



**SPECIFICATION FOR APPROVAL**

PRODUCT NAME: 0603 Package (0.4T) White Chip LED

DESCRIPTION: HT19-2151UWC-5A

REV: 2.0

CUSTOMER:

DATE: 2011-10-31

Please return to us one copy of "SPECIFICATION FOR APPROVAL" with your  
approved signatures

PREPARED	CHECK	APPROVED

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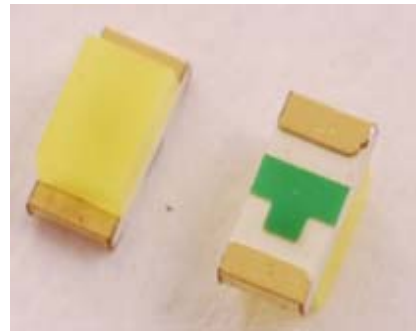


Revision Note

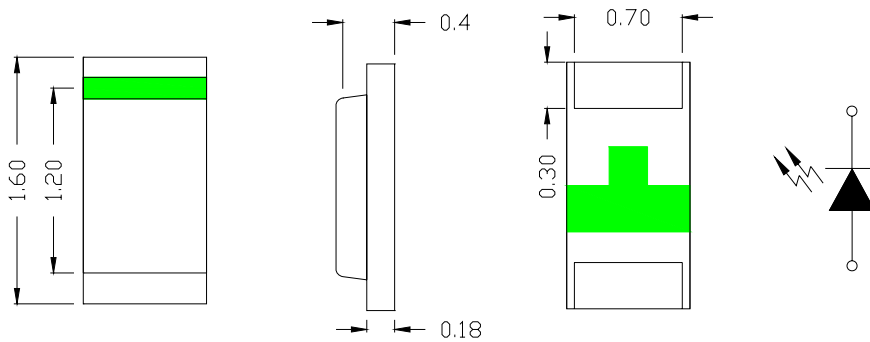
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1. Features

- Small Size(1.6\*0.8\*0.4mm)
- Industry Standard Footprint
- High Efficiency
- Pb-Free

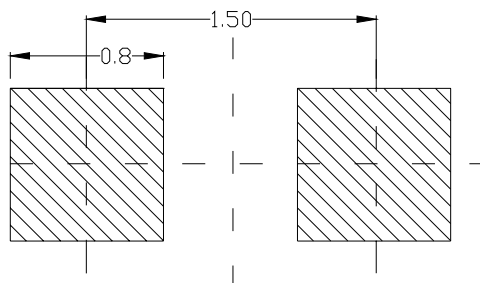


2. Dimension



Unit:mm  
Tolerance::±0.1mm

The following soldering patterns are recommended for reflow soldering.



Unit:mm



### 3. Absolute Maximum Ratings (TA=25°C)

Parameter	Maximum Value	Unit
DC Forward Current	30	mA
Peak Pulse Current(Pulse width 1msec)	100	mA
Reverse Voltage	5	V
LED Junction Temperature	125	°C
Operating Temperature	-30~+85	°C
Storage Temperature	-40~+90	°C
Storage Humidity	<60	%RH

### 4. Electrical/Optical Characteristics For Individual LED (TA=25°C)

PART NUMBER	LED CHIP		COLOR RANKS @5mA		FORWARD VOLTAGE (V)@5mA		REVERSE CURRENT	LUMINOUS INTENSITY (mcd)@5mA		VIEW ANGLE (DEG)
	MATERIAL	EMITTING COLOR	X	Y	MIN	MAX	IR VR=5V	MIN	MAX	TYP
HT19-2151UWC-5A	InGaN	White	0.28*	0.29*	2.6	3.4	10uA	140	450	120

### 5. General Characteristics

#### Luminous Intensity

ITEM	IV(mcd) @5mA		(lm) @5mA
	Min	Max	Typ
L1	140	180	290
L2	180	230	360
M1	230	285	450
M2	285	350	560
N1	350	450	720

#### Forward Voltage

ITEM	VF(V) @5mA	
	Min	Max
5A	2.6	2.7
5B	2.7	2.8
6A	2.8	2.9
6B	2.9	3.0
7A	3.0	3.1
7B	3.1	3.2

Notes:

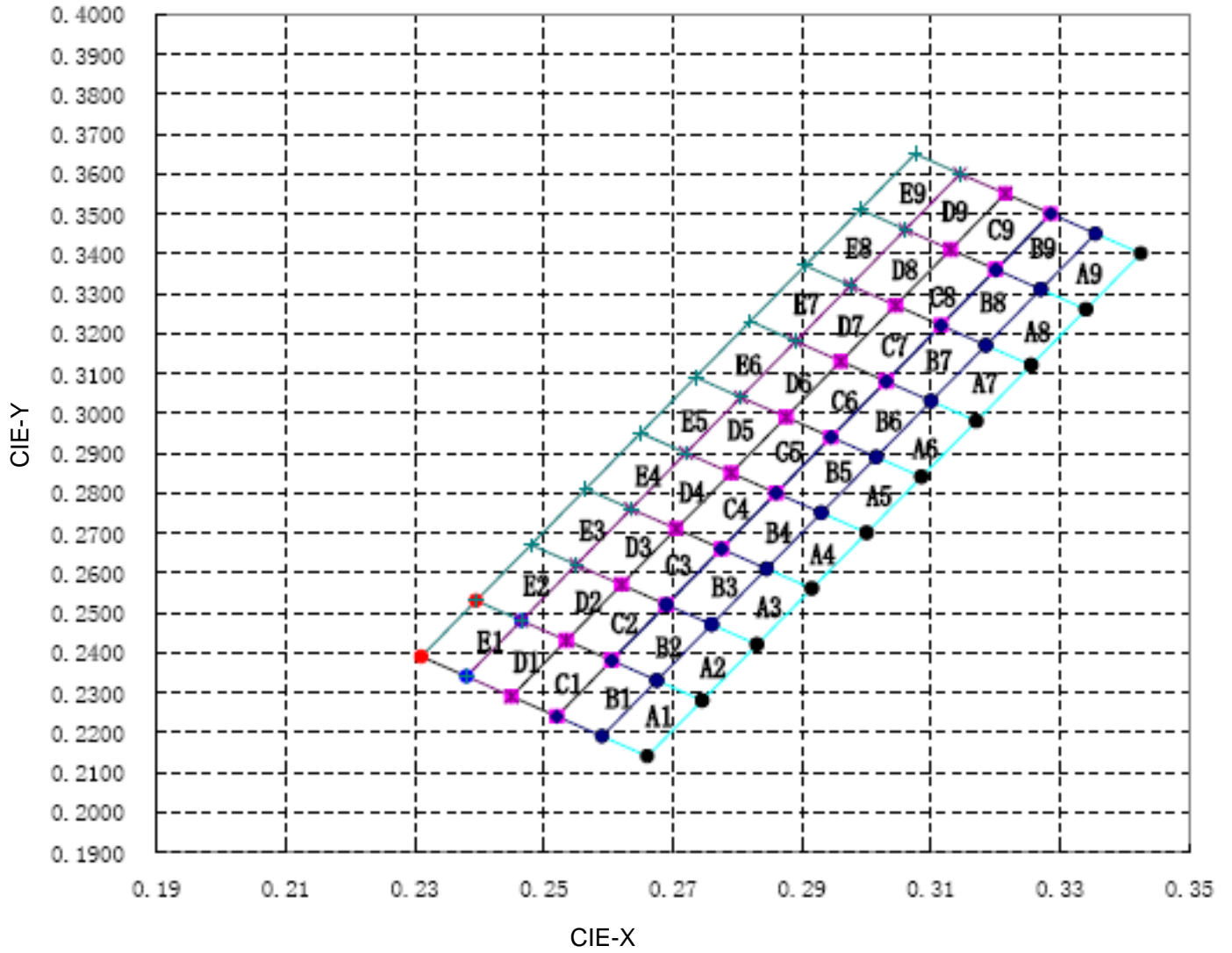
VF: Tolerance of Forward Voltage: ± 0.1V

