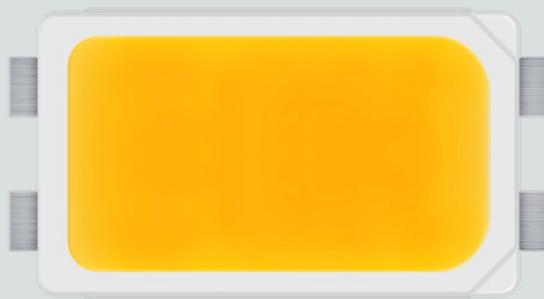


Middle Power LED Series 5630

LM561C CRI70



LM561C is highest performance and lm/W for fluorescent replacement

Features & Benefits

- 0.3 W class middle power LED
- Mold resin for high reliability
- Standard form factor for design flexibility (5.6 × 3.0 mm)



SAMSUNG

Table of Contents

1.	Characteristics	-----	3
2.	Product Code Information	-----	5
3.	Typical Characteristics Graphs	-----	16
4.	Outline Drawing & Dimension	-----	18
5.	Reliability Test Items & Conditions	-----	19
6.	Soldering Conditions	-----	20
7.	Tape & Reel	-----	21
8.	Label Structure	-----	23
9.	Packing Structure	-----	24
10.	Precautions in Handling & Use	-----	27

1. Characteristics

a) Absolute Maximum Rating

Item	Symbol	Rating	Unit	Condition
Ambient / Operating Temperature	T _a	-40 ~ +85	°C	-
Storage Temperature	T _{stg}	-40 ~ +120	°C	-
LED Junction Temperature	T _j	110	°C	-
Forward Current	I _F	200	mA	-
Peak Pulsed Forward Current	I _{fp}	300	mA	Duty 1/10, pulse width 10 ms
Assembly Process Temperature	-	260 <10	°C s	-
ESD (HBM)	-	±5	kV	-

b) Electro-optical Characteristics ($I_F = 65 \text{ mA}$, $T_s = 25^\circ\text{C}$)

Item	Unit	CRI (R_a) Min.	Nominal CCT (K)	Rank	Bin	Min.	Typ.	Max.
Forward Voltage (V_F)	V			XA	AY	2.6	-	2.7
					AZ	2.7	-	2.8
					A1	2.8	-	2.9
			3000		S5	32.5		34.5
					S6	34.5		36.5
					S7	36.5		38.5
			3500		S5	33.0		35.0
					S6	35.0		37.0
					S7	37.0		39.0
Luminous Flux (Φ_v)	lm	70			S5	34.0		36.0
			4000		S6	36.0		38.0
					S7	38.0		40.0
			5000		S5	35.0		37.0
					S6	37.0		39.0
					S7	39.0		41.0
Reverse Voltage (@ 5 mA)	V					0.7	-	1.2
Color Rendering Index (R_a)	-					70	-	-
Thermal Resistance (junction to solder point)	°C/W					-	12	-
Beam Angle	°					-	120	-

Note:

Samsung maintains measurement tolerance of: forward voltage = $\pm 0.1 \text{ V}$, luminous flux = $\pm 5 \%$, CRI = ± 3

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	W	H	T	5	4	1	M	L	3	X	A	R	0	S	0	
Digit	PKG Information					Code					Specification							
1 2 3	Samsung Package Middle Power					SPM												
4 5	Color					WH White												
6	Product Version					T												
7 8 9	Form Factor					541 5.6 x 3.0 x 0.7 mm; 4 pads; LM561C												
10	Sorting Current (mA)					M 65 mA												
11	Chromaticity Coordinates					L ANSI Standard												
12	CRI					3 Min. 70												
											AY 2.6~2.7							
13 14	Forward Voltage (V)					XA 2.6~2.9					Bin Code:					AZ 2.7~2.8		
																A1 2.8~2.9		
						V★ 3000					V1, V2, V3, V4, V5, V6, V7, V8, V9, VA, VB, VC, VD, VE, VF, VG							
						U★ 3500					Bin Code:					U1, U2, U3, U4, U5, U6, U7, U8, U9, UA, UB, UC, UD, UE, UF, UG		
15 16	CCT (K)					T★ 4000					Bin Code:					T1, T2, T3, T4, T5, T6, T7, T8, T9, TA, TB, TC, TD, TE, TF, TG		
						R★ 5000										R1, R2, R3, R4, R5, R6, R7, R8, R9, RA, RB, RC, RD, RE, RF, RG		
											★ "0" (Whole bin) "M" (Quarter bin) "K" (K Kitting) or "S" (S Kitting)							
						S0					S5, S6, S7							
17 18	Luminous Flux					S5					S5							
						S6					S6							
						S7					S7							

a) Luminous Flux Bins ($I_F = 65 \text{ mA}$, $T_s = 25^\circ\text{C}$)

CRI (R_a) Min.	Nominal CCT (K)	Product Code	Flux Bin	Flux Range (Φ_v, Im)
70	3000	SPMWHT541ML3XAV☆S0	S5	32.5 ~ 34.5
			S6	34.5 ~ 36.5
			S7	36.5 ~ 38.5
	3500	SPMWHT541ML3XAU☆S0	S5	33.0 ~ 35.0
			S6	35.0 ~ 37.0
			S7	37.0 ~ 39.0
	4000	SPMWHT541ML3XAT☆S0	S5	34.0 ~ 36.0
			S6	36.0 ~ 38.0
			S7	38.0 ~ 40.0
	5000	SPMWHT541ML3XAR☆S0	S5	35.0 ~ 37.0
			S6	37.0 ~ 39.0
			S7	39.0 ~ 41.0

Note:

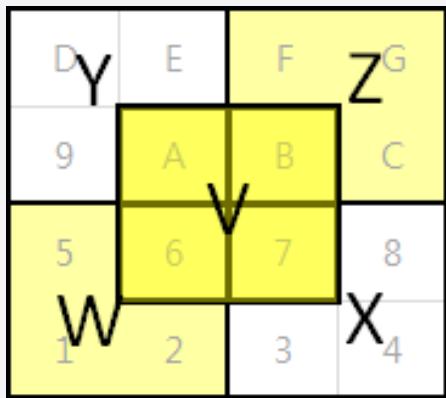
"☆" can be "0" (Whole bin), "M" (Quarter bin), "K" (K Kitting) or "S" (S Kitting) of the color binning

b) Kitting rule

1) K Kitting bin Concept

1. Under agreement between customer and SAMSUNG ELECTRONICS, SAMSUNG can supply kitting bin (VF, Color, Im).
2. A forward voltage (VF) of kitting bin is combined by a pair of same VF rank such as (A1+A1), (AY+AY) or (AZ+AZ).
3. A Chromaticity Coordinates of kitting bin is mixed by kitting procedure. (below kitting simulation)
4. A luminous flux(Im) of kitting bin is combined by a pair of IV rank such as (S5+S5), (S6+S6) or (S7+S7).

[Kitting example]



[Binning Information]

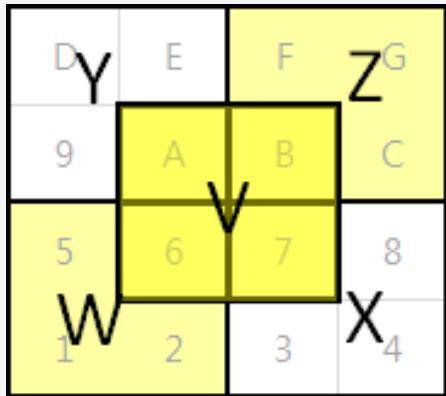
	Bin #1	Bin #2	Priority
VF	AY	AY	
	AZ	AZ	
	A1	A1	
CIE	W (1, 2, 5, 6)	Z (B, C, F, G)	
	V (6, 7, A, B)	V (6, 7, A, B)	
	X (3, 4, 7, 8)	Y (9, A, D, E)	
IV	S5	S5	
	S6	S6	
	S7	S7	

※ Each of V, W, X, Y and Z can be one bin without details division.

2) S Kitting bin Concept

- Under agreement between customer and SAMSUNG ELECTRONICS, SAMSUNG can supply kitting bin (VF, Color, Im).
- A forward voltage (VF) of kitting bin is combined by a pair of VF rank such as (A1+A1), (AY+AY), or (AZ+AZ).
- A Chromaticity Coordinates of kitting bin is mixed by kitting procedure. (below kitting simulation)
- A luminous flux(Im) of kitting bin is combined by a pair of IV such as (S5+S5), (S6+S6) or (S7+S7).

