



Pb Free

Specification

SSC-LCW100Z1

(Rev. 3.3 - 101123)

Rev. 3.3

November 2010

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서식번호 : SSC-QP-7-07-25 (Rev.0.0)

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SSC-LCW100Z1

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1. Description

- Small size suitable for compact appliances.
- Surface-mounted chip LED device.
- Pb-free and RoHS complaint component.
- High brightness, High efficiency
- Tape and Reel packing.
- Increases the life time of battery.



Features

- 3.5 X 2.8 X 1.6 mm
- Emitted Color : White
- CIE chromaticity

| | |
|----------|----------|
| x : 0.33 | y : 0.34 |
| x : 0.37 | y : 0.37 |
| x : 0.44 | y : 0.41 |

Material : InGaN

Applications

- Array lighting
- Other decoration lighting
- Information Boards
- Lighting for Small Size Device.

2. Absolute maximum ratings

(Ta=25°C)

| Parameter | Symbol | Value | Unit |
|-----------------------|---------------|----------|------|
| Power Dissipation | P_d | 175 | mW |
| Forward Current | I_F | 50 | mA |
| Peak Forward Current | I_{FM}^{*1} | 60 | mA |
| ESD Sensitivity | HBM | 10,000 | V |
| Operation Temperature | $T_{opr.}$ | -30 ~ 85 | °C |
| Storage Temperature | $T_{stg.}$ | -40 ~ 95 | °C |
| Junction Temperature | T_j | 115 | °C |

*1 I_{FM} conditions: Pulse width $T_w \leq 1\text{msec}$ and Duty ratio $\leq 1/10$.

3. Electro-Optical Characteristics

(Ta=25°C)

| Parameter- | Symbol | Condition | Min | Typ | Max | Unit | |
|-------------------------|--------------------|--------------------|--------------------|------|------|------|-----|
| Forward Voltage | V_F | $I_F=20\text{ mA}$ | 2.7 | 3.1 | 3.7 | V | |
| Zener Forward Voltage | $V_{F(z)}$ | $I_F=5\text{ mA}$ | 0.6 | 0.8 | 1.5 | V | |
| Color Temperature | CCT | $I_F=20\text{ mA}$ | 2600 | - | 8200 | K | |
| 4,700 K ~ 8,200 K | Luminous Intensity | I_v | $I_F=20\text{ mA}$ | 1270 | 2100 | - | mcd |
| | Luminous Flux*2 | Φ_v | $I_F=20\text{ mA}$ | 4 | 6.6 | - | lm |
| | CRI | Ra | $I_F=20\text{ mA}$ | 70 | 75 | 80 | - |
| 2,600 K ~ 4,700 K | Luminous Intensity | I_v | $I_F=20\text{ mA}$ | 1270 | 1700 | - | mcd |
| | Luminous Flux*2 | Φ_v | $I_F=20\text{ mA}$ | 4 | 5.4 | - | lm |
| | CRI | Ra | $I_F=20\text{ mA}$ | 75 | 80 | 90 | - |
| Viewing Angle*3 | $2\theta_{1/2}$ | $I_F=20\text{ mA}$ | - | 120 | - | ° | |
| Thermal Resistance | $R\theta_{(J-S)}$ | $I_F=20\text{ mA}$ | 57 | | | °C/W | |

*2 Φ_v is total luminous flux output as measured with an integrating sphere.

*3 $\theta_{1/2}$ is the off-axis where the luminous intensity is 1/2 the peak intensity.

[Note] All products confirm to the listed minimum and maximum specifications for electric and optical characteristics, when operated at 20mA within the maximum ratings shown above. All measurements were made under the standardized environment of SSC.

(Tolerance : $I_v \pm 10\%$, color coordinate 0.01, $V_F \pm 0.1\text{ V}$)

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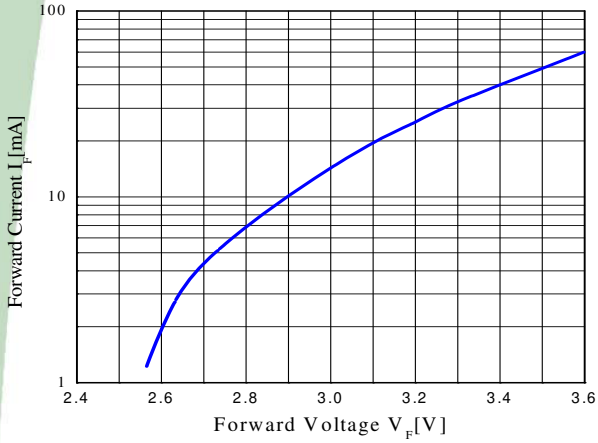
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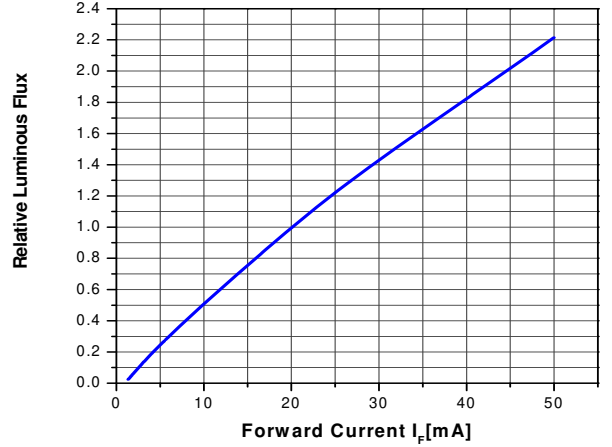
4. Electro-Optical Characteristic Diagram

