

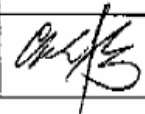

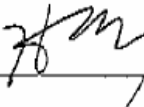
DATE OF ISSUE : 2007. 02. 12

| |
|--------------------------|
| SPECIFICATION |
| MODEL : SLSNNWH825TSASSS |

COOL WHITE MIDDLE POWER LED

CUSTOMER : _____

삼성전기

| 기안 | 심의 | 결재 |
|---|---|--|
|  |  |  |

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/Al₂O₃ 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_{opr}) -30°C ~ 85°C
- Storage Temperature Range (T_{stg}) -40°C ~ 100°C

■ Characteristics

(Ta : 25°C)

| | Rank | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|--------------------|------|--------|------|------|------|------|------------|
| Forward Voltage | S | VF | 2.9 | - | 3.6 | V | IF = 40mA |
| Luminous Intensity | S | IV | 2.8 | 3.5 | - | cd | IF = 40mA |
| Reverse Voltage | - | VR | 0.5 | 1.0 | 1.5 | V | IR = 10mA |

* Tolerance : VF:±0.1, IV:±10%

* Luminous intensity measuring equipment : CAS140 B

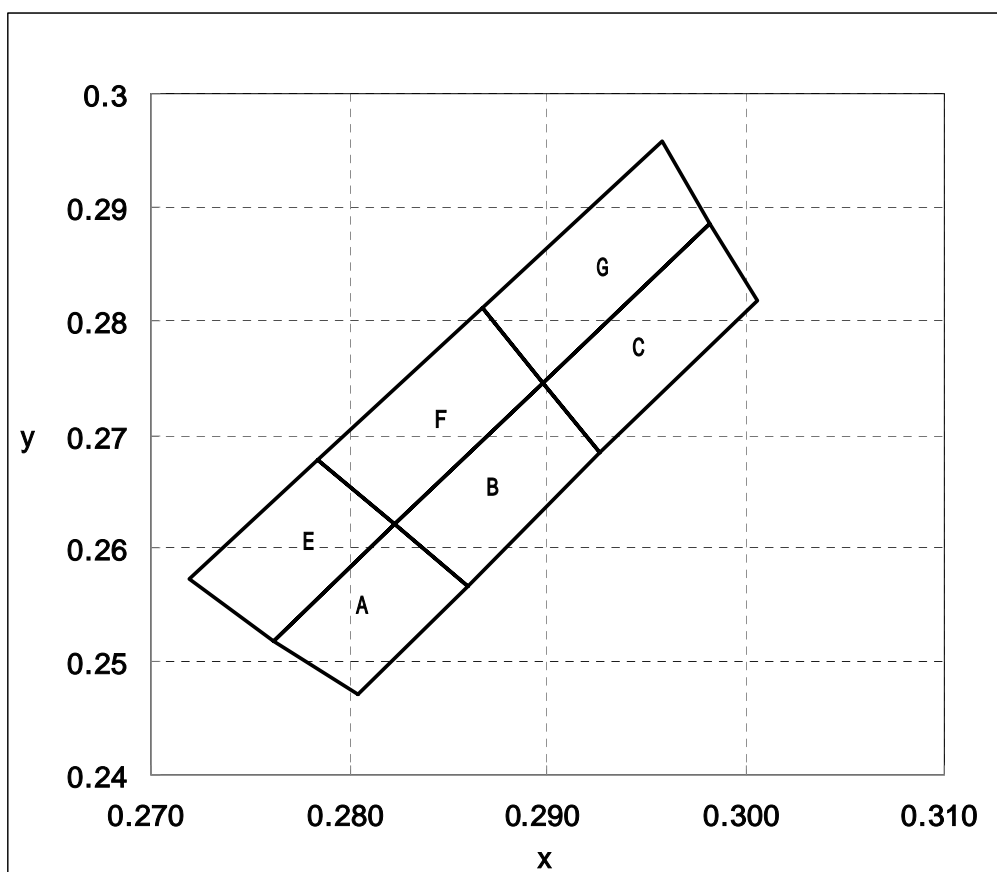
Chromaticity Coordinate

| Rank | x | | | | y | | | | Condition |
|------|--------|--------|--------|--------|--------|--------|--------|--------|-----------------------|
| A | 0.2804 | 0.2859 | 0.2823 | 0.2762 | 0.2470 | 0.2565 | 0.2620 | 0.2518 | I _F = 40mA |
| B | 0.2859 | 0.2927 | 0.2898 | 0.2823 | 0.2565 | 0.2683 | 0.2746 | 0.2620 | |
| C | 0.2927 | 0.3006 | 0.2982 | 0.2898 | 0.2683 | 0.2819 | 0.2885 | 0.2746 | |
| E | 0.2762 | 0.2823 | 0.2784 | 0.2719 | 0.2518 | 0.2620 | 0.2677 | 0.2572 | |
| F | 0.2823 | 0.2898 | 0.2867 | 0.2784 | 0.2620 | 0.2746 | 0.2811 | 0.2677 | |
| G | 0.2898 | 0.2982 | 0.2958 | 0.2867 | 0.2746 | 0.2885 | 0.2958 | 0.2811 | |

