

High Voltage LED Series 5630 18 Volt

LV566B



LV566B is a high voltage LED designed for downlight with AC step IC module



Features & Benefits

- 0.4 W class, 18 V high voltage middle power LED
- Standard form factor (5.6 x 3.0 x 0.8 mm)

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1. Characteristics

a) Absolute Maximum Rating

Item	Symbol	Rating	Unit	Condition
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	30	mA	-
Peak Pulsed Forward Current	I_{Fp}	150	mA	Duty 1/10, pulse width 10 ms
Assembly Process Temperature	-	260 <10	°C s	-
ESD (HBM)	-	5	kV	-

b) Electro-optical Characteristics ($I_F = 20 \text{ mA}$, $T_s = 25 \text{ }^{\circ}\text{C}$)

Item	Unit	CRI (R _a) Min.	Nominal CCT (K)	Rank	Bin	Min.	Typ.	Max.
Forward Voltage (V _f)	V			SG	AG	17.2	-	17.7
					BG	17.7	-	18.2
					CG	18.2	-	18.7
					DG	18.7	-	19.2
					EG	19.2	-	19.7
Reverse Voltage (@ 10 mA)	V					0.7	-	1.2
Color Rendering Index (R _a)	-			5		80	-	-
Special CRI (R9)	-					0	-	-
Thermal Resistance (junction to solder point)	$^{\circ}\text{C/W}$					-	10	-
Beam Angle	$^{\circ}$					-	115	-

Note:

Samsung maintains measurement tolerance of: forward voltage = $\pm 0.1 \text{ V}$, CRI = ± 3 , R9 = ± 6.5

c) Luminous Flux Characteristics ($I_F = 20 \text{ mA}$, $T_s = 25 \text{ }^\circ\text{C}$)

Item	Unit	CRI (R_a) Min.	Nominal CCT (K)	Rank	Bin	Min.	Typ.	Max.
Luminous Flux (Φ_v)	lm	80	2700	S0	S1	38.8	-	42.3
					S2	42.3	-	45.8
					S3	45.8	-	49.3
					S4	49.3	-	53.0
			3000	S0	S1	39.4	-	42.9
					S2	42.9	-	46.4
					S3	46.4	-	49.9
					S4	49.9	-	53.6
			3500	S0	S1	40.4	-	44.0
					S2	44.0	-	47.6
					S3	47.6	-	51.4
					S4	51.4	-	55.3
			4000	S0	S1	41.4	-	45.1
					S2	45.1	-	48.8
					S3	48.8	-	52.5
					S4	52.5	-	56.4
			5000	S0	S1	41.8	-	45.5
					S2	45.5	-	49.2
					S3	49.2	-	52.9
					S4	52.9	-	56.9
			5700	S0	S1	41.4	-	45.1
					S2	45.1	-	48.8
					S3	48.8	-	52.6
					S4	52.6	-	56.5
			6500	S0	S1	40.8	-	44.4
					S2	44.4	-	48.1
					S3	48.1	-	51.9
					S4	51.9	-	55.8

Note:

Samsung maintains measurement tolerance of: 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	9	2	D	5	S	G	W	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	Form Factor	54	5.6 x 3.0 x 0.8 mm; 4 pads
9	Product	9	LV566B
10	Sorting Current	2	20 mA
11	Chromaticity Coordinates	D	ANSI Standard
12	CRI & Sorting Temperature	5	Min. 80 25 °C
13 14	Forward Voltage (V)	S G	AG 17.2~17.7 BG 17.7~18.2 CG 18.2~18.7 DG 18.7~19.2 EG 19.2~19.7 17.2~19.7 Bin Code:
15 16	CCT (K)	W★ 2700 V★ 3000 U★ 3500 T★ 4000 R★ 5000 Q★ 5700 P★ 6500	W1, W2, W3, W4, W5, W6, W7, W8, W9, WA, WB, WC, WD, WE, WF, WG V1, V2, V3, V4, V5, V6, V7, V8, V9, VA, VB, VC, VD, VE, VF, VG U1, U2, U3, U4, U5, U6, U7, U8, U9, UA, UB, UC, UD, UE, UF, UG T1, T2, T3, T4, T5, T6, T7, T8, T9, TA, TB, TC, TD, TE, TF, TG R1, R2, R3, R4, R5, R6, R7, R8, R9, RA Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q9, QA P1, P2, P3, P4, P5, P6, P7, P8, P9, PA Bin Code: ★ : Warm white: "0" (Whole bin), "H" (Half bin), or "M" (Quarter bin) Cool White: "0" (Whole bin) or "M" (Quarter bin)
17 18	Luminous Flux (lm)	S 0	Bin Code: S1, S2, S3, S4

a) Luminous Flux Bins ($I_F = 20 \text{ mA}$, $T_s = 25 \text{ }^\circ\text{C}$)

