

# SPECIFICATION

REFOND P/N

RF-W1SA15IS-A47

Mass Product



## Contents

1. Description	
1.1 General Description	
1.2 Features	
1.3 Application	
1.4 Package Dimension	
1.5 Product Parameters	
1.6 Typical optical characteristics curves	
2. Packaging	
2.1 Packaging Specification	
2.1.1 Carrier Tape Dimension	11
2.1.2 Reel Dimension	11
2.1.3 Label Form Specification	12
2.2 Moisture Resistant Packing	
2.3 Cardboard Box	
2.4 Reliability Test Items And Conditions	
2.5 Criteria For Judging Damage	
3. SMT Reflow Soldering Instructions SMT	
3.1 SMT Reflow Soldering Instructions SMT	
3.1.1 Soldering Iron	17
3.1.2 Repairing	17
3.1.3 Cleaning	17
4. Handling Precautions	
4.1 Handling Precautions	
4.1.1 Storage	18
4.1.2 Static Electricity	19
4.1.3 Reverse voltage protection	19
4.1.4 The safe temperature for LEDs working	20

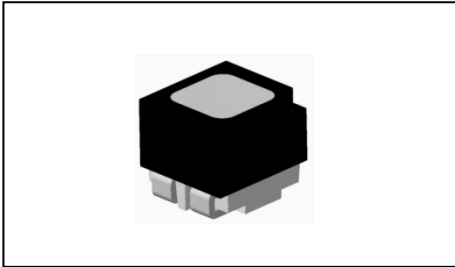


4.1.5 Directionsfor Use	20
4.1.6 Others	22
4.1.7 Declare	23



## 1. Description

### 1.1 General Description



The product is a full-color LED device, Common anode RGB SMD, High contrast (Surface brush ink technology), The product size: 1.6mmX1.7mmX1.6mm.

LED

RGB SMD

1.6mmX1.7mmX1.6mm

### 1.2 Features

Extremely wide viewing angle.

High luminous Intensity, Low power dissipation, Good reliability and Long life.

Water-resistant (IPX6).

(IPX6)

Moisture sensitivity level: 5a.

5a

RoHS compliant.

Matte surface.

Pb-free reflow soldering application.

### 1.3 Application

Outdoor full-color video screen.

Indoor and outdoor decorative lighting.

Amusement.

General use.



