

Technical Data Sheet

Product Name: 2835 Warm White Color LED

Part Number: 2835UWAC-K3C-02W-R70

Customer: _____

Customer PN: _____

Version: _____

Date: _____

<h2>Customer Approval</h2>		

Instituted By: _____ **Checked By:** _____ **Approved By:** _____

Products: 2835 Warm White Color LED

Part No.: 2835UWAC-K3C-02W-R70

1. Features:

- Package (L/W/H) : 2.8 × 3.5 × 0.7 mm
- Color : Ultra Bright White
- Lens: Yellow Diffused
- EIA STD Package
- Meet ROHS, Green Product
- Compatible With SMT Automatic Equipment
- Compatible With Infrared Reflow Solder And Wave Solder Process

2. Absolute Maximum Ratings At Ta=25°C

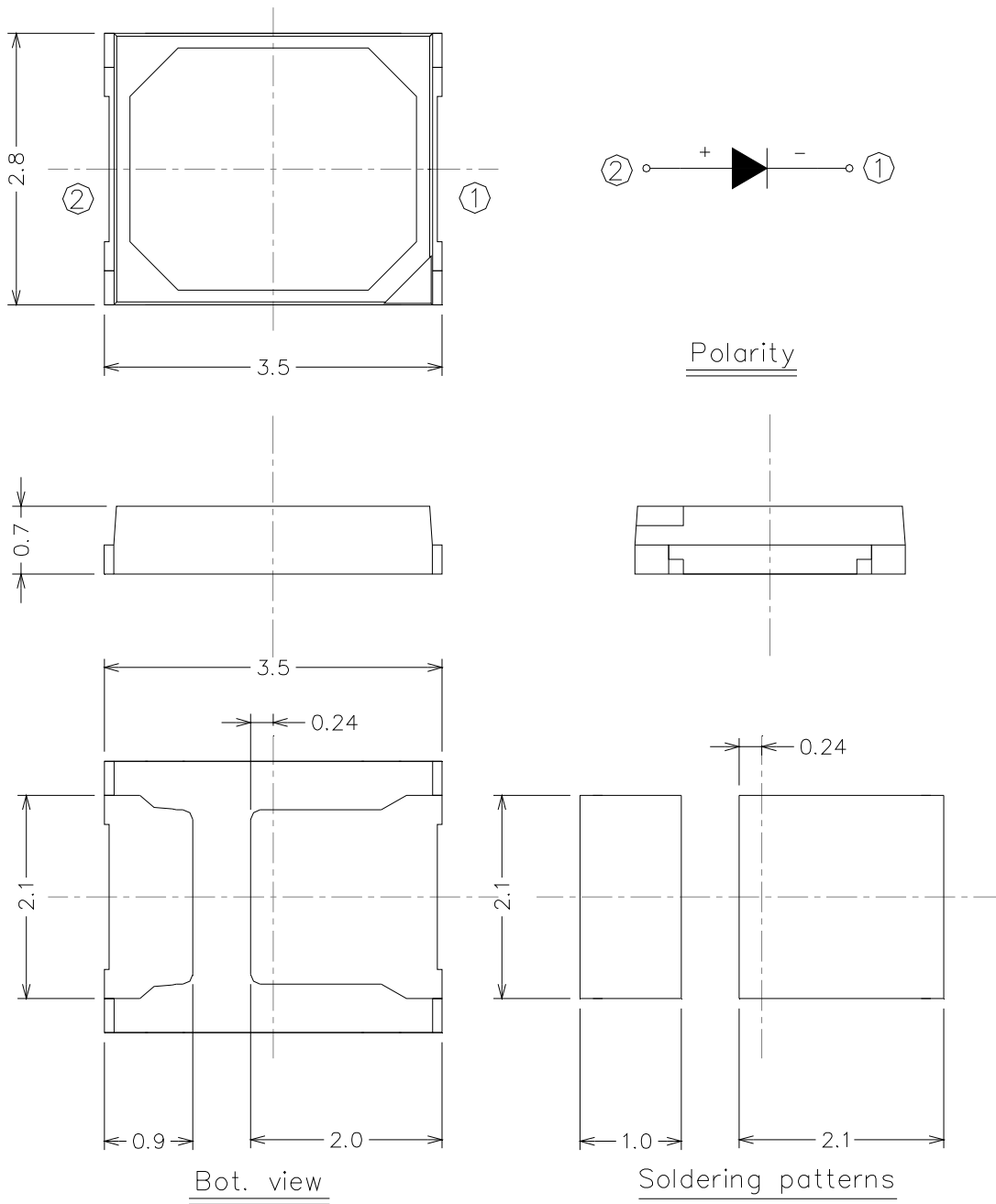
Parameter	Symbol	Rating	Unit
Power Dissipation	Pd	210	mW
Peak Forward Current (1/10 Duty Cycle, 0.1ms Pulse Width)	I _{FP}	250	mA
DC Forward Current	I _F	60	mA
Reverse Voltage	V _R	5	V
Electrostatic Discharge	ESD	2000(HBM)	V
Operating Temperature Range	T _{opr}	-40°C ~ +90°C	
Storage Temperature Range	T _{stg}	-40°C ~ +90°C	
Soldering Condition	T _{sol}	Reflow soldering : 260°C For 5 Seconds Hand soldering: 300°C For 3 Seconds	

