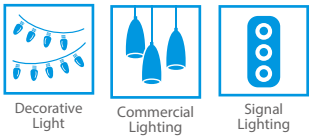
EDISON
Lighting Design Manufacturing Service

PLCC Series

PLCC 5050 0.2W RGBW 4in1 Datasheet



Introduction :

PLCC 5050 RGBW 4in1 Series.Three colors(RGB) high density integration.RGB+W can achieve more evenly mixing light effect.Four colors(RGB+W) can be controled separately,which can adjust light color on the demand of scene.

Description :

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

Feature and Benefits :

- RGBW 4 in1,more color options
- Dimmable Design
- Wide viewing angle:120℃
- Suitable for all SMT assembly methods
- IR reflow process compatible
- Environmental friendly; RoHS compliance

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General Information

Ordering Code Format

2	T	0 4	x 2	M x	A	x 0	0 3	x x x
X1	X2	X3-X4	X5-X6	X7-X8	X9	X10-X11	X12-X13	X14-X16

X1		X2		X3-X4		X5-X6		X7-X8	
Type		Component		Series		Wattage		Color	
2	Emitter	T	PLCC	04	5050	X2	0.2W	MC	Cool White
								MN	Neutral White
								MW	Warm White

X9		X10-X11		X12-X13		X14-X16	
BIN		CRI(Ra)		Voltage		Serial Number	
A	Ansi	70	CRI(Ra)70	03	3V	-	-
		80	CRI(Ra)80				

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Absolute Maximum Ratings

Absolute maximum ratings (T_a=25°C)

Parameter	Symbol	Value	Units
DC Forward Current (R/G/B/W)	I_F	30	mA
Pulse Forward Current (tp≤100μs, Duty cycle=0.25) (R/G/B/W)	I_{pulse}	100	mA
Reverse Voltage	V_R	-	V
LED Junction Temperature	T_J	125	°C
Operating Temperature	-	-40 ~ +85	°C
Storage Temperature	-	-40 ~ +125	°C
ESD Sensitivity (HBM)	V_B	2,000	V
Soldering Temperature	T_s	Reflow Soldering : 255~260°C/10~30sec Manual Soldering : 350°C/3sec	

Notes:
1. The values are based on 1-die performance.
2.* I_{FP} condition: pulse width ≤0.1msec and duty ≤1/10.

Characteristics

Parameter	Symbol	Value	Units
Viewing Angle	$2\Theta_{1/2}$	120	Degree
Forward voltage	V_F	R:1.9-2.2 G:2.8-3.1 B:2.8-3.1 W:2.8-3.1	V
Wavelength(Red/Green/Blue)	Wd	R:620-625 G:520-525 B:465-470	nm
CCT(White)	-	2700 3000 3500 4000 5000 5700 6500	K
Ra(White)	-	70 80	-
JEDEC Moisture Sensitivity	-	Level 3 **Floor Life** Conditions: ≤30°C / 60% RH **Soak Requirements(Standard)** Time (hours): 120+1/-0 Conditions: 60°C / 60% RH	-

Note:
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: ±2.
3.CIE_x/y tolerance: ±0.005.

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Luminous Intensity Characteristic

Luminous Intensity Characteristics, I_F=20mA and T_J=25˚C

Color	Group	Min. Luminous Intensity(mcd)	Max. Luminous Intensity(mcd)	Forward Current (mA)	Order Code
Red	C	400	600	20	
	D	600	900		
Green	F	1200	1500	20	2T04X2MCA7003001 2T04X2MNA7003001 2T04X2MWA7003001
	G	1500	2000		
	H	2000	2500		
Blue	B	200	400	20	2T04X2MCA8003001 2T04X2MNA8003001 2T04X2MWA8003001
	C	400	600		
White	G	1500	2000	20	
	H	2000	2500		
	I	2500	3000		

Wavelength Bin Structure

Wavelength Bin Structure, I_F=70mA , T_J=25˚C

Color	Group	Min. Dominant wavelength (nm)	Max. Dominant wavelength (nm)
Red	A	620	625
Green	B	520	525
Blue	C	465	470
	E	460	465

Note:
1.The luminous intensity performance is guaranteed within published operating conditions. Edison Opto maintains a tolerance of ±10% on intensity measurements.
2.Dominant wavelength meansurement allowance is ± 1nm.

