Technical Data Sheet

SEOUL SEMICONDUCTOR

Specification
SWT821-S

SSC		CUSTOMER
Drawn	Approval	Approval

Rev. 04

March 2010

www.acriche.com

Technical Data Sheet

SEOUL SEMICONDUCTOR

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SSC-QP-7-07-24 (Rev.00)

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SEOUL SEMICONDUCTOR

SWT821-S

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1. Description

TOP VIEW LED is designed for high current operation and high flux output applications. Furthermore, its thermal management characteristic is better than other LED solutions by package SMD design and good thermal emission material.

According to these advantages, it enables to apply various lighting applications and design solution, automotive lighting etc.

Features

- White colored SMT package.
- Pb-free Reflow Soldering Application
- Suitable for all SMT assembly methods ; Suitable for all soldering methods
- RoHS Compliant

Applications

- Interior lighting
- General lighting
- Indoor and out door displays
- Architectural / Decorative lighting

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2. Absolute maximum ratings [1]

Parameter	Symbol	Value	Unit
Power Dissipation	P_d	324	mW
Forward Current	I_F	90	mA
Peak Forward Current (per die)	I_{FM} [2]	100	mA
Reverse Voltage (per die)	V_R	5	V
Operating Temperature	T_{opr}	-40~+85	℃
Storage Temperature	T_{stg}	-40~+100	℃
Junction Temperature	T_j	125	℃

[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 Tw≤1 msec of pulse width and D≤1/10 of duty ratio.

3. Electro-Optical characteristics

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage (per die) *	V_F	I_F=20mA	2.8	3.2	3.8	V
Reverse Current (per die)	I_R	V_F=5V	-	-	10	μA
Luminous Intensity* [1]	I_v	I_F=60mA	4.0	5.5	-	cd
Color Temperature	CCT	I_F=60mA	4,800	-	10,000	K
Optical Temperature	η_{elc}	I_F=60mA	-	70	-	lm/W
Viewing Angle [2]	$2\Theta_{1/2}$	I_F=60mA	-	120	-	deg.
Color Rendering Index*	Ra	I_F=60mA	62	68	-	-
ESD (HBM)		1.5kΩ;100pF	1	-	-	KV

[1] The luminous intensity IV was measured at the peak of the spatial pattern which may not be aligned with the mechanical axis of the LED package.
[2] $2\Theta_{1/2}$ is the off-axis where the luminous intensity is 1/2 of the peak intensity.

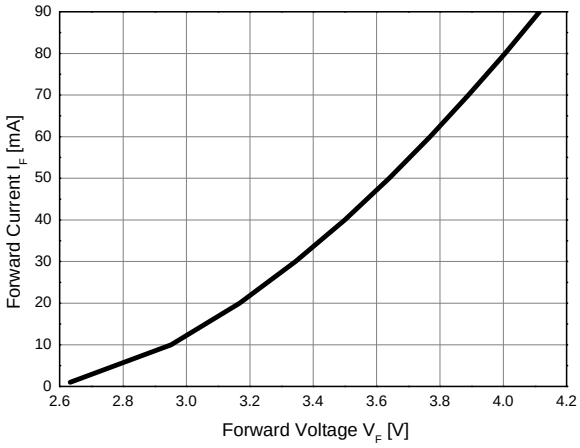
* Tolerance : V_F :±0.05V, I_V :±10%, ΦV:±10%, Ra :±3, x,y :±0.01

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

4. Optical characteristics

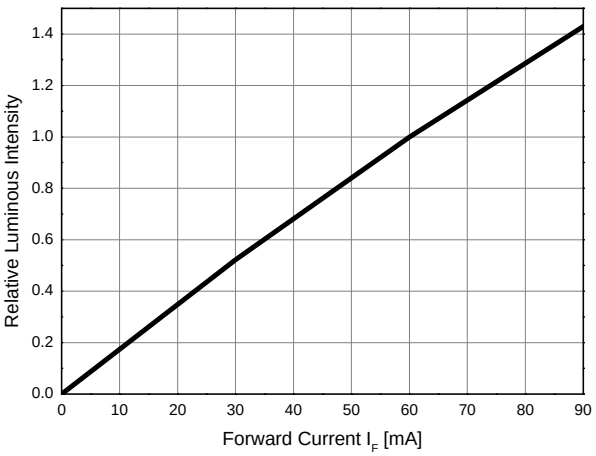
Forward Voltage vs. Forward Current (Per die)

