Technical Data Sheet

SEOUL SEMICONDUCTOR

Specification
FCW321G

SSC		CUSTOMER
Drawn	Approval	Approval

Rev. 00

September 2008

www.ZLED.com

Document No. : SSC-QP-7-07-24 (Rev.00)

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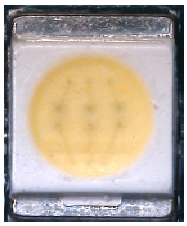
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SEOUL SEMICONDUCTOR

FCW321G

FCW321G

Description



- Vary Thin PKG of Reflector type
- Surface-mounted chip LED device.
- Pb-free and RoHS complaint component.
- High brightness
- Low Thermal Resistance
- Tape and Reel packing.

Features

- 3.5 X 2.8 X 0.6 mm
- Emitted Color : White
- CIE chromaticity x : 0.3 y : 0.3
- Material : InGaN

Applications

- Electric appliance
- Other decoration lighting

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1. Absolute maximum ratings

(Ta=25℃)

Parameter	Symbol	Value	Unit
Power Dissipation	P_d	306	mW
Forward Current	I_F	90	mA
Peak Forward Current	I_{FM} *1	300	mA
Reverse Voltage	V_R	5	V
Operation Temperature	$T_{opr.}$	-30 ~ 85	℃
Storage Temperature	$T_{stg.}$	-40 ~ 100	℃

*1 I_{FM} conditions: Pulse width Tw≤0.1ms and Duty ratio≤1/10.

2. Electro-Optical Characteristics

(Ta=25℃)

Characteristics	Symbol	Condition	Min	Typ	Max	Unit
Forward Voltage	V_F	I_F=90㎃	2.8	3.4	3.8	V
		I_F=1㎂	1.7		2.7	
		I_F=10㎂	2.0		2.7	
Zener Voltage	$V_{F(Z)}$	$I_{F(Z)}$=5mA	0.7	-	1.5	V
Luminous Intensity *2	I_V	I_F=90㎃	5	7	13	cd
		I_F=200㎃ (Flash mode) *3	7	12.5	-	
		I_F=300㎃ (Peak current mode) *4	9	17	-	
Illumination	lx	I_F=200㎃ (Flash mode) *3	-	25.5	-	lx@0.7m
			-	12.5	-	lx@1m
Luminous Flux	lm	I_F=90㎃	-	39.5	-	lm
Chromaticity Coordinates	X	I_F=90㎃	0.295	0.330	0.368	
	Y	I_F=90㎃	0.288	0.330	0.380	
Viewing Angle	$\Delta 1/2\theta$	I_F=90㎃	-	120	-	°

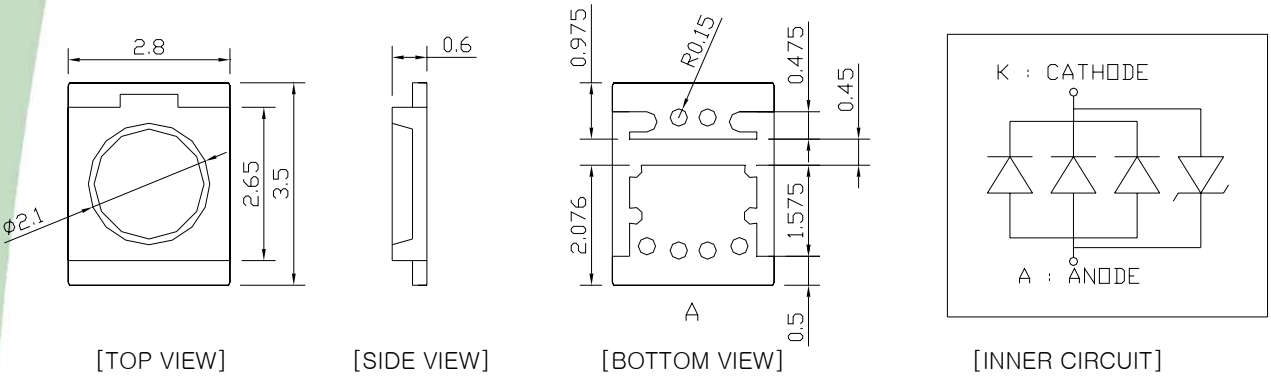
*2 The luminous intensity IV is measured at the peak of the spatial pattern which may not be aligned with the mechanical axis of the LED package.

