

### CHIP-ON-TOP SMD TYPE LED

Model No.: WS-L5256-CW-K1-1

Description: 5.4x5.0x1.6mm Top SMD Type 1-chip 0.2-Watt Power White LED



### Features and Benefits

- Ideal for LED lighting application to avoid multi-shadows
- Higher heat conductivity for better thermal management
- Provide variable and innovative array LED layout designs and combinations
- Reduce the initial development cost and time
- High lumen-performance per dollar cost
- Lead free reflow solder compatible with RoHS compliant

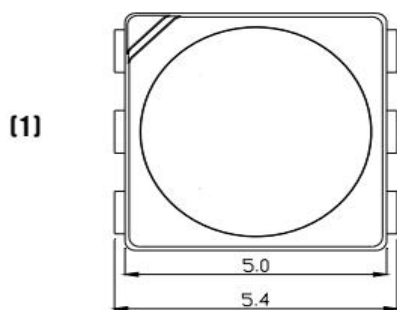
### Applications

- Solid State Lighting
- Indoor/Outdoor/Decoration
- Signal Light Engine
- Commercial Display
- Industrial Light Engine

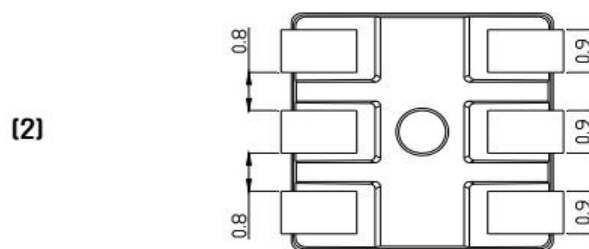
### Dimensions and Materials

- Dimensions: 5.4 mm x 5.0 mm x 1.6 mm
- Packages: Top SMD
- Capsulated Resin: Silicone Resin with Silicate Phosphor
- Electrodes: Ag Plating
- Chips: ONE-chip packed in cavity

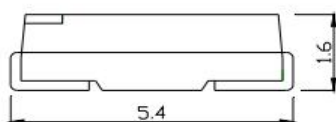
Unit : mm, Tolerance :  $\pm 0.1\text{mm}$



[ Top view ]



[ Bottom view ]



[ Side view ]



Cathode

Anode

[ Circuit diagram ]

Notes:

1. All dimensions are in millimeters.
2. Tolerance is  $\pm 0.1\text{mm}$  unless otherwise noted.



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### Electrical/Optical Characteristics (Thermal Pad Temperature @25°C)

Item	Symbol	Test Conditions	Unit	Min.	Typ.	Max.	
Forward Voltage	Vf	If=60mA	V	2.8	3.2	3.4	
Reverse Current	Ir	Vr=5V	μA	--	--	5	
Viewing Angle	2θ 1/2_	--	deg	--	120	--	
Color Rendering Index(*1)	CRI	If=60 mA	--	70	80	90	
Junction/Solder 1 chips on (*2)	Rθj-c	If=60 mA	°C/W	--	--	4	
Luminous Intensity (*3)	Rank H2	Iv	If=60 mA	mcd	4800	--	5400
	Rank J1				5400	--	6000
	Rank J2				6000	--	6600
Luminous Flux(*4)	Rank E2	Φv	If=60 mA	lm	16	--	18
	Rank F1				18	--	20
	Rank F2				20	--	22

1. Measurement tolerance of the Color Rendering Index: ±2
2. Rth test condition: Mounted on PC Board FR 4(pad size≥16mm<sup>2</sup>)
3. Measurement tolerance of the luminous intensity: ±10%. This value for reference only.
4. Measurement tolerance of the luminous flux: ±10%.

