



Specification

Wah Wang Data Sheet

Top High Power White Color LED

Part No: WW-T502WH0-W2U



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No.57 Hung To Road, Kwun Tong,
Kowloon, Hong Kong
Tel : 852-2512 9939 (10 line)
Fax : 852-2344 2398
Web Site : www.wahwang.com

S.D.N. or D.N. No. : _____

Customer Name : _____

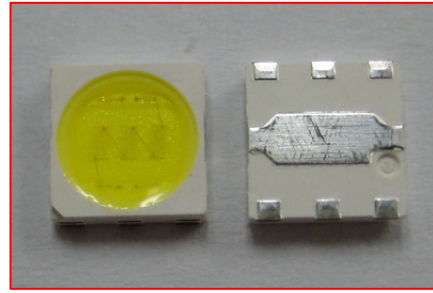
Sample Approval Signature : _____

Date : _____



Technical Datasheet

WAH WANG TOP High Power SMD is a surface mount, compact, high brightness LED that is built for various illumination needs.



WAH WANG TOP High Power SMD is suitable for any kind of lighting sources, including general illumination, flashlights, streetlights, spotlights, residential lighting, tube light source, freezer lighting, industrial and commercial lightings. The small physical dimension can free customers from any constraints or limitations in these fields of applications. Furthermore, the reflow-solderable nature of TOP High Power SMD provides an easy path towards the optimum thermal management to achieve a promising reliability.

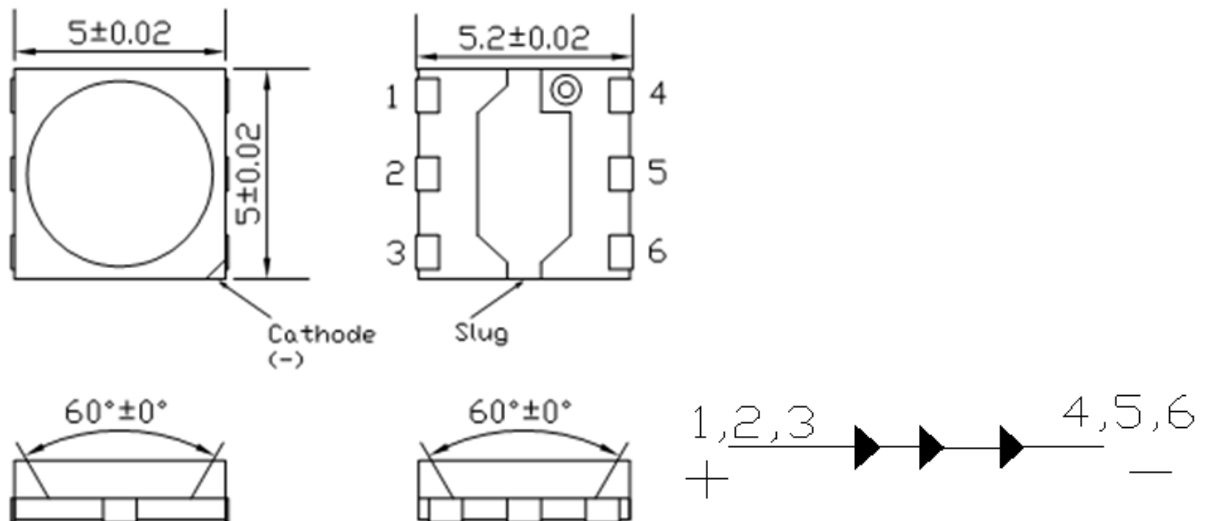
Applications:

- Signal and symbol luminaire
- Indoor and outdoor displays
- Backlighting (illuminated advertising, general lighting)
- Interior automotive lighting
- Emergency lighting

Features

- High luminous intensity and high efficiency
- Wide viewing angle: 120°
- Excellent performance and visibility
- Suitable for all SMT assembly methods
- IR reflow process compatible
- Environmental friendly
- RoHS compliance

Package Dimension



Notes:

1. All dimension units are in millimeters
2. All dimension Tolerance is ± 0.25 mm unless otherwise noted.

* Caution

1. Please do not drive at rated current more than 5 sec. without proper heat sink

**Absolute Maximum Ratings at Ta=25°C**

Parameter	Symbol	Value	Unit
Power dissipation	Pd	1.2	W
Continuous Forward Current	I _F	120	mA
Peak Forward Current (1/10 Duty Cycle, 0.1ms Pulse Width)	I _{FP}	200	mA
Electrostatic Discharge (HBM)	ESD	3000	V
Operating Temperature Range	Topr	-20 to +100	°C
Storage Temperature Range	Tstg	-40 to +120	°C
Junction To Heat-Sink Thermal Resistance	Rth	10	°C/W
Lead Soldering Temperature	Tsol	Reflow Soldering:255~260°C/10~30sec Manual Soldering:350°C/3sec	

Electrical Optical Characteristics at Ta=25°C

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Luminous Flux	Φ _v	110	---	130	Lm	I _F = 120mA
Color Temperature	CT	4600	---	5600	K	I _F = 120mA
Color Index	CRI	68	73	---	Ra	I _F = 120mA
Viewing Angle	2θ1/2	---	120	---	Deg	I _F = 120mA
Forward Voltage	V _F	9	---	11	V	I _F = 120mA
Colour rank	X/Y	PH2-3/PI2-3			---	I _F = 120mA

Notes:

1. WW maintains a tolerance of ±10% on flux and power measurements.
2. (d ±1nm; X.Y Tolerance each Bin limit is ± 0.01
3. A tolerance of ±0.1V on forward voltage measurements
4. View Angle maintains a tolerance of ±20°
5. Specifications are subject to change without notice.
6. These products are sensitive to static electricity; high standard of care must be fully taken when handling them. Particularly if an over-voltage that exceeds the Absolute maximum Rating of these products were applied, the overflow energy will cause damage to and possibly result in destruction of these products. Buyer shall take absolute secure countermeasures against static electricity and surge when handling these products.
7. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.θ1/2 is the off-axis angle at which the luminous intensity is half the axial luminous intensity.

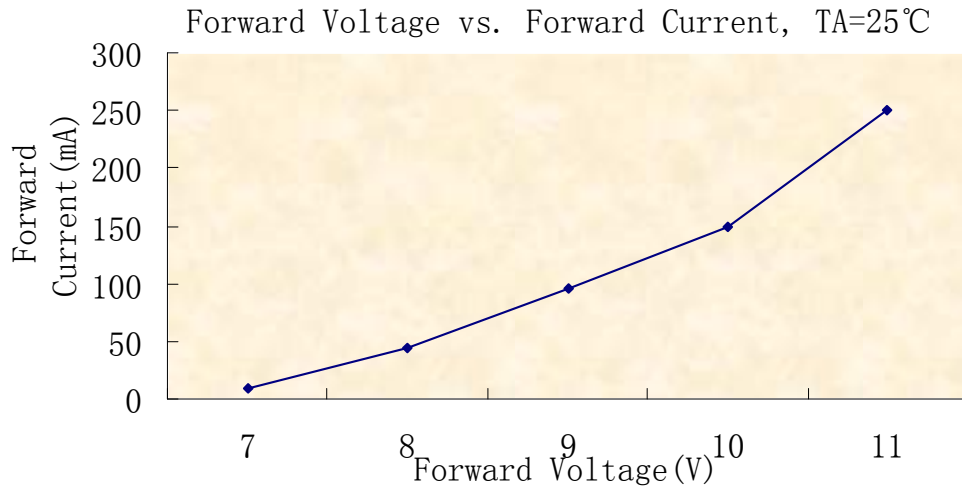


8. It uses many parameters that correspond to the CIE 1931 2°
X, Y, and Z are CIE1931 2° values of Red, Green and Blue content of the measurement.