*3 Flash mode condition is Pulse width Tw = 2sec, Duty ratio = 2 / 7

*4 Peak current mode is Pulse width Tw≤300ms, Duty ratio≤1/10

[Note] (Tolerance : IV±10%, color coordinate ±0.01, VF ±0.1)

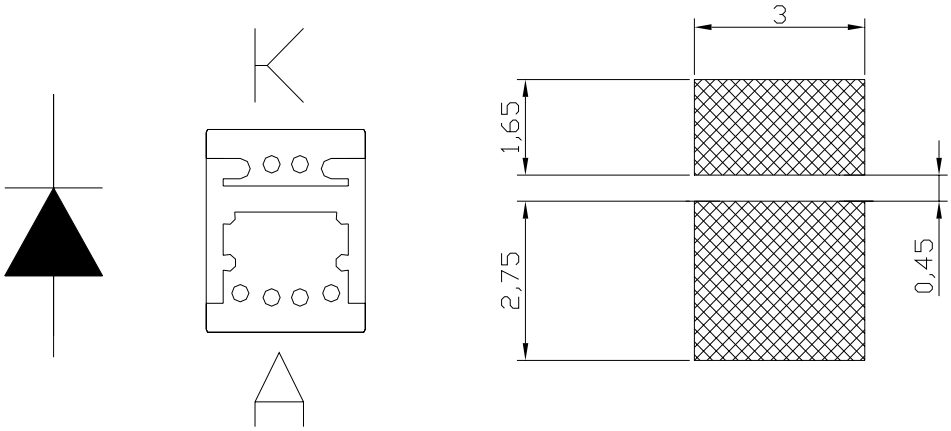
3.Outline Dimension



[TOP VIEW] [SIDE VIEW] [BOTTOM VIEW] [INNER CIRCUIT]

(Tolerance: ±0.1, Unit: mm)

