

### PRODUCT:

5730 SURFACE MOUNT LED VTC

### FEATURES:

5.7 mm × 3.0 mm × 0.8 mm surface-mount LED  
 120° emission angle  
 95 min CRI



### DESCRIPTION

Yuji LED's VTC 5730 SMD provides true full spectrum coverage and ultra high CRI using violet die technology. Providing 97 CRI (typical), this mid-power LED can be used in a variety of applications demanding high color quality and performance.



| ELECTRICAL-OPTICAL CHARACTERISTICS (T <sub>c</sub> = 25 °C) |                      |       |      |      |      |           |                       |
|---|----------------------|-------|------|------|------|-----------|-----------------------|
| PARAMETER   | SYMBOL               | VALUE |      |      | UNIT | TOLERANCE | CONDITION             |
|   |                      | MIN.  | TYP. | MAX. |      |           |                       |
| Forward Voltage   | V <sub>f</sub>       | 3.1   | --   | 3.6  | V    | ±0.05     | I <sub>f</sub> =120mA |
| Luminous flux   | Φ <sub>2700K</sub>   | 23    | --   | 27   | lm   | --        | I <sub>f</sub> =120mA |
|   | Φ <sub>3200K</sub>   | 26    |      | 30   |      |           |                       |
|   | Φ <sub>4000K</sub>   | 26    |      | 31   |      |           |                       |
|   | Φ <sub>5600K</sub>   | 28    |      | 32   |      |           |                       |
| Color temperature   | CCT <sub>2700K</sub> | 2550  | 2700 | 2850 | K    | --        | I <sub>f</sub> =120mA |
|   | CCT <sub>3200K</sub> | 3050  | 3200 | 3350 |      |           |                       |
|   | CCT <sub>4000K</sub> | 3800  | 4000 | 4200 |      |           |                       |
|   | CCT <sub>5600K</sub> | 5300  | 5600 | 5900 |      |           |                       |
| Color rendering index                                       | R <sub>a</sub>       | 95    | 97   | --   | --   | --        | I <sub>f</sub> =120mA |
| TCS R9 (CRI Red)  | R <sub>9</sub>       | --    | 90   | --   | --   | --        | I <sub>f</sub> =120mA |
| Chromaticity coordinates                                    | (X,Y)                | --    | --   | --   | --   | ±0.005    |                       |
| Reverse Current   | I <sub>r</sub>       |       |      | 10   | μA   | ±0.1      | V <sub>r</sub> =5V    |
| Viewing angle   | 2θ <sub>1/2</sub>    |       | 120  |      | Deg  | ±5        | I <sub>f</sub> =120mA |

| ORDERING INFORMATION |              |                             |               |
|----------------------|--------------|-----------------------------|---------------|
| PART NUMBER          | CCT          | CHROMATICITY BINS           | VOLTAGE RANGE |
| VTC-5730-27          | 2700K ± 150K | VF47,VF58,VF710,VF811       | 0.1 V         |
| VTC-5730-32          | 3200K ± 150K | VF4-2, VF7-2, VF5-1, VF8-1  | 0.1 V         |
| VTC-5730-40          | 4000K ± 200K | VD4-1, VD4-2, VD6-1, VD6-2  | 0.1 V         |
| VTC-5730-56          | 5600K ± 300K | VB8-2, VB10-2, VC3-1, VC5-1 | 0.1 V         |
| VTC-5730-XX          | CUSTOM       |                             |               |



| ABSOLUTE MAXIMUM RATING (T <sub>c</sub> = 25 °C) |                  |            |      |
|--|------------------|------------|------|
| PARAMETER  | SYMBOL           | LIMIT      | UNIT |
| Power Consumption                                | P <sub>D</sub>   | 510        | mW   |
| DC Forward Current                               | I <sub>F</sub>   | 150        | mA   |
| Reverse Voltage                                  | V <sub>R</sub>   | 5          | V    |
| Junction Temperature                             | T <sub>j</sub>   | 150        | °C   |
| Solder Point Temperature*                        | T <sub>s</sub>   | 105        | °C   |
| Operating Temperature                            | T <sub>opr</sub> | -40 ~ +85  | °C   |
| Storage Temperature                              | T <sub>stg</sub> | -30 ~ +100 | °C   |
| Soldering Temperature                            | T <sub>sol</sub> | 260 ± 5    | °C   |
| Reflow Cycles Allowed                            | -                | 2          | -    |

