

DATE :  
CUSTOMER :

## APPROVAL SHEET

PRODUCT	TOP VIEW LED 5450 WHITE
MODEL	ETL - F3W2100-P1C
REVISION DATE	JAN . 15 . 2013 Rev.00

<b>COMMENT</b>
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ENTEC			CUSTOMER		
WRITTED	CHECKED	APPROVED			
/	/	/	/	/	/



**ENTEC LED & ELECTRONIC CO.,LTD.**

78-2 Buncheon-ri Bongdam-eup Hwaseong-City Gyungki-Do Korea 445-894

TEL : 82-31-299-8471, FAX : 82-31-227-0185

Http : //www.entecle.co.kr

# SPECIFICATION

MODEL : ETL - F3W2100-P1C



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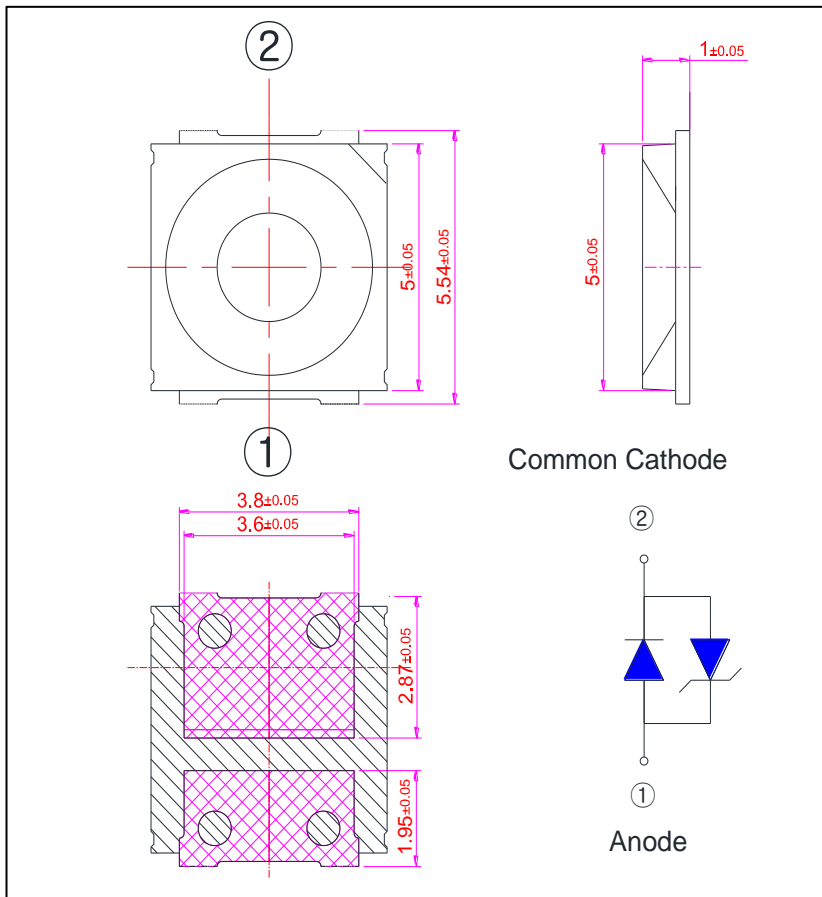
**1. Features**

- External dimensions : 5.4(L) x 5.0(W) x 1.1(H) mm
- Surface mount type
- Wide view angle :  $2\theta$  1/2 120°
- Material : BLUE : InGaN
  
- Soldering methods : IR reflow soldering
- Taping : 12mm conductive black
- Quantity : The maximum packing quantity per a reel is to be 1,000 pcs
- Lead frame package with individual 2 pin

**2. Applications**

- LCD backlighting
- Front panel indicator lamp
- Symbol backlighting
- LED Lighting

**3. Outline Dimension**



**4. Absolute Maximum Ratings**

(Ta=25°C)

PARAMETERS	SYMBOL	RATINGS	UNIT	TEST CONDITION
Forward Current	I <sub>F</sub>	160	mA	
Pulse Forward Current ①	I <sub>FP</sub>	300	mA	
Power Dissipation	P <sub>D</sub>	JAN . 15 . 2013 Rev.00	mW	
Reverse Voltage	V <sub>R</sub>	5	V	I <sub>R</sub> =10uA
Operating Temperature	T <sub>opr</sub>	-25°C to +80°C	°C	
Storage Temperature	T <sub>stg</sub>	-40°C to +90°C	°C	
Soldering Temperature	T <sub>slid</sub>	260	°C	within 5 Seconds

