



YJ-HE-2835-G01

Surface Mount Device

Applications

- High-end architectural lighting
- High-end commercial lighting
- Photoelectric device and relevant research



Features

- Luminous efficacy up to 210 lm/W
- Vivid color performance
- 2.8mm × 3.5mm universal package
- TM-30 specified

[About Yujileds[®]](#)

Rev Version: 2.2

P3220034.00

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General description

The HE series LED is designed for creating a new era of LED with high color rendering performance and high luminous efficacy. Improving the luminous efficacy and color rendering of artificial lighting is the top need of customers. However, due to the limitations of traditional technology, if LEDs achieve high color rendering and high luminous efficacy at the same time, customers need to pay extremely high purchase costs. The new technology brought by HE series achieves high light efficacy and high color rendering while reducing costs to a competitive level.

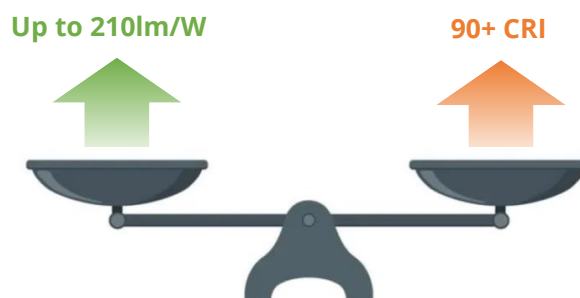
Yujileds® HE series LED technology, up to 210lm/W

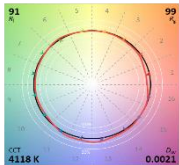
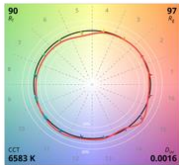
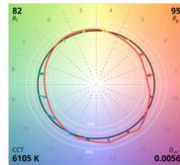
Yujileds® HE series LED technology aims to provide the superb luminous efficacy to match the increasingly demand of energy saving for commercial lighting industry. By providing up to 210lm/W (60mA at 6500K) and appropriate lighting design, the HE series technology helps to achieve A-class of the latest European Product Registry for Energy Labels (EPREL) and DLC Premium.



Color quality is no longer compromised to high luminous efficacy

Technically, luminous efficacy and color rendition is contradictory and difficult to get both promising. Yujileds® HE series LED overcomes this by achieving up to 210lm/W and 90+ CRI when the general high luminous efficacy LEDs are all 80 CRI. Even for pursuing the extreme efficacy, the CRI should not be sacrificed since it is a nature of illumination quality. Even for the advanced color metric of TM-30, Yujileds® HE series LED performs the same as nominal high CRI LED with Rf 90 and Rg 99.



| | Yujileds® HE series LED | Nominal high CRI LED | Standard LED |
|-----------------------------------|---|--|---|
| Luminous efficacy | Up to 210lm/W | 80 – 130 lm/W | 130 – 200 lm/W |
| Fidelity index (Rf) | 90 | 90 | 80 |
| Gamut index (Rg) | 99 | 97 | 95 |
| Fidelity of 99 CES | Average 85 | Average 85 | Average 80 |
| Color Vector Graphic (CVG) |  |  |  |

Redefine lumen per dollar (lm/\$)

For general commercial lighting, calculating lm/\$ is a common method to evaluate the economic efficiency of LED business and it becomes a measurement for commercialized competitive force. Yujileds® HE series LED provides the promising lm/\$ based on its better color quality to help customers win the business and higher profits simultaneously, thus the HE series redefines the lm/\$.

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



TM-30
Specified

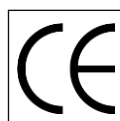
TM-30 specification

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



RoHS
Compliance

RoHS 2011/65/EU compliance



CE
Compliance

CE compliance



REACH compliance (Phosphor)

Ordering information

| PART NUMBER | PRODUCT CODE | CCT | CHROMATICITY BINS | VOLTAGE RANGE |
|-------------------|--------------|------------|-------------------|---------------|
| YJ-HE-2835-G01-30 | P3220034.30 | 3000K | 30HE | - |
| YJ-HE-2835-G01-40 | P3220034.40 | 4000K | 40HE | - |
| YJ-HE-2835-G01-65 | P3220034.65 | 6500K | 65HE | - |
| YJ-HE-2835-G01-XX | P3220034.xx | Custom CCT | - | - |

