



Specification HBFR113-S

SSC		CUSTOMER
Drawn	Approval	Approval

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HBFR113-S

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Description

- Small size suitable for compact appliances.
- Surface-mounted chip LED device.
- Pb-free and RoHS complaint component.
- Tape and Reel packing.
- Increases the life time of battery.



Features

- 1.6(W) X 0.8(D)X 0.5(T)mm
- Emitted Color : Red/Blue
- Red: 625 nm
Blue: 470 nm

Applications

- Cellular phone's keypad lightning
- Other decoration lighting
- Information Boards
- Lighting for Small Size Device.

1. Absolute maximum ratings

(Ta=25°C)

Parameter	Symbol	Value		Unit
Power Dissipation	P _d	Blue	66	mW
		Red	72	
Forward Current	I _F	Blue	20	mA
		Red	30	
Peak Forward Current	I _{FM} *1	Blue	50	mA
		Red	60	
Reverse Voltage	V _R	5		V
Operation Temperature	T _{opr.}	-30 ~ 85		°C
Storage Temperature	T _{stg.}	-40 ~ 100		°C

*1 I_{FM} conditions: Pulse width Tw≤0.1ms and Duty ratio≤1/10.

2. Electro-Optical Characteristics

(Ta=25°C)

Parameter-	Symbol	Condition	Color	Min	Typ	Max	Unit
Forward Voltage	V _F	I _F =5 mA	Blue	2.6	2.9	3.3	V
			Red			2.4	
Reverse Current	I _R	V _R =5V	Blue			10	μA
			Red	-	-	10	
Luminous Intensity*2	I _V	I _F =5 mA	Blue	15	22	-	mcd
			Red	20	30	-	
Dominant Wavelength	λ _D	I _F =5 mA	Blue	462	470	475	nm
			Red	615	625	635	
Viewing Angle*3	2θ _{1/2}	I _F =5 mA	Blue	-	120	-	°
			Red		120		

*2 The luminous intensity I_V is measured at the peak of the spatial pattern which may not be aligned with the mechanical axis of the LED package.

*3 θ_{1/2} is the off-axis where the luminous intensity is 1/2 the peak intensity.

[Note] All products confirm to the listed minimum and maximum specifications for electric and optical characteristics, when operated at 20mA within the maximum ratings shown above. All measurements were made under the standardized environment of SSC.

(Tolerance : I_v ±10 %, λ_D ±2 nm, V_F ±0.1 V)

Rev. 00

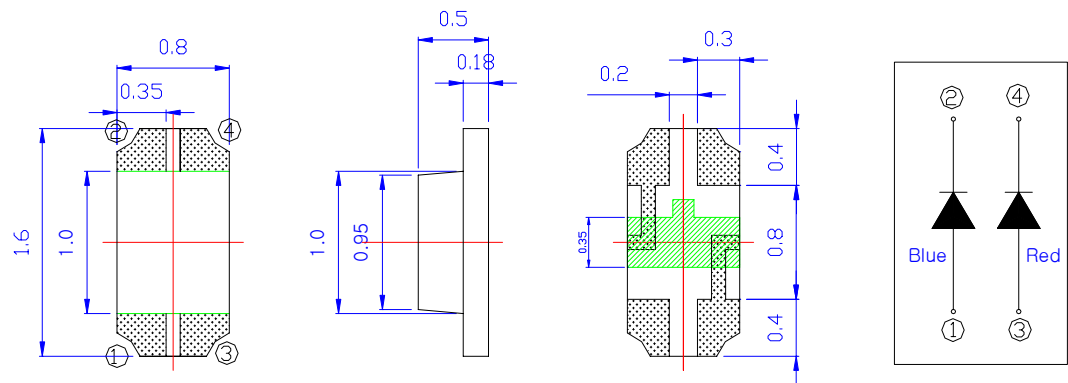
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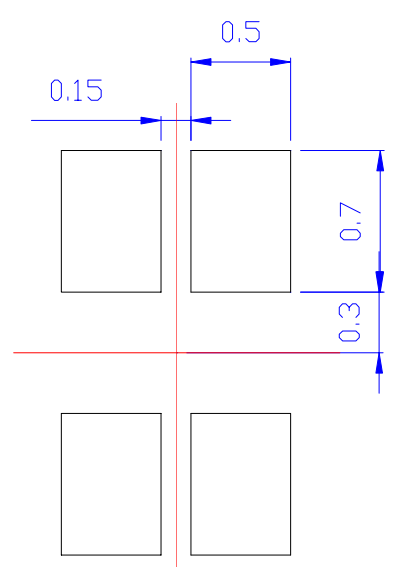
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3.Outline Dimension

