

DATE OF ISSUE : 2009. 01. 16

SPECIFICATION**MODEL : SLTRGB35166N**

[Approved Rank : $V_F(SS)$, CIE(T1, T2),
 $I_v(D1, D2, D3, D4, D5, D6, D7, D8, D9, DA, DB, DC)$]

FULL COLOR TOP VIEW**CUSTOMER : 대표 승인원**

CUSTOMER : 대표 승인원		
DRAWN	CHECKED	APPROVED

SAMSUNG ELECTRO-MECHANICS		
DRAWN	CHECKED	APPROVED

SAMSUNG ELECTRO-MECHANICS CO., LTD.

314. MAETAN3-DONG, YEONGTONG-KU,
 SUWON-SI, GYUNGKI-DO, KOREA, 442-743

Contents

1. Product outline	3
2. Absolute Maximum Rating	3
3. Characteristics	3
4. Chromaticity Diagram	5
5. Typical Characteristic Graph	6
6. Outline Drawing and Dimension	7
7. Reliability Test Items and Conditions	8
8. Solder Conditions	9
9. Taping Dimension	10
10. Label Structure	11
11. Lot Number	11
12. Reel Packing Structure	12
13. Aluminum Vinyl Bag	13
14. Precaution for Use	14
15. Hazard Substance Analysis	15
16. Revision History	18

1. Product Outline

1) Feature

- . Lead Frame Type LED Package (5.2 * 6.0 * t 1.3mm)
- . Beam Angle ($\Delta\theta$: 120 °)
- . AlGaInP, GaN/Al₂O₃ Chip & Long Time Reliability

2) Applications

- . Indoor, Outdoor Display and etc.

2. Absolute Maximum Rating

Item	Symbol	Absolute Maximum Rating			Unit
		Red	Green	Blue	
Forward Current	I _F	30	30	30	mA
Pulse Forward Current	I _{FP}	100	100	100	mA
Reverse Voltage	V _r	5	-	-	V
Reverse Current	I _r	-	85	85	mA
Power Dissipation	PD	78	111	108	mW
Operating Temperature	T _{opr}	- 30 ~ 85			°C
Storage Temperature Range	T _{stg}	- 40 ~ 100			°C

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

3. Characteristics

Electrical properties

(Ta : 25°C)

Item	Symbol	Condition	Rank	Color	min.	Typ.	MAX.	Unit
Forward Voltage (*)	V _F	I _F = 20 mA	SS	Red	1.8	2.1	2.6	V
				Green	2.9	3.2	3.6	
				Blue	2.9	3.2	3.6	
Reverse Current	I _r	V _R = 5V	-	R	-	-	50	μA
Reverse Voltage	V _r	I _r =10mA	-	G, B	0.6	-	2.0	V

Chromaticity Coordinate

(Ta : 25°C)

Item	Condition	Rank	Color	x				y				
Chromaticity Coordinate (*)	IF=20mA	ST	T1	R	0.696	0.707	0.690	0.676	0.284	0.304	0.325	0.304
				GB	0.186	0.216	0.191	0.157	0.680	0.680	0.753	0.748
				BB	0.138	0.150	0.145	0.130	0.039	0.057	0.075	0.054
			T2	R	0.696	0.707	0.690	0.676	0.284	0.304	0.325	0.304
				GB	0.186	0.216	0.191	0.157	0.680	0.680	0.753	0.748
				BC	0.130	0.145	0.139	0.121	0.054	0.075	0.097	0.075

Luminous Intensity

(Ta : 25°C)

Item	Symbol	Condition	Color						Unit
			Red		Green		Blue		
			Rank	Value	Rank	Value	Rank	Value	
Luminous Intensity (*)	I _v	I _F =20mA	A	620~760	A	1200~1340	A	300~380	mcd
			B	760~925	B	1340~1630	B	380~470	
			-	-	-	-	C	470~570	

* Tolerance : V_F:±0.1V, I_v:±5%, x,y:±0.01

* Luminous intensity measuring equipment : CAS140 B

Luminous Intensity Detail Ranks

Item	Symbol	Condition	Rank	Color			Unit	
				Red	Green	Blue		
Luminous Intensity (*)	I _v	I _F =20mA	SD	D1	620~760	1200~1340	300~380	mcd
				D2	620~760	1200~1340	380~470	
				D3	620~760	1200~1340	470~570	
				D4	620~760	1340~1630	300~380	
				D5	620~760	1340~1630	380~470	
				D6	620~760	1340~1630	470~570	
				D7	760~925	1200~1340	300~380	
				D8	760~925	1200~1340	380~470	
				D9	760~925	1200~1340	470~570	
				DA	760~925	1340~1630	300~380	
				DB	760~925	1340~1630	380~470	
				DC	760~925	1340~1630	470~570	

