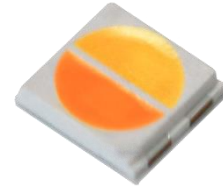




YJ-BC-3032-G03

Surface Mount Device



Applications

- High-end architectural lighting
- Photographic/broadcast lighting
- Human-centric lighting
- Photoelectric device and relevant research

Features

- Industrial high CRI performance
- 3.0mm × 3.2mm package
- TLCI & TM-30 specified
- SimpleBinning solution

[About Yujileds[®]](#)

Rev Version: 2.4

P3200006.00

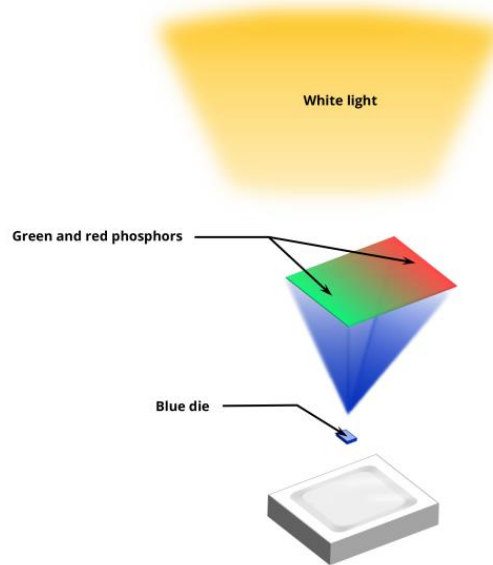
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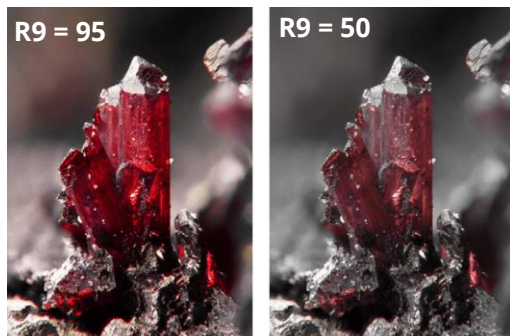
General description

Industrial-leading high CRI technology

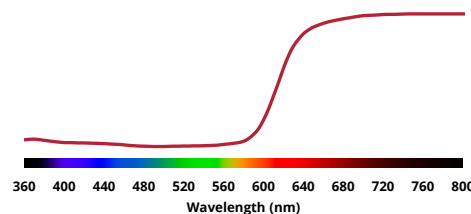
Yujileds® BC series LED is based on the efficient blue (typical 450nm) die, mixing with Yuji advanced phosphors and specifically designed spectral recipes. Although there are more and more nominal “high CRI LED” manufacturers on the market, after relevant test and analysis, it is proud to say that Yujileds® BC series LED is still one of the top performance product on the global markets. Achieving typical Ra 97 and minimum Ra 95, the stability and consistent quality in mass production are verified by statistical identification.



Enhanced CRI R9 technology



The standard CRI Ra is the average score of the first eight Test Color Samples (TCS), where the 9th for saturated red color is missed. However R9 is significantly different for different light sources. In spectral analysis and CRI arithmetic, the integral area between the spectrum and the spectral reflectance response of TCS-9 decides the R9 to a large extent – in other words, how much of TCS-9 spectra reflectance is overlaid in the light source spectrum, that is a key factor.



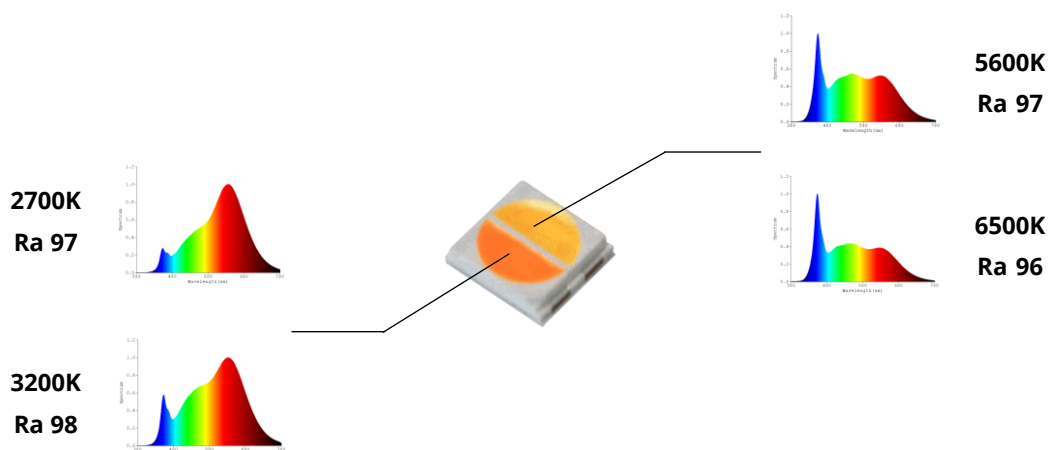
Light source	R9
Halogen (2865K)	99
Fluorescent (3000K)	-27
Standard LED (3000K)	13
Yujileds® BC series LED (3000K)	96

It is obvious to see from 600nm, which is just the start of red color in the visible spectrum, the TCS-9 spectral reflectance raises sharply, in consequence, if the light source does not have sufficient spectral power distribution in 600nm-800nm, it will be difficult to get a high R9. The capability of rendering the red color cannot be promised if the red spectrum is missed or not sufficient in the original light. In the comparison of fluorescent and halogen, apparently, halogen offers the richest 600+nm power, while the discrete fluorescent spectrum has limited energy there. Then in this comparison, halogen R9 = 99 but the fluorescent is R9 = -27. Comparing a standard LED to Yujileds® BC series LED at 3000K, although the emission principle is the same, the results present different R9 significantly where the standard LED is R9 = 13 and Yujileds® BC series LED is R9 = 96.

