

S192PW-W2-1CH

1.6x0.8mm, White LED

Surface Mount Chip LED Indicator

LuckyLight

Technical Data Sheet

Features:

- Package in 8mm tape on 7" diameter reel.
- Compatible with automatic placement equipment.
- Compatible with infrared and vapor phase reflow solder process.
- Mono-color type.
- The product itself will remain within RoHS compliant version.

Descriptions:

- The S192P SMD LED is much smaller than lead frame type components, thus enable smaller board size, higher packing density, reduced storage space and finally smaller equipment to be obtained.
- Besides, lightweight makes them ideal for miniature applications, etc.

Applications:

- Backlighting in dashboard and switch.
- Telecommunication: Indicator and backlighting in telephone and fax.
- Flat backlight for LCD, switch and symbol.
- General use.

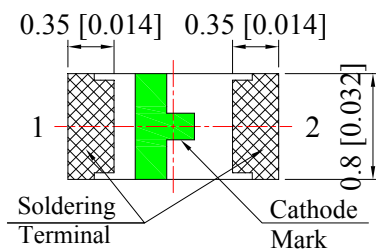
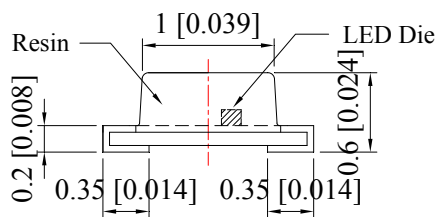
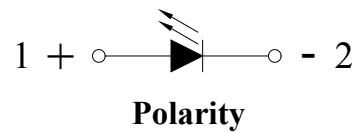
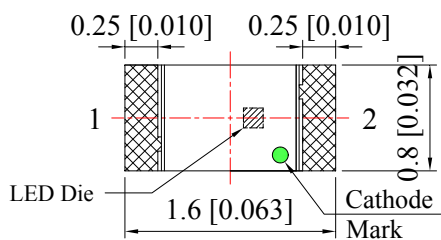
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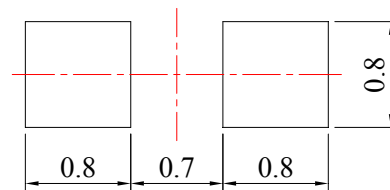
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Part No.	Emitting Color	Lens Color
S192PW-W2-1CH	White	Yellow Diffused

Package Dimension:



Recommended Soldering Pad Dimensions



Unit: mm
Tolerance: $\pm 0.10\text{mm}$

Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{ mm}$ (.010") unless otherwise noted.

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Absolute Maximum Ratings at Ta=25°C

Parameters	Symbol	Max	Unit
Power Dissipation	Pd	90	mW
Peak Forward Current ^(a)	IFP	100	mA
DC Forward Current ^(b)	IF	25	mA
Reverse Voltage	VR	5	V
Electrostatic Discharge (HBM)	ESD	400	V
Operating Temperature Range	Topr	-40°C to +80°C	
Storage Temperature Range	Tstg	-40°C to +85°C	
Soldering Temperature	Tsld	260°C for 5 Seconds	

Notes:

- Derate linearly as shown in derating curve.
- Duty Factor = 10%, Frequency = 1 kHz

Electrical Optical Characteristics at Ta=25°C

Parameters	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Luminous Intensity ^(a)	IV	500	800	---	mcd	IF=20mA
Viewing Angle ^(b)	2θ1/2	---	120	---	Deg	IF=20mA
Chromaticity Coordinates ^(c)	x	---	0.31	---		IF=20mA
	y	---	0.32	---		
Forward Voltage	VF	2.60	3.20	3.60	V	IF=20mA
Reverse Current	IR	---	---	10	μA	VR=5V

Notes:

- Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.
- 2θ1/2 is the o-axis angle where the luminous intensity is 1/2 the peak intensity
- The dominant wavelength (λd) is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.

