DATE OF ISSUE : 2009. 07. 01

SPECIFICATION

MODEL : SPMRED3212

Approved rank : V_F(S0), λ_D(V0), I_V(C1,C2,C3,C4)

RED LED

SAMSUNG LED CO., LTD.
314. MAETAN 3-DONG, YEONGTONG-GU,
SUWON-SI,GYEONGGI-DO,KOREA,443-743

Contents

1. Product Outline

1) Feature

. Lead Frame Type LED Package (3.5 * 2.8 * t 1.9 mm)

. Beam Angle (△θ : 120 °)

. AlGaInP/AIN Chip & Long Time Reliability

2) Applications

. Indoor, Outdoor Display and etc.

2. Absolute Maximum Rating

1). Operation Forward Current Per Chip..... 30 ㎃

2). Peak Pulsed Forward Current Per Chip..... 100 ㎃

(Duty 1/10 Pulse Width 10msec)

3). Reverse Voltage..... 10 V

4). Operating Temperature Range (T_{opr}) ..... -30℃ ~ 85℃

5). Storage Temperature Range (T_{stg}) ..... -40℃ ~ 100℃

-. I_{FP} Conditions : Duty 1/10 Pulse Width 10 ㎳

3. Characteristics

Electrical/ Optical Characteristics

(Ta : 25 ℃)

Item	Symbol	Conditions	Rank	Min.	Typ.	Max.	Unit
Forward Voltage (*)	V_F	I_F = 20 ㎃	S0	1.7	-	2.6	V
Reverse Current	I_R	V_R = 5 V	-	-	-	50	㎂

Dominant Wavelength

(Ta : 25°C)

Item	Symbol	Condition	Rank	Model Name	Min.	Typ.	Max.	Unit
Dominant Wavelength (*)	λ_D	I_F = 20 ㎃	V0	SPMRED3212N0S0V0SC	618		630	㎚

Luminous Intensity

(Ta : 25 ℃)

Item	Symbol	Condition	Rank		Min.	Typ.	Max.	Unit
Luminous Intensity (*)	I_V	I_F = 20 ㎃	SC	C1	300	-	400	mcd
				C2	400	-	520	
				C3	520	-	670	
				C4	670	-	850	

* Tolerance : V_F ; ±0.1V, λ_D ; ±2㎚, I_V ; ±10%

* Luminous intensity measuring equipment : CAS140CT

※ Approved Rank

V_F	λ_D	I_v
S0	V0	C1, C2, C3, C4

* Each reel contains only one of the C1, C2, C3 or C4 a segment (1/4) of the SC rank.