(Tolerance: ± 0.1 , Unit: mm)



- Recommended Soldering Design



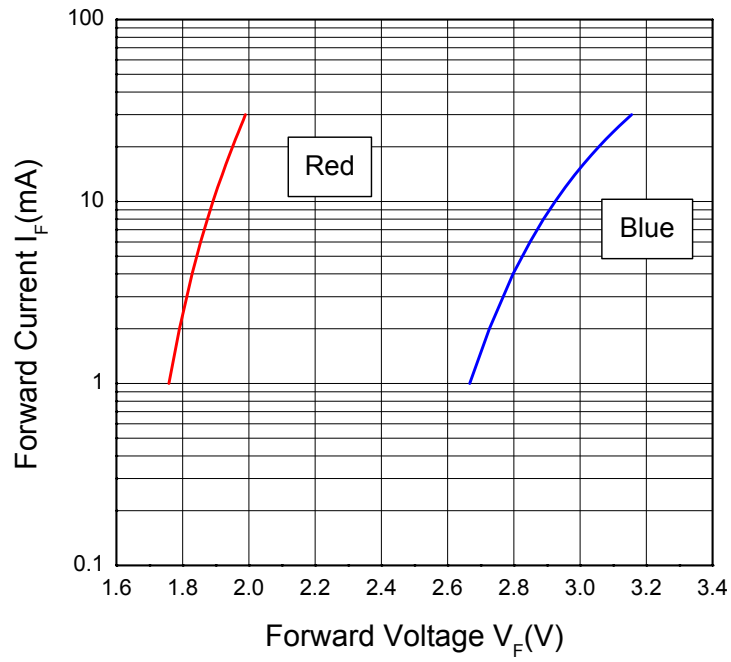
* MATERIALS

PARTS	MATERIALS
Package	BT Resin
Encapsulating Resin	Epoxy Resin
Electrodes	Au Plating Copper Alloy

4. Electro-Optical characteristic Diagram

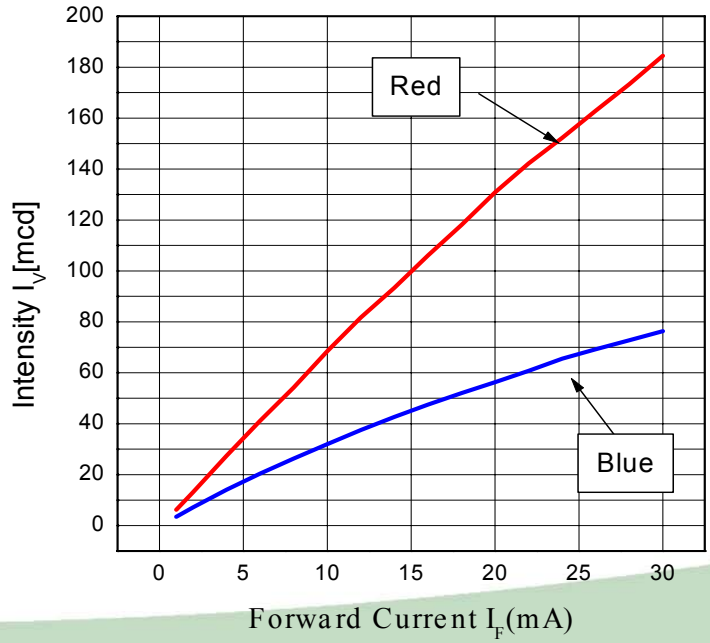
Forward Current vs. Forward Voltage (per die)