### Absolute Maximum Ratings (Thermal Pad Temperature @25°C)

Item	Symbol	Absolute Maximum Rating	Unit
D.C Forward Current	If	60	mA
Pulse Forward Current (*1)	I <sub>fp</sub>	80	mA
Reverse Voltage	Vr	5	V
Power Dissipation	Pd	0.2	W
Operating Temperature	Topr	-25~+85	°C
Storage Temperature	Tstg	-40~+100	°C
Soldering Temperature (Reflow) (*2)	Tsld	max.240 <30 sec	°C

1. Ifp conditions: 1/10 Duty Cycle & 0.1ms for pulse width.
2. Reflow method: 1.2mm FR4 from body for 5 seconds not exceeding the recommended maximum temperature.

### Luminous Flux Rank

LEDs are sorted to Luminous Flux –lm bins shown. Orders for The LED may be filled with any or all bins contained as below. All Luminous Flux-lm shown and specified are at IF =60mA.

#### WS-L5256-CW-K1-1 Luminous Flux Ran

Luminous Flux Rank	N1	N2	P1
Luminous Flux (lm)	16-18lm	18-20 lm	20-22lm

### Forward Voltage Rank

Rank	g	h	i	j
Voltage	2.8-3.0 V	3.0-3.2 V	3.2-3.4 V	3.4-3.6 V

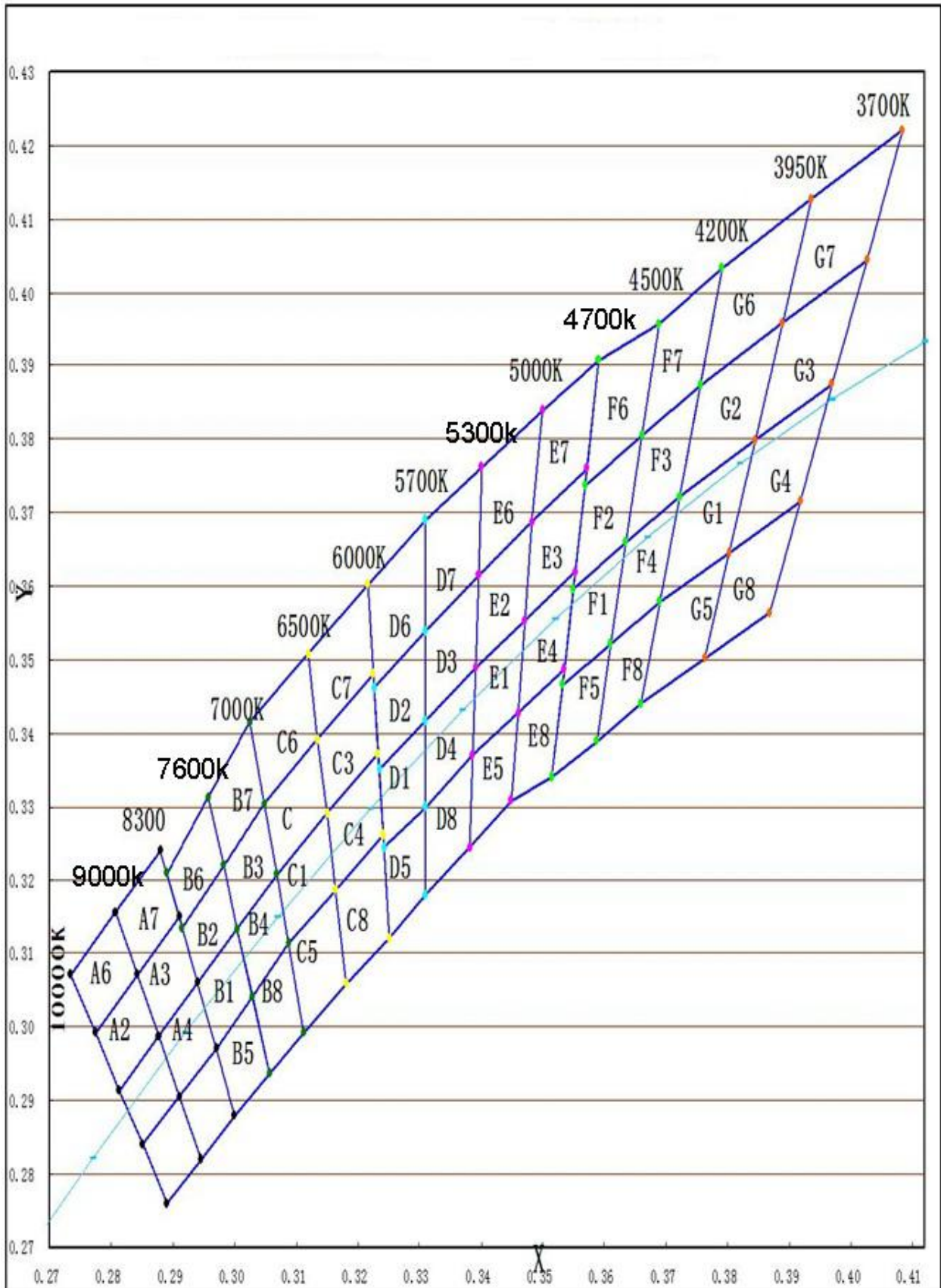
LEDs are sorted to VF bins shown. Orders for The LED may be filled with any or all bins contained as below. All VF values shown and specified are at IF =60mA.

