

QT-Brightek High Power Series

1.0 W High Power LED

Part No.: QBHP684U-XXU Series

**XX = Color Code
U = 350mA**

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Introduction

Feature:

- Package in tape and reel
- 1W High Bright LED
- Low thermal resistance <math>< 6^{\circ}\text{C}/\text{W}</math>
- Super high flux and luminance
- AlInGaP technology for R, S and Y
- InGaN technology for IB and IG
- ESD Protection (IB and IG)
- ESD protection up to 8KV

Description:

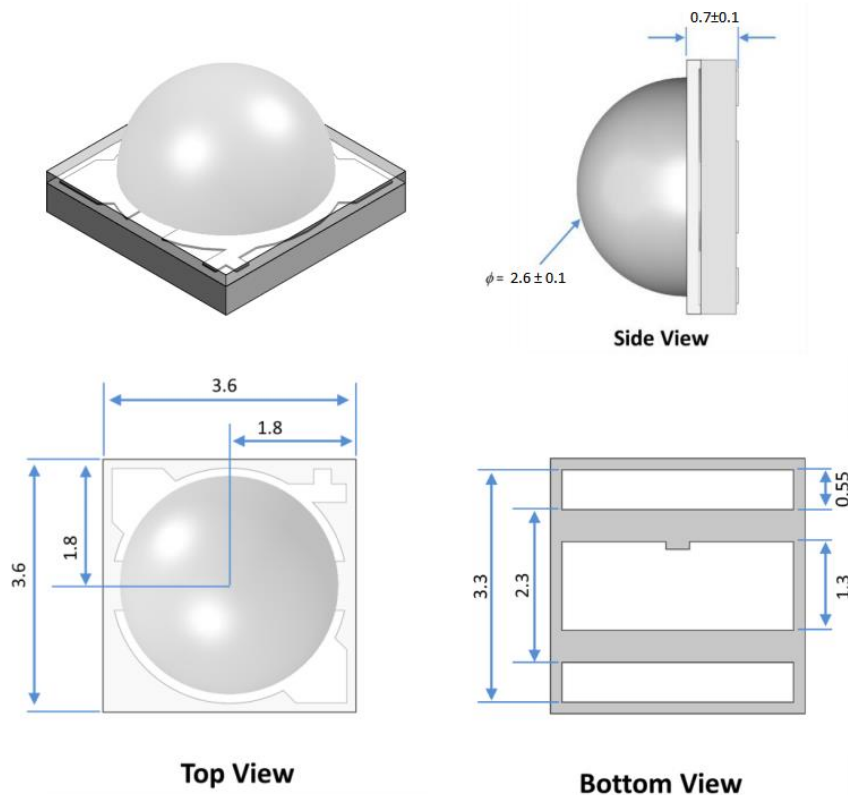
This 1W high bright high power LED has compact size of 3.6 x 3.6mm. It is ideal for both in door and outdoor lighting

Application:

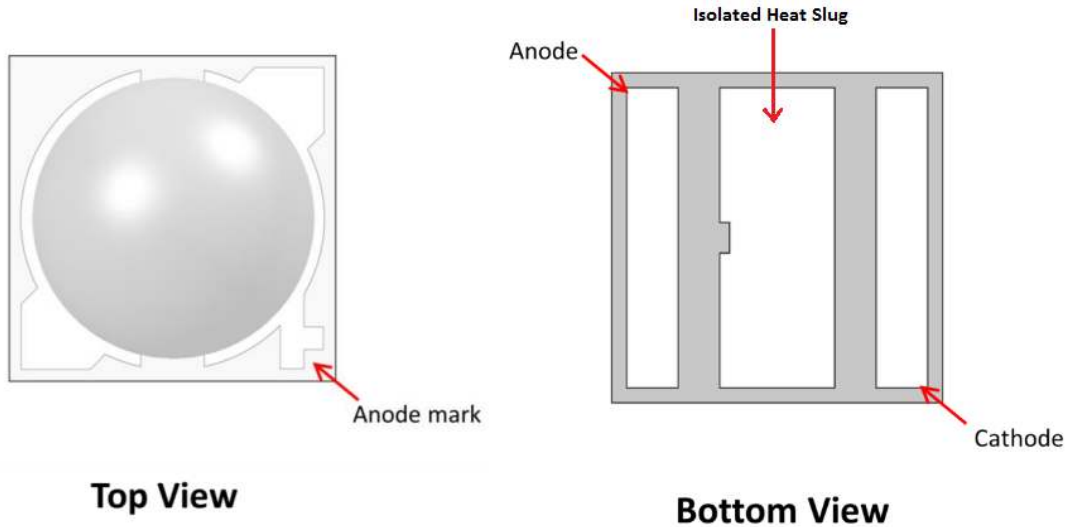
- Architectural and outdoor lighting
- Household appliances
- General lighting

