

## Product Specification

# HK - 5630 LED



## Introduction

### Features

- Beam Angle: 120°
- Precondition: JEDEC Level 2a
- Dimension : 5.6 x 3.0 x 0.8 mm
- ESD withstand Voltage : up to  $\pm 5KV$  [HBM]

# 1. Product Code Information

## 1) Luminous Flux Bins ( $T_s = 25^\circ\text{C}$ )

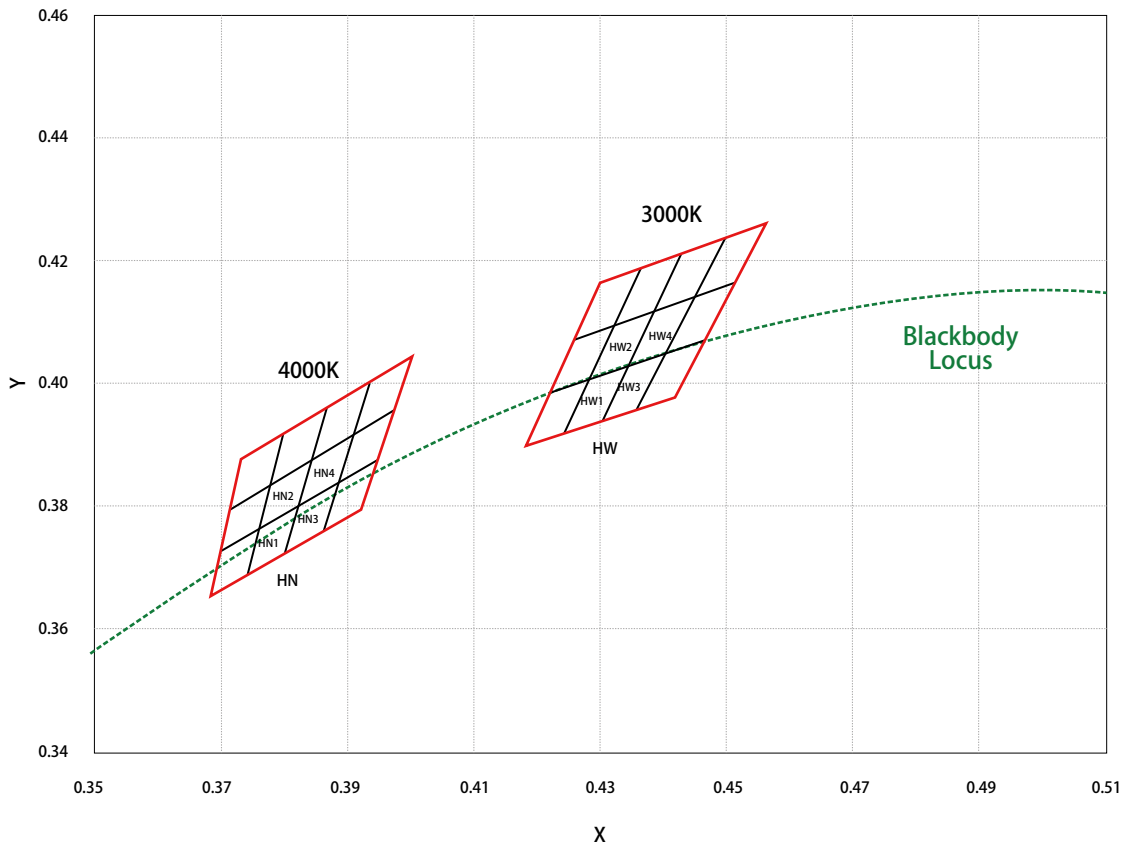
Nominal CCT	Product Code	Flux Rank	Sorting Condition $I_m$ @65mA
			Flux Range ( $\Phi_v, I_m$ )
3000K	5630 warm white	H6	32~34
4000K	5630 natural white	H6	34~36

## 2) Color Binning ( $T_s = 25^\circ\text{C}$ )

### 2-1) Color Binning

Nominal CCT	Product Code	Color Rank	Chromaticity Bins
3000K	5630 warm white	HW (Whole bin)	HW1,HW2,HW3,HW4
4000K	5630 natural white	HN (Whole bin)	HN1,HN2,HN3,HN4

## 2-2) Chromaticity Region & Coordinates



## 2-2) Chromaticity Region & Coordinates (Continued )

Region	CIE X	CIE Y	Region	CIE X	CIE Y
WW rank (3000K)					
HW1	0.4319	0.4004	HW2	0.4341	0.4064
	0.4296	0.3946		0.4319	0.4004
	0.4348	0.3962		0.4371	0.4019
	0.4371	0.4019		0.4395	0.4076
HW3	0.4371	0.4019	HW4	0.4395	0.4076
	0.4348	0.3962		0.4371	0.4019
	0.4400	0.3977		0.4424	0.4034
	0.4424	0.4034		0.4448	0.4089

Region	CIE X	CIE Y	Region	CIE X	CIE Y
NW rank (4000K)					
HN1	0.3777	0.3782	HN2	0.3793	0.3844
	0.3761	0.3720		0.3777	0.3782
	0.3810	0.3748		0.3828	0.3812
	0.3828	0.3812		0.3846	0.3876
HN3	0.3828	0.3812	HN4	0.3846	0.3876
	0.3810	0.3748		0.3828	0.3812
	0.3858	0.3776		0.3879	0.3842
	0.3879	0.3842		0.3899	0.3907

