

*Customer:

SPECIFICATION

ITEM	TOP LED DEVICE
MODEL	SSC-HBMGFRT821

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1. Features

- Pb-free Reflow Soldering application
- RoHS Compliant
- Material : InGaN(Blue) / InGaN(Green) / AlInGaP(Red)
- 6-Pin (R,G,B separate) type
- Suitable for all SMT assembly methods ; Suitable for all soldering methods
- White colored SMT package and colorless clear window

2. Application

- Indoor and outdoor displays
- LCD Backlights etc.
- R G B – displays
- Indicator

3. Absolute Maximum Ratings ^{*1}

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

Parameter	Symbol	Value			Unit
		Red	Y/Green	Blue	
Forward Current	I_F	30	30	30	mA
Forward Peak Surge Current ^{*2}	I_{FM}	100	100	100	mA
Reverse Voltage (per die)	V_R	5			V
Power Dissipation	P_d	81 ^{*3}	120 ^{*3}	114 ^{*3}	mW
		263 ^{*4}			
Operating Temperature	T_{opr}	-40 ~ +100			°C
Storage Temperature	T_{stg}	-40 ~ +100			°C

*1 Care is to be taken that power dissipation does not exceed the absolute maximum rating of the product.

*2 I_{FM} was measured at $T_w \leq 1\text{msec}$ of pulse width and $D \leq 1/10$ of duty ratio.

*3 The value for one LED device.(Single color)

*4 The value for total power dissipation when two and more devices are lit simultaneously.

4. Electro-Optical Characteristics

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit	
Forward Voltage	Red	V_F	$I_F=12\text{mA}$	1.7	1.9	2.6	V
	Green		$I_F=20\text{mA}$	2.8	3.3	4.1	
	Blue		$I_F=20\text{mA}$	2.8	3.3	4.0	
Reverse Current	Red	I_R	$V_R=5\text{V}$	-	-	10	μA
	Green			-	-	10	
	Blue			-	-	10	
Luminance Intensity ^{*1}	Red	I_V	$I_F=12\text{mA}$	130	240	350	mcd
	Green		$I_F=20\text{mA}$	300	500	700	
	Blue		$I_F=20\text{mA}$	60	165	270	
Peak Wavelength	Red	λ_P	$I_F=12\text{mA}$	-	632	-	nm
	Green		$I_F=20\text{mA}$	-	520	-	
	Blue		$I_F=20\text{mA}$	-	459	-	
Dominant Wavelength	Red	λ_d	$I_F=12\text{mA}$	618	625	632	nm
	Green		$I_F=20\text{mA}$	519	527	537	
	Blue		$I_F=20\text{mA}$	464	470	477	
Spectral Bandwidth	Red	$\Delta\lambda$	$I_F=12\text{mA}$	-	20	-	nm
	Green		$I_F=20\text{mA}$	-	35	-	
	Blue		$I_F=20\text{mA}$	-	26	-	
Viewing Angle ^{*2}	R, G, B	$2\theta_{1/2}$	$I_F=52\text{mA}$ Total	-	120	-	deg.

*1 The luminous intensity I_V was measured at the peak of the spatial pattern which may not be aligned with the mechanical axis of the LED package.
Luminous Intensity Measurement allowance is $\pm 10\%$

*2 $2\theta_{1/2}$ is the off-axis where the luminous intensity is 1/2 of the peak intensity.

[Note] All measurements were made under the standardized environment of SSC.

