

PREPARED BY: DATE:  
T. Ueda Jun. 17, 1996

APPROVED BY: DATE:  
M. Abe Jun. 17, 1996

# SHARP

ELECTRONIC COMPONENTS GROUP  
SHARP CORPORATION

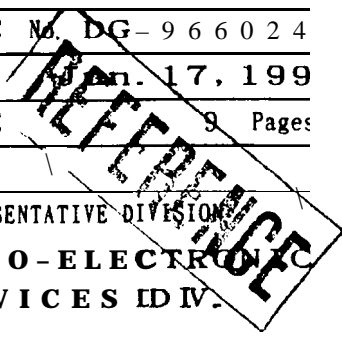
## SPECIFICATION

SPEC No. DG-966024

ISSUE No. 17, 1996

PAGE 9 Pages

REPRESENTATIVE DIVISION  
**OPTO-ELECTRONIC  
DEVICES DIV.**



DEVICE SPECIFICATION FOR

Light emitting diode Lamp

MODEL No.

GL6UR11T

1. These specification sheets include the contents under the copyright of Sharp Corporation ("Sharp"). Please keep them with reasonable care as important information. Please do not reproduce or cause anyone reproduce them without Sharp's consent.

2. Please obey the instructions mentioned 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 mentioned 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 (1).

CUSTOMER'S APPROVAL

DATE

B Y

DATE  
PRESENTED  
BY

Jun. 17, '96

M. Abe

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

**REFERENCE**

1. Application

This specification applies to the outline and characteristics of Light emitting diode Model No. G L 6 U R 11 T. 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.

3. Ratings and characteristics

Refer to the attached sheet, Page 3.to 4.

4. Reliability

Refer to the attached sheet, Page 5.

5. Incoming inspection'

Refer to the attached sheet, Page 6.

6. Supplement

Refer to the attached sheet, Page 7.

7. Notes

Refer to the attached sheet, Page 8. to 9.



REFERENCE

## 3. Ratings and characteristics

## 3-1. Absolute maximum ratings

( T a = 2 5 ° C )

Parameter	Symbol	Value	Unit
Power dissipation	P	75	mW
Continuous forward current	I <sub>F</sub>	30	mA
Peak forward current (Note 1)	I <sub>FM</sub>	50	
Derating factor	-	(DC) 0.40   (Pulse) 0.67	mA/°C
Reverse voltage	V <sub>R</sub>	4	V
Operating temperature	T <sub>opr</sub>	-25 ~ +85	°C
Storage temperature	T <sub>stg</sub>	-25 ~ +100	
Soldering temperature (Note 2)	T <sub>sol</sub>	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

( T a = 2 5 ° C )

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward voltage	V <sub>F</sub>	I <sub>F</sub> = 20 mA	-	1.85	2.5	V
Luminous intensity (Note 3)	I <sub>V</sub>		100	300	-	mcd
Peak emission wavelength	λ <sub>p</sub>		-	660	-	nm
Spectrum radiation bandwidth	Δλ		-	20	-	
Reverse current	I <sub>R</sub>	V <sub>R</sub> = 3 V	-	-	100	μA
Terminal capacitance	C <sub>t</sub>	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 ~ 199	mcd	I <sub>F</sub> =20mA
B	200 ~ 399		
C	400 ~ (799)		