[Kitting example]



[Binning Information]

	Bin #1	Bin #2	Priority
VF	AY	AY	
	AZ	AZ	
	A1	A1	
CIE	W (1, 2, 5)	B	
	X (3, 4, 8)	A	
	Y (9, D, E)	7	
	Z (C, F, G)	6	
	V (6, 7, A, B)	V (6, 7, A, B)	
	S5	S5	
IV	S6	S6	
	S7	S7	

※ Each of V, W, X, Y and Z can be one bin without details division.

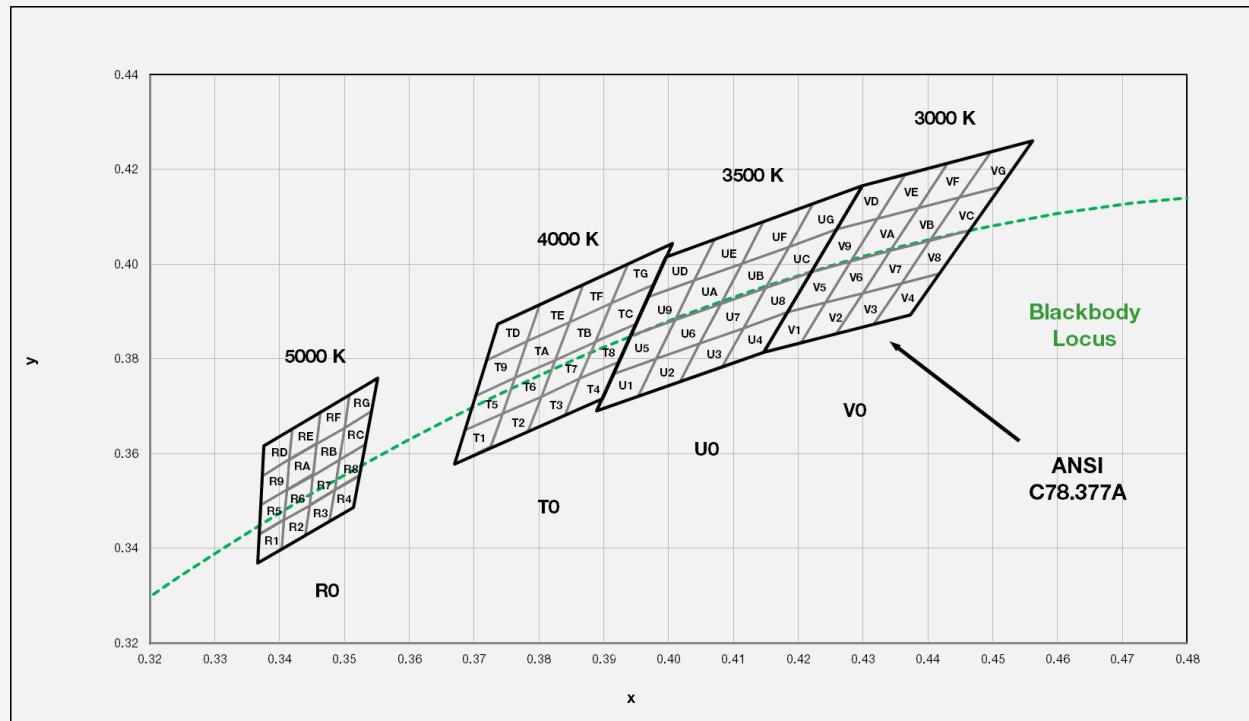
c) Color Bins (IF = 65 mA, Ts= 25 °C)

CRI (Ra) Min.	Nominal CCT (K)	Product Code	Color Rank	Chromaticity Bins
3000	3000	SPMWHT541ML3XAV0S0	V0 (Whole bin)	V1, V2, V3, V4, V5, V6, V7, V8, V9, VA, VB, VC, VD, VE, VF, VG
		SPMWHT541ML3XAVMS0	VM (Quarter bin)	V6, V7, VA, VB
		SPMWHT541ML3XAVSS0	VS (S Kitting)	V6, V7, VA, VB, VV, VW, VX, VY, VZ
		SPMWHT541ML3XAVKS0	VK (K Kitting)	VV, VW, VX, VY, VZ
	3500	SPMWHT541ML3XAU0S0	U0 (Whole bin)	U1, U2, U3, U4, U5, U6, U7, U8, U9, UA, UB, UC, UD, UE, UF, UG
		SPMWHT541ML3XAUMS0	UM (Quarter bin)	U6, U7, UA, UB
		SPMWHT541ML3XAUSS0	US (S Kitting)	U6, U7, UA, UB, UV, UW, UX, UY, UZ
		SPMWHT541ML3XAUKS0	UK (K Kitting)	UV, UW, UX, UY, UZ
		SPMWHT541ML3XAT0S0	T0 (Whole bin)	T1, T2, T3, T4, T5, T6, T7, T8, T9, TA, TB, TC, TD, TE, TF, TG
		SPMWHT541ML3XATMS0	TM (Quarter bin)	T6, T7, TA, TB
70	4000	SPMWHT541ML3XATSS0	TS (S Kitting)	T6, T7, TA, TB, TV, TW, TX, TY, TZ
		SPMWHT541ML3XATKS0	TK (K Kitting)	TV, TW, TX, TY, TZ
		SPMWHT541ML3XAR0S0	R0 (Whole bin)	R1, R2, R3, R4, R5, R6, R7, R8, R9, RA, RB, RC, RD, RE, RF, RG
		SPMWHT541ML3XARMS0	RM (Quarter bin)	R6, R7, RA, RB
		SPMWHT541ML3XARSS0	RS (S Kitting)	R6, R7, RA, RB, RV, RW, RX, RY, RZ
	5000	SPMWHT541ML3XARKS0	RK (K Kitting)	RV, RW, RX, RY, RZ

d) Voltage Bins (IF = 65 mA, Ts = 25 °C)

CRI (Ra) Min.	Nominal CCT (K)	Product Code	Voltage Rank	Voltage Bin	Voltage Range (V)
-	-	-	AY		2.6 ~ 2.7
-	-	-	XA	AZ	2.7 ~ 2.8
-	-	-	A1		2.8 ~ 2.9

e) Chromaticity Region & Coordinates ($I_F = 65 \text{ mA}$, $T_s = 25^\circ\text{C}$)



Note :

Samsung maintains measurement tolerance of: $C_x, C_y = \pm 0.005$

e) Chromaticity Region & Coordinates ($I_F = 65 \text{ mA}$, $T_s = 25^\circ\text{C}$)

Region	CIE x	CIE y	Region	CIE x	CIE y
V rank (3000 K)					
V1	0.4147	0.3814	V9	0.4221	0.3984
	0.4183	0.3898		0.4259	0.4073
	0.4242	0.3919		0.4322	0.4096
	0.4203	0.3833		0.4281	0.4006
V2	0.4203	0.3833	VA	0.4281	0.4006
	0.4242	0.3919		0.4322	0.4096
	0.4300	0.3939		0.4385	0.4119
	0.4259	0.3853		0.4342	0.4028
V3	0.4259	0.3853	VB	0.4342	0.4028
	0.4300	0.3939		0.4385	0.4119
	0.4359	0.3960		0.4449	0.4141
	0.4316	0.3873		0.4403	0.4049
V4	0.4316	0.3873	VC	0.4403	0.4049
	0.4359	0.3960		0.4449	0.4141
	0.4418	0.3981		0.4513	0.4164
	0.4373	0.3893		0.4465	0.4071
V5	0.4183	0.3898	VD	0.4259	0.4073
	0.4221	0.3984		0.4299	0.4165
	0.4281	0.4006		0.4364	0.4188
	0.4242	0.3919		0.4322	0.4096
V6	0.4242	0.3919	VE	0.4322	0.4096
	0.4281	0.4006		0.4364	0.4188
	0.4342	0.4028		0.4430	0.4212
	0.4300	0.3939		0.4385	0.4119
V7	0.4300	0.3939	VF	0.4385	0.4119
	0.4342	0.4028		0.4430	0.4212
	0.4403	0.4049		0.4496	0.4236
	0.4359	0.3960		0.4449	0.4141
V8	0.4359	0.3960	VG	0.4449	0.4141
	0.4403	0.4049		0.4496	0.4236
	0.4465	0.4071		0.4562	0.4260
	0.4418	0.3981		0.4513	0.4164

