Technical Data Sheet

SEOUL SEMICONDUCTOR

Pb Free

Specification

SSC-LCW100Z1

Preliminary
(Rev 3.1 - 100223)

SSC		Customer
Drawn	Approval	Approval

서식번호 : SSC-QP-7-07-25 (Rev.0.0)

SEOUL SEMICONDUCTOR

[Contents]

Technical Data Sheet

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SSC-LCW100Z1

SSC-LCW100Z1

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℃)

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	℃
Storage Temperature	$T_{stg.}$	-40 ~ 95	℃
Junction Temperature	$T_{j.}$	115	℃

*1 I_{FM} conditions: Pulse width Tw≤ 1msec and Duty ratio≤1/10.

3. Electro-Optical Characteristics

(Ta=25℃)

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

*2 Φv 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.

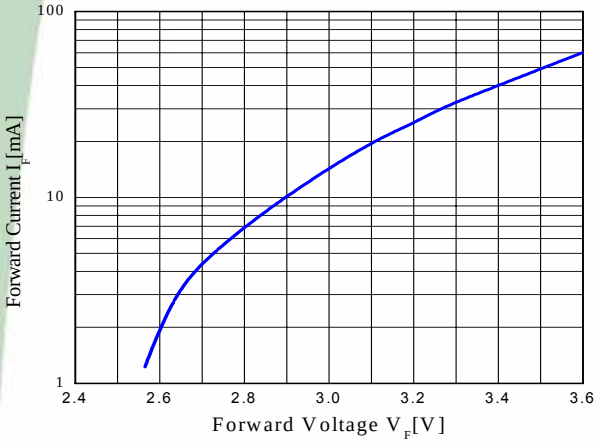
[Note] All products confirm to the listed minimum and maximum specifications for electric and optical characteristics, when operated at 20mA within the maximum ratings shown above. All measurements were made under the standardized environment of SSC.

(Tolerance : I_v ±10 %, color coordinate 0.01, V_F ±0.1 V)

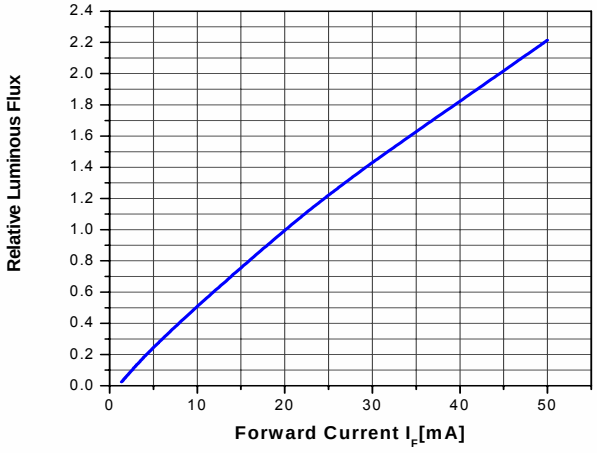
4. Electro-Optical Characteristic Diagram

