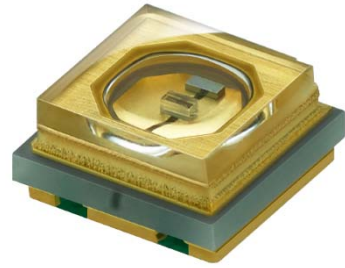


UC353A

(Deep UV LED)



Use of Samsung's deep ultraviolet light technology

Features & Benefits

- Deep ultraviolet LED
- Wavelength between 270nm to 280nm
- SMT solderable
- Lead Free product



Applications

- Surface disinfection
- Air disinfection
- Water disinfection

Table of Contents

| | | | |
|-----|------------------------------------|-------|----|
| 1. | Characteristics | ----- | 3 |
| 2. | Product Code Information | ----- | 5 |
| 3. | Typical Characteristics Graphs | ----- | 6 |
| 4. | Outline Drawing & Dimension | ----- | 8 |
| 5. | Reliability Test Items & Condition | ----- | 9 |
| 6. | Soldering Conditions | ----- | 10 |
| 7. | Tape & Reel | ----- | 11 |
| 8. | Label Structure | ----- | 13 |
| 9. | Packing Structure | ----- | 14 |
| 10. | Precautions in Handling & Use | ----- | 16 |

1. Characteristics

a) Absolute Maximum Rating

| Item | Symbol | Rating | Unit | Condition |
|---------------------------------|-----------|------------|---------|-----------|
| Ambient / Operating Temperature | T_a | -40 ~ +60 | °C | - |
| Storage Temperature | T_{stg} | -40 ~ +100 | °C | - |
| LED Junction Temperature | T_{j-s} | 90 | °C | - |
| Forward Current | I_F | 40 | mA | - |
| Assembly Process Temperature | - | 260 <10 | °C s | - |
| ESD (HBM) | - | ±2 | kV | - |

b) Electro-optical Characteristics (@30mA)

| Item | Symbol | Value | Unit |
|--|-----------------|-------|------|
| Peak Wavelength | λ_p | 275 | nm |
| Radiant Flux | Φ_e | 3.7 | mW |
| Forward Voltage | V_f | 5.8 | V |
| Thermal Resistance (junction to solder point) | R_{th} | 60 | K/W |
| Spectrum Half Width | $\Delta\lambda$ | 12 | nm |
| View Angle | $2\theta_{1/2}$ | 120 | deg |

Note:

Samsung maintains measurement tolerance of: Radiant flux = ±10%, forward voltage = ±3%, Peak Wavelength = ±3nm

c) Bin Structure (@30mA)

| Item | BIN Code | Min | Typ | Max |
|---|----------|-----|-----|-----|
| Forward Voltage (V) | 56 | 5.6 | | 5.8 |
| | 58 | 5.8 | | 6.0 |
| | 60 | 6.0 | | 6.2 |
| | 62 | 6.2 | | 6.4 |
| Peak Wavelength (nm) | 70 | 270 | | 280 |
| Radiant Flux (mW) | 30 | 3.0 | | 3.5 |
| | 35 | 3.5 | | 4.0 |
| | 40 | 4.0 | | 4.5 |
| All of the above bins are in the range 0.12 ~ 0.17mW (@1.5mA) | | | | |

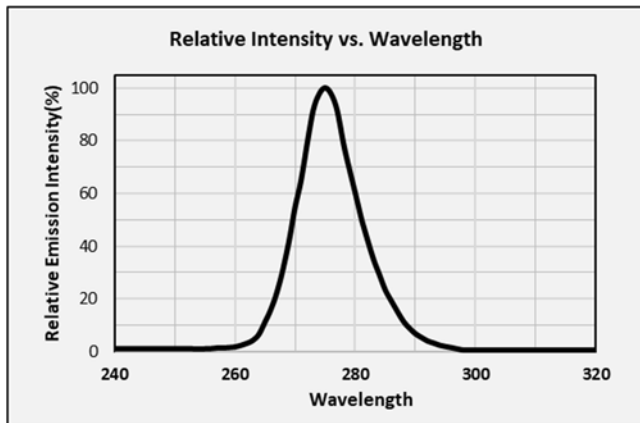
2. Product Code Information

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| S | P | M | U | V | 1 | 3 | 5 | J | 3 | D | 0 | V | 0 | W | 0 | P | 0 |

