

# Kingbright

## 1.6X0.8mm SMD CHIP LED LAMP

### PRELIMINARY SPEC

Part Number: APH1608RWF/A

WHITE



**ATTENTION**  
OBSERVE PRECAUTIONS  
FOR HANDLING  
ELECTROSTATIC  
DISCHARGE  
SENSITIVE  
DEVICES

### Features

- 1.6mmX0.8mm SMT LED, 0.65mm THICKNESS.
- LOW POWER CONSUMPTION.
- WIDE VIEWING ANGLE.
- IDEAL FOR BACKLIGHT AND INDICATOR.
- PACKAGE: 2000PCS / REEL .
- MOISTURE SENSITIVITY LEVEL : LEVEL 3.
- ELECTROSTATIC DISCHARGE THRESHOLD (HBM):1000V.
- TYP. COLOR TEMPERATURE:6500K
- COLOR COORDINATES:X=0.33,Y=0.34 ACC. TO CIE1931(WHITE).
- OPTICAL EFFICIENCY:7.9 lm/W(TYP.)
- COLOR REPRODUCTION INDEX:80
- RoHS COMPLIANT.

### Description

The source color devices are made with InGaN on SiC Light Emitting Diode.

Static electricity and surge damage the LEDs.

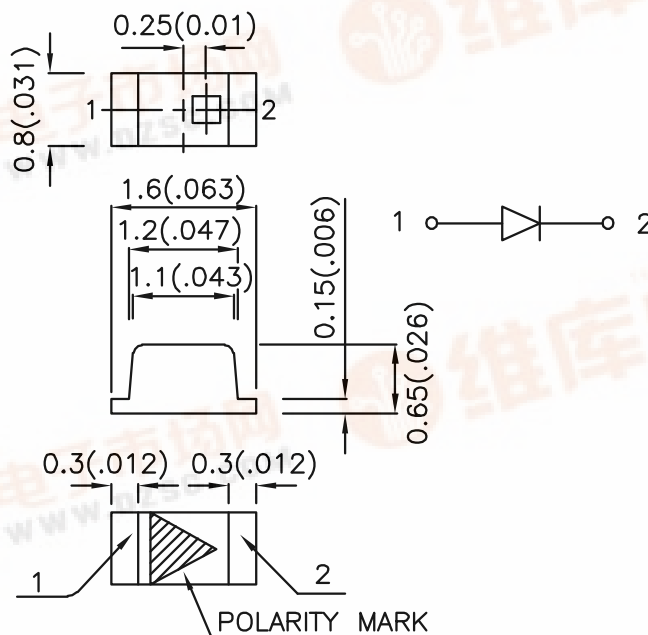
It is recommended to use a wrist band or anti-electrostatic glove when handling the LEDs.

All devices, equipment and machinery must be electrically grounded.

### Applications

- traffic signaling.
- backlighting (illuminated advertising , general lighting).
- interior and exterior automotive lighting.
- substitution of micro incandescent lamps.
- reading lamps.
- signal and symbol luminaire for orientation.
- marker lights (e.g. steps, exit ways, etc).
- decorative and entertainment lighting.
- indoor and outdoor commercial and residential architectural lighting.

### Package Dimensions



#### Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is  $\pm 0.1(0.004)$  unless otherwise noted.
3. Specifications are subject to change without notice.

## Selection Guide

| Part No.     | Dice          | Lens Type          | luminous Intensity <sup>Note2</sup><br>Iv(mcd) @ 20 mA |      | $\Phi_v$ (mlm) <sup>Note3</sup><br>@ 20 mA | Viewing<br>Angle <sup>Note1</sup> |
|--------------|---------------|--------------------|--------------------------------------------------------|------|--------------------------------------------|-----------------------------------|
|              |               |                    | Min.                                                   | Typ. | Typ.                                       | 2 $\theta$ 1/2                    |
| APH1608RWF/A | WHITE (InGaN) | YELLOW FLUORESCENT | 70                                                     | 140  | 520                                        | 120°                              |