Characteristics

Electrical-optical characteristics ($T_A = 25^\circ\text{C}$, 60mA)

| PARAMETER | SYMBOL | VALUE | | | UNIT | TOLERANCE |
|---|-----------------------------|-------|------|------|---------------|----------------------------------|
| | | MIN. | TYP. | MAX. | | |
| Forward voltage | V_F | 2.7 | - | 2.9 | V | ± 0.1 |
| Luminous flux | $\Phi_{3000\text{K}}$ | 29 | - | 33 | lm | - |
| | $\Phi_{4000\text{K}}$ | 30 | - | 34 | | |
| | $\Phi_{6500\text{K}}$ | 30 | - | 34 | | |
| Correlated color temperature⁽¹⁾ | $\text{CCT}_{3000\text{K}}$ | 2900 | - | 3100 | K | - |
| | $\text{CCT}_{4000\text{K}}$ | 3800 | - | 4200 | | |
| | $\text{CCT}_{6500\text{K}}$ | 6200 | - | 6800 | | |
| Color rendering index | R_a | 90 | - | - | - | ± 2 |
| | R_9 | 50 | - | - | - | - |
| Fidelity index⁽²⁾ | R_f | - | 90 | - | - | - |
| Gamut index⁽²⁾ | R_g | - | 99 | - | - | - |
| Reverse current | I_r | - | - | 10 | μA | ± 0.1 ($V_r = 15\text{V}$) |
| View angle | $2\theta_{1/2}$ | - | 120 | - | Deg | ± 5 |

(1). Yujileds® promises the chromaticity coordinate tolerance of ± 0.005 (CIE 1931 x,y) based on Yuji standard equipment shall prevail.

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

Characteristics

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

| PARAMETER | SYMBOL | LIMIT | UNIT |
|--|-----------|--------------------|------------------|
| Power Consumption | P_D | 1000 | mW |
| DC Forward Current (pulsed)⁽¹⁾ | I_{FP} | 300 ⁽²⁾ | mA |
| DC Forward Current | I_F | 300 | mA |
| Reverse Voltage | V_R | 5 | V |
| Junction Temperature | T_j | 115 | $^\circ\text{C}$ |
| Operating Temperature | T_{opr} | -30 ~ +85 | $^\circ\text{C}$ |
| Storage Temperature | T_{stg} | -30 ~ +100 | $^\circ\text{C}$ |
| Soldering Temperature | T_{sol} | 260 \pm 5 | $^\circ\text{C}$ |
| Reflow Cycles Allowed | - | 2 | - |

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

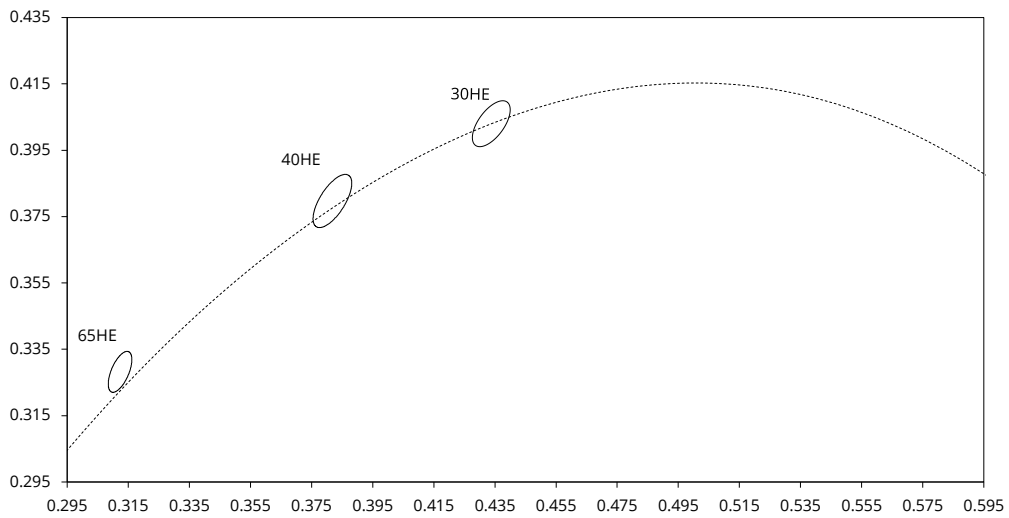
(2). Theoretical data.