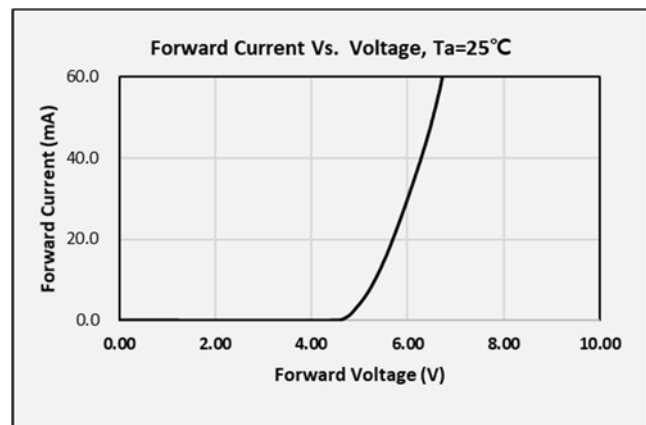
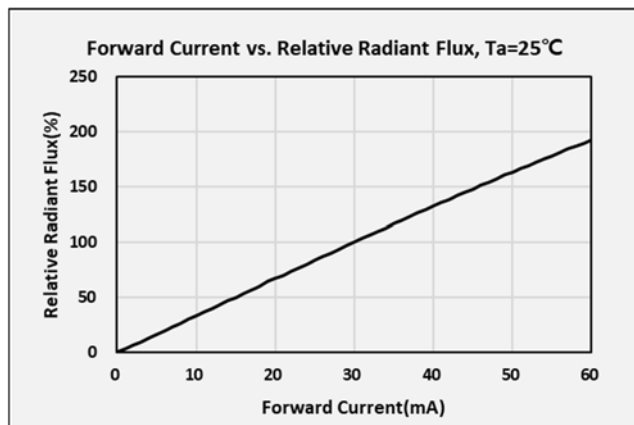
| Digit | PKG Information | Code | Specification | | | |
|-------|------------------------------|------|-------------------|----------|--|--|
| 1 2 3 | Samsung Package Middle Power | SPM | | | | |
| 4 5 | Color | UV | Ultra Violet | | | |
| 6 | Product Version | 1 | 1st version | | | |
| 7 8 | Product Size | 35 | 3.5*3.5mm | | | |
| 9 | Product Thickness | J | 1.75mm | | | |
| 10 | Sorting Current (mA) | 3 | 30mA | | | |
| 11 | Peak Wavelength Range | D | 270~280nm | | | |
| 12 | Sorting Temperature | 0 | Room Temperature | | | |
| 13 14 | Forward Voltage (V) | V0 | V0 : 5.6 ~ 6.4V | Bin Code | 56 : 5.6 ~ 5.8V 58 : 5.8 ~ 6.0V 60 : 6.0 ~ 6.2V 62 : 6.2 ~ 6.4V | |
| 15 16 | Peak Wavelength (nm) | W0 | W0 : 270 ~ 280nm | Bin Code | 70 : 270 ~ 280nm | |
| 17 18 | Radiant Power (mW) | P0 | P0 : 3.0 ~ 4.5 mW | Bin Code | 30 : 3.0 ~ 3.5 mW 35 : 3.5 ~ 4.0 mW 40 : 4.0 ~ 4.5 mW | |

3. Typical Characteristics Graphs

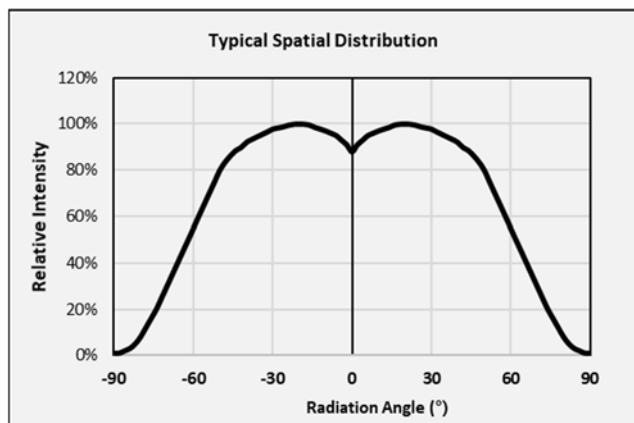
a) Spectrum Distribution ($I_F = 30\text{mA}$, $T_s = 25^\circ\text{C}$)