* Tolerance : x,y:±0.005

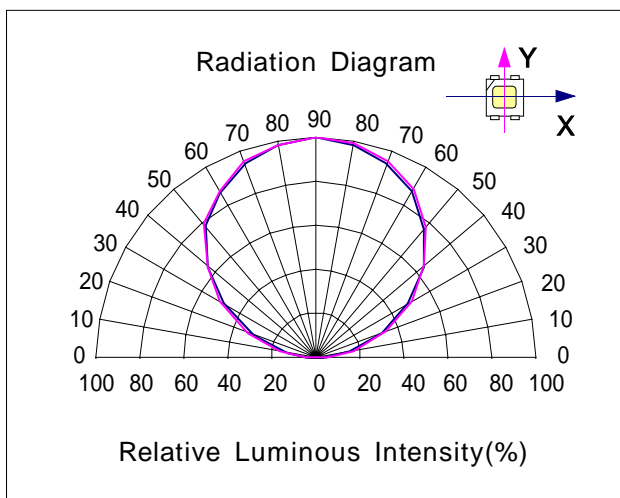
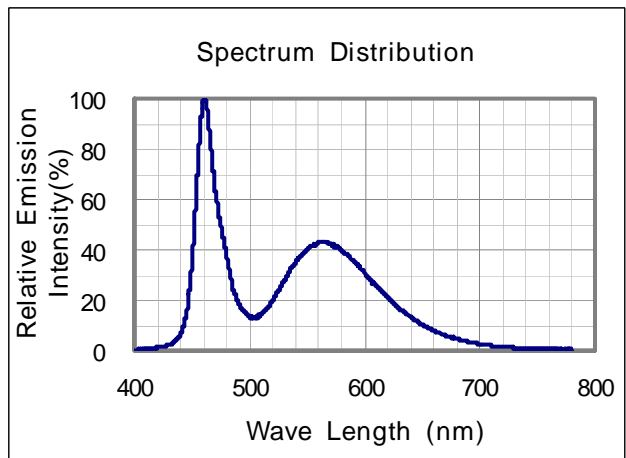
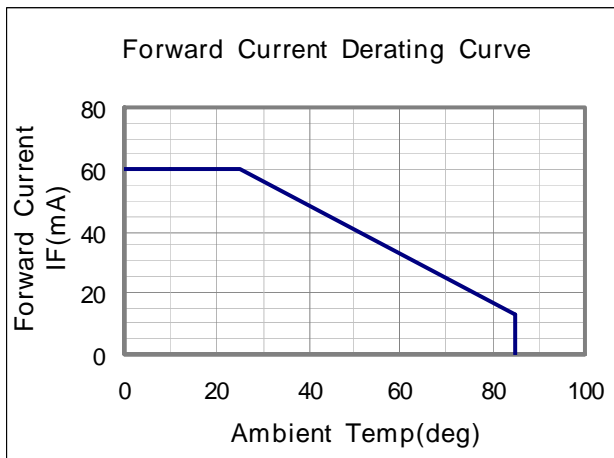
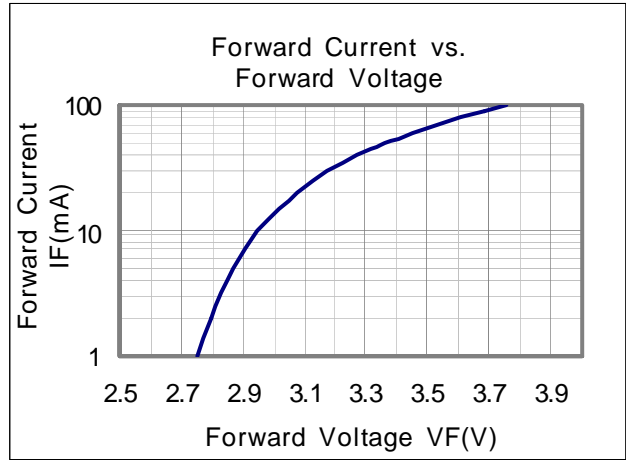
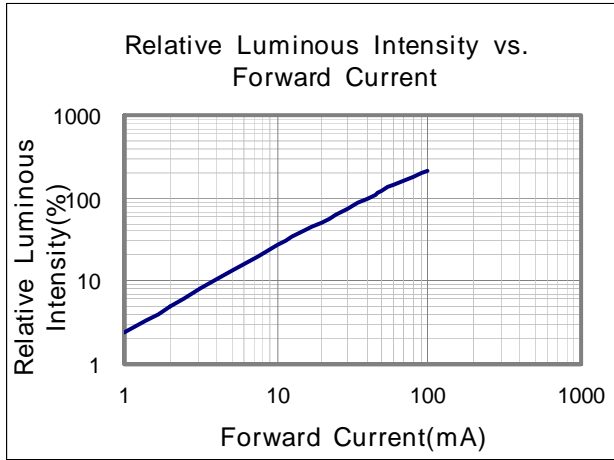
* Luminous intensity measuring equipment : CAS140 B