(Note 4) Tolerance; ±30%

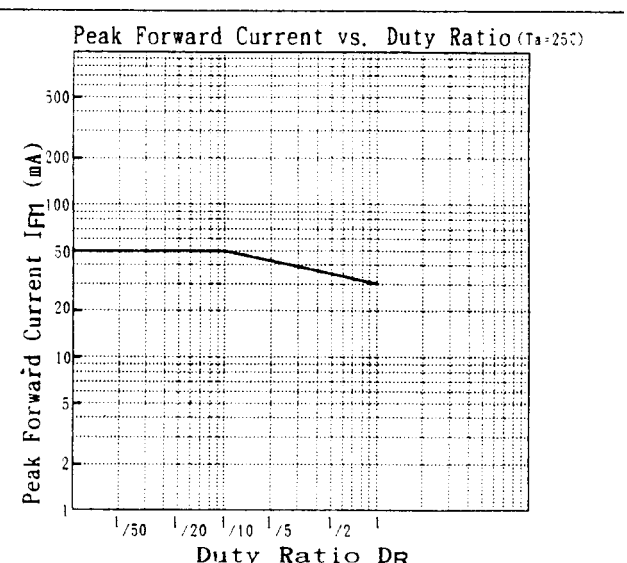
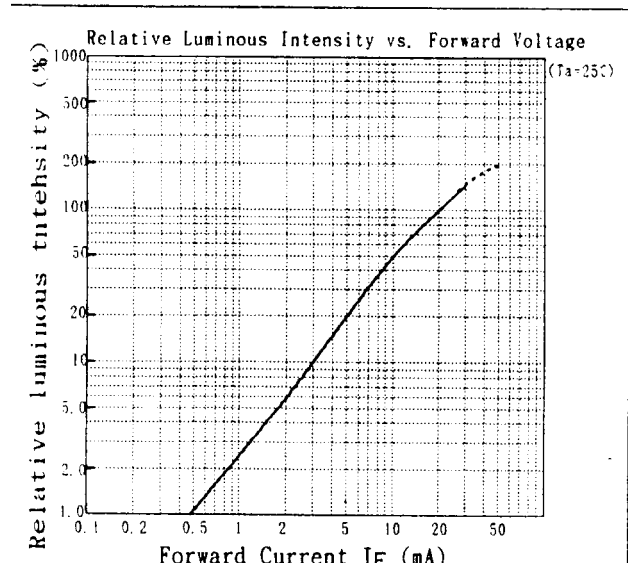
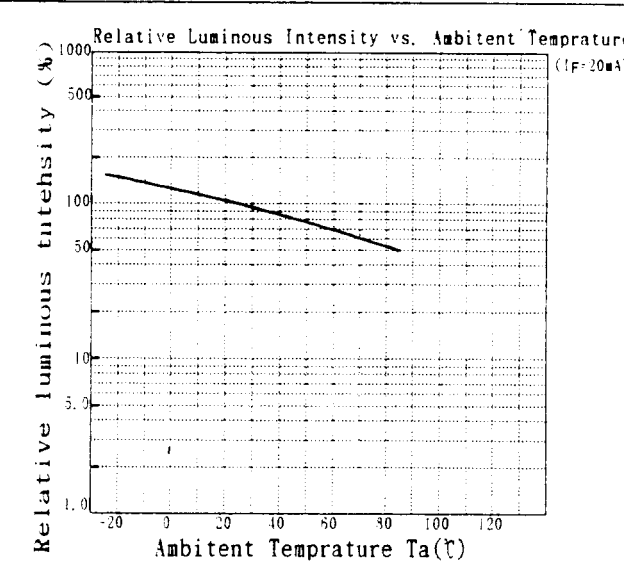
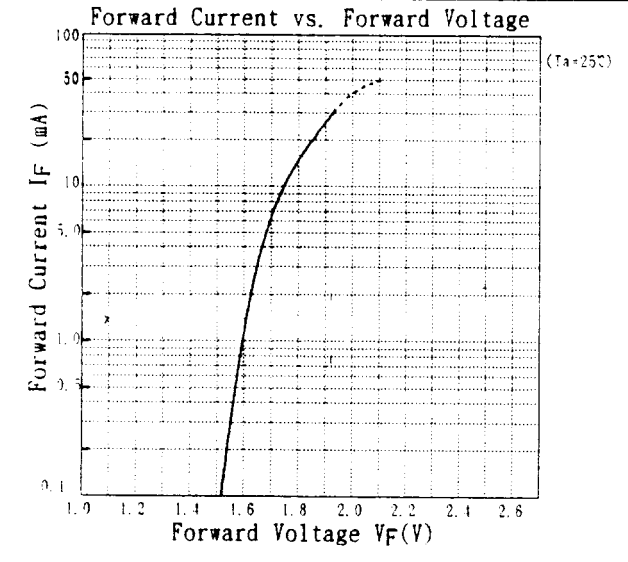