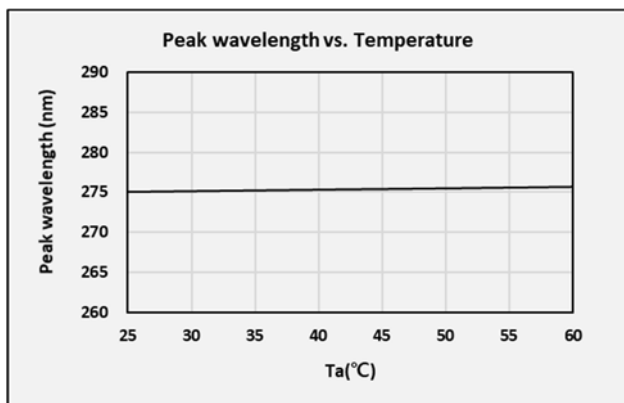
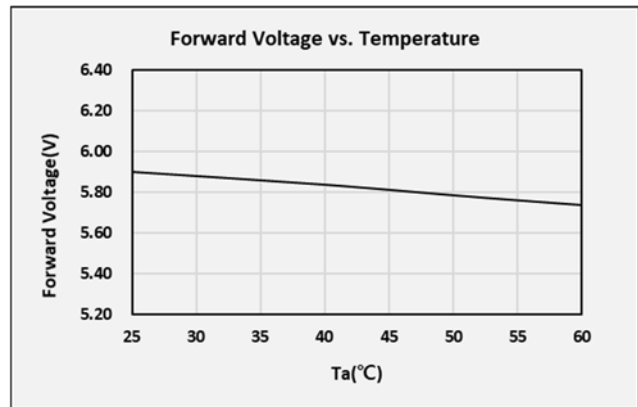
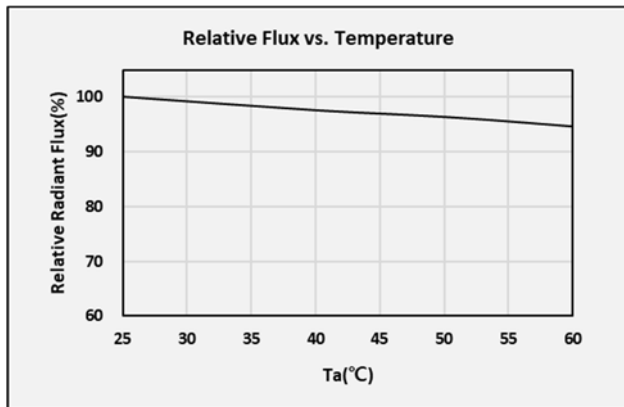
b) Forward Current Characteristics ($T_s = 25^\circ\text{C}$)



c) Beam Angle Characteristics ($I_F = 30\text{mA}$, $T_s = 25^\circ\text{C}$)

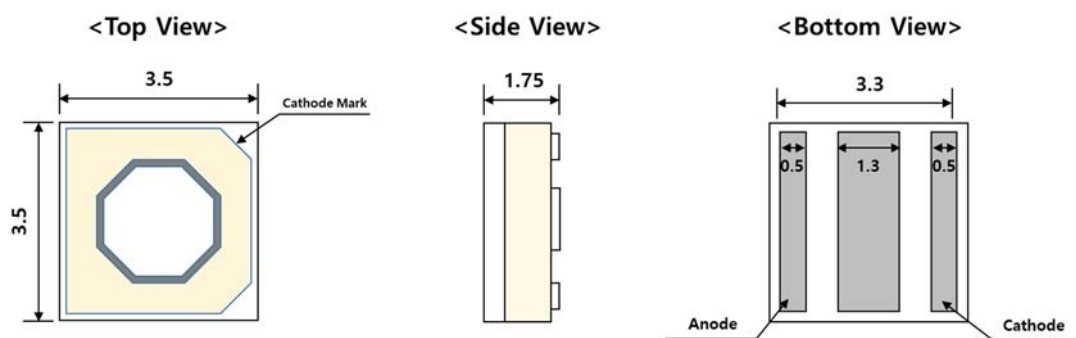


d) Temperature Characteristics ($I_F = 30 \text{ mA}$)



