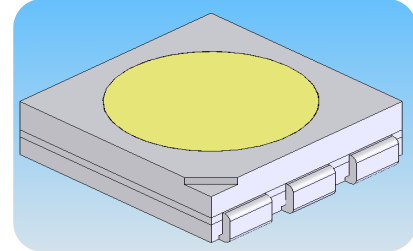


SMD Technical Data Sheet



Top View White LED (1.6mm)

[LT5050LBN3.LW01](#)



Features

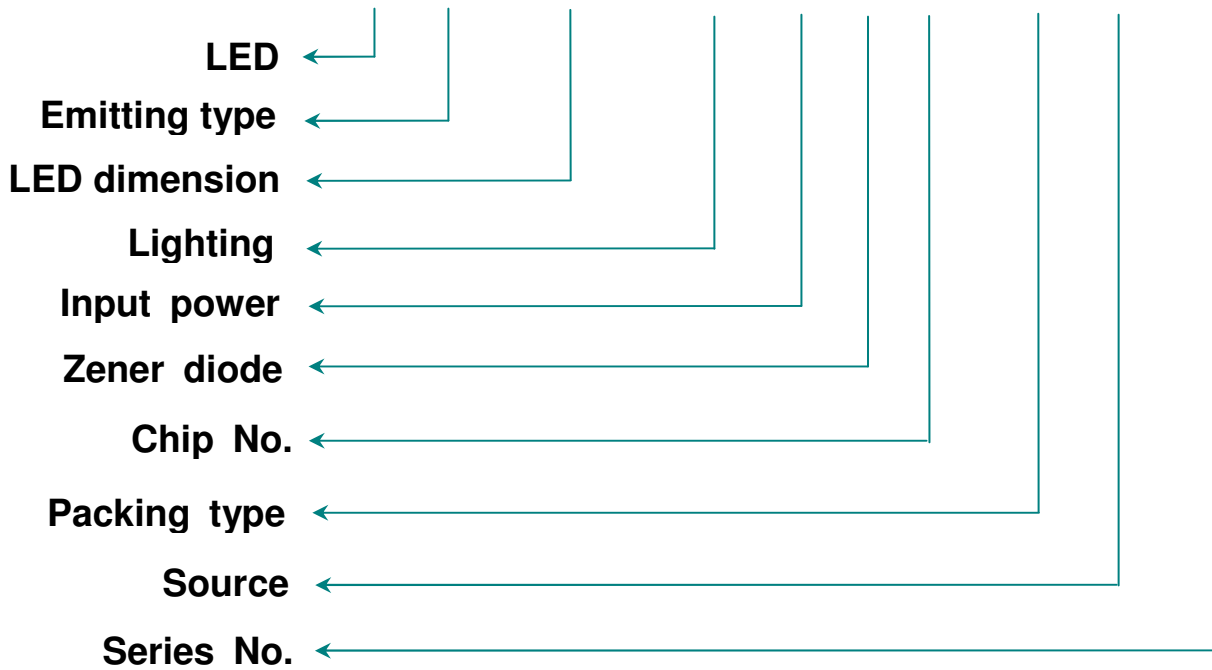
- Top view white LED (5.0 x 5.0 x 1.6 mm) for lighting
- White SMT package
- 3 chips inside
- Lead frame package with individual 6 pins
- InGaN with yellow phosphor
- Wide view angle (X : 120° / Y : 120°)
- IR reflow soldering
- Pb free
- Green product, remain within RoHS

Application

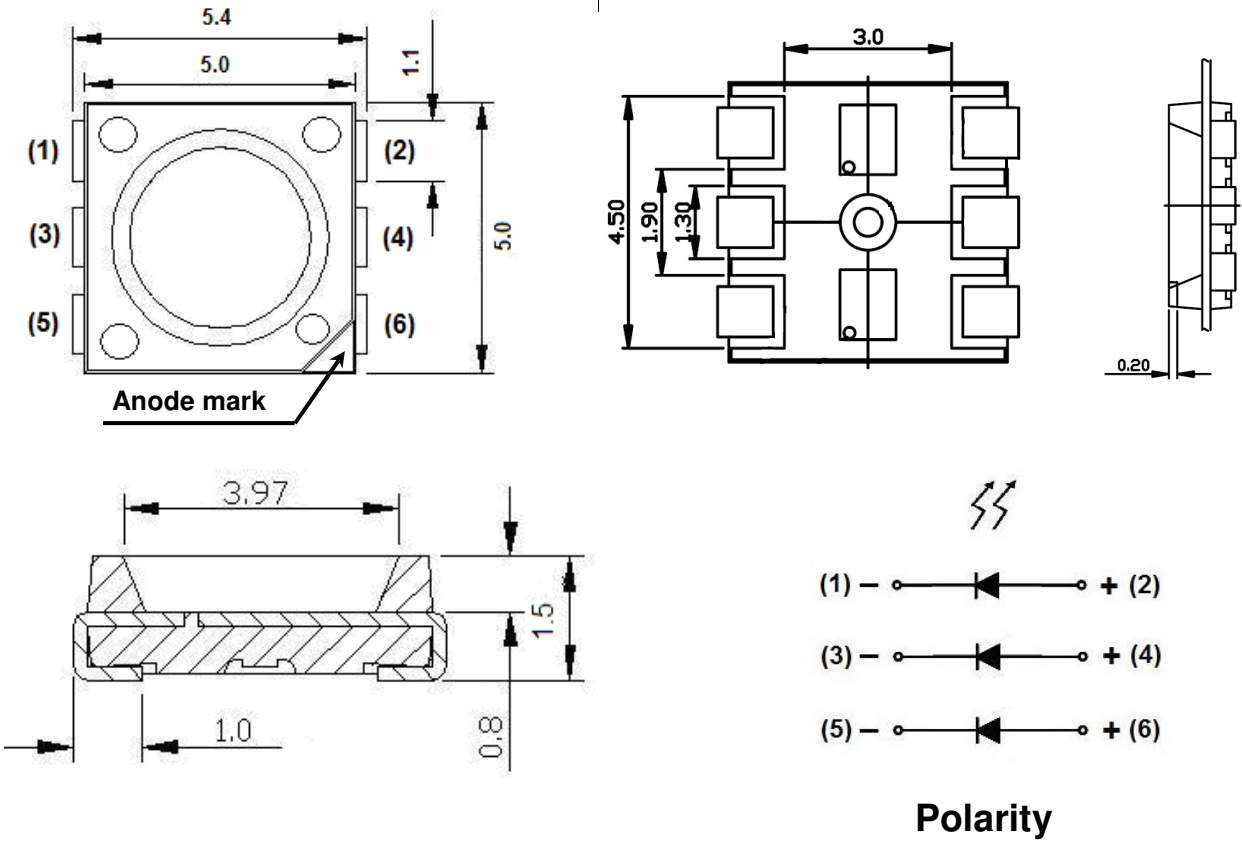
- General lighting
- Decoration lighting
- Indicator
- Out lighting

