

DATE OF ISSUE : 2007. 02. 06

# SPECIFICATION

MODEL : SLSNNWH815TS

MIDDLE POWER WHITE LED

CUSTOMER : \_\_\_\_\_

## Preliminary

***SAMSUNG ELECTRO MECHANICS CO., LTD***

314, MAETAN3-DONG, YEONGTONG-KU,  
SUWON-SI, KYUNGKI-DO, KOREA, 442-743

## Contents

|  |       |
|--|-------|
| 1. Product Outline                       | 3     |
| 2. Absolute Maximum Rating               | 3     |
| 3. Characteristics                       | 3~4   |
| 4. Chromaticity Diagram                  | 4     |
| 5. Typical Characteristic Graph          | 5     |
| 6. LED Package Outline Dimensions        | 6     |
| 7. Reliability Test Items and Conditions | 7~8   |
| 8. Solder Conditions                     | 8     |
| 9. Taping Dimension                      | 9     |
| 10. Reel Packing Structure               | 10    |
| 11. Label Structure                      | 11    |
| 12. Precaution for Use                   | 12    |
| 13. Hazard Substance Analysis            | 13~15 |
| 14. Revision History                     | 16    |

## ■ Product Outline

### 1) Feature

1. Lead Frame Type LED Package ( 5.2 \* 6.0 \* t 1.3mm )
2. Beam Angle (  $\Delta\theta$  : 120 ° )
3. GaN/Al<sub>2</sub>O<sub>3</sub> Chip & Long Time Reliability

### 2) Applications

- . Mobile Camera Phone, Flashlight for Camera.....
- . Channel letter, General lighting, Architectural lighting.....

## ■ Absolute Maximum Rating

- . Operation Forward Current Per Chip..... 30 mA
- . Peak Pulsed Forward Current Per Chip..... 100 mA  
(Duty 1/10 Pulse Width 10msec)
- . Operating Temperature Range ( T<sub>opr</sub> ) ..... -30°C ~ 85°C
- . Storage Temperature Range ( T<sub>stg</sub> ) ..... -40°C ~ 100°C

## ■ Characteristics

( Ta : 25°C )

|                    | Symbol         | Rank | Mn. | Typ. | Max. | Unit | Conditions            |
|--------------------|----------------|------|-----|------|------|------|-----------------------|
| Forward Voltage    | V <sub>F</sub> | S    | 2.9 | -    | 3.6  | V    | I <sub>F</sub> = 60mA |
| Luminous Intensity | I <sub>V</sub> | S    | 4   | 5.2  | -    | cd   | I <sub>F</sub> = 60mA |
| Reverse Voltage    | V <sub>R</sub> | -    | 0.5 | 1.0  | 1.5  | V    | I <sub>R</sub> = 15mA |