5. Rank of HBMGFRT821

■ Rank Name

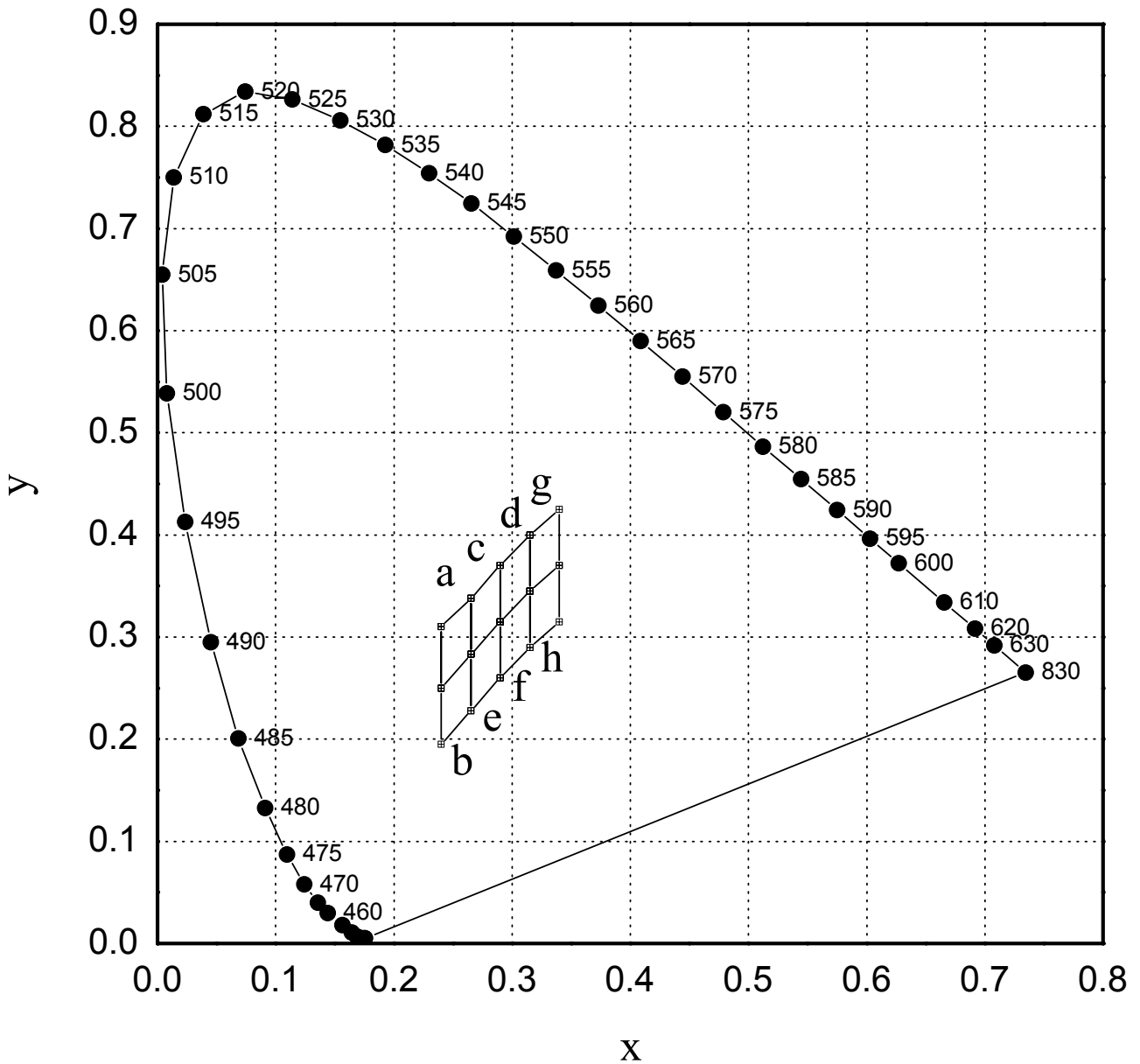
X₁	X₂
W rank	Total Iv

■ Luminous Intensity

Rank Name	Total Iv	
	MIN	MAX
1	600	800
2	800	1000
3	1000	1200

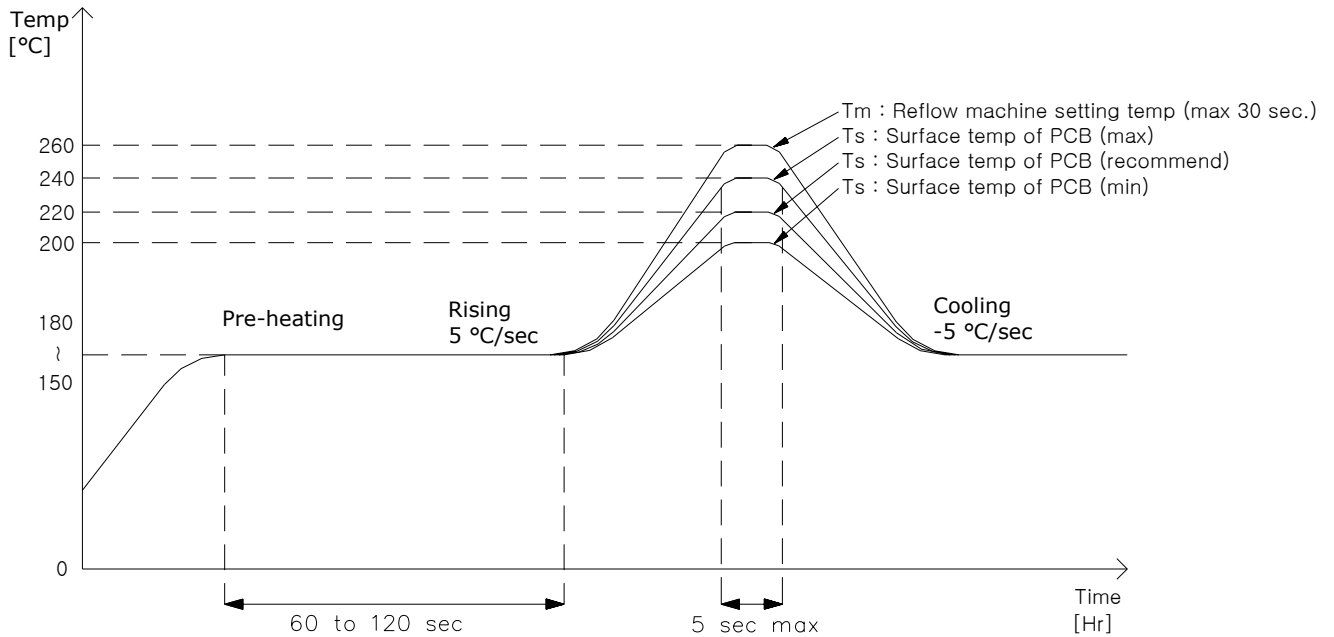
WHITE RANK	White Color Coordinates			
	x1	x2	x3	x4
	y1	y2	y3	y4
	a	0.24	0.24	0.265
	0.31	0.250	0.283	0.338
b	0.24	0.24	0.265	0.265
	0.250	0.195	0.228	0.283
c	0.265	0.265	0.29	0.29
	0.338	0.283	0.315	0.370
d	0.265	0.265	0.29	0.29
