

国星之光 精彩照明
NATIONSTAR, LIGHTING UP THE WORLD



NATIONSTAR

ReeStar 星悦

SPECIFICATION

Customer		Product	
Customer No.		Type	RS-2727MWAP



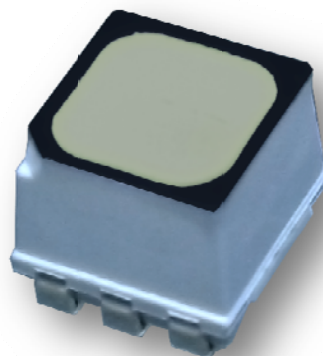
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R&D.RGB			Customer (Stamp)
APPROVE	CHECK	DRAW	CONFIRM
Version NO: A2			
Release Date: 2014.02.08			

20140220TYBD2



RS-2727MWAP



These SMD LEDs are packaged in an industry standard PLCC6 package. These high reliability and high brightness LEDs are designed to work in a wide range of environmental conditions. A wide viewing angle and high brightness make these LEDs suitable for outdoor video screen, decorative lighting and amusement applications.

Features

- Multiple Waterproof, White Frame with Black Surface , High Contrast Ratio, Not Reflective Surface
- High Luminous Intensity ,Low Power Dissipation, Good Reliability and Long Life
- Complied With ROHS Directive
- Soldering methods: Pb-Free Reflow Soldering

Applications

- Outdoor Full-color Video Screen
- Decorative Lighting
- Amusement

1. SPECIFICATIONS

1.1 Absolute Maximum Ratings (Temperature=25°C)

Parameter		Symbol	Rating	Unit
Forward Current		I_F	20	mA
Pulse Forward Current*		I_{FP}	50	mA
Reverse Voltage		V_R	5	V
Operating Temperature		T_{OPR}	-30~+85	°C
Storage Temperature		T_{stg}	-40~+100	°C
Power Dissipation	Red	P_D	48	mW
	Green		72	
	Blue		72	

* Note: Pulse Width $\leq 0.1\text{ms}$, Duty $\leq 1/10$

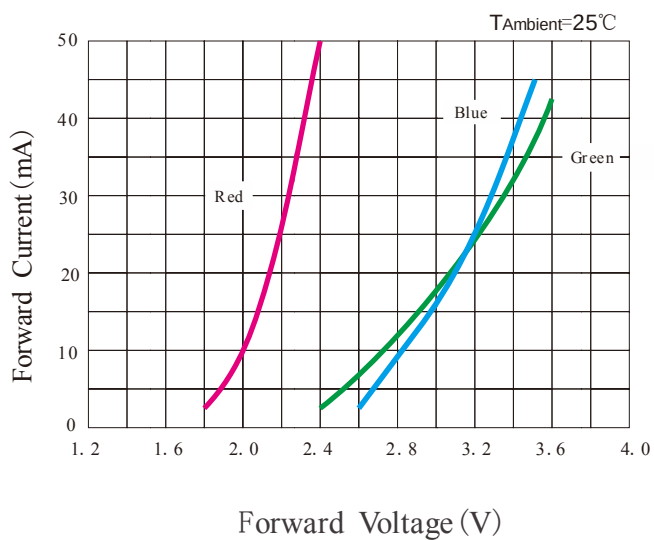
1.2 Electro-Optical Characteristics (Temperature=25°C)

Parameter	Symbol	Condition	Color	Min.	Typ.	Max.	Unit
Reverse Current	I_R	$V_R=5V$	Red			10	μA
			Green			10	
			Blue			10	
Forward Voltage	V_F	$I_F=20\text{mA}$	Red	1.8	2.0	2.4	V
		$I_F=15\text{mA}$	Green	2.6	3.0	3.6	
		$I_F=10\text{mA}$	Blue	2.6	3.0	3.6	
Dominant Wavelength	λ_D	$I_F=20\text{mA}$	Red	615	620	630	nm
		$I_F=15\text{mA}$	Green	515	520	535	
		$I_F=10\text{mA}$	Blue	465	470	480	
Spectrum Radiation Bandwidth	$\Delta\lambda$	$I_F=20\text{mA}$	Red		20		nm
		$I_F=15\text{mA}$	Green		35		
		$I_F=10\text{mA}$	Blue		30		
Luminous Intensity	I_v	$I_F=20\text{mA}$	Red	400	670	1080	mcd
		$I_F=15\text{mA}$	Green	950	1580	2600	
		$I_F=10\text{mA}$	Blue	140	230	370	
View Angle	$2\theta_{1/2}$				110		deg.

