

# Specification

**ZC-16**

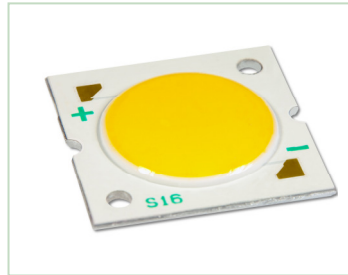
**(SSC-SBWW4F1A)**

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# Specification

## SBWW4F1A



### Description

The ZC series are High Flux and High Efficacy COB (Chip On Board) series designed for easy to attach to lighting fixture directly without reflow process.

ZC series's thermal management perform exceeds other power LED solutions.

The Z-Power LED is ideal light sources for general illumination applications, custom designed solutions, and high performance lights.

### Features

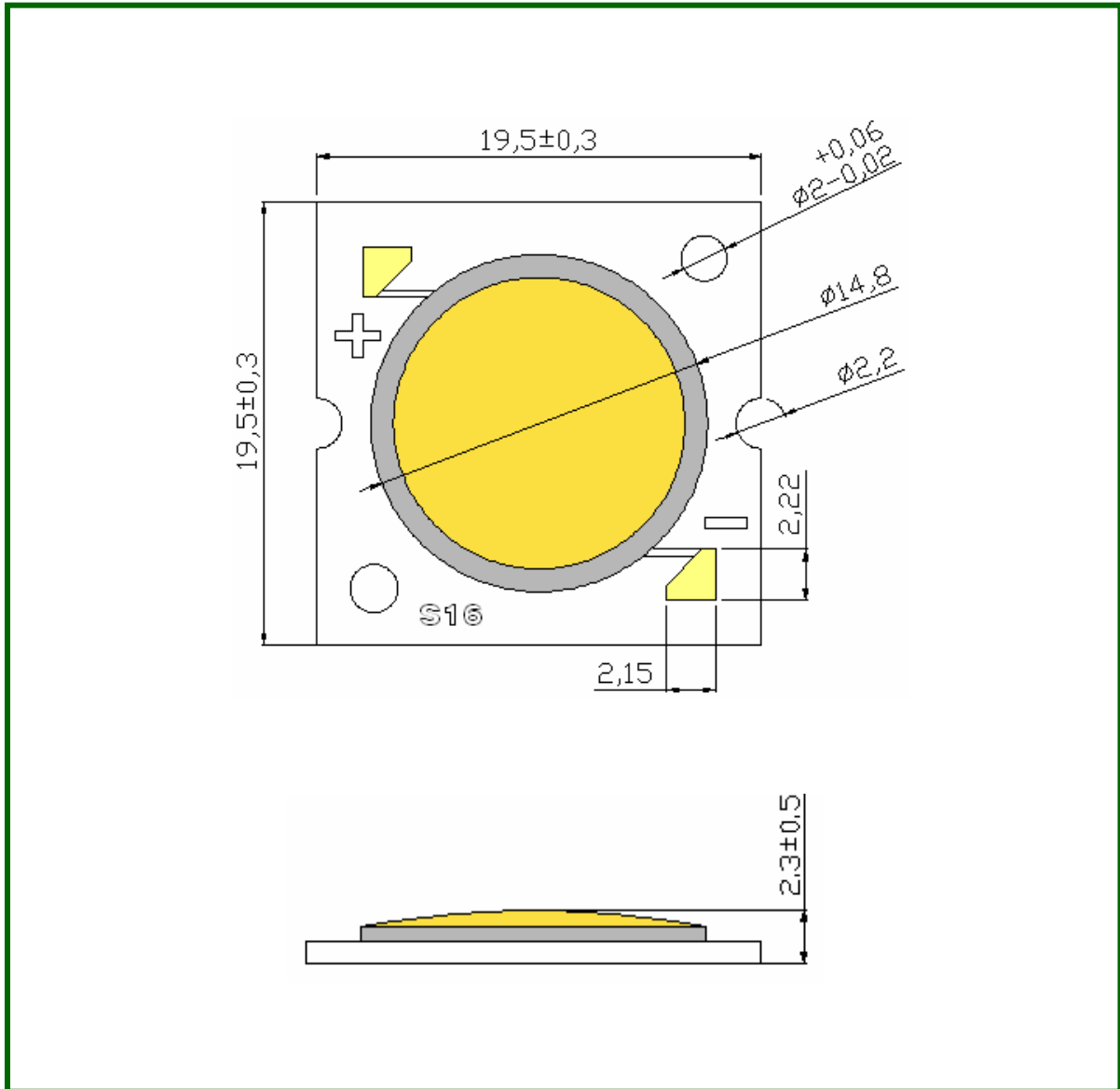
- Super high Flux output and high Luminance
- Designed for high current operation
- Lead Free product
- RoHS compliant

### Applications

- Bulb
- Down Light
- Architectural lighting
- Decorative / Pathway lighting

\* The appearance and specifications of the product can be changed for improvement without notice.