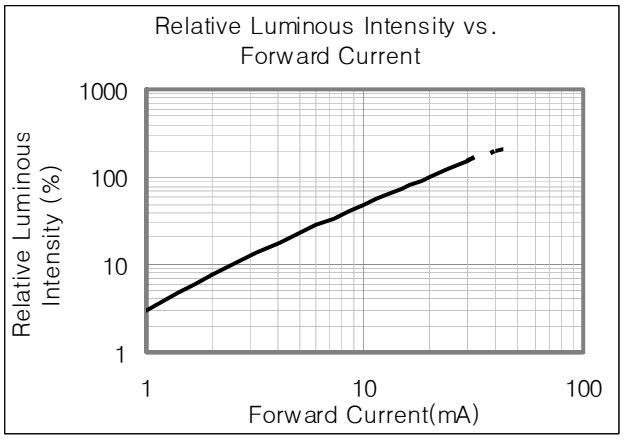
※ Special Approved Rank

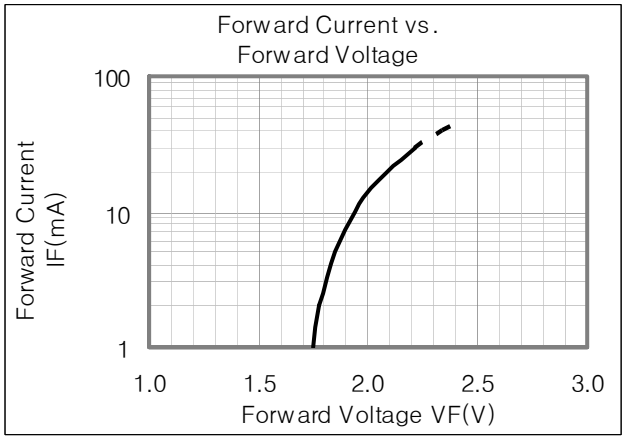
V_F	λ_D	I_v
-	-	-

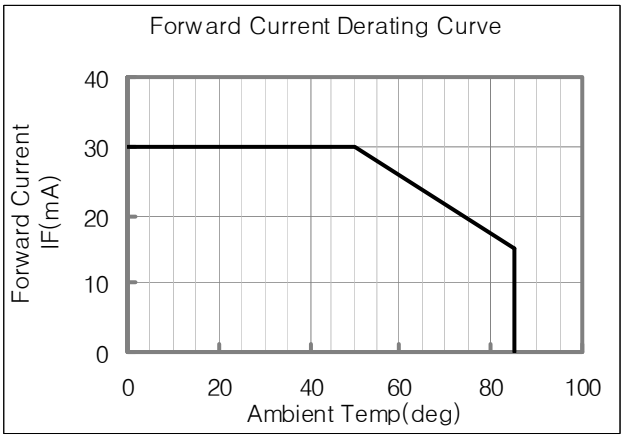
4. Typical Characteristics Graph

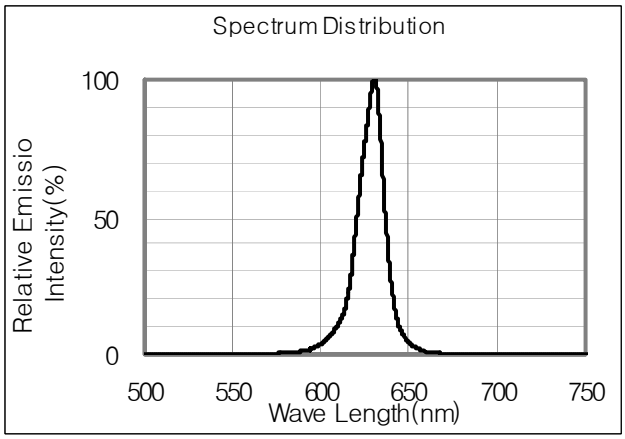
* These graphs show typical values.

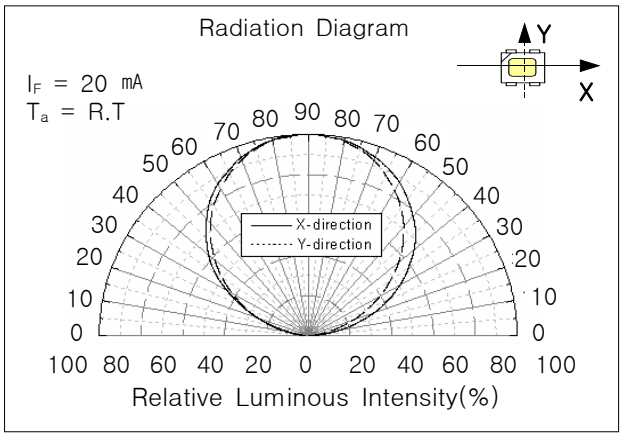
(Ta : 25°C)