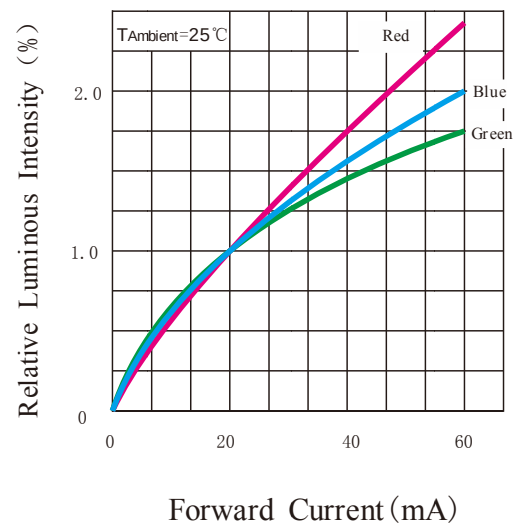
* Note: The above data just for reference, these data come from the standard testing system of NationStar.

2. TYPICAL CHARACTERISTICS CURVES(1)

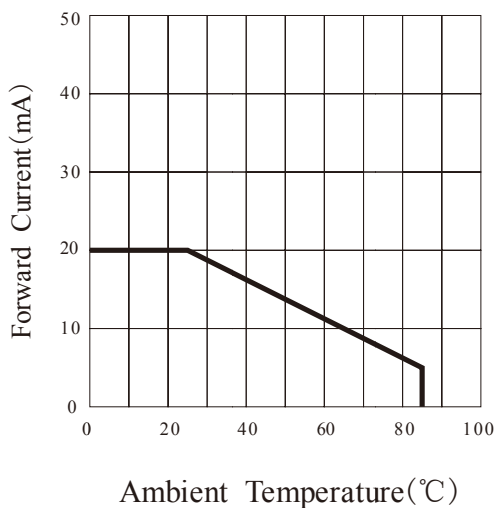
Volt-Ampere Characteristics



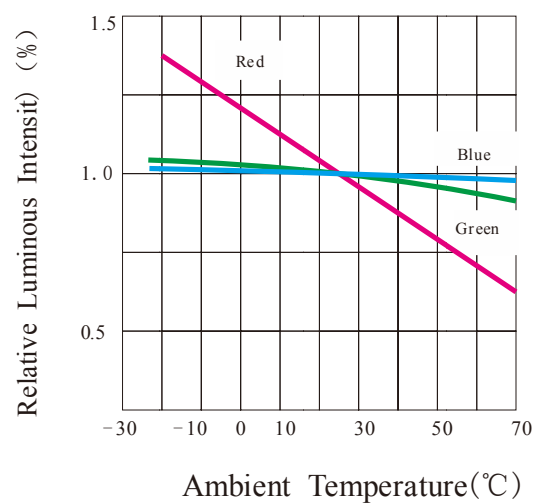
Relative Luminous Intensity VS Forward Current