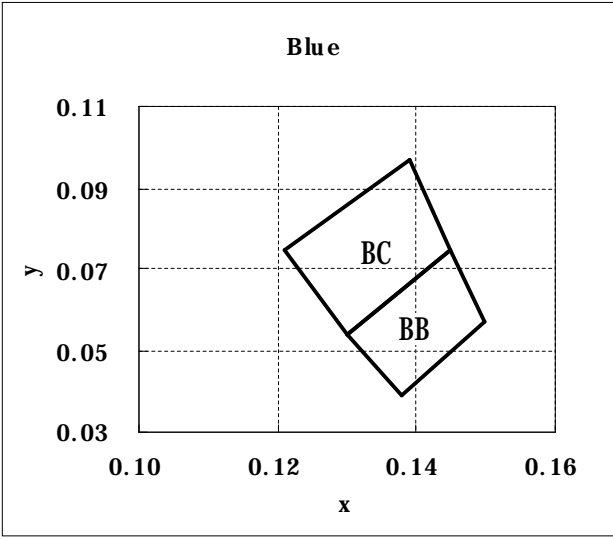
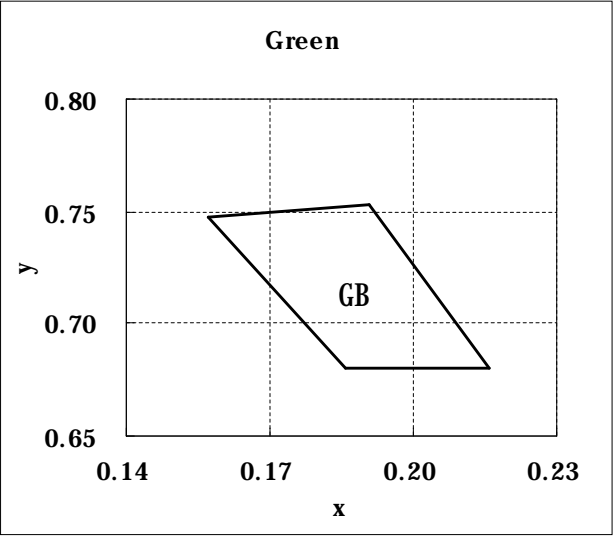
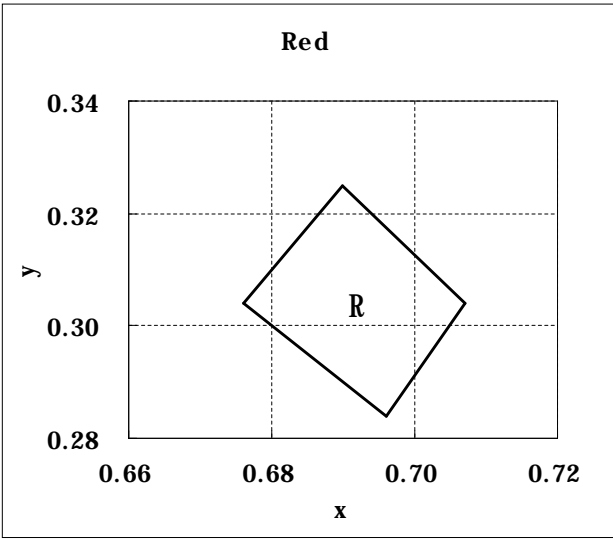
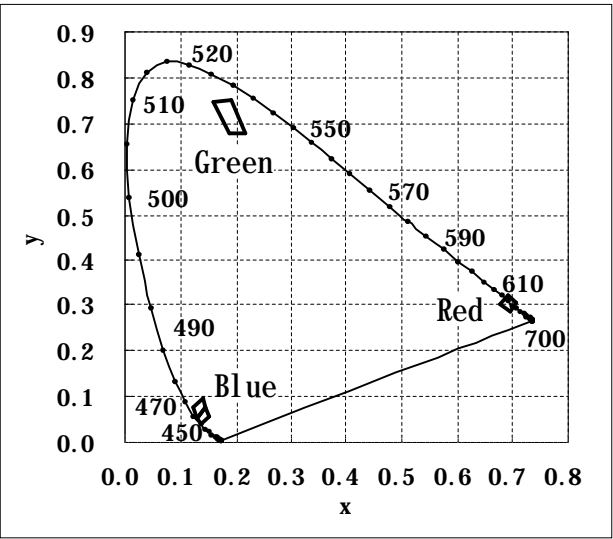
※ Approved Rank

V _F	CIE	I _v
SS	T1, T2	D1, D2, D3, D4, D5, D6, D7, D8, D9, DA, DB, DC

* Each reel contains only one of the T1 or T2, a segment (1/2) of the CIE rank.