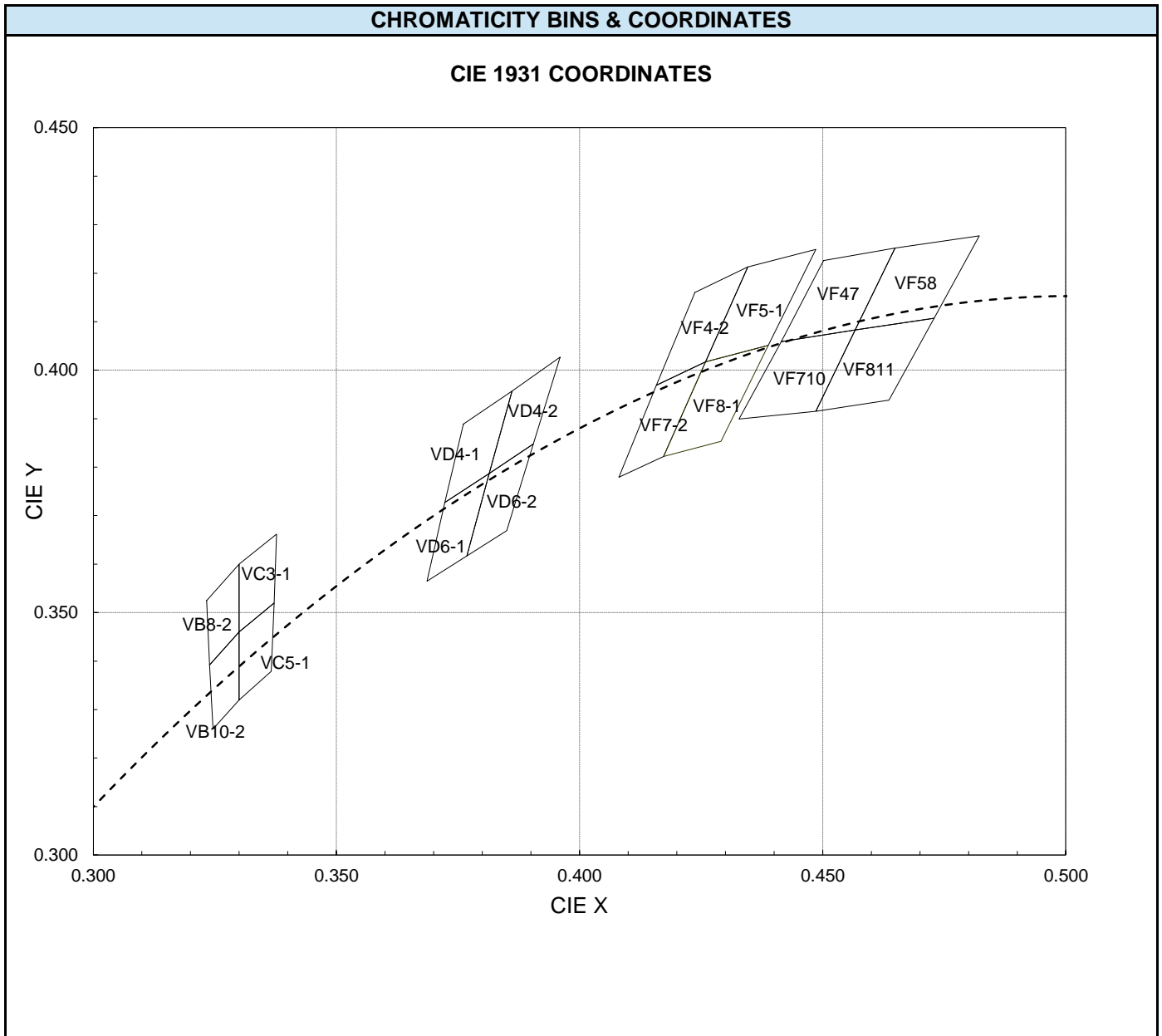
\*See page 4 for solder point definition

| PRODUCT CODES  |                |                   |   |
|--|----------------|-------------------|---|
| <b>XG0.5-13-X<sub>3</sub>SL9-R(X<sub>4</sub>)-CA</b> |                |                   |   |
|  | X <sub>4</sub> | CHROMATICITY BIN  | SEE BELOW   |
|  | X <sub>3</sub> | COLOR TEMPERATURE | WW: CCT < 3500K<br>NW: 3500K < CCT < 5300K<br>CW: CCT > 5300K |

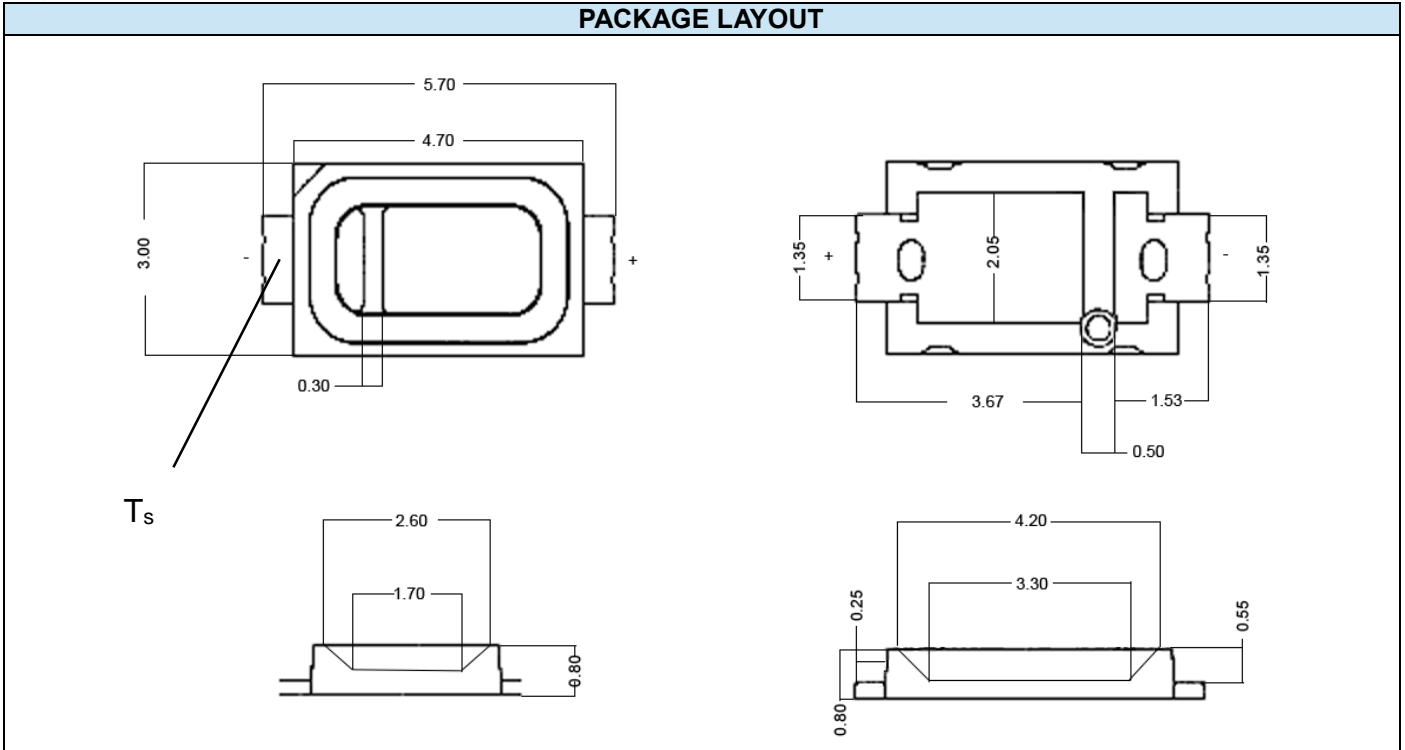
| VOLTAGE BIN CODES |         |         |         |         |         |
|-------------------|---------|---------|---------|---------|---------|
| Bin               | V31     | V32     | V33     | V34     | V35     |
| V <sub>F</sub>    | 3.1-3.2 | 3.2-3.3 | 3.3-3.4 | 3.4-3.5 | 3.5-3.6 |



