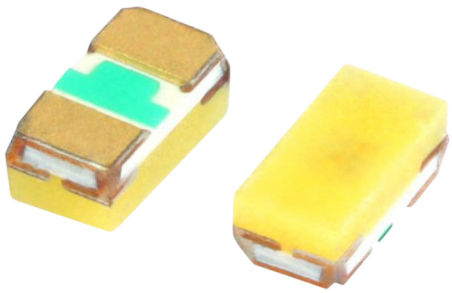
White SMD LED, 1.6x0.8mm

RND components

Features



- 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.

Applications:

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

Descriptions:

- 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.

Absolute Maximum Ratings at Ta=25℃

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℃ to +80℃	
Storage Temperature Range	Tstg	-40℃ to +85℃	
Soldering Temperature	Tsld	260℃ for 5 Seconds	

Notes:

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

Device Selection Guide

Part No.	Emitting Color	Lens Color
RND 135-00236	White	Yellow Diffused

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Electrical Optical Characteristics at Ta 25℃

Parameters	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Luminous Intensity[a]	IV	180	220	---	mcd	IF=5mA
		400	650	---	mcd	IF=20mA
Viewing Angle [b]	2θ1/2	---	120	---	Deg	IF=20mA
Chromaticity Coordinates[C]	x	---	0.27	---		IF=20mA
	y	---	0.27	---		
Forward Voltage	VF	2.60	3.20	3.60	V	IF=20mA
Reverse Current	IR	---	---	10	μA	V_R=5V

Notes:

a. ALuminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.

b. 2θ1/2 is the o -axis angle where the luminous intensity is 1⁄2 the peak intensity

c. 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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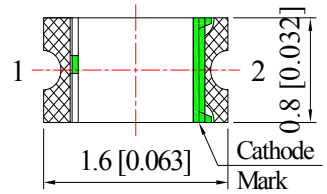
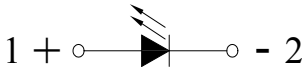
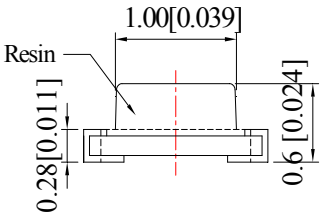
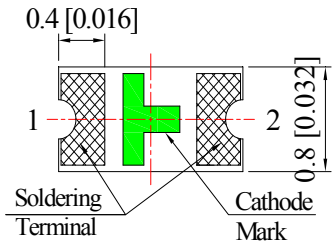
Package Dimensions



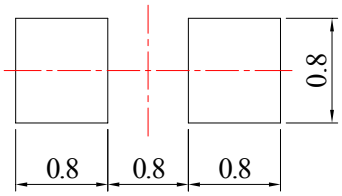


Polarity





Recommended Soldering Pad Dimensions



Unit: mm
Tolerance: ±0.10mm

Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is ± 0.25 mm (.010″) unless otherwise noted.

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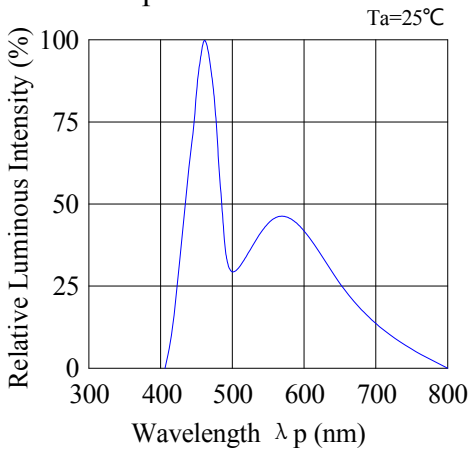
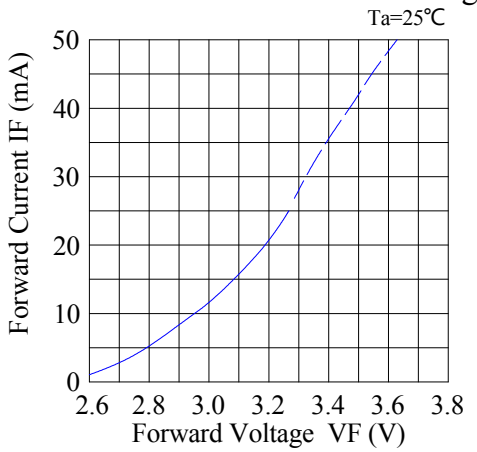
Typical Electrical / Optical Characteristics Curves
(25℃ Ambient Temperature Unless Otherwise Noted)