Chromaticity group

Chromaticity bins & coordinates

| CCT | BIN | CIE 1931 COORDINATES | | | | | SDCM | Refer to CCT |
|-------|------|----------------------|--------|---------|---------|----------|--------|--------------|
| | | X | Y | a | b | θ | | |
| 3000K | 30HE | 0.4338 | 0.4030 | 0.01585 | 0.00680 | 53.10° | 5-step | 2900 - 3100 |
| 4000K | 40HE | 0.3818 | 0.3797 | 0.01565 | 0.00670 | 54.00° | 5-step | 3800 - 4200 |
| 6500K | 65HE | 0.3123 | 0.3282 | 0.01115 | 0.00475 | 58.23° | 5-step | 6200 - 6800 |

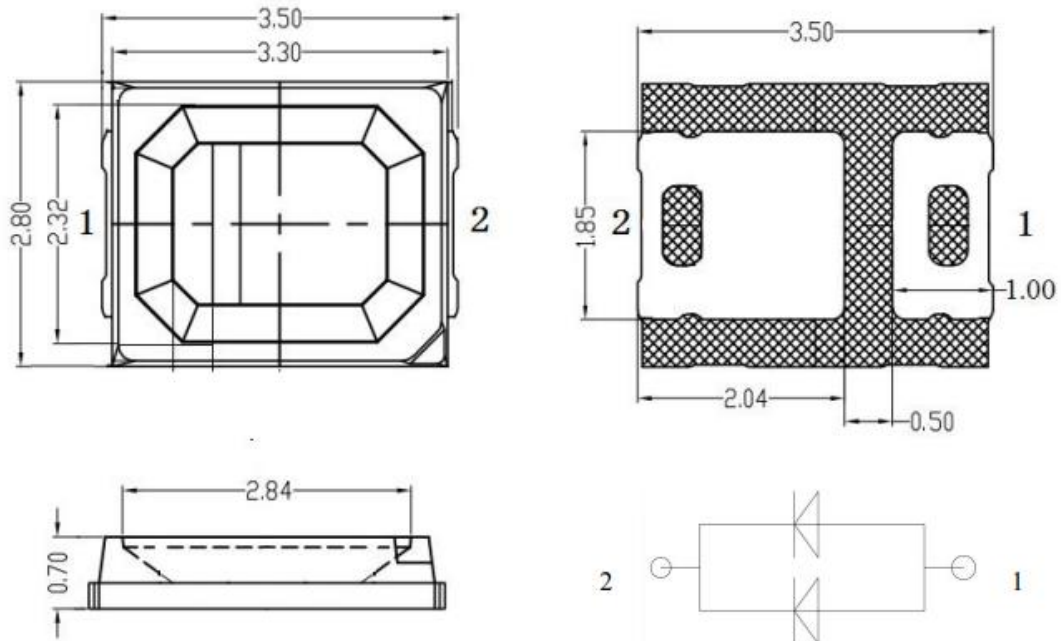
