



# YJ-WB-HRB-PTW-2835L-24V

Dim-to-warm LED Flexible Ribbon

## Applications

- High-end architectural lighting
- Human-centric lighting
- Biological research



## Features

- Optimized M/P ratio for biological comfort
- Ultra-smooth regulation for dimming to warm
- Blue-light-hazard excluded
- Vivid color rendition
- Consistent and uniform chromaticity
- 5000mm (length) × 10mm (width), 160g per reel
- Lifespan > 54000 hours (IES LM80)

[About Yujileads®](#)

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F3200001.00

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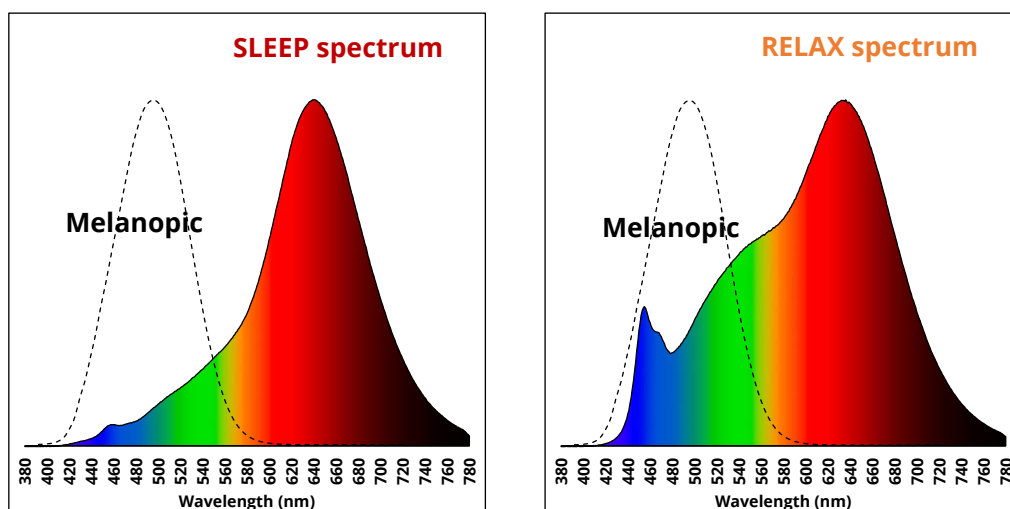
## General description



This unique Dim-to-warm LED solution is a specially designed tunable white light LED with optimized dimming process, and it is applied as a flexible strip to achieve the full compatibility for different install environments.

- Specialized spectra for optimizing the M/P (Melanopic/Photopic) ratio.**  
 M/P ratio is the critical factor that affects the alert or relaxes stimulus at the biological level. For any spectral power distribution, the ratio M/P is introduced as the [melanopic spectral factor](#), which indicates a direct responding of a lamp to human's synchronization of circadian clocks to light/dark cycles, sleep propensity and pineal melatonin production.

For matching with melanopic sensitivity, Yujileds® designs the "SLEEP spectrum" to minimum the M/P ratio, which promotes the secretion of melatonin, and designs the "RELAX spectrum" to achieve a balanced lighting effect both for comfortable environment and sufficient illumination with suitable color temperature.



Different spectral patterns give significantly different M/P results, Figure 26 indicates the typical M/P ratios from various sources. Yujileds® Dim-to-warm RELAX has an even lower M/P ratio as 0.57 than the sunset, and the SLEEP has the M/P ratio as

