

Customer :

# Specification for Approval

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Part Name : WH20C1F

**(Preliminary)**

Customer : \_\_\_\_\_

2015. . . .

Checked	Checked	Approved	Remark
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WOOREE E&L Co., Ltd.

2015. 11. 12.

Designed	Checked	Checked	Approved
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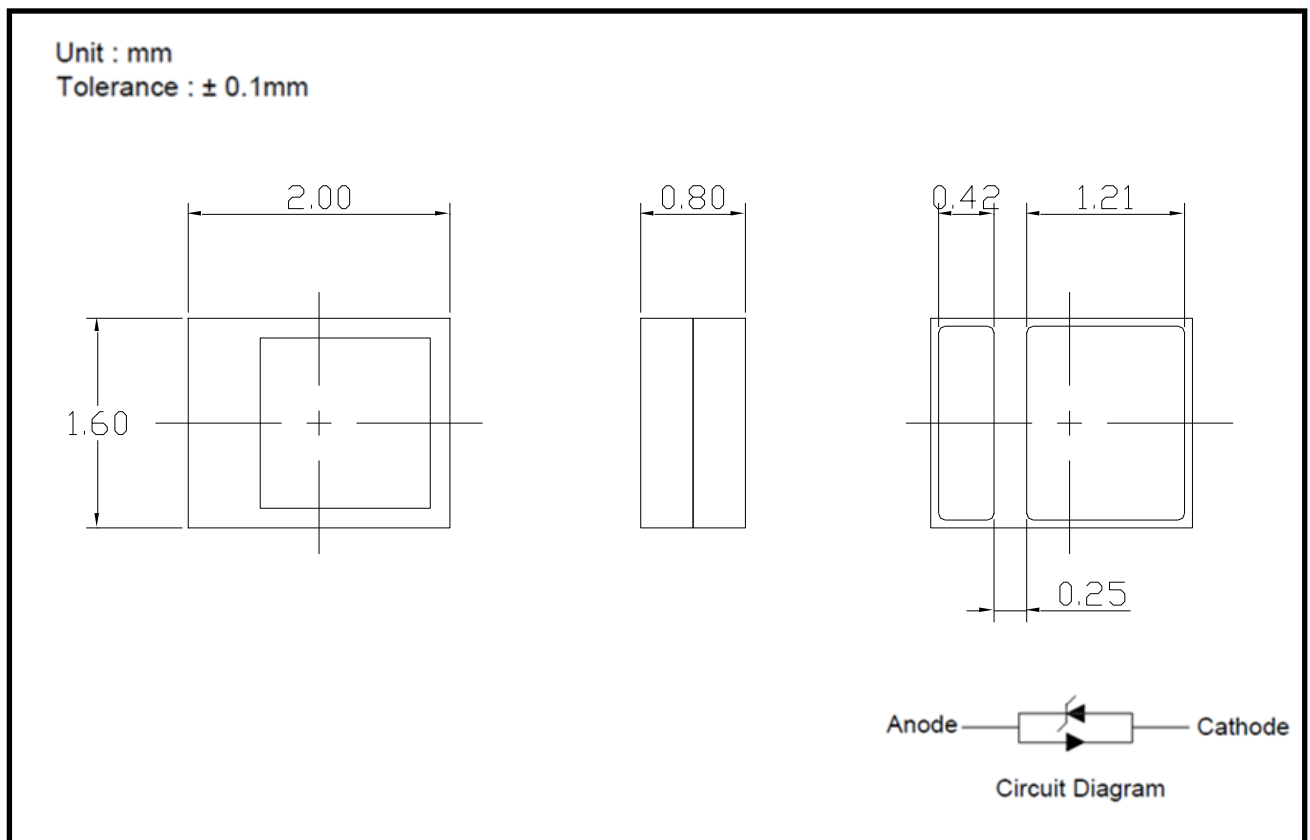
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## 1. Features

