R3020W-W6-1F

3.0x2.0mm,Warm White LED
Surface Mount PLCC-2 LED Indicator

Luckylight

Technical Data Sheet

Features:

- PLCC-2 package.

- High reliability LED package.

- Inter reflector.

- Suitable for automatic placement equipment.

- Suitable for vapor-phase reflow, Infrared reflow and wave solder processes.

- Available on tape and reel (8mm Tape).

- The product itself will remain within RoHS compliant Version.

Descriptions:

- The R3020 series is available in soft red, orange, yellow, green, blue and white. Due to the package design, the LED has wide viewing angle and optimized light coupling by inter reflector. This feature makes the SMT TOP LED ideal for light pipe application. The low current requirement makes this device ideal for portable equipment or any other application where power is at a premium.

Applications:

- Indicator and backlight in office and family equipment.
- Flat backlight for LCD's, switches and symbols.
- Light pipe application.
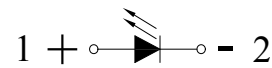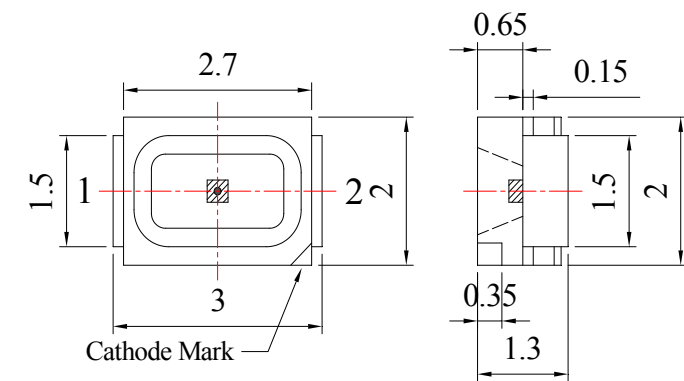- General use.

R3020W-W6-1F

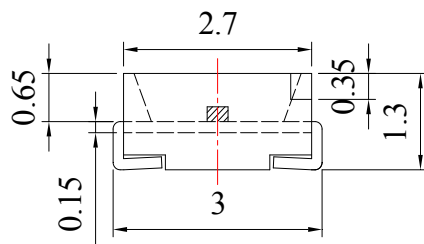3.0x2.0mm,Warm White LED
Surface Mount PLCC-2 LED Indicator

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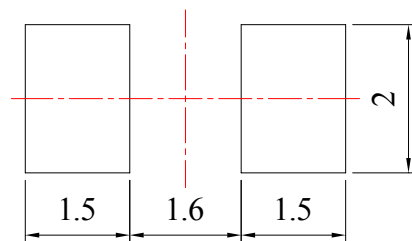| Part No.	Emitting Color	Lens Color
R3020W-W6-1F	Warm White	Yellow Diffused

Package Dimension:

Cathode Mark

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.

Spec No.: R3020
Issue No.: G-Rev-4
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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	30	mA
Reverse Voltage	VR	5	V
Electrostatic Discharge (HBM)	ESD	1000	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