* Each reel contains only one of the D1, D2, D3, D4, D5, D6, D7, D8, D9, DA, DB, or DC a segment (1/12) of the I_v rank.

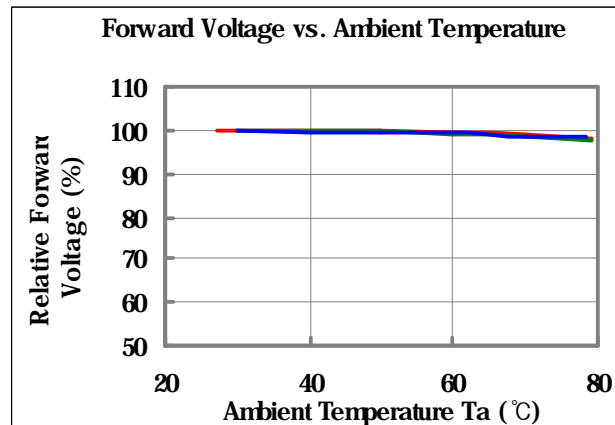
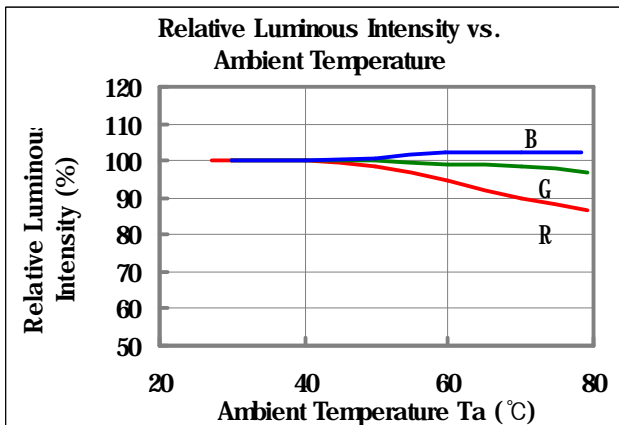
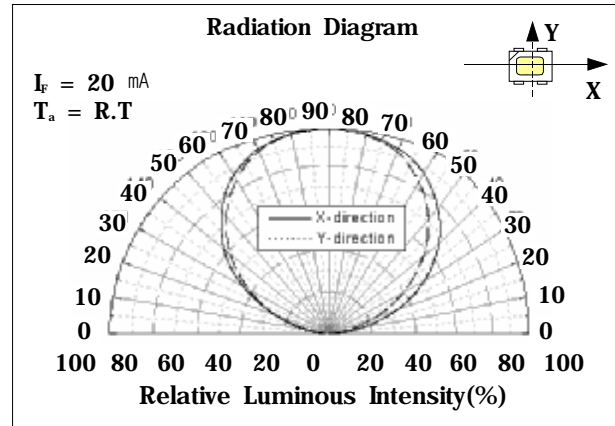
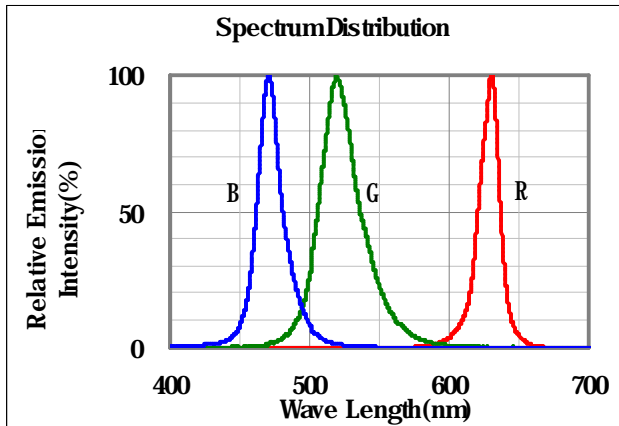
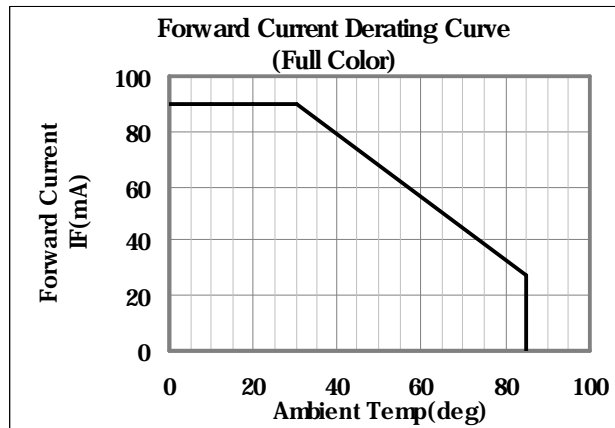
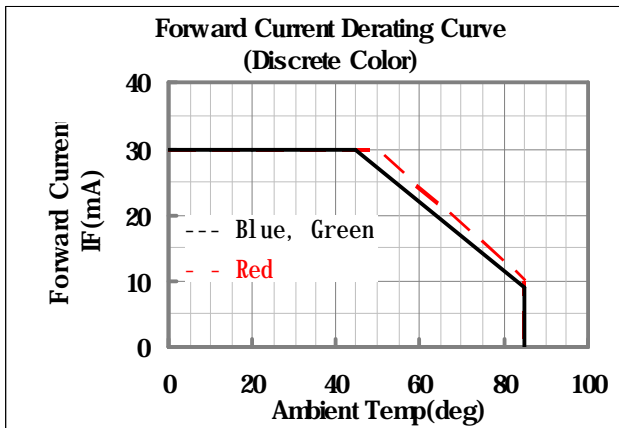
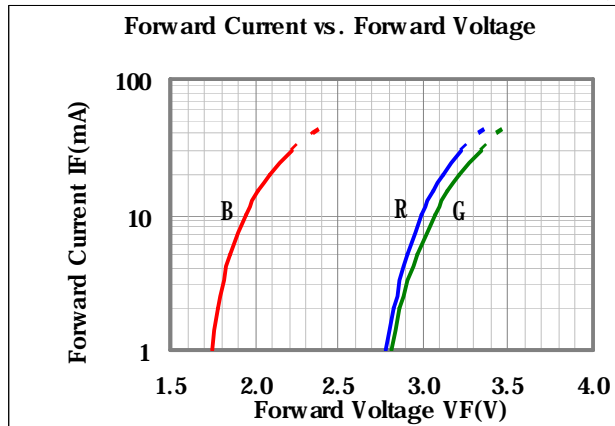
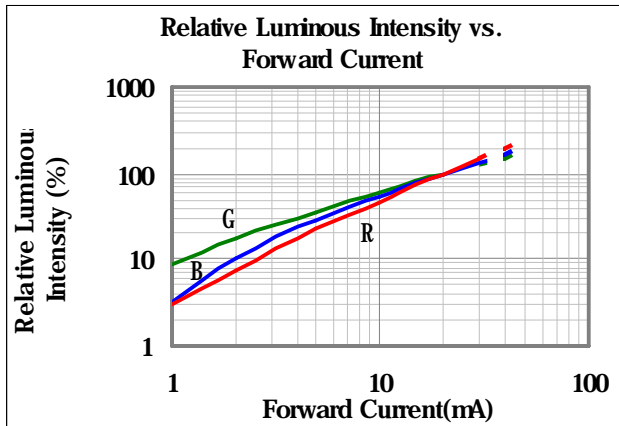
4. Chromaticity Diagram



