UC35AA
(Deep UV LED)

UVC disinfection and sterilization light

Features & Benefits

- Deep ultraviolet LED
- Optimized UVC wavelength for efficacy and germicide effect
- Robust design for longer lifetime
- Lead Free

Applications

- Surface, liquid and air purification

Table of Contents

1. Characteristics

a) Absolute Maximum Rating

Item	Symbol	Rating	Unit	Condition
Ambient / Operating Temperature	T_a	-40 ~ +60	ºC	-
Storage Temperature	T_{stg}	-40 ~ +100	ºC	-
LED Junction Temperature	$T_{j\text{-}s}$	90	ºC	-
Forward Current	I_F	150	mA	-
Assembly Process Temperature	-	260 <10	ºC s	-
ESD (HBM)	-	±2	kV	-

b) Electro-optical Characteristics (@100mA)

Item	Symbol	Value	Unit
Peak Wavelength	λp	275	nm
Radiant Flux	Φe	14.0	mW
Forward Voltage	Vf	5.8	V
Thermal Resistance (junction to solder point)	R_{th}	20	K/W
Spectrum Half Width	$\Delta\lambda$	10	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 (@100mA)

Item	BIN Code	Min	Typ	Max
Forward Voltage (V)	50	5.0		5.5
	55	5.5		6.0
	60	6.0		6.5
	65	6.5		7.0
Peak Wavelength (nm)	70	270	275	280
Radiant Flux (mW)	10	10		14
	14	14		18

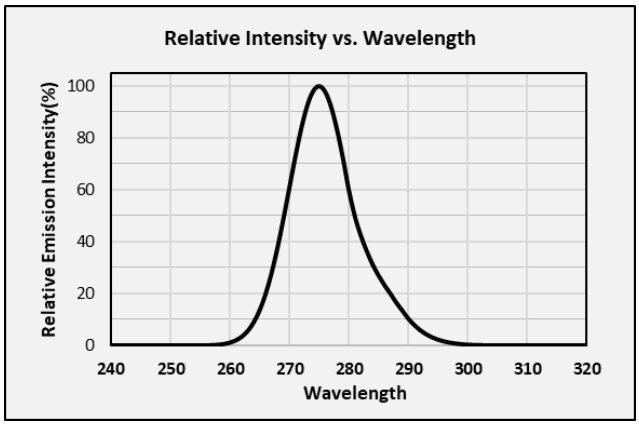
2. Product Code Information

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	A	D	0	V	0	W	0	P	0

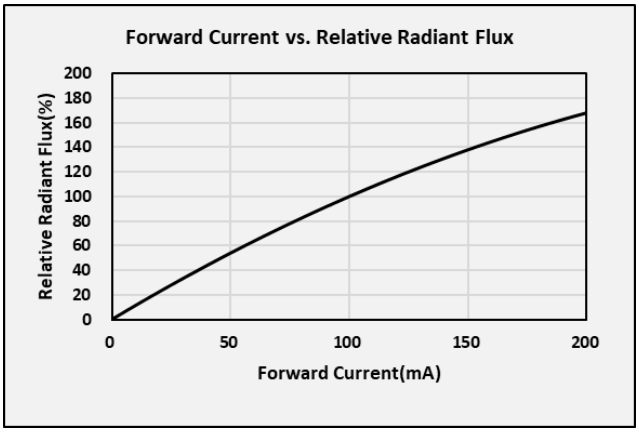
Digit	PKG Information	Code	Specification		
1 2 3	Samsung Package Middle Power	**SPM**			
4 5	Color	**UV**	Ultra Violet		
6	Product Version	**1**	1st version		
7 8	Product Size	**35**	3.5*3.5mm		
9	Product Thickness	**J**	1.75mm		
10	Sorting Current (mA)	**A**	100mA		
11	Peak Wavelength Range	**D**	270~280nm		
12	Color	**0**	UVC		
13 14	Forward Voltage (V)	**V0**	V0 : 5.0 ~ 7.0V	Bin Code	50 : 5.0 ~ 5.5V 55 : 5.5 ~ 6.0V 60 : 6.0 ~ 6.5V 65 : 6.5 ~ 7.0V
15 16	Peak Wavelength (nm)	**W0**	W0 : 270 ~ 280nm	Bin Code	70 : 270 ~ 280nm
17 18	Radiant Power (mW)	**P0**	P0 : 10.0 ~ 18.0 mW	Bin Code	10 : 10.0 ~ 14.0 mW 14 : 14.0 ~ 18.0 mW

