SMD LED Datasheet

WR-3528C05-80XX

Features

- PLCC package
- Top view white LED
- High luminous intensity output
- Wide viewing angle
- Pb-free
- RoHS compliant
- ANSI Binning

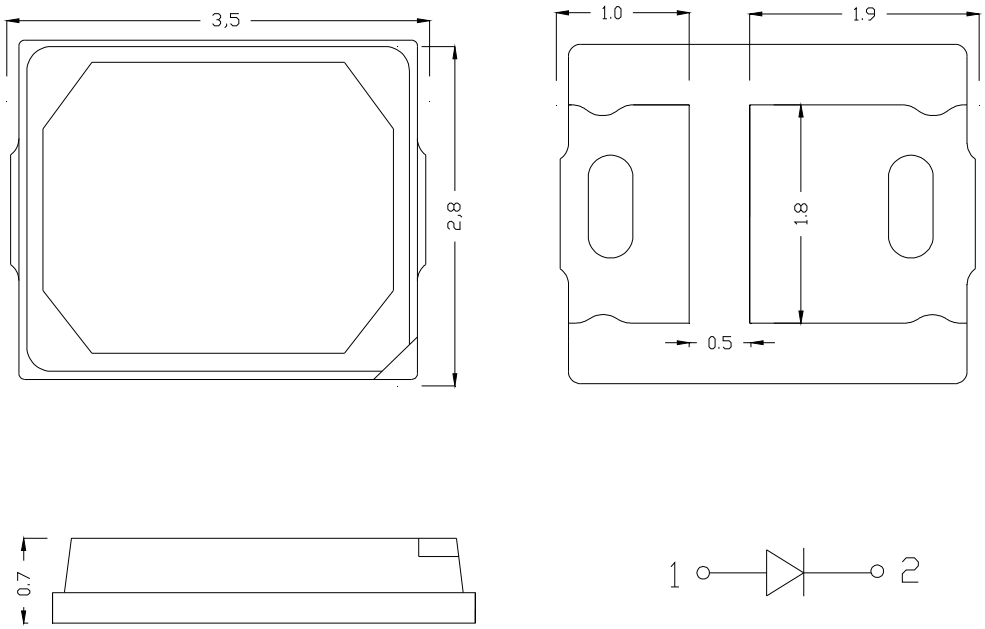
Description

The 2835 package has high efficacy, high CRI, low power consumption, wide viewing angle and a compact form factor. These features make this package an ideal LED for all lighting applications.

Applications

- General lighting
- Decorative and Entertainment Lighting
- Indicators
- Illumination
- Switch lights

Package outline



Notes:

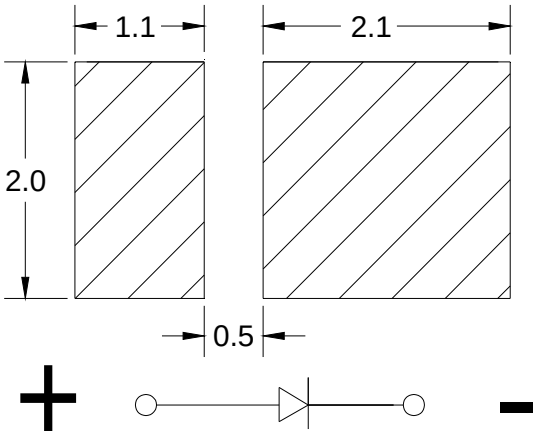
1.All dimensions are in millimeters.

2.Tolerances are

X.X ±0.1;

X.XX ±0.05.

Recommend Printed Circuit Board Attachment Pad



Absolute maximum ratings at Ta=25℃

Parameter	Symbol	Absolute Maximum Rating	Unit
Continuous Forward current	If	180	mA
Power Dissipation	PD	600	mW
Pulse Forward Current[1]	Ifp	360	mA
Solder Point temperature	Top	85	℃
Storage temperature range	Tstg	-40 ~+100	℃
Junction Temperature	Tj	115	℃
Thermal resistance	Rthj,s	45	°C/W
Electrostatic Discharge(HBM)	ESD	2000	V

Notes:

[1]1/10 Duty cycle,0.1ms pulse width.

