

# **QT-Brightek PLCC Series**

## **3014 PLCC2 LED**

**Part No.: QBLP674-XX Series**

|                            |                       |              |
|----------------------------|-----------------------|--------------|
| Product: QBLP674-XX Series | Date: August 29, 2014 | Page 1 of 12 |
|                            | Version# 2.3          |              |

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## Introduction

### Feature:

- Package in tape and reel
- Ultra bright reflector type 3014 PLCC2 LED
- InGaN technology for IB/IG
- AlInGaP technology for R/AG/Y/O/S
- 120 degree viewing angle

### Description:

These ultra bright reflector type 3014 PLCC2 LEDs have a height profile of 0.75mm. Combination of high brightness output and robust package, these LEDs are ideal for architecture lighting, status indication, and industrial equipment lighting applications.

### Application:

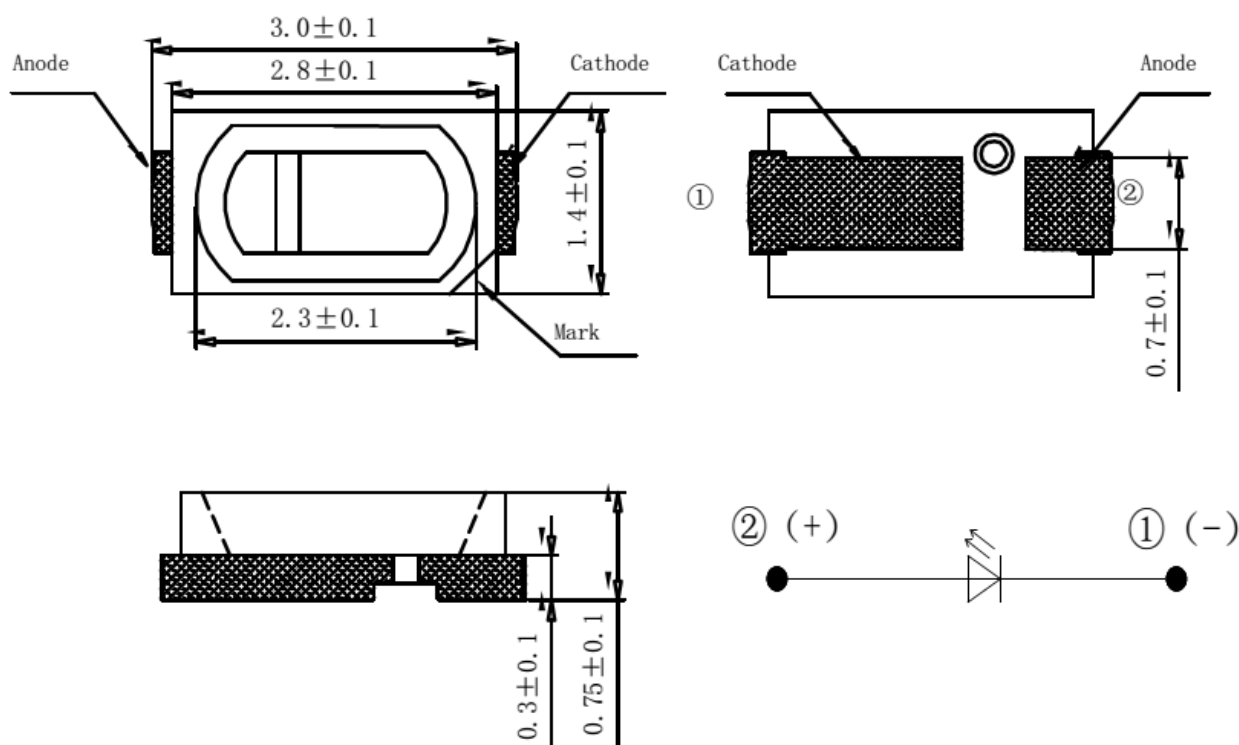
- Status indication
- Industrial equipment backlighting
- Architecture lighting