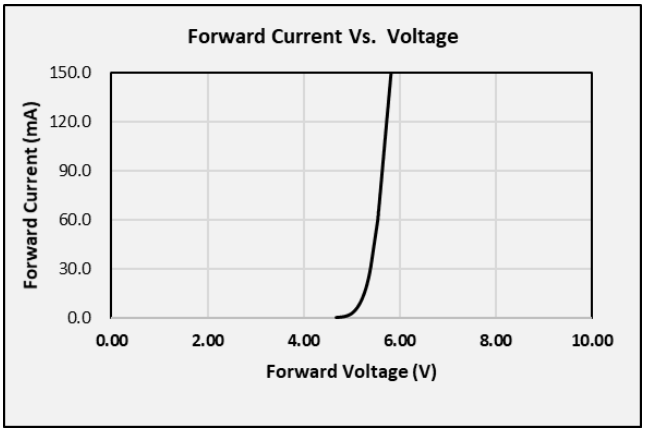
3. Typical Characteristics Graphs

a) Spectrum Distribution (I_F = 100mA, Ts = 25 ºC)

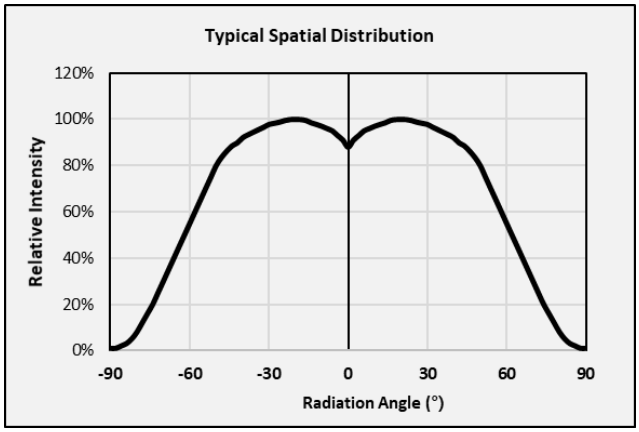


b) Forward Current Characteristics (Ts = 25 ºC)