3. Electrical Optical Characteristics At Ta=25°C

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Luminous Intensity	FLUX	22	26	---	mcd	IF = 60mA
CIE 1931 Coordinate	X	---	0.43	---	nm	IF = 60mA
	Y	---	0.41	---		
Chromaticity	TC	2700	---	3500	K	IF = 60mA
Color Rendering Index	CRI	---	80	---	Ra	IF = 60mA
Spectral Line Half-Width	$\Delta\lambda$	---	30	---	nm	IF = 60mA
Forward Voltage	VF	3.0	---	3.6	V	IF = 60mA
Reverse Current	IR	---	---	50	uA	VR=5V
Viewing Angle	2 θ 1/2	---	120	---	deg	IF = 60mA

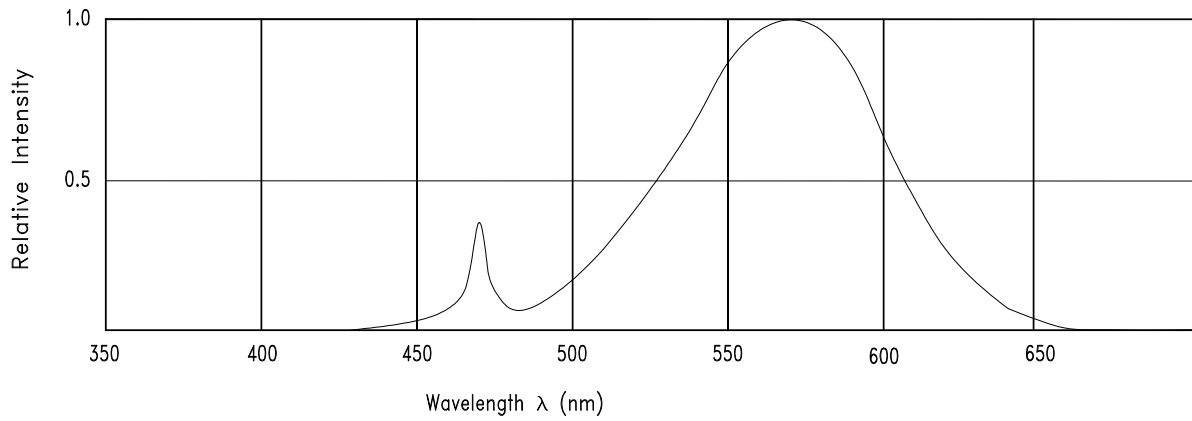
- Notes: 1. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.
2. θ 1/2 is the off-axis angle at which the luminous intensity is half the axial luminous intensity.
3. The dominant wavelength, λ_d is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.

4. Package Profile & Soldering PAD Suggested



- ✧ All dimensions are millimeters.
- ✧ Tolerance is 0.1mm unless otherwise noted.

