



DATASHEET

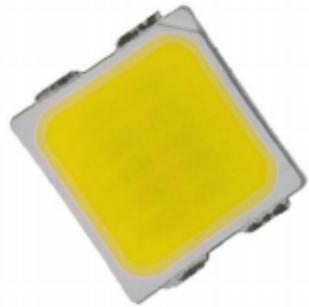
ES-E5050-506V-XX-XXX

## ES-E5050-506V-XX-XXX Datasheet

This is EMC Package 5050 LED light source is a energy efficient device which can handle high thermal and high driving current. The small package outline and high intensity make it an ideal choice for outdoor lighting LED.

The white power LED available in the range of color temperature from 2700K to 6500K.

This part has a foot print that is compatible to most of the same size LED in the market today.



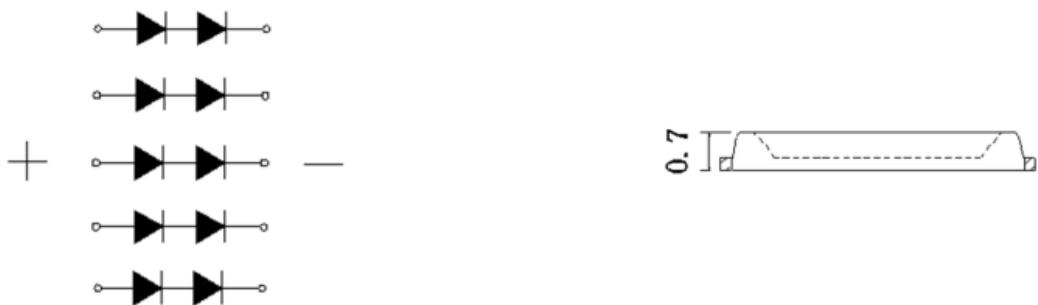
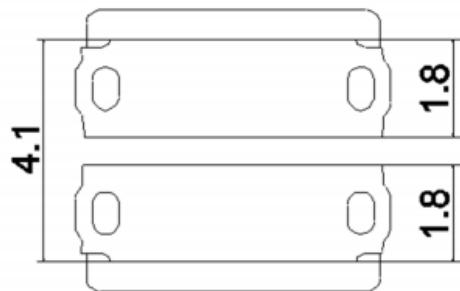
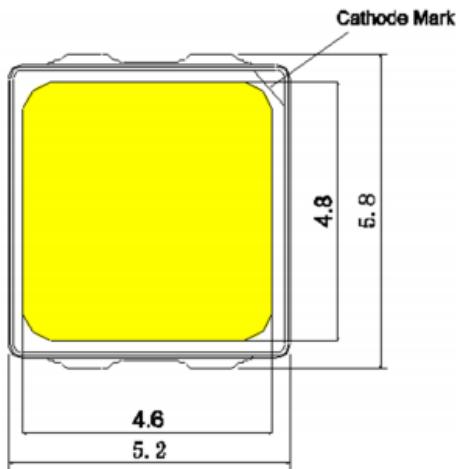
### FEATURES

- Available in Cool White, Neutral White and Warm White color
- ANSI-compatible chromaticity bins
- High luminous Intensity and high efficiency
- Compatible with reflow soldering process
- Low thermal resistance
- Long operation life
- Wide viewing angle at 120°
- Silicone encapsulation
- Environmental friendly, RoHS compliance

### APPLICATIONS

- Street lamp
- Par lighting
- Outdoor lighting

## PACKAGE DIMENSIONS

**Note:**

1. All dimensions in millimeters.
2. Thickness tolerance of product is  $\pm 0.05\text{mm}$ .
3. Tolerance is  $\pm 0.1\text{mm}$  unless otherwise noted.

**ABSOLUTE MAXIMUM RATINGS (T<sub>j</sub>=25°C)**

Parameter	Symbol	Value	Unit
Forward current	IF	1000	mA
Peak Forward Current	IPF	1500	mA
Reverse Voltage	VR	10	V
Power Dissipation	Pd	6700	mW
Operating solder point Temperature	T <sub>opr</sub>	-40~+105	°C
Storage Temperature	T <sub>stg</sub>	-40~+105	°C
Soldering Temperature	T <sub>ld</sub>	Reflow Soldering: 260°C for 10 seconds	
LED Junction Temperature	T <sub>j</sub>	125	°C

