



Specification

KWT722

| SSC | | CUSTOMER |
|-------|----------|----------|
| Drawn | Approval | Approval |
| | | |

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KWT722

Description

This surface-mount LED comes in PLCC standard package dimension. It has a substrate made up of a molded plastic reflector sitting on top of a bent lead frame. The die is attached within the reflector cavity and the cavity is encapsulated by epoxy or silicone.

The package design coupled with careful selection of component materials allow these products to perform with high reliability in a larger temperature range -40°C to 100°C. The high reliability feature is crucial to Automotive interior and Indoor ESS.



KWT722

Features

- White colored SMT package.
- Material : InGaN/SiC
- Encapsulating Resin : Epoxy Resin
- Suitable for all SMT assembly methods ; Suitable for all soldering methods
- RoHS Compliant

Applications

- Interior automotive
- Office Automation, Electrical Appliances, Industrial Equipment
- Lightings

2. Absolute maximum ratings

| Parameter | Symbol | Value | Unit |
|---------------------------|---------------|------------|------|
| Power Dissipation | P_d | 350 | mW |
| Forward Current | I_F | 90 | mA |
| Peak Forward Current | I_{FM}^{*2} | 270 | mA |
| Reverse Voltage (per die) | V_R | 5 | V |
| Operating Temperature | T_{opr} | -30 ~ +85 | °C |
| Storage Temperature | T_{stg} | -40 ~ +100 | °C |

*1 Care is to be taken that power dissipation does not exceed the absolute maximum rating of the product.

*2 I_{FM} was measured at $T_w \leq 1$ msec of pulse width and $D \leq 1/10$ of duty ratio.

3. Electric & Optical characteristics

| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|---------------------------|-----------------|-------------|------|------|-------|---------|
| Forward Voltage (per die) | V_F | $I_F=20$ mA | 2.7 | 3.2 | 3.7 | V |
| Reverse Current (per die) | I_R | $V_R=5$ V | - | - | 50 | μ A |
| Luminance Intensity *1 | I_V | $I_F=60$ mA | 3000 | 4800 | 6000 | mcd |
| Luminance Flux | Φ_V | $I_F=60$ mA | - | 13 | - | lm |
| Color Temperature | CCT | $I_F=60$ mA | 4800 | - | 12000 | K |
| Color Coordinate | X | $I_F=60$ mA | - | 0.31 | - | - |
| | Y | | - | 0.31 | - | |
| Viewing Angle *2 | $2\theta_{1/2}$ | $I_F=60$ mA | - | 120 | - | deg |
| Optical Efficiency | η_{op} | $I_F=60$ mA | - | 68 | - | lm/W |

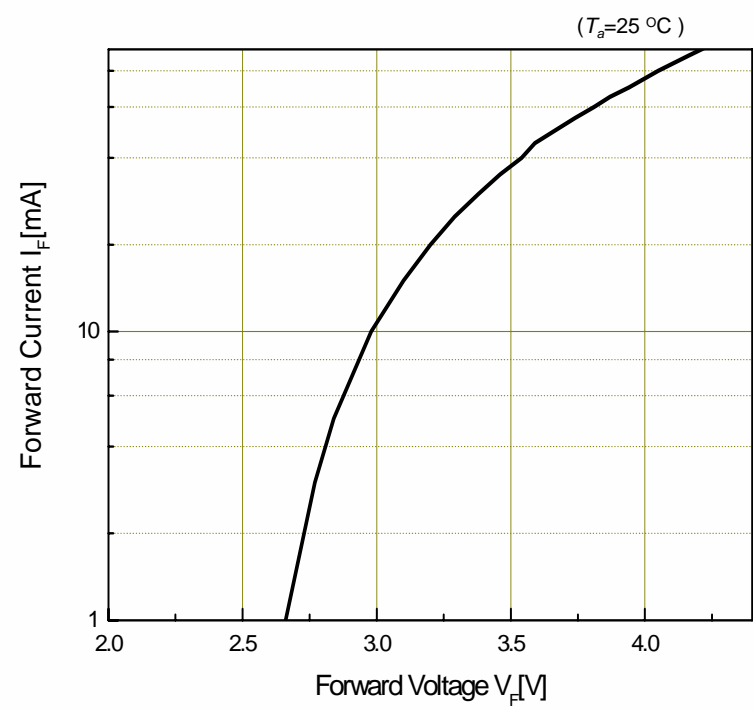
*1. The luminous intensity I_V was measured at the peak of the spatial pattern which may not be aligned with the mechanical axis of the LED package. Luminous Intensity Measurement allowance is $\pm 10\%$

*2. $2\theta_{1/2}$ is the off-axis where the luminous intensity is 1/2 of the peak intensity.