① IFP Conditions : Pulse Width ≤ 10msec. And Duty ≤ 1/10

**5. Electro-optical Characteristics**

PARAMETERS	SYMBOL	Min.	Typ.	Max.	UNIT	TEST CONDITION
Luminous Intensity ①	IV	10.0	-	16.0	cd	IF=100mA
Forward Voltage	VF	2.9	-	3.4	V	IF=100mA
Chromaticity Coordinates	Cx	0.3035	-	0.3930		IF=100mA
	Cy	0.2830	-	0.3725		
Reverse Current	I <sub>R</sub>	-	-	10	uA	V <sub>R</sub> =5V
Viewing Angle	2Θ 1/2		120		deg.	IF=100mA

① Luminous Intensity Measurement allowance is ± 10%

**6. Rank Sheet**

■ **Luminous Intensity Rank**

RANK	IV
Z1	10 ~ 12
Z2	12 ~ 14
Z3	14 ~ 16

※ Luminous intensity is tested at a current pulse duration of 25ms and accuracy of ±10%.

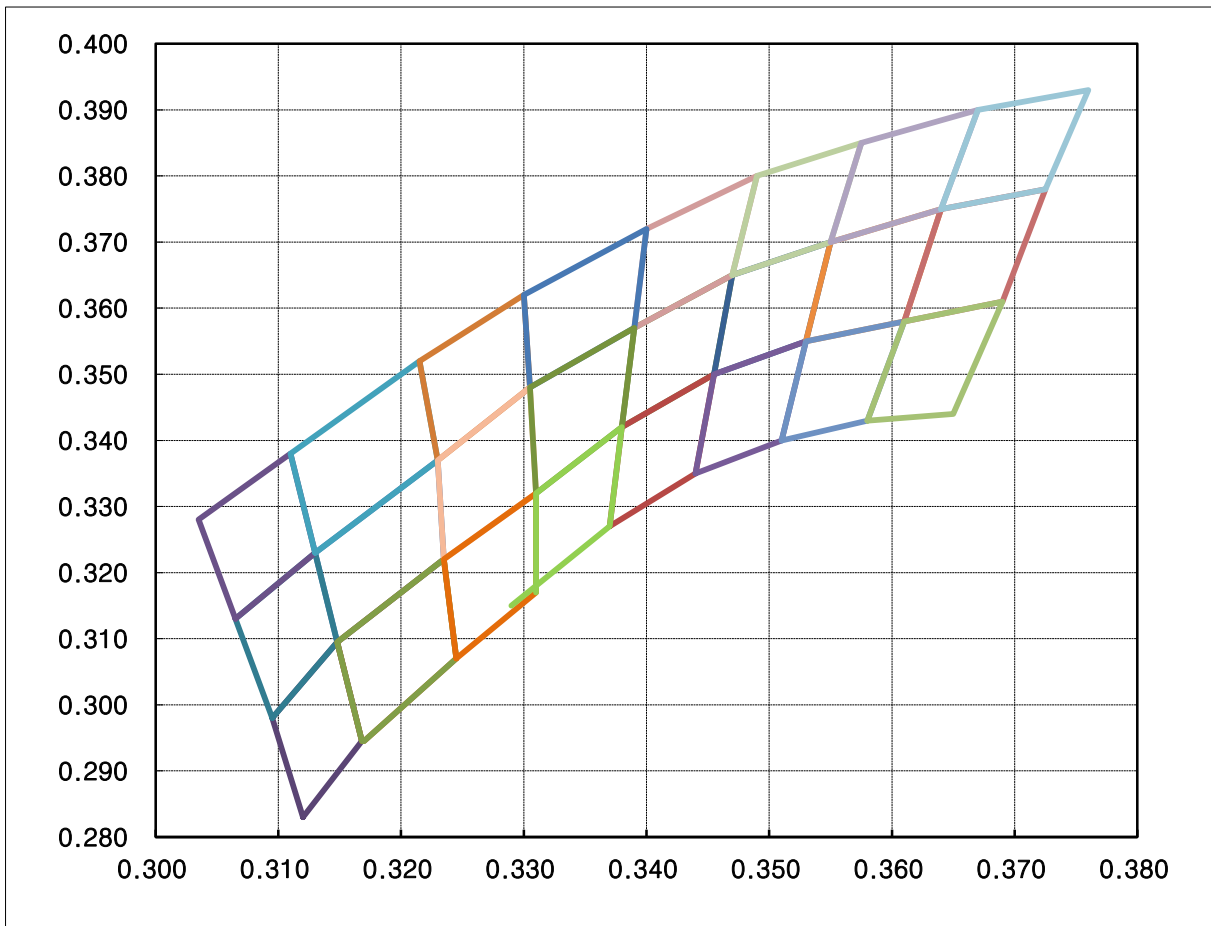
■ **Forward Voltage**

JAN . 15 . 2013 Rev.00

RANK	VF
L3	2.9 ~ 3.0
1	3.0 ~ 3.1
2	3.1 ~ 3.2
3	3.2 ~ 3.3
4	3.3 ~ 3.4

※ Voltages are tested at a current pulse duration of 1ms and accuracy of ±0.1V.

