REFERENCE

SPEC No. ED-04G072
ISSUE Aug.2, 2004

SHARP

OPTO-ELECTRONIC DEVICES DIVISION
ELECTRONIC COMPONENTS GROUP
SHARP CORPORATION

SPECIFICATION

DEVICE SPECIFICATION FOR

INFRARED EMITTING DIODE

MODEL No.

GL4800E0000F

Specified for

Enclosed please find copies of the Specifications which consists of 9pages including cover.
After confirmation of the contents, please be sure to send back ☐ copy of the Specifications with approving signature on each.

CUSTOMER'S APPROVAL	PRESENTED
DATE	DATE
BY	BY

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

REFERENCE

Product name : INFRARED EMITTING DIODE

Model No. : GL4800E0000F

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2. When using this product, please observe the absolute maximum ratings and the instructions for use outlined in these specification sheets, as well as the precautions mentioned below. Sharp assumes no responsibility for any damage resulting from use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets, and the precautions mentioned below.

   (Precautions)

   (1) This product is designed for use in the following application areas ;
   - · OA equipment · Audio visual equipment · Home appliances
   - · Telecommunication equipment (Terminal) · Measuring equipment
   - · Tooling machines · Computers

   If the use of the product in the above application areas is for equipment listed in paragraphs (2) or (3), please be sure to observe the precautions given in those respective paragraphs.

   (2) Appropriate measures, such as fail-safe design and redundant design considering the safety design of the overall system and equipment, should be taken to ensure reliability and safety when this product is used for equipment which demands high reliability and safety in function and precision, such as ;
   - · Transportation control and safety equipment (aircraft, train, automobile etc.)
   - · Traffic signals · Gas leakage sensor breakers · Rescue and security equipment
   - · Other safety equipment

   (3) Please do not use this product for equipment which require extremely high reliability and safety in function and precision, such as ;
   - · Space equipment · Telecommunication equipment (for trunk lines)
   - · Nuclear power control equipment · Medical equipment

   (4) Please contact and consult with a Sharp sales representative if there are any questions regarding interpretation of the above three paragraphs.

3. Please contact and consult with a Sharp sales representative for any questions about this product.

1. Application

This specification applies to the outline and characteristics of GaAs type chip infrared emitting diode Model No. GL4800E0000F.

2. Outline

Refer to the attached drawing No. CY12510i02, page 3.

3. Ratings and characteristics

Refer to the attached sheet, page 4, 5.

4. Reliability

Refer to the attached sheet, page 6.

5. Outgoing inspection

Refer to the attached sheet, page 7.

6. Supplement

(6-1) Packing

Refer to the attached sheet, page 8.

(6-2) 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 : CFC$_S$, Halon, Carbon tetrachloride, 1.1.1-Trichloroethane (Methylchloroform)

(6-3) This product and packaging material shall not contain lead material.

(6-4) Product mass (Piece) : Approximately 70mg

7. Notes

(7-1) In circuit designing, make allowance for the degradation of the light emitting diode output that results from long continuous operation. (50% degradation/ 5years)

(7-2) Cleaning conditions :

Solvent cleaning : Solvent temperature 45℃ or less Immersion for 3 min or less

Ultrasonic cleaning : The effect to device by ultrasonic cleaning differs by cleaning bath size, ultrasonic power output, cleaning time, PCB size or device mounting condition etc.
Please test it in actual using condition and confirm that doesn't occur any defect before starting the ultrasonic cleaning.
The cleaning shall be carried out with solvent below.

Solvent : Ethyl alcohol, Methyl alcohol, Isopropyl alcohol

(7-2) Soldering

The lead pins should be soldered according to the absolute maximum ratings.
While or after soldering, the lead pins shall be free from external force.
This device shall not be soldered with preheat or reflow.
The lead pins surface(solder dip) of this device is using lead-free solder.
Regarding lead-free solder, by the kind of solder, there are cases that separation between land pattern and solder occurs.So please use this device after confirmation of the solder issue by actual conditions.