\* Tol erance : V<sub>F</sub>:±0.1, I<sub>V</sub>:±10%

\* Luminous intensity measuring equipment : CAS140 B

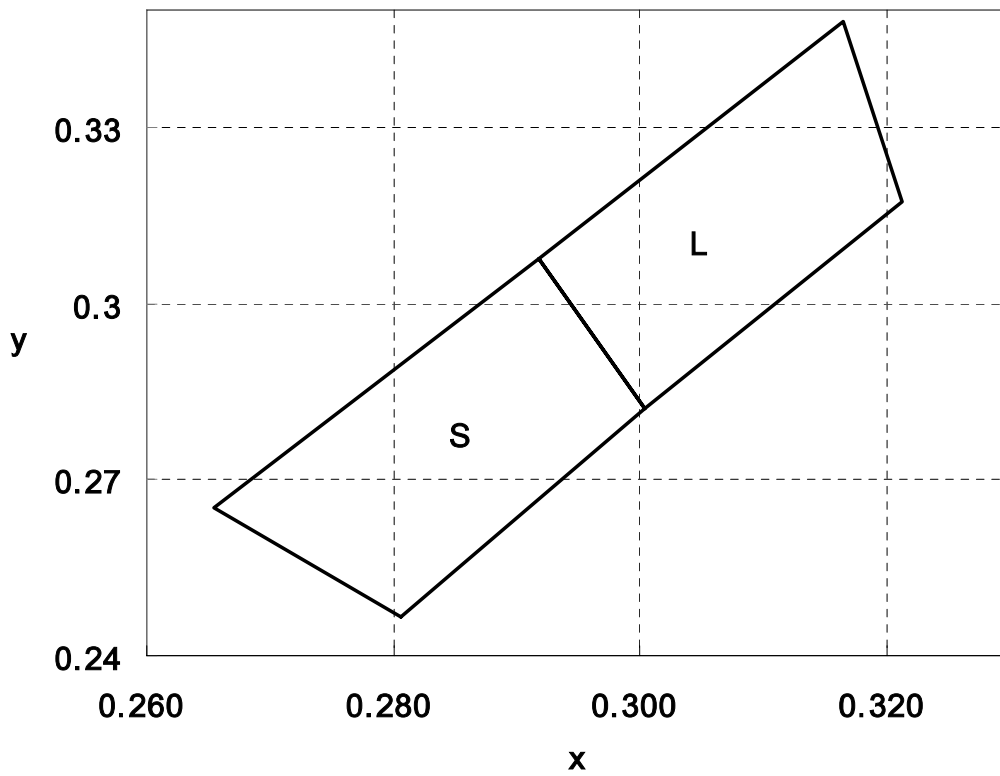
Chromaticity Coordinate

| Rank | x      |        |        |        | y      |        |        |        | Condition |
|------|--------|--------|--------|--------|--------|--------|--------|--------|-----------|
| A    | 0.2805 | 0.3005 | 0.2919 | 0.2655 | 0.2465 | 0.2820 | 0.3077 | 0.2650 | IF = 60mA |
| B    | 0.2995 | 0.3200 | 0.3165 | 0.2919 | 0.2849 | 0.3255 | 0.3480 | 0.3077 |           |

\* Tolerance :  $x,y:\pm 0.005$

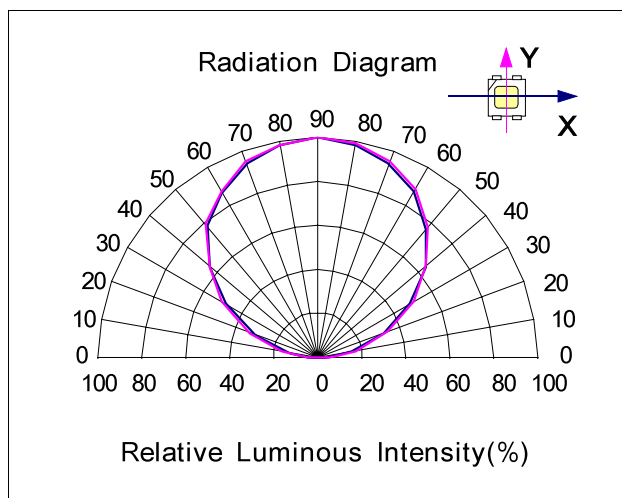
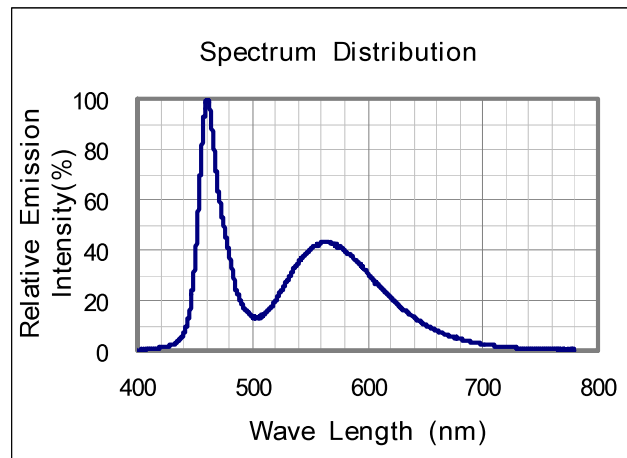
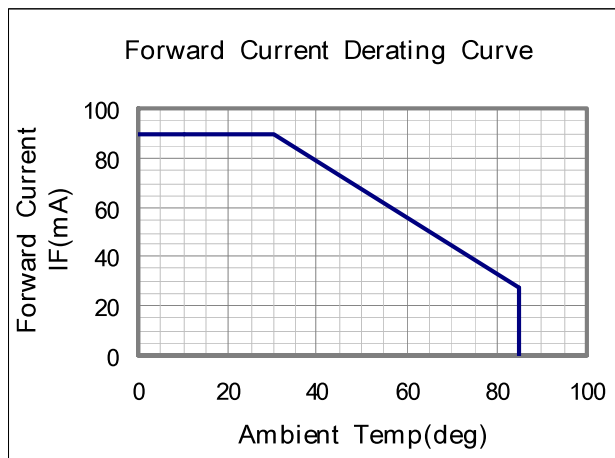
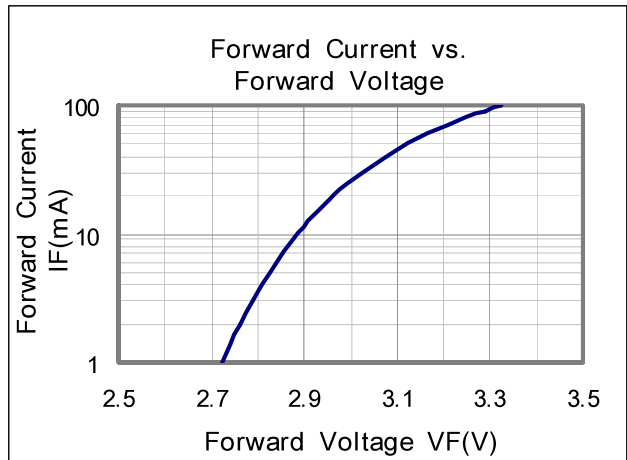
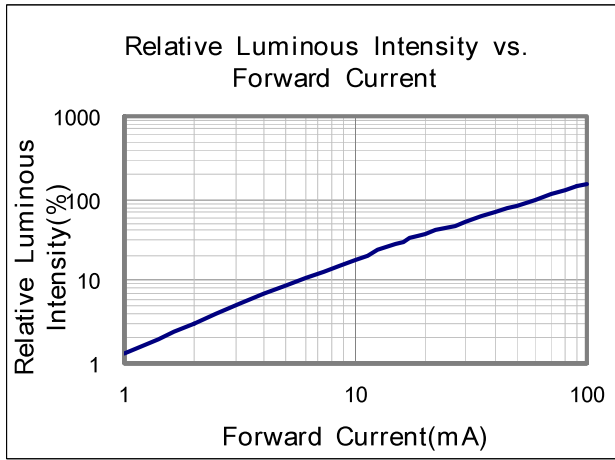
\* Luminous intensity measuring equipment : CAS140 B