Nominal CCT (K)	CRI Min.	Product Code	Flux Rank	Flux Bin	Flux Range (Φ_v , lm)
2700	80	SPMWHT5492D5SGW☆S0	S0	S1	38.8 ~ 42.3
				S2	42.3 ~ 45.8
				S3	45.8 ~ 49.3
				S4	49.3 ~ 53.0
3000	80	SPMWHT5492D5SGV☆S0	S0	S1	39.4 ~ 42.9
				S2	42.9 ~ 46.4
				S3	46.4 ~ 49.9
				S4	49.9 ~ 53.6
3500	80	SPMWHT5492D5SGU☆S0	S0	S1	40.4 ~ 44.0
				S2	44.0 ~ 47.6
				S3	47.6 ~ 51.4
				S4	51.4 ~ 55.3
4000	80	SPMWHT5492D5SGT☆S0	S0	S1	41.4 ~ 45.1
				S2	45.1 ~ 48.8
				S3	48.8 ~ 52.5
				S4	52.5 ~ 56.4
5000	80	SPMWHT5492D5SGR☆S0	S0	S1	41.8 ~ 45.5
				S2	45.5 ~ 49.2
				S3	49.2 ~ 52.9
				S4	52.9 ~ 56.9
5700	80	SPMWHT5492D5SGQ☆S0	S0	S1	41.4 ~ 45.1
				S2	45.1 ~ 48.8
				S3	48.8 ~ 52.6
				S4	52.6 ~ 56.5
6500	80	SPMWHT5492D5SGP☆S0	S0	S1	40.8 ~ 44.4
				S2	44.4 ~ 48.1
				S3	48.1 ~ 51.9
				S4	51.9 ~ 55.8

Note:

Warm white: "☆" can be "0" (Whole bin), "H" (Half bin) or "M" (Quarter bin) of the color binning

