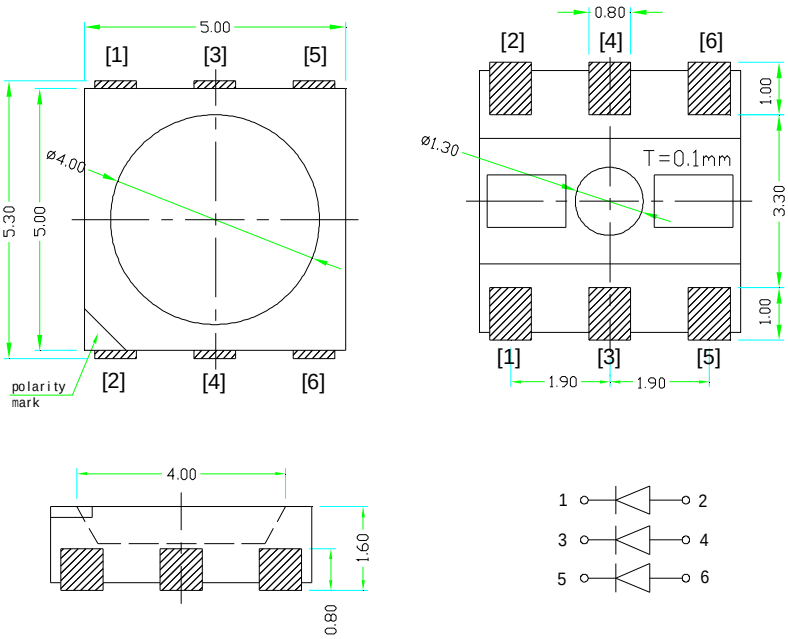
Feature

- Viewing angle:120 deg
- The materials of the LED dice is InGaN
- 5.30mm×5.00mm×1.60mm SMT-LED
- RoHS compliant lead-free soldering compatible

P/N:RF-WNMA50DS-ED

Package Outline



ATTENTION
OBSERVE PRECAUTIONS
FOR HANDLING
ELECTROSTATIC
SENSITIVE DEVICES

NOTES:

1. All dimensions are in millimeters (inches);
2. Tolerances are ±0.2mm (0.008inch) unless otherwise noted.

Absolute maximum ratings at Ta=25℃

Parameter	Symbol	Value	Unit
Power dissipation per chip	Pd	108	mW
Forward current per chip	If	30	mA
Reverse voltage	Vr	5	V
Operating temperature range	Top	-35 ~+85	℃
Storage temperature range	Tstg	-35~+85	℃
Pulse Forward Current per chip	Ifp	100	mA
Electrostatic Discharge	ESD	1000(HBM)	V