■ Chromaticity Diagram



# Typical Characteristics Graph

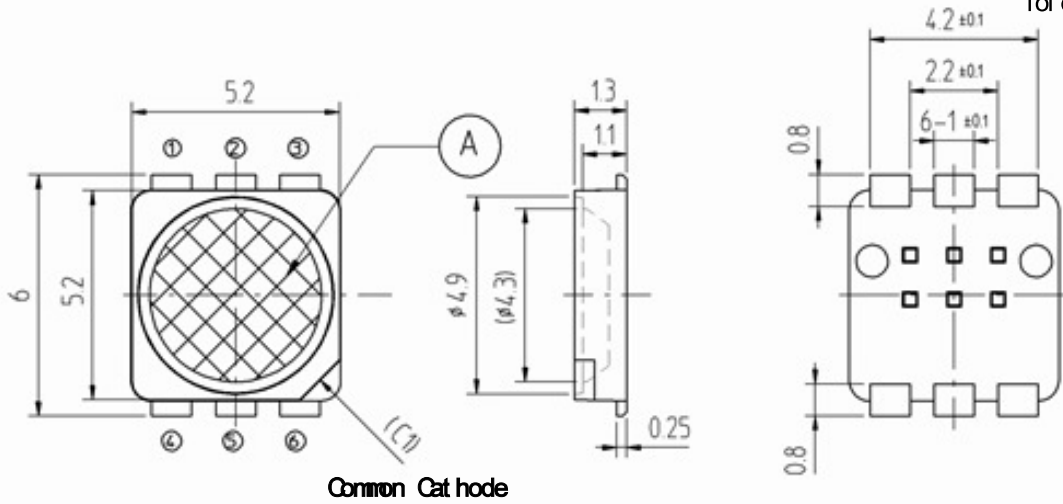
( Ta : 25°C )



