

# QT-Brightek High Power Series

## 0.5W High Power 2835 LED

**Part No.: QBHP686-XXH Series**

**XX = Color Code  
H = 150mA**

Product: QBHP686-XXH Series	Date: June 20, 2017	Page 1 of 12
	Version# 3.1	

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## Introduction

### Feature:

- Clear lens
- Package in tape and reel
- 0.5W high power
- Low thermal resistance
- InGaN technology for IB/IG
- AlInGaP technology for R/Y/O
- 120 degree viewing angle

### Description:

The low profile 0.5W high bright LED has height of 0.8mm. It is ideal for indoor lighting and general use.

### Application:

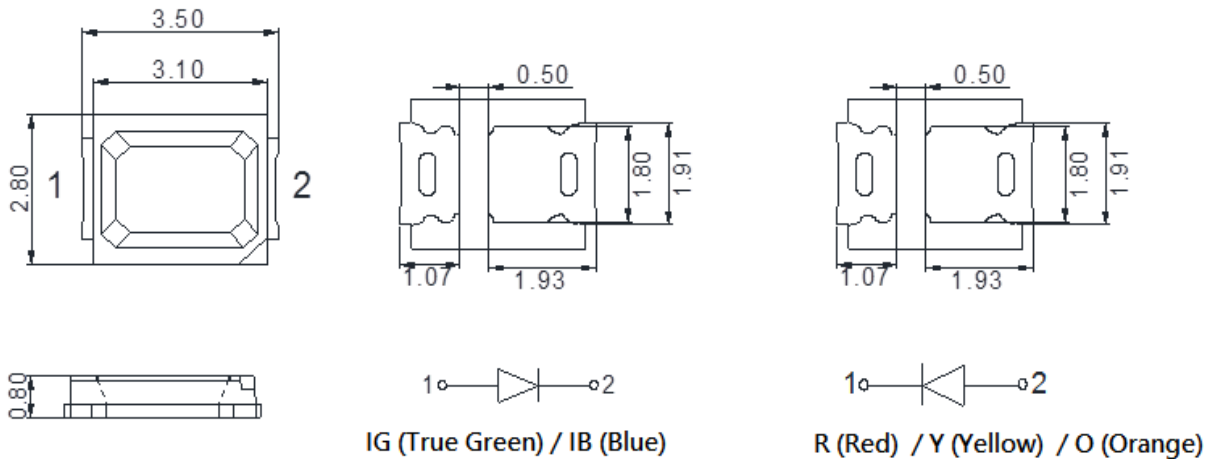
- Status indication
- Industrial equipment backlighting
- Architecture lighting

### Certification & Compliance:

- TS16949
- ISO9001
- RoHS Compliant



### Dimension:



Units: mm / tolerance = +/-0.2mm

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

Product	Color	I <sub>F</sub> (mA)	V <sub>F</sub> (V)		λ <sub>D</sub> (nm)			Φ <sub>V</sub> (lm)	
			Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.
QBHP686-RH	Red	150	2.4	2.65	615	620	630	8	15
QBHP686-YH	Yellow	150	2.4	2.65	585	590	595	5	9
QBHP686-OH	Orange	150	2.4	2.65	600	605	610	8	17
QBHP686-IGH	True Green	150	2.9	3.7	520	525	530	21	29
QBHP686-IBH	Blue	150	3.0	3.7	460	465	470	6	10

**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>SO L</sub> (°C)**
AllnGaP (R/Y/O)	424	160	125	5	-40 ~ +85	-40 ~ +100	260
InGaN (IB/IG)	550	160	125	5	-40 ~ +85	-40 ~ +100	260