## 2. Characteristics

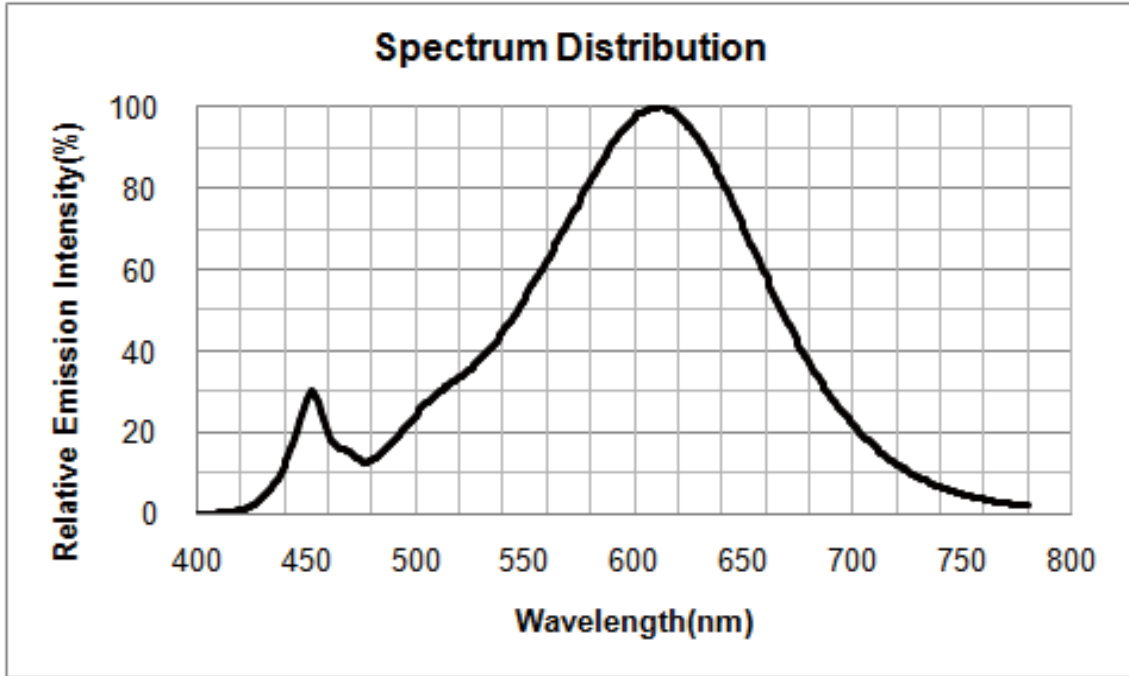
### 1) Absolute Maximum Rating

Item	Symbol	Rating	Condition
Operating temperature range	T <sub>op</sub>	-40°C ~ +85°C	-
Storage temperature range	T <sub>stg</sub>	-40°C ~ +120°C	-
Forward Current	I <sub>F</sub>	150 mA	
Peak Pulsed Forward Current	I <sub>FP</sub>	300 mA	Duty 1/10 pulse width 10ms
Assembly Process Temperature	-	260°C, < 10sec	-
Thermal Resistance (junction to solder point)	R <sub>thj-s</sub>	17	°C/W
LED junction temperature	T <sub>J</sub>	110°C	-
ESD	-	5kV	HBM

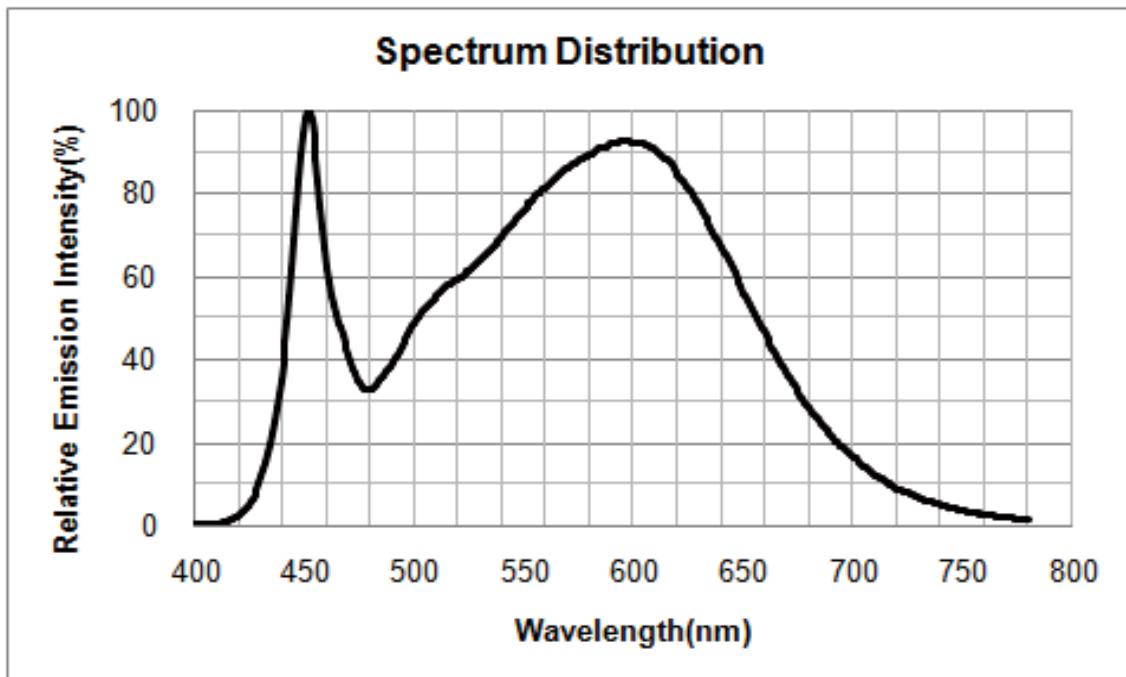
### 3. Typical Characteristics Graph ( $T_s = 25^\circ\text{C}$ )

#### 1) Spectrum Distribution

[CCT: 3000K]



