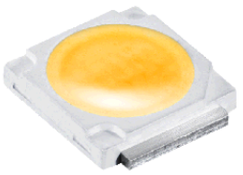
DATE OF ISSUE : 2011. 02. 07

SPECIFICATION

MODEL : SPHWWTS8N105EBT0H3



Approved rank : V_F (E5, K7),
CIE (T1, T2, T3, T4, T5, T6, T7, T8, T9,
TA, TB, TC, TD, TE, TF, TG),
Φ_V (H1, M1)

Sunnix8 WHITE LED T0 RANK

CUSTOMER		
CHECKED	CHECKED	APPROVED

SAMSUNG LED			
DRAWN	CHECKED(Sales)	CHECKED(Qual)	APPROVED

SAMSUNG LED CO,.LTD.

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1. Product Outline

1) Features

Plastic Molded Lead Frame Type : 6.0 (L), 7.0 (W), 1.2 (T)

Beam View Angle(θ)* : 120 °

High Power / Brightness Chip & Long Time Reliability

2) Applications

General Lighting, Indoor Illumination, Refrigerator lighting etc.

View Angle describes the spatial intensity distribution and is the difference between the angles corresponding to 50% of the maximum intensity.

2. Absolute Maximum Rating

Operation Forward Current(1) 700

Peak Pulsed Forward Current 800

(Duty 1/10 and Pulse Width 10 msec)

Reverse Current(2) 20

Thermal Resistance ($R_{th\ j\text{-}s}$) ..... 5 /W

Operating Temperature Range (T_{OPR}) ..... -40 85

Storage Temperature Range (T_{STG}) ..... -40 110

LED Junction Temperature (T_j) 125

(1) Refer to derating curve in the page 6.

(2) Does not operate in the reverse direction.

3. Characteristics

1) Electrical properties (T_a = 25)

Parameter	Symbol	Condition	Rank		Min.	Typ.	Max.	Unit
Reverse Voltage	V_R	I_R = 10	-		0.5	0.8	2.0	V
Forward Voltage	V_F	I_F = 350	EB	E5	2.90		3.15	
				K7	3.15		3.50	

2) Color Rendering Index (T_a = 25)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Color Rendering	R_a	I_F = 350	80	83	-	-

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3) Chromaticity Coordinates (T_a = 25)

Item	Condition	Rank		x				y			
Chromaticity Coordinate (*)	I_F=350	T0	T1	0.3670	0.3726	0.3744	0.3686	0.3578	0.3612	0.3685	0.3649
			T2	0.3726	0.3783	0.3804	0.3744	0.3612	0.3646	0.3721	0.3685
			T3	0.3783	0.3840	0.3863	0.3804	0.3646	0.3681	0.3758	0.3721
			T4	0.3840	0.3898	0.3924	0.3863	0.3681	0.3716	0.3794	0.3758
			T5	0.3686	0.3744	0.3763	0.3702	0.3649	0.3685	0.3760	0.3722
			T6	0.3744	0.3804	0.3825	0.3763	0.3685	0.3721	0.3798	0.3760
			T7	0.3804	0.3863	0.3887	0.3825	0.3721	0.3758	0.3836	0.3798
			T8	0.3863	0.3924	0.3950	0.3887	0.3758	0.3794	0.3875	0.3836
			T9	0.3702	0.3763	0.3782	0.3719	0.3722	0.3760	0.3837	0.3797
			TA	0.3763	0.3825	0.3847	0.3782	0.3760	0.3798	0.3877	0.3837
			TB	0.3825	0.3887	0.3912	0.3847	0.3798	0.3836	0.3917	0.3877
			TC	0.3887	0.3950	0.3978	0.3912	0.3837	0.3875	0.3958	0.3917
			TD	0.3719	0.3782	0.3802	0.3736	0.3797	0.3837	0.3916	0.3874
			TE	0.3782	0.3847	0.3869	0.3802	0.3837	0.3877	0.3958	0.3916
			TF	0.3847	0.3912	0.3937	0.3869	0.3877	0.3917	0.4001	0.3958
			TG	0.3912	0.3978	0.4006	0.3937	0.3917	0.3958	0.4044	0.4001