The design for tunable white

Tunable white, or saying bi-color LED, is not a novel concept on the market. For human-centric lighting or cinematography lighting which requires a tunable spectrum, bi-color LED is already widely applied in many products. So far, most tunable white LEDs on the market are separated single-white colors, however, considering some special projects which desire not only bi-color effect but also limited space of illumination, or high illuminating density, YUJILEDS® BC series 3032 LED will be a preferable option.

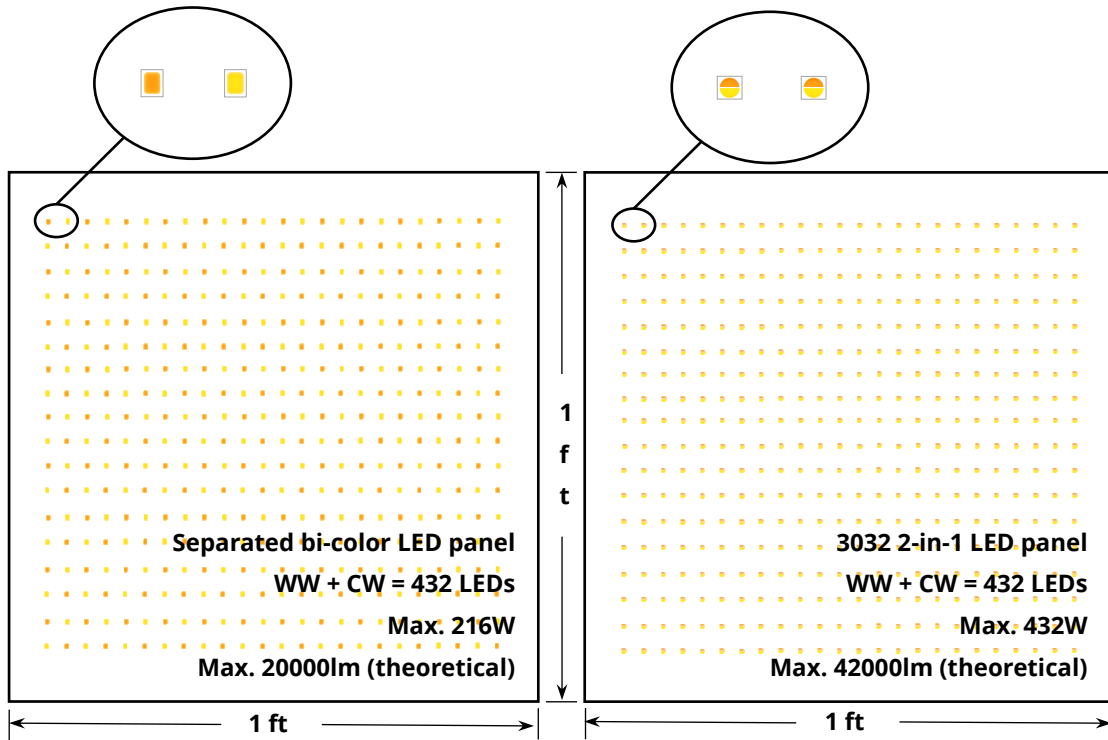
YUJILEDS® BC series 3032 SMD provides a high CRI and high efficacy solution with the specific design of 2-in-1. This compact layout offers easier diffusion capability because of the feature of closing to a spot source.



The design for high power density

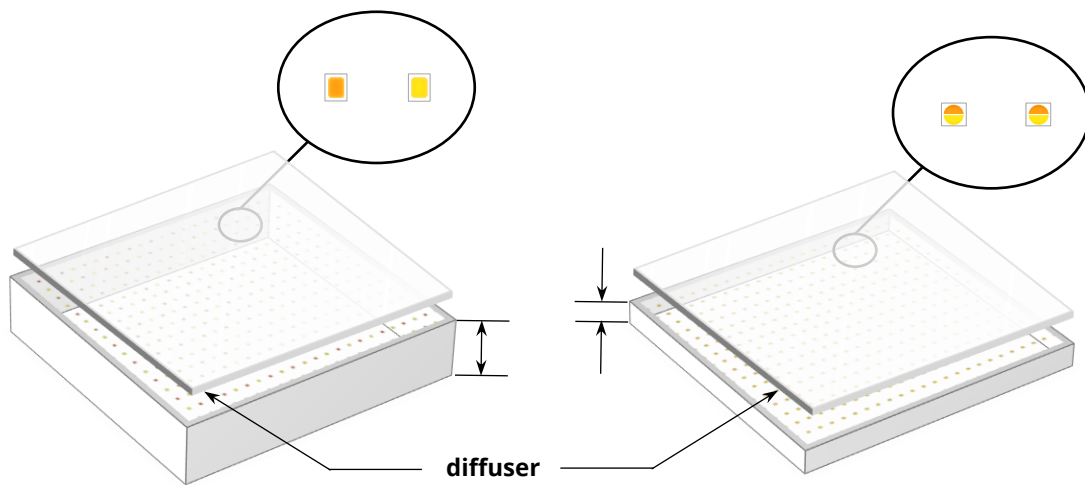
Compared with the designs of a PCB with standard bi-color LEDs and the 3032 LED, when assembling the LEDs as a high-density matrix, there will be a significant difference. For example of a 1 ft × 1 ft panel with separated bi-color LEDs to achieve high density compared to the solution with 3032 LED. Apparently, the 3032 LED can not only achieve twice the

