



Technical Data Sheet

High Power Infrared LED

Features

- Small package with high efficiency
- Peak wavelength $\lambda_p=850\text{nm}$
- Soldering methods: SMT
- Thermal resistance (junction to lead): $35^\circ\text{C}/\text{W}$.
- Pb free
- The product itself will remain within RoHS compliant version.

HIR-A07/L183-P01



Descriptions

- HIR-A07/L183-P01 series is an infrared emitting diode in miniature SMD package which is molded in a water clear plastic with flat top view lens.
- The device is spectrally matched with silicon photodiode, Phototransistor.

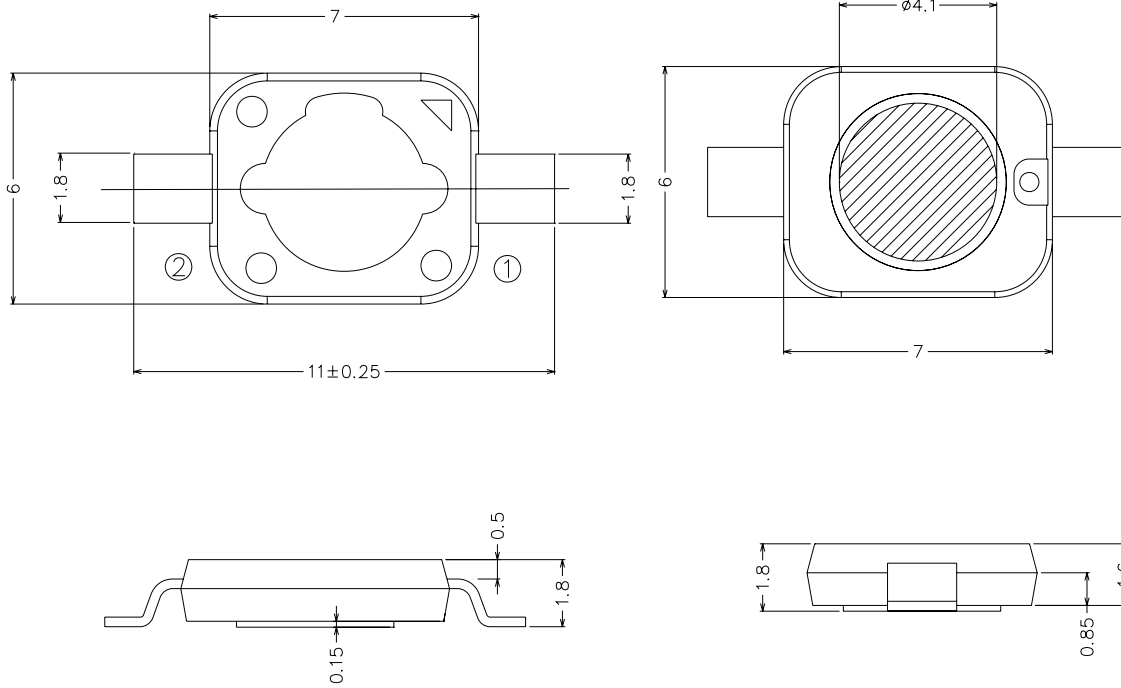
Applications

- CCD Camera
- Night Vision
- Infrared applied system

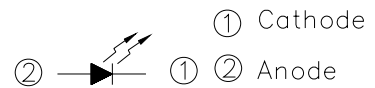
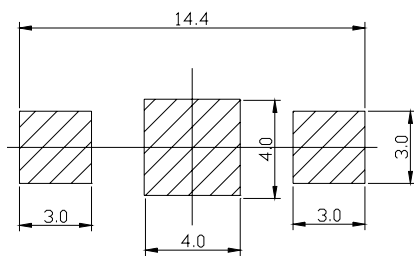
Materials

| Items | Description |
|---------------------|-------------------------|
| Housing | Heat resistant polymer |
| Encapsulating Resin | Clear silicone resin |
| Electrodes | Ag plating copper alloy |
| Die attach | Silver paste |
| Chip | AlGaAs |

Package Dimensions



Recommended solder pad



- Notes:**
- 1.All dimensions are in millimeters
 - 2.Tolerances unless dimensions ± 0.25 mm

HIR-A07/L183-P01

Absolute Maximum Ratings (Ta=25°C)

| Parameter | Symbol | Rating | Units |
|---------------------------------|-----------|-----------|-------|
| Forward Current | I_F | 700 | mA |
| Reverse Voltage | V_R | 5 | V |
| Operating Temperature | T_{opr} | -40 ~ +85 | °C |
| Storage Temperature | T_{stg} | -40 ~ +85 | °C |
| Junction temperature | T_j | 125 | °C |
| Power Dissipation @ $I_F=700mA$ | P_d | 1 | W |

Note: We suggest that customer should add the heat sink with

HIR-A07/L183-P01

to exclude the heat.