**Note: IFP Conditions: Pulse Width ≤ 10msec. and Duty ≤ 1/10.**

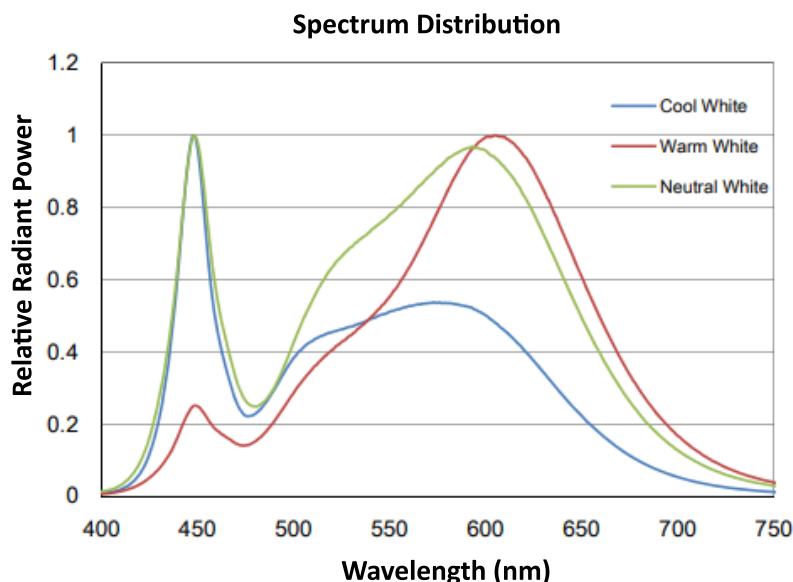
**CHARACTERISTIC (T<sub>j</sub>=25°C)**

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage	V <sub>F</sub>	IF=750mA	6.0	--	7.0	V
Viewing Angle	2θ <sub>1/2</sub>	IF=750mA	--	120	--	deg.
Luminous Flux	Φ <sub>v</sub>	IF=750mA	720	--	870	lm
Color Rendering Index	CRI	IF=750mA	70	--	80	--
Color Temperature	CCT	IF=750mA	3000	--	6500	K
Thermal Resistance (Junction to Solder Point)	R <sub>th-jS</sub>	IF=750mA	--	5	--	°C/W

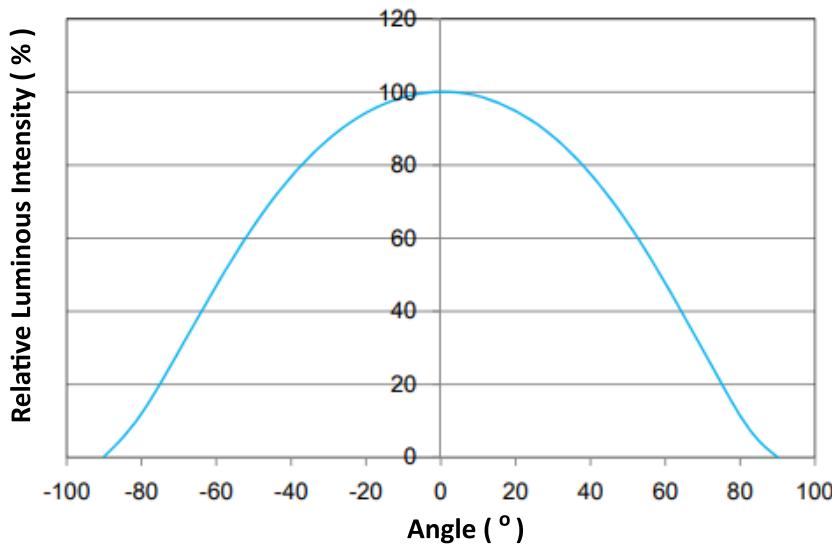
**Notes:**

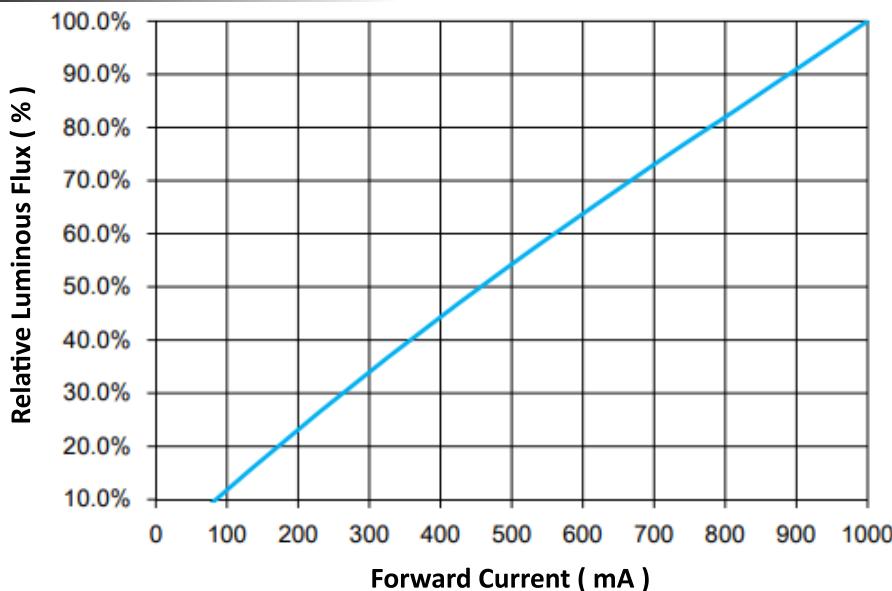
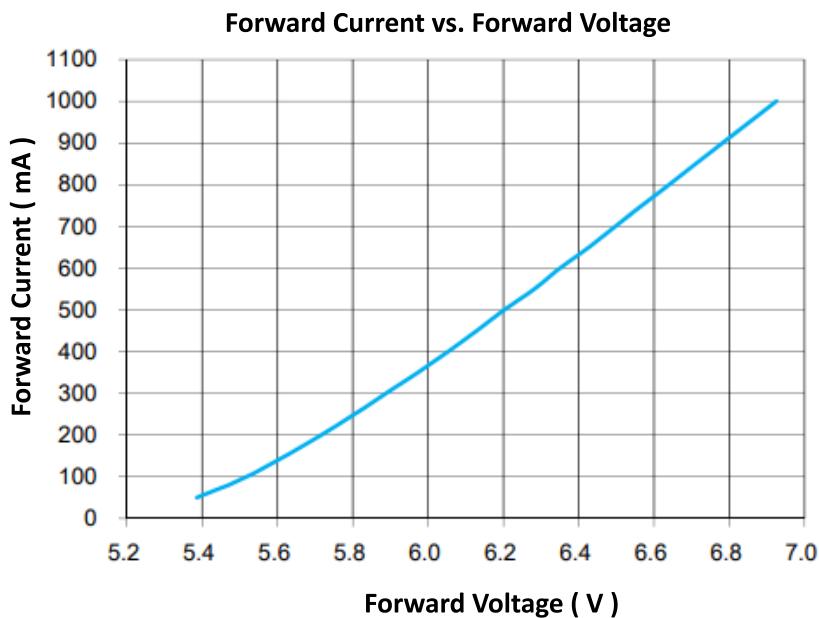
1. Luminous flux is measured with an accuracy of ± 10%.
2. Chromaticity coordinate bins are measured with an accuracy of ± 0.01.
3. CRI is measured with an accuracy of ± 2 ;