| CHROMATICITY BINS & COORDINATES |        |                      |        |        |        |        |        |        |        |
|---------------------------------|--------|----------------------|--------|--------|--------|--------|--------|--------|--------|
| CCT                             | BIN    | CIE 1931 COORDINATES |        |        |        |        |        |        |        |
|                                 |        | X0                   | Y0     | X1     | Y1     | X2     | Y2     | X3     | Y3     |
| 5600K                           | VB8-2  | 0.3233               | 0.3525 | 0.3300 | 0.3600 | 0.3300 | 0.346  | 0.3239 | 0.3392 |
|                                 | VB10-2 | 0.3239               | 0.3392 | 0.3246 | 0.3260 | 0.3300 | 0.332  | 0.3300 | 0.3460 |
|                                 | VC3-1  | 0.3300               | 0.3460 | 0.3300 | 0.3600 | 0.3377 | 0.3662 | 0.3372 | 0.352  |
|                                 | VC5-1  | 0.3300               | 0.3320 | 0.3300 | 0.3460 | 0.3372 | 0.3520 | 0.3366 | 0.3379 |
| 4000K                           | VD4-1  | 0.3761               | 0.3889 | 0.3723 | 0.3727 | 0.3814 | 0.3787 | 0.3861 | 0.3957 |
|                                 | VD4-2  | 0.3861               | 0.3957 | 0.3814 | 0.3787 | 0.3905 | 0.3848 | 0.3960 | 0.4027 |
|                                 | VD6-1  | 0.3723               | 0.3727 | 0.3686 | 0.3565 | 0.3768 | 0.3617 | 0.3814 | 0.3787 |
|                                 | VD6-2  | 0.3814               | 0.3787 | 0.3768 | 0.3617 | 0.3850 | 0.3669 | 0.3905 | 0.3848 |
| 3200K                           | VF4-2  | 0.4237               | 0.416  | 0.4158 | 0.3969 | 0.4259 | 0.4017 | 0.4346 | 0.4213 |
|                                 | VF7-2  | 0.4158               | 0.3969 | 0.4081 | 0.3779 | 0.4173 | 0.3822 | 0.4259 | 0.4017 |
|                                 | VF5-1  | 0.4346               | 0.4213 | 0.4259 | 0.4017 | 0.4388 | 0.4051 | 0.4486 | 0.4249 |
|                                 | VF8-1  | 0.4259               | 0.4017 | 0.4173 | 0.3822 | 0.4291 | 0.3853 | 0.4388 | 0.4051 |
| 2700K                           | VF47   | 0.4502               | 0.4226 | 0.4649 | 0.4252 | 0.4567 | 0.4083 | 0.4415 | 0.4059 |
|                                 | VF58   | 0.4649               | 0.4252 | 0.4822 | 0.4277 | 0.4729 | 0.4107 | 0.4567 | 0.4083 |
|                                 | VF710  | 0.4415               | 0.4059 | 0.4567 | 0.4083 | 0.4486 | 0.3915 | 0.4328 | 0.3899 |
|                                 | VF811  | 0.4567               | 0.4083 | 0.4729 | 0.4107 | 0.4636 | 0.3938 | 0.4486 | 0.3915 |