Ta=25℃

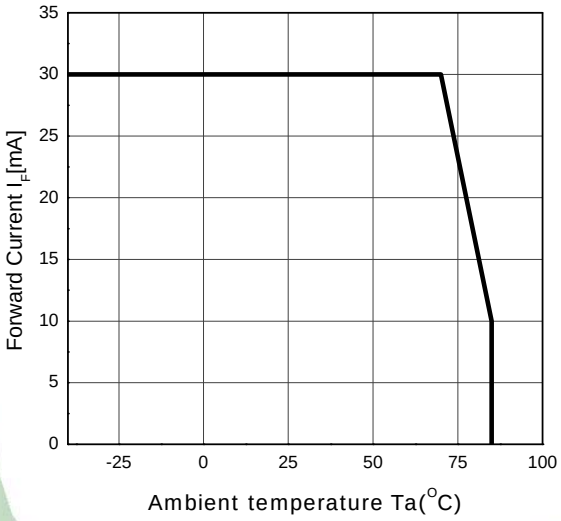


Forward Current vs. Relative Luminous Intensity

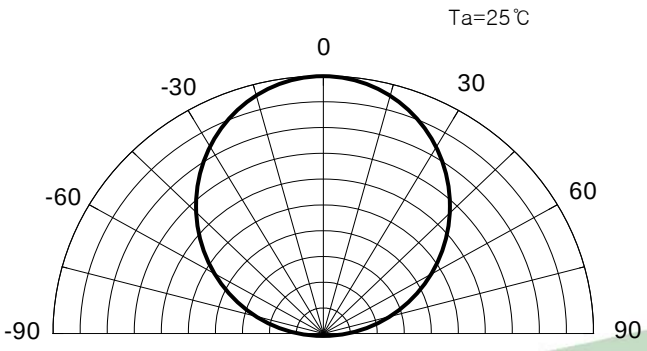
Ta=25℃



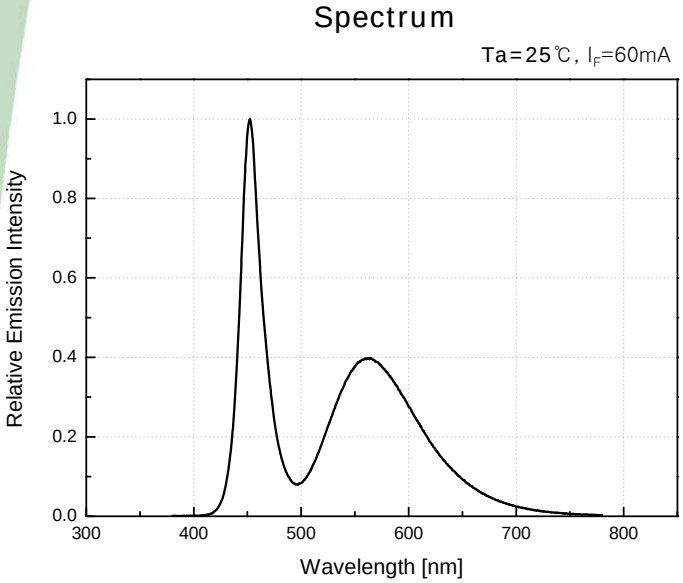
Ambient Temperature vs. Maximum Forward Current (per die)