Note: Measurement tolerance of the forward voltage: ±0.06V

# WS-L5256-CW-K1-1

## CHIP-ON-TOP SMD TYPE LED

White Color Temperature Ranks & CIE Color Rank (Refer to CIE 1931 chromaticity diagram)





# WS-L5256-CW-K1-1

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### CIE chromaticity coordinates

C. A	C. A. S	X1	Y1	X2	Y2	X3	Y3	X4	Y4
A	A1	0.2830	0.2840	0.2793	0.2914	0.2857	0.2987	0.2890	0.2905
	A2	0.2793	0.2914	0.2754	0.2993	0.2822	0.3071	0.2857	0.2987
	A3	0.2857	0.2987	0.2822	0.3071	0.2890	0.3150	0.2920	0.3060
	A4	0.2890	0.2905	0.2857	0.2987	0.2920	0.3060	0.2950	0.2970
	A5	0.2870	0.2760	0.2830	0.2840	0.2890	0.2905	0.2925	0.2820
	A6	0.2754	0.2993	0.2714	0.3072	0.2787	0.3156	0.2822	0.3071
	A7	0.2822	0.3071	0.2787	0.3156	0.2860	0.3240	0.2890	0.3150
	A8	0.2925	0.2820	0.2890	0.2905	0.2950	0.2970	0.2980	0.2880
B	B1	0.2950	0.2970	0.2920	0.3060	0.2984	0.3133	0.3009	0.3042
	B2	0.2920	0.3060	0.2895	0.3135	0.2962	0.3220	0.2984	0.3133
	B3	0.2984	0.3133	0.2962	0.3220	0.3028	0.3304	0.3048	0.3207
	B4	0.2984	0.3133	0.3048	0.3207	0.3068	0.3113	0.3009	0.3042
	B5	0.2980	0.2880	0.2950	0.2970	0.3009	0.3042	0.3037	0.2937
	B6	0.2895	0.3135	0.2870	0.3210	0.2937	0.3312	0.2962	0.3220
	B7	0.2962	0.3220	0.2937	0.3312	0.3005	0.3415	0.3028	0.3304
	B8	0.3037	0.2937	0.3009	0.3042	0.3068	0.3113	0.3093	0.2993
C	C1	0.3048	0.3207	0.3130	0.3290	0.3144	0.3186	0.3068	0.3113
	C2	0.3028	0.3304	0.3115	0.3391	0.3130	0.3290	0.3048	0.3207
	C3	0.3115	0.3391	0.3205	0.3481	0.3213	0.3373	0.3130	0.3290
	C4	0.3130	0.3290	0.3213	0.3373	0.3221	0.3261	0.3144	0.3186
	C5	0.3068	0.3113	0.3144	0.3186	0.3161	0.3059	0.3093	0.2993
	C6	0.3005	0.3415	0.3099	0.3509	0.3115	0.3391	0.3028	0.3304
	C7	0.3099	0.3509	0.3196	0.3602	0.3205	0.3481	0.3115	0.3391
	C8	0.3144	0.3186	0.3221	0.3261	0.3231	0.3120	0.3161	0.3059
D	D1	0.3215	0.3350	0.3290	0.3417	0.3290	0.3300	0.3222	0.3243
	D2	0.3207	0.3462	0.3290	0.3538	0.3290	0.3417	0.3215	0.3350
	D3	0.3290	0.3538	0.3376	0.3616	0.3371	0.3490	0.3290	0.3417