- SMD Top View Type
- Package : Package for mobile flash
- Long Time Reliability
- Package size is 2.0 \* 1.6 \* 0.8t (mm), 2Lead

## 2. Outline Dimension



### Part list

Parts No.	Name	Description
1	Chip source	Flip Chip Blue LED
2	Body	Ceramic
3	Phosphor	Yellow color Emitting
4	Encapsulant	Silicone Resin

### 3. Absolute maximum ratings

Item	Symbol	Absolute Maximum Ratings	Unit
Forward Current	$I_F$	350	mA
Power Dissipation	$P_D$	1.2	W
Pulse Forward Current	$I_{FP*1}$	1200	mA
Reverse Current	$I_R$	50	mA
Operating Temperature	$T_{OPR}$	-40 ~ +85	°C
Storage Temperature	$T_{STG}$	-40 ~ +100	°C
Solder Temperature	$T_{SLD}$	Reflow 260 °C, 10sec under Hand 340 °C 3sec under	°C
Junction Temperature	$T_J$	130	°C

\*1. Pulse Width  $\leq$  500msec, Duty  $\leq$  10%

### 4. Electrical/Optical characteristics

( $T_a=25^\circ\text{C}$ )

Item	Symbol	Condition	Value			Unit
			Min.	Typ.	Max.	
Luminous Flux *1	$\Phi_V$	$I_F=1000\text{mA}$	245	265	-	lm
Forward Voltage *2	$V_F$	$I_F=1000\text{mA}$	-	3.6	4.0	V
Color Temperature *3 [CIE 1931 Coordinates]	CCT	$I_F=1000\text{mA}$	6500	-	5500	K
Reverse Voltage	$V_R$	$I_R=5\text{mA}$	-0.7	-	-1.2	V
Viewing Angle	$2\Theta_{1/2}$	$I_F=350\text{mA}$	-	120	-	Deg.

\*1. Luminous Flux measurement allowance is  $\pm 10\%$

\*2. Forward voltage measurement allowance is  $\pm 0.1\text{V}$

\*3. CIE coordinates measurement allowance is  $\pm 100\text{K}$

## 5. Ranks

### (1) Forward Voltage

Rank	Condition	Min.	Typ.	Max.	Unit
1	$I_F = 1000\text{mA}$	2.8	3.6	4.0	V

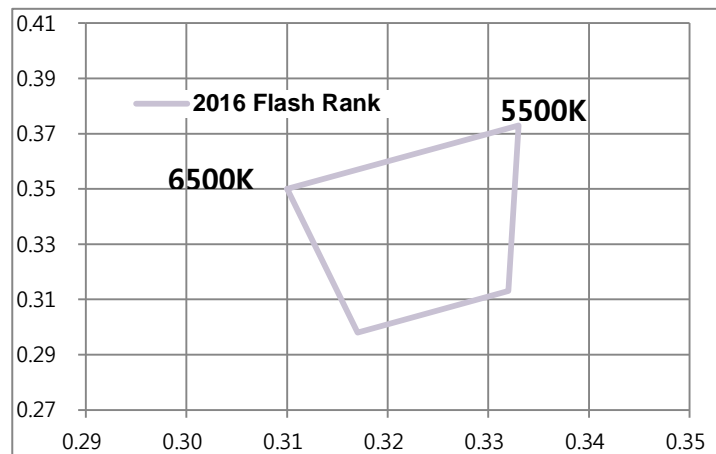
### (2) Luminous Flux

Rank	Condition	Min.	Typ.	Max.	Unit
L	$I_F = 1000\text{mA}$	245	265	-	lm

### (3) Chromaticity coordinates

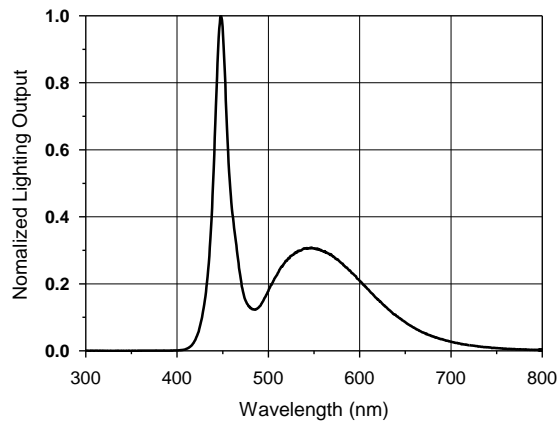
( $I_F = 1000\text{mA}$ ,  $T_a = 25^\circ\text{C}$ )

