

| | |
|-----------------------|------------------|
| Part no. | SP2808USD |
| Emitting color | RED |
| Material | AlGaInP |
| Picture | |

■ Absolute Maximum Ratings at (TA=25°C)

| Part No. | REVERSE VOLTAGE (<100 uA) | D.C.FORWARD CURRENT | OPERATING TEMPERATURE RANGE | STORAGE TEMPERATURE RANGE | LEAD SOLDERING TEMP. |
|-----------|---------------------------|---------------------|-----------------------------|---------------------------|----------------------|
| SP2808USD | 5.0V | 30mA | -30°C TO +85°C | -40°C TO +90°C | 250 FOR 4 SEC |

■ Electrical/Optical Characteristics at TA=25 °C

| Part No. | WAVELENGTH Hue @20mA (nm) | | FORWARD VOLTAGE @20mA(V) | | Reverse Current IR(VR=5V) | LUMINOUS INTENSITY @20mA (mcd) | |
|-----------|---------------------------|-----|--------------------------|-----|---------------------------|--------------------------------|-----|
| | MIN | MAX | MIN | MAX | | MIN | MAX |
| SP2808USD | 620 | 632 | 1.8 | 2.3 | 10uA | 100 | 400 |

IV :Tolerance each Binlimit is ±15%

VF: Tolerance each Binlimit is ±15%

■ WAVELENGTH(IF=20mA.Ta=25 °C)

| COLOR | RED | |
|-------|--------------|-----|
| ITEM | λ d 20mA(nm) | |
| BIN | MIN | MAX |
| R1 | 620 | 623 |
| R2 | 623 | 626 |
| R3 | 626 | 629 |
| R4 | 629 | 632 |

■ LUMINOUS INTENSITY@20mA(mcd)

| COLOR | RED | |
|-------|--------------|-----|
| ITEM | IV 20mA(mcd) | |
| BIN | MIN | MAX |
| BIN1 | 100 | 200 |
| BIN2 | 200 | 300 |
| BIN3 | 300 | 400 |

■ FORWARD VOLTAGE@20mA(V)

| COLOR | RED | |
|-------|------------|-----|
| ITEM | VF 20mA(V) | |
| BIN | MIN | MAX |
| B | 1.8 | 1.9 |
| B-1 | 1.9 | 2.0 |
| C | 2.0 | 2.1 |
| C-1 | 2.1 | 2.2 |
| D | 2.2 | 2.3 |

Directivity

Relative Spectrum Emission $I_{rel} = f(\lambda)$, $T_A = 25^\circ\text{C}$, $I_F = 20\text{ mA}$
 $V(\lambda) = \text{Standard eye response curve}$

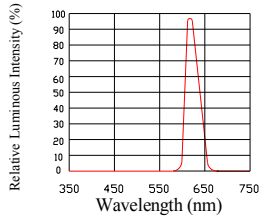
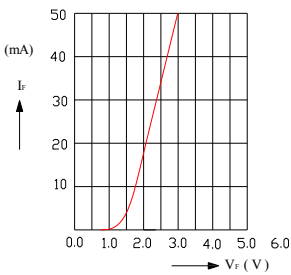


FIG.1 RELATIVE LUMINOUS INTENSITY

Forward Current $I_F = f(V_F)$

$T_A = 25^\circ\text{C}$

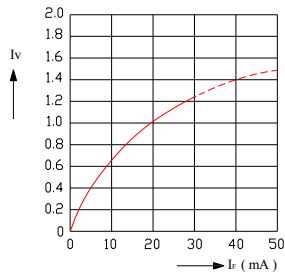


Forward Voltage (V)

FIG.2 FORWARD CURRENT VS. FORWARD VOLTAGE

Relative Luminous Intensity $I_v/I_v(20\text{mA}) = f(I_F)$

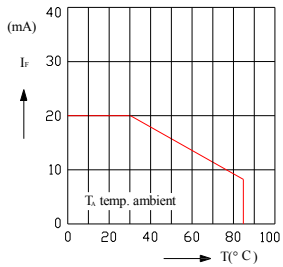
$T_A = 25^\circ\text{C}$



Forward Current I_F (mA)

FIG.3 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

Ambient Temperature VS. Allowable Forward Current



Ambient Temperature T_A ($^\circ\text{C}$)
 FIG.4 FORWARD CURRENT VS. AMBIENT TEMPERATURE