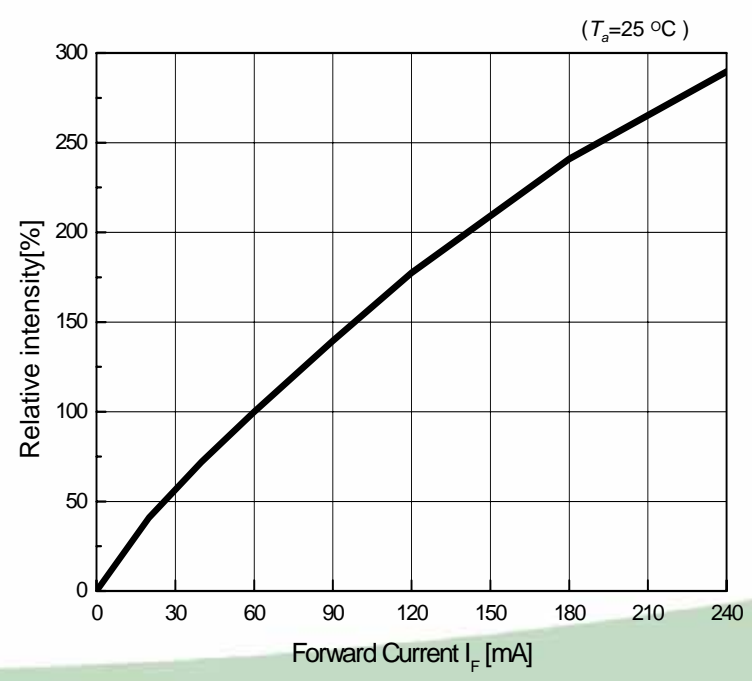
[Note] All measurements were made under the standardized environment of SSC.

4. Optical characteristics

Forward Current vs. Forward Voltage (per die)