## 1.4 Package Dimension

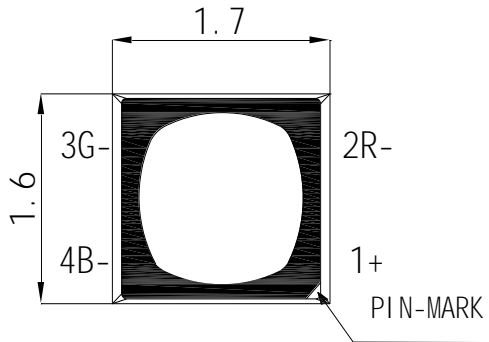


Fig.1-1 Top view

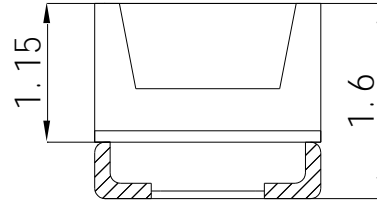


Fig.1-2 Side view

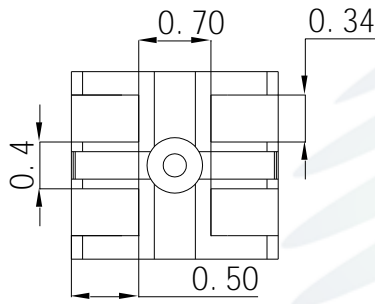


Fig.1-3 Bottom view

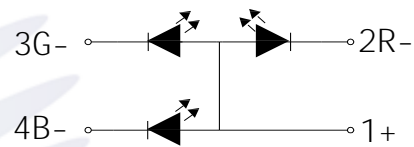


Fig.1-4 Polarity

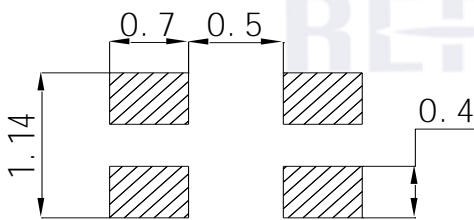


Fig.1-5 Soldering patterns

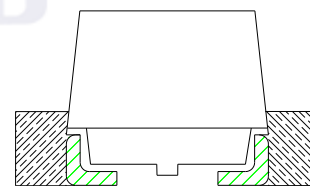


Fig.1-6 Glue filling

### Notes

All dimensions units are millimeters.

All dimensions tolerances are  $\pm 0.1$ mm unless otherwise noted.



## 1.5 Product Parameters

Table 1-1 Electrical / Optical Characteristics at Ts=25°C

Item	Symbol	Test Condition	Value			Unit
			R	G	B	
Reverse Current	$I_R$	$V_R=5V$	6	6	6	
Forward Voltage	$V_F$ (min)		1.7	2.5	2.5	V
	$V_F$ (max)		2.4	3.3	3.3	V