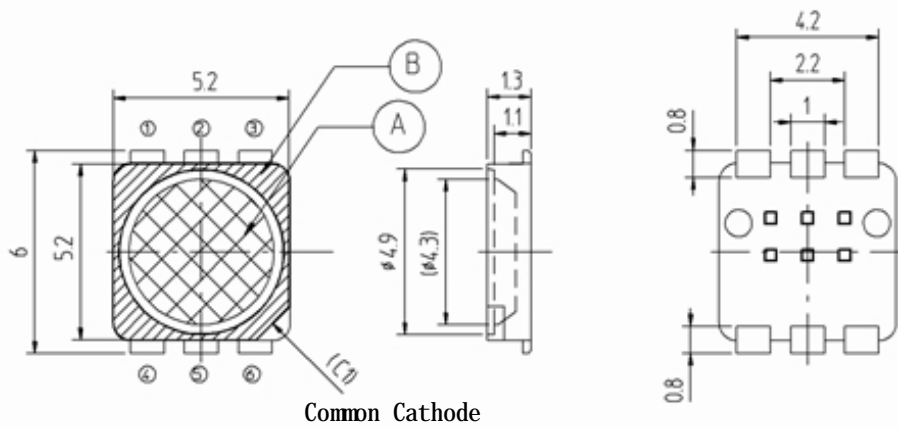
5. Typical Characteristics Graph

* These graphs show typical values.