Cool white: "☆" can be "0" (Whole bin) or "M" (Quarter bin) of the color binning

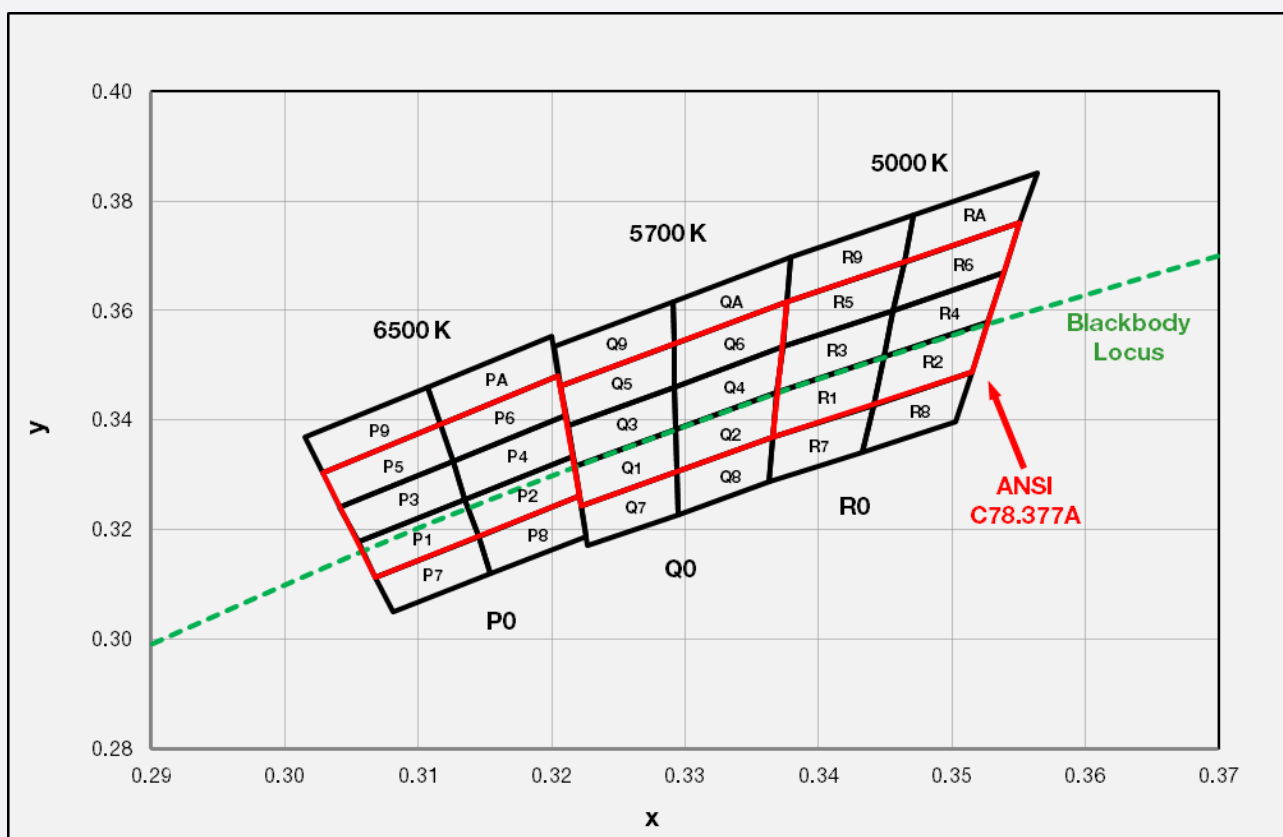
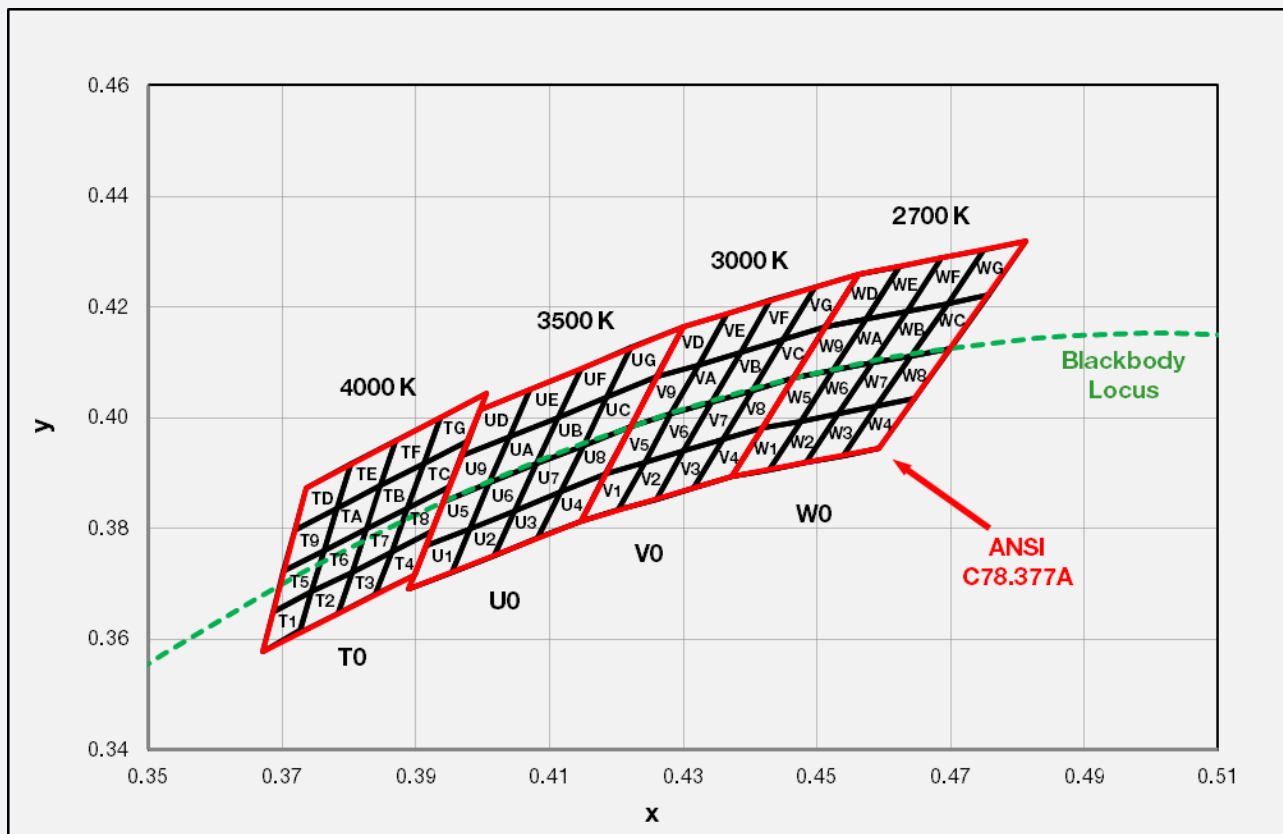
b) Color Bins ($I_F = 20 \text{ mA}$, $T_s = 25^\circ\text{C}$)

