

SPECIFICATION
MODEL : SPHWWTHDD005



[Approved Rank : $V_F(34.4)$, CCT(2700), $I_{mV}(390)$]

HV-DC WA4 LED

CUSTOMER :		
DRAWN	CHECKED	APPROVED
PRELIMINARY		

SAMSUNG LED		
DRAWN	CHECKED	APPROVED

SAMSUNG LED CO.,LTD.
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1. Product Outline

1) Features

- 8W HVDC LED : 18.0 x 13.5 x t 6.4 (mm)
- Wide Beam Angle ($\Delta\theta$: 120° x 120°) for uniform illuminance
- InGaN/GaN MQW LED with long-time reliability
- Lead (Pd) free product – RoHS compliant

2) Applications

- Substitution for Incandescent lamp
- Substitution for Fluorescent lamp
- Substitution for Signal lamp
- Other applications

2. Absolute Maximum Rating

- 1) Operation Forward Current ($T_a = 25^\circ\text{C}$) 230 mA
- 2) Flash Mode Peak Pulsed Forward Current 250 mA
(Pulse width $t \leq 10\text{msec}$, Duty ratio=0.06, $T_a=25^\circ\text{C}$)
- 3) Thermal Resistance ($R_{\text{th,j-s}}$) 2.23°C/W
- 4) LED Junction Temperature (T_J) 150°C
- 5) Operating Temperature Range (T_{opr}) -40°C ~ 80°C
- 6) Storage Temperature Range (T_{stg}) -40°C ~ 100°C

3. Characteristics

1) Electro-Optical characteristics

a) Warm White

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

Item	Unit	Condition	Rank	Min	Typ	Max
Luminous Flux	lm	$I_F = 222 \text{ mA}^{1)}$	-	350	390 ²⁾	430
Forward Voltage (V_F)	V ³⁾	$I_F = 222 \text{ mA}$	-	33.4	34.4	35.4
CCT	K	$I_F = 222 \text{ mA}$	-	2550	2700 ⁴⁾	2850
CRI		$I_F = 222 \text{ mA}$	-	80		
View Angle ⁵⁾	°				120°	
Size	mm			18.0 x 13.5 x 6.4 ⁶⁾		

Notes:

- 1) Samsung LED tested in pulsed condition. $T_J=25^\circ\text{C}$, pulse width is 10ms at rated test current because of LED Thermal degradation. (Thermal degradation factor is depend on chip and package parameters)
- 2) Samsung LED has $\pm 10\%$ tolerance of flux measurements.
- 3) Samsung LED has $\pm 5\%$ tolerance of forward voltage measurements.
- 4) Samsung LED has $\pm 5\%$ tolerance of CCT measurements.
- 5) Samsung LED tested in DC=222mA when luminous flux is saturated.
- 6) Samsung LED has $\pm 0.15 \text{ mm}$ tolerance on device dimensions.