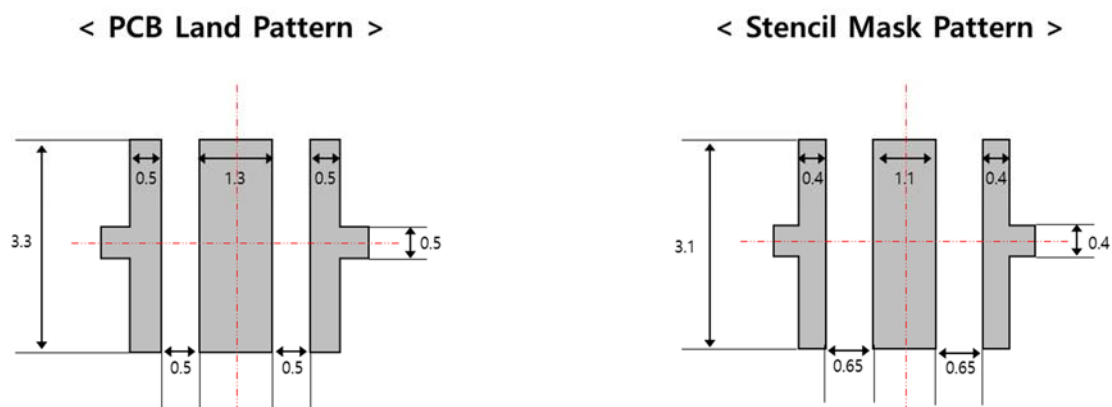
4. Outline Drawing & Dimension

a) Mechanical Dimension



- Measurement unit: mm
- Tolerance: ± 0.15 mm

b) Recommended foot-print for SMT



- Measurement unit: mm
- Tolerance: ± 0.15 mm

Notes:

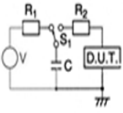
- 1) This LED has built-in ESD protection device(s) connected in parallel to LED chip(s).
- 2) The thermal pad is electrically isolated from the anode and cathode contact pads.
- 3) Ts point and measurement method:
 - ① Measure the nearest point to thermal pad as shown above. If necessary, remove PSR of PCB to reach Ts point.
 - ② All pads must be soldered to the PCB to dissipate heat properly, otherwise the LED can be damaged.

Precautions:

- 1) Pressure on the LEDs will influence to the reliability of the LEDs. Precautions should be taken to avoid strong pressure on the LEDs. Do not put stress on the LEDs during heating.
- 2) Re-soldering should not be done after the LEDs have been soldered. If re-soldering is unavoidable, LED's characteristics should be carefully checked before and after such repair.
- 3) Do not stack assembled PCBs together. Since materials of LEDs is soft, abrasion between two PCB assembled with LED might cause catastrophic failure of the LEDs.

5. Reliability Test Items & Conditions

a) Test Items

| Test Item | Test Condition | Test Hour / Cycle | Sample Size |
|---------------------------------------|---|-------------------|-------------|
| Room Temperature Life Test | 25°C, Maximum rated drive current | 1000 h | 20 |
| High Temperature Humidity Life Test | 40°C, 90% RH, Maximum rated drive current | 500 h | 20 |
| High Temperature Humidity On/Off Test | 40°C, 90% RH , On/Off 5sec, Maximum rated drive current | 500 h | 20 |
| Temperature Cycling | -30 °C / 30 min ↔ 120 °C / 30 min temperature change within 5 min | 300 cycles | 100 |
| High Temperature Humidity Storage | 40°C, 90% RH | 500 h | 20 |
| High Temperature Storage | 100 °C | 500 h | 2 |
| Low Temperature Storage | -40 °C | 500 h | 20 |
| ESD (HBM) |  <div> R₁: 10 MΩ R₂: 1.5 kΩ C: 100 pF V: ±5 kV </div> | 5 times | 30 |