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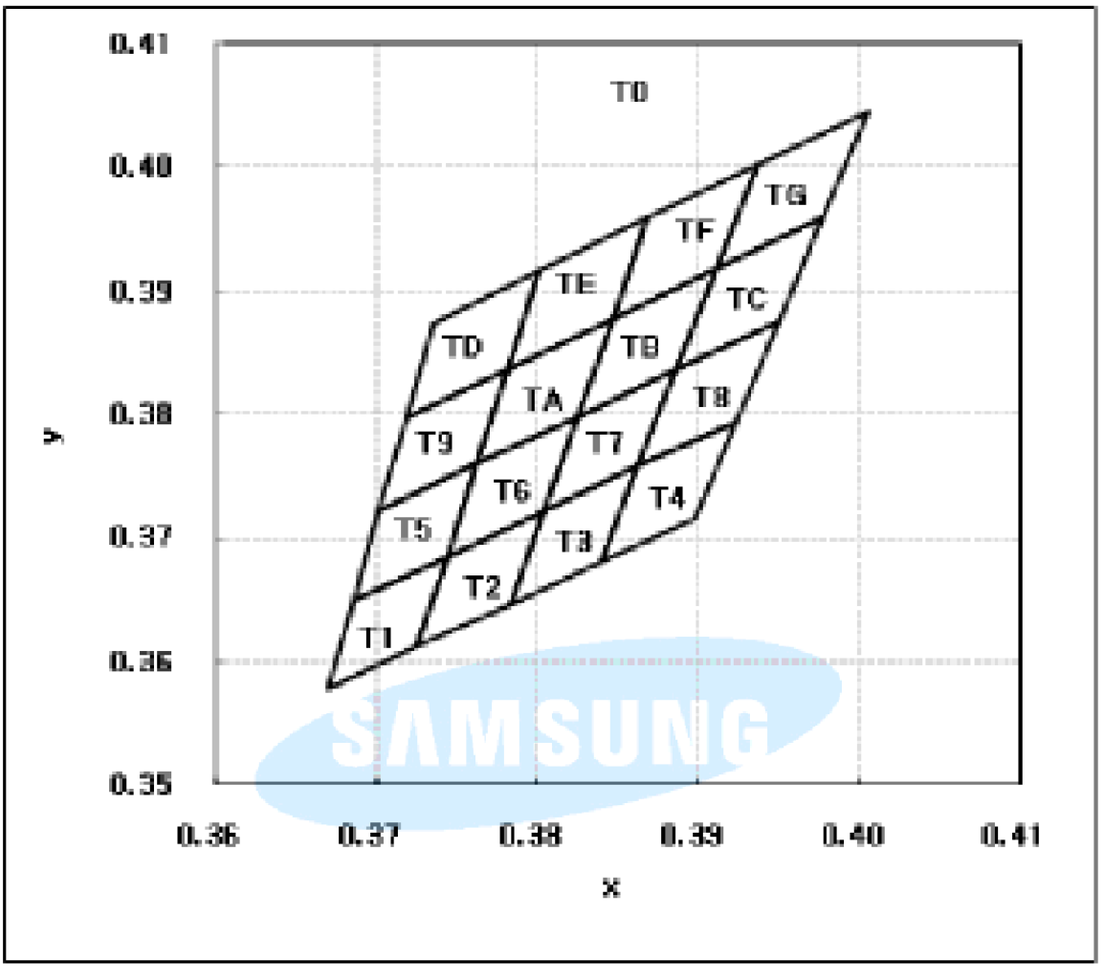
4) Luminous Flux (T_a = 25)

Parameter	Symbol	Condition	Rank		Min.	Typ.	Max.	Unit
Luminous Flux	Φ_V	I_F = 350	H3	H1	90		105	
				M1	105		-	

Tolerance : V_F : ±0.1, Φ_V : ±7 %, CCx CCy : ±0.02, R_a :±5.0

Luminous Intensity measuring equipment : CAS140CT

4. Chromaticity Diagram



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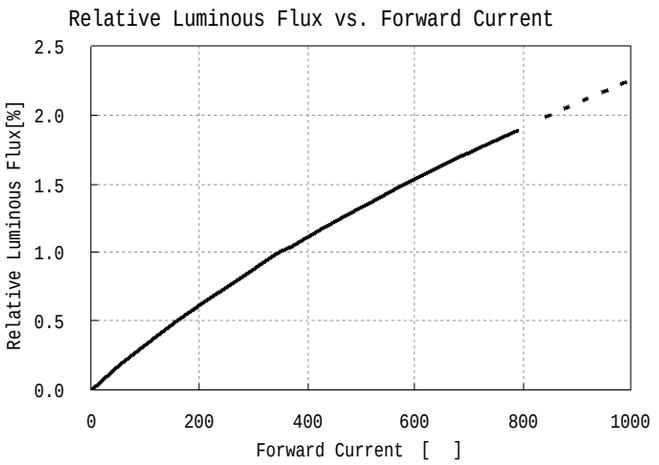
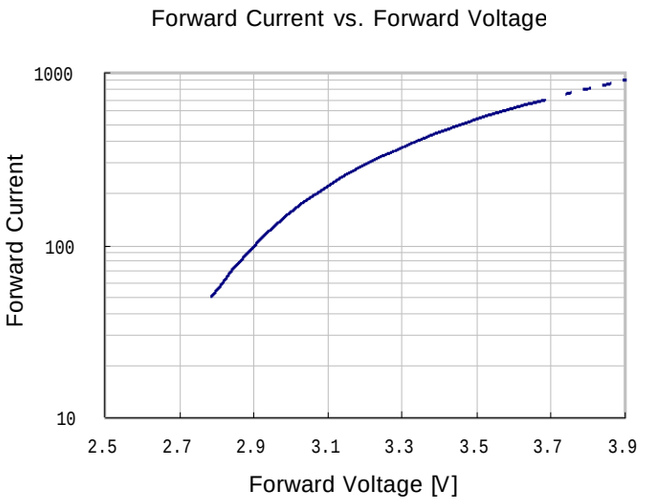
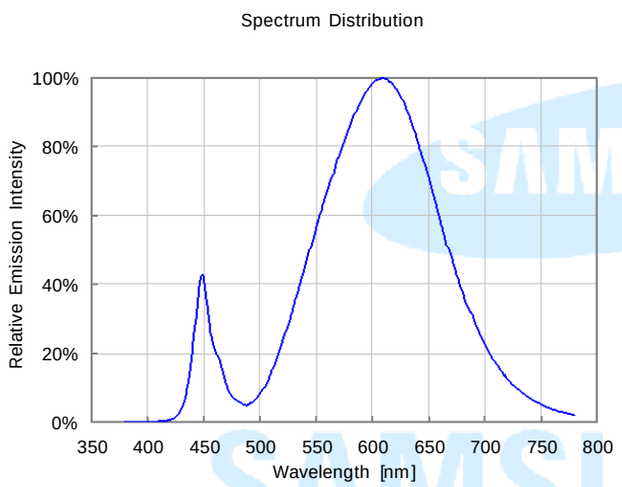
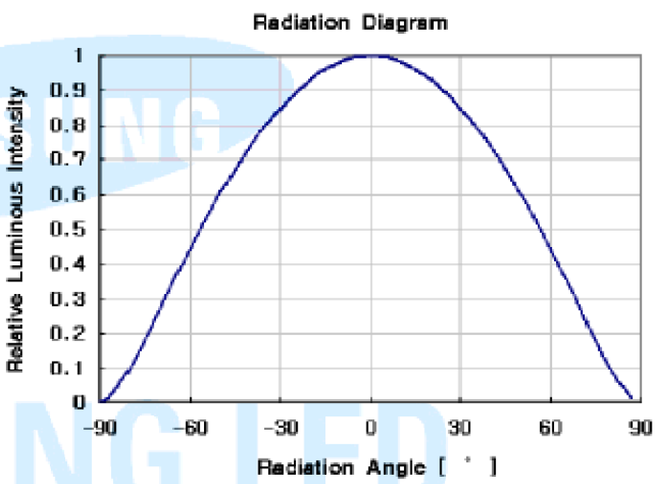
5. Typical Characteristic Graphs









