

CRI-Max™ Constant Brightness

LED Flexible Strip

Introduction & Datasheet

Applications

- High-end architectural/residential lighting
- Photographic/broadcast lighting
- Human-centric lighting



Features

- Industrial grade high CRI performance, TLCI & TM-30 specified
- Ultra consistent and precise color with Yujileds® SimpleBinning technology (equal to <3-step MacAdam)
- 24V DC, 126 LEDs per meter, can be cut every 7 LEDs (50mm)
- 5m/reel, and constant brightness
- 5000mm (length) × 10mm (width)
- Improved adhesive backing for easy installation
- Lifespan > 54000 hours (IES LM80)

[About Yuji Lighting](#)

Rev Version: 2.1

F3230003.00

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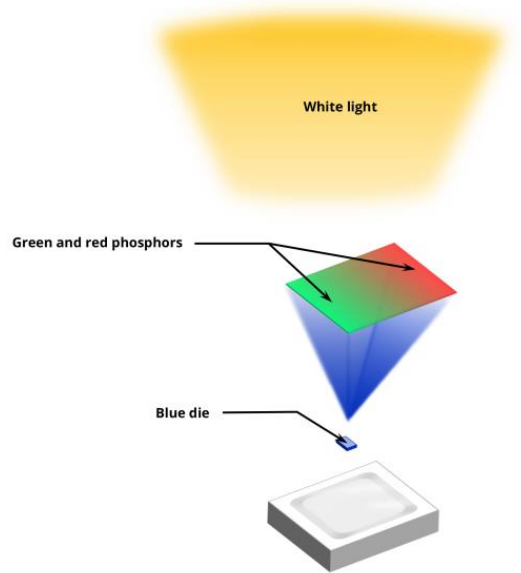
Introduction



Welcome to the Yuji Lighting CRI-MAX™ family

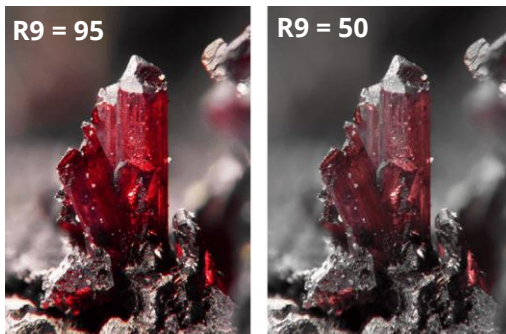
Industrial-leading high CRI technology

Yuji Lighting® CRI-MAX™ technology 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 CRI-MAX™ technology 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.

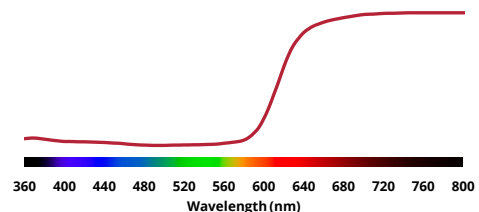


Enhanced CRI R9 technology

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
CRI-MAX™ technology (3000K)	96

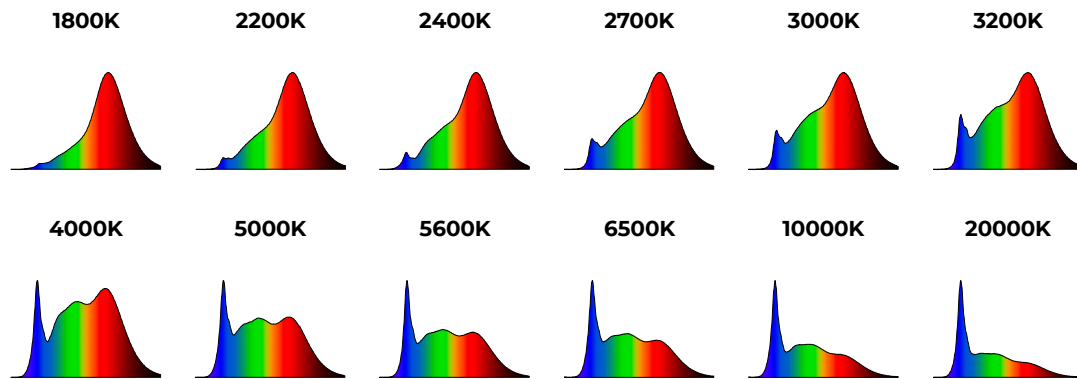


It is obvious to see from 600nm, which is just the start of red color in the visible spectrum, the TCS-9 spectral reflectance raises sharply, in consequence, if the light source does not have sufficient spectral power distribution in 600nm-800nm, it will be difficult to get a high R9. The capability of rendering the red color cannot be