Certification & Compliance:

- TS16949
- ISO9001
- RoHS Compliant

**Dimension:**

Units: mm / tolerance = +/-0.2mm

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-RU	Red	350	2.4	2.8	620	625	630	45	55
QBHP684U-SU	Deep Red	350	2.4	2.8	650	660	670	15	20
QBHP684U-YU	Yellow	350	2.4	2.8	585	590	595	50	60
QBHP684UE-IGU	True Green	350	3.4	3.8	520	525	530	90	110
QBHP684UE-IBU	Blue	350	3.4	3.8	450	455	460	10	20

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} ($^\circ\text{C}$)
AllInGaP (R/S/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 @ $I_F=350\text{mA}$

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 @ $I_F=350\text{mA}$

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	

Luminous Flux Φ_v for Red @ $I_F=350\text{mA}$

Bin	Min.	Max.	Unit
RE	45	55	lm
RF	55	65	
RG	65	75	
RH	75	85	
RI	85	95	

Luminous Flux Φ_v for Deep Red @ $I_F=350\text{mA}$

Bin	Min.	Max.	Unit
RB	15	25	lm

Luminous Flux Φ_v for Yellow @ $I_F=350\text{mA}$

Bin	Min.	Max.	Unit
AB	50	60	lm
AC	60	70	
AD	70	80	

Luminous Flux Φ_v for True Green @ $I_F=350\text{mA}$

Bin	Min.	Max.	Unit
GB	90	100	lm
GC	100	110	
GD	110	120	
GE	120	130	
GF	130	140	

Luminous Flux Φ_v for Blue @ $I_F=350\text{mA}$

Bin	Min.	Max.	Unit
BA	10	15	lm
BB	15	20	
BC	20	25	

Dominant Wavelength λ_D for Red @ $I_F=350\text{mA}$

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

Dominant Wavelength λ_D for Deep Red @ $I_F=350\text{mA}$

Bin	Min.	Max.	Unit
RB	650	670	nm

Dominant Wavelength λ_D for Yellow @ $I_F=350\text{mA}$

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

Dominant Wavelength λ_D for True Green @ $I_F=350\text{mA}$

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

Dominant Wavelength λ_D for Blue @ $I_F=350\text{mA}$

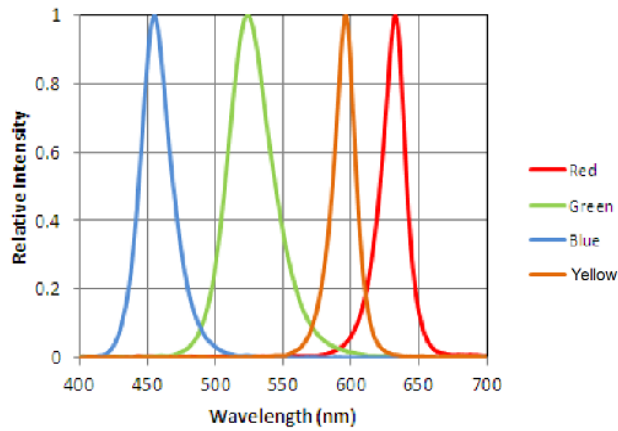
Bin	Min.	Max.	Unit
B2	450	460	nm

Note:

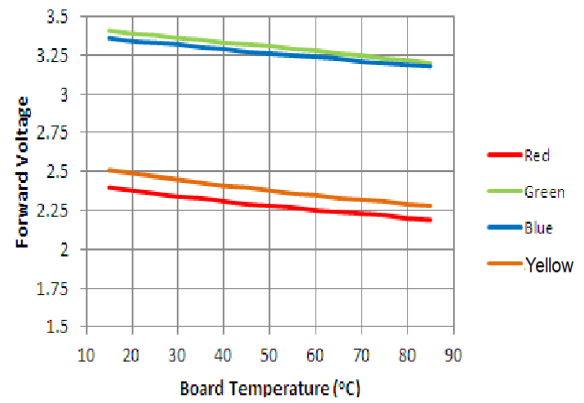
Tolerance of measurement of forward voltage: $\pm 0.1\text{V}$ Tolerance of measurement of luminous flux: $\pm 10\%$ Tolerance of measurement of dominant wavelength: $\pm 2\text{nm}$