60A	
x	y
0.310	0.350
0.333	0.373
0.332	0.313
0.317	0.298



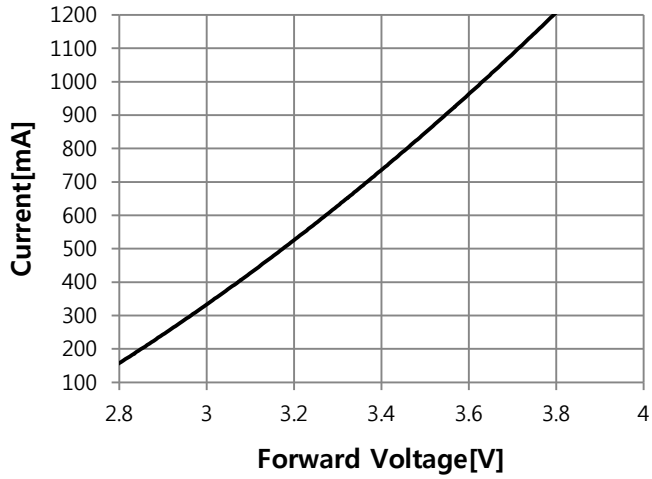
## 6. Color Spectrum

( $I_F = 1000\text{mA}$ ,  $T_a = 25^\circ\text{C}$ )

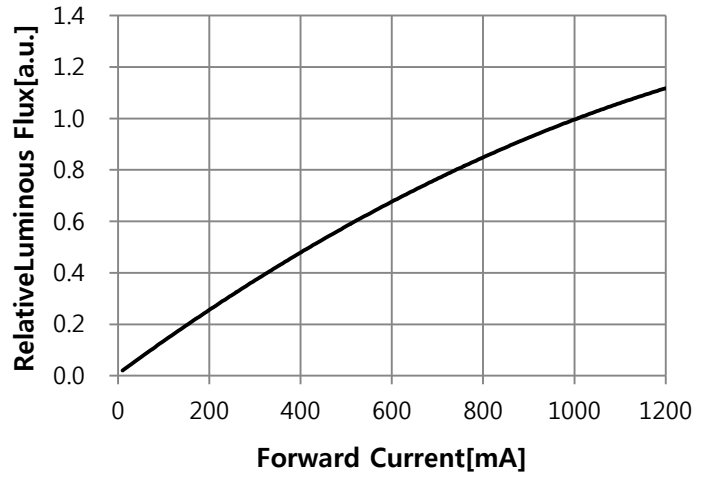


# 7.Characteristic Diagrams

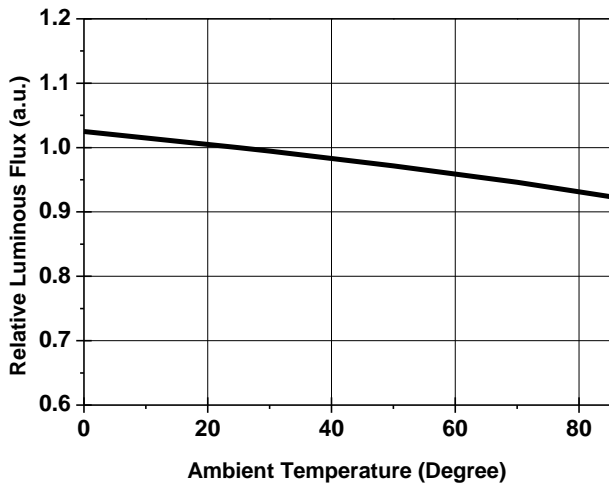
(1) Forward Voltage vs Forward Current  
(Ta = 25°C)