■ **Chromaticity Coordinates**



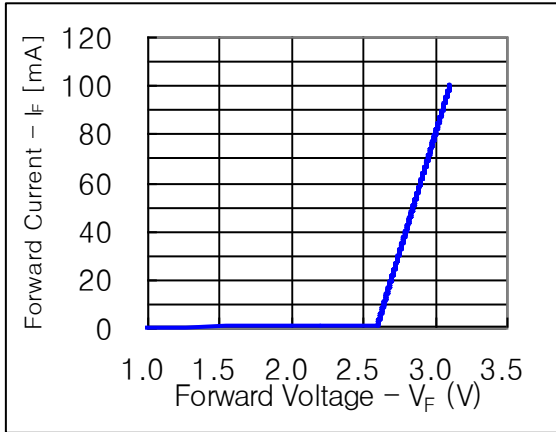
**TOP VIEW LED**

**ETL-F3W2100-P1C**

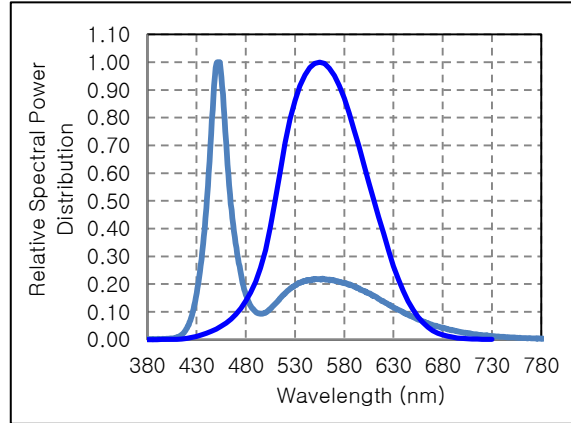
6500~7000K		6000~6500K		5600~6000K		5300~5600K		5000~5300K	
AA		BA		CA		DA		EA	
Cx	Cy	Cx	Cy	Cx	Cy	Cx	Cy	Cx	Cy
0.3120	0.2830	0.3168	0.2945	0.3245	0.3070	0.3310	0.3170	0.3370	0.3270
0.3095	0.2980	0.3148	0.3095	0.3235	0.3220	0.3310	0.3320	0.3380	0.3420
0.3148	0.3095	0.3235	0.3220	0.3310	0.3320	0.3380	0.3420	0.3455	0.3500
0.3168	0.2945	0.3245	0.3070	0.3310	0.3170	0.3370	0.3270	0.3440	0.3350
6500~7000K		6000~6500K		5600~6000K		5300~5600K		5000~5300K	
AB		BB		CB		DB		EB	
Cx	Cy	Cx	Cy	Cx	Cy	Cx	Cy	Cx	Cy
0.3095	0.2980	0.3148	0.3095	0.3235	0.3220	0.3310	0.3320	0.3380	0.3420
0.3065	0.3130	0.3130	0.3230	0.3230	0.3370	0.3305	0.3480	0.3390	0.3570
0.3130	0.3230	0.3230	0.3370	0.3305	0.3480	0.3390	0.3570	0.3470	0.3650
0.3148	0.3095	0.3235	0.3220	0.3310	0.3320	0.3380	0.3420	0.3455	0.3500
6500~7000K		6000~6500K		5600~6000K		5300~5600K		5000~5300K	
AC		BC		CC		DC		EC	
Cx	Cy	Cx	Cy	Cx	Cy	Cx	Cy	Cx	Cy
0.3065	0.3130	0.3130	0.3230	0.3230	0.3370	0.3305	0.3480	0.3390	0.3570
0.3035	0.3280	0.3110	0.3380	0.3215	0.3520	0.3300	0.3620	0.3400	0.3720
0.3110	0.3380	0.3215	0.3520	0.3300	0.3620	0.3400	0.3720	0.3490	0.3800
0.3130	0.3230	0.3230	0.3370	0.3305	0.3480	0.3390	0.3570	0.3470	0.3650
4745~5000K		4745~5000K		4745~5000K		4500~4745K		4500~4745K	
FA		FB		FC		GA		GB	
Cx	Cy	Cx	Cy	Cx	Cy	Cx	Cy	Cx	Cy
0.3470	0.3650	0.3455	0.3500	0.3470	0.3650	0.3510	0.3400	0.3530	0.3550
0.3490	0.3800	0.3470	0.3650	0.3490	0.3800	0.3530	0.3550	0.3550	0.3700
0.3575	0.3850	0.3550	0.3700	0.3575	0.3850	0.3610	0.3580	0.3640	0.3750
0.3550	0.3700	0.3530	0.3550	0.3550	0.3700	0.3580	0.3430	0.3610	0.3580
4500~4745K		4260~4500K		4260~4500K		4260~4500K			
GC		HA		HB		HC			
Cx	Cy	Cx	Cy	Cx	Cy	Cx	Cy		
0.3550	0.3700	0.3580	0.3430	0.3610	0.3580	0.3640	0.3750		
0.3575	0.3850	0.3610	0.3580	0.3640	0.3750	0.3670	0.3900		
0.3670	0.3900	0.3690	0.3610	0.3725	0.3780	0.3760	0.3930		
0.3640	0.3750	0.3650	0.3440	0.3690	0.3610	0.3725	0.3780		