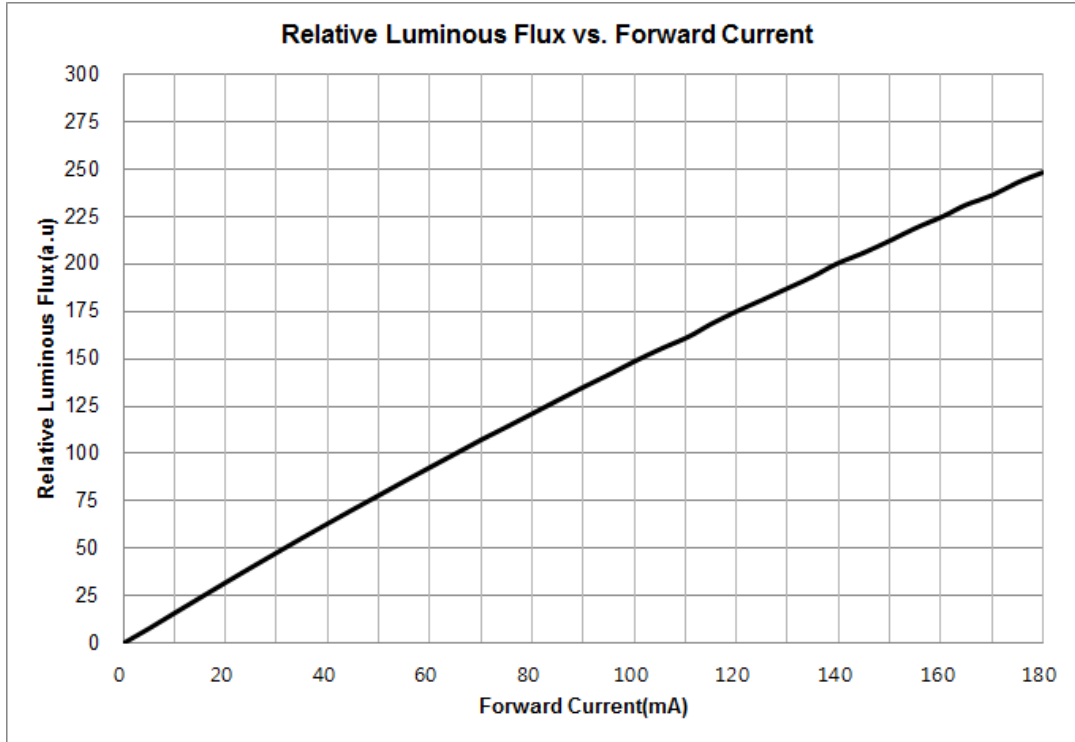
[CCT : 4000K]



## 2) Forward Current Characteristics

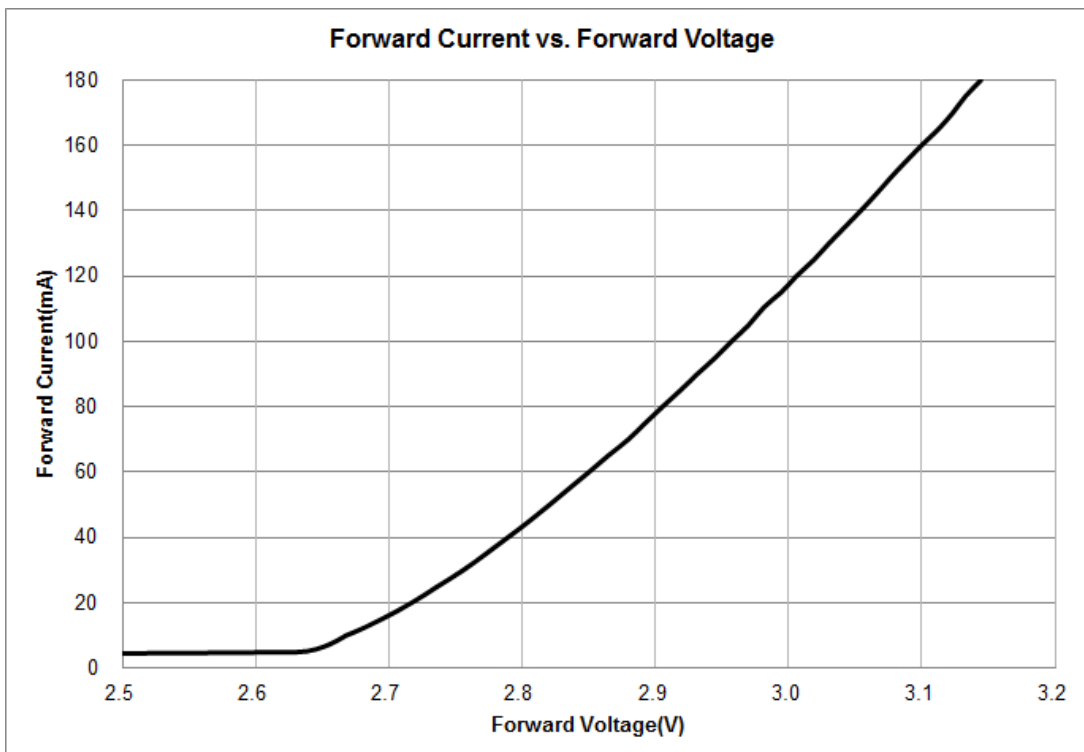
[Relative Luminous Flux vs. Forward Current]

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



[Forward Current vs. Forward Voltage]