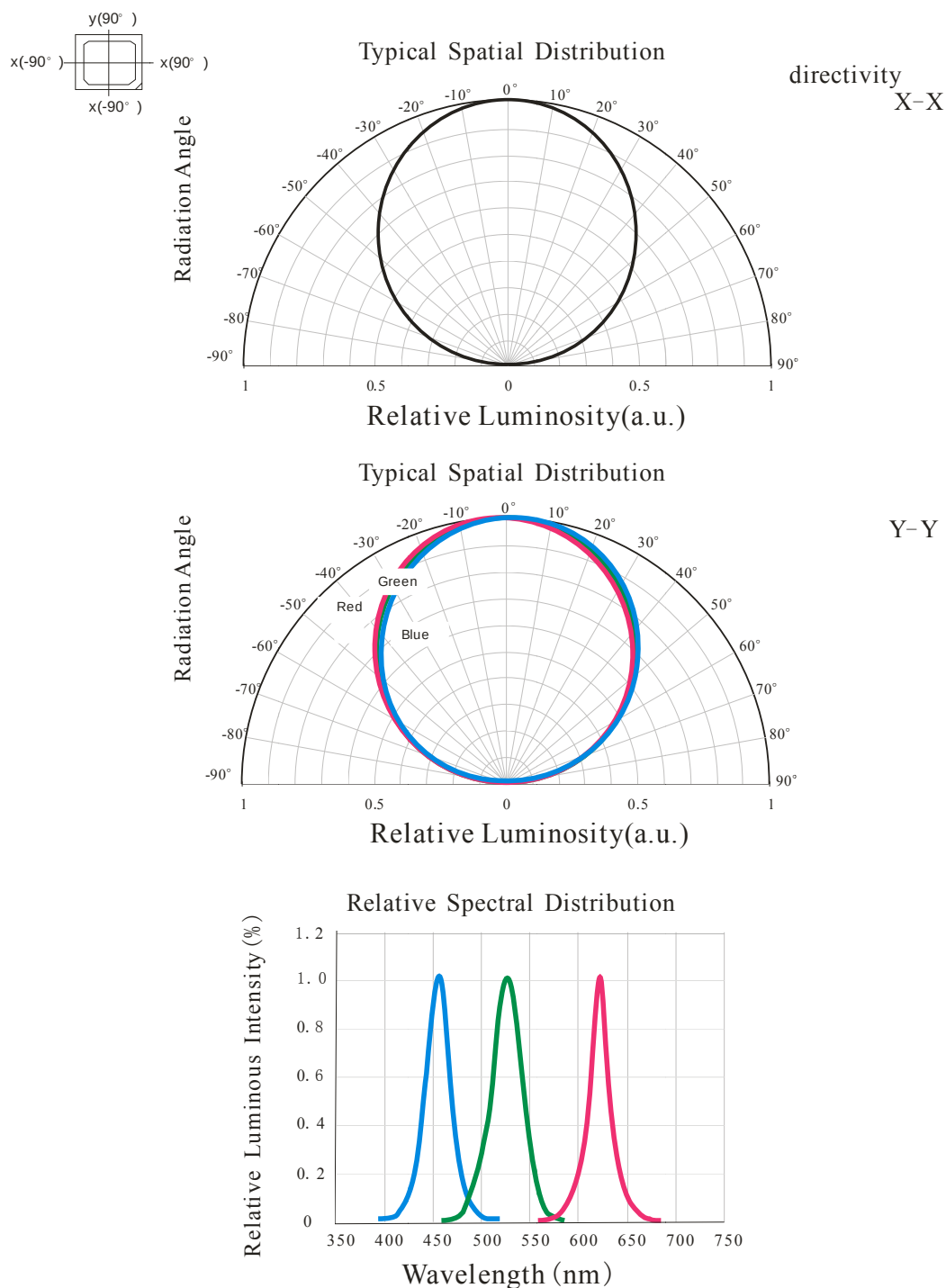
Forward Current Derating Curve



Luminous Intensity VS Ambient Temperature



2. TYPICAL CHARACTERISTICS CURVES(2)



3. RELIABILITY

3.1 Reliability Test Items And Conditions

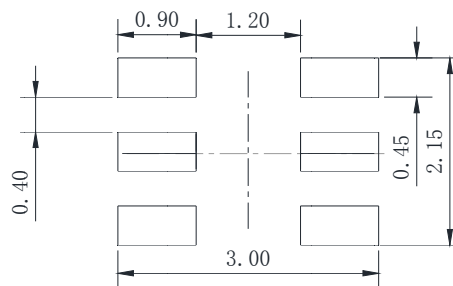
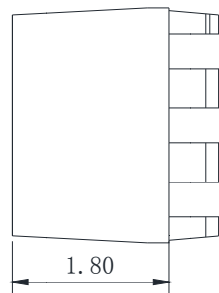
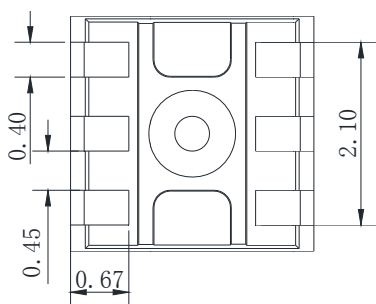
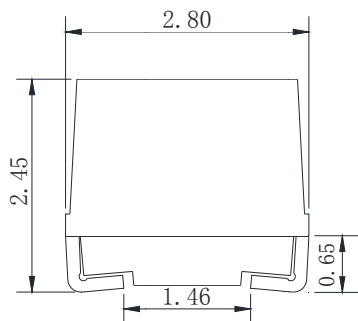
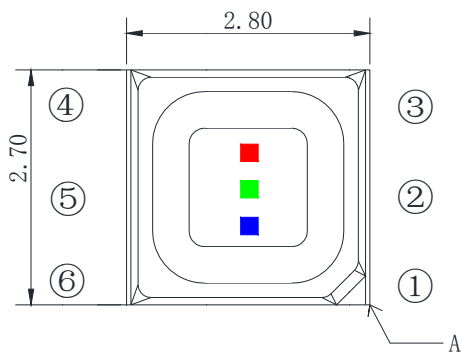
Test Items	Reference	Test Conditions	Time	Quantity	Criterion
Resistance to Soldering Heat	JEITA ED-4701 300 301	Tsol*=(260±5)℃ 10secs. Precondition:30℃, 70%RH,168h	3 times	100	0/100
Thermal Shock	MIL-STD-202G	-40℃(30min)↔100℃(30min)	300 cycles	100	0/100
Temperature And Humidity Cyclic	JEITA ED-4701 200 203	-10℃~65℃ , 0~90%RH 24hrs./1cycle	10 cycles	100	0/100
High Temperature Storage	JEITA ED-4701 200 201	Ta=100℃	1000h	100	0/100
Low Temperature Storage	JEITA ED-4701 200 202	Ta=-40℃	1000h	100	0/100
High Temperature High Humidity Storage	JEITA ED-4701 100 103	Ta=85℃, RH=85%	1000h	100	0/100