## RELATIVE SPECTRAL POWER DISTRIBUTION ( $T_j=25^\circ\text{C}$ )

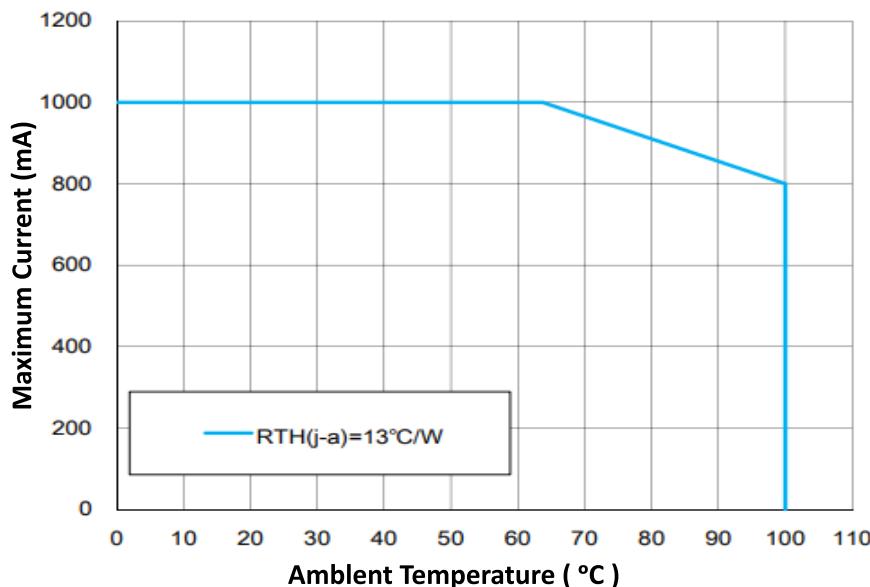


## TYPICAL SPATIAL DISTRIBUTION

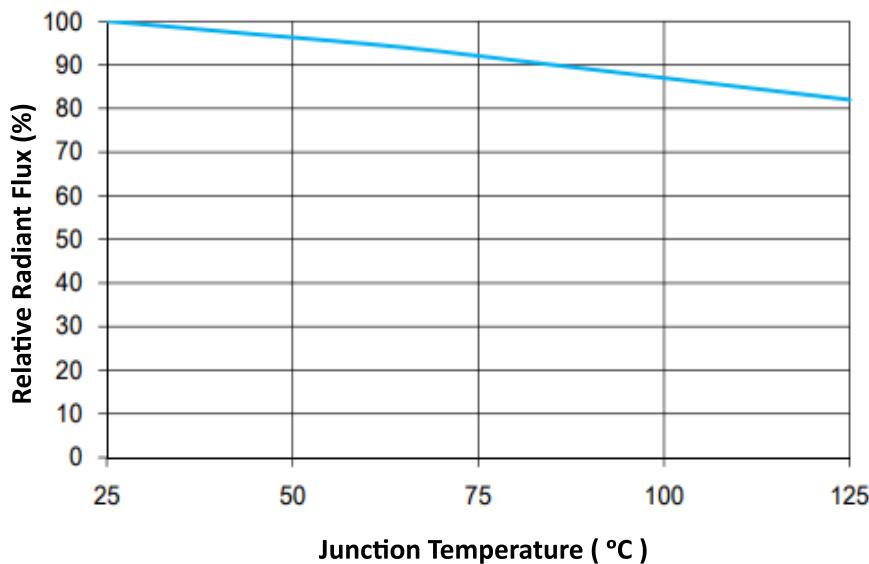


RELATIVE LUMINOUS FLUX VS. CURRENT ( $T_j=25^\circ\text{C}$ )ELECTRICAL CHARACTERISTICS ( $T_j=25^\circ\text{C}$ )

## MAXIMUM CURRENT VS. AMBIENT TEMPERATURE



## RELATIVE RADIANT FLUX VS. JUNCTION TEMPERATURE



70 CRI

Part No.	Condition	Rank	Unit
ES-E5050-506V-L2-730		L2 770-820	
ES-E5050-506V-L2-740		L2 820-870	
ES-E5050-506V-L2-750		L2 820-870	
ES-E5050-506V-L2-757	750mA	L2 820-870	lm
ES-E5050-506V-L2-760		L2 820-870	
ES-E5050-506V-L2-765		L2 800-850	