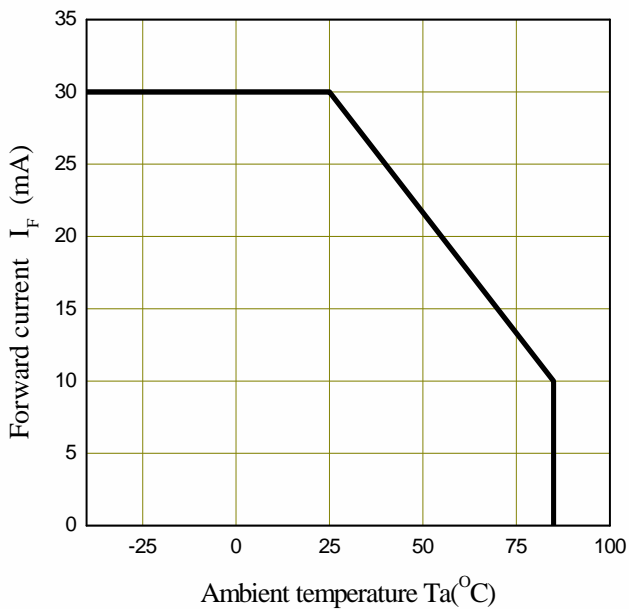


Relative Luminous Intensity vs Forward Current

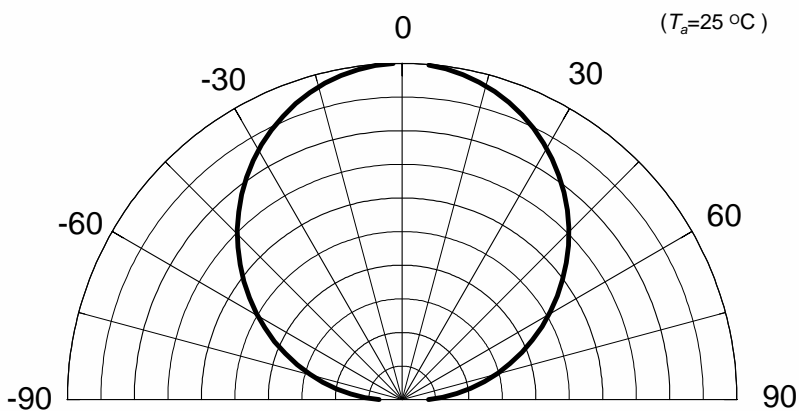


4. Optical characteristics

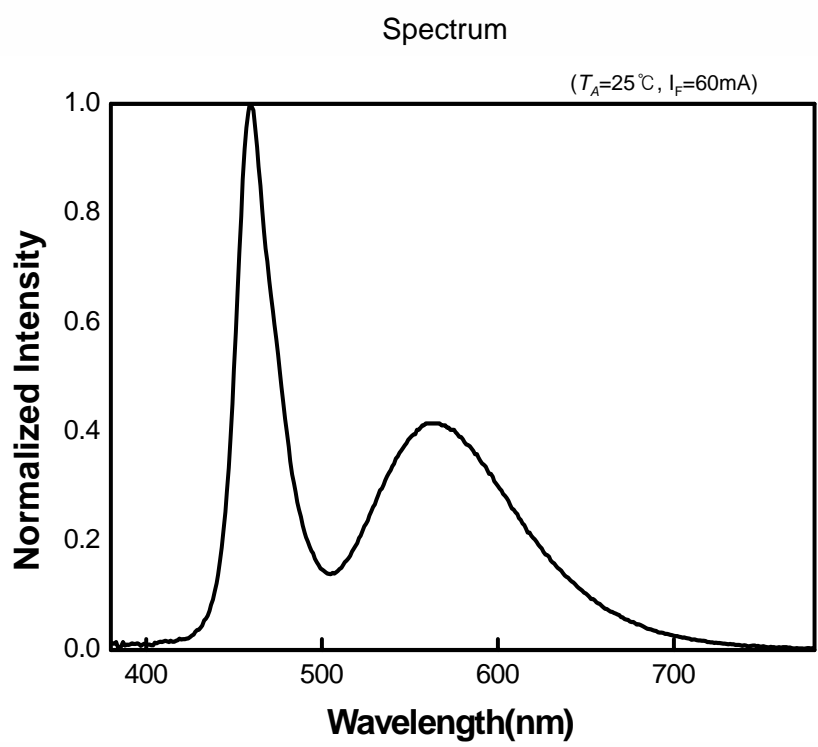
Ambient Temperature vs. Allowable Forward Current (per die)