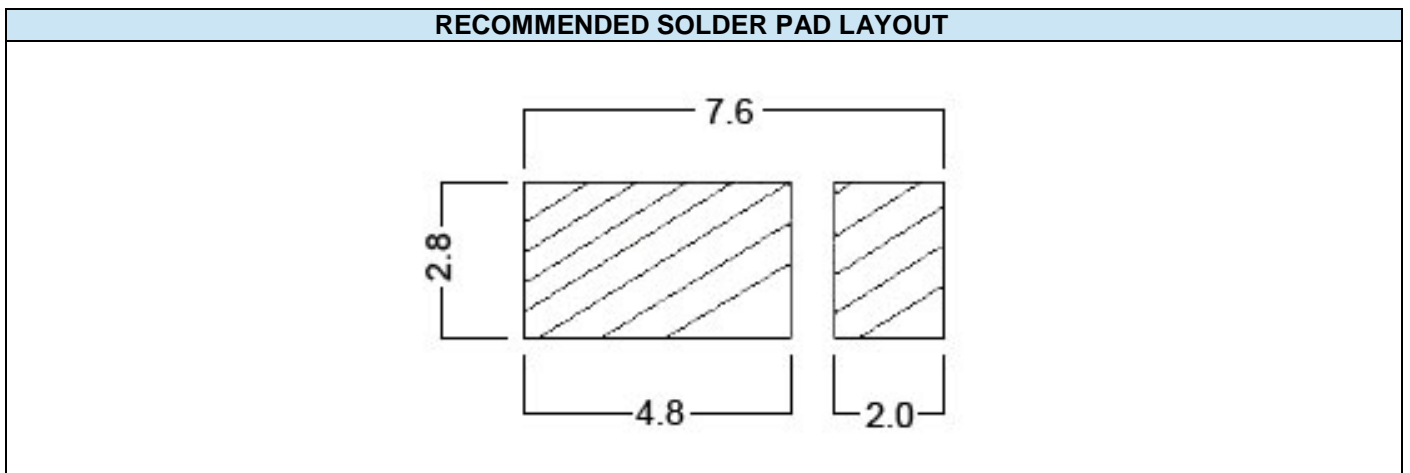
**PACKAGE LAYOUT**



**PACKAGE MATERIALS**

| ITEM                       | DESCRIPTION          |
|----------------------------|----------------------|
| DIE MATERIAL               | InGaN                |
| LEAD FRAME MATERIAL        | PCT                  |
| ENCAPSULANT RESIN MATERIAL | SILICONE + PHOSPHOR  |
| ELECTRODES MATERIAL        | SILVER-PLATED COPPER |

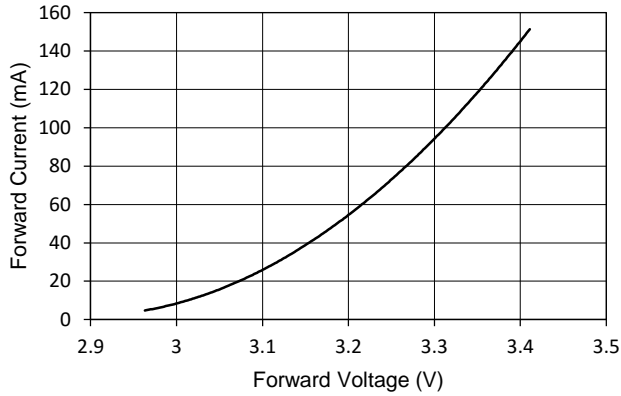
**RECOMMENDED SOLDER PAD LAYOUT**



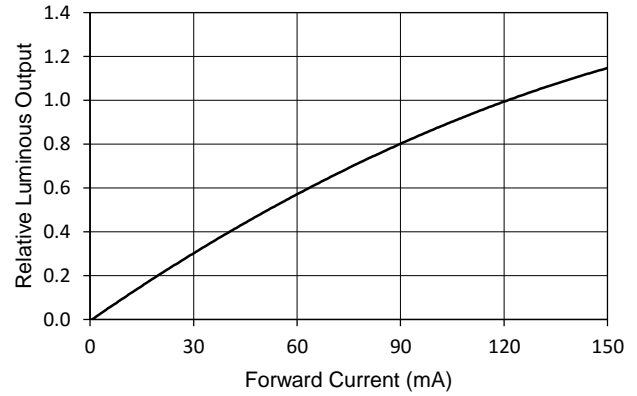
**CHARACTERISTIC CURVES**

ALL CHARACTERISTIC CURVES ARE FOR REFERENCE ONLY AND NOT GUARANTEED

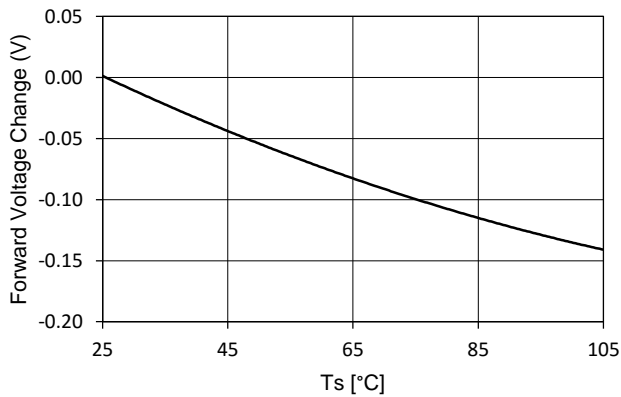
**FORWARD CURRENT VS FORWARD VOLTAGE ( $T_A=25^\circ\text{C}$ )**



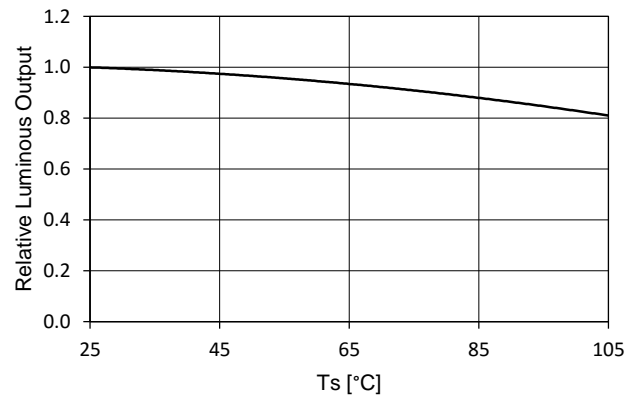
**FORWARD CURRENT VS RELATIVE LUMINOUS OUTPUT ( $T_A=25^\circ\text{C}$ )**