Electro-Optical Characteristics (Ta=25°C)

| Parameter | Symbol | Condition | Min. | Typ. | Max. | Units |
|---|------------------|-------------|------|------|------|---------|
| Total Radiated Power | P_o | $I_F=350mA$ | 60 | 110 | -- | mW |
| | | $I_F=700mA$ | 120 | 220 | -- | |
| Radiant Intensity | I_E | $I_F=350mA$ | 10 | 35 | -- | mW/sr |
| | | $I_F=700mA$ | 30 | 70 | -- | |
| Peak Wavelength | λ_p | $I_F=20mA$ | -- | 850 | -- | nm |
| Spectral Bandwidth | $\Delta \lambda$ | $I_F=20mA$ | -- | 50 | -- | nm |
| Forward Voltage | V_F | $I_F=350mA$ | 1.0 | 1.6 | 2.5 | V |
| | | $I_F=700mA$ | 1.2 | 1.9 | 3.0 | |
| Reverse Current | I_R | $V_R=5V$ | -- | -- | 10 | μA |
| Optical Rise Time | T_r | $I_F=20mA$ | -- | 11 | -- | ns |
| Optical Fall Time | T_f | $I_F=20mA$ | -- | 7 | -- | ns |
| View Angle | $2\theta_{1/2}$ | $I_F=20mA$ | -- | 125 | -- | deg |
| Thermal resistance, junction to heat-sink | $R_{th\ j-L}$ | $I_F=700mA$ | -- | 35 | -- | °C/W |

Note. 1. Radiometric measurement tolerance : $\pm 10\%$

2. $2\theta_{1/2}$ is the off axis angle from lamp centerline where the radiant intensity is 1/2 of the peak value.