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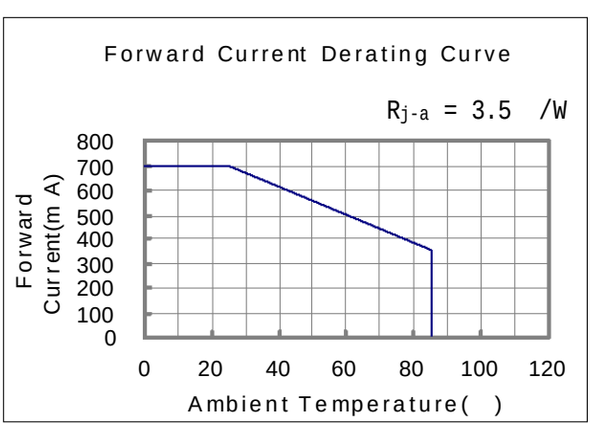
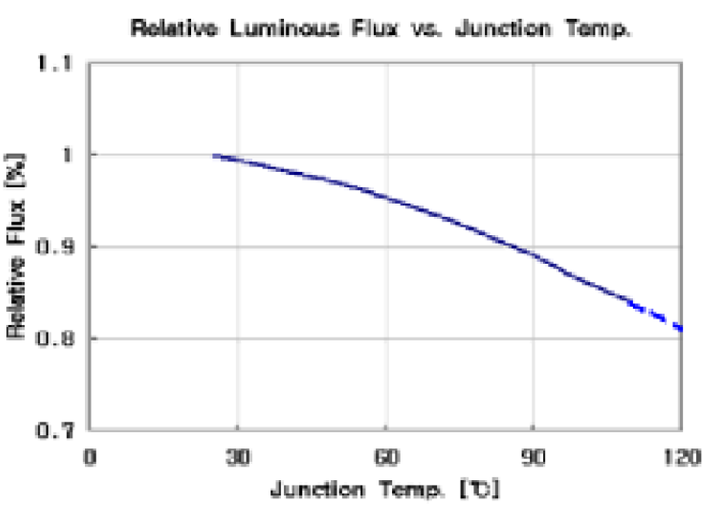
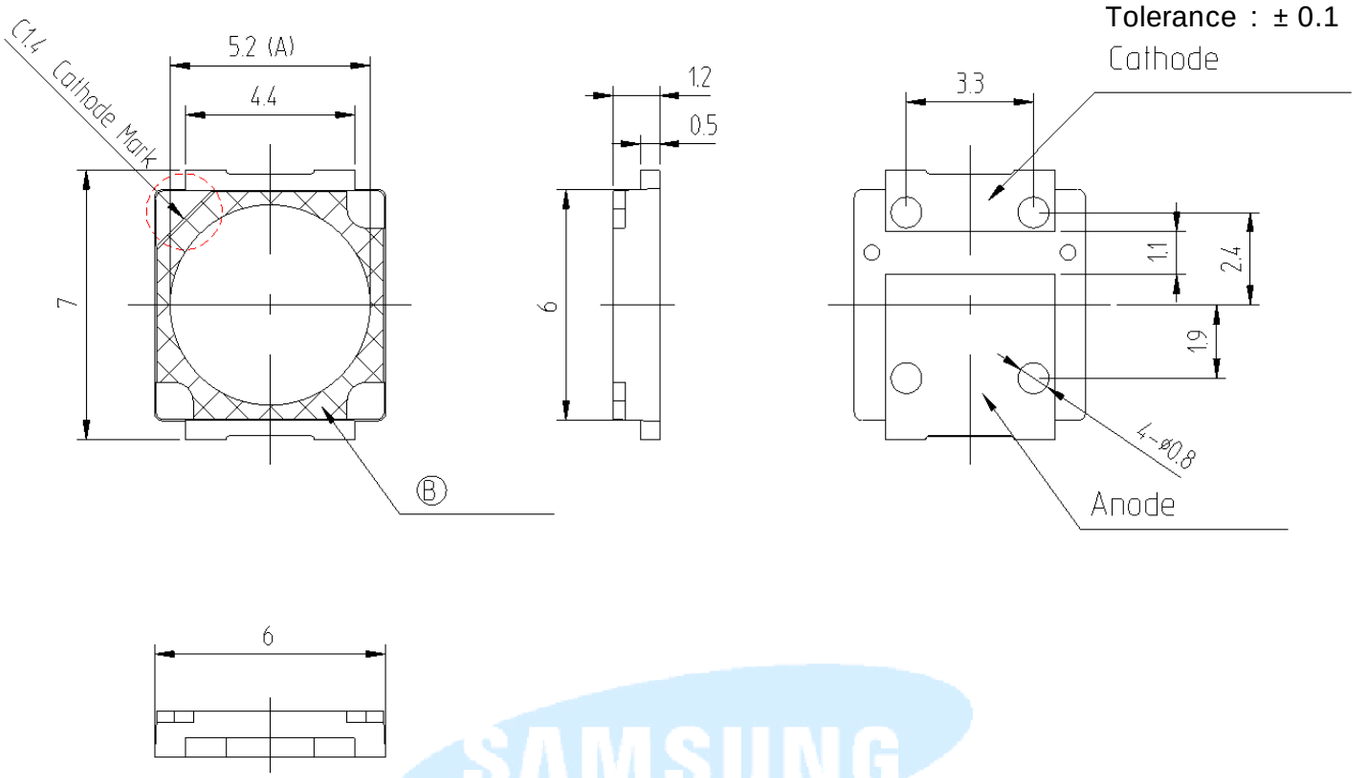