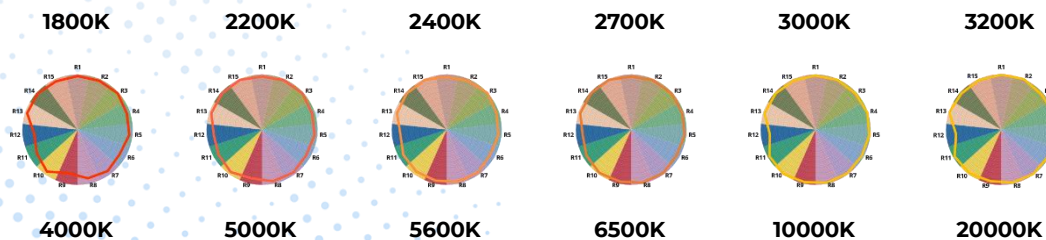
promised if the red spectrum is missed or not sufficient in the original light. In the comparison of fluorescent and halogen, apparently, halogen offers the richest 600+nm power, while the discrete fluorescent spectrum has limited energy there. Then in this comparison, halogen R9 = 99 but the fluorescent is R9 = -27. Comparing a standard LED to CRI-MAX™ technology at 3000K, although the emission principle is the same, the results present different R9 significantly where the standard LED is R9 = 13 and CRI-MAX™ technology is R9 = 96.

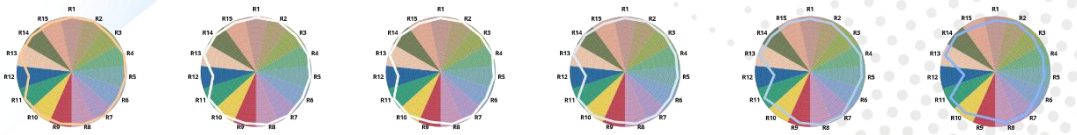
Transcend high CRI

High CRI becomes the tendency for LED products in recent years, and manufacturers start providing “nominal” high CRI LED to the market, however, as the result of a detailed investigation, most manufacturers’ high CRI LED are limited in the range of 2700K-5000K, where lower and higher CCTs are missed when applying to more specific applications. CRI-MAX™ technology extends high CRI performance from 1800K to 20000K CCT.



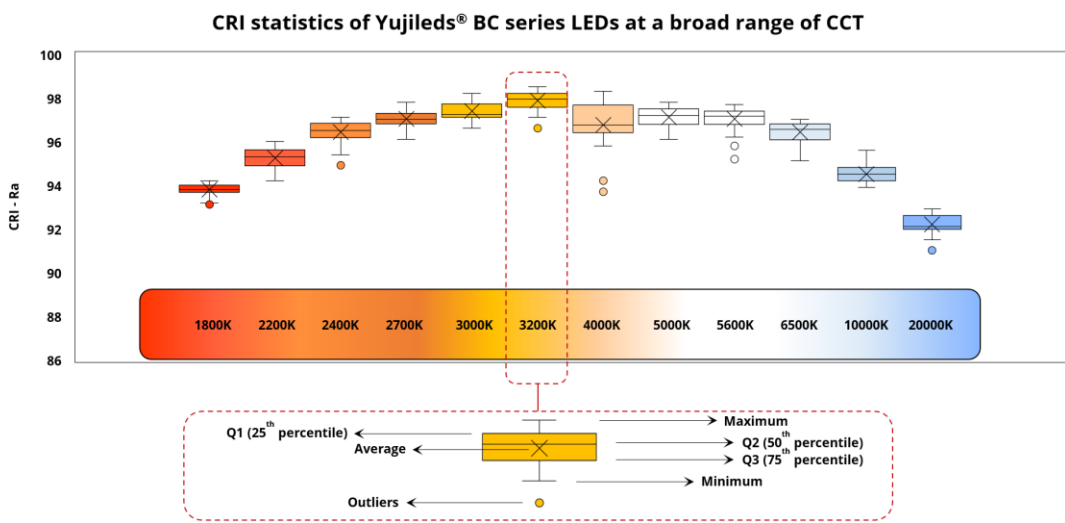
In comparison to a standard LED on the market is generally in the available CCT range of 2700K-6500K, and high CRI LEDs are more limited to fewer options, CRI-MAX™ technology can be extended to 1800K-20000K with the unique phosphor solutions, maintaining the CRI still above 92-97 and excellent spectral qualities. Moreover, looking into the specific Ri in each CCT, the color rendition is well balanced without significant difference, even for the extreme CCTs. Therefore, the CRI is always consistent regardless of what CCT we combine with the CRI-MAX™ technology.





CRI statistic support - introducing the plot box statistics.

