

# QT-Brightek High Power Series

## 3W High Power LED

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

**XX = WW/NW/CW**

**V = 700mA**

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## Introduction

### Feature:

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

### Application:

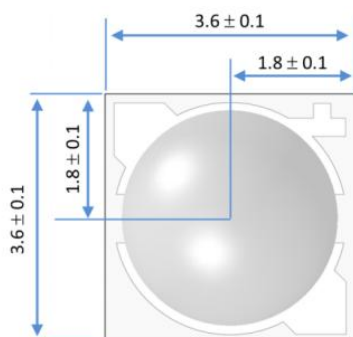
- Architectural and outdoor lighting
- Household appliances
- General lighting

### Certification & Compliance:

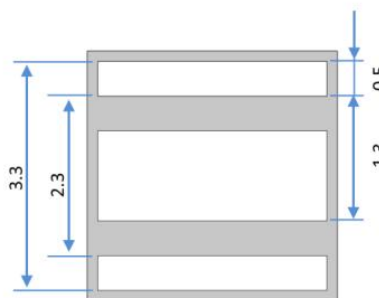
- TS16949
- ISO9001
- RoHS Compliant



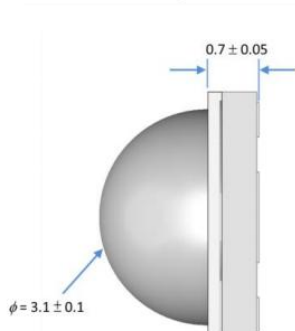
## Dimensions:



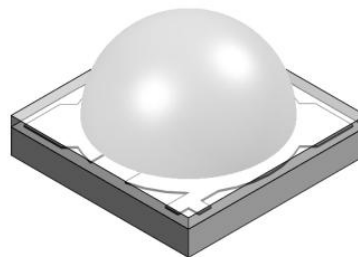
Top View



Bottom View

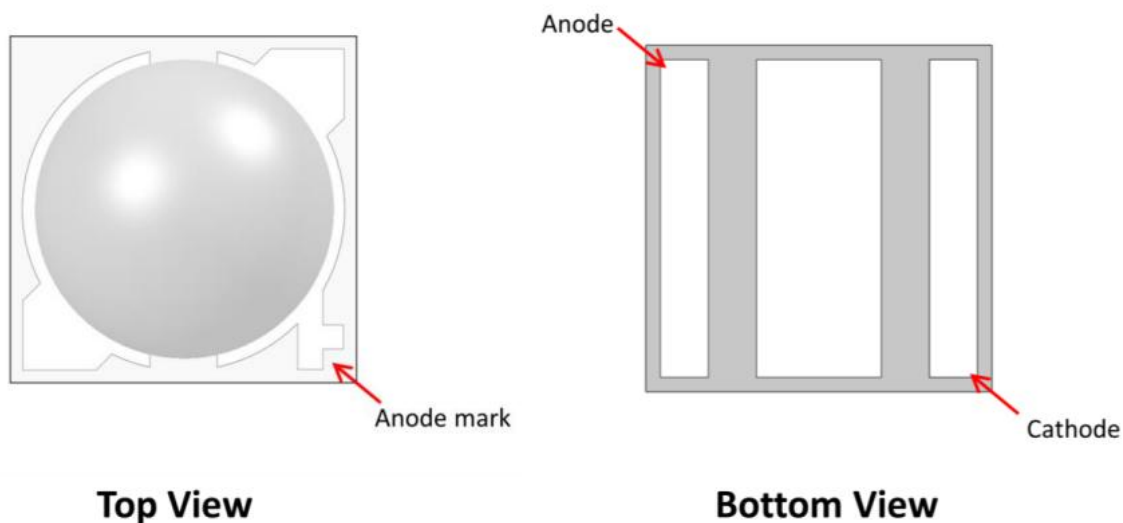


Side View



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)	
			Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.
QBHP684UE-IWV-WW	Warm White	700	3.8	4.0	2870	3000	3220	140	144
QBHP684UE-IWV-NW	Natural White		3.8	4.0	3710	4000	4260	155	165
QBHP684UE-IWV-CW	Cool White		3.8	4.0	5310	5700	6020	170	180