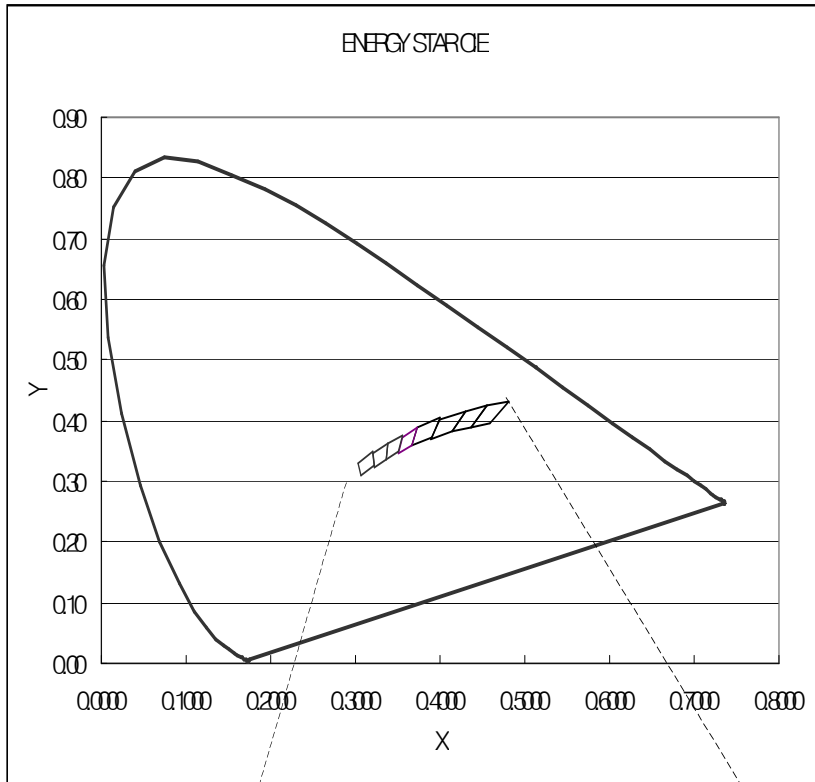
2) Electro-Optical characteristics

Model	If (mA)	Vf (V)	Flux (lm)	Lm/W	CRI
3W	90	33.9	330	101	80+
4W	116	34.4	392	98	80+
5W	143	34.9	470	94	80+
6W	170	35.2	550	92	80+
7W	196	35.6	630	90	80+
8W	222	35.9	700	87.5	80+

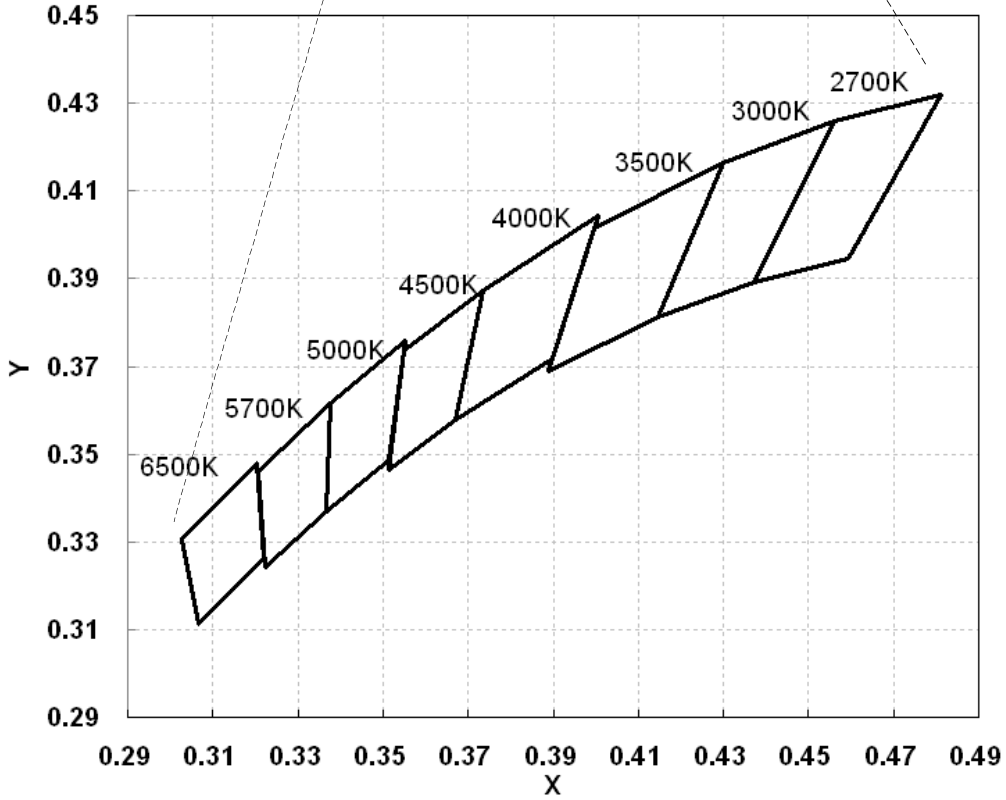
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3) Chromaticity Diagram

