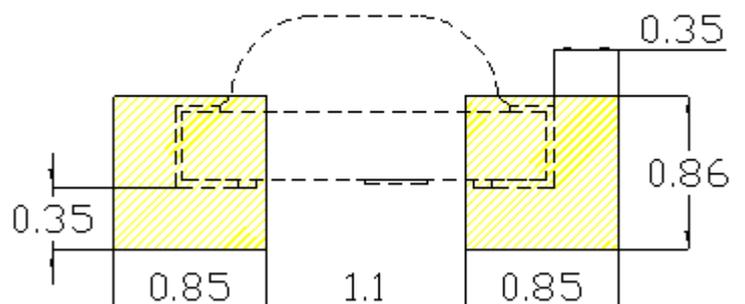
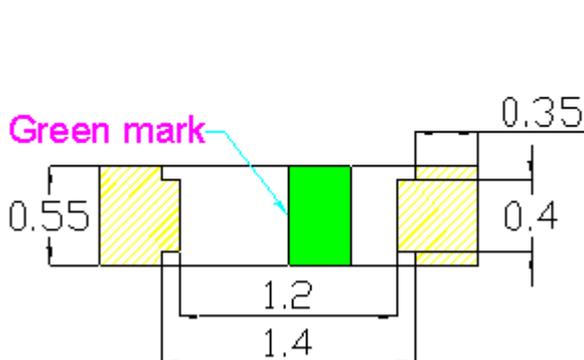
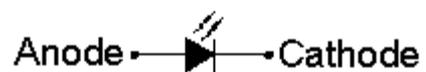
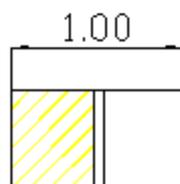
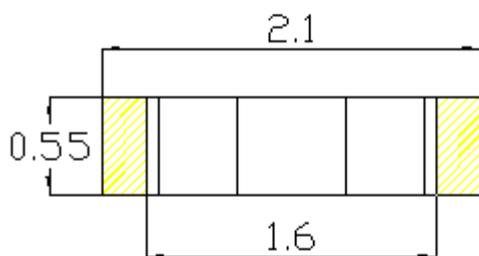
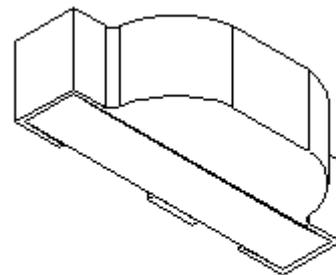
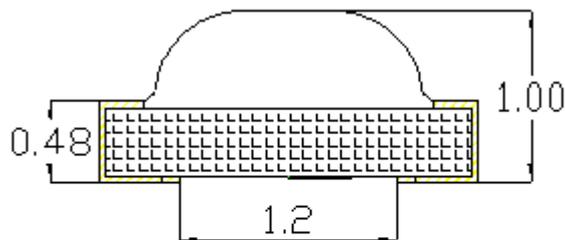


1. Product Description:

1. L/W/H: 2.1 x 0.6 x 1.0 mm
2. Color: High brightness Red
3. Colloid: Transparency colloid
4. EIA Standard Packaging
5. Eco-friendly products, ROHS compliant
6. For automatic pickers
For reflow welding processes