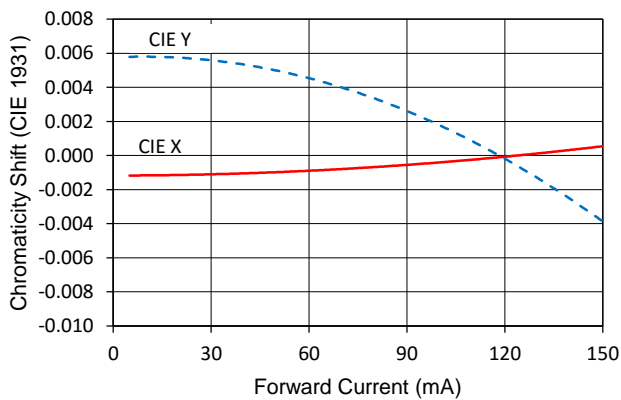
**SOLDER POINT TEMPERATURE VS FORWARD VOLTAGE ( $I_F = 120\text{ mA}$ )**



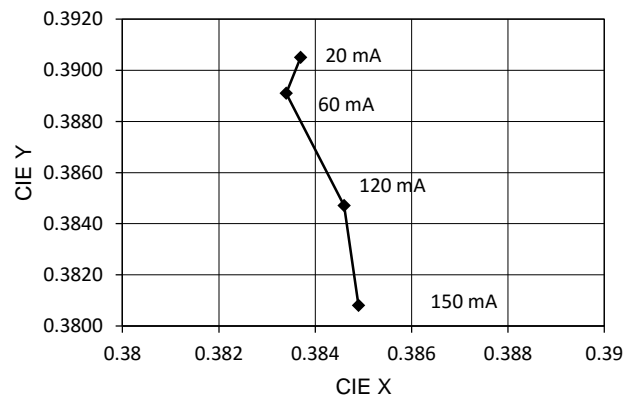
**SOLDER POINT TEMPERATURE VS RELATIVE LUMINOUS OUTPUT ( $I_F = 120\text{ mA}$ )**



**FORWARD CURRENT VS CHROMATICITY SHIFT (4000K,  $T_A=25^\circ\text{C}$ )**

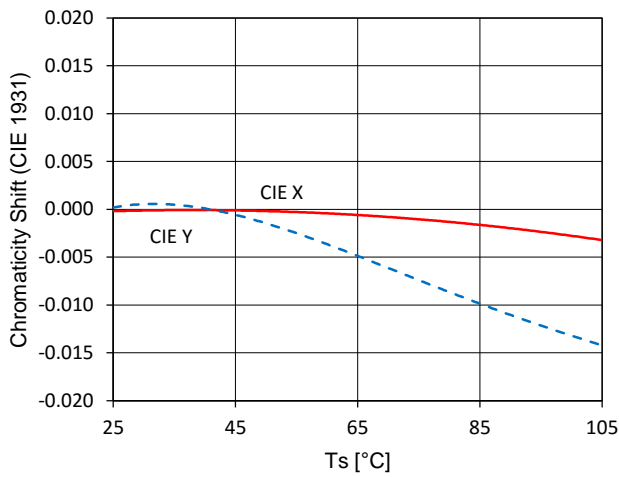


**FORWARD CURRENT VS CHROMATICITY SHIFT (4000K,  $T_A=25^\circ\text{C}$ )**

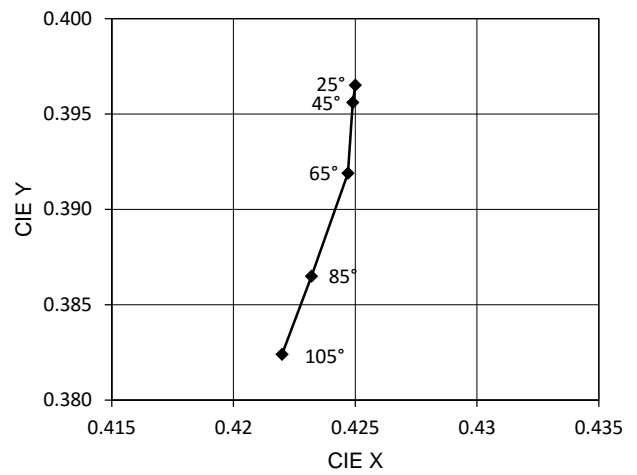


**CHARACTERISTIC CURVES (CONTINUED)**

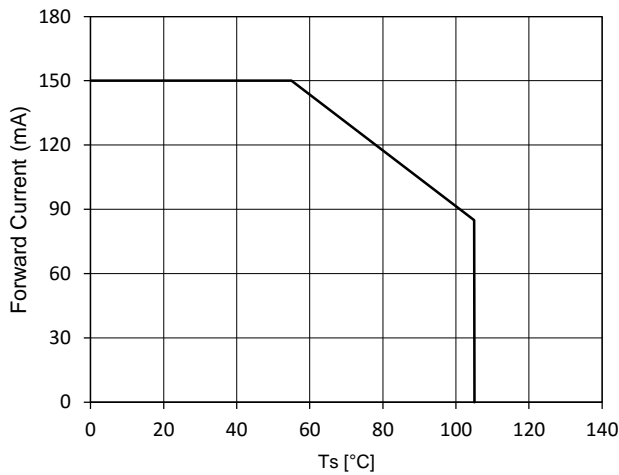
SOLDER POINT TEMPERATURE  
VS CHROMATICITY (3200K,  $I_F = 120$  mA)



