



# YJ-BC-RGBWW-5050L-G03

Surface Mount Device

## Applications

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



## Features

- Industrial highest CRI performance of white light
- Full-color gamut of red, green and blue
- 5.4mm × 5.0mm package
- TLCI & TM-30 specified (white light)
- SimpleBinning solution (white light)

[About Yujileads®](#)

Rev Version: 2.0

P3180001.00

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## General description

Yujileds® Multichromatic series 5050L LED is an innovative low-power LED. It integrates five different color channels in a compact package. With Yujileds® advanced phosphors technology, the white light channels achieve industrial highest CRI performance and consistency, and the color channels reach saturated and stable monochromatic. The compact package and high output make the LED suitable for a wide variety of applications demanding higher color quality and homogeneous lighting distribution, and it also simplify the optical design.

The Multichromatic series 5050L LED also supports the unique service/certification by Yujileds® as described below.



### TM-30-18 specification

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



### TLCI specification

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

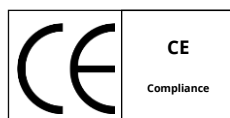


### SimpleBinning specification

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



### RoHS 2011/65/EU compliance



### CE compliance



### REACH compliance (Phosphor)

## Ordering information

PART NUMBER	PRODUCT CODE	CCT	CHROMATICITY BINS	VOLTAGE RANGE
YJ-BC-RGBWW-5050L-G03-2765	P3180001.26	2700K-6500K	27M / 65M	0.2V

## Characteristics

Electrical-optical characteristics ( $T_A = 25^\circ\text{C}$ , 20mA / 30mA)

COLOR	PARAMETER	SYMBOL	VALUE			UNIT
			MIN.	TYP.	MAX.	
Red (20mA)	Forward voltage	$V_F$	1.95	-	2.4	V
	Intensity	$\Phi$	800	-	1200	mcd
	Dominant wavelength <sup>(1)</sup>	$\lambda$	619	-	624	nm
	View angle	$2\theta_{1/2}$	-	120	-	Deg
	Reverse current	$I_r$	-	-	10	$\mu\text{A}$
Green (20mA)	Forward voltage	$V_F$	2.9	-	3.3	V
	Intensity	$\Phi$	1200	-	2100	mcd
	Dominant wavelength <sup>(1)</sup>	$\lambda$	518	-	523	nm
	View angle	$2\theta_{1/2}$	-	120	-	Deg
	Reverse current	$I_r$	-	-	10	$\mu\text{A}$
Blue (20mA)	Forward voltage	$V_F$	3.0	-	3.4	V
	Intensity	$\Phi$	320	-	530	mcd
	Dominant wavelength <sup>(1)</sup>	$\lambda$	465	-	470	nm
	View angle	$2\theta_{1/2}$	-	120	-	Deg
	Reverse current	$I_r$	-	-	10	$\mu\text{A}$
2700K (30mA)	Forward voltage	$V_F$	2.7	-	3.2	V
	Intensity	$\Phi$	8	-	13	lm
	Correlated color temperature <sup>(1)</sup>	CCT	2625	2700	2775	K
	Color rendering index	Ra	95	-	-	-
	TCS R9 (CRI red)	R9	-	80	-	-
	Fidelity index <sup>(2)</sup>	Rf	-	92	-	-
	Gamut index <sup>(2)</sup>	Rg	-	100	-	-
	TLCI 2012 <sup>(3)</sup>	-	-	97	-	-
	View angle	$2\theta_{1/2}$	-	120	-	Deg
	Reverse current	$I_r$	-	-	10	$\mu\text{A}$

## Characteristics

Electrical-optical characteristics ( $T_A = 25^\circ\text{C}$ , 20mA / 30mA) (continued)

COLOR	PARAMETER	SYMBOL	VALUE			UNIT
			MIN.	TYP.	MAX.	
6500K (30mA)	Forward voltage	$V_F$	2.7	-	3.2	V
	Intensity	$\Phi$	9	-	13	lm
	Correlated color temperature <sup>(1)</sup>	CCT	6250	6500	6750	K
	Color rendering index	Ra	93	95	-	-
	TCS R9 (CRI red)	R9	-	80	-	-
	Fidelity index <sup>(2)</sup>	Rf	-	92	-	-
	Gamut index <sup>(2)</sup>	Rg	-	100	-	-
	TLCI 2012 <sup>(3)</sup>	-	-	97	-	-
	View angle	$2\theta_{1/2}$	-	120	-	Deg
	Reverse current	$I_r$	-	-	10	$\mu\text{A}$