Product Code

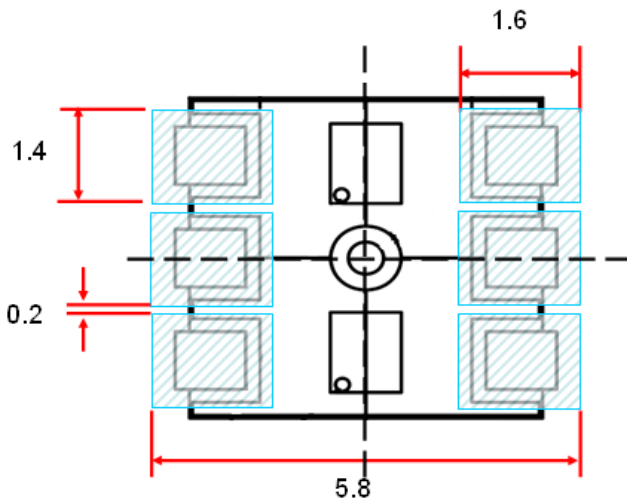
L T 5050 L B N 3 . L W 01



Package Dimensions



Recommended Soldering Pad



Unit : mm

Absolute Maximum Ratings

(LED Die)

(Ta=25°C)

Item	Symbol	Absolute Maximum Rating	Unit
Forward Current	I_F	30	mA/1chip
Pulse Forward Current*	I_{FP}	100	mA/1chip
Reverse Voltage	V_R	5	V/1chip
Power Dissipation	P_D	0.21	W
Operating Temperature	T_{opr}	-40 ~ +85	°C
Storage Temperature	T_{stg}	-40 ~ +100	°C
Soldering Temperature	T_{sld}	Reflow Soldering : 260°C for 10secs Hand Soldering : 350°C for 3secs	

Electro-Optical Characteristics

(Ta=25°C)

Item	Symbol	Condition	Min.	Max.	Unit	
Forward Voltage*	<u>E0</u>	Vf	If = 20mA / chip	<u>2.9</u>	<u>3.0</u>	V
	<u>E1</u>			<u>3.0</u>	<u>3.1</u>	
	<u>E2</u>			<u>3.1</u>	<u>3.2</u>	
	<u>E3</u>			<u>3.2</u>	<u>3.3</u>	
	<u>E4</u>			<u>3.3</u>	<u>3.4</u>	
Luminous Intensity**	<u>V1</u>	Iv	If = 20mA / chip	<u>3400</u>	<u>3900</u>	mcd
	<u>V2</u>			<u>3900</u>	<u>4400</u>	
	<u>W1</u>			<u>4400</u>	<u>5100</u>	
	<u>W2</u>			<u>5100</u>	<u>5700</u>	
	<u>X1</u>			<u>5700</u>	<u>6500</u>	
	<u>X2</u>			<u>6500</u>	<u>7400</u>	

Correspondence Table of Luminous Flux – Intensity

Rank	Luminous Intensity (mcd)	Luminous Flux (lm)***
<u>V1</u>	3400~3900	10.0~11.3
<u>V2</u>	3900~4400	11.3~12.8
<u>W1</u>	4400~5100	12.8~14.6
<u>W2</u>	5100~5700	14.6~16.2
<u>X1</u>	5700~6500	16.2~18.3
<u>X2</u>	6500~7400	18.3~20.7

* Forward Voltage is measured with an accuracy of ±0.05V.

** Luminous intensity is measured with an accuracy of ±10%.

***Luminous flux measurement allowance is ±10% (for reference).

Bin Range of Chromaticity Coordinates

	CIE-X	CIE-Y		CIE-X	CIE-Y		CIE-X	CIE-Y
E21	0.4531	0.3947	E04	0.4780	0.4388	E12	0.4559	0.4231
	0.4395	0.3912		0.4626	0.4362		0.4416	0.4195
	0.4308	0.3750		0.4559	0.4231		0.4333	0.4029
	0.4443	0.3793		0.4708	0.4261		0.4478	0.4072
E14	0.4622	0.4110	E22	0.4395	0.3912	E03	0.4626	0.4362
	0.4478	0.4072		0.4260	0.3868		0.4477	0.4325
	0.4395	0.3912		0.4180	0.3700		0.4416	0.4195
	0.4531	0.3947		0.4308	0.3750		0.4559	0.4231
E11	0.4708	0.4261	E13	0.4478	0.4072	F21	0.4260	0.3868
	0.4559	0.4231		0.4333	0.4029		0.4130	0.3810
	0.4478	0.4072		0.4260	0.3868		0.4066	0.3655
	0.4622	0.4110		0.4395	0.3912		0.4180	0.3700
F14	0.4333	0.4029	F11	0.4416	0.4195	F04	0.4477	0.4325
	0.4200	0.3975		0.4270	0.4145		0.4330	0.4280
	0.4130	0.3810		0.4200	0.3975		0.4270	0.4145
	0.4260	0.3868		0.4333	0.4029		0.4416	0.4195
F22	0.4130	0.3810	F13	0.4200	0.3975	F12	0.4270	0.4145
	0.4000	0.3750		0.4055	0.3915		0.4110	0.4080
	0.3945	0.3600		0.4000	0.3750		0.4055	0.3915
	0.4066	0.3655		0.4130	0.3810		0.4200	0.3975
F03	0.4330	0.4280	D22	0.4660	0.3970	D13	0.4767	0.4140
	0.4163	0.4222		0.4531	0.3947		0.4622	0.4110
	0.4110	0.4080		0.4443	0.3793		0.4531	0.3947
	0.4270	0.4145		0.4567	0.3822		0.4660	0.3970
D12	0.4855	0.4281	D21	0.4783	0.3983	D11	0.4995	0.4292
	0.4708	0.4261		0.4660	0.3970		0.4855	0.4281
	0.4622	0.4110		0.4567	0.3822		0.4767	0.4140
	0.4767	0.4140		0.4690	0.3840		0.4899	0.4150
D03	0.4930	0.4405	D14	0.4899	0.4150	D04	0.5077	0.4410
	0.4780	0.4388		0.4767	0.4140		0.4930	0.4405
	0.4708	0.4261		0.4660	0.3970		0.4855	0.4281
	0.4855	0.4281		0.4783	0.3983		0.4995	0.4292