80 CRI

Part No.	Condition	Rank	Unit
ES-E5050-506V-L1-830		L1 680-730	
ES-E5050-506V-L1-840		L1 720-770	
ES-E5050-506V-L1-850		L1 720-770	
ES-E5050-506V-L1-857	750mA	L1 720-770	lm
ES-E5050-506V-L1-860		L1 720-770	
ES-E5050-506V-L1-865		L1 710-760	

(2) Forward Voltage ( $T_j=25^\circ\text{C}$ )

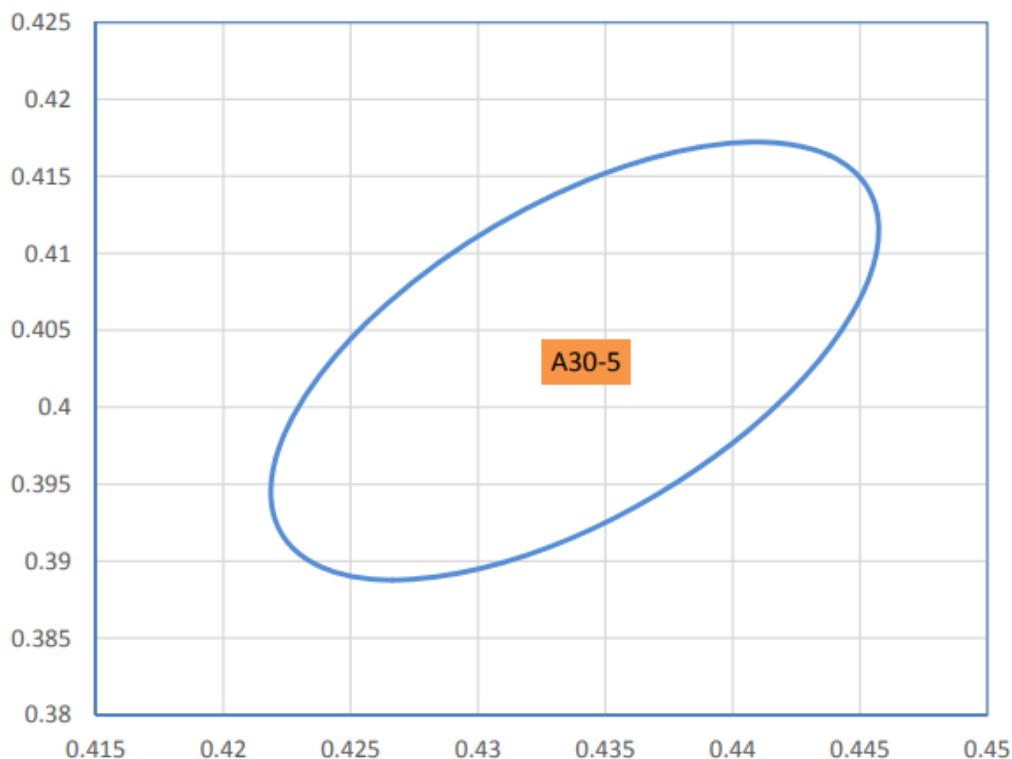
Rank	Condition	Min.	Max.	Unit
V0		6.0	6.2	
V1		6.2	6.4	
V2	750mA	6.4	6.6	V
V3		6.6	6.8	
V4		6.8	7.0	

## Notes:

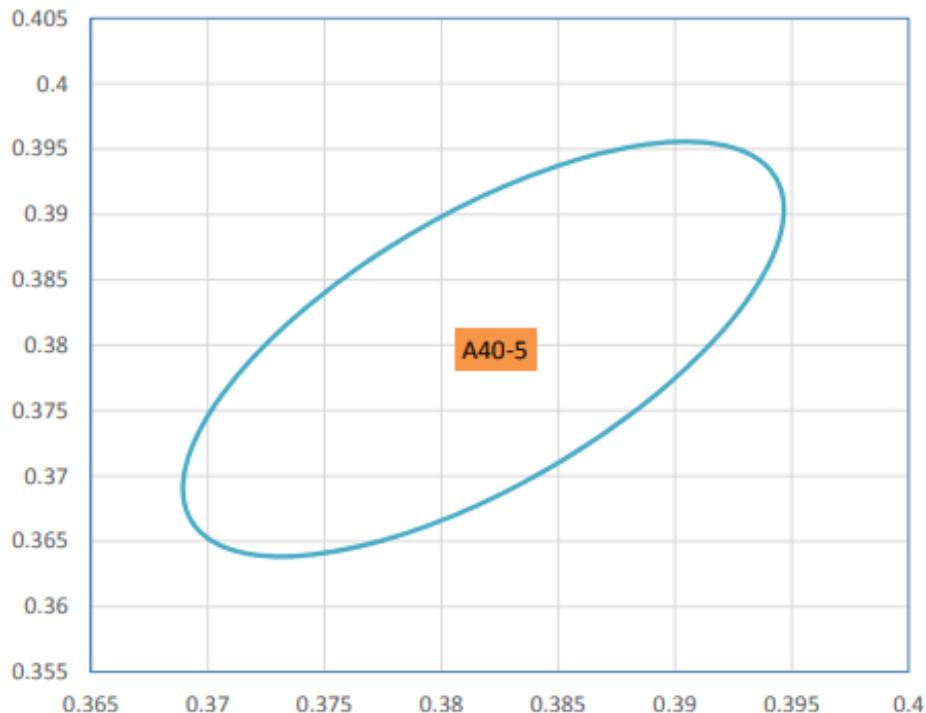
1. 10% tolerance for luminous intensity may be caused by measurement inaccuracy.
2. Measurement Uncertainty of the Forward Voltage :  $\pm 0.06\text{V}$