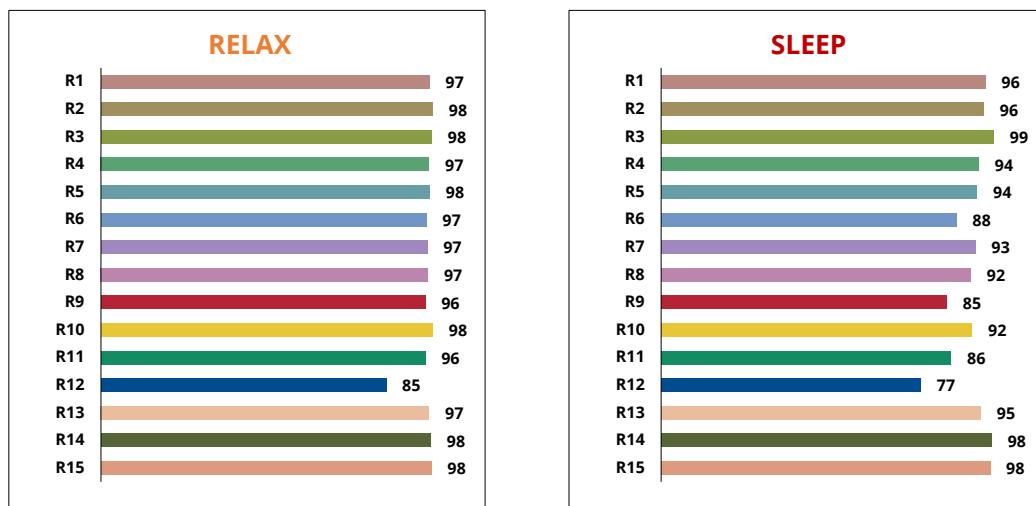
0.30, lower than a halogen lamp.

Light source	M/P ratio ↓	CRI - Ra
Sunlight (4889K)	1.12	100
Standard LED (3855K)	0.82	80
Sunset (3000K)	0.67	100
Incandescent lamp (2810K)	0.64	100
<b>Yujileds® Dim-to-warm RELAX</b>	<b>0.57</b>	<b>97</b>
Halogen (2700K)	0.55	99
<b>Yujileds® Dim-to-warm SLEEP</b>	<b>0.30</b>	<b>93</b>
Candle (1800K)	0.28	90

- **Super comfort dim-to-warm CCTs of high CRI 3000K - 1800K.**

By dimming from the RELAX to SLEEP model, the color temperature is tuned from 3000K to 1800K accordingly, thus the Dim-to-warm LED strip creates a naturally comfortable lighting scene. With a maximum power density of above 5.0W/ft, the strip could serve as an illuminating lamp as well as a cozy atmosphere creator when it dims and gets warmer.

At the RELAX mode of 3000K, the LED offers the color rendition ability as ultra-high CRI of 97, and tuning to the SLEEP model does not compromise to the quality and it still maintains the CRI as high as 93. With this dimming effect, it turns living, reading, indoor leisure and sleeping into a pleasant and enjoyable experience.



- **Unique dimming method for ultra-smooth regulation.**

Unlike a standard bi-color LED strip, this dim-to-warm LED strip simplifies the connection and control as only one pair of positive/negative anodes of 2-pin design with the help of high precision transistors. Thus it can be controlled by a standard driver but both brightness and color adjustments are achieved simultaneously.

In addition, with the optimized method, the dimming from the RELAX to SLEEP model performs ultra-smooth, which does not bring any abrupt effect compared to

a general dim-to-warm product on the market, Yujileds® Dim-to-warm technology makes the whole dimming process naturally.

General dim-to-warm solution with abrupt effect.

Warming



Dimming

Yujileds® ultra-smooth dim-to-warm solution.

- **Optimized design of the flexible strip.**

This dim-to-warm strip has also optimized in designs including introducing 3oz copper electrodes, 1% accuracy resistors, high precision transistors and 0.4mm spacing between neighboring emitters in a pair, which eliminates the visible light spots during the dimming process, and a variety of PWM compatible controlling units of DALI, TRIAC, 0/1-10V dimmers.

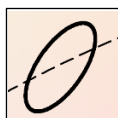
The dim-to-warm flexible strip also supports the unique service/certification by Yujileds® as described below.



LM80  
Certificated

**IESNA LM-80-08 certification (LED)**

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



Simple  
Binning

**SimpleBinning specification**

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



IES/LDT

**Photometric data**

Luminous intensity distribution and illuminance data for simplifying the lighting design.