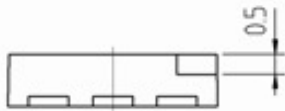
# LED Package Outline Dimensions

unit : mm

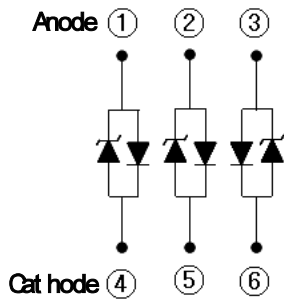
Tolerance: ± 0.1



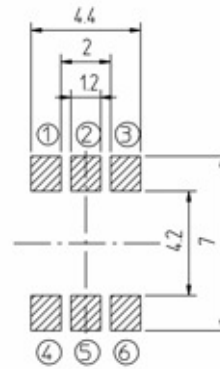
Common Cathode



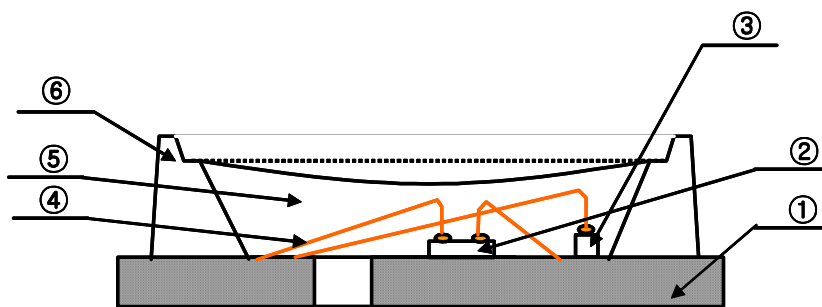
Tolerance is ±0.2mm unless otherwise noted.  
The maximum compressing pressure is 15N.  
Do not apply any damage on the phosphor ( 'A' ).



Circuit Diagram



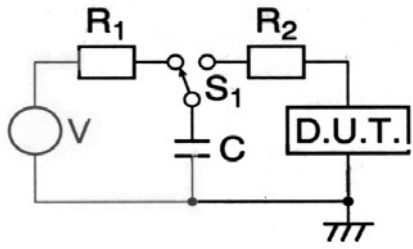
Pattern



| NUMBER | ITEM        | MATERIAL                           |
|--------|-------------|------------------------------------|
| ①      | FRAME       | Copper Frame(Silver Plated)        |
| ②      | LED CHIP    | GaN Al <sub>2</sub> O <sub>3</sub> |
| ③      | Zener Diode | S                                  |
| ④      | WIRE        | Gold Wire                          |
| ⑤      | RESIN       | Resin                              |
| ⑥      | PACKAGE     | Heat-resistant Polymer             |

## ■ Reliability Test Items and Conditions

### 1) Test Items

| Test Item                           | Test Conditions  | Test Hours/Cycles | Sample No |
|-------------------------------------|--|-------------------|-----------|
| Room Temperature life test          | 25°C±3°C, DC90 mA  | 500 h             | 50        |
| High Temperature humidity life test | 60°C±3°C, 95%±2%RH, DC55 mA  | 500 h             | 50        |
| High Temperature life test          | 85°C±3°C, DC30mA   | 500 h             | 50        |
| Low Temperature life test           | -30°C±3°C, DC90 mA   | 500 h             | 50        |
| High Temperature Storage            | Ta=100°C±3°C   | 500 h             | 22        |
| Low Temperature Storage             | Ta=-40°C±3°C   | 500 h             | 22        |
| High Temperature humidity Storage   | 60°C±3°C, 95%±2%RH   | 500 h             | 22        |
| Thermal Shock                       | -40°C ~ 100°C<br>0.5 h      0.5 h  | 100 cycles        | 50        |
| Temperature humidity Cycle          | 25°C ~ 65°C ~ -10°C<br>24hrs/1cycle, 95%RH   | 10 cycles         | 22        |
| Reflow (Pb-Free)                    | Peak 260±5°C for 10sec   | 3 times           | 22        |
| ESD(HBM)                            |  <p>-R1:10MΩ , R2:1.5KΩ , C:100pF</p> | 5 times           | 5         |
| On/Off test                         | 50°C±3°C, 95%±2%RH,<br>DC90 mA, On/2sec, Off/2sec  | 108000 cycles     | 50        |