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

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

(3). 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	RED	GREEN	BLUE	2700K	6500K	UNIT
<b>Power Consumption (Simultaneous)</b>	$P_D$			500			mW
<b>DC Forward Current (Individual)</b>	$I_F$	30	30	30	40	40	mA
<b>DC Forward Current (Pulsed individual)<sup>(1)</sup></b>	$I_{FP}$			80 <sup>(2)</sup>			mA
<b>DC Forward Current (Simultaneous)</b>	$I_F$			130			mA
<b>Reverse Voltage</b>	$V_R$			5			V
<b>Solder Point Temperature<sup>(3)</sup></b>	$T_s$			70			$^\circ\text{C}$
<b>Junction Temperature</b>	$T_j$			95			$^\circ\text{C}$
<b>Operating Temperature</b>	$T_{opr}$			-40 ~ +85			$^\circ\text{C}$
<b>Storage Temperature</b>	$T_{stg}$			-40 ~ +100			$^\circ\text{C}$
<b>Electrostatic Discharge(HBM)</b>	ESD			2000			V
<b>Reflow Cycles Allowed</b>	-			2			-

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

(2). Theoretical data.

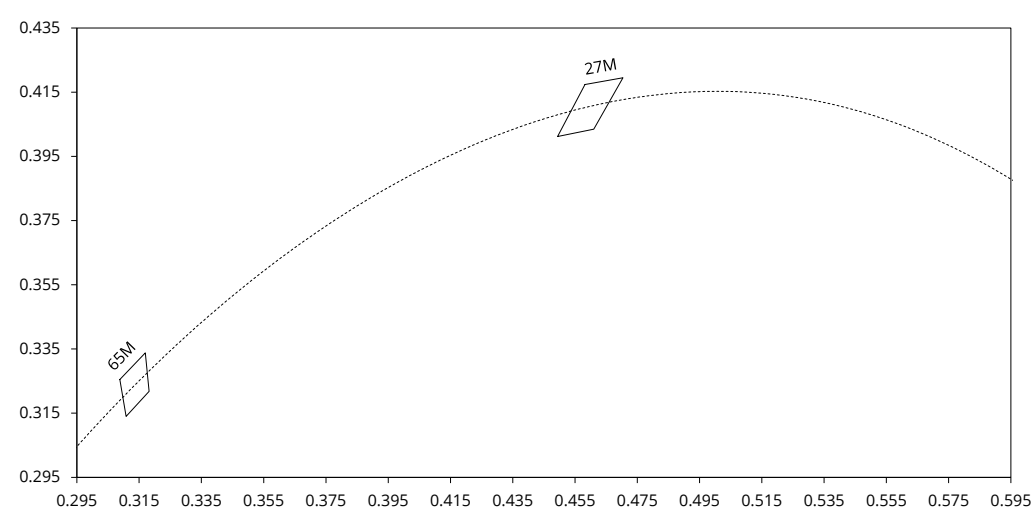
(3). See page [Package material and dimension](#).

Chromaticity group and diagram

Chromaticity bins & coordinates

CCT	BIN	CIE 1931 COORDINATES							
		X0	Y0	X1	Y1	X2	Y2	X3	Y3
2700K	27M	0.4582	0.4174	0.4494	0.4012	0.4610	0.4035	0.4704	0.4195
6500K	65M	0.3088	0.3255	0.3108	0.3140	0.3182	0.3218	0.3170	0.3338

