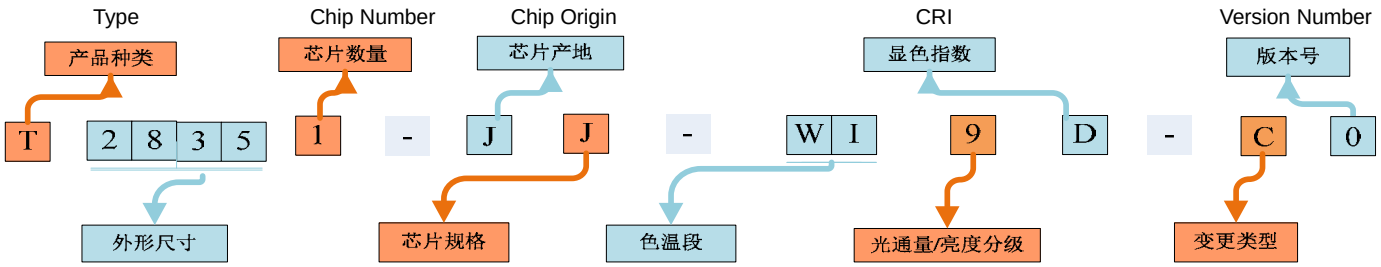
SMD 2835 Series Specifications

Features

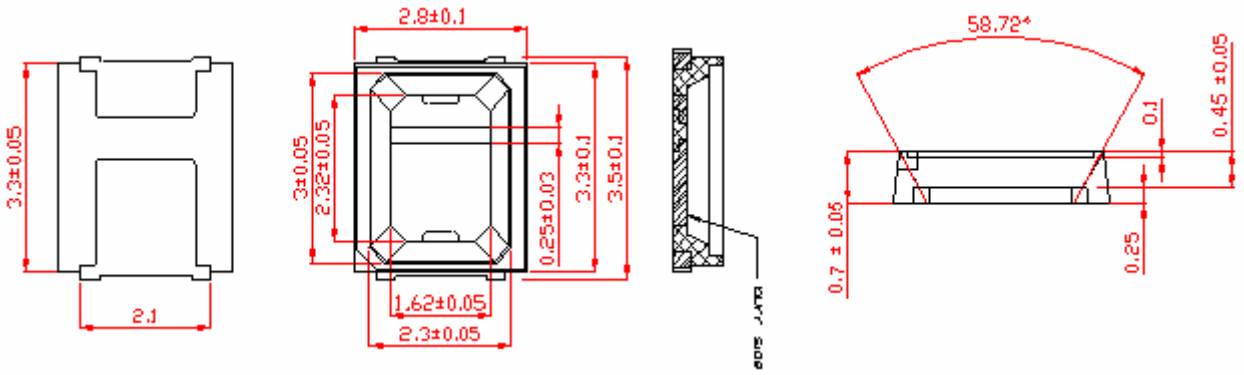
Super high efficiency
High reliability performance
Viewing angle 120°
Suitable for all SMT assembly and solder process
Complied with RoHS directive

Product Definition Code

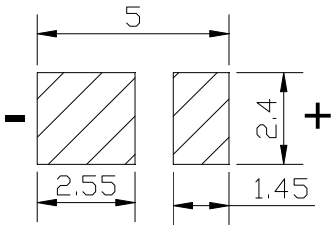


Part number:

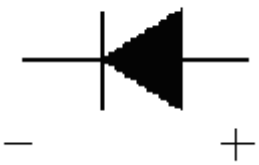
T28351-JD-CELF-C0 ------*6020-6530K/CRI>80/24~26~28*Lm
T28351-JD-CDLF-C0 ------5447-6020K/CRI>80/*22~24~26*Lm
T28351-JD-NBLF-C5 ------ 4060±163K/CRI>80/*24~26~28*Lm
T28351-JD-WJLF-C5 ------ 2940±85K/CRI>80/*22~24~26*Lm



All dimensions are in millimeter
Tolerance is ±0.1mm unless otherwise noted



Recommended pad layout



●（Ta=25℃）Absolute maximum ratings at Ta=25℃

Item	Symbol	Absolute Maximum Rating	Unit
Forward Current	I_F	90	mA
Pulse Forward Current	I_{fp}	270	mA
Reverse Voltage	V_R	5	V
Power Dissipation	P_D	300	mW
Operating Temperature	T_{opr}	-30~80	℃
Storage Temperature	T_{stg}	-40~85	℃
Junction Temperature	T_j	110	℃
Thermal Resistance	R_{ja}	50	℃/W
Solder Temperature	T_s	260/10sec	℃

