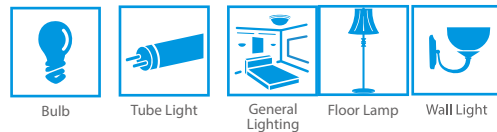
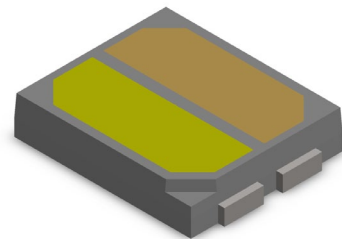


## PLCC Series

# 2835 0.5W Dual Color Full Spectrum

## Datasheet



### Introduction :

The PLCC Dual Color Series Full Spectrum provides the comprehensive combination of two or more colors on one components. The Series which features evenly blending light is operated at 0.5W with dimmable function to offer customers the flexibility in SMT and luminaries design.

### Description :

- Best luminous and color uniformity
- Enables halogen and CDM replacement
- The article itself presents the actual color.

### Feature and Benefits :

- High luminous intensity
- CRI(Ra)>95
- R1-R15 $\geq$ 90
- Wide beam angle 120°
- More color options
- Evenly blending light
- Dimmable Design
- Suitable for all SMT assembly methods

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## General Information

### Ordering Code Format

2      T      03      X5      XX      A      TM      33      XXX  
 X1      X2      X3-X4      X5-X6      X7-X8      X9      X10-X11      X12-X13      X14-X16

X1		X2		X3-X4		X5-X6		X7-X8	
Type	Emitter	Component		Series		Wattage		Color/CCT	
2	Emitter	T	PLCC	03	2835	X5	0.5 W	WW	Warm White+Warm White
								WN	Warm White+Neutral White
								WC	Warm White+Cool White
								NC	Neutral White+Cool White
								CC	Cool White+Cool White

X9		X10-X11		X12-X13		X14-X16	
BIN	Ansi	TM	TM30	Voltage		Serial Number	
A	Ansi	TM	TM30	33	3V +3V	XXX	-

## Absolute Maximum Ratings

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

Parameter	Symbol	Value	Units
DC Forward Current	$I_F$	90/90	mA
Pulse Forward Current ( $t_p \leq 100\mu\text{s}$ , Duty cycle=0.25)	$I_{\text{pulse}}$	120/120	mA
Reverse Current	$I_R$	10	$\mu\text{A}$
Reverse Voltage	$V_R$	-	V
LED Junction Temperature	$T_J$	125	$^{\circ}\text{C}$
Operating Temperature	-	-40 ~ +85	$^{\circ}\text{C}$
Storage Temperature	-	-40 ~ +125	$^{\circ}\text{C}$
ESD Sensitivity (HBM)	$V_B$	2,000	V
Soldering Temperature	$T_s$	Reflow Soldering : 255~260 $^{\circ}\text{C}$ /10~30sec Manual Soldering : 350 $^{\circ}\text{C}$ /3sec	

Notes:

1. Proper current derating must be observed to maintain junction temperature below the maximum at all time.
2. LEDs are not designed to be driven in reverse bias.
3. Maximum Forward current of each side (one color) is 90mA.

## Characteristics

Parameter	Symbol	Value	Units
Viewing Angle	(Typ.) $2\theta_{1/2}$	120	Degree
Thermal resistance	-	35	$^{\circ}\text{C}/\text{W}$
CRI (Ra)	-	95	-
R1-R15	-	90	-
CCT	-	2,700	K
		3,000	
		(Cool White) 3,500	
		(Neutral White) 4,000	
		(Warm White) 5,000 5,700 6,500	
JEDEC Moisture Sensitivity	-	Level 3 <b>Floor Life</b> Conditions: $\leq 30^{\circ}\text{C}$ / 60% RH <b>Soak Requirements(Standard)</b> Time (hours): 40+1/-0 Conditions: 60 $^{\circ}\text{C}$ / 60% RH	

Notes:

1.  $2\theta_{1/2}$  is the off-axis angle where the luminous intensity is half of the axial luminous intensity.
2. Color Rendering index CRI tolerance:  $\pm 2$ .
3. CIE\_x/y tolerance:  $\pm 0.005$ .
4. R1-R15 tolerance  $\pm 5$

## Luminous Flux Characteristic

Luminous Flux Characteristics,  $I_f=60\text{mA}$  and  $T_j=25^\circ\text{C}$

Color	Group	Min. Luminous Flux(lm)	Max. Luminous Flux(lm)	Forward Current (mA)	Order Code
WW	16	16	18	60	2T03X5WWATM33001 2T03X5WNATM33001 2T03X5WCATM33001 2T03X5NCATM33001 2T03X5CCATM33001
2700K	18	18	20		
3000K	20	20	22		
3500K					
NW 4000K	16	16	18		
	18	18	20		
	20	20	22		
CW	18	18	20		
5000K	20	20	22		
5700K					
6500K	22	22	24		

Note:

The luminous flux performance is guaranteed within published operating conditions. Edison Opto maintains a tolerance of  $\pm 10\%$  on flux measurements.

## Voltage Bin Structure

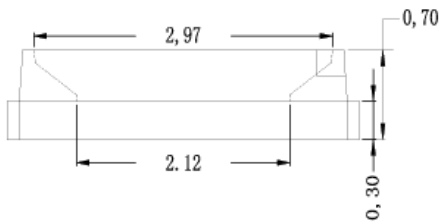
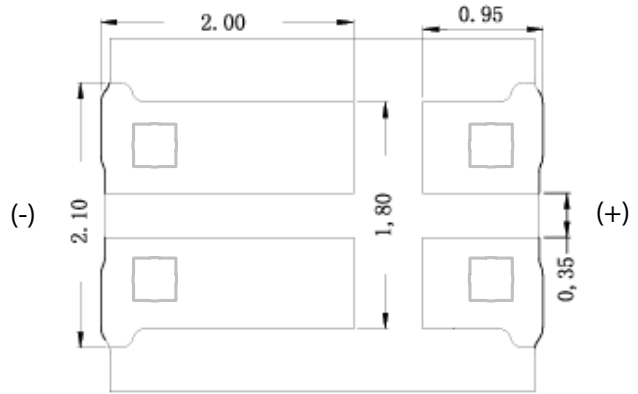
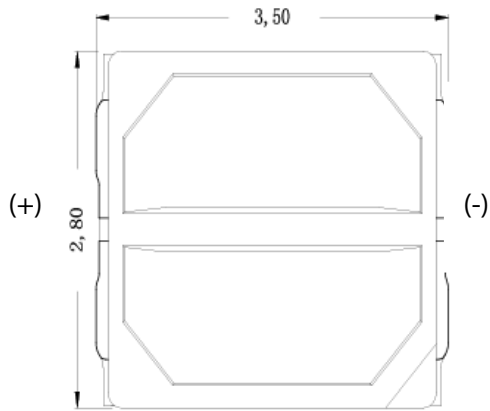
Voltage Characteristics,  $I_f=60\text{mA}$  and  $T_j=25^\circ\text{C}$