CIE 1931 diagram

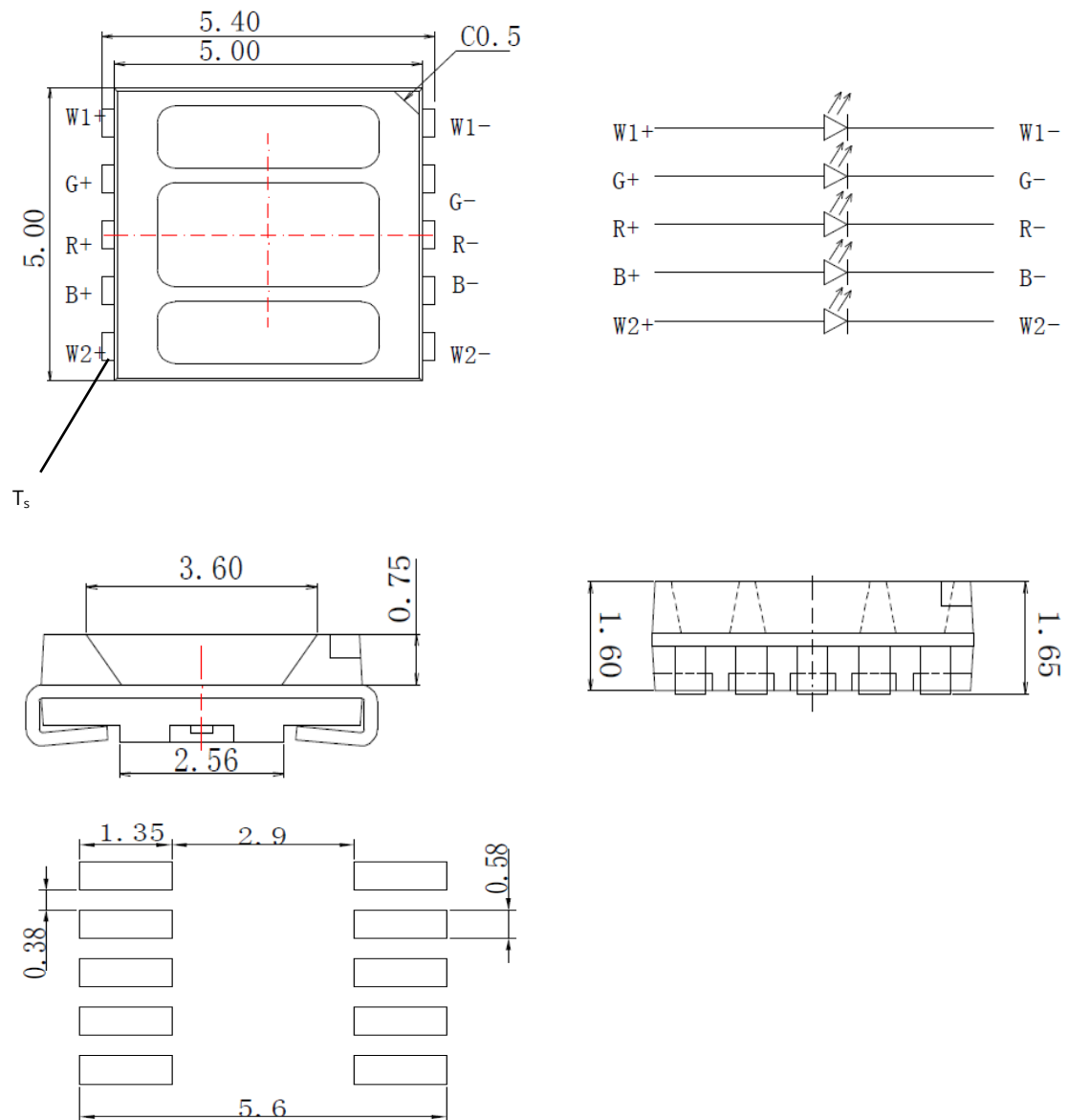


## Package material and dimension

### Package layout

All dimensions in mm, tolerance unless mentioned is  $\pm 0.1$ mm.