In actual applications, LED can work individually or as a group on a printed circuit board, therefore the consistent CRI is critical for both. Generally, a manufacturer only provides a typical datasheet or report to infer the overall performance but the risk is that if some LEDs in a batch have worse CRI but the typical report cannot match, especially when the application uses fewer LEDs which means CRI is difficult to be averaged with those higher ones, then the risk falls to the customers' lighting fixture.



Understanding the statistical features of LED and processing relevant analysis and control are important in this case, and these are what we do for the CRI-MAX™ technology. We provide the full statistic and data support from the production of 1,000,000pcs of each CCT from 1800K to 20000K, and present all characteristics and guidance for customers to make reliable simulation and prediction accordingly. And from the statistical data, we can also read that the CRI-MAX™ technology perform excellently on the CRI consistency.

The CRI-MAX™ technology LED strip is extremely versatile and can be installed in a variety of linear and curved surface alike where demands high color quality and homogeneous lighting distribution. The 24V DC strip can be cut and connected individually every 6 LEDs (50 mm), the enhanced 3oz copper traces with precise SMT resistors provide consistently high power and brightness. The improved adhesive backing is upgraded for easy installation.

The strip also supports the unique service/certification by Yuji Lighting® as described below.



TM-30 specification

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



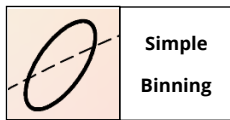
TLCI specification

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



IESNA LM-80 certification (LED)

9000 hours data of chromaticity shift and TM-21 reported L70 lifetime at 55°C, 85°C and 105°C.

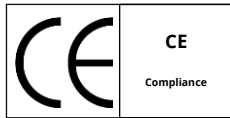


SimpleBinning specification

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)

Datasheet



Ordering information

PRODUCT CODE	VOLTAGE (DC)	DESCRIPTION	CCT
F3230003.27	24V	CRI-Max™ Constant Brightness LED Flexible Strip	2700K
F3230003.30			3000K
F3230003.40			4000K
F3230003.50			5000K
F3230003.56			5600K
F3230003.65			6500K
F3230003.XX			Custom CCT

Characteristics

Electrical-optical characteristics ($T_A = 25^\circ\text{C}$, 24V DC)

PARAMETER	SYMBOL	VALUE			UNIT
		MIN.	TYP.	MAX.	
Power per meter⁽¹⁾	P	-	14.4	-	W
Luminous flux per meter⁽¹⁾	Φ_{2700}	-	1390	-	lm
	Φ_{3000}	-	1390	-	
	Φ_{4000}	-	1390	-	
	Φ_{5000}	-	1700	-	
	Φ_{5600}	-	1700	-	
	Φ_{6500}	-	1700	-	
Luminous efficacy	K_{2700}	-	97	-	lm/W-
	K_{3000}	-	97	-	
	K_{4000}	-	97	-	
	K_{5000}	-	118	-	
	K_{5600}	-	118	-	
	K_{6500}	-	118	-	
Color rendering index	Ra	95 ⁽²⁾	-	-	-
TCS R9 (CRI red)	R9	90	-	-	-
Fidelity index⁽³⁾	Rf	-	92	-	-
Gamut index⁽³⁾	Rg	-	100	-	-
TLCI 2012⁽⁴⁾			97		
View angle	$2\theta_{1/2}$	-	120	-	Deg

(1). Tested by goniophotometer with one-meter cut.

(2). Ra minimum 93 at 6500K

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

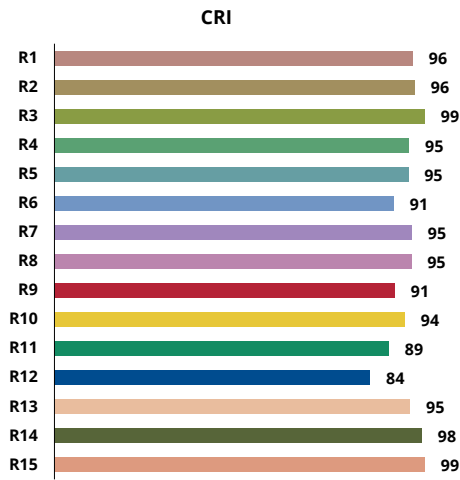
(4). Defined by the EBU, TLCI is the abbreviation of Television Lighting Consistency Index, this data is for trial.