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



CIE Diagram

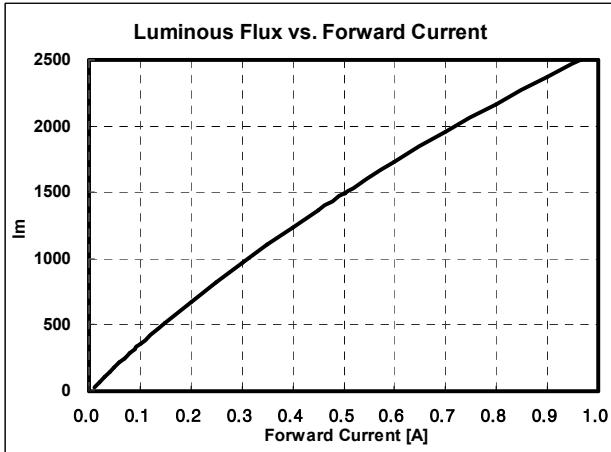


4. Typical Characteristics Graph

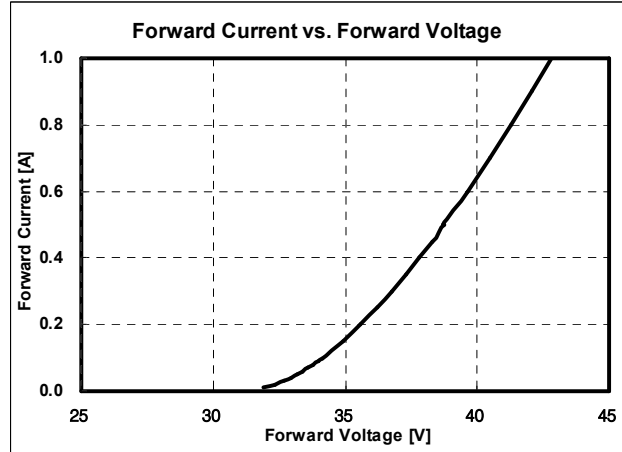
* These graphs show typical values.

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

Luminous Flux vs. Forward Current

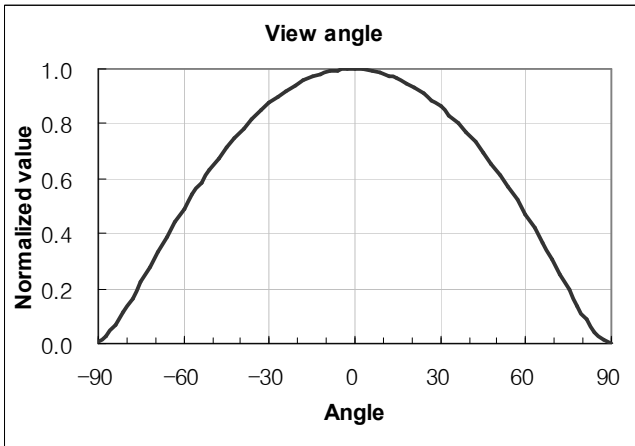


Forward Current vs. Forward Voltage

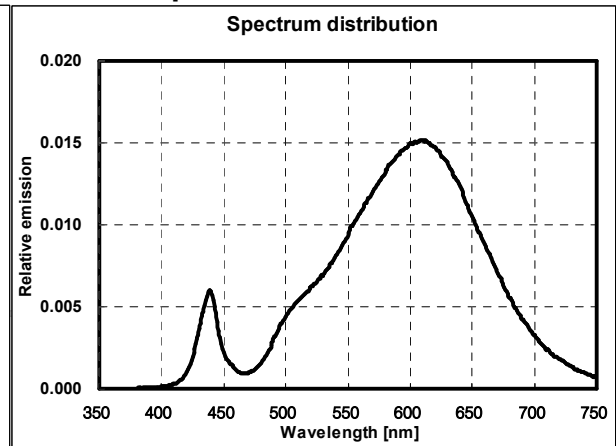


NOTE : Kiethley max current 1A (compliance 63v)