Ta = 25°

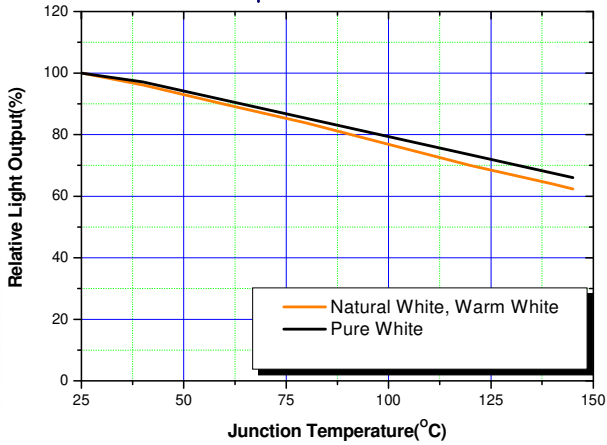
Forward Current vs. Forward Voltage



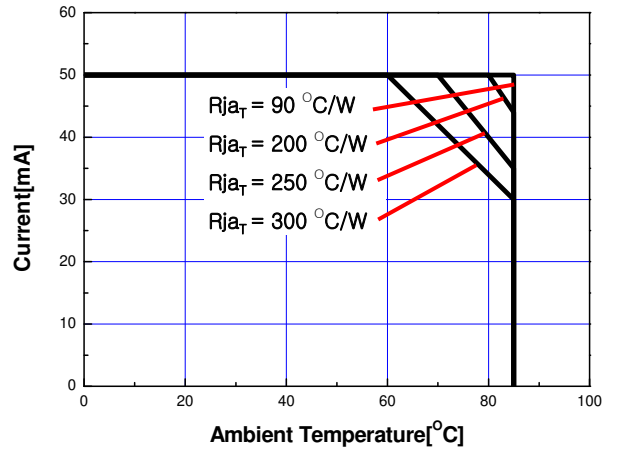
Relative Luminous Flux vs. Forward Current



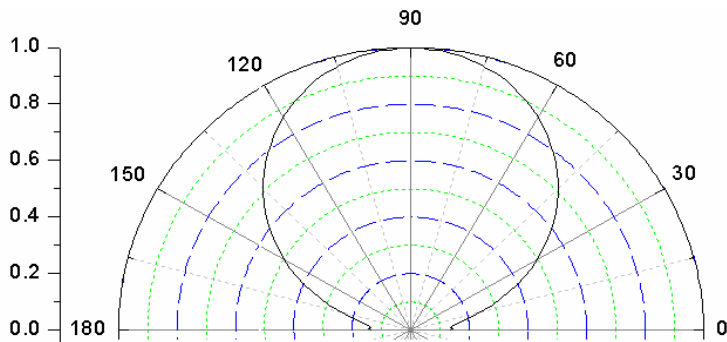
Relative Light Output vs. Junction Temperature at IF=20mA