Temperature

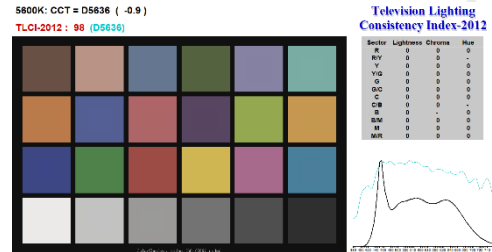
PARAMETER	SYMBOL	VALUE			UNIT
		MIN.	TYP.	MAX.	
Case	T_C	-20	-	85	°C
Ambient	T_A	-20	-	40	
Storage	T_S	-20	-	50	

Characteristics

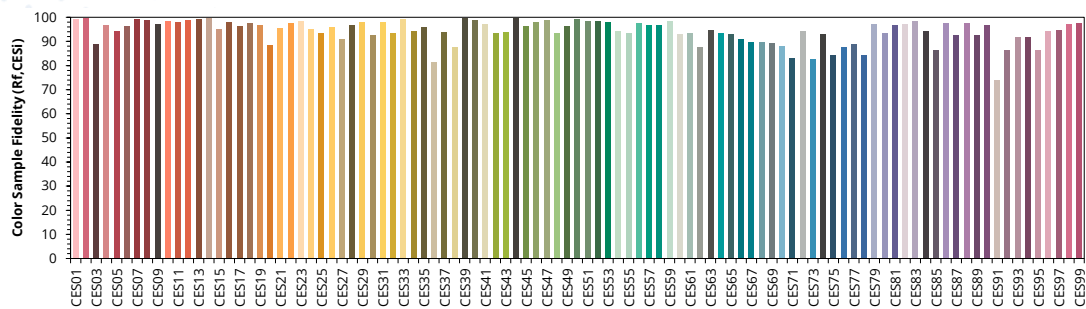
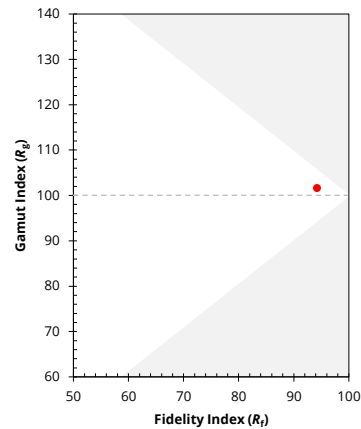
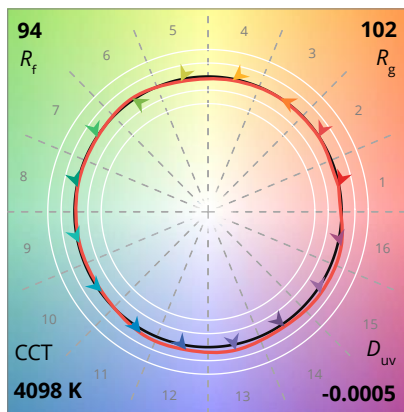
CRI graph (2700K)



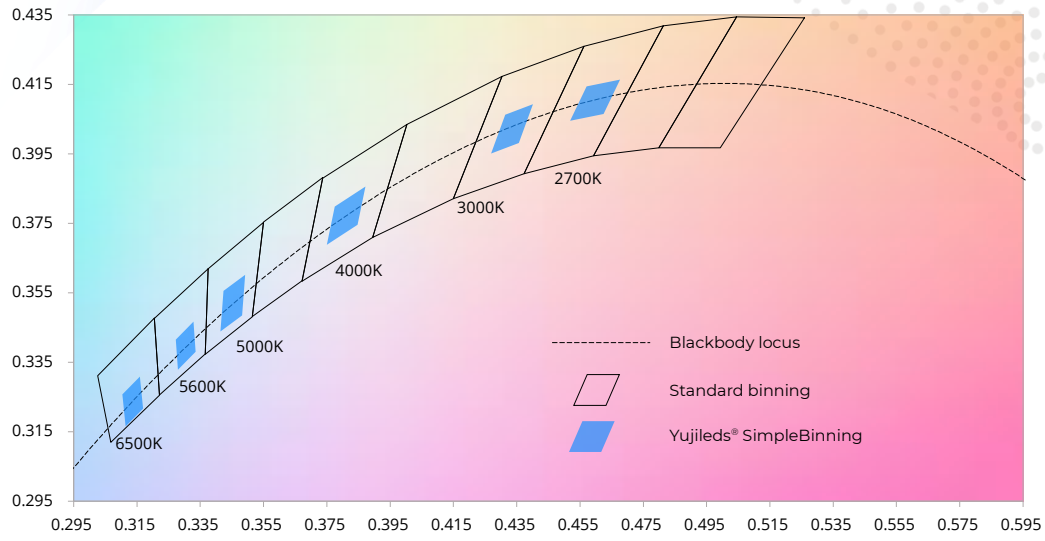
TLCI (5600K)



TM-30 graph (4000K)