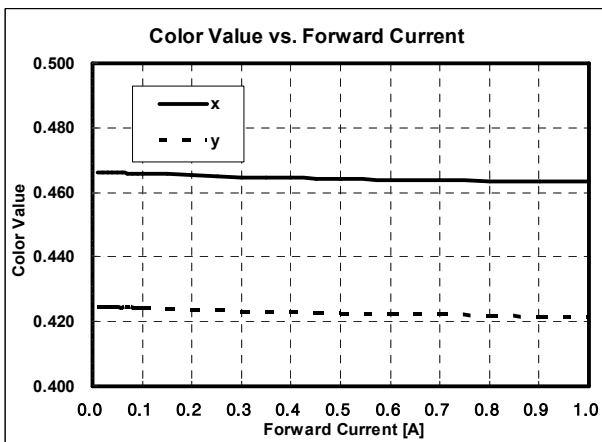
Radiation Pattern



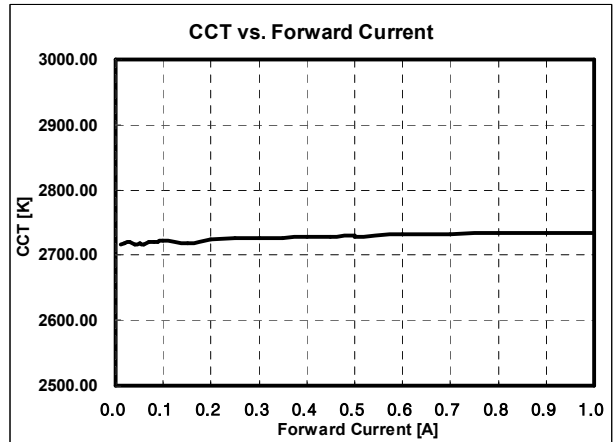
Relative Spectral Emission

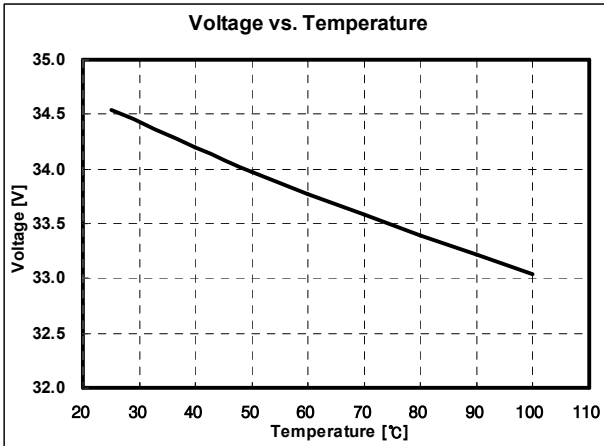
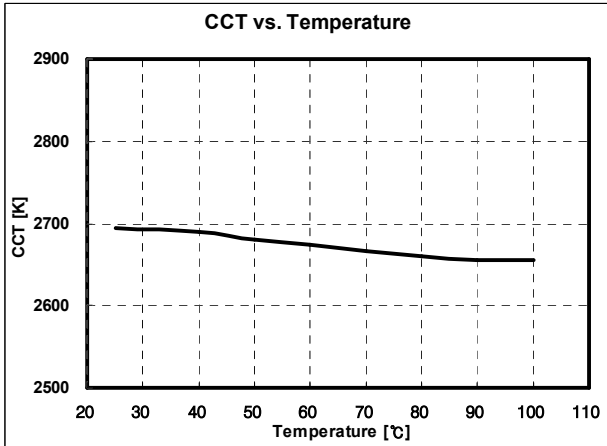