Ambient Temperature vs Allowable Forward Current

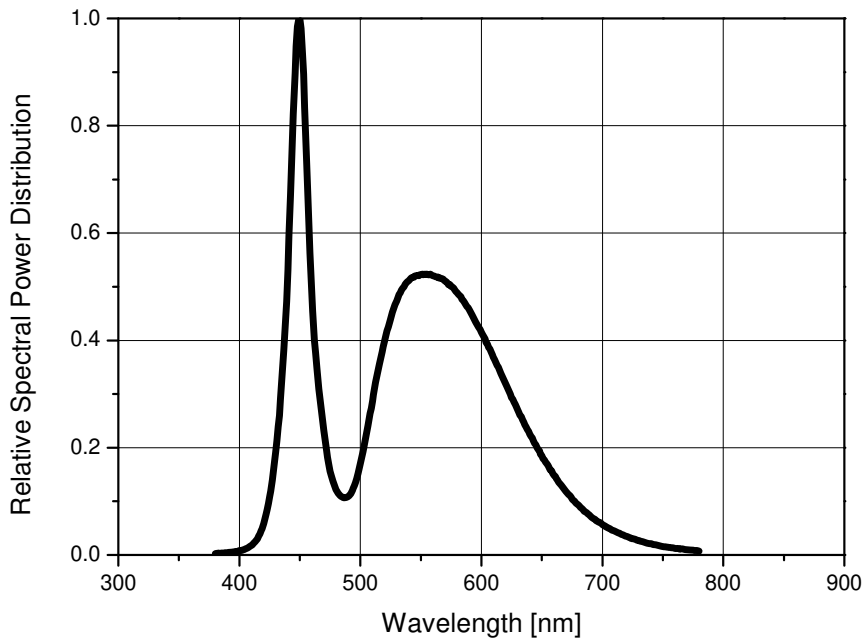


Radiation Diagram

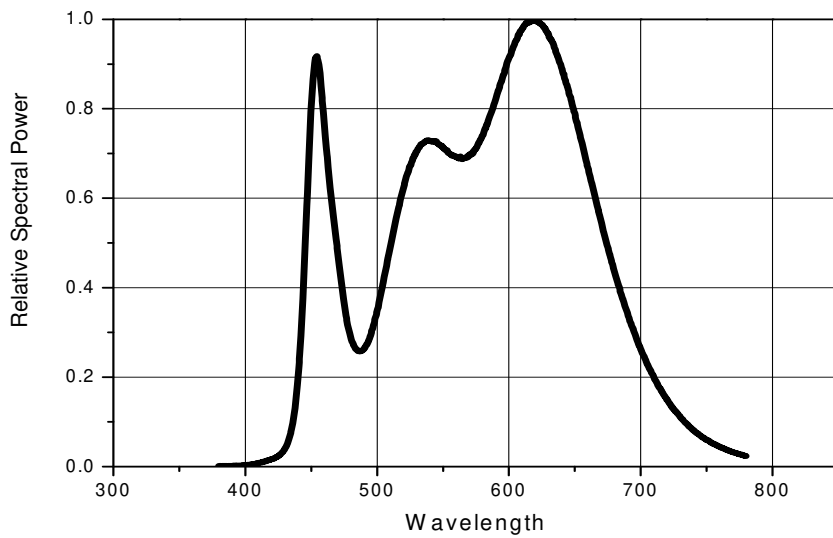


Spectrum Distribution

1. 4700K ~ 8200K



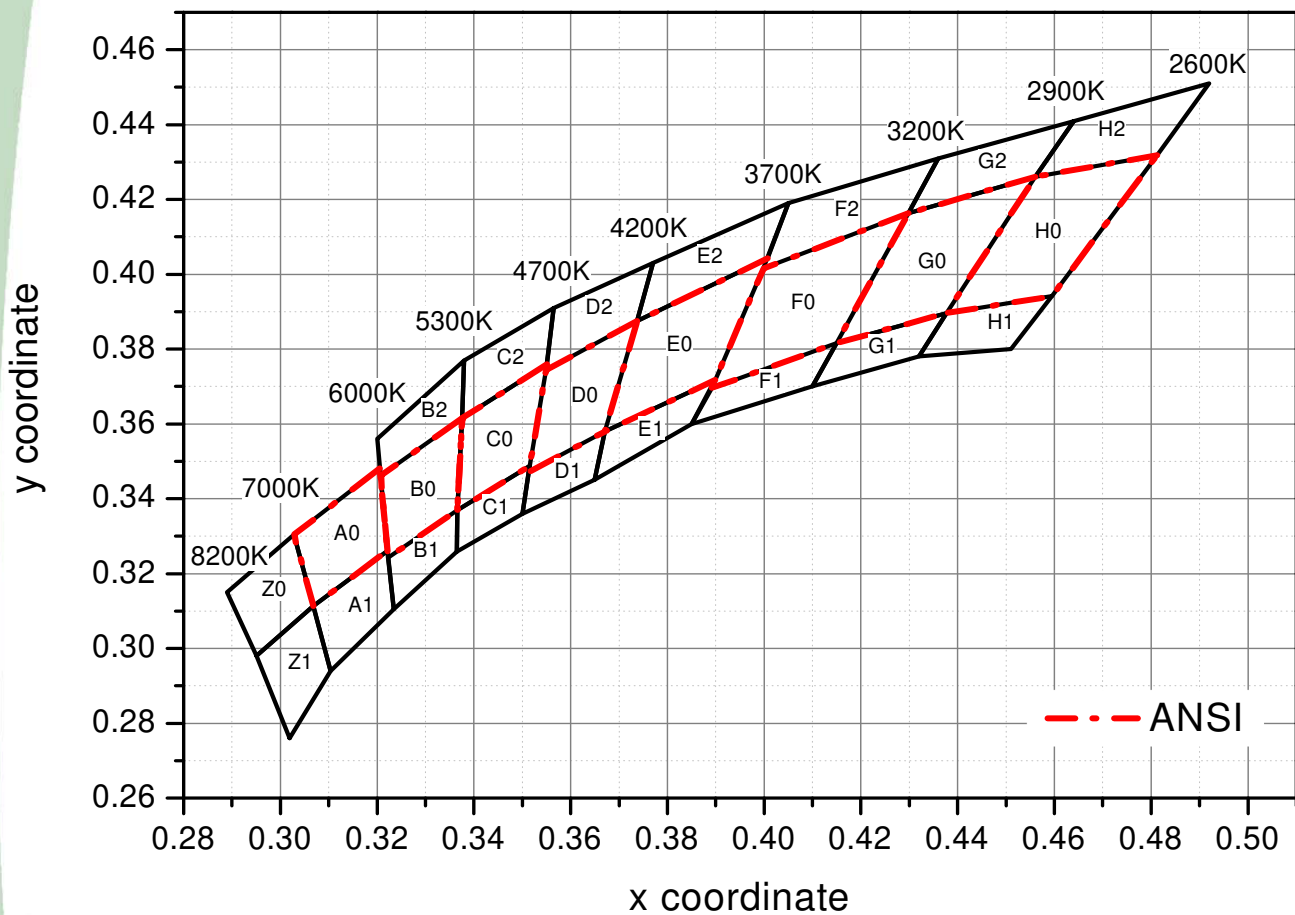
2. 2600K ~ 4700K



5. Reliability Test

| Item | Test Conditions | Duration / Cycle | Number Of Damaged |
|------------------------------------|--|------------------|-------------------|
| Thermal Shock | $T_a = -40^{\circ}\text{C}$ (1 hour) ~ 85°C (1 hour) | 100 Cycle | 0/22 |
| Thermostable | $T_a = 85^{\circ}\text{C}$, RH = 85% (24 hours Storage) → Reflow 3 cycle → Thermal Shock 30 Cycle | | 0/22 |
| High Temperature Storage | $T_a = 85^{\circ}\text{C}$ | 1000 Hours | 0/22 |
| High Temp. High Humidity Storage | $T_a = 85^{\circ}\text{C}$, RH = 85% | 1000 Hours | 0/22 |
| Low Temperature Storage | $T_a = -40^{\circ}\text{C}$ | 1000 Hours | 0/22 |
| High Temp. High Humidity Life Test | $T_a = 60^{\circ}\text{C}$, RH = 90%, $I_F = 20\text{mA}$ | 1000 Hours | 0/22 |
| High Temperature Life Test | $T_a = 85^{\circ}\text{C}$, $I_F = 20\text{mA}$ | 1000 Hours | 0/22 |

6. Binning & Labeling



(1) Color Coordinate : x, y

<IF=20mA, Ta=25°C>

| 8200~7000 K | | | | 7000~6000 K | | | |
|-------------|--------|--------|--------|-------------|--------|--------|--------|
| Z0 | | Z1 | | A0 | | A1 | |
| x | y | x | y | x | y | x | y |