## Outline dimensions



Notes :

- [1] All dimensions are in millimeters.
- [2] Scale : none
- [3] Undefined tolerance is  $\pm 0.2$ mm

## Characteristics of ZC-16 (SBWW4F1A)

### 1. Warm White

#### 1-1 Electro-Optical characteristics at 16W(LED emitter's power) @540mA

Parameter	Symbol	Value			Unit
		Min	Typ	Max	
Luminous Flux <sup>[1]</sup>	$\Phi_V$ <sup>[2]</sup>	-	1368	-	lm
Correlated Color Temperature <sup>[3]</sup>	CCT	-	2700	-	K
CRI	$R_a$	80	82	-	-
Forward Current	$I_F$	100	540	600	mA
Forward Voltage <sup>[4]</sup>	$V_F$	24.0	30.5	32.0	V
Thermal resistance (J to s) <sup>[6]</sup>	$R_{\theta_{J-s}}$		1.6		K/W
View Angle	$2\Theta \frac{1}{2}$	115			deg.

#### 1-2 Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Power Dissipation	$P_D$	19.2	W
Forward Current	$I_F$	600	mA
Junction Temperature	$T_j$	125	°C
Operating Temperature <sup>[7]</sup>	$T_{opr}$	-40 ~ +85	°C
Storage Temperature	$T_{stg}$	-40 ~ +100	°C
ESD Sensitivity (HBM)	-	± 8	kV

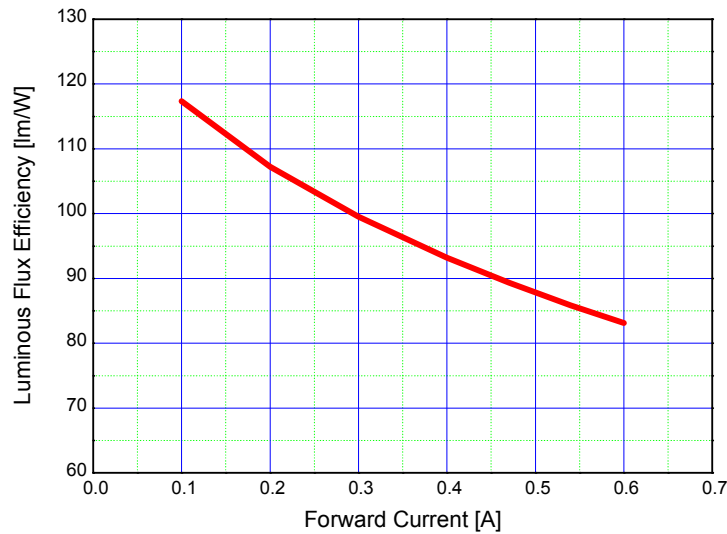
\*Notes :

- [1] SSC maintains a tolerance of ±10% on flux and power measurements.
- [2]  $\Phi_V$  is the total luminous flux output as measured with an integrating sphere.
- [3] Correlated Color Temperature is derived from the CIE 1931 Chromaticity diagram.  
Color coordinate : 0.005, CCT ±5% tolerance.
- [4] Tolerance is ±0.1V on forward voltage measurements
- [5] A zener diode is included to protect the product from ESD.
- [6] At thermal Resistance, J to S means junction to COB's metal pcb bottom.
- [7] Operating temperature is ambient temperature.

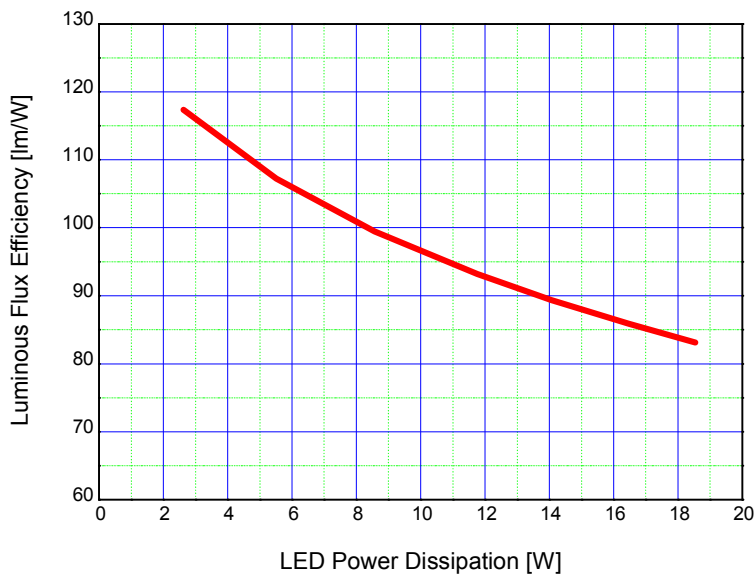
## Luminous Flux Efficiency Characteristics

Forward Current vs. Luminous Flux efficiency [lm/W], Ta=25℃

Current [mA]	Power Dissipation [W]	Luminous Flux efficiency [lm/W]
540	16.5	85
400	11.7	93
100	2.6	117