Color	Group	Min. Voltage (V)	Max. Voltage (V)
WW	V00	2.5	2.8
NW	V01	2.8	3.1
CW			
	V02	3.1	3.4

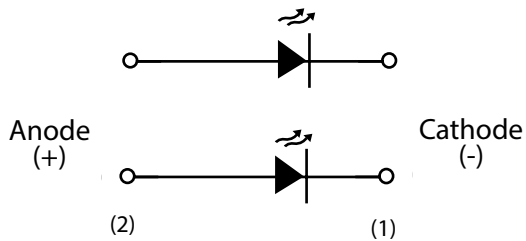
Note:

Forward voltage measurement allowance is  $\pm 0.06\text{V}$ .

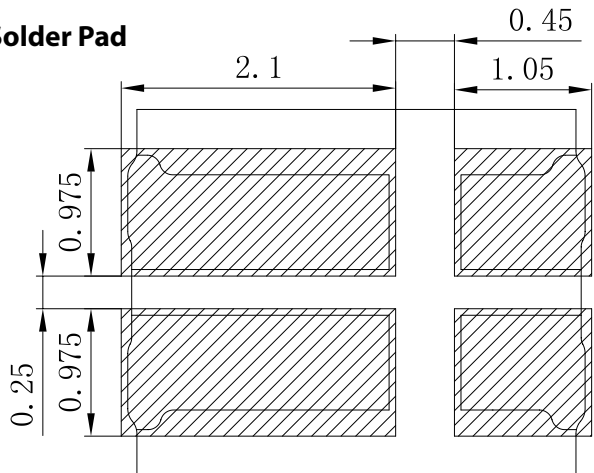
## Mechanical Dimensions



### Circuit



### Solder Pad

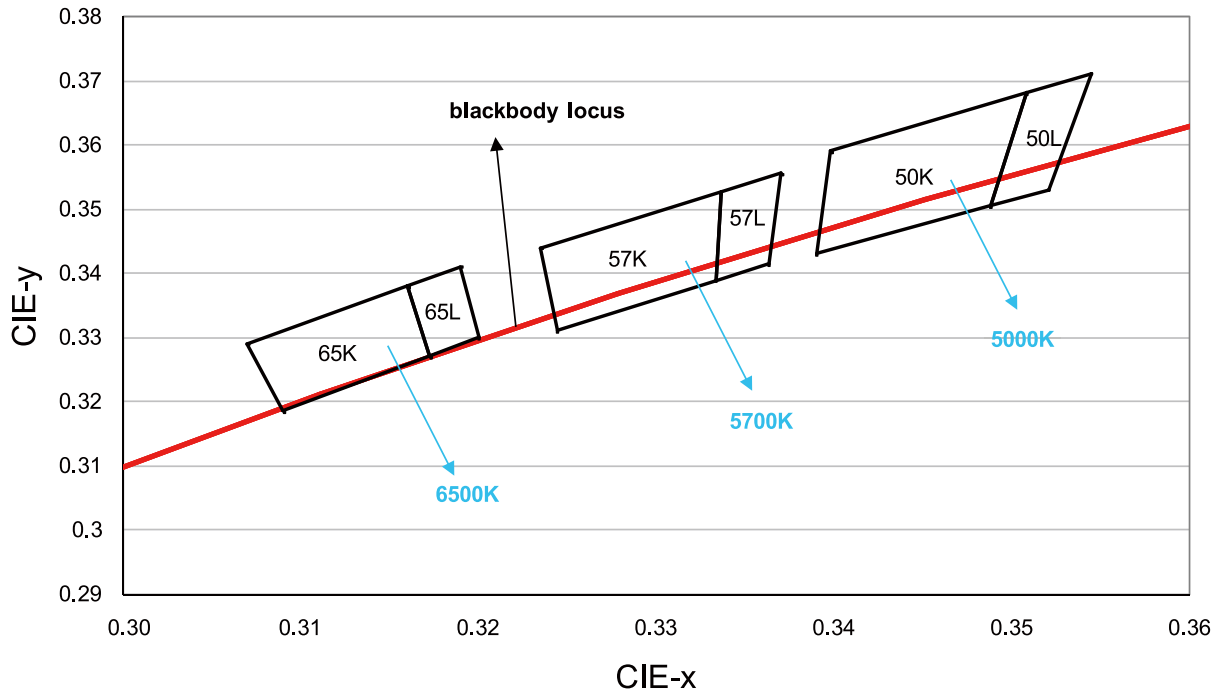


### Notes:

1. All dimensions are measured in mm.
2. Tolerance :  $\pm 0.20$  mm

## Color BIN code

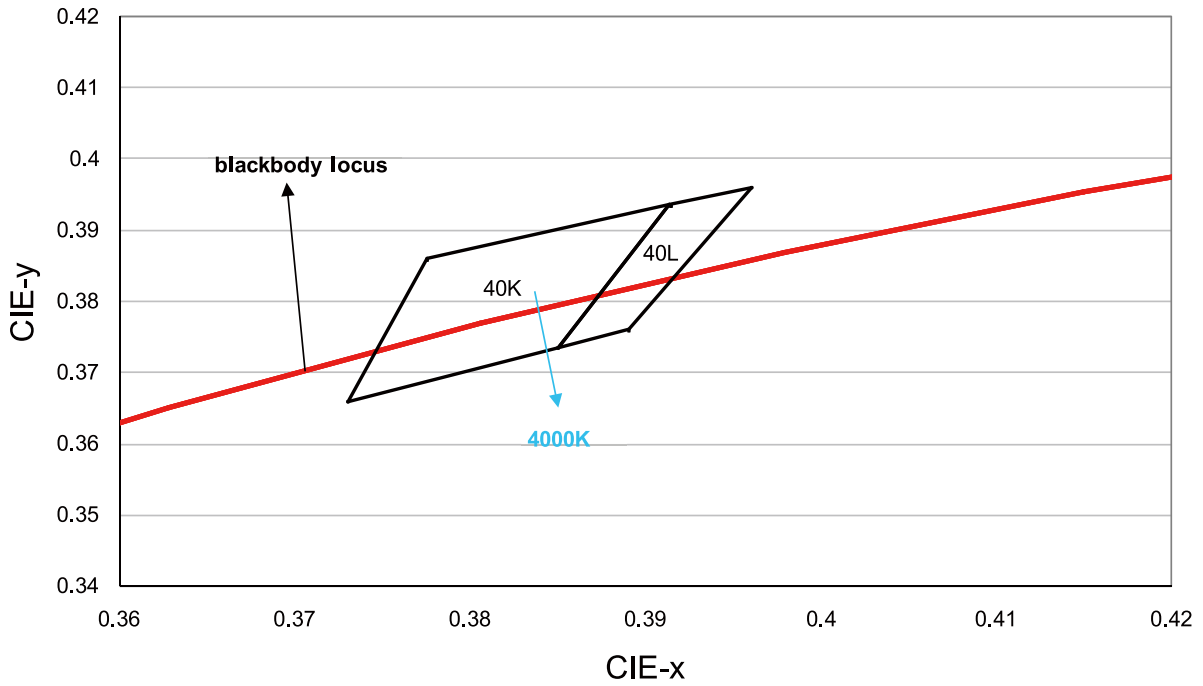
### Cool White



65K		57K		50K	
X	Y	X	Y	X	Y