2. Form factor and recommended pad size:

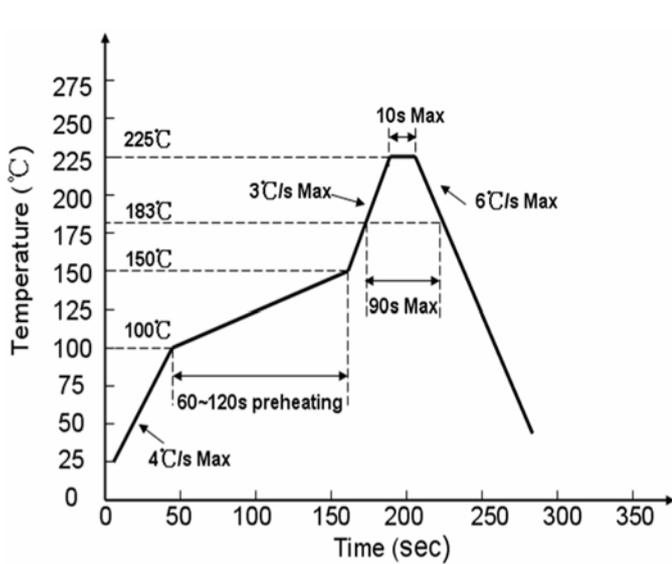


Recommand soldering pad

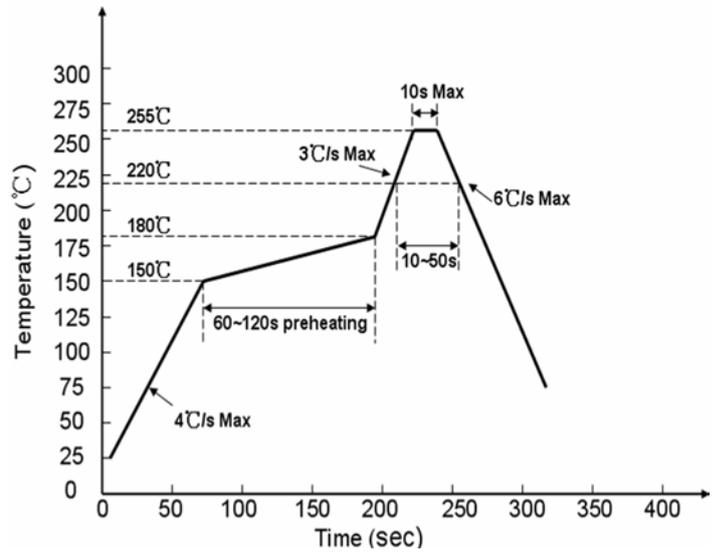
Note:

1. Units: mm (mm)
2. Tolerance: .10 mm without special labels

3. The recommended welding temperature curve:



For Lead Solder



For Lead Free Solder

4. Maximum absolute rating $T_a=25^\circ\text{C}$

Number of parameters	The no.	Maximum rating	Single-bit
power dissipation	P_d	55	mW
Maximum pulse current (1/10 duty ratio, 0.1ms pulse width)	I_{FP}	100	mA
Forward DC operating current	I_F	25	mA
Reverse voltage	V_R	5	V
Working environment temperature	T_{opr}	$-30^\circ\text{C} \sim +85^\circ\text{C}$	
Storage ambient temperature	T_{stg}	$-40^\circ\text{C} \sim +90^\circ\text{C}$	
Welding conditions	T_{sol}	Reflow welding : 260°C , 10s Manual welding : 300°C , 3s	

5. Photoelectric parameters (Ta=25°C) :

Parameters	Symbol	Min.	Typical	Max.	Unit	Test conditions
Luminous intensity	IV	---	50	---	mcd	IF=5mA
viewing angle	2θ1/2	---	120	---	deg	IF=5mA
Forward voltage	VF	---	---	3.2	V	IF=5mA
Reverse current	IR	---	---	5	uA	VR=5V
Wavelength	λD	620	---	630	nm	IF=5mA

Brightness split:

Code	Min.	Max.	Unit	Test conditions
L3	40	48	mcd	IF=5mA
L4	48	57.5		
M3	57.5	70		

Note: Luminous intensity $\pm 11\%$

Voltage split:

Code	Min.	Max.	Unit	Test conditions
1	1.5	1.7	V	IF=5mA
2	1.7	1.9		
3	1.9	2.1		
4	2.1	2.3		

wavelength split:

Code	Min.	Max.	Unit	Test conditions
A	615	620	nm	IF=5mA
B	620	625		
C	625	630		
D	630	635		