Electro-optical characteristics at Ta=25℃

Parameter	Symbol	MIN.	TYP.	MAX.	Unit	Test Condition
Forward Voltage	V_F	3.0	---	3.4	V	IF=150mA
Luminous Flux	Φ_V	60	---	70	lm	IF=150mA
Color Temperature	CCT	2850	---	10000	K	IF=150mA
Color Rendering Index	Ra	80	---	--	/	IF=150mA
View Angle	$2\theta_{1/2}$	---	120	---	°	IF=150mA
Reverse Current	IR	---	---	10	uA	VR =5V

Notes:

1. Tolerance of Luminous flux: ±10%.
2. Tolerance of Forward Voltage: ±0.1V.
3. Tolerance of Color Rendering Index: ±2
4. Rthj,s is the thermal resistance from junction to solder point on MCPCB with electrical power.

Mass Production List

Product	CRI Min	CCT(K)	Φ(lm) Min.	Φ(lm)Max.
WR-3528C05-80W1	80	3000K	60	65
WR-3528C05-80N3	80	4000K	65	70
WR-3528C05-80C5	80	5000K	65	70
WR-3528C05-80C3	80	5700K	65	70
WR-3528C05-80C2	80	6000K	65	70
WR-3528C05-80C1	80	6500K	65	70
WR-3528C05-80C8	80	7000-8000K	65	70
WR-3528C05-80C9	80	8000-10000K	60	65

Notes:

1.Tolerance of Color Rendering Index: ±2
2.Tolerance of Luminous flux: ±10%.