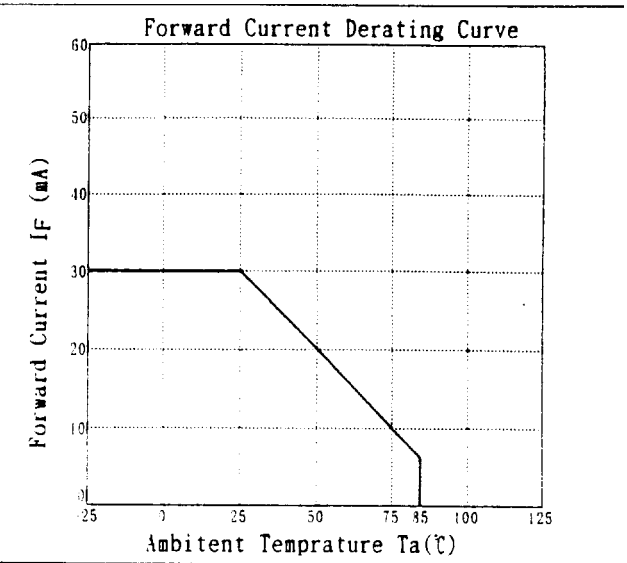
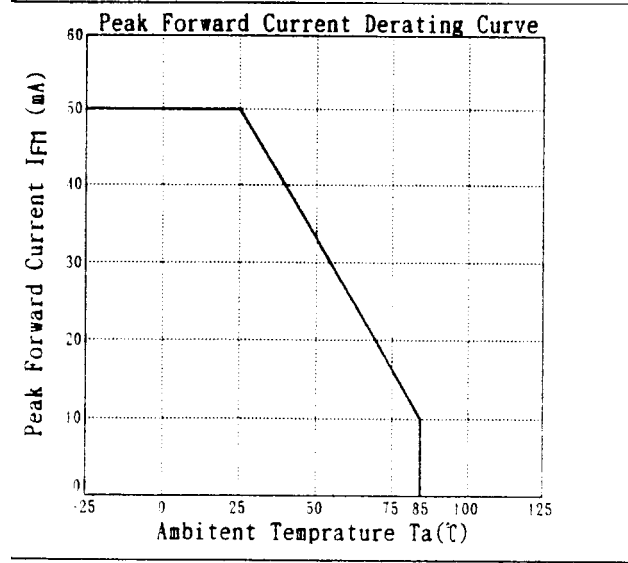
In regard to luminous intensity, the following ranking shall be carried out. However the quantity of each rank shall not be prescribed.

