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# QT-Brightek High Power Series

## 1.0 W High Power LED

**Part No.: QBHP684UE-IWU-XX**

**XX = WW/NW/CW**

**U = 350mA**

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## Introduction

### Feature:

- 1W High Bright LED
- Packed in tape and reel
- Low thermal resistance <math><6^{\circ}\text{C}/\text{W}</math>
- Super high flux and luminance
- InGaN White
- ESD protection up to 8KV
- Viewing Angle 130°

### Description:

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

### Application:

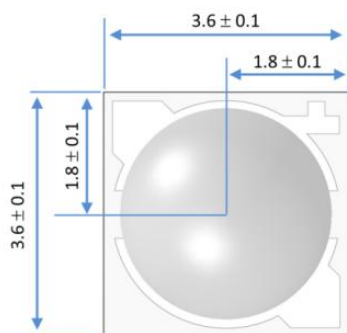
- Architectural and outdoor lighting
- Household appliances
- General lighting

### Certification & Compliance:

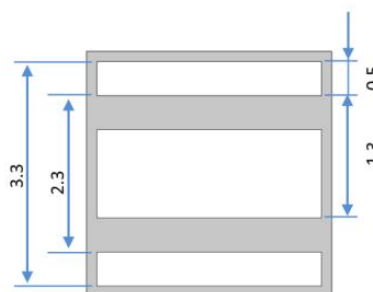
- TS16949
- ISO9001
- RoHS Compliant



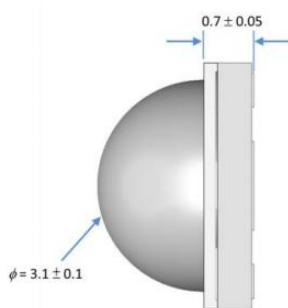
## Dimensions:



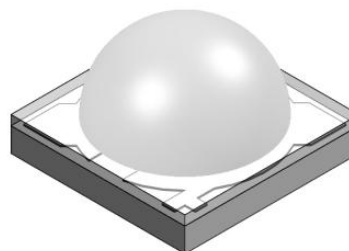
Top View



Bottom View



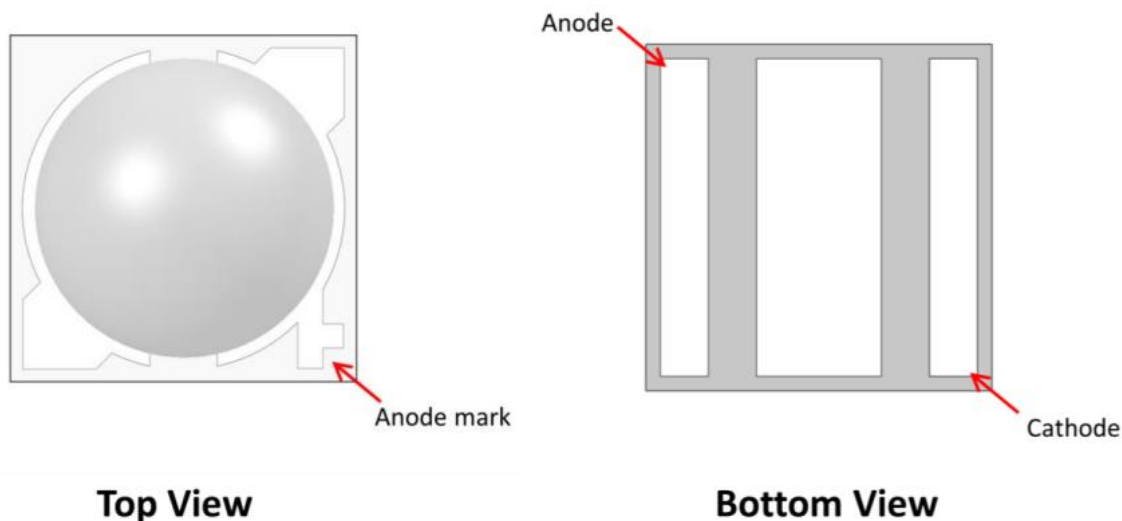
Side View



Units: mm / tolerance = +/-0.1mm



## Pad Configurations:


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

Product Number	Color	$I_F$ (mA)	$V_F$ (V)			CCT (K)			$\Phi_v$ (lm)	
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.
QBHP684UE-IWU-WW	Warm White	350	2.8	3.4	3.6	2870	3000	3220	85	90
QBHP684UE-IWU-NW	Natural White		2.8	3.4	3.6	3710	4000	4260	95	100
QBHP684UE-IWU-CW	Cool White		2.8	3.4	3.6	5310	5700	6020	105	110

**Absolute Maximum Rating**

Material	$P_d$ (W)	$I_F$ (mA)	$I_{FP}$ (mA)*	$V_R$ (V)	$T_{OP}$ ( $^\circ\text{C}$ )	$T_{ST}$ ( $^\circ\text{C}$ )	$T_{SOL}$ ( $^\circ\text{C}$ )
InGaN	2.52	700	1000	5	-40 to +85	-40 to +100	240

\*Duty 1/10 @ 0.1ms Pulse Width

**Forward Voltage  $V_F$  @  $I_F=350\text{mA}$** 

Bin	Min.	Max.	Unit
H	2.8	3.0	V
I	3.0	3.2	
J	3.2	3.4	
K	3.4	3.6	

**Luminous Flux  $\Phi_v$  @  $I_F=350\text{mA}$** 

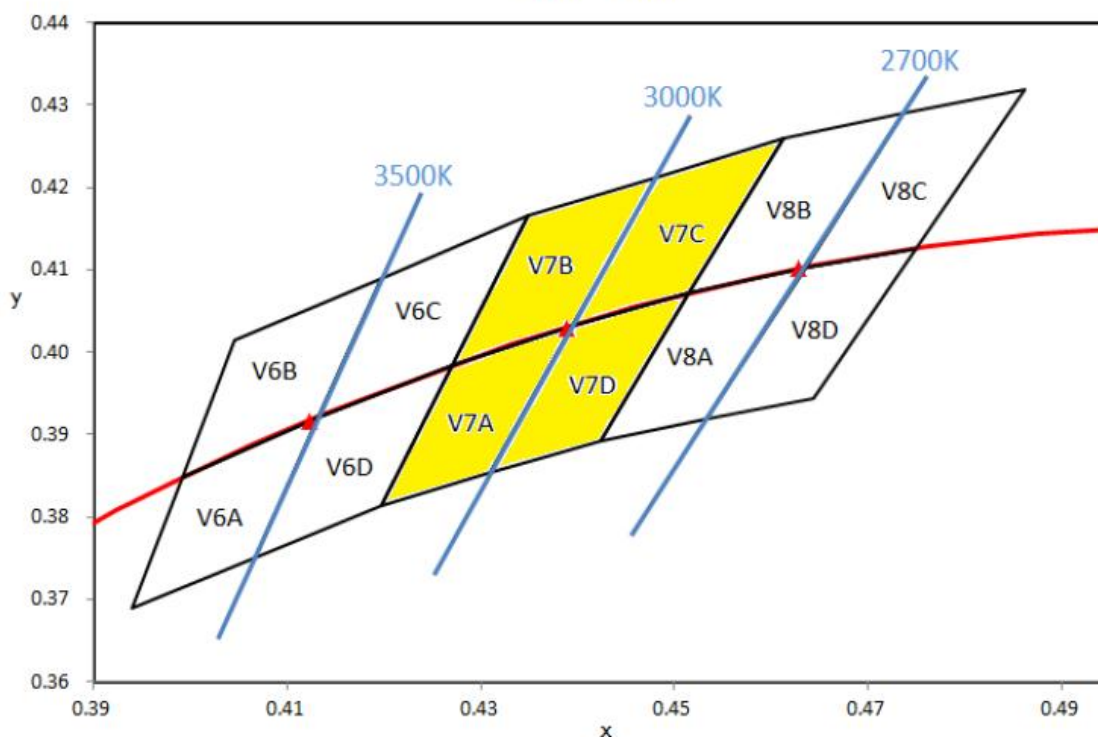
Bin	Min.	Max.	Unit
WD	85	95	lm
WE	95	105	
WF	105	115	
WG	115	125	
WH	125	135	
WI	135	145	
WJ	145	155	
WK	155	165	