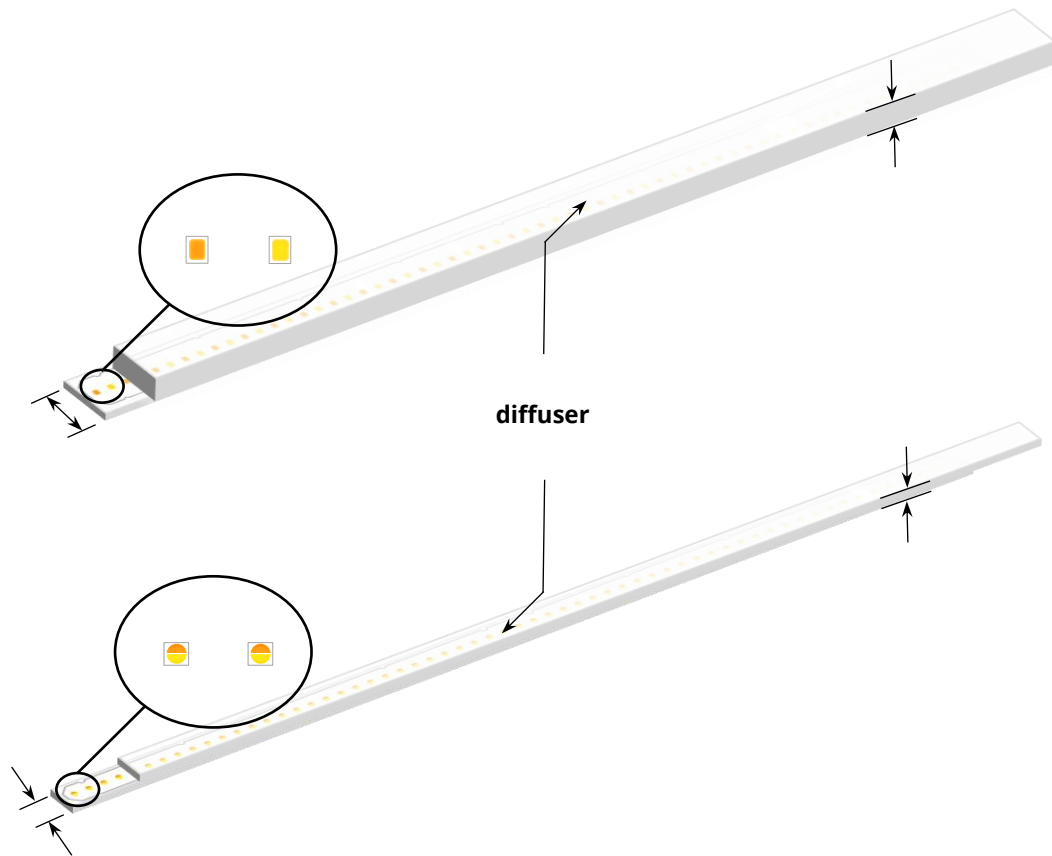
power within the same limitation of size but provide easier electrical design.



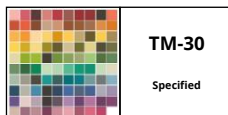
The design for easier diffusion

The BC series 3032 LED offers easier diffusion capability as well because of the feature of closing to a spot source, and it is friendly to design linear lighting fixtures because of the compact structure. A direct advantage is to reduce the PCB width for thinner or narrower side-emitting lights, with the same diffused effect compared to standard bi-color LEDs.





The BC series 3032 LED also supports the unique service/certification by Yujileds® as described below.



TM-30
Specified

TM-30-18 specification

The most advanced colorimetric for color rendition, widely recognized as the successor of CRI.



TLCI
Specified

TLCI specification

Based on the Macbeth ColorChecker, for evaluating the colorimetric quality of the broadcast lighting.



**Simple
Binning**

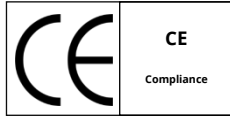
SimpleBinning specification

Simplify the chromaticity binning with TrueChroma data support to provide the most economical, simple, and practical solution to customers.



RoHS
Compliance

RoHS 2011/65/EU compliance



CE compliance



REACH compliance (Phosphor)

Ordering information

PART NUMBER	PRODUCT CODE	CCT	CHROMATICITY BINS	VOLTAGE RANGE
YJ-BC-3032-G03-2765	P3200006.26	2700K 6500K	27M 65M	0.1V
YJ-BC-3032-G03-3256	P3200006.35	3200K 5600K	32M 56M	0.1V
YJ-BC-3032-G03-XXXX	P3200006.XX	Custom	-	0.1V

Characteristics

Electrical-optical characteristics ($T_A = 25^\circ\text{C}$, 150mA)

PARAMETER	SYMBOL	VALUE			UNIT	TOLERANCE
		MIN.	TYP.	MAX.		
Forward voltage	V_F	2.8	-	3.4	V	± 0.05
Luminous Flux	Φ_{2700K}	44	-	50	lm	-
	Φ_{3200K}	46	-	52		
	Φ_{5600K}	52	-	60		
	Φ_{6500K}	52	-	60		
Correlated color temperature⁽¹⁾	CCT_{2700K}	2550	-	2850	K	-
	CCT_{3200K}	3050	-	3350		
	CCT_{5600K}	5300	-	5900		
	CCT_{6500K}	6000	-	7000		
Color rendering index	R_a	95 ⁽²⁾	-	-	-	± 1
TCS R9 (CRI red)	R_9	-	90	-	-	-
Fidelity index⁽³⁾	R_f	-	92	-	-	-
Gamut index⁽³⁾	R_g	-	100	-	-	-
TLCI 2012⁽⁴⁾	-	-	97	-	-	-
Reverse current	I_r	-	-	10	μA	$\pm 0.1 (V_r = 5V)$
View angle	$2\theta_{1/2}$	-	120	-	Deg	± 5

(1). Yujileds® promises the chromaticity coordinate tolerance of ± 0.0015 (CIE 1931 x,y) based on Yuji standard equipment shall prevail.

(2). R_a typical 95 at 6500K.

(3). Defined by the IES TM-30-18 method, this data is for trial.

(4). Defined by the EBU, TLCI is the abbreviation of Television Lighting Consistency Index, this data is for trial.