3. Forward Voltage measurement tolerance : $\pm 0.1V$

Typical Electro-Optical Characteristics Curves

Fig.1 Forward Current vs. Ambient Temperature

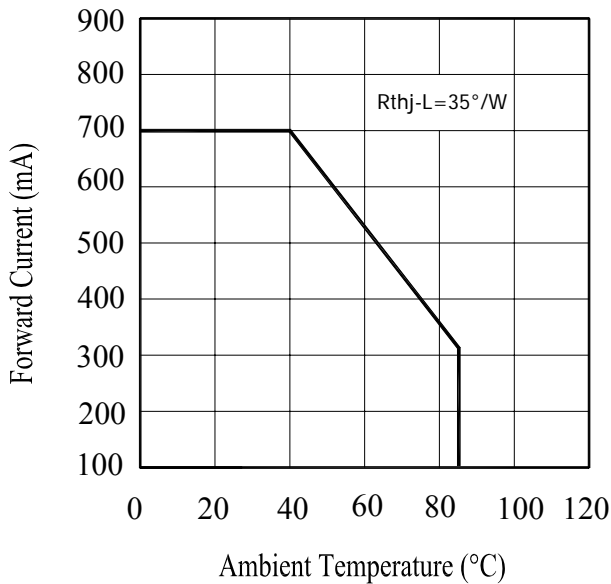


Fig.2 Spectral Distribution

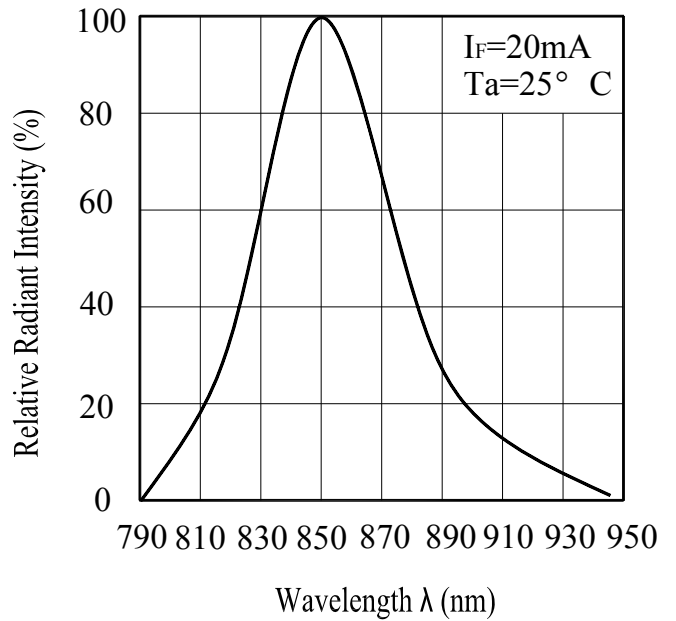


Fig.3 Peak Emission Wavelength vs. Ambient Temperature

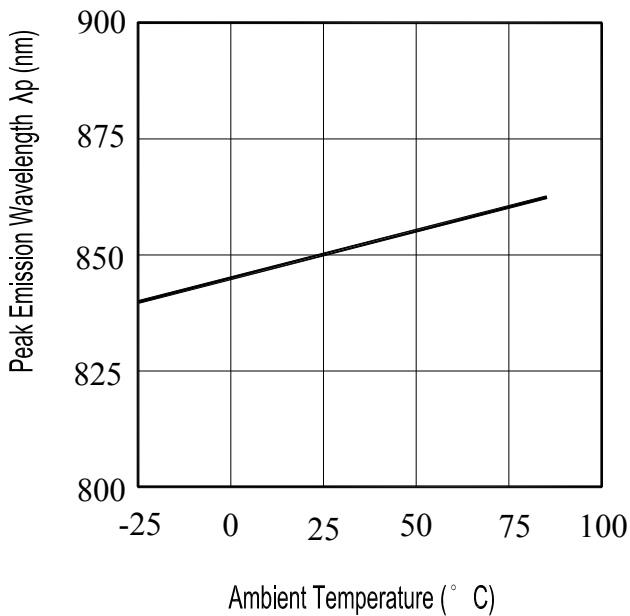
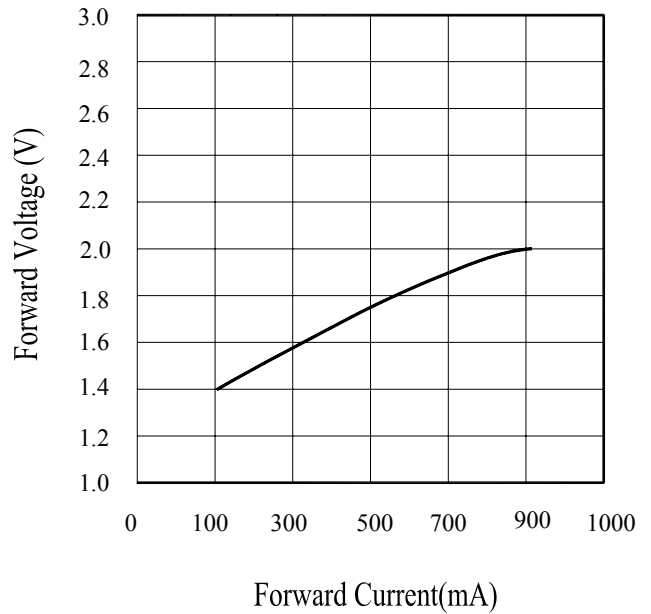
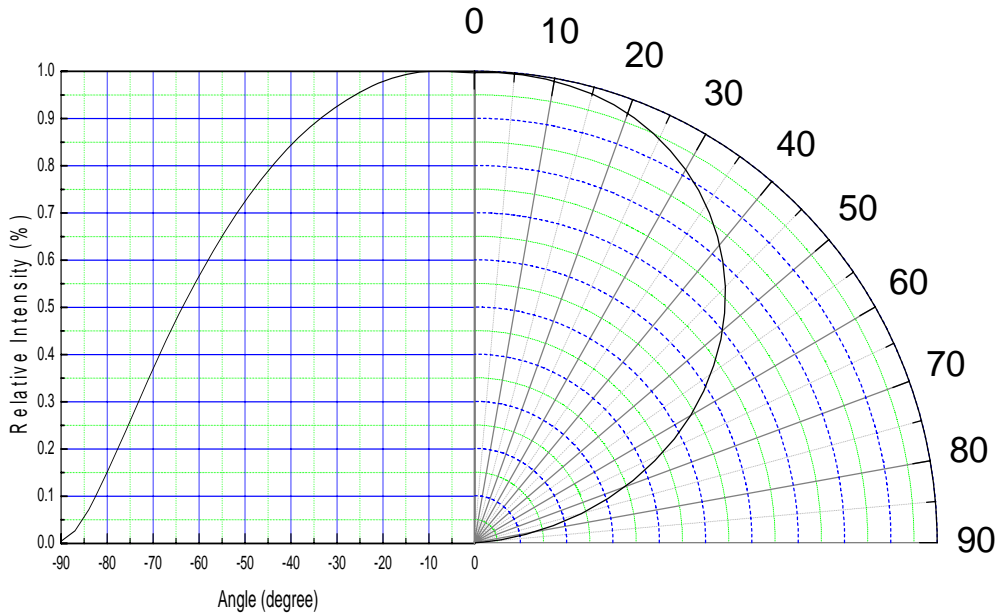