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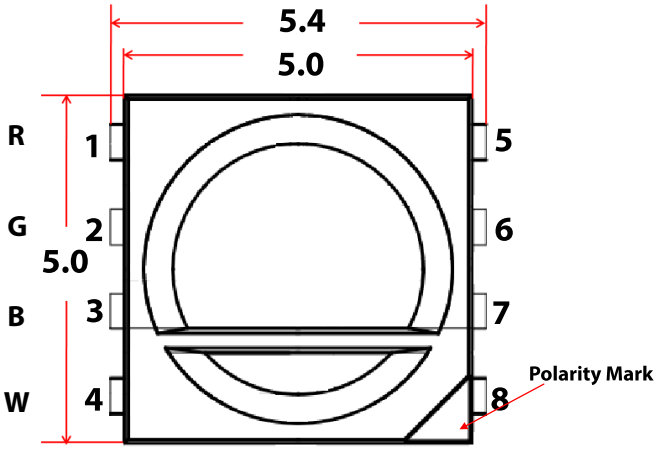
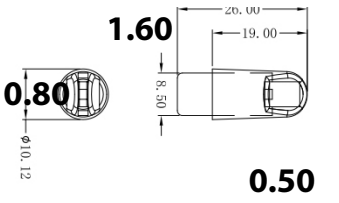
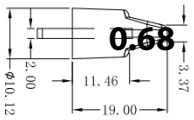
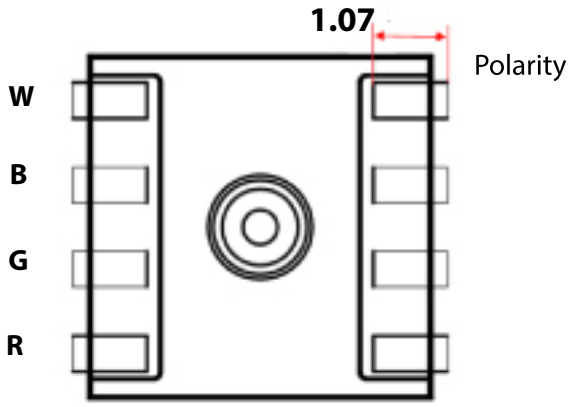
Mechanical Dimensions