IV: Tolerance of Luminous Intensity: ± 15%

X,Y: Tolerance of the CIE X,Y : ± 0.01

6.Chromaticity Coordinate Groups\*

Cool-white



Bin Code	X	Y	Bin Code	X	Y	Bin Code	X	Y
C1	0.2520	0.2240	B1	0.2520	0.2240	A1	0.2590	0.2190
	0.2450	0.2290		0.2590	0.2190		0.2660	0.2140
	0.2535	0.2430		0.2675	0.2330		0.2745	0.2280
	0.2605	0.2380		0.2605	0.2380		0.2675	0.2330
C2	0.2605	0.238	B2	0.2675	0.2330	A2	0.2675	0.2330
	0.269	0.252		0.2760	0.2470		0.2745	0.2280
	0.262	0.2570		0.269	0.252		0.2830	0.2420
	0.2535	0.2430		0.2605	0.2380		0.2760	0.2470
C3	0.269	0.252	B3	0.2760	0.2470	A3	0.2760	0.2470
	0.2775	0.266		0.2845	0.2610		0.2830	0.2420
	0.2705	0.2710		0.2775	0.266		0.2915	0.2560
	0.262	0.2570		0.269	0.252		0.2845	0.2610
C4	0.2775	0.266	B4	0.2845	0.261	A4	0.2845	0.2610
	0.286	0.28		0.293	0.275		0.2915	0.2560
	0.279	0.2850		0.286	0.28		0.3000	0.2700
	0.2705	0.2710		0.2775	0.266		0.2930	0.2750
C5	0.286	0.28	B5	0.293	0.275	A5	0.2930	0.2750
	0.2945	0.294		0.3015	0.289		0.3000	0.2700
	0.2875	0.2990		0.2945	0.294		0.3085	0.2840
	0.279	0.2850		0.286	0.28		0.3015	0.2890
C6	0.2945	0.294	B6	0.3015	0.289	A6	0.3015	0.2890
	0.303	0.308		0.31	0.303		0.3085	0.2840
	0.296	0.3130		0.303	0.308		0.3170	0.2980
	0.2875	0.2990		0.2945	0.294		0.3100	0.3030
C7	0.303	0.308	B7	0.31	0.303	A7	0.3100	0.3030
	0.3115	0.322		0.3185	0.317		0.3170	0.2980
	0.3045	0.3270		0.3115	0.322		0.3255	0.3120
	0.296	0.3130		0.303	0.308		0.3185	0.3170
C8	0.3115	0.322	B8	0.3185	0.317	A8	0.3185	0.3170
	0.32	0.336		0.327	0.331		0.3255	0.3120
	0.313	0.3410		0.32	0.336		0.3340	0.3260
	0.3045	0.327		0.3115	0.322		0.3270	0.3310
C9	0.32	0.336	B9	0.327	0.331	A9	0.3270	0.3310
	0.3285	0.35		0.3355	0.345		0.3340	0.3260
	0.3215	0.3550		0.3285	0.35		0.3425	0.3400
	0.313	0.3410		0.32	0.3357		0.3355	0.3450

X,Y: Tolerance of the CIE X,Y : ± 0.01

Bin Code	X	Y	Bin Code	X	Y
D1	0.2450	0.2290	E1	0.2380	0.2340
	0.2380	0.2340		0.2310	0.2390
	0.2465	0.2480		0.2395	0.2530
	0.2535	0.2430		0.2465	0.2480
D2	0.2535	0.2430	E2	0.2465	0.2480
	0.2465	0.2480		0.2395	0.2530
	0.2550	0.2620		0.2480	0.2670
	0.2620	0.2570		0.2550	0.2620
D3	0.2620	0.2570	E3	0.2550	0.2620
	0.2550	0.2620		0.2480	0.2670
	0.2635	0.2760		0.2565	0.2810
	0.2705	0.2710		0.2635	0.2760
D4	0.2705	0.2710	E4	0.2635	0.2760
	0.2635	0.2760		0.2565	0.2810
	0.2720	0.2900		0.2650	0.2950
	0.2790	0.2850		0.2720	0.2900
D5	0.2790	0.2850	E5	0.2720	0.2900
	0.2720	0.2900		0.2650	0.2950
	0.2805	0.3040		0.2735	0.3090
	0.2875	0.2990		0.2805	0.3040
D6	0.2875	0.2990	E6	0.2805	0.3040
	0.2805	0.3040		0.2735	0.3090
	0.2890	0.3180		0.2820	0.3230
	0.2960	0.3130		0.2890	0.3180
D7	0.2960	0.3130	E7	0.2890	0.3180
	0.2890	0.3180		0.2820	0.3230
	0.2975	0.3320		0.2905	0.3370
	0.3045	0.3270		0.2975	0.3320
D8	0.3045	0.3270	E8	0.2975	0.3320
	0.2975	0.3320		0.2905	0.3370
	0.3060	0.3460		0.2990	0.3510
	0.3130	0.3410		0.3060	0.3460
D9	0.3130	0.3410	E9	0.3060	0.3460
	0.3060	0.3460		0.2990	0.3510
	0.3145	0.3600		0.3075	0.3650
	0.3215	0.3550		0.3145	0.3600