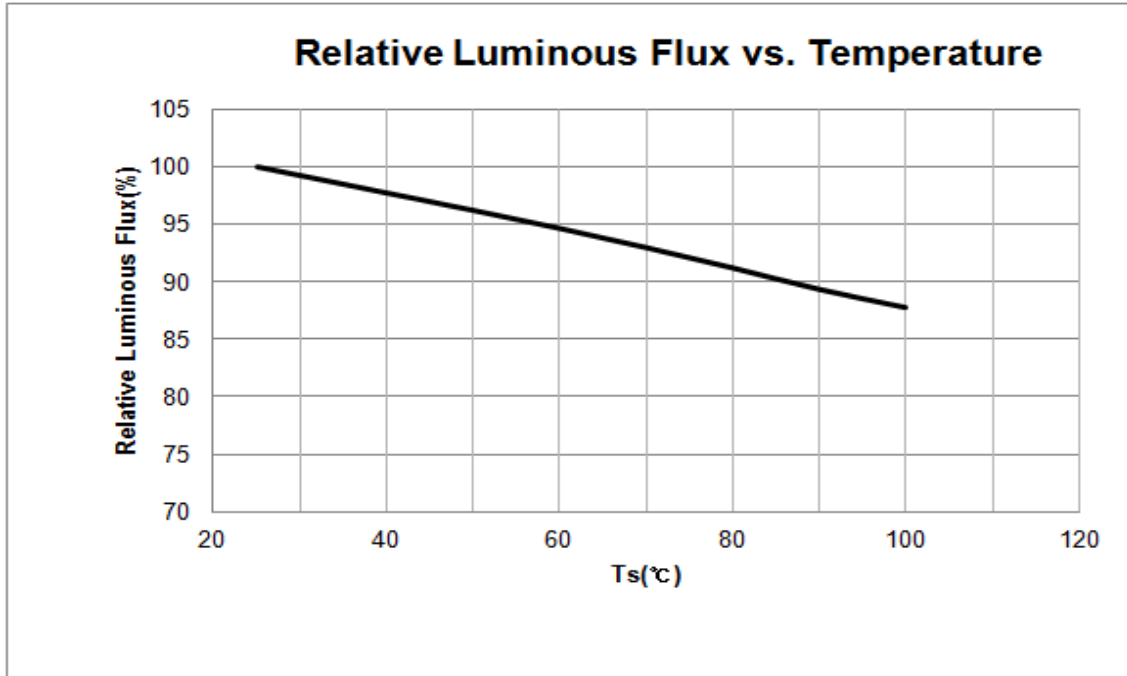
( $T_s = 25^\circ\text{C}$ )



### 3) Temperature Characteristics

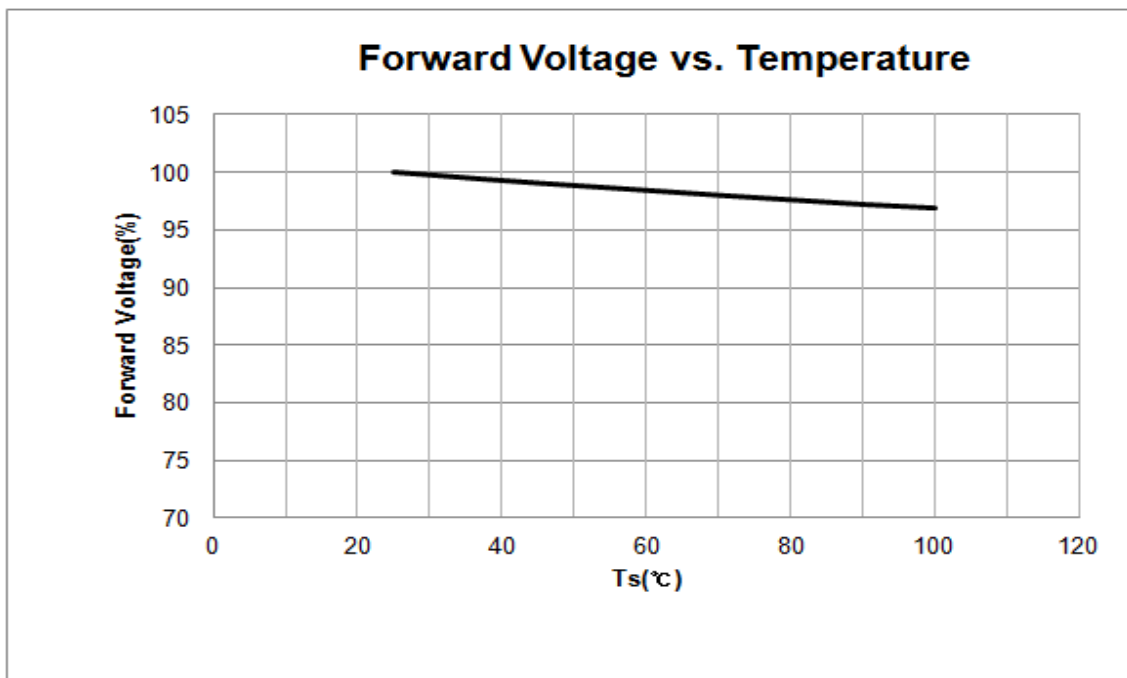
[Relative Luminous Flux vs.  $T_s$ ]

( $I_F = 65\text{mA}$ )



[Forward Voltage vs.  $T_s$ ]