RoHS  
Compliance

**RoHS 2011/65/EU compliance**



CE  
Compliance

**CE compliance**



**REACH compliance (Phosphor)**

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## Ordering information

PART NUMBER	PRODUCT CODE	CCT	VOLTAGE
YJ-WB-HRB-PTW-2835L-24V-3018	F3200001.13	1800K - 3000K	24V DC

## Characteristics

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

PARAMETER	SYMBOL	VALUE			UNIT	TOLERANCE
		MIN.	TYP.	MAX.		
<b>Power per meter<sup>(1)</sup></b>	P	-	-	16.8	W	-
<b>Forward current per meter</b>	$I_f$	-	-	0.70	A	-
<b>Correlated color temperature<sup>(2)</sup></b>	$CCT_{\text{SLEEP}}$	1800 $\pm$ 100			K	-
	$CCT_{\text{RELAX}}$	3000 $\pm$ 150				
<b>Luminous flux per meter</b>	$\Phi_{\text{SLEEP}} + \Phi_{\text{RELAX}}$	80	-	1200	lm	-
<b>M/P ratio<sup>(3)</sup></b>	$M/P_{\text{SLEEP}}$	-	0.304	-	-	-
	$M/P_{\text{RELAX}}$	-	0.571	-	-	-
<b>Color rendering index</b>	Ra	-	95	-	-	$\pm 1$
<b>TCS R9 (CRI red)</b>	R9	-	90	-	-	-
<b>View angle</b>	$2\theta_{1/2}$	-	120	-	Deg	$\pm 5$

(1). Unless otherwise noted, specifications are based on a 1 meter segment. Due to electrical resistance, power draw per meter decreases approximately by 0.05A for each additional meter increase per segment.

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

(3). The M/P ratio algorithm is based on the standard from [INTERNATIONAL WELL BUILDING INSTITUTE™](https://www.internationalwellbuildinginstitute.com/).

Luminous intensity distribution and illuminance<sup>(1)</sup> ( $T_A = 25^\circ\text{C}$ , 24V DC, one-meter cut)

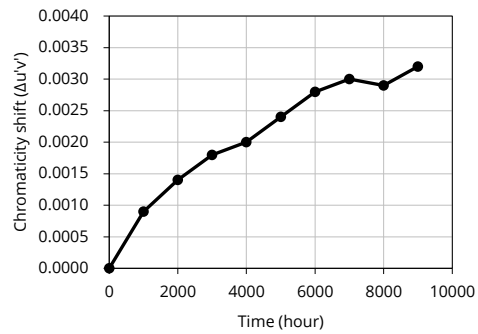
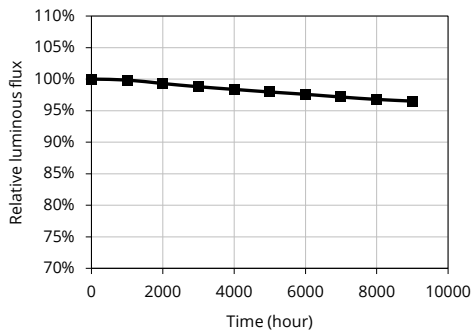
CCT	HEIGHT	DIAMETER	AVG.	MAX.
			ILLUMINATION	ILLUMINATION
<b>SLEEP</b>	1m	296.81cm	8.1 lx	28.9 lx
<b>RELAX</b>		312.61cm	115.5 lx	422.0 lx

(1). The full luminaire photometric test report (IES/LDT file) can be downloaded from [www.yujiintl.com](http://www.yujiintl.com).

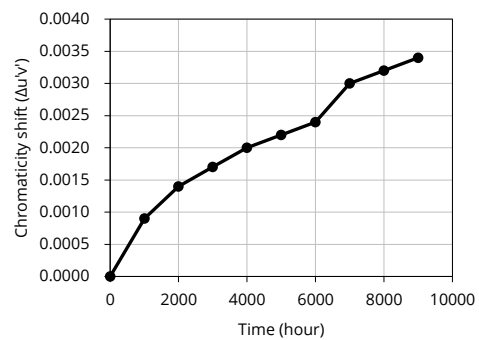
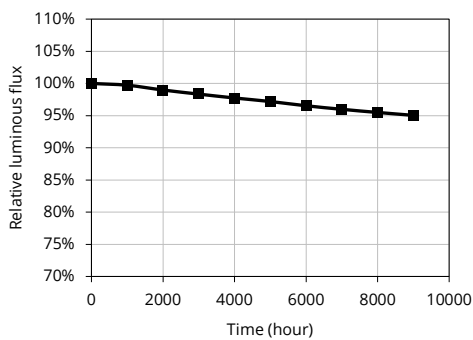