Emitter Type Dimension

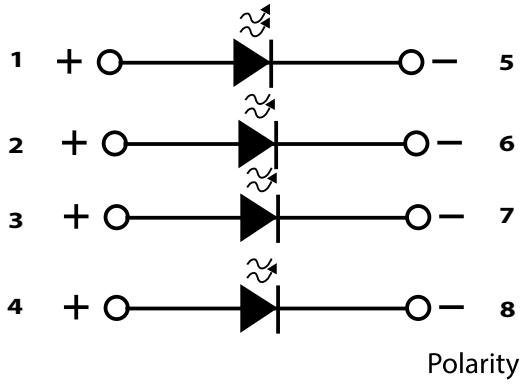




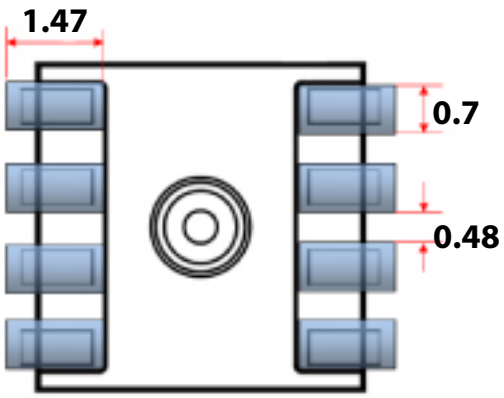




Circuit



Solder Pad



Notes:
1. All dimensions are measured in mm.
2. Tolerance : ± 0.2 mm

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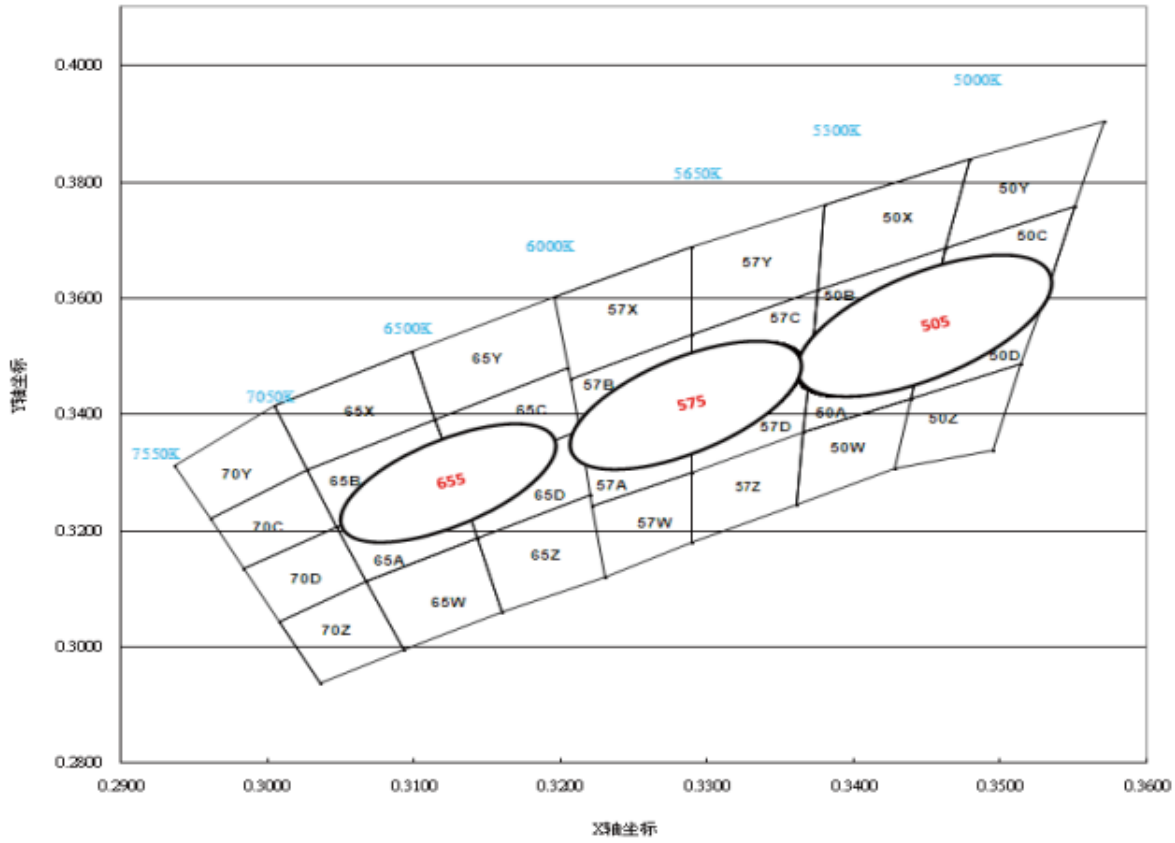
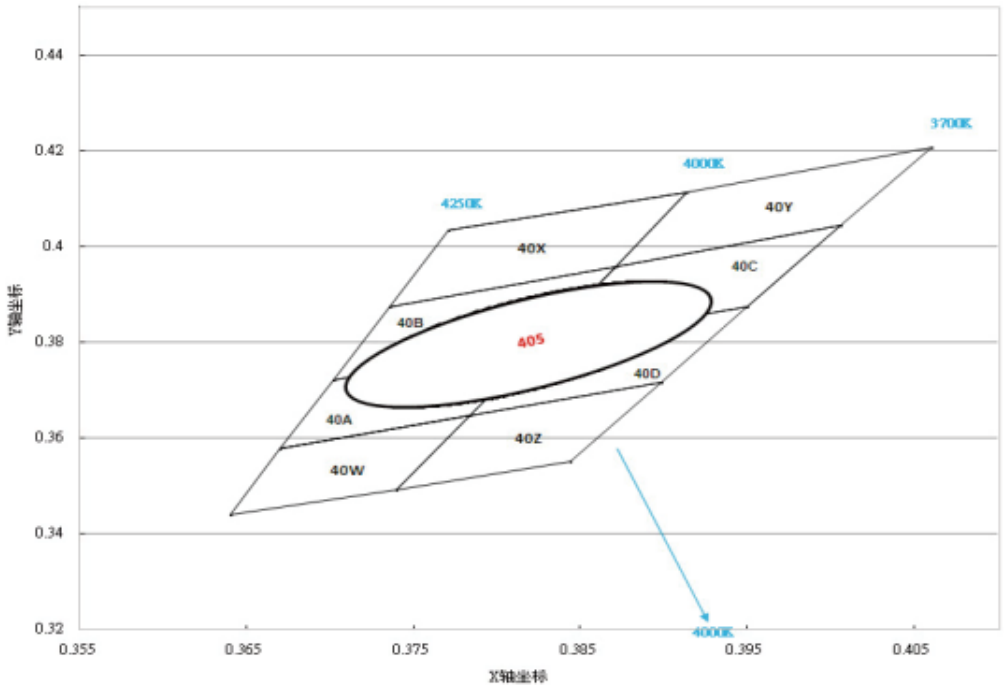
Color region stay within Macadam "3-Step/5-step" ellipse from the chromaticity center.
The chromaticity center refers to ANSI C78.377:2008.
Please refer to ANSI C78.377 for the chromaticity center.

CCT	Steps	Cx	Cy	a	b	theta
2700K	5	0.4578	0.4101	0.01350	0.00700	53.70
3000K	5	0.4338	0.4030	0.01390	0.00680	53.22
3500K	5	0.4073	0.3917	0.01545	0.00690	54.00
4000K	5	0.3818	0.3797	0.01565	0.00670	53.72
5000K	5	0.3447	0.3553	0.01370	0.00590	59.62
5700K	5	0.3287	0.3417	0.01243	0.00533	59.09
6500K	5	0.3123	0.3282	0.01115	0.00475	58.57