Ta = 25°

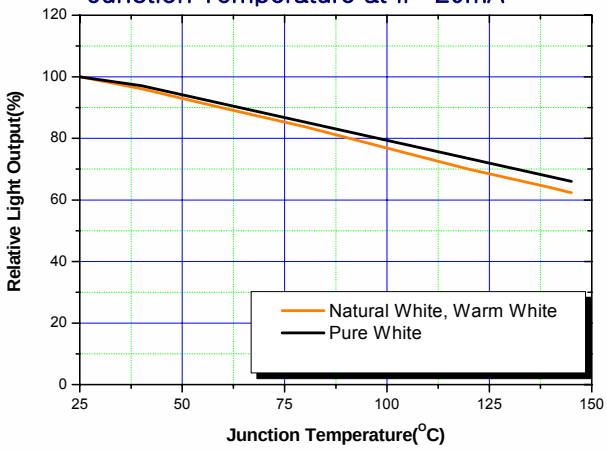
Forward Current vs. Forward Voltage



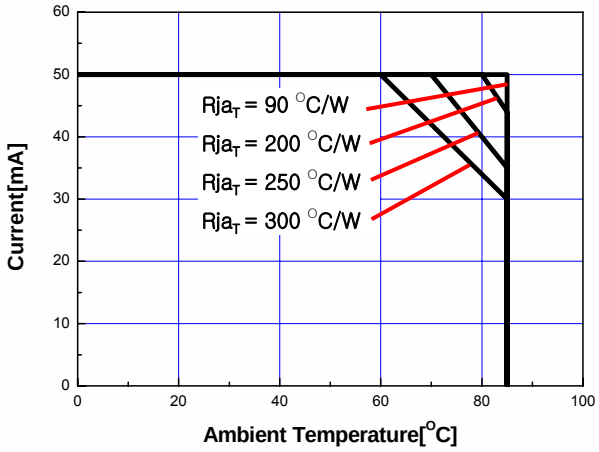
Relative Luminous Flux vs. Forward Current



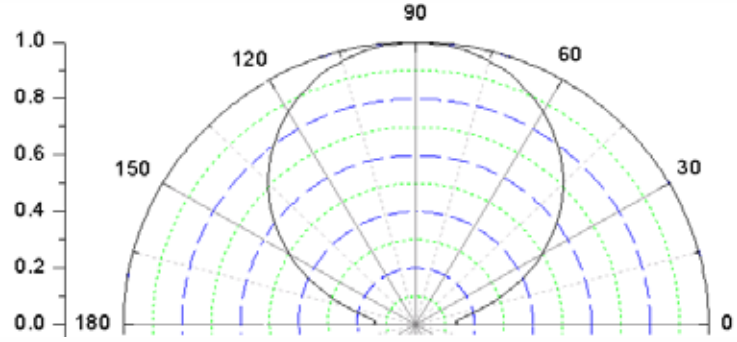
Relative Light Output vs. Junction Temperature at IF=20mA