Electrical Optical Characteristics at Ta=25℃

Parameters	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Luminous Intensity[a]	IV	1800	2100	---	mcd	IF=20mA
Luminous Flux [a]	Φv	6	7	---	lm	IF=20mA
Viewing Angle [b]	2θ1/2	---	130	---	Deg	IF=20mA
Chromaticity Coordinates[C]	x	---	0.43	---		IF=20mA
	y	---	0.40	---		
Color Temperature	CCT	2600	3000	3500	K	IF=20mA
Color Rendering Index	CRI	---	73	---	Ra	IF=20mA
Forward Voltage	VF	2.80	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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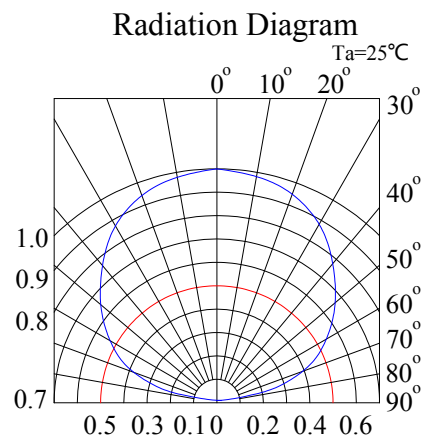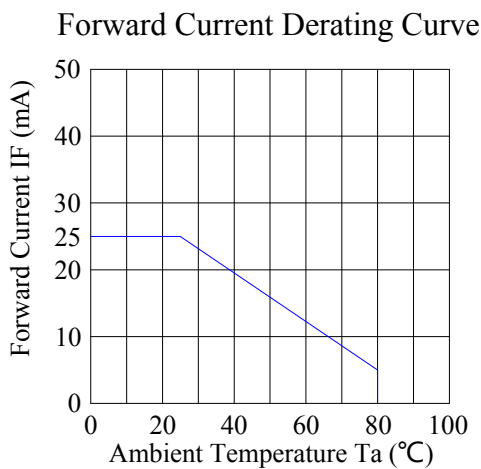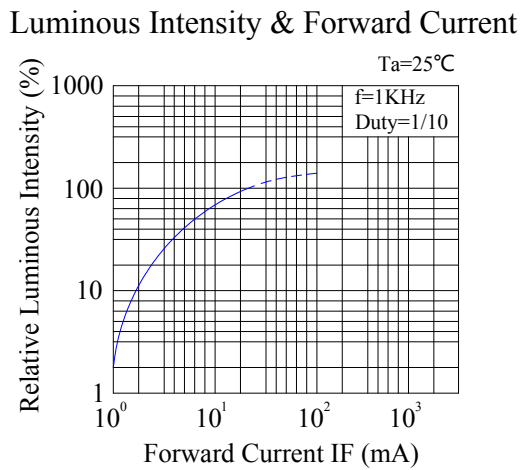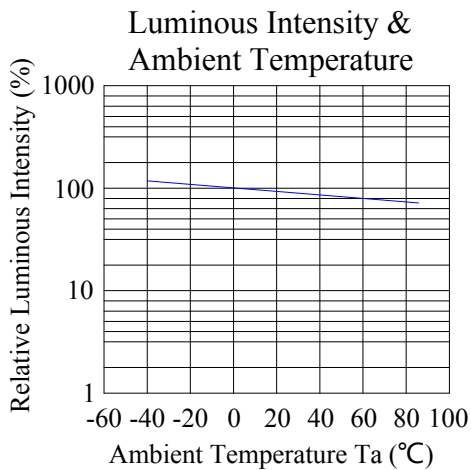http://　www.luckylight.cn

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Surface Mount PLCC-2 LED Indicator

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Typical Electrical / Optical Characteristics Curves
(25℃ Ambient Temperature Unless Otherwise Noted)
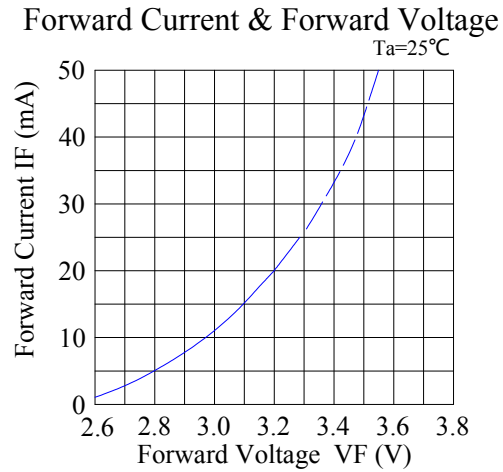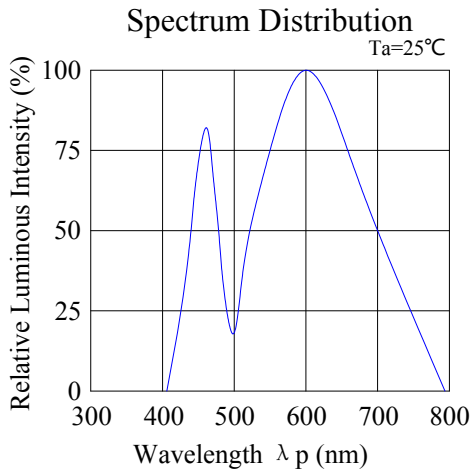
Spectrum Distribution
Ta=25℃

Relative Luminous Intensity (%) vs Wavelength λp (nm)

Forward Current & Forward Voltage
Ta=25℃

Forward Current IF (mA) vs Forward Voltage VF (V)