**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  $V_F$  @  $I_F=700\text{mA}$** 

Bin	Min.	Max.	Unit
H	3.2	3.4	V
I	3.4	3.6	
J	3.6	3.8	
K	3.8	4.0	

**Luminous Flux  $\Phi_v$  @  $I_F=700\text{mA}$** 

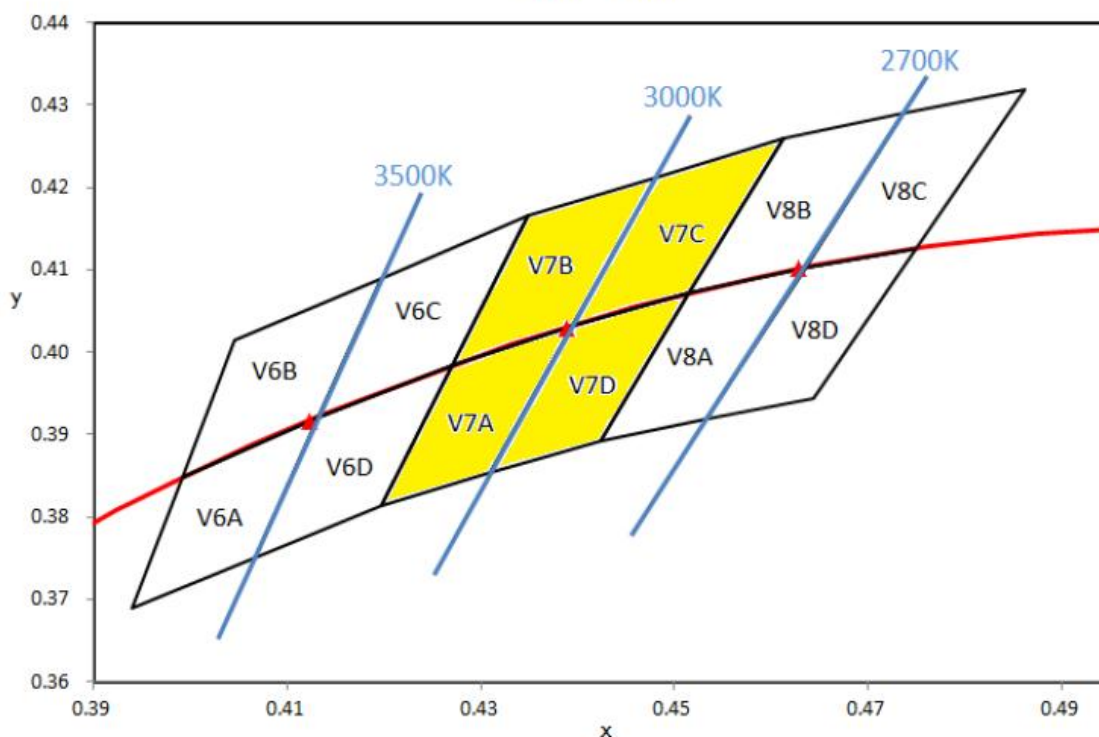
Bin	Min.	Max.	Unit
WD	140	155	lm
WE	155	170	
WF	170	190	
WG	190	210	
WH	210	230	
WI	230	250	
WJ	250	280	