## CHROMATICITY BINS

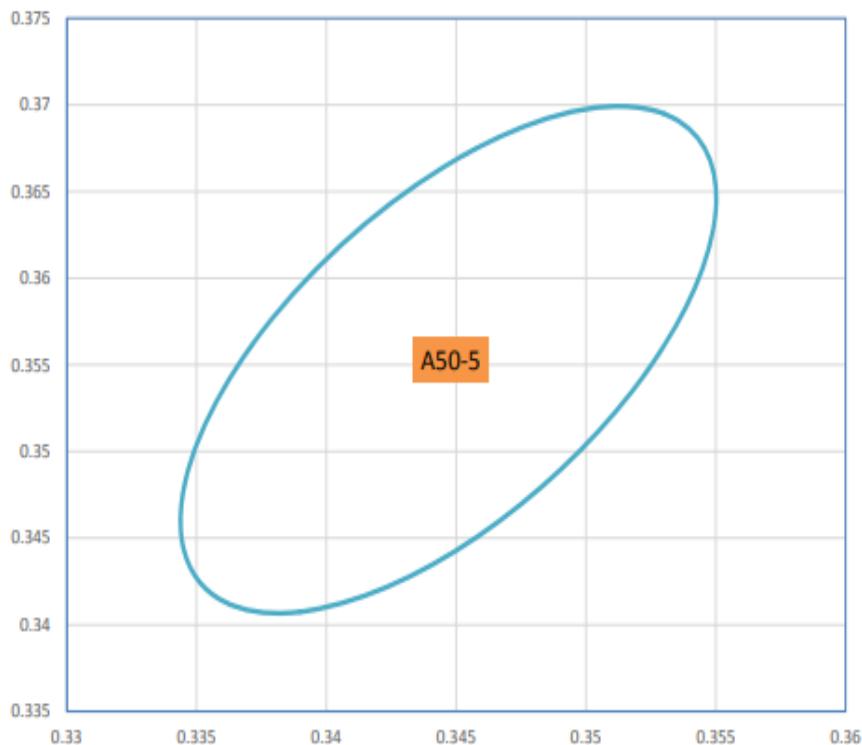
Part Number	ES-E5050-506V-XX-X30			CCT	3000K
Bin Code	Color Coordinates(x,y)				
A30-5	x	y	a	b	Theta
	0.4338	0.4030	0.0139	0.0068	53.22



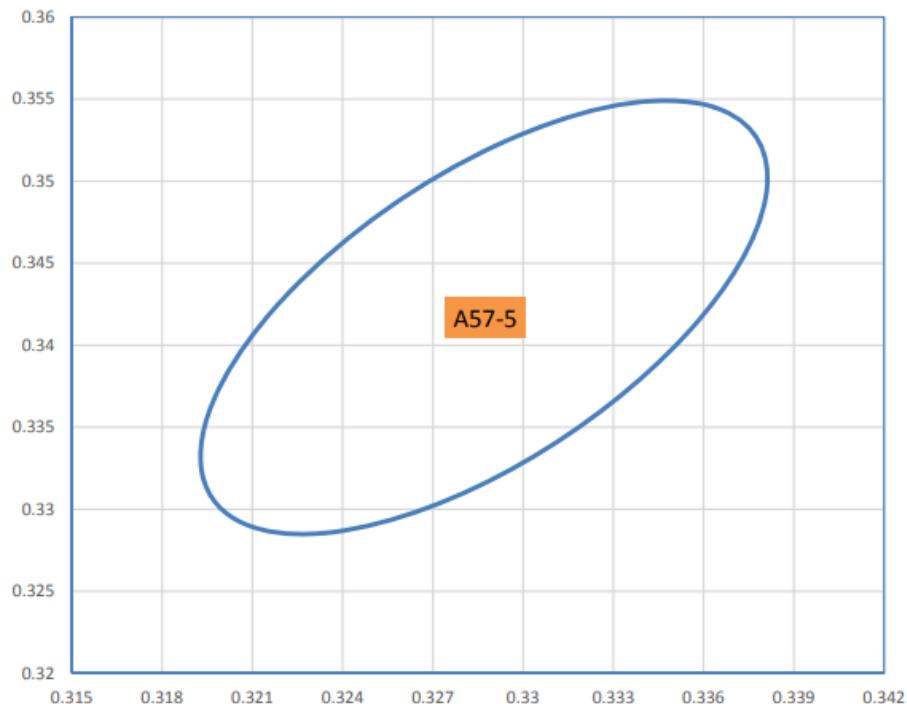
Part Number	ES-E5050-506V-XX-X40			CCT	4000K
Bin Code	Color Coordinates(x,y)				
A40-5	x	y	a	b	Theta
	0.3818	0.3797	0.01565	0.0067	53.72