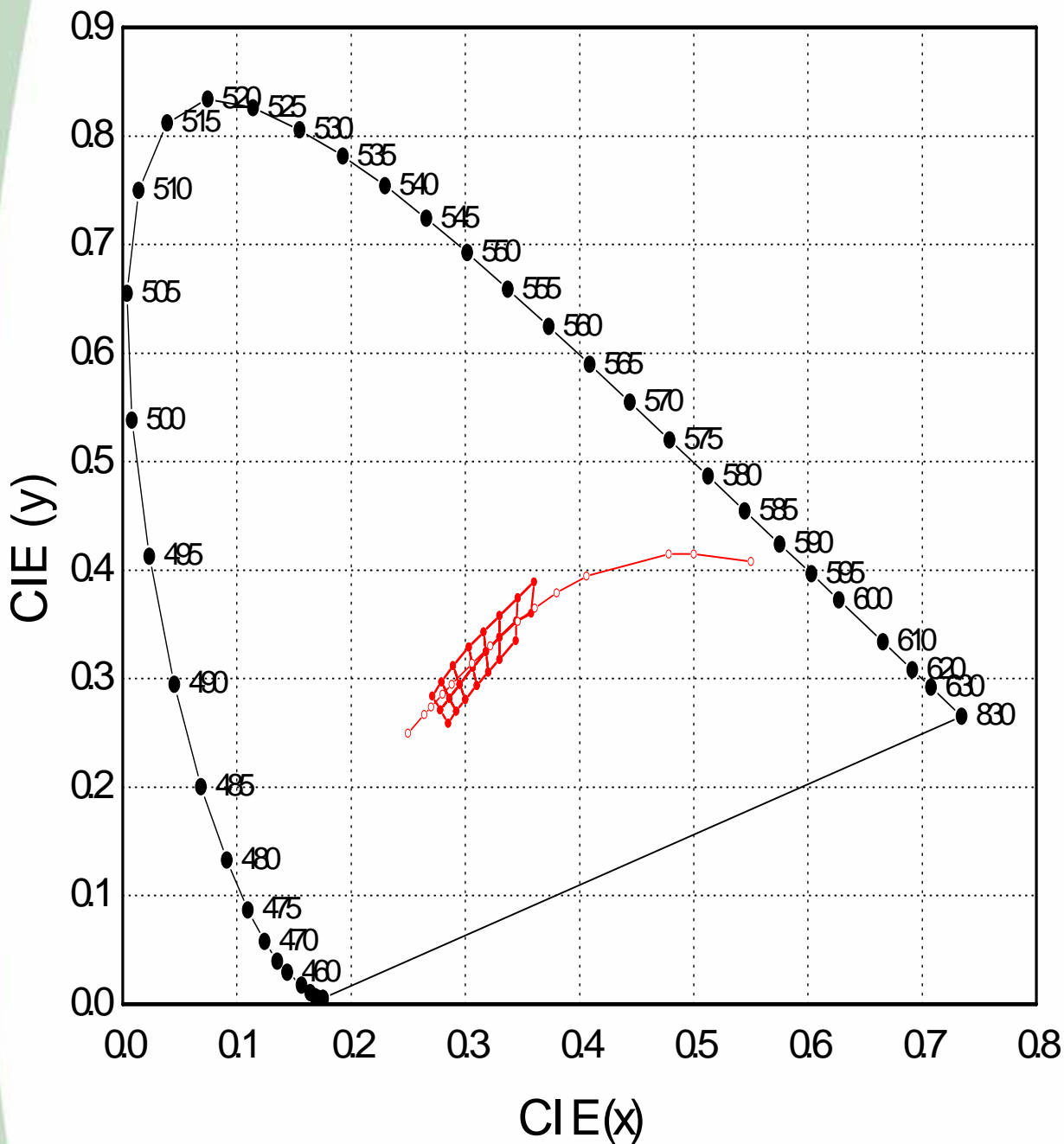
Radiation Diagram



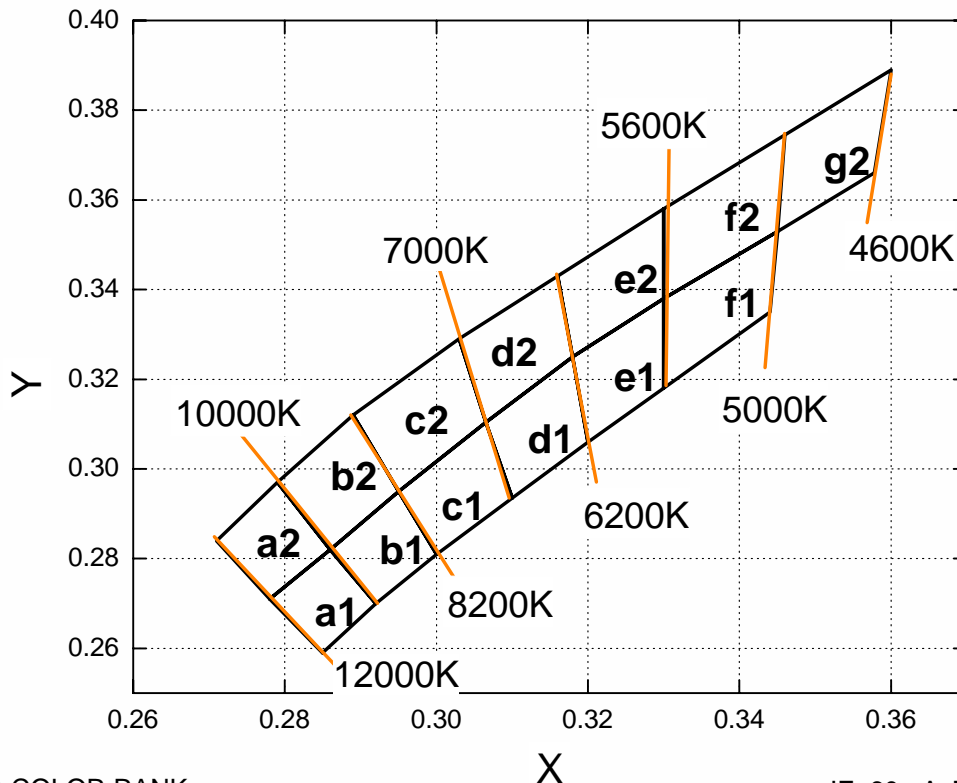
4. Optical characteristics



5. Color & Binning



5. Color & Binning



● COLOR RANK

<IF=60mA, Ta=25°C>

| a1 | | a2 | | b1 | | b2 | | | |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| X | Y | X | Y | X | Y | X | Y | | |
| 0.285 | 0.259 | 0.278 | 0.271 | 0.292 | 0.27 | 0.286 | 0.282 | | |
| 0.292 | 0.27 | 0.286 | 0.282 | 0.3 | 0.281 | 0.295 | 0.295 | | |
| 0.286 | 0.282 | 0.279 | 0.297 | 0.295 | 0.295 | 0.289 | 0.312 | | |