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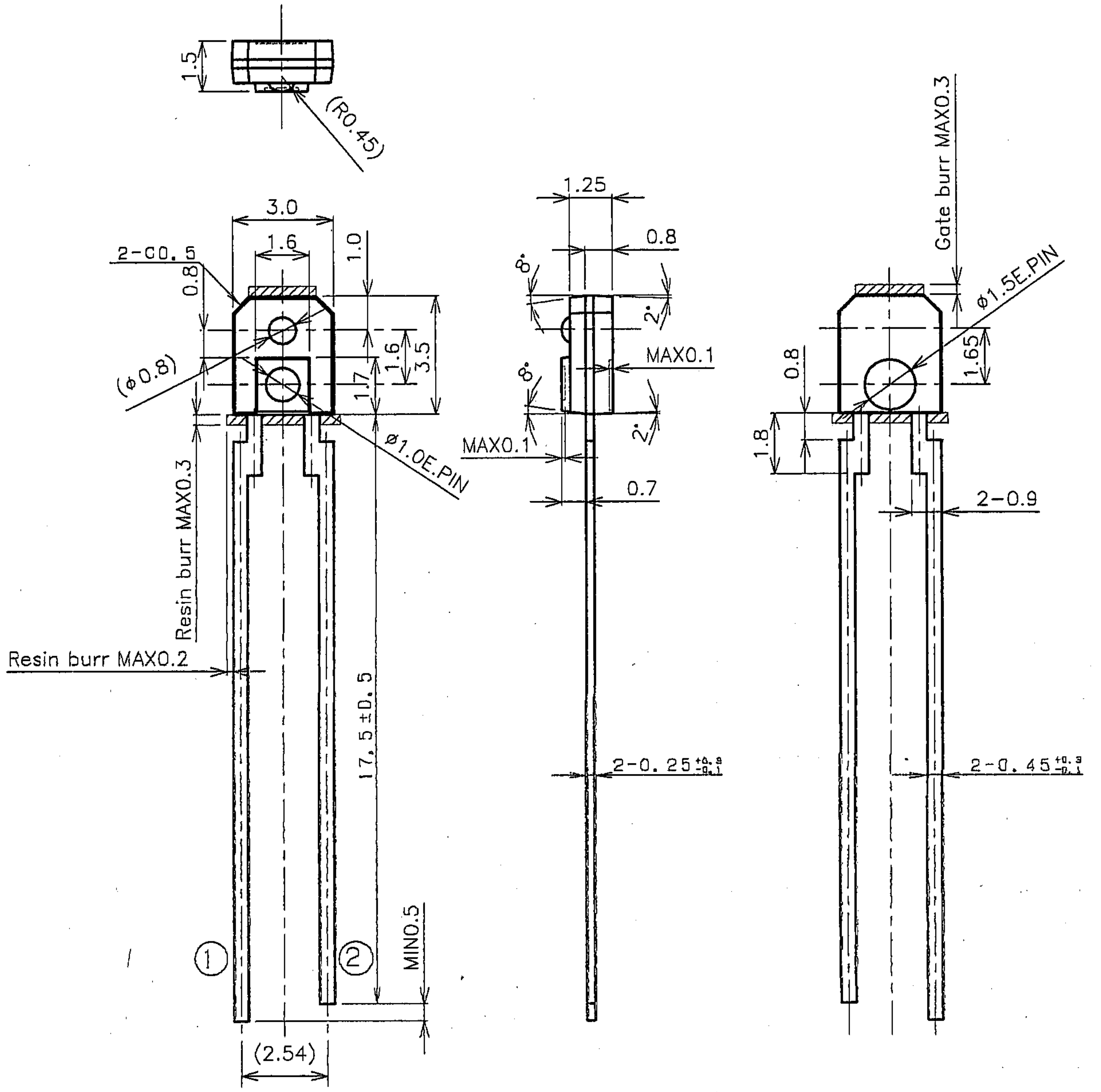
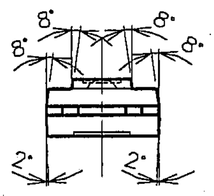
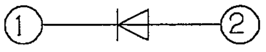




1) Unspecified tolerance shall be ±0.2.
2) Package : Pink transparent epoxy resin
3) Dimensions in parenthesis are shown for reference.
4) The thin burr thickness (MAX. 0.05mm) and the gate burr (MAX. 0.3mm) shall not be included in the outline dimensions.
5) Protruded resin 0.3mm MAX. However, the thin burr which is attached with a lead is 1.8mm MAX. from the resin.