Ambient Temperature vs Allowable Forward Current



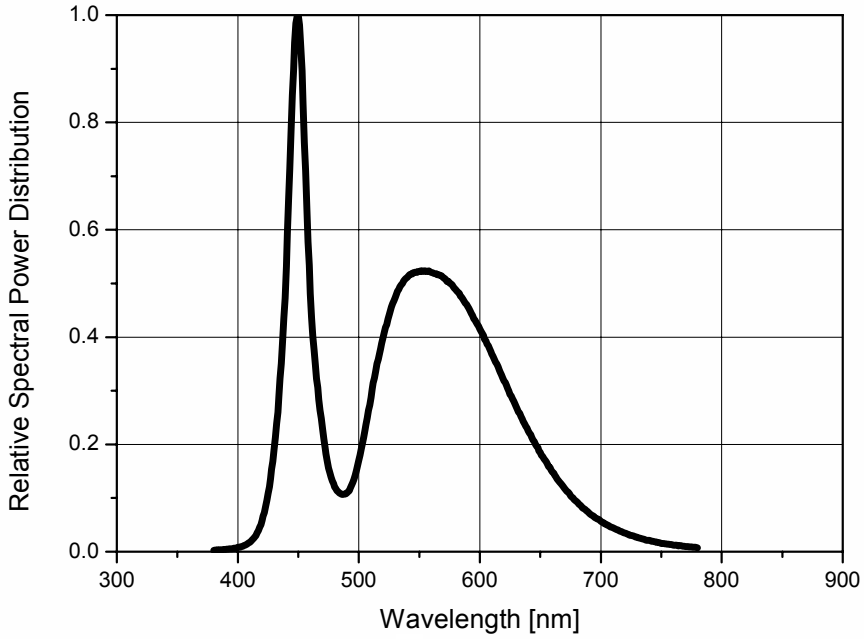
Radiation Diagram



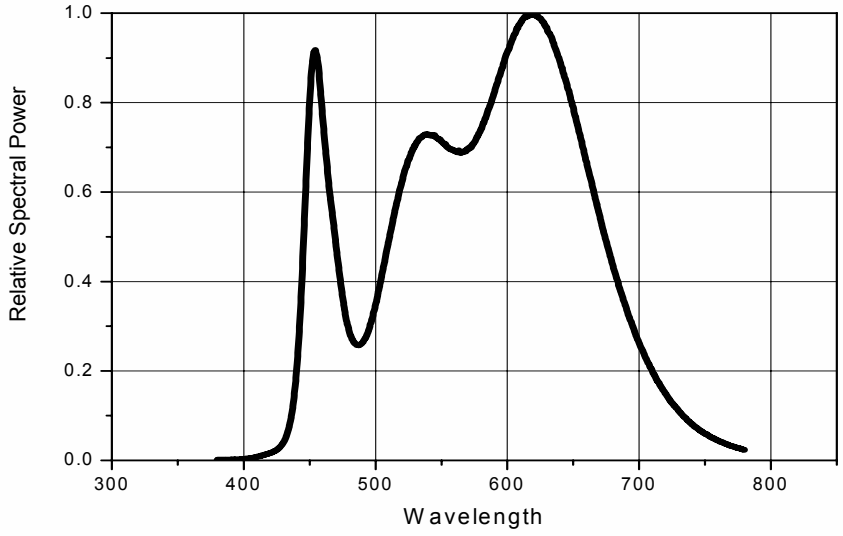
서식번호 : SSC-QP-7-07-25 (Rev.0.0)