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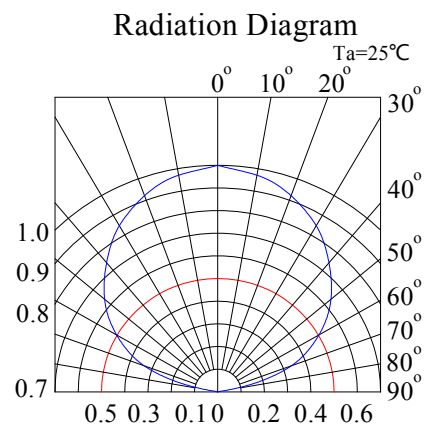
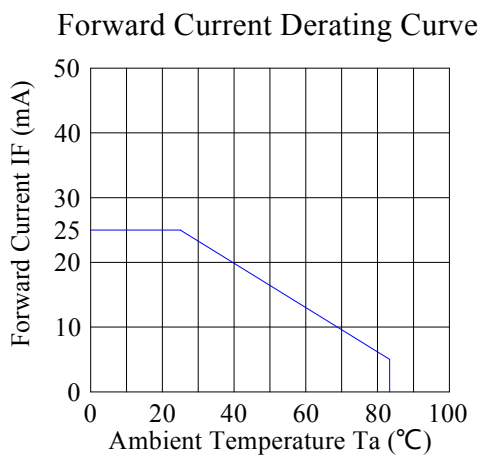
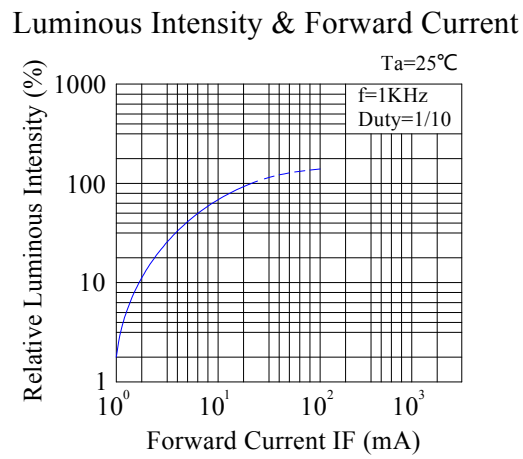
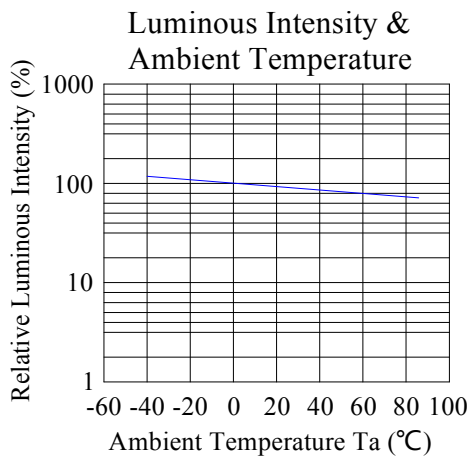
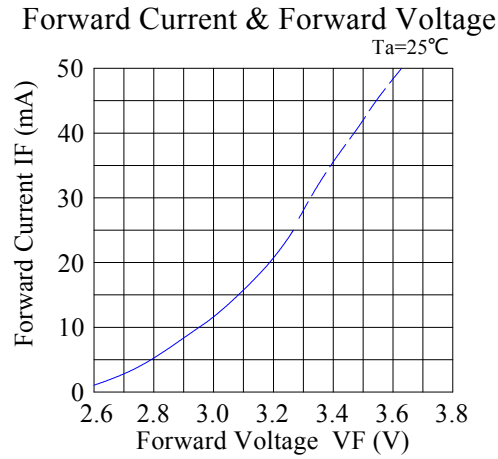
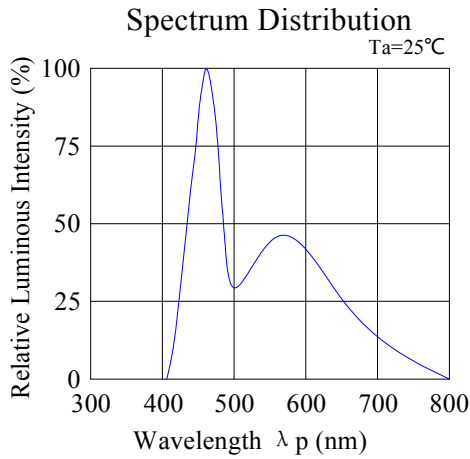
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Typical Electrical / Optical Characteristics Curves (25°C Ambient Temperature Unless Otherwise Noted)