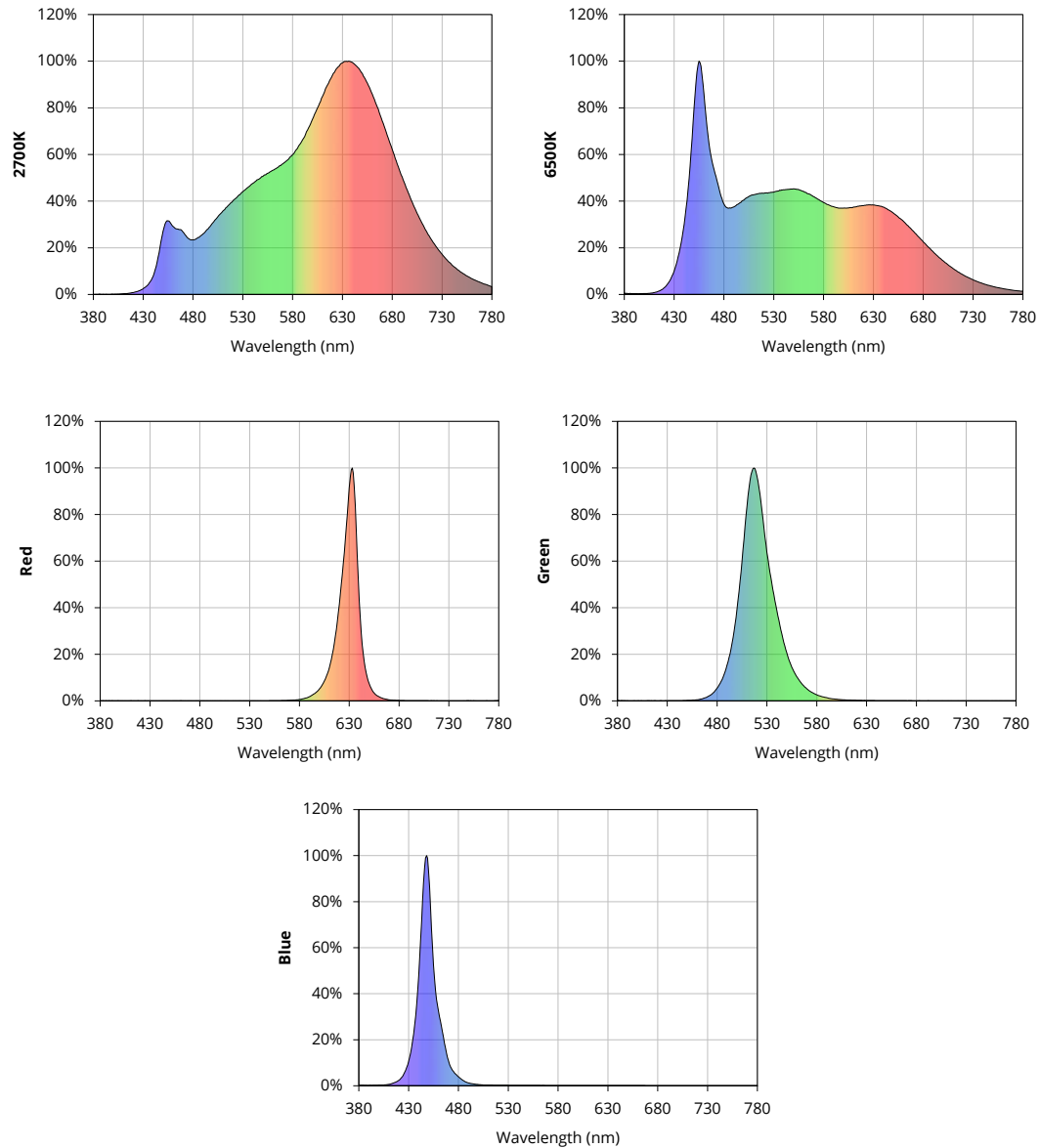
W1 = 2700K, W2 = 6500K



## Characteristic graph

Typical spectral power distribution ( $T_A = 25^\circ\text{C}$ ,  $I_F = 20\text{mA} / 30\text{mA}$ ) (normalized)