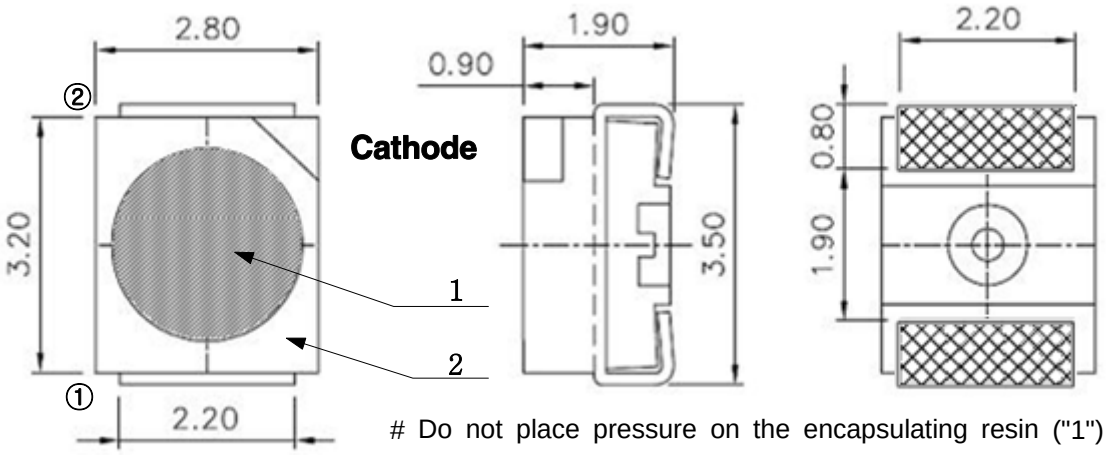




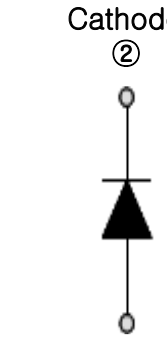


5. LED Package Outline Dimensions

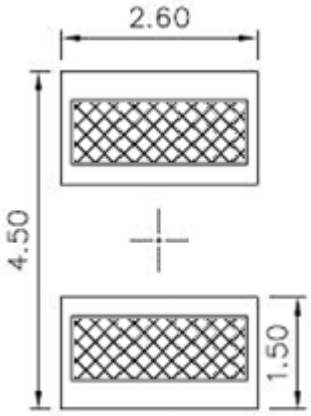
unit:mm
Tolerance:±0.15



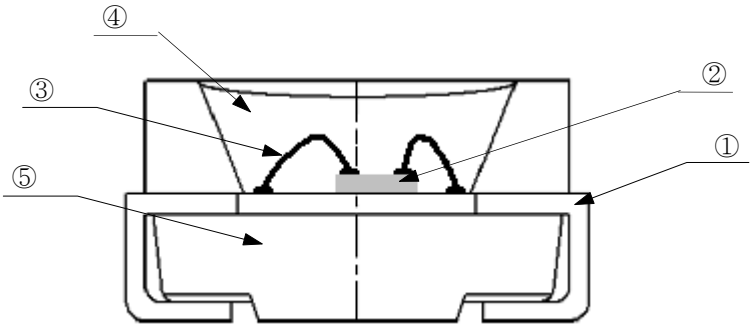
Do not place pressure on the encapsulating resin ("1")
The maximum compressing force is 15N on the polymer ("2")



Circuit Diagram



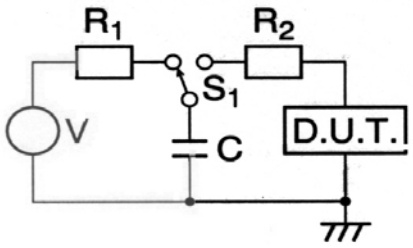
Land Layout



NUMBER	ITEM	MATERIAL
①	FRAME	Copper Frame(Silver Plated)
②	LED CHIP	AlGaInP/AlN
③	WIRE	Gold Wire
④	RESIN	Resin
⑤	PACKAGE	Heat-resistant Polymer

6. Reliability Test Items and Conditions

1) Test Items

Test Item	Test Conditions	Test Hours/Cycles	Sample No
Room Temperature life test	25℃±3℃, DC 30 mA	500 hr	0/100
High Temperature humidity life test	60℃±3℃, 85%±2%RH, DC 20 mA	500 hr	0/100
High Temperature life test	85℃±3℃, DC 10 mA	500 hr	0/100
Temperature Cycle	-40℃ ~ 25℃ ~ 100℃ ~ 25℃ [30min, 5min, 30min, 5min], 70min/1cycle	100 cycles	0/100
Thermal Shock	-40℃ ~ 100℃ [30min, 30min], 60min/1cycle	100 cycles	0/100
Reflow (Pb-Free)	Peak 260±5℃ for 10sec	3 times	0/11
Vibration test	100~2000~100Hz 200m/S2, Sweep 4min, 48min X, Y, Y 3direction.	4 cycles	0/11
ESD(HBM)	ESD 1 kV  -R1:10 MΩ , R2:1.5 kΩ , C:100 pF	1 time	0/11