Nominal CCT (K)	CRI Min.	Product Code	Color Rank	Chromaticity Bins
2700	80	SPMWHT5492D5SGW0S0	W0 (Whole bin)	W1, W2, W3, W4, W5, W6, W7, W8, W9, WA, WB, WC, WD, WE, WF, WG
		SPMWHT5492D5SGWHS0	WH (Half bin)	W5, W6, W7, W8, W9, WA, WB, WC
		SPMWHT5492D5SGWMS0	WM (Quarter bin)	W6, W7, WA, WB
3000	80	SPMWHT5492D5SGV0S0	V0 (Whole bin)	V1, V2, V3, V4, V5, V6, V7, V8, V9, VA, VB, VC, VD, VE, VF, VG
		SPMWHT5492D5SGVHS0	VH (Half bin)	V5, V6, V7, V8, V9, VA, VB, VC
		SPMWHT5492D5SGVMS0	VM (Quarter bin)	V6, V7, VA, VB
3500	80	SPMWHT5492D5SGU0S0	U0 (Whole bin)	U1, U2, U3, U4, U5, U6, U7, U8, U9, UA, UB, UC, UD, UE, UF, UG
		SPMWHT5492D5SGUHS0	UH (Half bin)	U5, U6, U7, U8, U9, UA, UB, UC
		SPMWHT5492D5SGUMS0	UM (Quarter bin)	U6, U7, UA, UB
4000	80	SPMWHT5492D5SGT0S0	T0 (Whole bin)	T1, T2, T3, T4, T5, T6, T7, T8, T9, TA, TB, TC, TD, TE, TF, TG
		SPMWHT5492D5SGTHS0	TH (Half bin)	T5, T6, T7, T8, T9, TA, TB, TC
		SPMWHT5492D5SGTMS0	TM (Quarter bin)	T6, T7, TA, TB
5000	80	SPMWHT5492D5SGR0S0	R0 (Whole bin)	R1, R2, R3, R4, R5, R6, R7, R8, R9, RA
		SPMWHT5492D5SGRMS0	RM (Quarter bin)	R1, R2, R3, R4, R5, R6
5700	80	SPMWHT5492D5SGQ0S0	Q0 (Whole bin)	Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q9, QA
		SPMWHT5492D5SGQMS0	QM (Quarter bin)	Q1, Q2, Q3, Q4, Q5, Q6
6500	80	SPMWHT5492D5SGP0S0	P0 (Whole bin)	P1, P2, P3, P4, P5, P6, P7, P8, P9, PA
		SPMWHT5492D5SGPMS0	PM (Quarter bin)	P1, P2, P3, P4, P5, P6

c) Voltage Bins ($I_F = 20 \text{ mA}$, $T_s = 25 \text{ °C}$)

Nominal CCT (K)	CRI Min.	Product Code	Voltage Rank	Voltage Bin	Voltage Range (V)
-	-	-	SG	AG	17.2 ~ 17.7
				BG	17.7 ~ 18.2
				CG	18.2 ~ 18.7
				DG	18.7 ~ 19.2
				EG	19.2 ~ 19.7

d) Chromaticity Region & Coordinates ($I_F = 20 \text{ mA}$, $T_s = 25^\circ\text{C}$)



d) Chromaticity Region & Coordinates ($I_F = 20 \text{ mA}$, $T_s = 25^\circ\text{C}$)