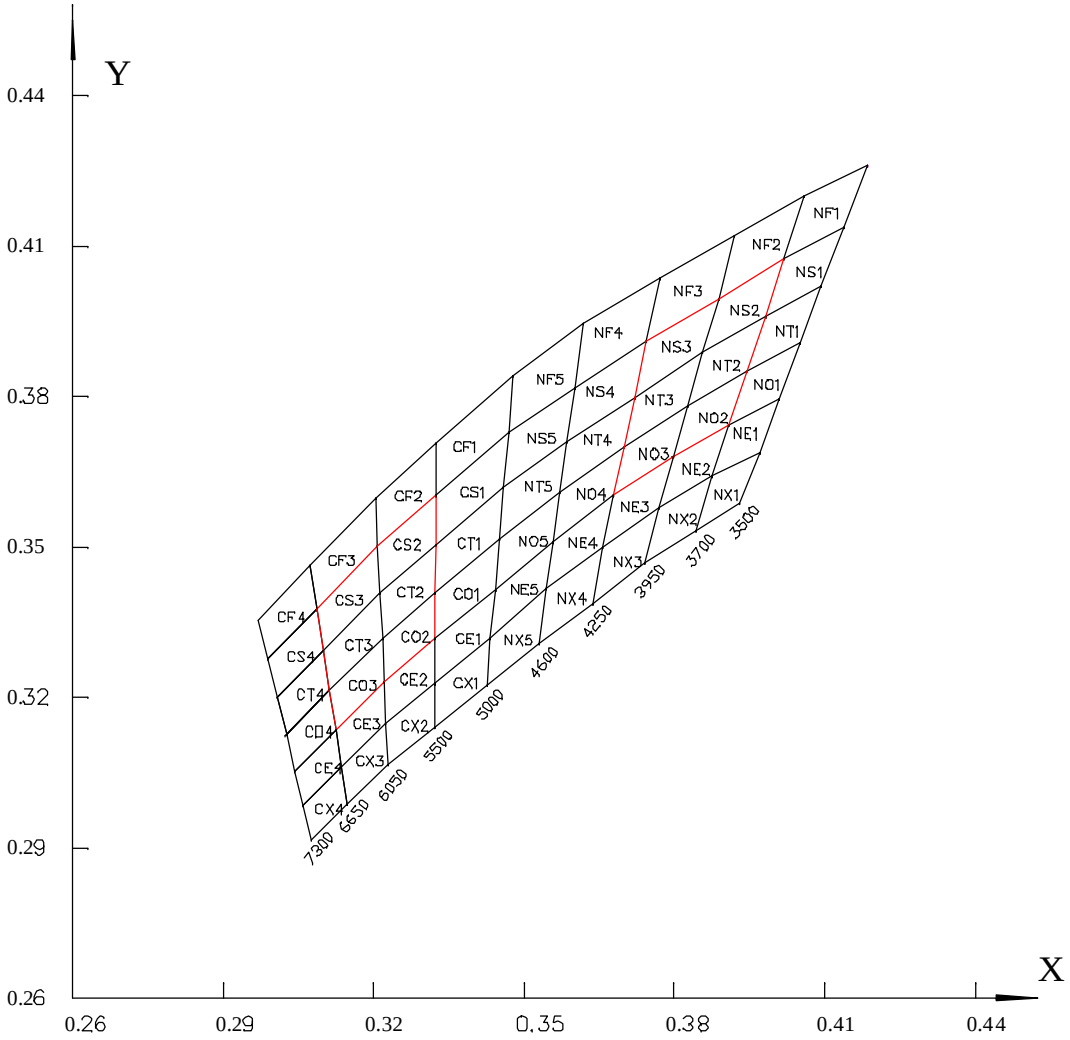
Electro-optical characteristics at Ta=25℃

Parameter		Test Condition	Symbol	Value			Unit
				Min.	Typ.	Max.	
Forward voltage	Rank G2	If=60mA	Vf	2.9	--	3.0	V
	Rank H1			3.0	--	3.1	V
	Rank H2			3.1	--	3.2	V
	Rank I1			3.2	--	3.3	V
	Rank I2			3.3	--	3.4	V
	Rank J1			3.4	--	3.5	V
Luminous intensity	Rank P1	If=60mA	Iv	4300	--	5300	mcd
	Rank P2			5300	--	6500	mcd
	Rank Q1			6500	--	8000	mcd
Viewing angle at 50% Iv		If=60mA	2 θ 1/2	--	120	--	Deg
Color Rending Index		If=60mA	CRI	--	75	--	--
Reverse current		Vr=5V	Ir	--	--	10	μA

NOTE: (Tolerance: Iv ±10%, λ_d ±2nm, Vf ±0.05V, X, Y ±0.01))

IFP Conditions: Pulse Width≦10msec. and Duty ≦1/10.

Chromaticity Bin



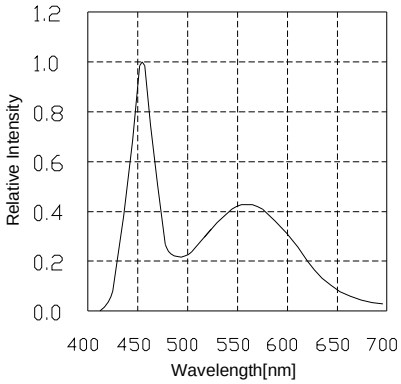
Bin data:

BIN CODE	CIE-X1	CIE-Y1	CIE-X2	CIE-Y2	CIE-X3	CIE-Y3	CIE-X4	CIE-Y4
NS2	0.4019	0.4074	0.3888	0.3996	0.3857	0.3887	0.3981	0.396
NS3	0.3888	0.3996	0.3745	0.3909	0.3722	0.3799	0.3857	0.3887
NT2	0.3981	0.396	0.3857	0.3887	0.3826	0.3781	0.3944	0.385
NT3	0.3857	0.3887	0.3722	0.3799	0.3699	0.3699	0.3826	0.3781
NO2	0.3944	0.385	0.3826	0.3781	0.3797	0.3679	0.3909	0.3743
NO3	0.3826	0.3781	0.3699	0.3699	0.3677	0.3603	0.3797	0.3679
CS2	0.3324	0.3604	0.3208	0.3501	0.3213	0.3408	0.3324	0.3505
CS3	0.3208	0.3501	0.3087	0.3377	0.31	0.3294	0.3213	0.3408
CT2	0.3324	0.3505	0.3213	0.3408	0.3217	0.3318	0.3323	0.3409
CT3	0.3213	0.3408	0.31	0.3294	0.3112	0.3214	0.3217	0.3318
CO2	0.3323	0.3409	0.3217	0.3318	0.3221	0.3231	0.3322	0.3317
CO3	0.3217	0.3318	0.3112	0.3214	0.3124	0.3136	0.3221	0.3231

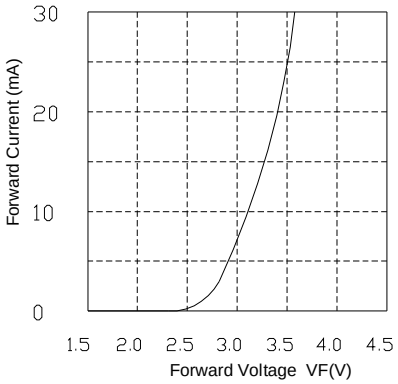
Typical optical characteristics curves

Spectral Distribution

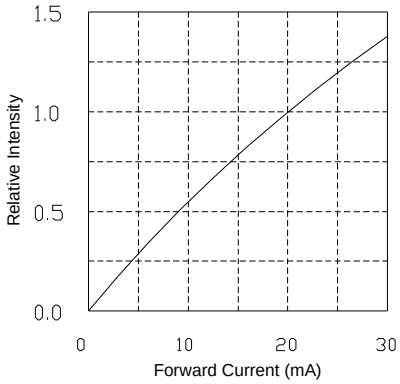
Relative Intensity vs. Wavelength (Ta=25℃)



Forward Current vs. Forward Voltage(Ta=25℃)

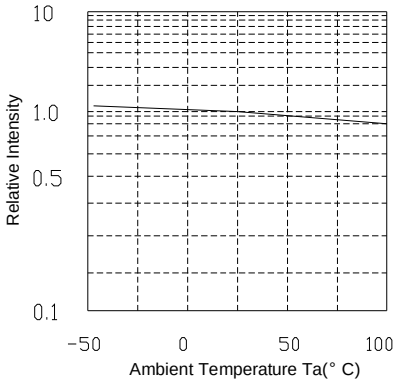


Relative Intensity vs. Forward Current (Ta=25℃)

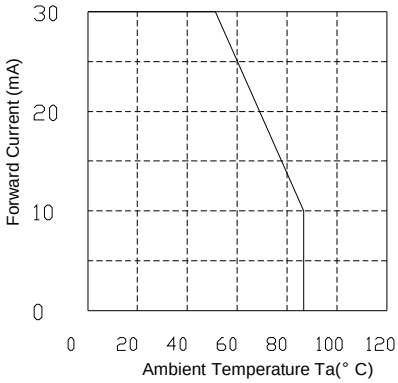


Derating

Relative Intensity vs. Ambient Temperature



Ambient Temperature vs. Maximum Forward Current



Forward Current vs. Chromaticity (Ta=25℃)

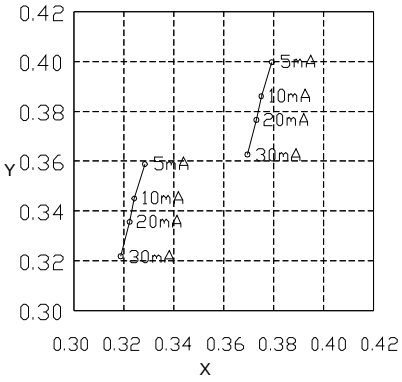
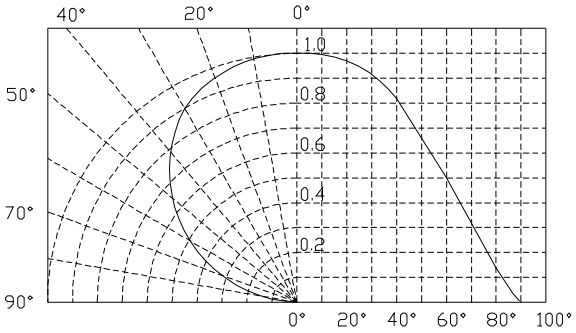