## 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

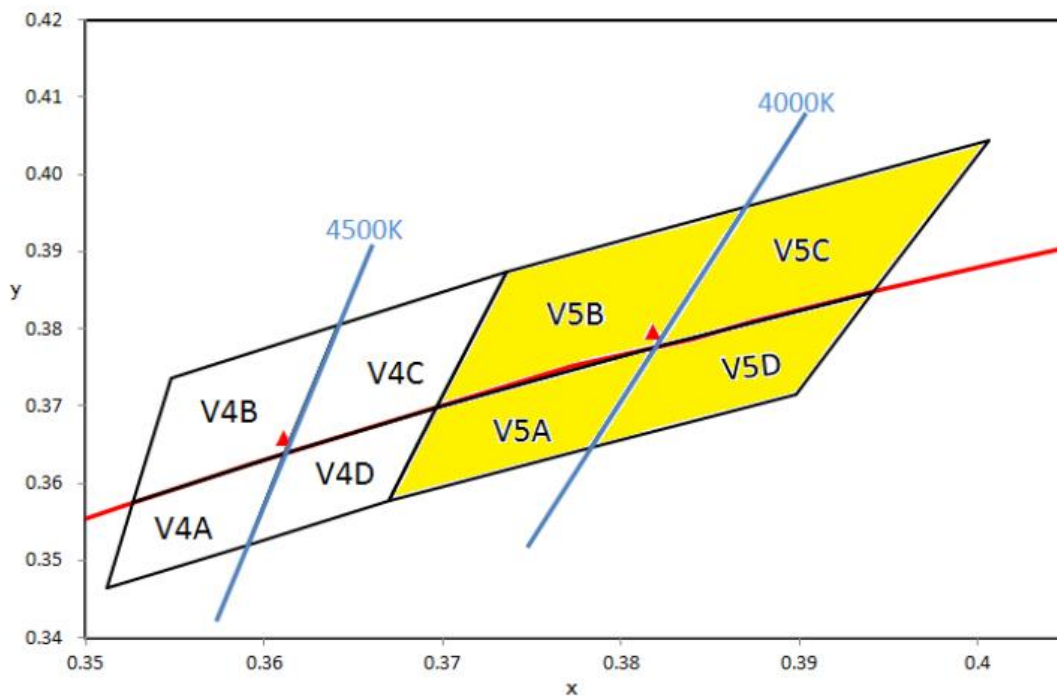
Warm White



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
		0.4430	0.4212
		0.4562	0.4260
		0.4465	0.4071