① Cathode
② Anode



尺度 SCALE 5/1	材質 MATERIAL	仕上 FINISH	名称 NAME	GL4800E0000F Outline Dimensions
単位 UNIT 1 = 1/1 mm	Lead :Cu Package : Epoxy resin	Lead pin: Solder dip (Lead-free solder use Composition(Standard value) Sn96.5%,Ag3.0%,Cu0.5%)	図番 DRAWING No.	CY12510i02

3. Ratings and characteristics

3.1 Absolute maximum ratings

Ta=25℃

Parameter	Symbol	Rating	Unit
Forward current	I_F	50	mA
Peak forward current *1	I_{FM}	1	A
Reverse voltage	V_R	6	V
Power dissipation	P	75	mW
Operating temperature	Topr	-25 to +85	℃
Storage temperature	Tstg	-40 to +85	℃
Soldering temperature *2	Tsol	260	℃

*1 Pulse width : 100 μ s, Duty ratio : 0.01

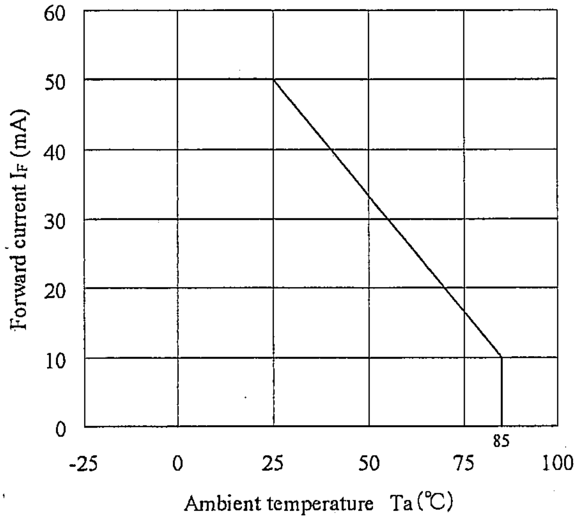
*2 For 3 seconds MAX. at the position of 1.8mm from the resin edge.

3.2 Electro-optical characteristics

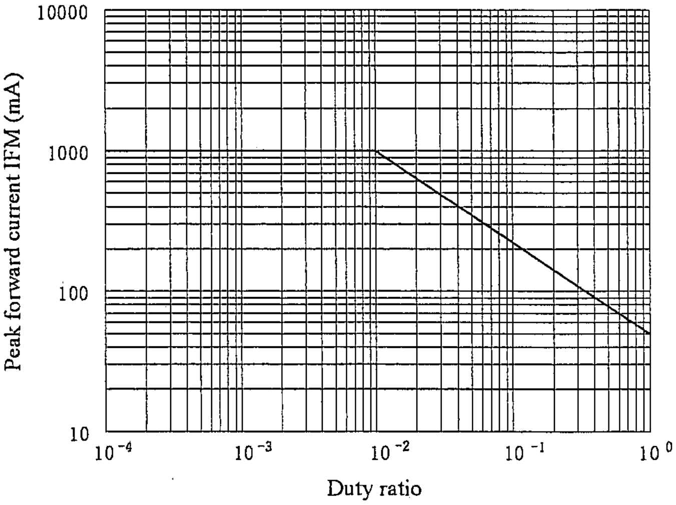
Ta=25℃

Parameter	Symbol	MIN.	TYP.	MAX.	Unit	Conditions
Forward voltage	V_F	-	1.2	1.4	V	I_F=20mA
Peak forward voltage	V_{FM}	-	3.0	4.0	V	I_{FM}=0.5A
Reverse current	I_R	-	-	10	μA	V_R=3V
Radiant flux	ϕe	0.7	1.6	3.0	mW	I_F=20mA
Peak emission wavelength	λp	-	950	-	nm	I_F=5mA
Half intensity wavelength	$\Delta\lambda$	-	45	-	nm	I_F=5mA
Terminal capacitance	Ct	-	70	-	pF	V_R=0, f=1MHz
Cut-off frequency	fc	-	300	-	kHz	-

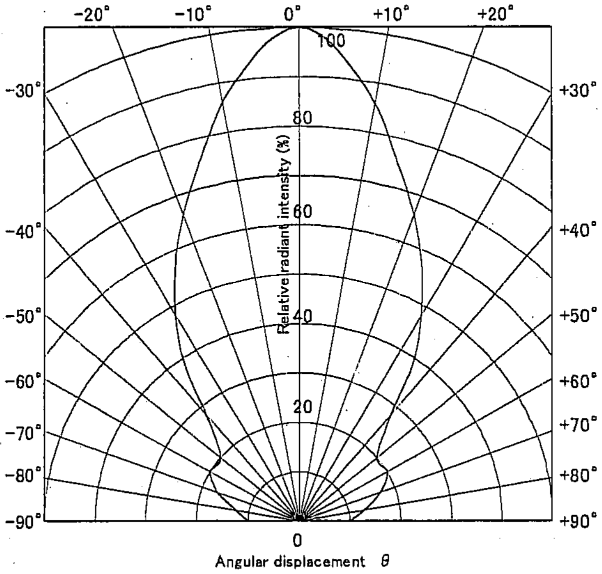
(3.3) Forward current vs. ambient temperature



(3.4) Peak forward current vs. duty ratio
Pulse width≦100μs
Ta=25℃



(3.5) Radiation diagram (For reference)
Ta=25℃



4. Reliability

The reliability of products shall satisfy items listed below.