| 0.278 | 0.271 | 0.271 | 0.284 | 0.286 | 0.282 | 0.279 | 0.297 | | |
| c1 | | c2 | | d1 | | d2 | | | |
| X | Y | X | Y | X | Y | X | Y | | |
| 0.3 | 0.281 | 0.295 | 0.295 | 0.31 | 0.2935 | 0.3065 | 0.3104 | | |
| 0.31 | 0.2935 | 0.3065 | 0.3104 | 0.32 | 0.306 | 0.318 | 0.325 | | |
| 0.3065 | 0.3104 | 0.303 | 0.329 | 0.318 | 0.325 | 0.316 | 0.343 | | |
| 0.295 | 0.295 | 0.289 | 0.312 | 0.3065 | 0.3104 | 0.303 | 0.329 | | |
| e1 | | e2 | | f1 | | f2 | | g2 | |
| X | Y | X | Y | X | Y | X | Y | X | Y |
| 0.32 | 0.306 | 0.318 | 0.325 | 0.33 | 0.318 | 0.33 | 0.338 | 0.346 | 0.3745 |
| 0.33 | 0.318 | 0.33 | 0.338 | 0.344 | 0.335 | 0.345 | 0.353 | 0.36 | 0.389 |
| 0.33 | 0.338 | 0.33 | 0.358 | 0.345 | 0.353 | 0.346 | 0.374 | 0.3578 | 0.36 |
| 0.318 | 0.325 | 0.316 | 0.343 | 0.33 | 0.338 | 0.33 | 0.358 | 0.345 | 0.353 |

* Measurement Uncertainty of the Color Coordinates : ± 0.01

6. rank of KWT722

Rank Name Table

| | | |
|-------|-------|-------|
| X_1 | X_2 | X_3 |
| VF | IV | CIE |

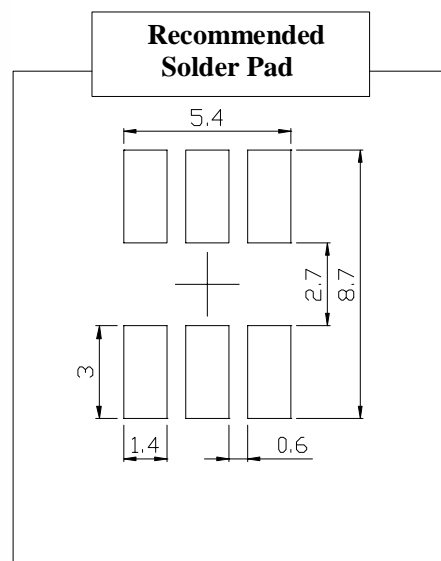
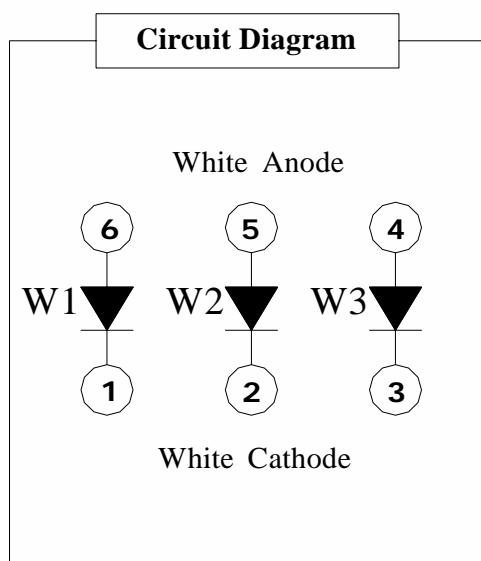
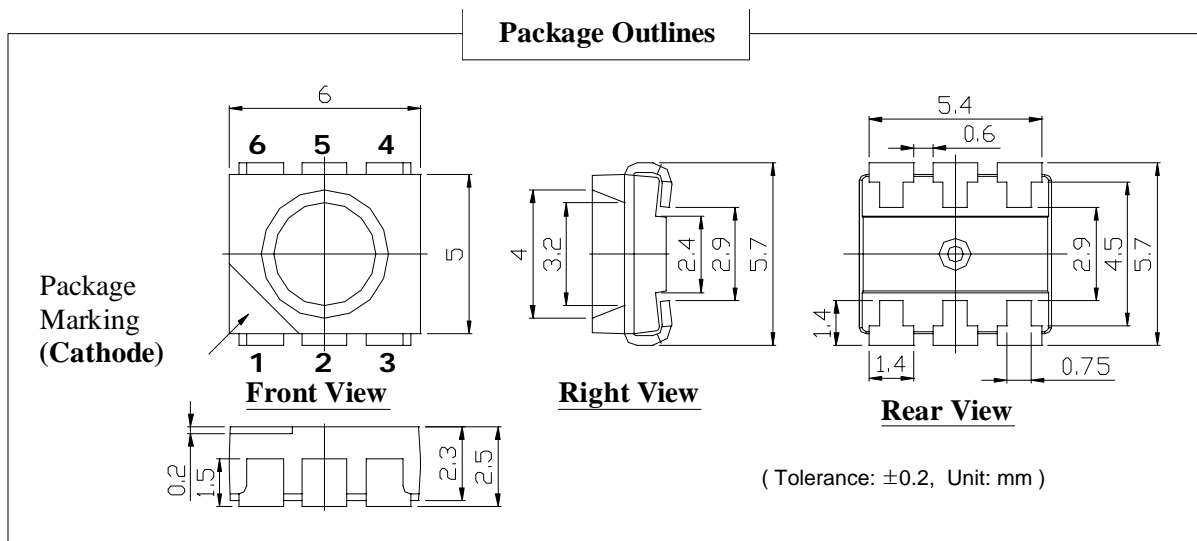
Forward Voltage [V]