Life Test	JESD22-A108D	Ta=25℃ IF _R =30mA, IF _G =15mA , IF _B =15mA	1000h	100	0/100
Low Temperature Life Test	JESD22-A108D	Ta=-40℃ IF _R =30mA, IF _G =15mA , IF _B =15mA	1000h	100	0/100
High Temperature High Humidity Life Test	JEITA ED-4701 100 102	Ta=60℃, RH=90% IF _R =20mA, IF _G =12mA , IF _B =12mA	1000h	100	0/100
Water Proof Test	IEC 60529:2001	Immersing in 1m water	24h	100	0/100
Electrostatic Discharge Test	AEC(Q101-001)	Human body model 1000 V (Forward and reverse current Conduct, electricity each 1time)		100	0/100

3.2 Criteria For Judging Damage

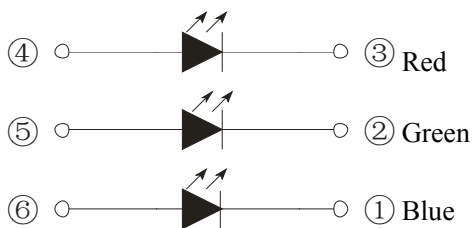
Test Items	Symbol	Test Conditions	Criteria For Judging Damage
Forward Voltage	V _F	I _F = I _{FT}	Initial Data±10%
Reverse Current	I _R	V _R = 5V	I _R ≤10μA
Luminous Intensity	I _V	I _F = I _{FT}	I _V degradation≤30%
Resistance to Soldering Heat			No dead lamps and visual damage

* Note: Tsol-Temperature of tin liquid; IFT: Typical current.

4. OUTLINE DIMENSION



Recommended Soldering Pad



Polarity

Note:

A : Nick Mark

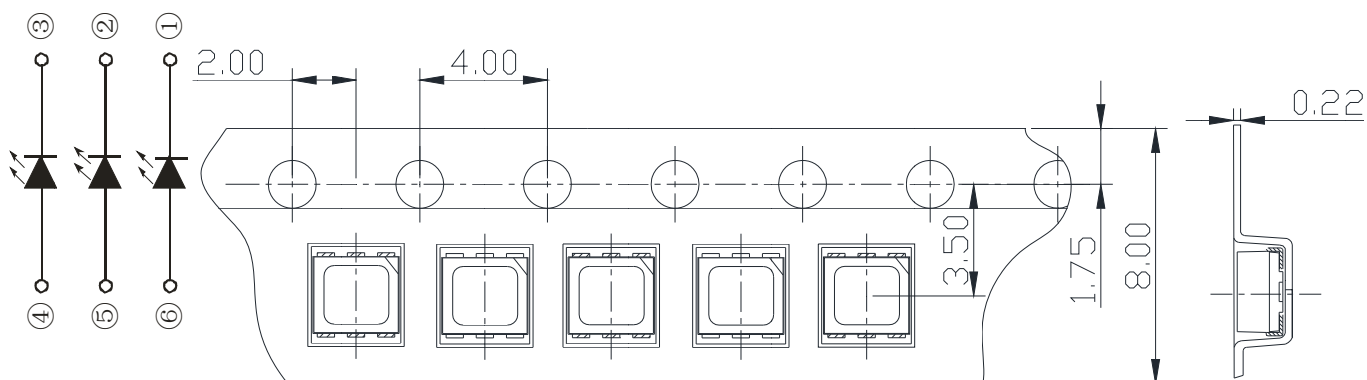
All dimensions in mm.