## Reliability<sup>(1)</sup>

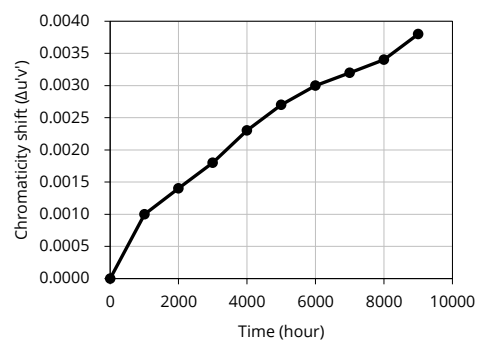
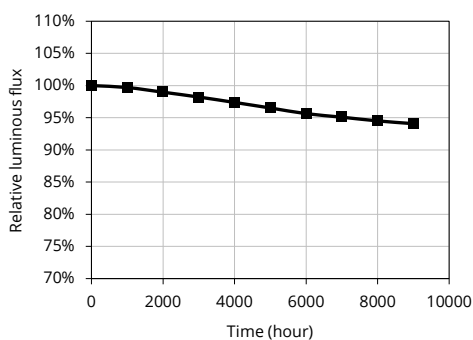
T<sub>A</sub> = 55°C, RH < 65%, reported L70 > 54000 hours<sup>(2)</sup>



T<sub>A</sub> = 85°C, RH < 65%, reported L70 > 54000 hours



T<sub>A</sub> = 105°C, RH < 65%, reported L70 = 52000 hours



(1). Data from IESNA LM-80-2008, report number R2DG150122050-10-9000.

(2). Yujileads® reserves all the right for final explanation of reliability.

## Thermal data

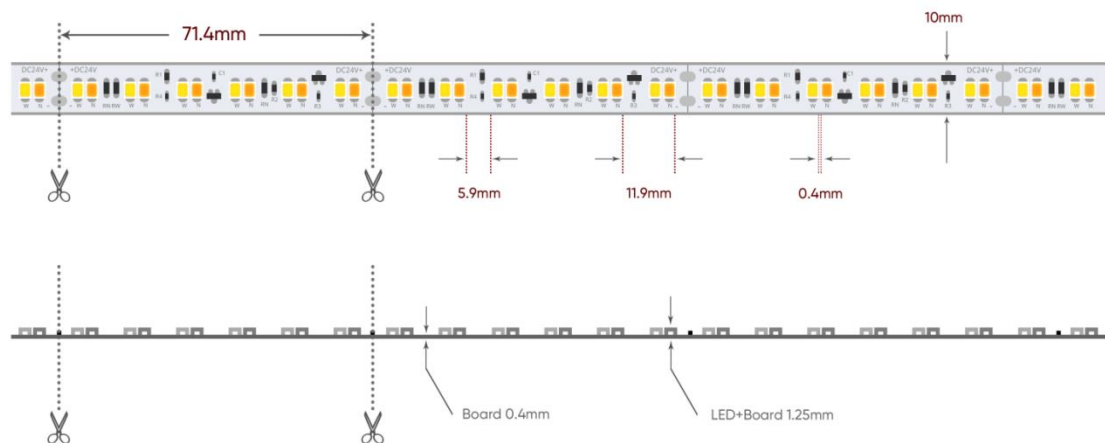


### Condition and recommendation:

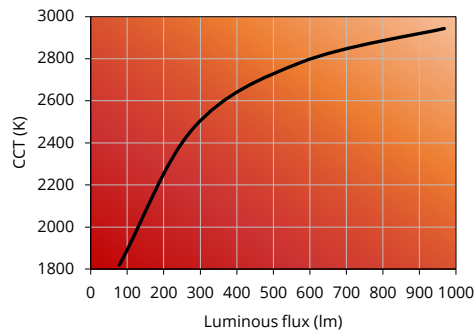
1. Ambient temperature 25°C, hang in the air without a heatsink.
2. The test devices are thermocouple and infrared imagery.
3. Test after 20 minutes at the hottest spot of the strip.
4. The temperature is typical 67.7°C.
5. The heatsink is not necessary.