Spectrum Distribution

1. 4700K ~ 8200K



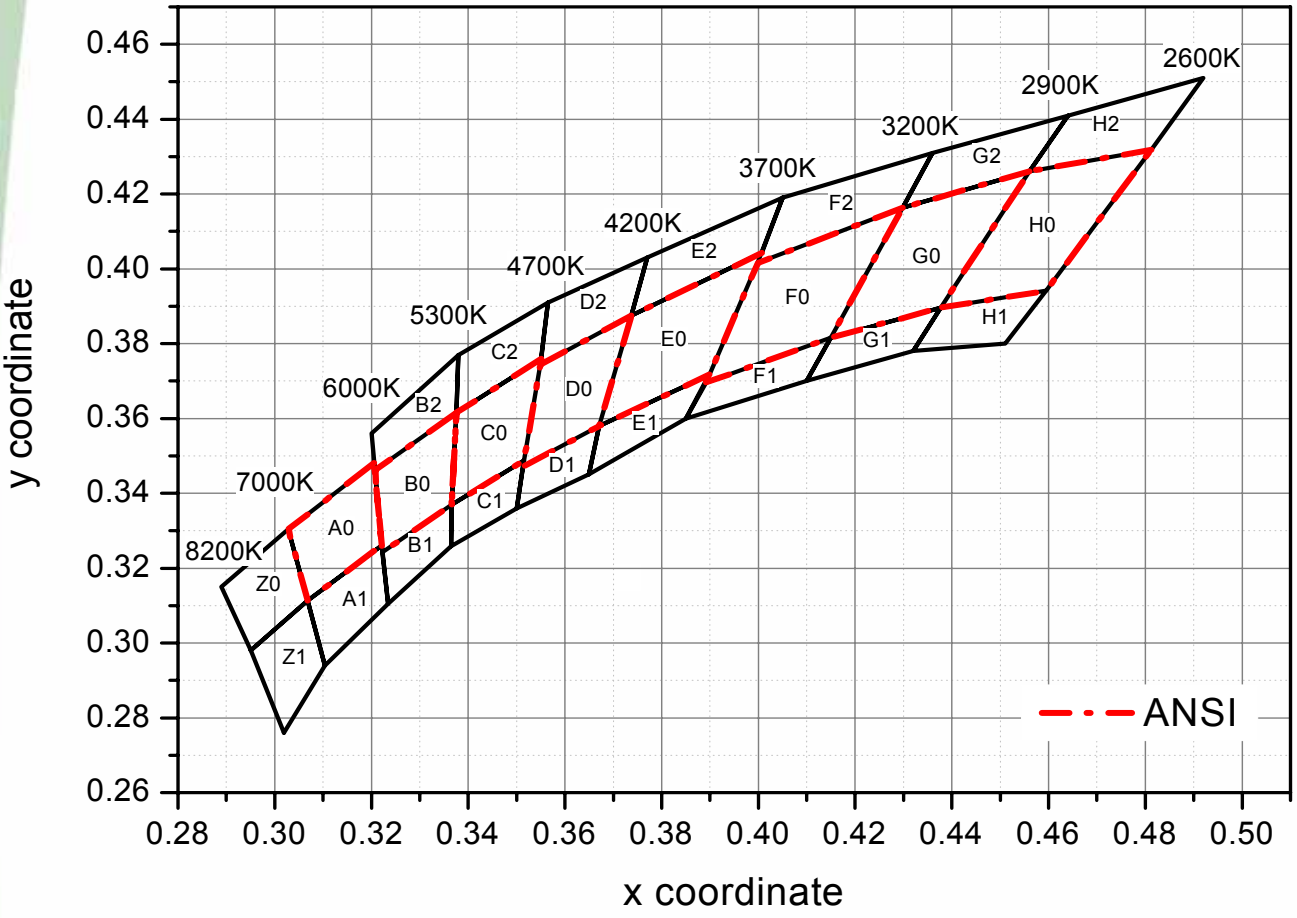
2. 2600K ~ 4700K



5. Reliability Test

Item	Test Conditions	Duration / Cycle	Number Of Damaged
Thermal Shock	*Ta* = −40℃ (1 hour) ~ 85℃ (1 hour)	100 Cycle	0/22
Thermostable	*Ta* = 85℃, RH = 85% (24 hours Storage) → Reflow 3 cycle → Thermal Shock 30 Cycle		0/22
High Temperature Storage	*Ta* = 85℃	1000 Hours	0/22
High Temp. High Humidity Storage	*Ta* = 85℃, RH = 85%	1000 Hours	0/22
Low Temperature Storage	*Ta* = −40℃	1000 Hours	0/22
High Temp. High Humidity Life Test	*Ta* = 60℃, RH = 90%, *IF* = 20mA	1000 Hours	0/22
High Temperature Life Test	*Ta* = 85℃, *IF* = 20mA	1000 Hours	0/22

6. Binning & Labeling



서식번호 : SSC-QP-7-07-25 (Rev.0.0)

(1) Color Coordinate : x, y

<IF=20mA, Ta=25℃>

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

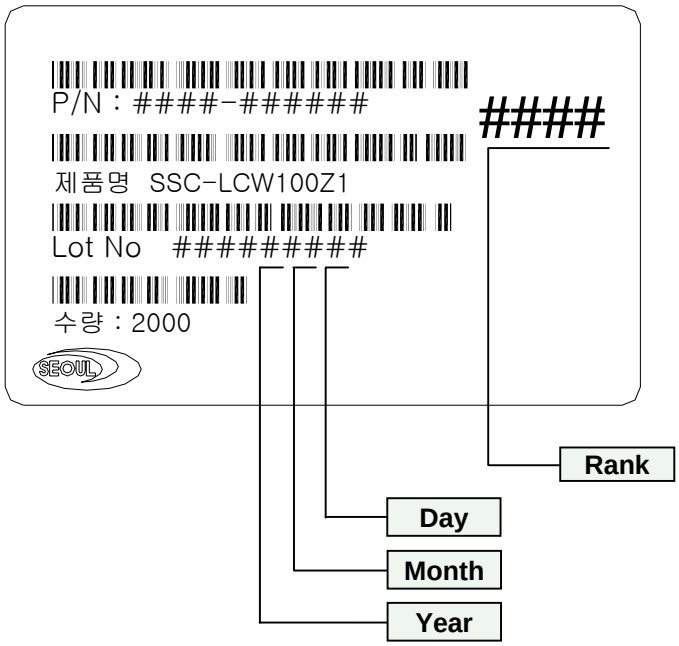
(2) Luminous Intensity : LI [mcd] / Luminous Flux: LF [lm]