0.3070	0.3290	0.3235	0.3440	0.3398	0.3590
0.3090	0.3185	0.3244	0.3310	0.3390	0.3430
0.3173	0.3271	0.3333	0.3389	0.3488	0.3505
0.3160	0.3380	0.3336	0.3527	0.3508	0.3682

65L		57L		50L	
X	Y	X	Y	X	Y
0.3160	0.3380	0.3336	0.3527	0.3508	0.3682
0.3173	0.3271	0.3333	0.3389	0.3488	0.3505
0.3200	0.3300	0.3363	0.3415	0.3520	0.3530
0.3190	0.3410	0.3370	0.3556	0.3544	0.3712

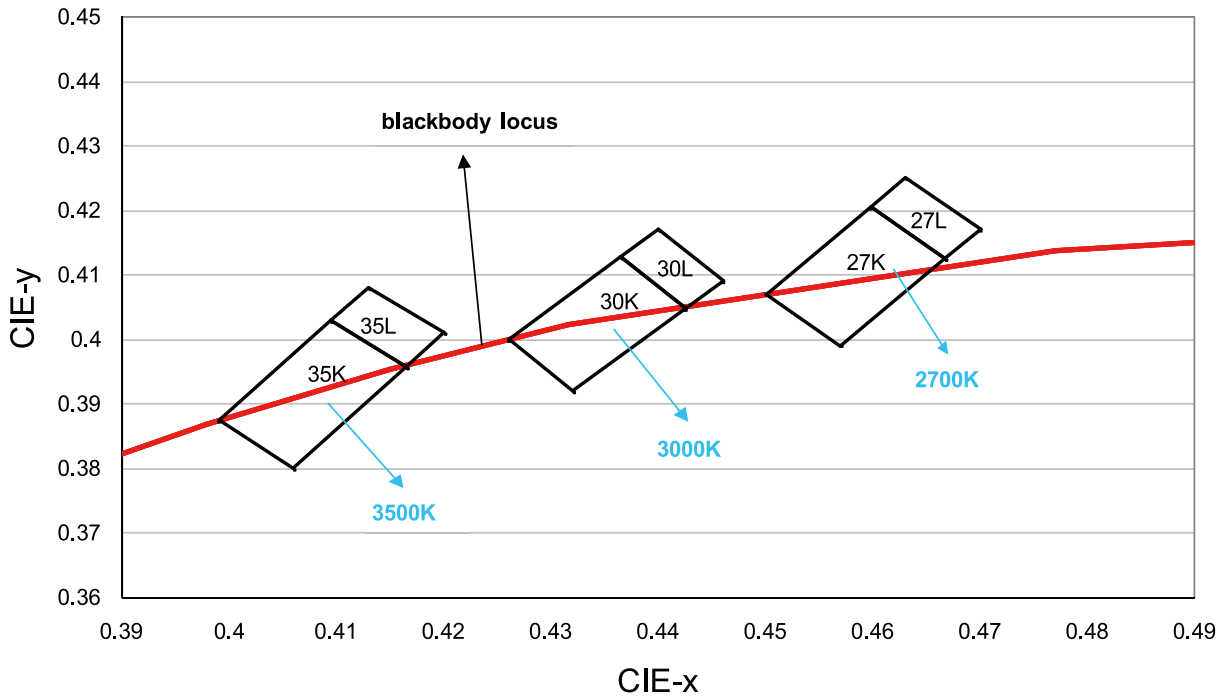
Neutral White



40K		40L	
X	Y	X	Y
0.3775	0.3860	0.3914	0.3935
0.3730	0.3660	0.3850	0.3735
0.3850	0.3735	0.3890	0.3760
0.3914	0.3935	0.3960	0.3960