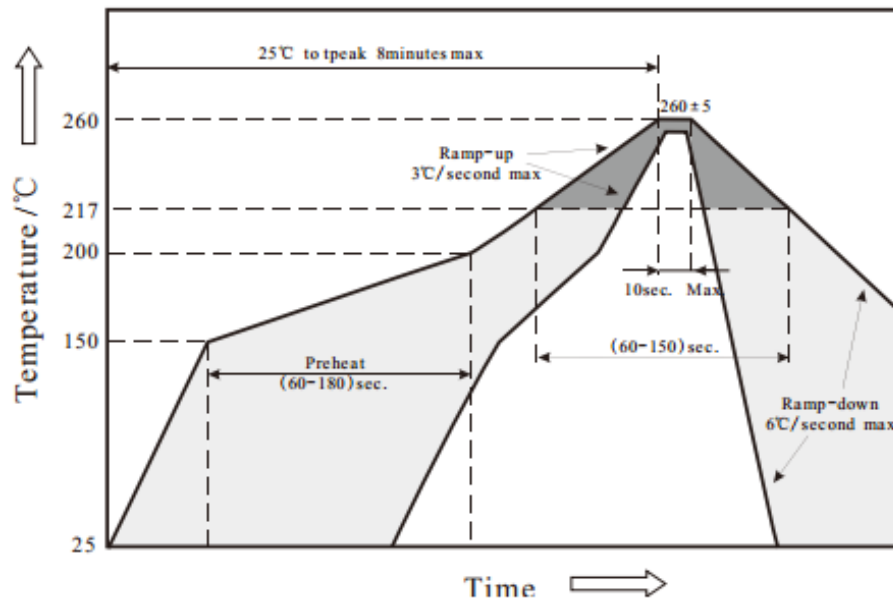
b) Criteria for Judging the Damage

| Item | Symbol | Test Condition (Ts = 25 °C) | Max or Min Allowable shift value |
|-----------------|----------------|--------------------------------|-------------------------------------|
| Forward Voltage | V _F | I _F = 30 mA | Max : Init. Value * 1.2 |
| Radiant Flux | Φ _e | I _F = 30 mA | Min : Init. Value * 0.7 |

6. Soldering Conditions

a) Reflow Conditions (Pb free)

Reflow frequency: 2 times max.



b) Manual Soldering Conditions

No more than 5 seconds @ max. 300 °C, under soldering iron.