X,Y: Tolerance of the CIE X,Y :  $\pm 0.01$

7. Electrical and Optical Characteristics(TA=25°C)

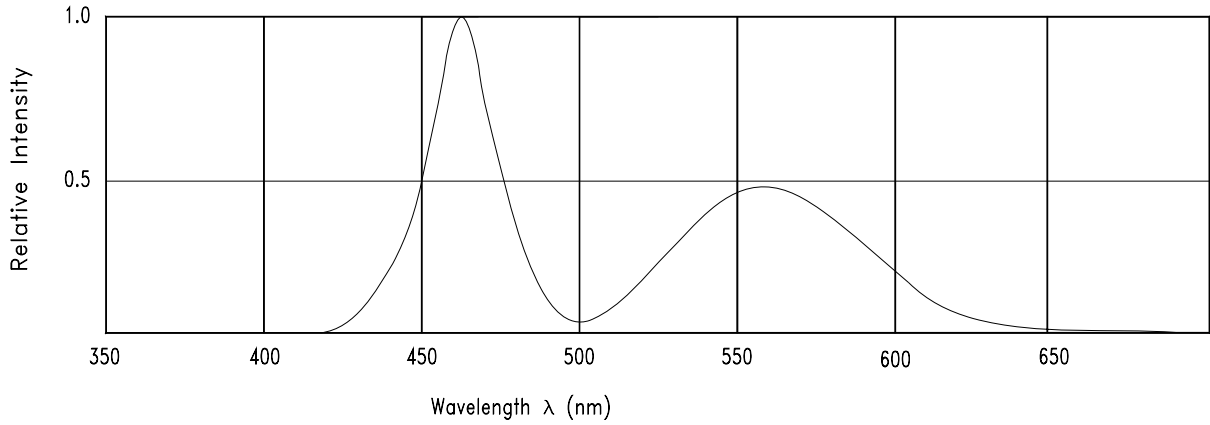


Fig.1 Relative Intensity vs. Wavelength

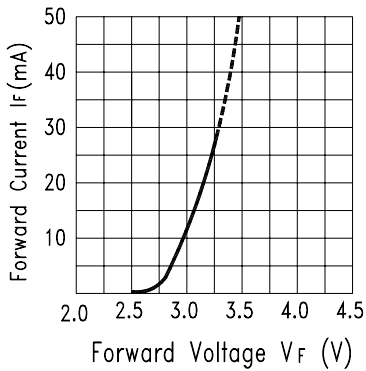


Fig.2 Forward Current vs. Forward Voltage

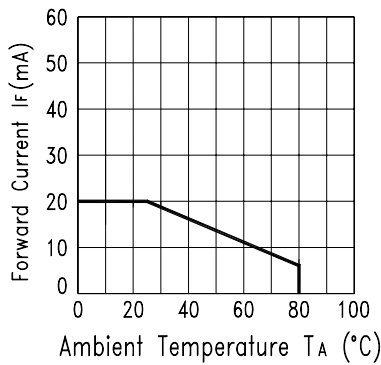


Fig.3 Forward Current Derating Curve