Warm White

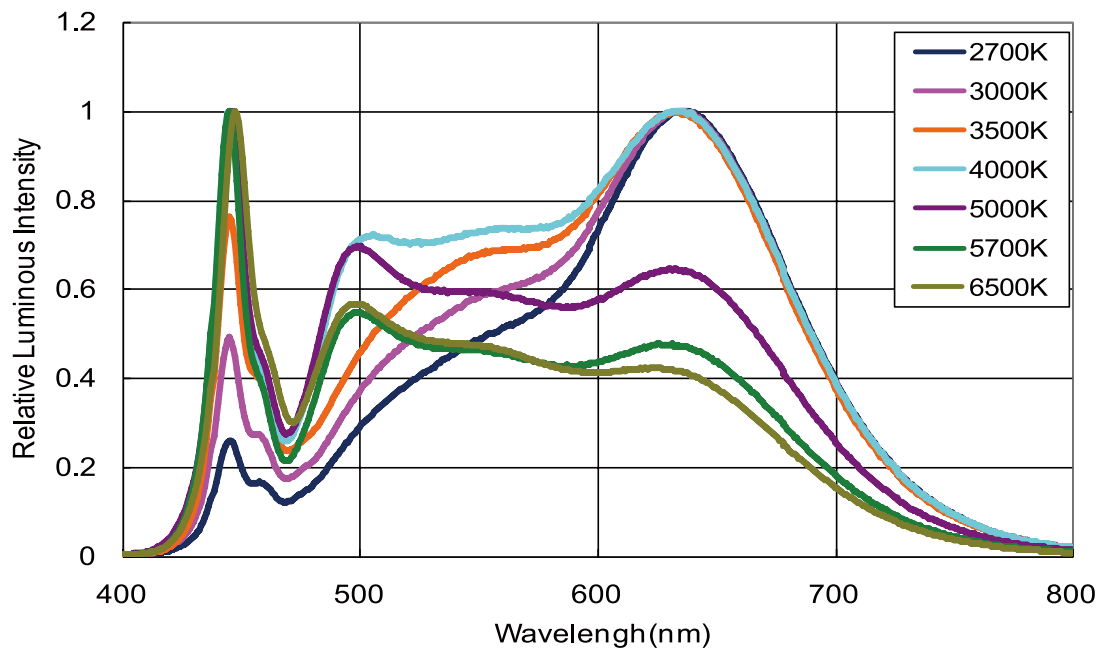


35K		30K		27K	
X	Y	X	Y	X	Y
0.3990	0.3875	0.4260	0.4000	0.4500	0.4070
0.4060	0.3800	0.4320	0.3920	0.4570	0.3990
0.4165	0.3958	0.4425	0.4048	0.4668	0.4125
0.4095	0.4029	0.4365	0.4128	0.4598	0.4205

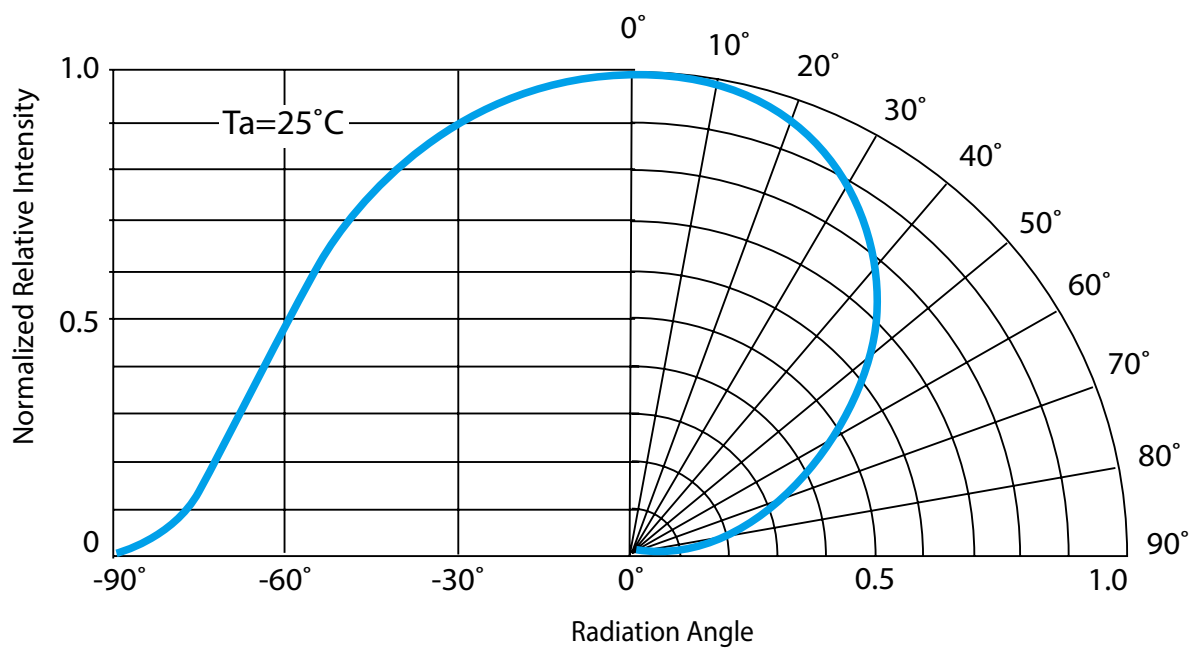
35L		30L		27L	
X	Y	X	Y	X	Y
0.4095	0.4029	0.4365	0.4128	0.4598	0.4205
0.4165	0.3958	0.4425	0.4048	0.4668	0.4125
0.4200	0.4010	0.4460	0.4090	0.4700	0.4170
0.4130	0.4080	0.4400	0.4170	0.4630	0.4250