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

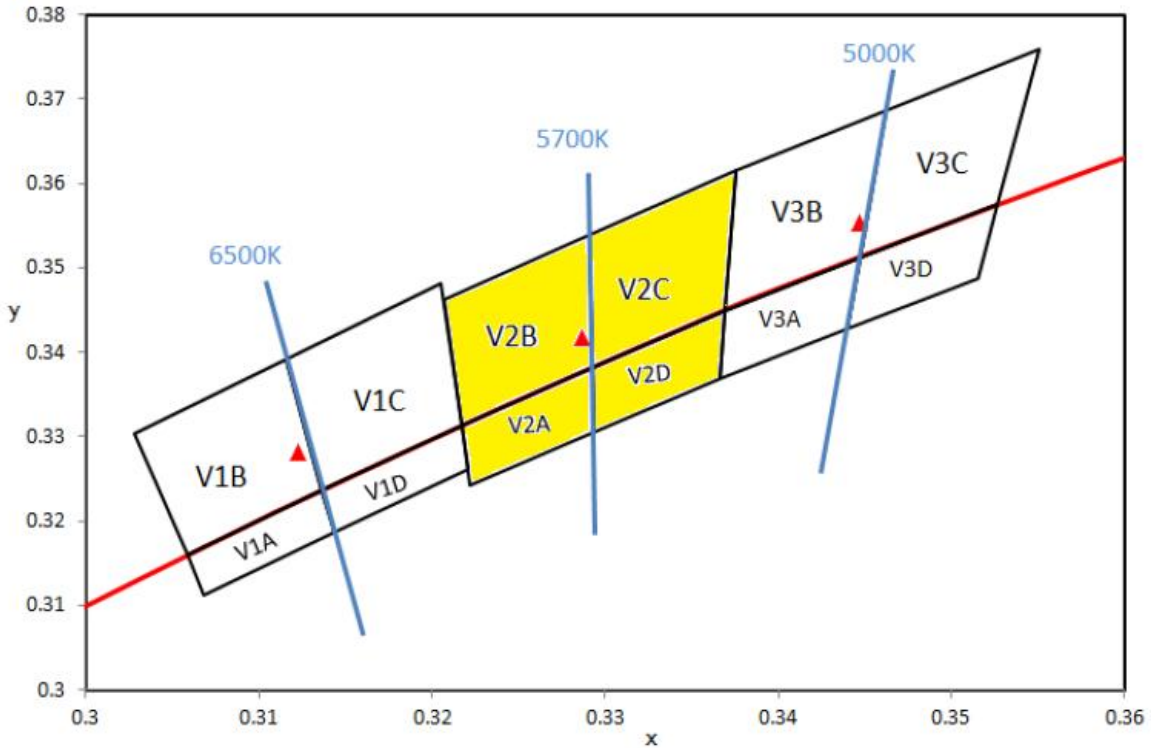
Natural White



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

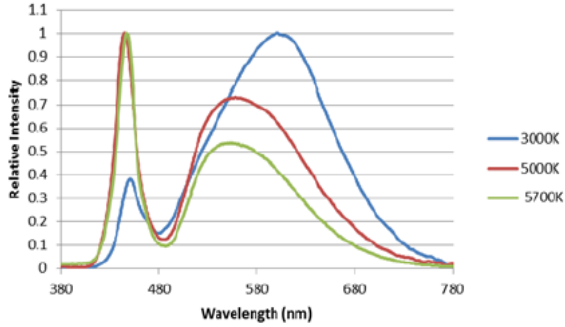
Note:  
Tolerance of measurement of color coordinates:  $\pm 0.01$



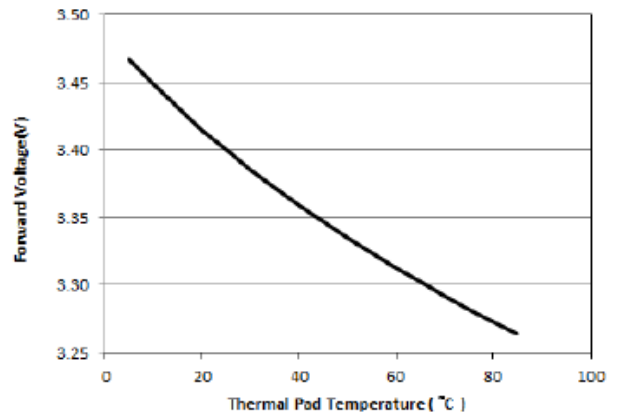
## Characteristic Curves

**Relative Spectral Distribution vs. Wavelength Characteristics**

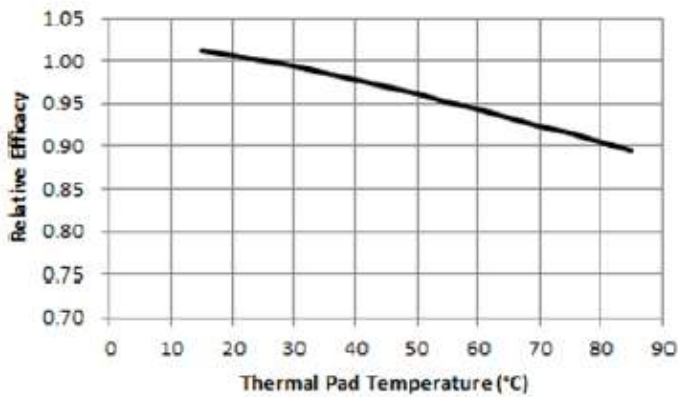
Nominal 3000K · 5000K and 5700K - Thermal Pad Temperature = 25°C