Directivity



4. Optical characteristics



5. Reliability Test

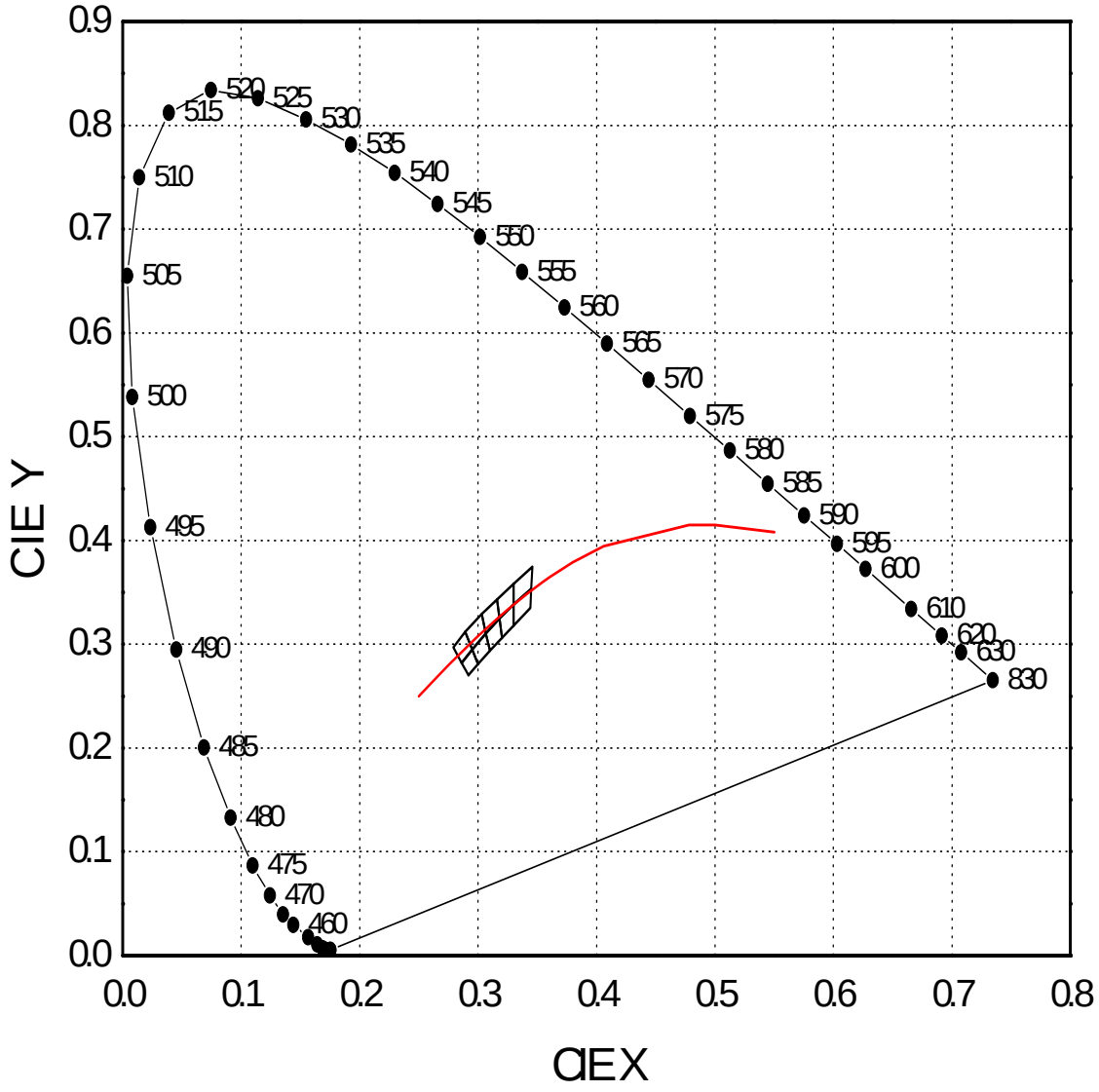
Item	Reference	Test Conditions	Duration / Cycle	Number of Damaged
Thermal Shock	EIAJ ED-4701	T_a =-40ºC(30min) ~ 100ºC(30min)	100 Cycle	0/22
High Temperature Storage	EIAJ ED-4701	T_a =100ºC	1000 Hours	0/22
High Temp. High Humidity Storage	EIAJ ED-4701	T_a =60ºC, RH=90%	1000 Hours	0/22
Low Temperature Storage	EIAJ ED-4701	T_a =-40ºC	1000 Hours	0/22
Operating Endurance Test	Internal Reference	T_a =25ºC, I_F =60mA	1000 Hours	0/22
High Temperature High Humidity Life Test	Internal Reference	T_a =60ºC, RH=90%, I_F =60mA	500 Hours	0/22
High Temperature Life Test	Internal Reference	T_a =85ºC, I_F =60mA	500 Hours	0/22
Low Temperature Life Test	Internal Reference	T_a =-40ºC, I_F =60mA	1000 Hours	0/22
ESD(HBM)	MIL-STD-883D	1KV at 1.5kΩ; 100pF	3 Time	0/22