	CIE-X	CIE-Y		CIE-X	CIE-Y		CIE-X	CIE-Y
G21	0.4000	0.3750	G12	0.3945	0.3982	H22	0.3568	0.3475
	0.3846	0.3660		0.3774	0.3878		0.3438	0.3378
	0.3803	0.3515		0.3740	0.3730		0.3428	0.3254
	0.3945	0.3600		0.3895	0.3820		0.3547	0.3345
G14	0.4055	0.3915	G03	0.3990	0.4130	H13	0.3590	0.3625
	0.3895	0.3820		0.3807	0.4020		0.3452	0.3528
	0.3846	0.3660		0.3774	0.3878		0.3438	0.3378
	0.4000	0.3750		0.3945	0.3982		0.3568	0.3475
G11	0.4110	0.4080	H21	0.3705	0.3573	H12	0.3615	0.3780
	0.3945	0.3982		0.3568	0.3475		0.3465	0.3680
	0.3895	0.3820		0.3547	0.3345		0.3452	0.3528
	0.4055	0.3915		0.3675	0.3435		0.3590	0.3625
G04	0.4163	0.4222	H14	0.3740	0.3730	H03	0.3634	0.3910
	0.3990	0.4130		0.3590	0.3625		0.3477	0.3806
	0.3945	0.3982		0.3568	0.3475		0.3465	0.3680
	0.4110	0.4080		0.3705	0.3573		0.3615	0.3780
G22	0.3846	0.3660	H11	0.3774	0.3878	H04	0.3807	0.4020
	0.3705	0.3573		0.3615	0.3780		0.3634	0.3910
	0.3675	0.3435		0.3590	0.3625		0.3615	0.3780
	0.3803	0.3515		0.3740	0.3730		0.3774	0.3878
G13	0.3895	0.3820						
	0.3740	0.3730						
	0.3705	0.3573						
	0.3846	0.3660						

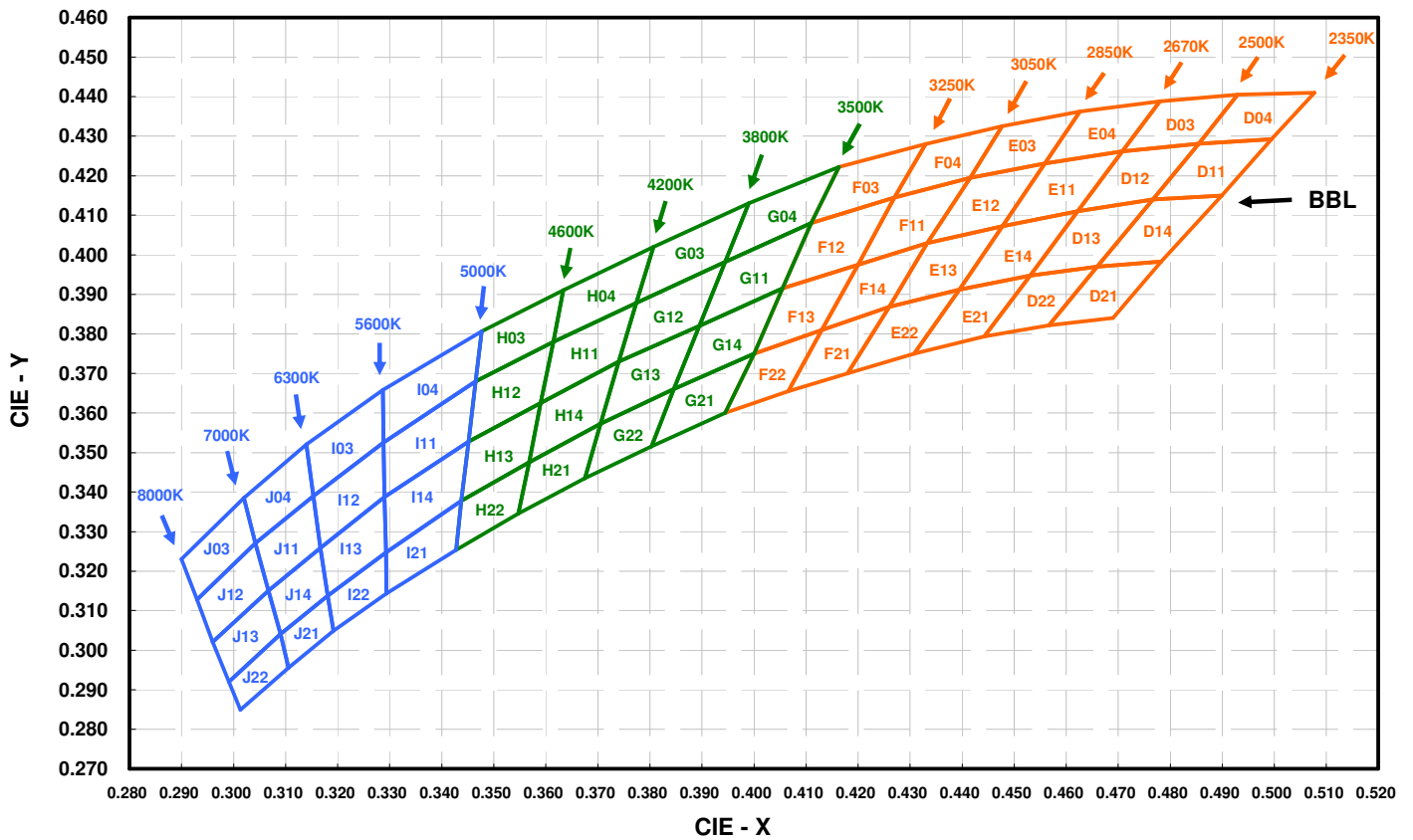
	CIE-X	CIE-Y		CIE-X	CIE-Y		CIE-X	CIE-Y
I21	0.3438	0.3378	I12	0.3288	0.3525	J22	0.3090	0.3041
	0.3293	0.3247		0.3153	0.3390		0.2991	0.2920
	0.3294	0.3143		0.3167	0.3259		0.3013	0.2849
	0.3428	0.3254		0.3290	0.3387		0.3106	0.2955
I14	0.3452	0.3528	I03	0.3287	0.3658	J13	0.3067	0.3150
	0.3290	0.3387		0.3140	0.3520		0.2960	0.3021
	0.3293	0.3247		0.3153	0.3390		0.2991	0.2920
	0.3438	0.3378		0.3288	0.3525		0.3090	0.3041
I11	0.3465	0.3680	J21	0.3181	0.3138	J12	0.3042	0.3271
	0.3288	0.3525		0.3090	0.3041		0.2930	0.3128
	0.3290	0.3387		0.3106	0.2955		0.2960	0.3021
	0.3452	0.3528		0.3192	0.3049		0.3067	0.3150
I04	0.3477	0.3806	J14	0.3167	0.3259	J03	0.3020	0.3385
	0.3287	0.3658		0.3067	0.3150		0.2900	0.3230
	0.3288	0.3525		0.3090	0.3041		0.2930	0.3128
	0.3465	0.3680		0.3181	0.3138		0.3042	0.3271
I22	0.3293	0.3247	J11	0.3153	0.3390	J04	0.3140	0.3520
	0.3181	0.3138		0.3042	0.3271		0.3020	0.3385
	0.3192	0.3049		0.3067	0.3150		0.3042	0.3271
	0.3294	0.3143		0.3167	0.3259		0.3153	0.3390
I13	0.3290	0.3387						
	0.3167	0.3259						
	0.3181	0.3138						
	0.3293	0.3247						