Notes: I_{fp} conditions with pulse width ≤10ms and duty cycle ≤10%

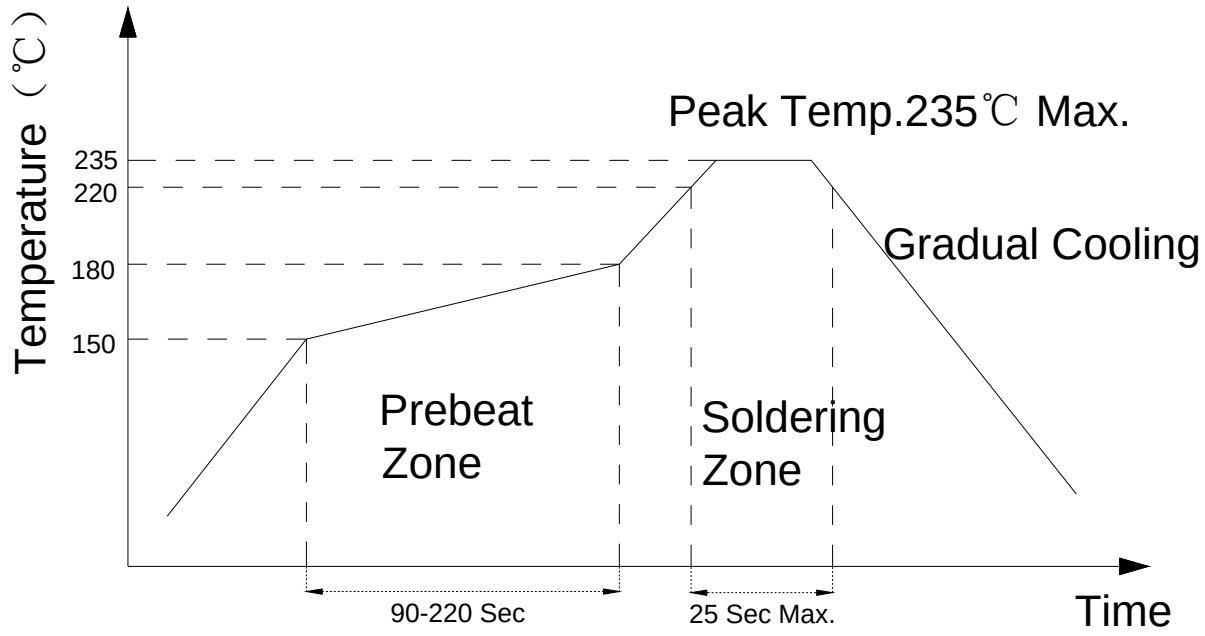
●（Ta=25℃）Optical-Electrical Characteristics at Ta=25℃

Parameter	Symbol	Value			Unit	Test condition
		Min.	Typ.	Max.		
Forward Voltage	V_F	2.8	3.1	3.4	V	If=60mA
Luminous Flux	Φ	22	24	28	LM	If=60mA
Color Temperature	CCT	2725	2940/4060/5100	6530	K	If=60mA
Color rendering Index	CRI	80			---	If=60mA
Reverse Current	I_R	---	---	10	uA	V_R=5V
Viewing angle	2θ1/2	---	120	---	Deg	If=60mA
Antistatic ability	ESD	HBM		4000V/ class 2		
		MM		300V/ class M3		