## 2) Criteria for Judging the Damage

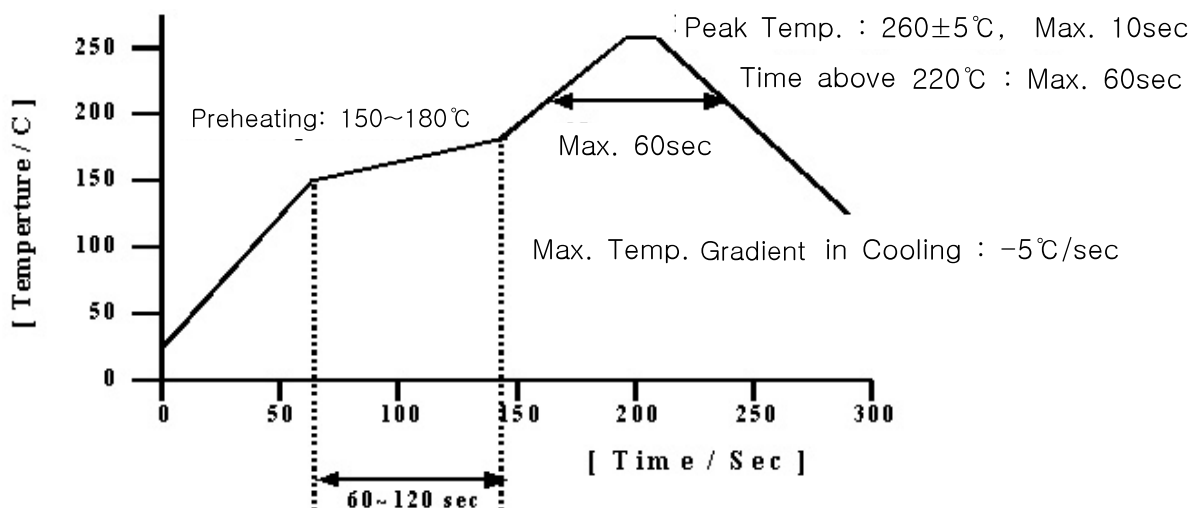
| Item               | Symbol         | Test Condition        | Limit      |            |
|--------------------|----------------|-----------------------|------------|------------|
|                    |                |                       | Min        | Max        |
| Forward Voltage    | V <sub>F</sub> | I <sub>F</sub> = 60mA | -          | U.S.L.*1.2 |
| Luminous Intensity | I <sub>V</sub> | I <sub>F</sub> = 60mA | L.S.L.*0.5 | -          |
| Reverse Voltage    | V <sub>R</sub> | I <sub>R</sub> = 15mA | L.S.L.*0.8 | U.S.L.*1.2 |

\* USL : Upper Standard Level    LSL : Lower Standard Level

## ■ Solder Conditions

### 1) Reflow Conditions ( Pb Free )

Reflow Frequency : 2 times max.

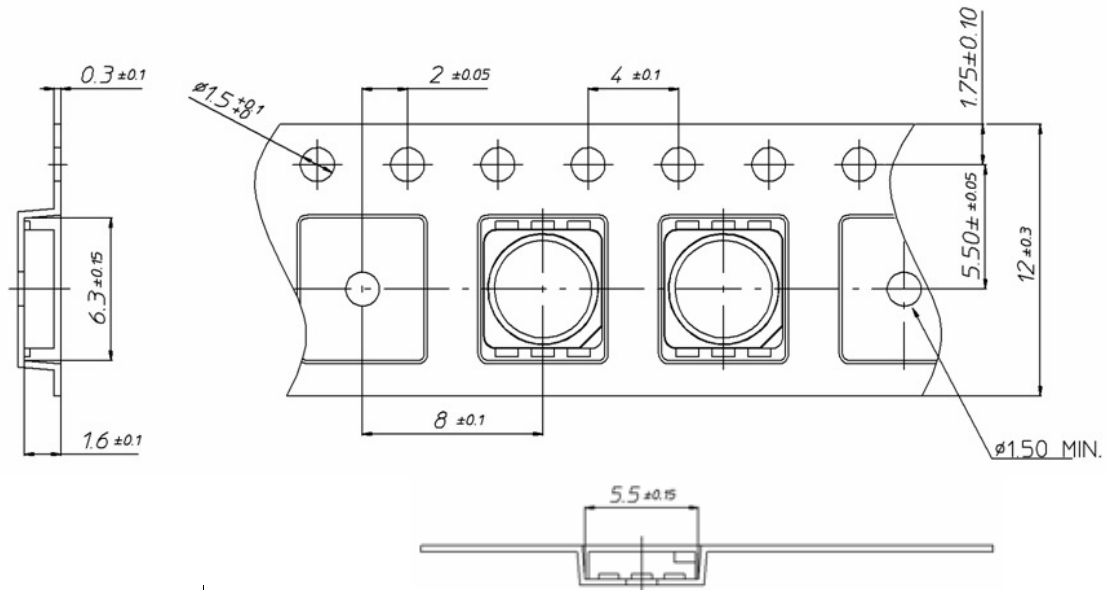


### 2) For Manual Soldering

Not more than 5 seconds @MAX $300^\circ\text{C}$ , under soldering iron.