CIE 1931 diagram



Package material and dimension

Package layout

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



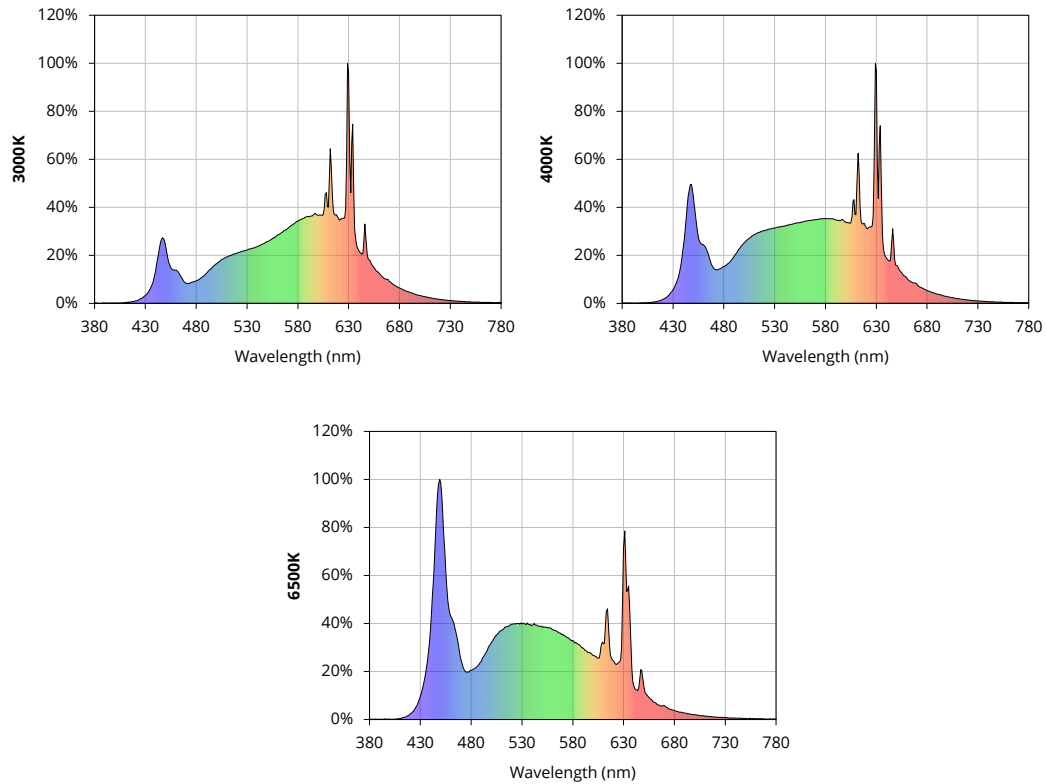
Package materials

| 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)

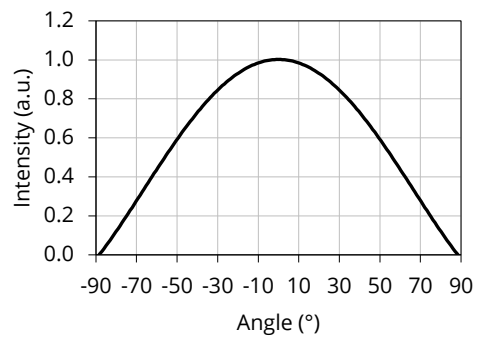
All characteristic curves are for reference only and not guaranteed.



Characteristic graph

Spatial distribution ($T_A = 25^\circ\text{C}$, $I_F = 60\text{ mA}$)

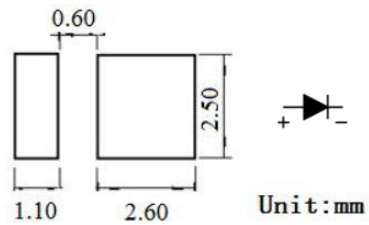
All characteristic curves are for reference only and not guaranteed.