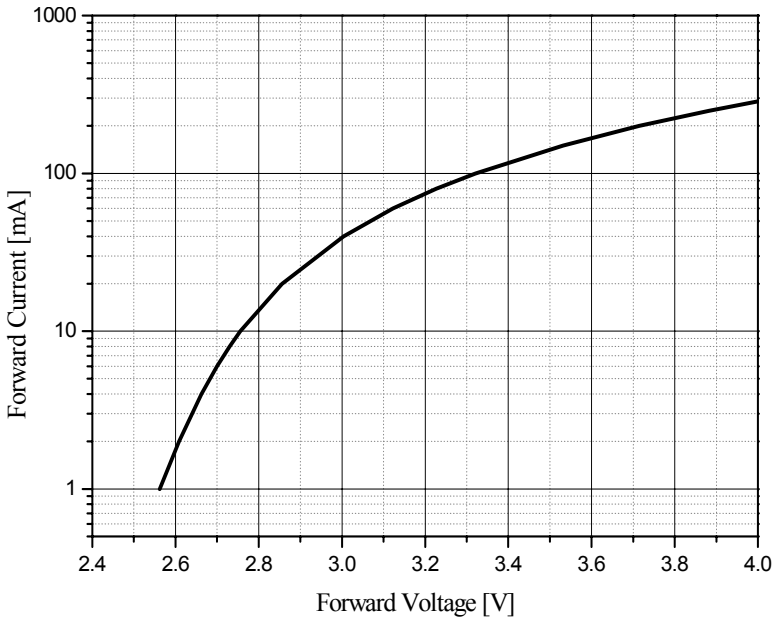
- Recommended Soldering Design



4. Electro-Optical characteristic Diagram

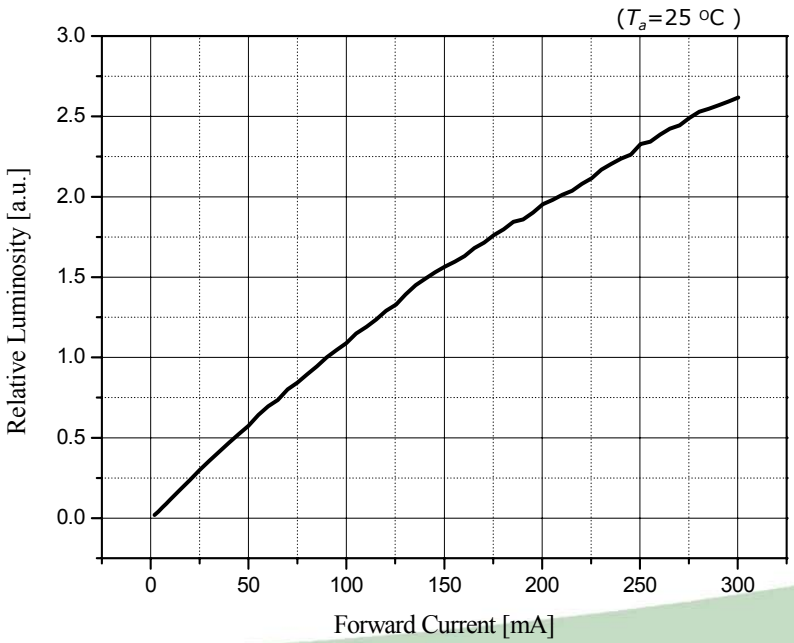
Forward Current vs. Forward Voltage

(T_a=25 ºC)



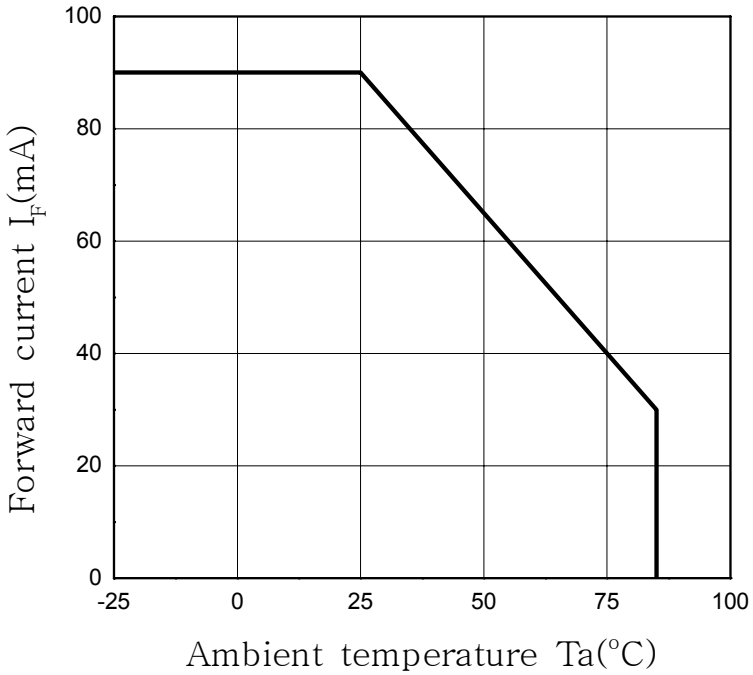
Relative Luminous Intensity vs Forward Current

(T_a=25 ºC)



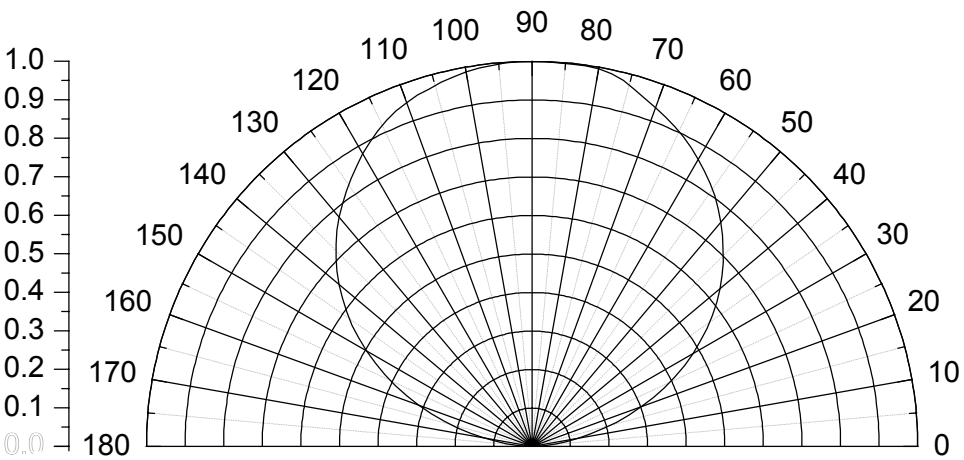
4. Electro-Optical characteristic Diagram