Diagram characteristics of radiation



Reflow profile

n Soldering condition

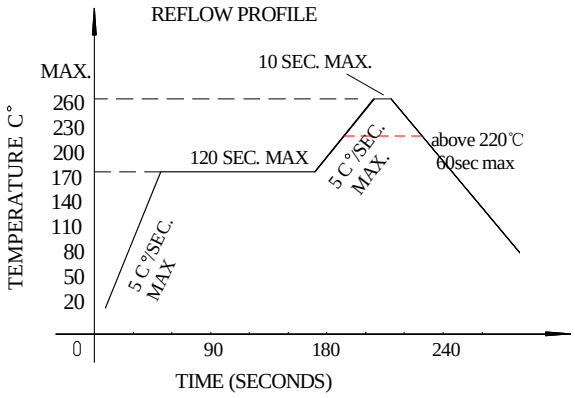
• Recommended soldering conditions

Reflow Soldering		Hand Soldering	
Pre-heat	160～180℃	Temperature	300℃ Max.
Pre-heat time	120 seconds Max.		
Peak temperature	260℃ Max.	Soldering time	3 second Max.
Soldering time	10 seconds Max.		(one time only)
Condition	Refer to Temperature-profile		

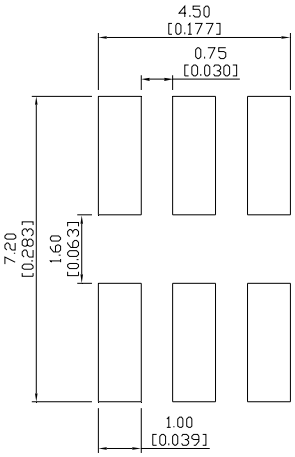
• After reflow soldering rapid cooling should be avoided

n Temperature-profile (Surface of circuit board)

Use the following conditions shown in the figure.



RECOMMEND PAD DESIGN (Units: mm)



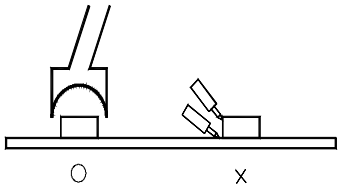
1. Reflow soldering should not be done more than two times
2. When soldering ,do not put stress on the LEDs during heating

n Soldering iron

1. When hand soldering, keep the temperature of the iron under 300℃, and at that temperature keep the time under 3 sec.
2. The hand soldering should be done only a time
3. The basic spec is ≤5 sec. when the temperature of 260℃, do not contact the resin when hand soldering

n Rework

1. Customer must finish rework within 5 sec under 260℃
2. The head of iron can not touch the resin
3. Twin-head type is preferred.



n CAUTIONS

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.

Reliability

(1)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	2 times	0/22
	Temperature Cycle	JESD22-A104	-40℃ 30min ↑↓5min 100℃ 30min	300 cycle	0/100
	Thermal Shock	JESD22-A106	-40℃ 15min ↑↓ 100℃ 15min	300 cycle	0/100
	High Temperature Storage	JESD22-A103	T_a=100℃	1000 hrs	0/100
	Low Temperature Storage	JESD22-A119	T_a=-40℃	1000 hrs	0/100
Operation Sequence	Life Test	JESD22-A108	T_a=25℃ I_F=30mA	1000 hrs	0/100
	High Humidity Heat Life Test	JESD22-A101	60℃ RH=90% I_F=20mA	1000 hrs	0/100

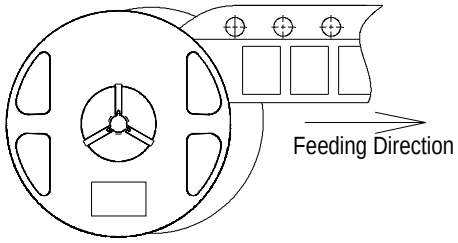
(2)CRITERIA FOR JUDGING THE DAMAGE

Item	Symbol	Test Conditions	Criteria for Judgement	
			Min.	Max.
Forward Voltage	VF	IF=20mA	_	U.S.L*)×1.1
Reverse Current	IR	VR=5V	_	U.S.L*)×2.0
Luminous Intensity	IV	IF=20mA.	L.S.L**)×0.7	_