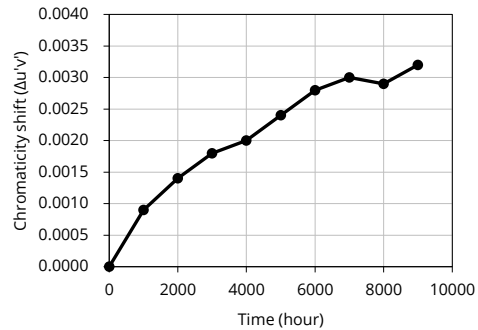
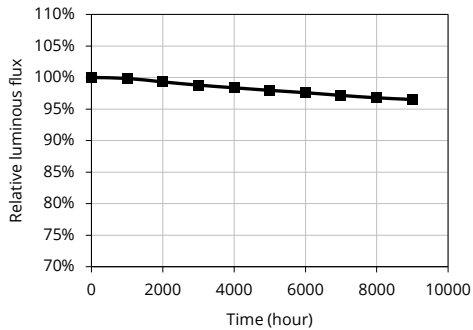


Chromaticity group and diagram

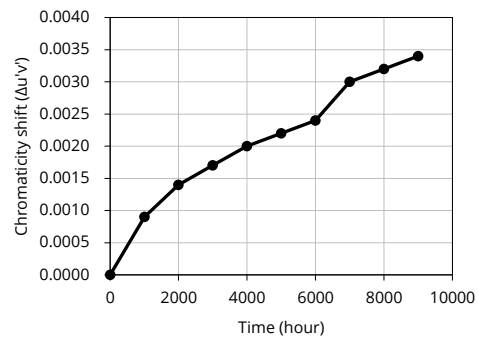
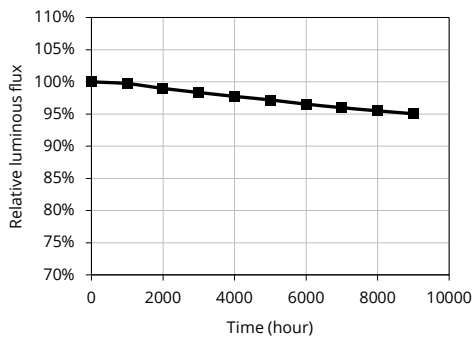


Reliability⁽¹⁾

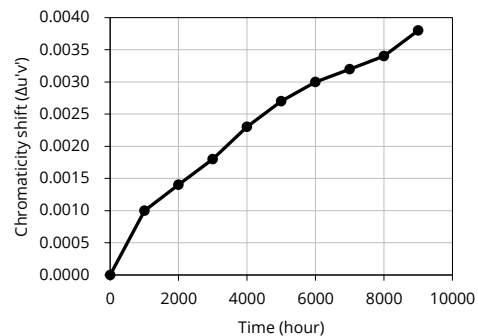
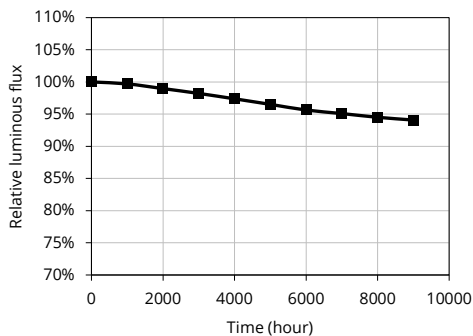
T_A = 55°C, RH < 65%, reported L70 > 54000 hours²



T_A = 85°C, RH < 65%, reported L70 > 54000 hours

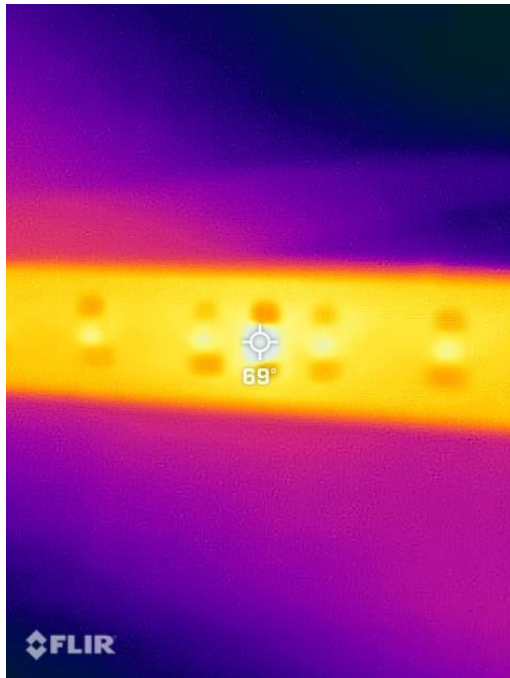


T_A = 105°C, RH < 65%, reported L70 = 52000 hours



- (1). Data from IESNA LM-80-2008, report number R2DG150122050-10-9000. The data is based on individual LED of 100% rated current, the LED on the strip works at typical 50% rated current.
- (2). Yuji reserves all the right for final explanation of reliability.