6. Outline Drawing and Dimension

Unit :

Tolerance : ± 0.1



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Pick and Place

1. Do not place pressure on the encapsulating resin ("A")
   It is recommended to us a pick&place nozzle with inside diameter at 5.2mm
2. The maximum compressing force is 15N on the polymer ("B")

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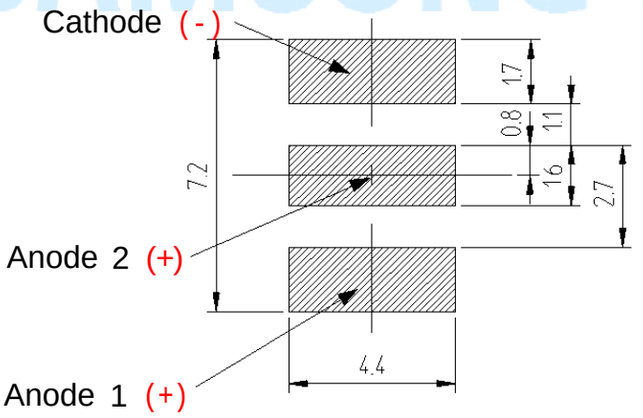
Solder Pattern for Surface Mount



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

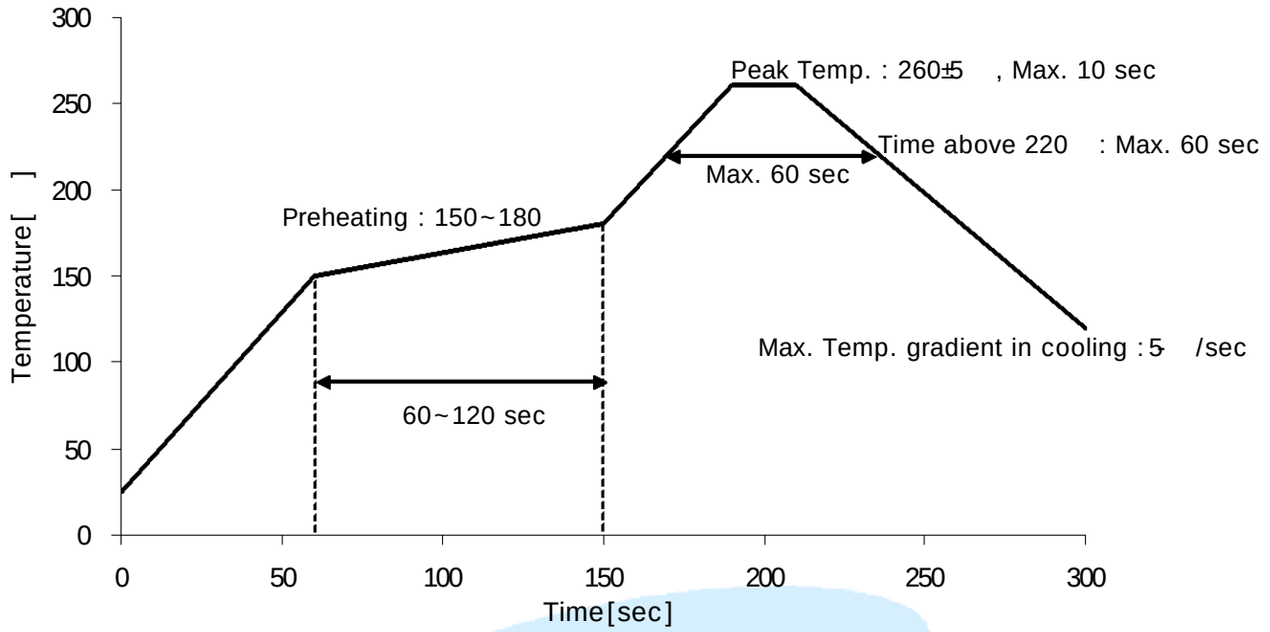
Remarks

Make sure that Anode 2 is electrically connected to the Anode 1.
Anode 2 is to be soldered, If not, use the heat conductive adhesive.

7. Solder Conditions

1) Reflow Conditions (Pb-Free)

Reflow Frequency : 2 time max.



2) For Manual Soldering

Not more than 5 seconds @Max. 300 , under soldering iron.

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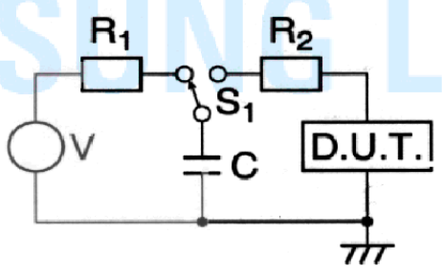
8. Reliability Test Items and Conditions

1) Test Items

Test Items	Test Conditions	Test Hours/Cycles
Room Temperature life test	25 , I_F = Max DC	1,000 h
High Temperature humidity life test	85 , 85 % RH, I_F = Max DC	1,000 h
High Temperature life test	85 , I_F = Max DC	1,000 h
Low Temperature life test	-40 , I_F = Max DC	1,000 h
High Temperature Storage	110	1,000 h
Low Temperature Storage	-40	1,000 h
Thermal Shock	-40 / 120 , each 30 min	200 cycles
Temperature humidity Cycle On/Off test	-40 / 85 , each 20 min, 100 min transfer Power On/off each 5 min, DC 350	100 cycles
Reflow (Pb-Free)	Peak 260±5 for 10 sec	3 times
ESD(HBM)	 R1 : 10 , R2 : 1.5 , C : 100	3 times (± 5)

Max. DC current is depending on maximum current derating curve.