\*Duty 1/8 @ 1KHz

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

**Forward Voltage V<sub>F</sub> for AllnGaP @ I<sub>F</sub>=150mA**

Bin	Min.	Max.	Unit
□	1.9	2.65	V

**Forward Voltage V<sub>F</sub> for InGaN @ I<sub>F</sub>=150mA**

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	

**Luminous Flux  $\Phi_v$  for Red (R) @  $I_F=150\text{mA}$** 

Bin	Min.	Max.	Unit
L1	8	12	lm
L2	12	16	
L3	16	22	

**Luminous Flux  $\Phi_v$  for Yellow (Y) @  $I_F=150\text{mA}$** 

Bin	Min.	Max.	Unit
L1	5	7	lm
L2	7	9.5	
L3	9.5	13	

**Luminous Flux  $\Phi_v$  for Orange (O) @  $I_F=150\text{mA}$** 

Bin	Min.	Max.	Unit
L1	8	12	lm
L2	12	16	
L3	16	22	

**Luminous Flux  $\Phi_v$  for True Green (IG) @  $I_F=150\text{mA}$** 

Bin	Min.	Max.	Unit
L1	21	28	lm
L2	28	37	
L3	37	48	

**Luminous Flux  $\Phi_v$  for Blue (IB) @  $I_F=150\text{mA}$** 

Bin	Min.	Max.	Unit
L1	6	8	lm
L2	8	12	
L3	12	16	

**Dominant Wavelength  $\lambda_D$  for Red (R) @  $I_F=150\text{mA}$** 

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

**Dominant Wavelength  $\lambda_D$  for Yellow (Y) @  $I_F=150\text{mA}$** 

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

**Dominant Wavelength  $\lambda_D$  for Orange (O) @  $I_F=150\text{mA}$** 

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

**Dominant Wavelength  $\lambda_D$  for True Green (IG) @  $I_F=150\text{mA}$** 

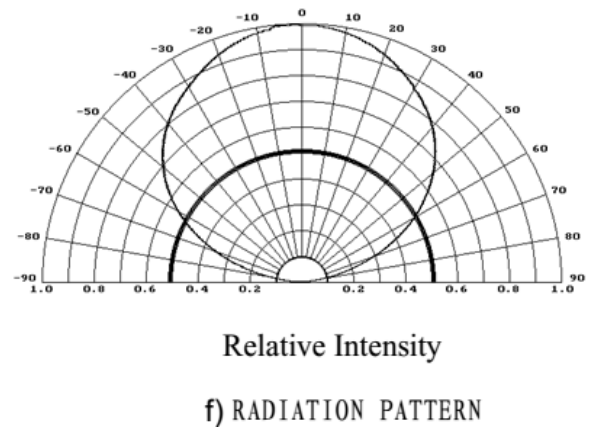
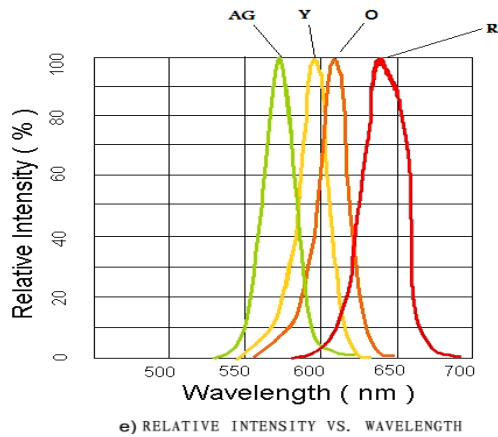
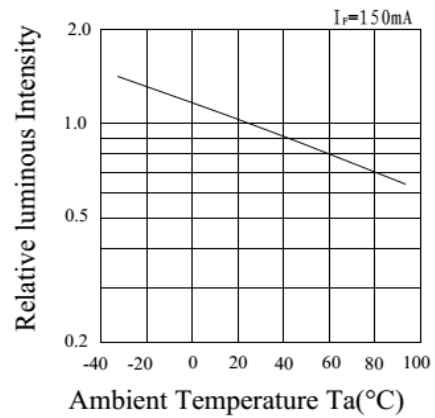
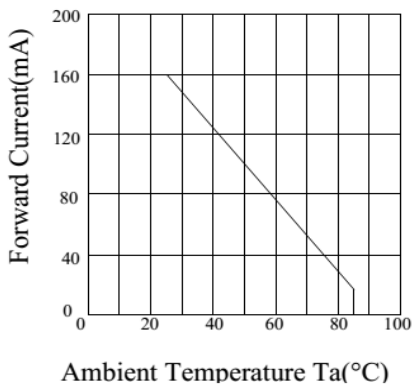
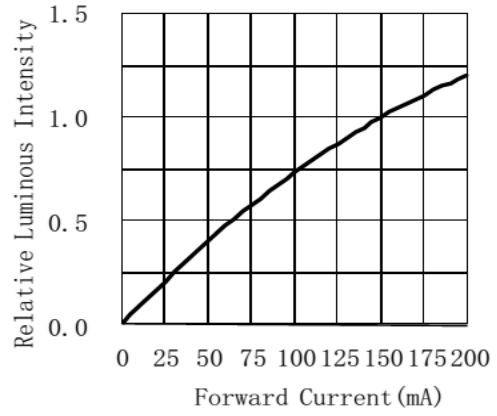
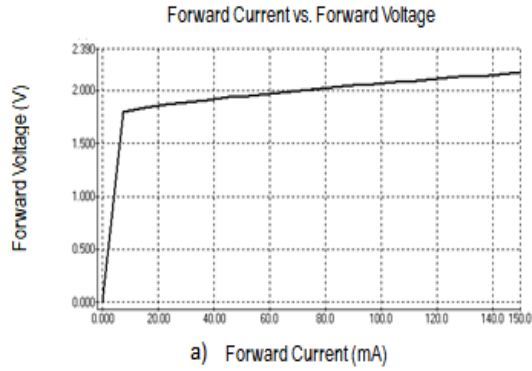
Bin	Min.	Max.	Unit
U	520	522.5	nm
V	522.5	525	
W	525	527.5	
X	527.5	530	