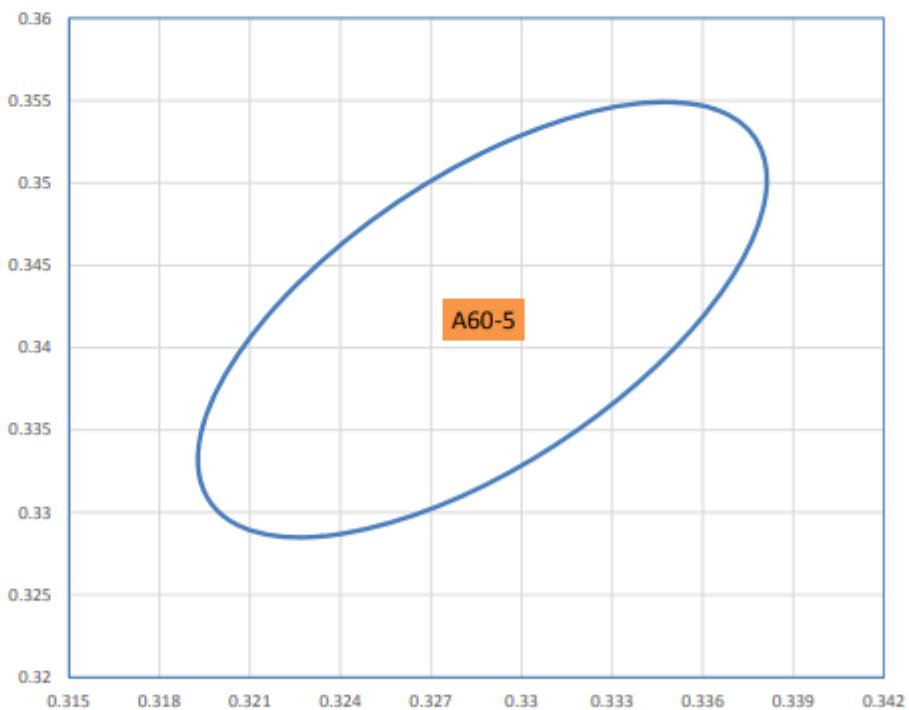
Part Number	ES-E5050-506V-XX-X50			CCT	5000K
Bin Code	Color Coordinates(x,y)				
A50-5	x	y	a	b	Theta
	0.3447	0.3553	0.0137	0.0059	59.62



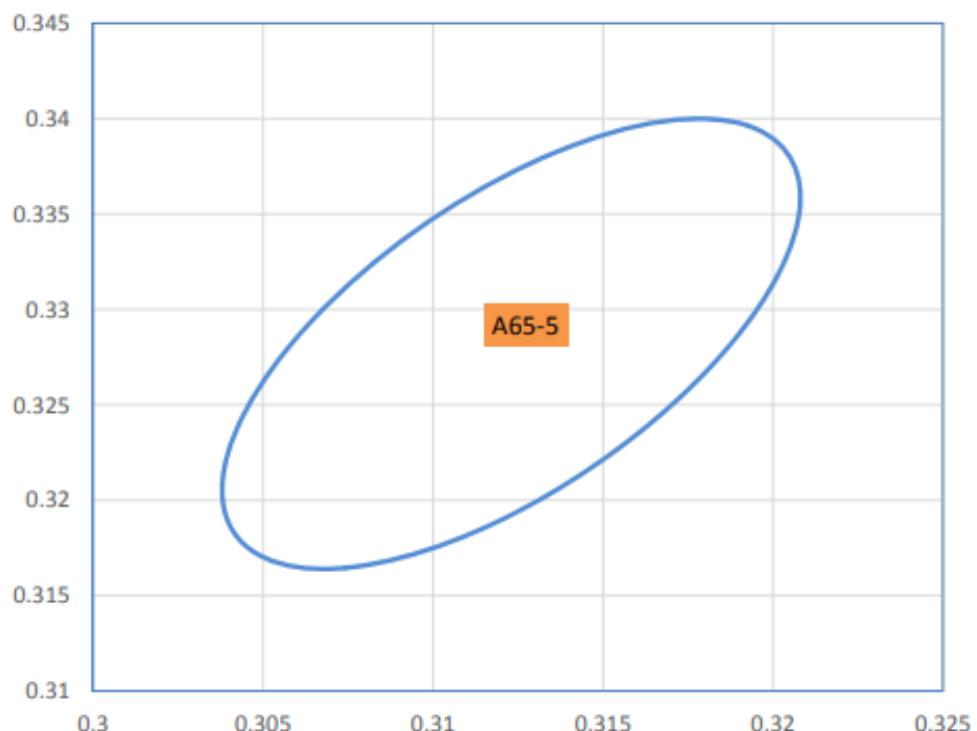
Part Number	ES-E5050-506V-XX-X57			CCT	5700K
Bin Code	Color Coordinates(xy)				
A57-5	x	y	a	b	Theta
	0.3287	0.3417	0.01243	0.00533	59.09



Part Number	ES-E5050-506V-XX-X60			CCT	6000K
Bin Code	Color Coordinates(x,y)				
A60-5	x	y	a	b	Theta
	0.322	0.3365	0.01179	0.00504	59.21



Part Number	ES-E5050-506V-XX-X65			CCT	6500K
Bin Code	Color Coordinates(x,y)				
A65-5	x	y	a	b	Theta
	0.3123	0.3282	0.01115	0.00475	58.57



## REFLOW SOLDERING CHARACTERISTICS

For Reflow Process

Preheating :  $140^{\circ}\text{C} \sim 160^{\circ}\text{C} \pm 5^{\circ}\text{C}$ ,within 2 minutes.