### Certification & Compliance:

- TS16949
- ISO9001
- RoHS Compliant



### Dimension:



Units: mm / tolerance = +/-0.1mm

## Electrical / Optical Characteristic (Ta=25 °C)

| Product    | Color        | I <sub>F</sub> (mA) | V <sub>F</sub> (V) |      | λ <sub>D</sub> (nm) |      |      | I <sub>V</sub> (mcd) |      |
|------------|--------------|---------------------|--------------------|------|---------------------|------|------|----------------------|------|
|            |              |                     | Typ.               | Max. | Min.                | Typ. | Max. | Min.                 | Typ. |
| QBLP674-IB | Blue         | 20                  | 3.1                | 3.7  | 465                 | 470  | 475  | 100                  | 210  |
| QBLP674-IG | True Green   | 20                  | 3.1                | 3.7  | 520                 | 525  | 530  | 500                  | 900  |
| QBLP674-R  | Red          | 20                  | 2.0                | 2.5  | 615                 | 620  | 630  | 125                  | 230  |
| QBLP674-AG | Yellow Green | 20                  | 2.0                | 2.5  | 565                 | 570  | 576  | 40                   | 80   |
| QBLP674-Y  | Yellow       | 20                  | 2.0                | 2.5  | 585                 | 590  | 595  | 125                  | 210  |
| QBLP674-O  | Orange       | 20                  | 2.0                | 2.5  | 600                 | 605  | 610  | 125                  | 240  |
| QBLP674-S  | Deep Red     | 20                  | 2.0                | 2.5  | 630                 | 640  | 650  | 50                   | 80   |

## Absolute Maximum Rating

| Material             | P <sub>d</sub> (mW) | I <sub>F</sub> (mA) | I <sub>FP</sub> (mA)* | V <sub>R</sub> (V) | T <sub>OP</sub> (°C) | T <sub>ST</sub> (°C) | T <sub>SOL</sub> (°C)** |
|----------------------|---------------------|---------------------|-----------------------|--------------------|----------------------|----------------------|-------------------------|
| AlInGaP (R/AG/Y/O/S) | 75                  | 30                  | 125                   | 5                  | -30 ~ +85            | -40 ~ +100           | 260                     |
| InGaN (IB/IG)        | 120                 | 30                  | 100                   | 5                  | -30 ~ +85            | -40 ~ +100           | 260                     |

\*Duty 1/10 @ 1KHz

\*\* IR Reflow for no more than 10 sec @ 260 °C

## Forward Voltage V<sub>F</sub> for AlInGaP @ I<sub>F</sub>=20mA

| Bin | Min. | Max. | Unit |
|-----|------|------|------|
| □   | 1.7  | 2.5  | V    |

## Forward Voltage V<sub>F</sub> for InGaN @ I<sub>F</sub>=20mA

| Bin | Min. | Max. | Unit |
|-----|------|------|------|
| e   | 2.5  | 2.8  | V    |
| f   | 2.8  | 3.1  |      |
| g   | 3.1  | 3.4  |      |
| h   | 3.4  | 3.7  |      |

**Dominant Wavelength  $\lambda_D$  for Blue @  $I_F=20\text{mA}$** 

| Bin | Min.  | Max.  | Unit |
|-----|-------|-------|------|
| G   | 465   | 467.5 | nm   |
| H   | 467.5 | 470   |      |
| I   | 470   | 472.5 |      |
| J   | 472.5 | 475   |      |

**Dominant Wavelength  $\lambda_D$  for Green @  $I_F=20\text{mA}$** 

| Bin | Min.  | Max.  | Unit |
|-----|-------|-------|------|
| U   | 520   | 522.5 | nm   |
| V   | 522.5 | 525   |      |
| W   | 525   | 527.5 |      |
| X   | 527.5 | 530   |      |

**Dominant Wavelength  $\lambda_D$  for Red @  $I_F=20\text{mA}$** 

| Bin | Min. | Max. | Unit |
|-----|------|------|------|
| s   | 615  | 620  | nm   |
| t   | 620  | 625  |      |
| u   | 625  | 630  |      |

**Dominant Wavelength  $\lambda_D$  for Yellow Green @  $I_F=20\text{mA}$** 

| Bin | Min. | Max. | Unit |
|-----|------|------|------|
| h   | 565  | 568  | nm   |
| i   | 568  | 572  |      |
| j   | 572  | 576  |      |