Note: Wavelength tolerance ± 1 nm

Forward voltage deviation ± 0.02 V

6. Photonic parameters represent value characteristic curves:

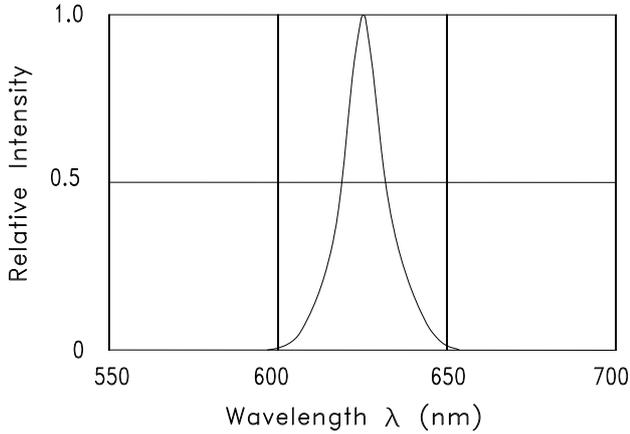


Fig.1 RELATIVE INTENSITY VS. WAVELENGTH

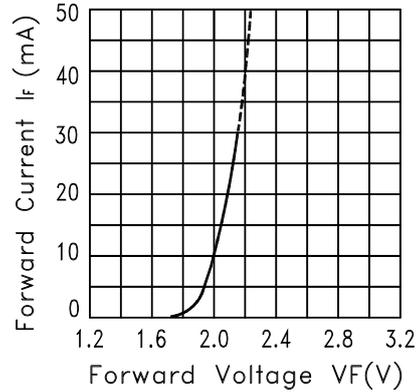


Fig.2 FORWARD CURRENT VS. FORWARD VOLTAGE

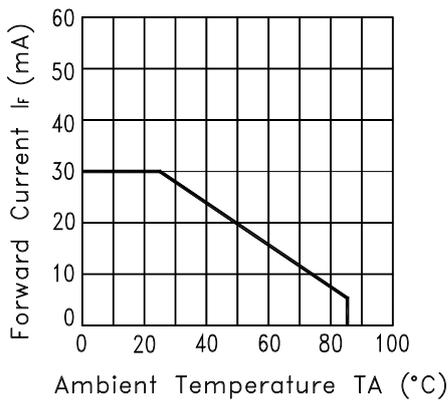


Fig.3 FORWARD CURRENT DERATING CURVE

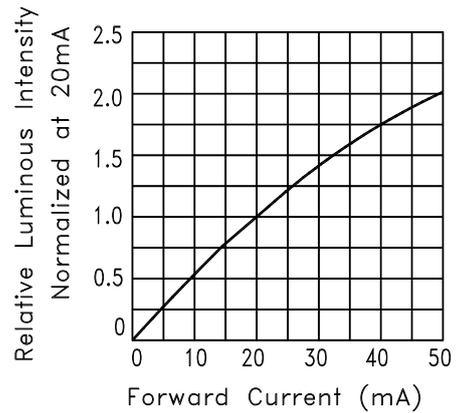


Fig.4 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

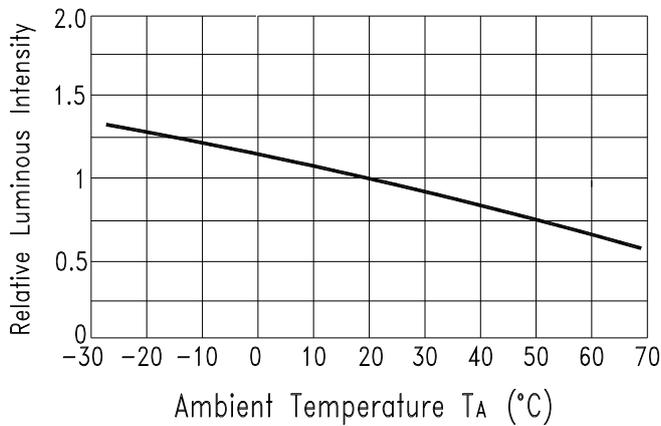


Fig.5 Luminous Intensity vs. Ambient Temperature

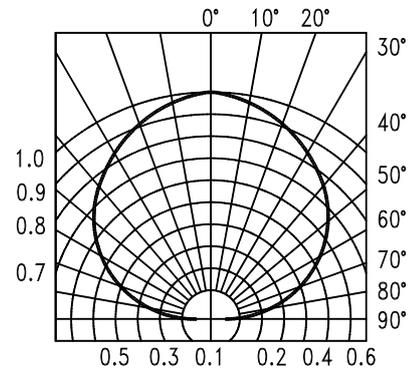


Fig.6 SPATIAL DISTRIBUTION

Note: If not otherwise noted, the test ambient temperature is $25 \pm 3^\circ\text{C}$