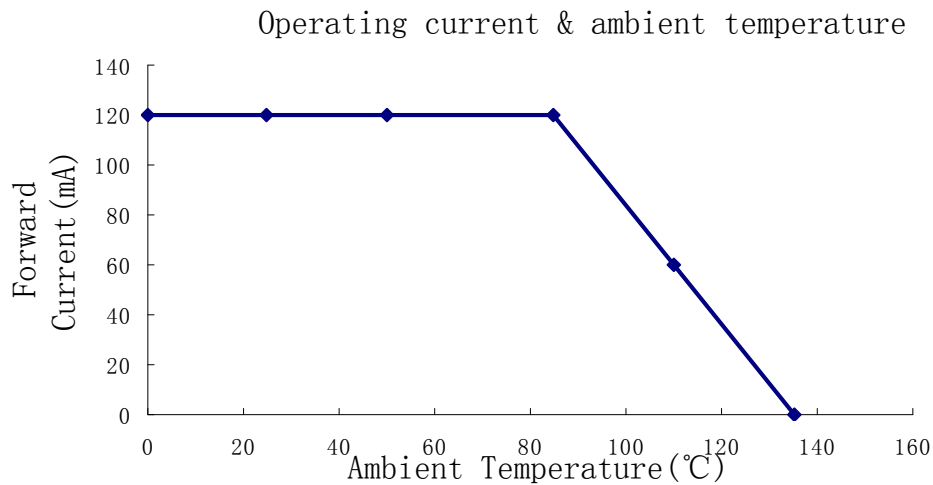


Typical Optical/Electrical Characteristics Curves (Ta=25°C Unless Otherwise Noted)

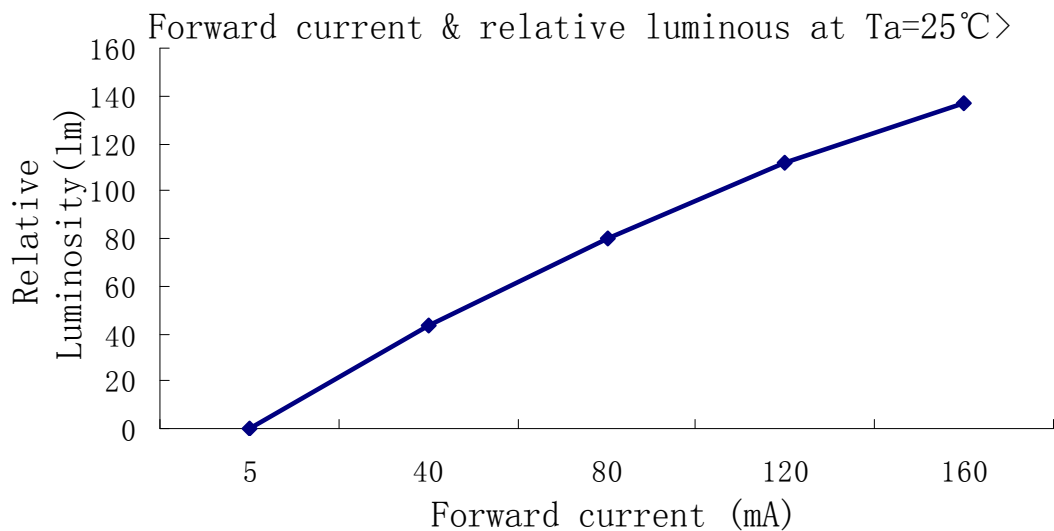
<Figure 1: Forward Voltage vs. Forward Current, TA=25°C