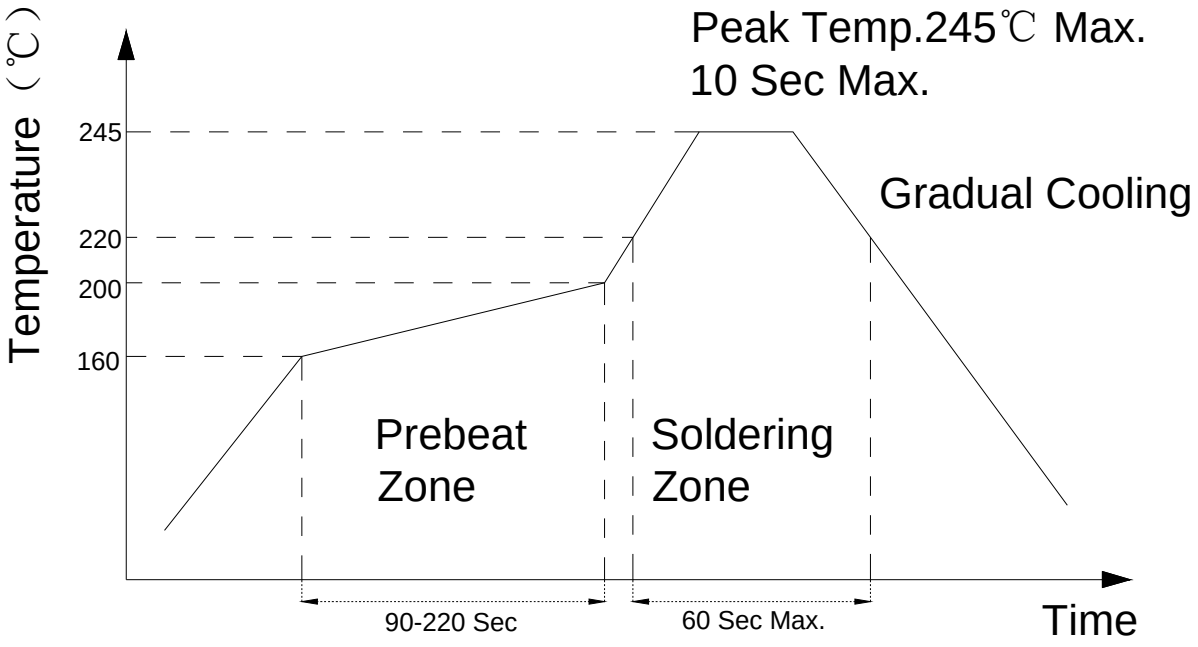
Notes: Luminous flux (LM) ±5%
Forward Voltage (VF) ±0.1V
Wavelength (X,Y) ±0.01（CCT±5%）
Color rendering Index (CRI) ±2
Viewing angle（2θ1/2）±5

● IR reflow soldering Profile

Lead solder



Lead Free solder



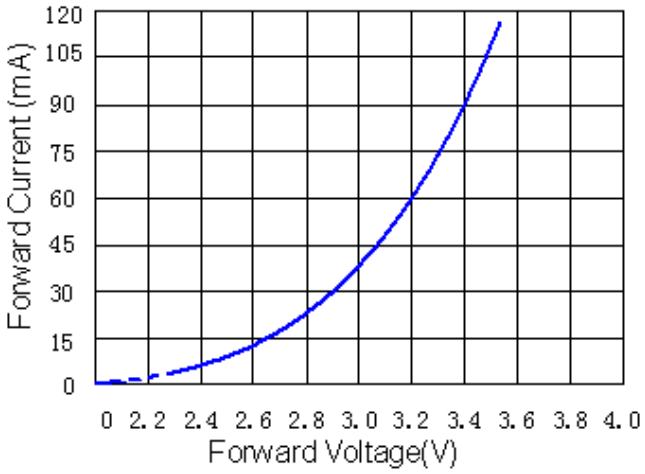
NOTES：

1. **We recommend the reflow temperature 240℃±5℃.**
2. **Don't cause stress to the silicone resin while it is exposed to high temperature.**
3. **Number of reflow process shall be 1 time.**

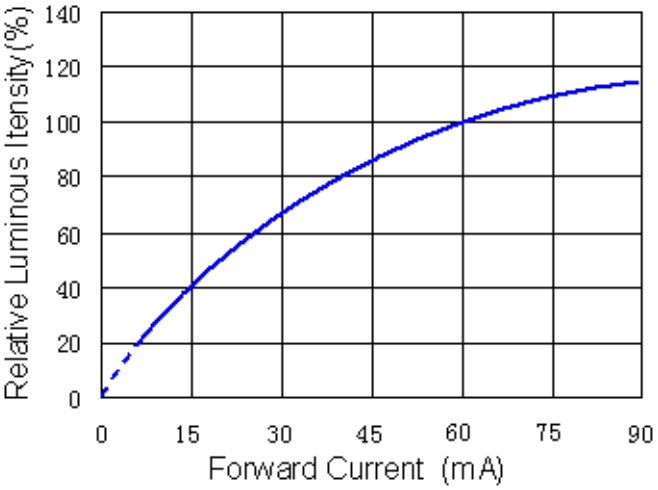
●Typical Optical-Electrical Characteristics curves