Thermal data

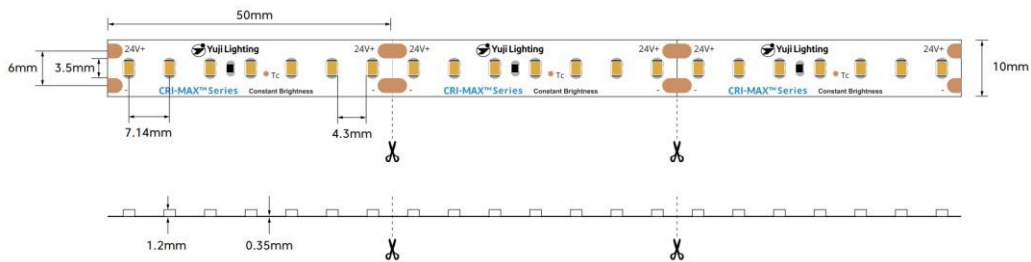


Condition and recommendation:

1. Ambient temperature 25°C, hung in the air without a heatsink.
2. The test devices are thermocouple and infrared imagery.
3. Test after 20 minutes at the hottest spot of the strip.
4. The temperature is typical 69.0°C.
5. The heatsink is not necessary.

Dimension drawing

Tolerance unless mentioned is $\pm 1\text{mm}$.



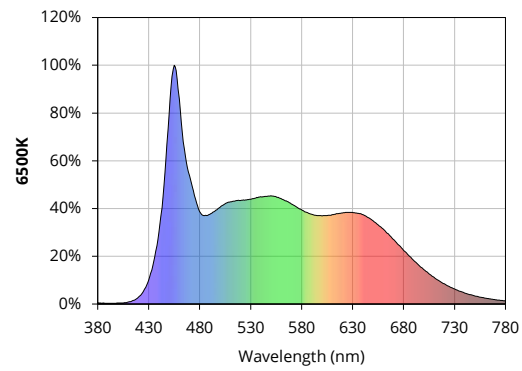
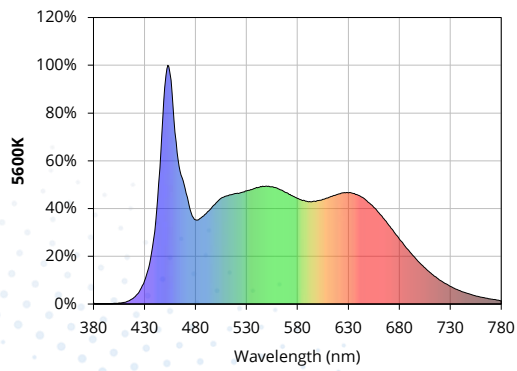
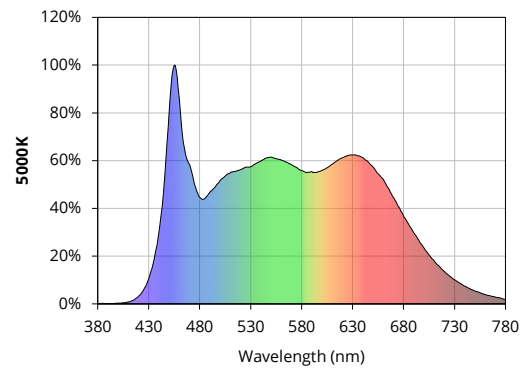
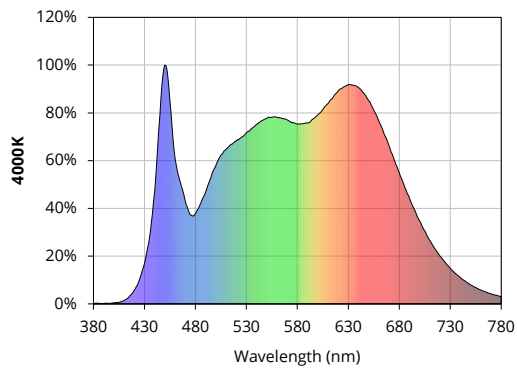
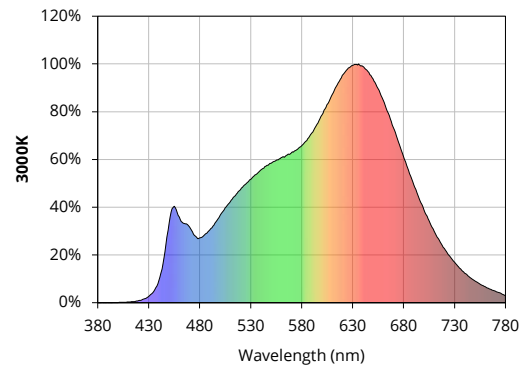
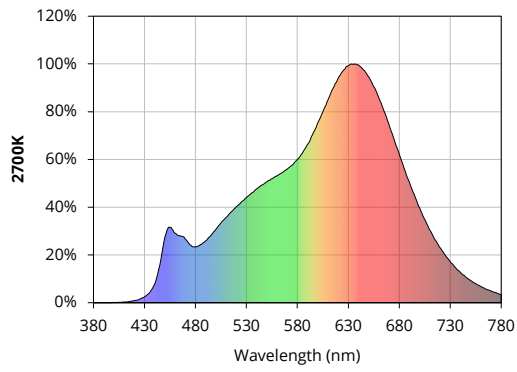
Flexible Printed Circuit Board (FPCB)