## ■ Taping Dimension



End

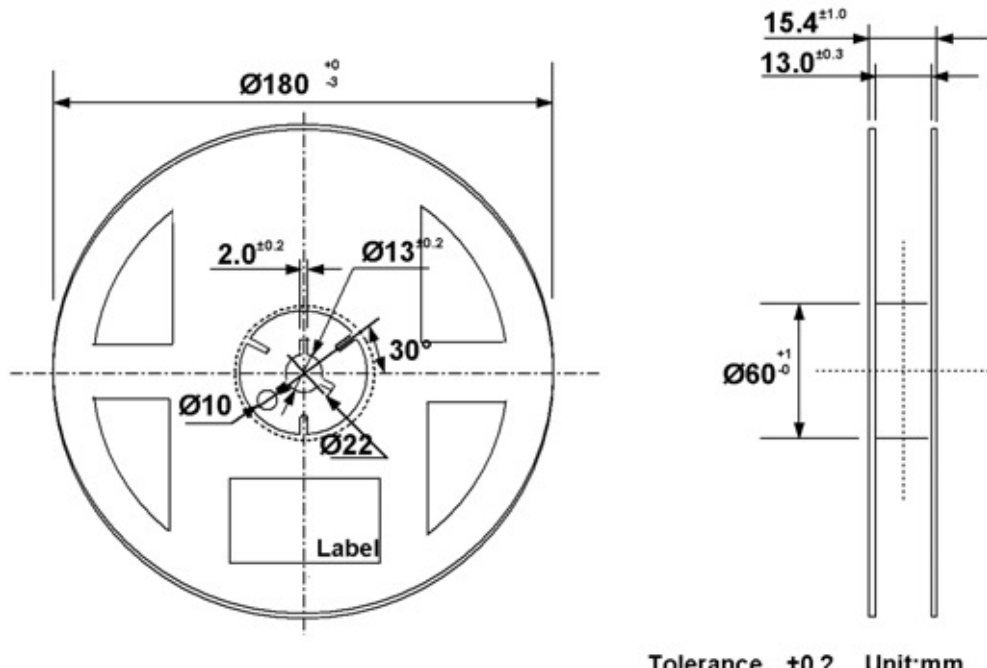
Start

More than 40 mm  
Unloaded tape

Mounted with  
Flash LED

More than (100~200)mm  
Unloaded tape

Leading part more than  
(200~400)mm

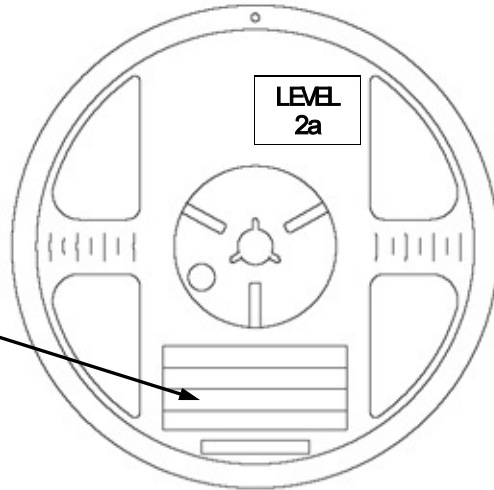
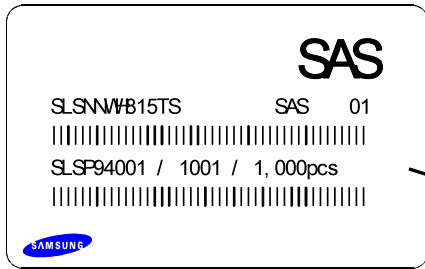