7. Characteristic Graph

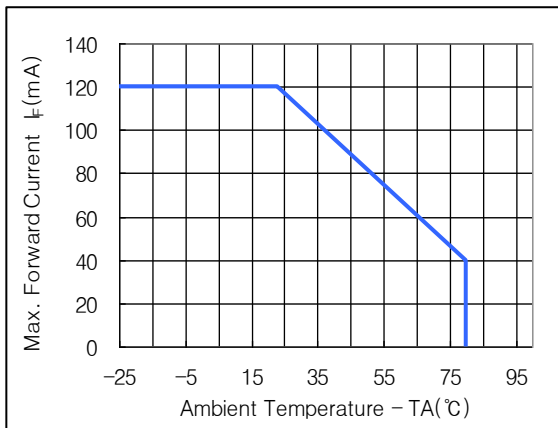
Forward Voltage vs Forward Current Graph



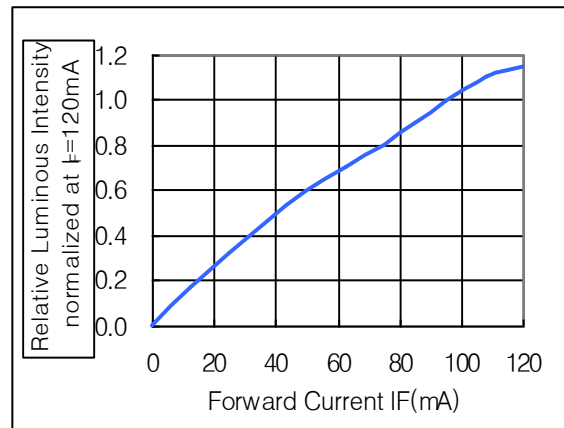
Spectrum Graph



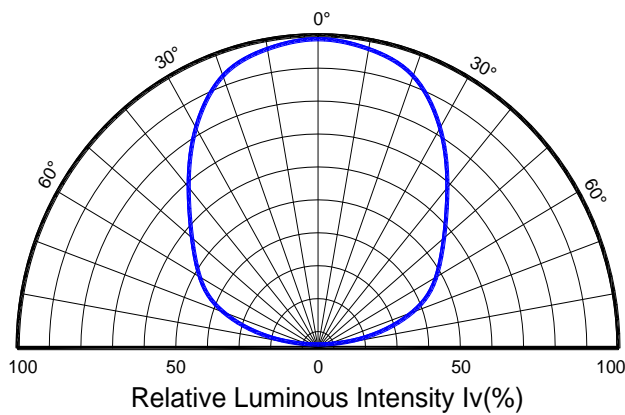
Forward Current Derating Graph



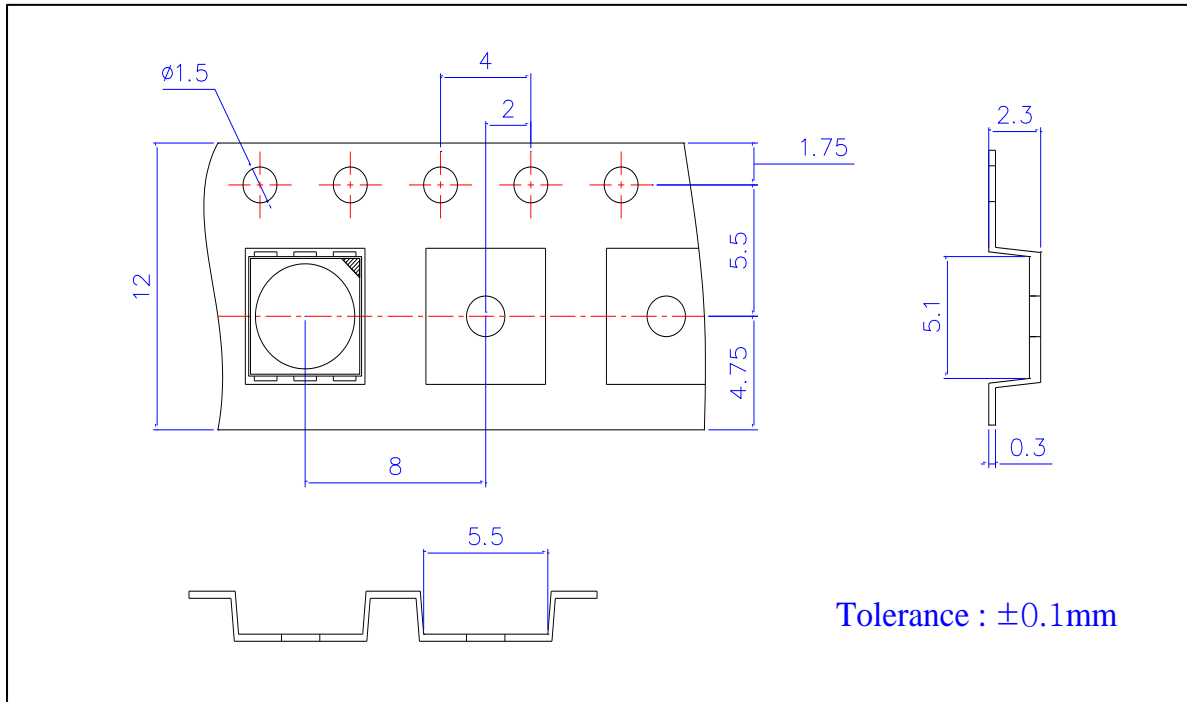
Forward Current vs Relative Luminosity



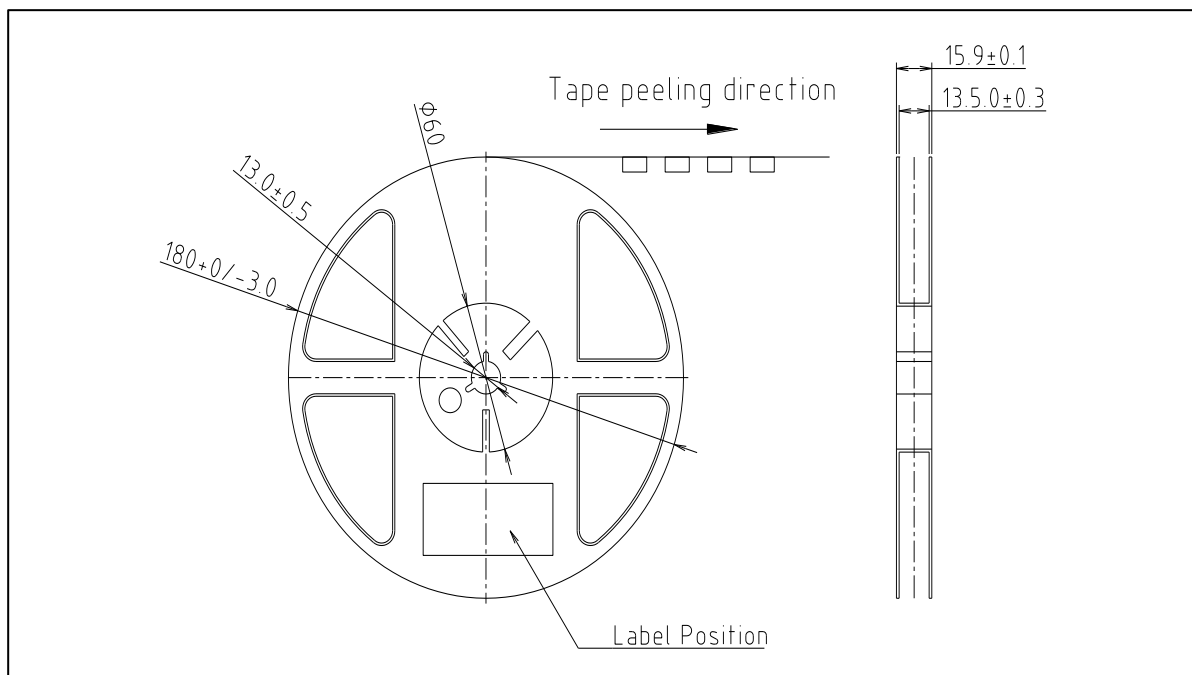
Radiation Diagram



8. Taping pocket Dimension



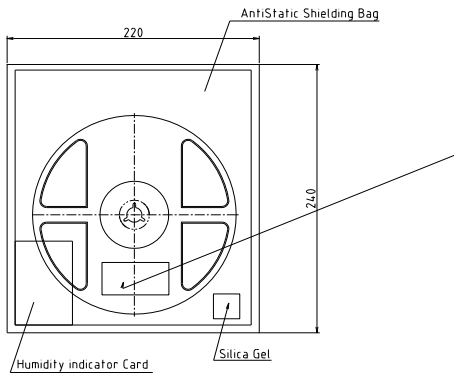