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	
E	2550~2860	8.0~9.0	
F	2860~3180	9.0~10.0	

(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

$\underline{\#_1\#_2\#_3\#_4}$

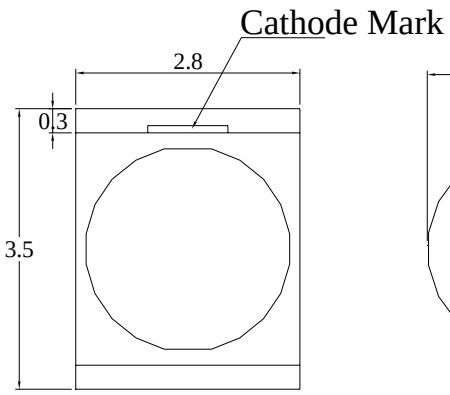
- #1 : Luminous Intensity : LI [mcd] / Luminous Flux : LF [lm]

- #2#3 : Color Coordinates : x, y

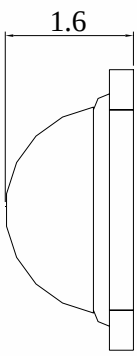
- #4 : Forward Voltage : V_F [V]

7. Outline Dimension

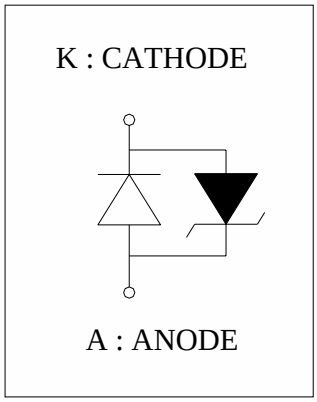
Tolerance: ±0.1, Unit: ㎜



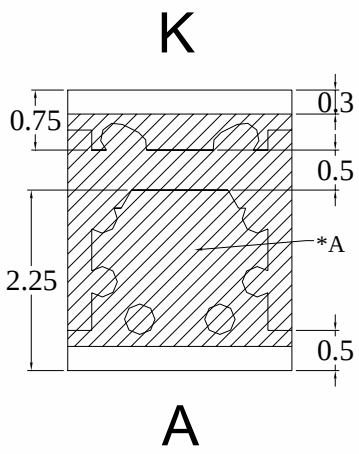
[TOP VIEW]



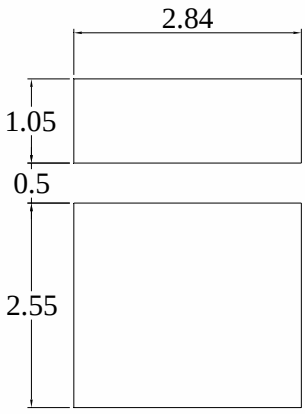
[SIDE VIEW]



[INNER CIRCUIT]

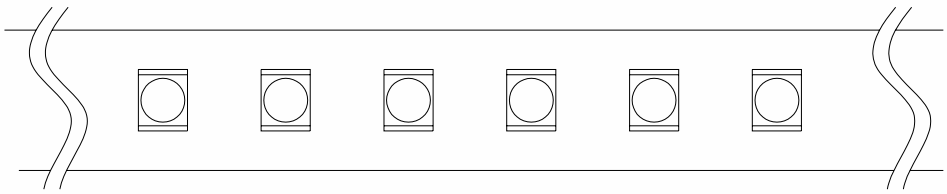


[BOTTOM VIEW]