Note:

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

## Correlated Color Temperature and Chromaticity Correlation

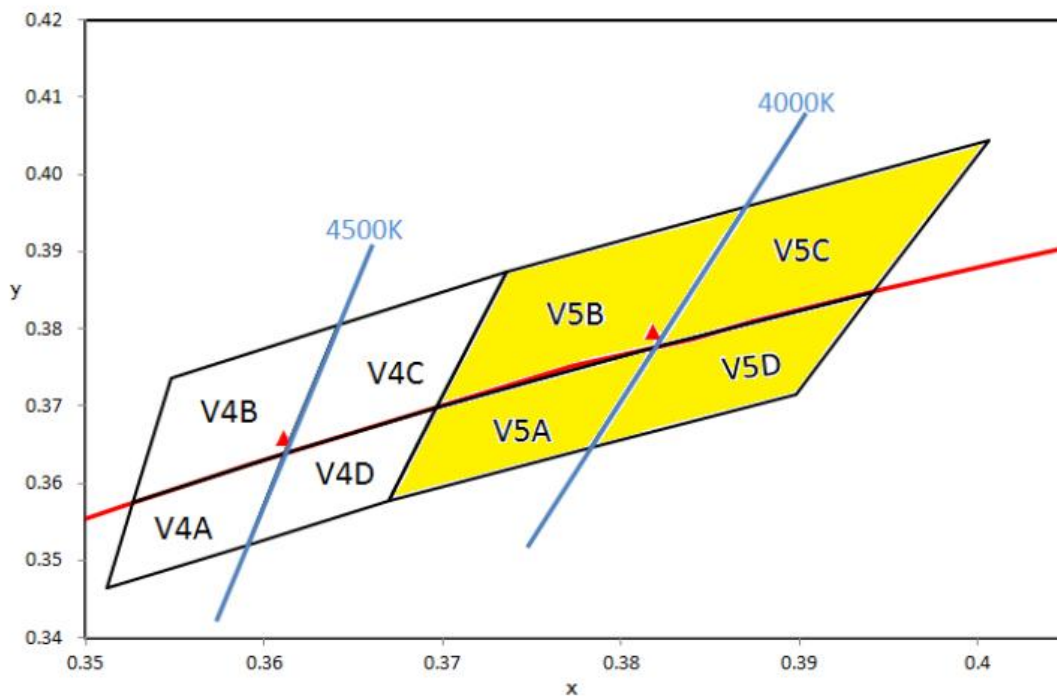
Warm White



Nominal	Bin code	x	y
3000K	V7A	0.4344	0.4032
		0.4221	0.3984
		0.4147	0.3814
		0.4260	0.3853
	V7B	0.4344	0.4032
		0.4430	0.4212
		0.4299	0.4165
		0.4221	0.3984
	V7C	0.4344	0.4032
		0.4430	0.4212
		0.4562	0.4260
		0.4465	0.4071
	V7D	0.4344	0.4032
		0.4465	0.4071
		0.4260	0.3853
		0.4373	0.3893
		0.4465	0.4071