9. Reel Dimension






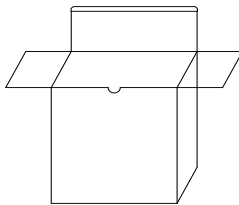
10. Packing


Reel & Aluminum Vinyl Bag



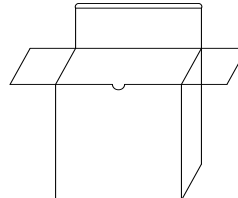
MODEL :  
 LOT No. :  
 RANK :  
 Q'TY : 1,000 pcs  
 DATE :  
 **ENTEC** LED & ELECTRONIC CO., LTD.  
[Http://entecene.co.kr](http://entecene.co.kr) Tel : 82-31-298-3332


Inner box (小)



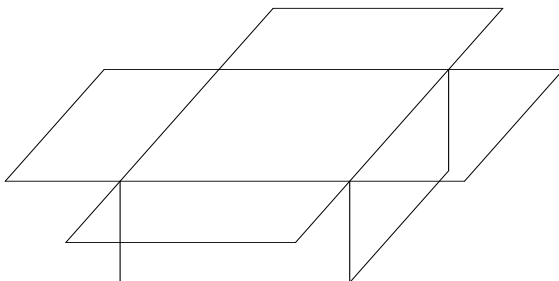
MODEL :  
 Q'TY : 5,000 pcs  
 DATE :  