Ambient Temperature vs. Allowable Forward Current



Radiation Diagram

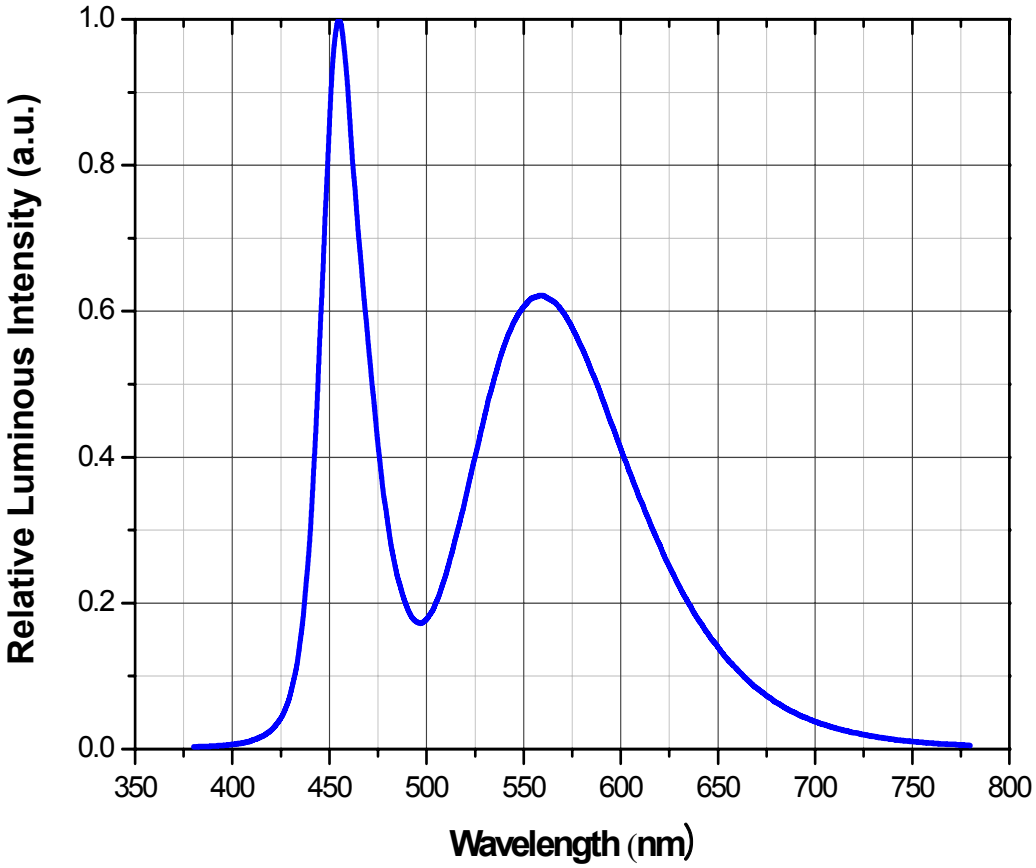
(T_a=25 °C)