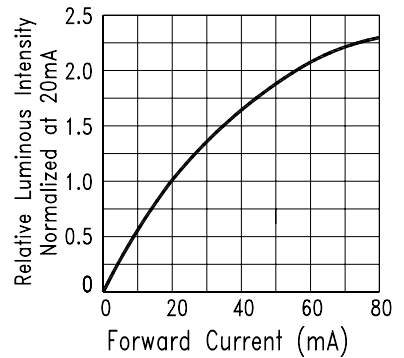


Fig.4 Relative Luminous Intensity vs. Forward Current

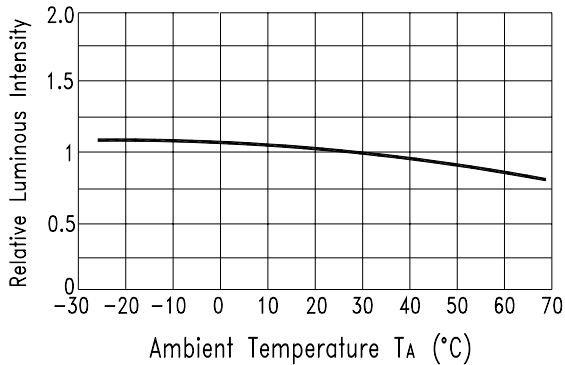


Fig.5 Luminous Intensity vs. Ambient Temperature

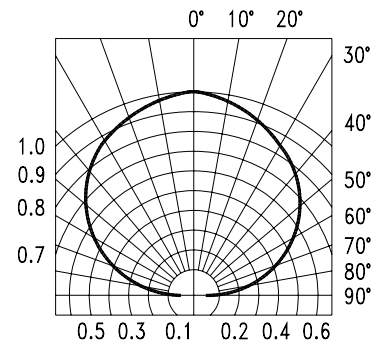
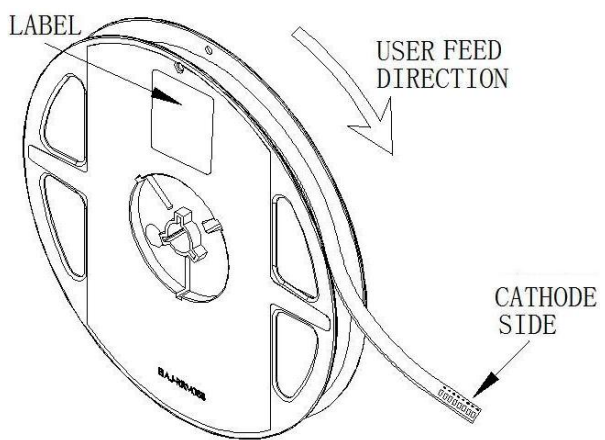
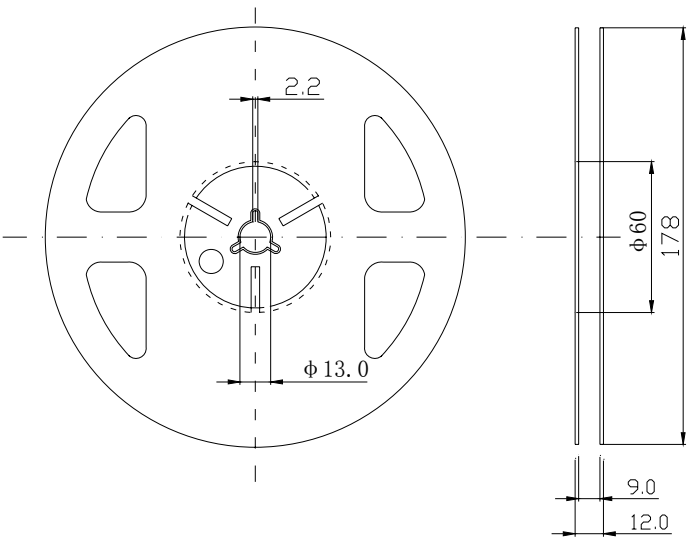
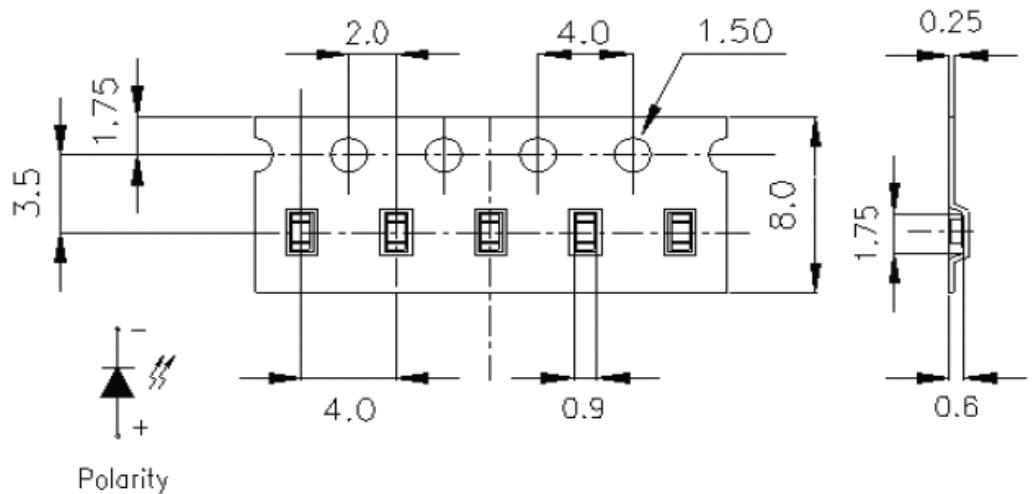


