

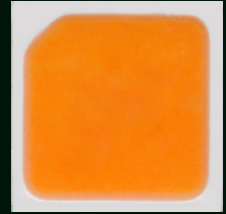


Bridgelux® SMD 3030 1W 6V

Product Data Sheet DS671

Introduction

SMD 3030



Features

- Industry-standard 3030 footprint
- RoHS compliant and lead free
- The color of the product can help plants grow

Benefits

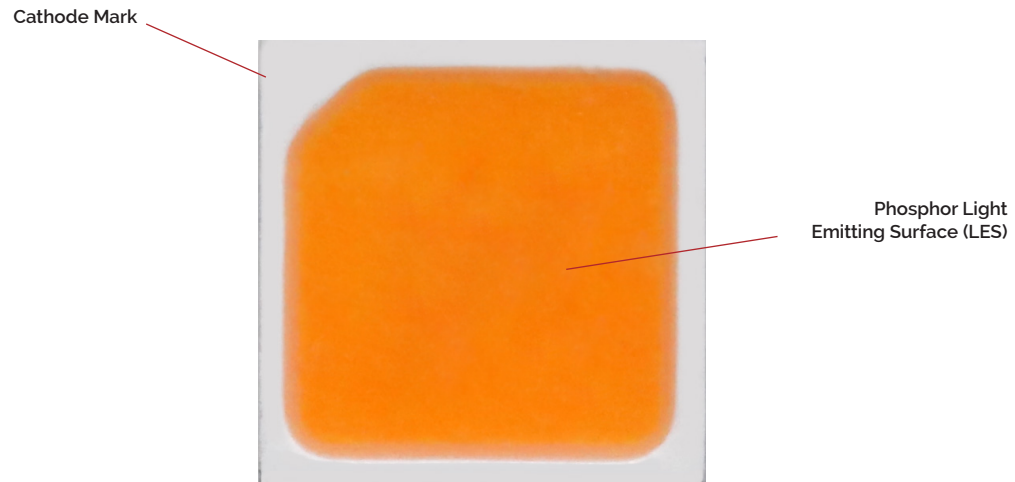
- Lower operating and manufacturing cost
- Rapid go-to-market
- Compliant with environmental standards
- Design flexibility

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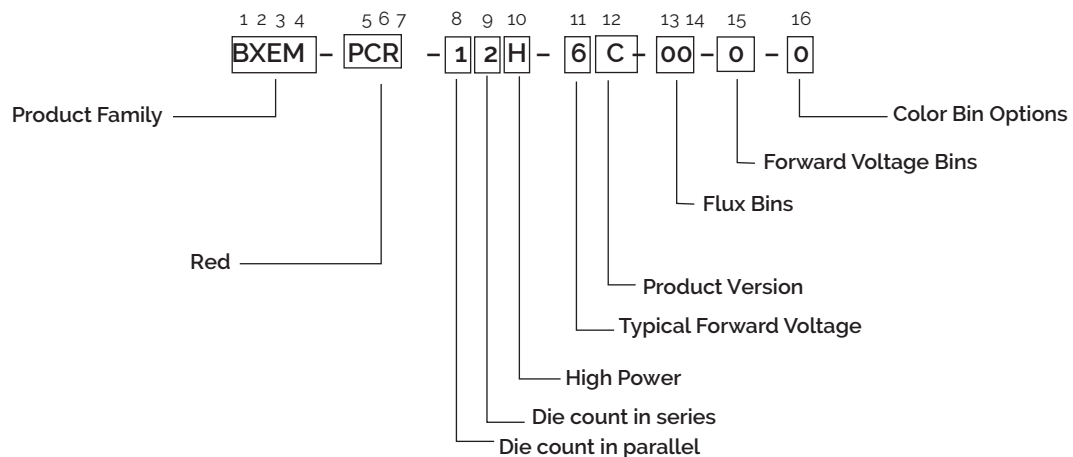
Product Feature Map

Bridgelux SMD LED products come in industry standard package sizes . These LEDs are optimized for cost and performance, helping to ensure highly competitive system lumen per dollar performance while addressing the stringent efficacy and reliability standards required for modern lighting applications.



Product Nomenclature

The part number designation for Bridgelux SMD 3030 is explained as follows:



Product Selection Guide

The following product configurations are available:

Table 1: Selection Guide, Pulsed Measurement Data at 150mA ($T_j = T_{sp} = 25^\circ\text{C}$)

Part Number ^{1,6}	Color	Nominal Drive Current (mA)	Forward Voltage ^{4,5} (V)			Typical Dominant Wavelength (nm)	Typical Pulsed Flux (lm) ^{4,5}	Typical Power (W)	Typical Efficacy (lm/W)
			Min	Typical	Max				
BXEM-PCR-12H-6C-00-0-0	red	150	5.8	6.1	6.6	590	101	0.9	112.5

Table 2: Selection Guide, Pulsed Test Performance ($T_{sp} = 85^\circ\text{C}$)^{7,8}

Part Number ^{1,6}	Color	Nominal Drive Current (mA)	Forward Voltage ^{4,5} (V)			Typical Dominant Wavelength (nm)	Typical Pulsed Flux (lm) ^{4,5}	Typical Power (W)	Typical Efficacy (lm/W)
			Min	Typical	Max				
BXEM-PCR-12H-6C-00-0-0	red	150	5.6	5.9	6.4	589.5	82.9	0.9	95.9

Notes for Tables 1 & 2:

1. The last 6 characters (including hyphens '-') refer to flux bins, forward voltage bins, and color bin options, respectively. "00-0-0" denotes the full distribution of flux, forward voltage, and color bin.