5. Typical Electrical-Optical Characteristics Curves



Typical Electro-Optical Characteristics Curves

Fig.1 – Forward Voltage Shift vs. Junction Temperature

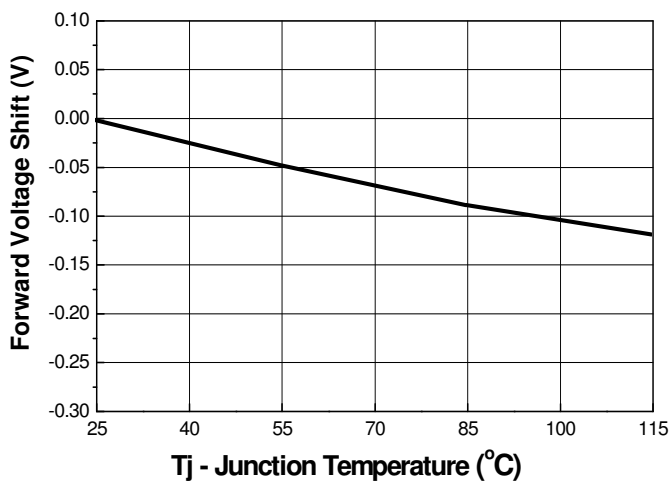
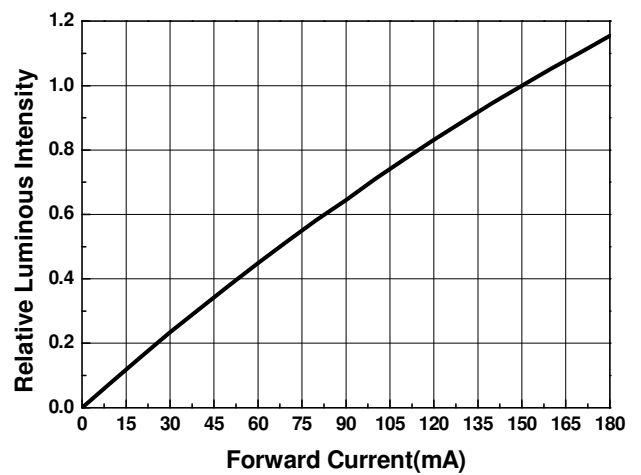