SOLDER POINT TEMPERATURE  
VS CHROMATICITY (3200K,  $I_F = 120$  mA)

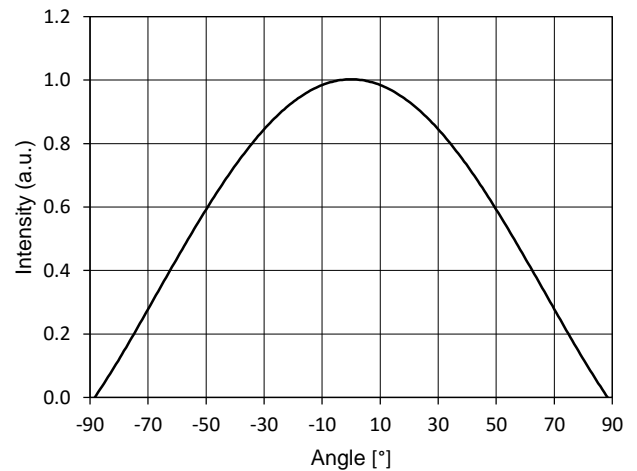


FORWARD CURRENT DERATING BASED ON SOLDER  
POINT

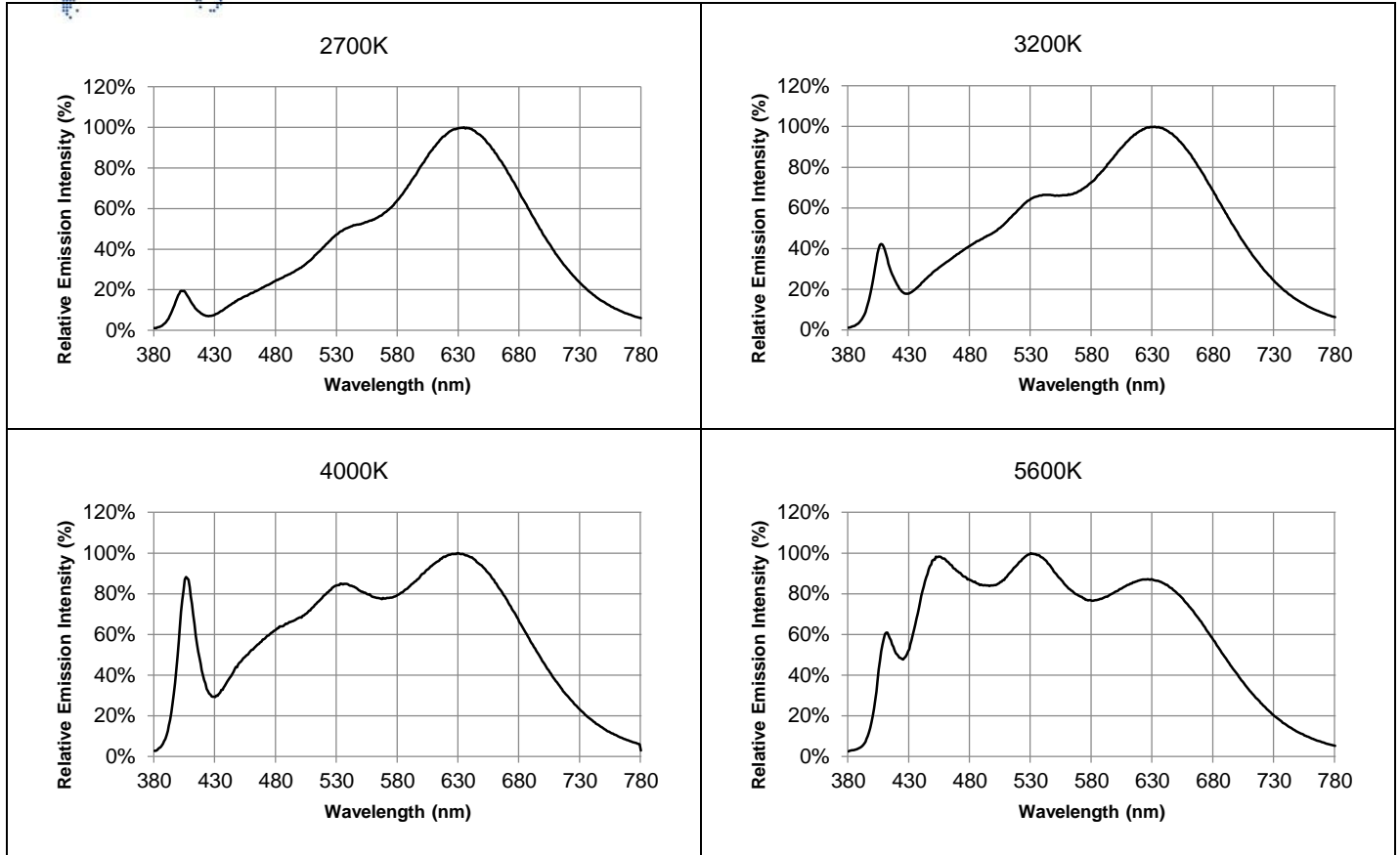


NOTE: DE-RATING CURVES ARE MEANT FOR RECOMMENDATION  
ONLY AND ARE NOT MEANT TO PROVIDE GUARANTEES OF  
PRODUCT STABILITY AND LONGEVITY