(2) Forward Current vs Relative L-Flux  
(Ta = 25°C)



(3) Ambient Temperature vs Relative Luminosity  
(If=350mA)



## 8. Reliability

### (1) Test items and results

Test	EA	Stress Condition	Test Acceptance	Intermediate Test Points	PASS/ FAIL
Pulsed WHTOL	20	Ta=85°C, RH=85%, If=1,200mA Pulsed at 0.5sec ON/4.5sec OFF 10% duty cycle	100,000 cycles (~139 hrs)	0, 10K, 30K, 50K, 75K, 100K cycles	PASS
DC WHTOL	20	Ta=85°C, RH=85%, If=300mA DC	168 hrs	0, 48, 120, 168, hrs	PASS
Reflow	30	Ta=85°C, RH=85%, no bias, 24hrs storage then 2 reflows @ Tpeak=260°C for 10sec then test after 2hrs storage @RT	n.a.	n.a	PASS
Thermal Shock	20	-40°C to+85°C, no bias, 1hr dwell/5min transfer: 2hrs5min/cycle then test after 2hr storage @RT	30 cycles	0, 30 cycles	PASS
RTOL	20	Ta=25°C, If=300mA DC	168 hrs	0, 48, 120, 168, hrs	PASS
HTOL	20	Ta=85°C, If=300mA DC	168 hrs	0, 48, 120, 168, hrs	PASS

### (2) Criteria for judging the damage

ITEM	Symbol	Test Condition	Criteria for Judgement	
			Min.	Max.
Forward Voltage	VF	If=350mA	-	USL *1 × 1.2
Luminous Intensity	Iv	If=350mA	LSL*2 × 0.7	

\*1) U.S.L. : Upper Standard Level    \*2) L.S.L : Lower Standard Level

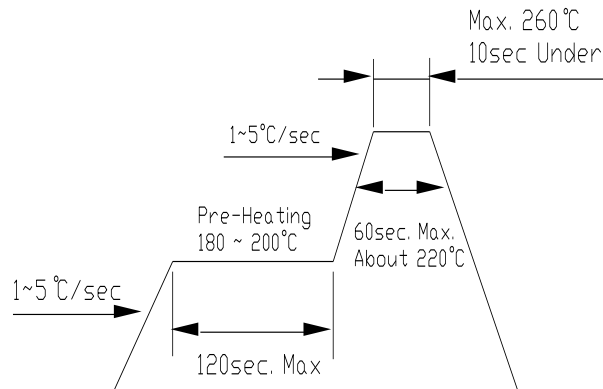
## 9.Recommend soldering conditions

### (1) Recommend soldering conditions

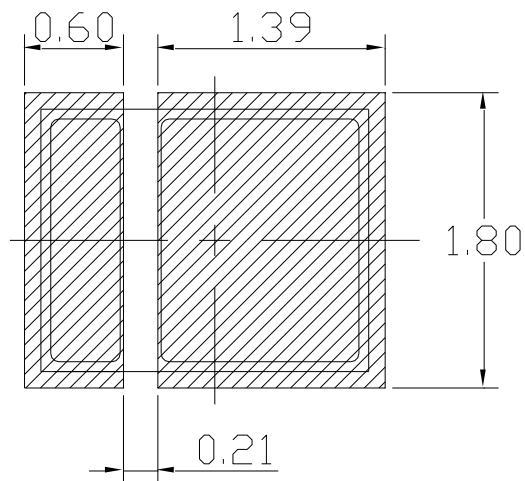
Reflow Soldering		Hand Soldering(Lead Part)	
Pre-heat Pre-heat time Peak temperature Soldering Time Condition	Lead Free Solder	Temperature Soldering Time	Max. 340℃ Max. 3sec (only one time)
	180-200℃ 120sec. Max. Max. 260℃ Max. 10sec		

### Temperature-profile

#### <Lead-free Solder>



#### <Recommended soldering pad design>



Unit : mm  
Tolerance±0.05



## **(2)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. The moisture proof package is made of an aluminum moisture proof bag. A package of a moisture absorbent material(silica gel) is inserted into the aluminum moisture proof bag. The silica gel changes its color from blue to pink as it absorbs moisture.

