S P E C I F I C A T I O N S

SMD TYPE SIDE VIEW WHITE LED

Model : AS427TWPE1

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1. General Description

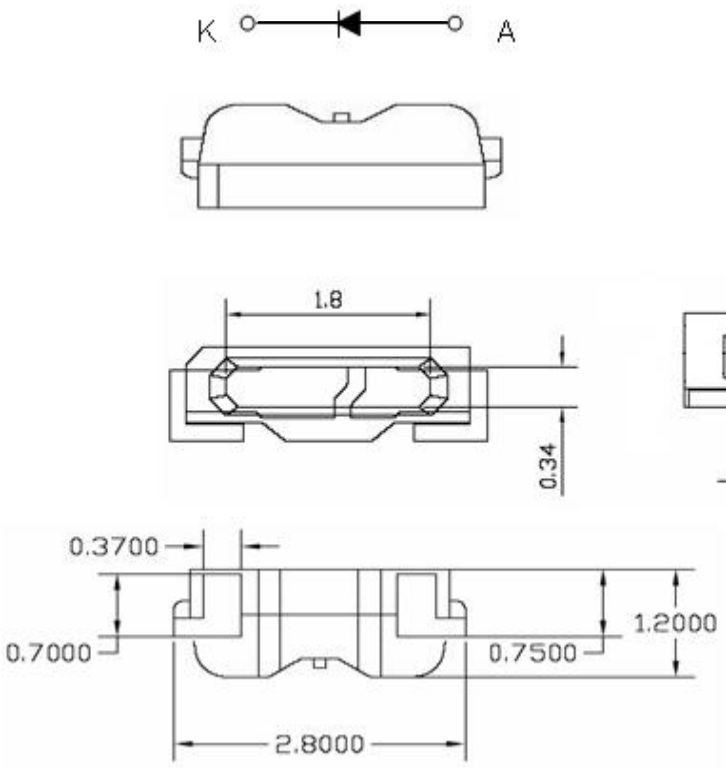
(1) Features

- Package Size - 2.8 × 1.2 × 0.8(t) mm
- White Emission Package (Side View)

(2) Applications

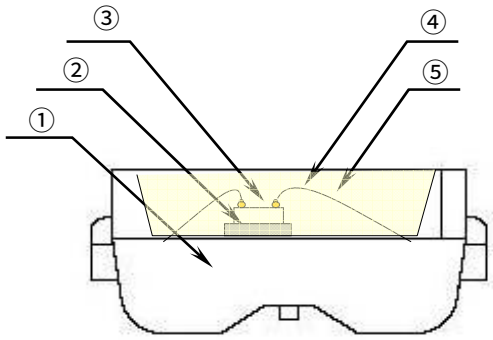
- Mobile phone , PDA , Indicator , Backlighting etc.

(3) Outline Dimensions



[Unit : mm]
General Tolerance : ± 0.1 mm

(4) Material Construction



No.	Items	Material
①	Lead Frame	PPA
②	Paste	Resin
③	LED Chip	$InGaN/Al_2O_3$
④	Gold Wire	Au
⑤	Mold Epoxy	Silicone + Phosphor

2. Specifications

(1) Absolute maximum ratings

Parameter	Symbol	Absolute maximum rating	Unit
Power Dissipation	P_D	105	mW
Forward Current	I_F	30	mA
Peak Pulse Current(1)	I_{FP}	100	mA
Reverse Voltage	V_R	5	V
Operating Temperature	T_{OPR}	-30 to +80	℃
Storage Temperature	T_{STG}	-40 to +100	℃

Notes (1) Duty ratio = 1/10, pulse with = 10msec

(2) Initial Electrical/Optical Characteristics

(T_a=25℃)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage	V_F	I_F = 20mA	3.0	3.2	3.4	V
Reverse Current	I_R	V_R = 5V	-	-	10	μA
Luminous Intensity(1)(2)	I_V	I_F = 20mA	1,300	1,600	-	mcd
Chromaticity Coordinate(3)	Cx	I_F = 20mA	0.265	0.288	-	-
	Cy		0.231	0.278	-	-
Radiation Angle	Δθ	I_F = 20mA	X - X : 120deg.			°
			Y - Y : 115deg.			

notes (1) Luminous Intensity measuring equipment : CAS140B(Instrument system)

(2) Luminous Intensity Measurement allowance is ± 5%

(3) The coordinate refer to CIE 1931 chromaticity diagram.