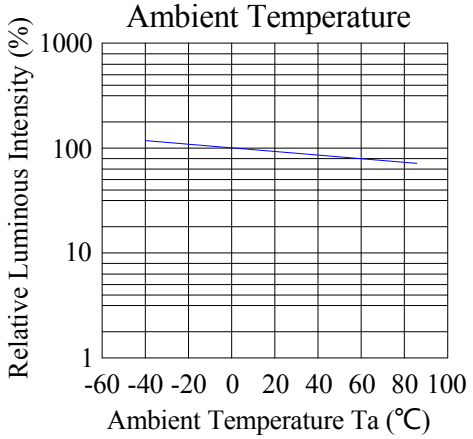
Spectrum Distribution



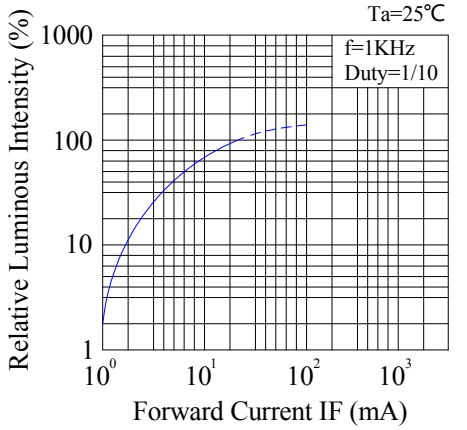
Forward Current & Forward Voltage



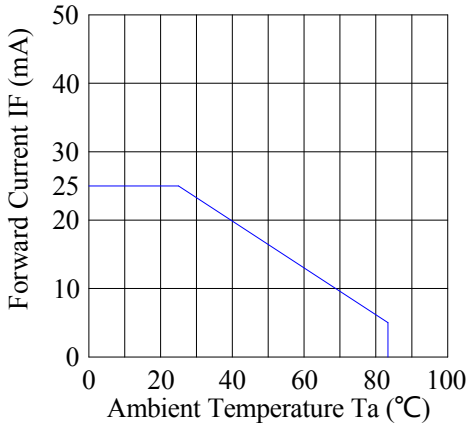
Luminous Intensity & Ambient Temperature