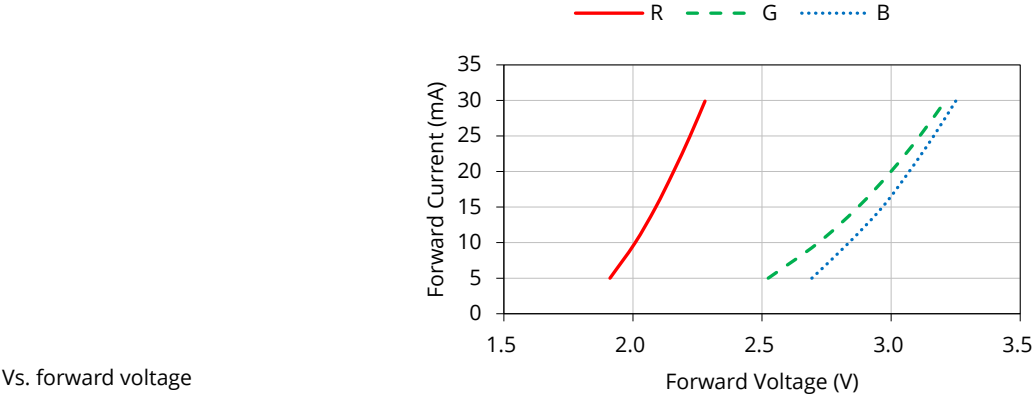
All characteristic curves are for reference only and not guaranteed.



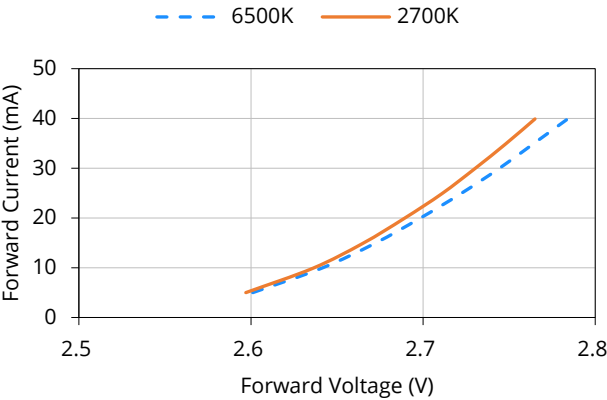
Characteristic graph

Forward current

All characteristic curves are for reference only and not guaranteed.



(T<sub>A</sub> = 25°C)



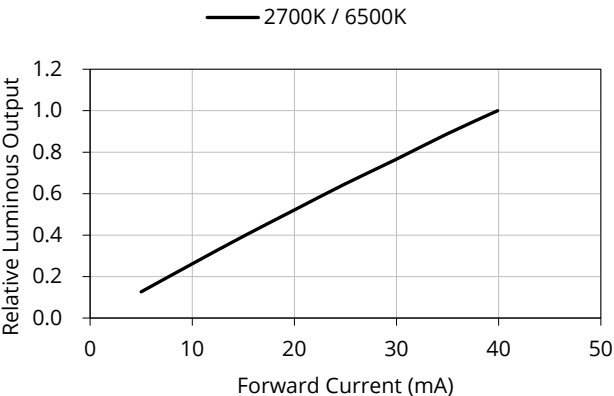
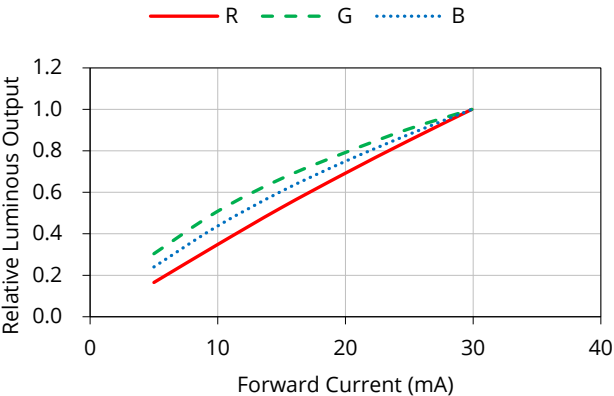
Characteristic graph

Forward current (continued)

All characteristic curves are for reference only and not guaranteed.

Vs. relative luminous output

(T<sub>A</sub> = 25°C)



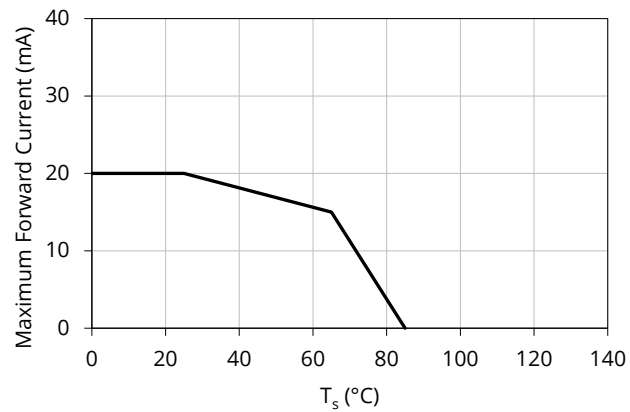
## Characteristic graph

### Forward current (continued)

All characteristic curves are for reference only and not guaranteed.