	D4	0.3290	0.3417	0.3371	0.3490	0.3366	0.3369	0.3290	0.3300
	D5	0.3222	0.3243	0.3290	0.3300	0.3290	0.3180	0.3231	0.3120
	D6	0.3196	0.3602	0.3290	0.3690	0.3290	0.3538	0.3207	0.3462
	D7	0.3287	0.3690	0.3381	0.3762	0.3376	0.3616	0.3290	0.3538
	D8	0.3290	0.3300	0.3366	0.3369	0.3361	0.3245	0.3290	0.3180
E	E1	0.3371	0.3490	0.3451	0.3554	0.3440	0.3427	0.3366	0.3369
	E2	0.3376	0.3616	0.3463	0.3687	0.3451	0.3554	0.3371	0.3490
	E3	0.3463	0.3687	0.3551	0.3760	0.3533	0.3620	0.3451	0.3554
	E4	0.3451	0.3554	0.3533	0.3620	0.3515	0.3487	0.3440	0.3427
	E5	0.3366	0.3369	0.3440	0.3428	0.3429	0.3307	0.3361	0.3245
	E6	0.3381	0.3762	0.3480	0.3840	0.3463	0.3687	0.3376	0.3616
	E7	0.3480	0.3840	0.3571	0.3907	0.3551	0.3760	0.3463	0.3687
	E8	0.3440	0.3428	0.3515	0.3487	0.3495	0.3339	0.3429	0.3307
F	F1	0.3530	0.3597	0.3615	0.3659	0.3590	0.3521	0.3512	0.3465
	F2	0.3548	0.3736	0.3641	0.3804	0.3615	0.3659	0.3530	0.3597
	F3	0.3641	0.3804	0.3736	0.3874	0.3702	0.3722	0.3615	0.3659
	F4	0.3615	0.3659	0.3702	0.3722	0.3670	0.3578	0.3590	0.3521
	F5	0.3512	0.3465	0.3590	0.3521	0.3567	0.3389	0.3495	0.3339
	F6	0.3571	0.3907	0.3668	0.3957	0.3641	0.3804	0.3548	0.3736
	F7	0.3668	0.3957	0.3771	0.4034	0.3736	0.3874	0.3641	0.3804
	F8	0.3590	0.3521	0.3670	0.3578	0.3640	0.3440	0.3567	0.3389
G	G1	0.3670	0.3578	0.3702	0.3722	0.3825	0.3798	0.3783	0.3646
	G2	0.3702	0.3722	0.3736	0.3874	0.3869	0.3958	0.3825	0.3798
	G3	0.3825	0.3798	0.3869	0.3958	0.4006	0.4044	0.3950	0.3875
	G4	0.3783	0.3646	0.3825	0.3798	0.3950	0.3875	0.3898	0.3716
	G5	0.3670	0.3578	0.3783	0.3646	0.3743	0.3502	0.3640	0.3440
	G6	0.3771	0.4034	0.3916	0.4127	0.3869	0.3958	0.3736	0.3874
	G7	0.3916	0.4127	0.4064	0.4221	0.4006	0.4044	0.3869	0.3958
	G8	0.3783	0.3646	0.3898	0.3716	0.3848	0.3565	0.3743	0.3502

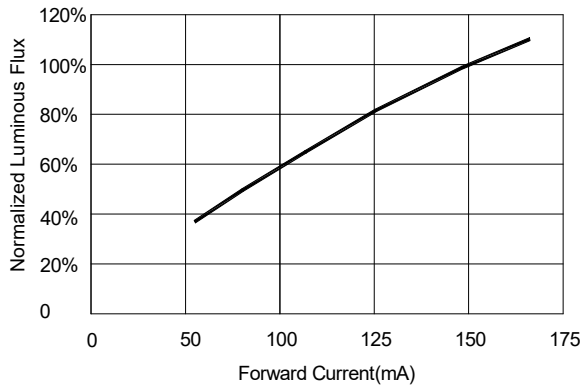
Color coordinates measurement allowance is  $\pm 0.005$

To order specify color temperature ranks, please contact Konglighting Lighting Holdings LTD. for further information.