Characteristics

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

PARAMETER	SYMBOL	LIMIT	UNIT
Power Consumption	P_D	1200	mW
DC Forward Current (pulsed Individual)⁽¹⁾	I_{FP}	180 ⁽²⁾	mA
DC Forward Current (pulsed Simultaneous)⁽¹⁾	I_{FP}	300 ⁽²⁾	mA
DC Forward Current (Individual)	I_F	180	mA
DC Forward Current (Simultaneous)	I_F	300	mA
Reverse Voltage	V_R	5	V
Junction Temperature	T_J	125	$^\circ\text{C}$
Solder Point Temperature⁽³⁾	T_S	105	$^\circ\text{C}$
Operating Temperature	T_{opr}	-40 ~ +85	$^\circ\text{C}$
Storage Temperature	T_{stg}	-30 ~ +85	$^\circ\text{C}$
Soldering Temperature	T_{sol}	260 \pm 5	$^\circ\text{C}$
Reflow Cycles Allowed	-	2	-

(1). Pulse width $\leq 0.1\text{ms}$, duty $\leq 1/10$.

(2). Theoretical data.

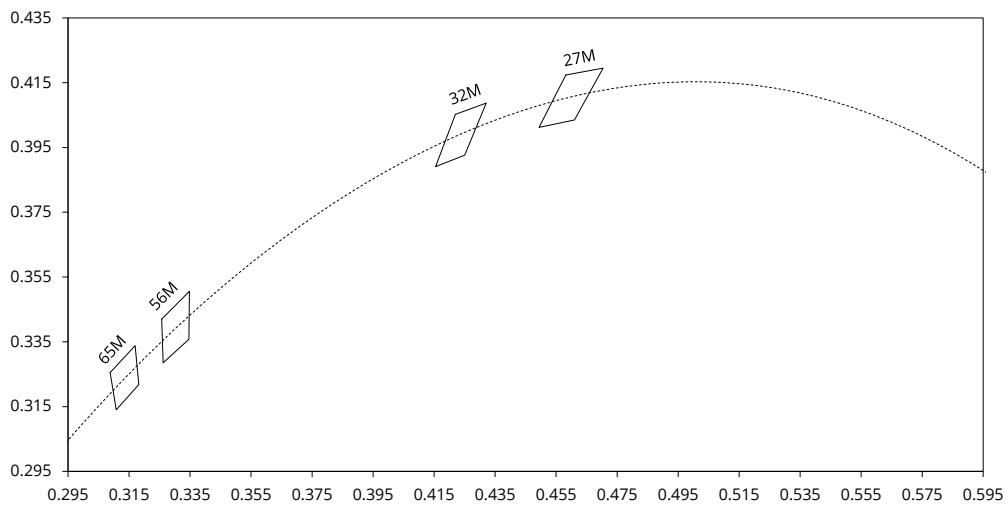
(3). See page [Package material and dimension](#).

Chromaticity group and diagram

Chromaticity bins & coordinates

CCT	BIN	CIE 1931 COORDINATES							
		X0	Y0	X1	Y1	X2	Y2	X3	Y3
2700K	27M	0.4562	0.4170	0.4477	0.4009	0.4631	0.4039	0.4727	0.4199
3200K	32M	0.4207	0.4047	0.4143	0.3887	0.4263	0.3931	0.4334	0.4091
5600K	56M	0.3247	0.3411	0.3253	0.3277	0.3358	0.3368	0.3360	0.3516
6500K	65M	0.3078	0.3245	0.3098	0.3131	0.3194	0.3230	0.3181	0.3349

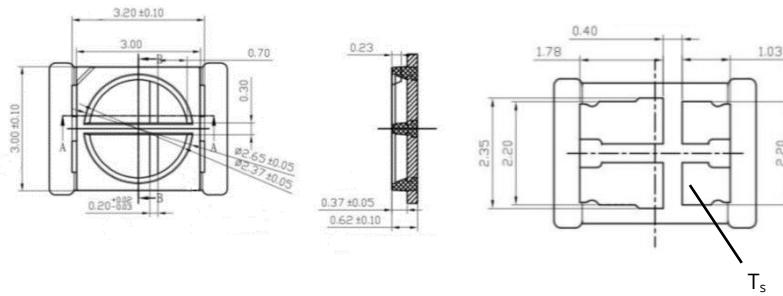
CIE 1931 diagram



Package material and dimension

Package layout

All dimensions in mm, tolerance unless mentioned is ± 0.1 mm.