Region	CIE x	CIE y	Region	CIE x	CIE y
U rank (3500 K)					
U1	0.3889	0.3690	U9	0.3941	0.3848
	0.3915	0.3768		0.3968	0.3930
	0.3981	0.3800		0.4040	0.3966
	0.3953	0.3720		0.4010	0.3882
U2	0.3953	0.3720	UA	0.4010	0.3882
	0.3981	0.3800		0.4040	0.3966
	0.4048	0.3832		0.4113	0.4001
	0.4017	0.3751		0.4080	0.3916
U3	0.4017	0.3751	UB	0.4080	0.3916
	0.4048	0.3832		0.4113	0.4001
	0.4116	0.3865		0.4186	0.4037
	0.4082	0.3782		0.4150	0.3950
U4	0.4082	0.3782	UC	0.4150	0.3950
	0.4116	0.3865		0.4186	0.4037
	0.4183	0.3898		0.4259	0.4073
	0.4147	0.3814		0.4221	0.3984
U5	0.3915	0.3768	UD	0.3968	0.3930
	0.3941	0.3848		0.3996	0.4015
	0.4010	0.3882		0.4071	0.4052
	0.3981	0.3800		0.4040	0.3966
U6	0.3981	0.3800	UE	0.4040	0.3966
	0.4010	0.3882		0.4071	0.4052
	0.4080	0.3916		0.4146	0.4089
	0.4048	0.3832		0.4113	0.4001
U7	0.4048	0.3832	UF	0.4113	0.4001
	0.4080	0.3916		0.4146	0.4089
	0.4150	0.3950		0.4222	0.4127
	0.4116	0.3865		0.4186	0.4037
U8	0.4116	0.3865	UG	0.4186	0.4037
	0.4150	0.3950		0.4222	0.4127
	0.4221	0.3984		0.4299	0.4165
	0.4183	0.3898		0.4259	0.4073

e) Chromaticity Region & Coordinates

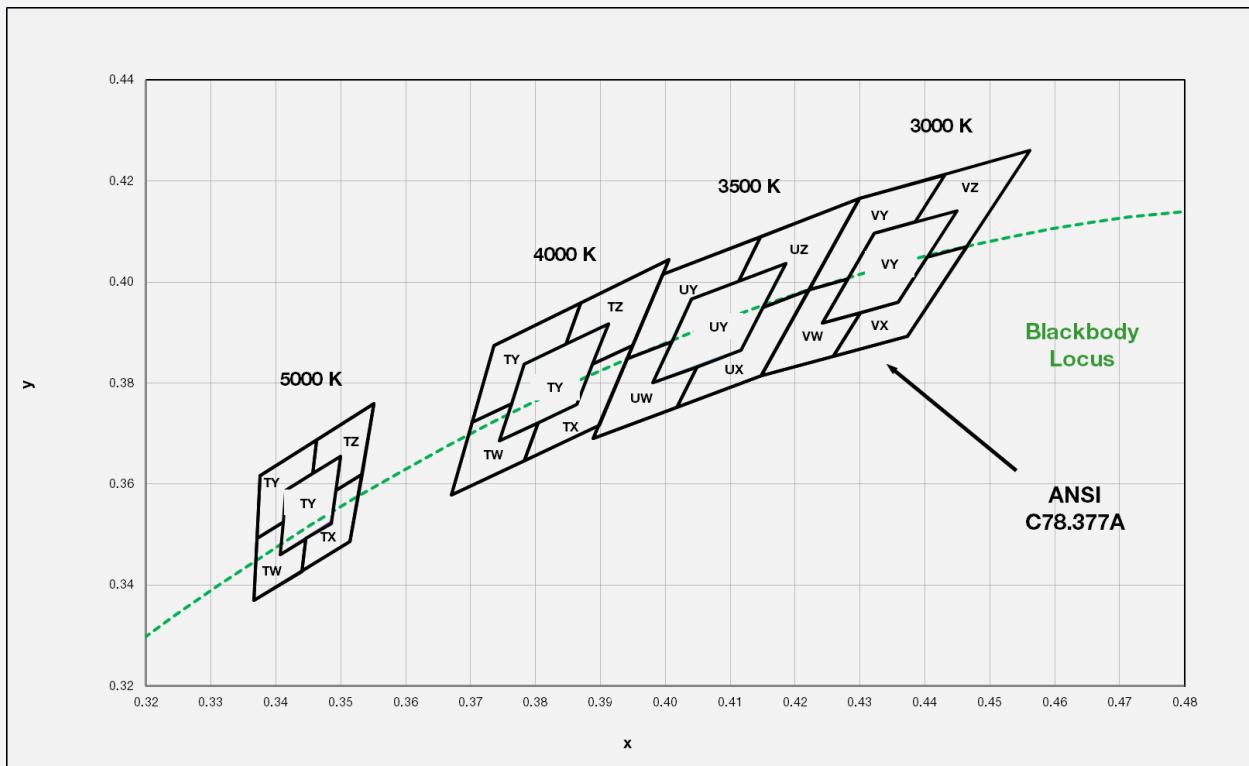
Region	CIE x	CIE y	Region	CIE x	CIE y
T rank (4000 K)					
T1	0.3670	0.3578	T9	0.3702	0.3722
	0.3726	0.3612		0.3763	0.3760
	0.3744	0.3685		0.3782	0.3837
	0.3686	0.3649		0.3719	0.3797
T2	0.3726	0.3612	TA	0.3763	0.3760
	0.3783	0.3646		0.3825	0.3798
	0.3804	0.3721		0.3847	0.3877
	0.3744	0.3685		0.3782	0.3837
T3	0.3783	0.3646	TB	0.3825	0.3798
	0.3840	0.3681		0.3887	0.3836
	0.3863	0.3758		0.3912	0.3917
	0.3804	0.3721		0.3847	0.3877
T4	0.3840	0.3681	TC	0.3887	0.3836
	0.3898	0.3716		0.3950	0.3875
	0.3924	0.3794		0.3978	0.3958
	0.3863	0.3758		0.3912	0.3917
T5	0.3686	0.3649	TD	0.3719	0.3797
	0.3744	0.3685		0.3782	0.3837
	0.3763	0.3760		0.3802	0.3916
	0.3702	0.3722		0.3736	0.3874
T6	0.3744	0.3685	TE	0.3782	0.3837
	0.3804	0.3721		0.3847	0.3877
	0.3825	0.3798		0.3869	0.3958
	0.3763	0.3760		0.3802	0.3916
T7	0.3804	0.3721	TF	0.3847	0.3877
	0.3863	0.3758		0.3912	0.3917
	0.3887	0.3836		0.3937	0.4001
	0.3825	0.3798		0.3869	0.3958
T8	0.3863	0.3758	TG	0.3912	0.3917
	0.3924	0.3794		0.3978	0.3958
	0.3950	0.3875		0.4006	0.4044
	0.3887	0.3836		0.3937	0.4001

Note : Samsung maintains measurement tolerance of:

Cx, Cy = ±0.005

Region	CIE x	CIE y	Region	CIE x	CIE y
R rank (5000 K)					
R1	0.3366	0.3369	R9	0.3374	0.3554
	0.3369	0.3431		0.3371	0.3493
	0.3407	0.3460		0.3411	0.3522
	0.3403	0.3398		0.3415	0.3587
R2	0.3403	0.3398	RA	0.3415	0.3587
	0.3407	0.3460		0.3411	0.3522
	0.3446	0.3491		0.3451	0.3554
	0.3440	0.3427		0.3457	0.3621
R3	0.3446	0.3491	RB	0.3451	0.3554
	0.3440	0.3427		0.3457	0.3621
	0.3477	0.3458		0.3500	0.3655
	0.3485	0.3522		0.3492	0.3587
R4	0.3485	0.3522	RC	0.3492	0.3587
	0.3477	0.3458		0.3500	0.3655
	0.3514	0.3487		0.3542	0.3690
	0.3524	0.3554		0.3533	0.3620
R5	0.3371	0.3493	RD	0.3376	0.3616
	0.3369	0.3431		0.3374	0.3554
	0.3407	0.3460		0.3415	0.3587
	0.3411	0.3522		0.3420	0.3652
R6	0.3407	0.3460	RE	0.3415	0.3587
	0.3411	0.3522		0.3420	0.3652
	0.3451	0.3554		0.3463	0.3687
	0.3446	0.3491		0.3457	0.3621
R7	0.3446	0.3491	RF	0.3457	0.3621
	0.3451	0.3554		0.3463	0.3687
	0.3492	0.3587		0.3507	0.3724
	0.3485	0.3522		0.3500	0.3655
R8	0.3485	0.3522	RG	0.3500	0.3655
	0.3492	0.3587		0.3507	0.3724
	0.3533	0.3620		0.3551	0.3760
	0.3524	0.3554		0.3542	0.3690

f) Kitting Chromaticity Region & Coordinates (IF = 65 mA, Ts = 25 °C)