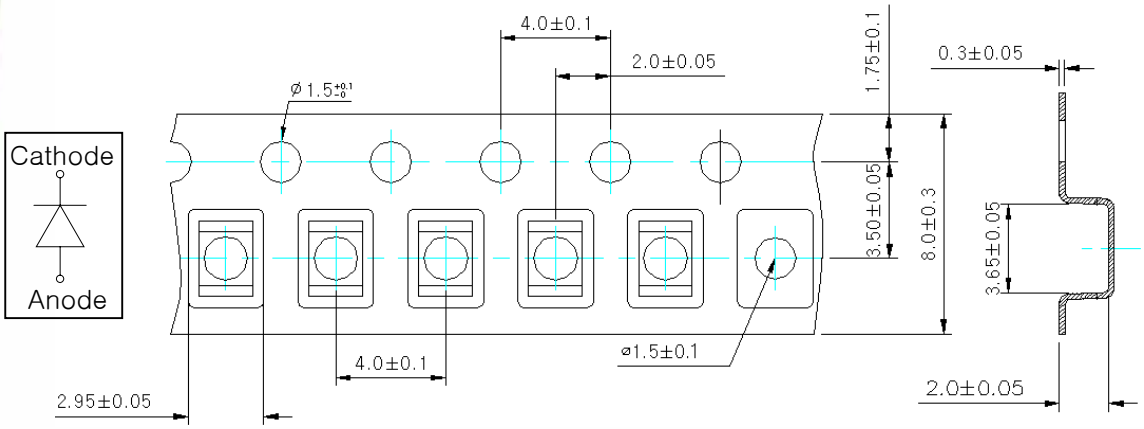
[Recommended Solder Pattern]

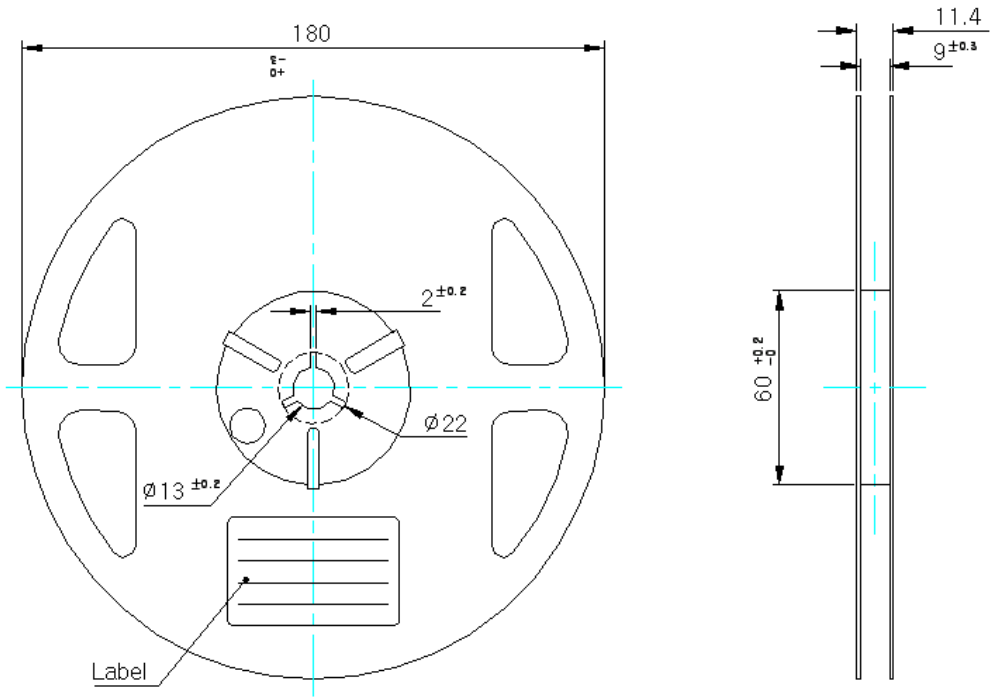
*A : This area can be covered with thin resin.