## Absolute Maximum Ratings at T<sub>A</sub>=25°C

| Parameter                                                                        | Symbol                                   | Value       | Unit         |
|----------------------------------------------------------------------------------|------------------------------------------|-------------|--------------|
| Power dissipation                                                                | P <sub>t</sub>                           | 114         | mW           |
| Reverse Voltage                                                                  | V <sub>R</sub>                           | 5           | V            |
| Junction temperature                                                             | T <sub>J</sub>                           | 110         | °C           |
| Operating Temperature                                                            | T <sub>op</sub>                          | -40 To +85  | °C           |
| Storage Temperature                                                              | T <sub>stg</sub>                         | -40 To +100 | °C           |
| DC Forward Current                                                               | I <sub>F</sub>                           | 30          | mA           |
| Peak Forward Current <sup>Note4</sup>                                            | I <sub>FM</sub>                          | 100         | mA           |
| Thermal resistance<br>Junction/ambient <sup>Note5</sup><br>Junction/solder point | R <sub>th JA</sub><br>R <sub>th JS</sub> | 400<br>150  | °C/W<br>°C/W |

Notes:

1.  $\theta$ 1/2 is the angle from optical centerline where the luminous intensity is 1/2 the optical centerline value.

2. Luminous intensity is measured by a current pulse of 10ms at a tolerance of  $\pm 15\%$ .

3. The typical data of Luminous Flux can only reflect statistical figures, actual parameters of individual product could differ from the typical data.

For the purpose of product enhancement, the typical data is subject to change without prior notice.

4. 1/10 Duty Cycle, 0.1ms Pulse Width.

5. R<sub>th</sub>(J-A) Results from mounting on PC board FR4 (pad size  $\geq 16 \text{ mm}^2$  per pad),

## Electrical / Optical Characteristics at T<sub>A</sub>=25°C

| Parameter                                                                                             | Symbol                          | Value | Unit                 |
|-------------------------------------------------------------------------------------------------------|---------------------------------|-------|----------------------|
| Chromaticity coordinate x acc.to CIE1931<br>I <sub>F</sub> =20mA [Typ.]                               | X <sup>Note1</sup>              | 0.33  | -                    |
| Chromaticity coordinate y acc.to CIE1931<br>I <sub>F</sub> =20mA [Typ.]                               | Y <sup>Note1</sup>              | 0.34  | -                    |
| Forward Voltage I <sub>F</sub> =20mA [Min.]                                                           | V <sub>F</sub> <sup>Note2</sup> | 2.7   | V                    |
| Forward Voltage I <sub>F</sub> =20mA [Typ.]                                                           |                                 | 3.3   |                      |
| Forward Voltage I <sub>F</sub> =20mA [Max.]                                                           |                                 | 3.8   |                      |
| Reverse Current (V <sub>R</sub> =5V) [Typ.]                                                           | I <sub>R</sub>                  | 0.01  | $\mu\text{A}$        |
| Reverse Current (V <sub>R</sub> =5V) [Max.]                                                           |                                 | 10    |                      |
| Temperature coefficient of x<br>I <sub>F</sub> =20mA, -10°C $\leq$ T $\leq$ 100°C [Typ.]              | TC <sub>x</sub>                 | -0.1  | 10 <sup>-3</sup> /°C |
| Temperature coefficient of y<br>I <sub>F</sub> =20mA, -10°C $\leq$ T $\leq$ 100°C [Typ.]              | TC <sub>y</sub>                 | -0.2  | 10 <sup>-3</sup> /°C |
| Temperature coefficient of V <sub>F</sub><br>I <sub>F</sub> =20mA, -10°C $\leq$ T $\leq$ 100°C [Typ.] | TC <sub>v</sub>                 | -2.5  | mV/°C                |

Notes:

1. Chromaticity coordinates are measured by a current pulse of 20ms with a tolerance of  $\pm 0.01$  in X and Y color coordinates.