TYPICAL SPATIAL DISTRIBUTION  
( $T_A = 25^\circ\text{C}$ ,  $I_F = 120$  mA)

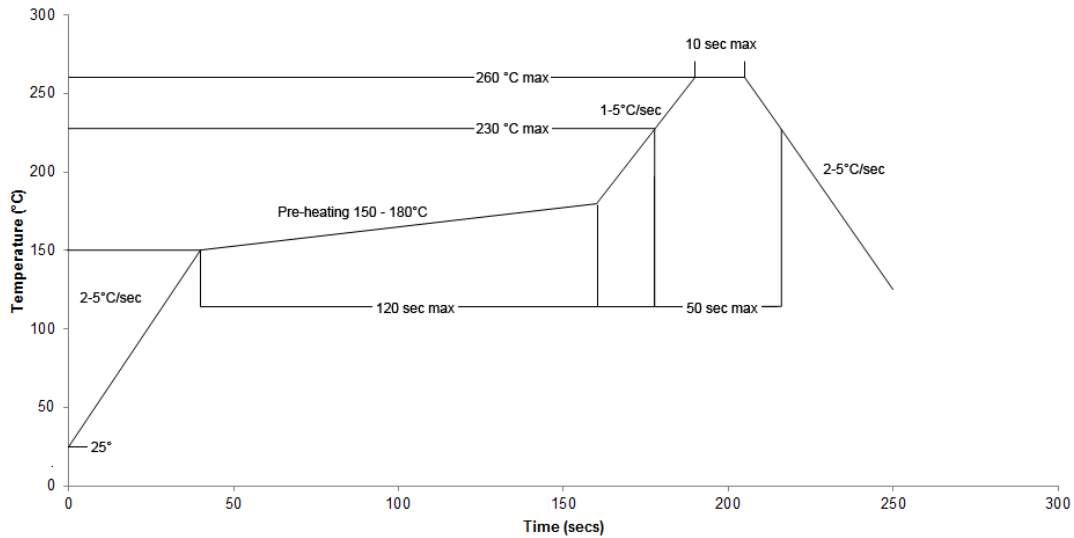


**TYPICAL SPECTRAL DISTRIBUTION GRAPHS**



**REFLOW PROFILE**

**SOLDERING RAMP-UP TIME (Pb-FREE)**



NOTE: Solder paste with the melting point at 230°C is recommended

**INSTRUCTIONS FOR SMT**

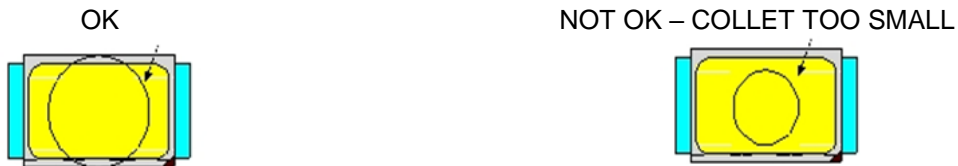


**Problems caused by improper selection of collet**

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 collet that has larger outer diameter than the lighting area of lens, in order to avoid damage the gold wire inside the LED. Different collets fit for different products, please refer to the following figures below.



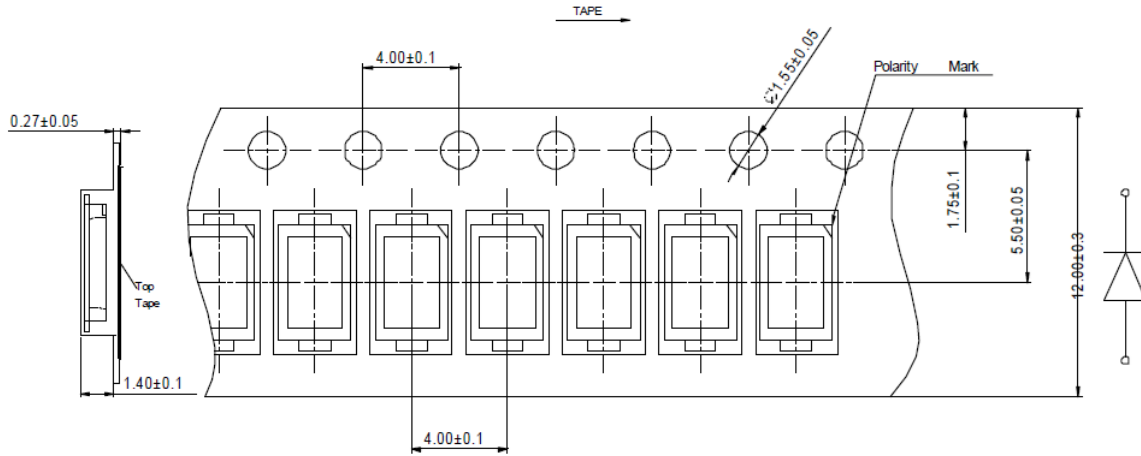
Setting the height of the collet is crucial in order to avoid damage to the top view SMD. If the collet setting is set to too low of an altitude, the collet will press down on the SMD, causing damage or breakage to the encapsulant and cause distortion or breakage of the gold wire.