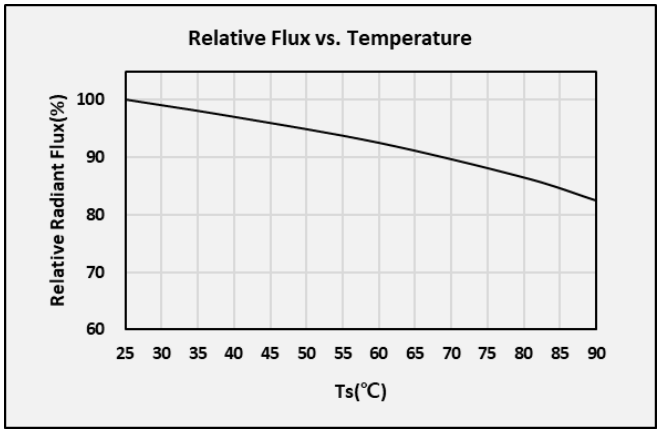


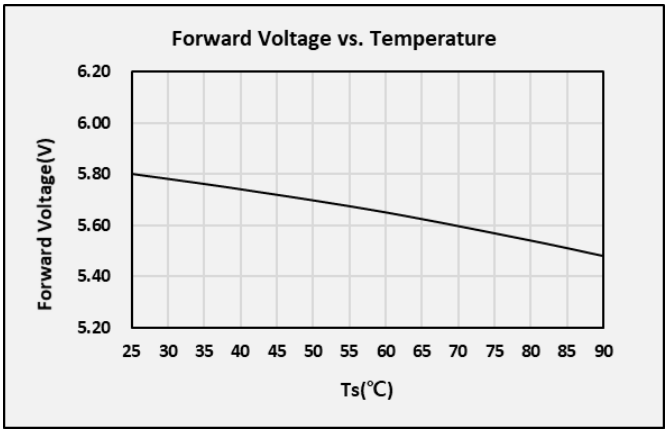


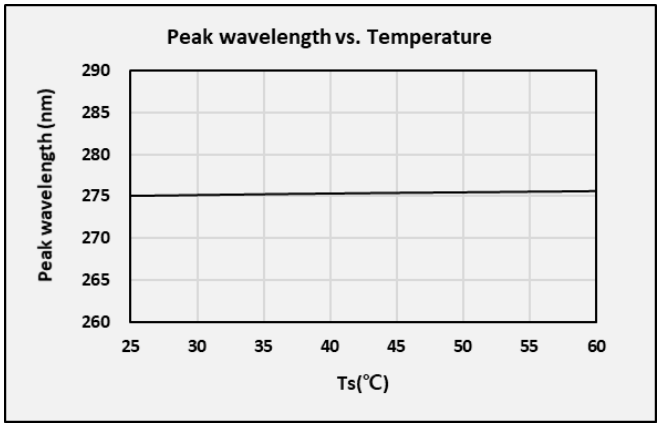
c) Beam Angle Characteristics (I_F = 100 mA, Ts=25℃)



d) Temperature Characteristics (I_F = 100 mA)



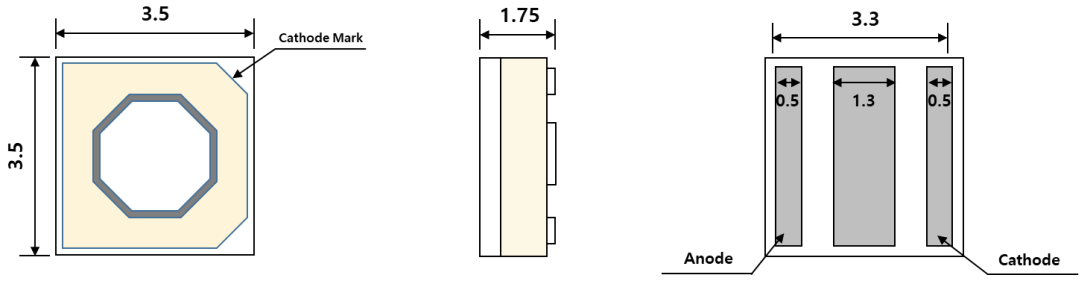




4. Outline Drawing & Dimension

a) Mechanical Dimension

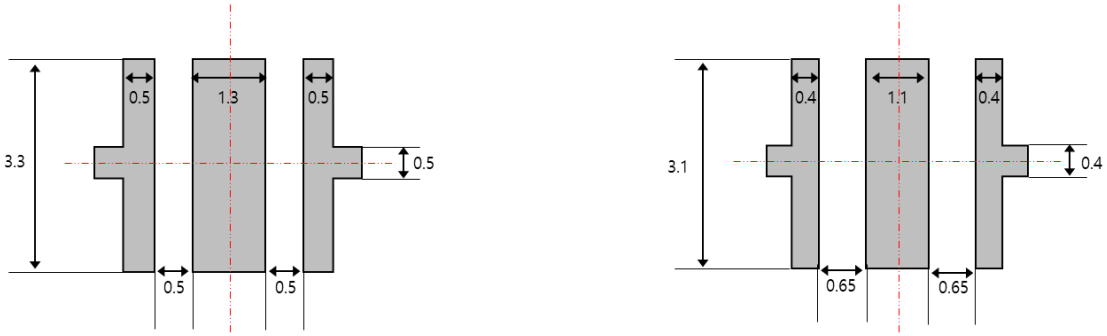
<Top View> <Side View> <Bottom View>



- Measurement unit: mm
- Tolerance: ±0.15 mm

b) Recommended foot-print for SMT

< PCB Land Pattern > < Stencil Mask Pattern >



- 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:

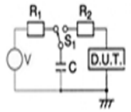
1) Pressure on the LEDs will influence to the reliability of the LEDs. Precautions should be taken to avoid strong pressure on the LEDs. Do not put stress on the LEDs during heating.

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	25ºC, Maximum rated drive current	1000 h	20
High Temperature Humidity Life Test	40ºC, 90% RH, Maximum rated drive current	500 h	20
High Temperature Humidity On/Off Test	40ºC, 90% RH , On/Off 5sec, Maximum rated drive current	500 h	20
Temperature Cycling	-45 ºC / 30 min ↔ 125 ºC / 30 min temperature change within 5 min	300 cycles	100
High Temperature Humidity Storage	40ºC, 90% RH	500 h	20
High Temperature Storage	100 ºC	500 h	2
Low Temperature Storage	-40 ºC	500 h	20
ESD (HBM)	 R_1: 10 MΩ R_2: 1.5 kΩ C: 100 pF V: ±5 kV	5 times	30

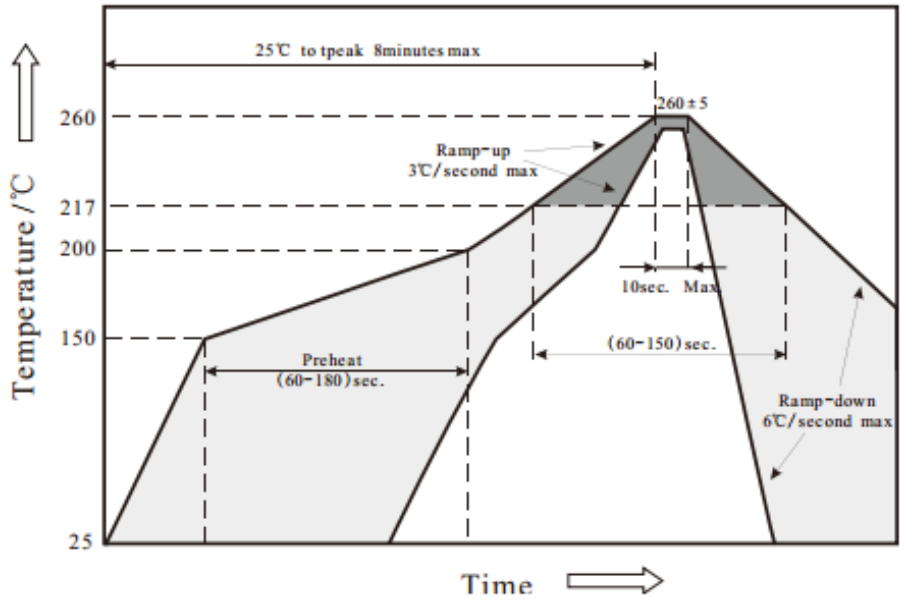
b) Criteria for Judging the Damage

Item	Symbol	Test Condition (Ta = 25 ºC)	Max or Min Allowable shift value
Forward Voltage	V_F	I_F = 150 mA	Max : Init. Value * 1.2
Radiant Flux	Φ_e	I_F = 150 mA	Min : Init. Value * 0.7

6. Soldering Conditions

a) Reflow Conditions (Pb free)

Reflow frequency: 2 times max.