Note:  
Tolerance of measurement of color coordinates:  $\pm 0.01$

Natural White

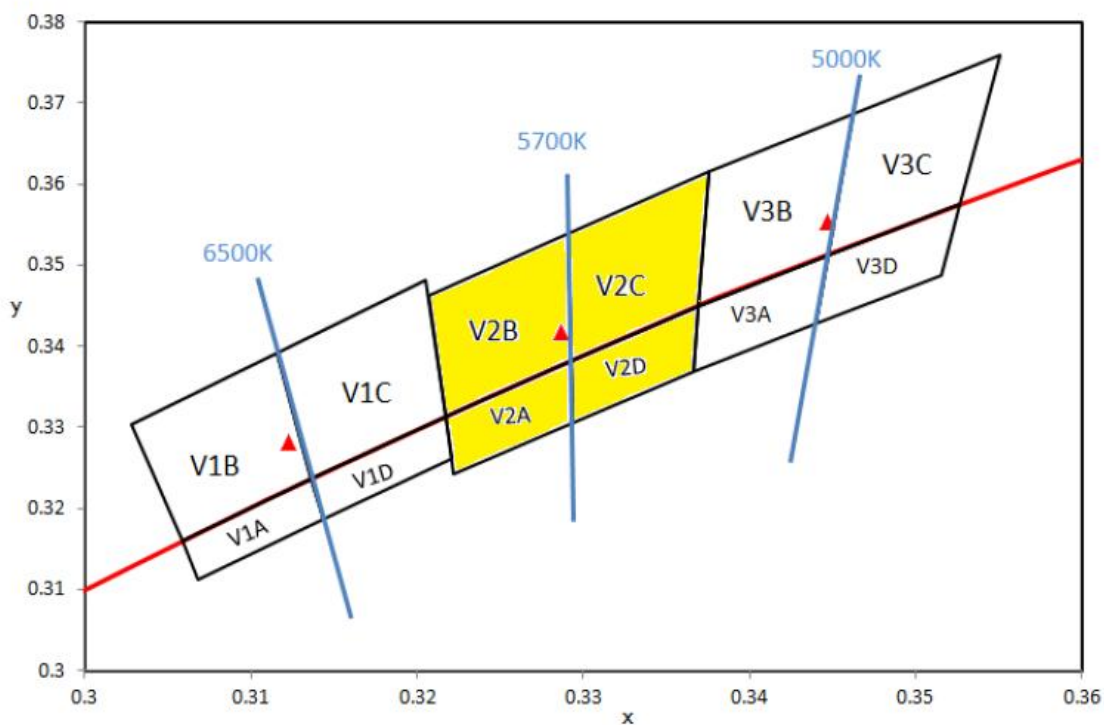


Nominal	Bin code	x	y
4000K	V5A	0.3819	0.3776
		0.3697	0.3697
		0.3670	0.3578
		0.3783	0.3646
		0.3819	0.3776
	V5B	0.3870	0.3958
		0.3736	0.3874
		0.3697	0.3697
		0.3819	0.3776
		0.3870	0.3958
	V5C	0.4006	0.4044
		0.3870	0.3958
		0.3819	0.3776
		0.3941	0.3848
		0.4006	0.4044
	V5D	0.3941	0.3848
		0.3819	0.3776
		0.3783	0.3646
		0.3898	0.3716
		0.3941	0.3848

Note:  
Tolerance of measurement of color coordinates:  $\pm 0.01$



Cool White



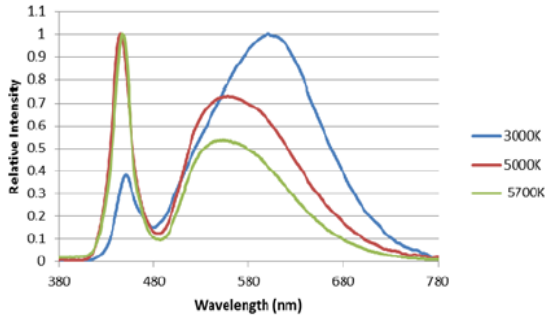
Nominal	Bin code	x	y
5700K	V2A	0.3292	0.3382
		0.3217	0.3314
		0.3222	0.3243
		0.3293	0.3305
	V2B	0.3292	0.3382
		0.3291	0.3538
		0.3207	0.3462
		0.3217	0.3314
	V2C	0.3292	0.3382
		0.3369	0.3449
		0.3376	0.3616
		0.3291	0.3538
	V2D	0.3292	0.3382
		0.3293	0.3305
		0.3366	0.3369
		0.3369	0.3449
		0.3292	0.3382