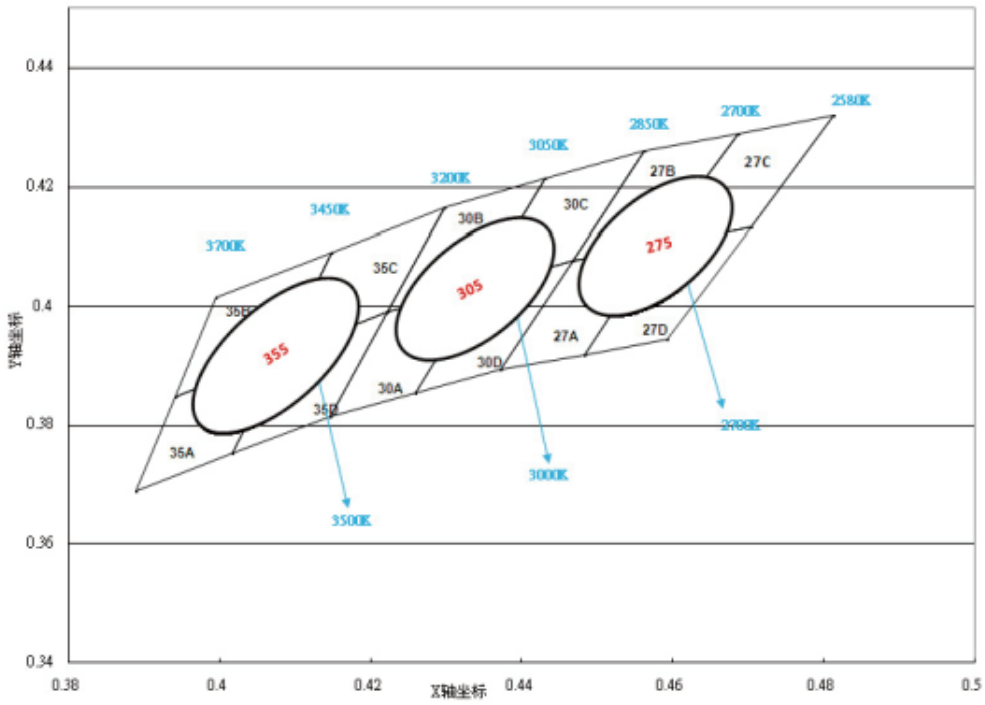
Cool White



Neutral White

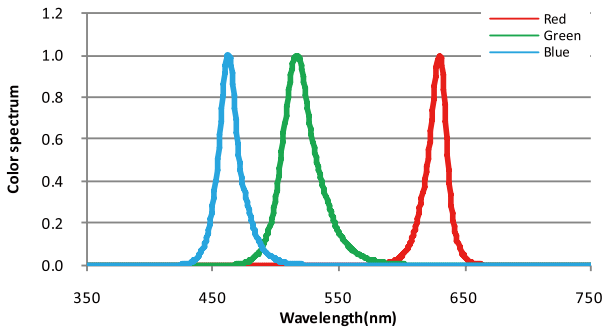


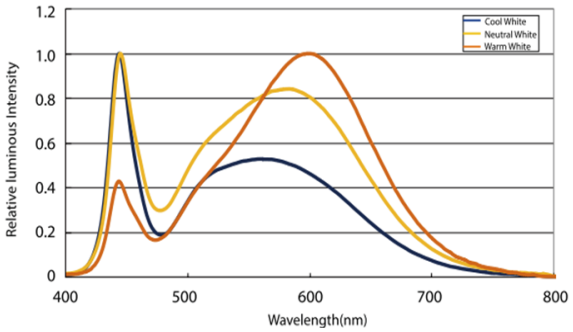
Warm White



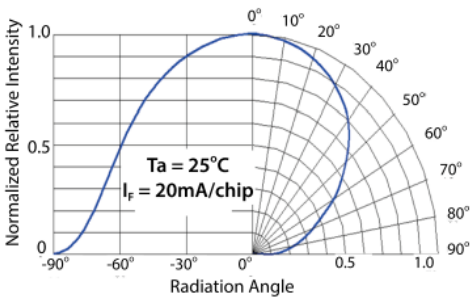
Characteristic curve

Color Spectrum



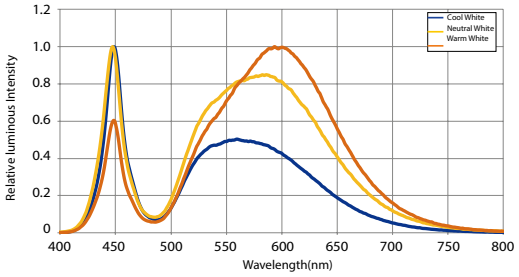