Example: BXEM-PCR-12H-6C-00-0-0 refers to the full distribution of flux, forward voltage, 1x2 die configuration, high power, 6.1V typical forward voltage.

2. Products tested under pulsed condition (10ms pulse width) at nominal drive current.

3. Bridgelux maintains a $\pm 7.5\%$ tolerance on luminous flux measurements, $\pm 0.1\text{V}$ tolerance on forward voltage measurements for the SMD 3030.

4. Refer to Table 5 and Table 6 for Bridgelux SMD 3030 Luminous Flux Binning and Forward Voltage Binning information.

5. Typical pulsed test performance values are provided as reference only and are not a guarantee of performance.

6. Typical performance is estimated based on operation under pulsed current with LED emitter mounted onto a heat sink with thermal interface material and the solder point temperature maintained at 85°C . Based on Bridgelux test setup, values may vary depending on the thermal design of the luminaire and/or the exposed environment to which the product is subjected.

Electrical Characteristics

Table 3: Electrical Characteristics

Part Number ¹	Drive Current (mA)	Forward Voltage (V) ^{2,3}			Typical Temperature Coefficient of Forward Voltage $\Delta V_f / \Delta T$ (mV/°C)	Typical Thermal Resistance Junction to Solder Point ³ R_{j-sp} (°C/W)
		Minimum	Typical	Maximum		
BXEM-PCR-12H-6C-00-0-0	150	5.8	6.1	6.6	-2.3	18.8

Notes for Table 3:

1. Bridgelux maintains a tolerance of $\pm 0.1V$ on forward voltage measurements. Voltage minimum and maximum values at the nominal drive current are guaranteed by 100% test.
2. Products tested under pulsed condition (10ms pulse width) at nominal drive current where $T_{sp} = 25^{\circ}C$.
3. Thermal resistance value was calculated using total electrical input power; optical power was not subtracted from input power.

Absolute Maximum Ratings

Table 4: Maximum Ratings

Parameter	Maximum Rating
LED Junction Temperature (T_j)	125°C
Storage Temperature	-40°C to +105°C
Operating Solder Point Temperature (T_{sp})	-40°C to +105°C
Soldering Temperature	260°C or lower for a maximum of 10 seconds
Maximum Drive Current	240mA
Maximum Peak Pulsed Forward Current ¹	480mA
Maximum Reverse Voltage ²	-
Moisture Sensitivity Rating	MSL 3
Electrostatic Discharge	2kV HBM. JEDEC-JS-001-HBM and JEDEC-JS-001-2012

Notes for Table 4:

1. Bridgelux recommends a maximum duty cycle of 10% and pulse width of 10 ms when operating LED SMD at maximum peak pulsed current specified. Maximum peak pulsed current indicate values where LED SMD can be driven without catastrophic failures.
2. Light emitting diodes are not designed to be driven in reverse voltage and will not produce light under this condition. no rating is provided

Product Bin Definitions

Table 5 lists the standard photometric luminous flux bins for Bridgelux SMD 3030 LEDs. Although several bins are listed, product availability in a particular bin varies by production run and by product performance.

Table 5: Luminous Flux Bin Definitions at 150mA, $T_{sp}=25^{\circ}\text{C}$

Bin Code	Minimum	Maximum	Unit	Condition
09	90	100	lm	$I_F=150\text{mA}$
10	100	110		

Note for Table 5:

1. Bridgelux maintains a tolerance of $\pm 7.5\%$ on luminous flux measurements.

Table 6: Forward Voltage Bin Definition at 150mA, $T_{sp}=25^{\circ}\text{C}$

Bin Code	Minimum	Maximum	Unit	Condition
P	5.8	6.0	V	$I_F=150\text{mA}$
Q	6.0	6.2		
R	6.2	6.4		
S	6.4	6.6		

Note for Table 6:

1. Bridgelux maintains a tolerance of $\pm 0.1\text{V}$ on forward voltage measurements.

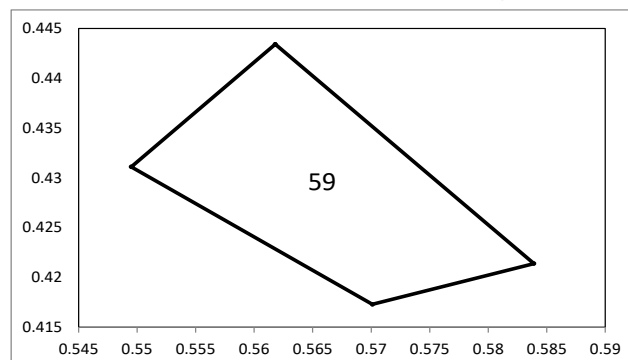
Table 7: Color Bin Definitions

Center Point		
X	Y	BINCODE
0.5618	0.4434	59
0.5495	0.4311	
0.5701	0.4173	
0.5839	0.4214	

Note for Table 7:

1. Color binning at $T_{sp}=25^{\circ}\text{C}$ unless otherwise specified
2. Bridgelux maintains a tolerance of ± 0.007 on x and y color coordinates in the CIE 1931 color space.

Figure 1: C.I.E. 1931 Chromaticity Diagram (Targeted at $T_{sp}=25^{\circ}\text{C}$)



Performance Curves

Figure 2: Drive Current vs. Forward Voltage ($T_{sp}=25^{\circ}\text{C}$)

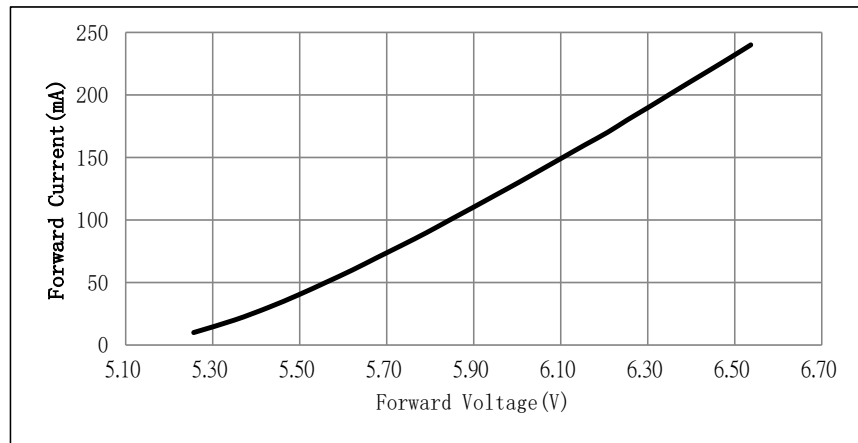
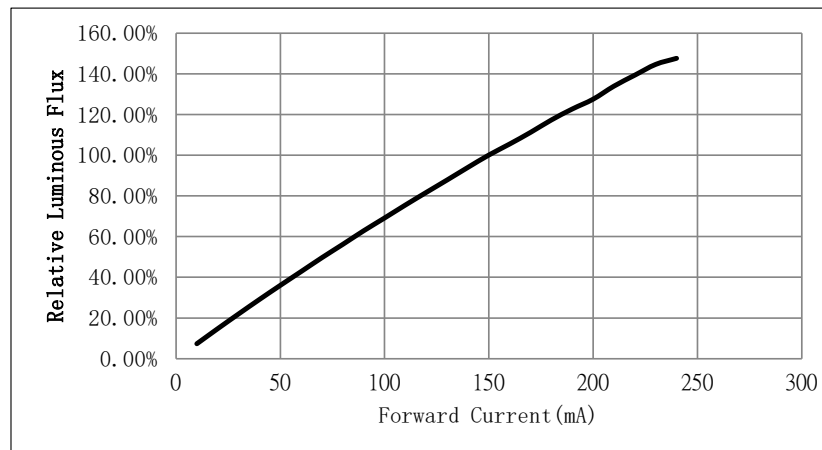


Figure 3: Relative Luminous Flux vs. Forward Current ($T_{sp}=25^{\circ}\text{C}$)

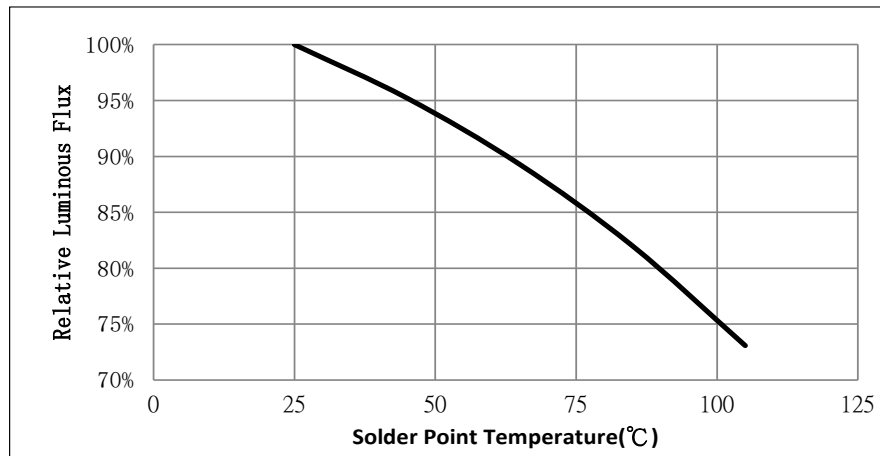


Note for Figure 3:

1. Pulse width modulation (PWM) is recommended for dimming effects.

Performance Curves

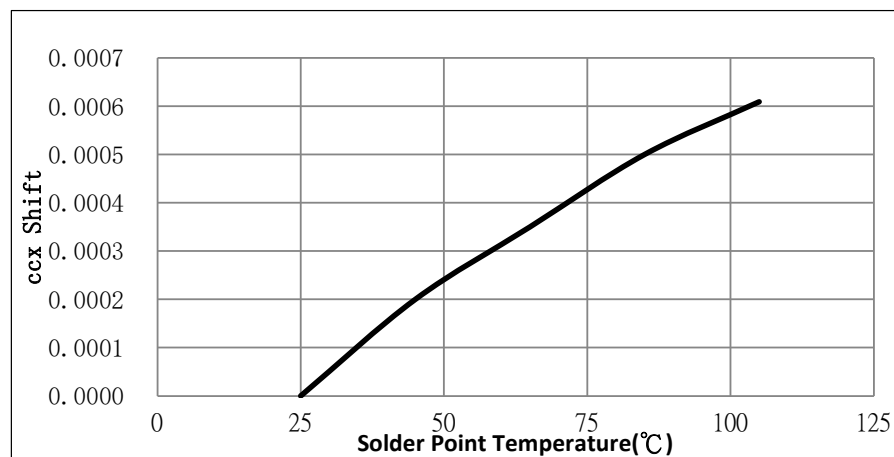
Figure 4: Relative Flux vs. Solder Point Temperature



Notes for Figures 4 :

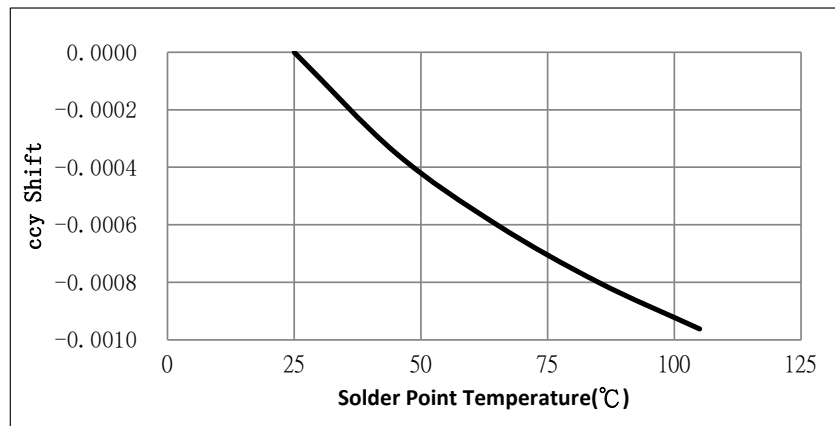
1. Characteristics shown for red Color .
2. For other color SKUs, the shift in color will vary. Please contact your Bridgelux Sales Representative for more information.

Figure 5: Typical ccx Shift vs. Solder Point Temperature



Typical Radiation Pattern

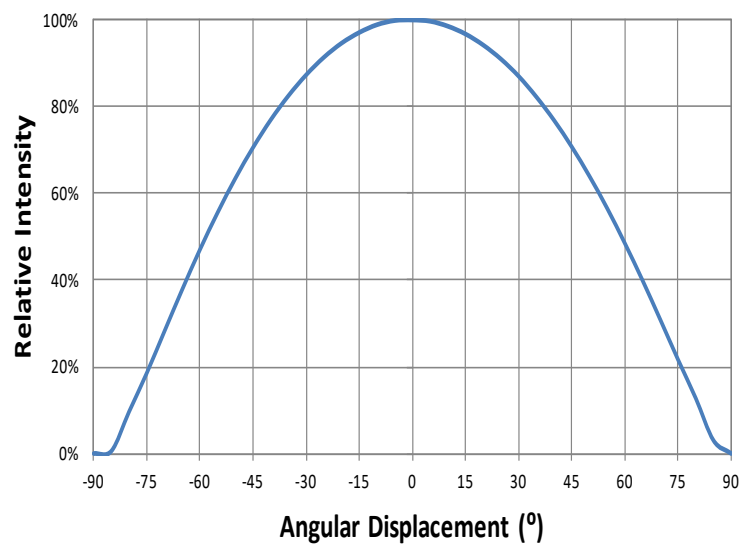
Figure 6: Typical ccy Shift vs. Solder Point Temperature



Notes for Figure 5&6:

1. Characteristics shown for red Color.

Figure 7: Typical Polar Radiation Pattern at 150mA, $T_{sp} = 25^{\circ}\text{C}$



Notes for Figure 7:

1. Typical viewing angle is 120° .
2. The viewing angle is defined as the off axis angle from the centerline where luminous intensity (Iv) is $\frac{1}{2}$ of the peak value.