Fig.2 - Relative Luminous Intensity vs. Forward Current



Typical Electro-Optical Characteristics Curves

Fig.3 - Relative Luminous Intensity vs. Junction Temperature

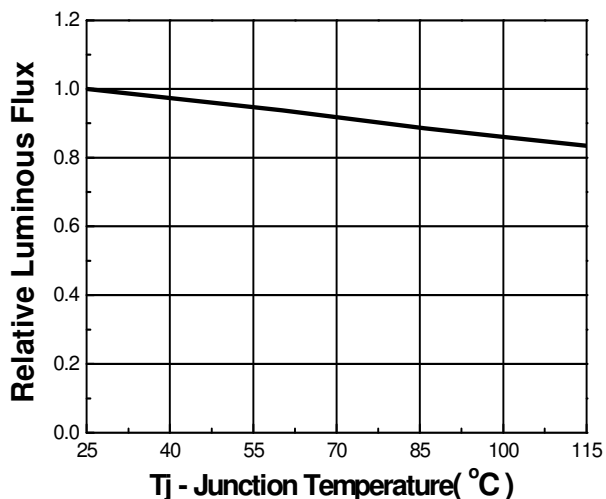


Fig.4 - Forward Current vs. Forward Voltage

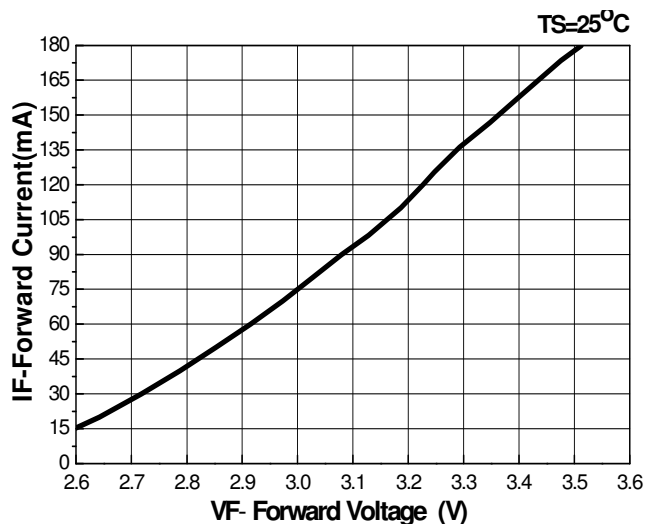


Fig.5 - Max. Driving Forward Current vs. Soldering Temperature

R_{th j-s}=21 °C/W

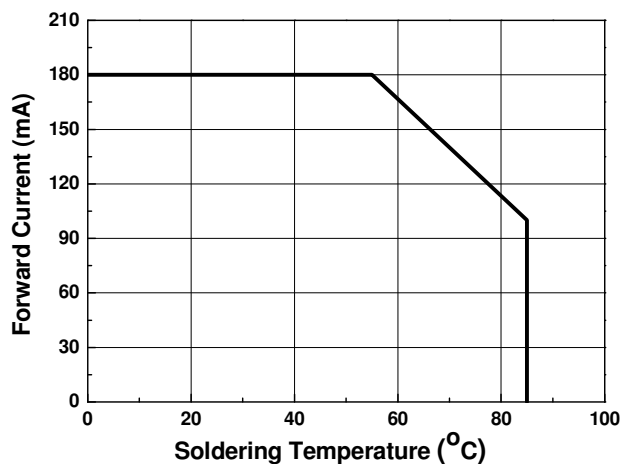
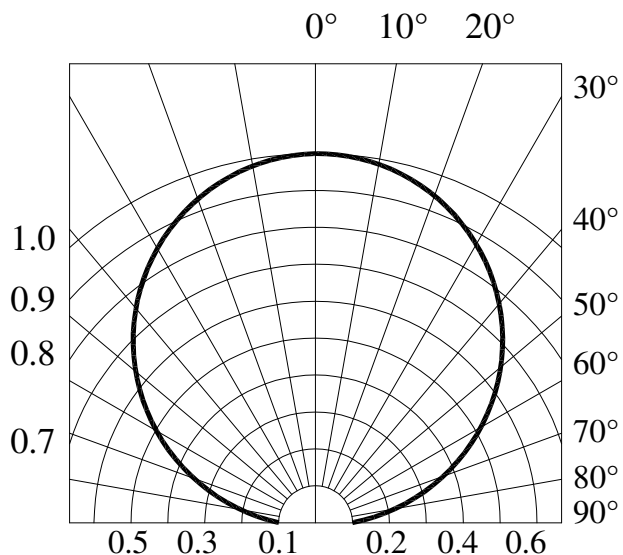


Fig.6 - Radiation Diagram



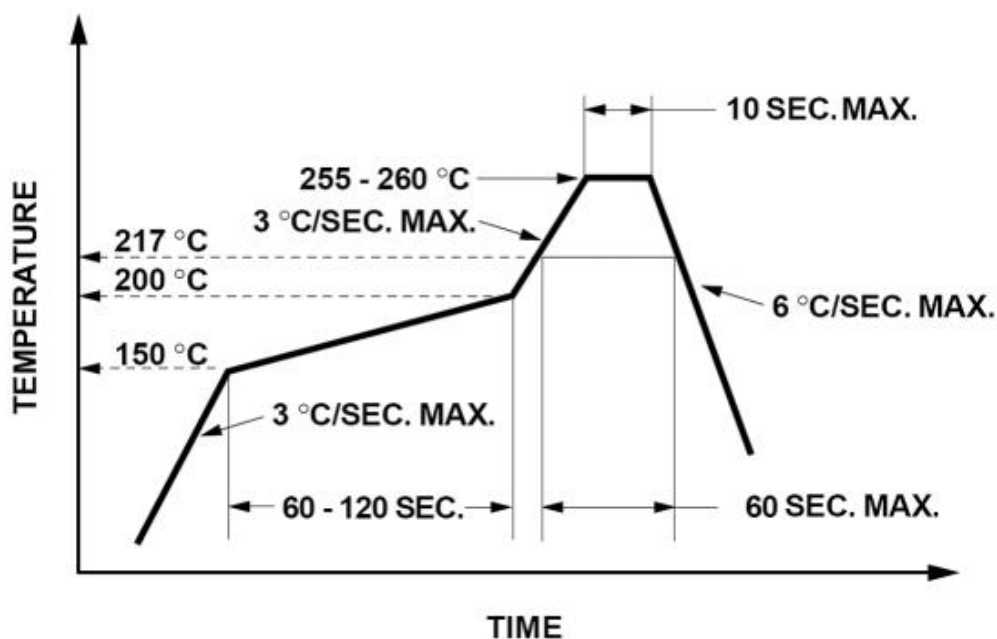
6. Precautions For Use

6.1、 Storage

- 6.1.1 Do not open moisture proof bag before the products are ready to use.
- 6.1.2 Before opening the package: The LEDs should be kept at 30°C or less and 85% RH or less.
- 6.1.3 After opening the package: The LEDs floor life is 168 Hrs under 30°C or less and 60% RH or less. If unused LEDs remain, it should be stored in moisture proof packages.
- 6.1.4 If the moisture absorbent material(silica gel)has faded 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)