Tolerances: X.X ±0.2 mm



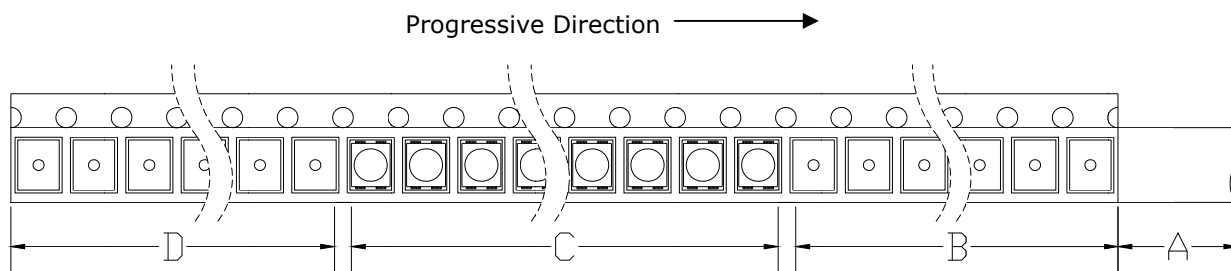
5. PACKAGING

5.1 Carrier Tape



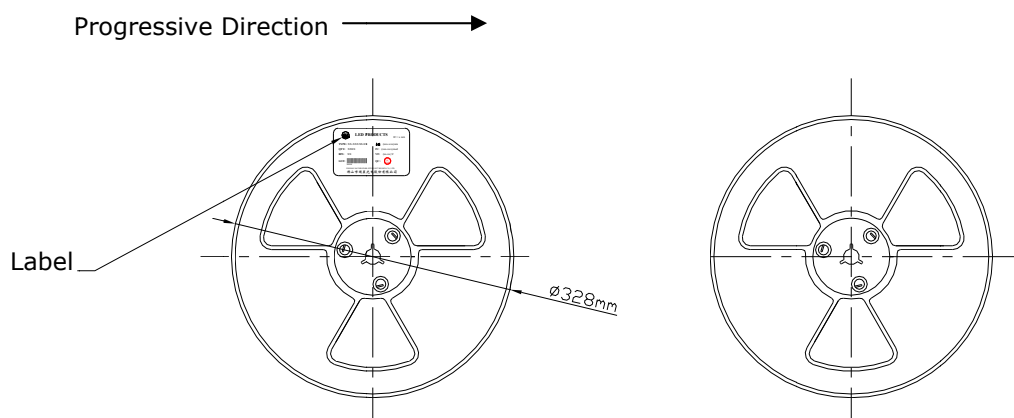
All dimensions in mm, tolerances unless mentioned is ± 0.1 mm.