*If color binning is required, only one color group is allowed for each chip within a reel.

Chromaticity coordinate groups are measured with an accuracy of ± 0.01 .

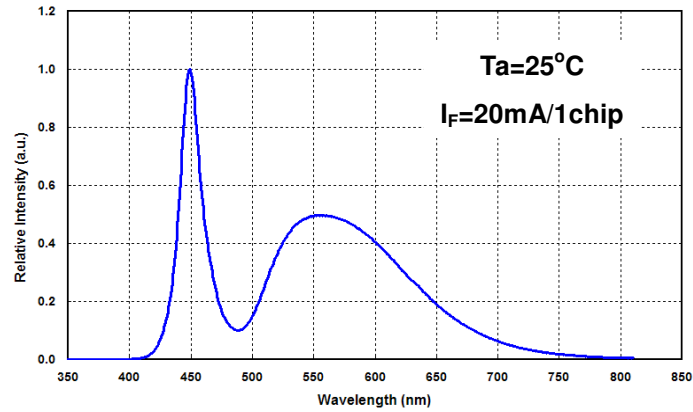
*Color coordinate is derived from the CIE 1931 chromaticity.

Chromaticity Diagram

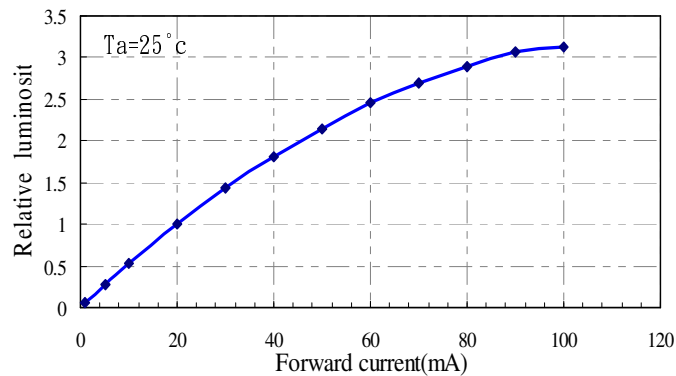


Typical Electro-Optical Characteristics Curves

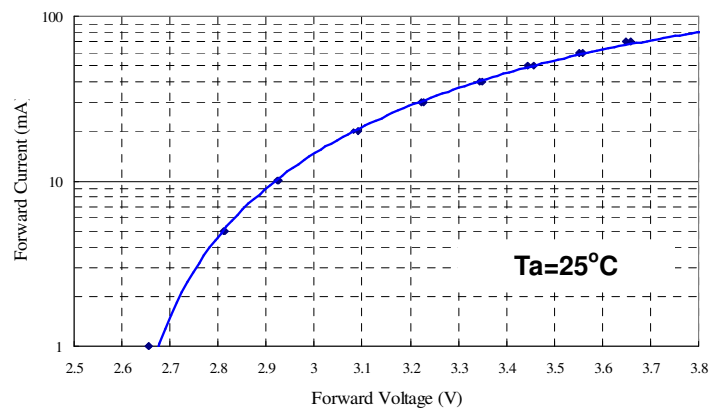
Spectrum



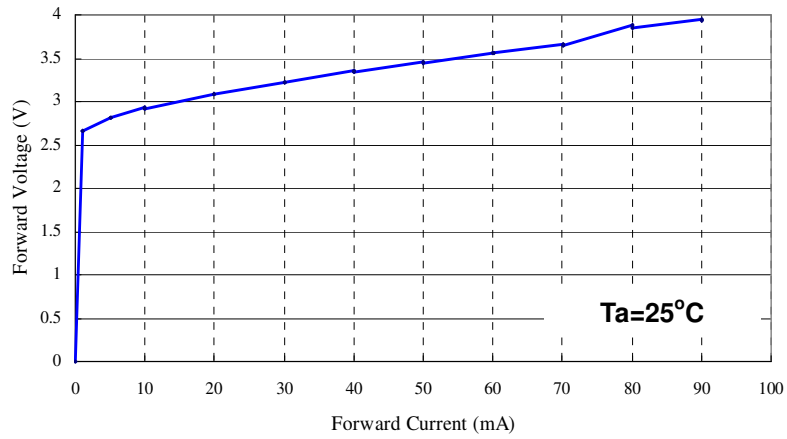
Forward current vs. Relative luminosity (per chip)