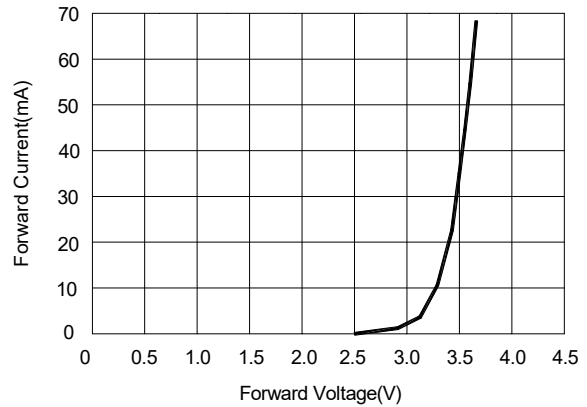
Thermal Pad Temperature @25°C @ 150mA

### Optical-Electrical Characteristic Graphs

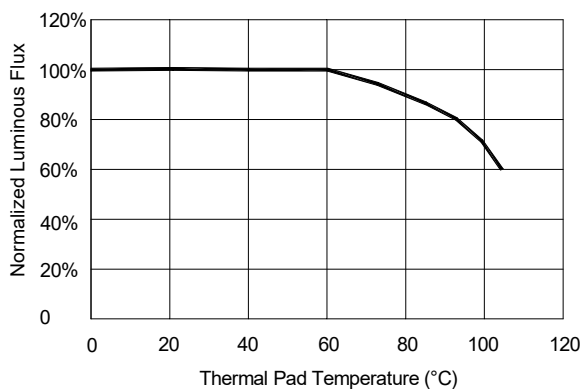
Forward Current vs. Typical Relative Luminous Flux



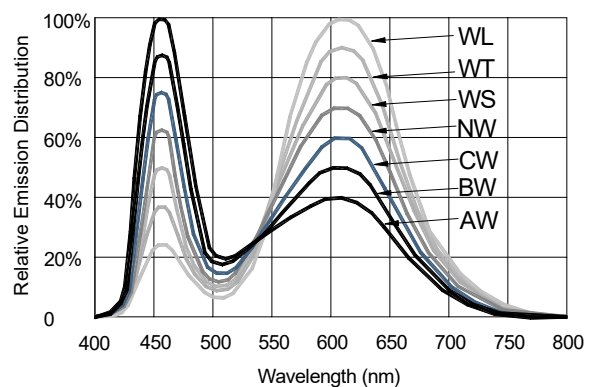
Forward Voltage vs. Forward Current



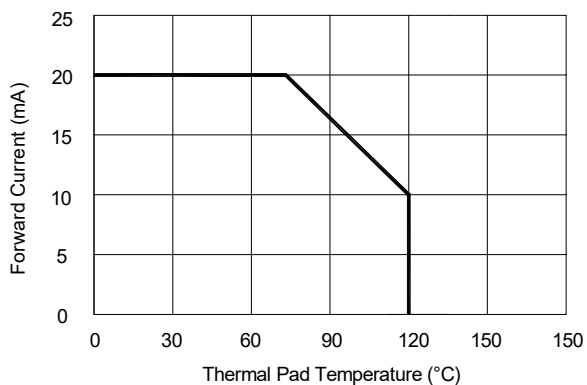
Thermal Pad Temperature vs. Relative Light Output