<Figure 2: Operating current & ambient temperature>



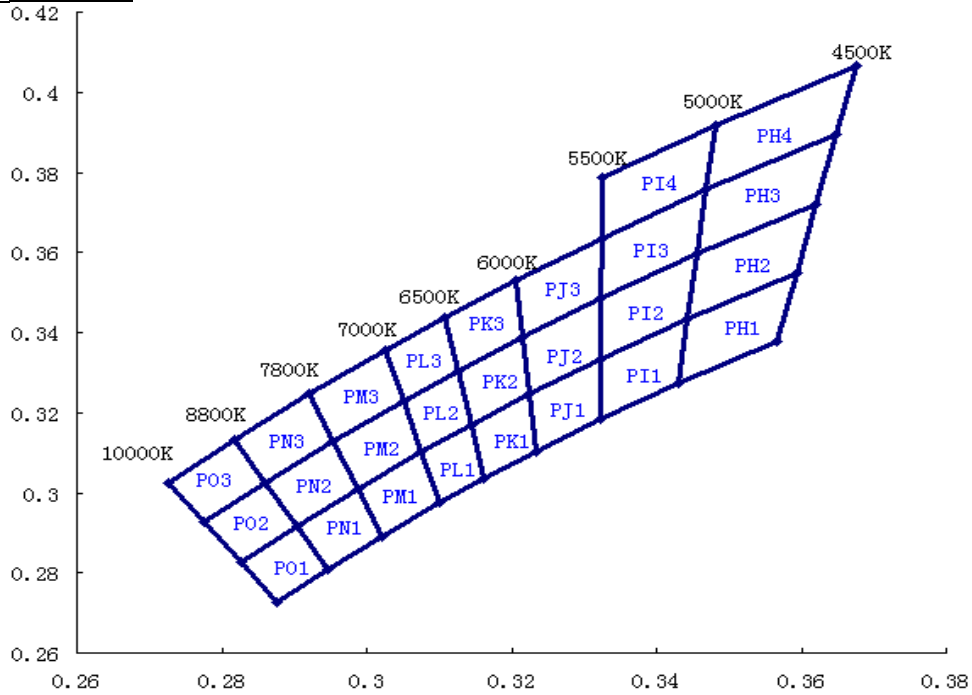
<Figure 3. Forward current & relative luminous at Ta=25°C





Chromaticity Coordinates Specifications for Bin Grading:

Colour rank ($I_F=120mA$)



BIN	CHR-X	CHR-Y	TC (K)	BIN	CHR-X	CHR-Y	TC (K)
P01	0.2827	0.2827	8800-10000	PK1	0.3144	0.3169	6000-6500
	0.2877	0.2727			0.3162	0.3035	
	0.2946	0.2808			0.3235	0.3104	
	0.2903	0.2916			0.3225	0.3246	
P02	0.2776	0.2926	8800-10000	PK2	0.3126	0.3303	6000-6500
	0.2827	0.2827			0.3144	0.3169	
	0.2903	0.2916			0.3225	0.3246	
	0.286	0.3025			0.3215	0.3388	
P03	0.2726	0.3026	8800-10000	PK3	0.3108	0.3437	6000-6500
	0.2776	0.2926			0.3126	0.3303	
	0.286	0.3025			0.3215	0.3388	
	0.2818	0.3133			0.3206	0.353	
PN1	0.2903	0.2916	7800-8800	PJ1	0.3225	0.3246	5500-6000
	0.2946	0.2808			0.3235	0.3104	
	0.3022	0.2892			0.3323	0.3183	
	0.2988	0.301			0.3323	0.3334	
PN2	0.286	0.3025	7800-8800	PJ2	0.3215	0.3388	5500-6000
	0.2903	0.2916			0.3225	0.3246	
	0.2988	0.301			0.3323	0.3334	
	0.2954	0.3128			0.3323	0.3486	
PN3	0.2818	0.3133	7800-8800	PJ3	0.3206	0.353	5500-6000
	0.286	0.3025			0.3215	0.3388	
	0.2954	0.3128			0.3323	0.3486	
	0.292	0.3246			0.3324	0.3636	
PM1	0.2988	0.301	7000-7800	PI1	0.3323	0.3334	5000-5500
	0.3022	0.2892			0.3323	0.3183	
	0.3101	0.2975			0.3431	0.3273	
	0.3076	0.3102			0.3443	0.3435	
PM2	0.2954	0.3128	7000-7800	PI2	0.3323	0.3486	5000-5500



WAH WANG HOLDINGS (HONG KONG) CO., LTD.

Factory : WAH WANG OPTOELECTRONIC (SHENZHEN) CO LTD.