2. Forward voltage is measured with a current pulse of 10ms at a tolerance of  $\pm 0.1\text{V}$ .

## Brightness codes

| luminous Intensity <sup>Note1</sup><br>Iv(mcd) @ 20 mA |      |      | $\Phi_v$ (mlm) <sup>Note2</sup><br>@ 20 mA |
|--------------------------------------------------------|------|------|--------------------------------------------|
| Code.                                                  | Min. | Max. | Typ.                                       |
| M                                                      | 70   | 130  | 300                                        |
| N                                                      | 110  | 220  | 480                                        |
| P                                                      | 180  | 320  | 710                                        |
| Q                                                      | 280  | 420  | 960                                        |

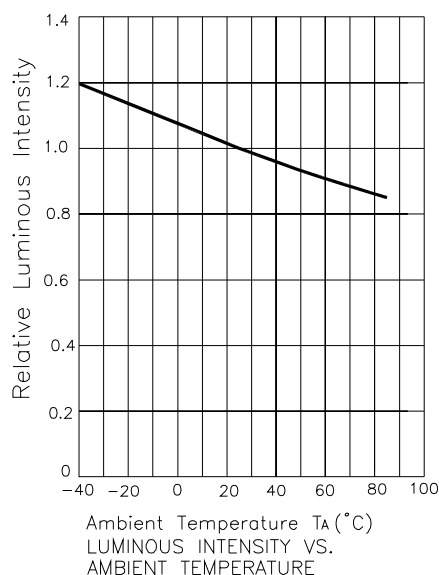
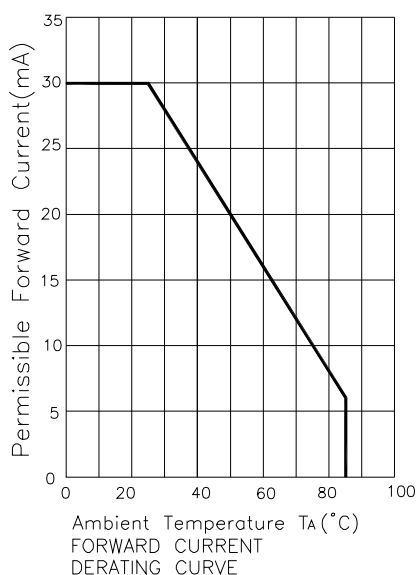
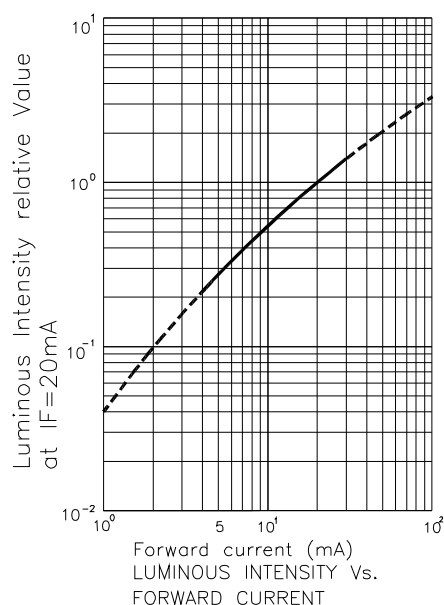
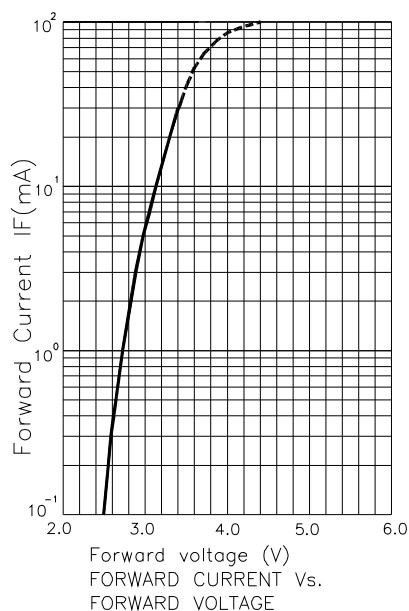
Notes:

1. Luminous intensity is measured by a current pulse of 10ms at a tolerance of  $\pm 15\%$ .

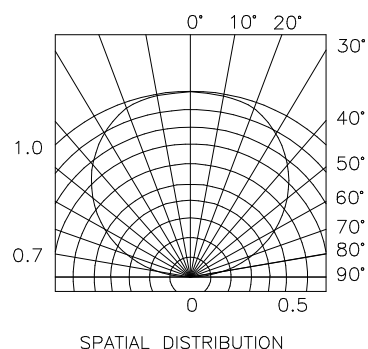
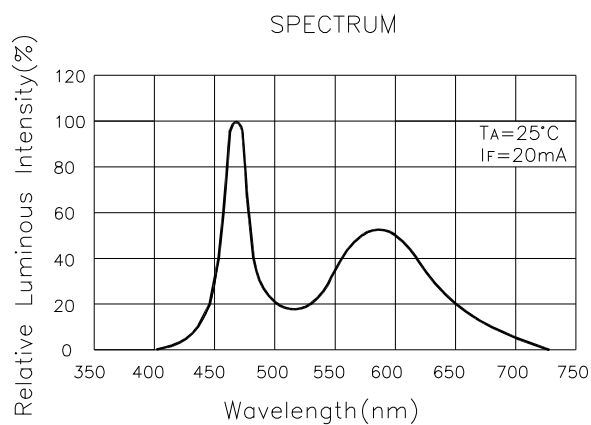
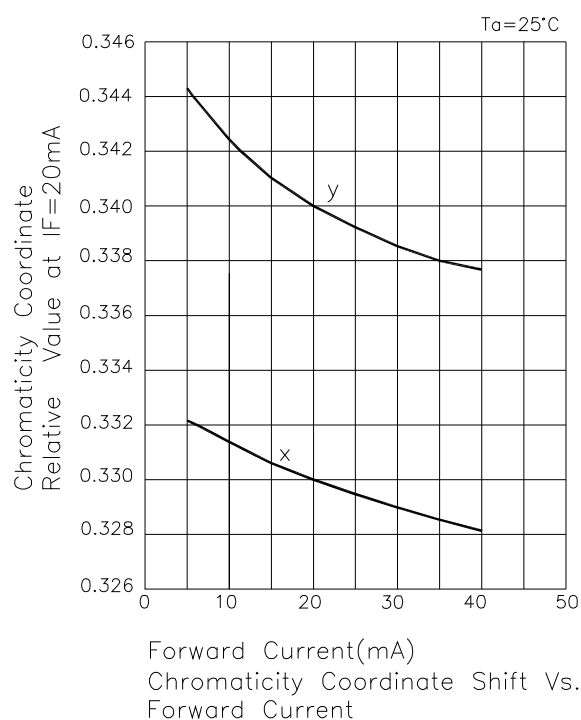
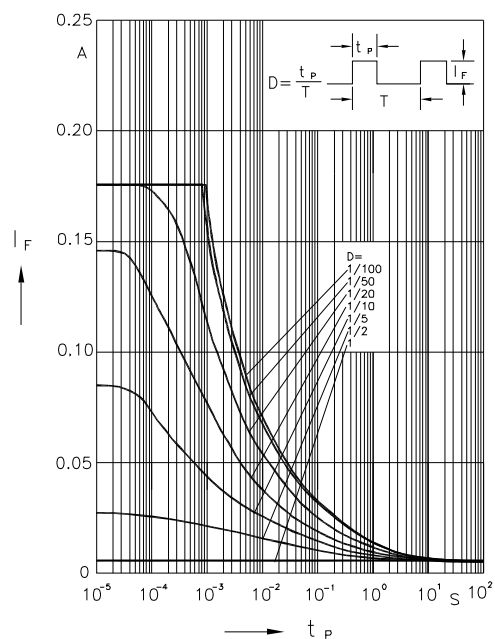
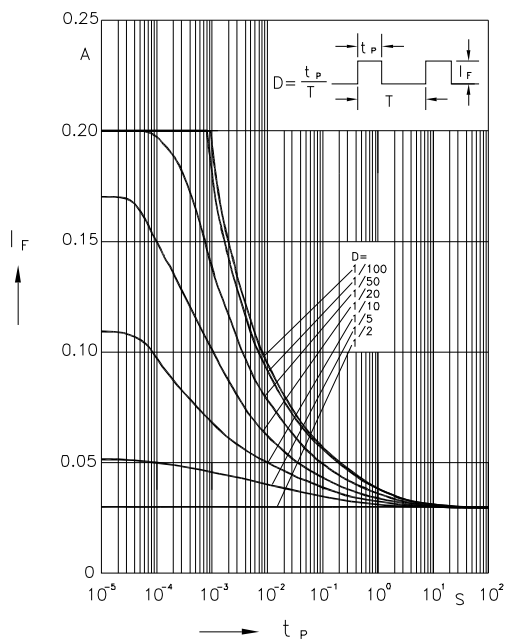
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White