($T_a=25\text{ }^\circ\text{C}$)

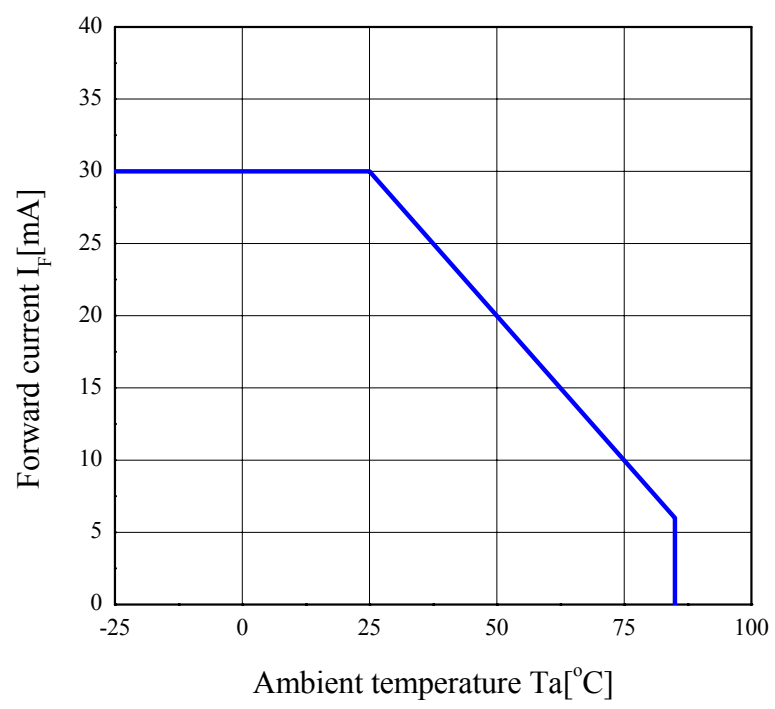


Relative Luminous Intensity vs Forward Current

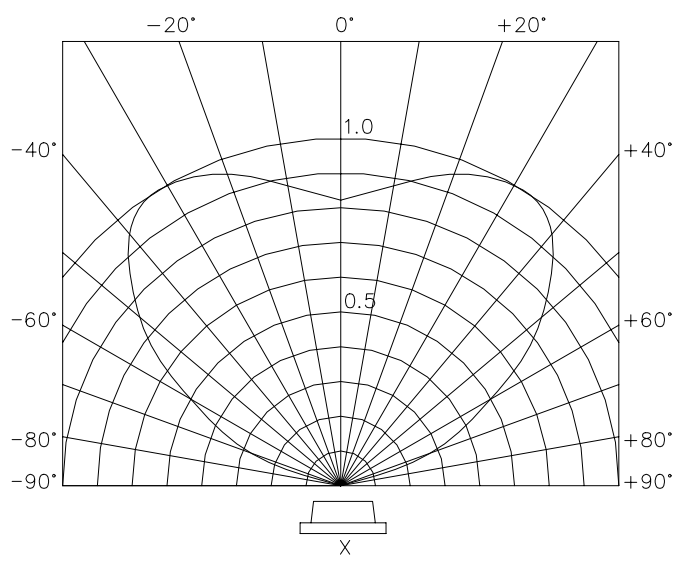
($T_a=25\text{ }^\circ\text{C}$)



Ambient Temperature vs. Allowable Forward Current (per die)



Radiation Diagram



5. Rank Division

V _F [V] (I _F =5mA)		I _v [mcd] (I _F =5mA)		WLD[nm] (I _F =5mA)		Bin
RED	Blue	RED	Blue	RED	Blue	
1.70~2.40 (B)	2.7~2.9(B)	20~50 (B)	15~40 (B)	615~635 (B)	465~470 (B)	01
					470~475 (C)	02
	2.9~3.1(C)	20~50 (B)	15~40 (B)	615~635 (B)	465~470 (B)	03
					470~475 (C)	04
	3.1~3.3 (D)	20~50 (B)	15~40 (B)	615~635 (B)	465~470 (B)	05
					470~475 (C)	06