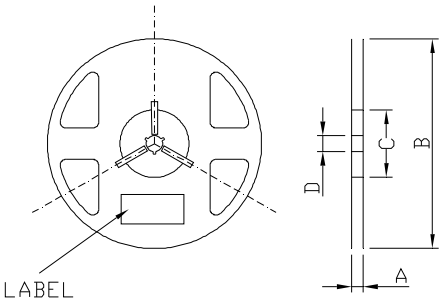
U.S.L.: Upper Standard Level L.S.L.: Lower Standard Level

Packaging Specifications

● Feeding Direction

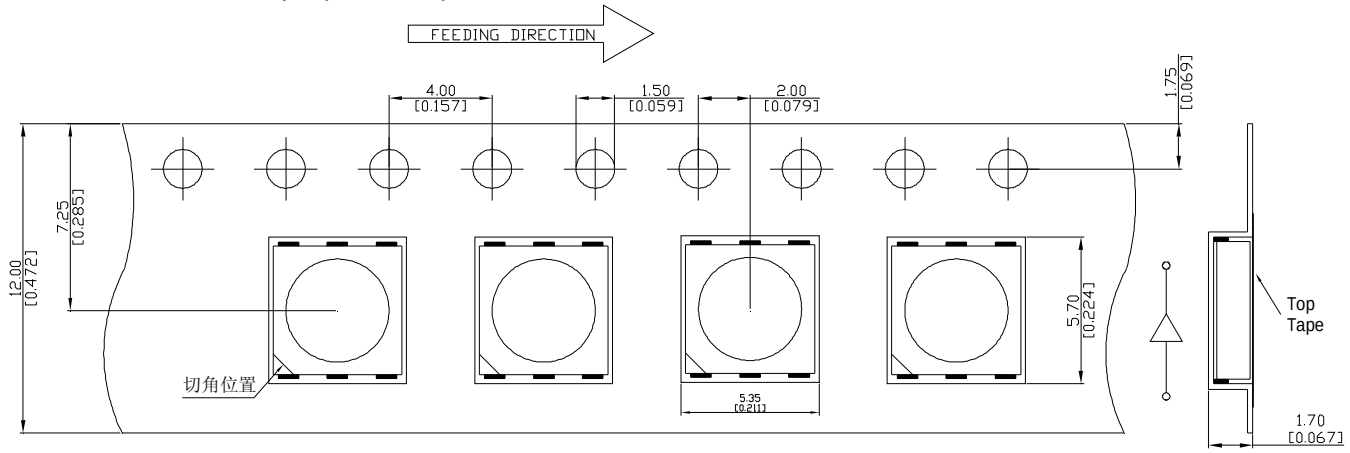


● Dimensions of Reel (Unit: mm)

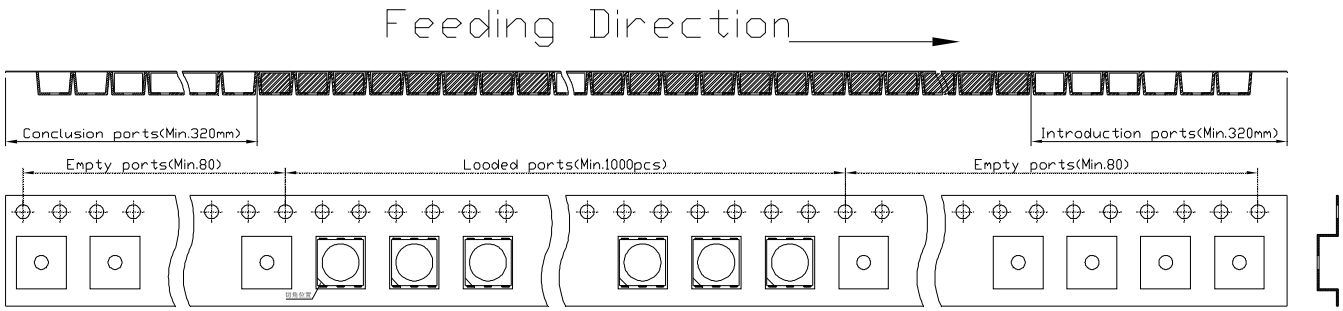


A	12±0.1mm
B	178±1mm
C	60±1mm
D	13.0±0.5mm

● Dimensions of Tape (Unit: mm)