| Rank Name | MIN | MAX |
|-----------|-----|-----|
| Y | 3.0 | 3.1 |
| Z | 3.1 | 3.2 |
| Z1 | 3.2 | 3.3 |
| A1 | 3.3 | 3.4 |
| A2 | 3.4 | 3.5 |

Luminous Intensity [mcd]

| Rank Name | MIN | MAX |
|-----------|------|------|
| L | 3000 | 4000 |
| M | 4000 | 5000 |
| N | 5000 | 6000 |

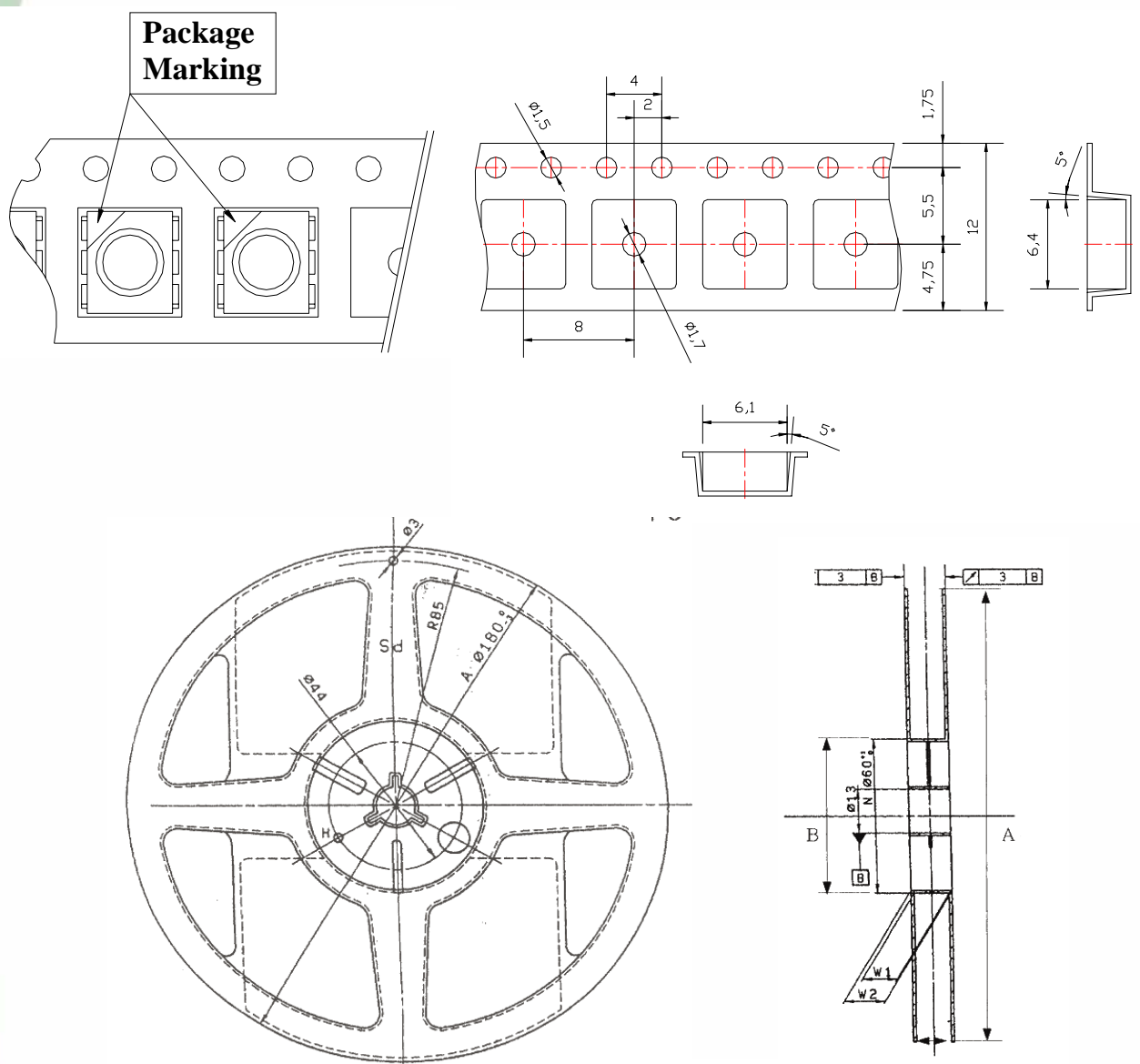
7.outline dimension



* MATERIALS

| PARTS | MATERIALS |
|---------------------|-------------------------|
| Package | Heat-Resistant Polymer |
| Encapsulating Resin | Epoxy Resin |
| Electrodes | Ag Plating Copper Alloy |

8. packing



(Tolerance: ± 0.2 , Unit: mm)

- 1)Quantity : 700pcs/Reel
- 2)Cumulative Tolerance : Cumulative Tolerance/10 pitches to be ± 0.2 mm
- 3)Adhesion Strength of Cover Tape : Adhesion strength to be 0.1-0.7N when the cover tape is turned off from the carrier tape at the angle of 10 to the carrier tape
- 4)Package : P/N, Manufacturing data Code No. and quantity to be indicated on a damp proof Package

Rev. 01

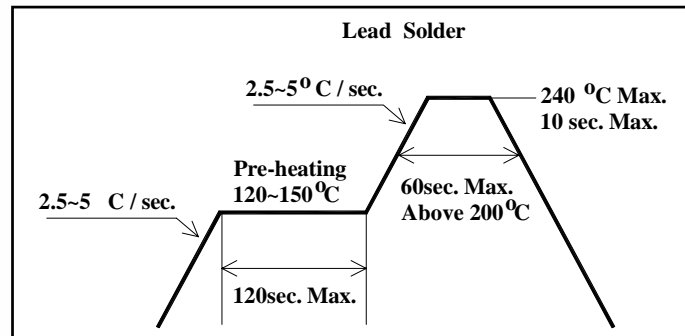
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9. soldering

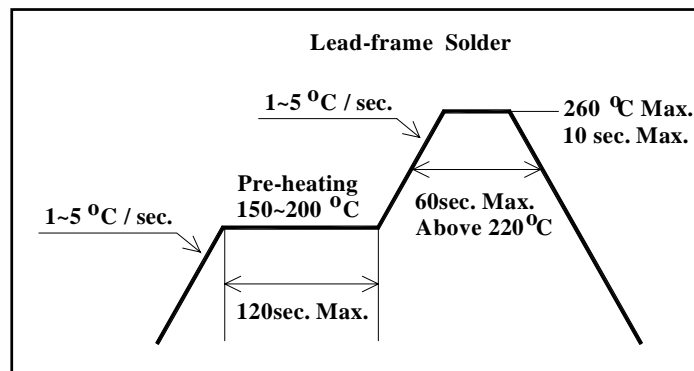
(1) Lead Solder

| Lead Solder | |
|--------------------------|---------------|
| Pre-heat | 120~150 °C |
| Pre-heat time | 120 sec. Max. |
| Peak-Temperature | 240 °C Max. |
| Soldering time Condition | 10 sec. Max. |



(2) Lead-Free Solder

| Lead Free Solder | |
|--------------------------|---------------|
| Pre-heat | 150~200 °C |
| Pre-heat time | 120 sec. Max. |
| Peak-Temperature | 260 °C Max. |
| Soldering time Condition | 10 sec. Max. |



(3) Hand Soldering conditions

Do not exceed 4 seconds at maximum 315°C under soldering iron.