Environment Parameter： Temperature=25℃， Humidity=45%

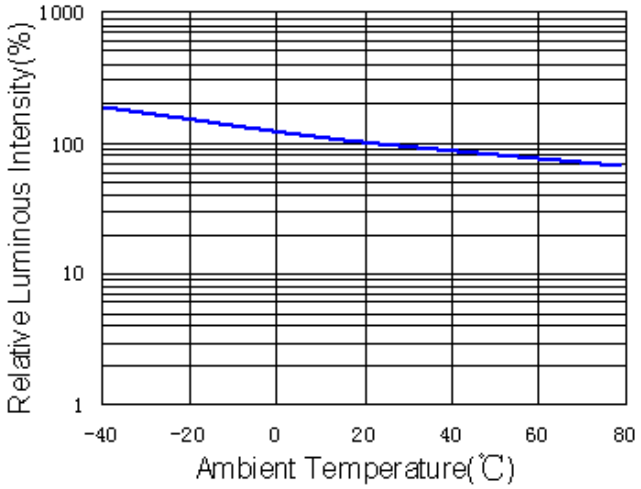
Forward Current VS Forward Voltage



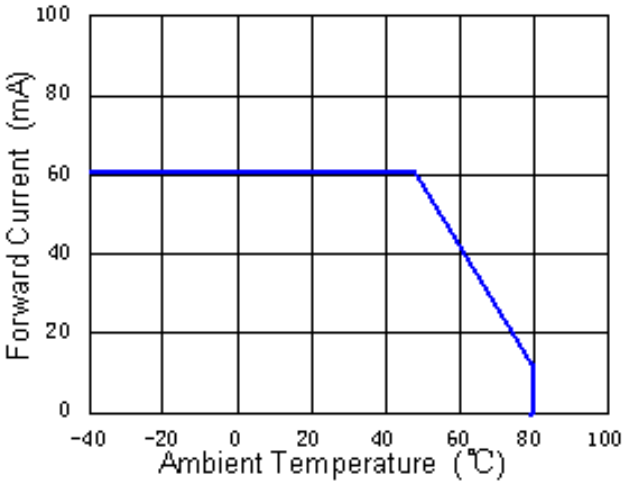
Relative Flux VS Forward Current



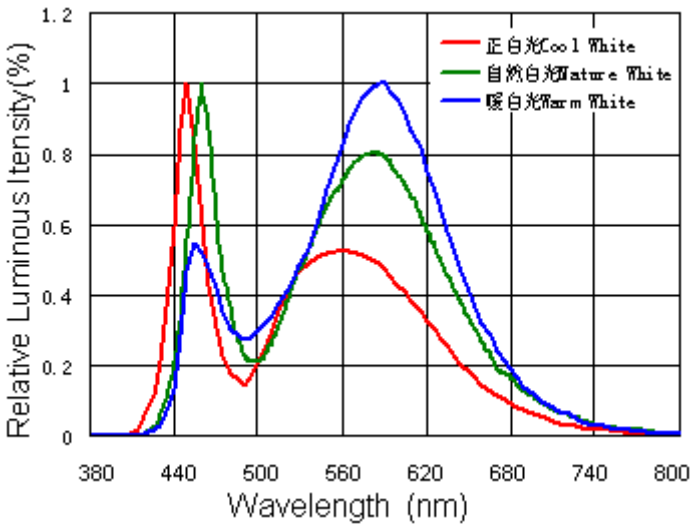
Relative Flux VS Ambient Temperature



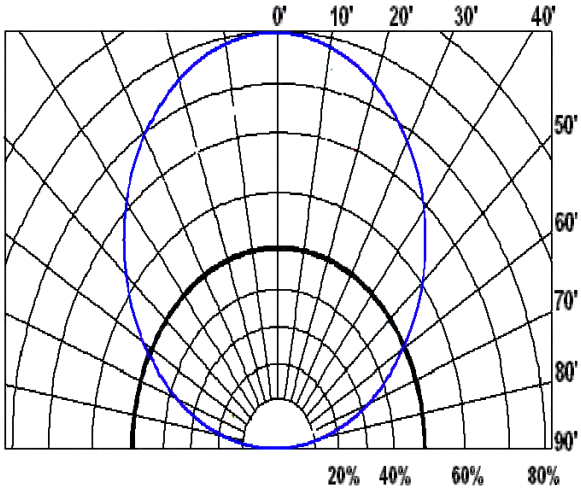