☐ CRITERIA FOR JUDGING THE DAMAGE

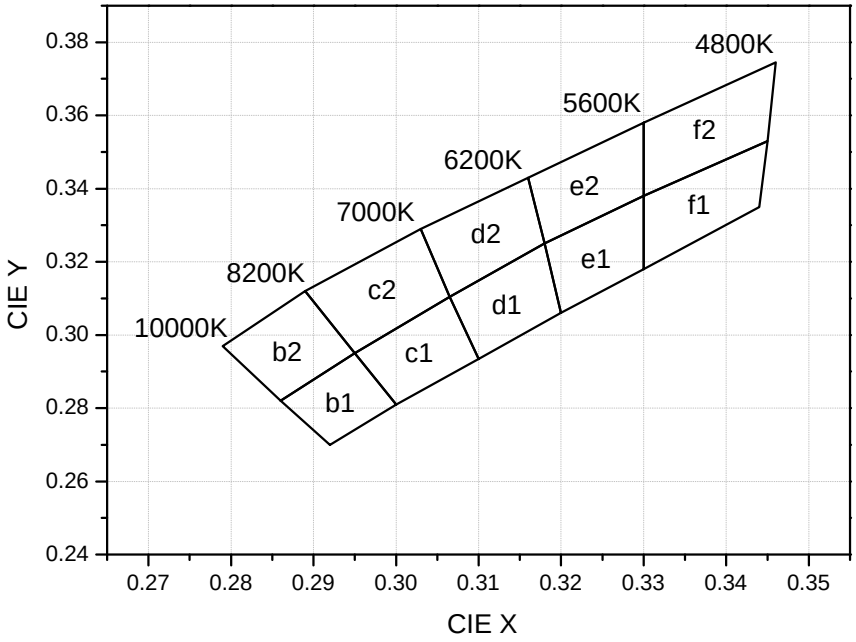
Item	Symbol	Condition	Criteria for Judgment	
			MIN	MAX
Forward Voltage	V_F	I_F =60mA (20mA per die)	-	USL [1]× 1.2
Luminous Intensity	I_V	I_F =60mA (20mA per die)	LSL [2]× 0.5	-

Note : [1] USL : Upper Standard Level
[2] LSL : Lower Standard Level

6. Color & Binning



6. Color & Binning



● COLOR RANK

<IF=60mA, Ta=25℃>

				b1		b2	
				X	Y	X	Y
				0.292	0.27	0.286	0.282
				0.3	0.281	0.295	0.295
				0.295	0.295	0.289	0.312
				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	
X	Y	X	Y	X	Y	X	Y
0.32	0.306	0.318	0.325	0.33	0.318	0.33	0.338
0.33	0.318	0.33	0.338	0.344	0.335	0.345	0.353
0.33	0.338	0.33	0.358	0.345	0.353	0.346	0.374
0.318	0.325	0.316	0.343	0.33	0.338	0.33	0.358

* Measurement Uncertainty of the Color Coordinates : ± 0.01

7. Bin Code Description

§.Rank Name

X1	X2	X3
VF	IV	CIE

§.Forward Voltage[V]

rank name	min	max	Unit
Z1	3.0	3.1	V
Z2	3.1	3.2	
Z3	3.2	3.3	
A1	3.3	3.4	
A2	3.4	3.5	

§.Luminous Intensity [IV]

rank name	min	max	Unit
M	4000	5000	mcd
N	5000	6500	

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

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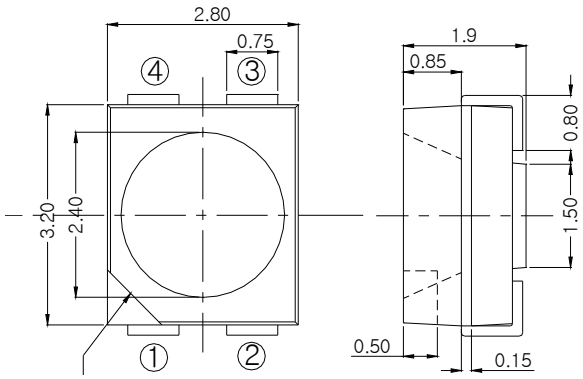
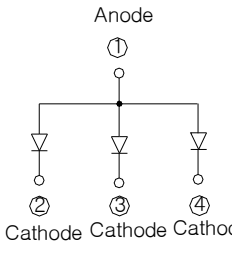
8. Outline Dimension