Samsung maintains measurement tolerance of: $C_x, C_y = \pm 0.005$

f) Kitting Chromaticity Region & Coordinates ($I_F = 65 \text{ mA}$, $T_s = 25^\circ\text{C}$)

Region	CIE x	CIE y	Region	CIE x	CIE y
V rank (3000K)					
VV	0.4242	0.3919	VY	0.4221	0.3984
	0.4359	0.3960		0.4281	0.4006
	0.4449	0.4141		0.4322	0.4096
	0.4322	0.4096		0.4385	0.4119
VW	0.4147	0.3814	VZ	0.4430	0.4212
	0.4259	0.3853		0.4463	0.4071
	0.4300	0.3939		0.4562	0.4260
	0.4242	0.3919		0.4430	0.4212
	0.4281	0.4006		0.4385	0.4119
	0.4221	0.3984		0.4449	0.4141
VX	0.4259	0.3853	UX	0.4017	0.3751
	0.4373	0.3893		0.4147	0.3814
	0.4465	0.4071		0.4221	0.3984
	0.4403	0.4049		0.4150	0.3950
	0.4359	0.3960		0.4116	0.3865
	0.4300	0.3939		0.4048	0.3832

Region	CIE x	CIE y	Region	CIE x	CIE y
U rank (3500K)					
UV	0.3981	0.3800	UY	0.3889	0.3690
	0.4116	0.3865		0.4017	0.3751
	0.4186	0.4037		0.4048	0.3832
	0.4040	0.3966		0.3981	0.3800
UW	0.3941	0.3848	UZ	0.4010	0.3882
	0.4010	0.3882		0.4040	0.3966
	0.4113	0.4001		0.4146	0.4089
	0.3996	0.4015		0.4017	0.3751
	0.4150	0.3950		0.4221	0.3984
	0.4299	0.4165		0.4146	0.4089
UX	0.4113	0.4001		0.4116	0.3865
	0.4186	0.4037		0.4048	0.3832

f) Kitting Chromaticity Region & Coordinates ($I_F = 65 \text{ mA}$, $T_s = 25^\circ\text{C}$)

Region	CIE x	CIE y	Region	CIE x	CIE y
T rank (4000K)					
TV	0.3744	0.3685	TY	0.3702	0.3722
	0.3863	0.3758		0.3763	0.3760
	0.3912	0.3917		0.3782	0.3837
	0.3782	0.3837		0.3702	0.3722
TW	0.3670	0.3578	TZ	0.3887	0.3837
	0.3783	0.3646		0.3950	0.3875
	0.3804	0.3721		0.4006	0.4044
	0.3744	0.3685		0.3869	0.3958
	0.3763	0.3760		0.3847	0.3877
	0.3702	0.3722		0.3912	0.3917
TX	0.3783	0.3646			
	0.3898	0.3716			
	0.3950	0.3875			
	0.3887	0.3837			
	0.3863	0.3758			
	0.3804	0.3721			

Region	CIE x	CIE y	Region	CIE x	CIE y
R rank (5000K)					
RV	0.3407	0.3460	RW	0.3366	0.3369
	0.3485	0.3524		0.3440	0.3427
	0.3500	0.3655		0.3446	0.3491
	0.3415	0.3588		0.3407	0.3460
RY	0.3371	0.3493	RZ	0.3411	0.3525
	0.3411	0.3525		0.3415	0.3588
	0.3463	0.3687		0.3457	0.3621
	0.3376	0.3616		0.3371	0.3493
	0.3440	0.3428		0.3457	0.3621
	0.3514	0.3487		0.3500	0.3655
RX	0.3533	0.3620	RZ	0.3492	0.3587
	0.3492	0.3587		0.3533	0.3620
	0.3485	0.3522		0.3551	0.3760
	0.3446	0.3493		0.3463	0.3687

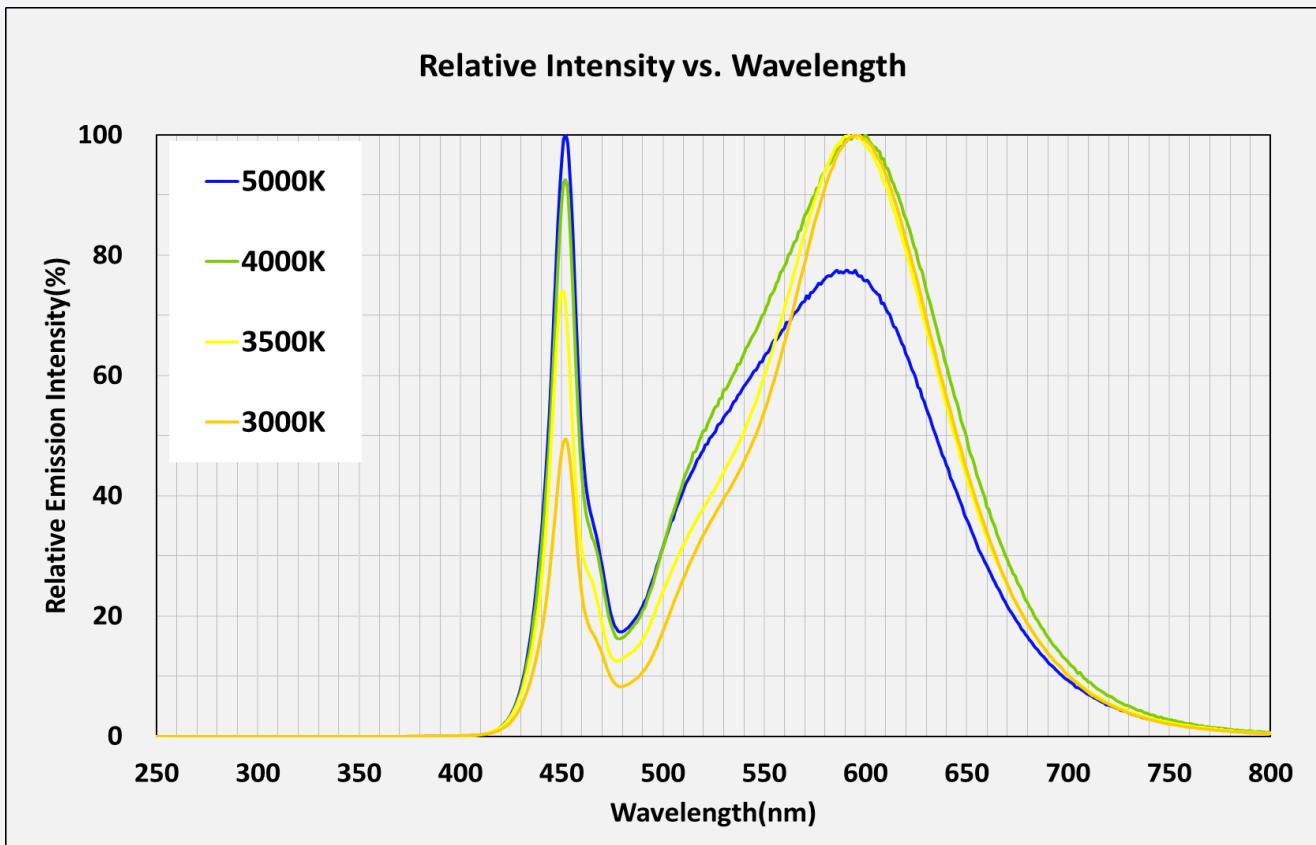
Note: Samsung maintains measurement tolerance of:

Cx, Cy = ± 0.005

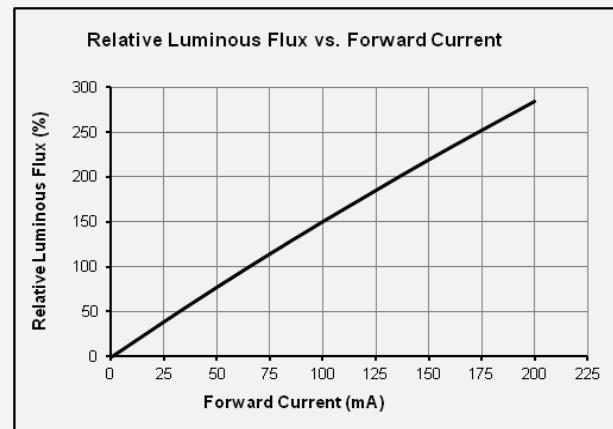
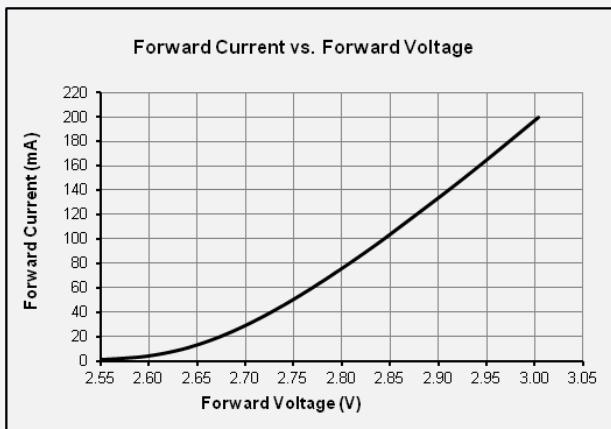
3. Typical Characteristics Graphs

a) Spectrum Distribution ($I_F = 65 \text{ mA}$, $T_s = 25^\circ\text{C}$)

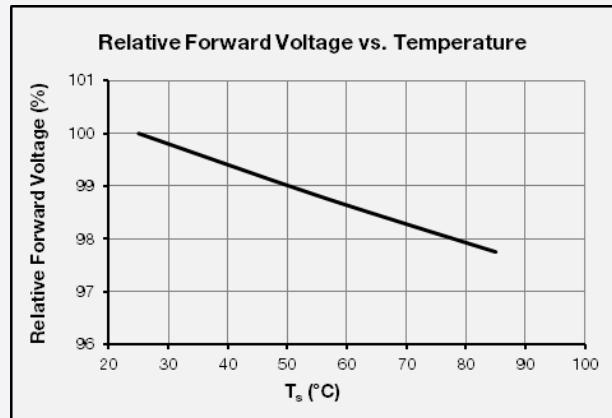
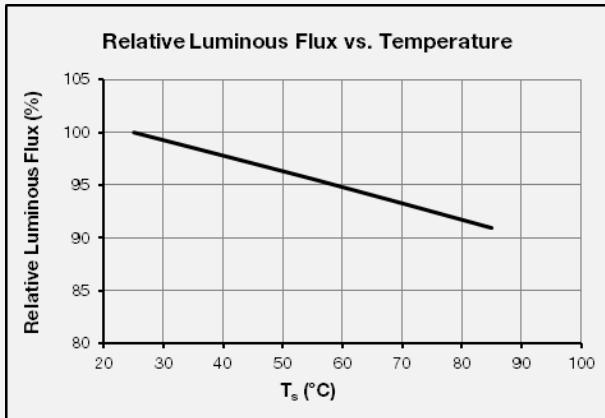
CRI Ra 70+



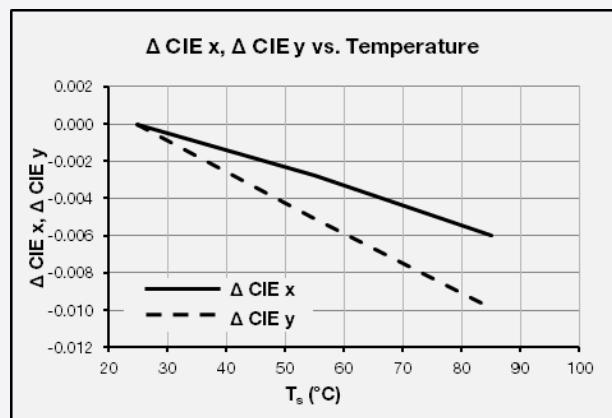
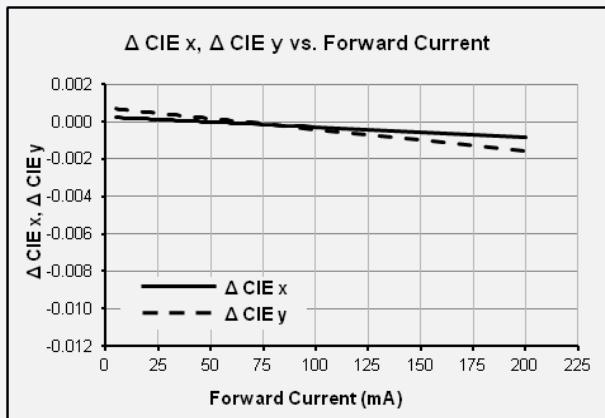
b) Forward Current Characteristics ($T_s = 25^\circ\text{C}$)



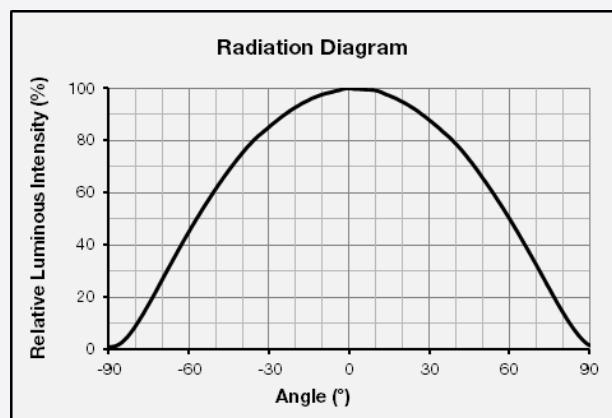
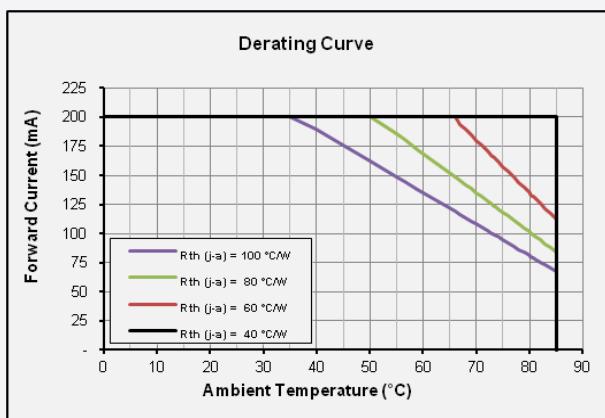
c) Temperature Characteristics ($I_F = 65 \text{ mA}$)



