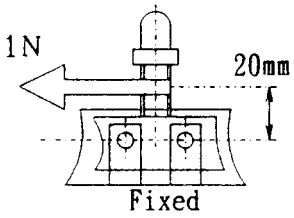
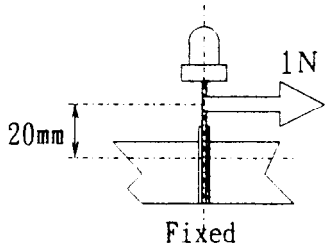
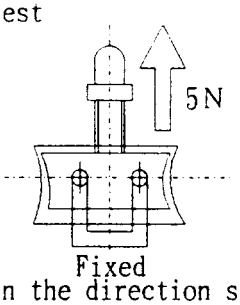
(Indication label sample)



*The definication of the lot number

K	A	95	A	18
Factory	Support code	Year (the last two digit of A. D.)	Month (Jan. to Dec. = A to L)	Date

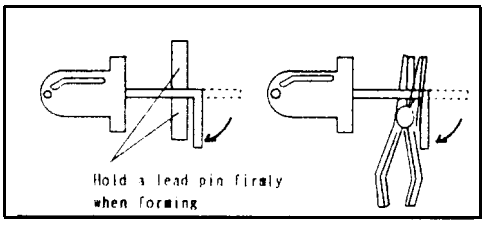
6 - 2. Taping test

Items	Test Method	Performance Criteria
Lead wire strength	1) Horizontal direction  Apply 1N load in the direction shown by the arrow above for 3sec. ±1.	In accordance with Specifications for Inserted parts.
	2) Vertical direction  Apply 1N load in the direction shown by the arrow above for 3sec. ±1.	
Adhesive test	1) Strength test  Apply 5N load in the direction shown by the arrow above for 3sec. ±1.	Lead wire must not be out of place or missing
	2) Life test Let sample stand at normal temperature and humidity for 6 months.	Same as above

7. Notes

7 - 1 . Lead forming method

Avoid forming a lead pin with the lead pin base as a fulcrum: be sure to hold a lead pin firmly when forming. Lead pins should be formed before soldering.

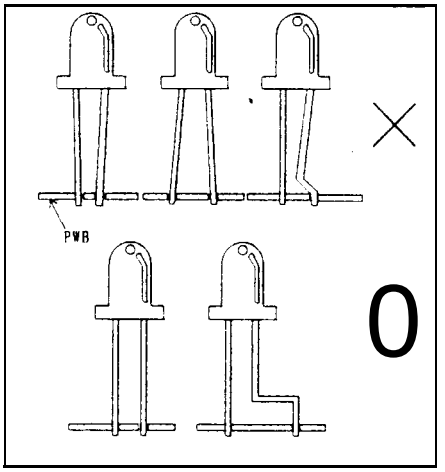


7 - 2 . Notice of installation

7-2-1 Installation on a PWB

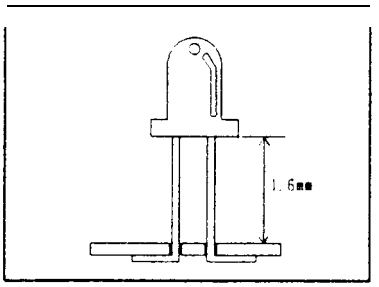
When mounting an LED lamp on a PWB, do not apply physical stress to the lead pins.

- The lead pin pitch should match the PWB pin-hole pitch: absolutely avoid widening or narrowing the lead pins.
- When positioning an LED lamp, basically employ an LED with tie–bar cut or use a spacer.



7-2-2 When an LED 1 is mounted directly on a PWB

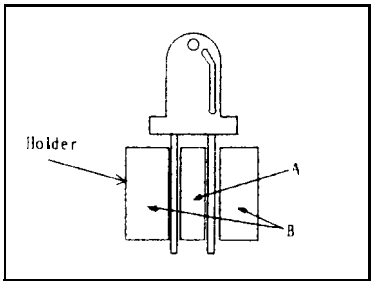
If the bottom face of an LED lamp is mounted directly on single-sided PWB, the base of the lead pins may be subjected to physical stress due to PWB warp, cutting or clinching of lead pins. Prior to use, be sure to check that no disconnection inside of the resin or damage to resin etc., is found. When an LED lamp is mounted on a double-sided PWB, the heat during soldering affects the resin ;therefore, keep the LED lamp more that 1.6mm afloat above the PWB.