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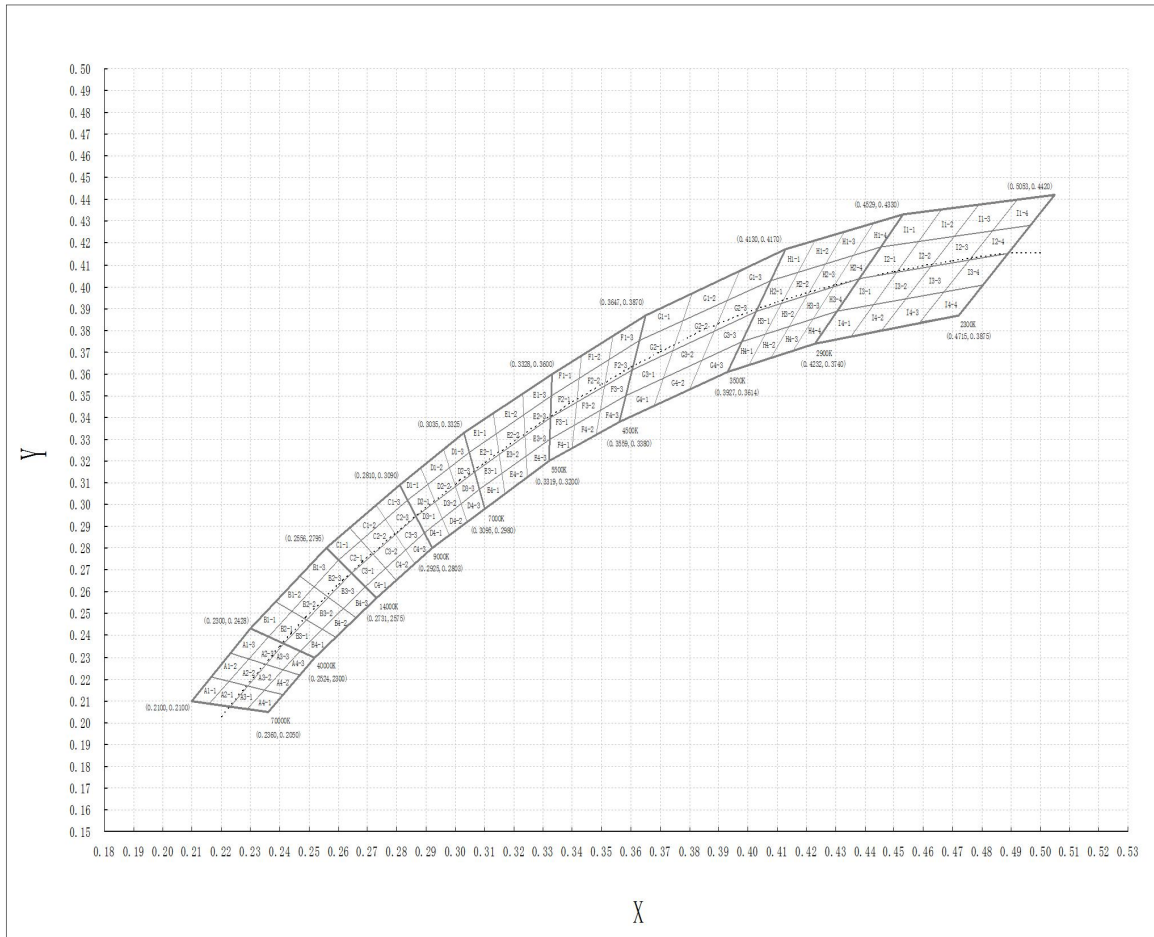
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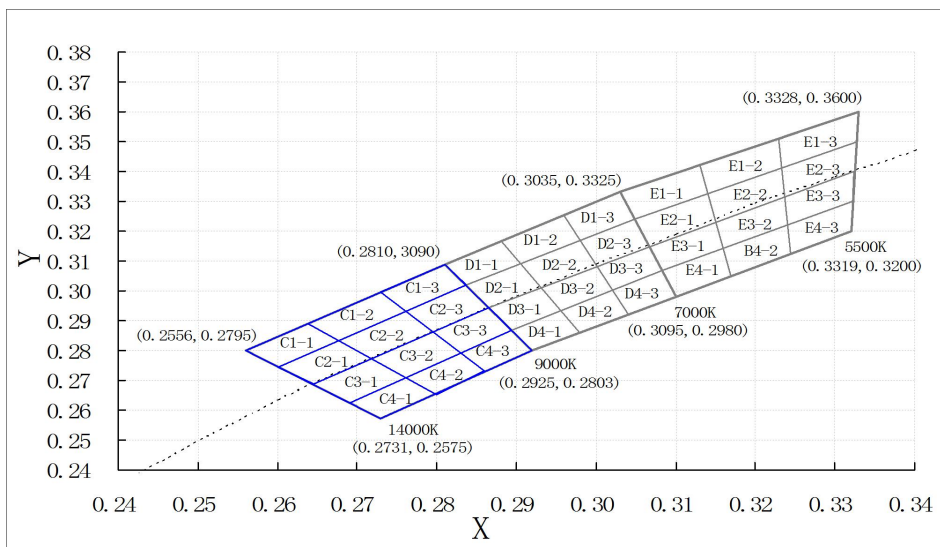