Radiation Characteristic $I_{rel} = f(\theta)$

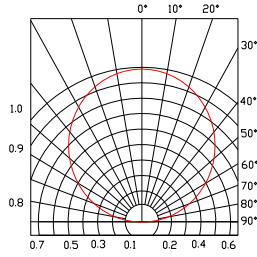
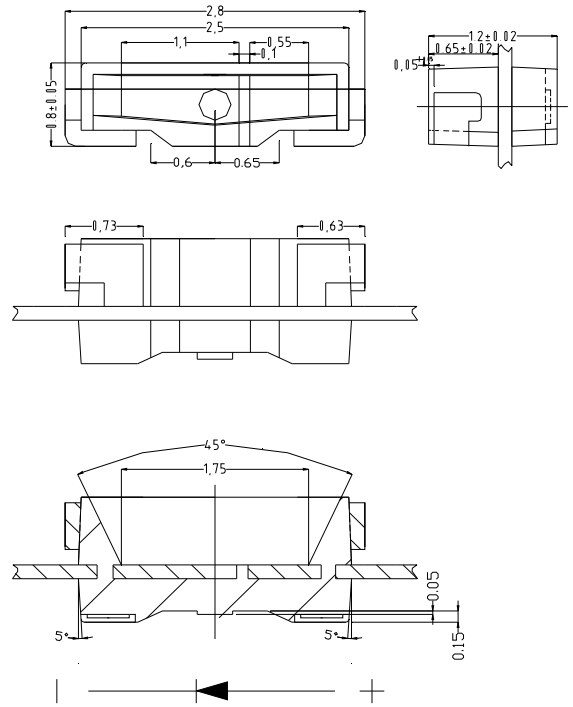
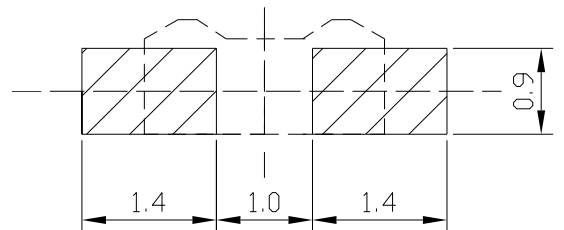


FIG.5 RADIATION DIAGRAM

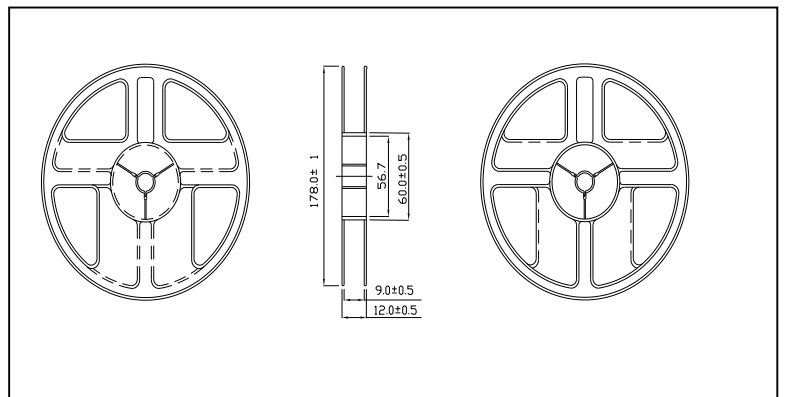
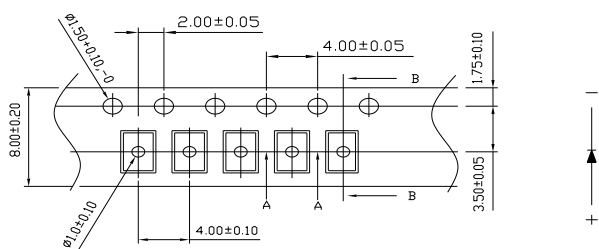
Dimensions (Unit:mm)



recommended



Package specifications (mm)



RELIABILITY

| TEST ITEMS AND RESULTS | | | | |
|---|--|--|-----------------|-------------------|
| Test Item | | Test Conditions | Note | Number of Damaged |
| Solderability (Reflow Soldering) | JEITA ED-4701 300-301 | Tald=250±5°C 4sec | 1 time over 95% | 0/50 |
| Thermal Shock | MIL-STD 202-107D MIL-STD 705-1051 MIL-STD 808-1011 | 0°C - 90°C 15sec. 15sec | 20cycles | 0/50 |
| Temperature Cycle | JEITA ED-4701 100-105 | -40°C - 25°C - 90°C - 25°C 30min. 5min. 30min. 5min | 100 cycles | 0/50 |
| Moisture Resistance Cyclic | JEITA ED-4701 200-203 | 25°C - 65°C - -10°C 90%RH 24hrs/1cycle | 10 cycles | 0/50 |
| Temperature Humidity Storage | MIL-STD202-103B JIS-C-7021 B-11 | Ta=60°C RH=90% | 1000hrs | 0/50 |
| Low Temperature Storage | JIS-C-7021 B-12 | Ta=-40°C | 1000hrs | 0/50 |
| Steady State Operating Life of High Humidity Heat | MIL-STD202-103B JIS-C-7021 B-11 | 85°C, RH=85%, If=20mA | 500hrs | 0/50 |

JUDGMENT CRITERIA OF FAILURE FOR THE RELIABILITY

| Measuring items | Symbol | Measuring conditions | Judgement criteria for failure |
|--------------------|----------|----------------------|--------------------------------|
| Forward voltage | VF (V) | IF=20mA | Over U*1.2 |
| Reverse current | IR (uA) | VR=5V | Over U*2 |
| Luminous intensity | IV (mcd) | IF=20mA | Below S*0.5 |

Note: 1.U means the upper limit of specified characteristics. S means initial value.