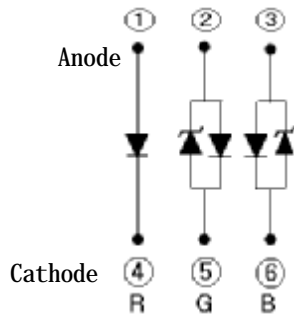
(Ta : 25°C)



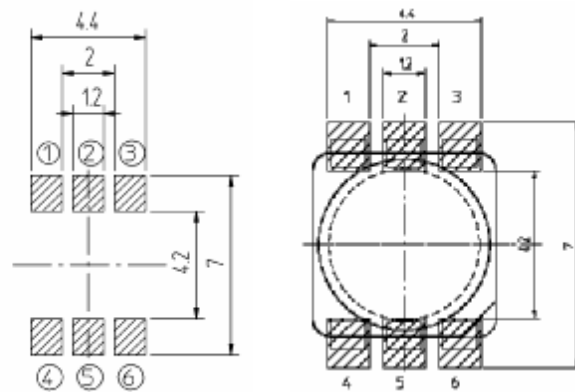
6. LED Package Outline Dimensions



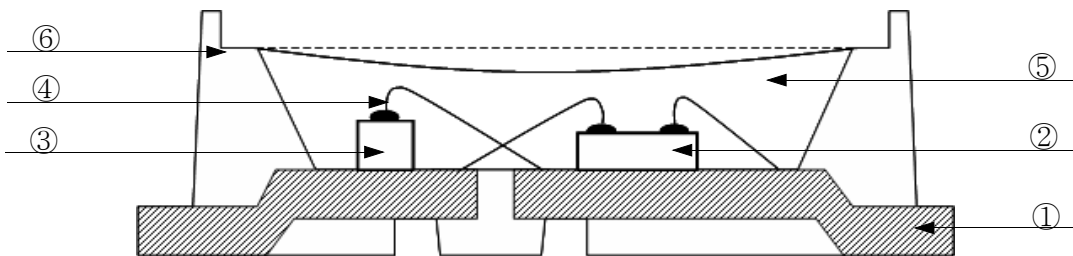
1. Tolerance is $\pm 0.1\text{mm}$.
2. Do not place pressure on the encapsulating resin ('A').
3. The maximum compressing force is 15N on the polymer ('B').



Circuit Diagram



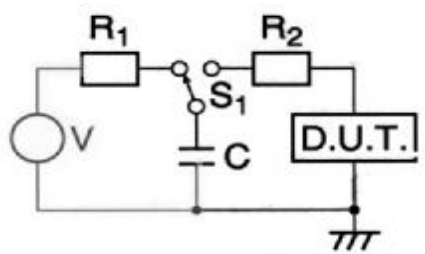
Land Pattern



NUMBER	ITEM	MATERIAL
①	FRAME	Copper Frame(Silver Plated)
②	LED CHIP	AlGaInP, GaN/Al ₂ O ₃
③	Zener Diode	Si
④	WIRE	Gold Wire
⑤	RESIN	Silicone
⑥	PACKAGE	Heat-resistant Polymer

7. Reliability Test Items and Conditions

1) Test Items and Results

Test Item	Test Conditions	Test Hours/Cycles	Sample No
Room Temperature life test	25°C ± 3°C, Red;DC30 mA, Green;DC30 mA, Blue;DC30 mA	500 h	50
High Temperature humidity life test	60°C ± 3°C, 95% ± 2%RH, Red;DC18 mA, Green;DC18 mA, Blue;DC18 mA	500 h	50
High Temperature life test	85°C ± 3°C, Red;DC9 mA, Green;DC9 mA, Blue;DC9 mA	500 h	50
Low Temperature life test	- 30°C ± 3°C, Red;DC30 mA, Green;DC30 mA, Blue;DC30 mA	500 h	50
Thermal Shock	- 40°C ~ 100°C 0.5 h 0.5 h	100 cycles	22
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	50
Temperature humidity Cycle	25°C ~ 65°C ~ - 10°C 24hrs/1cycle, 95%RH	10 cycles	22
Reflow Soldeing (Pb- Free)	Peak 260 ± 5°C for 10sec, 220°C over time 60sec max	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, On/2sec, Off/2sec Red;DC30 mA, Green;DC30 mA, Blue;DC30 mA	120h	50