Tolerance  $\pm 0.2$  Unit:mm

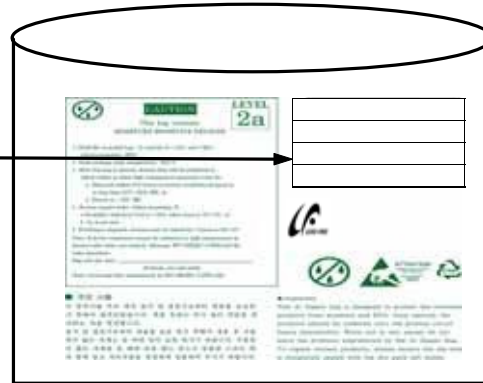
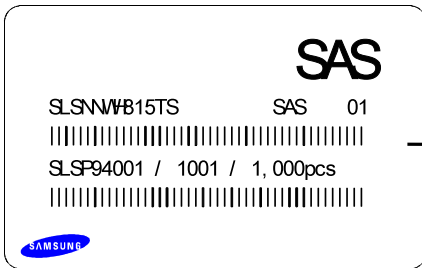
- (1) Quantity : The quantity/reel to be 1000pcs.
- (2) Cumulative Tolerance : Cumulative tolerance/10 pitches to be  $\pm 0.2$  mm
- (3) Adhesion Strength of Cover Tape : Adhesion strength to be 0.1–0.7N when the cover tape is turned off from the carrier tape at  $10^\circ\text{C}$  angle to be the carrier tape.
- (4) Packaging : P/N, Manufacturing data code no. and quantity to be indicated on a damp proof package.

# Reel Packing Structure

## Reel



## Aluminum Vinyl Bag

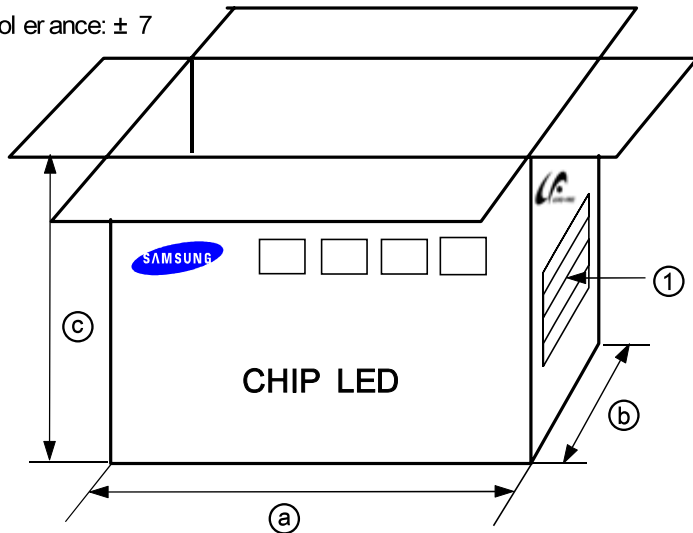


Material : Paper(SW3B(B))

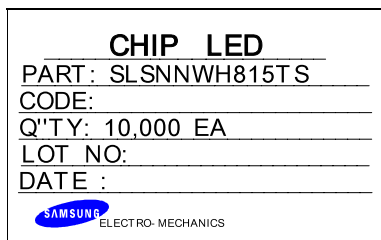
Unit : mm

Tolerance : ± 7

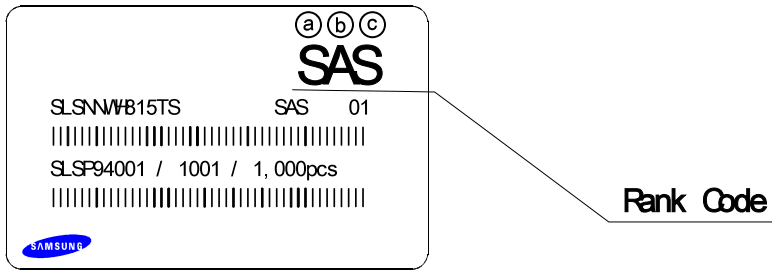
| TYPE  | SIZE(mm) |     |     |
|-------|----------|-----|-----|
|       | (a)      | (b) | (c) |
| 7inch | 245      | 220 | 182 |



① SIDE



## Label Structure



### Rank Code

- Ⓐ : VF Rank
- Ⓑ : Chr onat i ci t y Coo r di nat e Rank
- Ⓒ : I V Rank

## ■ Precaution for Use

1. 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.
2. When the LEDs are illuminating, operating current should be decided after considering the ambient maximum temperature.
3. LEDs must be stored to maintain a clean atmosphere.  
If the LEDs are stored for 3 months or more after being shipped from Samsung Electro-Mechanics, a sealed container with a nitrogen atmosphere should be used for storage.
4. The LEDs must be used within seven days after opening the moisture proof packing. Repack unused Products with anti-moisture packing, fold to close any opening and then store in a dry place.
5. The appearance and specifications of the product may be modified for improvement without notice.
6. This LEDs is sensitive to the static electricity and surge. It is recommended to use a wrist band or anti-electrostatic glove when handling the LEDs. If over voltage which exceeds the absolute maximum rating is applied to LEDs, it will cause damage LEDs and result in destruction.