(3) Characteristics Rank

■ Forward voltage & Luminous intensity rank

(T_a=25℃)

Parameter	Symbol	Condition	Rank	Min.	Max.	Unit
Forward Voltage	V_F	I_F = 20mA	0	3.0	3.4	V
Luminous Intensity	I_V	I_F = 20mA	I	1,300	1,400	mcd
			J	1,400	1,500	
			K	1,500	1,600	
			L	1,600	1,700	
			M	1,700	1,800	

■ Color Rank

(I_F=20mA, Ta=25℃)

	b1			
Cx	0.2690	0.2590	0.2650	0.2740
Cy	0.2240	0.2320	0.2450	0.2360

	c1			
Cx	0.2590	0.2500	0.2570	0.2650
Cy	0.2320	0.2390	0.2530	0.2450

	b2			
Cx	0.2740	0.2650	0.2720	0.2800
Cy	0.2360	0.2450	0.2580	0.2480

	c2			
Cx	0.2650	0.2570	0.2640	0.2720
Cy	0.2450	0.2530	0.2670	0.2580

	b3			
Cx	0.2800	0.2720	0.2820	0.2880
Cy	0.2480	0.2580	0.2720	0.2620

	c3			
Cx	0.2720	0.2640	0.2750	0.2820
Cy	0.2580	0.2670	0.2810	0.2720

	b4			
Cx	0.2880	0.2820	0.2910	0.2960
Cy	0.2620	0.2720	0.2870	0.2760

	c4			