2) Criteria for Judging the Damage

Item	Symbol	Test Condition	Limit	
			Min	Max
Forward Voltage	V_F	I_F = 350	-	U.S.L.*1.1
Luminous Flux	Φ_V	I_F = 350	L.S.L.*0.7	-

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

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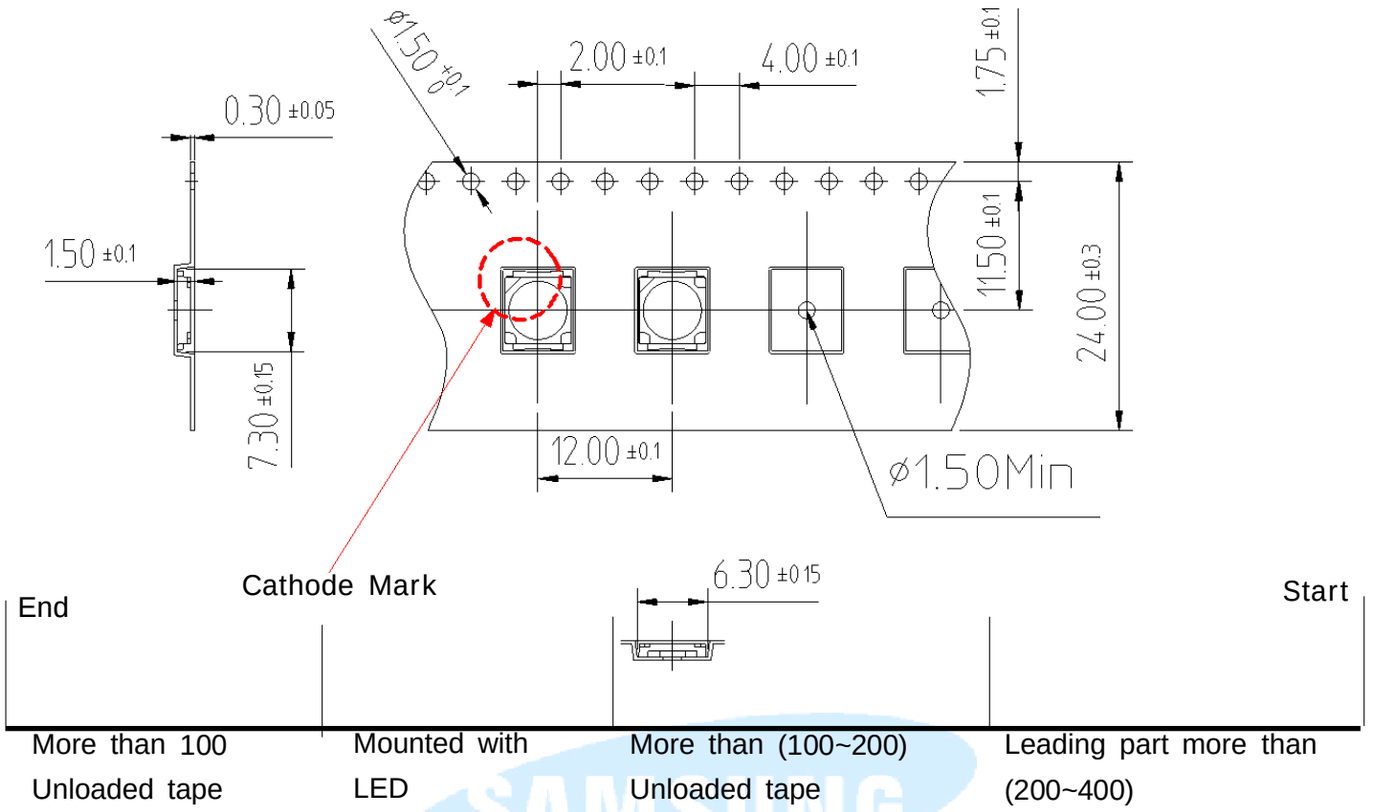
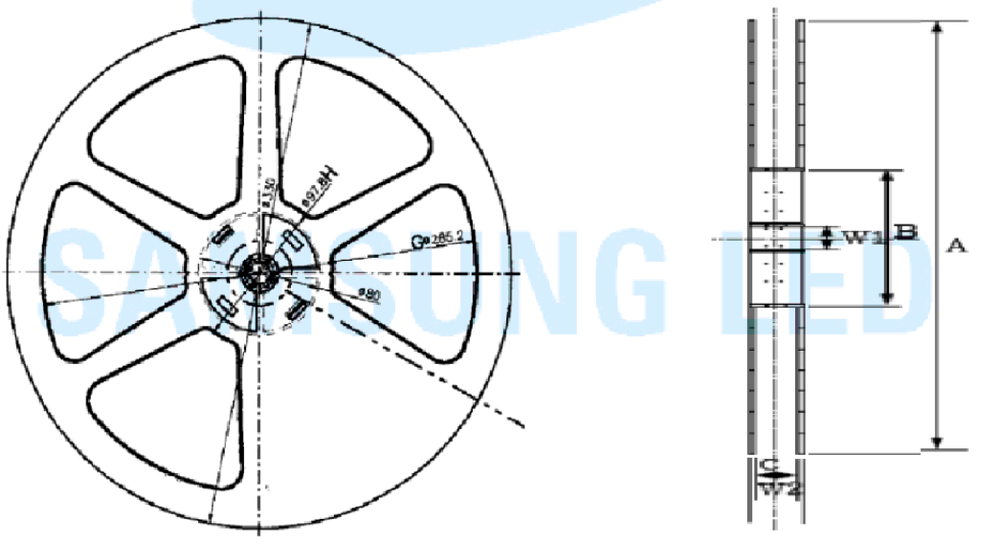
9. Taping Dimension