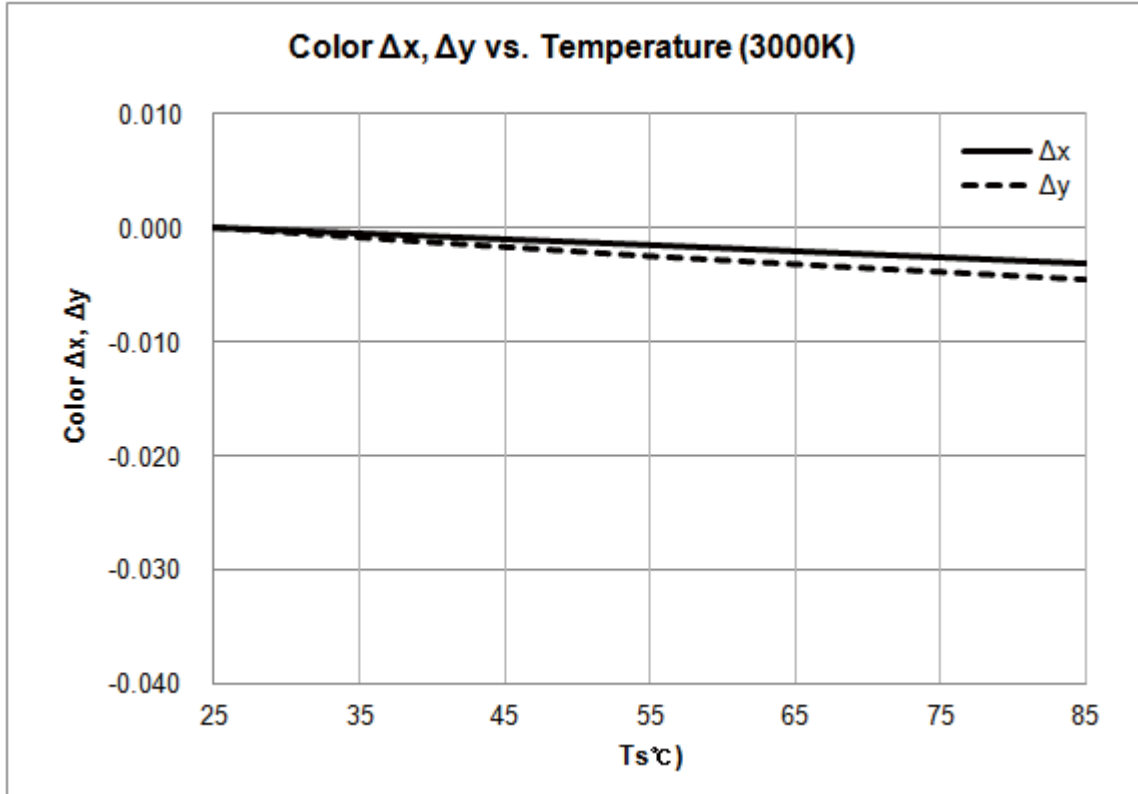
( $I_F = 65\text{mA}$ )



#### 4) Color shift Characteristics

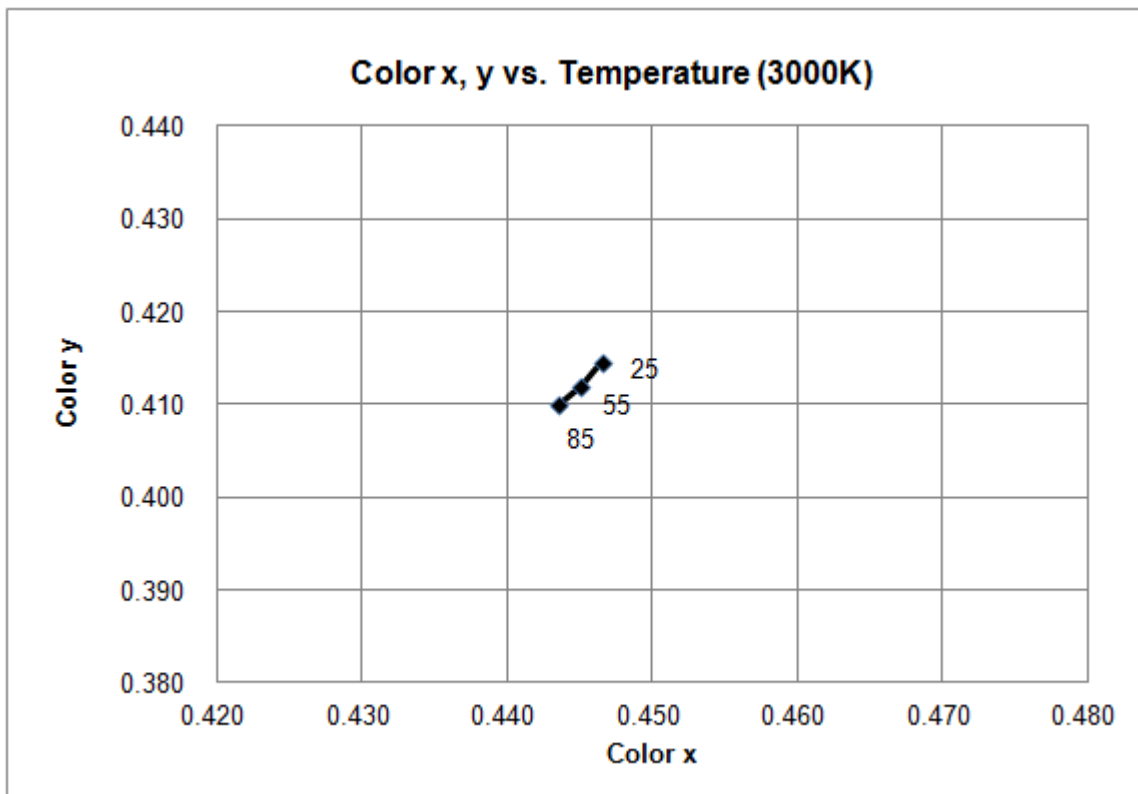
[Color  $\Delta x$ ,  $\Delta y$  vs.  $T_s$ ]

( $I_f = 65\text{mA}$ )