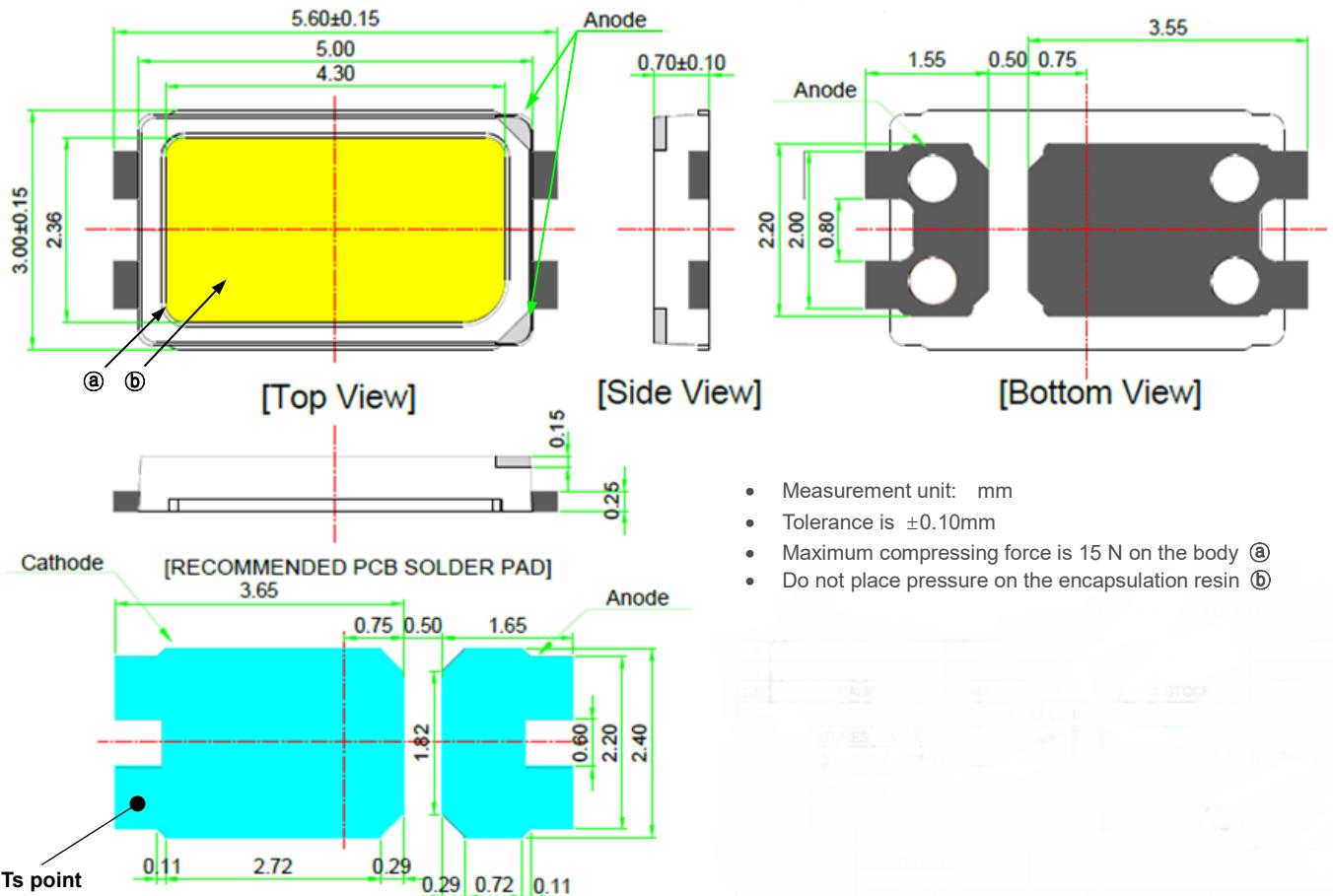
d) Color Shift Characteristics ($T_s = 25^\circ\text{C}$, $I_F = 65 \text{ mA}$)



e) Derating Curve



4. Outline Drawing & Dimension



Notes:

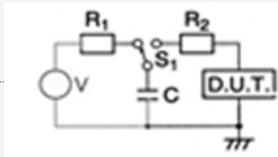
- 1) This LED has built-in ESD protection device(s) connected in parallel to LED chip(s).
- 2) T_s point and measurement method:
 - ① Measure one point at the cathode pad, if necessary remove PSR of PCB to reach T_s point.
 - ② All pads must be soldered to the PCB to dissipate heat properly, otherwise 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 No.
High Temperature Life Test	85 °C, DC 200 mA	1000 h	22
High Temperature Humidity Life Test	60 °C, 90 % RH, DC 200 mA	1000 h	22
Powered Temperature Cycle Test	-40 °C / 10 min ↔ 85 °C / 10 min, sweep 20 min cycle on/off: each 5 min, DC 200 mA	100 cycles	22
Thermal Cycle	-45 °C / 15 min ↔ 125 °C / 15 min → Hot plate 180 °C	500 cycles	100
High Temperature Storage	120 °C	1000 h	11
Low Temperature Storage	-40 °C	1000 h	11
ESD (HBM)	 <p>R₁: 10 MΩ R₂: 1.5 kΩ C: 100 pF V: ±5 kV</p>	5 times	30
ESD (MM)	<p>R₁: 10 MΩ R₂: 0 C: 200 pF V: ±0.5 kV</p>	5 times	30
Vibration Test	20~2000~20 Hz, 200 m/s ² , sweep 4 min X, Y, Z 3 direction, each 1 cycle	4 cycles	11
Mechanical Shock Test	1500 g, 0.5 ms 3 shocks each X-Y-Z axis	5 cycles	11

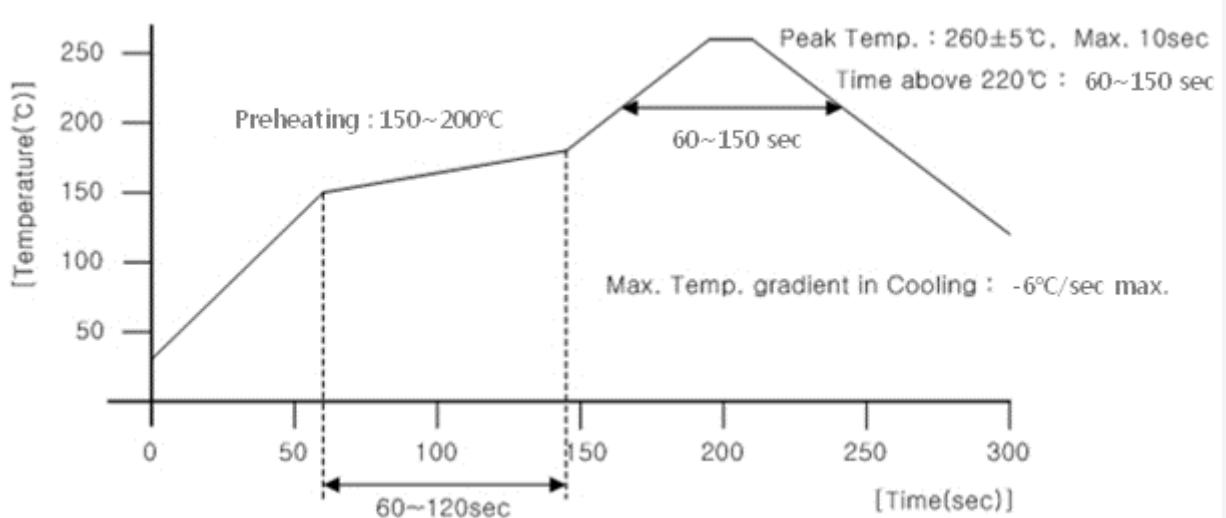
b) Criteria for Judging the Damage

Item	Symbol	Test Condition (T _s = 25 °C)	Limit	
			Min	Max
Forward Voltage	V _F	I _F = 65 mA	Init. Value * 0.9	Init. Value * 1.1
Luminous Flux	Φ _v	I _F = 65 mA	Init. Value * 0.7	Init. Value * 1.1

6. Soldering Conditions

a) Reflow Conditions (Pb free)

Reflow frequency: 2 times max.