[Recommended Array Pattern]

8. Reel Structure





Tolerance: ±0.2, Unit: ㎜

(1) Quantity: 2,000pcs./Reel

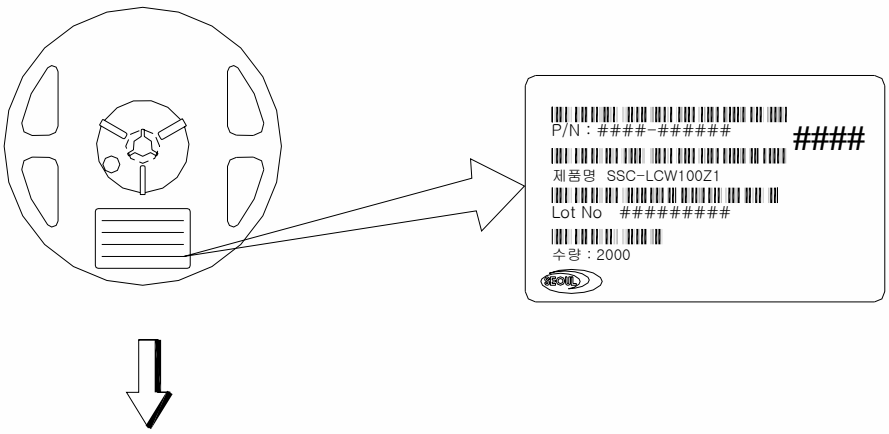
(2) Cumulative Tolerance: Cumulative Tolerance/10pitches to be ±0.2mm

(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 at10˚angle to be the carrier tape.

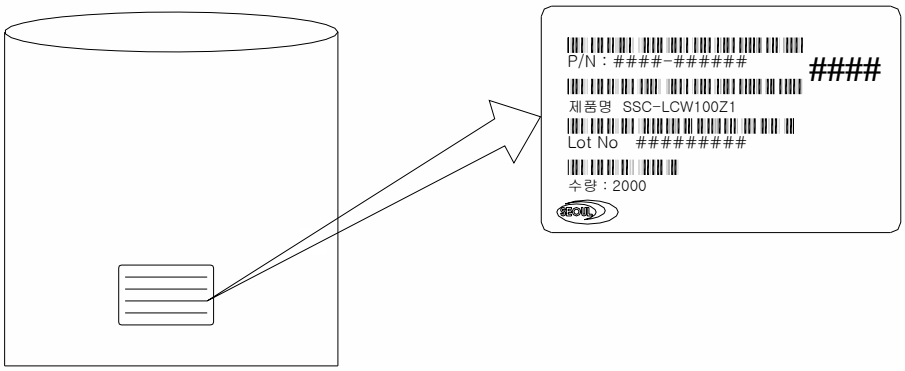
(4) Package: P/N, Manufacturing data Code No. and quantity to be indicated on a damp proof Package.