	0.2988	0.301			0.3323	0.3334	
	0.3076	0.3102			0.3443	0.3435	
	0.3051	0.3229			0.3456	0.3596	
PM3	0.292	0.3246	7000-7800	PI3	0.3324	0.3636	5000-5500
	0.2954	0.3128			0.3323	0.3486	
	0.3051	0.3229			0.3456	0.3596	
	0.3026	0.3357			0.3468	0.3758	
PL1	0.3076	0.3102	6500-7000	PI4	0.3324	0.3787	5000-5500
	0.3101	0.2975			0.3324	0.3636	
	0.3162	0.3035			0.3468	0.3758	
	0.3144	0.3169			0.3481	0.3919	
PL2	0.3051	0.3229	6500-7000	PH1	0.3443	0.3435	4500-5000
	0.3076	0.3102			0.3431	0.3273	
	0.3144	0.3169			0.3565	0.3377	
	0.3126	0.3303			0.3593	0.3549	
PL3	0.3026	0.3357	6500-7000	PH2	0.3456	0.3596	4500-5000
	0.3051	0.3229			0.3443	0.3435	
	0.3126	0.3303			0.3593	0.3549	
	0.3108	0.3437			0.362	0.3721	
PH4	0.3481	0.3919	4500-5000	PH3	0.3468	0.3758	4500-5000
	0.3468	0.3758			0.3456	0.3596	
	0.3648	0.3894			0.362	0.3721	
	0.3676	0.4067			0.3648	0.3894	

Notes :

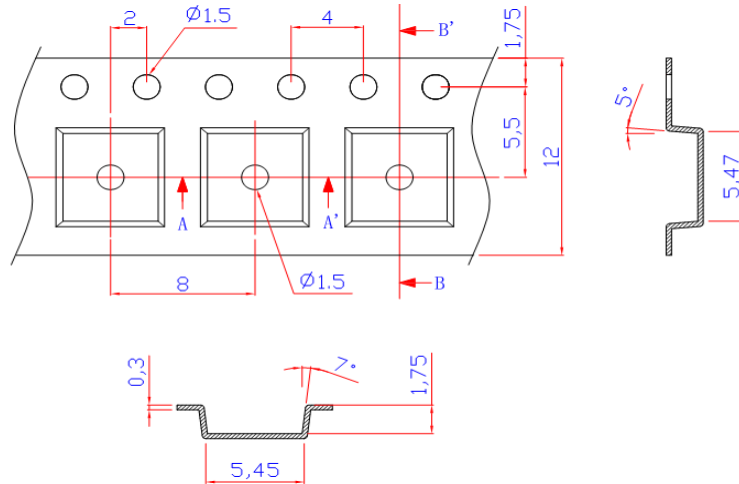
1. Luminous Flux measurement tolerance: $\pm 10\%$;
2. Forward Voltage measurement tolerance: $\pm 0.1V$;
3. Color Temperature measurement tolerance: $\pm 5\%$;
4. CRI measurement tolerance: ± 2 ;
5. $t_p=100\mu s$, Duty cycle = 0.25(t_p : Pulse width time).

Range ($I_F=120mA$)

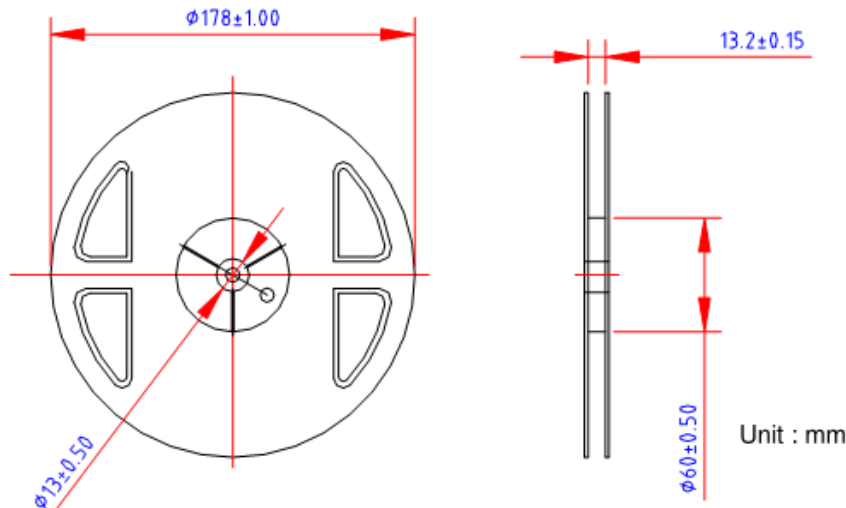
VF(V)	$\Phi V(lm)$	CT(K)	CRI
9-9.5	110-130	4600-5600	68-73
9.5-10	110-130	4600-5600	68-73
10-10.5	110-130	4600-5600	68-73
10.5-11	110-130	4600-5600	68-73