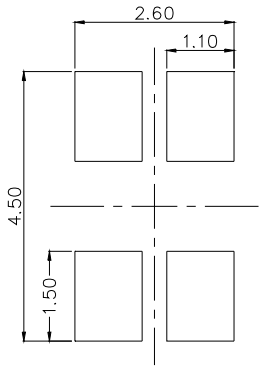


ATTENTION MARKING ON LED IS COMMON ANODE(+)



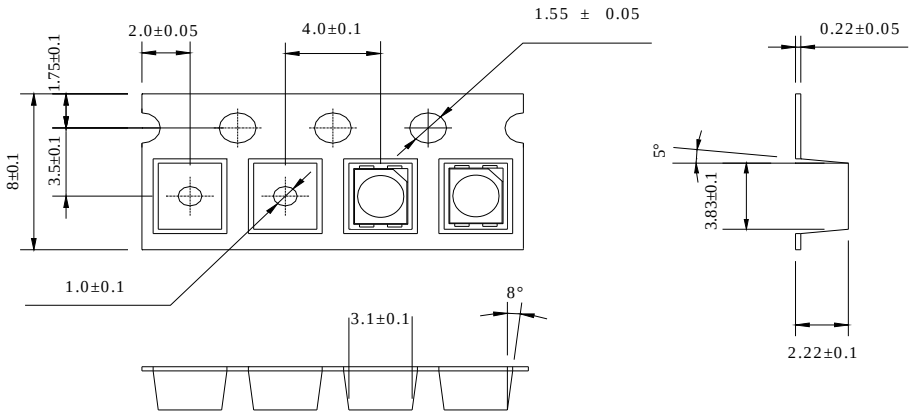
<Circuit diagram>

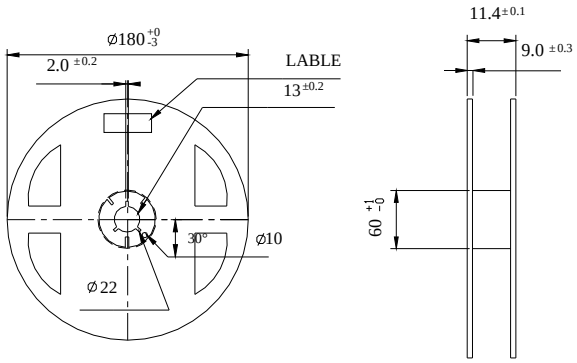
Recommended Solder Pattern



(Tolerance: ±0.2, Unit: mm)

9. Reel Structure





(1) Quantity : 2000pcs/Reel
(2) Cumulative Tolerance : Cumulative Tolerance/10 pitches to be ±0.2mm
(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 10º to the carrier tape
(4) Package : P/N, Manufacturing data Code No. and quantity to be indicated on a damp proof Package

10. Packing

Reel

RANK: XXX

QUANTITY : XXXX

LOT NUMBER : XXXXXXXXXX

PART NUMBER : XXXXXX

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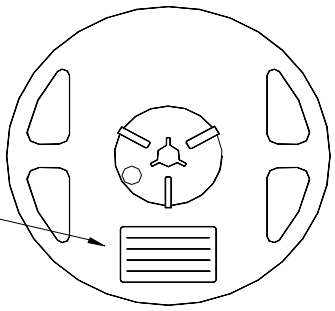

HUMIDITY INDICATOR 10% 20% 30% 40% 50% 60%

DESI PAK

Aluminum Vinyl Bag

RANK: XXX

QUANTITY : XXXX

LOT NUMBER : XXXXXXXXXX

PART NUMBER : XXXXXX

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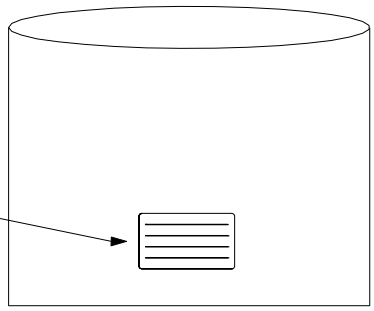

Outer Box Structure

Material : Paper(SW3B(B))