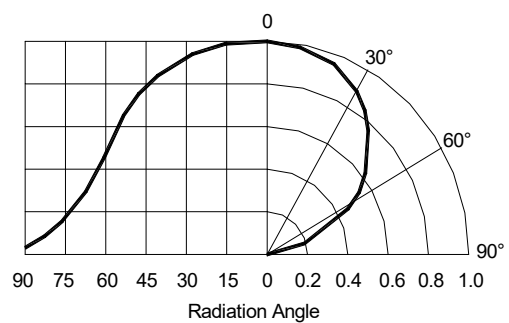
Wavelength Characteristics



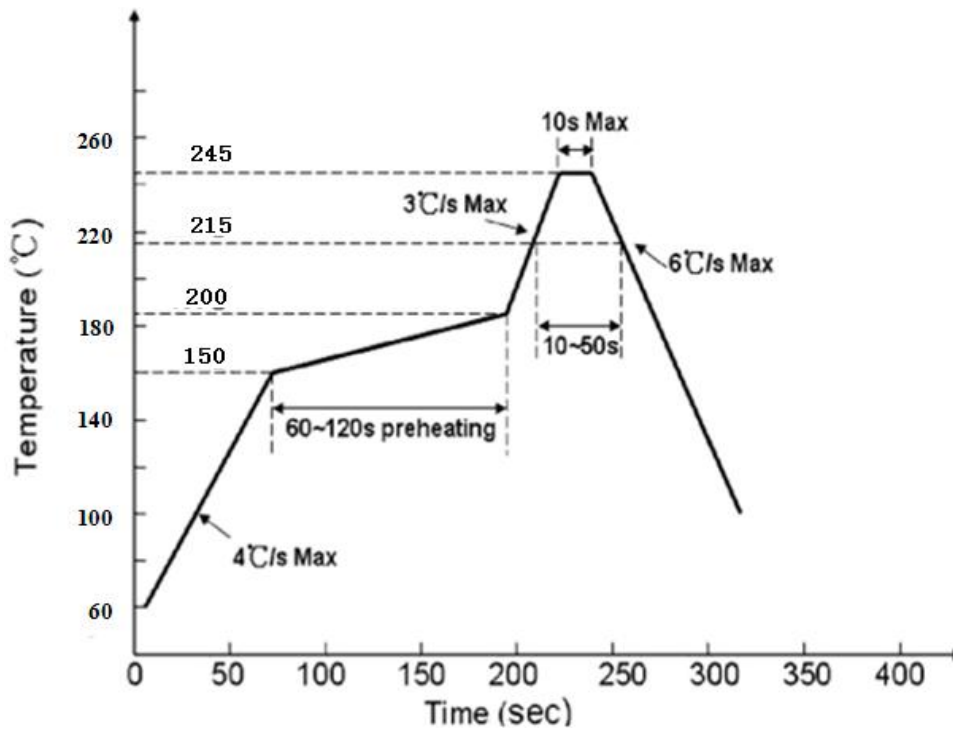
Thermal Pad Temperature vs. Forward Current



Typical Radiation Pattern 120°



### Lead-free Reflow Instructions/SMT



Curve Description	Lead-free Reflow Solder/SMT
The lowest preheat temperature (T <sub>smin</sub> )	150°C
The highest preheat temperature (T <sub>smax</sub> )	200°C
Preheating time (T <sub>smin</sub> to T <sub>smax</sub> ) (ts)	60-180 S
Average rate of temperature rise (T <sub>smax</sub> to T <sub>p</sub> )	<3°C/S
LIQUID REGION temperature (TL)	217°C
LIQUID REGION Holding Time (tL)	60-150 S
Peak Temperature (T <sub>p</sub> )	245 °C
High Temperature Region(T <sub>p</sub> -5°C) Holding Time (tp)	<10 S
Cooling Rate	<6°C/S
Room Temperature to Peak Holding Time	<6 min

#### ◆ Remarks

1. This has to be baked for 48 hours at the baking temperature of 70-75°C before being used.
2. Use up with 2 hours after taking out from oven.
3. Please replace the unused LEDs into oven.