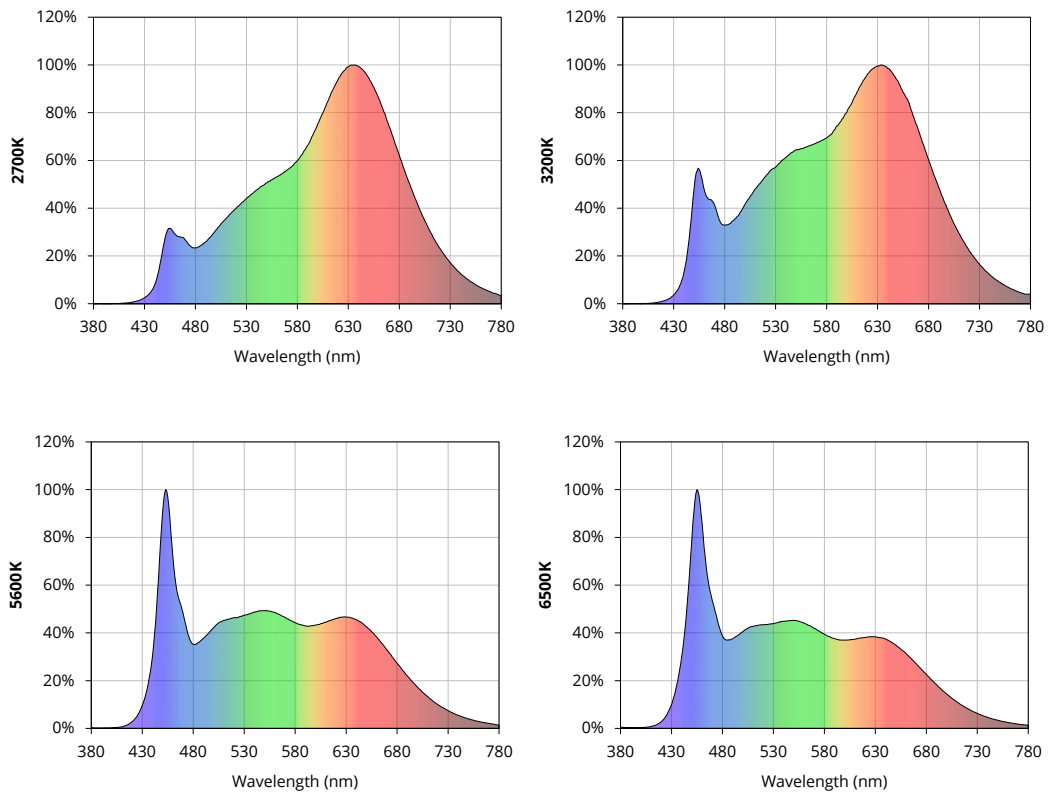
Package materials

ITEM	DESCRIPTION
Die material	InGaN
Lead frame material	PCT
Encapsulant resin material	Silicon + Phosphor
Electrodes material	Silver-plated copper

Characteristic graph

Typical spectral power distribution (normalized)

All characteristic curves are for reference only and not guaranteed.



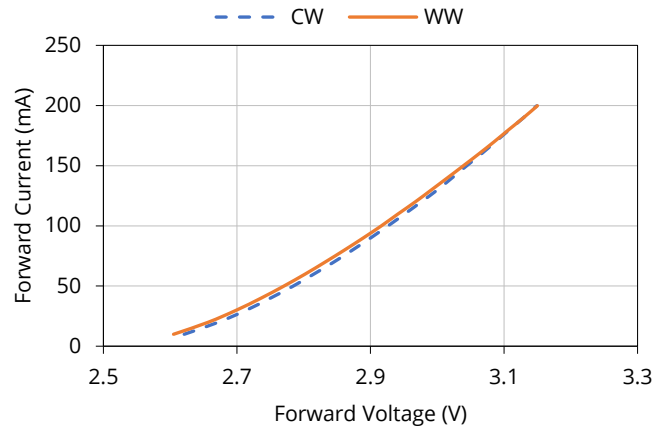
Characteristic graph

Forward current

All characteristic curves are for reference only and not guaranteed.

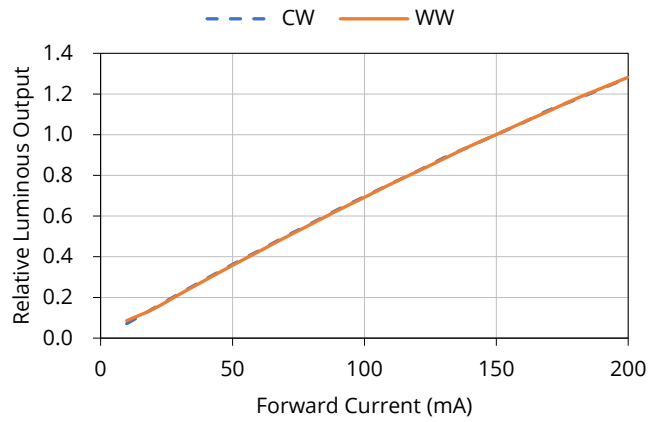
Vs. forward voltage

(T_A = 25°C)



Vs. relative luminous flux

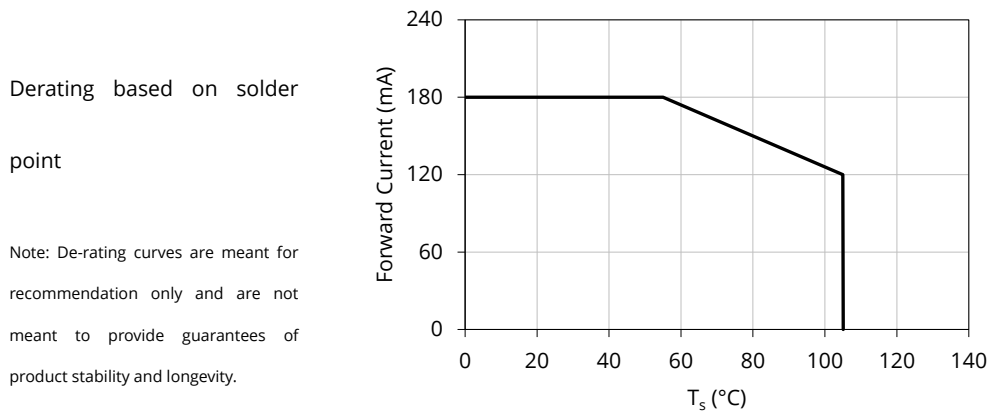
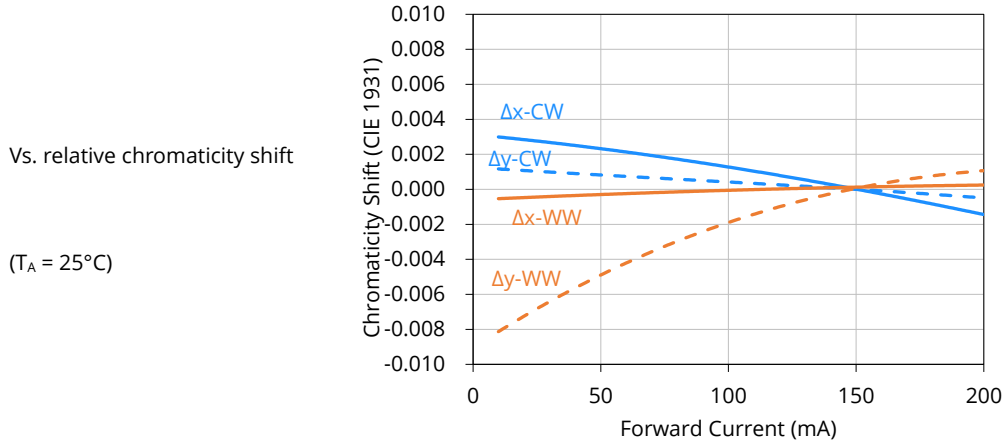
(T_A = 25°C)



Characteristic graph

Forward current (continued)

All characteristic curves are for reference only and not guaranteed.