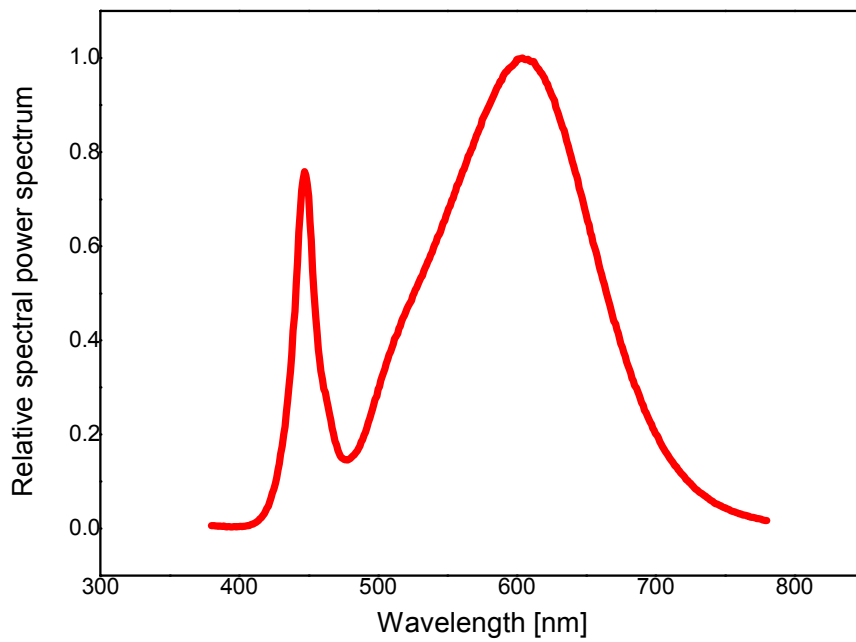


Power Dissipation vs. Luminous Flux efficiency [lm/W], Ta=25℃



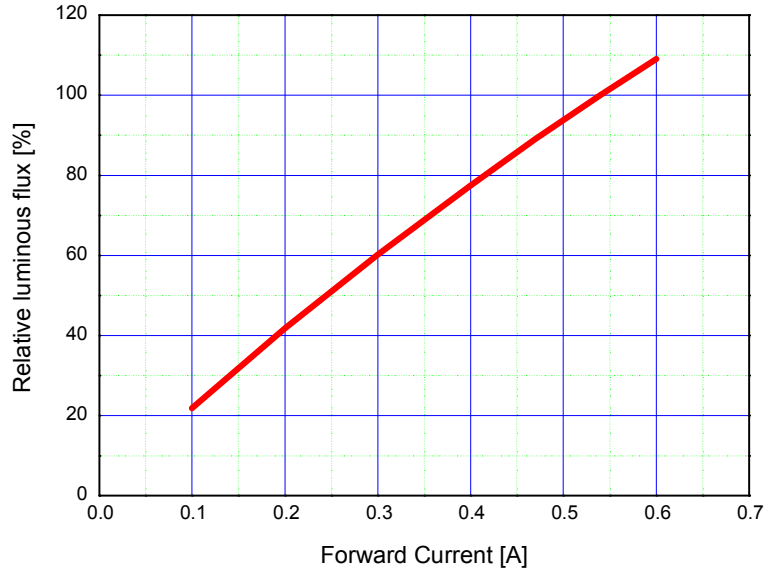
## Color Spectrum

IF=540mA, Ta=25℃, RH30%

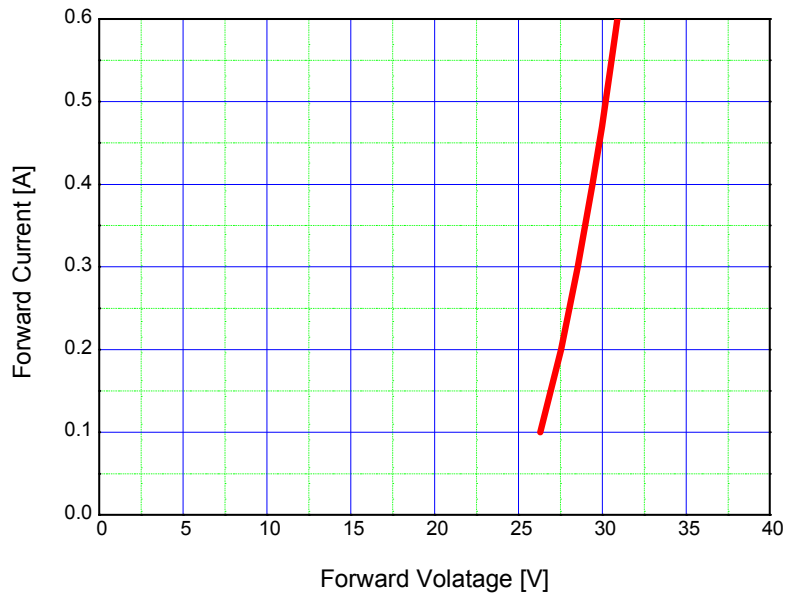


## Forward Current Characteristics

**Forward Current vs. Luminous Flux, Ta=25℃**



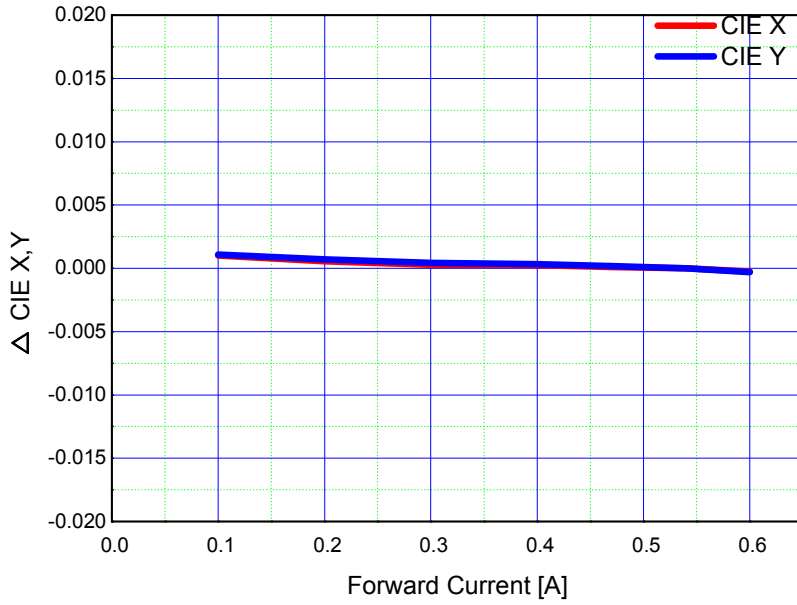
**Forward Voltage vs. Forward Current, Ta=25℃**