## **(3)Storage**

[Storage conditions]

Before opening the package

The LEDs should be kept at 30°C or less and 90% 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°C or less and 70% RH or less. The LEDs should be soldered within 168 hours(7days) after opening the package. If unused LEDs remain, they should be stored in moisture proof packages, such as sealed containers with package 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 24hours at 65±5°C

## **(4)Heat Generation**

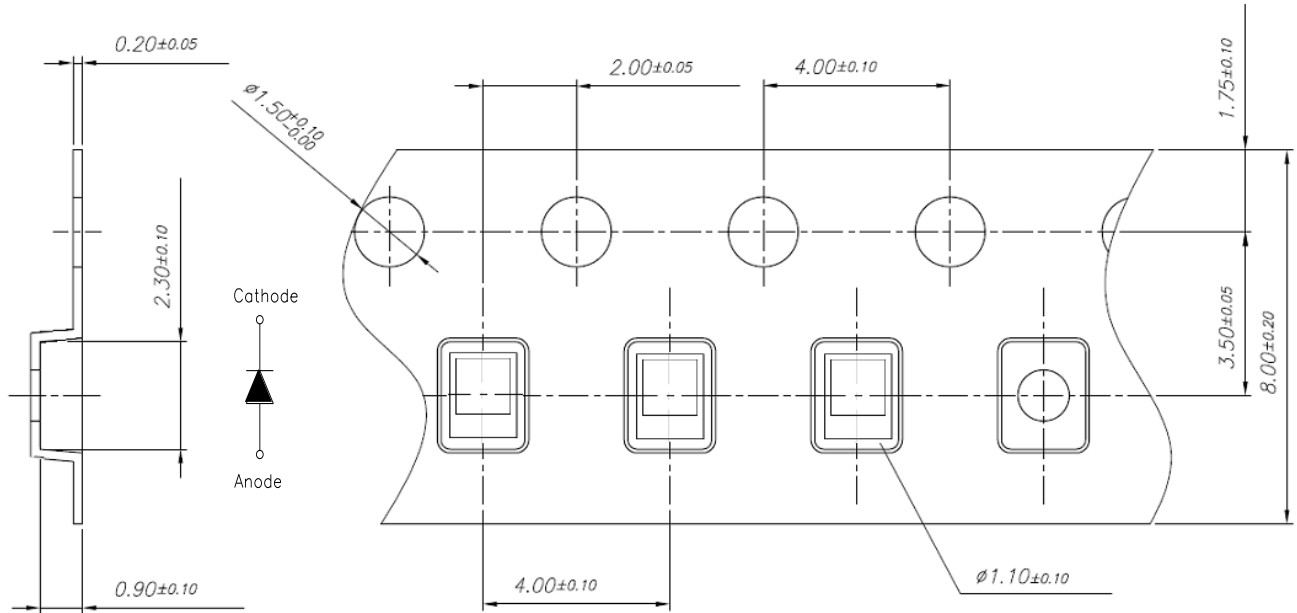
Thermal design of the end product is of paramount importance. Please consider the heat generation of the LED when making the system design. The coefficient of temperature increase per input electric power is affected by the thermal resistance of the circuit board and density of LED placement on the board,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

The operating current should be decided after considering the ambient maximum temperature of LEDs.