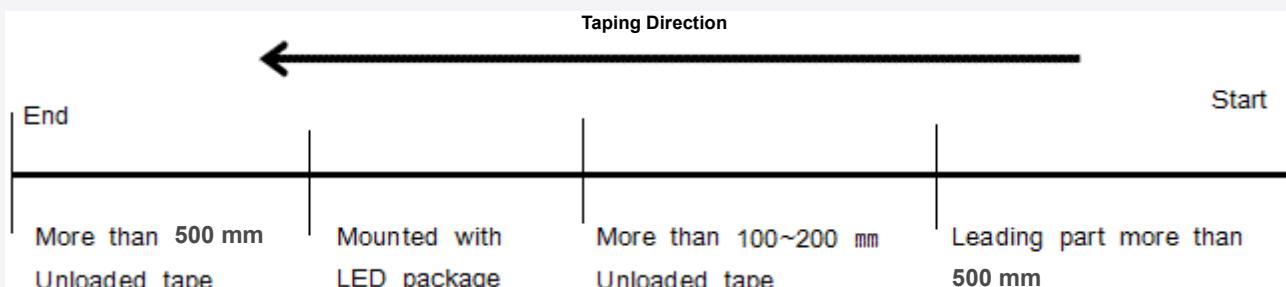
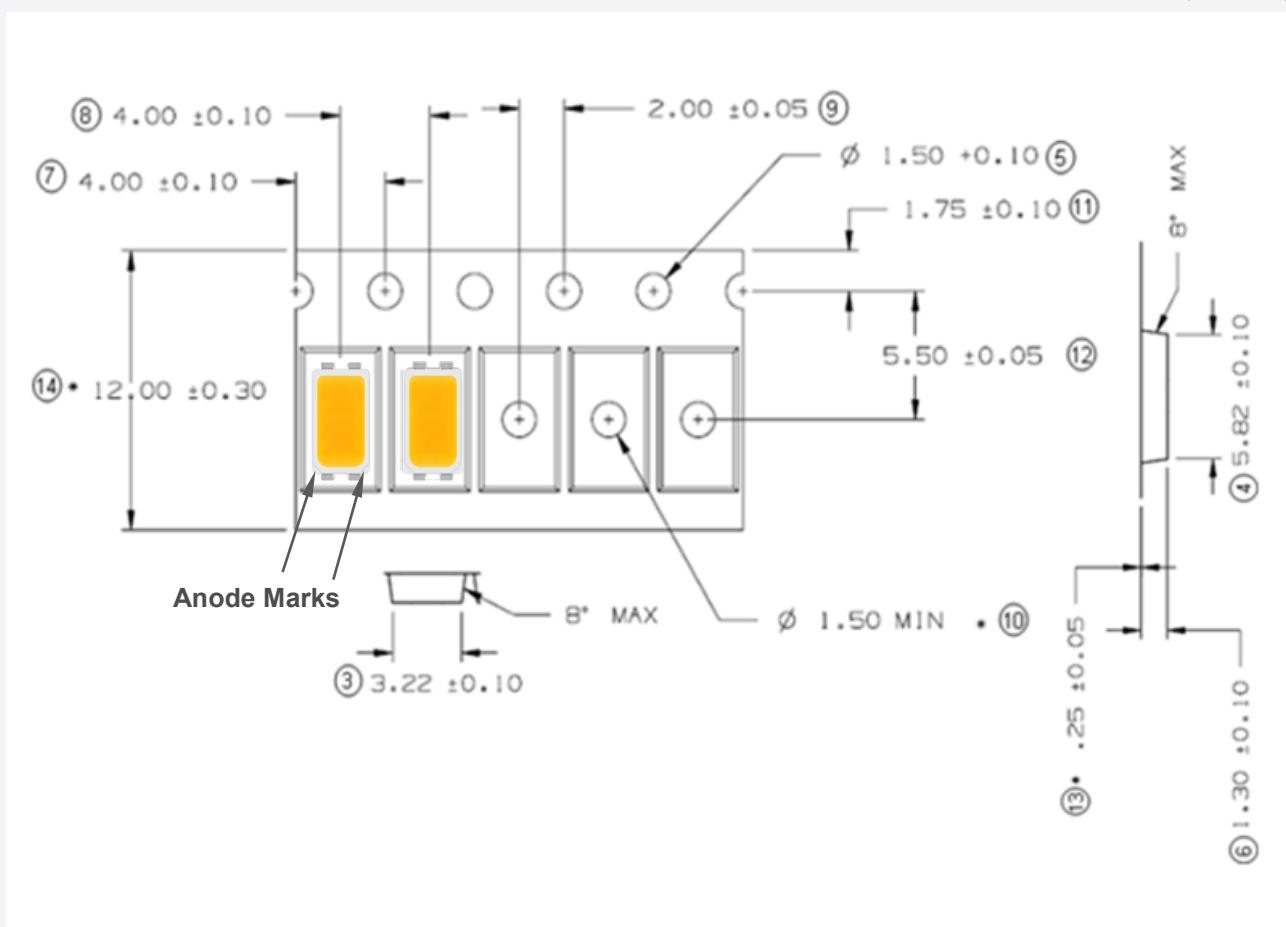
b) Manual Soldering Conditions

Not more than 5 seconds @ max. 300 °C, under soldering iron.

7. Tape & Reel

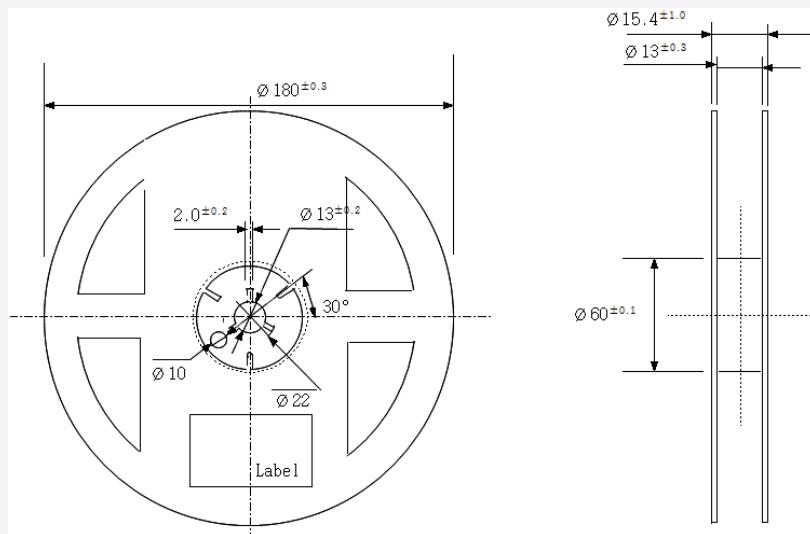
a) Taping Dimension

(unit: mm)



b) Reel Dimension (Max 2,500 pcs)

(unit: mm)

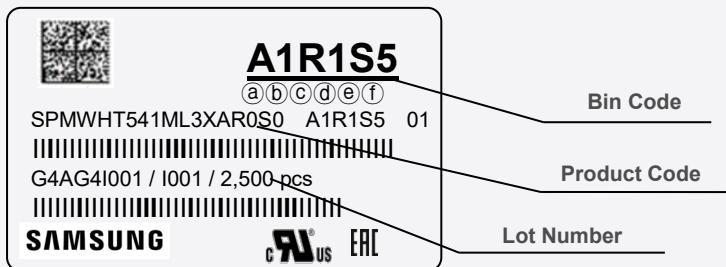


Notes:

- 1) Quantity: The quantity/reel is 2,500 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 9)
- ⒸⒹ: Chromaticity bin (refer to page 9-15)
- ⒺⒻ: Luminous Flux bin (refer to page 6)

b) Lot Number

The lot number is composed of the following characters:



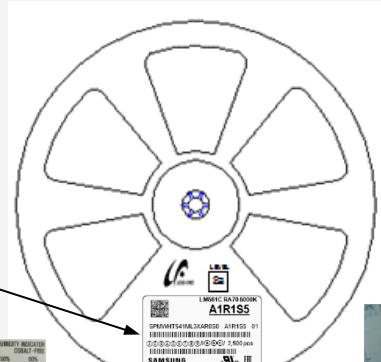
①②③④⑤⑥⑦⑧⑨ / ①ⒶⒷⒸ / 2,500 pcs

- ①, ② : Production site (G3: Shenzhen, China , G4: Guangzhou, China)
- ③ : Product state (A: Normal, B: Bulk, C: First Production, R: Reproduction, S: Sample)
- ④ : Year (F: 2020, G: 2021, H: 2022, I: 2023...)
- ⑤ : Month (1~9, A, B, C)
- ⑥ : Day (1~9, A, B~V)
- ⑦⑧⑨ : Serial number (001 ~ 999)
- ⒶⒷⒸ : Reel number (001 ~ 999)

9. Packing Structure

a) Packing Process (The quantity of PKG on the Reel to be Max 2,500pcs)

Reel



Aluminum Vinyl Packing Bag

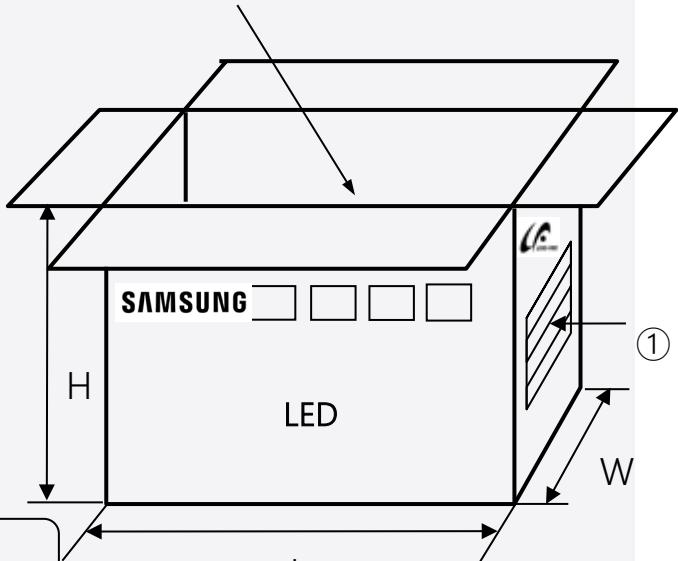


Outer Box

Material: Paper (SW3B(B))

Type	Size (mm)			Note
	L	W	H	
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