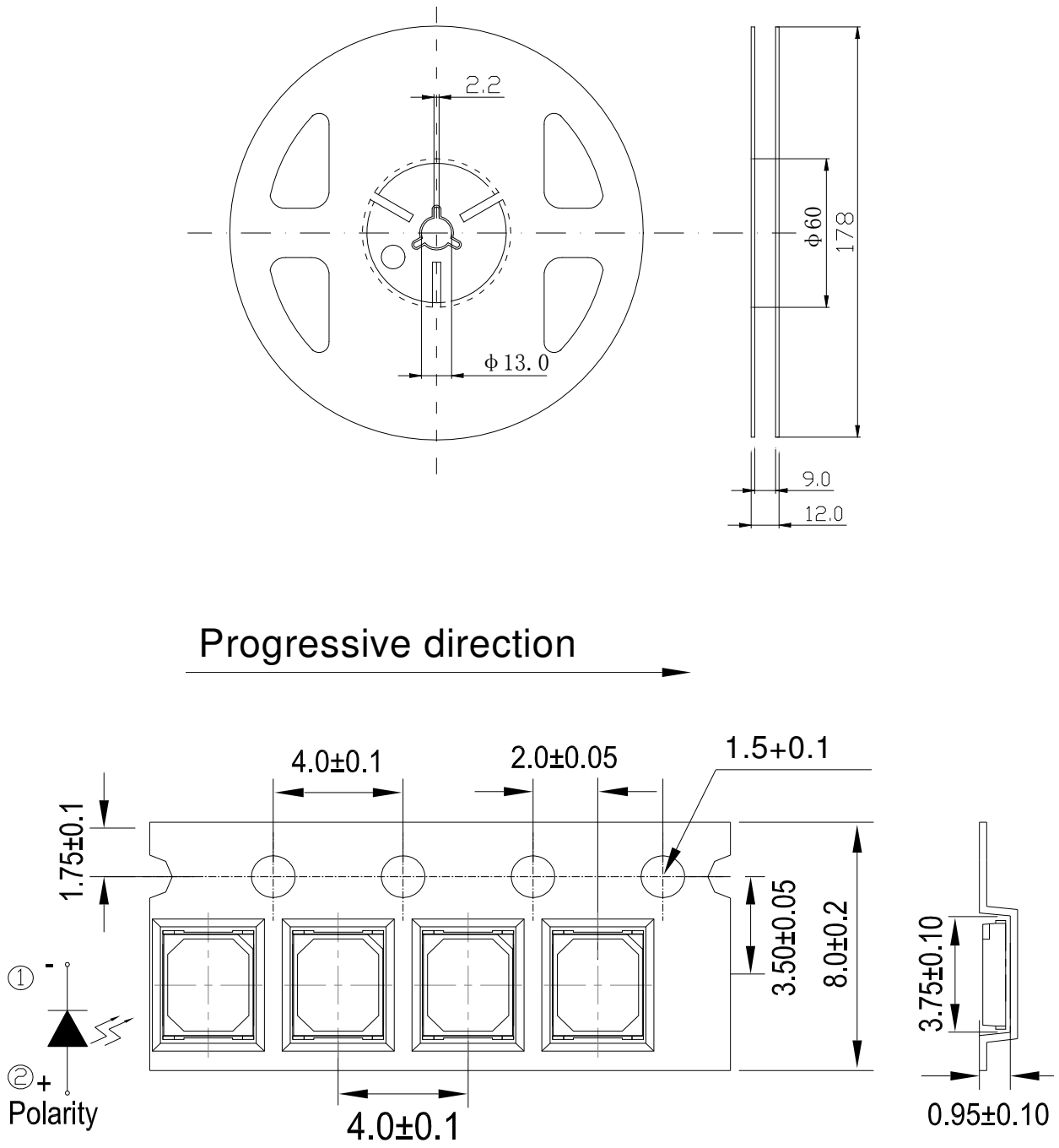
6.2、 Soldering Condition

- 6.2.1 Pb-free solder temperature profile



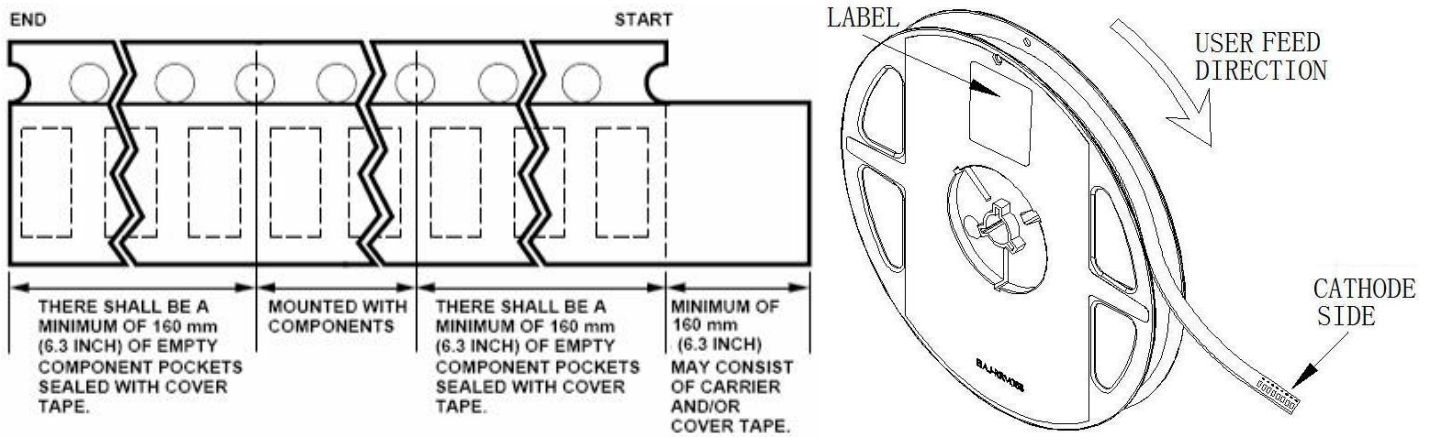
- 6.2.2 We recommend the soldering temperature 245 ± 5°C
The maximum temperature should be limited to 260°C
- 6.2.3 Reflow soldering should not be done more than two times.
- 6.2.4 When soldering do not put stress on the LEDs during heating.
- 6.2.5 After soldering do not warp the circuit board.