Reflow profile

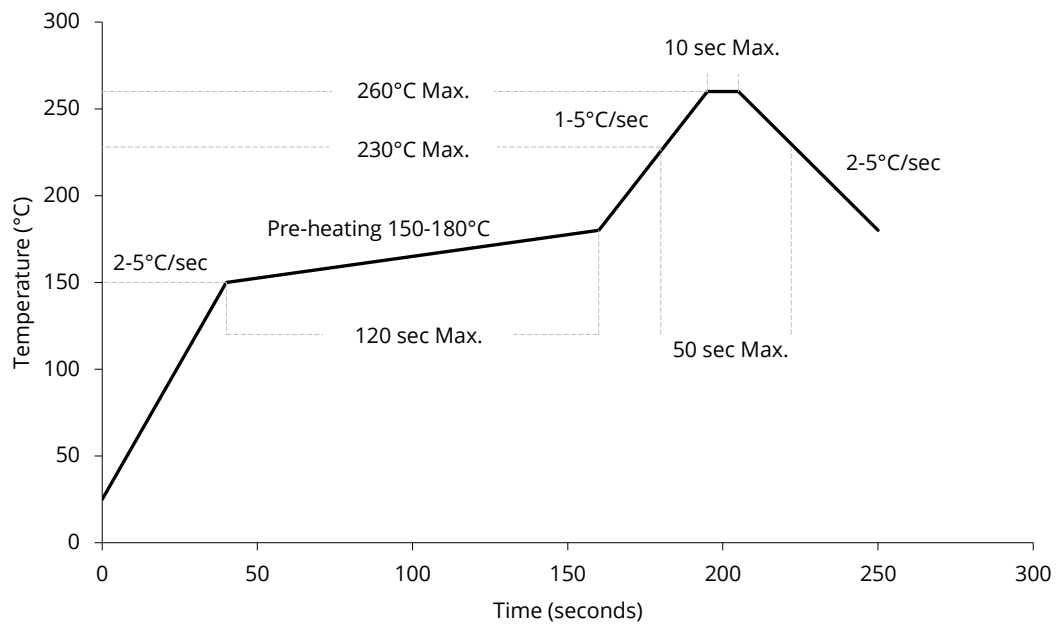
Recommended solder pad layout

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

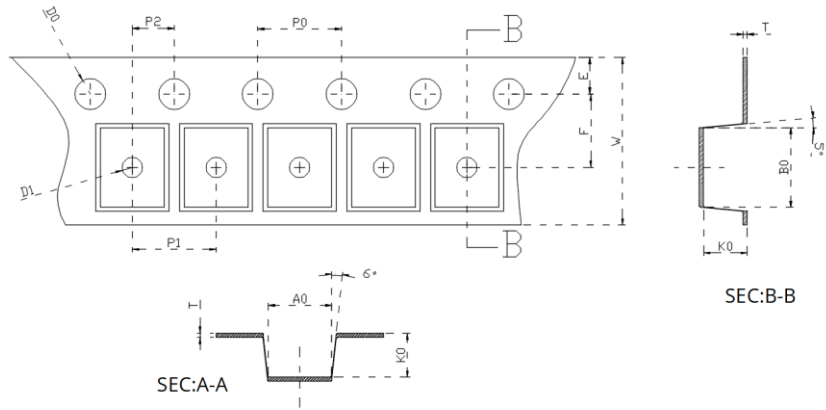
During SMT, please choose the appropriate collet in order to avoid damage the gold wire inside the LED or insufficient suction. Setting the height of the collet is crucial in order to avoid damage to the top view SMD. If the collet setting is set to too low of an altitude, the collet will press down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

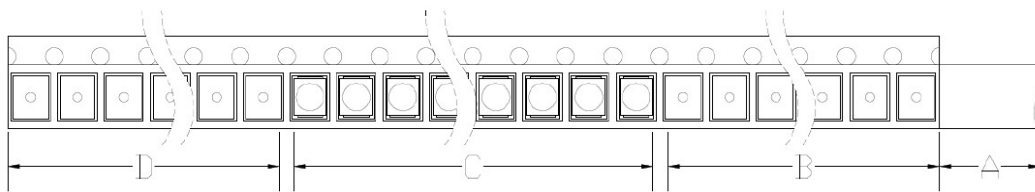
Tape dimensions (unit: mm)



| | | | | | | |
|------------------|--------|--------|--------|--------|--------|--------|
| Code | W | T | D1 | E | F | D0 |
| Value | 8.000 | 0.180 | 1.000 | 1.750 | 3.500 | 1.600 |
| Tolerance | ±0.100 | ±0.020 | ±0.100 | ±0.100 | ±0.100 | ±0.100 |
| Code | P0 | P1 | P2 | A0 | B0 | K0 |
| Value | 4.000 | 4.000 | 2.000 | 3.250 | 3.400 | 0.850 |
| Tolerance | ±0.100 | ±0.100 | ±0.100 | ±0.100 | ±0.100 | ±0.100 |

Tape layout

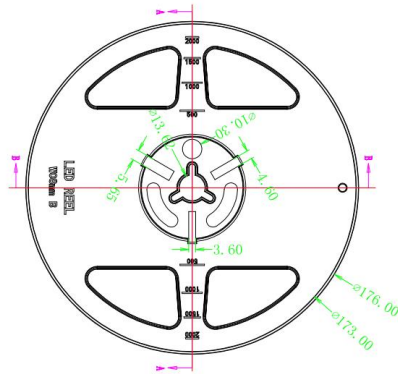
Not drawn to scale.