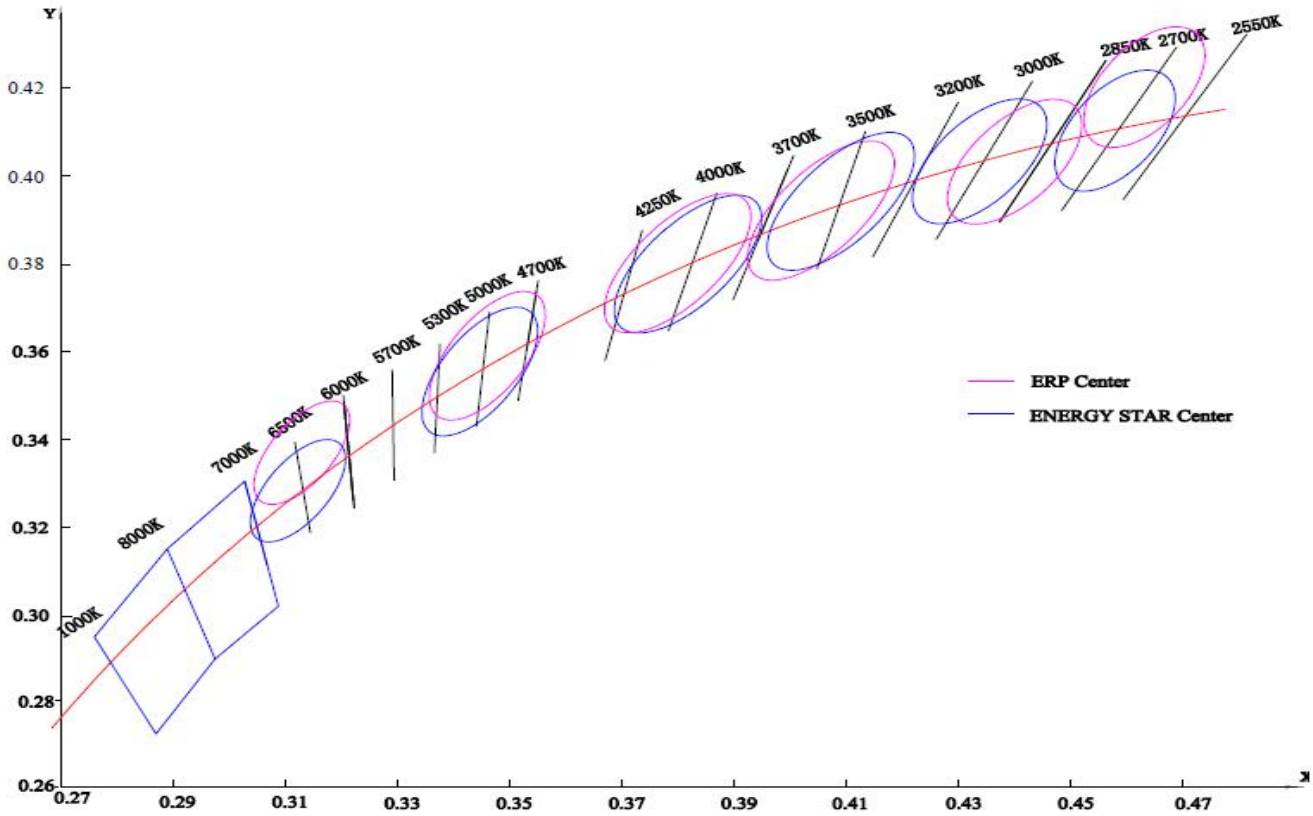
Bin Range of Forward Voltage

Bin Code	Min.	Max.	Unit	Condition
VAC	3.0	3.2	V	IF=150mA
VAD	3.2	3.4		

Note:

Tolerance of Forward Voltage: ±0.1V.

CIE chromaticity



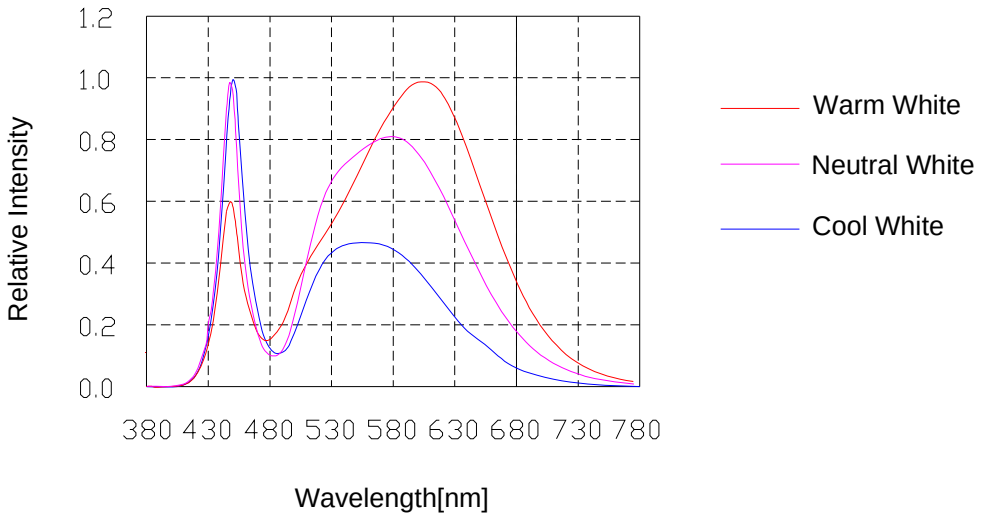
Bin data

1、ERP or Energy Star BIN (SDCM<6 or 5)

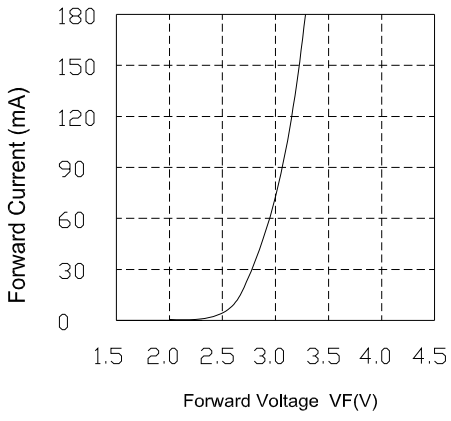
CCT Range: 2550K~2850K						CCT Range: 2850K~3200K					
ERP	X	0.463	ENERGY STAR	X	0.4578	ERP	X	0.440	ENERGY STAR	X	0.4338
	Y	0.420		Y	0.4101		Y	0.403		Y	0.4030
CCT Range: 3200~3700K						CCT Range: 4700K~5300K					
ERP	X	0.409	ENERGY STAR	X	0.4073	ERP	X	0.346	ENERGY STAR	X	0.3447
	Y	0.394		Y	0.3917		Y	0.359		Y	0.3553
CCT Range: 5300K~6000K						CCT Range: 6000K~7000K					
ERP	X	---	ENERGY STAR	X	0.3287	ERP	X	0.313	ENERGY STAR	X	0.3123
	Y	---		Y	0.3417		Y	0.337		Y	0.3282
CCT Range: 7000-8000K						CCT Range: 8000-10000K					
75A	X	0.3028	0.289	0.2975	0.3088	90A	X	0.289	0.276	0.287	0.2975
	Y	0.3304	0.315	0.29	0.302		Y	0.315	0.295	0.273	0.29