Luminous Intensity & Ambient Temperature

Relative Luminous Intensity (%) vs Ambient Temperature Ta (℃)

Luminous Intensity & Forward Current
Ta=25℃
f=1KHz
Duty=1/10

Relative Luminous Intensity (%) vs Forward Current IF (mA)

Forward Current Derating Curve

Forward Current IF (mA) vs Ambient Temperature Ta (℃)

Radiation Diagram
Ta=25℃

CIE 1931 Chromaticity Diagram:
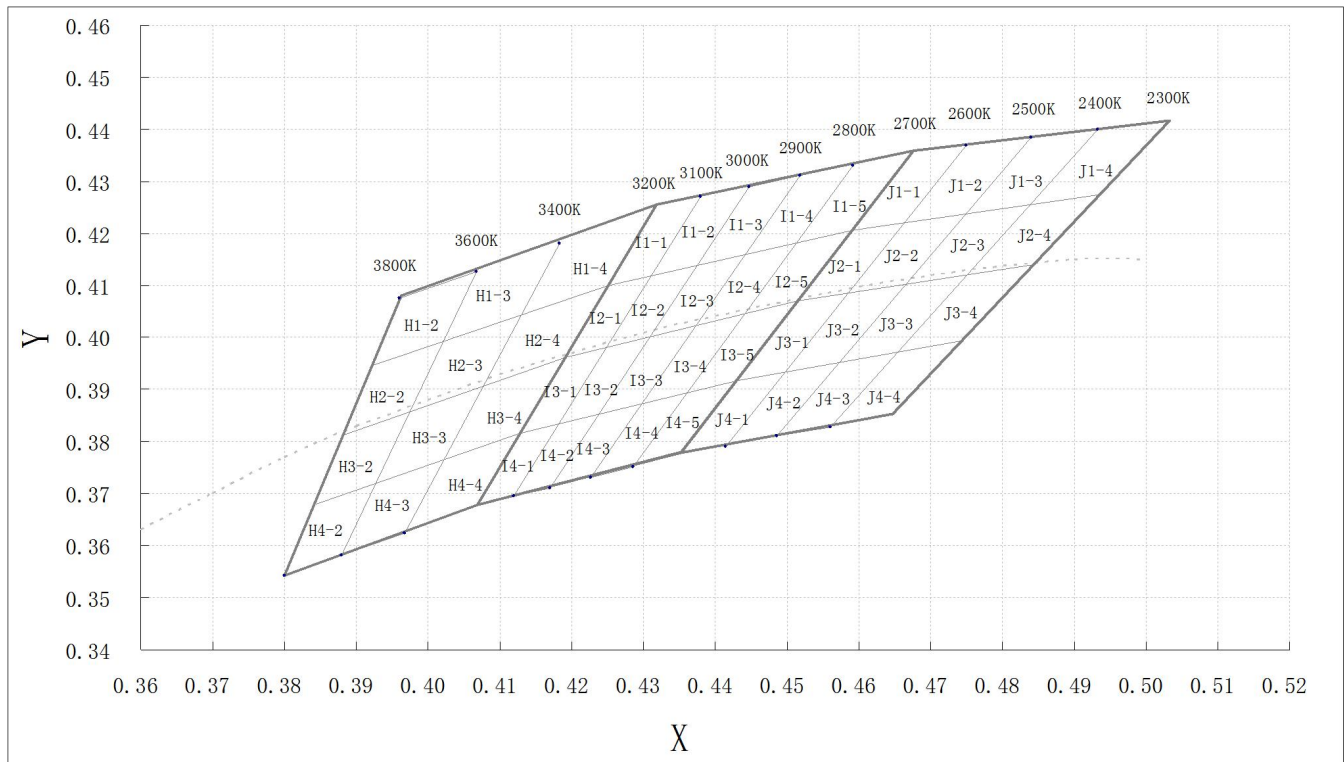
Chromaticity Coordinates Specifications for Bin Rank:

Bin Code	Left x	Left y	Top x	Top y	Right x	Right y	Bottom x	Bottom y
H1-2	0.392	0.394	0.402	0.399	0.407	0.413	0.396	0.408
H2-2	0.388	0.381	0.397	0.386	0.402	0.399	0.392	0.394
H3-2	0.384	0.367	0.393	0.372	0.397	0.386	0.388	0.381
H4-2	0.380	0.354	0.388	0.358	0.393	0.372	0.384	0.367
H1-3	0.402	0.399	0.412	0.403	0.418	0.419	0.407	0.413
H2-3	0.397	0.386	0.407	0.390	0.412	0.403	0.402	0.399
H3-3	0.393	0.372	0.402	0.376	0.407	0.390	0.397	0.386
H4-3	0.388	0.358	0.397	0.362	0.402	0.376	0.393	0.372
H1-4	0.412	0.403	0.425	0.410	0.432	0.426	0.418	0.419
H2-4	0.407	0.390	0.419	0.396	0.425	0.410	0.412	0.403
H3-4	0.402	0.376	0.413	0.382	0.419	0.396	0.407	0.390
H4-4	0.397	0.362	0.407	0.368	0.413	0.382	0.402	0.376
I1-1	0.425	0.410	0.431	0.412	0.438	0.428	0.432	0.426
I2-1	0.419	0.396	0.424	0.398	0.431	0.412	0.425	0.410
I3-1	0.413	0.382	0.418	0.384	0.424	0.398	0.419	0.396
I4-1	0.407	0.368	0.412	0.370	0.418	0.384	0.413	0.382

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I1-2	0.431	0.412	0.437	0.414	0.445	0.430	0.438	0.428
I2-2	0.424	0.398	0.430	0.400	0.437	0.414	0.431	0.412
I3-2	0.418	0.384	0.423	0.385	0.430	0.400	0.424	0.398
I4-2	0.412	0.370	0.417	0.372	0.423	0.385	0.418	0.384
I1-3	0.437	0.414	0.444	0.416	0.452	0.432	0.445	0.430
I2-3	0.430	0.400	0.437	0.402	0.444	0.416	0.437	0.414
I3-3	0.423	0.385	0.430	0.387	0.437	0.402	0.430	0.400
I4-3	0.417	0.372	0.423	0.374	0.430	0.387	0.423	0.385
I1-4	0.444	0.416	0.451	0.418	0.459	0.434	0.452	0.432
I2-4	0.437	0.402	0.444	0.404	0.451	0.418	0.444	0.416
I3-4	0.430	0.387	0.436	0.389	0.444	0.404	0.437	0.402
I4-4	0.423	0.374	0.429	0.376	0.436	0.389	0.430	0.387
I1-5	0.451	0.418	0.460	0.421	0.468	0.436	0.459	0.434
I2-5	0.444	0.404	0.452	0.407	0.460	0.421	0.451	0.418
I3-5	0.436	0.389	0.444	0.392	0.452	0.407	0.444	0.404
I4-5	0.429	0.376	0.436	0.378	0.444	0.392	0.436	0.389
J1-1	0.460	0.421	0.466	0.422	0.475	0.437	0.468	0.436
J2-1	0.452	0.407	0.458	0.408	0.466	0.422	0.460	0.421
J3-1	0.444	0.392	0.449	0.393	0.458	0.408	0.452	0.407
J4-1	0.436	0.378	0.441	0.379	0.449	0.393	0.444	0.392
J1-2	0.466	0.422	0.475	0.424	0.484	0.439	0.475	0.437
J2-2	0.458	0.408	0.467	0.410	0.475	0.424	0.466	0.422
J3-2	0.449	0.393	0.458	0.395	0.467	0.410	0.458	0.408
J4-2	0.441	0.379	0.449	0.381	0.458	0.395	0.449	0.393
J1-3	0.475	0.424	0.483	0.425	0.493	0.440	0.484	0.439
J2-3	0.467	0.410	0.475	0.412	0.483	0.425	0.475	0.424
J3-3	0.458	0.395	0.465	0.397	0.475	0.412	0.467	0.410
J4-3	0.449	0.381	0.456	0.383	0.465	0.397	0.458	0.395
J1-4	0.483	0.425	0.493	0.427	0.503	0.442	0.493	0.440
J2-4	0.475	0.412	0.484	0.414	0.493	0.427	0.483	0.425
J3-4	0.465	0.397	0.474	0.399	0.484	0.414	0.475	0.412
J4-4	0.456	0.383	0.465	0.385	0.474	0.399	0.465	0.397

Notes:

1. Color coordinates measurement allowance is ± 0.15.

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*.