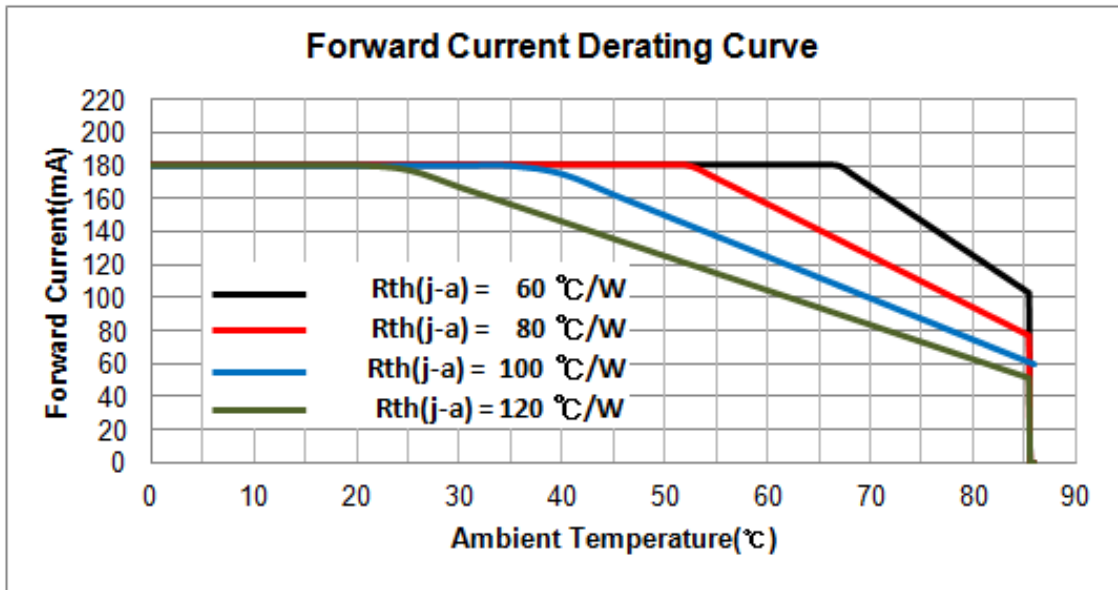
[Color  $x$ ,  $y$  vs.  $T_s$ ]

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



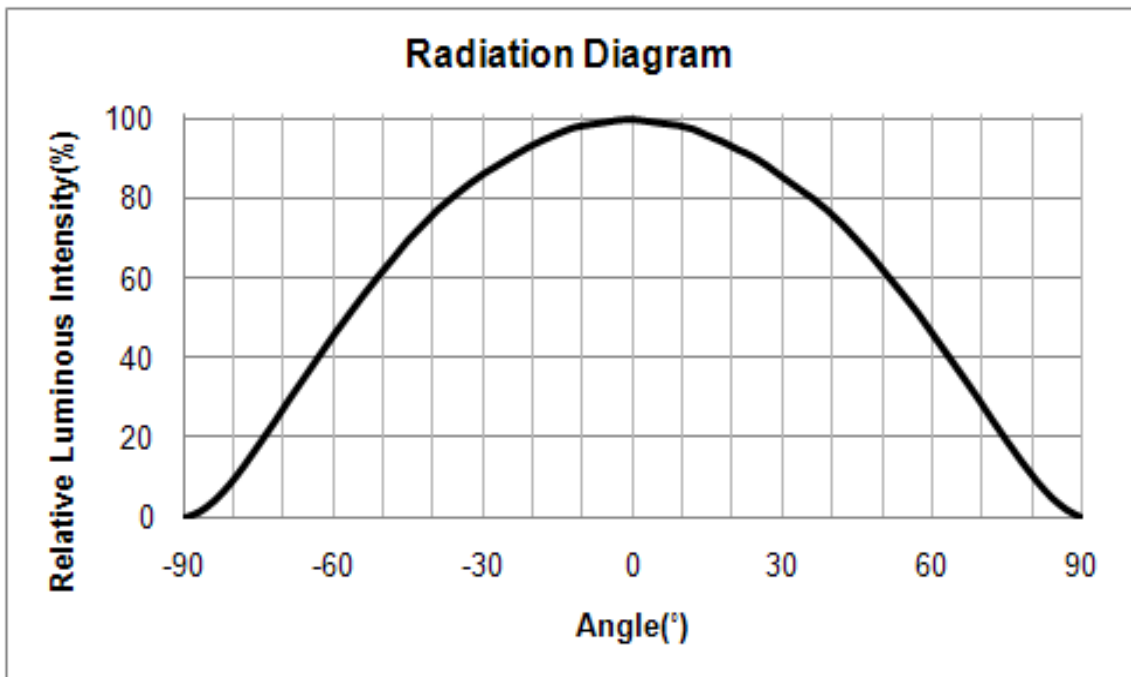


### 5) Derating Curve



### 6) Beam Angle Characteristics

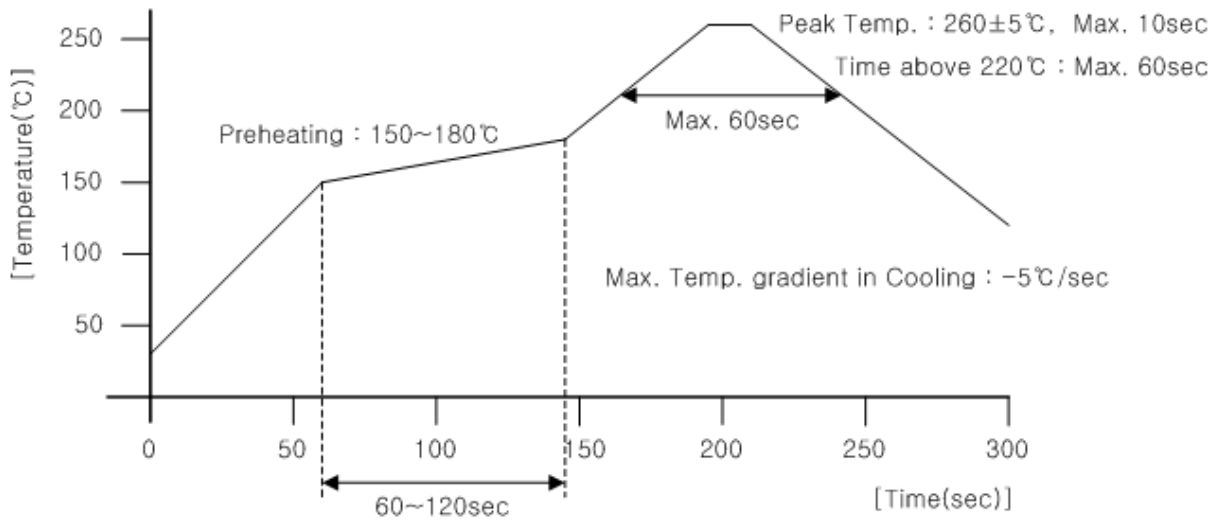
( $I_F = 65\text{mA}$  &  $T_a = 25^{\circ}\text{C}$ )