Cx	0.2820	0.2750	0.2870	0.2910
Cy	0.2720	0.2810	0.2950	0.2870

	b5			
Cx	0.2960	0.2910	0.2990	0.3020
Cy	0.2760	0.2870	0.2940	0.2830

	c5			
Cx	0.2910	0.2870	0.2960	0.2990
Cy	0.2870	0.2950	0.3040	0.2940

	b6			
Cx	0.3020	0.2990	0.3090	0.3110
Cy	0.2830	0.2940	0.3050	0.2940

	c6			
Cx	0.2990	0.2960	0.3070	0.3090
Cy	0.2940	0.3040	0.3150	0.3050

	b7			
Cx	0.3110	0.3090	0.3200	0.3210
Cy	0.2940	0.3050	0.3170	0.3060

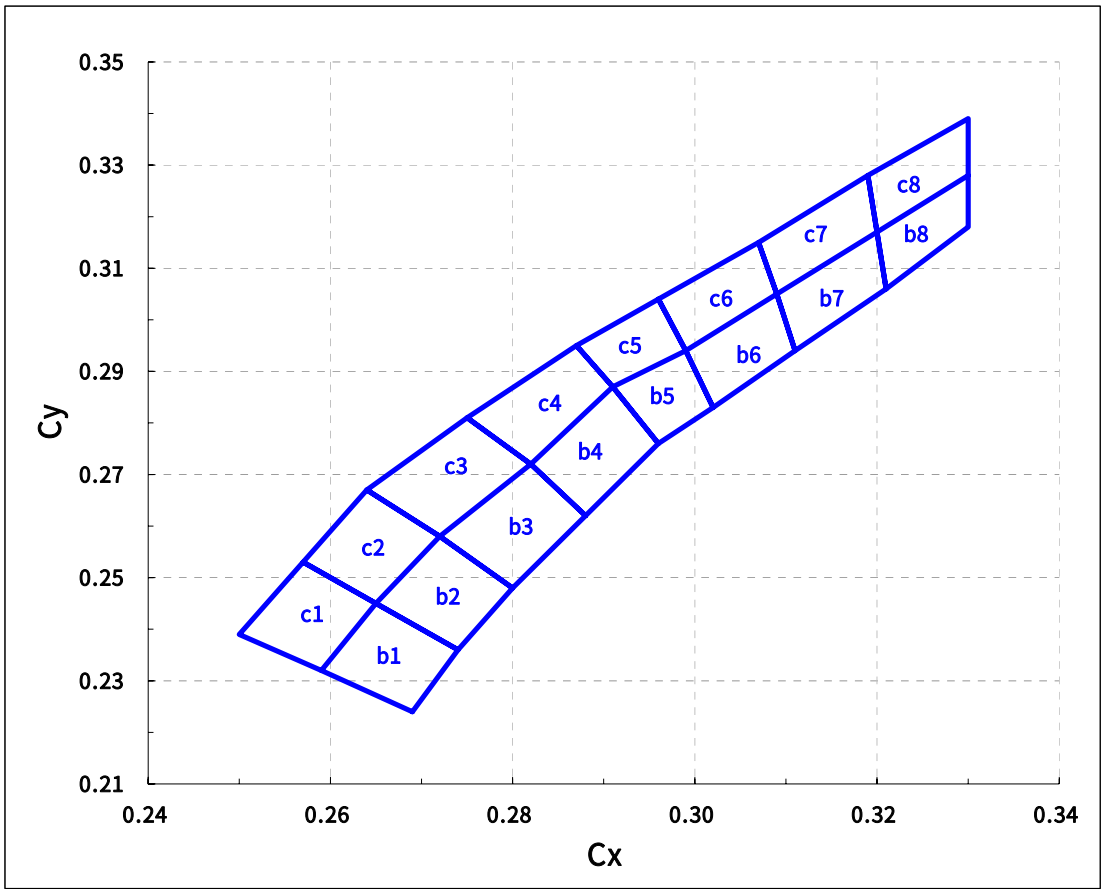
	c7			
Cx	0.3090	0.3070	0.3190	0.3200
Cy	0.3050	0.3150	0.3280	0.3170

	b8			
Cx	0.3210	0.3200	0.3300	0.3300
Cy	0.3060	0.3170	0.3280	0.3180

	c8			
Cx	0.3200	0.3190	0.3300	0.3300
Cy	0.3170	0.3280	0.3390	0.3280

Notes (1) Color coordinates measurement allowance is ±0.01.

■ Chromaticity Diagram



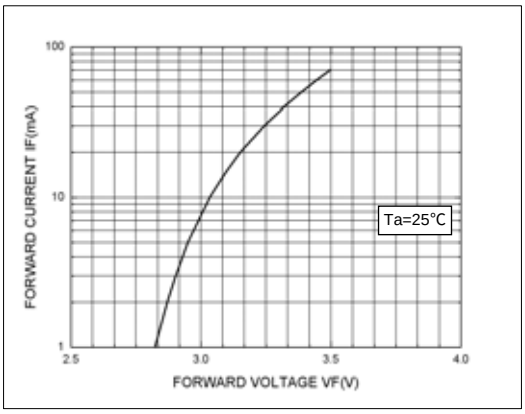
3. Rank

The rank inscription is composed of the follow method.