**Forward Voltage vs. Thermal Pad Temperature**

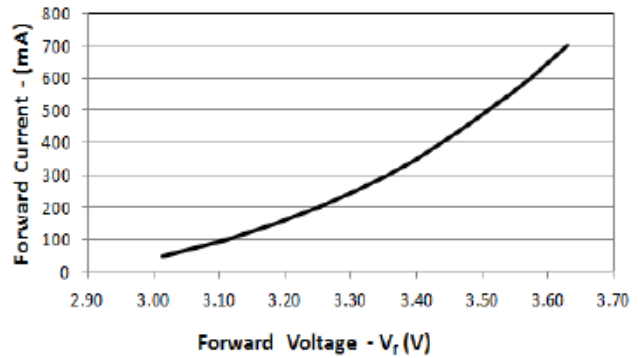


**Typical Efficacy vs. Thermal Pad Temperature**



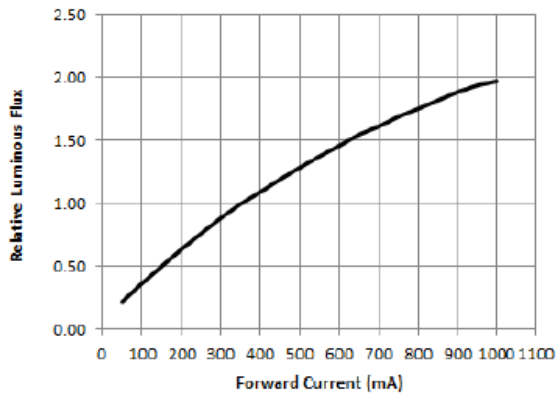
**Typical Forward Current Characteristics**