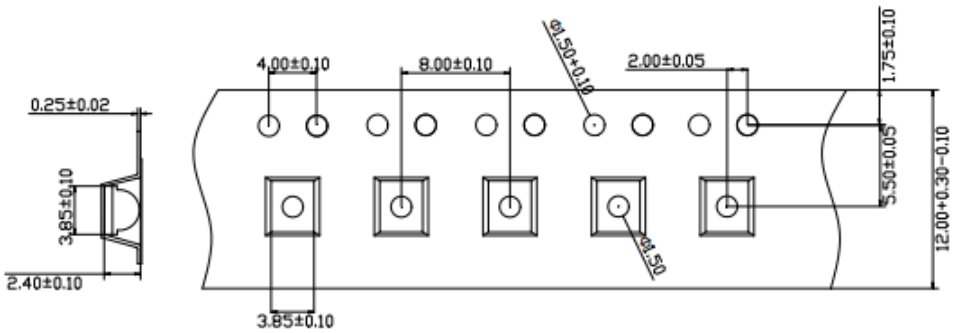
b) Manual Soldering Conditions

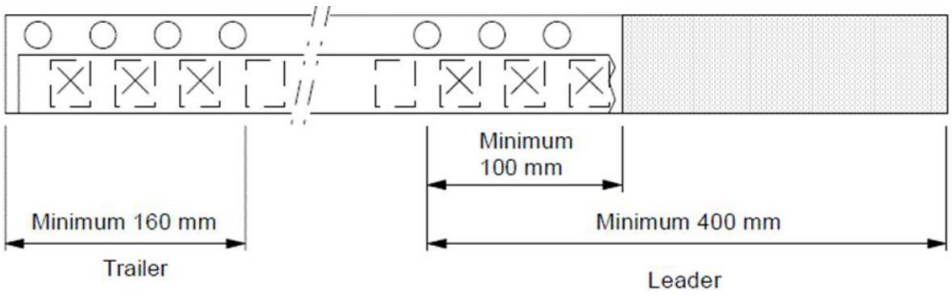
No more than 5 seconds @ max. 300 ºC, under soldering iron.

7. Tape & Reel

a) Taping Dimension

(unit: mm)

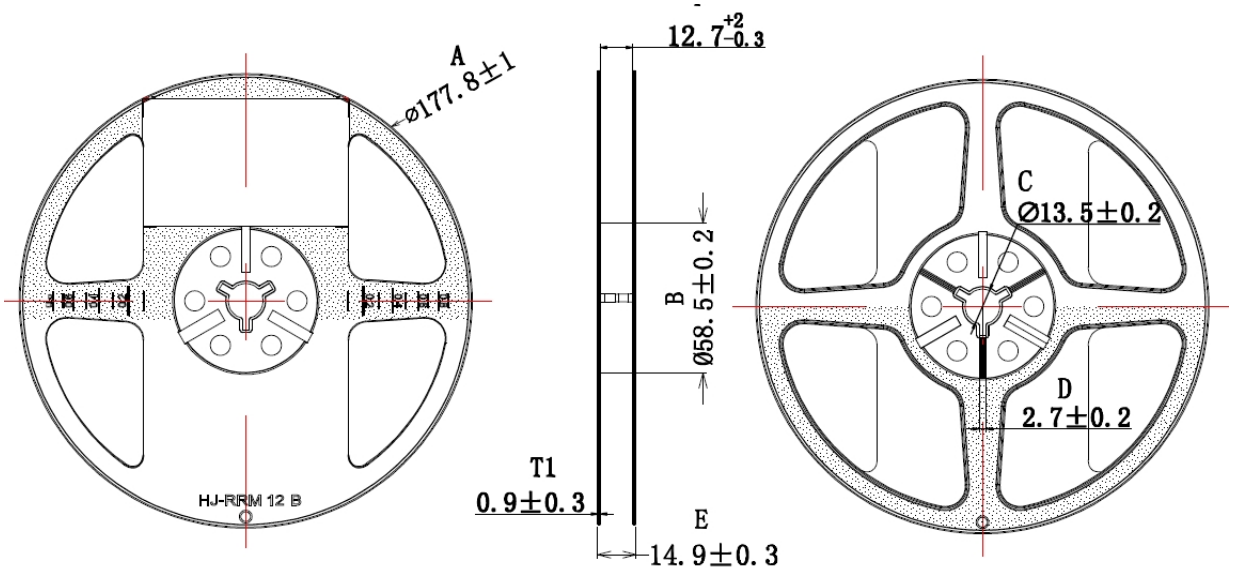




Taping Direction

b) Reel Dimension

(unit: mm)