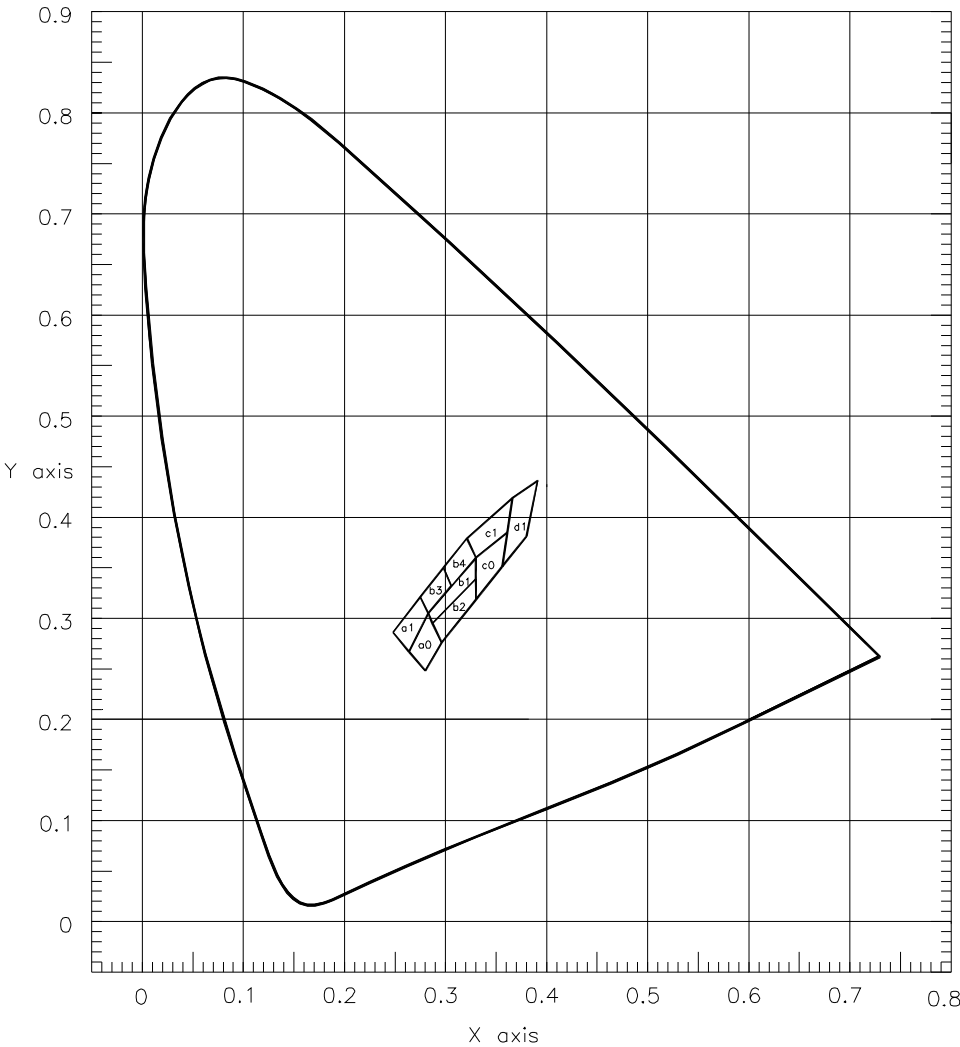
APH1608RWF/A



## APH1608RWF/A



## Color Codes



| a1 |       |       |       |       |
|----|-------|-------|-------|-------|
| X  | 0.248 | 0.275 | 0.283 | 0.264 |
| Y  | 0.286 | 0.321 | 0.305 | 0.267 |
| b1 |       |       |       |       |
| X  | 0.283 | 0.330 | 0.330 | 0.287 |
| Y  | 0.305 | 0.360 | 0.339 | 0.295 |
| c1 |       |       |       |       |
| X  | 0.321 | 0.366 | 0.361 | 0.330 |
| Y  | 0.379 | 0.419 | 0.385 | 0.360 |