Pad Temperature = 25°C

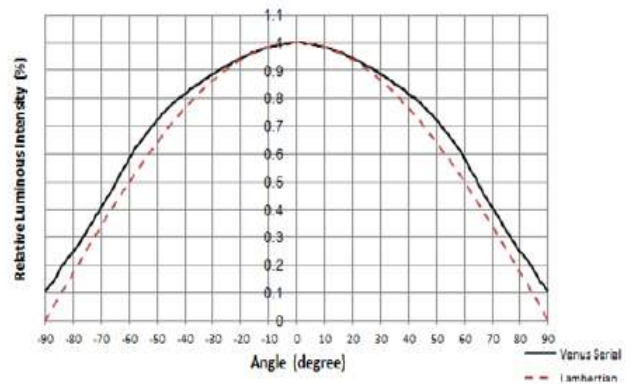


**Typical Relative Luminous Flux vs. Forward Current**

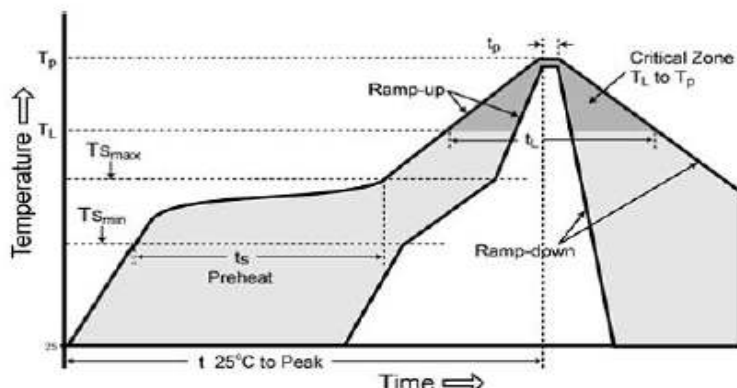
Thermal Pad Temperature = 25°C



**Typical Radiation Patterns**

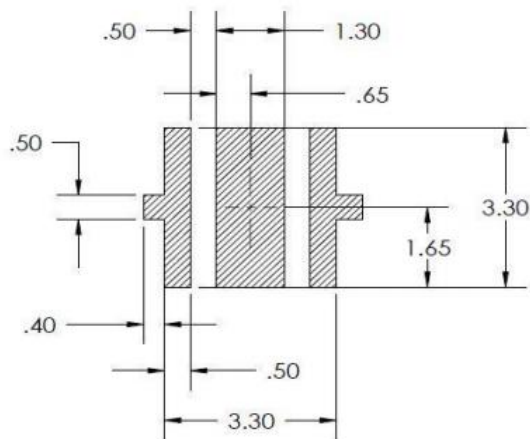


## IR Reflow Soldering Profile

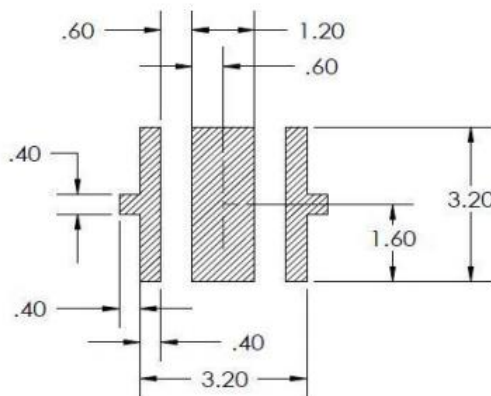


Profile Feature	Pb-Free Assembly
Average ramp-up rate (TL to TP)	3°C/second max.
Preheat	
Temperature Min (T <sub>min</sub> )	150°C
Temperature Max (T <sub>max</sub> )	200°C
Time (min to max) (t <sub>s</sub> )	60-180 seconds
Time maintained above:	
Temperature (T <sub>L</sub> )	217°C
Time (t <sub>L</sub> )	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

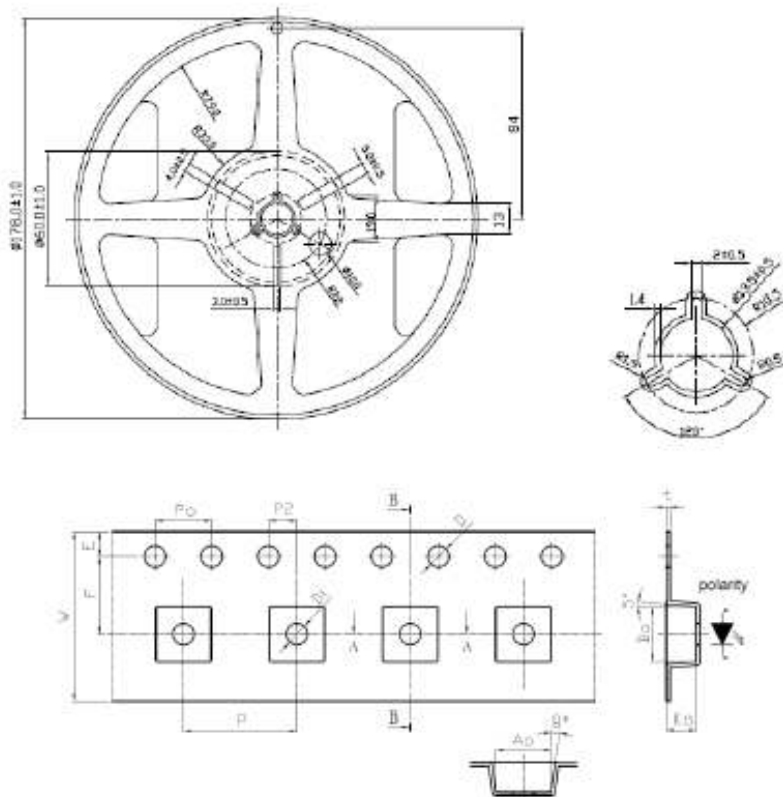


RECOMMENDED STENCIL PATTERN  
(HATCHED AREA IS OPENING)

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
F2	2.00 ± 0.05
D	1.50 + 0.10 or 1.50 - 0.00
Dt	1.50 ± 0.10
Pn	4.00 ± 0.10
10Po	40.00 ± 0.20
Ao	3.90 ± 0.10
Bo	3.90 ± 0.10
Ho	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-IWV-WW	QBHP684UE-IWV-WW	$\Phi_v=144\text{lm typ.}$ , CCT=2870K ~ 3220K @ $I_F=700\text{mA}$	1000 units
QBHP684UE-IWV-NW	QBHP684UE-IWV-NW	$\Phi_v=165\text{lm typ.}$ , CCT=3710K ~ 4260K @ $I_F=700\text{mA}$	1000 units
QBHP684UE-IWV-CW	QBHP684UE-IWV-CW	$\Phi_v=180\text{lm typ.}$ , CCT=5310K ~ 6020K @ $I_F=700\text{mA}$	1000 units

## Revision History

Description:	Revision #	Revision Date
New Release of QBHP684UE-IWV-XX	V1.0	08/26/2013
Add bin code, update spec (luminous flux)	V1.1	10/11/2013
Update luminous flux bin	V1.2	04/30/2014
Update package drawing color to reflect ceramic substrate	V1.3	06/22/2015

## 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.