| 0.2950 | 0.2980 | 0.3019 | 0.2760 | 0.3205 | 0.3481 | 0.3068 | 0.3113 |
| 0.2890 | 0.3150 | 0.2950 | 0.2980 | 0.3028 | 0.3304 | 0.3221 | 0.3261 |
| 0.3028 | 0.3304 | 0.3068 | 0.3113 | 0.3068 | 0.3113 | 0.3234 | 0.3105 |
| 0.3068 | 0.3113 | 0.3104 | 0.2940 | 0.3221 | 0.3261 | 0.3104 | 0.2940 |

| 6000~5300 K | | | | | |
|-------------|--------|--------|--------|--------|--------|
| B0 | | B1 | | B2 | |
| x | y | x | y | x | y |
| 0.3376 | 0.3616 | 0.3222 | 0.3243 | 0.3376 | 0.3616 |
| 0.3207 | 0.3462 | 0.3234 | 0.3105 | 0.3380 | 0.3770 |
| 0.3222 | 0.3243 | 0.3365 | 0.3258 | 0.3200 | 0.3560 |
| 0.3366 | 0.3369 | 0.3366 | 0.3369 | 0.3207 | 0.3462 |

| 5300~4700 K | | | | | |
|-------------|--------|--------|--------|--------|--------|
| C0 | | C1 | | C2 | |
| x | y | x | y | x | y |
| 0.3551 | 0.3760 | 0.3365 | 0.3258 | 0.3565 | 0.3910 |
| 0.3376 | 0.3616 | 0.3366 | 0.3369 | 0.3551 | 0.3760 |
| 0.3366 | 0.3369 | 0.3515 | 0.3487 | 0.3376 | 0.3616 |
| 0.3515 | 0.3487 | 0.3500 | 0.3360 | 0.3380 | 0.3770 |

| 4700~4200 K | | | | | |
|-------------|--------|--------|--------|--------|--------|
| D0 | | D1 | | D2 | |
| x | y | x | y | x | y |
| 0.3737 | 0.3875 | 0.3513 | 0.3471 | 0.3737 | 0.3875 |
| 0.3549 | 0.3743 | 0.3500 | 0.3360 | 0.3770 | 0.4030 |
| 0.3513 | 0.3471 | 0.3650 | 0.3450 | 0.3565 | 0.3910 |
| 0.3671 | 0.3580 | 0.3671 | 0.3580 | 0.3549 | 0.3743 |