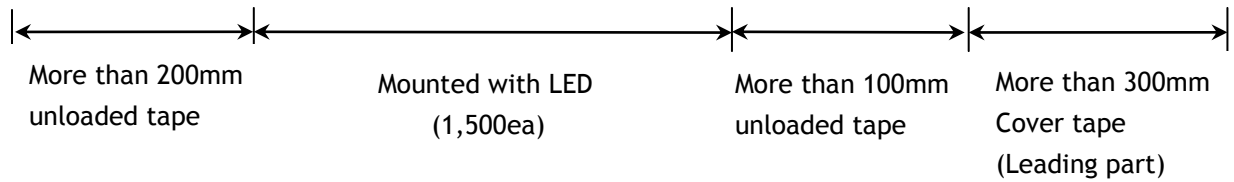
# 10. Packing & Label

## (1) Taping part

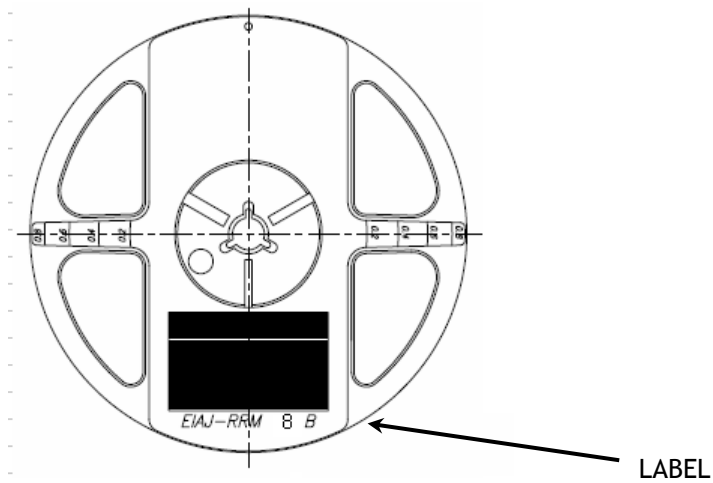
unit : mm



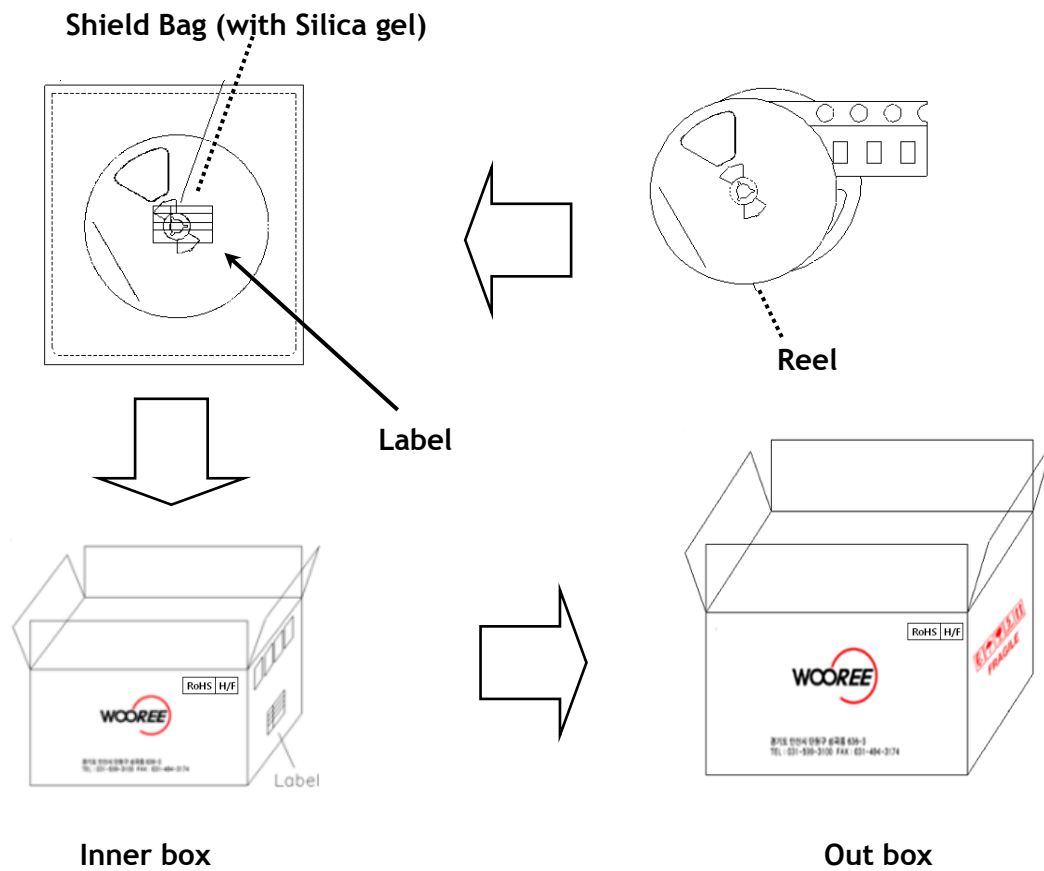
tolerance :  $\pm 0.1$



## (2) Reel part (Q'ty : 1,500ea/Reel)

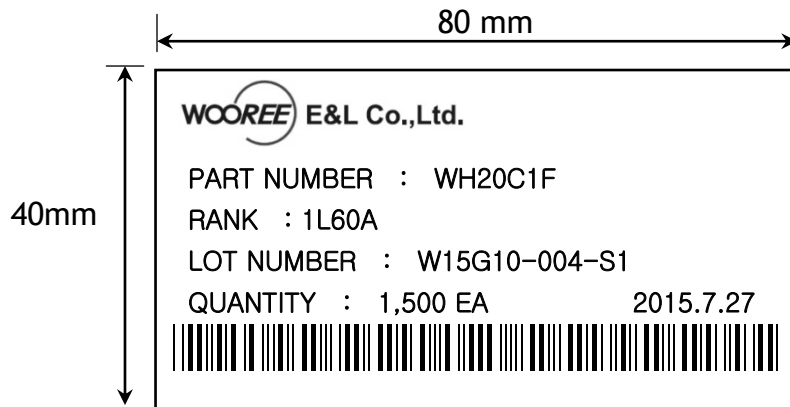


### (3) Boxing

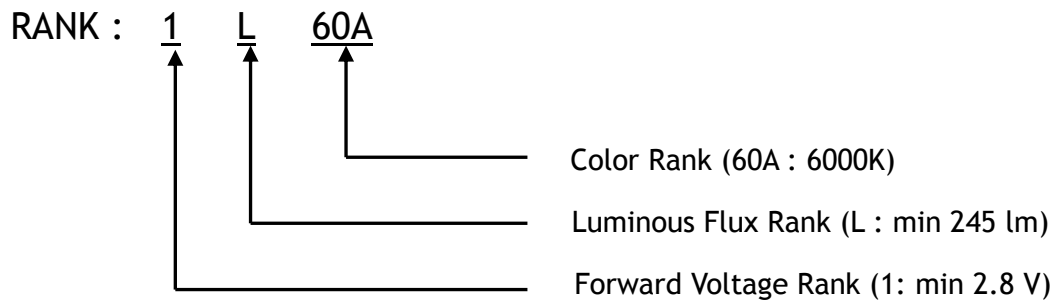


Box	Dimension (mm)	Reel/Box	Quantity/Box
Inner box	500*260*250	30 Reel max.	45,000 ea
Out box	555*515*540	120 Reel max.	180,000 ea

#### (4) Label Information



#### (5) Rank Code description



## 11. Revision History

Spec NO.			
Title	Specification for Approval		
Times	Date	Summary of revision	Remarks
1	2015. 10. 15	INITIAL ISSUE	R(0)
2	2015.11. 02	Reliability Test Sample Size Midification	R(1)
3	2015.11.12	Reliability Test Item Midification	R(2)