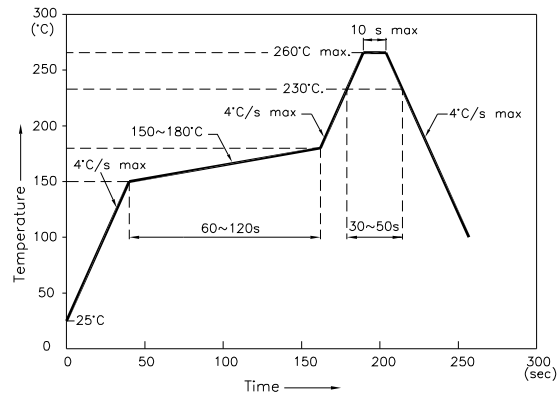
| a0 |       |       |       |       |
|----|-------|-------|-------|-------|
| X  | 0.264 | 0.283 | 0.296 | 0.280 |
| Y  | 0.267 | 0.305 | 0.276 | 0.248 |
| b2 |       |       |       |       |
| X  | 0.287 | 0.330 | 0.330 | 0.296 |
| Y  | 0.295 | 0.339 | 0.318 | 0.276 |
| c0 |       |       |       |       |
| X  | 0.330 | 0.361 | 0.356 | 0.330 |
| Y  | 0.360 | 0.385 | 0.351 | 0.318 |

| b3 |       |       |       |       |
|----|-------|-------|-------|-------|
| X  | 0.275 | 0.298 | 0.306 | 0.283 |
| Y  | 0.321 | 0.350 | 0.332 | 0.305 |
| b4 |       |       |       |       |
| X  | 0.298 | 0.321 | 0.330 | 0.306 |
| Y  | 0.350 | 0.379 | 0.360 | 0.332 |
| d1 |       |       |       |       |
| X  | 0.366 | 0.391 | 0.380 | 0.356 |
| Y  | 0.419 | 0.436 | 0.381 | 0.351 |

Ta=25°, IF=20mA      Measurement Uncertainty of the Color Coordinates: +/−0.01

## APH1608RWF/A

Reflow Soldering Profile For Lead-free SMT Process.



### NOTES:

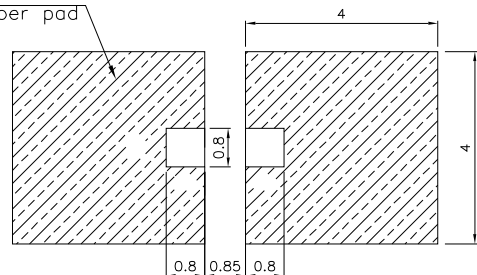
1. We recommend the reflow temperature 245°C(+/-5°C). The maximum soldering temperature should be limited to 260°C.
2. Don't cause stress to the epoxy resin while it is exposed to high temperature.
3. Number of reflow process shall be 2 times or less.