2) Criteria for Judging the Damage

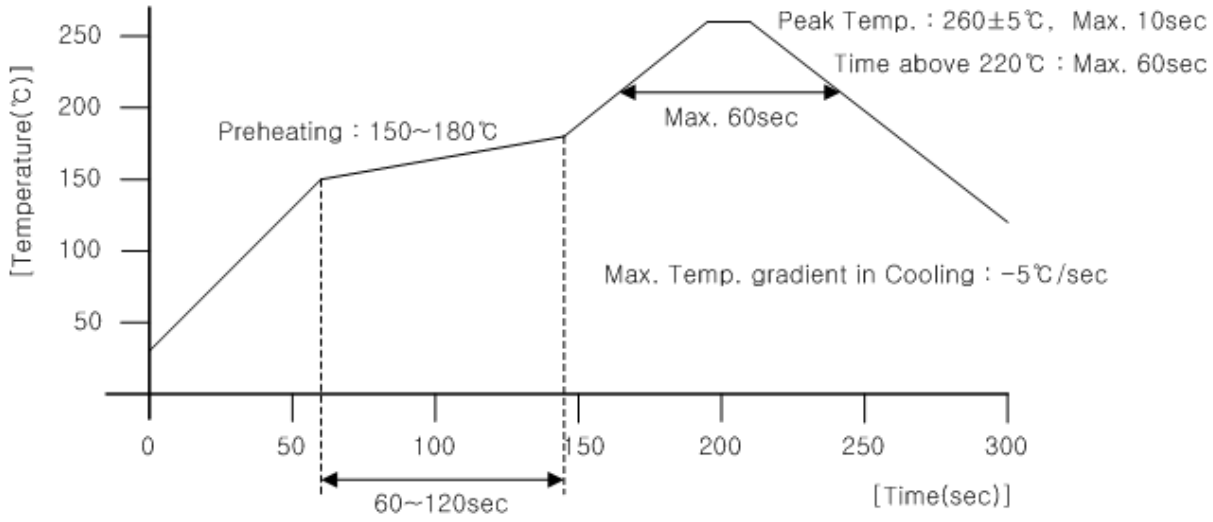
Item	Symbol	Test Condition	Limit	
			Min	Max
Forward Voltage	V_F	I_F = 20 mA	-	U.S.L.*1.2
Luminous Intensity	I_V	I_F = 20 mA	L.S.L.*0.5	-

* USL : Upper Standard Level LSL : Lower Standard Level

7. Solder Conditions

1) Reflow Conditions (Pb Free)

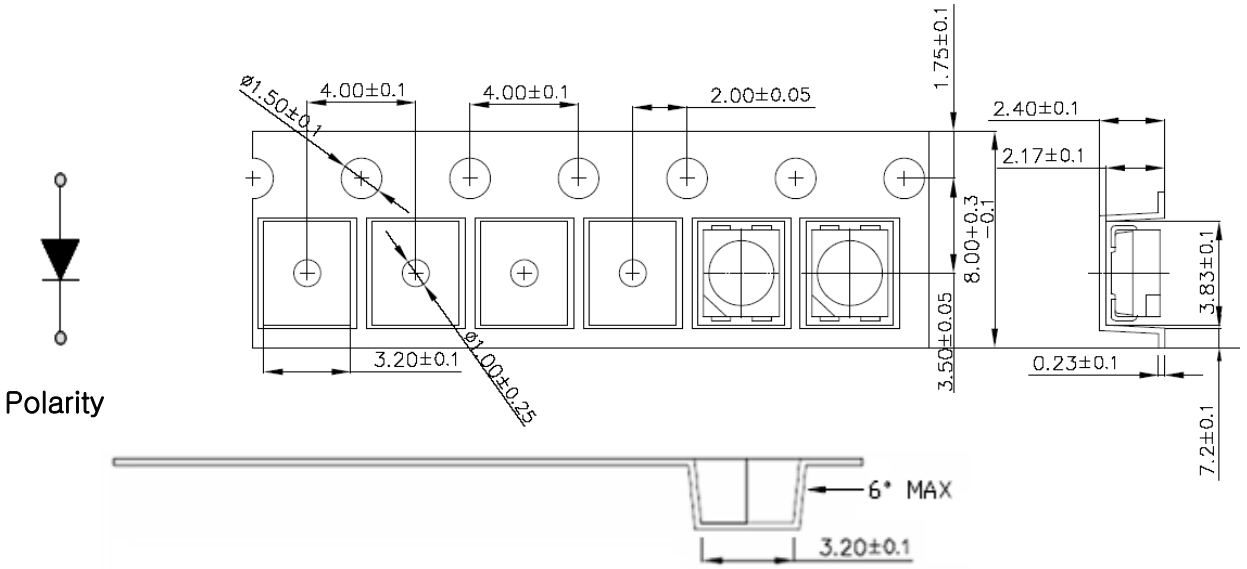
Reflow Frequency : 2 times max.