R  
 $I_F = 10mA$   
 G  
 $I_F = 10mA$   
 B  
 $I_F = 5mA$





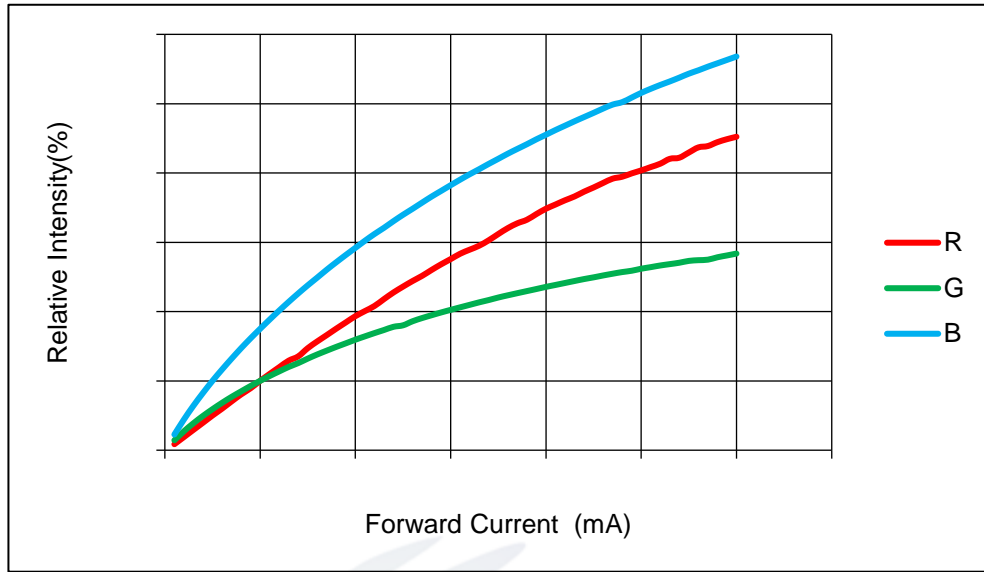


Fig 1-7 Forward Current Vs. Relative Intensity

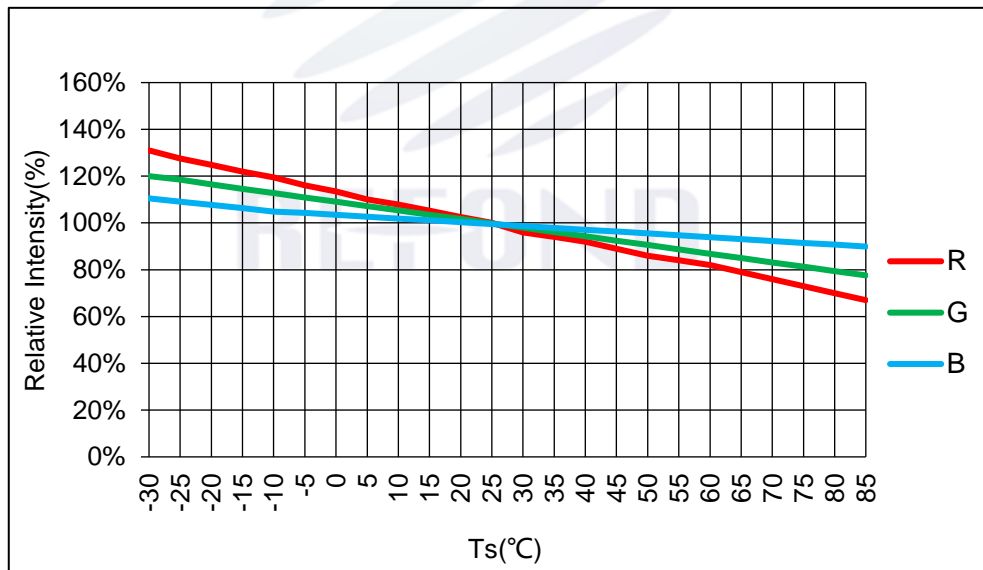


Fig 1-8 Luminous Intensity VS Ambient Temperature



Fig 1-9 Solder Temperature Vs Forward Current



Fig 1-10 Spectrum Distribution





## 2. Packaging

### 2.1 Packaging Specification

Package:15500pcs/reel. 15500pcs

#### 2.1.1 Carrier Tape Dimension

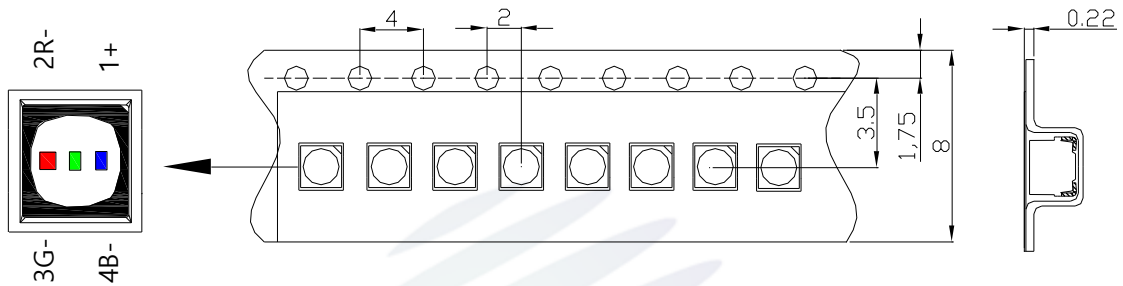


Fig.2-1 Carrier Tape Dimension

#### 2.1.2 Reel Dimension

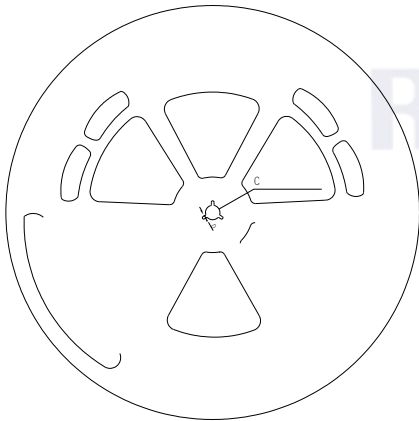
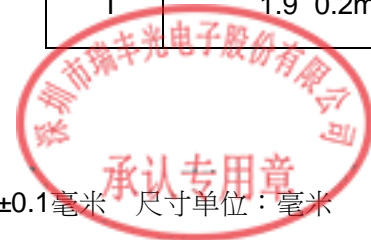