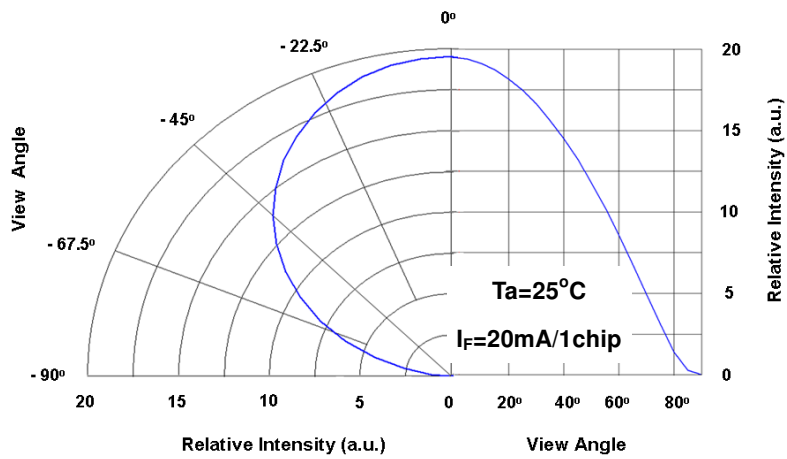
Forward voltage vs. Forward current (per chip)



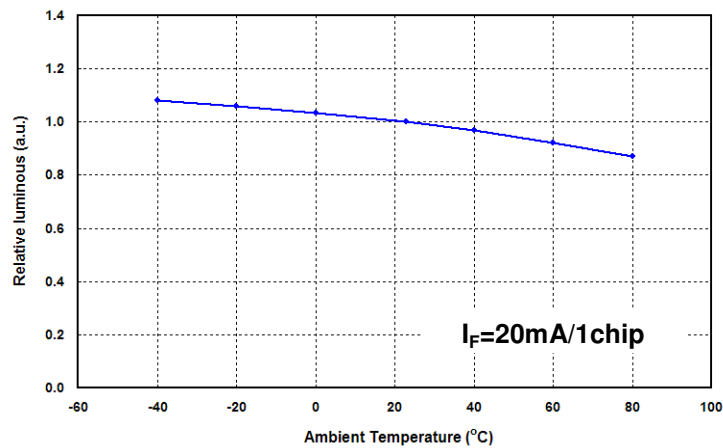
Forward current vs. Forward voltage (per chip)



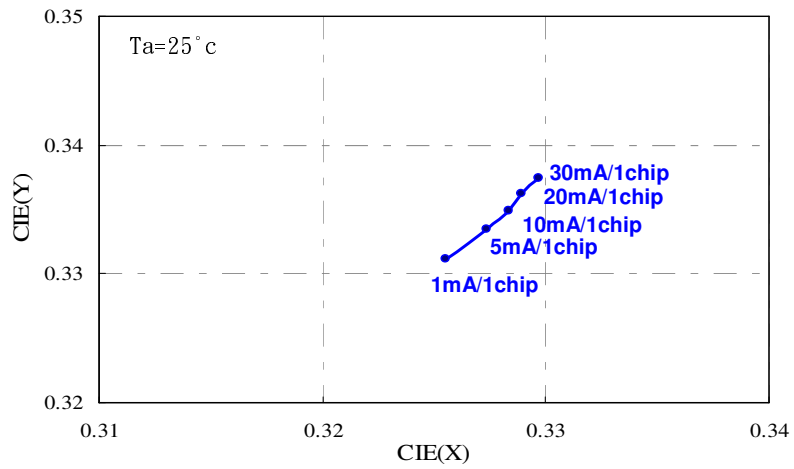
Radiation Pattern



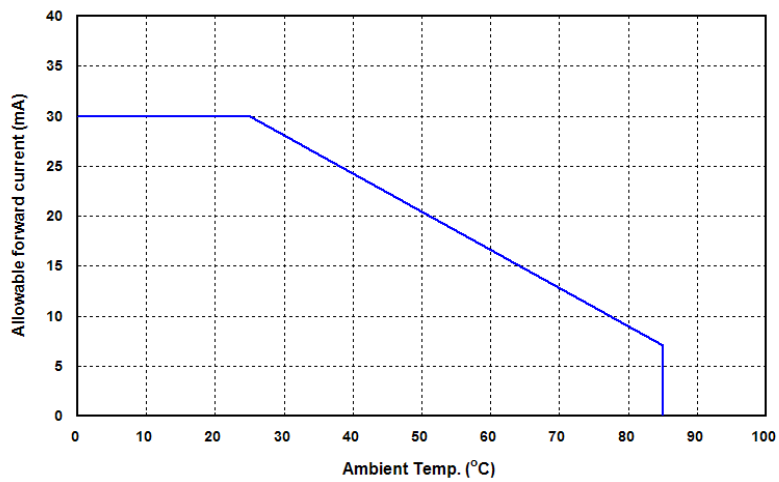
Ambient temp. vs. Relative luminous



Forward current vs. Chromaticity diagram



Ambient Temp. vs. Allowable forward current (per chip)



No.	Test item	Test condition	Notes	Equipment	# of damaged
1	Temperature cycle	-40°C~25°C~100°C~25°C	100 cycles	T/H chamber	0/50
		30min~5min~30min~5min			
2	High temperature storage	Ta=100°C	1000 hrs	Oven	0/50
3	Thermal shock	0°C~100°C	20 cycles	T/S chamber	0/50
		15sec~15sec			
4	Steady state operating life condition 1	Ta=25°C,IF=20mA	1000 hrs	Burn in sys.	0/50
5	Steady state operating life condition 2	Ta=25°C,IF=30mA	500 hrs	Burn in sys.	0/50
6	Steady state operating life of high temperature	Ta=85°C,IF=5mA	1000 hrs	Oven	0/50
7	Steady state operating life of high humidity heat	Ta=60°C,RH=90%,IF=15mA	500 hrs	T/H chamber	0/50
8	Resistance to soldering heat	Tsld=260°C ,10sec	2 times	Reflow	0/50