Forward Current VS Ambient Temperature



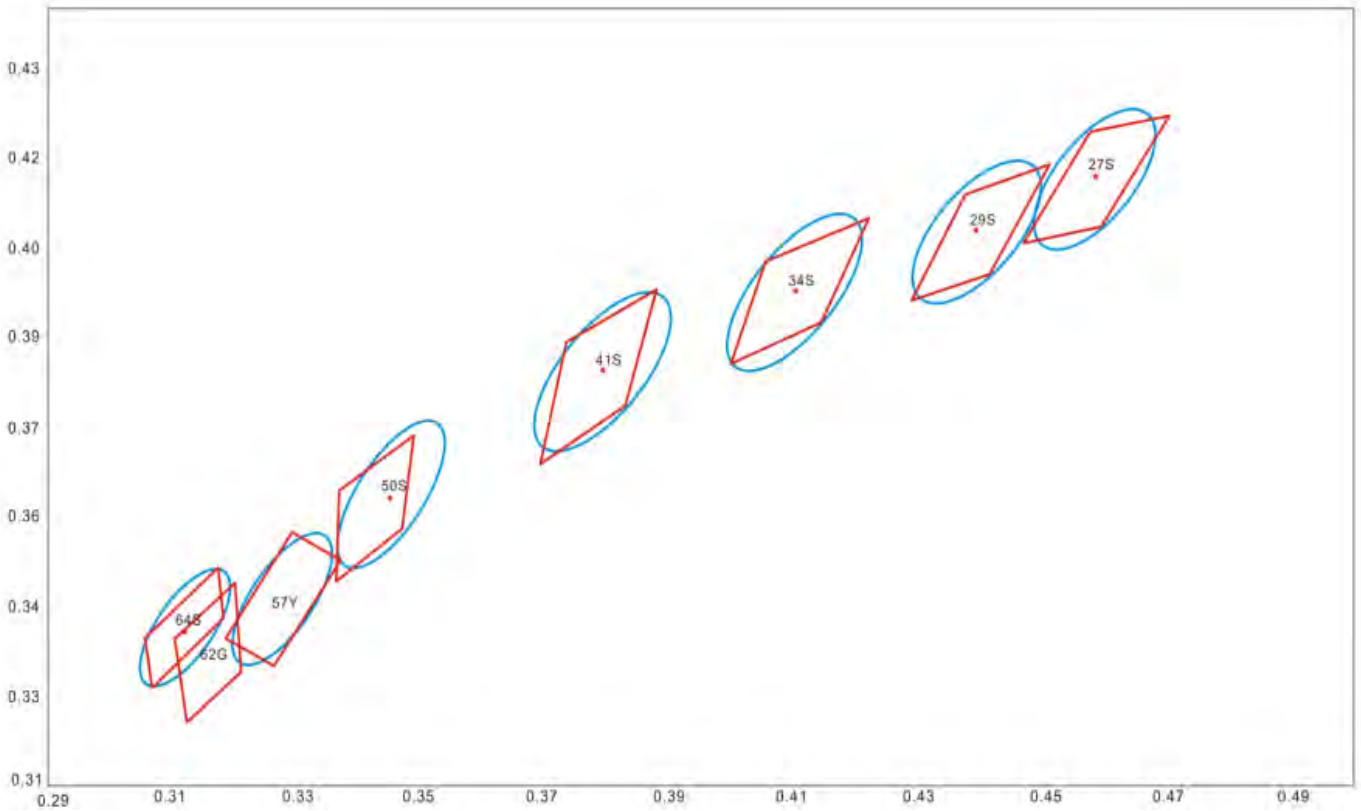
Relative Spectral Distribution



Typical Spectral Distribution



- **Chromaticity coordinates bin chart:**



Runlite shooting figure based on IEC60081 color tolerance standard coordinates
Coordinates within ellipse in blue by SDCM < 5