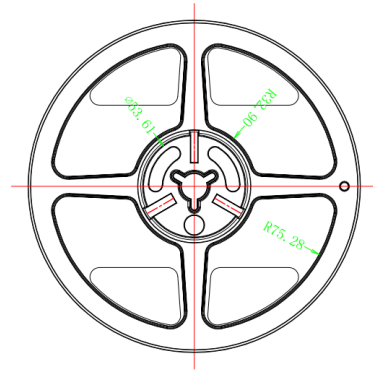
- A: Cover tape, 300mm;
- B: Empty leader, 200mm;
- C: LED, 5000pcs;
- D: Empty trailer, 200mm.

Tape and reel specifications

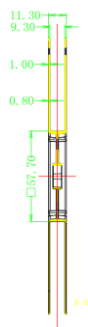
Reel dimensions top (unit: mm)



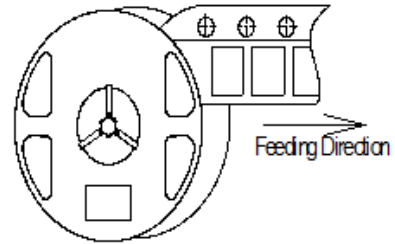
Reel dimensions bottom (unit: mm)



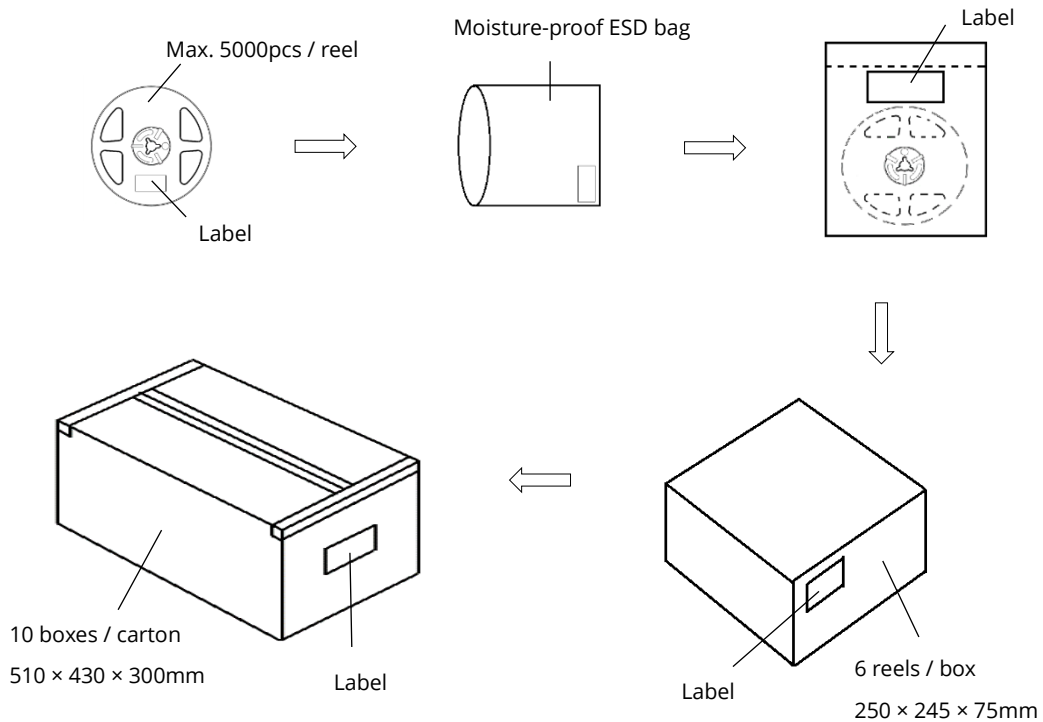
Reel dimensions side (unit: mm)



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 30000pcs). 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.

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