7-2-3 Installation using a holder

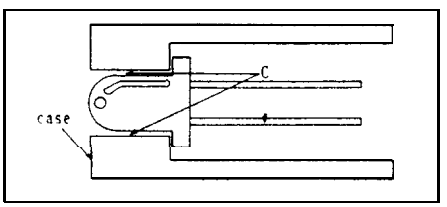
During an LED lamp positioning, when a holder is used, a holder should be designed not to subject lead pins to any undue stress.

(Note)Pay attention to the thermal expansion coefficient of the material used for the holder. Since the holder expands and contracts due to preheat and soldering heat, mechanical stress may be applied to the lead pins, resulting in disconnection.



7-2-4 Installation to the case

Do not fix part C with adhesives when fixed to the case as shown in Figure. A hole of the case should be designed not to subject the inside of resin to any undue stress.

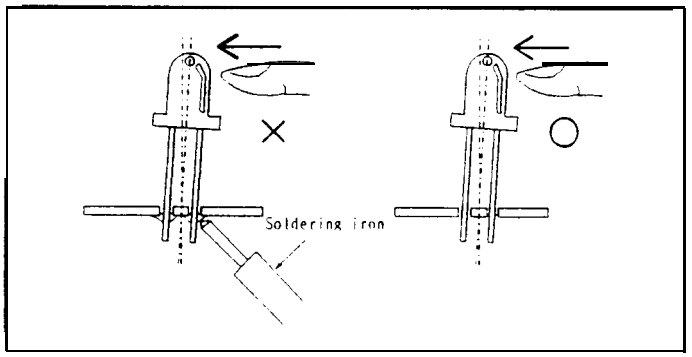


7 – 3. Soldering Conditions

Solder the lead pins under the following conditions

Type of Soldering	Conditions
I. Manual soldering	295℃ ± 5℃, within 3 seconds
2. Wave soldering	260℃ ± 5℃, within 5 seconds
3. Auto soldering	Preheating 70℃ to 80℃, within 30 seconds Soldering 245℃ ± 5℃, within 5 seconds

(Note) Avoid dipping resin into soldering bath.
Avoid applying stress to lead pins while they are heated. For example , when the LED lamp is moved with the heat applied to the lead pins during manual soldering or solder repair, disconnection may occur.



7–4. Solvent in Cleaning

7-4-1 Solvents

The package resin maybe penetrated by solvents used in cleaning.
Refer to the table below for usable solvents,

Solvent	Usable
Ethyl alcohol	○
Isopropyl alcohol	○
Chlorosen	×
Acetone	x
Trichloroethylene	x

(Note) There is a world-wide movement to restrict the use of chrolofluorocarbon(CFC) based solvents and we recommend that you avoid their use.
However, before using a CFC substitute solvent, carefully check that it will not penetrate the package resin.