● Range of bins

CCT	Bin Code	CIE-X	CIE-Y	CCT	Bin Code	CIE-X	CIE-Y
2725±80K	27S	0.4475	0.4012	5100±200K	50S	0.3372	0.3449
		0.4582	0.4199			0.3378	0.3596
		0.470	0.4228			0.3496	0.3694
		0.4598	0.4041			0.3478	0.3533
	Central point	**0.459**	**0.412**		Central point	**0.346**	**0.359**
2940±85K	29S	0.4295	0.3918	6500±325K	64S	0.3079	0.3274
		0.4381	0.4097			0.3068	0.3354
		0.4515	0.4145			0.3181	0.3467
		0.442	0.3962			0.3192	0.3387
	Central point	**0.44**	**0.403**		Central point	**0.313**	**0.337**
3400±135K	34S	0.3699	0.3646	6020-6530K	62G	0.3133	0.3214
		0.3743	0.3846			0.3113	0.3350
		0.3885	0.3934			0.3208	0.3444
		0.3835	0.3741			0.3219	0.3296
	Central point	**0.411**	**0.393**		Central point	**0.3168**	**0.3328**
4060±163K	41S	0.3699	0.3646	5665±380K	57Y	0.3273	0.3306
		0.3743	0.3846			0.3196	0.3352
		0.3885	0.3934			0.3301	0.3529
		0.3835	0.3741			0.3379	0.3482
	Central point	**0.38**	**0.38**		Central point	**0.3287**	**0.3417**

● Voltage classes

Group	Min.	Max.	Unlit	Condition
1	2.8	2.9	V	IF=60mA
2	2.9	3.0		
3	3.0	3.1		
4	3.1	3.2		
5	3.2	3.3		
6	3.3	3.4		
7	3.4	3.5		
8	3.5	3.6		

● Luminous flux standard step

Color	CRI	CCT Range		Lumen（60mA）		
		Min	Max	Code	Lumen	
					Min	Max
Warm white	80	2645	2805	27S	18	24
		2855	3025	29S	18	26
		3265	3535	34S	20	28
Neutral white	80	3897	4223	41S	24	28
Cool white	80	4900	5300	50S	22	28
		6175	6825	64S	22	28
		6020	6530	62G	20	28
		5285	6045	57Y	22	28

●Electro-Optical Characteristics(Warm white)

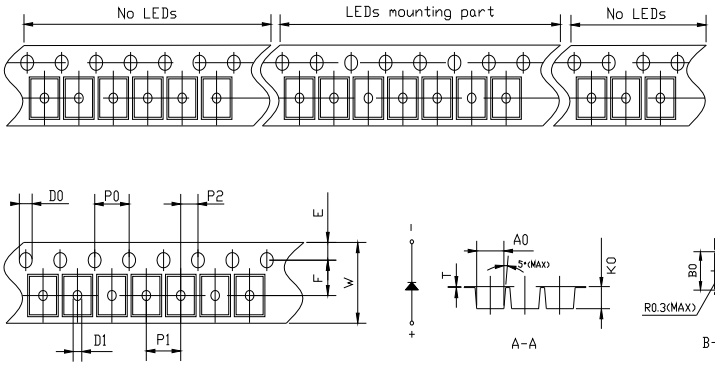
If(mA)	Vf(v)	Power(w)	Flux(LM)	LM/W	CCT	Ra
20	2.80	0.056	9.0	159.8	2954.1	81.0
25	2.84	0.071	10.9	155.1	2959.3	80.9
30	2.88	0.086	12.9	150.0	2960.7	80.8
35	2.91	0.102	14.8	145.8	2965.0	80.8
40	2.95	0.118	16.6	141.0	2970.0	80.8
45	2.98	0.134	18.1	135.1	2983.3	80.9
50	3.01	0.151	19.7	130.3	2989.6	80.8
55	3.04	0.167	21.2	126.8	3004.1	80.7
60	3.07	0.184	23.4	127.0	2971.9	80.7

●Test items and results of reliability

Test Item	Test Conditions	Duration/Cycle	Number of damage	Reference
Temperature	-40℃ 30min ↑↓25℃(2min) 100℃ 30min	100 cycles	0/100	JEITA ED-4701300 303
Thermal Shock	-40℃ 30min ↑↓ 5sec 100℃ 30min	100 cycles	0/100	JEITA ED-4701200 303
High Temperature Storage	Ta=100℃	1000 hours	0/100	EIAJED-4701200 201
Humidity Heat Storage	Ta=85℃ RH=85%	1000 hours	0/100	EIAJED-4701100 103
Low Temperature Storage	Ta=-40℃	1000 hours	0/100	EIAJED-4701200 202
Room Temperature Test	Ta=25℃ IF=60mA	1000 hours	0/100	Tested with Runlite standard
High Humidity Heat Test	60℃ RH=90% IF=60mA	1000 hours	0/100	Tested with Runlite standard
Low Temperature Test	Ta=-40℃ IF=60mA	1000 hours	0/100	Tested with Runlite standard
ESD(HBM)	4KV at 1.5KΩ; 100pF	3 times	0/100	MIL-STD-883D