 **ENTEC** LED & ELECTRONIC CO., LTD.  
[Http://entecene.co.kr](http://entecene.co.kr) Tel : 82-31-298-3332


Inner box (大)



MODEL :  
 Q'TY : 10,000 pcs  
 DATE :  
 **ENTEC** LED & ELECTRONIC CO., LTD.  
[Http://entecene.co.kr](http://entecene.co.kr) Tel : 82-31-298-3332

Out box

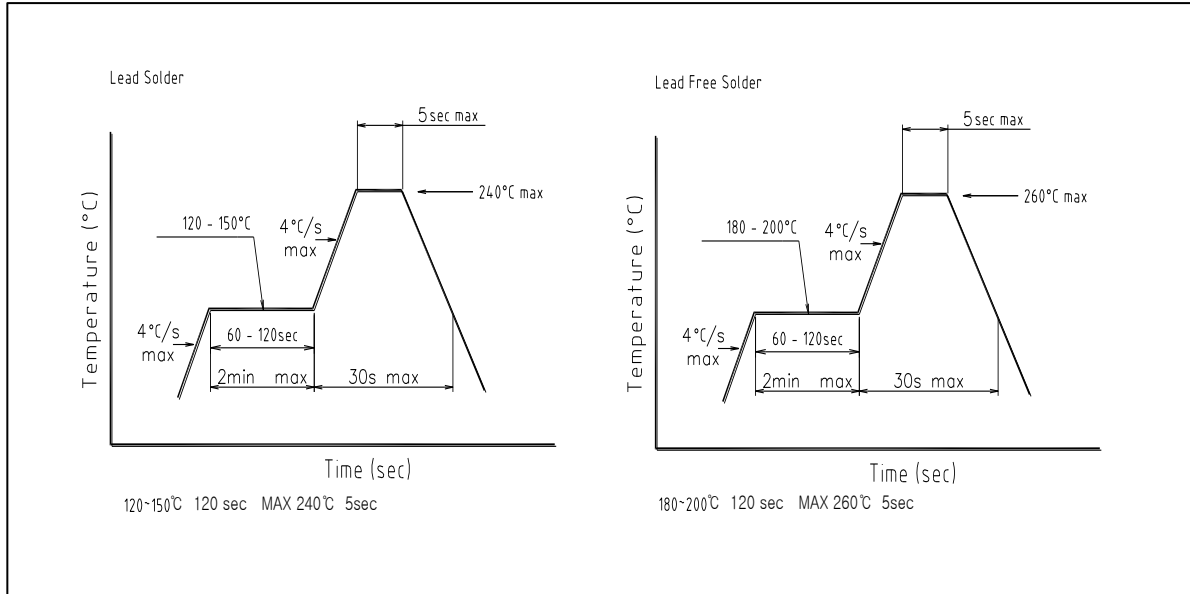


MODEL :  
 Q'TY : 40,000 pcs  
 DATE :  
 **ENTEC** LED & ELECTRONIC CO., LTD.  
[Http://entecene.co.kr](http://entecene.co.kr) Tel : 82-31-298-3332