2) Criteria for Judging the Damage

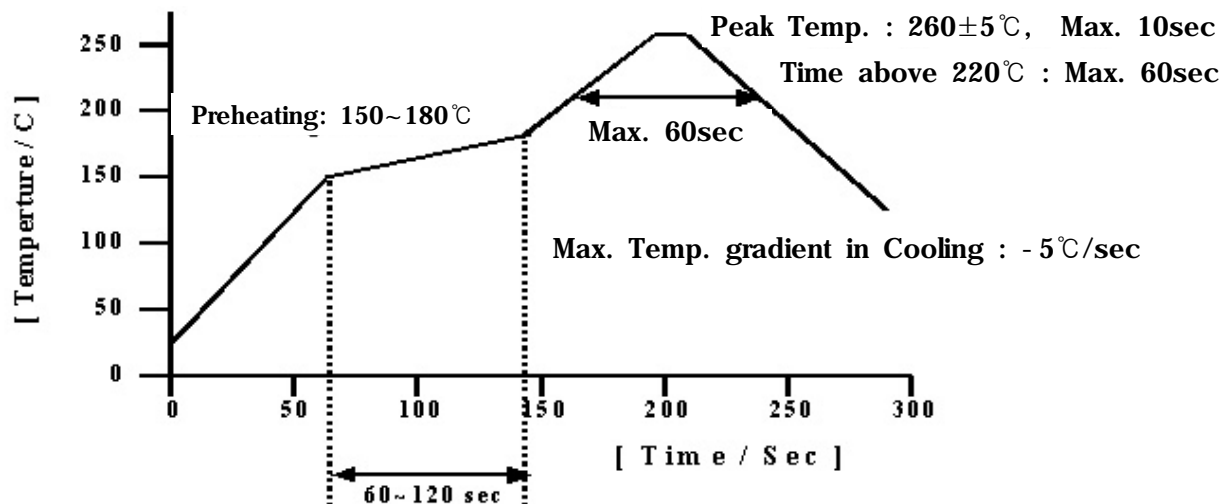
Item	Symbol	Test Condition	Limit	
			Min	Max
Forward Voltage	V_F	$I_F=20 \text{ mA}$	-	U.S.L.*1.2
Luminous Intensity	IV	$I_F=20 \text{ mA}$	L.S.L.*0.5	-

* USL : Upper Standard Level LSL : Lower Standard Level

8. Solder Conditions

1) Reflow Conditions (Pb Free)

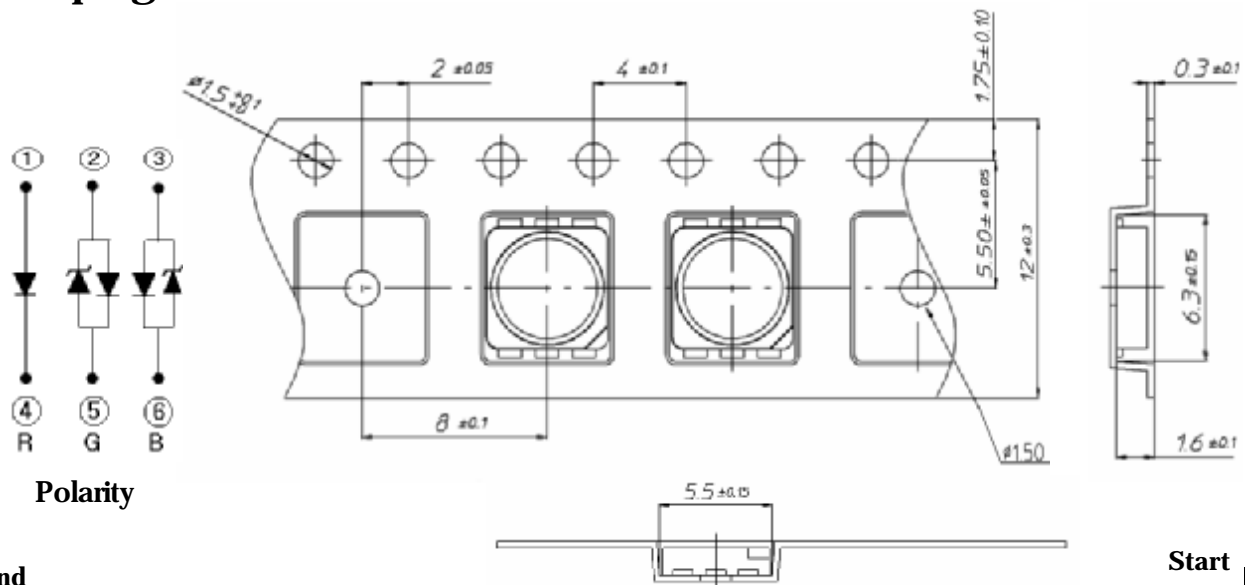
Reflow Frequency : 2 times max.