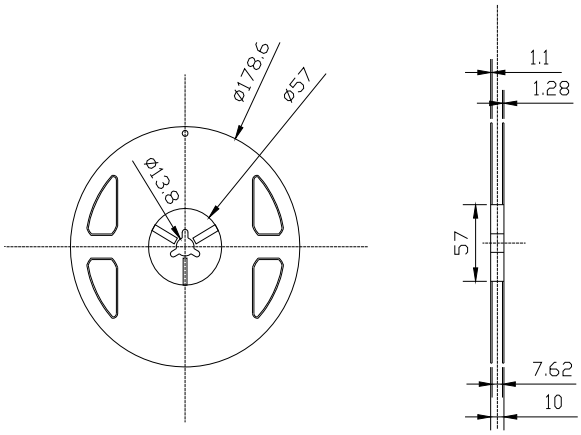
● Packaging

1.
Dimensions of Tape（Unit: mm）

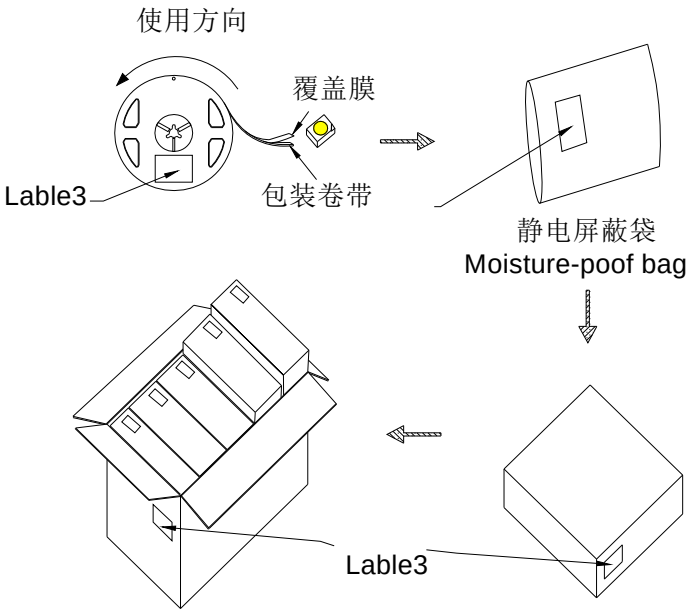


symbol	A0	B0	K0	P0	P1	P2	model	unit
spec	3.15±0.10	3.80±0.10	2.10±0.10	4.00±0.10	4.00±0.10	2.00±0.10		
symbol	W	T	E	F	D0	D1	2835	mm
spec	8.00±0.10	0.235±0.05	1.75±0.10	3.50±0.10	1.50+0.10 -0.00	1.00+0.10 -0.00		

2.
Dimensions of Reel (Unit: mm)



3.
Package Dimension（Unit: mm）



每个外箱装5个内箱
外箱尺寸=425*245*273mm
Outside box
Maximums for inside boses

每盒5袋
内箱尺寸：247*230*75
Inside box Maximums seven

Thanks for using relevant LED products of Shenzhen Runlite Technology Co., Ltd., in order to enhance your understanding of the characteristics of our products, as far as possible to reduce or avoid unnecessary damage to the product due to human factors, and make it can better service your production. We give corresponding instructions, According to the characteristic in the process of standard use. At the same time, even if the same specifications LED, in the practical application field its reliability are related to overall system design level, mode of operation and conditions of use. This Instructions can't cover all questions may encounter during customer use process; we sincerely apologize for any inconvenience this may cause.

1、Declaring：

In order to confirm if it is right for the purpose，Pretest is necessary before use the product. This product presentation does not guarantee not contravene any patent. Relate to imports and exports LED product Legal liability should be responsible by customer ,so please verify relevant provision about the LED product in your Target market. we may change specifications from time to time in the interest of product development, without prior notification or public announcement. An agreement of formal product specifications is required prior to mass production.

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2、Before use：

We suggest that the same parameters products should be used together，such as BIN coordinate，VF and luminous flux etc。

3、Package and Storage：

3.1、To avoid the moisture penetration, we recommend storing SMD LEDs in a dry box(or desiccator) with a desiccant . The recommended storage conditions are Temperature 5 to 30degrees Centigrade, humidity 50% maximum.