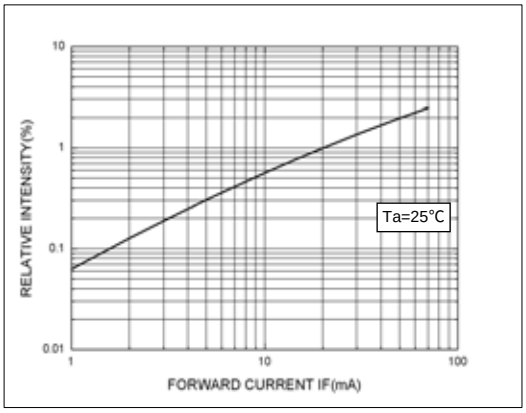
Ex.) 0 b5 J

- J → Iv : 1,400 ~ 1,500 mcd
- b5 → Cx, Cy
- 0 → V_F : 3.0 ~ 3.4 V

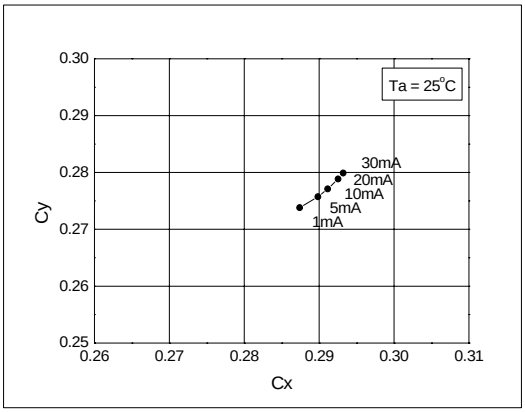
4. Characteristics Diagrams



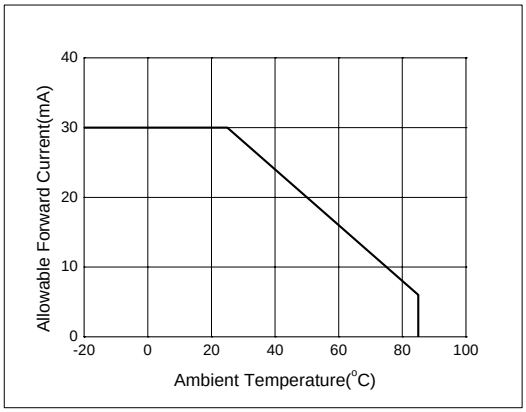
Forward Current vs Forward Voltage



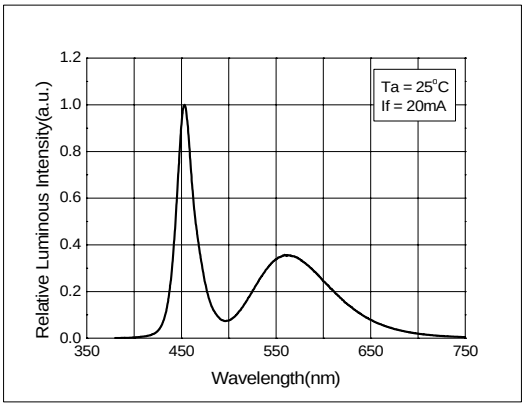
Relative Luminous Intensity vs Forward Current