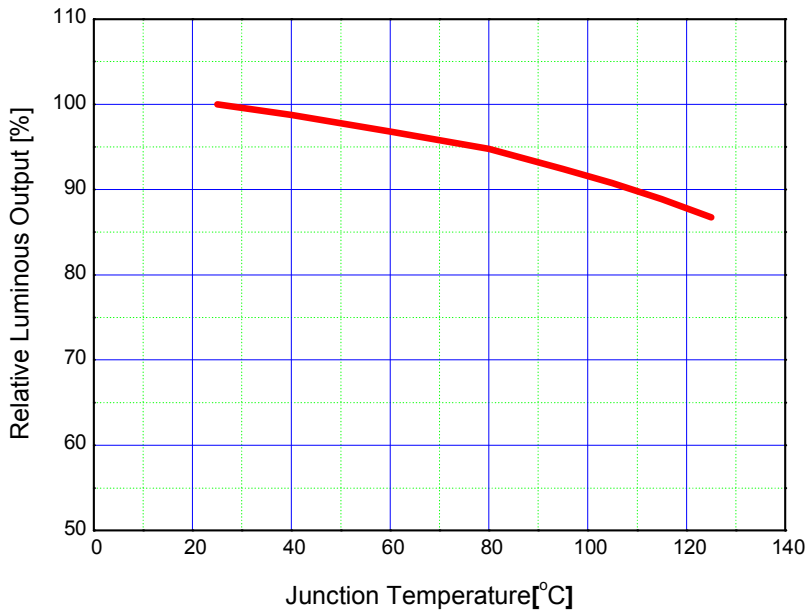
## Forward Current Characteristics

Forward Current vs. CIE , Ta=25℃



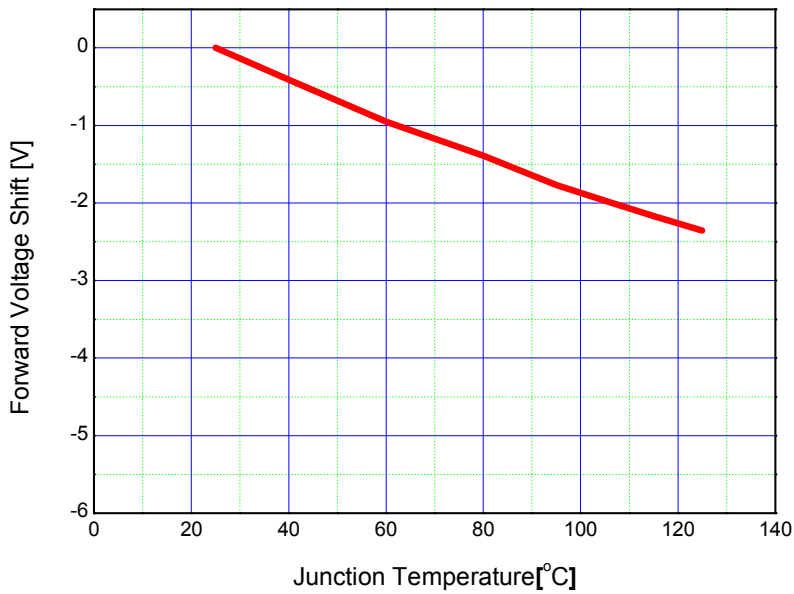
## Junction Temperature Characteristics

**Junction Temperature vs. Relative Light Output at IF=540mA**

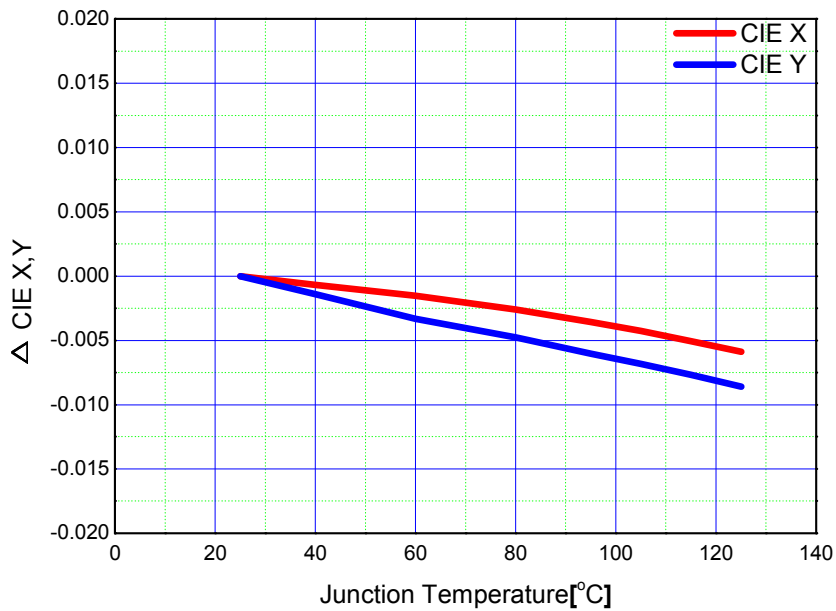