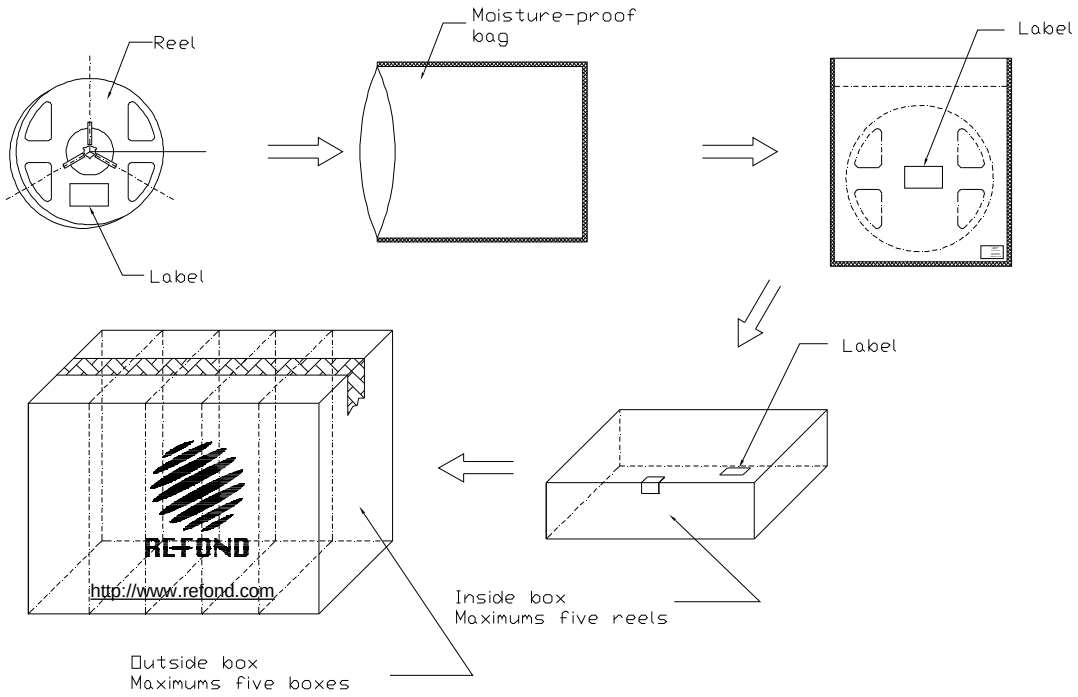
● Arrangement of Tape



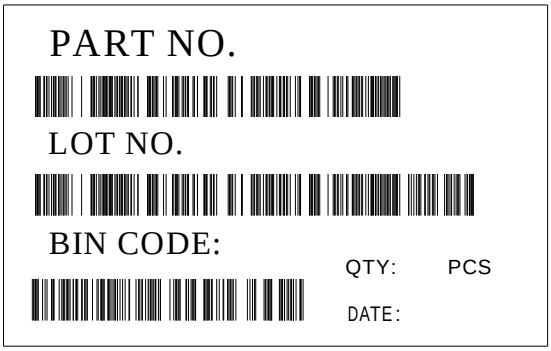
NOTES

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. 1,000 pcs/ Reel.

Packaging specifications



■ Label



CAUTIONS

Package specifications

Reeled products (numbers of products are 1,000pcs) packed in a seal off moisture-proof bag along with a desiccant one by one, Four moisture-proof bag of maximums (total maximum number of products are 4,000pcs) packed in an inside box (size: about 250mm x about 250 x about 68mm) and Five inside boxes of maximums are put the outside box (size: about 360mm x about 265mm x about 255mm) Together with buffer material, and it is packed. (Pare No., Lot No., quantity should appear on the label on the moisture-proof bag, part No. And quantity should appear on the label on the cardboard box.) The number of the loading steps of outside box (cardboard box) has three steps.

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.