Confidence level : 90%
LTPD : 10 or 20

Test Items	Test Conditions	Failure Judgement Criteria	Samples (n) / Defective(C)
Temperature cycling	1 cycle -40℃⟷+85℃ (30min) (30min) 20 cycles test	$\phi e < L \times 0.8$ $\phi e > U \times 1.2$ $I_R > U \times 2.0$ $V_F > U \times 1.2$ U: Upper specification limit L: Lower specification limit	n=22, C=0
High temp. and high humidity storage	+60℃, 90%RH, 500h		n=22, C=0
High temp. storage	+85℃, 500h		n=22, C=0
Low temp. storage	-40℃, 500h		n=22, C=0
Operation life	+25℃, I_F=50mA, 500h		n=22, C=0
Mechanical shock	1000m/s^2, 6ms, Half sine wave 3 times/±X, ±Y, ±Z direction		n=11, C=0
Variable frequency vibration	100 to 2000 to 100Hz/For approx. 4min 200m/s^2, 48 min/X, Y, Z direction		n=11, C=0
Terminal strength (Tension)	Weight: 5N 10 s/each terminal		n=11, C=0
Terminal strength (Bending)	Weight: 2.5N 0° →90° →0° →-90° →0° The one test should be performed.		n=11, C=0
Soldering heat	260±5℃, 3±0.5 s Position of 1.8mm from the resin edge.		n=11, C=0
Solderability	245±5℃, 5±1 s Position of 1.8mm from the resin edge. Flux:EC-19S (Tamura kaken corporation) No pretreatment	Solder shall adhere at less than95% area of dipped portion.	n=11, C=0

5. Outgoing inspection

(1) Inspection lot

Inspection shall be carried out per each delivery lot.

(2) Inspection method

A single sampling plan, normal inspection level II based on ISO2859 shall be adopted.

<table>
<tr><th colspan="2">Parameter</th><th>Inspection items and test method</th><th>AQL(%)</th></tr>
<tr><td rowspan="3">Major defect</td><td>1</td><td>Disconnection, short</td><td rowspan="3">0.065</td></tr>
<tr><td>2</td><td>Inverse polarity on terminal</td></tr>
<tr><td>3</td><td>Characteristics defect
<table>
<tr><th rowspan="2">Parameter</th><th rowspan="2">Symbol</th><th colspan="2">Judgement criteria</th><th rowspan="2">Unit</th></tr>
<tr><th>MIN.</th><th>MAX.</th></tr>
<tr><td>Forward voltage</td><td>V_F</td><td>-</td><td>1.4</td><td>V</td></tr>
<tr><td>Reverse current</td><td>I_R</td><td>-</td><td>10</td><td>μA</td></tr>
<tr><td>Radian flux</td><td>ϕe</td><td>0.7</td><td>3.0</td><td>mW</td></tr>
</table>
Test conditions refer to parameter 3.2.</td></tr>
<tr><td>Minor defect</td><td>1</td><td>Appearance defect
<table>
<tr><th>Parameter</th><th>Judgement criteria</th></tr>
<tr><td>Crack</td><td>Visible crack irrespective of its position shall be defect.</td></tr>
<tr><td>Split, Chip, Scratch, Stain, Blur</td><td>One which affects the characteristics of parameter 3.2 shall be defect.</td></tr>
<tr><td>Bubble, Foreign matter (One on resin surface which can wipe off shall not be applied.)</td><td>1. On light emitter
0.4mm ϕ or more shall be defect.
2. Area excepting on light emitter
1.0mm ϕ or more shall be defect.</td></tr>
</table></td><td>0.25</td></tr>
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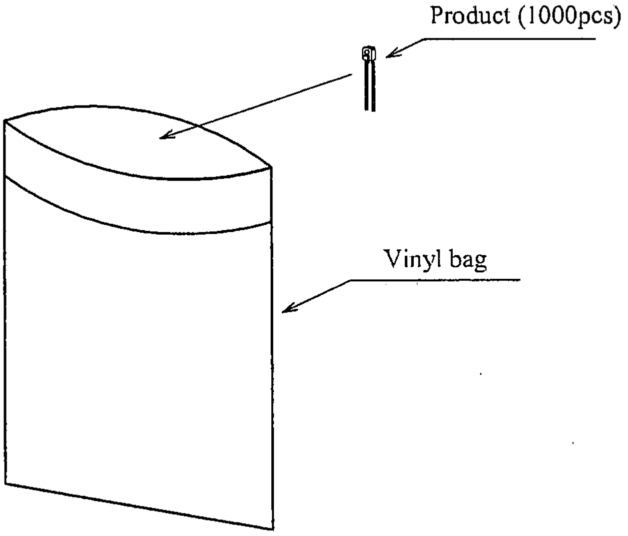
6-1 Packaging