Recommend Reflow Soldering Profile

Surface mounting condition

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

Soldering reflow

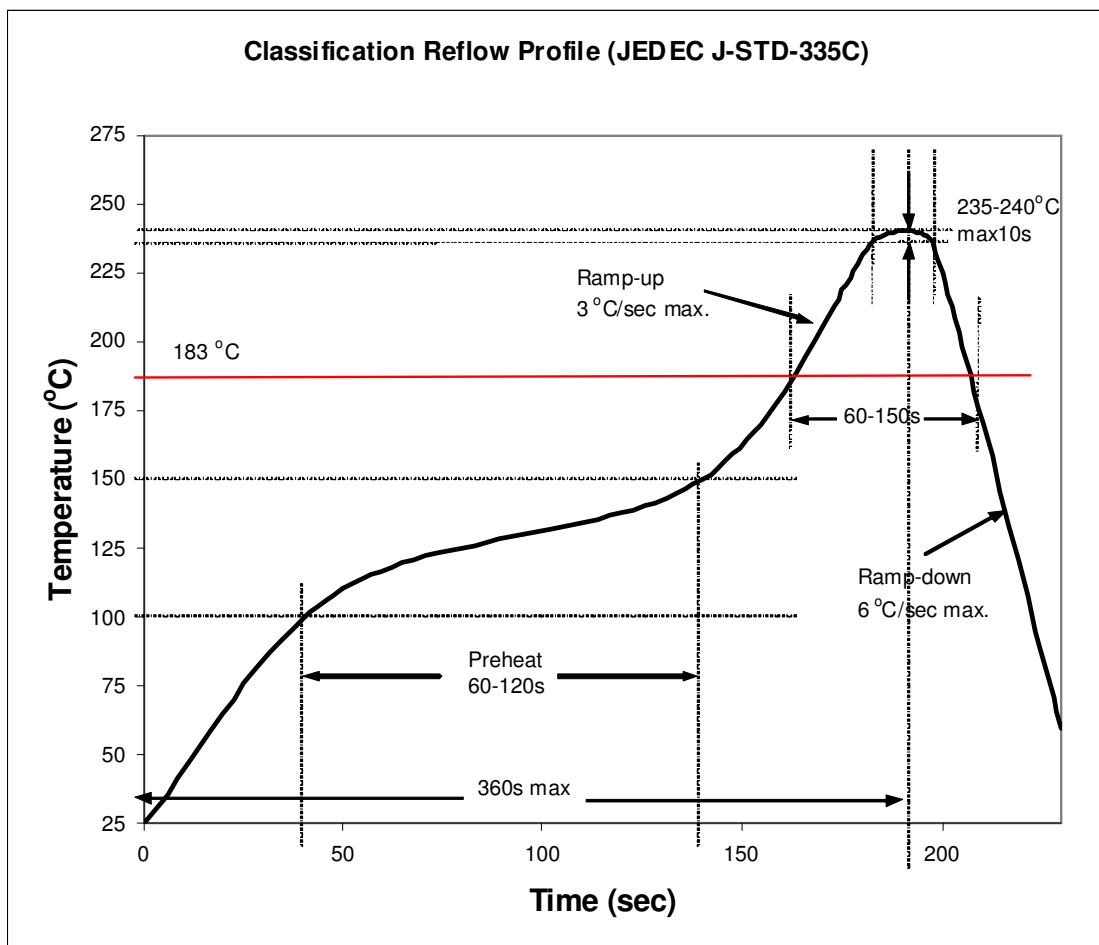
-Soldering of the SMD LEDs should conform to the soldering condition in the individual specifications.

-SMD LEDs are designed for reflow soldering.

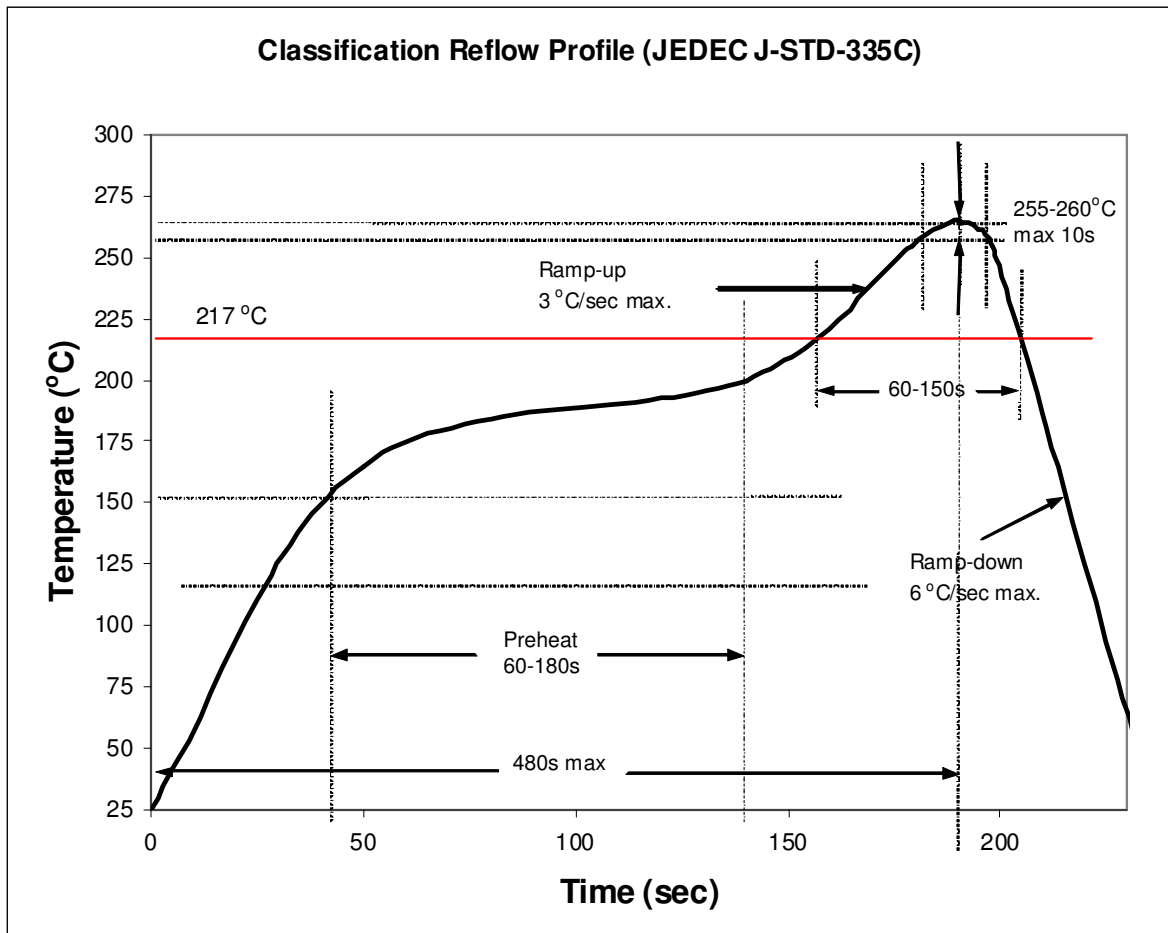
-In the reflow soldering, too high temperature and too large temperature gradient such as rapid heating/cooling may cause electrical & optical failures and damages of the devices.