Spec No.:   R3020

Issue No.:   G-Rev-4

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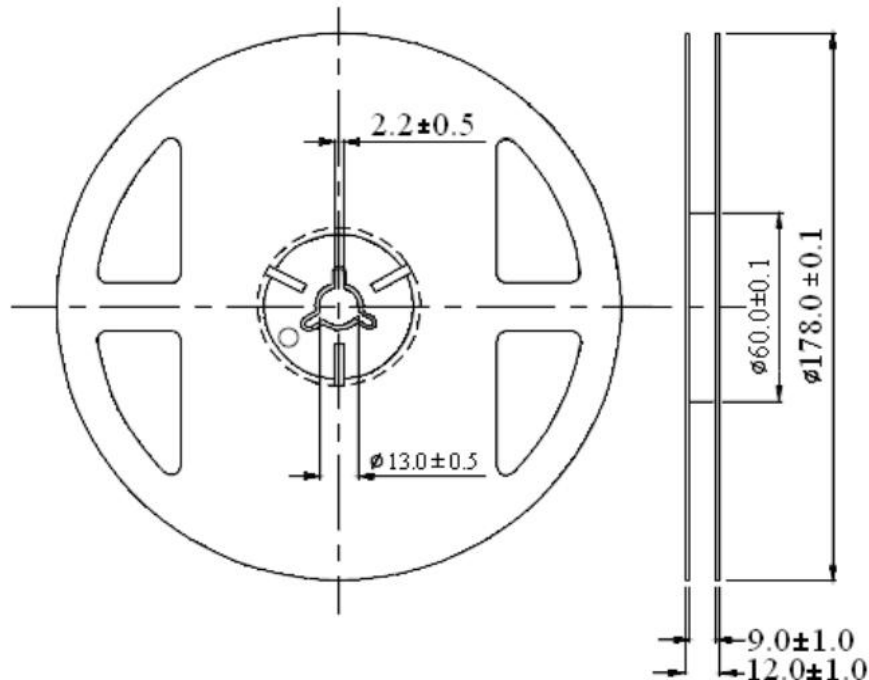
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Reel Dimensions:

2.2±0.5

ø60.0±0.1

ø178.0±0.1

ø13.0±0.5

9.0±1.0
12.0±1.0

Unit: mm
Tolerance: ±0.25mm

Carrier Tape Dimensions:

Loaded quantity 3000 pcs per reel.