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CIE Chromaticity Diagram:



W2:



Spec No.: S192P

Issue No.: G-Rev-4

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Chromaticity Coordinates Specifications for Bin Rank

(IF=20mA, Ta=25°C)

Bin Code	Left x	Left y	Top x	Top y	Right x	Right y	Bottom x	Bottom y
C1-1	0.2560	0.2800	0.2640	0.2890	0.2680	0.2830	0.2600	0.2740
C2-1	0.2600	0.2740	0.2680	0.2830	0.2720	0.2770	0.2640	0.2690
C3-1	0.2640	0.2690	0.2720	0.2770	0.2760	0.2710	0.2690	0.2630
C4-1	0.2690	0.2630	0.2760	0.2710	0.2800	0.2650	0.2730	0.2570
C1-2	0.2640	0.2890	0.2730	0.2990	0.2760	0.2930	0.2680	0.2830
C2-2	0.2680	0.2830	0.2760	0.2930	0.2790	0.2860	0.2720	0.2770
C3-2	0.2720	0.2770	0.2790	0.2860	0.2830	0.2790	0.2760	0.2710
C4-2	0.2760	0.2710	0.2830	0.2790	0.2860	0.2730	0.2800	0.2650
C1-3	0.2730	0.2990	0.2810	0.3090	0.2840	0.3020	0.2760	0.2930
C2-3	0.2760	0.2930	0.2840	0.3020	0.2870	0.2950	0.2790	0.2860
C3-3	0.2790	0.2860	0.2870	0.2950	0.2900	0.2870	0.2830	0.2790
C4-3	0.2830	0.2790	0.2900	0.2870	0.2920	0.2800	0.2860	0.2730
D1-1	0.2810	0.3090	0.2880	0.3170	0.2910	0.3090	0.2840	0.3020
D2-1	0.2840	0.3020	0.2910	0.3090	0.2930	0.3020	0.2870	0.2950
D3-1	0.2870	0.2950	0.2930	0.3020	0.2960	0.2940	0.2900	0.2870
D4-1	0.2900	0.2870	0.2960	0.2940	0.2980	0.2860	0.2920	0.2800
D1-2	0.2880	0.3170	0.2960	0.3250	0.2980	0.3170	0.2910	0.3090
D2-2	0.2910	0.3090	0.2980	0.3170	0.3000	0.3080	0.2930	0.3020
D3-2	0.2930	0.3020	0.3000	0.3080	0.3020	0.3000	0.2960	0.2940
D4-2	0.2960	0.2940	0.3020	0.3000	0.3040	0.2920	0.2980	0.2860
D1-3	0.2960	0.3250	0.3030	0.3330	0.3050	0.3240	0.2980	0.3170
D2-3	0.2980	0.3170	0.3050	0.3240	0.3070	0.3150	0.3000	0.3080
D3-3	0.3000	0.3080	0.3070	0.3150	0.3080	0.3070	0.3020	0.3000
D4-3	0.3020	0.3000	0.3080	0.3070	0.3100	0.2980	0.3040	0.2920
E1-1	0.3030	0.3330	0.3130	0.3420	0.3140	0.3330	0.3050	0.3240
E2-1	0.3050	0.3240	0.3140	0.3330	0.3150	0.3240	0.3070	0.3150
E3-1	0.3070	0.3150	0.3150	0.3240	0.3160	0.3140	0.3080	0.3070
E4-1	0.3080	0.3070	0.3160	0.3140	0.3170	0.3050	0.3100	0.2980
E1-2	0.3130	0.3420	0.3230	0.3510	0.3230	0.3410	0.3140	0.3330
E2-2	0.3140	0.3330	0.3230	0.3410	0.3240	0.3320	0.3150	0.3240
E3-2	0.3150	0.3240	0.3240	0.3320	0.3240	0.3220	0.3160	0.3140
E4-2	0.3160	0.3140	0.3240	0.3220	0.3240	0.3130	0.3170	0.3050
E1-3	0.3230	0.3510	0.3330	0.3600	0.3330	0.3500	0.3230	0.3410
E2-3	0.3240	0.3320	0.3330	0.3500	0.3320	0.3400	0.3240	0.3310
E3-3	0.3240	0.3320	0.3320	0.3400	0.3320	0.3300	0.3240	0.3220
E4-3	0.3240	0.3220	0.3320	0.3300	0.3320	0.3200	0.3240	0.3130