Color x,y vs. Forward current



CCT vs. Forward current

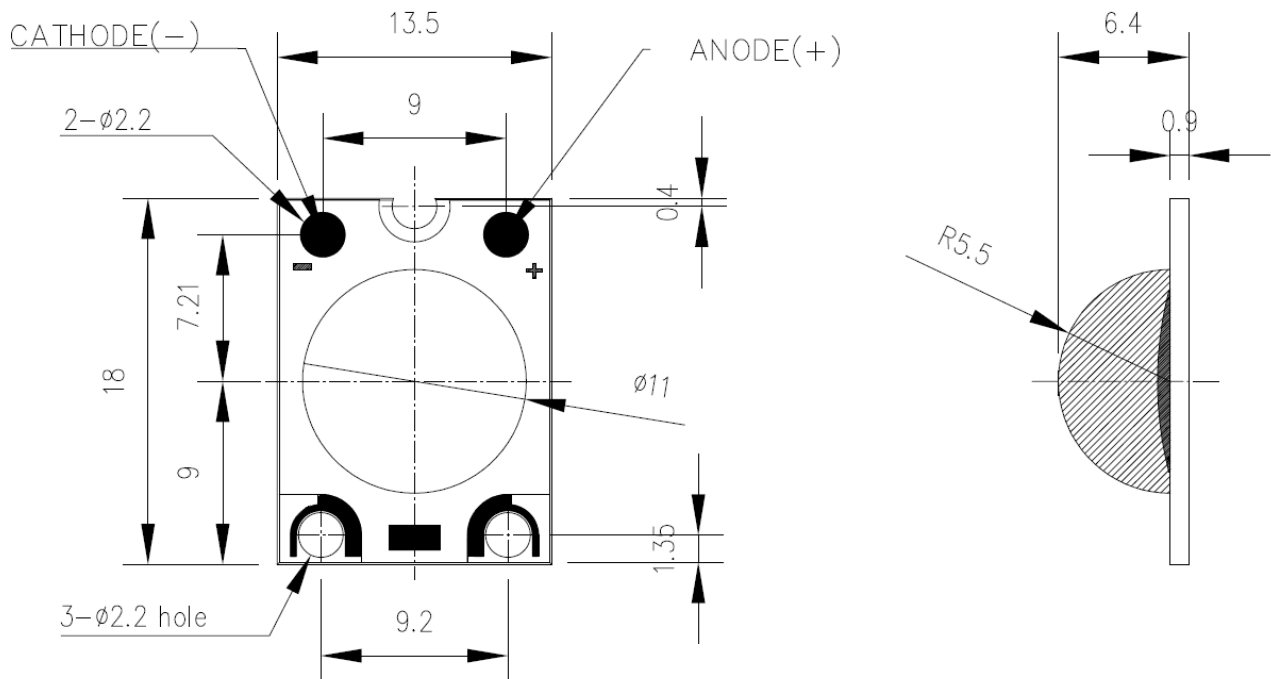


Voltage vs. Temperature**CCT vs. Temperature**

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5. Outline Drawing & Dimension

unit : mm

Tolerance : ± 0.15 

* This LED has built-in ESD protection device(s) connected in parallel to LED chip(s).

PRELIMINARY

6. Reliability Test Items and Conditions

1) Test Items

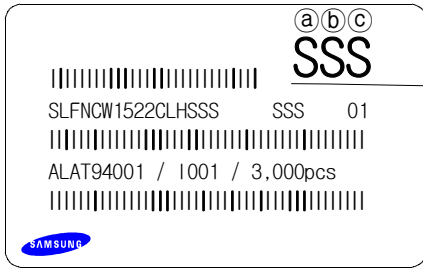
Test Items	Test Conditions	Test Hours/Cycles
Room Temperature life test	25°C, DC 116 mA	1,000 h
High Temperature humidity life test	85°C, 85% RH, DC 116 mA	1,000 h
High Temperature life test	85°C, DC 116 mA	1,000 h
Low Temperature life test	-40°C, DC 116 mA	1,000 h
High Temperature Storage	120°C	1,000 h
Low Temperature Storage	-40°C	1,000 h
Thermal Shock	-40 / 120°C, each 30 min	200 cycles
Temperature humidity Cycle On/Off test	-40 / 85°C, each 20 min, 100 min transfer Power On/off each 5 min, DC 116 mA	100 cycles
Reflow (Pb-Free)	Peak 260±5°C for 10 sec	3 times
ESD(HBM)	R1 : 10 MΩ , R2 : 1.5 kΩ , C : 100 pF	5 times (± 2 kV)
Surge	Line to Line	1 kV

2) Criteria for Failure

Item	Symbol	Test Condition [T _a = 25°C]	Limit	
			Min.	Max.
Forward Voltage	V _F	116 mA	L.S.L. × 0.9	U.S.L. × 1.1
Luminous flux	Im	116 mA	L.S.L. × 0.7	U.S.L. × 1.3

* U.S.L. : Upper Standard Level L.S.L. : Lower Standard Level

7. Label Structure



Rank Code

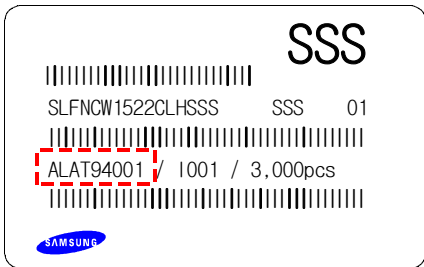
N.B) Denoted rank is the only example.