	0.283	0.228	0.260	0.315
e	0.29	0.29	0.315	0.315
	0.370	0.315	0.345	0.400
f	0.29	0.29	0.315	0.315
	0.315	0.260	0.290	0.345
g	0.315	0.315	0.34	0.34
	0.400	0.345	0.370	0.425
h	0.315	0.315	0.34	0.34
	0.345	0.290	0.315	0.370

6. Color Coordinates



7. Soldering Profile

(1) Reflow Soldering Conditions / Profile (Lead Free Solder)



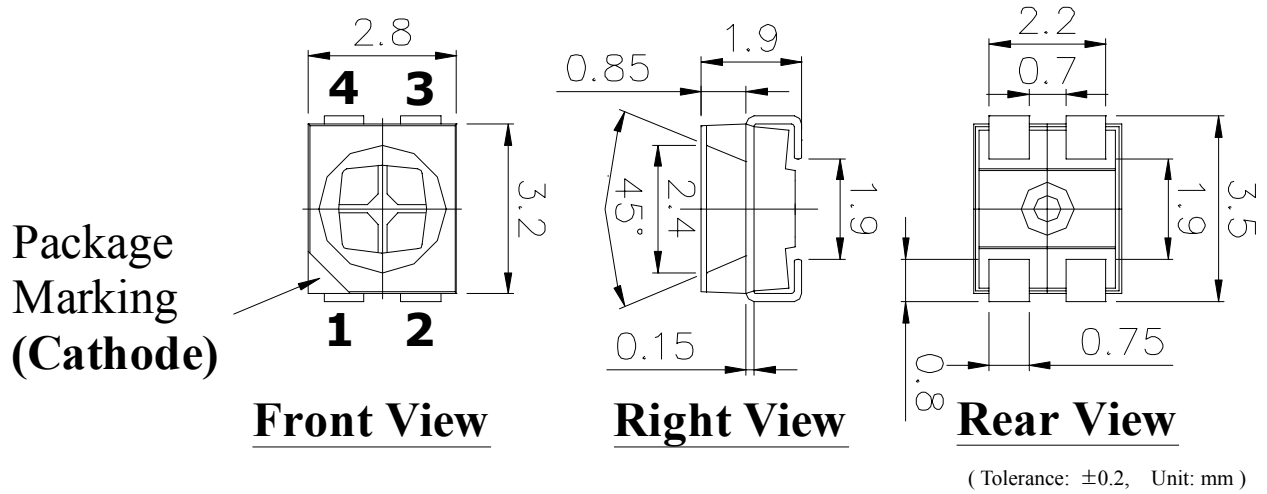
(2) Hand Soldering conditions

Do not exceed 4 seconds at maximum 315°C under soldering iron.