Note:  
Tolerance of measurement of color coordinates:  $\pm 0.01$

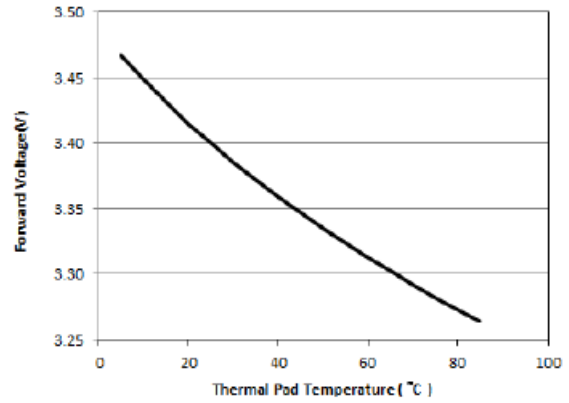
**Characteristic Curves**

**Relative Spectral Distribution vs. Wavelength Characteristics**

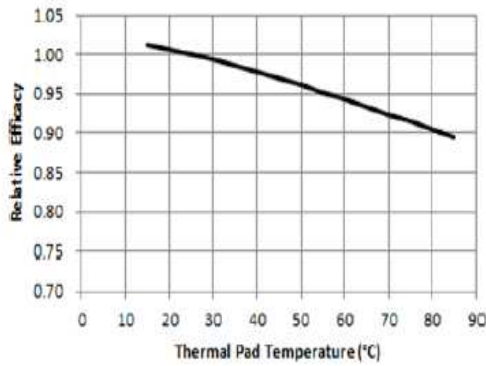
Nominal 3000K · 5000K and 5700K - Thermal Pad Temperature = 25°C



**Forward Voltage vs. Thermal Pad Temperature @350mA**

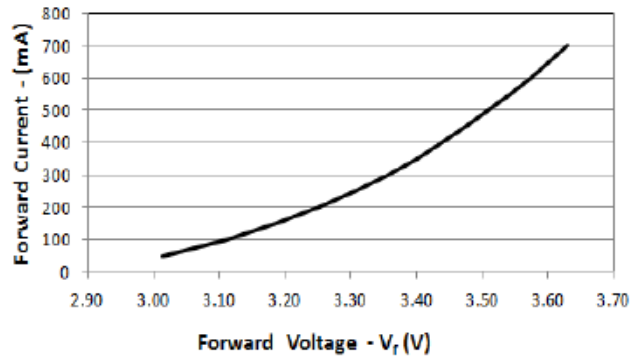


**Typical Efficacy vs. Thermal Pad Temperature @350mA**



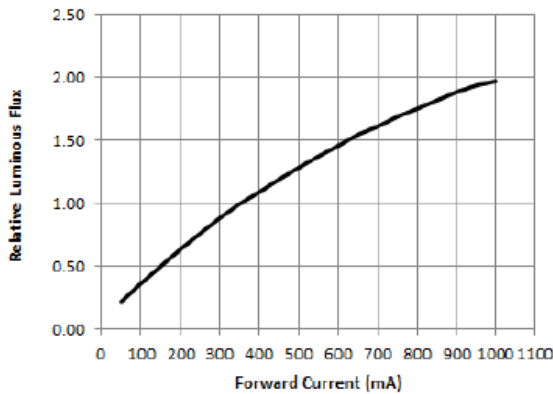
**Typical Forward Current Characteristics**