Region	CIE x	CIE y	Region	CIE x	CIE y
W rank (2700 K)					
W1	0.4373	0.3893	W9	0.4465	0.4071
	0.4418	0.3981		0.4513	0.4164
	0.4475	0.3994		0.4573	0.4178
	0.4428	0.3906		0.4523	0.4085
W2	0.4428	0.3906	WA	0.4523	0.4085
	0.4475	0.3994		0.4573	0.4178
	0.4532	0.4008		0.4634	0.4193
	0.4483	0.3919		0.4582	0.4099
W3	0.4483	0.3919	WB	0.4582	0.4099
	0.4532	0.4008		0.4634	0.4193
	0.4589	0.4021		0.4695	0.4207
	0.4538	0.3931		0.4641	0.4112
W4	0.4538	0.3931	WC	0.4641	0.4112
	0.4589	0.4021		0.4695	0.4207
	0.4646	0.4034		0.4756	0.4221
	0.4593	0.3944		0.4700	0.4126
W5	0.4418	0.3981	WD	0.4513	0.4164
	0.4465	0.4071		0.4562	0.4260
	0.4523	0.4085		0.4624	0.4274
	0.4475	0.3994		0.4573	0.4178
W6	0.4475	0.3994	WE	0.4573	0.4178
	0.4523	0.4085		0.4624	0.4274
	0.4582	0.4099		0.4687	0.4289
	0.4532	0.4008		0.4634	0.4193
W7	0.4532	0.4008	WF	0.4634	0.4193
	0.4582	0.4099		0.4687	0.4289
	0.4641	0.4112		0.4750	0.4304
	0.4589	0.4021		0.4695	0.4207
W8	0.4589	0.4021	WG	0.4695	0.4207
	0.4641	0.4112		0.4750	0.4304
	0.4700	0.4126		0.4813	0.4319
	0.4646	0.4034		0.4756	0.4221

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

d) Chromaticity Region & Coordinates

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

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	0.3837
	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	0.376		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

d) Chromaticity Region & Coordinates

Region	CIE x	CIE y	Region	CIE x	CIE y
R rank (5000 K)					
R1	0.3366	0.3369	R6	0.3456	0.3601
	0.3441	0.3428		0.3539	0.3669
	0.3449	0.3515		0.3551	0.3760
	0.3369	0.3451		0.3464	0.3688
R2	0.3441	0.3428	R7	0.3363	0.3287
	0.3515	0.3487		0.3433	0.3341
	0.3527	0.3578		0.3441	0.3428
	0.3449	0.3515		0.3366	0.3369
R3	0.3369	0.3451	R8	0.3433	0.3341
	0.3449	0.3515		0.3503	0.3396
	0.3456	0.3601		0.3515	0.3487
	0.3373	0.3534		0.3441	0.3428
R4	0.3449	0.3515	R9	0.3376	0.3616
	0.3527	0.3578		0.3464	0.3688
	0.3539	0.3669		0.3471	0.3775
	0.3456	0.3601		0.3379	0.3698
R5	0.3373	0.3534	RA	0.3464	0.3688
	0.3456	0.3601		0.3551	0.3760
	0.3464	0.3688		0.3564	0.3851
	0.3376	0.3616		0.3471	0.3775

Region	CIE x	CIE y	Region	CIE x	CIE y
Q rank (5700 K)					
Q1	0.3222	0.3243	Q6	0.3292	0.3461
	0.3294	0.3306		0.3373	0.3534
	0.3293	0.3384		0.3376	0.3616
	0.3217	0.3316		0.3292	0.3539
Q2	0.3294	0.3306	Q7	0.3227	0.3170
	0.3366	0.3369		0.3295	0.3228
	0.3369	0.3451		0.3294	0.3306
	0.3293	0.3384		0.3222	0.3243
Q3	0.3217	0.3316	Q8	0.3295	0.3228
	0.3293	0.3384		0.3363	0.3287
	0.3292	0.3461		0.3366	0.3369
	0.3212	0.3389		0.3294	0.3306
Q4	0.3293	0.3384	Q9	0.3207	0.3462
	0.3369	0.3451		0.3292	0.3539
	0.3373	0.3534		0.3291	0.3617
	0.3292	0.3461		0.3202	0.3535
Q5	0.3212	0.3389	QA	0.3292	0.3539
	0.3292	0.3461		0.3376	0.3616
	0.3292	0.3539		0.3379	0.3698
	0.3207	0.3462		0.3291	0.3617