## Recommended Soldering Pattern (Units: mm ; Tolerance: ± 0.1)

Pad design for improved heat dissipation

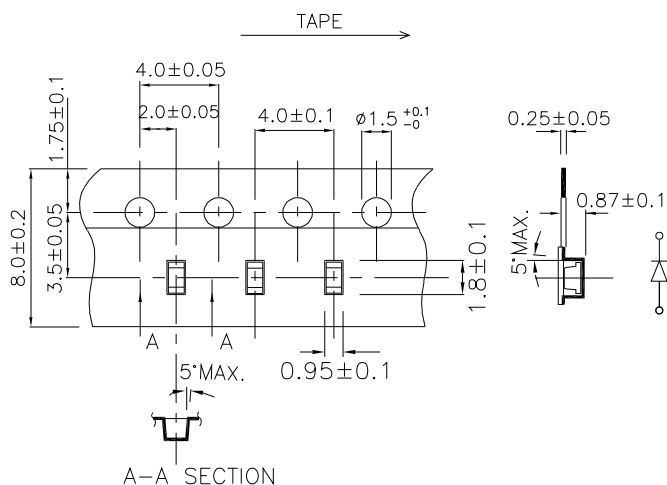


Cu-area > 16mm<sup>2</sup>  
per pad

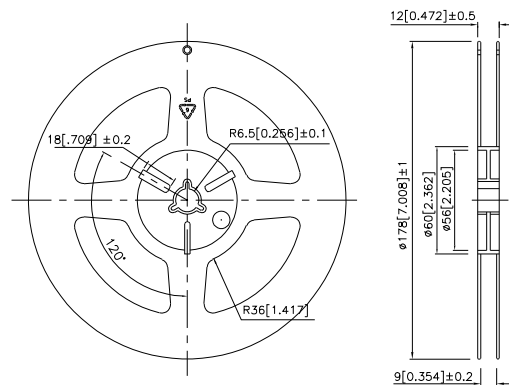


■ Solder resist

## Tape Specifications (Units : mm)

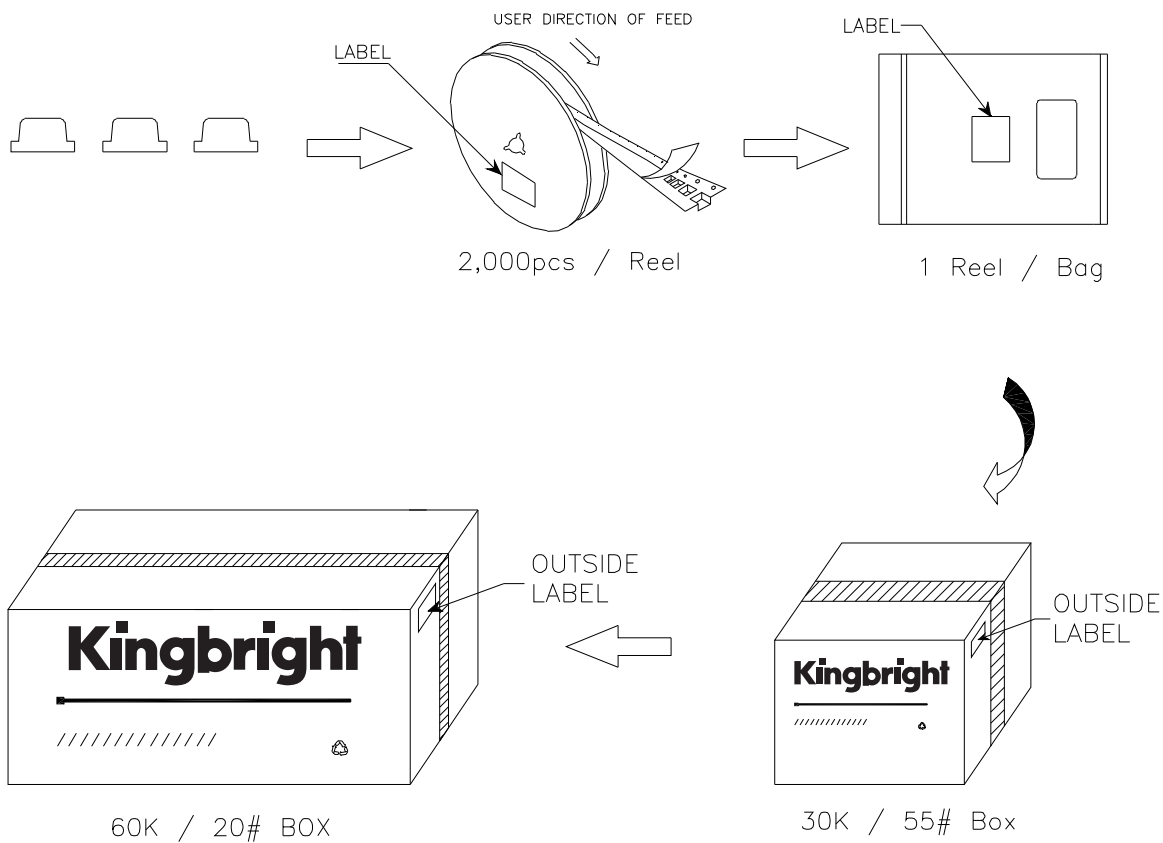


## Reel Dimension



PACKING & LABEL SPECIFICATIONS

APH1608RWF/A



|                                 |                                             |
|---------------------------------|---------------------------------------------|
| <b>Kingbright</b>               |                                             |
| P/No: APH1608XXX                |                                             |
| QTY: 2,000 pcs                  | Q.C. <div>Q C<br/>xx xx xx<br/>PASSED</div> |
| S/N: XXX                        |                                             |
| CODE: XXX                       |                                             |
| LOT NO:                         |                                             |
| <div>XXXXXXXXXXXXXXXXXXXX</div> |                                             |
| RoHS Compliant                  |                                             |