**Dominant Wavelength  $\lambda_D$  for Blue (IB) @  $I_F=150\text{mA}$** 

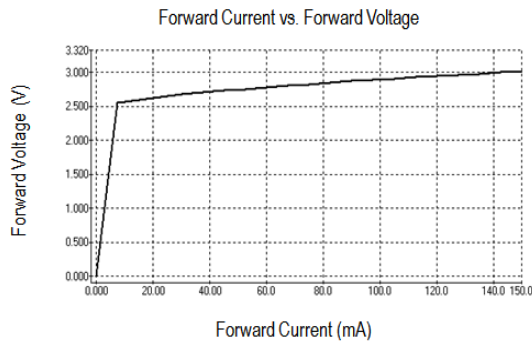
Bin	Min.	Max.	Unit
E	460	462.5	nm
F	462.5	465	
G	465	467.5	
H	467.5	470	

## Characteristic Curves

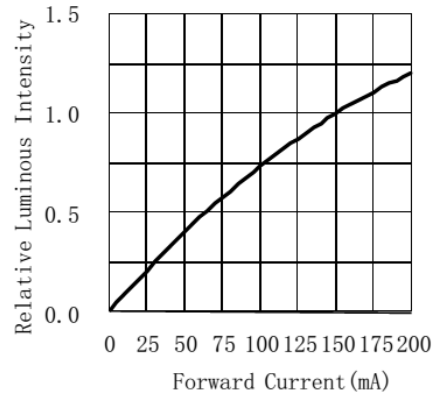
AllnGaP (R/Y/O/AG)



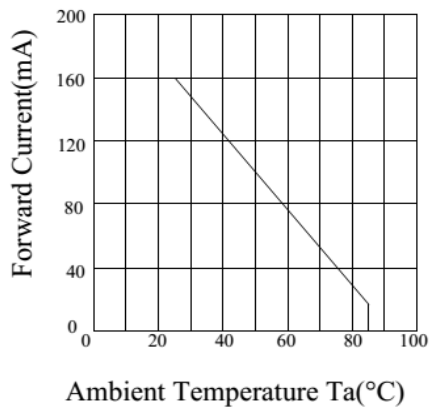
InGaN (IB/IG)



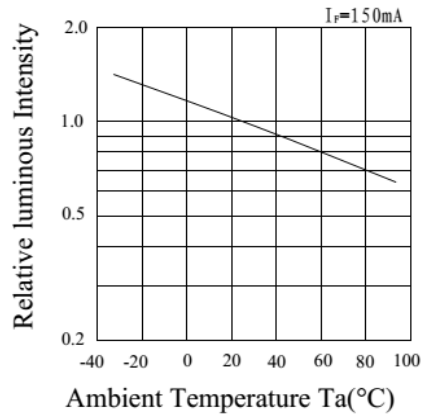
a) FORWARD CURRENT VS. FORWARD VOLTAGE



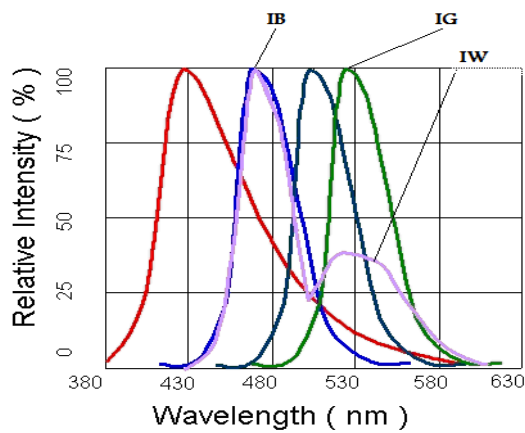
b) RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT



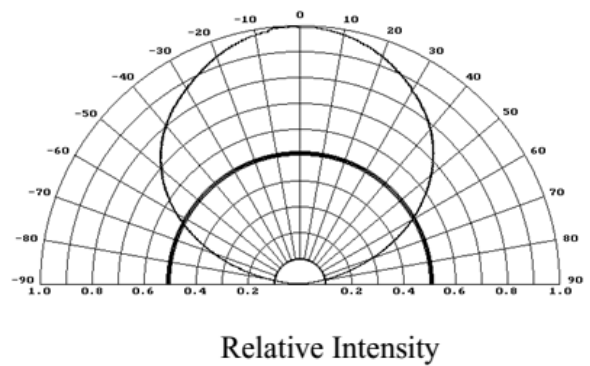
c) FORWARD CURRENT VS. AMBIENT TEMPERATURE



d) RELATIVE INTENSITY VS. AMBIENT TEMPERATURE



e) RELATIVE INTENSITY VS. WAVELENGTH

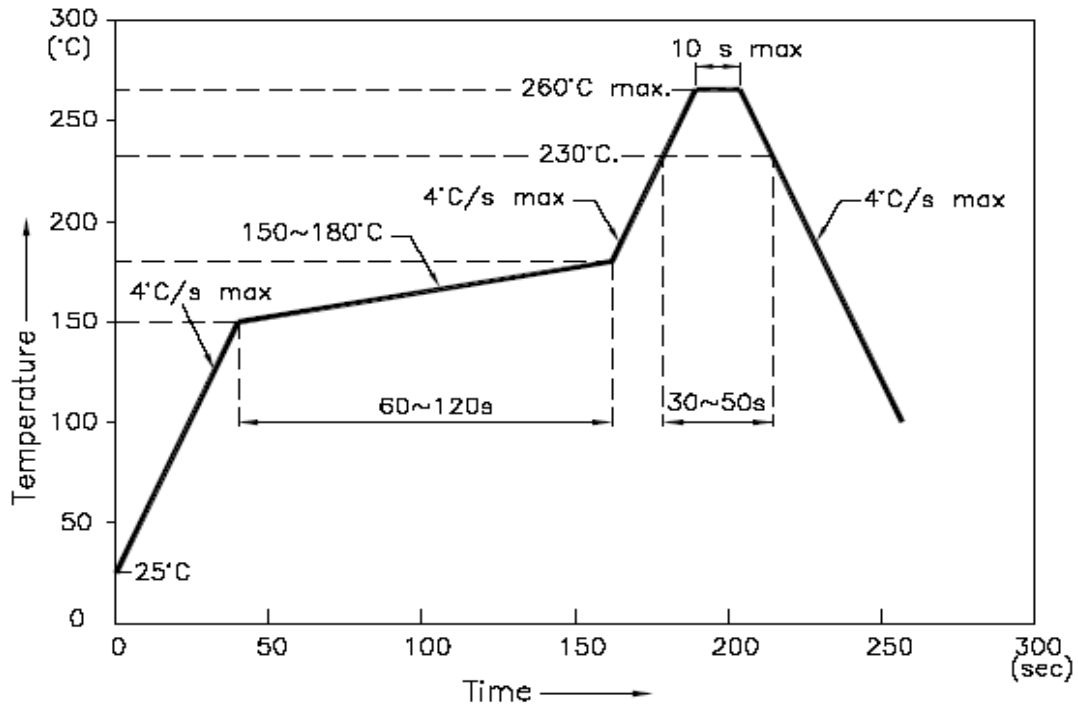


f) RADIATION PATTERN

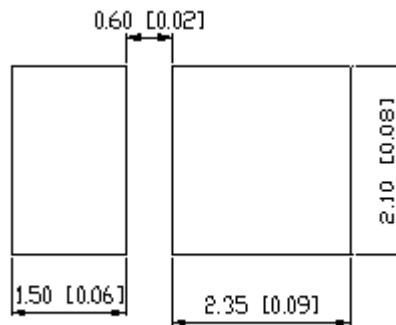


## Solder Profile & Footprint

- 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

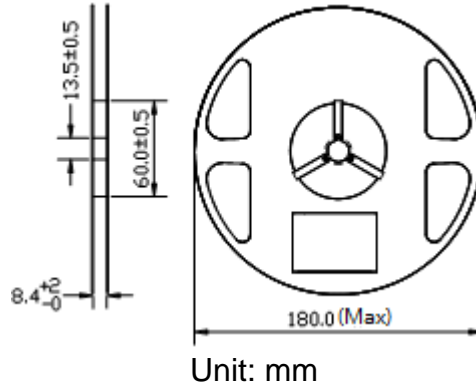


Units: mm

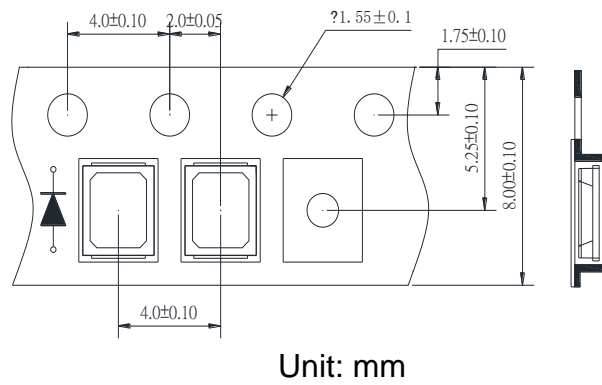
Tolerance: ± 0.2mm

## Packing

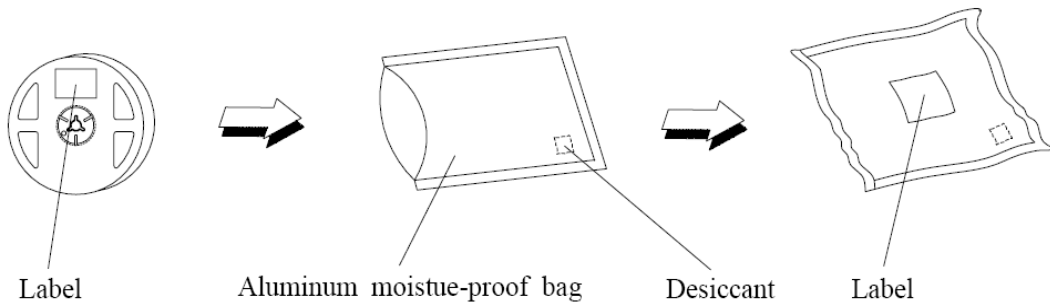
Reel Dimension:



Tape Dimension:



Packaging Specification:



**Labeling**

Part No: \_\_\_\_\_

Customer P/N: \_\_\_\_\_

Item: \_\_\_\_\_

Q'ty: \_\_\_\_\_

Vf: \_\_\_\_\_

Iv: \_\_\_\_\_

WI: \_\_\_\_\_

Date: \_\_\_\_\_

**Made in China****Ordering Information**

Part #	Orderable Part #	Spec Range	Quantity per reel
QBHP686-RH	QBHP686-RH	$\Phi v=15lm$ typ. @ 150mA/ $\lambda_D=615nm$ to 630nm	2,000 units
QBHP686-YH	QBHP686-YH	$\Phi v=9lm$ typ. @ 150mA/ $\lambda_D=585nm$ to 595nm	2,000 units
QBHP686-OH	QBHP686-OH	$\Phi v=17lm$ typ. @ 150mA/ Color=600nm to 610nm	2,000 units
QBHP686-IGH	QBHP686-IGH	$\Phi v=29lm$ typ. @ 150mA/ Color=520nm to 530nm	2,000 units
QBHP686-IBH	QBHP686-IBH	$\Phi v=10lm$ typ. @ 150mA/ Color=460nm to 470nm	2,000 units

## Revision History

Description:	Revision #	Revision Date
New Release of QBHP686_series	V1.0	03/14/2011
Amend Spec	V1.1	02/15/2012
Update format and spec	V1.2	05/30/2012
Update dimension drawing and spec	V2.0	12/19/2013
Update dimension drawing (lead frame) and spec	V3.0	06/09/2017
Update Polarity on R/Y/O	V3.1	06/20/2017

## Disclaimer

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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.