Pad Temperature = 25°C

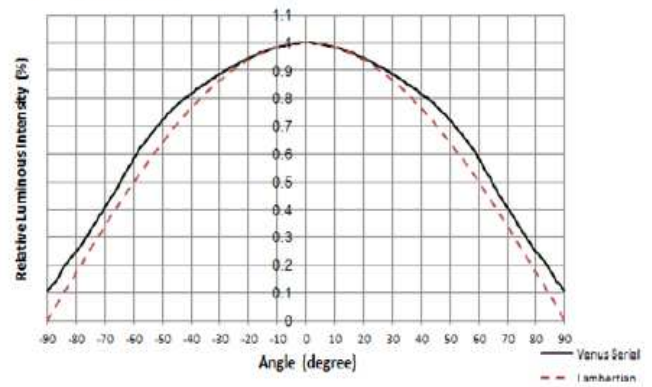


**Typical Relative Luminous Flux vs. Forward Current**

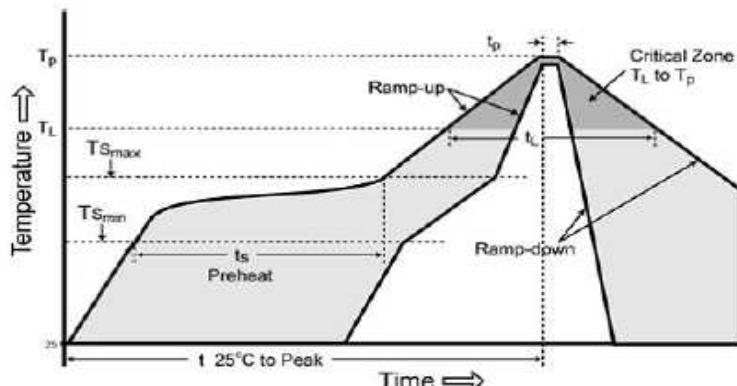
Thermal Pad Temperature = 25°C



**Typical Radiation Patterns**

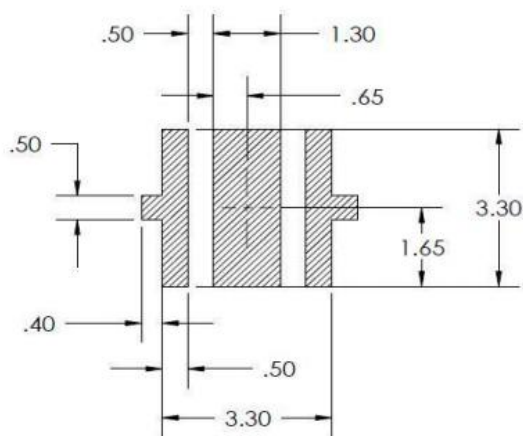


## IR Reflow Soldering Profile

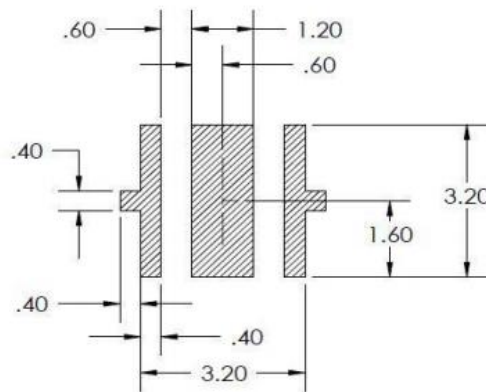


Profile Feature	Pb-Free Assembly
Average ramp-up rate (TL to TP)	3°C/second max.
Preheat	
Temperature Min (T <sub>smin</sub> )	150°C
Temperature Max (T <sub>smax</sub> )	200°C
Time (min to max) (t <sub>s</sub> )	60-180 seconds
Time maintained above:	
Temperature (T <sub>L</sub> )	217°C
Time (t <sub>L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