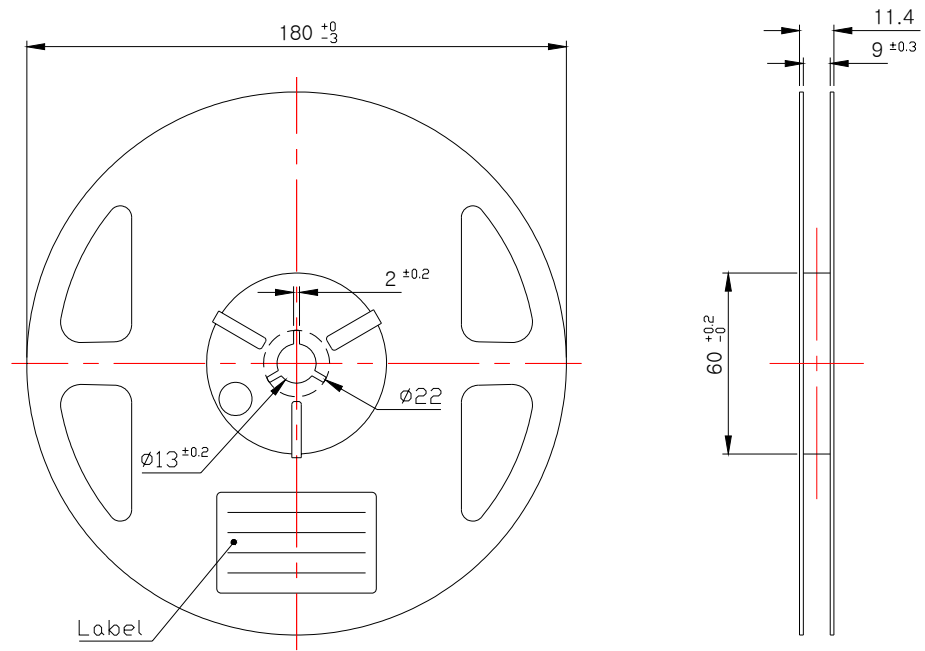
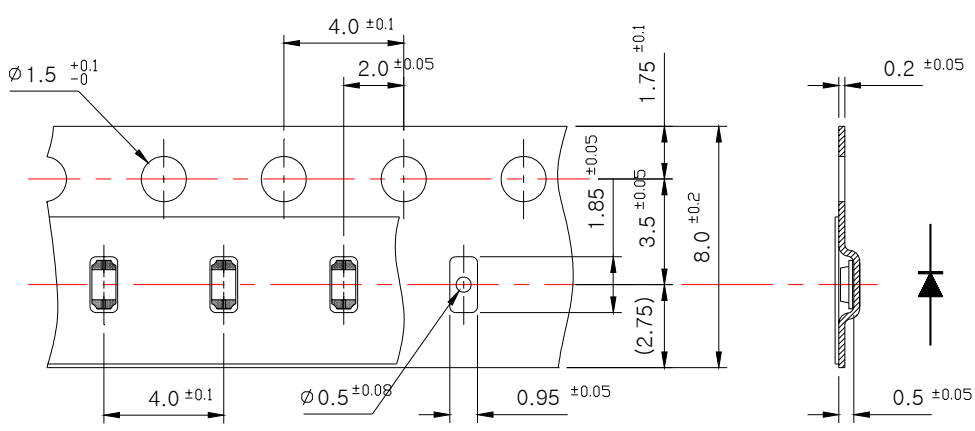
6. Reliability Tests

Item	Condition	Note	Flailed	Pass
On-Off Operating Life of High Humidity Heat	10mA, 2s, On/Off 60℃, 90%RH	100,000cycle	0/22	O.K
Reflow Test	85℃85%24hrs => Reflow 3 times(Max260℃10sec)=> thermal shock	500 hr	0/22	O.K