Rank Code

- Ⓐ : Forward Voltage (V_F) Rank (refer to page. 3)
- Ⓑ : Chromaticity Coordinate Rank (refer to page. 4)
- Ⓒ : Luminous Flux (Φ_V) Rank (refer to page. 3)

8. Lot Number

The Lot number is composed of the following characters



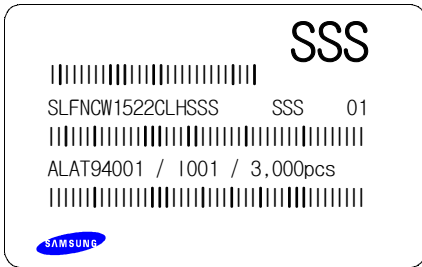
- ◎◇◆□■△▲▲ / 1▲▲▲ / 3,000PCS
- : Production Site (S:SAMSUNG LED Suwon, G:Gosin China, A:Aprosystems)
 - ◎ : L (LED)
 - ◇ : Product State (A:Normality, B: Bulk, C:First Production, R:reproduction, S:Sample)
 - ◆ : Year (S:2008, T:2009, U:2010, V:2011...)
 - : Month (1 ~ 9, A~C)
 - : Day (1 ~ 9, A, B ~ V)
 - △ : SAMSUNG LED Product number (1 ~ 999)
 - ▲ : Reel Number (1 ~ 999)