#### Derating based on solder point

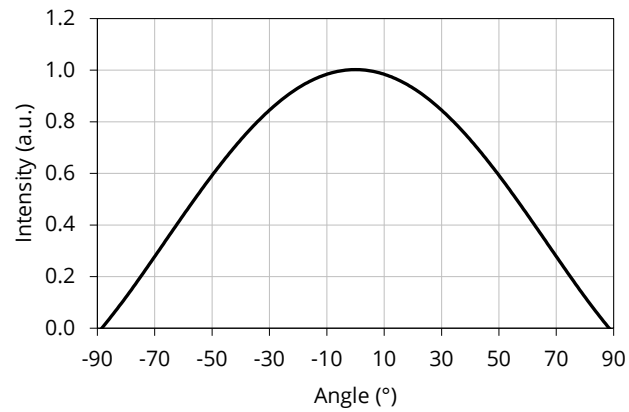
Note: De-rating curves are meant for recommendation only and are not meant to provide guarantees of product stability and longevity.



## Characteristic graph

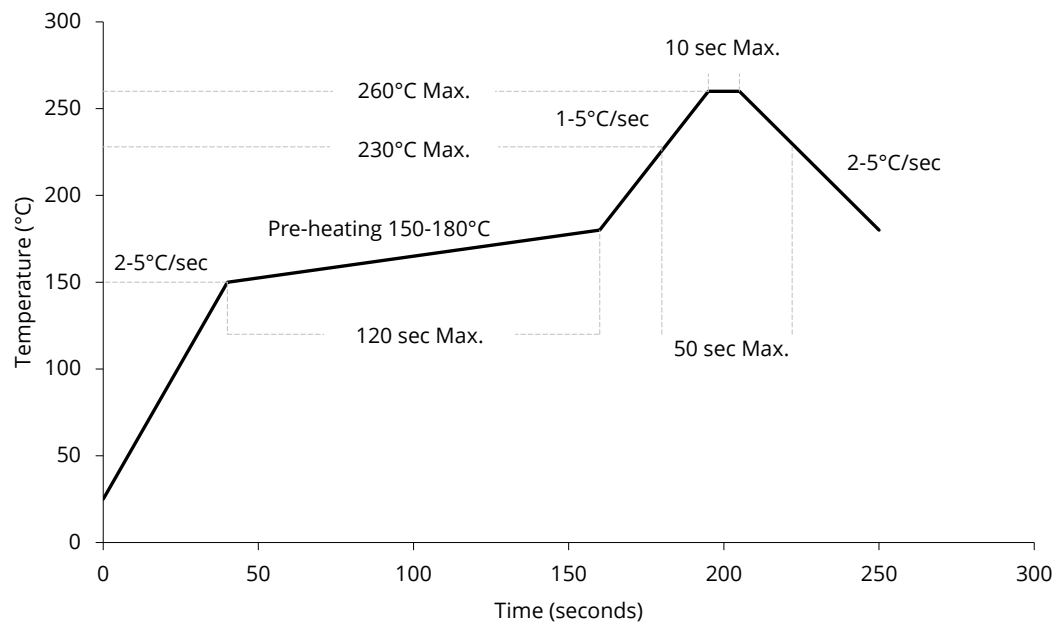
Spatial distribution ( $T_A = 25^\circ\text{C}$ ,  $I_F = 20\text{mA} / 30\text{mA}$ )

All characteristic curves are for reference only and not guaranteed.



## Reflow profile

Soldering ramp-up time (Pb-FREE).



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

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## 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.

## 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](http://www.yujiintl.com)

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

Contact: [info@yujigroup.com](mailto:info@yujigroup.com)

**LED lighting website:** [www.yujilighting.com](http://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](mailto:lighting@yujigroup.com)

**Online shop:** [store.yujiintl.com](http://store.yujiintl.com)

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

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