Operation heating :  $260^{\circ}\text{C}$ (Max.) within 10 seconds.(Max)

Gradual Cooling (Avoid quenching).

Lead solder		Lead-free solder	
Pre-heat	120-150	Pre-heat	150-200
Pre-heat time	120 sec.Max.	Pre-heat time	120 sec.Max.
Peak Temperature	240 Max.	Peak Temperature	260 Max.
Soldering time condition	10 sec.Max.	Soldering time condition	10 sec.Max.

**Lead Solder**

Temperature ramp rate:  $2.5\text{--}5^{\circ}\text{C / sec.}$

Pre-heating:  $120\text{--}150^{\circ}\text{C}$  (120sec. Max.)

Peak Temperature:  $240^{\circ}\text{C Max.}$  (10 sec. Max.)

Temperature drop rate:  $2.5\text{--}5^{\circ}\text{C / sec.}$

Above  $200^{\circ}\text{C}$ : 60sec. Max.

**Lead-free Solder**

Temperature ramp rate:  $1\text{--}5^{\circ}\text{C / sec.}$

Pre-heating:  $150\text{--}200^{\circ}\text{C}$  (120sec. Max.)

Peak Temperature:  $260^{\circ}\text{C Max.}$  (10 sec. Max.)

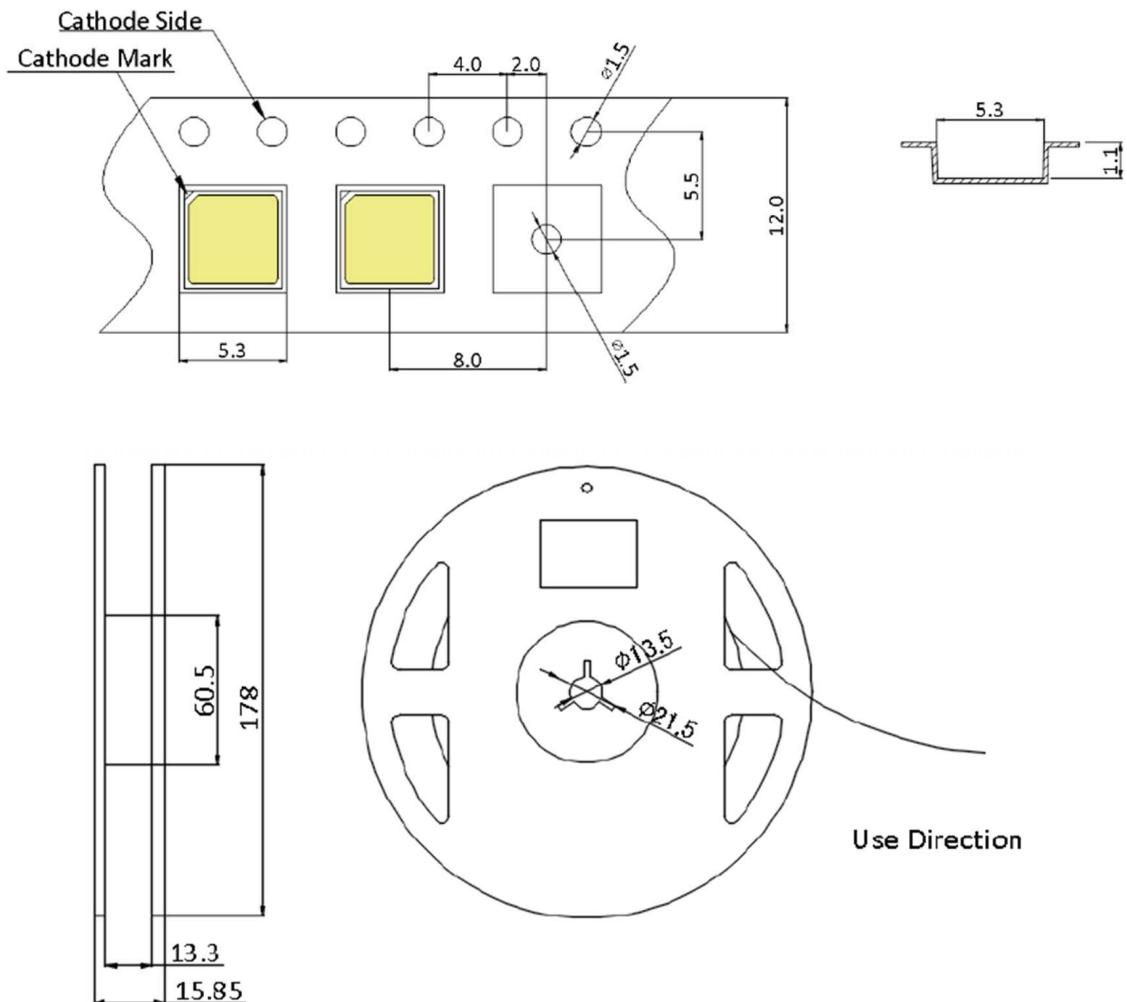
Temperature drop rate:  $1\text{--}5^{\circ}\text{C / sec.}$

Above  $220^{\circ}\text{C}$ : 60sec. Max.