**Dominant Wavelength  $\lambda_D$  for Yellow @  $I_F=20\text{mA}$** 

| Bin | Min. | Max. | Unit |
|-----|------|------|------|
| m   | 585  | 590  | nm   |
| n   | 590  | 595  |      |

**Dominant Wavelength  $\lambda_D$  for Orange @  $I_F=20\text{mA}$** 

| Bin | Min. | Max. | Unit |
|-----|------|------|------|
| p   | 600  | 605  | nm   |
| q   | 605  | 610  |      |

**Dominant Wavelength  $\lambda_D$  for Deep Red @  $I_F=20\text{mA}$** 

| Bin | Min. | Max. | Unit |
|-----|------|------|------|
| v   | 630  | 635  | nm   |
| w   | 635  | 650  |      |

**Luminous Intensity  $I_v$  @  $I_F=20mA$** 

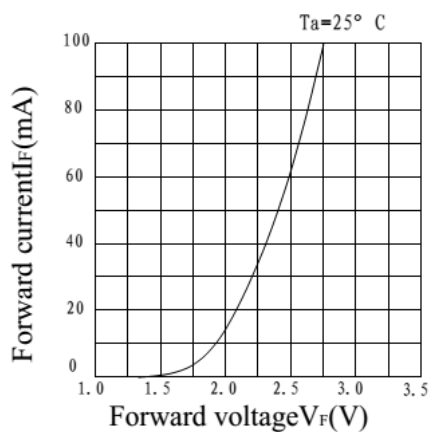
| Bin | Min. | Max. | Unit |
|-----|------|------|------|
| F   | 40   | 50   | mcd  |
| G   | 50   | 63   |      |
| H   | 63   | 80   |      |
| I   | 80   | 100  |      |
| J   | 100  | 125  |      |
| K   | 125  | 160  |      |
| L   | 160  | 200  |      |
| M   | 200  | 250  |      |
| N   | 250  | 320  |      |
| O   | 320  | 400  |      |
| P   | 400  | 500  |      |
| Q   | 500  | 630  |      |
| R   | 630  | 800  |      |
| S   | 800  | 1000 |      |
| T   | 1000 | 1250 |      |
| U   | 1250 | 1600 |      |
| V   | 1600 | 2000 |      |
| W   | 2000 | 2500 |      |
| X   | 2500 | 3200 |      |

**Note:**Tolerance of measurement of forward voltage:  $\pm 0.1V$ Tolerance of measurement of dominant wavelength:  $\pm 1nm$ Tolerance of measurement of luminous intensity:  $\pm 10\%$

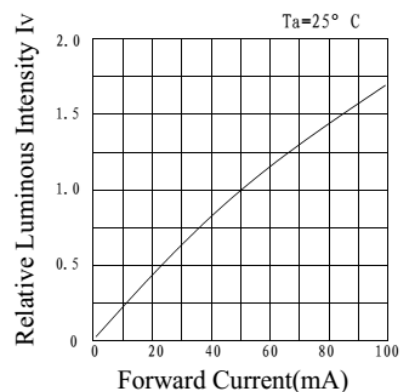
## Characteristic Curves

AllnGaP (R/AG/Y/O/S)

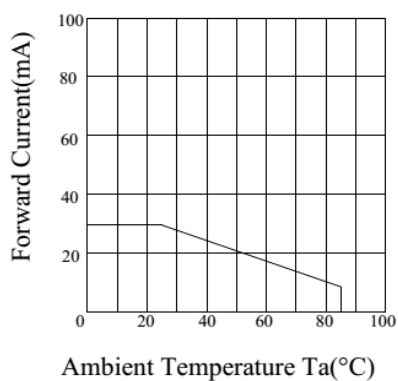
FORWARD CURRENT VS. FORWARD VOLTAGE



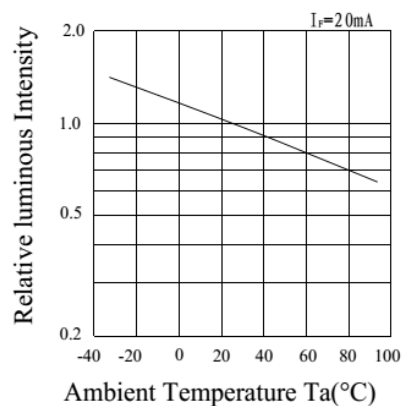
RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT



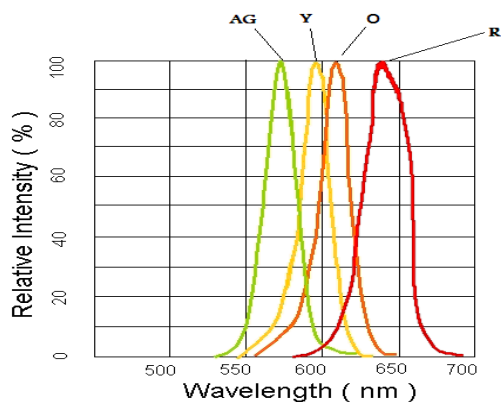
FORWARD CURRENT VS. AMBIENT TEMPERATURE



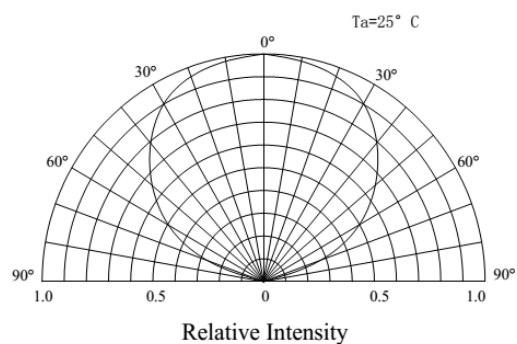
RELATIVE INTENSITY VS. AMBIENT TEMPERATURE



Relative Intensity vs. Wavelength

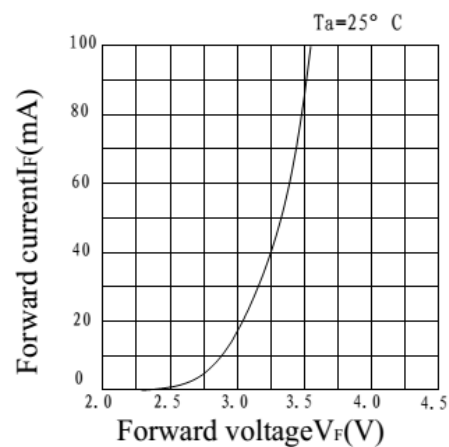


RADIATION PATTERN

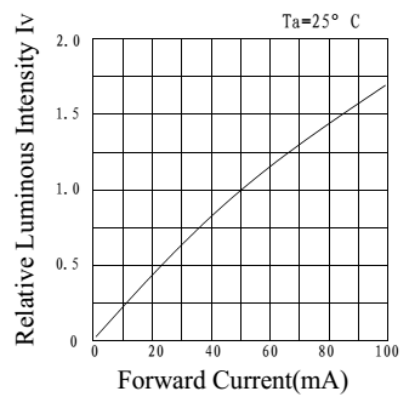


InGaN (IB/IG)

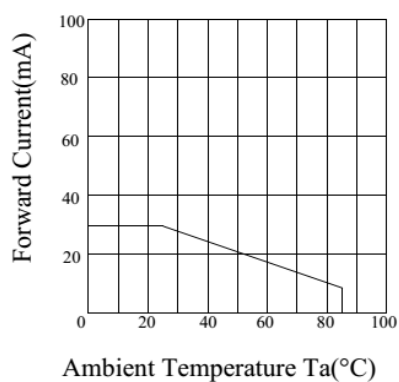
FORWARD CURRENT VS. FORWARD VOLTAGE



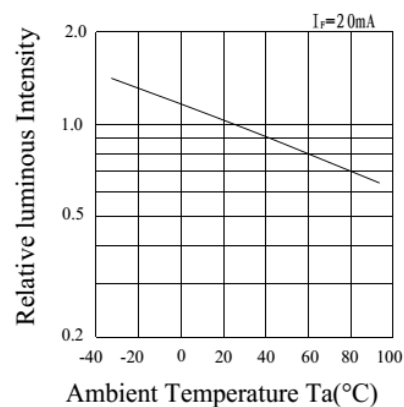
RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT



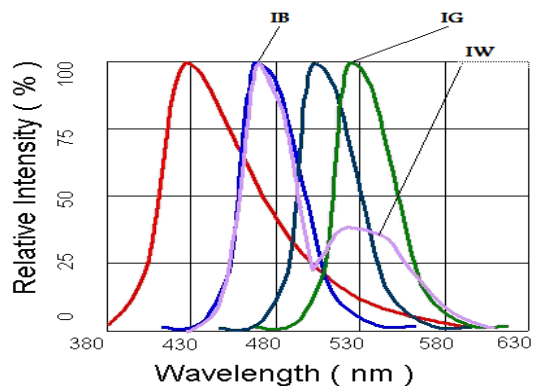
FORWARD CURRENT VS. AMBIENT TEMPERATURE



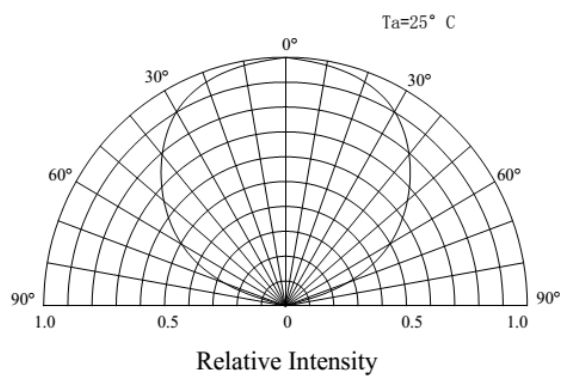
RELATIVE INTENSITY VS. AMBIENT TEMPERATURE



Relative Intensity vs. Wavelength

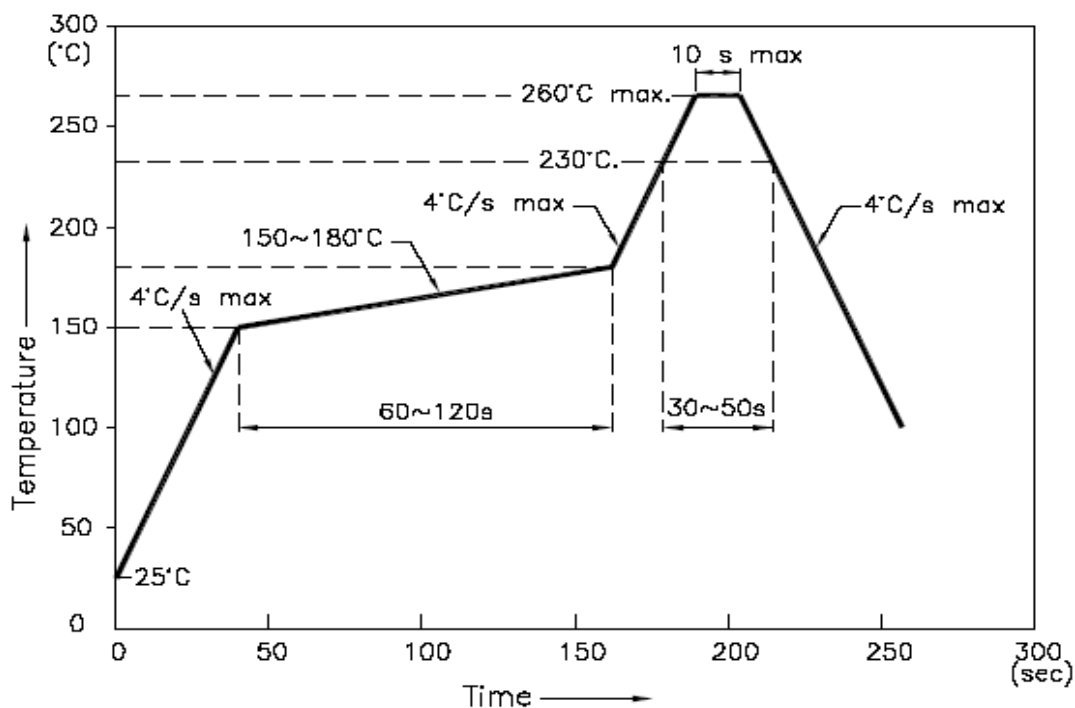


RADIATION PATTERN

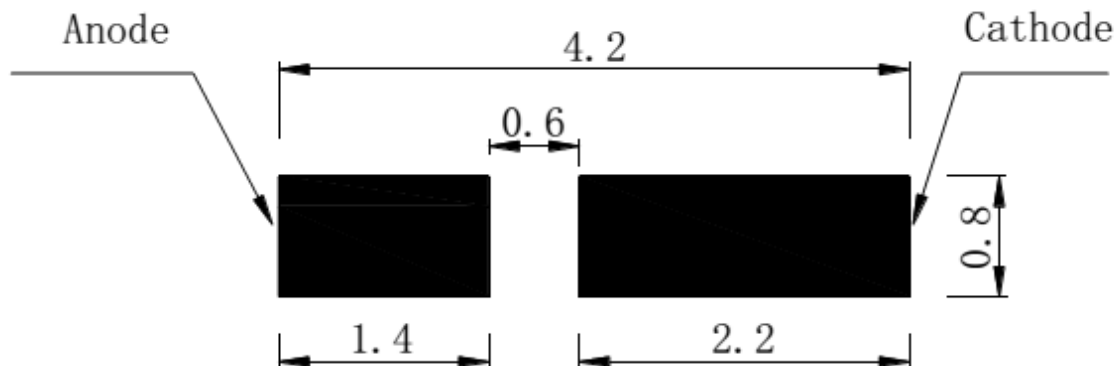


## Solder Profile & Footprint

- Recommended tin solder specifications: melting temperature in the range of 178~192 °C