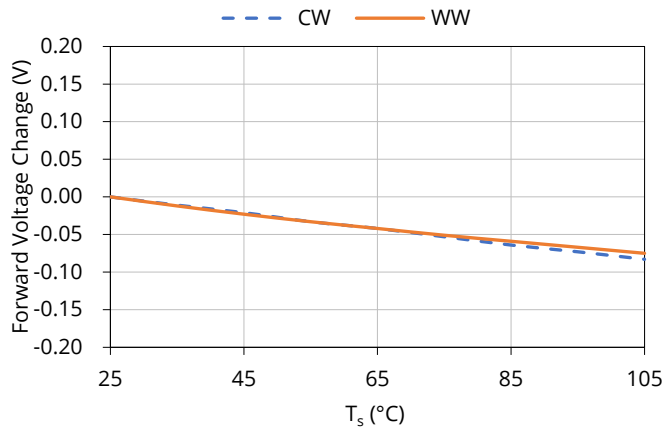
Characteristic graph

Solder point temperature (T_s)

All characteristic curves are for reference only and not guaranteed.

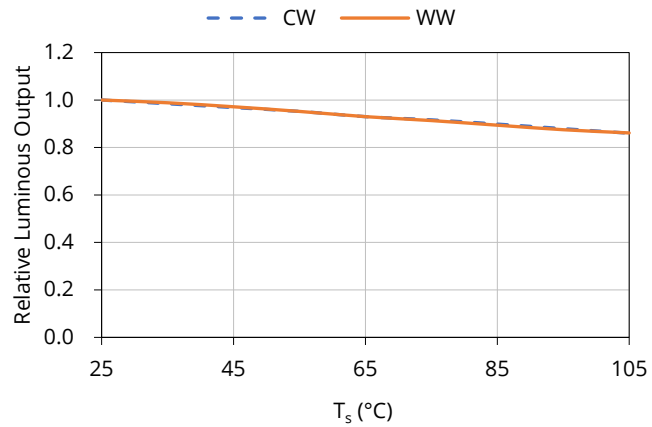
Vs. forward voltage

($I_F = 150\text{mA}$)



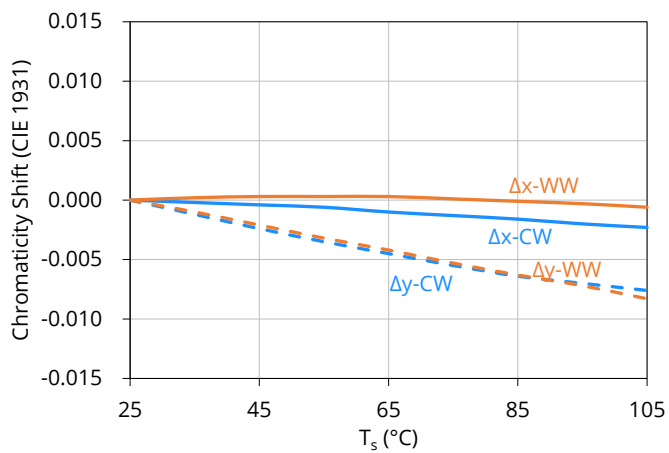
Vs. relative luminous flux

($I_F = 150\text{mA}$)



Vs. relative chromaticity shift

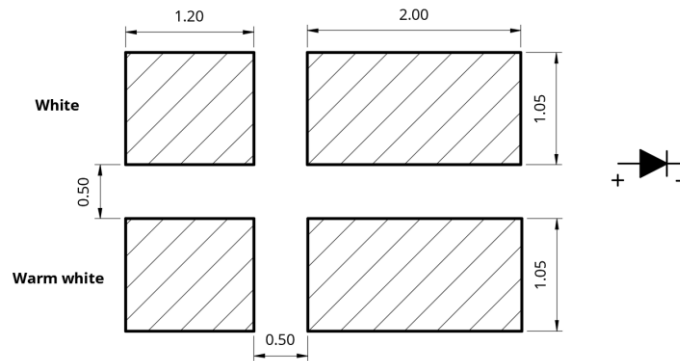
($I_F = 150\text{mA}$)



Solder and reflow profile

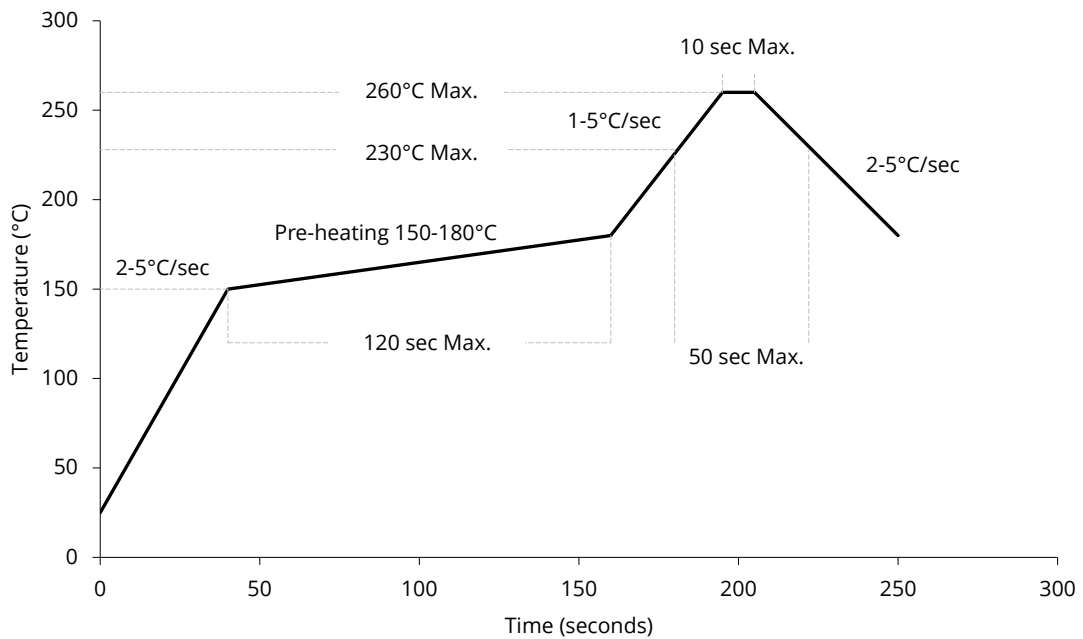
Recommended solder pad layout

All dimensions in mm, tolerance unless mentioned is ± 0.1 mm.