Typical optical characteristics curves（Ta=25℃ unless specified）

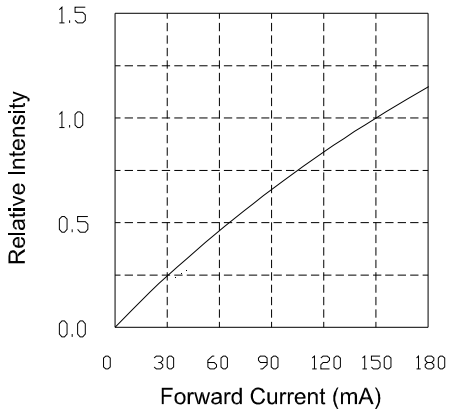
Spectral Distribution
Relative Intensity vs. Wavelength (Ta=25°C)



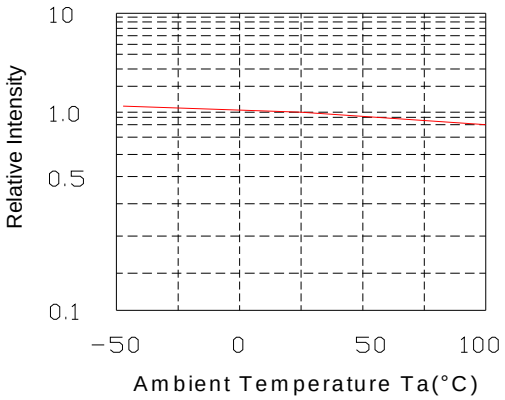
Forward Current vs. Forward Voltage(Ta=25°C)



Relative Intensity vs. Forward Current (Ta=25°C)



Relative Intensity vs. Ambient Temperature



Max. Driving Forward Current vs.Soldering Temperature
(Rth j-s=45℃/W)

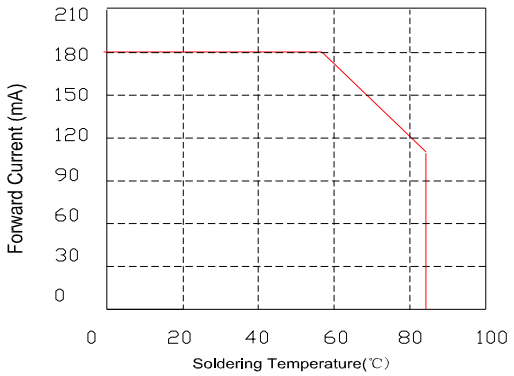
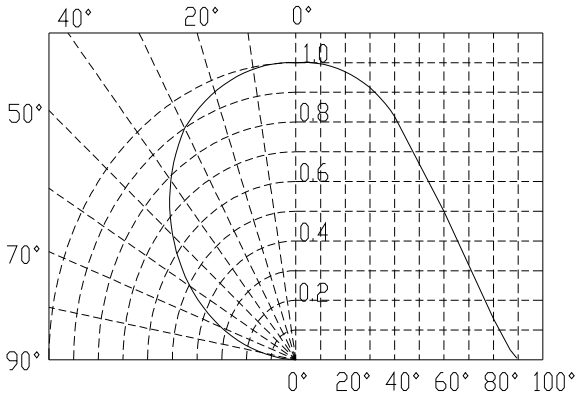


Diagram characteristics of radiation



Reflow profile

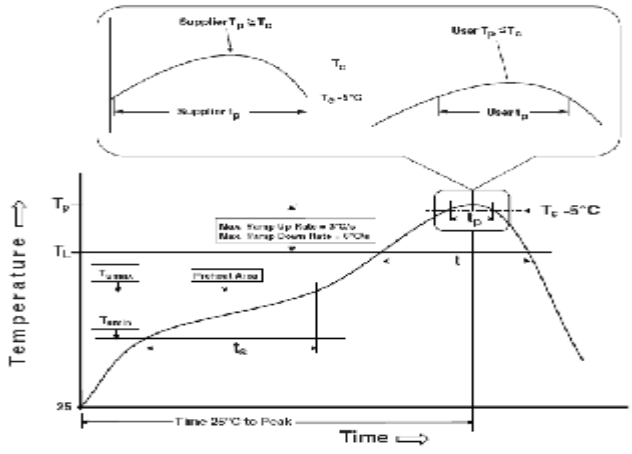
n Soldering condition(JEDEC-020D)