| 4200~3700 K | | | | | |
|-------------|--------|--------|--------|--------|--------|
| E0 | | E1 | | E2 | |
| x | y | x | y | x | y |
| 0.4007 | 0.4043 | 0.3650 | 0.3450 | 0.4050 | 0.4190 |
| 0.3737 | 0.3875 | 0.3671 | 0.3580 | 0.4007 | 0.4043 |
| 0.3671 | 0.3580 | 0.3898 | 0.3716 | 0.3737 | 0.3875 |
| 0.3900 | 0.3718 | 0.3850 | 0.3600 | 0.3770 | 0.4030 |

| 3700~3200 K | | | | | |
|-------------|--------|--------|--------|--------|--------|
| F0 | | F1 | | F2 | |
| x | y | x | y | x | y |
| 0.4298 | 0.4163 | 0.3892 | 0.3695 | 0.4298 | 0.4163 |
| 0.3998 | 0.4015 | 0.3850 | 0.3600 | 0.4360 | 0.4310 |
| 0.3892 | 0.3695 | 0.4100 | 0.3700 | 0.4050 | 0.4190 |
| 0.4150 | 0.3816 | 0.4150 | 0.3816 | 0.3998 | 0.4015 |

| 3200~2900 K | | | | | |
|-------------|--------|--------|--------|--------|--------|
| G0 | | G1 | | G2 | |
| x | y | x | y | x | y |
| 0.4560 | 0.4260 | 0.4100 | 0.3700 | 0.4640 | 0.4410 |
| 0.4298 | 0.4163 | 0.4150 | 0.3816 | 0.4560 | 0.4260 |
| 0.4150 | 0.3816 | 0.4377 | 0.3896 | 0.4298 | 0.4163 |
| 0.4377 | 0.3896 | 0.4320 | 0.3780 | 0.4360 | 0.4310 |

| 2900~2600K | | | | | |
|------------|--------|--------|--------|--------|--------|
| H0 | | H1 | | H2 | |
| x | y | x | y | x | y |
| 0.4812 | 0.4318 | 0.4377 | 0.3896 | 0.4812 | 0.4318 |
| 0.4560 | 0.4260 | 0.4320 | 0.3780 | 0.4920 | 0.4510 |
| 0.4377 | 0.3896 | 0.4510 | 0.3800 | 0.4640 | 0.4410 |
| 0.4595 | 0.3942 | 0.4595 | 0.3942 | 0.4560 | 0.4260 |

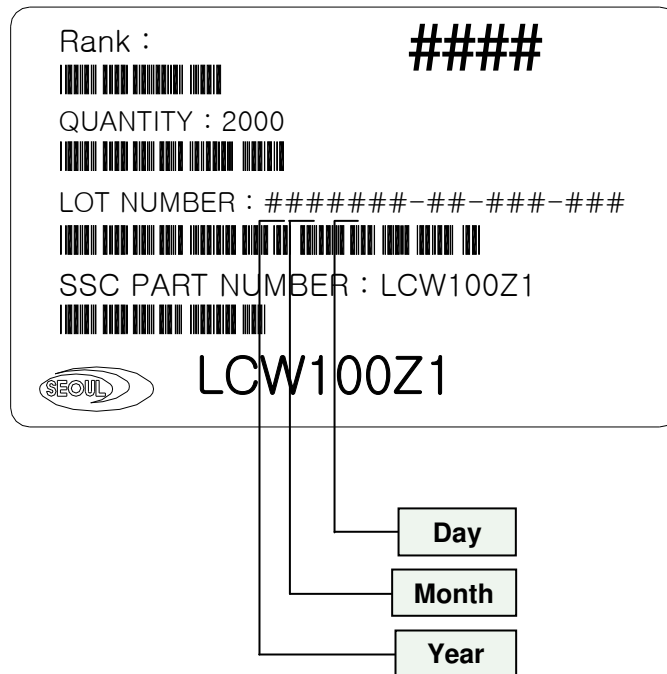
(2) Luminous Intensity : LI [mcd] / Luminous Flux: LF [lm]

| Rank | IV [mcd] | LF [lm] | Condition |
|------|-----------|---------|-----------|
| A | 1270~1590 | 4.0~5.0 | 20mA |
| B | 1590~1910 | 5.0~6.0 | |
| C | 1910~2230 | 6.0~7.0 | |
| D | 2230~2550 | 7.0~8.0 | |

(3) Forward Voltage: V_F [V]

| Rank | V_F [V] | Condition |
|------|-----------|-----------|
| A | 2.70~2.95 | 20mA |
| B | 2.95~3.20 | |
| C | 3.20~3.45 | |
| D | 3.45~3.70 | |