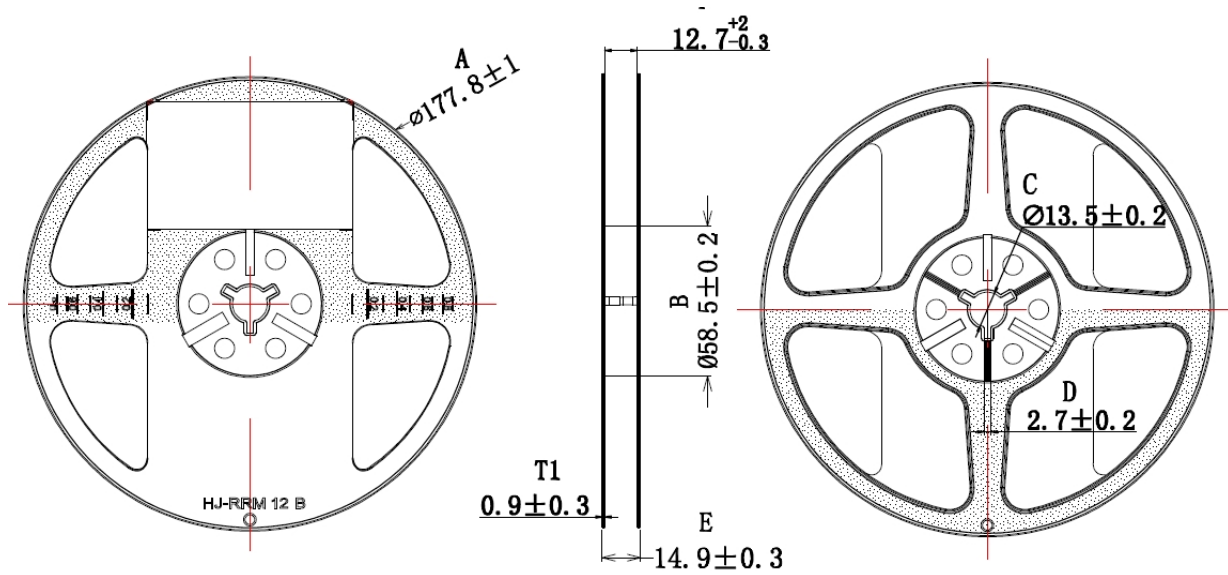
a) Taping Dimension

(unit: mm)



b) Reel Dimension

(unit: mm)

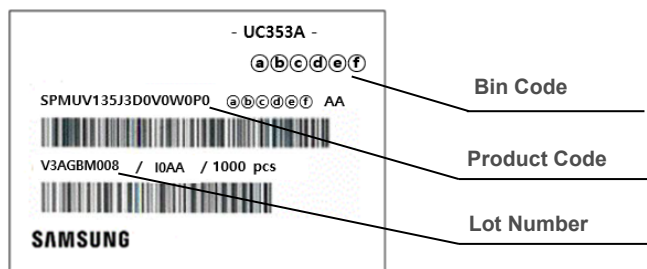


Notes:

- 1) Quantity: The quantity/reel is 1000 pcs
- 2) Cumulative tolerance: Cumulative tolerance / 10 pitches is ± 0.2 mm
- 3) Adhesion strength of cover tape: Adhesion strength is 0.1-0.7 N when the cover tape is turned off from the carrier tape at 10° angle to the carrier tape
- 4) Packaging: P/N, Manufacturing data code no. and quantity are indicated on the aluminum packing bag

8. Label Structure

a) Label Structure



Note: Denoted bin code and product code above is only an example (see description on page 5)

Bin Code:

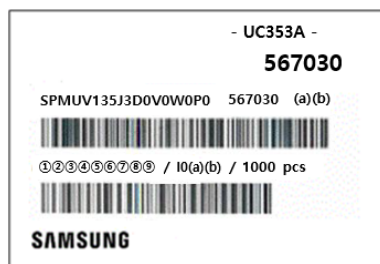
a b: Forward Voltage bin (refer to page 5)

c d: Wavelength bin (refer to page 5)

e f: Radiant Flux bin (refer to page 5)

b) Lot Number

The lot number is composed of the following characters:



1 2 3 4 5 6 7 8 9 / I0(a)(b) / 1000 pcs

1, 2 : Production site (V3 : Foshan , China)

3 : Product state (A: Normal, B: Bulk, C: First Production, R: Reproduction, S: Sample)

4 : Year (E: 2020, F: 2021, G: 2022, ...)

5 : Month (1~9, A, B, C)

6 : Day (1~9, A, B~V)

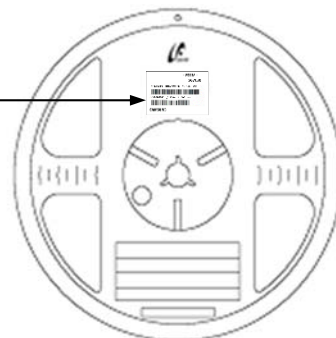
7 8 9 : Product serial number (001 ~ 999)

a(b) : Reel number (AA, AB, AC, ...)

9. Packing Structure

a) Packing Process

Reel



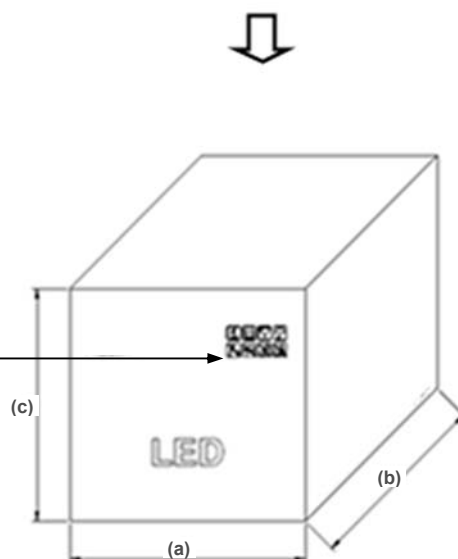
Aluminum Vinyl Packing Bag



Outer Box

Material: Paper SW(B)