Suggestion IR Reflow Profile For Pb Free Process

Prefile Feature	Pb-Free Assembly
Preheat & Soak Temperature min (Ts min) Temperature max(Ts max) Time (Ts min to Ts max)(ts)	 150℃ 200℃ 60-120seconds
Average ramp –up rate (Ts max to Tp)	3℃/second max
Liquidous temperature (TL) Time at liquidous (TL)	217℃ 60-150 seconds
Peak package boby temperature (Tp)*	See classification temp in the table below
Time (tp)**within 5℃ of thespecified Classification temperature (Tc)	30** seconds
Average ramp-down rate (Tp to Ts max)	6℃/second max
Time 25℃ to peak temperature	8 minutes max
*Tolerance for peak profile temperature (Tp) is defined as a supplier minimum and a user maximum . **Tolerance for time at peak profile temperature (tp) is defined as a supplier minimum and a user maximum .	

Pb-Free Process-Classlflcatlon Temperatures（Tc）

Package Thickness	Volume mm^3 <350	Volume mm^3 350-2000	Volume mm^3 >2000
<1.6mm	260℃	260℃	260℃
1.6mm-2.5mm	260℃	250℃	245℃
>2.5mm	250℃	245℃	245℃



1.Reflow soldering should not be done more than two times.

2.When soldering ,do not put stress on the LEDs during heating.

Reliability

Test items and results

Type	Test Item	Ref. Standard	Test Conditions	Note	Number of Damaged
Environmental Sequence	Resistance to Soldering Heat(Reflow Soldering)	JESD22-B106	Tsld=260℃,10sec	3 times	0/22
	Temperature Cycle	JESD22-A104	-40℃ 30min ↑↓5min 100℃ 30min	300 cycle	0/22
	Thermal Shock	JESD22-A106	-40℃ 15min ↑↓ 100℃ 15min	300 cycle	0/22
	High Temperature Storage	JESD22-A103	Ta=100℃	1000 hrs	0/22
	Low Temperature Storage	JESD22-A119	Ta=-40℃	1000 hrs	0/22
Operation Sequence	Life Test	JESD22-A108	Ta=25℃ IF=150mA	1000 hrs	0/22
	High Temperature Life Test	JESD22-A108	Ta=85℃ IF=150mA	1000 hrs	0/22
	High Humidity Heat Life Test	JESD22-A101	60℃ RH=90% IF=150mA	1000 hrs	0/22

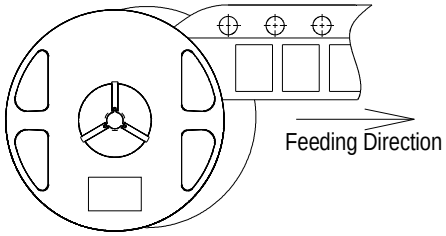
Criteria for judging the damage

Item	Symbol	Test Conditions	Criteria for Judgement	
			Min.	Max.
Forward Voltage	VF	IF=150mA	_	U.S.L*)×1.1
Luminous Intensity	IV	IF=150mA	L.S.L**)×0.7	_

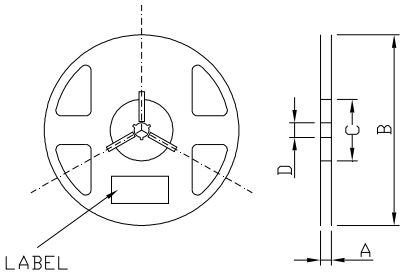
U.S.L.: Upper Standard Level **L.S.L.: Lower Standard Level**

Packaging specifications

● Feeding direction

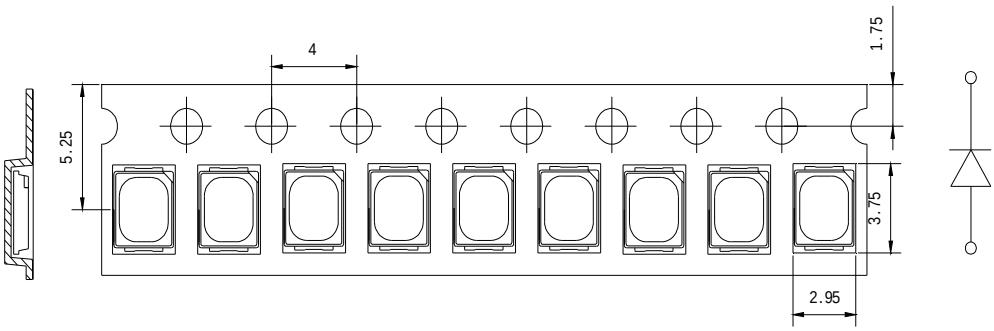


● Dimensions of reel (unit: mm)