7. Reel And Tape Dimensions:

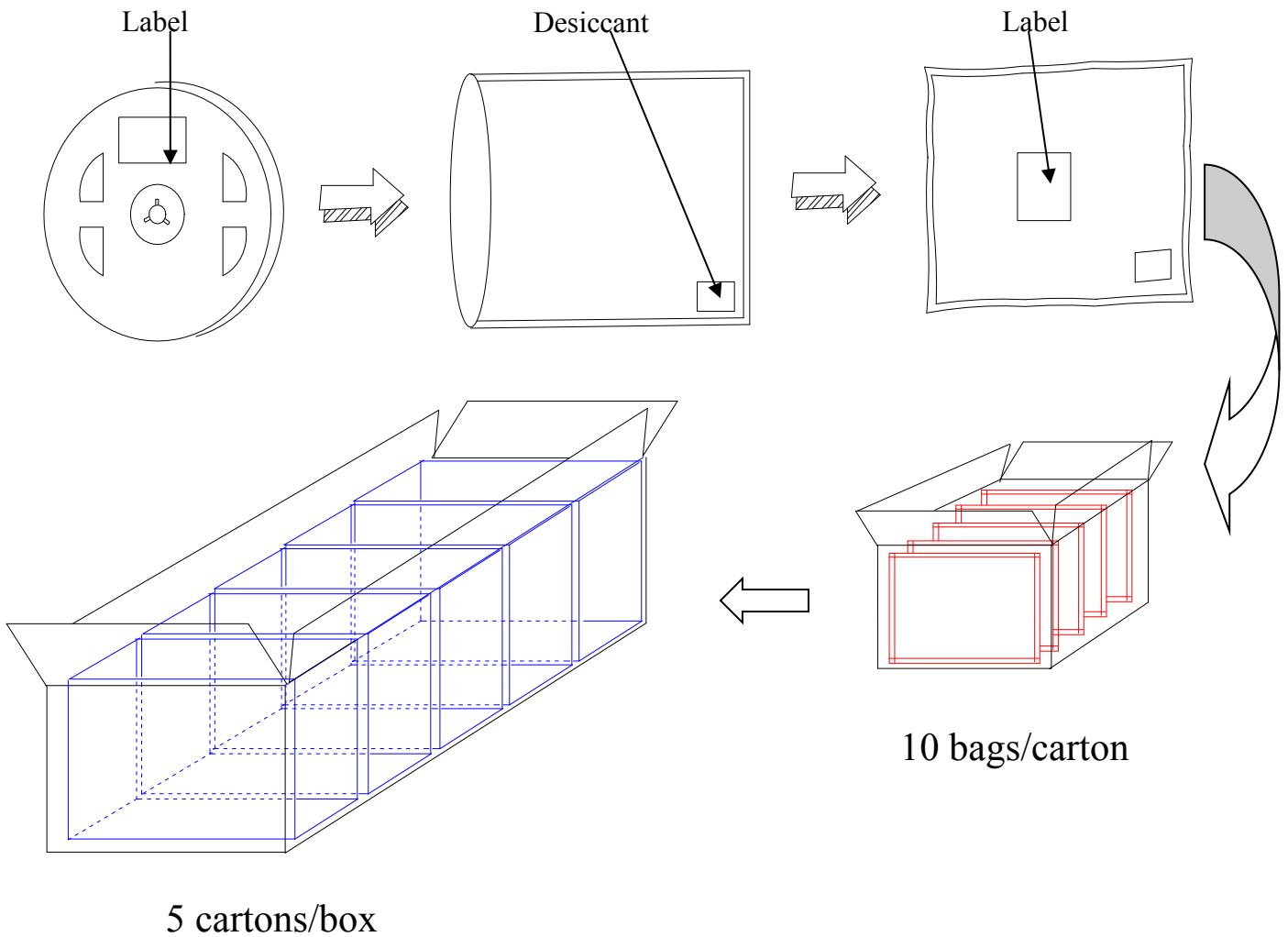


- Notes: 1. All dimensions are in millimeters ;
 2. Tolerance is ± 0.1 mm unless otherwise noted.

8. Tape Leader & Trailer Dimensions And Reel



9. Packaging:



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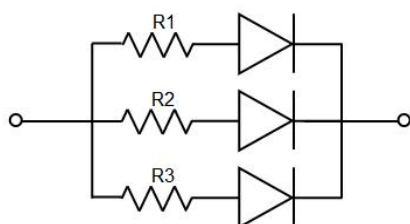
10. Reliability Test