■ Chromaticity Diagram



Typical Characteristics Graph

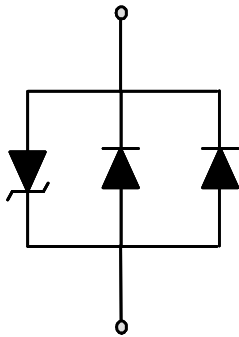
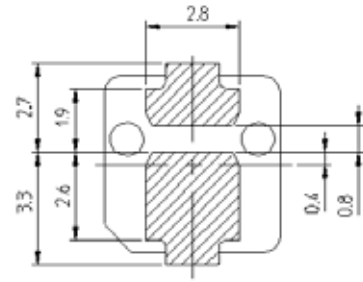
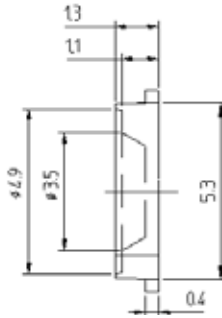
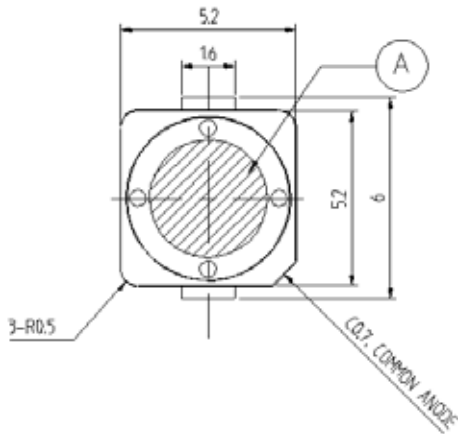
(Ta : 25°C)