Characteristic Curves

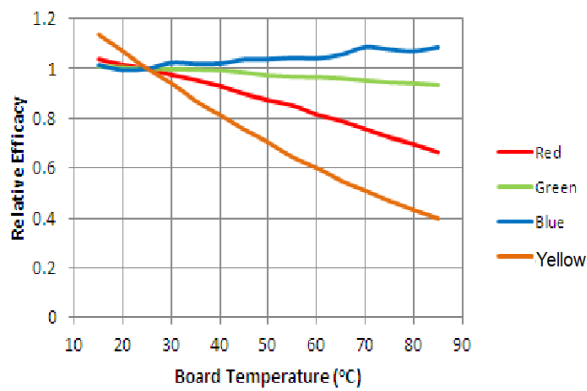
Relative Spectral Distribution vs. Wavelength Characteristics



Forward Voltage vs. Thermal Pad Temperature @350mA

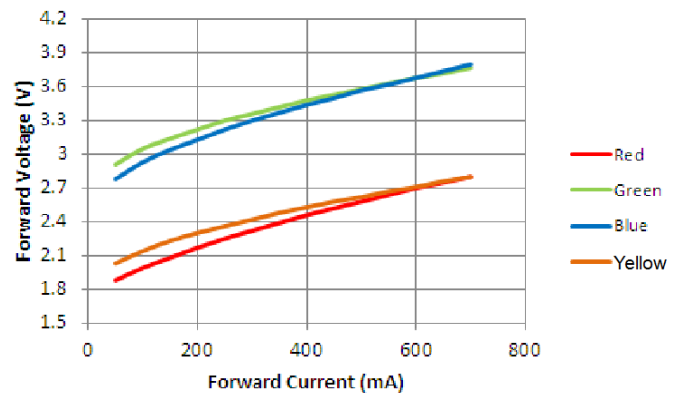


Typical Efficacy vs. Thermal Pad Temperature @350mA



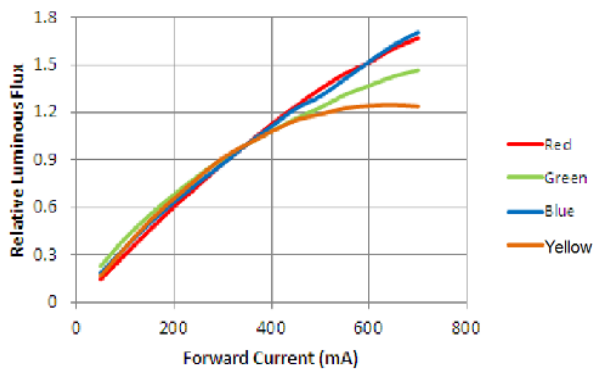
Typical Forward Current Characteristics

Thermal Pad Temperature = 25°C

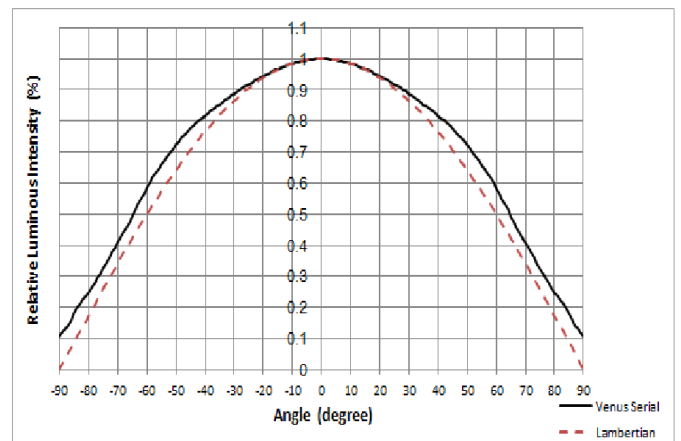


Typical Relative Luminous Flux vs. Forward Current

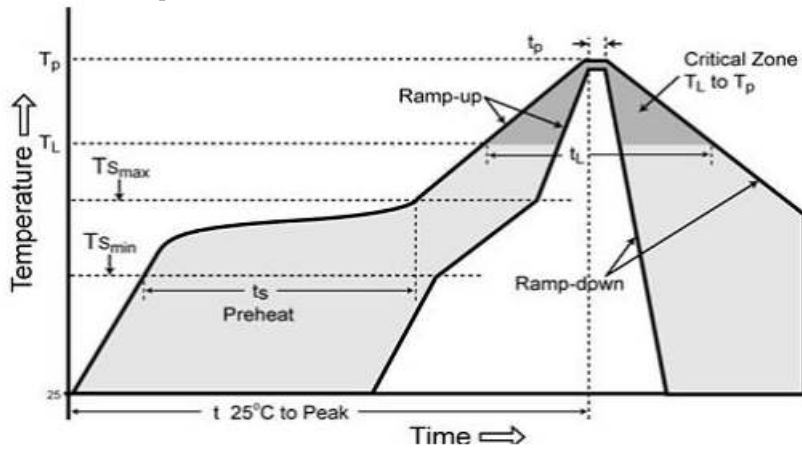
Thermal Pad Temperature = 25°C



Typical Radiation Patterns

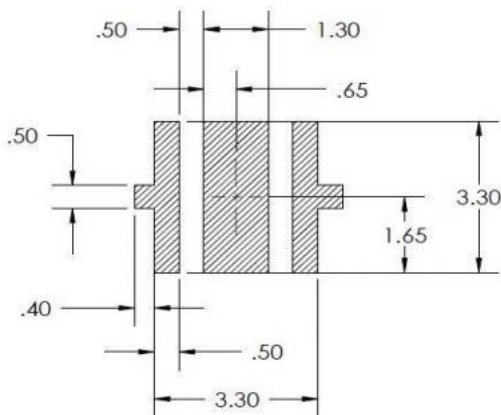


Solder Profile & Footprint

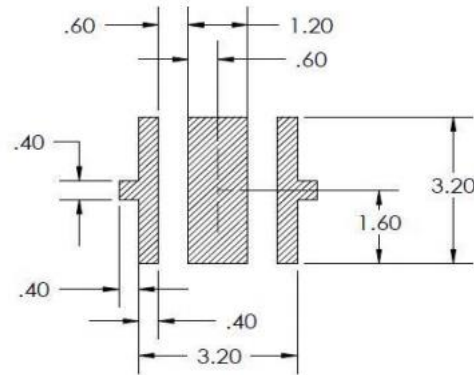


Profile Feature	Pb-Free Assembly
Average ramp-up rate (TL to TP)	3°C/second max.
Preheat	
Temperature Min (T _{smin})	150°C
Temperature Max (T _{smax})	200°C
Time (min to max) (t _s)	60-180 seconds
Time maintained above:	
Temperature (TL)	217°C
Time (t _L)	60-150 seconds
Peak/Classification Temperature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

Recommended Soldering Pattern:



RECOMMENDED PCB SOLDER PAD



RECOMMENDED STENCIL PATTERN
(HATCHED AREA IS OPENING)

Ordering Information

Part #	Orderable Part #	Spec Range	Quantity per reel
