

QT-Brightek High Power Series

3W High Power LED

Part No.: QBHP684U-XXV series

XX = Color Code

V = 700mA

Table of Contents:

Introduction	3
Electrical / Optical Characteristic ($T_A=25^{\circ}\text{C}$)	4
Absolute Maximum Rating	4
Characteristic Curves.....	7
Solder Profile & Footprint.....	8
Packing	9
Labeling	9
Ordering Information	10
Revision History	11
Disclaimer	11

Introduction

Feature:

- Package in tape and reel
- 3W High Bright LED
- Low thermal resistance $< 6^{\circ}\text{C/W}$
- Super high flux and luminance
- AlInGaP technology for R and Y
- InGaN technology for IB and IG
- ESD Protection (IB and IG)
- ESD protection up to 8KV

Description:

This 3W high bright high power LED has compact size of 3.6 x 3.6mm. It is ideal for both in door and outdoor lighting

Application:

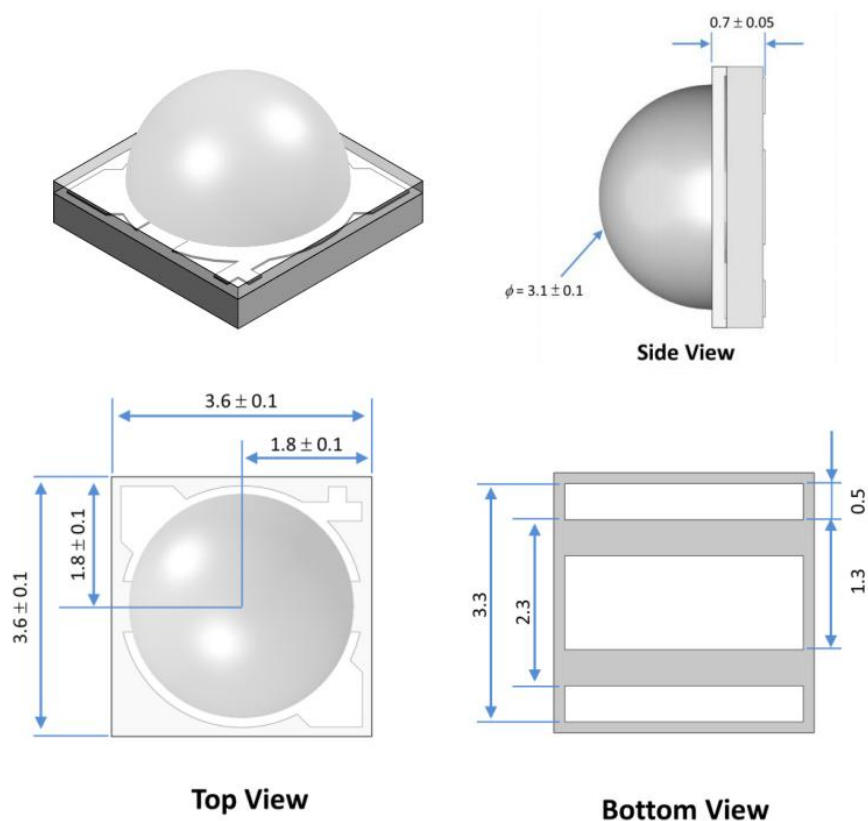
- Architectural and outdoor lighting
- Household appliances
- General lighting

Certification & Compliance:

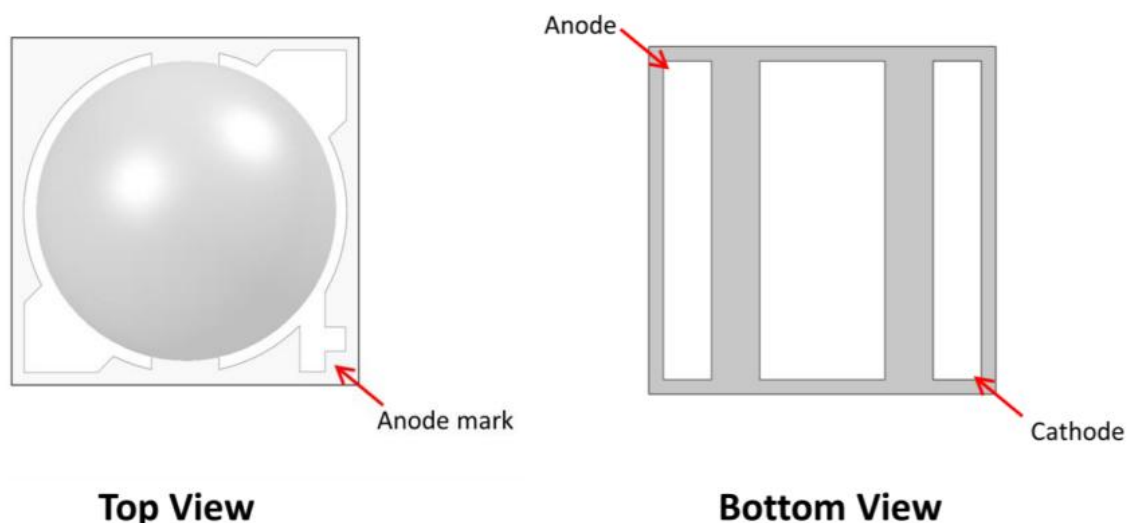
- TS16949
- ISO9001
- RoHS Compliant



Dimension:



Units: mm / tolerance = +/-0.1mm

Pad Configuration:

Electrical / Optical Characteristic ($T_A=25^{\circ}\text{C}$)

Product	Color	I_F (mA)	V_F (V)		λ_D (nm)			Φ_v (lm)	
			Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.
QBHP684U-RV	Red	700	2.6	2.8	620	625	630	80	105
QBHP684U-YV	Yellow	700	2.6	2.8	585	590	595	65	70
QBHP684UE-IGV	True Green	700	3.6	4.0	520	525	530	140	150
QBHP684UE-IBV	Blue	700	3.6	4.0	450	455	460	20	34

Absolute Maximum Rating

Material	P_d (mW)	I_F (mA)	I_{FP} (mA)*	V_R (V)	T_{OP} ($^{\circ}\text{C}$)	T_{ST} ($^{\circ}\text{C}$)	T_{SOL} ($^{\circ}\text{C}$)
AlInGaP (R/Y)	1.96	700	1000	5	-40 to +85	-40 to +100	240
InGaN (IB/IG)	2.66	700	1000	5	-40 to +85	-40 to +100	240

*Duty 1/10 @ 0.1ms Pulse Width

Forward Voltage V_F for AlInGaP @ $I_F=700\text{mA}$

Bin	Min.	Max.	Unit
D	2.0	2.2	V
E	2.2	2.4	
F	2.4	2.6	
G	2.6	2.8	

Forward Voltage V_F for InGaN @ $I_F=700\text{mA}$

Bin	Min.	Max.	Unit
I	3.0	3.2	V
J	3.2	3.4	
K	3.4	3.6	
L	3.6	3.8	
M	3.8	4.0	

Luminous Flux Φ_v for Red @ $I_F=700\text{mA}$

Bin	Min.	Max.	Unit
RE	80	100	lm
RF	100	110	
RG	110	125	
RH	125	140	
RI	140	160	

Luminous Flux Φ_v for Yellow @ $I_F=700\text{mA}$

Bin	Min.	Max.	Unit
AB	65	75	lm
AC	75	85	
AD	85	100	

Luminous Flux Φ_v for True Green @ $I_F=700\text{mA}$

Bin	Min.	Max.	Unit
GB	140	150	lm
GC	150	160	
GD	160	175	
GE	175	190	
GF	190	210	

Luminous Flux Φ_v for Blue @ $I_F=700\text{mA}$

Bin	Min.	Max.	Unit
BA	20	26	lm
BB	26	35	
BC	35	50	

Dominant Wavelength λ_D for Red @ $I_F=700\text{mA}$

Bin	Min.	Max.	Unit
R2	620	625	nm
R3	625	630	

Dominant Wavelength λ_D for Yellow @ $I_F=700\text{mA}$

Bin	Min.	Max.	Unit
A1	585	590	nm
A2	590	595	

Dominant Wavelength λ_D for True Green @ $I_F=700\text{mA}$

Bin	Min.	Max.	Unit
G2	520	525	nm
G3	525	530	

Dominant Wavelength λ_D for Blue @ $I_F=700\text{mA}$

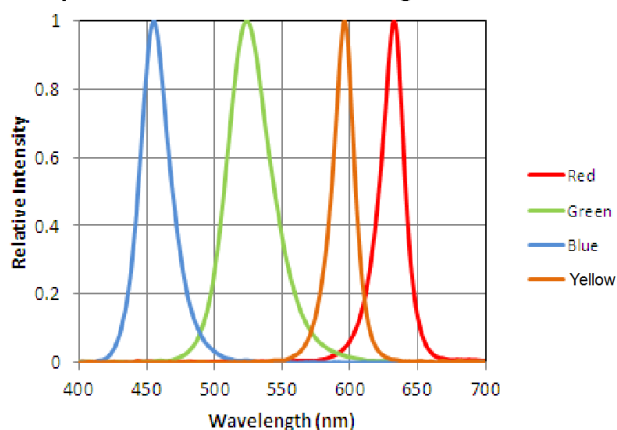
Bin	Min.	Max.	Unit
B2	450	460	nm

Note:

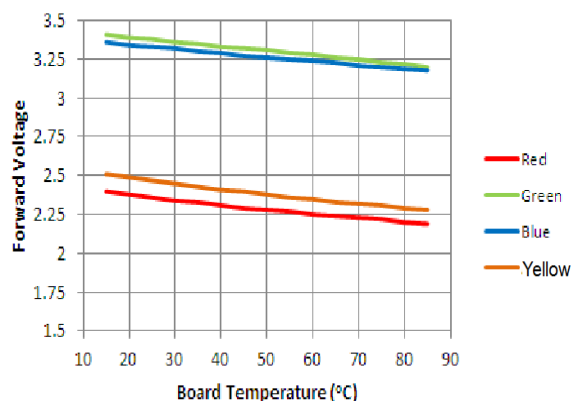
Tolerance of measurement of forward voltage: $\pm 0.1\text{V}$ Tolerance of measurement of dominant wavelength: $\pm 2\text{nm}$ Tolerance of measurement of luminous flux: $\pm 10\%$

Characteristic Curves

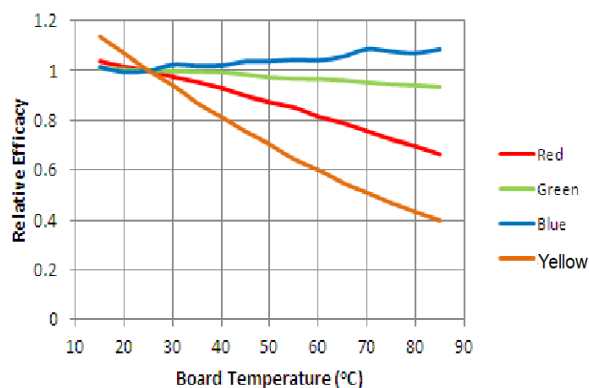
Relative Spectral Distribution vs. Wavelength Characteristics