Symbol	A	B	C	W1	W2
Dimension( )	330 ± 1	80 ± 1	25 ± 0.5	13 ± 0.3	29.5 ± 1

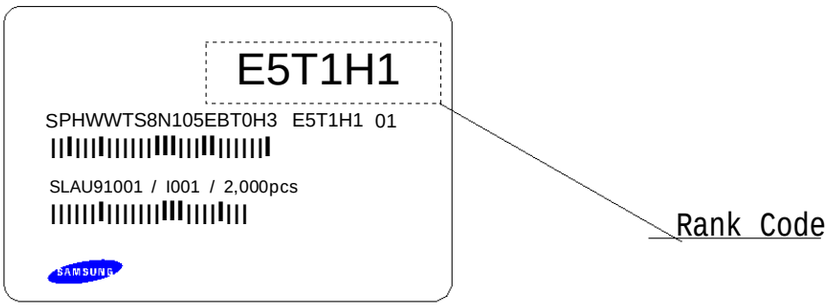
(1) Quantity : 2,000 Pcs / 13" Reel.

(2) Cumulative Tolerance : Cumulative Tolerance/10 pitches is less than ±0.2

(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 angle to be the carrier tape.

(4) Packaging : P/N, Manufacturing data Code No. and quantity to be indicated on a damp proof Package

10. Label Structure



Rank Code

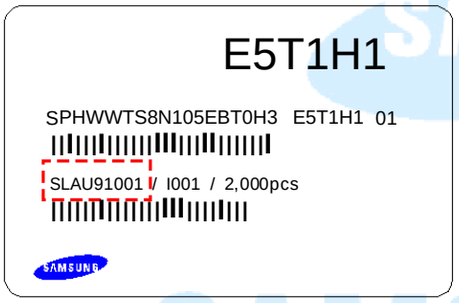
: VF Rank (refer to page 3)

: Chromaticity Coordinate Rank, CIE (refer to page 4)

: Luminous Flux (refer to page 4)

11. Lot Number

The Lot number is composed of the following characters



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● □■ / I▲▲▲ / 2000PCS

● : Production Site (S:SAMSUNG LED, G:Gosin China)

: L (LED)

: Product State (A:Normality, B:Bulk, C:First Production, R:Reproduction, S:Sample)

: Year (S:2008, T:2009, U:2010...)

□ : Month (1 ~ 9, A, B)

■ : Day (1 ~ 9, A, B ~ V)

: SAMSUNG LED Product Number (1 ~ 999)

▲ : Reel Number (1 ~ 999)

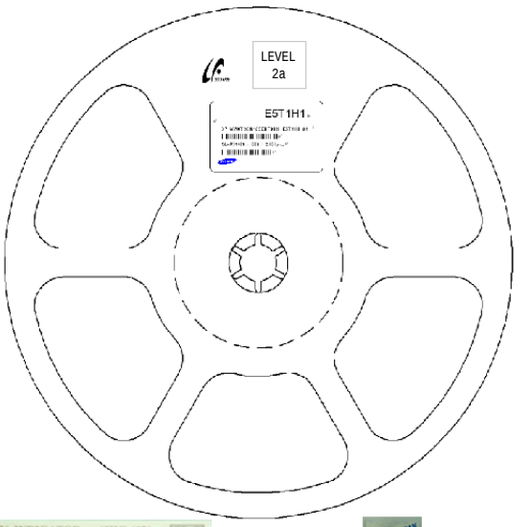
12. Reel Packing Structure

1) Reel

E5T1H1

SPHWWTS8N105EBT0H3 E5T1H1 01

SLAU91001 / I001 / 2,000pcs



2) Aluminum Bag

E5T1H1

SPHWWTS8N105EBT0H3 E5T1H1 01

SLAU91001 / I001 / 2,000pcs

Humidity Indicator Card

Silica gel

3) Inner Box

Material : Paper(SW3B(B))

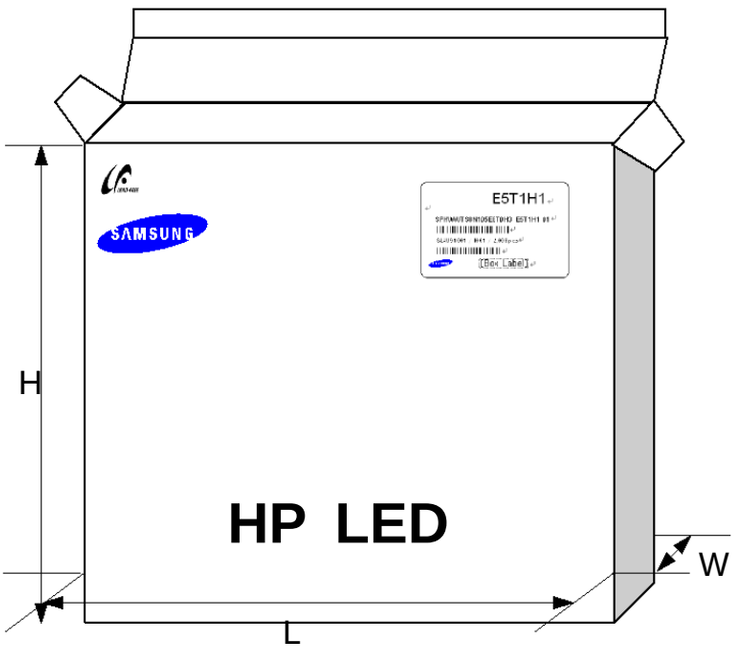
TYPE	SIZE( )		
	L	W	H
13inch	335	45	335

E5T1H1

SPHWWTS8N105EBT0H3 E5T1H1 01

SLAU91001 / I001 / 2,000pcs

[Box Label]