2. Measurement shall be taken between 2 hours and after the test pieces have been returned to normal ambient conditions after completion of each test.

LED

Application (Soldering)

Manual soldering (We do not recommend this method strongly.)

Soldering tin material: tin 6/4 alloy or contained Ag.

To prevent cracking, please bake before manual soldering.

keep the temperature on the edge of iron at 300 °C Max. (25W) and apply for 3 seconds. If the temperature become higher, apply in a shorter time (1sec)

In manual soldering, take care not to damage the package especially terminal or resin.

(Do not give stress to the product when soldering.)

Do not use again if you remove the soldeGREEN YELLOW product.

It is recommended using an iron with a temperature control.

Reflow Soldering

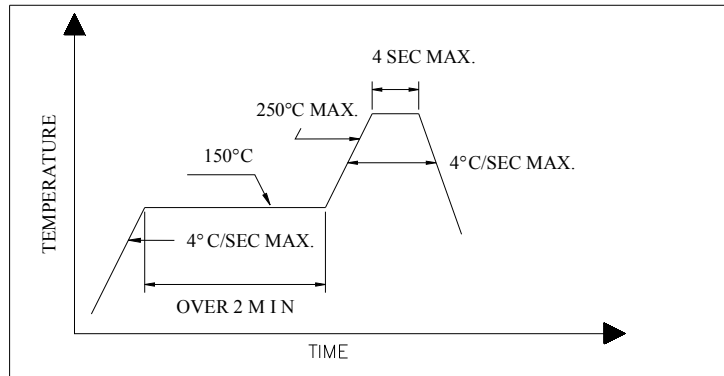
Recommend tin glue specifications:

Melting temperature: 150-260°C

Contains: Sn 96.5%, Ag 3.0%, Cu 0.5% JIS Z 3282 TEST

Never take next process until the component is cooled down to room temperature after reflow.

The recommended reflow soldering profile (measuring on the surface of the LED resin) is following:



Cleaning

The conditions of cleaning after soldering:

An alcohol-based solvent such as Isopropyl Alcohol (IPA) is recommended.

Temperature Time: 50°C*30sec, or 30°C*3min

Ultra sonic cleaning: 15W/bath; Bath volume: 1 liter max.

Curing: 100 max, 3min

Cautions of Pick and Place

It should be avoided to load stress on the resin during high temperature.

Avoid rubbing or scraping the resin by any object.

Electric-static may cause damage to the component. Please confirm that the equipment is grounding well. Using an ionzer fan is recommended.

Cautions of Design and Applications

It should be done to connect with a current-limiting serial resistor. Avoid to drive reverse voltage over the specifications on LED when ON/OFF.

Any application should refer to the specifications of absolute maximum ratings.

The dimensions of the recommended soldering pattern may not meet every user. Please confirm and study first before designing the soldering pattern in order to obtain the best performance of soldering.

Do not contact with any component on the assembly board.

Appendix

Notes for designing

Care must be taken to provide the current limiting resistor in the circuit so as to drive the Ju Juan LEDs within the rated figures. Also, caution should be taken not to overload Ju Yuan LEDs with instantaneous voltage at the turning ON and OFF of the circuit.

When using the pulse drive care must be taken to keep the average current within the rated figures. Also, the circuit should be designed so as to be subjected to reverse voltage when turning off the Ju Yuan LEDs.

Storage

In order to avoid the absorption of moisture, it is recommended to solder Ju Yuan LEDs as soon as possible after unpacking the sealed envelope.

If the envelope is still packed, to store it in the environment as following

- (1) Temperature: 5°C -30°C (41° F) Humidity: RH 60% Max.
- (2) After this bag is opened, devices that will be applied to infraGREEN YELLOW reflow, vapor-phase reflow, or equivalent soldering process must be:
 - a. Completed within 24 hours.
 - b. StoGREEN YELLOW at less than 30% RH.
- (3) Devices require baking before mounting, if:
 - (2) a or (2) b is not met.
- (4) If baking is required for GREEN YELLOW, devices must be baked under the following conditions:
48 hours at 70°C ± 3°C .