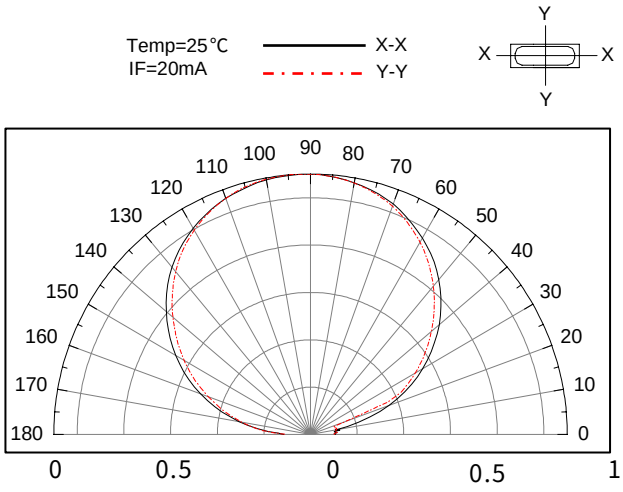
Forward Current vs Chromaticity Diagram



Forward Current Dissipation Curve



Relative Spectral Emission



Radiation Angle

5. Results of Reliability Tests

(1) Test Items and Results

Item	Test Condition	Notes	No. of Damaged
Temperature Cycle	-40℃ ~25℃ ~100℃ ~25℃ (30min~5min~30min~5min)	100Cycle	0/45
Steady State Operating Life	T_a = 25℃, I_F = 20mA	1000hrs.	0/45
Steady State Operating Life of High Temperature	T_a = 85℃, I_F = 5mA	1000hrs	0/45
Steady State Operating Life of High Humidity Heat	T_a = 60℃, RH = 90%, I_F = 15mA	1000hrs	0/45
Steady State Operating Life of Low Temperature	T_a = -30℃, I_F = 20mA	1000hrs	0/45
High Temperature Storage	T_a = 100℃	1000hrs.	0/45
High Temperature & Humidity Storage	T_a = 60℃, RH = 90%	1000hrs.	0/45
Low Temperature Storage	T_a = -40℃	1000hrs.	0/45
Resistance to Soldering Heat	Tmax=260℃, 10sec (Pre treatment 30℃,70%, 168hrs)	2 time	0/45

(2) Criteria for Judging the Damage

Parameter	Symbol	Condition	Criteria for Judgement	
			Min.	Max.
Forward Voltage	V_F	I_F = 20mA	-	U.S.L.(1) * 1.2
Luminous Intensity	Iv	I_F = 20mA	L.S.L.(2) * 0.5	-
Reverse Current	I_R	V_R = 5V		10uA

Notes (1) U.S.L. : Upper Standard Level

(2) L.S.L. : Lower Standard Level

6. Soldering Conditions

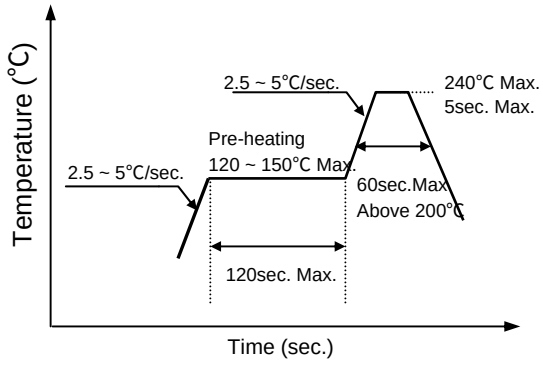
(1) Recommended Soldering Conditions

Reflow Soldering			Hand Soldering	
	Lead Solder	Lead-Free Solder	Temperature Soldering time	350℃ Max. 3 sec. Max. (one time only)
Pre-Heating	120 ~ 150℃	180 ~ 200℃		
Pre-Heat Time	120sec. Max.	120sec. Max.		
Peak Temperature	240℃ Max.	260℃ Max.		
Soldering Time	5sec. Max.	5sec. Max.		

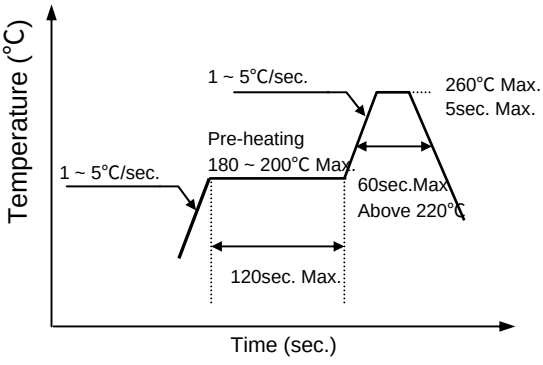
* After reflow soldering, Rapid cooling should be avoid.

(2) Recommended Reflow Soldering profile

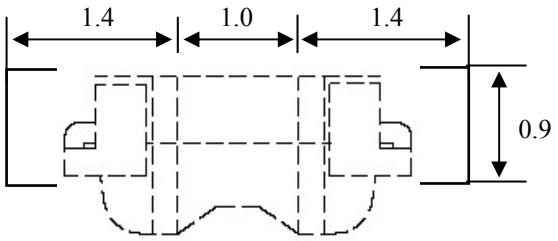
■ Lead Solder



■ Lead-Free Sol



(3) Recommended Soldering Pattern



(Unit : mm)

(4) Soldering Cautions

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

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

-. After soldering, do not wrap the circuit board.