7. Labels and logos:

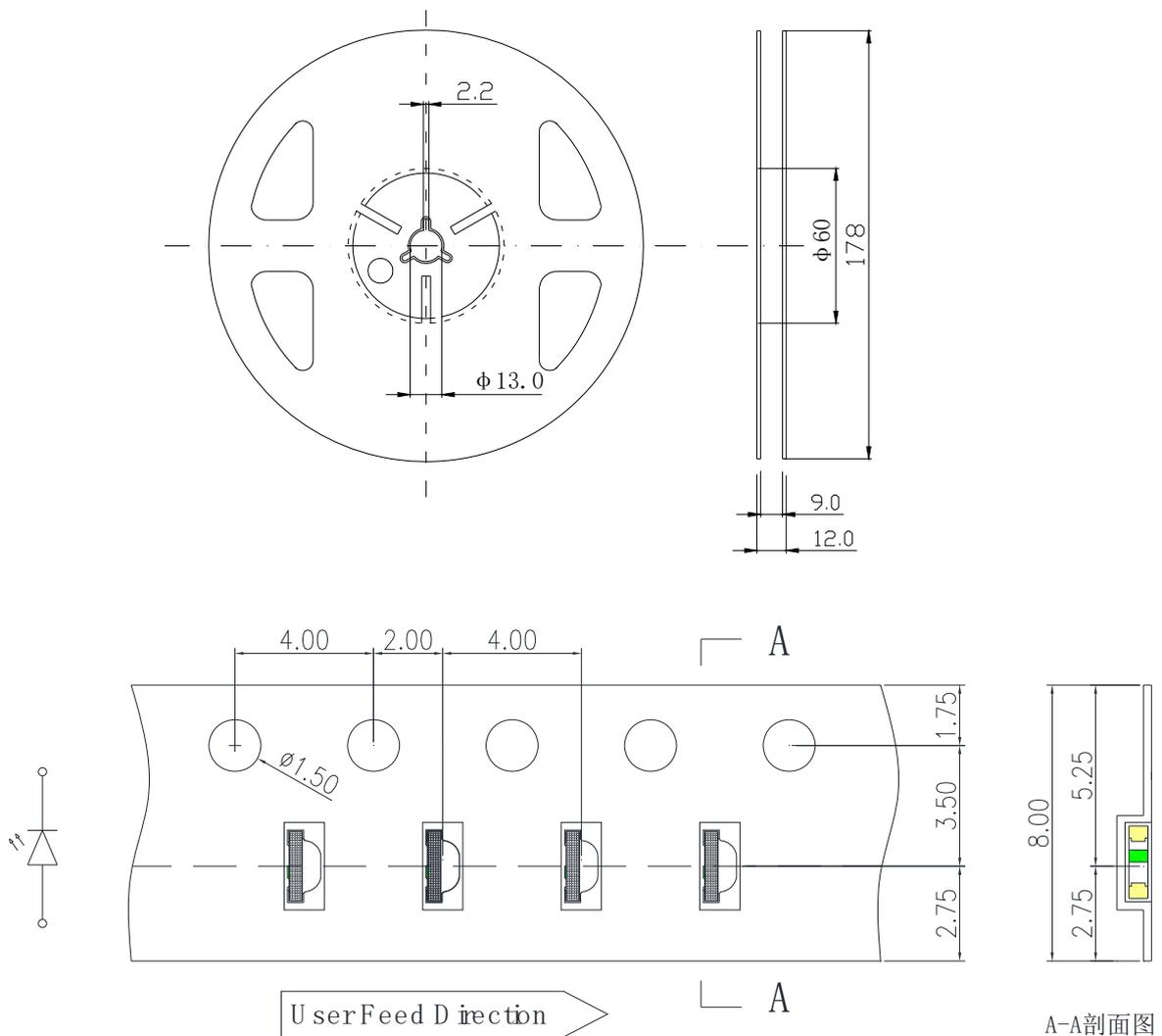
P/N: Product Name

WLD: Wavelength

QTY: Product quantity

LOT No.: Production Lot Code

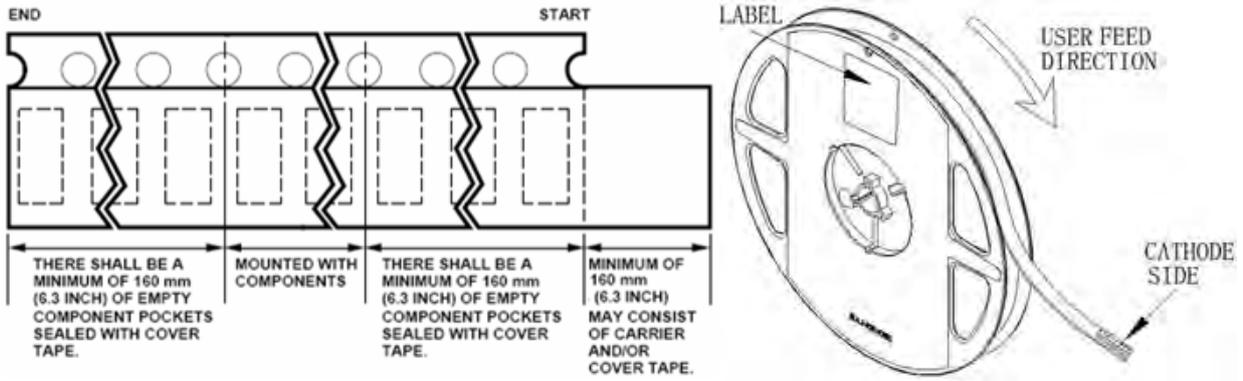
8. Packed carrier and disc size:



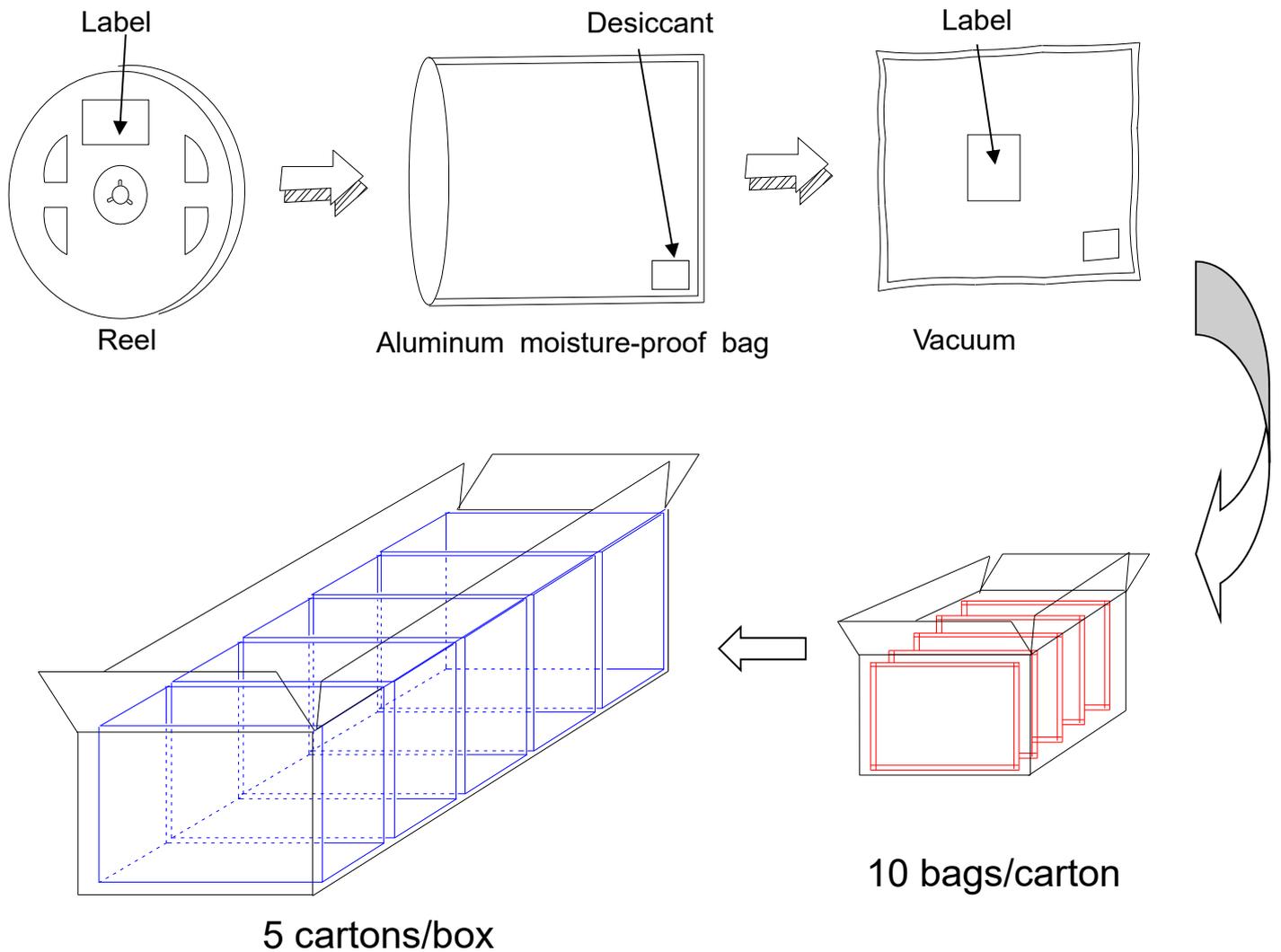
Note: 1. Unit : mm

2. Tolerance: -0.15 mm without a special label

9. Tape Leader & Trailer Dimensions And Reel



10. Packaging:



11. 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; 20mA	1000HRS (-24HRS,+72HRS)*@20mA	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℃,RH= 90~95%	240HRS±2HRS	MIL-STD-202F:103B JIS C 7021:B-11
	High Temperature storage	Ta= 105±5℃	1000HRS (-24HRS,+72HRS)	MIL-STD-883D:1008 JIS C 7021:B-10
	Low Temperature Storage	Ta= -55±5℃	1000HRS (-24HRS,+72HRS)	JIS C 7021:B-12
	Temperature Cycling	105℃ ~ 25℃ ~ -55℃ ~ 25℃ 30mins 5mins 30mins 5mins	1000HRS (-24HRS,+72HRS)	MIL-STD-202F:107D MIL-STD-750D:1051 MIL-STD-883D:1010 JIS C 7021:A-4
Environmental test	Thermal Shock	IR-Reflow In-Board, 2 Times 85 ± 5℃ ~ -40℃ ± 5℃ 10mins 10mins	10 Cycles	MIL-STD-202F:107D MIL-STD-750D:1051 MIL-STD-883D:1011
	Solder Resistance	T.sol= 240 ± 5℃	10 Cycles two times	MIL-STD-202F:210A MIL-STD-750D:2031 JIS C 7021:A-1
	IR-Reflow Normal Process	Ramp-up rate(183℃ to Peak) +3℃/ second max Temp. maintain at 125(±25)℃ 120 seconds max Temp. maintain above 183℃ 60-150 seconds Peak temperature range 235℃ +5/-0℃ Time within 5℃ of actual Peak Temperature (tp) 10-30 seconds Ramp-down rate +6℃/second max	-----	MIL-STD-750D:2031.2 J-STD-020C
	IR-Reflow Pb Free Process	Ramp-up rate(217℃ to Peak) +3℃/ second max Temp. maintain at 175(±25)℃ 180 seconds max Temp. maintain above 217℃ 60-150 seconds Peak temperature range 260℃+0/-5℃ Time within 5℃ of actual Peak Temperature (tp) 20-40 seconds Ramp-down rate +6℃/second max	-----	MIL-STD-750D:2031.2 J-STD-020C