2) For Manual Soldering

Not more than 5 seconds @MAX 300°C , under soldering iron.(one time only)

9. Taping Dimension

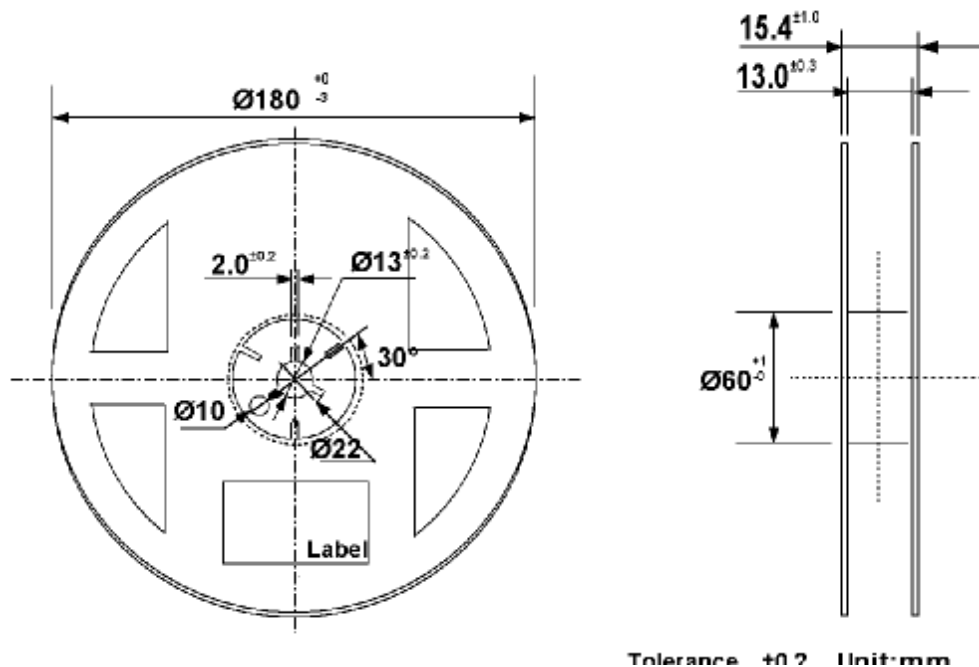


More than 40 mm
Unloaded tape

Mounted with
Flash LED

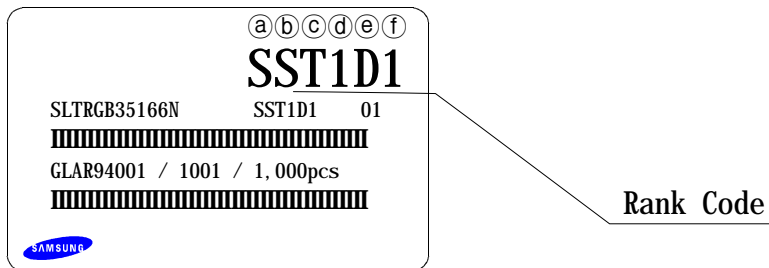
More than (100~200)mm
Unloaded tape

Leading part more than
(200~400)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.

10. Label Structure



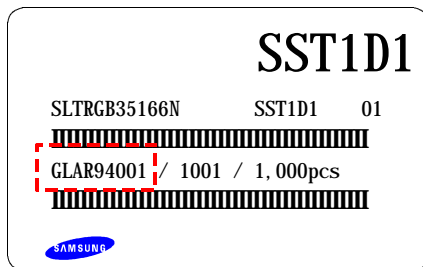
N.B) Denoted rank is the only example.

Rank Code

- (a)(b) : Forward Voltage(V_F) Rank (refer to page. 3)
- (c)(d) : Chromaticity Coordinate Rank (refer to page. 3)
- (e)(f) : Luminous Intensity(I_v) Rank (refer to page. 4)

11. Lot Number

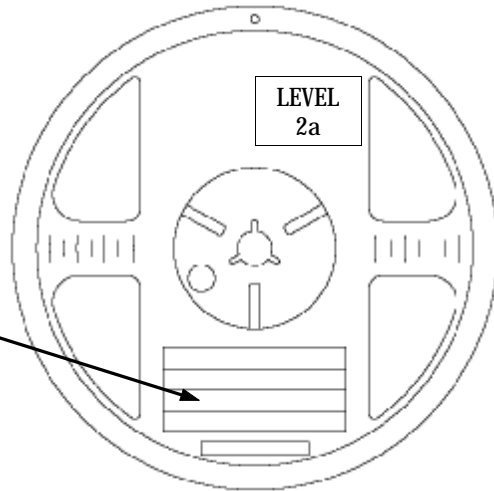
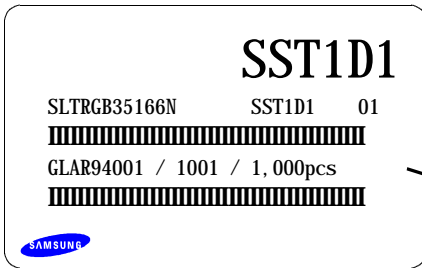
The Lot number is composed of the following characters