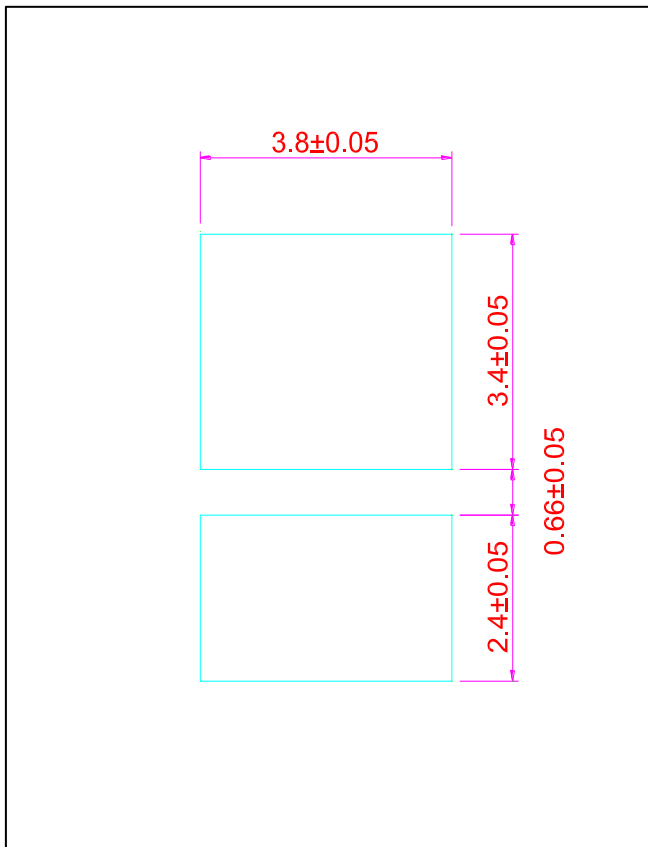
Box Spec.

	Dimension	Reel / Box	Q'ty(pcs)
Inner Box (小)	235×245×85	5 reel	5,000
Inner Box (大)	235×245×170	10 reel	10,000
Out Box	490×270×365	40 reel	40,000

11. Soldering Profile



12. Soldering Pad Pattern



### 13. Reliability Results

Test item	Test conditions	Standard test method	Note	Fail/sample
Thermal shock	-40℃ ~ 100℃ [1min(10sec.)1min] (Pre treatment 30℃, 70%, 168hrs.)	JEITA ED-4701 300 307	100 Cycle	0 / 22
Temperature cycle	-40℃ ~ 25℃ ~ 100℃ ~ 25℃ 30min 5min 30min 5min	JEITA ED-4701 100 105	100 Cycle	0 / 22
Moisture resistance cyclic	25℃ ~ 65℃ ~ -10℃ 90%RH 24Hrs./1cycle	JEITA ED-4701 200 203	10 Cycle	0 / 22
High temperature storage	Ta = 100℃	JEITA ED-4701 200 201	1000 hrs.	0 / 22
Temperature humidity storage	Ta = 60℃, RH = 90%	JEITA ED-4701 100 103	1000 hrs.	0 / 22
Low temperature storage	Ta = -40℃	JEITA ED-4701 200 202	1000 hrs.	0 / 22
Resistance to soldeing heat (dip soldering)	Tsld = 260℃. 10sec (pre treatment 30℃, 70%,168hrs.)	JEITA ED-4701 300 301	1 time	0 / 22
Resistance to soldeing heat (reflow soldering)	Tsld = 260℃. 10sec (pre treatment 30℃, 70%,168hrs.)	JEITA ED-4701 300 301	2 time	0 / 22
Vibration	200m/s <sup>2</sup> , 100~2000Hz (sweep 4min) 48min, 3directions	JEITA ED-4701 400 403	4 times	0 / 22
Drop	75cm		3 times	0 / 22
Electrostatic discharge	R =10.5kΩ, C=100pF Test viltage = 2KV	JEITA ED-4701 300 304	3 times	0 / 22
OLT	Ta = 25℃, IF=100mA		1000 hrs.	0 / 22
HTOL	Ta = 85℃, IF=50mA		1000 hrs.	0 / 22
H3TOL	60℃, RH=90%, IF=80mA		1000 hrs.	0 / 22
LTOL	Ta=-40℃, IF=60mA		1000 hrs.	0 / 22