Spec No.: S192P

Issue No.: G-Rev-4

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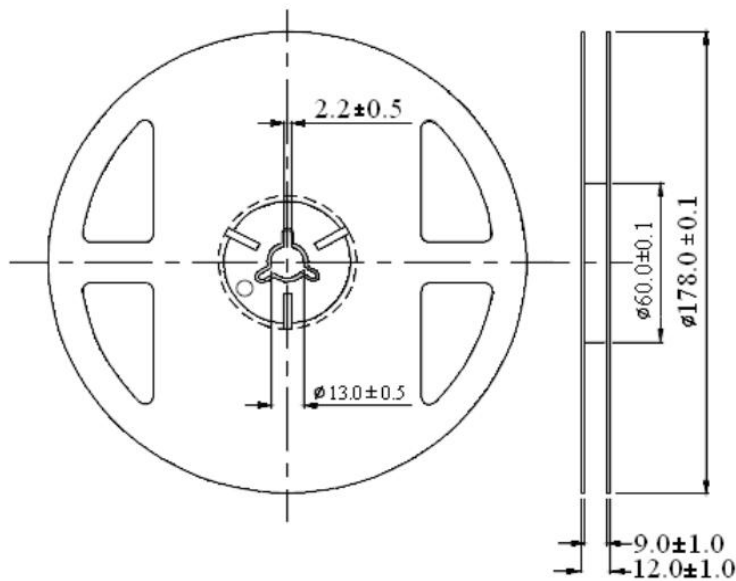
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Notes:

1. Color coordinates measurement allowance is ± 0.01 .
2. One delivery will include up to two consecutive color ranks and three luminous intensity ranks of the products the quantity-ratio of the ranks is decided by LuckyLight.