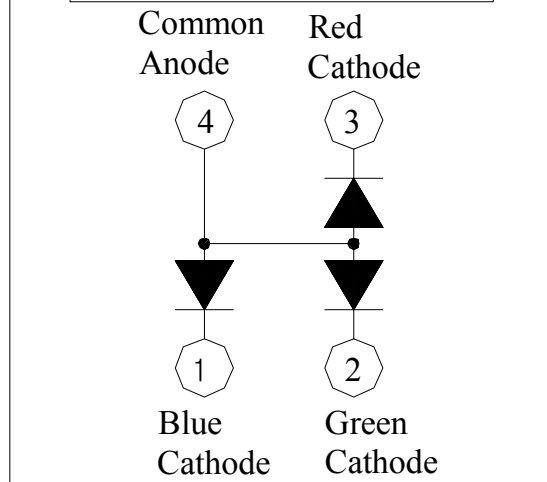
Note : In case that the soldered products are reused in soldering process, we don't guarantee the products.

8. Outline Dimension And Material

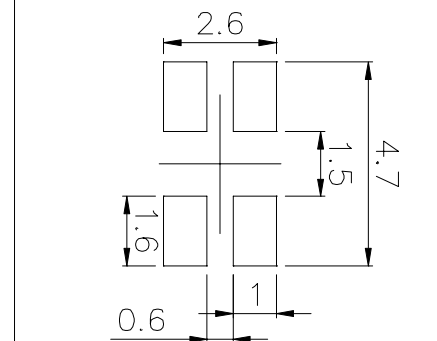
Package Outlines



Circuit Diagram



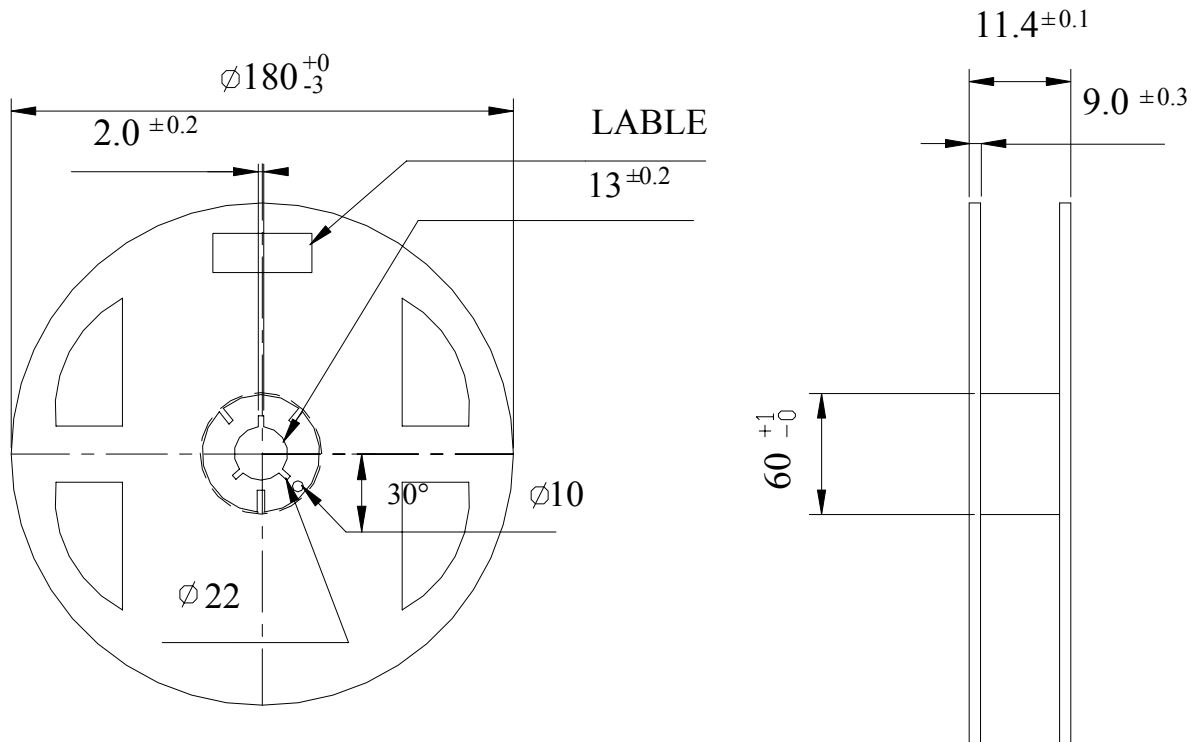
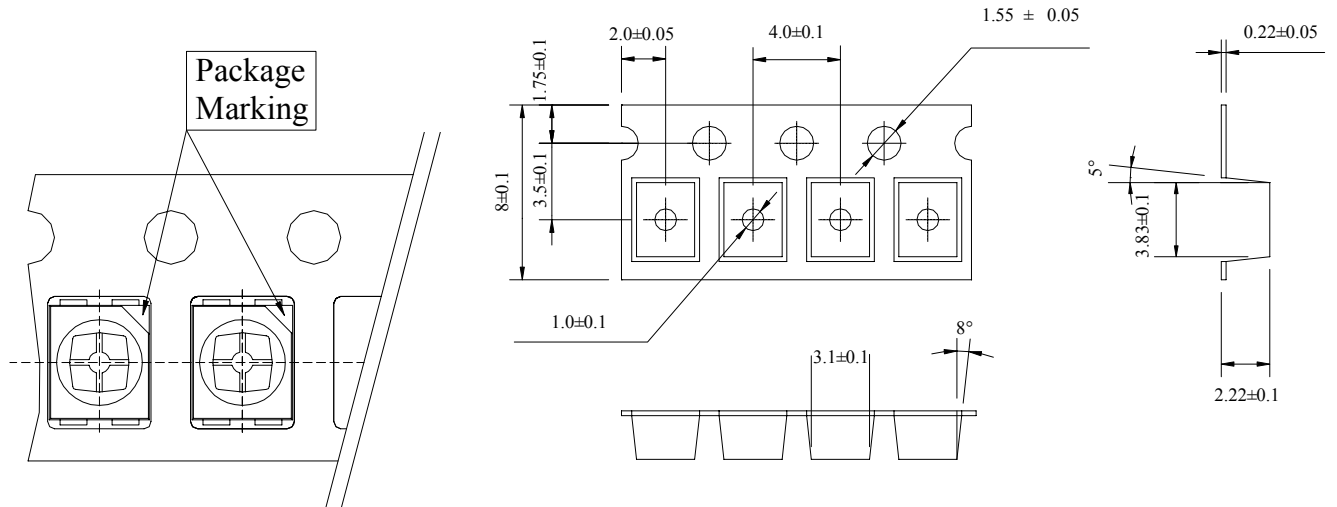