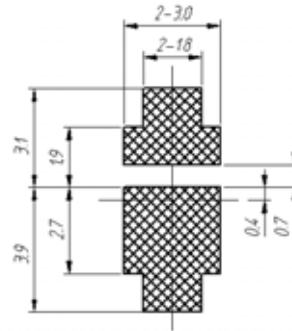
LED Package Outline Dimensions

unit:mm

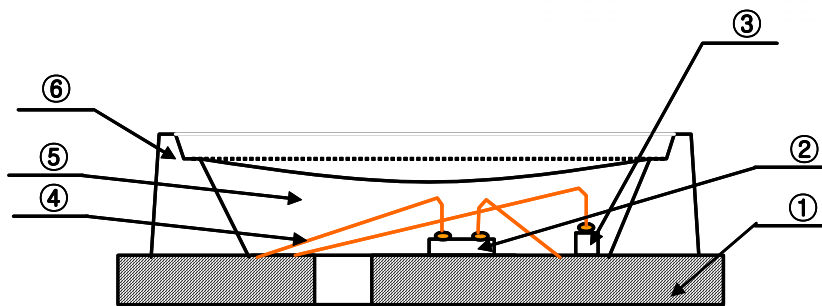
Tolerance: ±0.1



Circuit Diagram



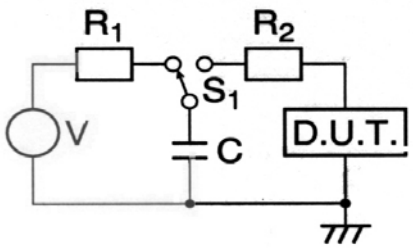
PCB PATTERN



| NUMBER | ITEM | MATERIAL |
|--------|-------------|------------------------------------|
| | FRAME | Copper Frame(Silver Plated) |
| | LED CHIP | GaN/Al ₂ O ₃ |
| | Zener Diode | Si |
| | WIRE | Gold Wire |
| | RESIN | Resin |
| | 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, DC60 mA | 500 h | 50 |
| High Temperature humidity life test | 60°C±3°C, 95%±2%RH, DC33 mA | 500 h | 50 |
| High Temperature life test | 85°C±3°C, DC12.5mA | 500 h | 50 |
| Low Temperature life test | -30°C±3°C, DC60 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 0.5 h 0.5 h | 100 cycles | 22 |
| Temperature humidity Cycle | 25°C ~ 65°C ~ -10°C 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, DC60 mA, On/2sec, Off/2sec | 108000 cycles | 50 |