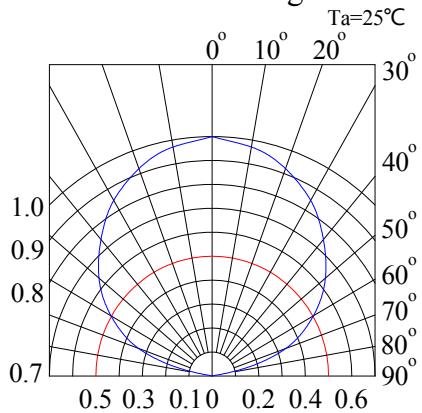
Luminous Intensity & Forward Current



Forward Current Derating Curve



Radiation Diagram



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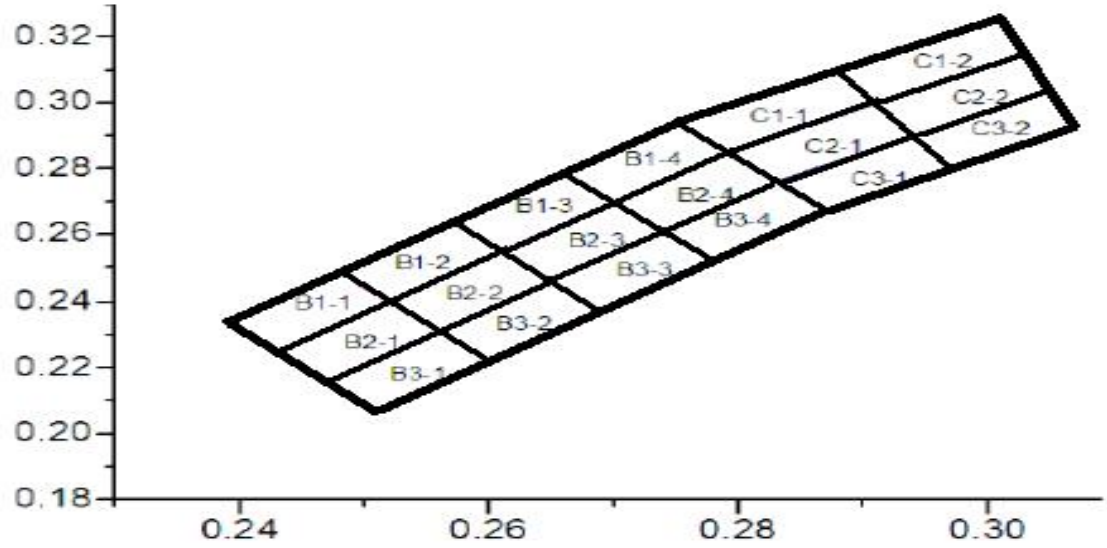
CIE Chromaticity Diagram:



Chromaticity Coordinates Specifications for Bin Rank

(IF=20mA, Ta=25℃)

Bin		Bottom	Left	Top	Right	Bin		Bottom	Lef	Tp	Right
B1-1	X	0.243	0.239	0.248	0.252	B2-1	X	0.247	0.243	0.252	0.256
	Y	0.225	0.234	0.249	0.24		Y	0.216	0.225	0.24	0.231
B1-2	X	0.252	0.248	0.257	0.261	B2-2	X	0.256	0.252	0.261	0.265
	Y	0.24	0.249	0.264	0.255		Y	0.231	0.24	0.255	0.246
B1-3	X	0.261	0.257	0.266	0.27	B2-3	X	0.265	0.261	0.27	0.274
	Y	0.255	0.264	0.279	0.27		Y	0.246	0.255	0.27	0.261
B1-4	X	0.27	0.266	0.275	0.279	B2-4	X	0.274	0.27	0.279	0.283
	Y	0.27	0.279	0.294	0.285		Y	0.261	0.27	0.285	0.276
B3-1	X	0.251	0.247	0.256	0.26	C1-1	X	0.279	0.275	0.288	0.291
	Y	0.207	0.216	0.231	0.222		Y	0.285	0.294	0.31	0.3
B3-2	X	0.26	0.256	0.265	0.269	C1-2	X	0.291	0.288	0.301	0.303
	Y	0.222	0.231	0.246	0.237		Y	0.3	0.31	0.326	0.315
B3-3	X	0.269	0.265	0.274	0.278	C2-1	X	0.283	0.279	0.291	0.294
	Y	0.237	0.246	0.261	0.252		Y	0.276	0.285	0.3	0.29
B3-4	X	0.278	0.274	0.283	0.287	C2-2	X	0.294	0.291	0.303	0.305
	Y	0.252	0.261	0.276	0.267		Y	0.29	0.3	0.315	0.304
C3-1	X	0.287	0.283	0.294	0.297	C3-2	X	0.297	0.294	0.305	0.307
	Y	0.267	0.276	0.29	0.28		Y	0.28	0.29	0.304	0.293

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 RND.