In case of the distribution of the luminous intensity shift to high, at that point new upper rank is prescribed and lower rank is deleted.

REFERENCE

SHARP CORPORATION

3 - 5 Characteristics Diagrams



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

REFERENCE

## 4. Reliability

The reliability of products shall 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/s <sup>2</sup> , 0.5ms 3 times/±X, ±Y, ±Z direction	11	0	20
Variable frequency vibration	200m/s <sup>2</sup> , 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 <sup>f</sup> life	25℃, I <sub>F</sub> MAX, 1000h	22	0	10
High temp. and high humidity operation life	60℃, 90%RH, I <sub>F</sub> =16mA, t=500h	22	0	10

## 4-2 . Measurement items and failure judgement criteria

Measurement Items	Symbol	Failure Judgement Criteria
Forward voltage	V <sub>F</sub>	U. S. L x1.2
Reverse current	I <sub>R</sub>	U. S. L x2.0
Luminous intensity	I <sub>v</sub>	Initial intensityx0.5

※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<sub>F</sub> MAX is shown by foward current of adsolute maximum ratings.

## SHARP CORPORATION

MODEL

N

PAGE

G

LUR

6/9

REFERENCE

## 5. Incoming inspection

5-1. Applied standard: ISO 2859-1

5-2. Sampling method and criteria : A single sampling plan, normal inspection criteria  
 : AQL Major defect: 0.065%  
 Minor defect: 0.4%  
 Finely defect: 1.0%

## 5-3. Test items, judgement criteria and classification of defect

No./Test Items	Judgement criteria	classification of Defect
1 1	Disconnection	Not emit light Major defect
2	Short	Not emit light Major defect
3	Position of Cutting off rim	Different from dimension Major defect
4	Reverse terminal	Different from dimension Major defect
5	Luminous color	Different from provided color Major defect
6	Label	Wrong label of lamp type Major defect
7	Mixture of wrong type	Wrong type lamp intermix Major defect
8	Outline dimension	Not satisfy outline specification Minor defect
9	Characteristic	Over the limit value of specification at $V_f$ , $I_R$ and $I_v$ Minor defect
1 0	Chip off the rim	Exceed 0.2mm Finely defect
1 1	Foreign substance	White point: Exceed $\phi$ 0.3mm Black point: Exceed $\phi$ 0.3mm String form: Exceed 3.0mm (on top view) Finely defect
1 2	Scratch	Exceed 0.3mm or 0.1mm x 1.0mm Finely defect
1 3	Void	Exceed $\phi$ 0.3mm (on top view) Finely defect
1 4	Uneven color of resin	Uneven color Finely defect
1 5	Uneven density of material for scattering	Extremely uneven density Finely defect
1 6	Unbalanced center	Exceed 0.25mm from package center Finely defect
1 7	Burr	Exceed 0.2mm against provided dimension Finely defect
1 8	Insertion position of terminal	Terminal is not inserted into resin enough Finely defect

## 5-4. Test items the surface is be applied for flat type, judgement criteria and classification of defect

No.	Test Items	Judgement criteria	classification of Defect
1 9	Chapped the surface	The surface chapped is striking for see the lamp top	Finely defect
2 0	Hollow the surface	The surface hollow is striking for see the lamp top	Finely defect

**REFERENCE**

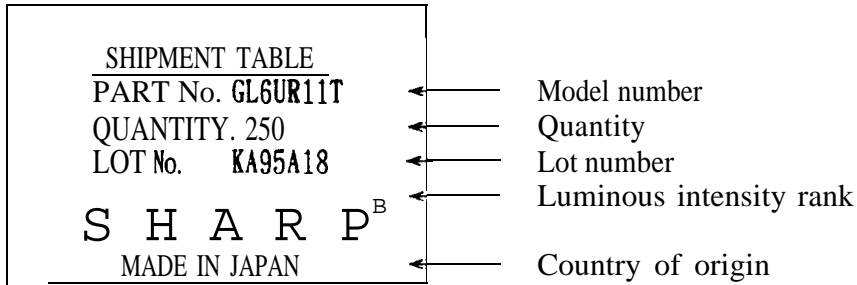
6. Supplement

6-1. Packing

6-1-1 Inner package

Put **250pcs** the same **luminous** intensity rank products into pack and put following label by pack.

(Indication label sample)



\*The defination of the lot number

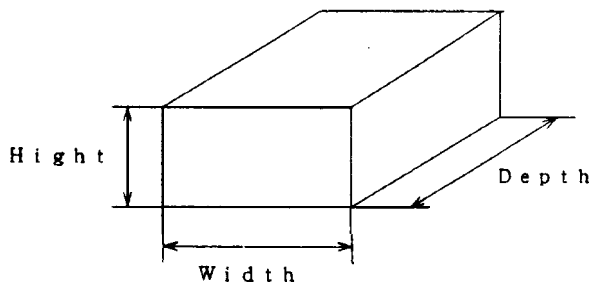
K	A	9 5	A	1 8
Factory	Support code	Year (the last two digit of A. D. )	Month (Jan. to Dec. = A to L)	Date