2) Criteria for Judging the Damage

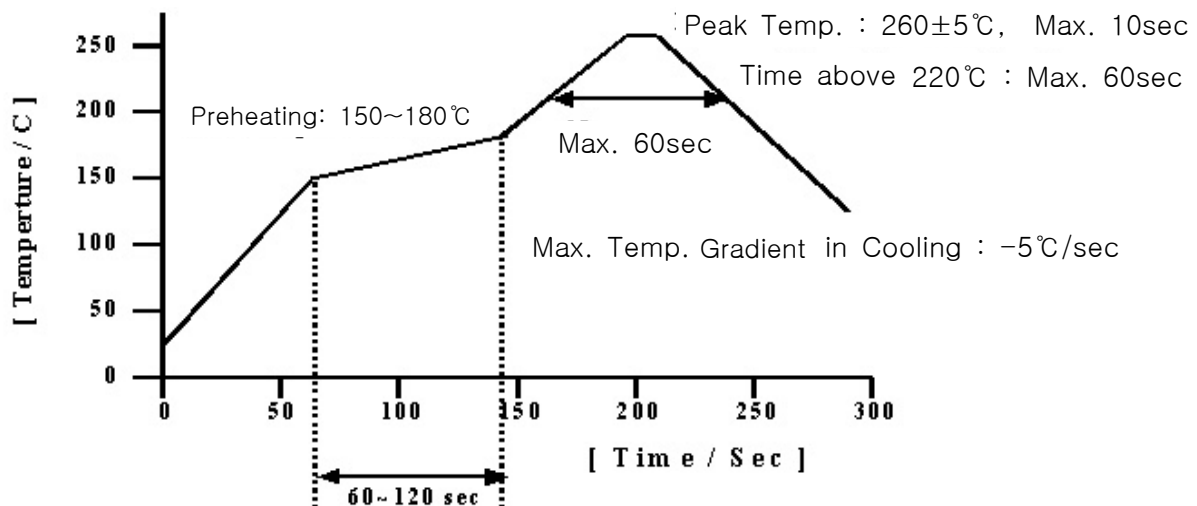
| Item | Symbol | Test Condition | Limit | |
|--------------------|----------------|-----------------------|------------|------------|
| | | | Min | Max |
| Forward Voltage | V _F | I _F = 40mA | - | U.S.L.*1.2 |
| Luminous Intensity | I _V | I _F = 40mA | L.S.L.*0.5 | - |
| Reverse Voltage | V _R | I _R = 10mA | - | U.S.L.*1.2 |

* USL : Upper Standard Level LSL : Lower Standard Level

■ Solder Conditions

1) Reflow Conditions (Pb Free)

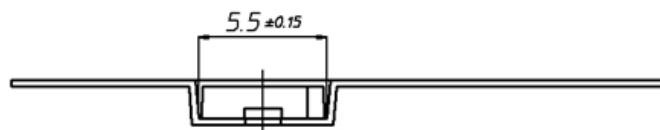
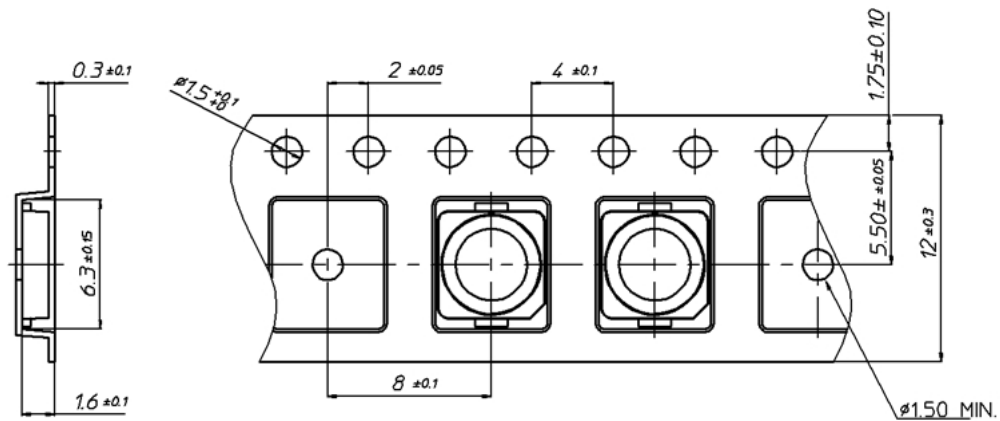
Reflow Frequency : 2 times max.



2) For Manual Soldering

Not more than 5 seconds @MAX 300°C , under soldering iron.