-Wellypower can't guarantee the LEDs after they have been assembled using the solder dipping method.

1) Lead solder



2) Lead-free solder (JEDEC J-STD-020B)

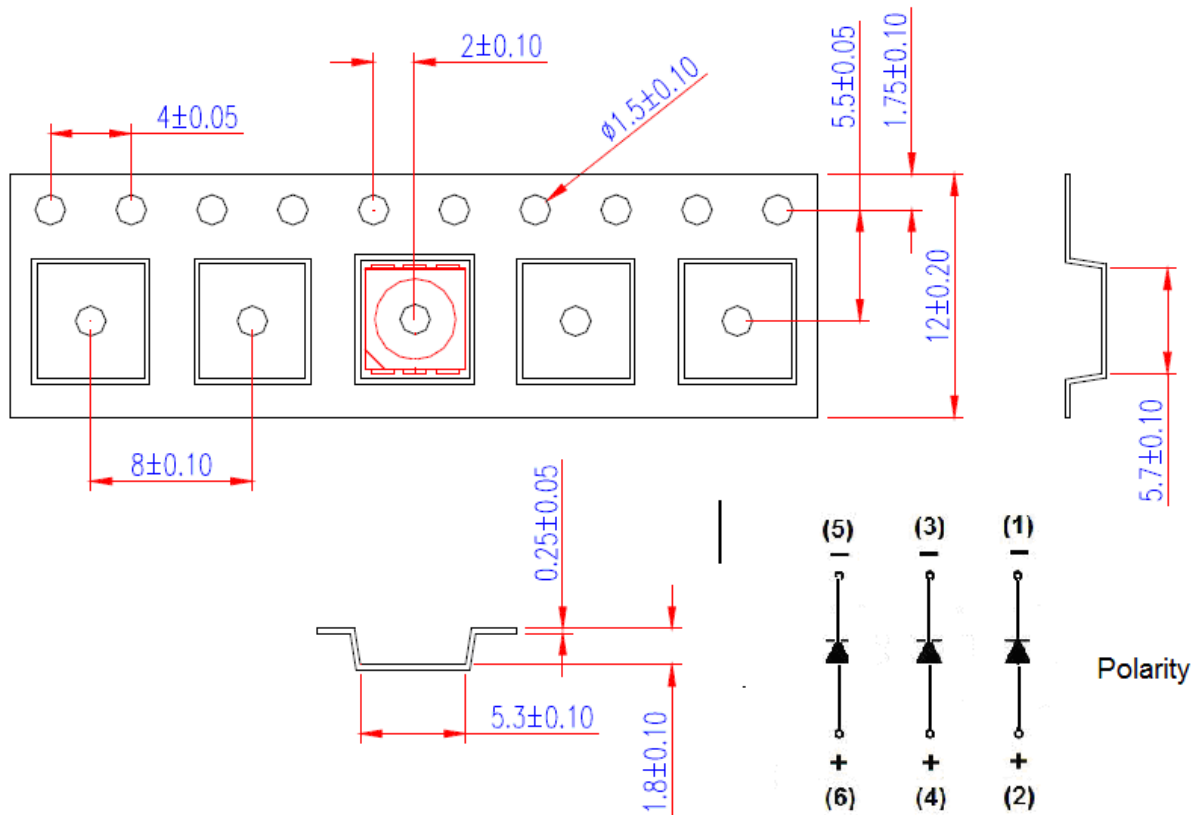


3) Manual soldering.