Forward Voltage vs. Thermal Pad Temperature

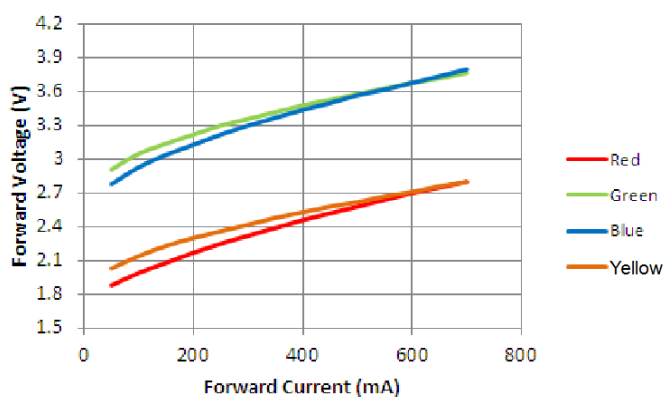


Typical Efficacy vs. Thermal Pad Temperature



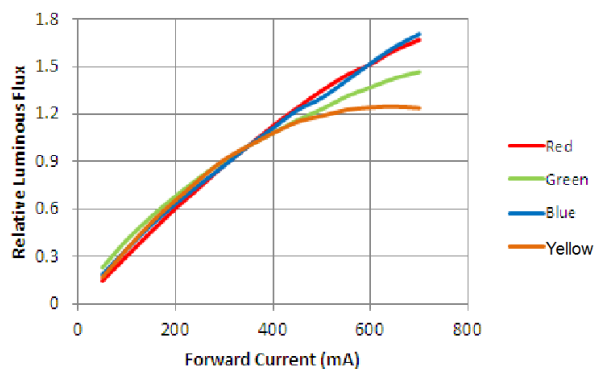
Typical Forward Current Characteristics

Thermal Pad Temperature = 25°C

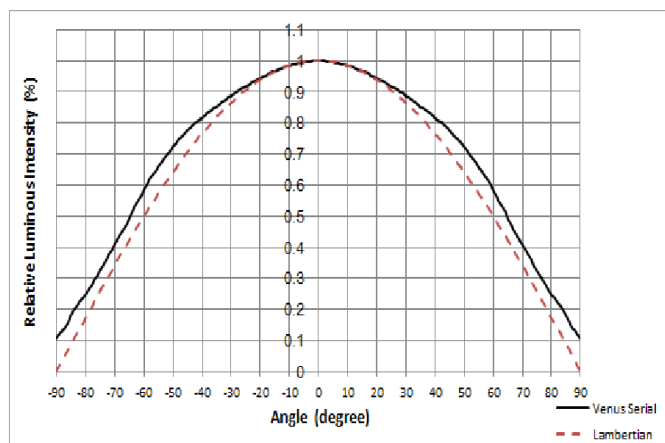


Typical Relative Luminous Flux vs. Forward Current

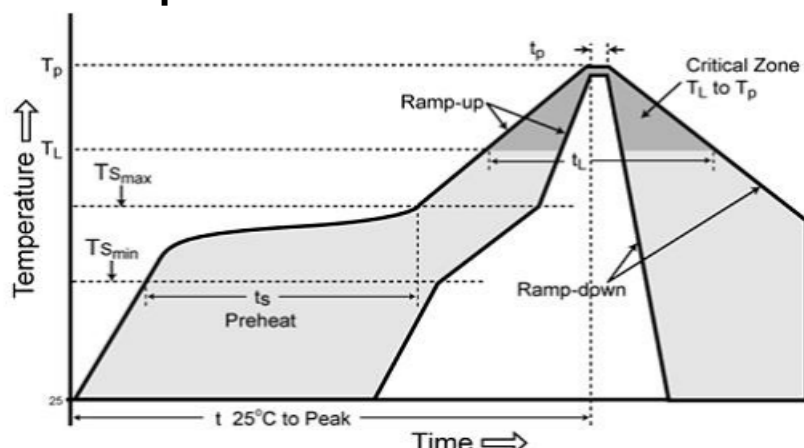
Thermal Pad Temperature = 25°C



Typical Radiation Patterns

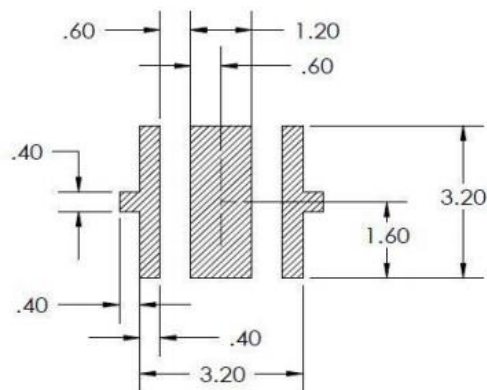
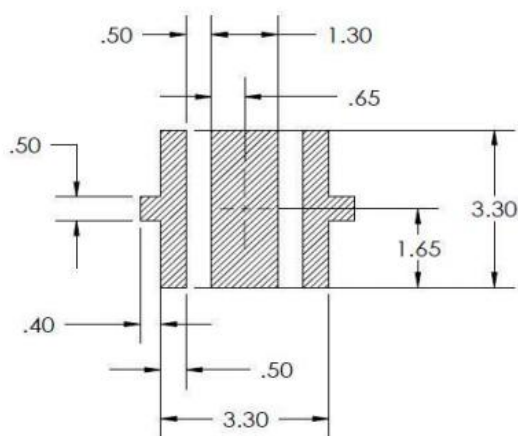