Radiation Diagram

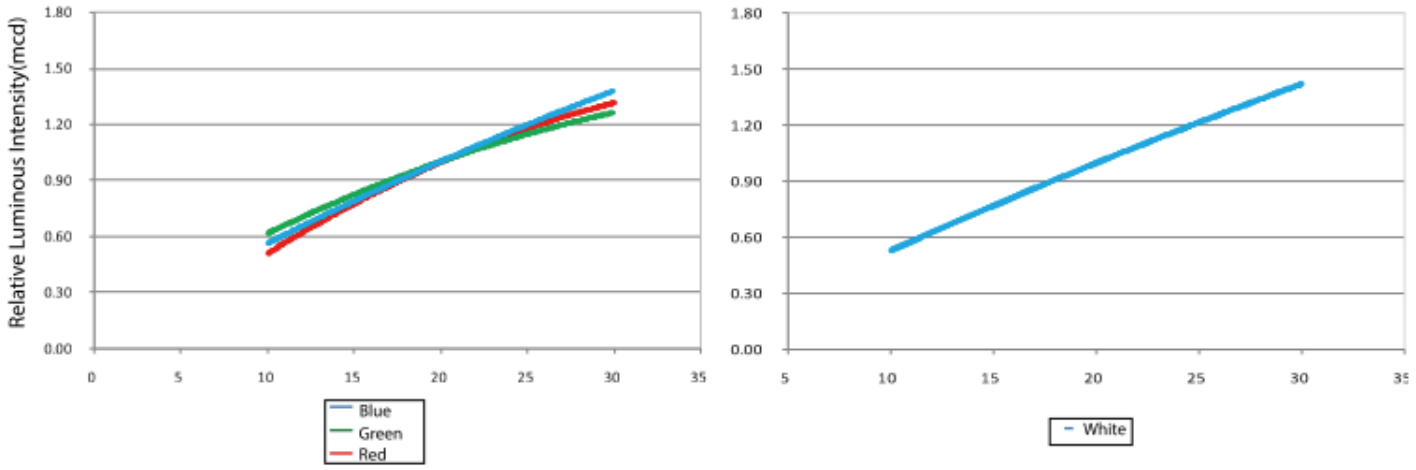


Beam pattern diagram for PLCC 5050 series

Color Spectrum CRI (Ra) 70



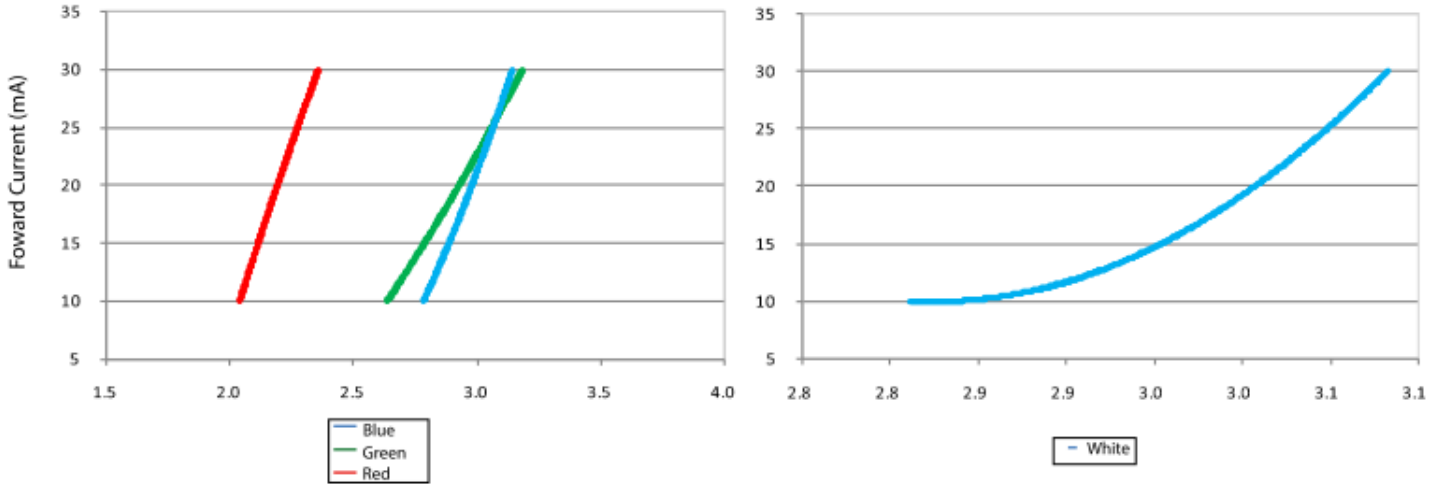
Relative Luminous Intensity vs. Forward Current



Forward Current I_F(mA)