## Junction Temperature Characteristics

**Junction Temperature vs. VF at IF=540mA**

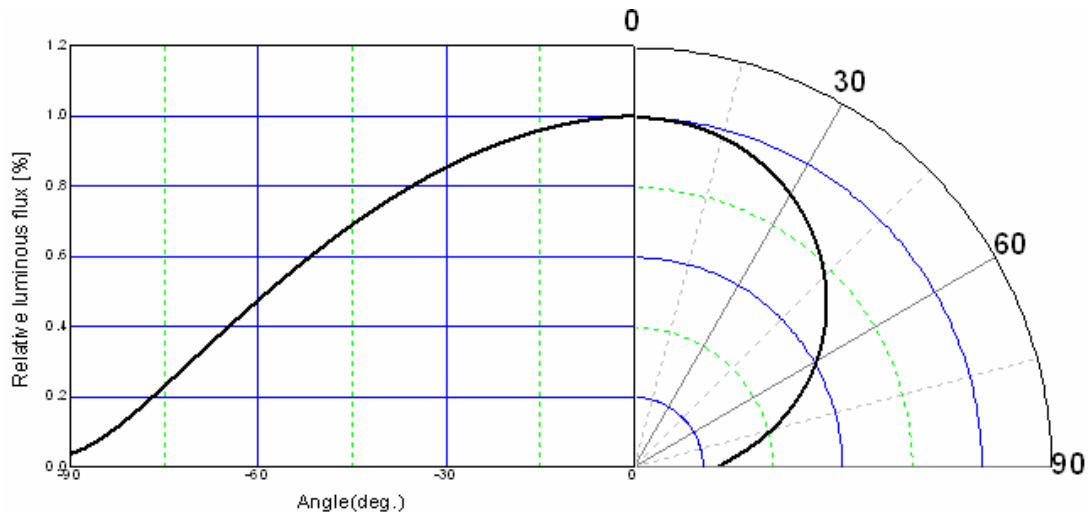


**Junction Temperature vs. CIE at IF=540mA**



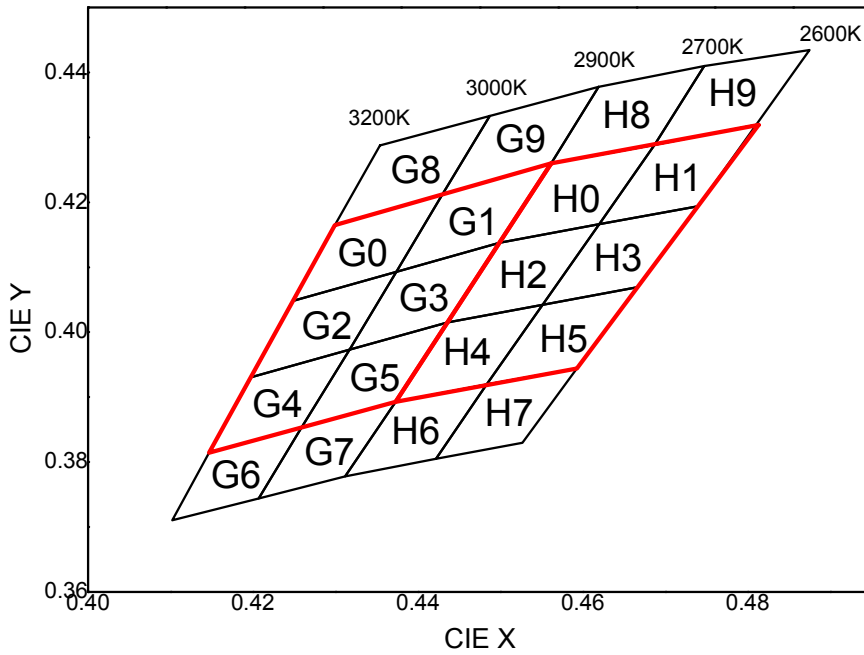
## Radiation pattern

VF=30.5, IF=540mA, Ta=25°C



## Color & Binning

Color Rank at IF=540mA, Ta=25℃



**\* Note**

Red area is ANSI chromaticity.