9. Packing

Reel



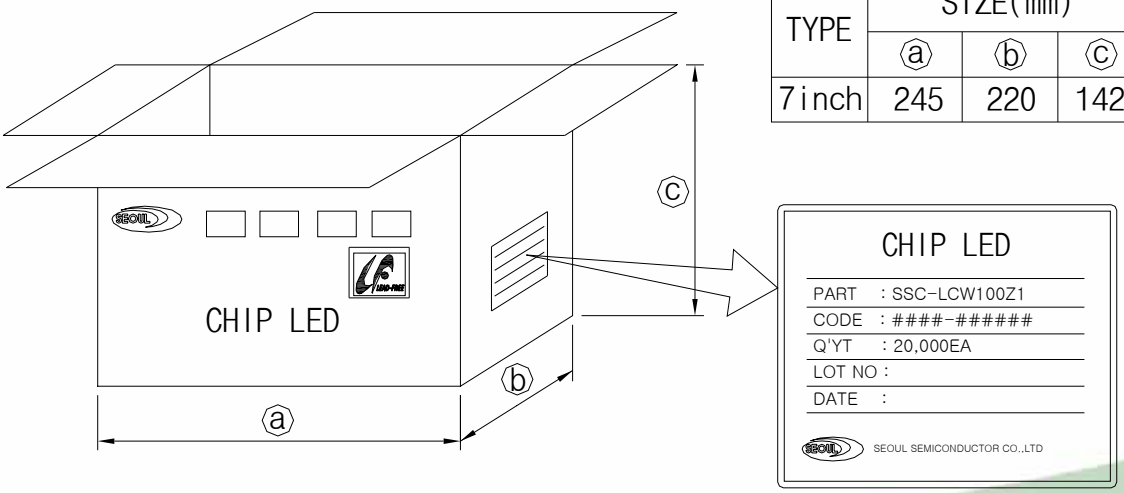
Aluminum Vinyl Bag



Outer Box

*Material: Paper(SW3B(B))

TYPE	SIZE(mm)		
	ⓐ	ⓑ	ⓒ
7inch	245	220	142

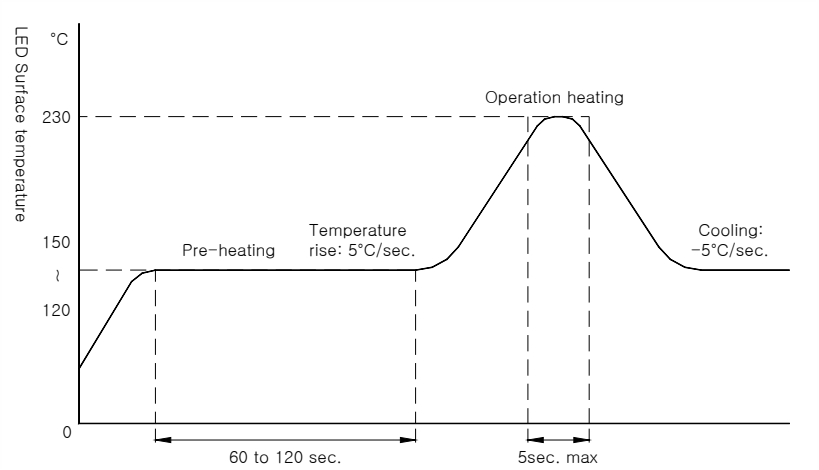


10. Soldering profile

Reflow Soldering Conditions/ Profile

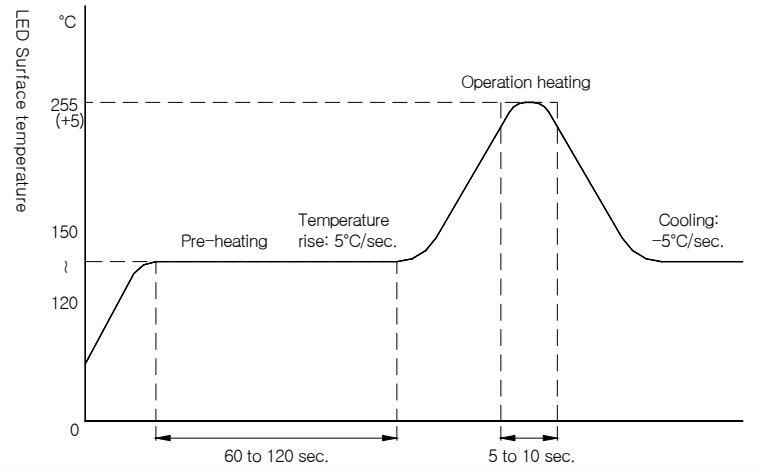
(1) Lead Solder

- Preliminary heating to be at 150℃max. for 2 minutes max.
- Soldering heat to be at 230 ± 5℃max. for 5 seconds max.



(2) Lead-Free Solder

- Preliminary heating to be at 150℃max. for 2 minutes max.
- Soldering heat to be at 255℃(+5/-0)℃max. for 10 seconds max.



(3) Hand Soldering Condition

- Not more than 1 seconds @MAX280℃, under Soldering iron.

[Note] In case 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℃~30℃ Humidity : 60%HR max.

2. Parts stored more than one week 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℃ or 12Hr at 100±5℃.

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 mush be properly grounded