Forward current vs. luminous flux at T_a=25°C for PLCC 5050 series

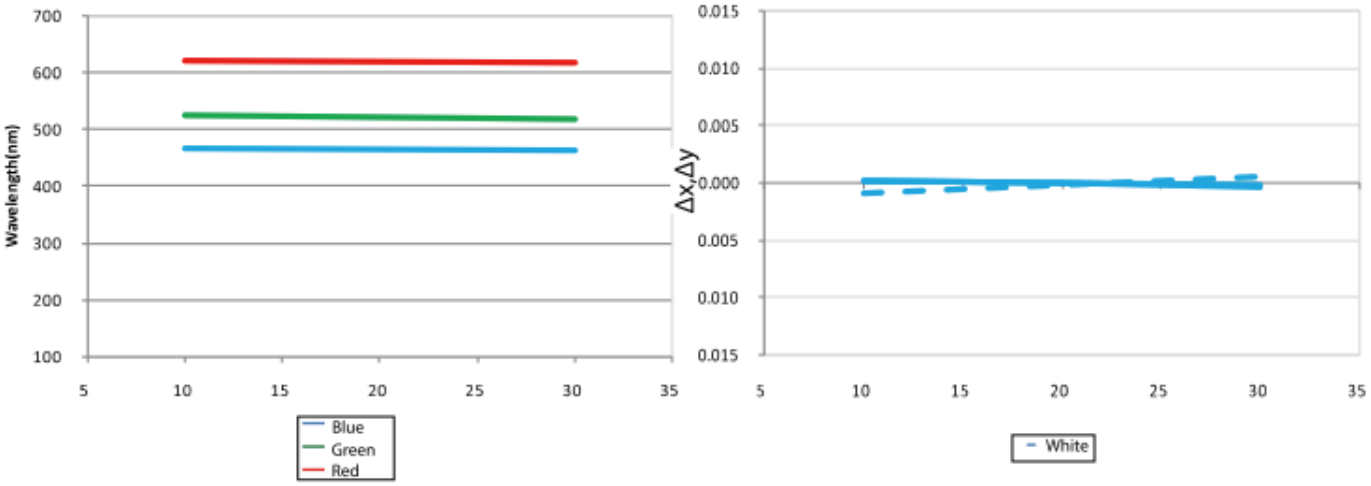
Forward voltage vs. Forward Current



Forward Voltage V_F(V)

Forward current vs. forward voltage for PLCC 5050 series

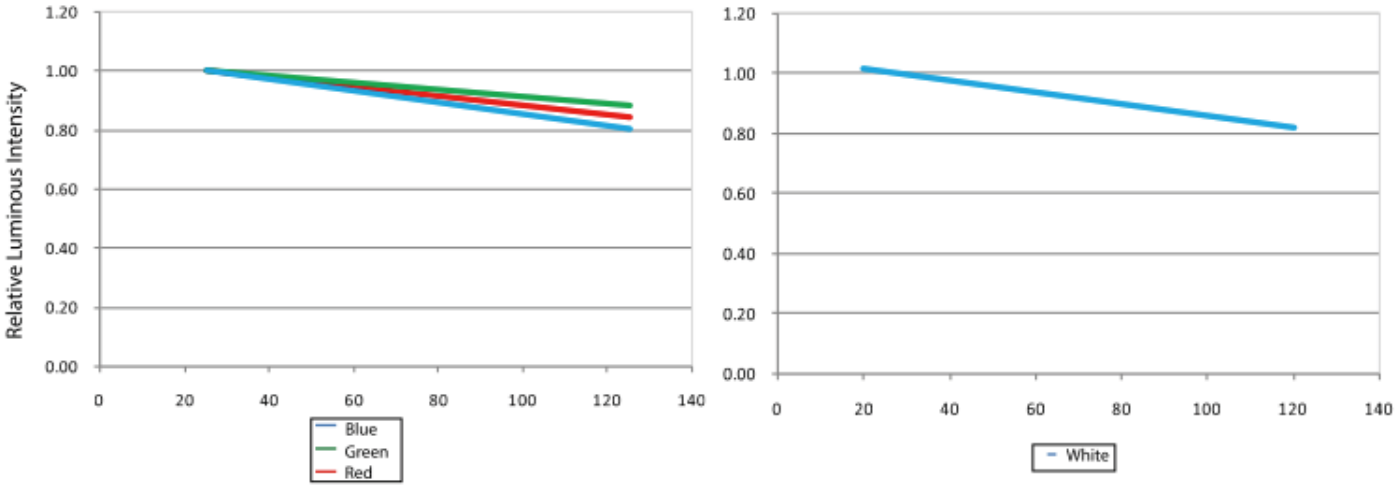
Wavelength vs. Forward Current **Δx,Δy vs. Foward Current**



Forward Current I_F(mA)

Wavelength vs. Forward Current for PLCC 5050

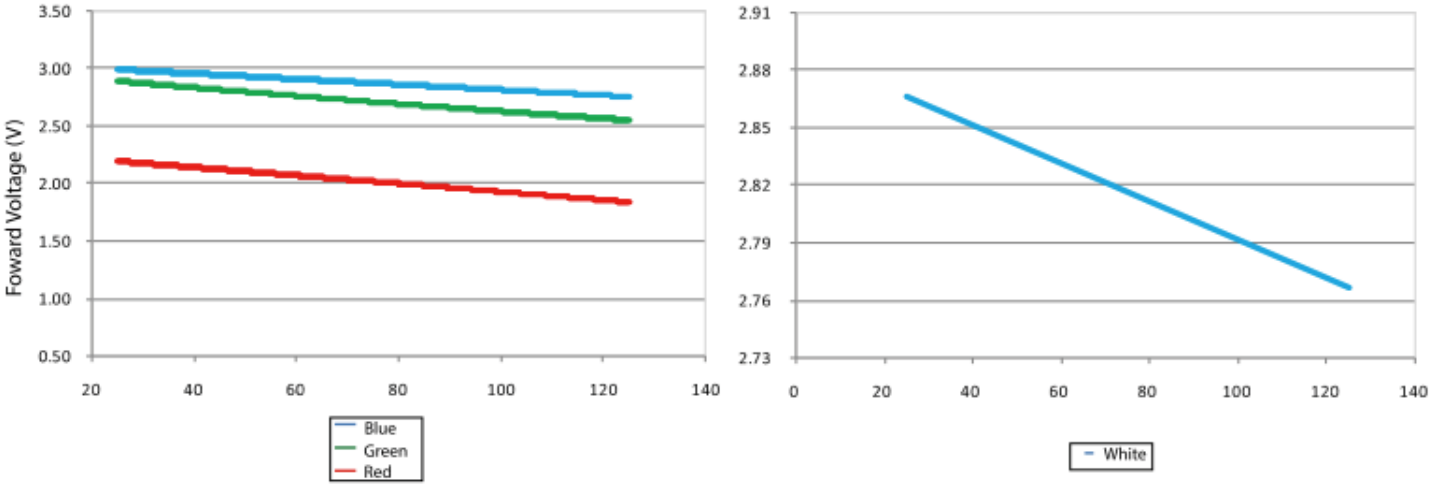
Relative Luminous Intensity vs. Junction temperature