Classification	Test Item	Test Condition	Reference Standard	Reference Standard
Endurance Test	Operation Life	Ta= Under Room Temperature As Per Data Sheet Maximum Rating	1000HRS (-24HRS,+72HRS)*@60mA	MIL-STD-750D:1026 MIL-STD-883D:1005 JIS C 7021:B-1
	High Temperature, High Humidity Storage	IR-Reflow In-Board, 2 Times Ta= 65±5°C,RH= 90~95%	240HRS±2HRS	MIL-STD-202F:103B JIS C 7021:B-11
	High Temperature Storage	Ta= 105±5°C	1000HRS (-24HRS,+72HRS)	MIL-STD-883D:1008 JIS C 7021:B-10
	Low Temperature Storage	Ta= -55±5°C	1000HRS (-24HRS,+72HRS)	JIS C 7021:B-12
Environmental Test	Temperature Cycling	105°C ~ 25°C ~ -55°C ~ 25°C 30mins 5mins 30mins 5mins	10 Cycles	MIL-STD-202F:107D MIL-STD-750D:1051 MIL-STD-883D:1010 JIS C 7021:A-4
	Thermal Shock	IR-Reflow In-Board, 2 Times 85 ± 5°C ~ -40°C ± 5°C 10mins 10mins	10 Cycles	MIL-STD-202F:107D MIL-STD-750D:1051 MIL-STD-883D:1011
	Solder Resistance	T.sol= 260 ± 5°C	10 ± 1secs	MIL-STD-202F:210A MIL-STD-750D:2031 JIS C 7021:A-1
	IR-Reflow Normal Process	Ramp-up rate(183°C to Peak) +3°C/ second max Temp. maintain at 125(±25)°C 120 seconds max Temp. maintain above 183°C 60-150 seconds Peak temperature range 235°C+5/-0°C Time within 5°C of actual Peak Temperature (tp) 10-30 seconds Ramp-down rate +6°C/second max	-----	MIL-STD-750D:2031.2 J-STD-020C
	IR-Reflow Pb Free Process	Ramp-up rate(217°C to Peak) +3°C/ second max Temp. maintain at 175(±25)°C 180 seconds max Temp. maintain above 217°C 60-150 seconds Peak temperature range 260°C+0/-5°C Time within 5°C of actual Peak Temperature (tp) 20-40 seconds Ramp-down rate +6°C/second max	-----	MIL-STD-750D:2031.2 J-STD-020C
	Solderability	T.sol= 235 ± 5°C Immersion rate 25±2.5 mm/sec Coverage ≧95% of the dipped surface	Immersion time 2±0.5 sec	MIL-STD-202F:208D MIL-STD-750D:2026 MIL-STD-883D:2003 IEC 68 Part 2-20 JIS C 7021:A-2

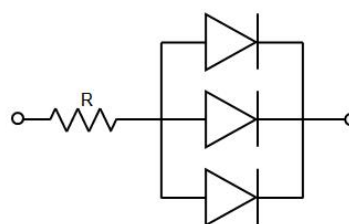
12. Cautions

Application

1. A LED is a current-operated device. The slight shift of voltage will cause big change of current, which will damage LEDs. Customer should use resistors in series for the Over-Current-Proof.
2. In order to ensure intensity uniformity on multiple LEDs connected in parallel in an application, it is recommended to use individual resistor separately, as shown in Circuit A below. The brightness of each LED shown in Circuit B might appear difference due to the differences in the I-V characteristics of those LEDs.



Circuit model A



Circuit model B

3. High temperature may reduce LEDs' intensity and other performances, so keeping it away from heat source to get good performance is necessary.

ESD (Electrostatic Discharge)-Protection

A LED (especially the Blue、 White and Green product) is an ESD sensitive component, and static electricity or power surge will damage the LED.

ESD-damaged LEDs will exhibit abnormal characteristics such as high reverse leakage current, low forward voltage, or “no light-up” at low currents, etc.

Some advice as below should be noticed:

1. A conductive wrist strap or anti-electrostatic glove should be worn when handling these LEDs.
2. All devices, equipment, machinery, work tables and storage racks, etc. must be properly grounded.
3. Use anti-static package or boxes to carry and storage LEDs. And ordinary plastic package or boxes is forbidden to use.
4. Use ionizer to neutralize the static charge during handling or operating.
5. All surfaces and objects within 1 ft close to LEDs measure less than 100V.

Cleaning

Use alcohol-based cleaning solvents such as IPA (isopropyl alcohol) to clean LEDs if necessary.

Soldering

1. Soldering condition refer to the draft “Soldering Profile Suggested” on page 1.
2. Reflow soldering should not be done more than 2 times.
3. Manual soldering is only suggested on repair and rework. The maximum

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soldering temperature should not exceed 300°C within 3 sec. And the maximum capacity of soldering iron is 30W in power.

4. During the soldering process, do not touch the lens at high temperature.
5. After soldering, any mechanical force on the lens or any excessive vibration shall not be accepted to apply, also the circuit board shall not be bent as well.

Others

1. The LEDs described here are intended to be used for ordinary electronic equipment (such as office equipment, communication equipment and household applications). Consult Sales in advance for the applications in which exceptional reliability is required, particularly when the failure or malfunction of the LEDs may directly jeopardize life or health. (such as in aviation, transportation, traffic control equipment, medical and life support systems and safety devices).
2. The light output from the high luminous intensity LEDs may cause injury to human eyes when viewed directly.
3. The appearance and specifications of the product may be modified for improvement without prior notice.