5.2 Details Of Carrier Tape



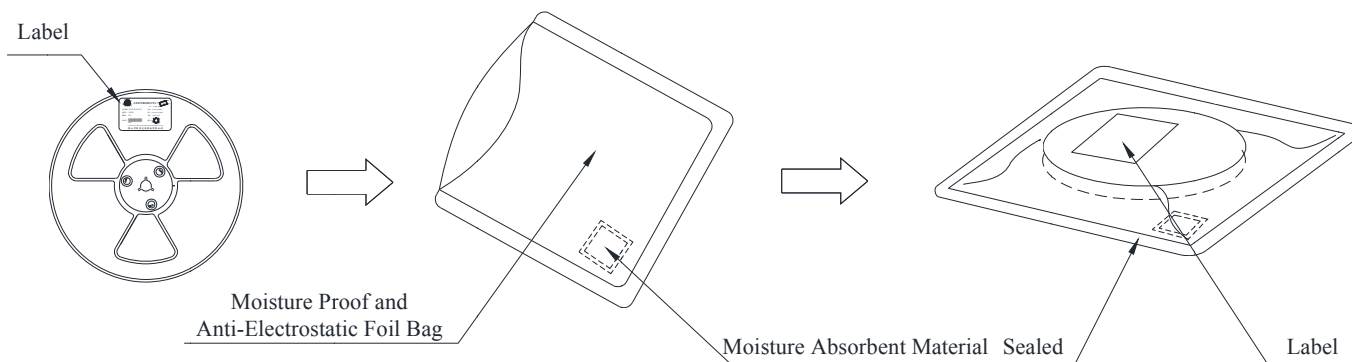
A: Top Cover Tape, 300mm; B: Leader, Empty, 200mm; C: 6500 Lamps Loaded; D: Trailer, Empty, 200mm.

5.3 Reel Dimension

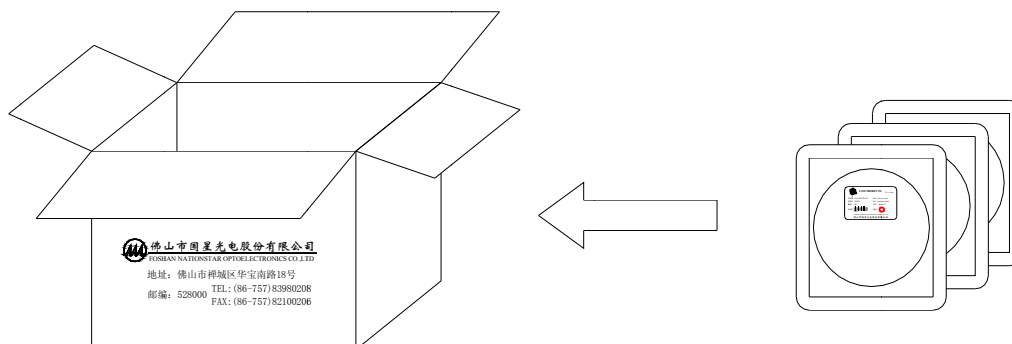




5.4 Moisture Proof and Anti-Electrostatic Foil Bag



5.5 Cardboard Box



5.6 Label Explanation

TYPE:

QTY: Quantity

BIN: Rank

SC: Bin Code

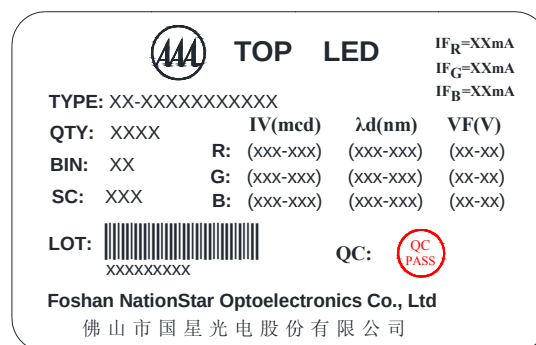
LOT: Lot Number

λ_d : Wavelength Range

IV: Luminous Intensity Range

VF: Forward Voltage Range

IF: Test Current



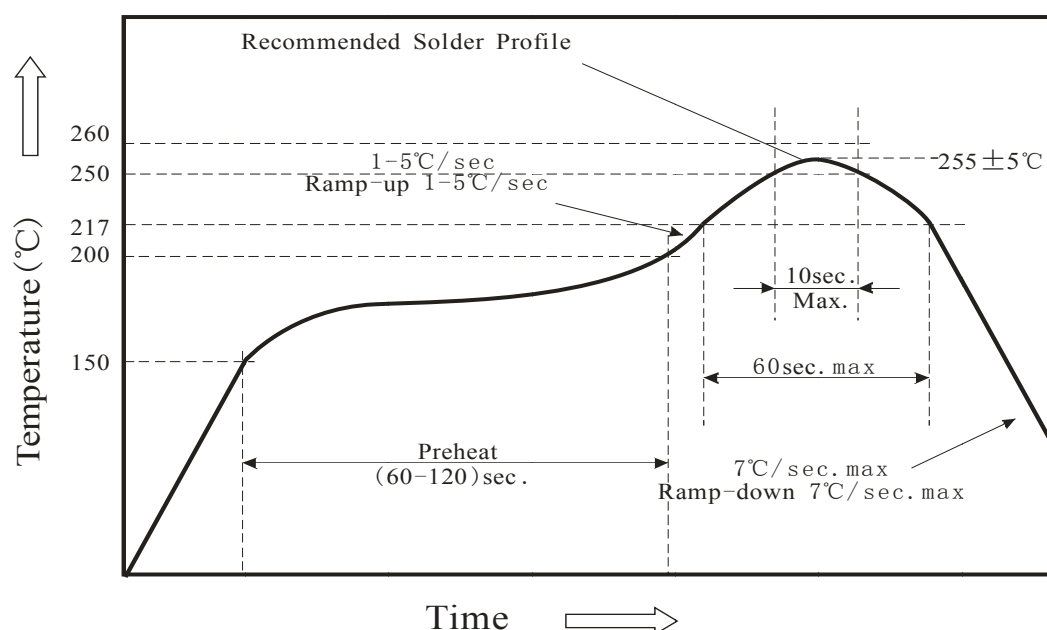
6. GUIDELINE FOR SOLDERING

6.1 Hand Soldering

- If manual soldering is used, the use of a soldering iron of less than 25W is recommended, and the temperature of the iron must be kept below 315°C, with soldering time within 2 seconds.
- The epoxy resin of the SMD LED should not contact the tip of the soldering iron.
- No mechanical stress should be exerted on the resin portion of the tip of the soldering iron.
- Handling of the SMD LED should be done when the package has been cooled down to below 40°C or less. This is to prevent LED failures due to thermal-mechanical stress during handling.

6.2 Reflow Soldering:

Use the conditions shown in the under Figure of Pb-Free Reflow Soldering.



- Reflow soldering should not be done more than two times.
- Stress on the LEDs should be avoided during heating in soldering process.
- After soldering, do not deal with the product before its temperature drop down to room temperature.

Note: This general guideline may not apply to all PCB designs and configurations of all soldering equipment. The technique in practice is influenced by many factors; it should be specialized base on the PCB designs and configurations of the soldering equipment.

7. CAUTIONS

7.1 Storage

- Moisture proof and anti-electrostatic package with moisture absorbent material is used, to keep moisture to a minimum.
- Before opening the package, the product should be kept at 30℃ or less and humidity less than 60% RH, and be used within 1 year.
- Before opening the sealed bag, please check whether or not the bag leaked air.
- If the bag has leaked air, baking is required, baking condition: (80±5)℃ for 12 hours.
- Before soldering the product must be stored under the condition <30℃ and <60%RH. Under these conditions the SMD LEDs must be used in 24 hours.
- Re-baking is required when exceeding the specified time. Baking condition is (80±5)℃ for 12 hours.
- Take the material out of the packaging bag for re-bake. Do not open the oven door frequently during the baking process.

7.2 Static Electricity

- Static electricity or surge voltage damages the LEDs. Damaged LEDs will show some unusual characteristics. That's why we should do some anti-static precautions when using the SMD LEDs.
- All devices, equipment and machinery must be properly grounded, at the same time we should take measures to prevent anti-static and voltage surge.
- At the same time, it is recommended that wrist bands or anti-electrostatic gloves, anti-electrostatic containers be used when dealing with the LEDs.

7.3 Handling Precaution

- Do not handle LEDs with bare hands, it may contaminate the LED surface and affect optical characteristics.
- When handling the product with tweezers, be careful not to apply excessive force to resin.
- Dropping the product may cause damage.

7.4 Reverse voltage protection

- In generally the reverse current of LED is very small, it can't effect using the component normally, but when it often suffered the reverse voltage which exceed the limits of the component than it will be damaged, the
- Reverse current increases rapidly causing the string light display grayscale so when designing; please pay attention to control the reverse voltage we suggest the reverse voltage less than 5V.

7.5 Heat Management

- Heat management of LEDs must be taken into consideration during the design stage of an LED application. The current should be de-rated appropriately by referring to the de-rating curve included in each product specification.
- The temperature surrounding the LED should not be so high that it will make the LED fall when used in an application, and the temperature surrounding the LED in the application should confirm to the de-rating curve in our LED specification documents.

7.6 Eye Safety

- Please proceed with caution when viewing directly any LEDs driven at high current, or viewing LEDs with optical instruments which may greatly increase the damages to your eyes.