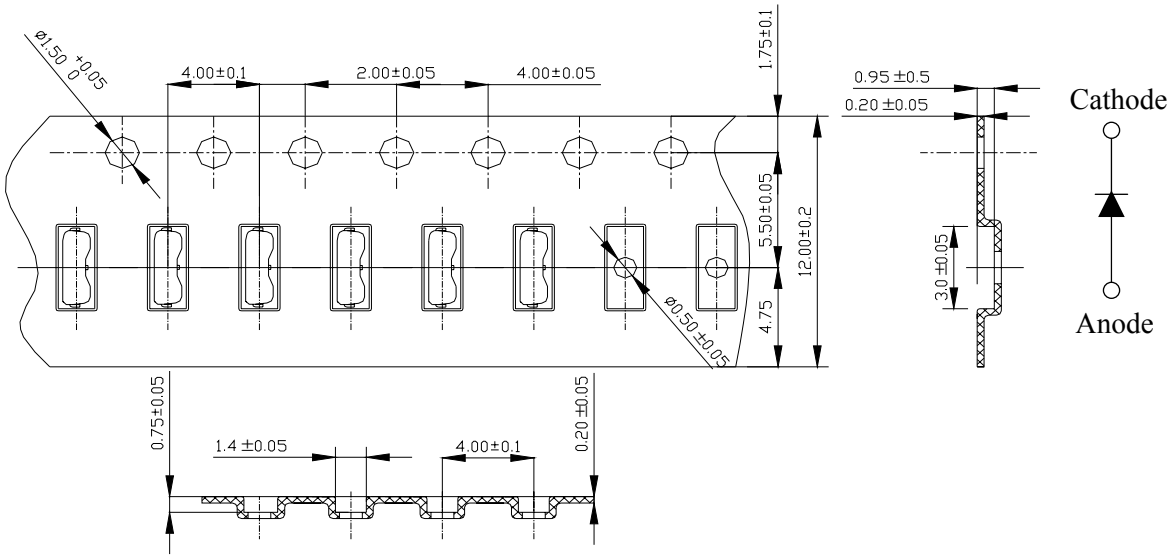
-. The LEDs can be soldered on place using the reflow soldering method.

-. Occasionaly there is a brightness decrease cause by the influence of heat or ambient atmosphere during air reflow. It is recommend that the user use the nitrogen reflow method.

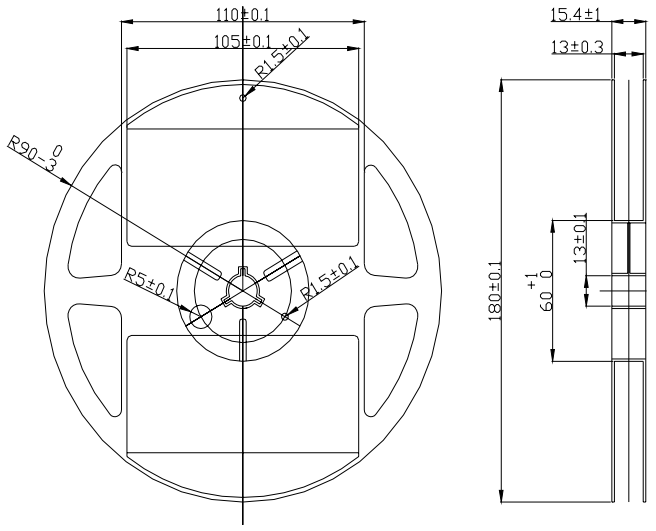
7. Packing

(1) Carrier Tape & Carrier Reel Dimensions

■ Carrier Tape



■ Carrier Reel



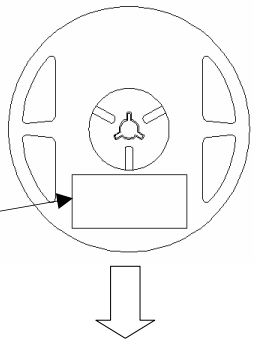
Notes (1) Quantity : 3,500pcs/reel

(2) Adhesion strength of cover tape is 0.1 ~ 0.7N when the cover tape is turned off from the carrier tape.