Junction Temperature (°C)

Luminous Intensity vs. Forward Current for PLCC 5050

Forward Voltage vs. Junction temperature

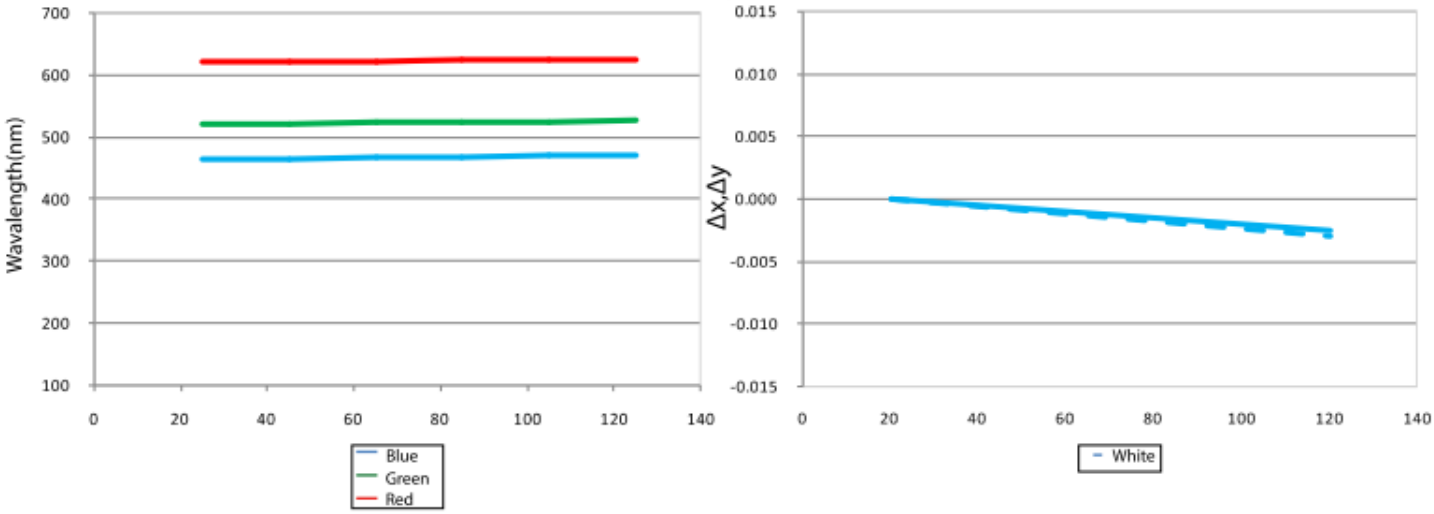


Junction Temperature (°C)

Wavelength vs. Forward Current for PLCC 5050

Wavelength vs. Junction temperature

Δx,Δy vs. Junction Temperature



Junction Temperature (°C)

Wavelength vs. Junction Temperature(°C) for PLCC 5050

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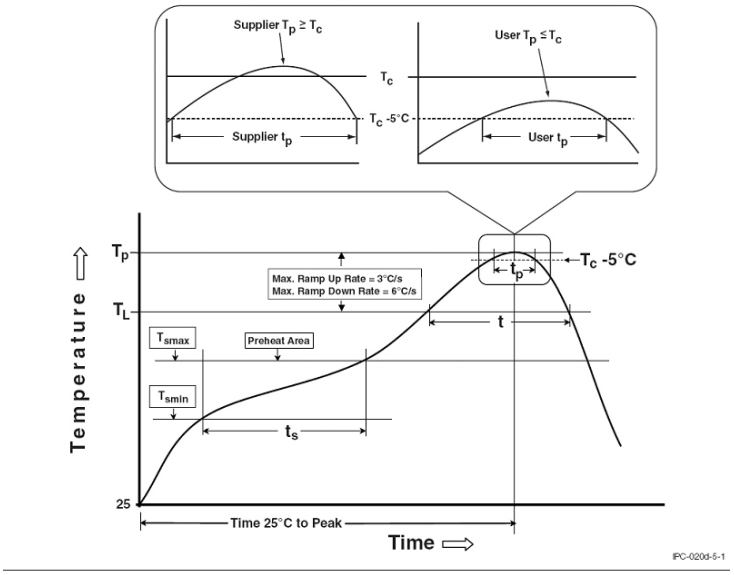
Reflow Profile

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



Reflow Profiles

Classification Reflow Profiles

Profile Feature	Pb-Free Assembly
Preheat & Soak Temperature min (Tsmin) Temperature max (Tsmax) Time (Tsmin to Tsmax) (ts)	150 °C 200 °C 60-120 seconds
Average ramp-up rate (Tsmax to Tp)	3 °C/second max.
Liquidous temperature (TL) Time at liquidous (tL)	217 °C 60-150 seconds
Peak package body temperature (Tp)*	255 °C ~260 °C *
Classification temperature (Tc)	260 °C
Time (tp)** within 5 °C of the specified classification temperature (Tc)	30** seconds
Average ramp-down rate (Tp to Tsmax)	6°C/second max.
Time 25°C to peak temperature	8 minutes max.