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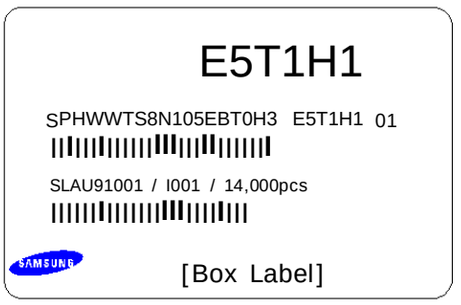
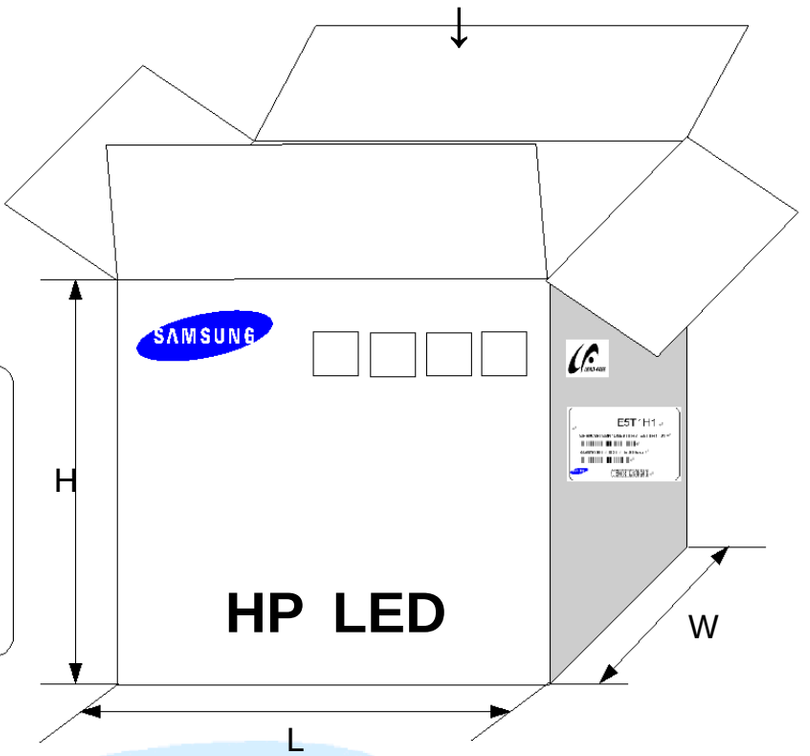
4) Carton Box

Material : Paper(SW3B(B))

TYPE	SIZE( )		
	L	W	H
13inch	350	350	350





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13. Aluminum Vinyl Bag

CAUTION

LEVEL 2a

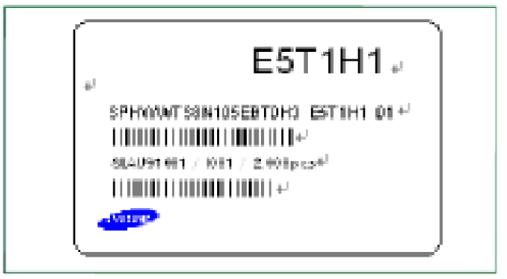
This bag contains
MOISTURE SENSITIVE DEVICES

1. Shelf life in sealed bag: 12 months at < 40℃ and < 90% relative humidity (RH)
2. Peak package body temperature: 240 ℃
3. After this bag is opened, devices that will be subjected to reflow soldor or other high temperature processes must be:
   a. Mounted within 672 hours at factory conditions of equal to or less than 30℃/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℃, or
   b. 2a is not met.
5. If baking is required, devices must be baked for 1 hours at 60±5℃

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



LEAD-FREE

ATTENTION
OBSERVE PRECAUTIONS FOR HANDLING
ELECTROSTATIC SENSITIVE DEVICES

OTHER

■ 주의 사항

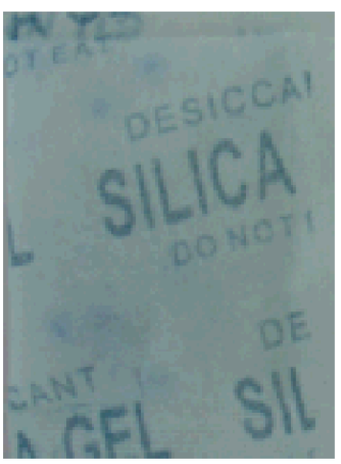
이 알루미늄 지퍼 백은 습기 및 정전기로부터 제품을 보호하기 위하여 제작되었습니다. 개봉 후에는 즉시 솔더 작업을 실시하는 것을 권장합니다.