2) For Manual Soldering

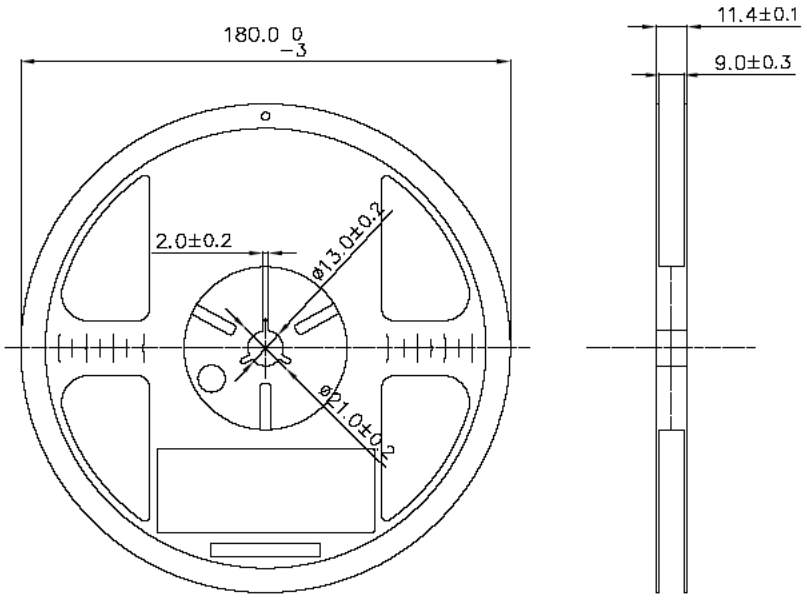
Not more than 5 seconds @MAX300℃, under soldering iron.(one time only)

8. Taping Dimension



End Start

More than 40 ㎜ Unloaded tape	Mounted with Flash LED	More than (100~200)㎜ Unloaded tape	Leading part more than (200~400)㎜



Tolerance ±0.2 , Unit:㎜

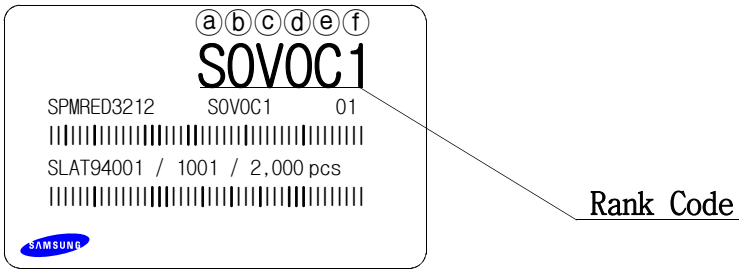
(1) Quantity : The quantity/reel to be 2000pcs.

(2) Cumulative Tolerance : Cumulative tolerance/10 pitches to be ±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.

9. Label Structure



N.B) Denoted rank is the only example.