Notes:
1. * Tolerance for peak profile temperature (Tp) is defined as a supplier minimum and a user maximum.
2. ** Tolerance for time at peak profile temperature (tp) 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 ≦10 sec	100 Cycle
3	Resistance to Soldering Heat	T_{SOL}=260°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°C	1,000 hrs
6	Humidity Heat Storage	T_A=85°C RH=85%	1,000 hrs
7	Low-Temperature Storage	T_A=-40°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%	-
Δu'v'	-	0.006
Forward Voltage	-	Initial Data x 1.1
Reverse Current	-	10 μA
Resistance to Soldering Heat	No dead lamps or visual damage	

Cautions

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

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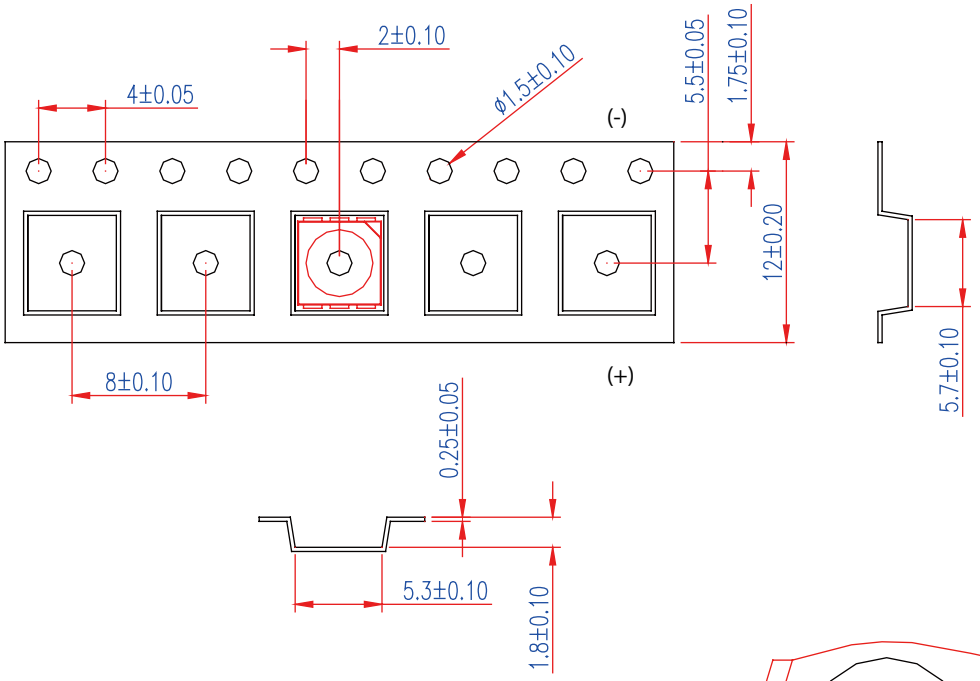
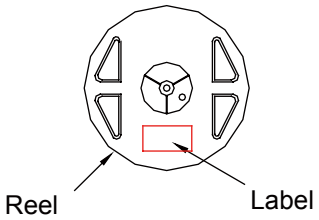
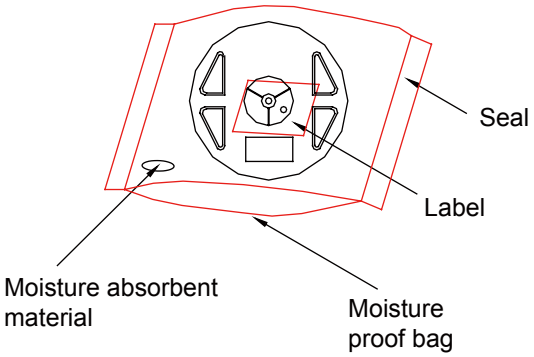
Product Packaging Information





Taping reel dimensions



Package & Label

Item	Quantity	Total	Dimensions(mm)
Reel	1,000pcs	1,000pcs	R=178
Box	4 Reels	4,000pcs	240*235*67
Carton	5 boxes	20,000pcs	500*260*355
Starting with 50pcs empty, and 50pcs empty at the last			

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Revision History

Versions	Description	Release Date
1	Establish order code information	2018/4/3
2	Update Mechanical Dimensions Update the Types of chart	2019/02/14
3	Update Package Outline	2019/3/22
4	Update Luminous Intensity Characteristic	2019/12/11
5	Update Wavelength Bin	2021/10/11

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

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