## Characteristic curve

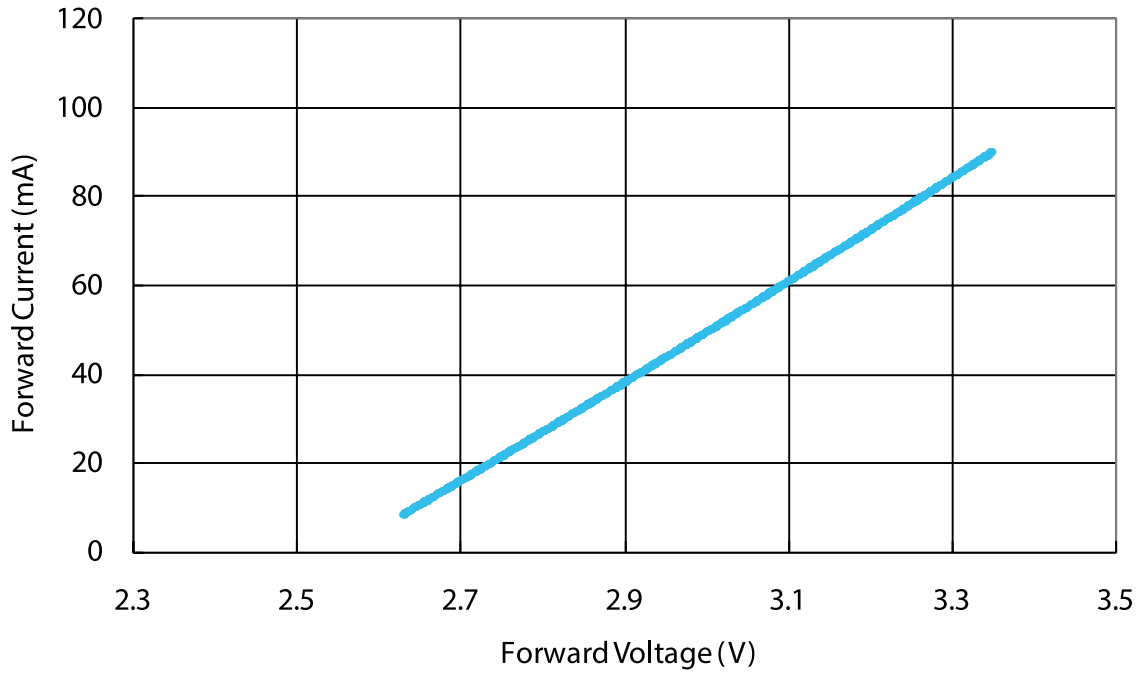
### Color Spectrum



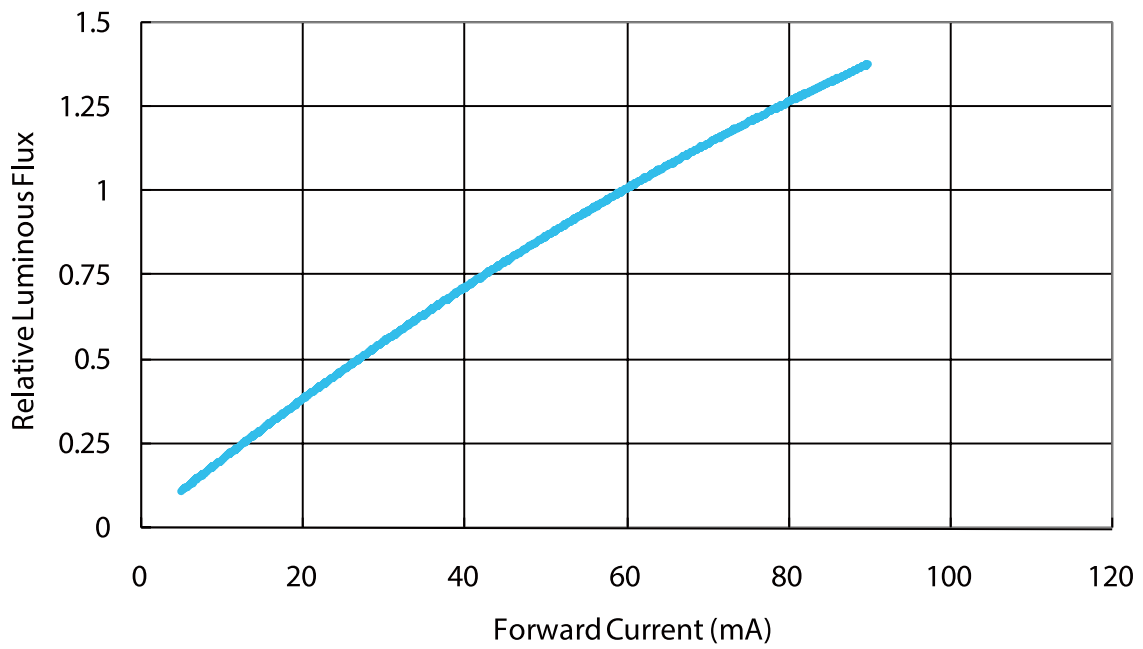
### Beam Pattern



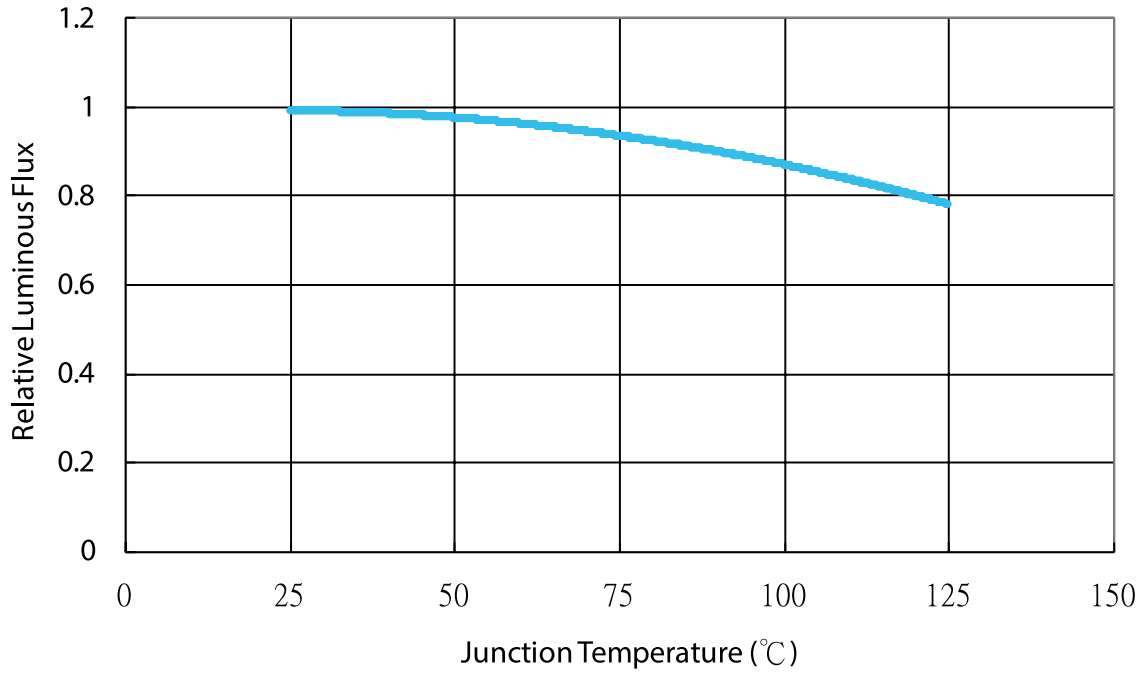
**Forward Current vs. Forward Voltage**



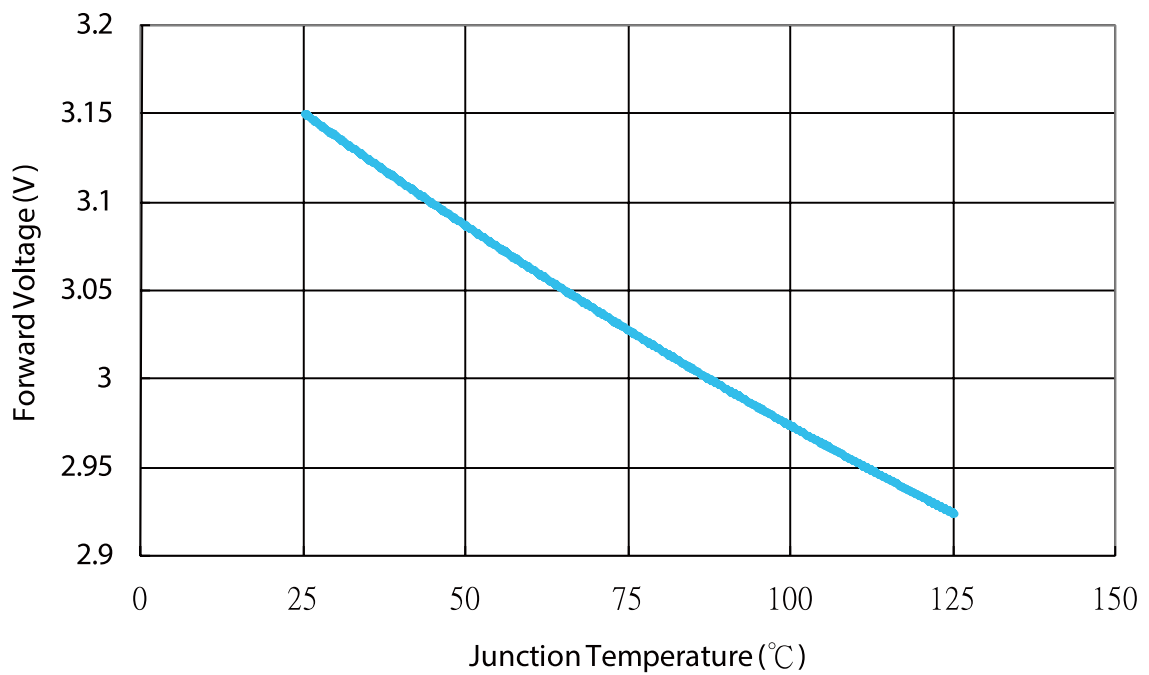