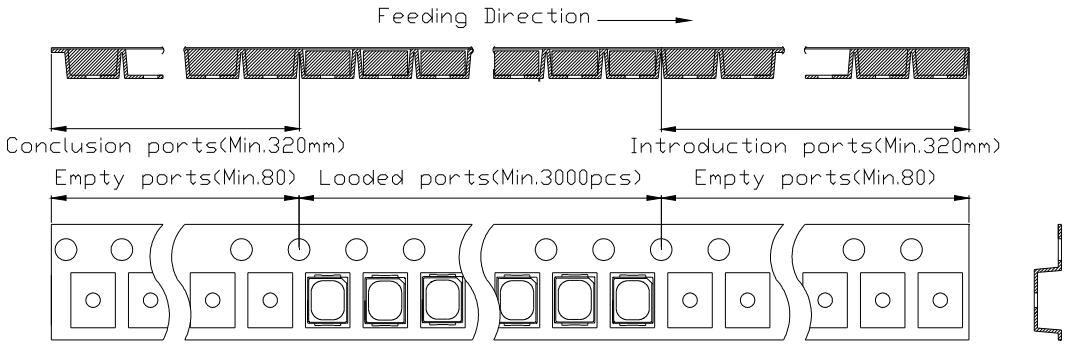


A	8.0±0.1mm
B	178±1mm
C	60±1mm
D	13.0±0.5mm

● Dimensions of tape (unit: mm)



● Arrangement of tape



Notes:

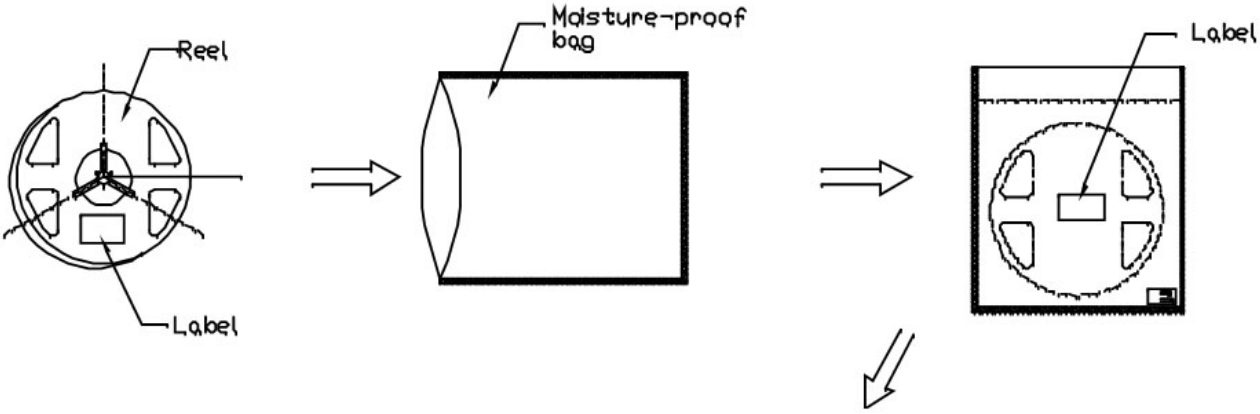
1.Empty component pockets are sealed with top cover tape.