ITEM	DESCRIPTION
FPCB material	Copper
Copper Thickness	3oz
PCB Color	White

Characteristic graph

Typical spectral power distribution (normalized)

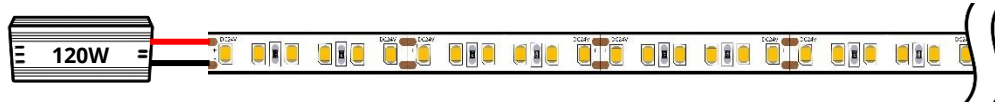
All characteristic curves are for reference only and not guaranteed.



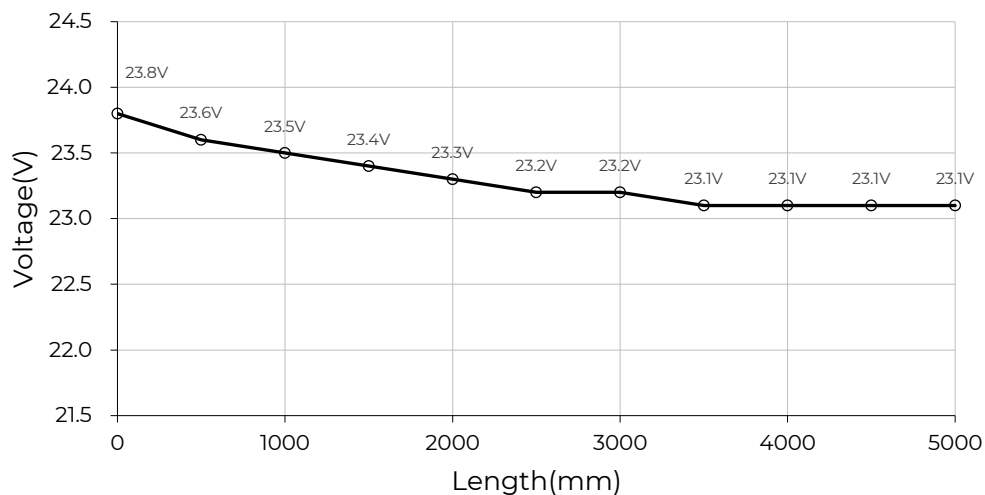
Characteristic graph

Connection and derating (one reel of 5000mm)

Single-ended side connection



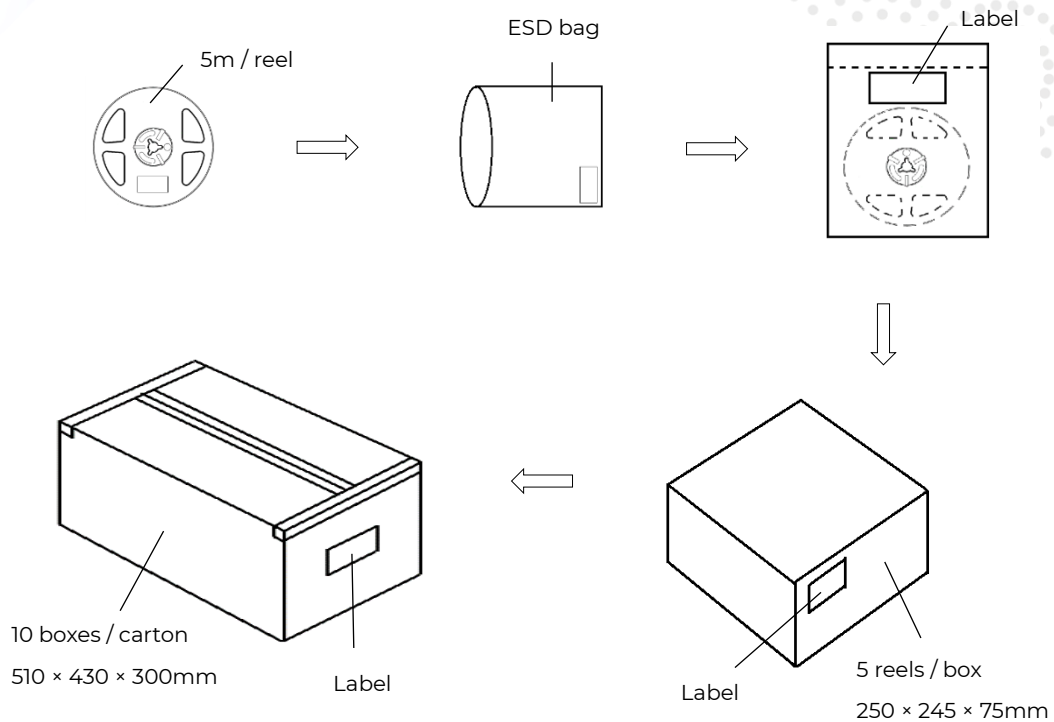
All characteristic curves are for reference only and not guaranteed.