Dimensions for Tape



Dimensions for Reel

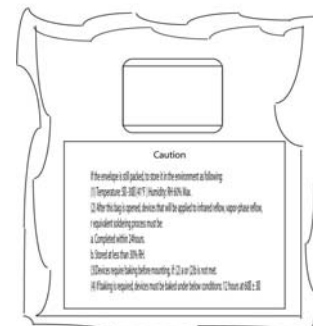
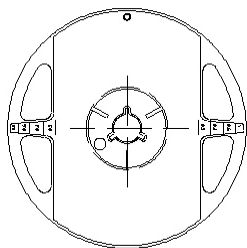


Unit : mm

Notes:

1. All dimensions are in mm, tolerance is $\pm 2.0\text{mm}$ unless otherwise noted.

Moisture, anti-static vacuum sealed packages



Notes:

- All dimensions are in mm, tolerance is $\pm 2.0\text{mm}$ unless otherwise noted.



PRECAUTION IN USE

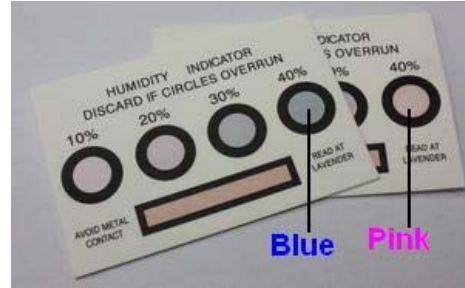
Storage

Recommended storage environment

Temperature: 5°C ~ 30°C (41°F ~ 86°F)

Humidity: 60% RH Max.

Recommend the use of drying cabinet storage



Use

Please check the Humidity indicator card after opening of sealed vapor/ESD (Picture 1.) If the 40% circle color is still blue, the product could normal use. Otherwise, 40% circle color is pink; please follow below Baking treatment before normal use. Baking treatment : Open-static bag, the product and reel dial out from the Static bag, and then 75±5°C for 8 hours baking treatment.

Remaining product be sealed in time, recommend storage in dry cabinet storage. It must be baking treatment when using the remaining product.

Handling Precautions

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,

1. Handle the component along the side surface by using forceps or appropriate tools.
2. Do not directly touch or handle the silicone lens surface. It may damage the internal circuitry
3. Do not stack together assembled PCBs containing LEDs. Impact may scratch the silicone lens or damage

Soldering

A. Reflow Process

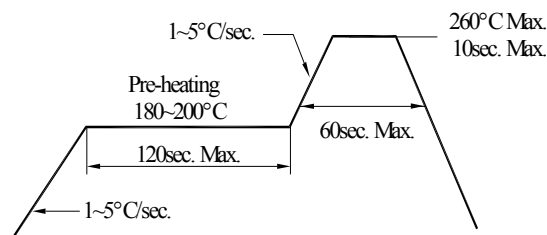
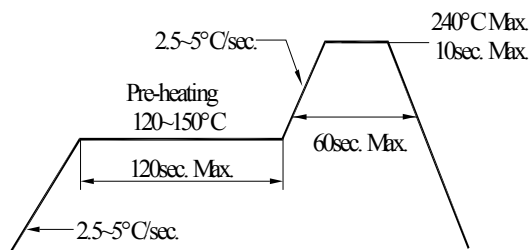
Reflow Soldering		
	Lead Solder	Lead – free Solder
Pre-heat	120~150°C	180~200°C
Pre-heat time	120sec. M x.	120sec. Max.
Peak temperature	240°C Max.	260°C Max.
Soldering time	10sec. Max.	10sec. Max.
Condition	refer to Temperature-profile 1	refer to Temperature-profile 2

After reflow soldering rapid cooling should be avoided.