(4) Labeling



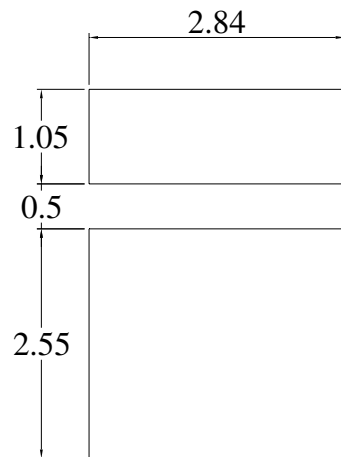
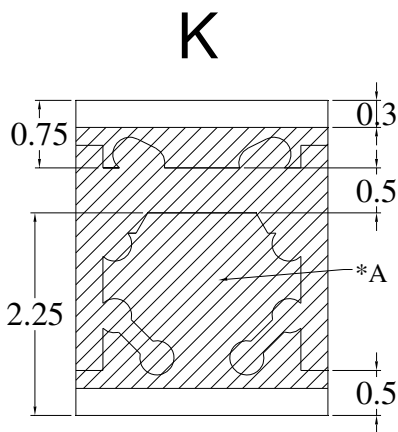
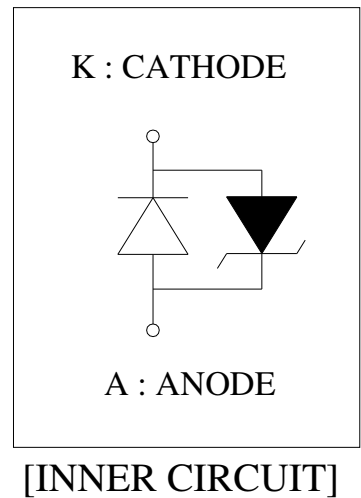
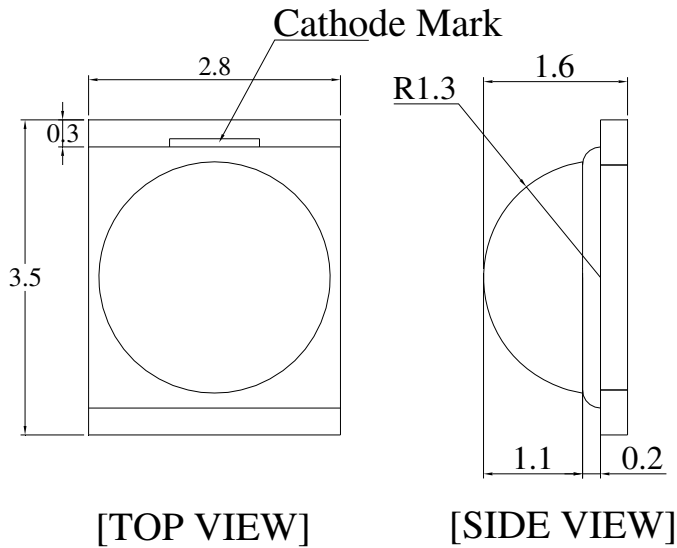
(5) Rank

#1#2#3#4

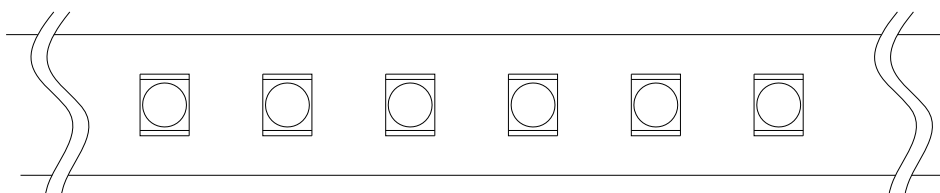
- #1 : Luminous Intensity : LI [mcd] / Luminous Flux : LF [lm]
- #2#3 : Color Coordinates : x, y
- #4 : Forward Voltage : V_F [V]