Rank Code

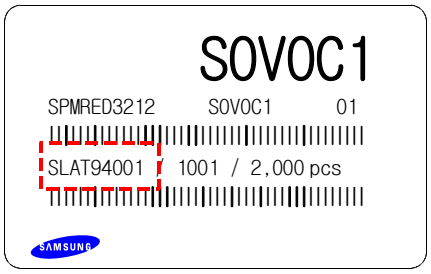
ⓐⓑ : Forward Voltage(V_F) Rank (refer to page. 3)

ⓒⓓ : Wavelength Rank(λ_D) (refer to page. 3)

ⓔⓕ : Luminous Intensity(I_V) Rank (refer to page. 3)

10 Lot Number

The Lot number is composed of the following characters



①②③④⑤⑥⑦⑧⑨ / 1ⓐⓑⓒ / 2,000 PCS

① : Production Site (S:SAMSUNG LED, G: GOSIN CHINA, I: Apro)

② : L (LED)

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

④ : Year (T:2009, U:2010, V:2011...)

⑤ : Month (1 ~ 9, A, B)

⑥ : Day (1 ~ 9, A, B ~ V)

⑦⑧⑨ : SAMSUNG LED Product number (1 ~ 999)

ⓐⓑⓒ : Reel Number (1 ~ 999)

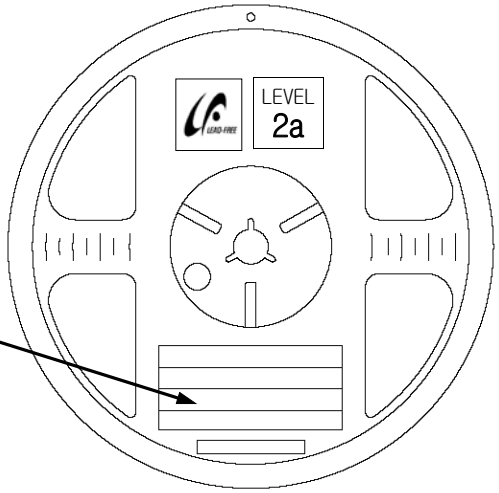
11. Reel Packing Structure

Reel

S0V0C1

SPMRED3212 S0V0C1 01

SLAT94001 / 1001 / 2,000 pcs



Aluminum Vinyl Bag

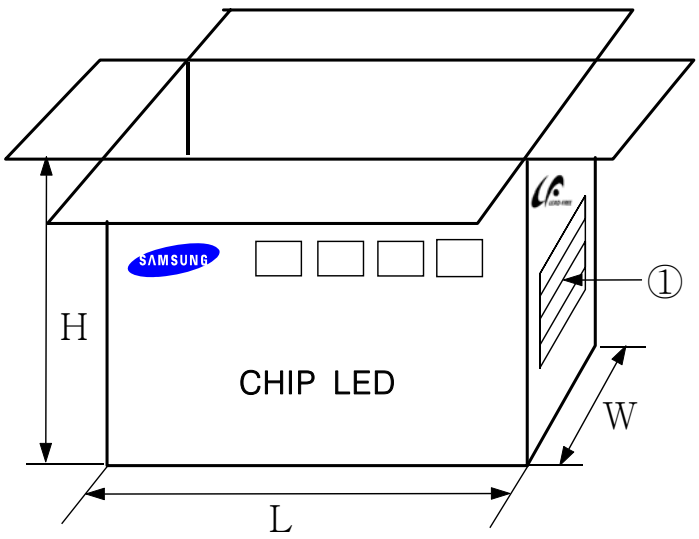
S0V0C1

SPMRED3212 S0V0C1 01

SLAT94001 / 1001 / 2,000 pcs

Material : Paper(SW3B(B))