9. Tray Packing Structure

Reel



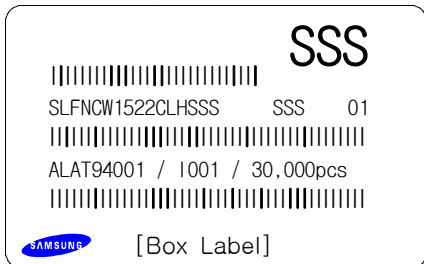
Aluminum Bag



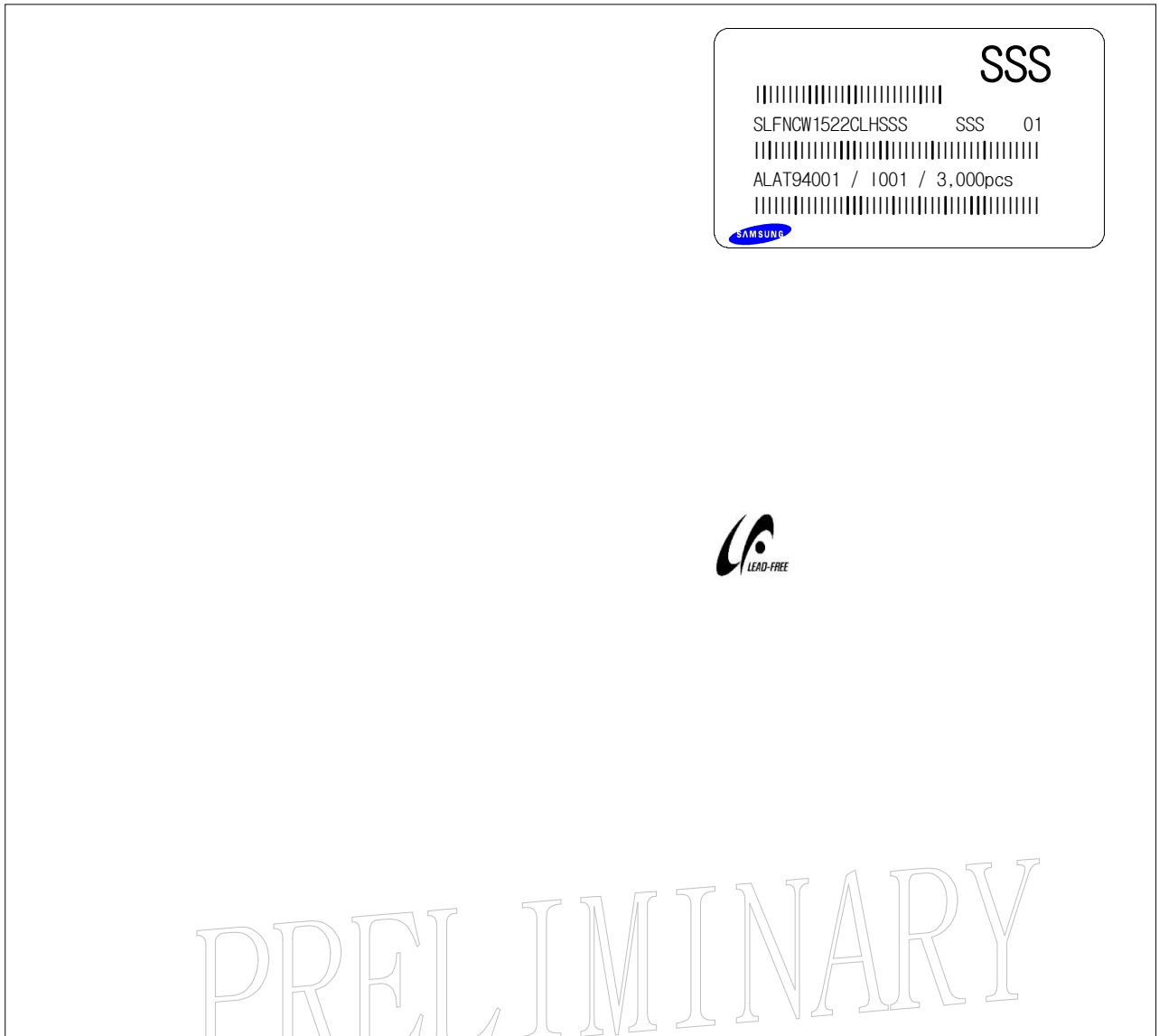
Material : Paper(SW3B(B))

TYPE	SIZE(mm)		
	a	b	c
13inch	335	335	335

① SIDE



10. Aluminum Packing Bag



Silica gel & Humidity Indicator Card in Aluminum Bag



11. Precaution for use

- 1) For overcurrent-protection, customers are recommended to apply resistors connected in series with the LEDs to mitigate sudden change of the forward current caused by shift of the forward voltage.
- 2) This device should not be used in any type of fluid such as water, oil, organic solvent, etc. When cleaning is required, IPA is recommended as cleaning agent. Solvent-based cleaning agent such as Zestron^(R) may damage the silicone resins used in the device.
- 3) When the device is in operation, the forward current should be carefully determined considering the maximum ambient temperature and the corresponding junction temperature.
- 4) LEDs must be stored in a clean environment. If the LEDs are to be stored for 3 months or more after being shipped from Samsung LED, they should be packed with a nitrogen-filled container.
(Shelf life of sealed bags: 12 months, temp. 0~40°C, 20~70%RH)
- 5) After storage bag is open, device subject to soldering, solder reflow, or other high temperature processes must be:
 - a. Mounted within 168 hours (7 days) at an assembly line with a condition of no more than 30°C/60%RH.
 - b. Stored at <10% RH.
- 6) Repack unused Products with anti-moisture packing, fold to close any opening and then store in a dry place.
- 7) Devices require baking before mounting, if humidity card reading reaches 60% at 23±5°C.
- 8) Devices must be baked for 24hours at 65±5°C, if baking is required.
- 9) The LEDs are sensitive to the static electricity and surge current. It is recommended to use a wrist band or anti-electrostatic glove when handling the LEDs.
If voltage exceeding the absolute maximum rating is applied to LEDs, it may cause damage or even destruction to LED devices.
Damaged LEDs may show some unusual characteristics such as increase in leakage current, lowered turn-on voltage, or abnormal lighting of LEDs at low current.