7. Outline Dimension

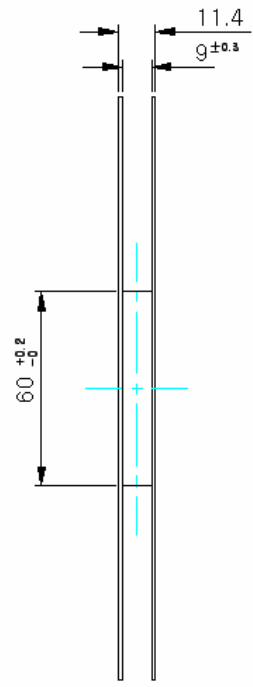
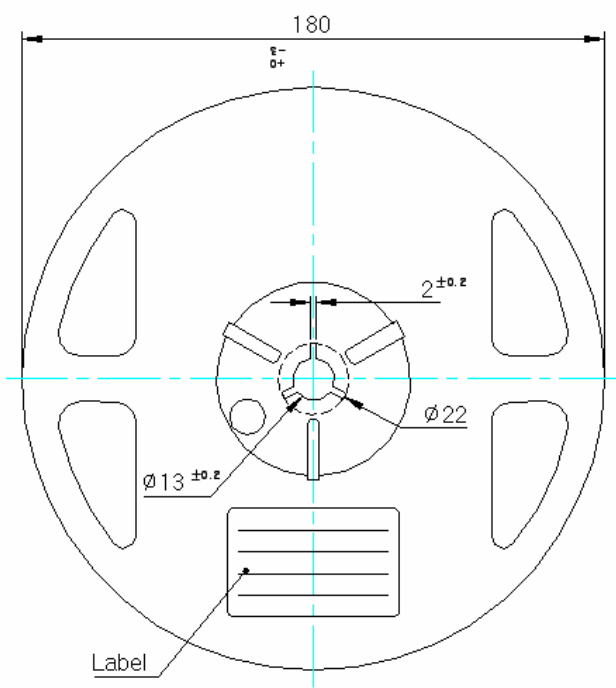
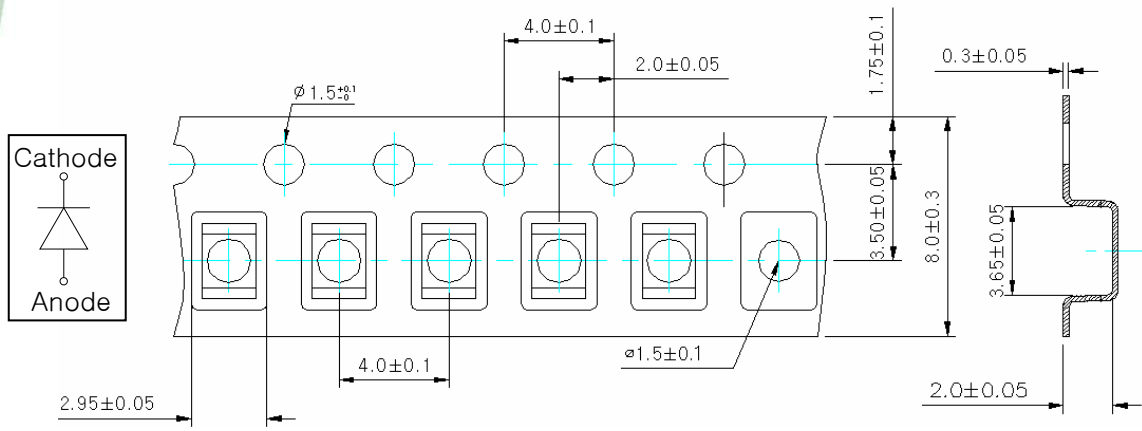
Tolerance: ± 0.1 , Unit: mm



*A : This area can be covered with thin resin.



8. Reel Structure

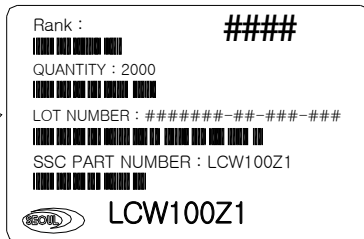
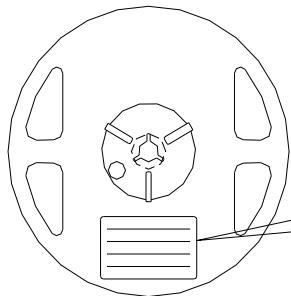


Tolerance: ±0.2, Unit: mm

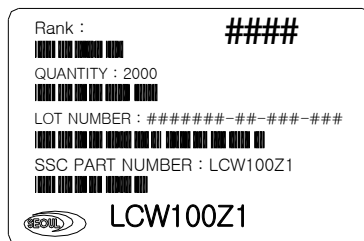
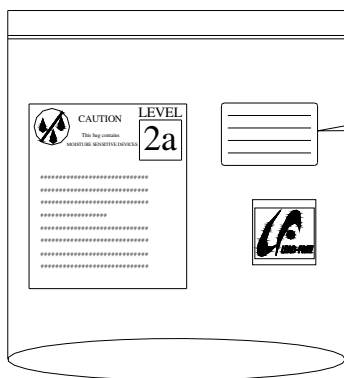
- (1) Quantity: 2,000pcs./Reel
- (2) Cumulative Tolerance: Cumulative Tolerance/10pitches to be ±0.2mm
- (3) Adhesion Strength of Cover Tape: Adhesion strength to be 0.1-0.7N when the over tape is turned off from the carrier tape at 10° angle to be the carrier tape.
- (4) Package: P/N, Manufacturing data Code No. and quantity to be indicated on a damp proof Package.