(1P) Supplier Part Number: SPMWHT541ML3XAR0S0 (Q) Quantity: 25,000

(33P) Bin Code: A1R1S5

(10D) Date Code: 2216

(1T) Lot Number: G4AG4I001

(4L) Country of Origin: CN

SAMSUNG

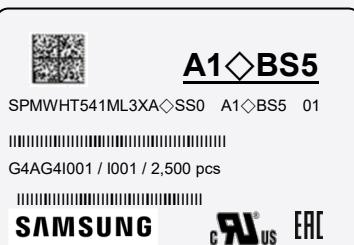
b) Packing Process for kitting (The quantity of PKG on the Reel to be Max 2,500pcs)

Reel

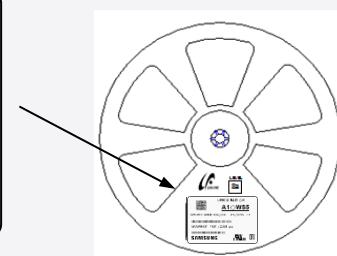
Kitting 'A'



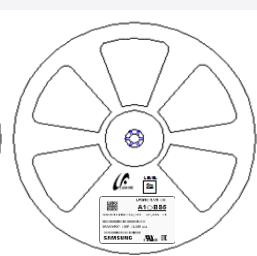
Kitting 'B'



Kitting 'A'



Kitting 'B'

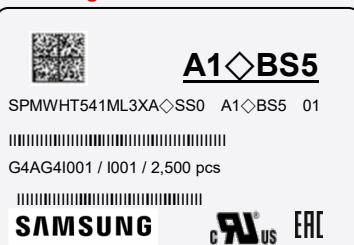


Aluminum Vinyl Packing Bag

Kitting 'A'



Kitting 'B'



Outer Box

Kitting 'A'



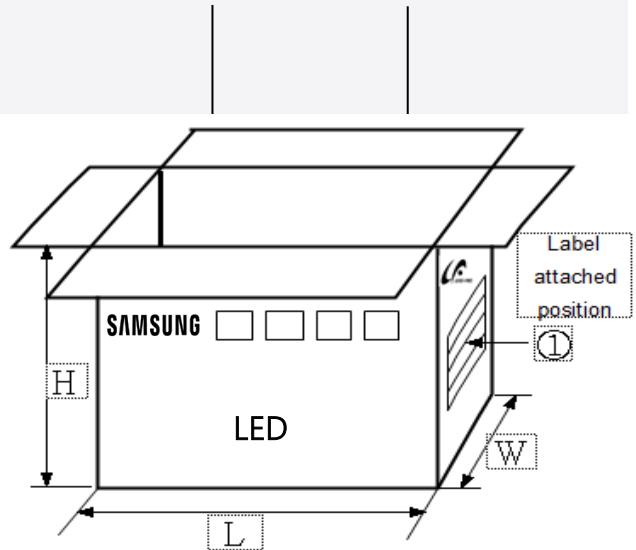
Kitting 'B'



Note: "◇" can be Nominal CCT code.

Material: Paper (SW3B(B))

Type	Size (mm)			Note
	L	W	H	
7 inch	245 ± 5	220 ± 5	182 ± 5	Up to 10 reels



(1P) Supplier Part Number: SPMWHT541ML3XARSS5 (Q) Quantity: 12,500

(33P) Bin Code: A1RWS5

(1T) Lot Number: G4AG4I001

(1P) Supplier Part Number: SPMWHT541ML3XARSS5 (Q) Quantity: 12,500

(10D) Date Code: 2216

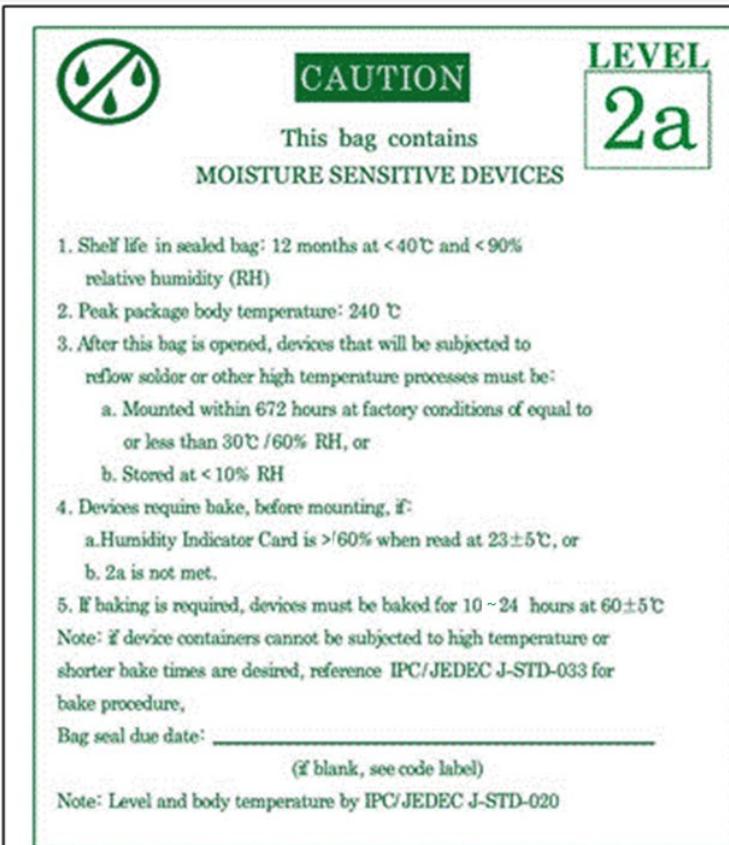
(4L) Country of Origin: CN

(33P) Bin Code: A1RBS5

(1T) Lot Number: G4AG4I001

SAMSUNG

c) Aluminum Vinyl Packing 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 보호하기 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.

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

(This image is for reference only. silicagel and humidity indicator shapes may be different.)



SAMSUNG

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) In order to obtain stable performance of LED, higher than 10% of the sorting current is recommended for operation.
- 5) LEDs must be stored in a clean environment. Shelf life of sealed bags is 12 months at temperature 0~40 °C, 0~90 % RH.
- 6) 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^{*Note 1}, or
 - b. Mounted within 24 hours (1 day) at an assembly line with a condition of more than 30 °C / 70 % RH^{*Note 2}, or
 - c. Stored at <10 % RH.

*Note 1, 2: IPC/JEDEC J-STD-033A, Recommended Equivalent Total Floor Life Table

Package Type and Body Thickness	Moisture Sensitivity Level	Maximum Percent Relative Humidity						Temperature
		40%	50%	60%	70%	80%	90%	
Body Thickness <2.1mm	Level 2a	*	*	28	1	1	1	30°C
		*	*	*	2	1	1	25°C
		*	*	*	2	2	1	20°C

- 7) Repack unused devices with anti-moisture packing, fold to close any opening and then store in a dry place.
- 8) Devices require baking before mounting, if humidity card reading is >60 % at 23 ± 5 °C.
- 9) Devices must be baked for 10~24 hours at 60 ± 5 °C, if baking is required.
- 10) 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.
- 11) 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.
- 12) Risk of sulfurization (or tarnishing)
The LED from Samsung uses a silver-plated lead frame and its surface color may change to black (or dark colored) when it is exposed to sulfur (S), chlorine (Cl) or other halogen compound. Sulfurization of lead frame may cause intensity degradation, change of chromaticity coordinates and, in extreme cases, open circuit. It requires caution. Due to possible sulfurization of lead frame, LED should not be used and stored together with oxidizing substances made of materials such as rubber, plain paper, lead solder cream, etc.

Legal and additional information.

About Samsung Electronics Co., Ltd.

Samsung 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 memory, system LSI, foundry and LED solutions.

For the latest news, please visit the Samsung Newsroom at news.samsung.com.

"Samsung provides limited warranty for its LED products, the full text of which is

available at <https://www.samsung.com/led/support/warranties>"

Copyright © 2022 Samsung Electronics Co., Ltd. All rights reserved.

Samsung is a registered trademark of Samsung Electronics Co., Ltd.

Specifications and designs are subject to change without notice. Non-metric weights and measurements are approximate. All data were deemed correct at time of creation. Samsung is not liable for errors or omissions. All brand, product, service names and logos are trademarks and/or registered trademarks of their respective owners and are hereby recognized and acknowledged.

Samsung Electronics Co., Ltd.

95, Samsung 2-ro

Giheung-gu

Yongin-si, Gyeonggi-do, 446-711

KOREA

www.samsungled.com