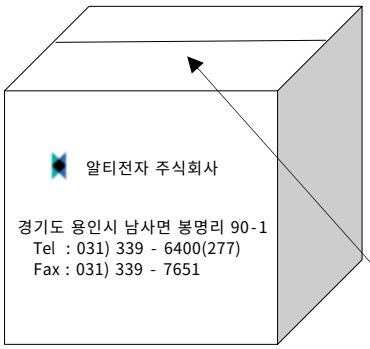
(2) Packing and Packaging

■ Label

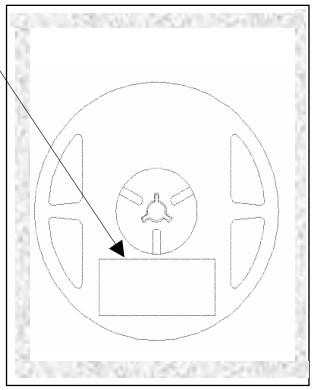
■ Reel



■ Inner Box

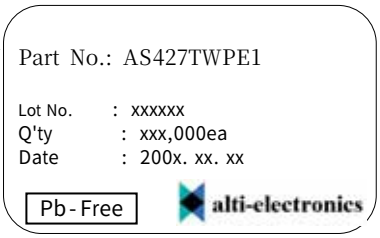


■ Aluminum Bag



■ Outer Box

■ Box Label



Box Type	Inner Box	Outer Box	
		Medium	Large
Max. Packing Q'ty(pcs)	28,000	112,000	224,000

(1) The carrier tape winded on the reel are placed into an ESD protected pack with a silicagel and sealed by the thermal pressure sealer. Then this sealed pack is packaged in a cardboard box.

8. Precaution

(1) Static Electricity

These LEDs are highly susceptible to static electricity or surge voltage. So a wrist strap or an anti-electrostatic glove necessarily be used when handling the LEDs. Do not use the equipment that surge voltage is came into existence.

All devices and equipment that measure or mount the LEDs must be properly grounded.

After being assembled LEDs, it should be ascertained a electrical characteristic whether that are damaged by static electricity or not. It is easy to find the damaged LEDs by a light-on or VF test at forward a below 1mA current.

(2) Packing

The moisture that is absorbed into the LED products may cause a badness and damage to the optical characteristics of the LEDs. Therefore the moisture barrier aluminum bag is used to keep moisture in the packing. And a silicagel is inserted into a moisture barrier aluminum bag that sealed by the thermal pressure sealer.

(3) Cleaning

It is recommended that isopropyl alcohol(IPA) be used as a solvent for cleaning the LEDs.

Do not clean the LEDs by the ultrasonic. When it use other solvents or is absolutely necessary ultrasonic, before cleaning, a pre-test should be done to confirm whether the LEDs are any damaged or not

(4) Storage

In order to avoid the absorption of moisture, it is recommended to store LEDs in the moisture barrier aluminum bag is not opened.

Storage condition before opening the packing :

Temperature : below 30℃

Humidity : 90%RH max

The LEDs should be used within a year.

Storage condition after opening the packing :

Temperature : below 30℃

Humidity : 60%RH max

After opening the packing, the LEDs should be used within 168 hours(7days). If unused LEDs remain, they should be stored in the place kept away moisture.

If the LEDs have exceeded the above storage time, it should be used after to bake using the following conditions.

Baking condition : 60±5℃, more than 24 hours

(5) Pick and Place

It should be avoided to rub or scratch the surface of resin by any hard material. It is possible that the LEDs are damaged to the optical characteristics.

(6) Heat

The LEDs are products that are generated heat. Please consider the heat generation of the LED when it is designed the PCB. After considering the ambient temperature and the heat generation of LEDs, the operating current should be decided

(7) Others

If the forward or reverse voltage which exceeds the absolute maximum rating is applied to the LEDs, that will cause the damage to the LEDs. It is possible that the damaged LEDs do not light on at the low current.

Be careful not to look the LEDs that the output power is strongly increased in the face. It is possible that eyesight has been getting weaker.

This specifications of the product may be revised without notice.