| Type | Size (mm) | | | Note |
|------------|-----------|---------|---------|---------------|
| | (a) | (b) | (c) | |
| 7 inch (L) | 245 ± 5 | 220 ± 5 | 182 ± 5 | Up to 8 reels |
| 7 inch (S) | 245 ± 5 | 220 ± 5 | 86 ± 5 | Up to 4 reels |



b) Aluminum Vinyl Packing Bag



CAUTION
 This bag contains
MOISTURE SENSITIVE DEVICES

LEVEL
2a

1. Shelf life in sealed bag: 12 months at <40°C and <90% relative humidity (RH)
2. Peak package body temperature: 240 °C
3. After this bag is opened, devices that will be subjected to reflow solder or other high temperature processes must be:
 - a. Mounted within 672 hours at factory conditions of equal to or less than 30°C /60% RH, or
 - b. Stored at < 10% RH
4. Devices require bake, before mounting, if:
 - a. Humidity Indicator Card is > 65% when read at 23±5°C, or
 - b. 2a is not met.
5. If baking is required, devices must be baked for 1 hours at 60±5°C

Note: If device containers cannot be subjected to high temperature or shorter bake times are desired, reference IPC/JEDEC J-STD-033 for bake procedure,

Bag seal due date: _____
 (if blank, see code label)

Note: Level and body temperature by IPC/JEDEC J-STD-020

- UC353A -

567030

SPMUV135J3D0V0W0P0 567030 AA



V3AGBM008 / I0AA / 1000 pcs



SAMSUNG




ATTENTION
OBSERVE PRECAUTIONS
FOR HANDLING
ELECTROSTATIC
SENSITIVE
DEVICES



■ 주의 사항

이 알루미늄 지퍼 백은 습기 및 정전기로부터 제품을 보호하기 위하여 제작되었습니다. 개봉 후에는 즉시 솔더 작업을 실시하는 것을 권장합니다.

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■ Important

This Al Zipper bag is designed to protect the enclosed products from moisture and ESD. Once opened, the products should be soldered onto the printed circuit board immediately. When not in use, please do not leave the products unprotected by the Al Zipper Bag. To repack unused products, please ensure the zip-lock is completely sealed with the dry pack left inside.


c) Silica Gel & Humidity Indicator Card inside Aluminum Vinyl Bag

HUMIDITY INDICATOR
Cobalt-Free


Bake Units if Blue 15%




Bake Units if Blue 10%



Change Desiccant if Blue 5%



Discard if Circles Overrun
Avoid Metal Contact



10. Precautions in Handling & Use

- 1) For over-current protection, users are recommended to apply resistors connected in series with the LEDs to mitigate sudden change of the forward current caused by shift of 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 the cleaning agent. Some solvent-based cleaning agent 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 corresponding junction temperature.
- 4) LEDs must be stored in a clean environment. If the LEDs are to be stored for three months or more after being shipped from Samsung, they should be packed with a nitrogen-filled container (shelf life of sealed bags is 12 months at temperature 0~40 °C, 0~90 % RH).
- 5) After storage bag is opened, device subjected to soldering, solder reflow, or other high temperature processes must be:
 - a. Mounted within 672 hours (28 days) at an assembly line with a condition of no more than 30 °C / 60 % RH, or
 - b. Stored at <10 % RH
- 6) Repack unused devices 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 is >60 % at 23 ± 5 °C.
- 8) Devices must be baked for 1 hour at 60 ± 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.
- 10) VOCs (Volatile Organic Compounds) can be generated from adhesives, flux, hardener or organic additives used in luminaires (fixtures). Transparent LED silicone encapsulant is permeable to those chemicals and they may lead to a discoloration of encapsulant when they exposed to heat or light. This phenomenon can cause a significant loss of light emitted (output) from the luminaires. In order to prevent these problems, we recommend users to know the physical properties of materials used in luminaires and they must be carefully selected.

Revision History

[illegible]

Legal and additional information.

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