Fig.2-2 Reel

A	400 2mm
B	100.0 0.4mm
C	14.3 0.3mm
D	2.6 0.2mm
E	12.4 0.3mm
F	8.6 0.2/-0.3 mm
T	1.9 0.2mm

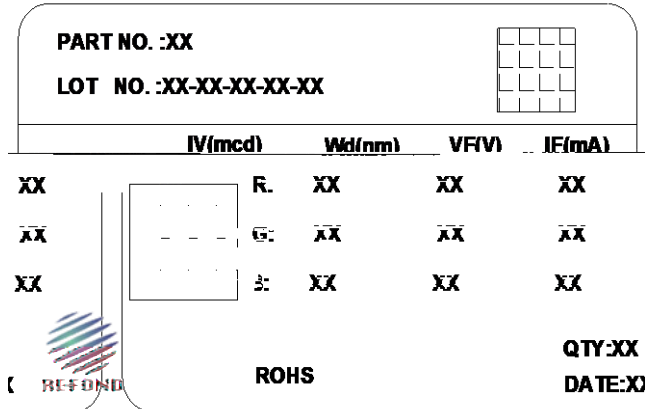
#### Notes

The tolerances unless mentioned  $\pm 0.1$ mm. Unit : mm 注：未注公差为 $\pm 0.1$ 毫米 尺寸单位：毫米



### 2.1.3 Label Form Specification

Table 2-2 Description



PART NO.	Part Number
LOT NO.	Lot Number + Packing Machine No. + Serial Number +BIN No. + Quantity (K)
	+ + +BIN + K
IV	Light intensity
VF	Forward Voltage
Wd	Wavelength
IF	Forward current
QTY	Packing Quantity
DATE	Made Date