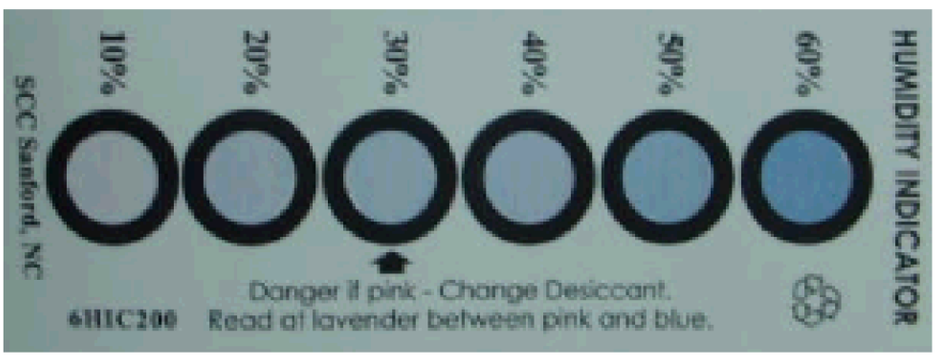
습기 및 정전기로부터 제품을 보호 하기 위해서 개봉 후 사용하지 않는 자재는 본 팩에 넣어 보관 하시기 바랍니다. 사용하지 않는 자재를 본 팩에 넣을 때는 반드시 동봉된 드라이 팩과 함께 넣고 지퍼부분을 완전하게 밀봉하여 주시기 바랍니다.

■ 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.

Silica gel & Humidity Indicator Card in Aluminum Vinyl Bag





14. Precaution for Use

1) For over-current-proof function, customers are recommended to apply resistors to prevent sudden change of the current caused by slight shift of the voltage.

2) This device should not be used in any type of fluid such as water, oil, organic solvent, etc. When washing is required, IPA is recommended to use.

3) When the LEDs illuminate, operating current should be decided after considering the ambient maximum 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 by a sealed container with nitrogen gas injected. (Shelf life of sealed bags : 12 months, temp. 0~40 , 20~70%RH)

5) After storage bag is open, device subjected to soldering, solder reflow, or other high temperature processes must be:
   a. Mounted within 168 hours (7days) at an assembly line with a condition of no more than 30 /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 is >60% at 23±5 .

8) Devices must be baked for 24hours at 65±5 , if baking is required.

9) The LEDs are sensitive to the static electricity and surge. 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 leak current, lowered turn-on voltage, or abnormal lighting of LEDs at low current.

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10) When handling LED with tweezers, the LED Should only be held by the polymer body, not by the encapsulant or LENS.

11) The use of appropriate nozzle for the LED recommended. For the recommended nozzle size, refer to the figure at the below.
Inner diameter of nozzle ≥ Φ6.1mm

12) Do not stack assembled PCBs together. Since silicone is a soft material, abrasion between two PCB assembled with silicone encapsulated LED might cause catastrophic failure of the LEDs due to damage to encapsulant and wire and LED detachment.

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15. Hazard Substance Analysis

SGS

Test Report No. F690501/LF-CTSAYAA10-41879 Issued Date: December 22, 2010 Page 1 of 5

To: SAMSUNG LED CO.,LTD.
314,Maetan-dong
Yeongtong-gu
Suwon-city
GYEONGGI-DO 443-370
Korea

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

SGS File No.	: AYAA10-41879
Product Name	: LED PKG
Item No./Part No.	: Sunnio® PKG(White)
Received Date	: Dec 17, 2010
Test Period	: Dec 20, 2010 to Dec 22, 2010
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)
Comments	: By the applicant's specific request, the sampling and testing was performed only for the part indicated in the photo without disassembly.

SGS Testing Korea Co. Ltd.

Jeff Jang

Jeff Jang / Chemical Lab Mgr

Timothy Jeon
Jinhee Kim
Cindy Park
Jerry Jung/ Testing Person

SAMSUNG LED

SGS

Test Report No. F690501/LF-CTSAYAA10-41879 Issued Date: December 22, 2010

Sample No. : AYAA10-41879.001

Sample Description : LED PKG

Item No./Part No. : Sunnix8 PKG(White)

Heavy Metals

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	With reference to IEC 62321:2008, ICP	0.5	N.D.
Lead (Pb)	mg/kg	With reference to IEC 62321:2008, ICP	5	N.D.
Mercury (Hg)	mg/kg	With reference to IEC 62321:2008, ICP	2	N.D.
Hexavalent Chromium (Cr VI)	mg/kg	With reference to IEC 62321:2008, UV-VIS	1	N.D.

Flame Retardants-PBBs/PBDEs

Test Items	Unit	Test Method	MDL	Results
Monobromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Dibromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tribromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tetrabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Pentabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Hexabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Heptabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Octabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Nonabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Decabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Monobromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Dibromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tribromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tetrabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Pentabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Hexabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Heptabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Octabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Nonabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Decabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.

NOTE:
(1) N.D. = Not detected.(<MDL)
(2) mg/kg = ppm
(3) MDL = Method Detection Limit
(4) - = No regulation
(5) ** = Qualitative analysis (No Unit)
(6) * = Boiling-water-extraction:
Negative = Absence of CrVI coating
Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.

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Sample No. : AYAA10-41879.001

Sample Description : LED PKG

Item No./Part No. : Sunnix8 PKG(White)

Halogen Contents

Test Items	Unit	Test Method	MDL	Results
Bromine(Br)	mg/kg	BS EN 14582:2007 , IC	30	N.D.
Chlorine(Cl)	mg/kg	BS EN 14582:2007 , IC	30	N.D.

Picture of Sample as Received:

SAMSUNG LED

NOTE: (1) N.D. = Not detected.(<MDL)
(2) mg/kg = ppm
(3) MDL = Method Detection Limit
(4) - = No regulation
(5) ** = Qualitative analysis (No Unit)
(6) * = Boiling-water-extraction:
Negative = Absence of CrVI coating
Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.

[illegible]

Revision History
(Model : SPHWWTS8N105EBT0H3)

Date	Revision History	Author	
		Drawn	Approved
2011.02.07	Initial Edition	H.J. Park	K.T. Kim

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SAMSUNG LED