3.2、Precaution after opening packaging

However LED is correspond SMD, when LED is soldered dip, interfacial separation may affect the light transmission efficiency, causing the light intensity to drop.

Attention in followed.

a. Soldering should be done right after opening the package(within 24Hrs).

b. Keeping of a fraction

- Sealing Temperature : 5 ~ 40℃ Humidity : less than 30%

c. If the package has been opened more than 1week or the humidity indicator color change from blue to pink（over 30%）, components should be dried for 24hrs at 60±5℃

4、Heat Generation

4.1、Thermal design of the end product is of paramount importance. Please consider the heat generation of the LED when making the system design. The coefficient of 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. It is necessary to avoid intense heat generation and operate within the maximum ratings given in this specification.

4.2、The operating current should be decided after considering the ambient maximum temperature of LEDs.

● Recommended soldering

5.1、Please refer to LED specification corresponded whether the product is adaptable to reflow process. Runlite cannot make guarantee on the LEDs after they have been assembled using the dip soldering method.

5.2、Reflow soldering should not be done more than two times.

5.3、Components should not be mounted on warped direction of PCB. Please avoid rapid cooling after soldering. Any mechanical force or any excess vibration shall not be accepted to apply during cooling process to normal temp after soldering. After soldering，do not warp the PCB.

5.4、Repairing should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron is suggested. It should be confirmed beforehand whether the characteristics of the LEDs will not be damaged by repairing.

6、Handling of static electricity ：

These products are sensitive to static electricity charge. Please take measures to prevent any static electricity being produced such as the wearing of a wristband or anti-static gloves when handling this product. All devices, equipment and machinery must be properly grounded. It is recommended that precautions be taken against surge voltage to the equipment .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 @1mA/ a dice（reference）

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7、Cleanning：

Runlite suggests using isopropyl alcohol for cleaning. In case other solvents are used, it must be assured that these solvents do not dissolve the package or resin. Ultrasonic cleaning is not recommended. Ultrasonic cleaning may cause damage to the LED.If have to do that, please pre-test the new method; it will avoid for leding exterior and color fail potentially.

8、Other caution：

8.1、he White LEDs are devices which are materialized by combining Blue LEDs and special phosphors. Consequently, the color of the LEDs is changed a little by an operating current. Care should be taken after due consideration when using LEDs

8.2、Anti radioactive ray design is not considered for the products listed here in.

8.3、Gallium arsenide is used in some of the products listed in this publication. These products are dangerous if they are burned or shredded in the process of disposal. It is also dangerous to drink the liquid or inhale the gas generated by such products when chemically disposed.

8.4、Long time exposure of sunlight or occasional UV exposure will cause lens discoloration.

8.5、LED electrode and lead frame are comprised of a silver plated copper alloy. The silver surface may be affected by environments which contain corrosive gases and so on. Please avoid conditions which may cause the LED to corrode, tarnish or discolor. This corrosion or discoloration might lower solderability or might affect on optical characteristics.

8.6、Please do not recommend to cover the silicone resin of the LEDs with other resin (epoxy, urethane, etc)

8.7、When populating boards in SMT production, there are basically no restrictions regarding the form of the pick and place nozzle, except that mechanical pressure on the surface of the resin must be prevent.

8.8、Please be aware that this product should not come into contact with other parts in assembled status.

8.9、Please design a circuit that prevents any reverse voltage (excess current) from being applied to this product instantaneously when the circuit is ON or OFF.

8.10、LED electrode and lead frame are comprised of a silver plated copper alloy. it is easy to chemical reaction with sulfur. It will be results in LED exterior and color have been changed. So during produce process and storage condition should avoid or far away for the sulfur

materials.

8.11、Avoid touching silicone resin parts especially by sharp tools such as Pincette(Tweezers)

8.12、This product complies with RoHs directives. This product is intended for the application in general electronic devices (such as office automation equipment, communication devices, audio-video equipment, home electrical appliances, measurement hardware and others), especially in general lighting. In cases where this product is used for the applications that requires high reliability or could directly affect human life or health due to failure or malfunction (aerospace hardware, medical equipment, atomic control equipment and others), please consult with our sales representatives beforehand. Our warranty does not cover situations where this product undergoes secondary fabrication such as changes in shape.

源磊 **Runlite**	批准 **Approved**		审核 **Checked**		制作 **Prepared**	
客户 **Customer**	客户批准 **Customer Approved**		品质 **Quality**		工程 **Engineering**	