## Color & Binning

Color Rank at IF=540mA, Ta=25℃

3000~3200K					
G0		G2		G4	
CIE X	CIE Y	CIE X	CIE Y	CIE X	CIE Y
0.4299	0.4165	0.4248	0.4048	0.4198	0.3931
0.4248	0.4048	0.4198	0.3931	0.4147	0.3814
0.4374	0.4093	0.4317	0.3973	0.4259	0.3853
0.443	0.4212	0.4374	0.4093	0.4317	0.3973
G6		G8			
CIE X	CIE Y	CIE X	CIE Y		
0.4147	0.3814	0.4354	0.4288		
0.4102	0.3710	0.4299	0.4165		
0.4207	0.3744	0.4430	0.4212		
0.4259	0.3853	0.4487	0.4333		
2900~3000K					
G1		G3		G5	
CIE X	CIE Y	CIE X	CIE Y	CIE X	CIE Y
0.4430	0.4212	0.4374	0.4093	0.4317	0.3973
0.4374	0.4093	0.4317	0.3973	0.4259	0.3853
0.4499	0.4138	0.4436	0.4015	0.4373	0.3893
0.4562	0.4260	0.4499	0.4138	0.4436	0.4015
G7		G9			
CIE X	CIE Y	CIE X	CIE Y		
0.4259	0.3853	0.4487	0.4333		
0.4207	0.3744	0.4430	0.4212		
0.4312	0.3778	0.4562	0.4260		
0.4373	0.3893	0.4619	0.4378		

\* Measurement Uncertainty of the Color Coordinates : ± 0.01

## Color & Binning

Color Rank at IF=540mA, Ta=25℃

2700~2900K					
H0		H2		H4	
CIE X	CIE Y	CIE X	CIE Y	CIE X	CIE Y
0.4562	0.426	0.4499	0.4138	0.4436	0.4015
0.4499	0.4138	0.4436	0.4015	0.4373	0.3893
0.4620	0.4166	0.4551	0.4042	0.4483	0.3919
0.4687	0.4289	0.4620	0.4166	0.4551	0.4042
H6		H8			
CIE X	CIE Y	CIE X	CIE Y		
0.4373	0.3893	0.4619	0.4378		
0.4312	0.3778	0.4562	0.4260		
0.4422	0.3805	0.4687	0.4289		
0.4483	0.3919	0.4747	0.4410		
2600~2700K					
H1		H3		H5	
CIE X	CIE Y	CIE X	CIE Y	CIE X	CIE Y
0.4687	0.4289	0.4620	0.4166	0.4551	0.4042
0.4620	0.4166	0.4551	0.4042	0.4483	0.3919
0.474	0.4194	0.4666	0.4069	0.4593	0.3944
0.481	0.4319	0.4740	0.4194	0.4666	0.4069
H7		H9			
CIE X	CIE Y	CIE X	CIE Y		
0.4483	0.3919	0.4747	0.4410		
0.4422	0.3805	0.4687	0.4289		
0.4527	0.3830	0.4810	0.4319		
0.4593	0.3944	0.4875	0.4435		

\* Measurement Uncertainty of the Color Coordinates : ± 0.01

## Part Number of ZC-16 (SBWW4F1A)


Full Part Number Form :  $X_1X_2X_3X_4X_5X_6X_7X_8 - X_9X_{10}X_{11}X_{12}X_{13}$

$X_1$	Company	S	SSC
$X_2$	Package series	B	COB
$X_3$	Color	W	Warm White
$X_4$		W	
$X_5$	Series number	4	ZC series
$X_6$	Lens Type	F	Flat
$X_7$	PCB type	1	PCB
$X_8$	Revision No.	A	Rev0
$X_9X_{10}$	Luminous flux	-	-
$X_{11}X_{12}$	Color bin	-	-
$X_{13}$	Forward Voltage	-	-


## Label

### Sticker Diagram on Reel & Aluminum Vinyl Bag


Rank :  $X_9 X_{10} X_{11} X_{12} X_{13}$




QUANTITY : #####




Lot No : #####



SSC PART NUMBER :  $X_1 X_2 X_3 X_4 X_5 X_6 X_7 X_8$







## Rank

**X<sub>9</sub> X<sub>10</sub> X<sub>11</sub> X<sub>12</sub> X<sub>13</sub>**

- X<sub>9</sub> X<sub>10</sub> : Luminous Flux : I<sub>v</sub> [lm]
- X<sub>11</sub> X<sub>12</sub> : Color coordinates : x, y
- X<sub>13</sub> : Forward Voltage : V<sub>F</sub> [V]