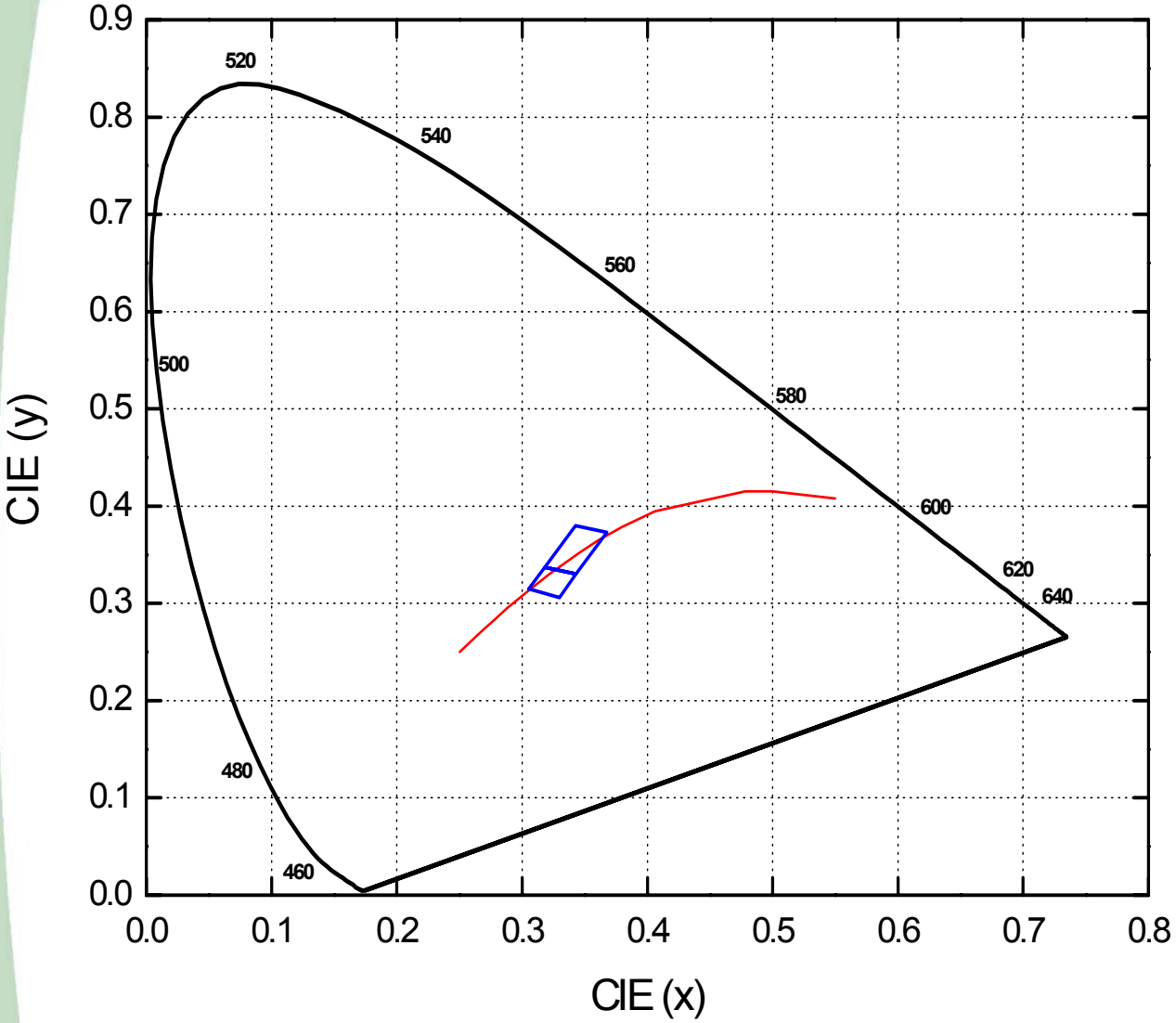
4. Electro-Optical characteristic Diagram

Spectrum

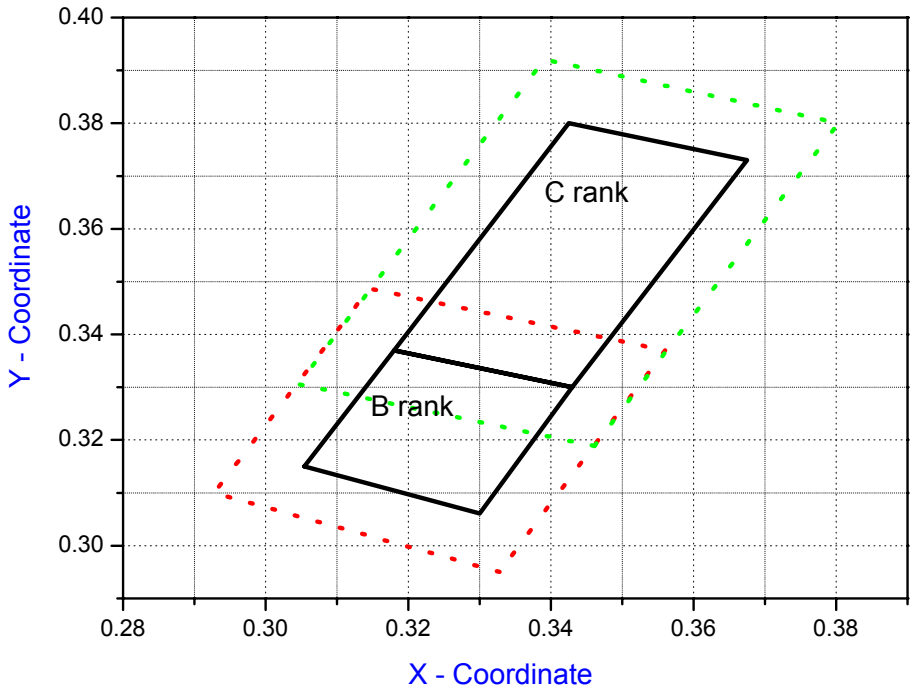
(T_A=25℃, I_F=90mA)