Fig.4 Forward Current vs. Forward Voltage



Typical Electro-Optical Characteristics Curves

Fig.5 Relative Radiant Intensity vs. Angular Displacement



Precautions For Use

1.Over-current-proof

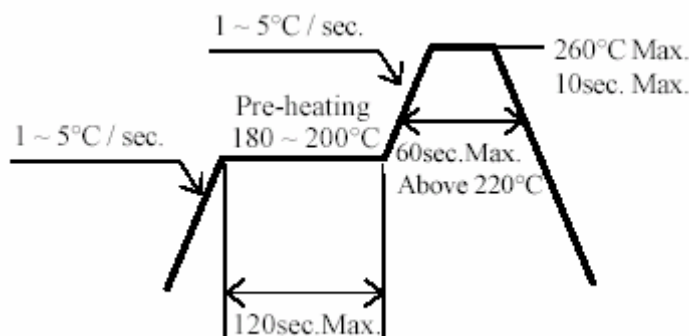
Though HIR-A07/L183-P01 has conducted ESD protection mechanism, customer must not use the device in reverse and should apply resistors for extra protection. Otherwise slight voltage shift may cause enormous current change and burn out failure would happen.

2.Thermal Management

- i. Because HIR-A07/L183-P01 is a high power dissipation device, special and sufficient consideration in thermal management design must be made to optimize the thermal performance.
- ii. Heat sink design is implemented in the device for an additional thermal connection. Since the device is capable of SMT process, tin must be spread both heat sink and solder pads areas to dissipate the heat.
- iii. A high thermal conductivity substrate, such as Aluminum or Copper plate etc, must be applied for external thermal management. It is strongly recommended that the outer heat sink or PCB dimension per LED can not be less than 25 x 25 x 1 (L x W x H) mm. The materials for outer heat sink can be FR4 on Aluminum, MCPCB, or FPC on Aluminum.
- iv. Special thermal designs are also recommended to take in outer heat sink design, such as FR4 PCB on Aluminum with thermal vias or FPC on Aluminum with thermal conductive adhesive, etc.
- v. Sufficient thermal management must be conducted, or the die junction temperature will be over the limit under large electronic driving and LED lifetime will decrease critically.

3.Soldering Condition

1.Lead reflow soldering temperature profile



2.Reflow soldering should not be done more than two times.

3.While soldering, do not put stress on the LEDs during heating.

4.After soldering, do not warp the circuit board

4.Soldering Iron

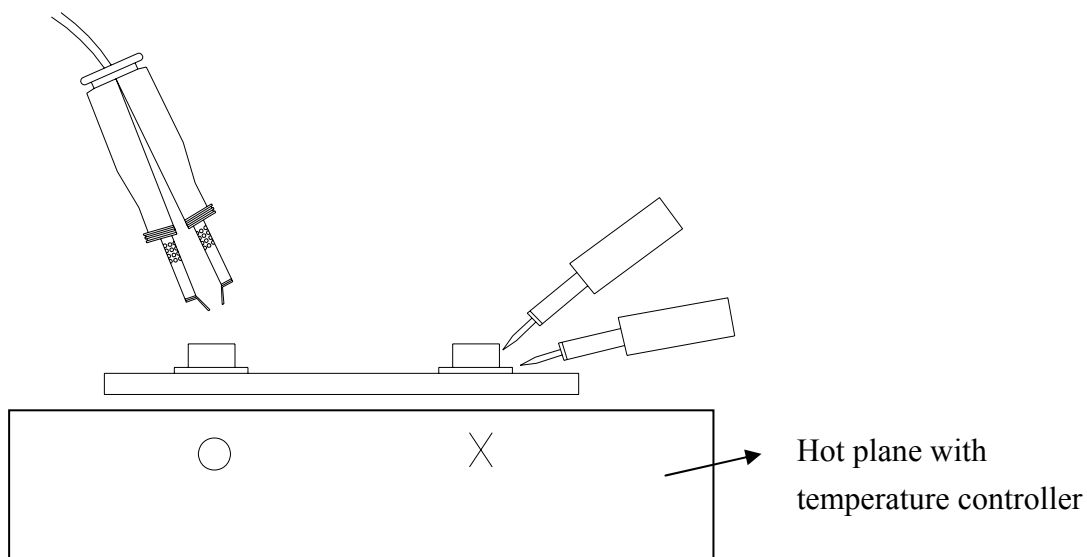
- 1.For prototype builds or small series production runs it is possible to place and solder the LED by hand.
- 2.Dispensing thermal conductive glue or grease on the substrates and follow its curing spec. Press LED housing to closely connect LED and substrate.
- 3.It is recommended to hand solder the leads with a solder tip temperature of 280°C for less than 3 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal.
- 4.Be careful because the damage of the product is often started at the time of the hand solder.