Progressive Direction

2.00±0.05   4.00±0.10   ø 1.50±0.10   0.25±0.10

1.75±0.10

3.50±0.05   8.00±0.30

3.23±0.10

4.00±0.10   2.23±0.10   1.53±0.10

Polarity
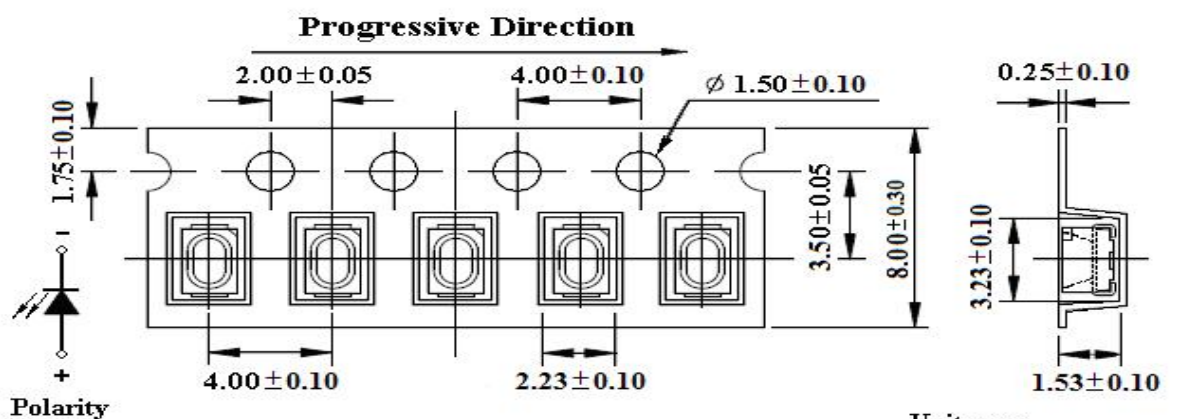
Unit: mm
Tolerance: ±0.10 mm

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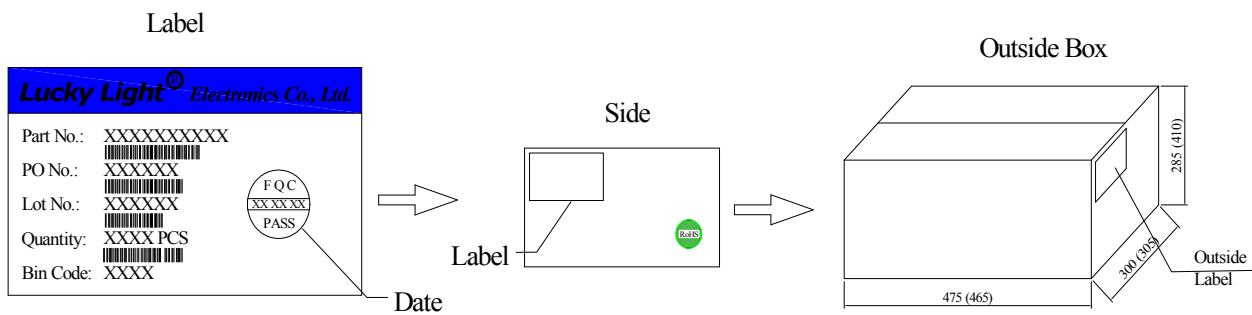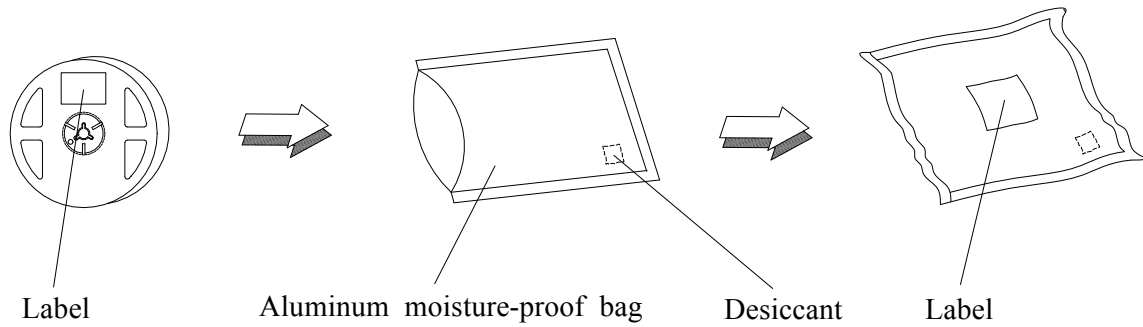
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Packing & Label Specifications:

Moisture Resistant Packaging:

Label   Aluminum moisture-proof bag   Desiccant   Label

Label

Lucky Light® *Electronics Co., Ltd.*

Part No.: XXXXXXXXXX
PO No.: XXXXXX
Lot No.: XXXXXX
Quantity: XXXX PCS
Bin Code: XXXX

F Q C
XX XX XX
PASS

Date

Side

Label

RoHS

Outside Box

285 (410)
300 (305)
475 (465)

Outside Label

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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.
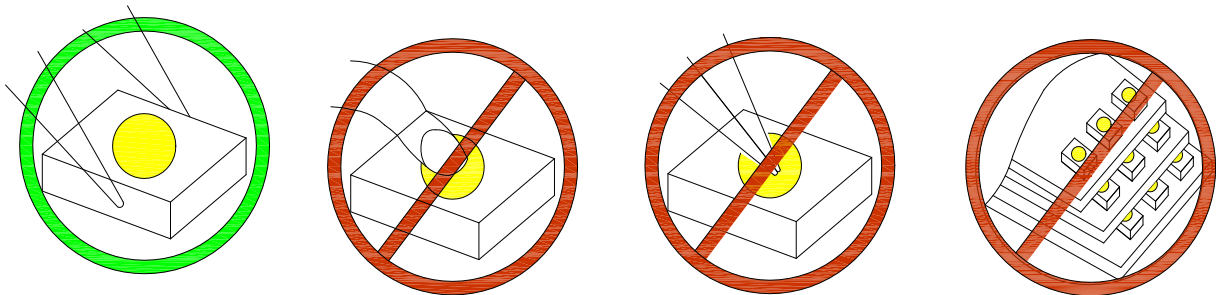
1.4 Compare to epoxy encapsulant that is hard and brittle, silicone is softer and flexible. Although its characteristic significantly reduces thermal stress, it is more susceptible to damage by external mechanical force. As a result, special handling precautions need to be observed during assembly using 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.