Fig 2-3 Label

### 2.2 Moisture Resistant Packing

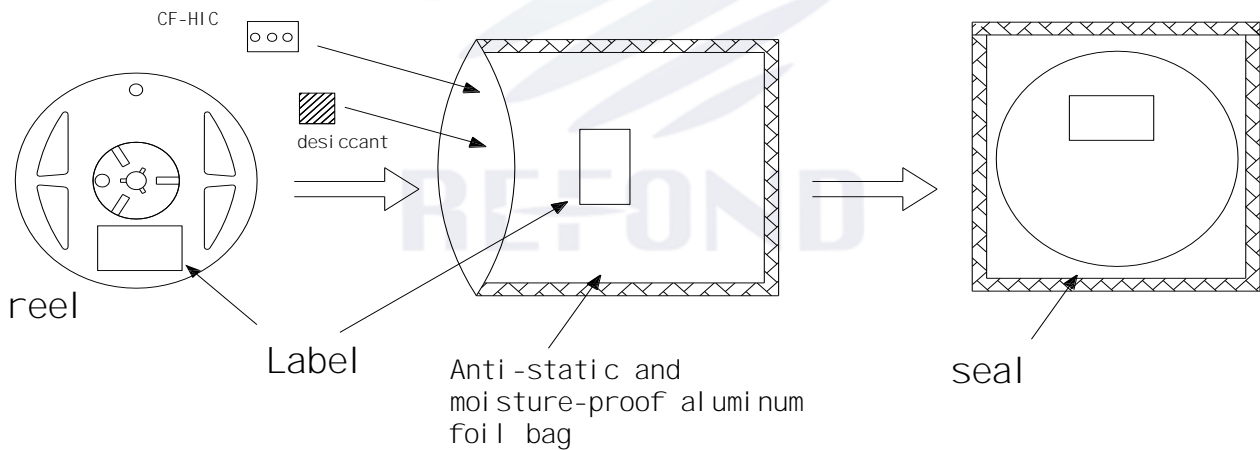


Fig.2-4 Pack



## 2.3 Cardboard Box

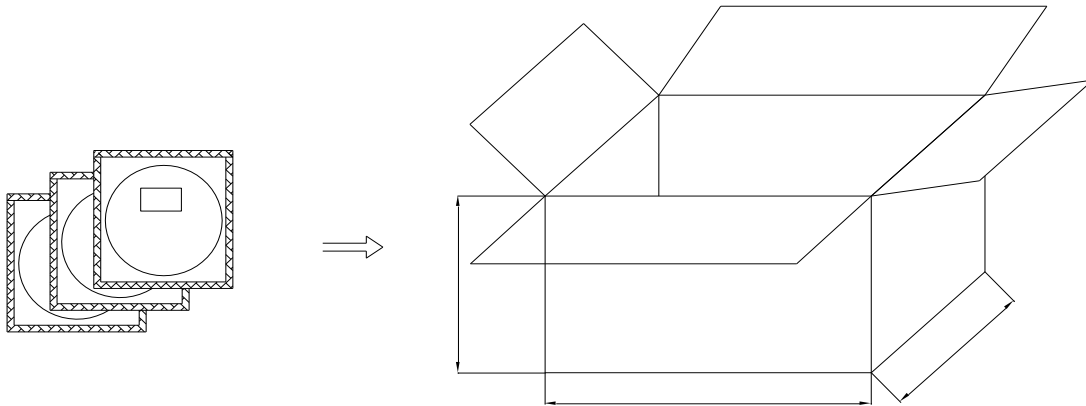
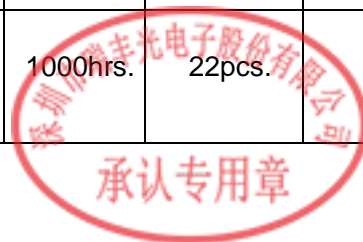


Fig.2-5 Box

## 2.4 Reliability Test Items And Conditions

Table 2-3 Reliability Condition

Test Items	Ref.Standard	Test Condition	Time	Quantity	Ac/Re /
Resistance to Soldering Heat	JESD22-B106	Temp:250 max T=10 sec	3times	22pcs.	0/1
Thermal Shock	JEITAED-4701 300 307	-40 15min 10s 100 15min	500cycle	22pcs.	0/1
Moisture Resistance	IPC/JEDEC J-STD-020D.1	1. Moisture Absorption Ta=85 / RH=85%/12HR 2. Tsol=250 , T=10s Reflow Soldering	3times	22pcs.	0/1
High Temperature Storage	JEITAED-4701 200 201	Temp:100	1000hrs.	22pcs.	0/1



Low Temperature Storage	JEITA ED-4701 200 202	Temp:-40	1000hrs.	22pcs.	0/1
Room Temperature Operating Life	JESD22-A108	T <sub>A</sub> =25 I <sub>F</sub> =10mA	1000hrs.	22pcs.	0/1
High Temperature High Humidity Life Test	JESD22-A101	85 / 85%RH I <sub>F</sub> =5mA	500hrs.	22pcs.	0/1
Temperature Humidity Storage	JEITA ED-4701 100 103	T <sub>A</sub> =85 R <sub>H</sub> =85%	1000hrs.	22pcs.	0/1
Low Temperature Life Test	JESD22-A108D	T <sub>A</sub> =-40°C, I <sub>F</sub> =10mA	1000hrs.	22pcs.	0/1

## 2.5 Criteria For Judging Damage

Table 2-4 Criteria

Test Items	Symbol	Test Condition	Criteria For Judgement
Forward Voltage	V <sub>F</sub>	I <sub>F</sub> =20mA	Initial Data 10% 10%
Reverse Current	I <sub>R</sub>	V <sub>R</sub> = 5V	I <sub>R</sub>
Luminous Intensity	I <sub>V</sub>	I <sub>F</sub> =20mA	Average I <sub>V</sub> degradation rate 30%
Material appearance	/	/	No internal cracks, no material between stripped, no deaded light 承认专用章

Notes

The Reliability tests are based on Refond existing test platform.