6-1-1 Inner packing

① Inner packing drawing

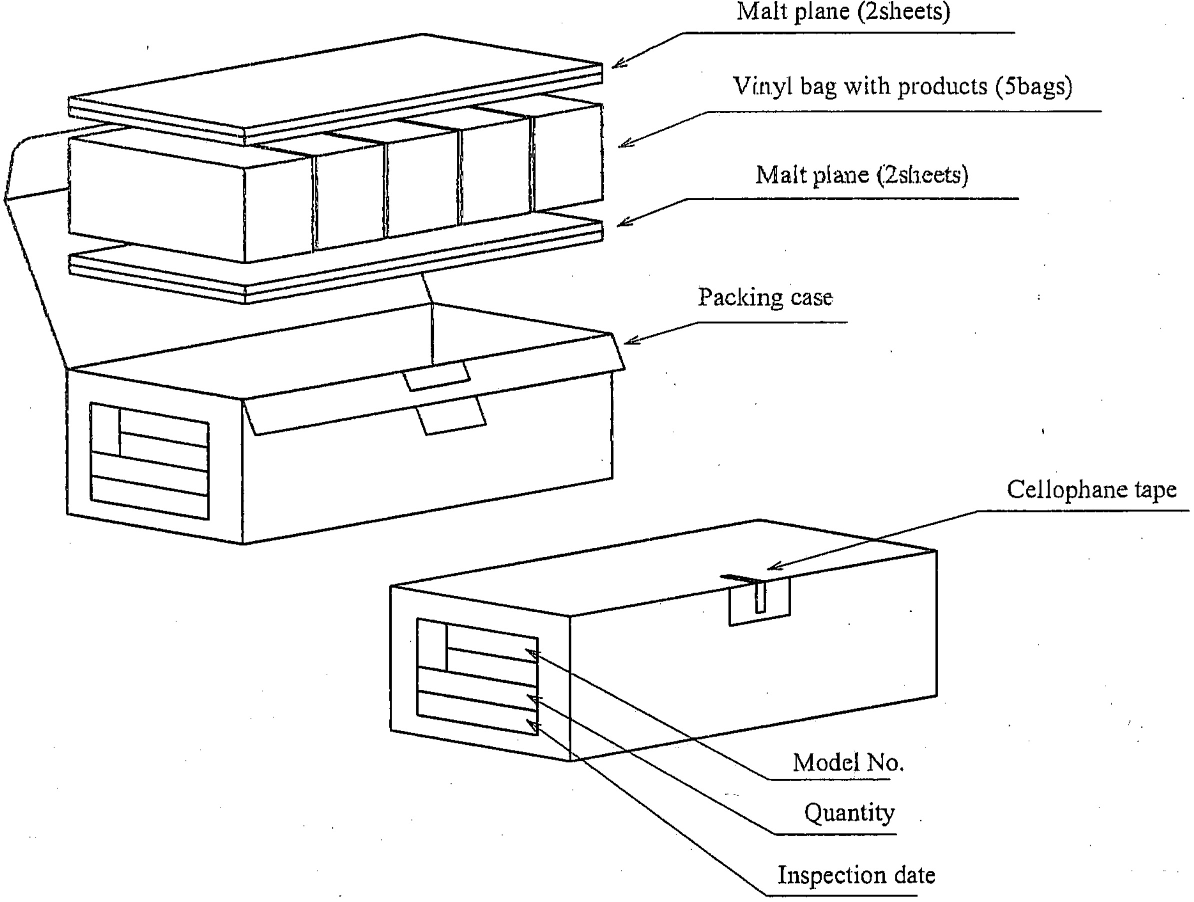


② Inner packing material : Vinyl bag (Polyethylene)

③ Quantity : 1000pcs./bag

6-1-2 Outer packing

① Outer packing drawing



② Outer packing material : Packing case (Corrugated cardboard),
Malt plane (Urethane), Cellophane tape

③ Quantity : 5000pcs./box

④ Indication : Model No., quantity and inspection date

⑤ Regular packaged mass : Approximately 460g