9. Packing

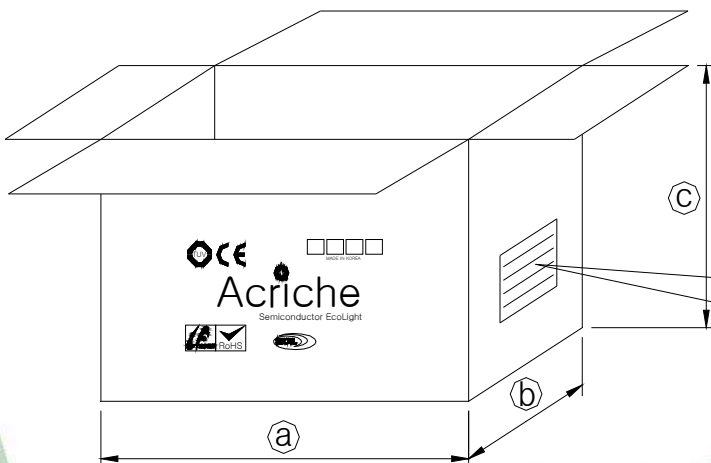
Reel



Aluminum Vinyl Bag

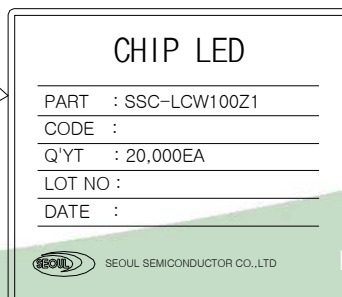


Outer Box



*Material : Paper (SW3B(B))

| TYPE | SIZE(mm) | | |
|--------|----------|-----|-----|
| | Ⓐ | Ⓑ | Ⓒ |
| 7 inch | 245 | 220 | 142 |



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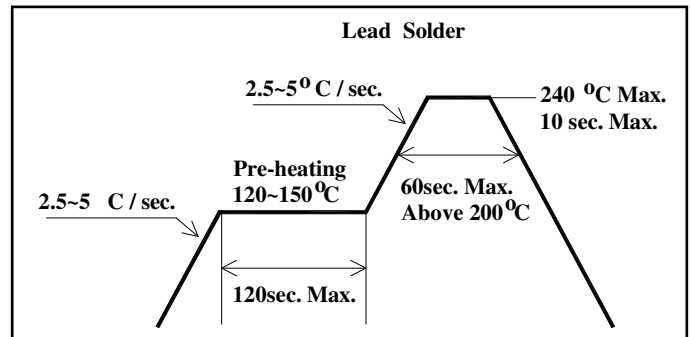
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10. Soldering profile

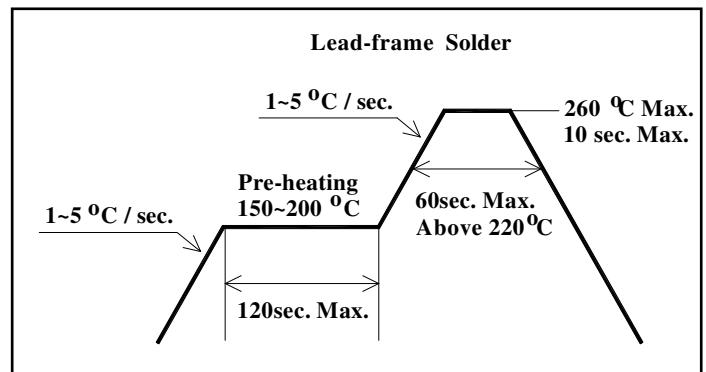
(1) Lead Solder

| 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 1 second at maximum 280°C under soldering iron.

(4) The encapsulated material of the LEDs is silicone.

Precautions should be taken to avoid the strong pressure on the encapsulated part.

So when using the chip moulder, the picking up nozzle that does not affect the silicone resin should be used.

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

11. Precaution for Use

1. Storage

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

※ Temperature : 5°C~30°C Humidity : 60%HR max.

2. Parts stored more than four weeks after opening or if desiccant indicator shower color changes, it is highly recommended that LED's should be baked for 10 ~ 12 hours at 60°C±5°C
3. LEDs must be stored at clean atmosphere. If the LEDs are stored for 3 months or more after shipment from SSC, storage in a sealed container with a nitrogen is recommended.
4. If the LED is considered to be wet, it is highly recommended that the LED should be dried for 100Hr at 80±5°C or 12Hr at 100±5°C.
5. Any mechanical force or excess vibration should be avoided during temperature cooling process to normal temperature after reflow.
6. Rapid cooling should be avoided
7. LED should not be placed on a flexible area of the PCB
8. This device should not be used in any type of fluid such as water, oil, organic solvent and etc. When washing is required, IPA should be used.
9. When the LED is operating in DC mode, the driving current should be determined after considering the thermal properties of the application and maximum ambient temperature requirements.
10. Damage prevention from ESD or Surge.
 - ☞ It is highly recommended to use the wrist-band or anti electrostatic gloves when handling the LED's
 - ☞ All devices, equipments and machines must be properly grounded