5. Color & Binning



5. Color & Binning



※ Color Rank

Bin	CIE x	CIE y
B	0.3054	0.3150
	0.3300	0.3061
	0.3430	0.3300
	0.3180	0.3370
C	0.3430	0.3300
	0.3180	0.3370
	0.3425	0.3800
	0.3675	0.3730

* Measurement Uncertainty of the Color Coordinates : ± 0.01

6. Rank of FCW321G

(1) Luminous Intensity: Iv [mcd]

Rank	Iv [mcd]	Condition
A	5000 ~ 8000	IF =90mA
B	8000 ~ 13000	

(2) Color Coordinate: x, y

Rank		1	2	3	4	Condition
B	x	0.3054	0.3300	0.3430	0.3180	IF =90mA
	y	0.3150	0.3061	0.3300	0.3370	
C	x	0.3430	0.3180	0.3425	0.3675	
	y	0.3300	0.3370	0.3800	0.3730	

(3) Forward voltage: V_F

VF [V]	Condition
2.8 ~ 3.8	IF =90mA

7. Reliability Tests

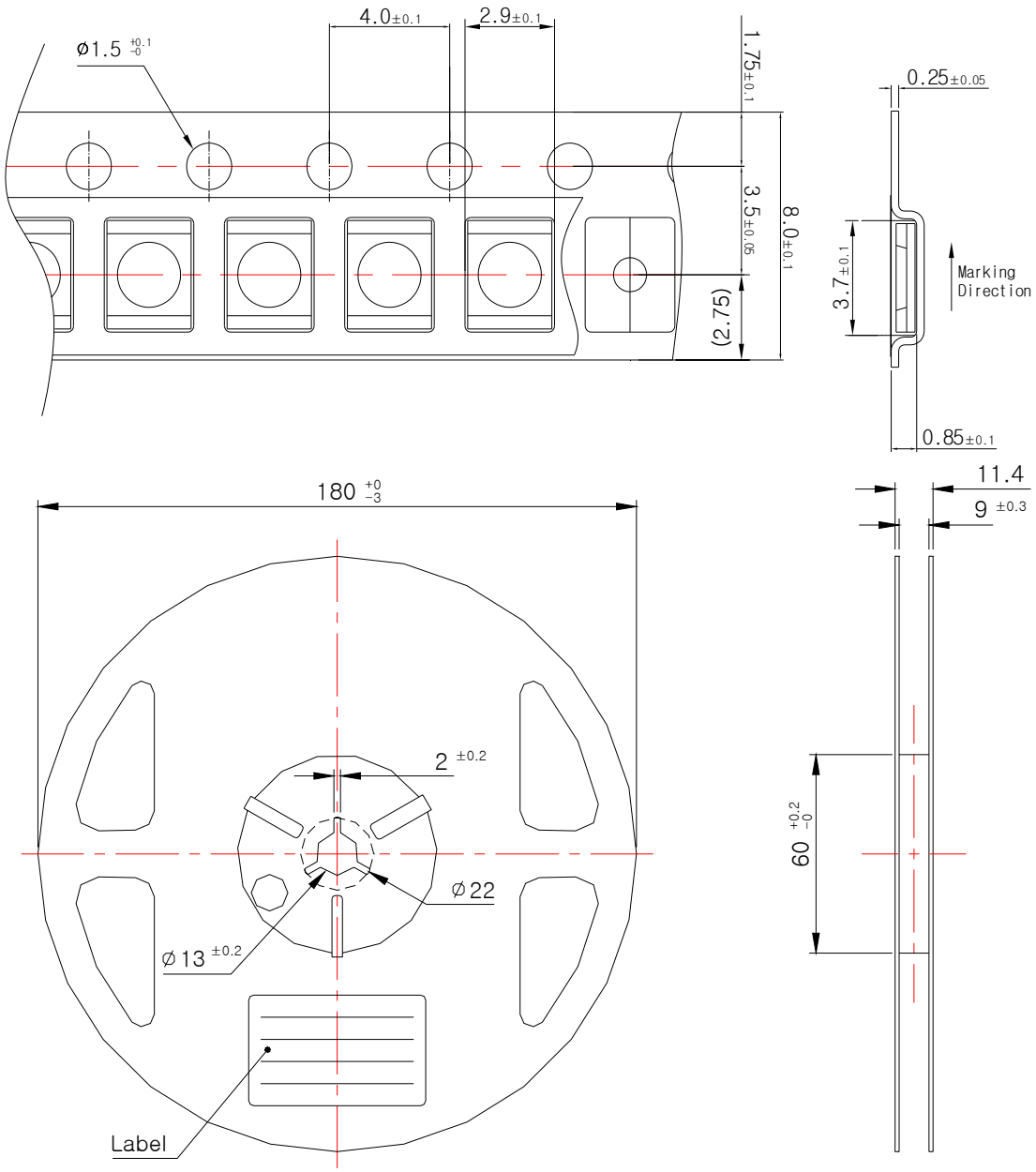
Item	Condition	Note	Failures
Life Test	T_a = RT, I_F = 90mA	1000hrs	0/22
High Temperature Operating	T_a = 85ºC, I_F = 90mA	1000hrs	0/22
Low Temperature Operating	T_a = -30ºC, I_F = 90mA	1000hrs	0/22
Thermal Shock	T_a = -30ºC (30min) ~ 85ºC (30min) (Transfer time : 10sec, 1Cycle = 1hr)	100 cycles	0/40
Resistance to soldering Heat	T_s = 255 ± 5ºC, t = 10sec	1 time	0/22
ESD (Human Body Model)	1kV, 1.5kΩ ; 100pF	1 time	0/22
High Temperature Storage	T_a = 100ºC	1000hrs	0/22
Low Temperature Storage	T_a = -40ºC	1000hrs	0/22
Temperature Humidity Storage	T_a = 85ºC, RH = 85%	1000hrs	0/22
Temperature Humidity Operating	T_a = 85ºC, RH = 85%, I_F = 90mA	100hrs	0/22