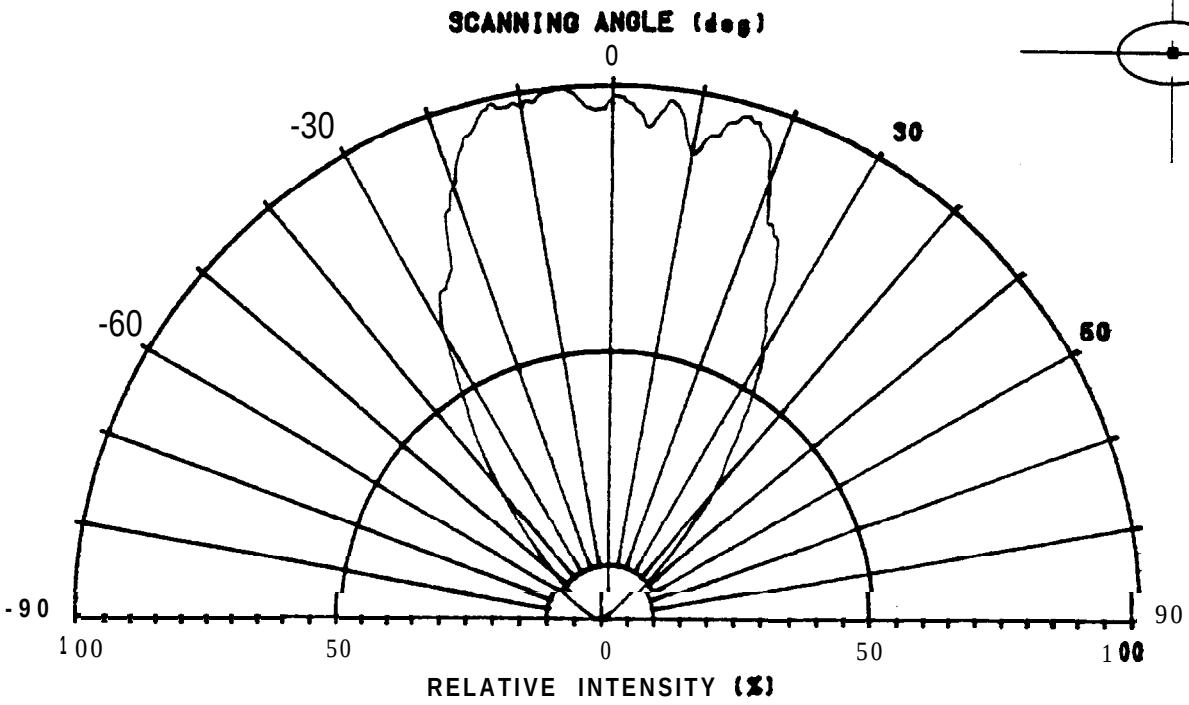
7-4-2 Cleaning methods

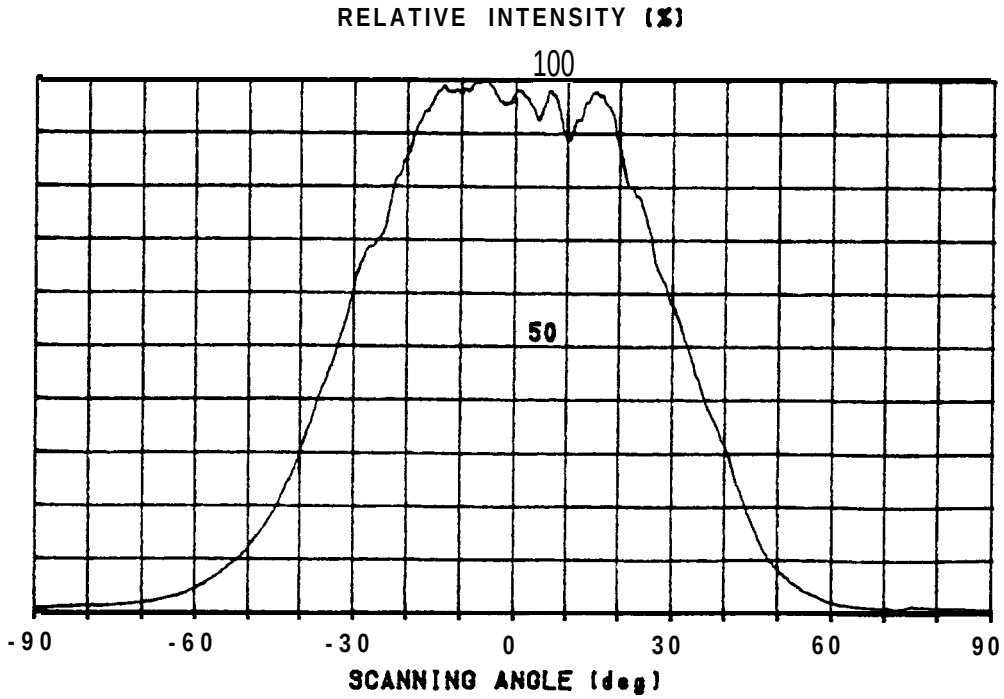
Cleaning method	Usable	Remarks
Solvent cleaning	0	Immersion up to one minute at room temperature
Ultrasonic cleaning	△	Generally we recommend the following conditions. (RT, 40kHz, 30 W/Not exceeding 90 seconds)

(Note) The affect on the device from ultrasonic cleaning differs depending on the size of the cleaning bath, ultrasonic output, duration, board size and device mounting method.
Test the cleaning method under actual conditions and check for abnormalities before actual use.
Cleaning with water is not allowed with the lead pins resin-tubulated: water may remain, thus causing rust to the lead pins.
Please contact your representative before using a cleaning solvent or method not given above.

SPECIAL DISTRIBUTION

Type No. : LT3U76TR
Lot No. :
Tested by :
Expect Angle :
User Comment :





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