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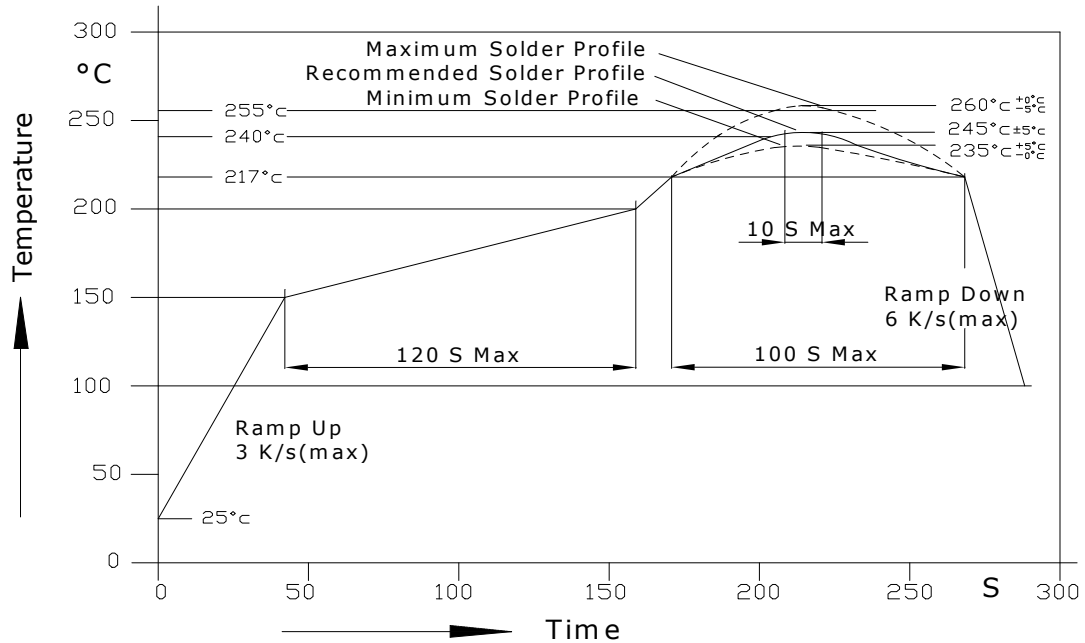
3. Soldering Condition:

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.

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   Circuit model B

LED   LED
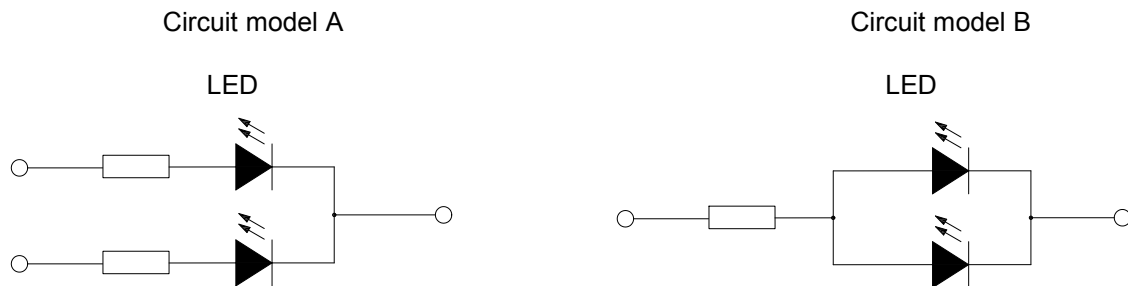
(A) Recommended circuit.

(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.

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2. The part number, type, and specifications mentioned in this document are subject to future change and improvement without notice. Before production usage customer should refer to the latest datasheet for the updated specifications.

3. When using the products referenced in this document, please make sure the product is being operated within the environmental and electrical limits specified in the datasheet. If customer usage exceeds the specified limits, Luckylight will not be responsible for any subsequent issues.

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