< Judging Criteria For Reliability Tests >

V_F	USL[1] X 1.2
I_R	USL X 2.0
Φ_V	LSL [2] X 0.7

Notes :
[1] USL : Upper Standard Level
[2] LSL : Lower Standard Level.

8. Packing



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

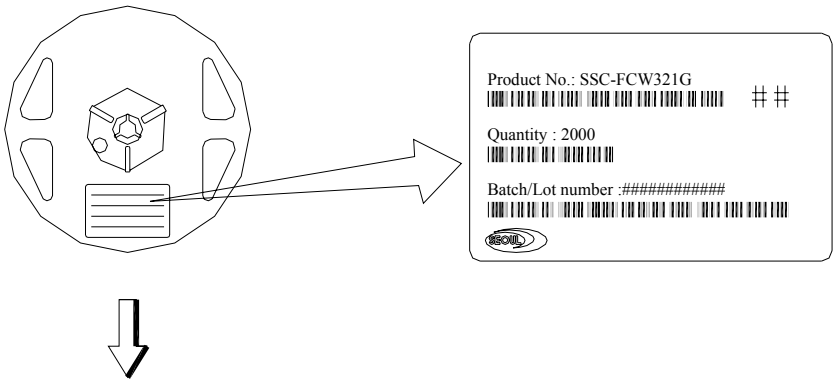
(2) Cumulative Tolerance: Cumulative Tolerance/10pitches to be ±0.2mm

(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.

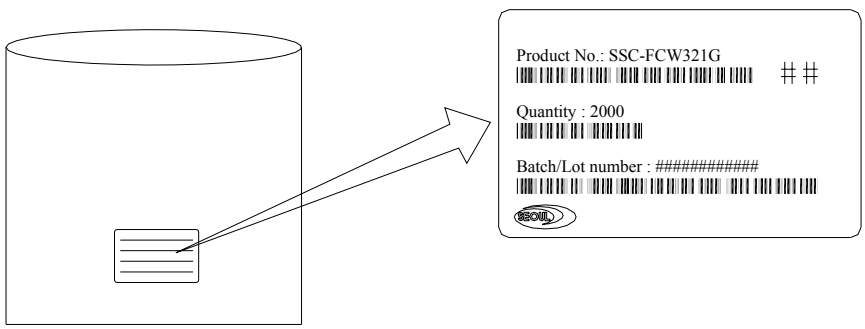
(4) Package: P/N, Manufacturing data Code No. and quantity to be indicated on a damp proof Package.