Typical Color Spectrum

Figure 8: Typical Polar Radiation Pattern at 150mA, $T_{sp}=25^{\circ}\text{C}$

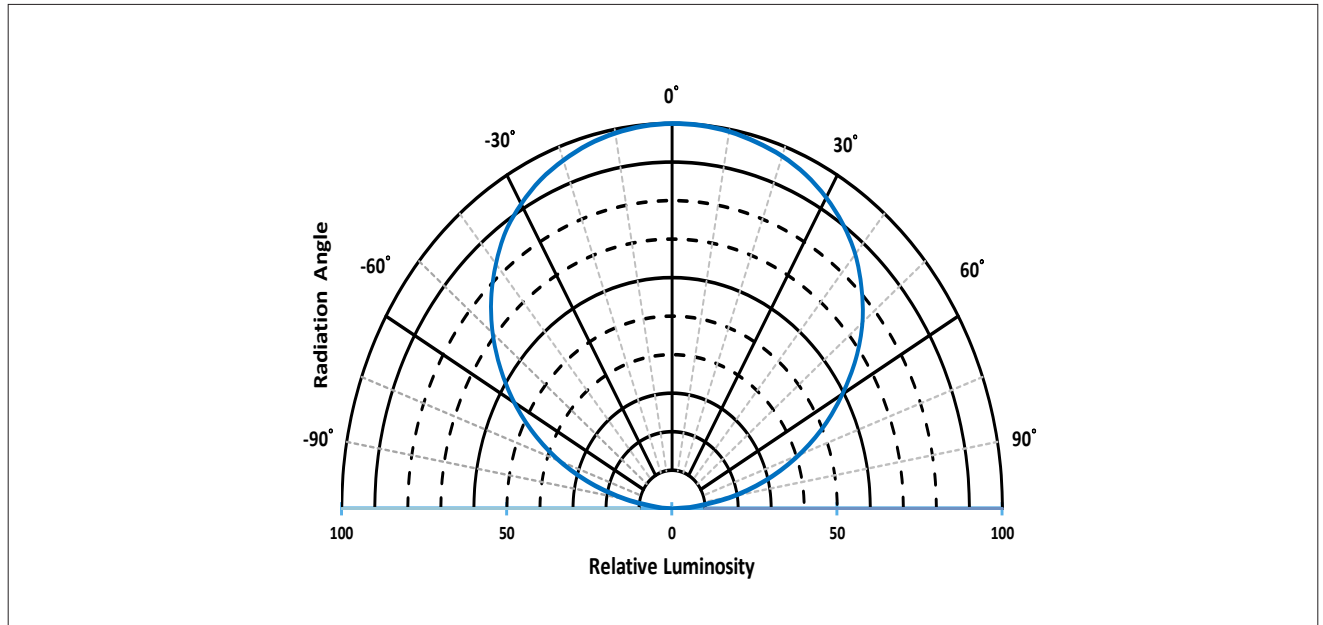
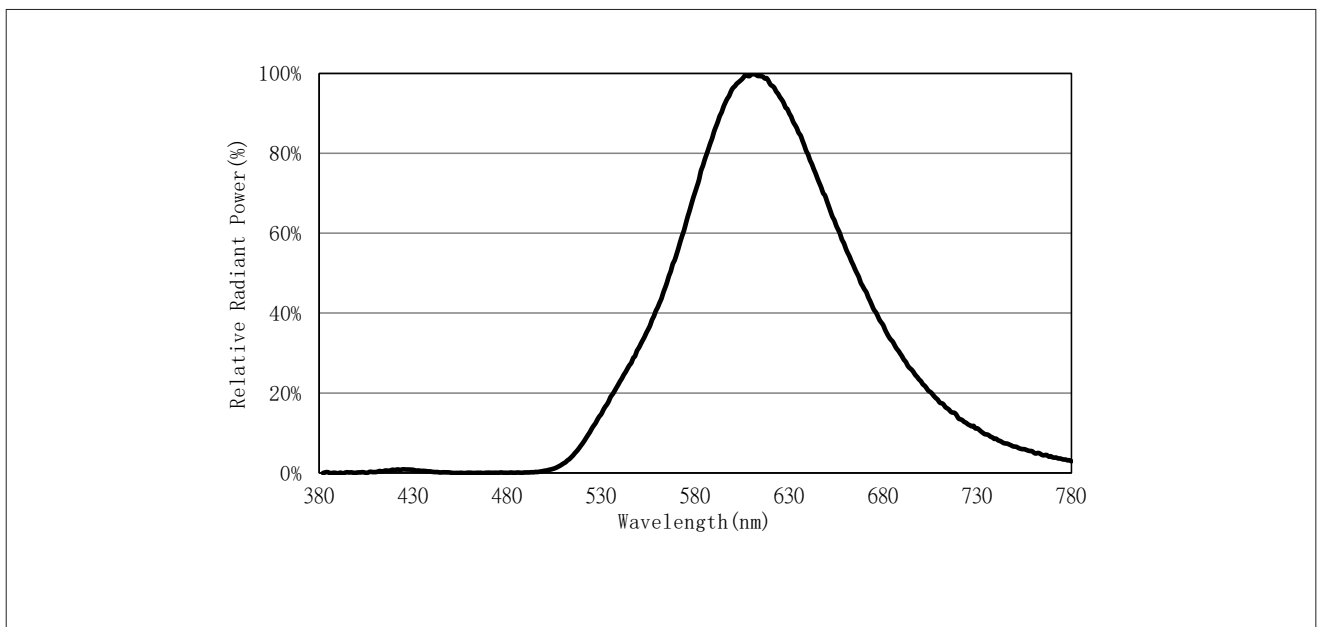