## 4. Solder Conditions

### 1) Reflow Conditions ( Pb Free )

Reflow Frequency : 2 times max.



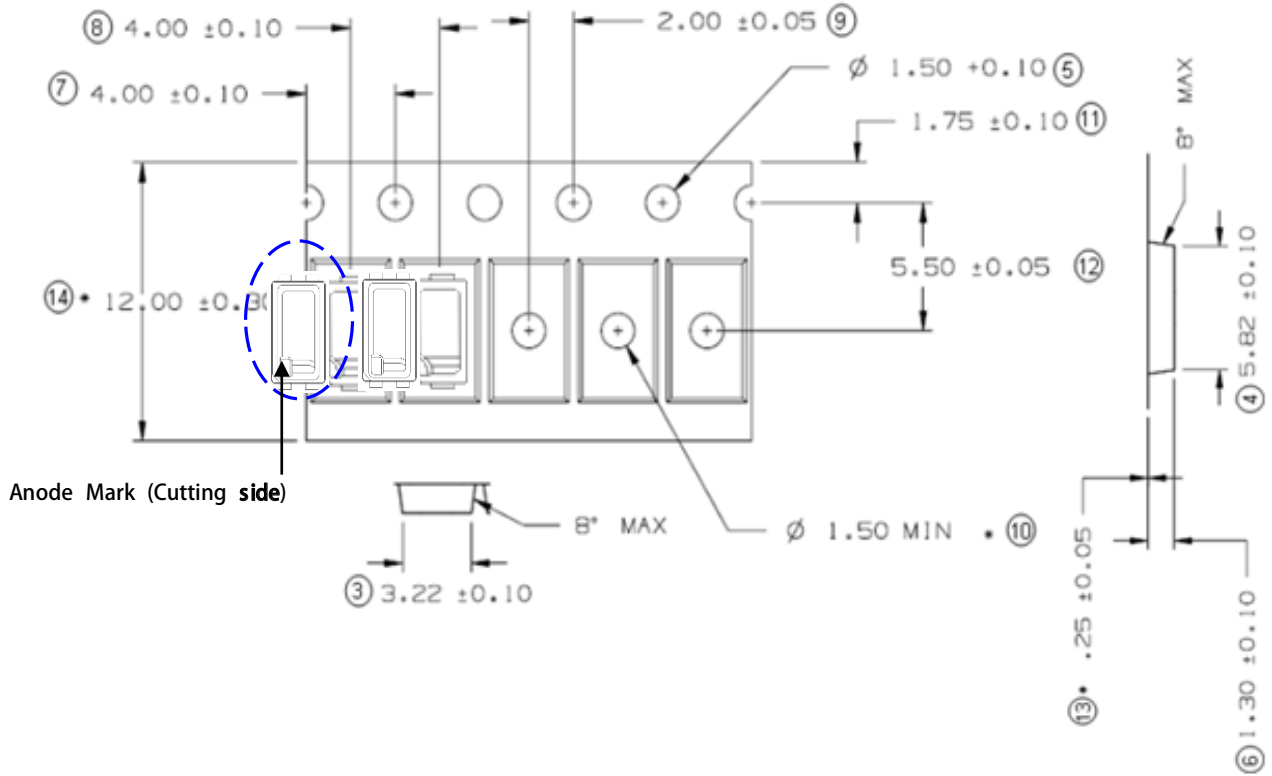
### 2) For Manual Soldering

Not more than 5 seconds @Max. 300°C, under soldering iron.

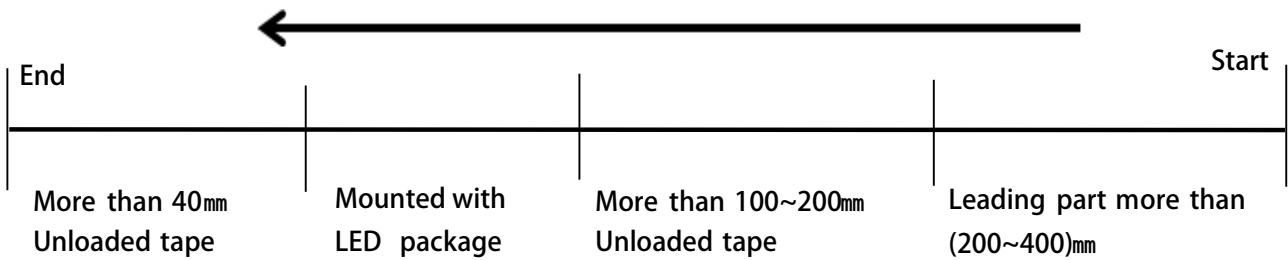
## 5. Tape & Reel

### 1) Taping Dimension

(unit : mm)