**Relative Luminous Flux vs. Forward Current**



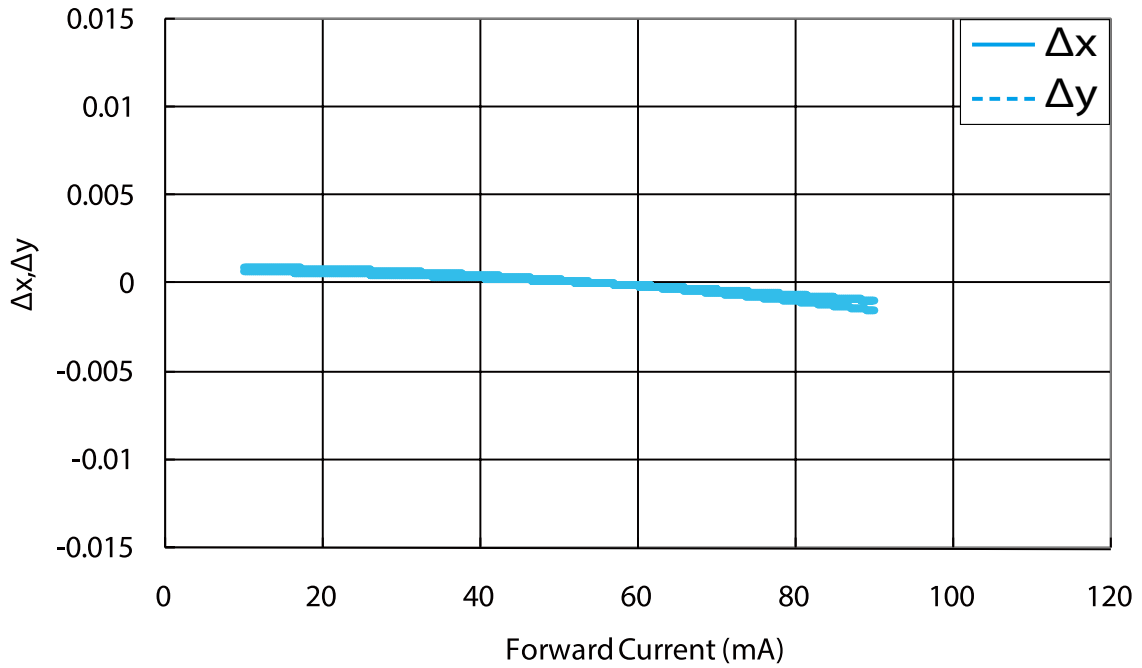
### Relative Luminous Flux vs. Junction Temperature



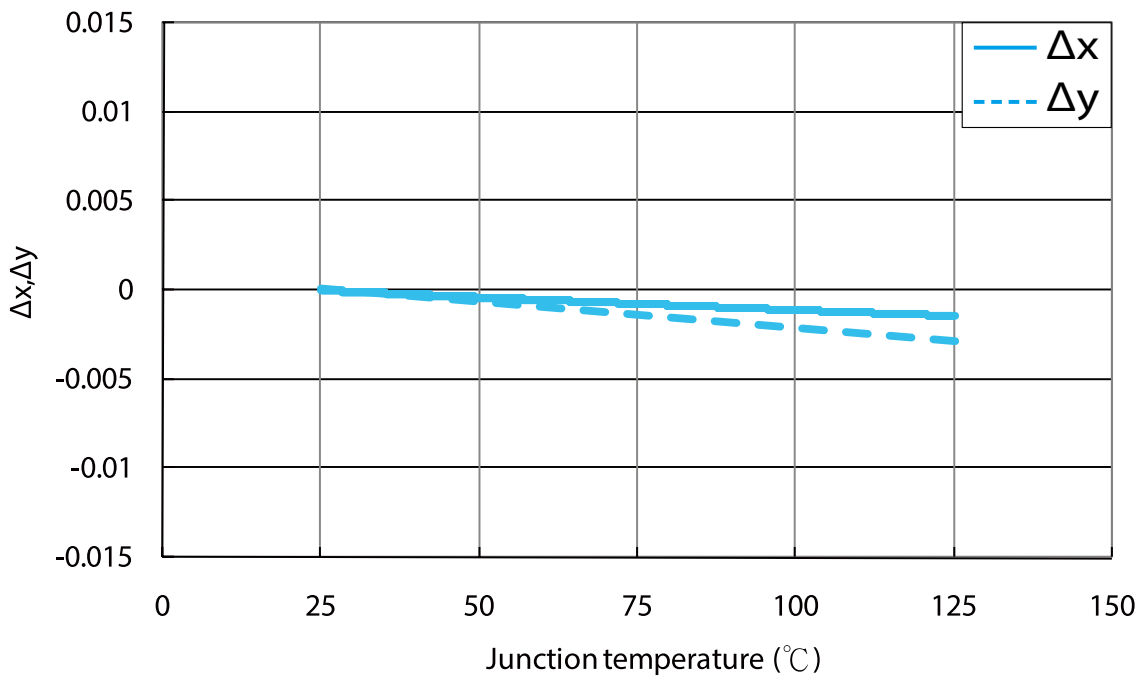
### Forward Voltage vs. Junction Temperature