2.The above reliability tests is based on the verification of a single/strip LED of Refond's existing experimental platform,the reliability experiment was taken under good heat dissipation conditions. when customers applies the LED to the series and parallel circuit,should take consideration of all the factors such as the current, voltage distribution, heat dissipation and others.

### 3. SMT Reflow Soldering Instructions SMT

#### 3.1 SMT Reflow Soldering Instructions SMT

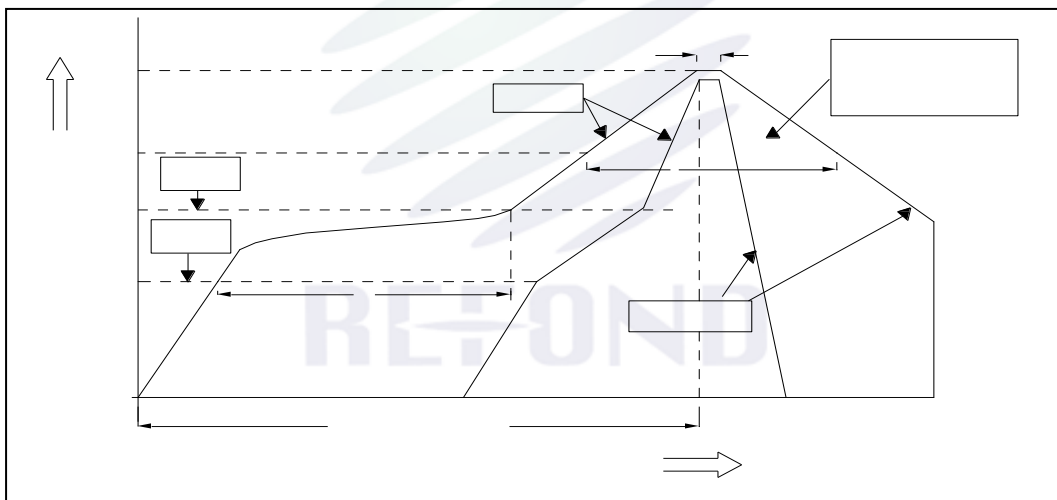


Fig.3-1 Profile





caused by heat or atmosphere.

6. This product can differ in optical characteristics depending on the number of reflow cycles. In a single display, only LEDs with same number of reflow cycles should be used regardless of the application type, such as rental and/or permanent installations.

7. This LED is designed to be reflow soldered on to a PCB. If dip soldered, cannot guarantee its reliability.

### 3.1.1 Soldering Iron

(1) When hand soldering, keep the temperature of iron below less 300°C less than 3 seconds

(2) The hand solder should be done only one time.

### 3.1.2 Repairing

Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed in advance whether the characteristics of LEDs will or will not be damaged by repairing.

LED

### 3.1.3 Cleaning

The LEDs should not be cleaned with water, benzene, and/or thinner.



## 4.Handling Precautions

### 4.1Handling Precautions

#### 4.1.1 Storage

(1) Moisture proof and anti-electrostatic package with moisture absorbent material is used, Suggest storage time is less than 6 months.

(2) Storage condition: temperature  $\leq 30^{\circ}\text{C}$ , humidity  $\leq 60\% \text{ RH}$ .

(3) Before opening the package, please check the package for air leaks, if there exists any air leaks, please return the product to our company for package after dehumidification by baking before your second use.

(4) After the package is opened, the product must be used in the specified environment of temperature below  $30^{\circ}\text{C}$ /humidity below 60% RH, and soldered within 12HR. Unused material must be stored in the environment of temperature below  $30^{\circ}\text{C}$ /humidity below 10% RH , These surplus products should be baked  $65\pm 5^{\circ}\text{C}/24\text{H}$  before next use.