5.Handling Indications

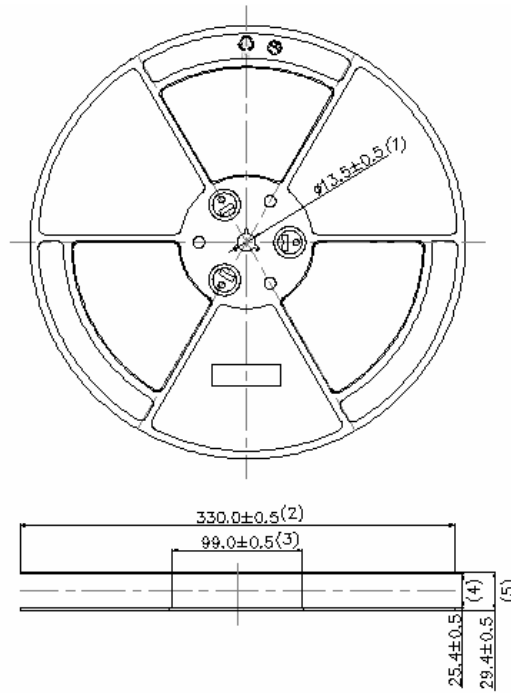
During processing, mechanical stress on the surface should be minimized as much as possible. Sharp objects of all types should not be used to pierce the sealing compound.

6.Repairing

Repair should not be done after the LEDs have been soldered. If unfortunately, repair is unavoidable. In addition to double-head soldering iron, hot plane must be used under external heat sink plate to liquefy tin between device heat sink and outer heat sink, shown as figure below. It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.

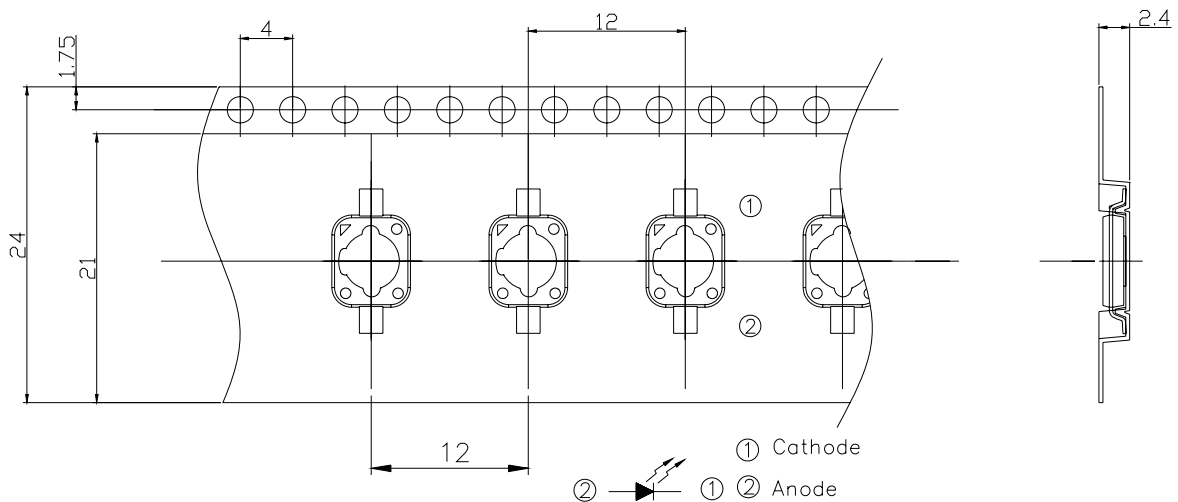


Tube Packing Specifications
1.Reel Dimensions



- Note: 1. Dimensions are in millimeters**
- 2. The tolerances unless mentioned is $\pm 0.1\text{mm}$**

2.Carrier Tape Dimensions: Loaded quantity 800 PCS per reel.