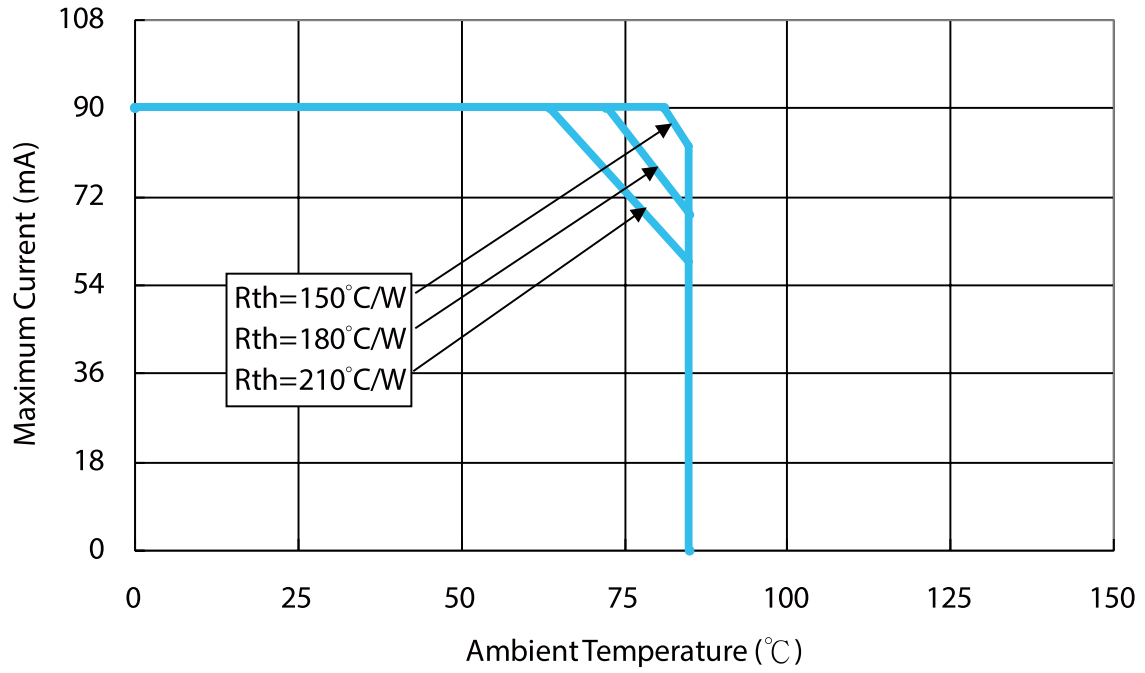
### $\Delta x, \Delta y$ vs. Forward Current



### $\Delta x, \Delta y$ vs. Junction Temperature

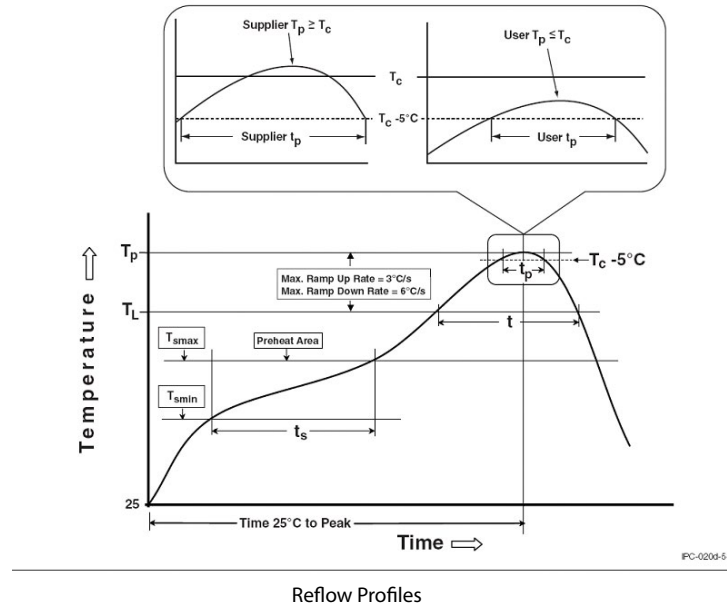


### Maximum Current vs. Ambient Temperature



## Reflow Profile

The following reflow profile is from IPC/JEDEC J-STD-020D which provided here for reference.



### Classification Reflow Profiles

Profile Feature	Pb-Free Assembly
Preheat & Soak	150 °C
Temperature min (T <sub>smin</sub> )	200 °C
Temperature max (T <sub>sm</sub> )	60-120 seconds
Time (T <sub>smin</sub> to T <sub>sm</sub> ) (t <sub>s</sub> )	3 °C/second max.
Average ramp-up rate (T <sub>sm</sub> to T <sub>p</sub> )	217 °C
Liquidous temperature (T <sub>L</sub> )	60-150 seconds
Time at liquidous (t <sub>L</sub> )	255 °C ~260 °C *
Peak package body temperature (T <sub>p</sub> )*	260 °C
Classification temperature (T <sub>c</sub> )	30** seconds
Time (t <sub>p</sub> )** within 5 °C of the specified classification temperature (T <sub>c</sub> )	6°C/second max.
Average ramp-down rate (T <sub>p</sub> to T <sub>sm</sub> )	8 minutes max.
Time 25°C to peak temperature	

**Notes:**

- \* Tolerance for peak profile temperature (T<sub>p</sub>) is defined as a supplier minimum and a user maximum.
- \*\* Tolerance for time at peak profile temperature (t<sub>p</sub>) is defined as a supplier minimum and a user maximum.