### Recommended Soldering Pad:



RECOMMENDED PCB SOLDER PAD

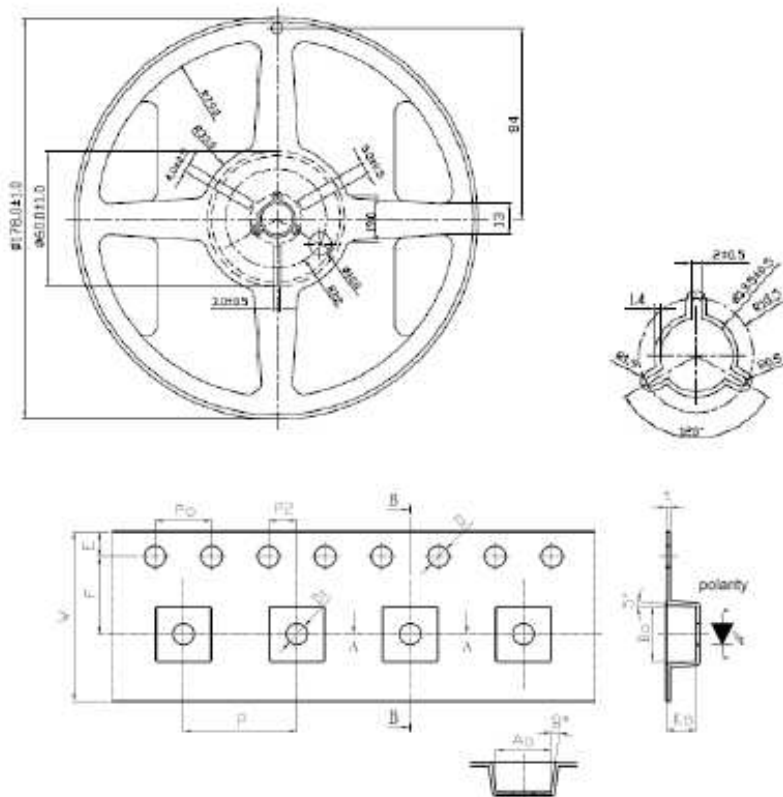


RECOMMENDED STENCIL PATTERN  
(HATCHED AREA IS OPENING)

Unit: mm

## Packing

### Tape and Reel:



Notes: Dimensions are in millimeters.

Symbol	Dimension
W	11.00 ± 0.10
P	8.00 ± 0.10
E	1.75 ± 0.10
F	5.50 ± 0.05
P2	2.00 ± 0.05
D	1.50 + 0.10 or 1.50 - 0.00
D1	1.50 ± 0.10
P0	4.00 ± 0.10
10P0	46.00 ± 0.20
A0	3.50 ± 0.10
B0	3.90 ± 0.10
K0	2.15 ± 0.1
t	0.26 ± 0.05

Unit: mm

**Labeling**

**Part No:** \_\_\_\_\_  
**Customer P/N:** \_\_\_\_\_  
**Item:** \_\_\_\_\_  
**Q'ty:** \_\_\_\_\_  
**Vf:** \_\_\_\_\_  
**Iv:** \_\_\_\_\_  
**WI:** \_\_\_\_\_  
**Date:** \_\_\_\_\_

**Made in Taiwan****Ordering Information**

Part #	Orderable Part #	Spec Range	Quantity per reel
QBHP684UE-IWU-WW	QBHP684UE-IWU-WW	$\Phi_v=90\text{lm typ.}$ , CCT=2870K ~ 3220K @ $I_F=350\text{mA}$	1000 units
QBHP684UE-IWU-NW	QBHP684UE-IWU-NW	$\Phi_v=100\text{lm typ.}$ , CCT=3710K ~ 4260K @ $I_F=350\text{mA}$	1000 units
QBHP684UE-IWU-CW	QBHP684UE-IWU-CW	$\Phi_v=110\text{lm typ.}$ , CCT=5310K ~ 6020K @ $I_F=350\text{mA}$	1000 units



## Revision History

Description:	Revision #	Revision Date
New Release of QBHP684UE-IWU-XX	V1.0	01/18/2013
Add Binning Information / Update Spec	V1.1	02/15/2013
Add Quantity per Reel / Update Typical Luminous Flux	V1.2	04/23/2013
Update soldering pattern	V1.3	10/28/2013
Update luminous flux bin	V1.4	04/30/2014
Update package drawing color to reflect ceramic substrate	V1.5	06/22/2015

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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.