TYPE	SIZE (mm)		
	ⓐ	ⓑ	ⓒ
7inch	245	220	102
	245	220	142

① SIDE

RANK: XXX

QUANTITY : XXXX

LOT NUMBER : XXXXXXXXXX

PART NUMBER : XXXXXX

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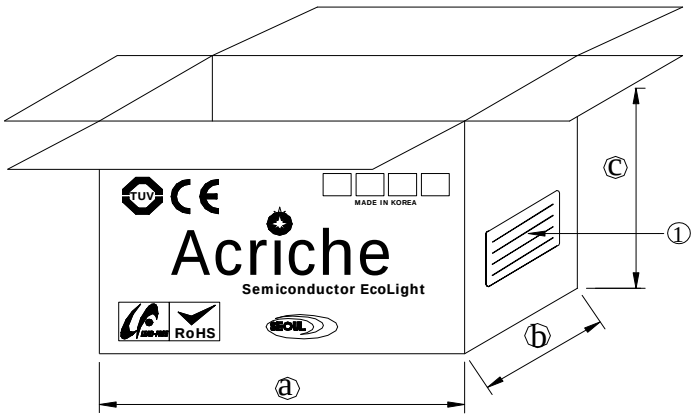
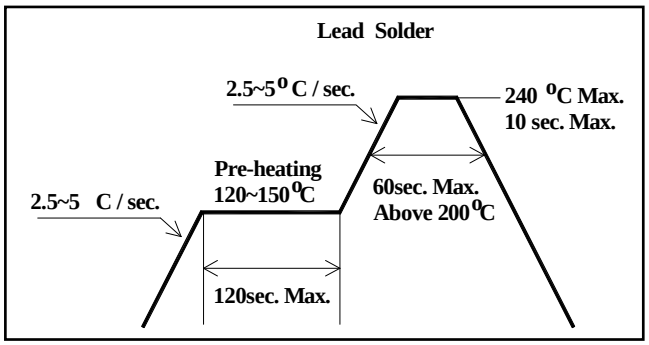


11. Soldering

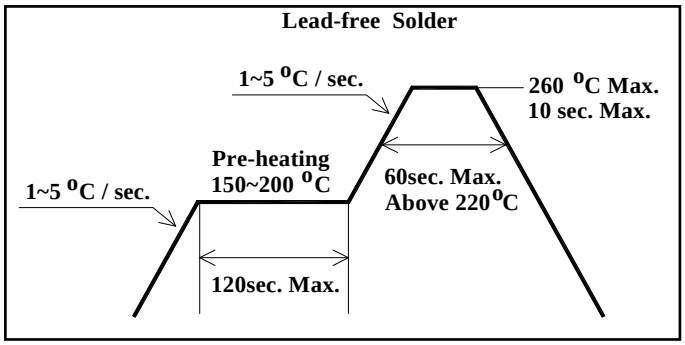
(1) Lead Solder

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 4 seconds at maximum 315°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.

12. 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 : 5ºC ~30ºC 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; Keeping of a fraction
Temperature : 5 ~ 40ºC Humidity : less than 30%

(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±5ºC.

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

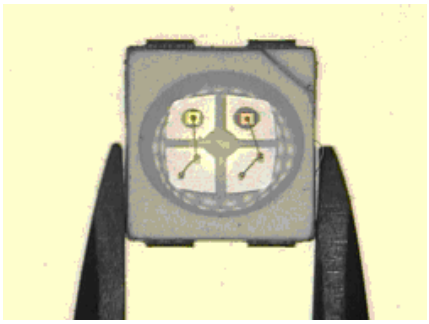
(11) Repack unused products with anti-moisture packing, fold to close any opening and then store in a dry place.

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

13. Handling of Silicone Resin LEDs

(1) 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.

(2) In general, LEDs should only be handled from the side. By the way, this also applies to LEDs without a silicone sealant, since the surface can also become scratched.



(3) When populating boards in SMT production, there are basically no restrictions regarding the form of the pick and place nozzle, except that mechanical pressure on the surface of the resin must be prevented.
This is assured by choosing a pick and place nozzle which is larger than the LED's reflector area.

(4) Silicone differs from materials conventionally used for the manufacturing of LEDs. These conditions must be considered during the handling of such devices. Compared to standard encapsulants, silicone is generally softer, and the surface is more likely to attract dust.
As mentioned previously, the increased sensitivity to dust requires special care during processing. In cases where a minimal level of dirt and dust particles cannot be guaranteed, a suitable cleaning solution must be applied to the surface after the soldering of components.

(5) SSC suggests using isopropyl alcohol for cleaning. In case other solvents are used, it must be assured that these solvents do not dissolve the package or resin.
Ultrasonic cleaning is not recommended. Ultrasonic cleaning may cause damage to the LED.

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