< Judging Criteria For Reliability Tests >

Item	Criteria for Judgment
Iv	< Initial * 0.5
Vf	< Initial ± 0.1V

7. Packing

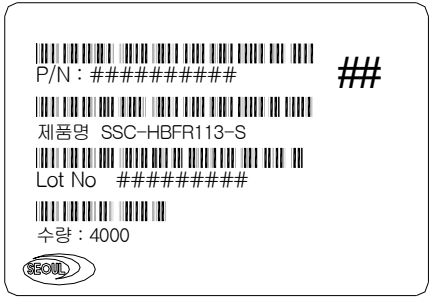
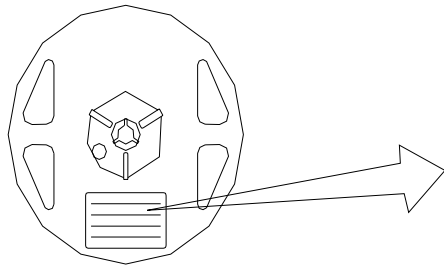


Tolerance: ± 0.2 , Unit: mm

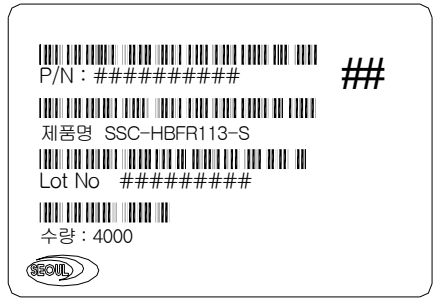
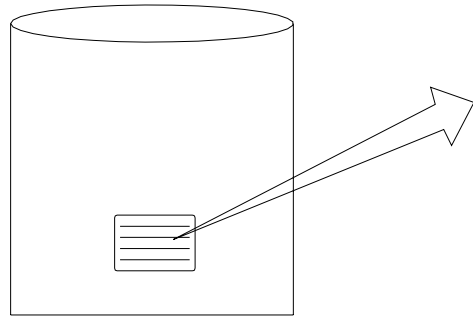
- (1) Quantity: 4,000pcs./Reel
- (2) Cumulative Tolerance: Cumulative Tolerance/10pitches to be ± 0.2 mm
- (3) Adhesion Strength of Cover Tape: Adhesion strength to be 0.1-0.7N when the over tape is turned off from the carrier tape at 10° angle to be the carrier tape.
- (4) Package: P/N, Manufacturing data Code No. and quantity to be indicated on a damp proof Package.

● Reel Packing Structure

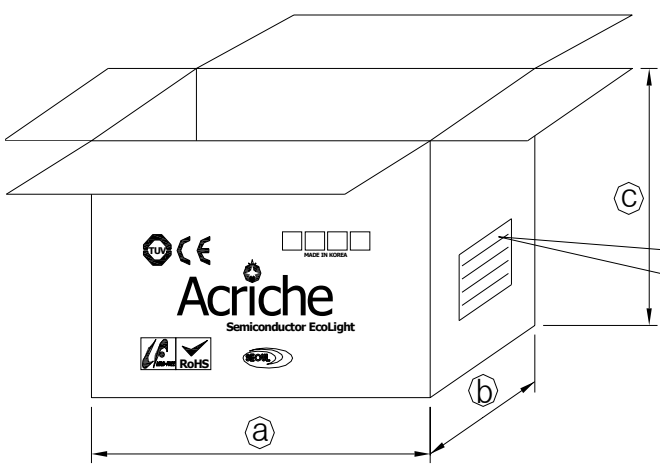
Reel



Aluminum Vinyl Bag

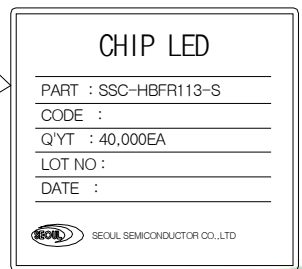


Outer Box



*Material : Paper (SW3B(B))