### ■ Criteria for judging the damage

Item	Symbol	Test conditions	Criteria for judgement	
			Min.	Max.
Forward voltage	VF	IF = 100mA	-	U.S.L*)×1.1
Luminous intensity condition1	IV	IF = 100mA	L.S.L.***)×0.7	-
Luminous intensity condition2 **	IV	IF = 100mA	L.S.L.***)×0.5	-

U.S.L\*) : Upper standard level L.S.L\*) : Lower standard level

\*\* These test items are judged by the criteria of Luminous intensity condition 2

## 14. Precaution for use

### 14-1. Moisture Proof Package

- When moisture is absorbed into the SMT package it may vaporize and expand during soldering. There is a possibility that this can cause exfoliation of the contacts and damage to the optical characteristics of the LEDs.  
For this reason, the moisture proof package is used to keep moisture to a minimum in the package.
- A package of a moisture absorber  
The silica gel changes its color from blue to pink as it absorbs moisture.

### 14-2. Storage conditions

- Before opening the package
  - ⇒ The LEDs should be kept at 30°C or less and 85%RH or less.  
The LEDs should be used within a year.
  - When storing the LEDs moisture proof packing with absorbent material (silica gel) is recommended.
- After opening the package
  - ⇒ The LEDs should be kept at 30°C or less and 65%RH or less.  
The LEDs should be soldered quick after opening the package.  
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 moisture absorbent material (silica gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions.  
(Baking treatment : more than 24 hours at 65±5°C)
- ENTEC LED electrode sections are comprised of a silver plated copper alloy.  
The silver surface may be affected by environments which contain corrosive gases and so on.  
Please avoid conditions which may cause the LED corrode, tarnish or discolor.  
This corrosion or discoloration may cause difficulty during soldering operations.  
It is recommended that the User use the LEDs as soon as possible.
- Please avoid rapid transitions in ambient temperature, especially in high humidity environments where condensation can occur.

### 14-3. Static electricity

- Static electricity or surge voltage damages the LEDs.  
It is recommended that a wrist band or an anti-electrostatic glove be used when handling the LEDs.
- All devices, equipment and machinery must be properly grounded.  
It is recommended that measure be taken against surge voltage on the equipment that mounts the LEDs.
- When inspecting the final products in which LEDs were assembled, it is recommended to check whether the assembled LEDs are damaged by static electricity or not.  
It is easy to find static-damaged LEDs by light-on test at a lower current (below 1mA is recommended).
- Damaged LEDs will show some unusual characteristics such as the forward voltage becomes lower, or the LEDs do not light at the low current. (Criteria :  $V_F > 2.0V$  at  $I_F = 0.5mA$ )

## 14-4. Cleaning

- It is recommended that isopropyl alcohol be used as a solvent or cleaning the LEDs.  
When using other solvents, it should be confirmed beforehand whether the solvents will dissolve the package and the resin or not.  
Freon solvents should not be used to clean the LEDs because of worldwide regulations.
- Do not clean the LEDs by the ul  
When it is absolutely necessary, the influence of ultrasonic cleaning on the LEDs depends on factors such as ultrasonic power and the assembled condition.  
Before cleaning, a pre-test should be done to confirm whether any damage to the LEDs will occur.

## 14-5. Heat generation

- Thermal design of the end product is of paramount importance.  
Please consider the heat generation of the LED when making the system design.  
The coefficient of temperature increase per input electric power is affected by the thermal resistance of the circuit board and density of LED placement on the board, as well as other components.  
It is necessary to avoid intense heat generation and operate within the maximum ratings given in this specification.
- The operating current should be decided after considering the ambient maximum temperature of LEDs.

## 14-6. Others

- The LED light output is strong enough to injure human eyes.  
Precautions must be taken to prevent looking directly at the LEDs with unaided eyes for more than a few seconds.
- Flashing lights have been known to cause discomfort in people; you can prevent this by taking precautions during use.  
Also, people should be cautious when using equipment that has had LEDs incorporated into it.
- The LEDs described in this brochure are intended to be used for ordinary electronic equipment (such as office equipment, communication equipment, measurement instruments and household appliances).
- User shall not reverse engineer by disassembling or analysis of the LEDs without having prior written consent from ENTEC.  
We defective LEDs are found, the User shall inform ENTEC directly before disassembling or analysis.
- The formal specifications must be exchanged and signed by both parties before large volume purchase begins.
- The appearance and specifications of the product may be modified for improvement without notice.