Reflow profile

Soldering ramp-up time (Pb-FREE).



Note: Soldering paste with the melting point at 230°C is recommended.

SMT instruction

Problems caused by improper selection of collet

Choosing the right collet is important in ensuring product quality after SMT. LEDs are different from other electronic components, as they are not only concerned with electrical output but also optical output. This characteristic makes LEDs more fragile in the process of SMT. If the collet's lowering height is not well set, it will bring damage to the gold wire at the time of collet's pick-and-place process which can cause the LED to not illuminate, flicker or contribute to other quality problems, some of which may not be immediately detectable.

Collet selection

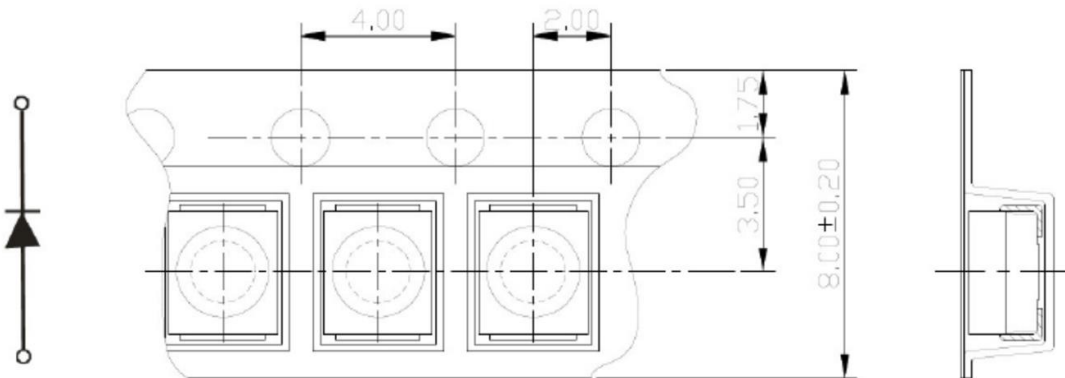
During SMT, please choose the appropriate collet in order to avoid damage the gold wire inside the LED or insufficient suction. Setting the height of the collet is crucial in order to avoid damage to the top view SMD. If the collet setting is set to too low of an altitude, the collet will press down on the SMD, causing damage or breakage to the encapsulant and cause distortion or breakage of the gold wire.

Other notes of caution

- No pressure should be exerted to the epoxy shell of the SMD under high temperature.
- Do not scratch or wipe the lens since the lens and gold wire inside are rather fragile and cross out easy to break.
- LED should be used as soon as possible when being taken out of the original package, and should be stored in anti-moisture and anti-ESD package.
- This usage and handling instructions are for reference only.

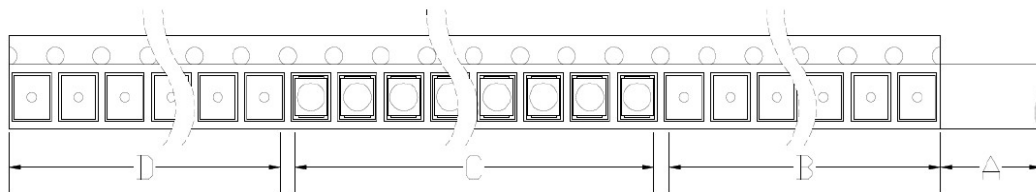
Tape and reel specifications

Tape dimensions (unit: mm)



Tape layout

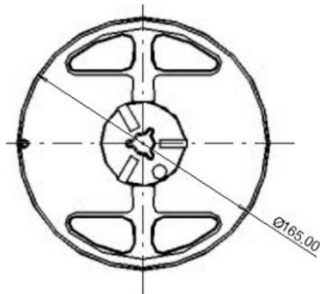
Not drawn to scale.



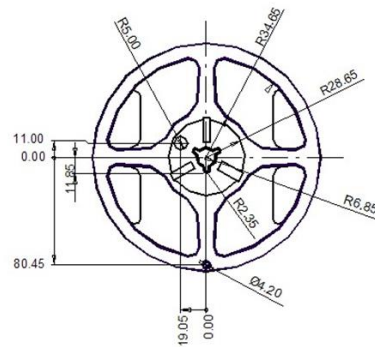
- A: Cover tape, 300mm;
- B: Empty leader, 200mm;
- C: LED, 5000pcs;
- D: Empty trailer, 200mm.

Tape and reel specifications

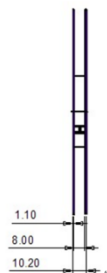
Reel dimensions top (unit: mm)



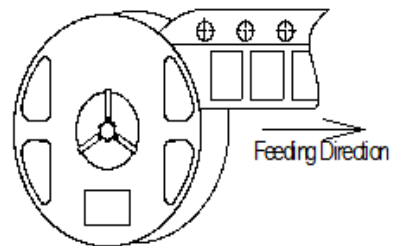
Reel dimensions bottom (unit: mm)