Recommended Solder Pad



* MATERIALS

PARTS	MATERIALS
Package	Heat-Resistant Polymer
Encapsulating Resin	Epoxy Resin
Electrodes	Ag Plating Copper Alloy

9. Packing

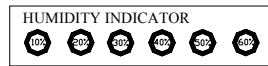
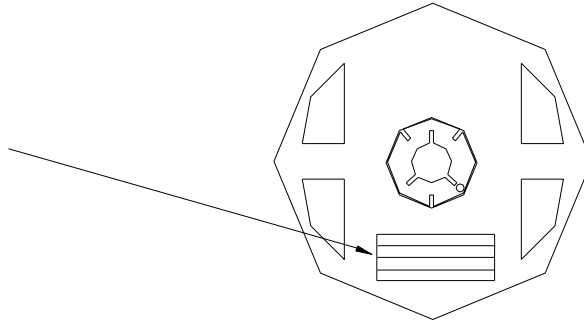
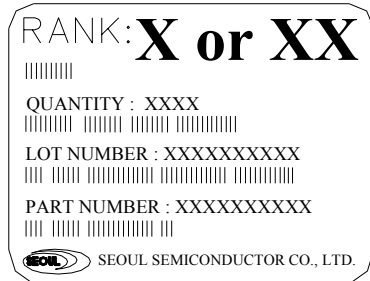


(Tolerance: ± 0.2 , Unit: mm)