## Dimension drawing

Tolerance unless mentioned is  $\pm 1$ mm.

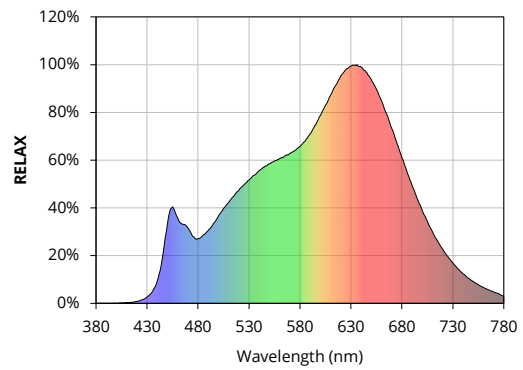
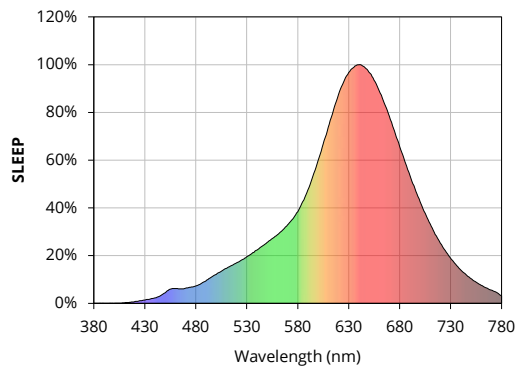


## Dimming curve



## Characteristic graph

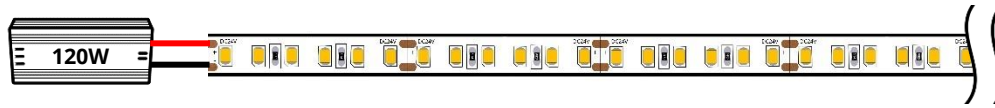
Typical spectral power distribution (normalized)



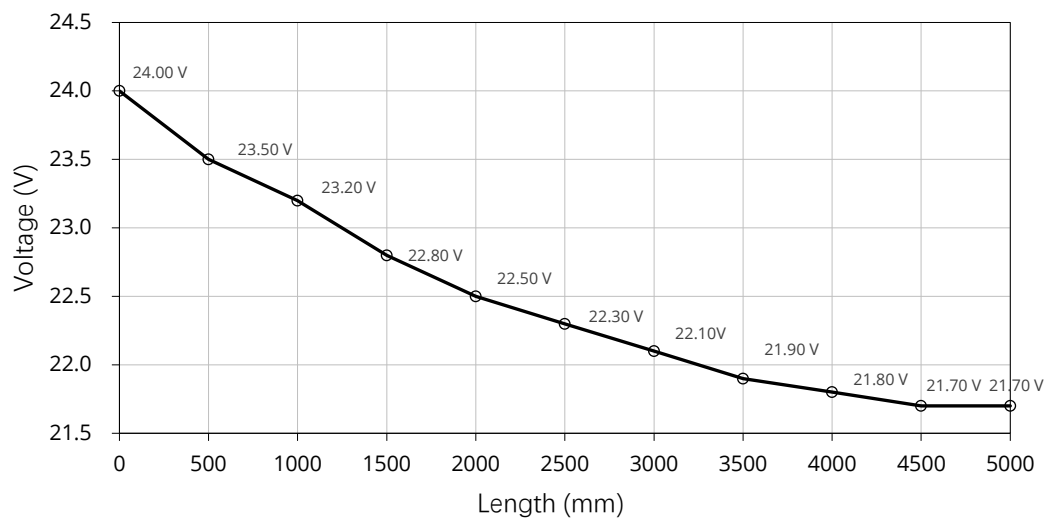
## Characteristic graph

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 W (100W + 20% x 100W).
- **Dimming**

Our LED flex strips are compatible with PWM dimming systems.
- **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.

## 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

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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.

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