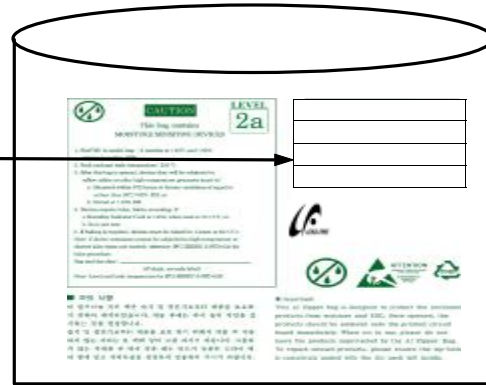
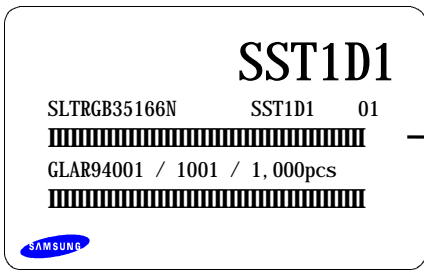
- ◎◇◆□■△△△ / I▲▲▲ / 1000PCS
- : Production Site (S:SEMCO, G:Gosin China)
- ◎ : L (LED)
- ◇ : Product State (A:Normality, B: Bulk, C:First Production, R:reproduction, S:Sample)
- ◆ : Year (Q:2006, R:2007, S:2008...)
- : Month (1 ~ 9, A, B)
- : Day (1 ~ 9, A, B ~ V)
- △ : SEMCO. Product number (1 ~ 999)
- ▲ : Reel Number (1 ~ 999)

12. Reel Packing Structure

Reel



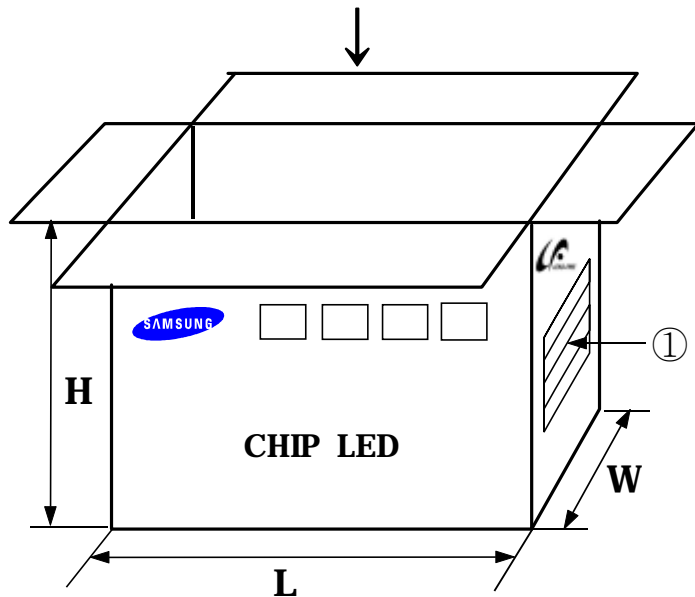
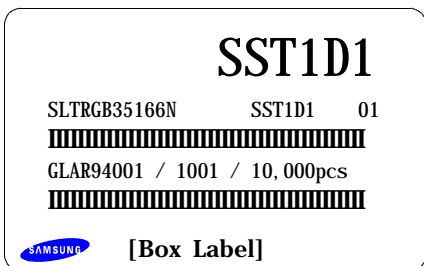
Aluminum Vinyl Bag



Material : Paper(SW3B(B))

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

① SIDE



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 SEMCO, they should be packed by a sealed container with nitrogen gas injected. (Shelf life of sealed bags: 12 months, temp. 0~40°C, 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°C/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 >65% at 23±5°C.
- 8) Devices must be baked for 24hours at 65±5°C, 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.

15. Hazard Substance Analysis



Test Report No. F690501/LF-CTSAYAA08-08878

Issued Date: March 25, 2008

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 :

Product Name : 5252 full color black painting
SGS File No. : AYAA08-08878
Received Date : March 19, 2008
Test Performing Date : March 20, 2008
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.

Pluto Kim
Monet Jeong
Billy Oh / Testing Person

SGS Testing Korea Co. Ltd.

Jeff Jang / Chemical Lab Mgr



Test Report No. F690501/LF-CTSAYAA08-08878

Issued Date: March 25, 2008

Page 2 of 3

Sample No. : AYAA08-08878.001
Sample Description : 5252 full color black painting
Item No./Part No. : 5252 full color black painting

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



Test Report No. F690501/LF-CTSAYAA08-08878

Issued Date: March 25, 2008

Page 3 of 3

Sample No. : AYAA08-08878.001
Sample Description : 5252 full color black painting
Item No./Part No. : 5252 full color black painting

Halogen Contents

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

Picture of Sample as Received:
Sample Color : White, black



*** 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