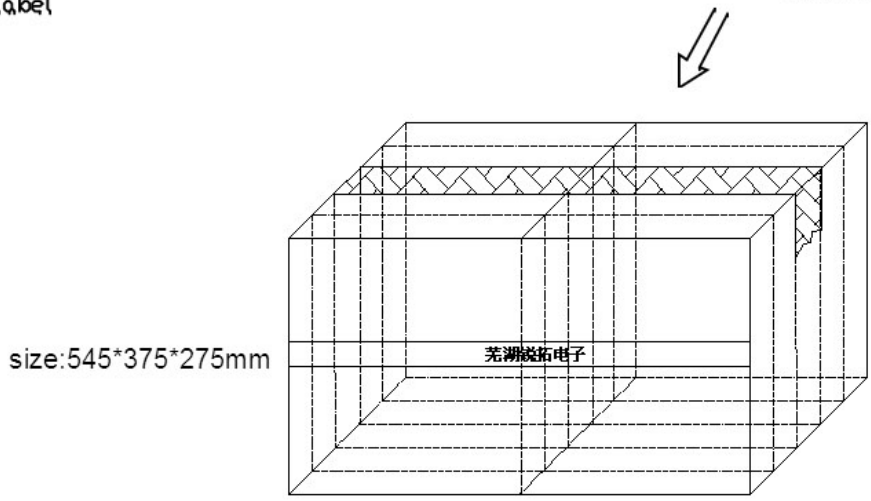
2.The maximum number of missing lamps is two.

3.The cathode is oriented towards the tape sprocket hole in accordance with ANSI/EIA RS-481 specifications.

4.4,000 pcs/ Reel.

Packaging specifications





Outside box Maximums forty reels

■ Label

芜湖锐拓电子有限公司 RoHS

规格型号：WR-3528XXX-XXXX

物料编码：13528XXXXXXXXX

VF:		IF:	
Φv:		BIN:	
CCT:		QTY:	
CIE:		DATE:	

- VF: Forward Voltage Rank
- IF: Forward Current
- ϕv: Luminous Intensity Rank
- CIE: XY Rank
- BIN: Retop Rank
- QTY: Packing Quantity
- DATE: Date of shipment

Cautions

Volatile substances

LED operating environment and sulfur element composition cannot be over 100PPM in the LED mating usage material. This is provided for informational purposes only and is not a warranty or endorsement.LED

VOCs (Volatile organic compounds) emitted from materials used in the construction of fixtures can penetrate silicone encapsulants of LEDs and discolor when exposed to heat and photonic energy. The result can be a significant loss of light output from the fixture. Knowledge of the properties of the materials selected to be used in the construction of fixtures can help prevent these issues. Retop advises against the use of any chemicals or materials that have been found or are suspected to have an adverse affect on device performance or reliability. To verify compatibility, Retop recommends that all chemicals and materials be tested in the specific application and environment for which they are intended to be used. Attaching LEDs, do not use adhesives that outgas organic vapor.

Storage conditions

Before opening the package:

The LEDs should be kept at 30℃ or less and 70%RH or less. The LEDs should be used within a year. When storing the LEDs, moisture proof packaging with absorbent material (silica gel) is recommended.

After opening the package:

The LEDs should be kept at 30℃ or less and 50%RH or less. If unused LEDs remain, they should be stored in moisture proof packages, such as sealed containers with packages of moisture absorbent material (silica gel). It is also recommended to return the LEDs to the original moisture proof bag and to reseal the moisture proof bag again. If the color of the desiccant changes, components should be dried for 10-12hr at 60±5℃.

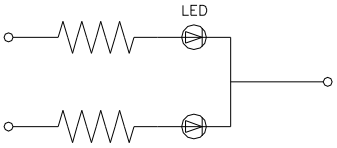
Cleaning

Use alcohol-based cleaning solvents such as isopropyl alcohol to clean the LED if necessary.

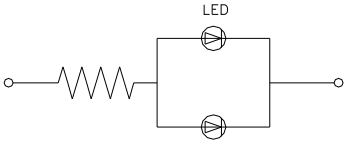
Drive method

An LED is a current-operated device. In order to ensure intensity uniformity on multiple LEDs connected in parallel in an application, it is recommended that a current limiting resistor be incorporated in the drive circuit, in series with each LED as shown in Circuit A below.

Circuit model A



Circuit model B



(A) Recommended circuit.

(B) The brightness of each LED might appear different due to the differences in the I-V characteristics of those LEDs.

The cooling requirements

Thermal Design is paramount importance because heat generation may result in the Characteristics decline, such as brightness decreased, Color change and so on. Please consider the heat generation of the LEDs when making the system design.LED

Reflow profile

The encapsulated material of the LEDs is silicone. Therefore the LEDs have a soft surface on the top of package. The pressure to the top surface will be influence to the reliability of the LEDs. Precautions should be taken to avoid the strong pressure on the encapsulated part. So when using the picking up nozzle, the pressure on the silicone resin should be proper.