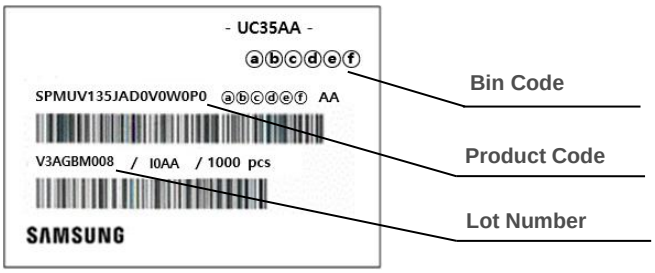


Notes:

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:

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

ⓒⓓ: Wavelength bin (refer to page 5)

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

b) Lot Number

The lot number is composed of the following characters:

①②③④⑤⑥⑦⑧⑨ / 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)

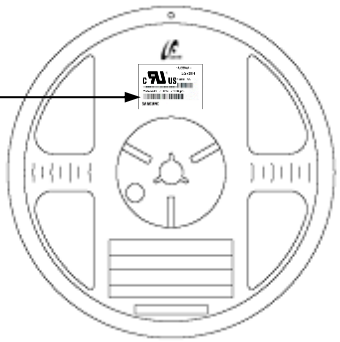
⑦⑧⑨ : Product serial number (001 ~ 999)

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

9. Packing Structure

a) Packing Process

Reel



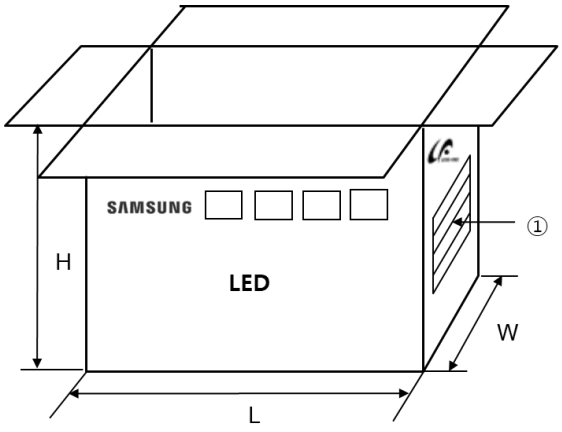
Aluminum Vinyl Packing Bag

Outer Box

Material: Paper (SW3B(B))

Type	Size (mm)			Note
	(a)	(b)	(c)	
7 inch S	245 ± 5	220 ± 5	86 ± 5	Up to 5 reels
7 inch L	245 ± 5	220 ± 5	182 ± 5	Up to 10 reels

① Side Label



b) Aluminum Vinyl Packing Bag

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

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 ºC, 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 ºC / 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 ºC.
8) Devices must be baked for 1 hour at 60 ± 5 ºC, 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

Date	Change History	Page	Version
2021.10.20	Creation of Document		1.0
2021.10.27	Correction of Typo		2.0
2022.11.08	Update Naming Code (UV352B → UC35AA)	1	3.0
	Added Naming Code to Label	13	

Legal and additional information.

About Samsung Electronics Co., Ltd.

Samsung Electronics Co. Ltd inspires the world and shapes the future with transformative ideas and technologies. The company is redefining the worlds of TVs, smartphones, wearable devices, tablets, digital appliances, network systems, and semiconductor and LED solutions. For the latest news, please visit the Samsung Newsroom at http://news.samsung.com.

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