Solder Profile & Footprint



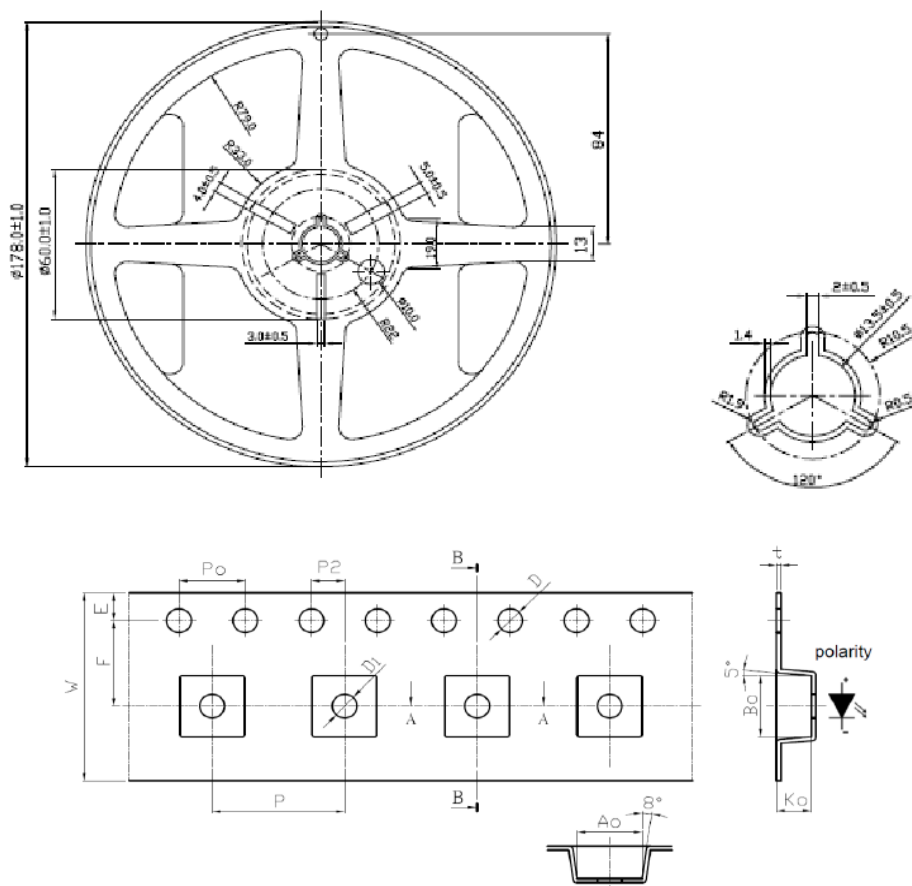
Profile Feature	Pb-Free Assembly
Average ramp-up rate (TL to TP)	3°C/second max.
Preheat	
Temperature Min (T _{smin})	150°C
Temperature Max (T _{smax})	200°C
Time (min to max) (ts)	60-180 seconds
Time maintained above:	
Temperature (TL)	217°C
Time (tL)	60-150 seconds
Peak/Classification Temperature (Tp)	240°C
Time within 5°C of actual Peak Temperature (tp)	20-40 seconds
Ramp-down Rate	6°C/second max.
Time 25°C to Peak Temperature	8 minutes max.

Recommended Soldering Pattern:



Packing

Tape and Reel:



Unit: mm

Labeling



Part No:

Customer P/N:

Item:

Q'ty:Vf:

lv:

WI:

Date:

Made in Taiwan

Product: QBHP684U-XXV Series	Date: April 28, 2015	Page 9 of 11
	Version# 2.1	

Ordering Information

Part #	Orderable Part #	Spec Range	Quantity per reel
QBHP684U-RV	QBHP684U-RV	$\Phi_v=105\text{lm typ. @ } I_F=700\text{mA} /$ $\lambda_D=620\text{nm to } 630\text{nm}$	1000 units
QBHP684U-YV	QBHP684U-YV	$\Phi_v=70\text{lm typ. @ } I_F=700\text{mA} /$ $\lambda_D=585\text{nm to } 595\text{nm}$	1000 units
QBHP684UE-IGV	QBHP684UE-IGV	$\Phi_v=150\text{lm typ. @ } I_F=700\text{mA} /$ $\lambda_D=520\text{nm to } 530\text{nm}$	1000 units
QBHP684UE-IBV	QBHP684UE-IBV	$\Phi_v=34\text{lm typ. @ } I_F=700\text{mA} /$ $\lambda_D=450\text{nm to } 460\text{nm}$	1000 units

Revision History

Description:	Revision #	Revision Date
New Release of QBHP684U-XXV series	V1.0	08/26/2013
Update soldering pattern	V1.1	09/24/2013
Update green luminous flux	V1.2	10/17/2013
Add VF bin	V1.3	03/27/2014
Update luminous flux	V1.4	04/30/2014
Update package drawing to ceramic package	V2.0	04/24/2015
Add luminous flux bin	V2.1	04/28/2015

Disclaimer

QT-BRIGHTTEK reserves the right to make changes without further notice to any products herein to improve reliability, function or design. QT-BRIGHTTEK does not assume any liability arising out of the application or use of any product or circuit described herein; neither does it convey any license under its patent rights, nor the rights of others.

Life Support Policy

QT-BRIGHTTEK's products are not authorized for use as critical components in life support devices or systems without the express written approval of QT-BRIGHTTEK. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
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.