Rank		
Luminous Flux	CIE	Forward Voltage
G1	G3	C

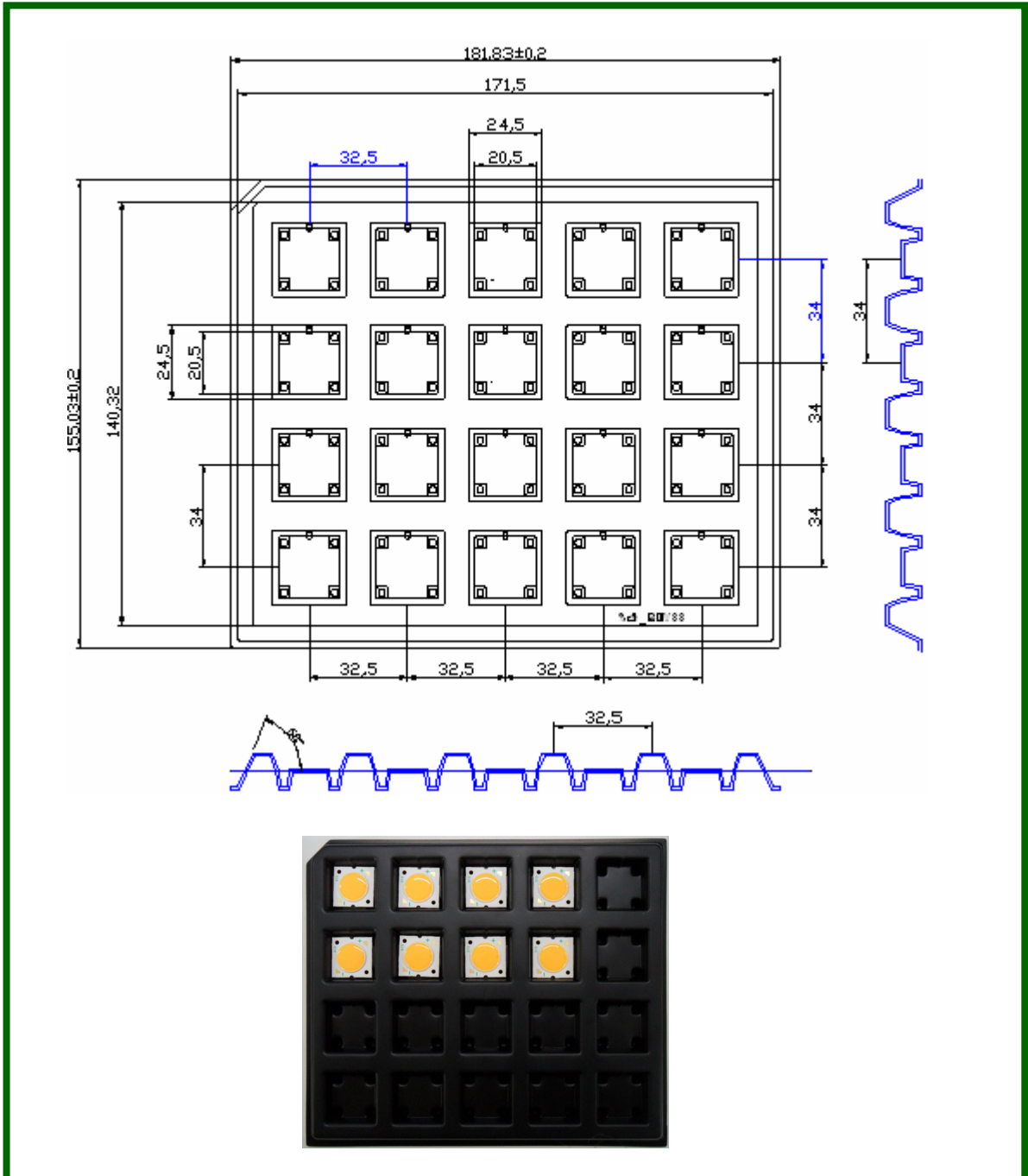
Luminous Flux [lm] @ I <sub>F</sub> = 540mA		
Bin Code	Min.	Max.
F1	1100	1250
F2	1250	1400
G1	1400	1600
G2	1600	1800

Color Rank @ I <sub>F</sub> = 540mA
G~H (2600K~3200K)

Forward Voltage [V] @ I <sub>F</sub> = 540mA		
Bin Code	Min.	Max.
A	23.0	26.0
B	26.0	29.0
C	29.0	32.0

\*Notes : Measurements were made under the standardized environment of SSC.  
In order to ensure availability, single color rank will not be orderable.

## Tray Packaging



\* Notes :

- [1] The number of loaded products in the tray is 20ea
- [2] All dimensions are in millimeters (tolerance :  $\pm 0.2$ )
- [3] Scale none

Rev.00

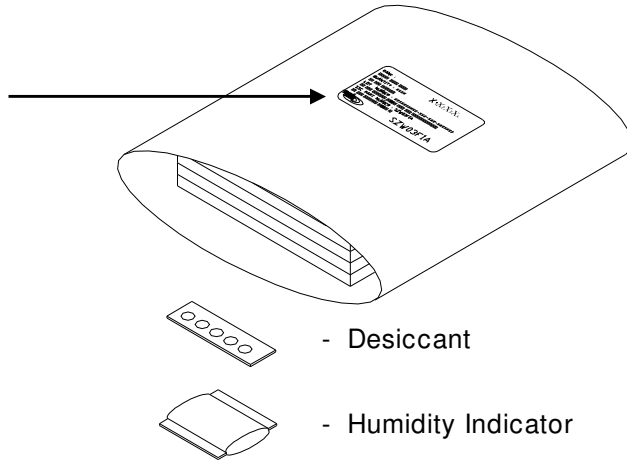
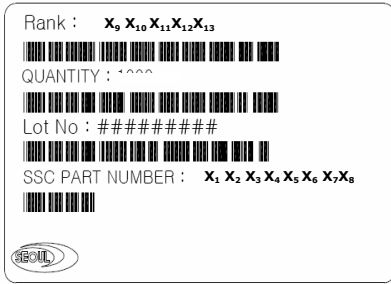
December. 2011