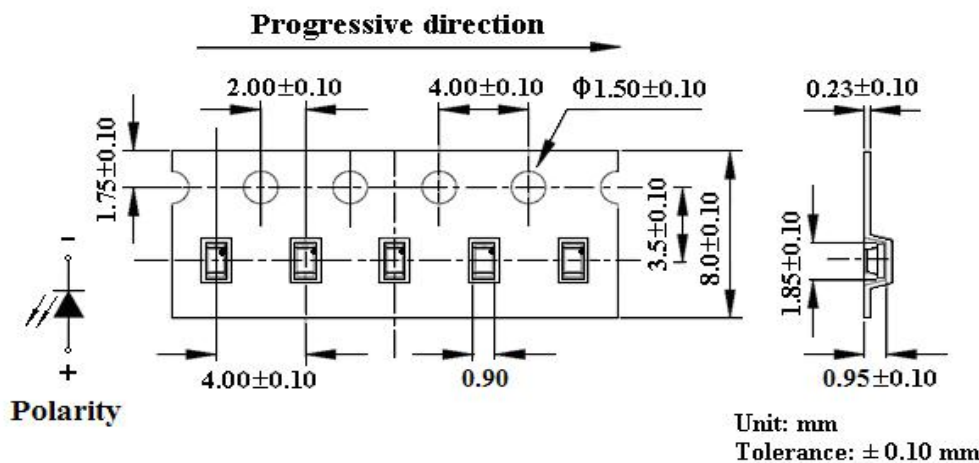
Reel Dimensions:



Unit: mm
Tolerance: ± 0.25 mm

Carrier Tape Dimensions:

Loaded quantity 4000 pcs per reel.



Unit: mm
Tolerance: ± 0.10 mm

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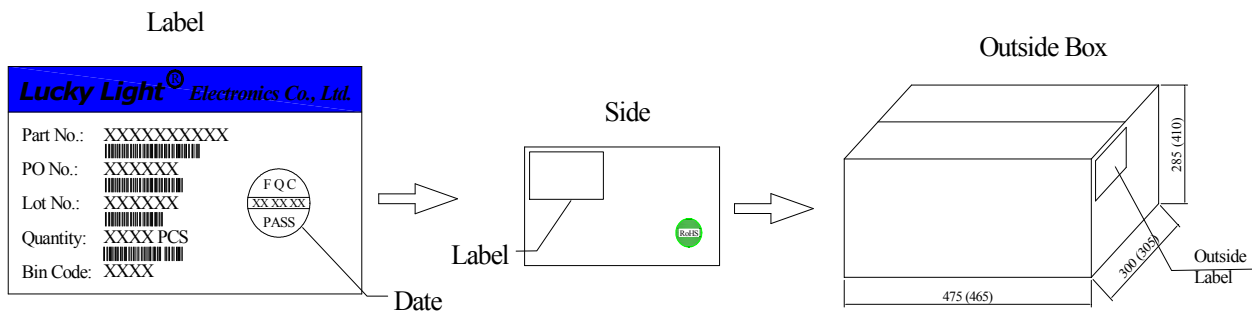
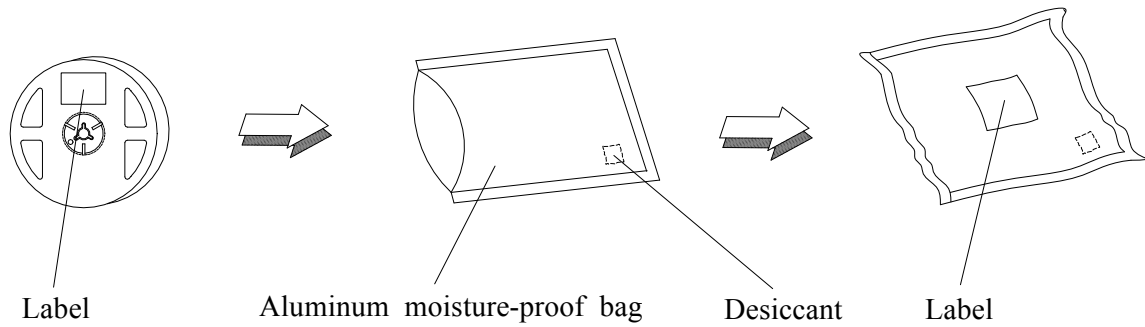
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Packing & Label Specifications:

Moisture Resistant Packaging:



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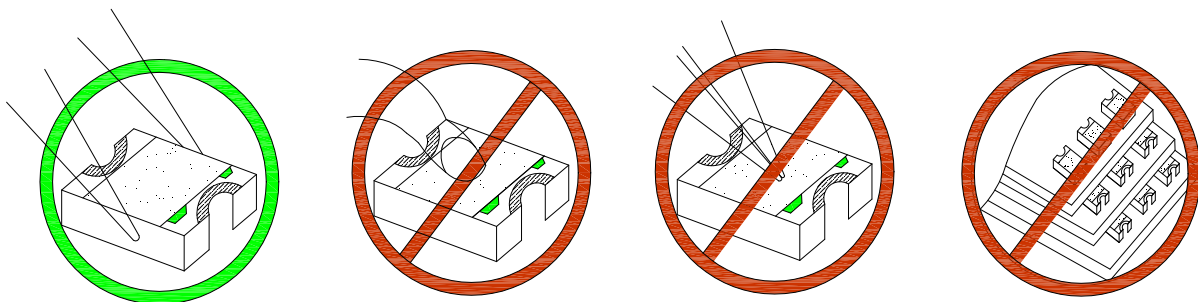
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CAUTIONS

1. Handling Precautions:

- 1.1. Handle the component along the side surfaces by using forceps or appropriate tools.
- 1.2. Do not directly touch or handle the silicone lens surface. It may damage the internal circuitry.
- 1.3. Do not stack together assembled PCBs containing exposed LEDs. Impact may scratch the silicone lens or damage the internal circuitry.



Compare to epoxy encapsulant that is hard and brittle, silicone is softer and flexible. Although its characteristic significantly reduces thermal stress, it is more susceptible to damage by external mechanical force. As a result, special handling precautions need to be observed during assembly using silicone encapsulated LED products. Failure to comply might lead to damage and premature failure of the LED.

2. Storage

- 2.1. Do not open moisture proof bag before the products are ready to use.
- 2.2. Before opening the package, the LEDs should be kept at 30°C or less and 60%RH or less.
- 2.3. The LEDs should be used within a year.
- 2.4. After opening the package, the LEDs should be kept at 30°C or less and 60%RH or less.
- 2.5. The LEDs should be used within 168 hours after opening the package.
- 2.6. If the moisture adsorbent material has fabled away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions. Baking treatment: 65±5°C for 24 hours.

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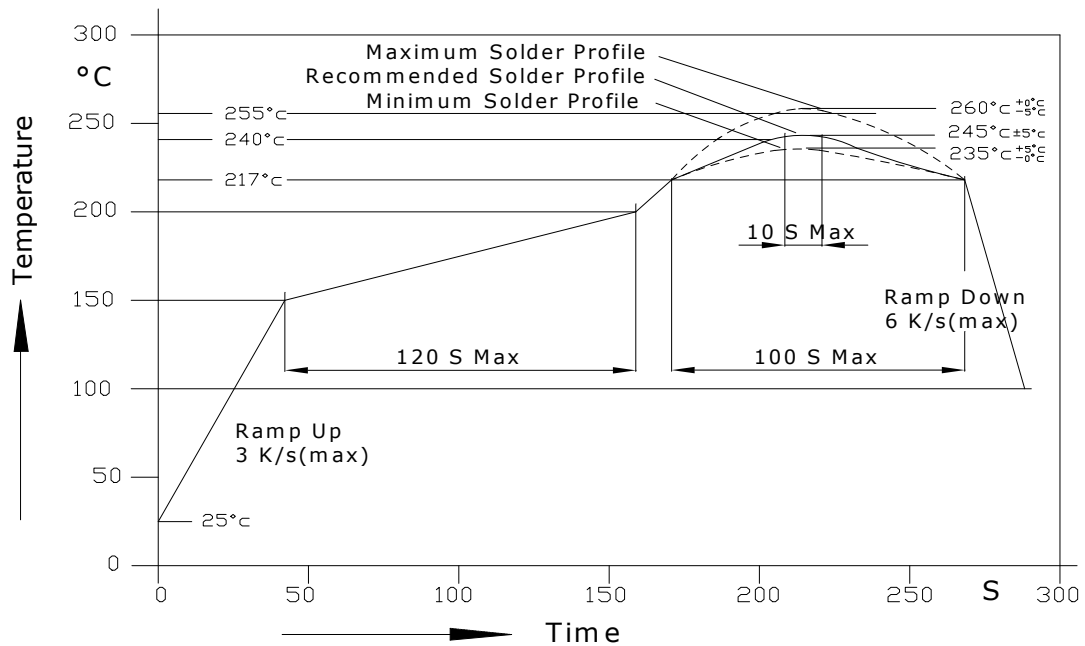
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3. Soldering Condition