Fig.6 Spatial Distribution



8.Packing & Reel Specification



Unit:mm  
Tolerance::  $\pm 0.1\text{mm}$



## 9. Reliability Test Items and Results

Test Item	Standard	Test Conditions	Note	Number of Damaged
Resistance Soldering Heat (Reflow soldering)	JEITA ED-4701 300-301	Tsld=260±5°C 4secs (Lead-Free solder)	2 times	0/50
Solder Reliability(Reflow Soldering)	JEITA ED-4701 300-303	Tsld=215±5°C 3secs (Lead-Free solder)	1 times over 95%	0/50
Thermal shock	MIL-STD 2002-107D MIL-STD 705-1051 MIL-STD 808-1011	0-100°C 15secs	20 cycles	0/50
Temperature Cycle	JEITA ED-4701 100-105	-40°C~25°C~100°C~25°C 30min,5min,30min,5min	100 cycles	0/50
Moisture Ristance Cycle	JEITA ED-4701 200-203	25°C~65°C~-10°C 90%RH 24hrs/1cycle	10 cycles	0/50
Temperature Humidity Storage	MIL-STD 202-103D JIS-C-7021 B-11	Ta=60°C,RH=90%	1000hr	0/50
Low Temperature Storage	JIS-C-7021 B-12	Ta=-40°C	1000hr	0/50
Steady State Operating Life Of High Humidity Heat	MIL-STD 202-103D JIS-C-7021 B-11	85°C,RH=85%,If=40mA	500hr	0/50

## 10. Storage

1. Before opening original package, it is recommended to store them in the following environment:  
Temperature: 5°C~30°C, Humidity: 85%RH max.
2. After opening original package, the storage ambient for the LEDs should be in 5~30°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°C at least 24 hours.

## 11.Soldering

**Manual soldering** (we do not recommend this method strongly)

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.

During the soldering process, do not touch the lens at high temperature.

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.

## Reflow soldering

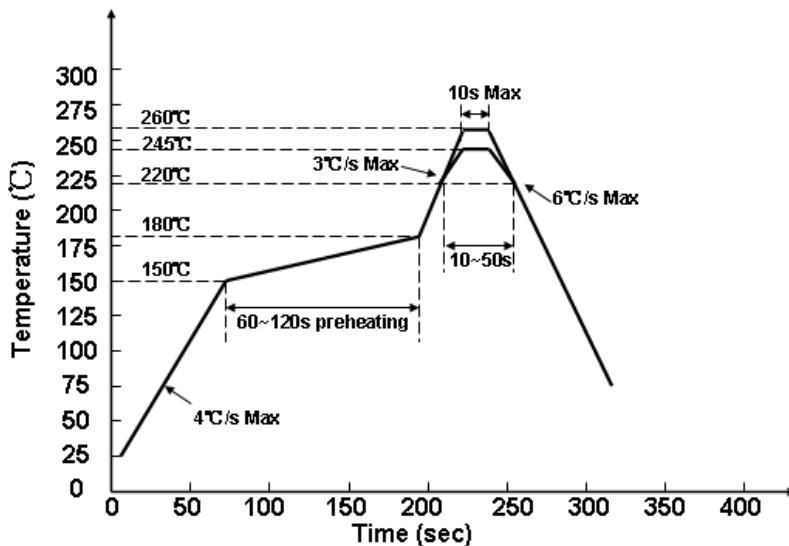
Recommend tin glue specifications:

Melting temperature :150~260°C

Contains:Sn96.5%,Ag3.0%,Cu0.5% JIS Z3282 TEST

Never take next process until the componet is cooled down to room temperature after reflow.

The recommend reflow soldering profile(measuring on the surface of the LED resin)is following.



Notes:

We recommend the soldering temperature  $245 \pm 5^\circ\text{C}$  ;

The maximum temperature should be limited to  $260^\circ\text{C}$ .

## 12.Cleaning

The conditions of cleaning after soldering:

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

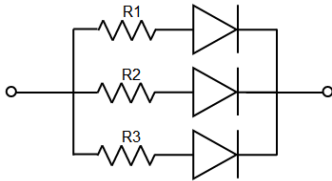
Temperature Time:<50°C 30sec,or <30°C 3min

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

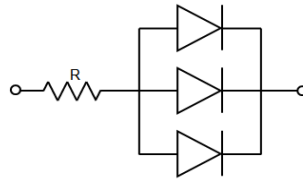
Curing:100 max,<3min

### 13. 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.

### 14. 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.

### 15. 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 Harvatek'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.