**Other notes of caution:**

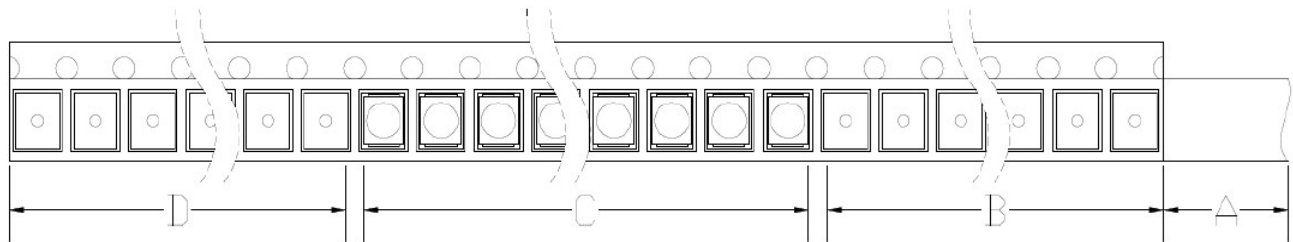
- No pressure should be exerted to the epoxy shell of the SMD under high temperature.
- Do not scratch or wipe the lens since the lens and gold wire inside are rather fragile and cross out easy to break.
- LED should be used as soon as possible when being taken out of the original package, and should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

**TAPE SPECIFICATIONS**

TAPE DIMENSIONS (UNIT: MM)



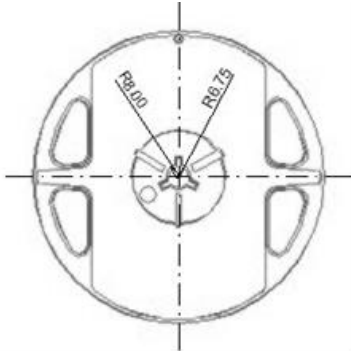
TAPE LAYOUT (NOT DRAWN TO SCALE)



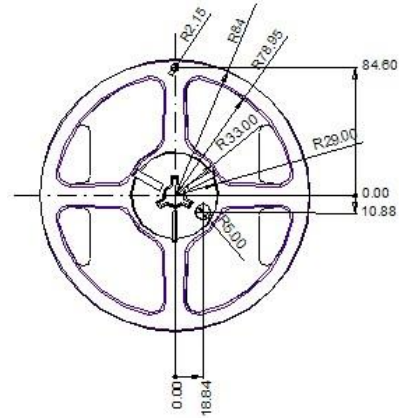
- A: COVER TAPE, 300 MM;
- B: EMPTY LEADER, 200 MM;
- C: LED, 3000 PCS;
- D: EMPTY TRAILER, 200 MM;

**REEL SPECIFICATIONS**

REEL DIMENSIONS TOP (UNIT: MM)



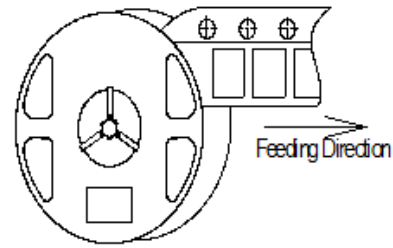
REEL DIMENSIONS BOTTOM (UNIT: MM)



REEL DIMENSIONS SIDE (UNIT: MM)



FEEDING DIRECTION



**LOT NUMBERING SCHEME**

Yuji LED uses two formats for lot numbering purposes:

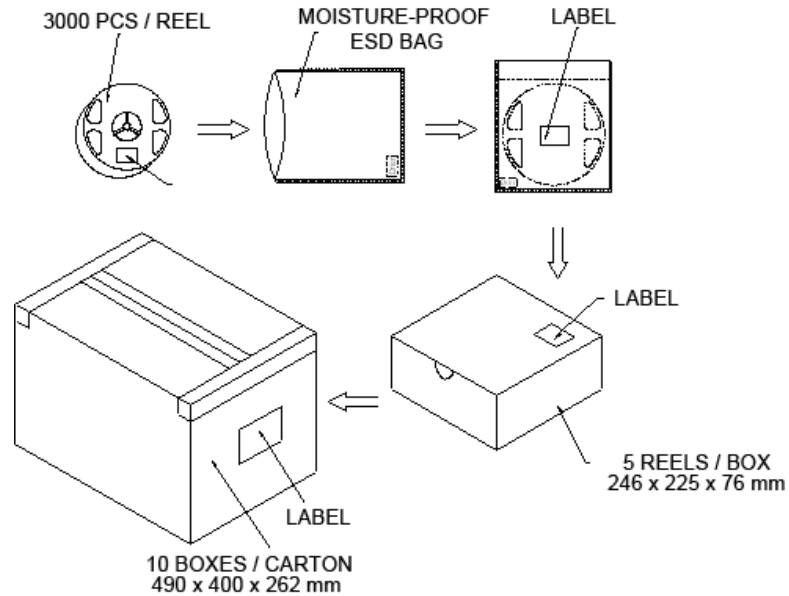
1) YYYY-MM-XXX-Z

YYYY: 4-digit manufacturing year  
MM: 2-digit manufacturing month  
XXX: 3-digit inventory number (000 – 999)  
Z: internal alphanumeric code

2) YYYYMMXXX

YYYY: 4-digit manufacturing year  
MM: 2-digit manufacturing month  
XXX: 3-digit inventory number (000 – 999)

**SHIPPING INFORMATION**



**NOTES:**

1. Reeled products (max 3,000 pcs / reel) are packed in a moisture-proof bag along with a moisture desiccant pack.
2. Each inner box contains up to 5 moisture-proof bag of (total maximum number of SMDs is 15,000pcs). Box package size: 246 mm x 225 mm x 76 mm.
3. Each outer package contains 10 inner boxes. Box size: 490 mm x 400 mm x 262 mm.
4. 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).
5. This packaging merely intended as a reference for standard quantity orders only – please note that actual packaging can differ depending on the order circumstances.