Damaged LEDs will show some unusual characteristics such as leak current remarkably increase, turn-on voltage becomes lower and the LEDs get unlighted at low current.

# Hazard Substance Analysis



Test Report No. F8H0501/LF-CTSGP06-21333

Date: August 22, 2006

Page 1 of 3

To: **SAMSUNG ELECTRO-MECHANICS CO., LTD.**  
314, Maetan3-dong  
Yeongtong-gu  
Suwon-city  
KYUNGGI-DO 442-373  
Korea

The following merchandise was submitted and identified by the client as :

Commodity : Flash LED 5252  
SGS File No. : GP06-21333  
Received Date : August 14, 2006  
Test Performing Date : August 15, 2006  
Test Performed : SGS Testing Korea tested the sample(s) selected by applicant with following results  
Test Results : For further details, please refer to following page(s)

Jade Jang  
Monet Jeong  
Jully Oh  
Jerry Jang  
(Testing Person)

SGS Testing Korea Co. Ltd.

Jeff Jang / Chemical Lab Mgr

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Test Report No. F690501/LF-CTSGP06-21333

Date: August 22, 2006

Page 2 of 3

Sample No. : GP06-21333.001

Sample Description : Flash LED 5252

Style/Item No. : N/A

#### Heavy Metals

| Test Items                  | Unit  | Test Method                                 | MDL | Results |
|-----------------------------|-------|---|-----|---------|
| Cadmium (Cd)                | mg/kg | US EPA 3050B(1996), US EPA 6010B(1996), ICP | 0.5 | N.D.    |
| Lead (Pb)                   | mg/kg | US EPA 3050B(1996), US EPA 6010B(1996), ICP | 5   | N.D.    |
| Mercury (Hg)                | mg/kg | US EPA 3052(1996), US EPA 6010B(1996), ICP  | 2   | N.D.    |
| Hexavalent Chromium (Cr VI) | mg/kg | US EPA 3060A(1996), US EPA 7196A(1992), UV  | 1   | N.D.    |

#### Flame Retardants-PBBs/PBDEs

| Test Items               | Unit  | Test Method         | MDL | Results |
|--------------------------|-------|---------------------|-----|---------|
| Monobromobiphenyl        | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Dibromobiphenyl          | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Tribromobiphenyl         | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Tetrabromobiphenyl       | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Pentabromobiphenyl       | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Hexabromobiphenyl        | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Heptabromobiphenyl       | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Octabromobiphenyl        | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Nonabromobiphenyl        | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Decabromobiphenyl        | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Monobromodiphenyl ether  | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Dibromodiphenyl ether    | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Tribromodiphenyl ether   | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Tetrabromodiphenyl ether | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Pentabromodiphenyl ether | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Hexabromodiphenyl ether  | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Heptabromodiphenyl ether | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Octabromodiphenyl ether  | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Nonabromodiphenyl ether  | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |
| Decabromodiphenyl ether  | mg/kg | US EPA 3540C, GC/MS | 5   | N.D.    |

- NOTE: (1) N.D. = Not detected.(<MDL)  
(2) ppm = mg/kg  
(3) MDL = Method Detection Limit  
(4) - = No regulation  
(5) \*\* = Qualitative analysis (No Unit)  
(6) Negative = Undetectable / Positive = Detectable

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t +82 (0)11 4500 000 f +82 (0)11 4600 000 www.sgslab.co.kr, www.kr.sgs.com/jpreed09  
1000-2, Hwasan-r, Gwanak-gu, Ulsan, Korea 669-800 t +82 (0)52 239 0000-10 f +82 (0)52 239 0911

Picture of Sample as Received:



\*\*\* End \*\*\*

- NOTE:
- (1) N.D. = Not detected. (<MDL)
  - (2) ppm = mg/kg
  - (3) MDL = Method Detection Limit
  - (4) - = No regulation
  - (5) \*\* = Qualitative analysis (No Unit)
  - (6) Negative = Undetectable / Positive = Detectable

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**Revision History  
(Model:SLSNNWH815TS)**

| Date       | Revision History | Writer   |          |
|------------|------------------|----------|----------|
|            |                  | Drawn    | Approved |
| 2007.02.07 | New Version      | S.B. Yun | J.L.Nam  |
|            |                  |          |          |
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