### ◆ Reflow instruction

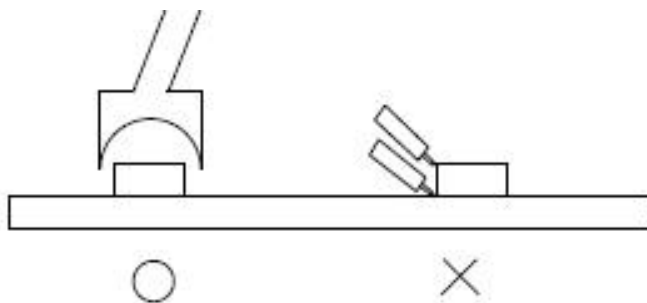
1. No more than two times of reflow.
2. Do not beat the colloid surface when the material is heated.

### ◆ Manual Soldering instruction

1. Soldering iron's temperature must be under 300°C, and operating time must be less than 3 seconds.
2. It should be done only once for the manual soldering.

### ◆ Repairing instruction

Normally, it can't be repaired after reflow. You need to use double-ended solder iron and make sure that whether it will do damage to the LEDs' characteristics when repairing is inevitable.



### ◆ Storing and Transporting

1. Scope of application

Front side up, moisture-proof and waterproof, no extrusion, no collision and no vibration.

2. Storage and its period

- ① Room temperature sealed storage: 20°C ~ 30°C, 40% ~ 60%RH, product is valid for ONE week.
- ② Moisture-proof sealed storage: 20°C ~ 30°C, 25% ~ 60%RH, product is valid for TWO weeks.
- ③ Use up with 2 hours after removing from packages. (Environmental conditions for temperature < 30°C, relative humidity < 60%)

### ◆ Dehumidification

We would recommend to do dehumidification if they exceed the valid storage period of products or dampened due to other reasons.

Dehumidification Method: 70°C - 75°C / 48 ± 2 Hours

### ◆ Electrostatic Protection

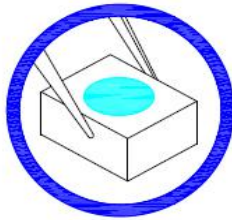
LED is an electrostatic sensitive component, although the LED products are with excellent anti-static ability, they will cause a certain damage by any electrostatic discharge. By taking some electrostatic measures to avoid the damages when using the LEDs, such as wearing anti-static gloves and anti-static bracelet, etc..



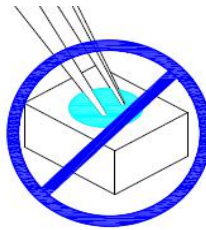
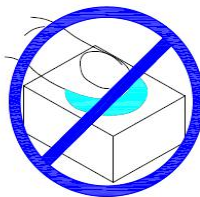
### ◆ Precautions

Pressing the colloid surface will affect the reliability of LED because the LED is advanced silicone-gel. And therefore precautions should be taken to avoid the strong pressure on the component. It's proper to make the LED be used in safe condition when using a suction nozzle. Silicon packing with soft and elastic, it greatly reduces thermal stresses and unable to bear external mechanical forces. Therefore, preventive measures should be taken in process of manually handling.

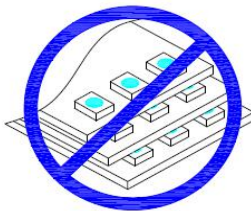
- ① Clip the LED from its side.



- ② Neither directly touch the gel surface with the hand or sharp instrument, it may damage its internal circuit.



- ③ Not to be double stacked, it may damage its internal circuit.



- ④ Can not be stored in or applied in the acidic sites of PH<7.





# WS-L5256-CW-K1-1

## CHIP-ON-TOP SMD TYPE LED

### Modify Records

Version №	Status Bar	Modify Content Summary	Date	Reviser	Approved
V1.0	N	New	20171129	Shen JinGuo	Yin HuaPing

Remarks: Initial version: V1.0; Version number plus "0.1" after each revision;

Status bar: N--New, A--Add, M--Modify, D--Delete.