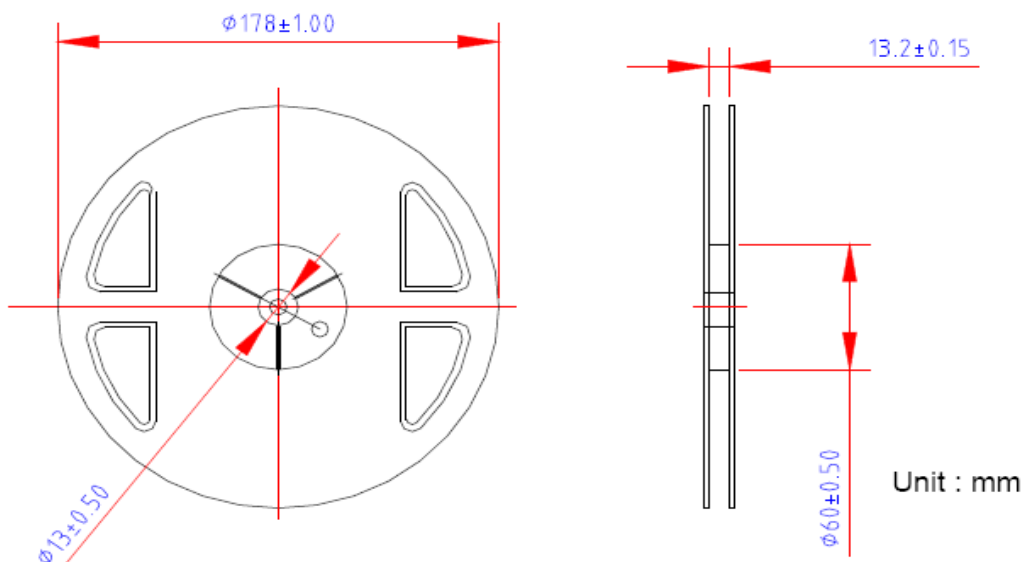
- Lead solder
 - Max. 300 °C for max. 3sec, and only one time.
- Lead-free solder
 - Max. 350 °C for max. 3sec, and only one time.
- There is possibility that the brightness of LEDs is decreased, which is influenced by heat or ambient atmosphere during reflow. It is recommended to use the nitrogen reflow method use the nitrogen reflow method.
- After LEDs have been soldered, repairs should not be done. As repairs is unavoidable, a double-head soldering iron should be used. It should be confirmed beforehand whether the characteristics of the LEDs will be damaged by repairing or not.
- Reflow soldering should not be done more than two times.

Package Model

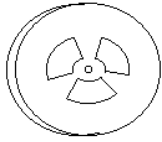
• Taping and Package Spec :



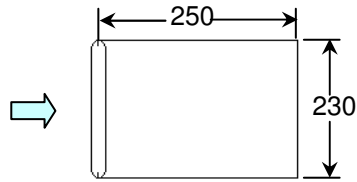
• Package Dimensions of Reel :



Packing formation

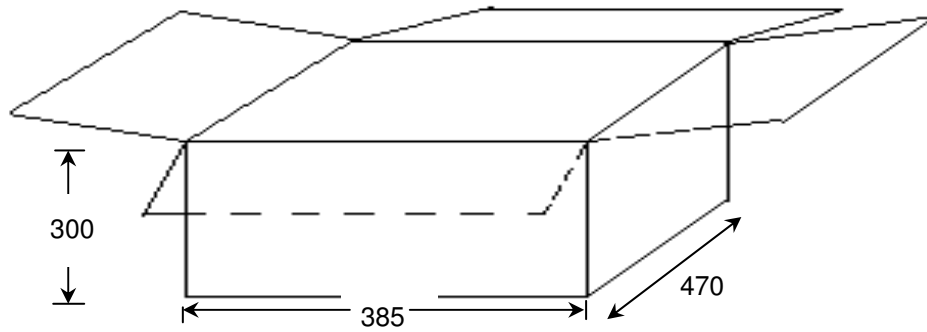


Diameter : 178 mm
 Width : 12 mm
 1,000 pcs/reel
 Anti-static black reel

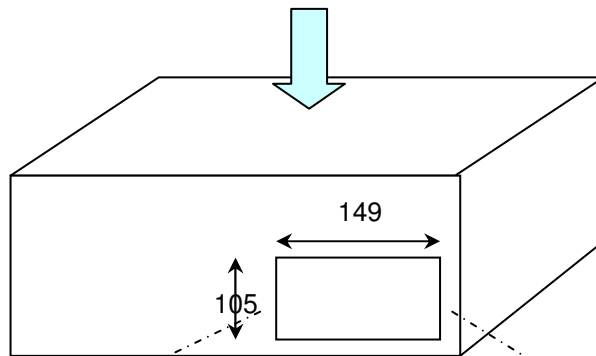


Aluminum bag, anti-static
 Shielding
 1 reel/bag (T=0.1mm)

50 bags in one box



Package Outlook:



Wellypower	
Customer	
Part number	
Quantity	
Date	
Remark	

Cautions

(1) Moisture proof package

The moisture proof package should be used to prevent moisture in the package as the moisture may cause damage to optical characteristics of the LEDs.

The aluminum bag with zipper is used for moisture proof package. And, the moisture absorbent material, silica gel, is inserted into aluminum bag.

(2) Storage:

Storage conditions

Before opening the package:

The LEDs should be kept at 30°C or less than 90%RH or less. The LEDs should be used within a year. When storing the LEDs, moisture proof packaging with absorbent material is recommended.

After opening the package:

2-1. The LEDs should be kept at 30°C, 60% RH environment or less.

2-2. The LEDs should be soldered within 168 hours (7 days).

2-3. If unused LEDs remain, they should be stored in moisture proof packages, such as sealed containers with packages of moisture absorbent material (silica gel).

2-4. After the product shielding bag is opened for more than 168 hrs in 30°C, 60% RH environment or less, The LEDs should be pre-bake 60°C / 24hrs before used.

(3) Heat generation

Thermal design of the end products is of paramount importance. The heat generation must be taken into design consideration when using the LED. The coefficient of the temperature increase per input electric power is affected by the thermal resistance of the circuit board and density of LED placement on the board, as well as other components.

(4) Static electricity

Static electricity or surge voltage damages the LEDs. All equipment and machinery must be properly grounded. It is recommended to use a wristband or anti-electrostatic glove when handling the LEDs. When inspecting the final products in which LEDs were assembled, it is recommended to check whether the assembled LEDs are damaged by static electricity or not. It is easy to find static-damaged LEDs by a light-on test or a Vf test at a lower current. (below 1mA is recommended).

Criteria: Vf >2.0V at If=0.01 mA

(5) Cleaning

Use isopropyl alcohol as a solvent for cleaning the LEDs. The other solvent may dissolve the LEDs package and the epoxy.

Ultrasonic cleaning should not be done.

(6) Others

Wellypower

When using the LEDs, it must care that the reverse voltage will not exceed the absolute maximum rating.
The LED light is enough to injure human eyes, so it should avoid looking at LED light directly.

Note

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Wellypower reserves the right to make changes at any time without notice to any products in order to improve reliability, function or design.

LED Radiation :

Do not view directly with optical instruments. (Class 1M LED Product)