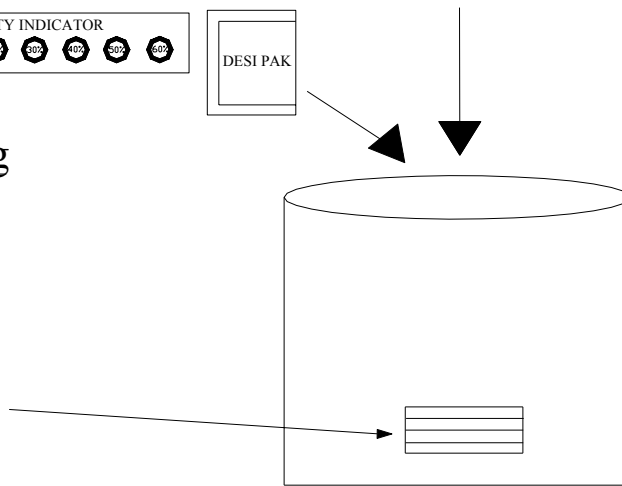
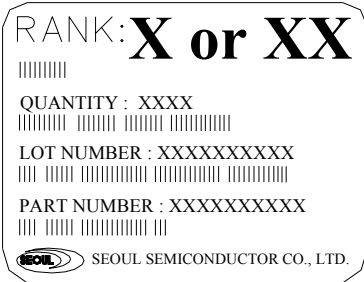
- (1) Quantity : 2000 pcs/Reel
- (2) Cumulative Tolerance : Cumulative Tolerance/10 pitches to be $\pm 0.2\text{mm}$
- (3) Adhesion Strength of Cover Tape : Adhesion strength to be 0.1-0.7N when the cover tape is turned off from the carrier tape at the angle of 10° to the carrier tape
- (4) Package : P/N, Manufacturing data Code No. and quantity to be indicated on a damp proof Package

10. Reel Packing Structure

Reel



Aluminum Vinyl Bag

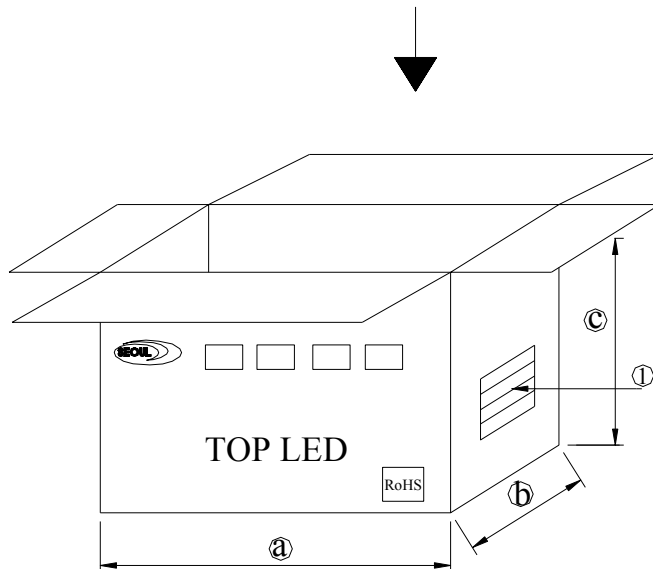
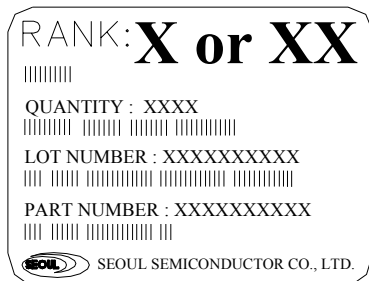


Outer Box Structure

Material : Paper(SW3B(B))

TYPE	SIZE (mm)		
	Ⓐ	Ⓑ	Ⓒ
7inch	245	220	142

① SIDE



11. Lot Number

The lot number is composed of the following characters;

HBM○□□◎◎ #~#

HBM **First Part Name**

○ **Year** (6 for 2006, 7 for 2007, 8 for 2008)

□□ **Month** (01 for Jan., 02 for Feb.,.....11 for Nov., 12 for Dec.)

◎◎ **Day** (01, 02, 03, 04,28, 29, 30, 31.)

#~# **The number of the internal quality control**

RANK: **X or XX**

|||||||

QUANTITY : 2000

||||||| ||||| ||||| |||||

LOT NUMBER : HBMGFRT70322 01 512

|||| |||| ||||| ||||| ||||| ||||| ||||| ||||| |||||

PART NUMBER : HBMGFRT821

|||| ||||| ||||| ||||| |||||

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12. 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 70%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;

Keeping of a fraction

Temperature : 5 ~ 40°C Humidity : less than 10%

(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 $60\pm 5^{\circ}\text{C}$.