[www.seoulsemicon.com](http://www.seoulsemicon.com)

서식번호 : SSC- QP- 7- 07- 12 (Rev.01)

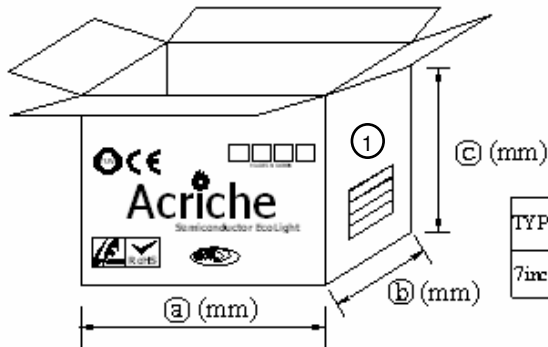
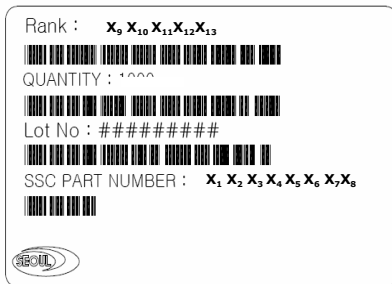
## Packaging (Bag and Box)

### 1. Moisture-proof bag \*1,2



### 2. Outer Box Structure

#### 1 SIDE



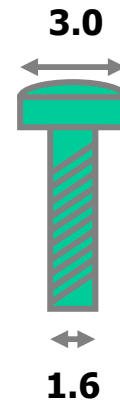
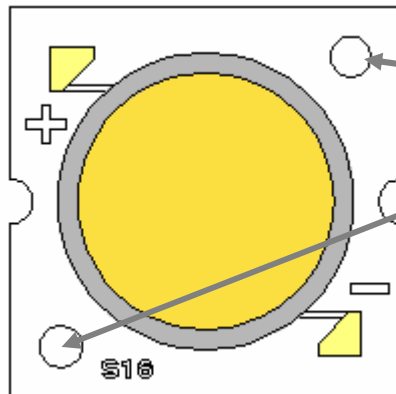
TYPE	SIZE (mm)		
	⌀	⌀	⌀
7inch	245	220	142
	245	220	80

\* Notice

1. Heat Sealed after packing (Use Zipper Bag)
2. Quantity : Max 4 Trays/Bag

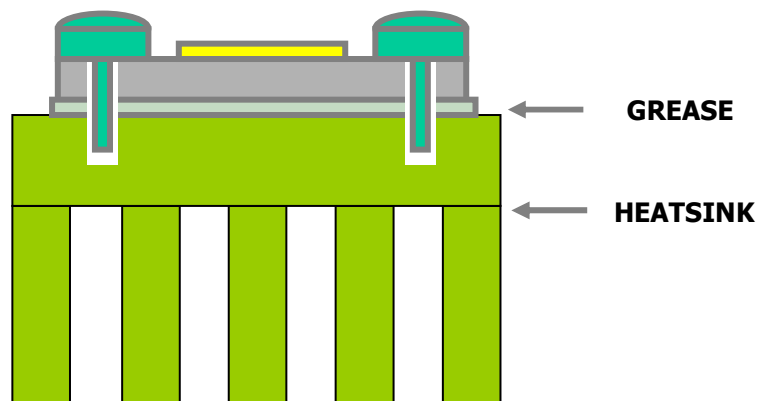
## Mechanical Connection to Heat sink

< Top View >



< M1.6 screw >

< Side View >



• **Notes**

- Please use M1.6 screw necessarily.
- Do not release screw while LED is operating.
- Use two screws.
- Fix LED package on heat sink tightly.

### Precaution for use

- Storage  
To avoid the moisture penetration, we recommend storing Power LEDs in a dry box with a desiccant . The recommended storage temperature range is 5C to 30C and a maximum humidity of 50%.
- Use Precaution after Opening the Packaging  
Pay attention to the following: Required conditions after opening the package
  - Sealing
  - Temperature : 5 ~ 40°C Humidity : less than 30%
- Radioactive exposure is not considered for the products listed here in.
- This device should not be used in any type of fluid such as water, oil, organic solvent and etc.  
When washing is required, IPA (Isopropyl Alcohol) should be used.
- When the LEDs are in operation the maximum current should be decided after measuring the package temperature.
- LEDs must be stored properly to maintain the device. If the LEDs are stored for 3 months or more after being shipped from SSC, a sealed container with vacuum atmosphere should be used for storage.
- The appearance and specifications of the product may be modified for improvement without notice.
- Long time exposure of sunlight or occasional UV exposure will cause silicone discoloration.
- Attaching LEDs, do not use adhesives that outgas organic vapor.

## Handling of Silicone resin LEDs

Notes for handling:

- Avoid touching silicone resin parts especially with sharp tools such as Pincette (Tweezers)
- Avoid leaving fingerprints on silicone resin parts and wire pads.
- Silicone resin will attract dust so use covered containers for storage.
- It is not recommend to cover the silicone resin of the LEDs with other resin (epoxy, urethane, etc)