## Reliability

NO .	Test Item	Test Condition	Remark
1	Temperature Cycle	-40°C~100°C 30, 30, mins	100 Cycle
2	Thermal Shock	-40°C~100°C 15, 15 mins $\leq$ 10 sec	100 Cycle
3	Resistance to Soldering Heat	$T_{SOL}=260^{\circ}C$ , 30 sec	3 times
4	Moisture Resistance	25°C~65°C 90% RH 24 hrs / 1 cycle	10 Cycle
5	High-Temperature Storage	$T_A=100^{\circ}C$	1,000 hrs
6	Humidity Heat Storage	$T_A=85^{\circ}C$ RH=85%	1,000 hrs
7	Low-Temperature Storage	$T_A=-40^{\circ}C$	1,000 hrs
8	Operation Life test	25°C	1,000 hrs
9	High Temperature Operation Life test	85°C	1,000 hrs
10	High Humidity Heat Life Test	85°C, 85%RH	1,000 hrs
11	ON/OFF Test	30 sec ON, 30 sec OFF	1.5W times

## Failure Criteria

Item	Criteria for Judgment	
	Min.	Max.
Lumen Maintenance	85%	-
$\Delta u'v'$	-	0.006
Forward Voltage	-	Initial Data x 1.1
Reverse Current	-	10 $\mu$ A
Resistance to Soldering Heat	No dead lamps or visual damage	

## Cautions

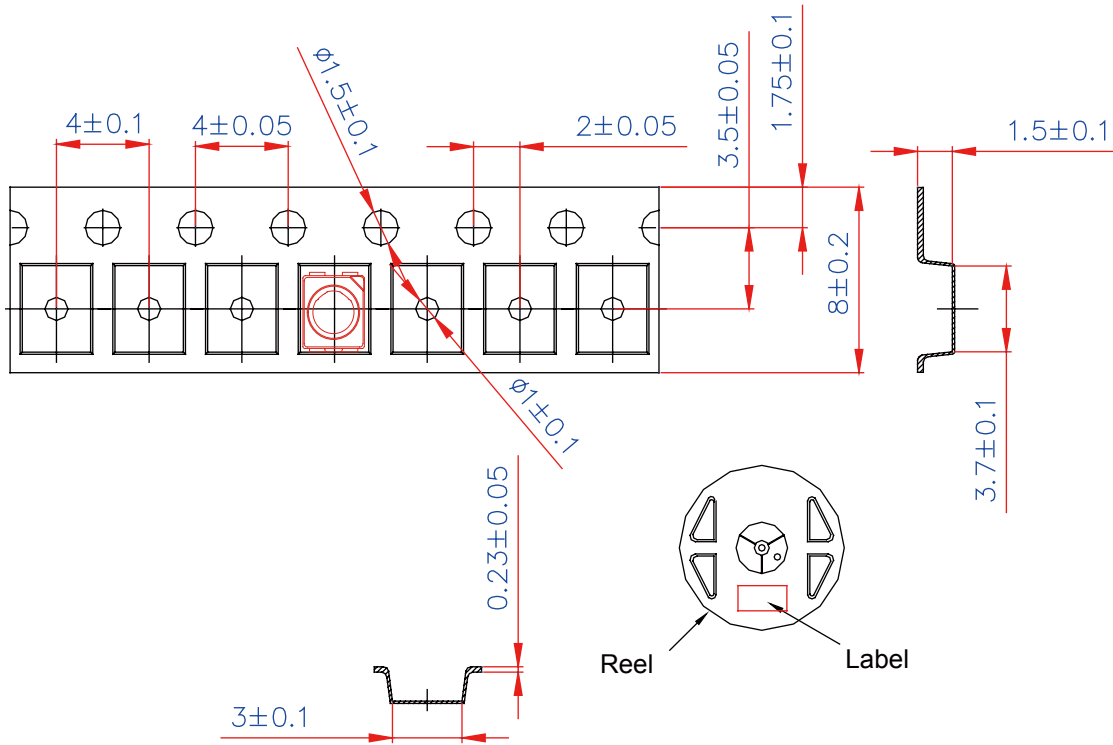
LEDs should be stored or lighted in the environment of no Sulfur.

Some materials, such as plastic seals, printing ink, enclosures and adhesives, may contain sulfur.

LEDs also should not be exposed in the acid or halogen environment.

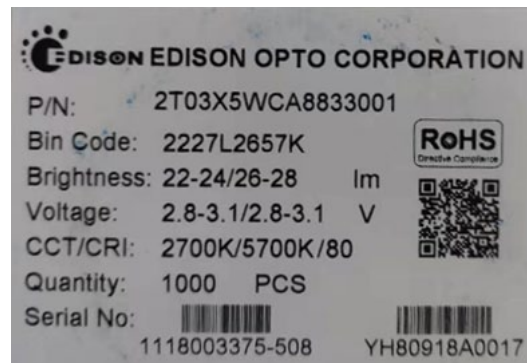
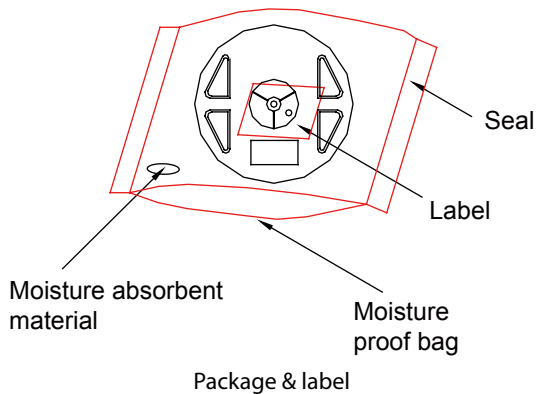


## Product Packaging Information



Taping reel dimensions

### Label Example:



Item	Quantity	Total	Dimensions(mm)
Reel	4,000pcs	4,000pcs	R=178
Starting with 250pcs empty, and 150pcs empty at the last			

## Revision History

Versions	Description	Release Date
1	Establish a Datasheet	2019/6/8
2	Update Label Example Update Ordering Code Format	2020/03/18

## About Edison Opto

Edison Opto is a leading manufacturer of high power LED and a solution provider experienced in LDMS. LDMS is an integrated program derived from the four essential technologies in LED lighting applications- Thermal Management, Electrical Scheme, Mechanical Refinement, Optical Optimization, to provide customer with various LED components and modules. More Information about the company and our products can be found at [www.edison-opto.com](http://www.edison-opto.com)

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