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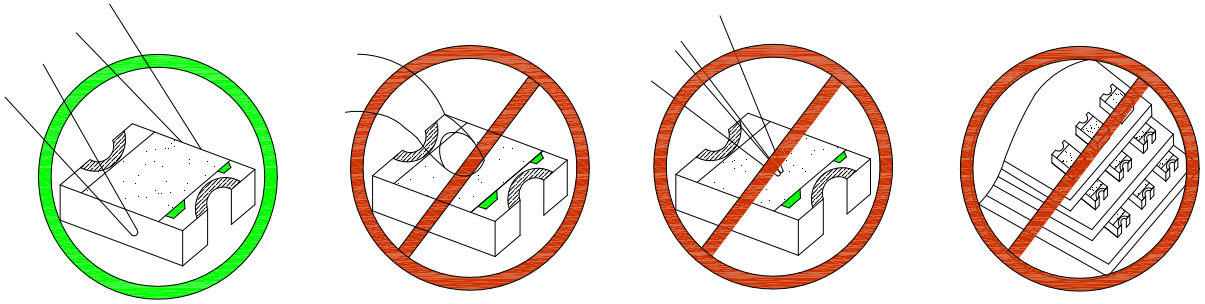
CAUTIONS

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.

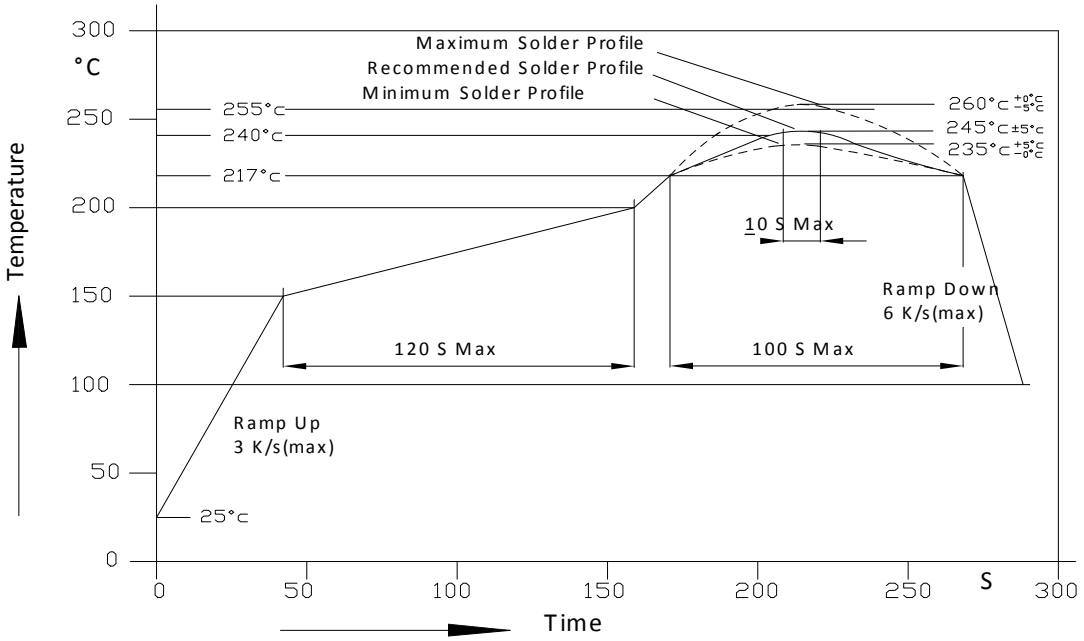
2.4. After opening the package, the LEDs should be kept at 30°C or less and 60%RH or less.

2.5. The LEDs should be used within 24 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.

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. 3
Pre-heat time Peak	120 sec. Max.	Soldering time	sec. Max.
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.
However, you can successfully mount your packages to the PCB by following the proper guidelines and PCB-specific characterization

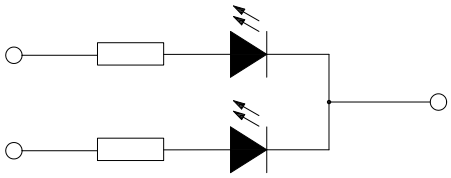
4. Drive Method

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.

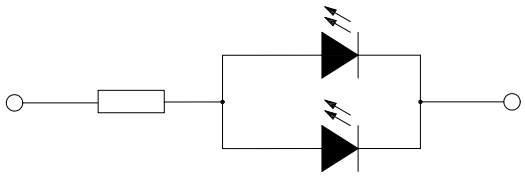
Circuit model A

LED



Circuit model B

LED



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.