Figure 9: Typical Color Spectrum

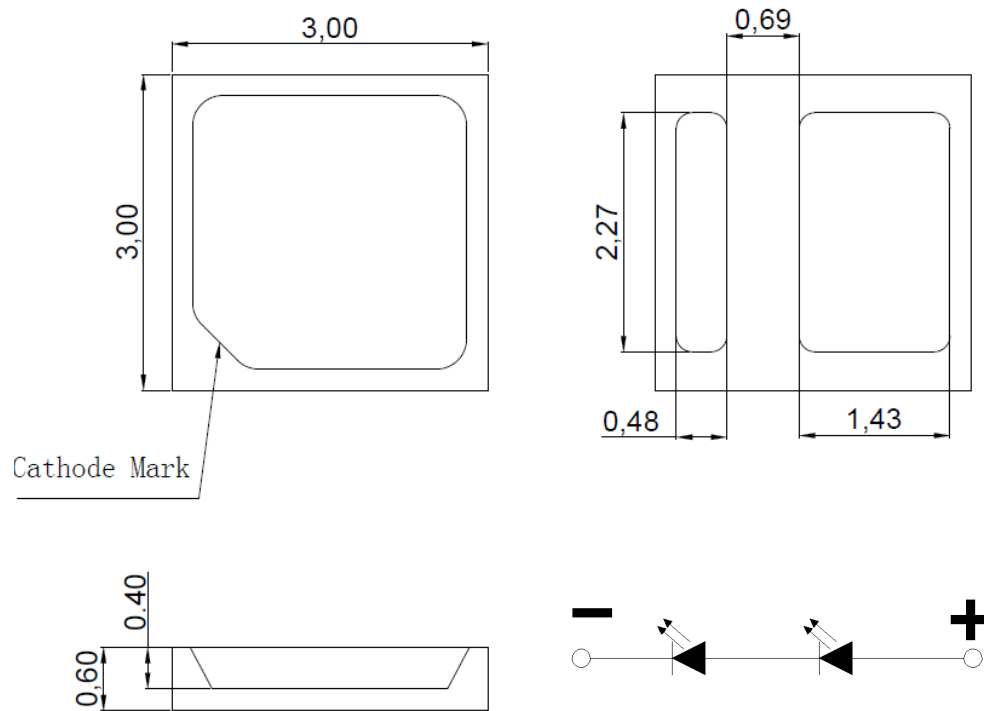


Notes for Figure 9:

1. Color spectra measured at nominal current for $T_{sp} = 25^{\circ}\text{C}$
2. Color spectra shown for red

Mechanical Dimensions

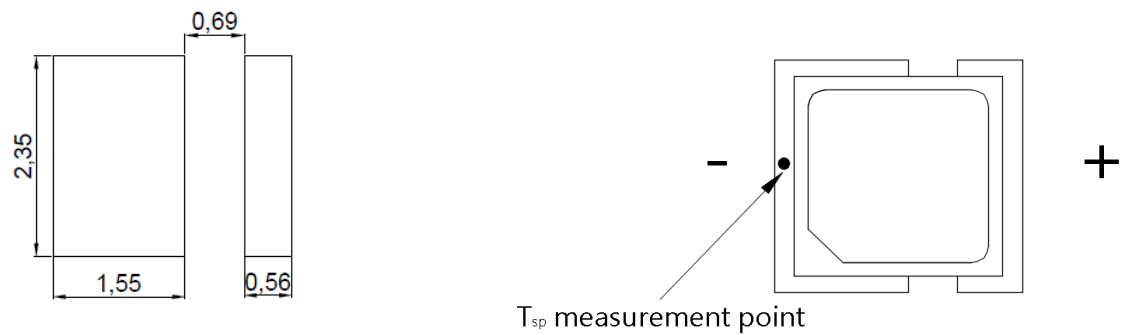
Figure 10: Drawing for SMD 3030



Notes for Figure 10:

1. Drawings are not to scale.
2. Drawing dimensions are in millimeters.
3. Unless otherwise specified, tolerances are $\pm 0.10\text{mm}$.