12 :30 :60%RH  
:65 5 /24H

(5) Before SMT, LEDs need to be baked , baking requirement as below :



Customer pre-treatment conditions before use				
Condition before use	undamped Production date 2 months 2	undamped Production date 2-6 months 2-6	undamped Production date 6-12 months 6-12	damped or Production date exceed 12 months 12
Pre-treatment	Baked 65 5 /12H 65 5 /12H	Baked 65 5 /24H 65 5 /24H	Baked 65 5 /48H 65 5 /48H	Return to the original factory for processing

#### 4.1.2 Static Electricity

Static electricity and surge voltage damage the LEDs. Damaged LEDs will show some unusual characteristics such as the forward voltage becomes lower, or the LEDs do not light at the low current and even not light. All devices, equipment and machinery must be properly grounded. At the same time, it is also recommended that anti-electrostatic wrist bands, pads, uniforms, gloves or containers can be used as effective measures when dealing with the LEDs.

#### 4.1.3 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 gray scale so when designing, please pay attention to control the reverse voltage we suggest the reverse voltage less than 5V.

LED ,  
 ,LED ,  
 , LED 5V.



#### 4.1.4 The safe temperature for LEDs working

(1) When LEDs work in a hot environment for a long time, their luminous intensity will decrease radically. When LEDs are working in a hot environment, the surface temperature should be lower than 55°C and the junction temperature should be lower than 75°C.

LEDs should be used in a hot environment, the surface temperature should be lower than 55°C, and the junction temperature should be lower than 75°C.

(2) Proper thermal management is an important when designing products with LEDs. LED die temperature is affected by PCB thermal resistance and LED spacing on the board. Please design products in a way that the LED die temperature does not exceed the maximum junction temperature (T<sub>J</sub>).

(3) Drive current should be determined for the surrounding ambient temperature (T<sub>A</sub>) to dissipate the heat from the product.

T<sub>A</sub>

#### 4.1.5 Directions for Use



used for a long time, the main power should be switched off, Dehumidification is necessary before using the screen again.

### LED

(5) Make sure that the reverse voltage will not exceed the Absolute MaxRating when using the LEDs with matrix drive. Ensure that excessive voltages such as lightning surges are not applied to the LEDs.

### LED

### LED

(6) Aging is recommended in order to detect manufacturing and assembly defects. Particularly, make sure that excessive current and/or voltage is not applied to the LEDs. This aging should be conducted in environments where water condensation does not occur.

### LED

(7) when the LEDs are used in the following environments, incorporate sufficient measures into the display to prevent debris, water/moisture and gases that will adversely affect the product.

- where water vapor is abundant
- where water condensation is likely to occur
- where water is likely to splash onto the LEDs
- where frost is likely to form on the surface of the LEDs (e.g. freezer, ice skating rink, etc.)
- where dust, dirt, debris, loose metallic materials and/or gases that will adversely affect the product are present

### LED

-

-

-

### LED

-LED



-

(8) In areas where hydrogen sulfide, which is a sulfide-based gas, is present (e.g. hot springs and volcanic areas), and where salt is abundant (e.g. coastal areas), the life may be shortened.

(9) 100% wattage for the LEDs may have absorbed moisture. Before normal use of this display, operate the display at approximately 20% wattage for an initial time period.

LED	100
20	

(10) If the display units will be rented, those units should be selected carefully to ensure that the display as a whole will appear the same color and brightness.

(11) If the display modules are loaded onto and/or transported by ship, the moisture environment on the vessel can cause condensation; the display units should be packaged to prevent moisture absorption.

(12) If a display that has been, or is being, used is relocated, it is possible that degradation of the LED has occurred. When transporting this display, provide sufficient protection for the LEDs in addition to the moisture-proof packaging for the display. When this display is reinstalled, ensure to follow the installation instructions for environments and use.

LED	LED
LED	







[www.refond.com](http://www.refond.com)



Declare

This specification is written both in English and in Chinese and the latter is formal.