● Reel Packing Structure

Reel



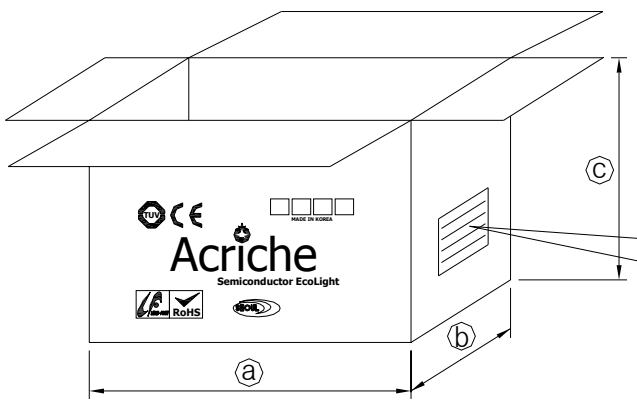
Aluminum Vinyl Bag

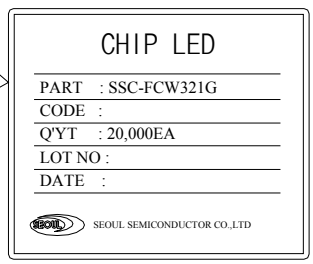


Outer Box

*Material: Paper(SW3B(B))

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

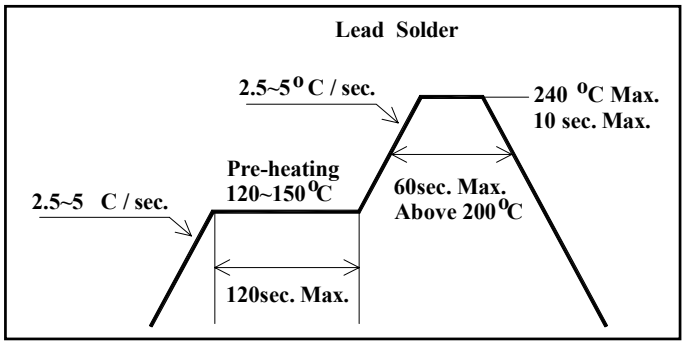




9. Soldering

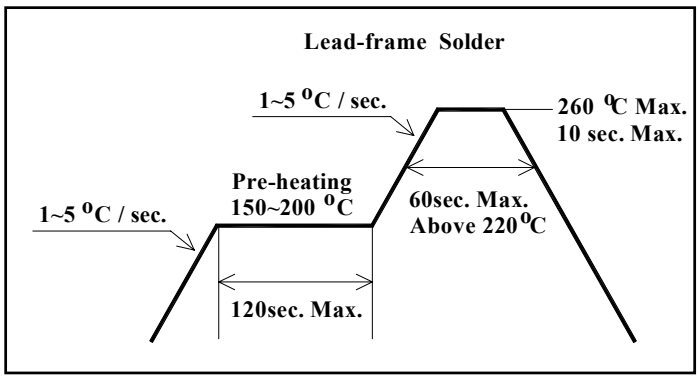
(1) Lead Solder

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



(2) Lead-Free Solder

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



(3) Hand Soldering conditions
Do not exceed 3 seconds 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 mounter, the picking up nozzle that does not affect the silicone resign should be used.

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 the dry box (or desiccator) with a desiccant. Otherwise, to store them in the following environment is recommended.

Temperature : 5℃~30℃ Humidity : 60%HR max.

(2) Attention after opened

However LED is corresponded 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℃ Humidity : less than 30%

(3) In case of more than 1 week passed after opening or change color of indicator on desiccant components shall be dried 10-12hr. at 60±5℃.

(4) In case of supposed the components is humid, shall be dried dip-solder just before.

100Hr at 80±5℃ or 12Hr at 100±5℃.

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

(6) Quick cooling shall not be avoid.

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

(8) Anti radioactive ray design is not considered for the products listed here in.

(9) Gallium arsenide is used in some of the products listed in this publication. These products are dangerous if they are burned or smashed in the process of disposal. It is also dangerous to drink the liquid or inhale the gas generated by such products when chemically disposed.

(10) 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.

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

(12) 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.

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

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

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