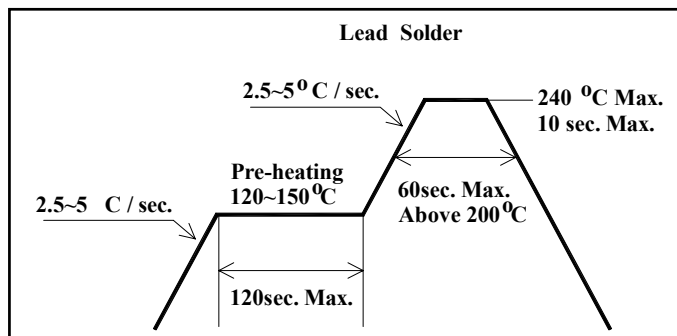
TYPE	SIZE(mm)		
	a	b	c
7inch	245	220	142



8. Soldering

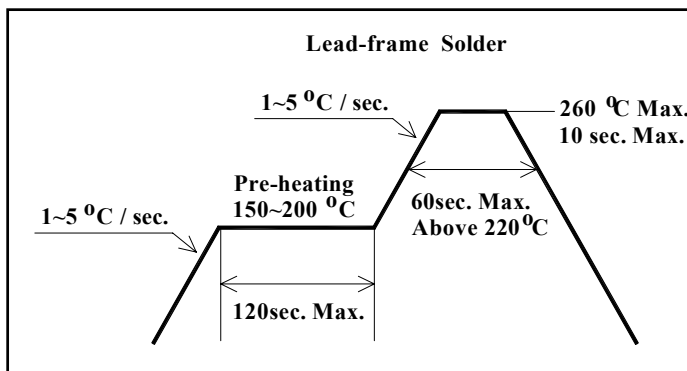
(1) Lead Solder

Lead Solder	
Pre-heat	120~150℃
Pre-heat time	120 sec. Max.
Peak-Temperature	240℃ Max.
Soldering time Condition	10 sec. Max.



(2) Lead-Free Solder

Lead Free Solder	
Pre-heat	150~200℃
Pre-heat time	120 sec. Max.
Peak-Temperature	260℃ Max.
Soldering time Condition	10 sec. Max.



(3) Hand Soldering conditions

Do not exceed 3 seconds at maximum 280℃ under soldering iron.

(4) The encapsulated material of the LEDs is silicone.

Precautions should be taken to avoid the strong pressure on the encapsulated part.

So when using the chip mounter, the picking up nozzle that does not affect the silicone resin should be used.

Note : In case that the soldered products are reused in soldering process, we don't guarantee the products.

9. Precaution for use

(1) Storage

In order to avoid the absorption of moisture, it is recommended to store in a dry box (or a desiccator) with a desiccant. Otherwise, to store them in the following environment is recommended.

Temperature : 5°C ~30°C Humidity : maximum 65%RH

(2) Attention after open.

LED is correspond to SMD, when LED be soldered dip, interfacial separation may affect the light transmission efficiency, causing the light intensity to drop. Attention in followed;

a. After opened and mounted the soldering shall be quickly.

b. Keeping of a fraction

Temperature : 5 ~ 40°C Humidity : less than 30%

(3) In the case of more than 1 week passed after opening or change color of indicator on desiccant, components shall be dried 10-12hr. at 60±5°C.

(4) Any mechanical force or any excess vibration shall not be accepted to apply during cooling process to normal temperature after soldering.

(5) Quick cooling shall be avoided.

(6) Components shall not be mounted on warped direction of PCB.

(7) Anti radioactive ray design is not considered for the products.

(8) This device should not be used in any type of fluid such as water, oil, organic solvent etc. When washing is required, IPA should be used.

(9) When the LEDs are illuminating, operating current should be decided after considering the ambient maximum temperature.

(10) LEDs must be stored to maintain a clean atmosphere. If the LEDs are stored for 3 months or more after being shipped from SSC, a sealed container with a nitrogen atmosphere should be used for storage.

(11) The LEDs must be soldered within seven days after opening the moisture-proof packing.

(12) Repack unused products with anti-moisture packing, fold to close any opening and then store in a dry place.

(13) The appearance and specifications of the product may be modified for improvement without notice.