6-1-2 Outer package

Put 8 packs (the same luminous intensity rank) into outer package.  
(approximtly 670g per one outer package)

6-1-3 Outer package out line dimension

Width: 140mm, Depth: 225mm, Hight: 90mm



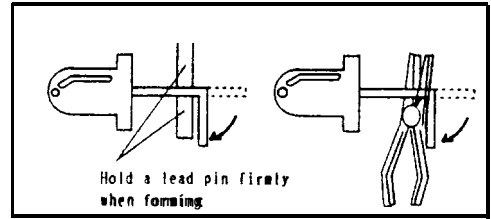


REFERENCE

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

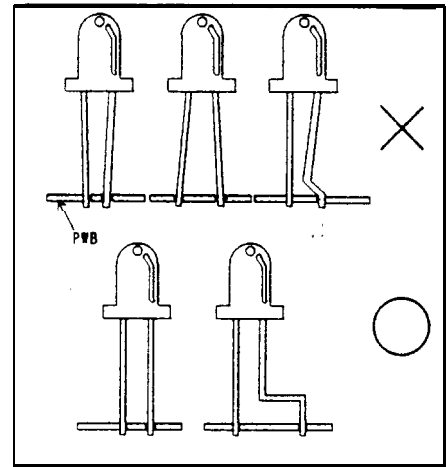
When mounting an LED lamp on a PWB, do not apply physical stress to the lead pins,

- 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

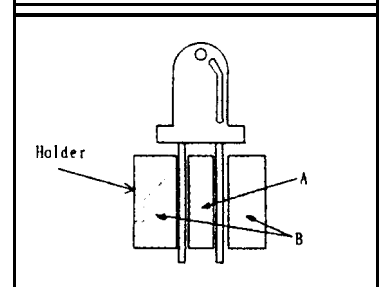
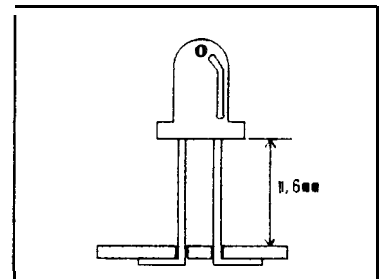
If the bottom face of an LED lamp is mounted directly on single-sided PWB, the base of the lead pins may be subjected to physical stress due to PWB warp, cutting or clinching of lead pins. Prior to use, be sure to check that no disconnection inside of the resin or damage to resin etc., is found. When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



7-2-3 Installation using a holder

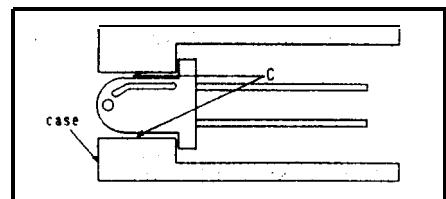
During an LED lamp positioning, when a holder is used, a holder should be designed not to subject lead pins to any undue stress.

(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.



REFERENCE

7-3. Soldering Conditions

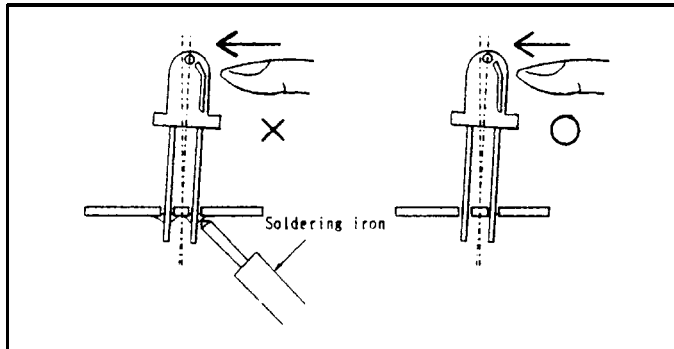
Solder the lead pins under the following conditions

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

□ anual 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	X
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 aCFC substitute solvent, carefully **check that** it will not penetrate the package resin.

7-4-2 Cleaning methods

Cleaning method	Usable	Remarks
Solvent cleaning	○	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.