(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.

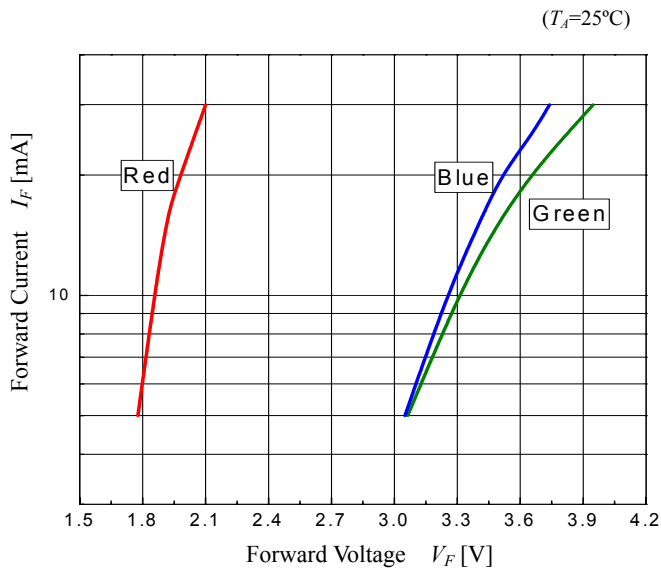
(10) The LEDs must be soldered within seven days after opening the moisture-proof packing.

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

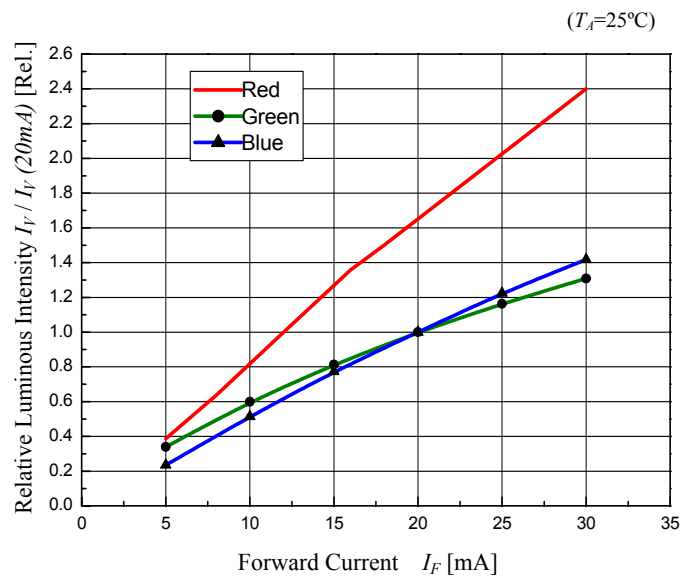
(12) The appearance and specifications of the product may be modified for improvement without notice.

13. Characteristic Diagram

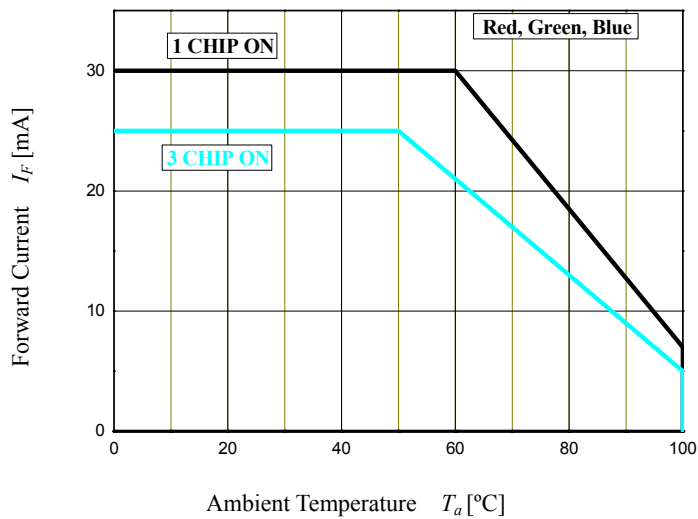
Forward Current vs. Forward Voltage



Relative Luminous Intensity vs. Forward Current



Forward Current Derating Curve



Radiation Diagram