[Temperature-profile (Surface of circuit board)] Use the conditions shown to the under figure.

< 1 : Lead Solder >

< 2 : Lead-free Solder >



B. Manual Soldering Process

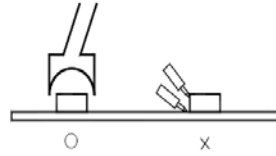
Hand Soldering	
Temperature	350°C Max.
Soldering time	3sec. Max. (one time only)

- a. For prototype builds or small series production runs it is possible to place and solder the LED by hand.
- b. Dispense thermal conductive glue or grease on the substrates and follow its curing specifications. Gently press LED housing to closely connect LED and substrate.
- c. It is recommended to hand solder the leads with a solder tip temperature of 280°C for less than 3 second, at a time with a soldering iron of less than 25W. Solder at intervals of two seconds or more.
- d. Take caution and be aware that damaged products are often a result of improper hand soldering technique.



Rework

1. Customer must finish rework within 5 sec under 260°C
2. The head of iron cannot touch the resin
3. Twin-head type is preferred.



Cleaning :

The conditions of cleaning after soldering:

An alcohol-based solvent such as Isopropyl Alcohol(IPA) is recommended.

Temperature Time:<50°C*30sec,or <30°C*3min

Ultra sonic cleaning:<15W/bath; Bath volume:1liter max.

Curing:100 max,<3min

Cautions of Pick and Place:

It should be avoided to load stress on the resin during high temperature.

Avoid rubbing or scraping the resin by any object.

Electric-static may cause damage to the component. Please confirm that the equipment is grounding well. Using an ionizer fan is recommended.

Cautions of Design and Applications:

It should be done to connect with a current-limiting serial resistor. Avoid to drive reverse voltage over the specifications on LED when ON/OFF. Any application should refer to the specifications of absolute maximum ratings.

The dimensions of the recommended soldering pattern may not meet every users. Please confirm and study before designing the soldering pattern in order to obtain the best performance of soldering.

Do not contact with any component on the assembly board.

Static Electricity:

These products are so sensitive to static electricity charge so that all equipment and machinery must be properly grounded and it is recommended to use a wristband or anti-electrostatic glove when handling the SMD LED.

Particularly if any over-current and over-voltage which exceed the Absolute Maximum Ratings of LED applied, the more energy may cause damage or possibly result in electrical destruction of the Products.

A protection design should be installed in the LED driving circuit, which does not exceed the max. rating for surge current during on/off switching.

A tip if soldering iron is requested to be grounded .An ionizer should be installed when risk of static generation is high.

If the countermeasures mentioned above are implemented, LED can work well.

Users are required to check those countermeasures when problems occur by static electricity charge

Other:

Damaged SMD LED will show unusual characteristics such as leak current remarkably low current. Increase, turn-on voltage becomes lower and the SMD LED get unlighted at low current.

In automatic mounting of the SMD LEDs on printed circuit boards, any bending and pulling forces or shock against the SMD LEDs shall be kept min. to prevent them from expanding or electrical failures and mechanical damages of the devices.

Illustration & Application:

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

The products described in this brochure are intended only for standard applications or general electronic equipment such as :

1. Telecommunication: indicator and backlight in telephone and fax.
2. Automotive: backlight in dashboard and switch.
3. LCD: Flat backlight for LCD, switch and symbol.

Notes for designing:

Care must be taken to provide the current limiting resistor in the circuit so as to drive the Wah Wang LEDs within the rated figures. Also, caution should be taken not to overload Wah Wang LEDs with instantaneous voltage at the turning ON and OFF of the circuit.

When using the pulse drive care must be taken to keep the average current within the rated figures. Also, the circuit should be designed so as be subjected to reverse voltage when turning off the Wah Wang LEDs.