(4) Reflow soldering should not be done more than three times.

Note : In case that the soldered products are reused in soldering process, we don't guarantee the products.

10. precaution for use

(1) Storage

In order to avoid the absorption of moisture, it is recommended to store in a dry box (or a desiccator) with a desiccant. Otherwise, to store them in the following environment is recommended.

Temperature : 5°C ~30°C Humidity : maximum 65%RH

(2) Attention after open.

LED is correspond to SMD, when LED be soldered dip, interfacial separation may affect the light transmission efficiency, causing the light intensity to drop. Attention in followed;

a. After opened and mounted the soldering shall be quickly.

b. Keeping of a fraction

Temperature : 5 ~ 40°C Humidity : less than 10%

(3) In the case of more than 1 week passed after opening or change color of indicator on desiccant, components shall be dried 10-12hr. at $60\pm 5^{\circ}\text{C}$.

(4) Any mechanical force or any excess vibration shall not be accepted to apply during cooling process to normal temperature after soldering.

(5) Quick cooling shall be avoided.

(6) Components shall not be mounted on warped direction of PCB.

(7) Anti radioactive ray design is not considered for the products.

(8) This device should not be used in any type of fluid such as water, oil, organic solvent etc. When washing is required, IPA should be used.

(9) When the LEDs are illuminating, operating current should be decided after considering the ambient maximum temperature.

(10) LEDs must be stored to maintain a clean atmosphere. If the LEDs are stored for 3 months or more after being shipped from SSC, a sealed container with a nitrogen atmosphere should be used for storage.

(11) The LEDs must be soldered within seven days after opening the moisture-proof packing.

(12) Repack unused products with anti-moisture packing, fold to close any opening and then store in a dry place.

(13) The appearance and specifications of the product may be modified for improvement without notice.

11. Reliability Test Item and Condition

| Item | Reference | Test Condition | Duration / Cycle | Number of Damage |
|--|--------------------|--|------------------|------------------|
| Thermal Shock | EIAJ ED-4701 | $T_a = -40^{\circ}\text{C}$ (30MIN) ~ 100°C (30MIN) | 100 Cycle | 0/22 |
| Temperature Cycle | EIAJ ED-4701 | $T_a = -40^{\circ}\text{C}$ (30MIN) ~ 25°C (5MIN) ~ 100°C (30MIN) ~ 25°C (5MIN) | 100 Cycle | 0/22 |
| High Temperature Storage | EIAJ ED-4701 | $T_a = 100^{\circ}\text{C}$ | 1000 Hours | 0/22 |
| High Temperature High Humidity Storage | EIAJ ED-4701 | $T_a = 85^{\circ}\text{C}$, RH=85% | 1000 Hours | 0/22 |
| Low Temperature Storage | EIAJ ED-4701 | $T_a = -40^{\circ}\text{C}$ | 1000 Hours | 0/22 |
| Operating Endurance Test | Internal Reference | $T_a = 25^{\circ}\text{C}$, $I_F = 20\text{mA}$ | 1000 Hours | 0/22 |
| High Temperature High Humidity Life Test | Internal Reference | $T_a = 85^{\circ}\text{C}$, RH=85%, $I_F = 15\text{mA}$ | 300 Hours | 0/22 |
| High Temperature Life Test | Internal Reference | $T_a = 85^{\circ}\text{C}$, $I_F = 20\text{mA}$ | 500 Hours | 0/22 |
| Low Temperature Life Test | Internal Reference | $T_a = -40^{\circ}\text{C}$, $I_F = 20\text{mA}$ | 1000 Hours | 0/22 |
| ESD(HBM) | MIL-STD-883D | 1KV at 1.5k Ω ; 100pF | 3 Time | 0/22 |

□ Criteria for Judging the Damage

| Item | Symbol | Condition | Criteria for Judgement | |
|--------------------|--------|---------------------|------------------------|--------------------|
| | | | MIN | MAX |
| Forward Voltage | V_F | $I_F = 20\text{mA}$ | - | USL*1 \times 1.2 |
| Reverse Current | I_R | $V_R = 5\text{V}$ | - | USL*1 \times 2.0 |
| Luminous Intensity | I_V | $I_F = 20\text{mA}$ | LSL*2 \times 0.5 | - |

Note : *1 USL : Upper Standard Level

*2 LSL : Lower Standard Level