Recommended PCB Soldering Pad Pattern



Reliability

Table 8: Reliability Test Items and Conditions

No .	Items	Reference Standard	Test Conditions	Drive Current	Test Duration	Units Failed/Tested
1	Moisture/Reflow Sensitivity	J-STD-020E	$T_{\text{slid}} = 260^{\circ}\text{C}$, 10sec, Precondition: 30°C , 60%RH, 168hr	-	3 reflows	0/20
2	Low Temperature Storage	JESD22-A11g	$T_a = -40^{\circ}\text{C}$	-	1000 hours	0/20
3	High Temperature Storage	JESD22-A103D	$T_a = 105^{\circ}\text{C}$	-	1000 hours	0/20
4	Low Temperature Operating Life	JESD22-A108D	$T_a = -40^{\circ}\text{C}$	150mA	1000 hours	0/20
5	Temperature Humidity Operating Life	JESD22-A101C	$T_{\text{sp}} = 85^{\circ}\text{C}$, RH-85%	150mA	1000 hours	0/20
6	High Temperature Operating Life	JESD22-A108D	$T_{\text{sp}} = 105^{\circ}\text{C}$	240mA	1000 hours	0/20
7	Thermal Shock	JESD22-A106B	$T_a = -40^{\circ}\text{C} \sim 100^{\circ}\text{C}$; Dwell : 15min; Transfer: 10sec	-	200 cycles	0/20
8	Temperature Cycle	JESD22-A104E	$T_a = -40^{\circ}\text{C} \sim 100^{\circ}\text{C}$; Dwell at extreme temperature: 15min; Ramp rate $< 105^{\circ}\text{C}/\text{min}$	-	200 cycles	0/20
9	Electrostatic Discharge	JS-001-2012	HBM, 2kV, 15k Ω , 100pF, Alternately positive or negative	-	-	0/20

Passing Criteria

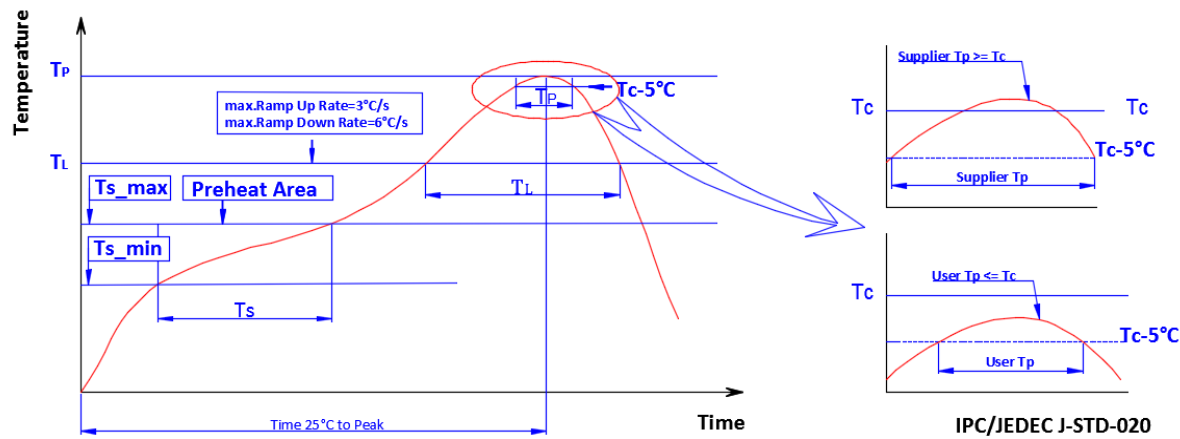
Item	Symbol	Test Condition	Passing Criteria
Forward Voltage	Vf	150mA	$\Delta V_f < 10\%$
Luminous Flux	Fv	150mA	$\Delta F_v < 30\%$
Chromaticity Coordinates	(x, y)	150mA	$\Delta u'v' < 0.007$

Notes for Table 8:

- Measurements are performed after allowing the LEDs to return to room temperature
- T_{slid} : reflow soldering temperature; T_a : ambient temperature

Reflow Characteristics

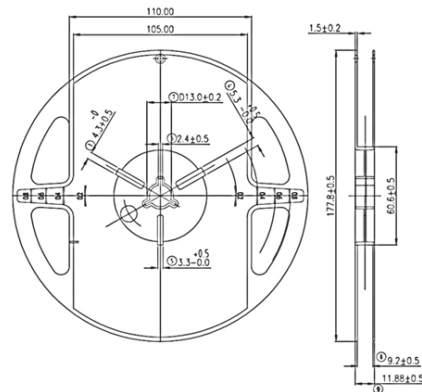
Figure 11 : Reflow Profile



Profile Feature	Lead Free Assembly
Temperature Min. (T_{s_min})	160°C
Temperature Max. (T_{s_max})	205°C
Time (ts) from T_{s_min} to T_{s_max}	60-150 seconds
Ramp-Up Rate (T_L to T_P)	3°C/second
Liquidus Temperature (T_L)	220°C
Time (T_L) Maintained Above T_L	60-150 seconds
Peak Temp(T_P)	260°C max.
Time (T_P) Within 5°C of the Specified Classification Temperature (T_c)	25 seconds max.
Ramp-Down Rate (T_P to T_L)	5°C/second max.
Time 25°C to Peak Temperature	10 minutes max.