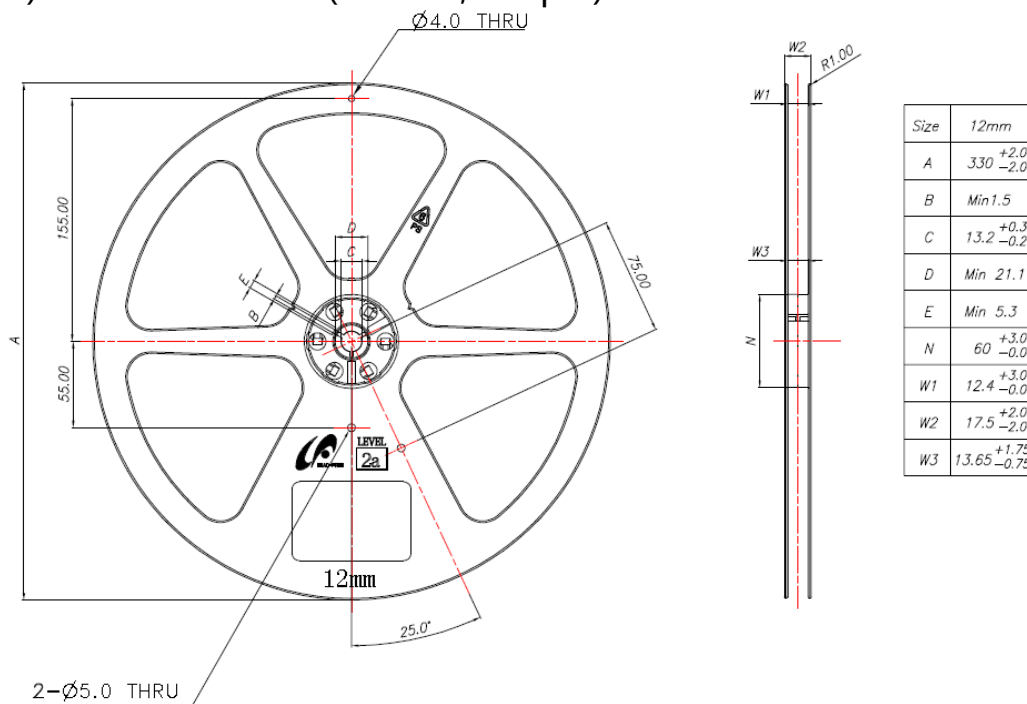


Tapping Direction



## 2-1) Reel Dimension (max 2,500 pcs)

## 2-2) Reel Dimension (max 10,000 pcs)



- (1) Quantity : The quantity/Reel to be 2,500 pcs or 10,000 pcs, .
- (2) Cumulative Tolerance : Cumulative tolerance/10 pitches to be  $\pm 0.2\text{mm}$
- (3) Adhesion Strength of Cover Tape : Adhesion strength to be 0.1-0.7N when the cover tape is turned off from the carrier tape at 10°C angle to be the carrier tape.
- (4) Packaging : P/N, Manufacturing data code no. and quantity to be indicated on a damp proof Package.

## 6. Precaution for use

- 1) For over-current-proof function, customers are recommended to apply resistors to prevent sudden change of the current caused by slight shift of the voltage.
- 2) This device should not be used in any type of fluid such as water, oil, organic solvent, etc. When washing is required, IPA is recommended to use.
- 3) When the LEDs illuminate, operating current should be decided after considering the ambient maximum temperature.
- 4) LEDs must be stored in a clean environment.  
If the LEDs are to be stored for 3 months or more after being shipped from Samsung Electronics, they should be packed by a sealed container with nitrogen gas injected. (Shelf life of sealed bags: 12 months, temp.  $\sim 40^{\circ}\text{C}$ ,  $\sim 90\%$  RH)
- 5) After storage bag is open, device subjected to soldering, solder reflow, or other high temperature processes must be:
  - a. Mounted within 672 hours (28 days) at an assembly line with a condition of no more than  $30^{\circ}\text{C}/60\%$  RH
  - b. Stored at  $<10\%$  RH.
- 6) Repack unused Products with anti-moisture packing, fold to close any opening and then store in a dry place.
- 7) Devices require baking before mounting, if humidity card reading is  $>60\%$  at  $23 \pm 5^{\circ}\text{C}$ .
- 8) Devices must be baked for 1 hour at  $60 \pm 5^{\circ}\text{C}$ , if baking is required.
- 9) The LEDs are sensitive to the static electricity and surge. It is recommended to use a wrist band or anti-electrostatic glove when handling the LEDs.  
If voltage exceeding the absolute maximum rating is applied to LEDs, it may cause damage or even destruction to LED devices.  
Damaged LEDs may show some unusual characteristics such as increase in leak current, lowered turn-on voltage, or abnormal lighting of LEDs at low current.

10) VOCs (volatile organic compounds) can be generated from adhesives, flux, hardener or organic additives used in luminaires (fixtures).

Transparent LED silicone encapsulant is permeable to those chemicals and they may lead a discoloration of encapsulant when they expose to heat or light.

This phenomenon can cause a significant loss of light emitted (output) from the luminaires (fixtures).

In order to prevent these problems, we recommend you to know the physical properties of the materials used in luminaires, They must be selected carefully.

11) Risk of Sulfurization (or Tarnishing)

The LED from Samsung Electronics uses a silver-plated lead frame and its surface color may change to black (or dark colored) when it is exposed to sulfur (S), chlorine (Cl) or other halogen compound.

Sulfurization of lead frame may cause intensity degradation, change of chromaticity coordinates and, in extreme cases, open circuit. It requires caution.

Due to possible sulfurization of lead frame, LED should not be used and stored together with oxidizing substances made of materials in a following list,  
: Rubber, plain paper, lead solder cream and so on.