TYPE	SIZE(mm)		
	L	W	H
7inch	245	220	182



① SIDE

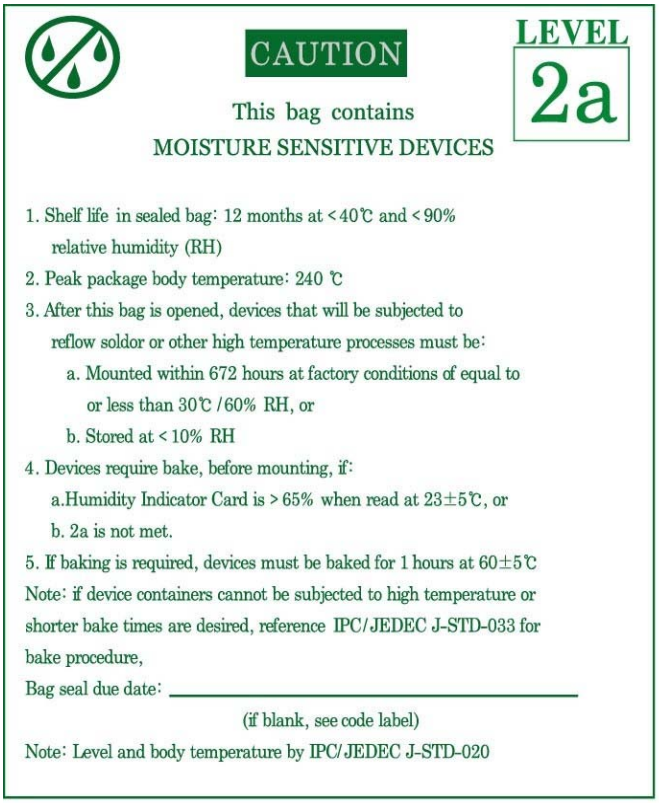
S0V0C1

SPMRED3212 S0V0C1 01

SLAT94001 / 1001 / 20,000 pcs

[Box Label]

12. Aluminum Vinyl Bag



■ 주의 사항

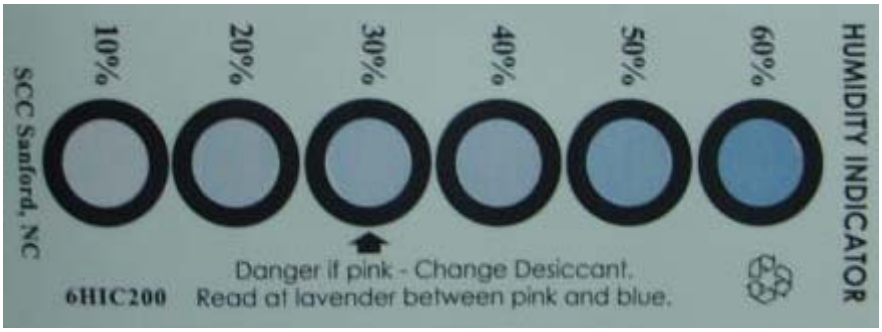
이 알루미늄 지퍼 백은 습기 및 정전기로부터 제품을 보호하기 위하여 제작되었습니다. 개봉 후에는 즉시 솔더 작업을 실시하는 것을 권장합니다.

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



13. 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, 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 (7 days) 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.

14. Hazard Substance Analysis

SGS

Test Report No. F690501/LF-CTSAYA07-21418 Issued Date: October 04, 2007 Page 1 of 3

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

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

Product Name	: LED
SGS File No.	: AYA07-21418
Received Date	: September 27, 2007
Test Performing Date	: September 28, 2007
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	: The sampling and testing was performed only for the part indicated in the photo without disassembly by the applicant's specific request.

SGS Testing Korea Co. Ltd.

Pluto Kim
Monet Jeong
Billy Oh / Testing Person

Jeff Jang / Chemical Lab Mgr

F052 Version2

SGS

Test Report No. F690501/LF-CTSAYA07-21418 Issued Date: October 04, 2007 Page 2 of 3

Sample No. : AYA07-21418.001

Sample Description : LED

Item No./Part No. : 3528 RED

Heavy Metals

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	US EPA 3052(1996), US EPA 6010B(1996), ICP	0.5	N.D.
Lead (Pb)	mg/kg	US EPA 3052(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) mg/kg = ppm
(3) MDL = Method Detection Limit
(4) - = No regulation
(5) ** = Qualitative analysis (No Unit)
(6) Negative = Undetectable / Positive = Detectable

F052 Version2

SGS

Test Report No. F690501/LF-CTSAYA07-21418 Issued Date: October 04, 2007

Picture of Sample as Received:

Sample Color : **White**

*** End ***

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) Negative = Undetectable / Positive = Detectable

F052 Version2

Revision History
(Model : SPMRED3212)

Date	Revision History	Writer	
		Drawn	Approved
2009.07.01.	New Version	W.H. Jung	Y.C. Kim