### Note:

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

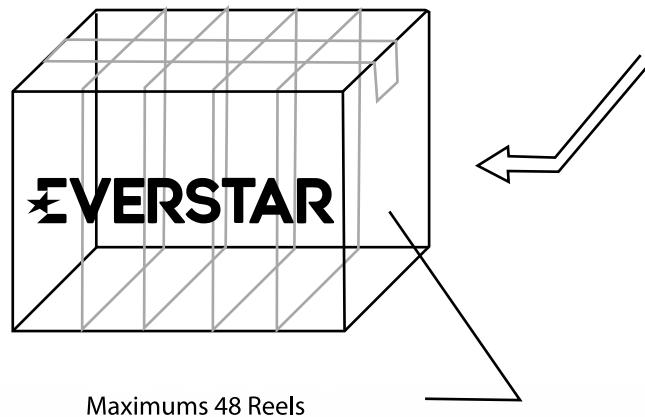
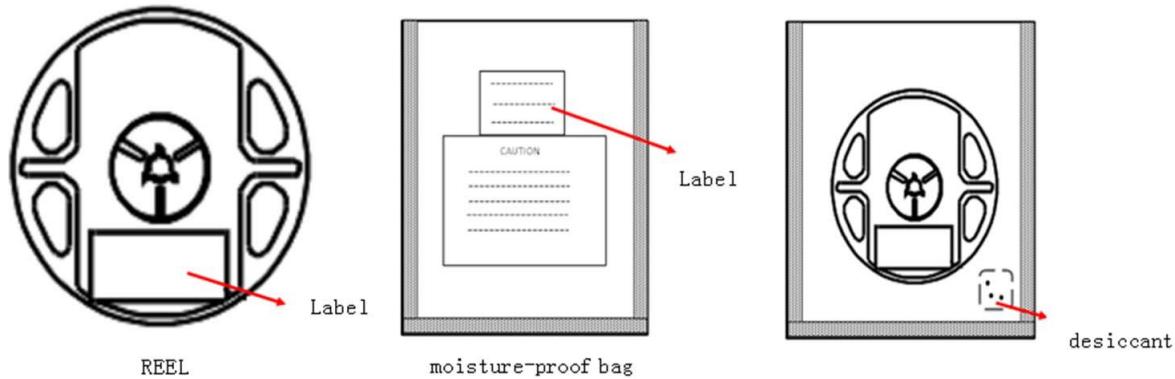
## TAPE AND REEL



### Notes:

- (1) Quantity : 1,000pcs/Reel
- (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 the angle of  $10^\circ$  to the carrier tape
- (4) Package : P/N, Manufacturing data Code No. and quantity to be indicated on a damp proof Package.

## PACKAGING



## RELIABILITY TEST ITEMS

Test Items	Test Duration	Number of Damaged
Steady State Operating Life of High Temperature (HTOL) Ts=85°C, IF=Max	1000hrs	0/20
Steady State Operating Life of Low Temperature (LTOL) Ta=-40°C, IF=Max	1000hrs	0/20
Pulse Wet Operating Life of High Temperature (PWHTOL) 60°C/90%RH, IF30mins ON/30min OFF	500hrs	0/20
High Temperature Storage (HTS) °C 80°C	1000hrs	0/20
Low Temperature Storage (LTS) -40°C	1000hrs	0/20
Thermal Shock (TS) -45°C~125°C 30min dwell 20sec transfer	100cycles	0/20
Solder Resistance (SR) 265°C, 3X MSL	5sec	0/20
Solder Ability (SA) 245°C 5sec, 95% coverage	5sec	0/11
Mechanical Shock (MS) 1500G 0.5msec pulse shock	Each6 axis	0/6
Random Vibration (RV) 6G RMS, 10-2000Hz, 10min	Per axis	0/6
Variable Vibration Frequency (VVF) 10-2000-10Hz, log or linear sweep rate, 20G for 1 min, 1.5mm each apply 3x per axis over	6hrs	0/6
Salt Spread (SS) 35°C, 30g/m2/day	48hrs	0/11

Item	Symbol	Test Condition	Criteria for Judgment
			Min. Max.
Forward	VF	IF=Typical Current	U.S.L x1.1
Luminous Flux	Im	IF=Typical Current	L.S.L x0.7
CCX&CCY	x,y	IF=Typical Current	Shift<0.02

## PRECAUTION FOR USE

- (1) This device should not be used in any type of fluid such as water, oil, organic solvent, etc. When washing is required, IPA should be used.
- (2) When the LEDs are illuminating, operating current should be decided after considering the ambient maximum temperature.
- (3) LEDs must be stored to maintain a clean atmosphere. If the LEDs are stored for 3months or more after being shipped from Everstar, a sealed container with a nitrogen atmosphere should be used for storage.
- (4) The LEDs must be used within seven days after opening the moisture proof packing. Repack unused Products with anti-moisture packing, fold to close any opening and then store in a dry place.
- (5) The appearance and specifications of the product may be modified for improvement without notice.
- (6) This LED is sensitive to the static electricity and surge. It is recommended to use a wrist Band or anti-electrostatic glove when handling the LEDs.
- (7) On manual soldering, a solder tip must be needed as grounded for usage. If over voltage which exceeds the absolute maximum rating is applied to LEDs, it will cause damage LEDs and result in destruction. Damaged LEDs will show some unusual characteristics such as leak current remarkably increase ,turn-on voltage becomes lower and the LEDs get unlighted at low current.