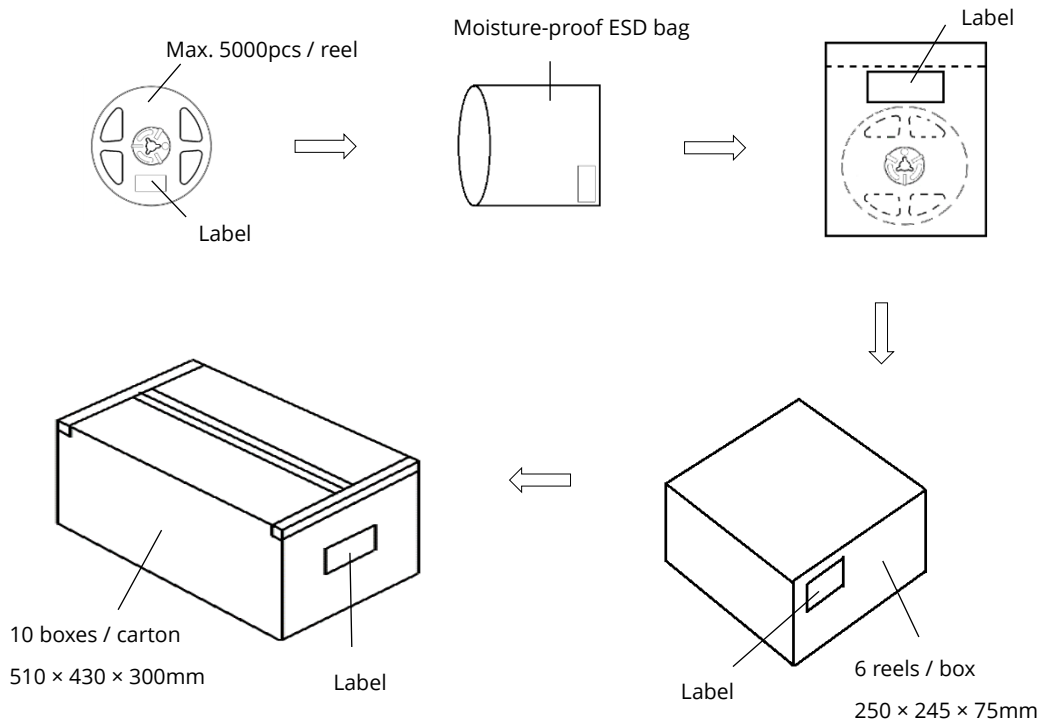
Reel dimensions side (unit: mm)



Feeding direction



Box packaging



- Reeled products (max 5000pcs / reel) are packed in a moisture-proof bag along with a moisture desiccant pack.
- Each inner box contains up to 6 moisture-proof bag (total maximum number of SMDs is 24000pcs). Box package size: 250 mm × 245 mm × 75 mm.
- Each outer package contains 10 inner boxes. Box size: 510 mm × 430 mm × 300 mm.
- Outer package is sealed with protective bubble wrap and foam. (Part numbers, lot numbers, quantity should appear on the label on the moisture-proof bag, part numbers).
- This packaging merely intended as a reference for standard quantity orders only – please note that actual packaging can differ depending on the order circumstances.

About Yujileds



Our story - Start from the superior stable red LED phosphor.

We started to make LED phosphor materials in 2006. White LEDs were still in very early stage, the industry focused on improving device brightness and efficiency via yellow phosphor very much. No one cared about the light quality. Based on this situation, we took a different approach and focused on red phosphor technology, which is the most important phosphor recipe for high CRI and/or low CCT LEDs, and it made Yuji become a JV partner with Mitsubishi Chemical from 2012.

Today, we are well known for our comprehensive research and full line-up production of LED phosphor from ultra-violet to near-infrared, and we are proud to commit to providing superior stable and efficient phosphors to the worldwide markets.

Our technology - Focus on LED spectrum innovation.

The industrial structure of both phosphor and LED gives us a unique view to develop our spectrum recipes. Compared to the general LED manufacturers, we have comprehensive information in evaluating the feasibility for both technical and commercial aspects. LED spectrum technology is not only about the quality of white LEDs, but also for different applications which have specialized requirements in lighting.

Yuji is one of the few companies that provide the service of designing or customizing a specific spectrum for clients, our confidence comes from the years of accumulation in focusing on the spectrum technologies and the control of LED phosphor and LED die supply-chain with thousands of successful cases in the past years. Innovating LED technologies and giving them commercial values are our eternal driving forces.

Our product - Yujileds®, stands for high-performance LED.

The trademark of Yujileds® is the identification of the LED products developed and manufactured by Yuji. We put our understanding of the LED technologies and the standard of our quality control into every LED we make. Regardless of any product series, we pay attention to expressing the high-performance feature and achieving the product value for clients and never compromise in pursuing the true performance.

Furthermore, we also care about every detail of any documentation we prepare for the product because we

understand the importance to transmit accurate information to clients. It is even more critical for clients to obtain the truth to decide the solution, rather than just a nominal high-performance.

Our client - Outstanding game players in different fields.

Clients are our proudest achievements, now over 200 of our clients are the best game players in their fields in more than 33 countries. We regard the clients' successes as our biggest accomplishments and appreciate their contribution in different fields, clients use our LEDs not just for simple lighting, but to design the lighting for plants, cameras, sensors, health, circadian rhythm, animals, and other industries that we have never imagined that our technologies can be utilized, that makes our work so meaningful.

Our service - Professional supporting team.

There is a group of people in Yuji passionate about creating maximum value for our clients. We have accumulated experience in different projects. Currently, the company gathers more than 30 experts from various fields of semiconductor, chemistry, optics, photoelectricity, circuitry, materials and color science.

Our sales team is well trained in deep LED technologies and has skilled global communication experience. Not just for sales, our team is more like a specialized consultancy to help every client succeed in different projects, and we do not only provide professional business service, but also support in the supply chain, logistics, marketing and technical discussions.

Contact us - We look forward to providing our efficient service for you.

LED website: www.yujiintl.com

Find Yujileds® high-performance LEDs, read our insights into a variety of advanced technologies and applications.

Contact: info@yujigroup.com

LED lighting website: www.yujilighting.com

Find our state-of-art LED lamps and luminaires designed for improving the lighting experience with the vision of illuminating the future.

Contact: lighting@yujigroup.com

Online shop: store.yujiintl.com

Shop your favorite Yuji Lighting product with rapid and professional service.

Contact: webstore@yujigroup.com