- Note: 1. Dimensions are in millimeters**
- 2. The tolerances unless mentioned is $\pm 0.1\text{mm}$**

Reliability Test Item And Condition

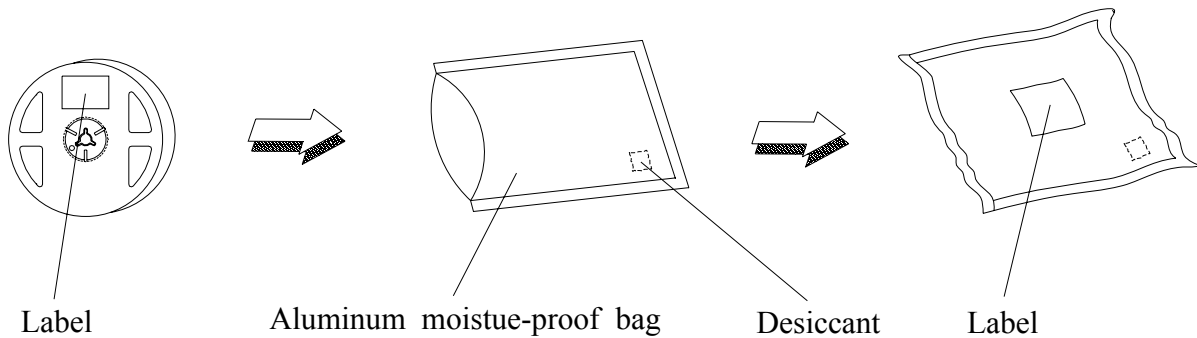
The reliability of products shall be satisfied with items listed below.

Confidence level : 90%

LTPD : 10%

| NO. | Item | Test Conditions | Test Hours/ Cycles | Sample Sizes | Failure Judgement Criteria | Ac/Re |
|-----|------------------------------------|--|-----------------------|-----------------|--|-------|
| 1 | REFLOW Soldering | TEMP. : 260°C±5°C 10secs | 6Mins | 22pcs | $I_R \geq U \times 2$ | 0/1 |
| 2 | Temperature Cycle | H : +100°C 15mins ↑ 5mins ↓ 15mins L : -40°C | 300Cycles | 22pcs | $I_e \leq L \times 0.8$ $V_F \geq U \times 1.2$ | 0/1 |
| 3 | Thermal Shock | H : +100°C 5mins ↑ 10secs ↓ 5mins L : -10°C | 300Cycles | 22pcs | U : Upper Specification Limit | 0/1 |
| 4 | High Temperature Storage | TEMP. : +100°C | 1000hrs | 22pcs | L : Lower Specification Limit | 0/1 |
| 5 | Low Temperature Storage | TEMP. : -40°C | 1000hrs | 22pcs | | 0/1 |
| 6 | DC Operating Life | $I_F = 700\text{mA}$ | 1000hrs | 22pcs | | 0/1 |
| 7 | High Temperature/ High Humidity | 85°C / 85% R.H | 1000hrs | 22pcs | | 0/1 |

Moisture Resistant Packaging



Label Form Specification



CPN: Customer's Production Number
P/N : Production Number
QTY: Packing Quantity
CAT: Ranks
HUE: Peak Wavelength
REF: Reference
LOT No: Lot Number
MADE IN TAIWAN: Production Place

Notes

1. Above specification may be changed without notice. EVERLIGHT will reserve authority on material change for above specification.
2. When using this product, please observe the absolute maximum ratings and the instructions for using outlined in these specification sheets. EVERLIGHT 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.
3. These specification sheets include materials protected under copyright of EVERLIGHT corporation. Please don't reproduce or cause anyone to reproduce them without EVERLIGHT's consent.

EVERLIGHT ELECTRONICS CO., LTD.
Office: No 25, Lane 76, Sec 3, Chung Yang Rd,
Tucheng, Taipei 236, Taiwan, R.O.C

Tel: 886-2-2267-2000, 2267-9936
Fax: 886-2267-6244, 2267-6189, 2267-6306
http://www.everlight.com