3.1. Pb-free solder temperature profile



3.2. Reflow soldering should not be done more than two times.

3.3. When soldering, do not put stress on the LEDs during heating.

3.4. After soldering, do not warp the circuit board.

3.5. Recommended soldering conditions:

Reflow soldering		Soldering iron	
Pre-heat	150~200°C	Temperature	300°C Max.
Pre-heat time	120 sec. Max.	Soldering time	3 sec. Max.
Peak temperature	260°C Max.		(one time only)
Soldering time	10 sec. Max.(Max. two times)		

3.6. Because different board designs use different number and types of devices, solder pastes, reflow ovens, and circuit boards, no single temperature profile works for all possible combinations.

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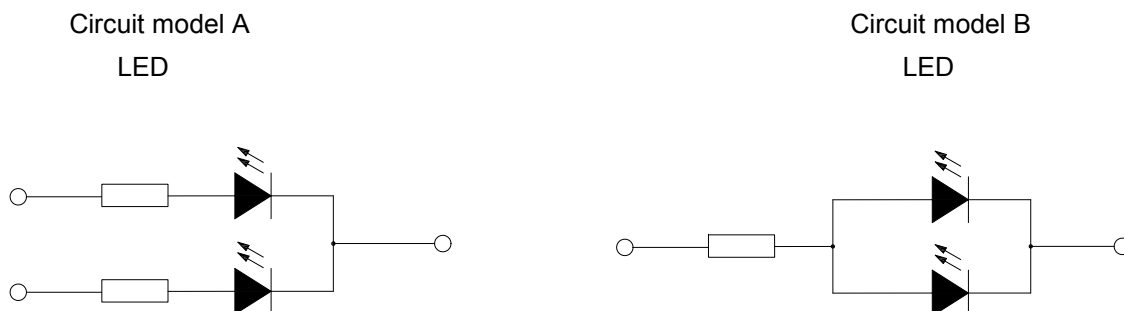
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However, you can successfully mount your packages to the PCB by following the proper guidelines and PCB-specific characterization.

4. Drive Method

4.1. An LED is a current-operated device. In order to ensure intensity uniformity on multiple LEDs connected in parallel in an application, it is recommended that a current limiting resistor be incorporated in the drive circuit, in series with each LED as shown in Circuit A below.



a. Recommended circuit.

b. The brightness of each LED might appear different due to the differences in the I-V characteristics of those LEDs.

5. ESD (Electrostatic Discharge):

Static Electricity or power surge will damage the LED. Suggestions to prevent ESD damage:

- Use of a conductive wrist band or anti-electrostatic glove when handling these LEDs.
- All devices, equipment, and machinery must be properly grounded.
- Work tables, storage racks, etc. should be properly grounded.
- Use ion blower to neutralize the static charge which might have built up on surface of the LED's plastic lens as a result of friction between LEDs during storage and handling.

ESD-damaged LEDs will exhibit abnormal characteristics such as high reverse leakage current, low forward voltage, or "no lightup" at low currents. To verify for ESD damage, check for "lightup" and Vf of the suspect LEDs at low currents. The Vf of "good" LEDs should be $>2.0V@0.1mA$ for InGaN product and $>1.4V@0.1mA$ for AlInGaP product.

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