QBHP684U-RU	QBHP684U-RU	$\Phi_v=55\text{lm typ.}$, @ $I_F=350\text{mA}$ / $\lambda_D=620\text{nm to }630\text{nm}$	1000 units
QBHP684U-SU	QBHP684U-SU	$\Phi_v=20\text{lm typ.}$, @ $I_F=350\text{mA}$ / $\lambda_D=650\text{nm to }670\text{nm}$	1000 units
QBHP684U-YU	QBHP684U-YU	$\Phi_v=60\text{lm typ.}$ @ $I_F=350\text{mA}$ / $\lambda_D=585\text{nm to }595\text{nm}$	1000 units
QBHP684UE-IGU	QBHP684UE-IGU	$\Phi_v=110\text{lm typ.}$ @ $I_F=350\text{mA}$ / $\lambda_D=520\text{nm to }530\text{nm}$	1000 units
QBHP684UE-IBU	QBHP684UE-IBU	$\Phi_v=20\text{lm typ.}$ @ $I_F=350\text{mA}$ / $\lambda_D=450\text{nm to }460\text{nm}$	1000 units

Revision History

Description:	Revision #	Revision Date
New Release of QBHP684U-XXU series	V1.0	01/18/2013
Add binning information / Update spec	V1.1	02/15/2013
Update binning and spec	V1.2	05/31/2013
Update absolute maximum rating	V1.3	08/26/2013
Update Luminous flux (red and green) and soldering pad	V1.4	10/17/2013
Add deep red option (655nm ~ 665nm), QBHP684U-SU	V1.5	10/31/2013
Update deep red spec	V1.6	12/03/2013
Update luminous flux bin	V1.7	04/30/2014
Update package drawing to ceramic package	V2.0	04/24/2015

Disclaimer

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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.