Packaging

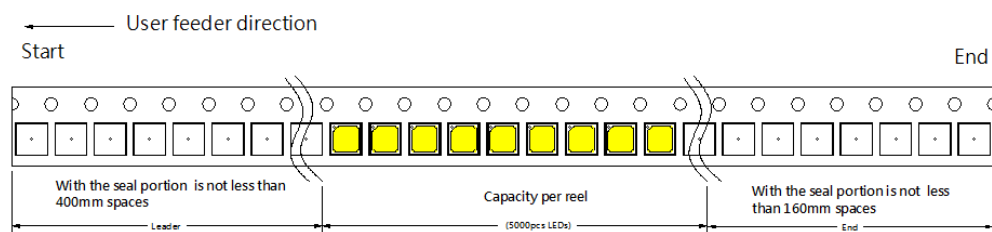
Figure 12: Emitter Reel Drawings



Note for Figure 12:

1. Drawings are not to scale. Drawing dimensions are in millimeters.

Figure 13: Emitter Tape Drawings

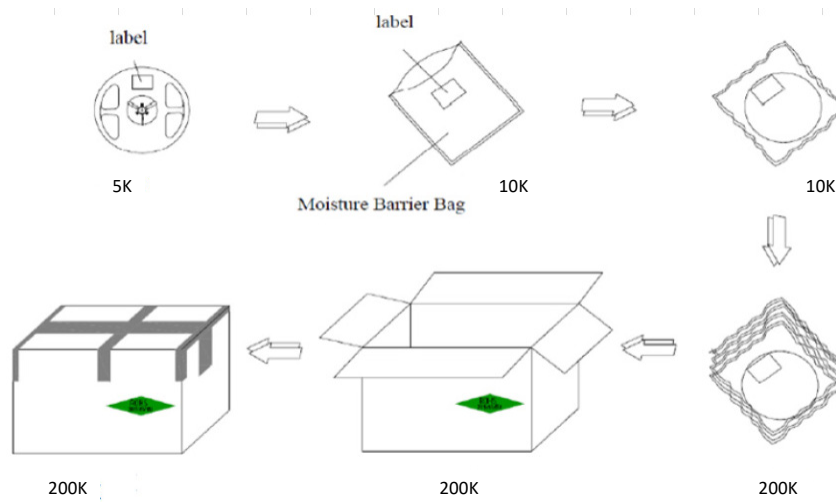


Note for Figure 13:

1. Drawings are not to scale. Drawing dimensions are in millimeters.

Packaging

Figure 14: Emitter Reel Packaging Drawings



Note for Figure 14:

1. Drawings are not to scale.

Design Resources

Please contact your Bridgelux sales representative for assistance.

Precautions

CAUTION: CHEMICAL EXPOSURE HAZARD

Exposure to some chemicals commonly used in luminaire manufacturing and assembly can cause damage to the LED emitter. Please consult Bridgelux Application Note AN51 for additional information.

CAUTION: EYE SAFETY

This SMD package emits visible light, that, under certain circumstances, could be harmful to the eye. Proper safeguards must be used.

CAUTION: RISK OF BURN

Do not touch the SMD LED emitter during operation. Allow the emitter to cool for a sufficient period of time before handling. The SMD LED emitter may reach elevated temperatures such that could burn skin when touched.

CAUTION

CONTACT WITH LIGHT EMITTING SURFACE (LES)

Avoid any contact with the LES. Do not touch the LES of the emitter or apply stress to the LES.

Contact may cause damage to the emitter

Optics and reflectors must not be mounted in contact with the LES.

Disclaimers

MINOR PRODUCT CHANGE POLICY

The rigorous qualification testing on products offered by Bridgelux provides performance assurance. Slight cosmetic changes that do not affect form, fit, or function may occur as Bridgelux continues product optimization.

STANDARD TEST CONDITIONS

Unless otherwise stated, LED emitter testing is performed at the nominal drive current.

About Bridgelux: Bridging Light and Life™

At Bridgelux, we help companies, industries and people experience the power and possibility of light. Since 2002, we've designed LED solutions that are high performing, energy efficient, cost effective and easy to integrate. Our focus is on light's impact on human behavior, delivering products that create better environments, experiences and returns—both experiential and financial. And our patented technology drives new platforms for commercial and industrial luminaires.

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