- The recommended reflow soldering profile is as follows (temperatures indicated are as measured on the surface of the LED resin):



### Recommended Pad Layout

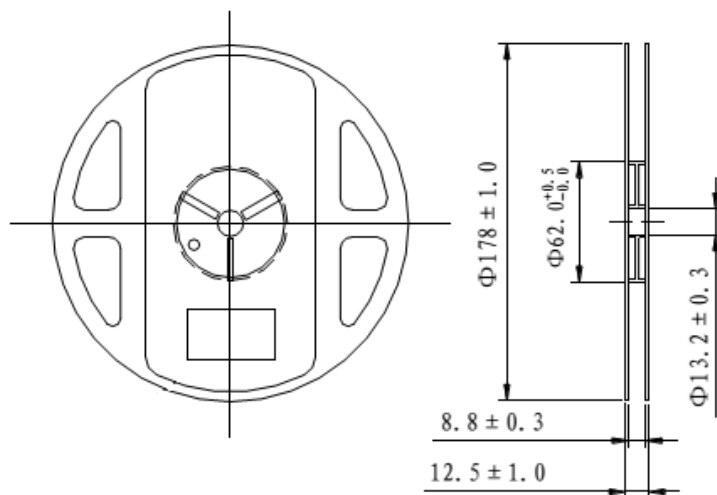


Units: mm

Tolerance:  $\pm 0.2\text{mm}$

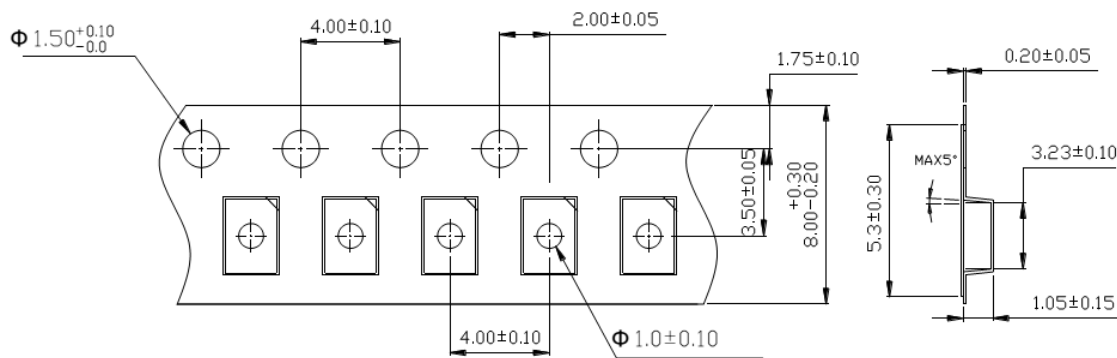
## Packing

Reel Dimension:



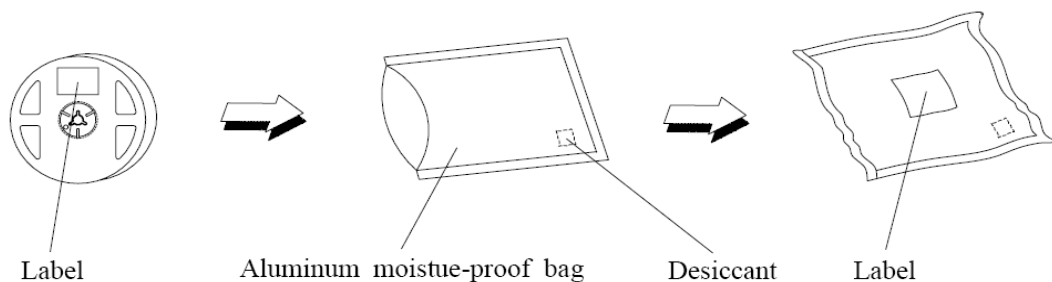
Unit: mm

Tape Dimension:



Unit: mm

Packaging Specification:



## Labeling

|                                                                                       |
|---------------------------------------------------------------------------------------|
| <span style="font-size: 1.2em; font-weight: bold; margin: 0 10px;">QT-Brightek</span> |
|                                                                                       |
| Part No: _____                                                                        |
| Customer P/N: _____                                                                   |
| Item: _____                                                                           |
| Q'ty: _____                                                                           |
| Vf: _____                                                                             |
| Iv: _____                                                                             |
| Wl: _____                                                                             |
| Date: _____                                                                           |
| <b>Made in China</b>                                                                  |

## Ordering Information

| Part #     | Orderable Part # | Spec Range                                      | Quantity per reel |
|------------|------------------|-------------------------------------------------|-------------------|
| QBLP674-IB | QBLP674-IB       | Iv=210 mcd typ. @ 20mA/<br>Color=465nm to 475nm | 2,000 units       |
| QBLP674-IG | QBLP674-IG       | Iv=900mcd typ. @ 20mA/<br>Color=520nm to 530nm  | 2,000 units       |
| QBLP674-R  | QBLP674-R        | Iv=230mcd typ. @ 20mA/<br>Color=615nm to 630nm  | 2,000 units       |
| QBLP674-AG | QBLP674-AG       | Iv=80mcd typ. @ 20mA/<br>Color=565nm to 576nm   | 2,000 units       |
| QBLP674-Y  | QBLP674-Y        | Iv=210mcd typ. @ 20mA/<br>Color=585nm to 595nm  | 2,000 units       |
| QBLP674-O  | QBLP674-O        | Iv=240mcd typ. @ 20mA/<br>Color=600nm to 610nm  | 2,000 units       |
| QBLP674-S  | QBLP674-S        | Iv=80mcd typ. @ 20mA/<br>Color=630nm to 650nm   | 2,000 units       |

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## Revision History

| Description:                     | Revision # | Revision Date |
|----------------------------------|------------|---------------|
| New Release of QBLP674-XX Series | V1.0       | 02/20/2013    |
| Update spec and drawing          | V2.0       | 11/12/2013    |
| Update drawing tolerance         | V2.1       | 12/06/2013    |
| Update luminous intensity bin    | V2.2       | 06/02/2014    |
| Update VF bin for InGaN          | V2.3       | 08/29/2014    |
|                                  |            |               |
|                                  |            |               |
|                                  |            |               |
|                                  |            |               |

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2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.