	Solderability	T.sol= 235 ± 5℃ 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

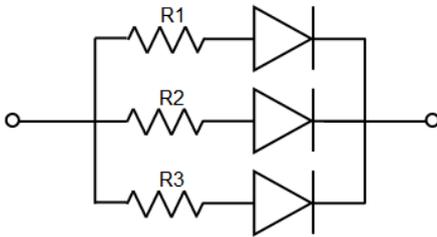
12. Cautions Application

1. A LED is a current-operated device. The slight shift of voltage will cause big change of current, which will damage LEDs.

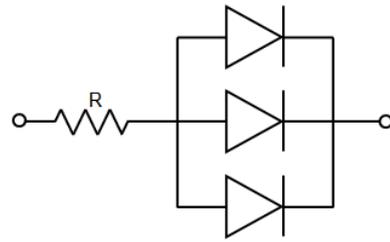
Customer should use resistors in series for the Over-Current-Proof.

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.

4. Photonic parameter tolerance:

Forward voltage REF/VF: $\pm 0.1V$

Brightness CAT/IV: $\pm 15\%$

Wavelength HUE/WLD: $\pm nm$

Storage

1. Before opening original package, it is recommended to store them in the following environment:

Temperature: $5^{\circ}C \sim 30^{\circ}C$

Humidity: 85%RH max.

2. After opening original package, the storage ambient for the LEDs should be in $5 \sim 30^{\circ}C$ temperature and 60% or less relative humidity.

3. In order to avoid moisture absorption, it is recommended that the LEDs that out of the original package should be stored in a sealed container with appropriate desiccant, or in desiccators with nitrogen ambient.

4. The LEDs should be used within 168hrs (7 days) after opening the package. Once been mounted, soldering should be quick.

5. If the moisture absorbent material (silica gel) has faded away or the LEDs stored out of original package for more than 168hrs (7 days), baking treatment should be performed using the conditions: $60^{\circ}C$ at least 24 hours.

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 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 Gtlight’s 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.