Additional notes

- Selecting a power supply**
 The wattage / amperage requirement is directly proportional to the length of LED flexible strip installed. Calculate the power requirement by multiplying the total length in meters by the maximum wattage or amperage per meter. For additional power supply stability, we recommend specifying 20% additional power capacity above the requirement. For example, a 5 meter length would require 5 meters x 20 W / meter = 100W; for power supply stability, we would recommend a power supply that is capable of supplying at least [100W + 20% x 100W].
- Dimming**
 Compatible to PWM, DALI, TRIAC, or 0/1-10V dimmers.
- Heat management**
 Heatsinking is not necessary if product is used in standard indoor environments where ambient temperatures do not exceed 50°C. Our testing at $T_A = 25^\circ\text{C}$ shows LED solder point temperatures stabilizing at 68°C. Maximum allowed LED solder point temperature is 105°C.

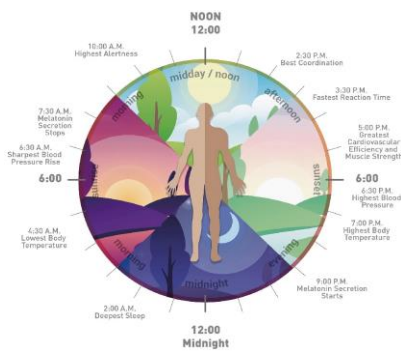
Box packaging



- Each inner box contains up to 5 reels (total maximum length is 25m). 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 us

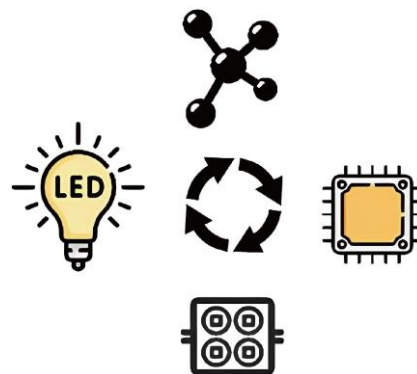


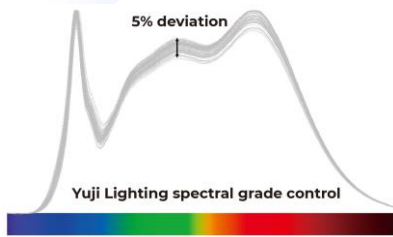
Innovating for Wellness

Since our inception in 2006, Yuji Lighting has been at the forefront of LED technology, dedicated to enhancing the journey to wellness through lighting. Our passion for excellence and deep understanding of light's impact drives us to create technologies that harmonize with natural rhythms, enhance daily experiences, and soothe the senses.

Mastery in Light Craftsmanship

Our meticulous control over the LED manufacturing process, from phosphor production to the final assembly, grants us the ability to shape light like no other. We develop countless LED spectra with innovative designs which cover an extensive range of applications, ensuring the extraordinary fidelity in color and lighting quality.





Spectral Precision in Light Quality Control

Yuji Lighting excels in spectral precision, limiting LED deviation to a mere 5%—significantly tighter than the typical 25%. This stringent standard minimizes color inconsistencies, ensuring each Yuji LED emanating true, reliable hues.

HSE - Health, Safety and Environment

We follow the concept of HSE standard by regulating all Yuji Lighting products with:

- Flicker index below 0.001;
- Risk Group Zero (RG0) from IEC62471;
- Recyclable materials.

Our commitments support the sustainable well-being for our customers.



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

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

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