■ Taping Dimension



End

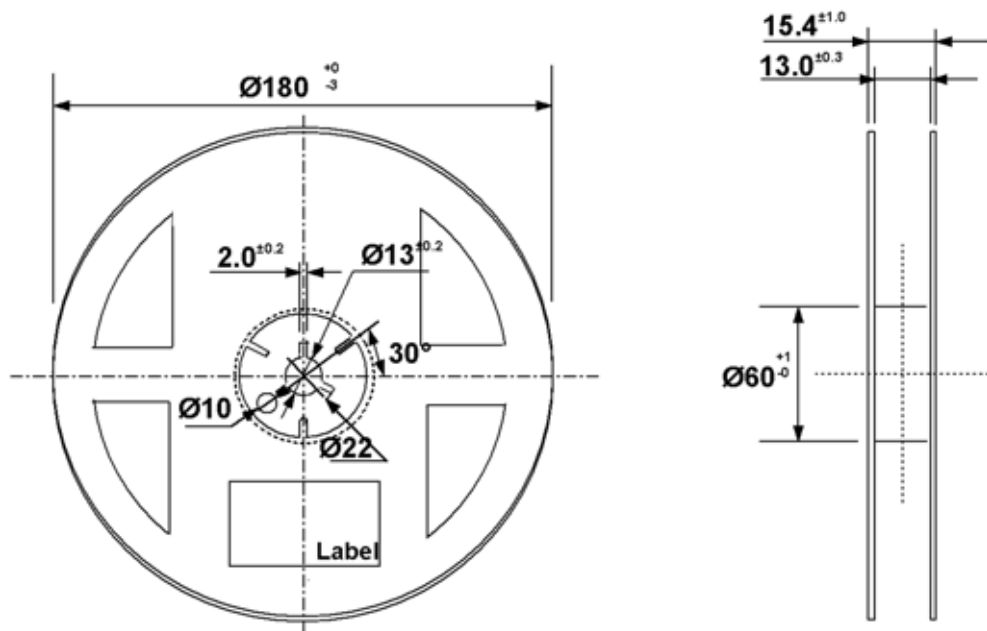
Start

More than 40 mm
Unloaded tape

Mounted with
Flash LED

More than (100~200)mm
Unloaded tape

Leading part more than
(200~400)mm

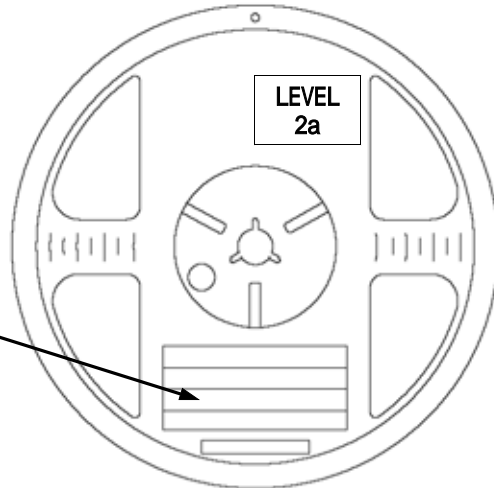
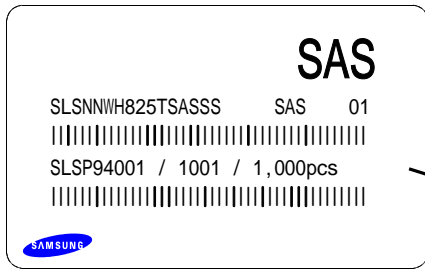


Tolerance ± 0.2 Unit:mm

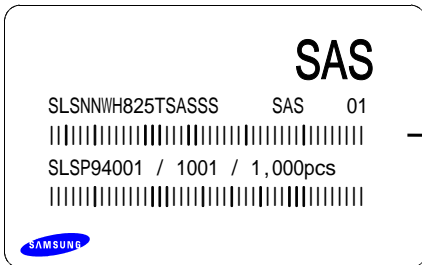
- (1) Quantity : The quantity/reel to be 1000pcs.
- (2) Cumulative Tolerance : Cumulative tolerance/10 pitches to be ± 0.2 mm
- (3) Adhesion Strength of Cover Tape : Adhesion strength to be 0.1–0.7N when the cover tape is turned off from the carrier tape at 10°C angle to be the carrier tape.
- (4) Packaging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

Reel Packing Structure

Reel



Aluminum Vinyl Bag



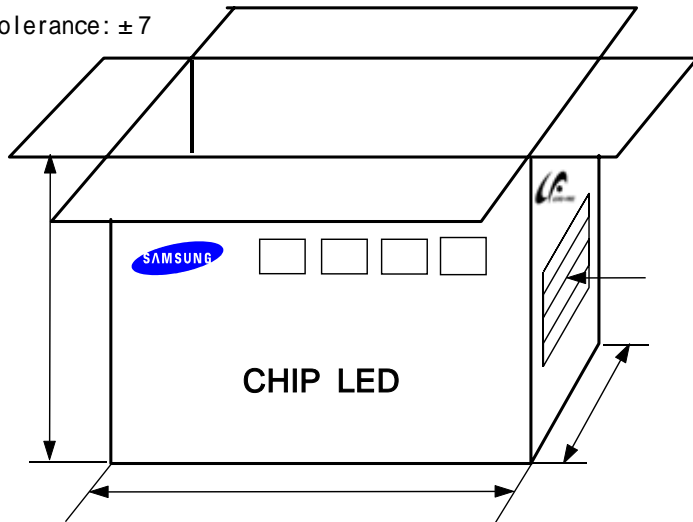
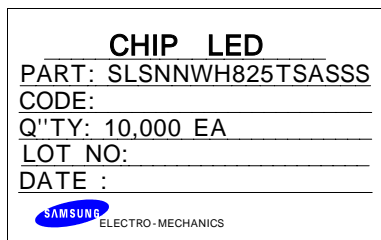
Material : Paper(SW3B(B))

Unit:mm

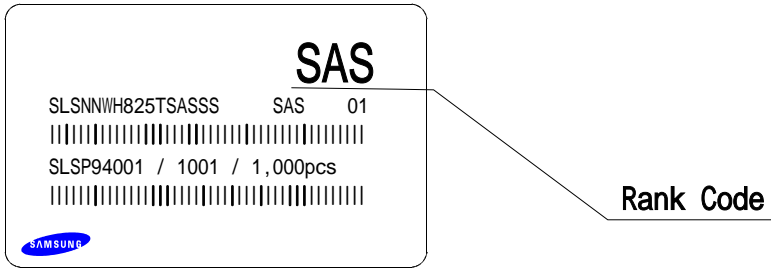
Tolerance: ±7

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

① SIDE



Label Structure



Rank Code

- : VF Rank
- : Chromaticity Coordinate Rank
- : IV 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

This Test Report is issued by the Company subject to its General Conditions of Service printed overleaf. Attention is drawn to the limitations of liability, indemnification and jurisdictional issues defined therein. The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This Test Report cannot be reproduced, except in full, without prior written permission of the Company.



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

This Test Report is issued by the Company subject to its General Conditions of Service printed overleaf. Attention is drawn to the limitations of liability, indemnification and jurisdictional issues defined therein. The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This Test Report cannot be reproduced, except in full, without prior written permission of the Company.

SGS Testing Korea Co., Ltd. 322, The D valley, 555-8, Hogeje-dong, Gangan-gu, Anyang-si, Gyeonggi-do, Korea 431-000
t +82 (0)31 4508 000 f +82 (0)31 4608 000 www.sgslab.co.kr, www.kr.sgs.com/jpreedlab
1000-2, Hwasan-rj, Daejeon-sj, Ulsan-gu, Ulsan, Korea 889-800 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

This Test Report is issued by the Company subject to its General Conditions of Service printed overleaf. Attention is drawn to the limitations of liability, indemnification and jurisdictional issues defined therein. The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This Test Report cannot be reproduced, except in full, without prior written permission of the Company.