d) Chromaticity Region & Coordinates

Region	CIE x	CIE y	Region	CIE x	CIE y
P rank (6500 K)					
P1	0.3068	0.3113	P6	0.3126	0.3324
	0.3145	0.3187		0.3210	0.3408
	0.3135	0.3256		0.3205	0.3481
	0.3055	0.3177		0.3117	0.3393
P2	0.3145	0.3187	P7	0.3081	0.3049
	0.3221	0.3261		0.3154	0.3119
	0.3216	0.3334		0.3145	0.3187
	0.3135	0.3256		0.3068	0.3113
P3	0.3055	0.3177	P8	0.3154	0.3119
	0.3135	0.3256		0.3226	0.3188
	0.3126	0.3324		0.3221	0.3261
	0.3041	0.3240		0.3145	0.3187
P4	0.3135	0.3256	P9	0.3028	0.3304
	0.3216	0.3334		0.3117	0.3393
	0.3210	0.3408		0.3107	0.3461
	0.3126	0.3324		0.3015	0.3368
P5	0.3041	0.3240	PA	0.3117	0.3393
	0.3126	0.3324		0.3205	0.3481
	0.3117	0.3393		0.3200	0.3554
	0.3028	0.3304		0.3107	0.3461

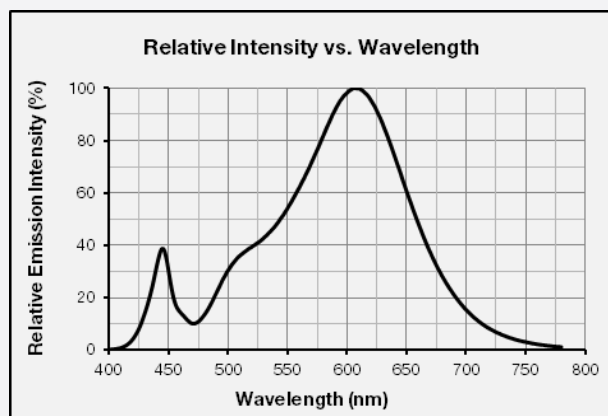
Note:

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

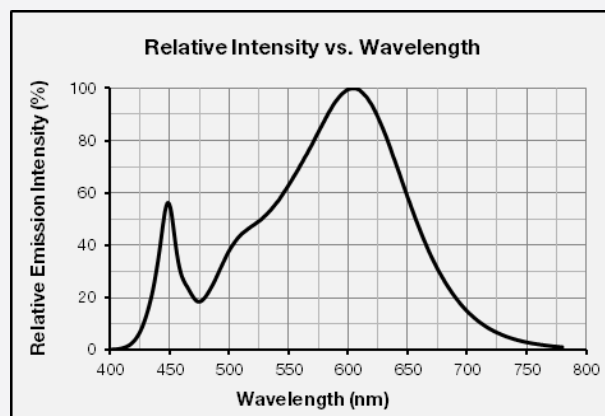
3. Typical Characteristics Graphs

a) Spectrum Distribution ($I_f = 20 \text{ mA}$, $T_s = 25^\circ\text{C}$)

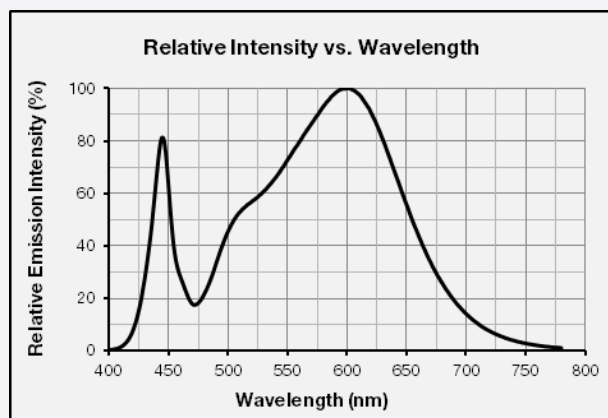
CCT: 2700 K



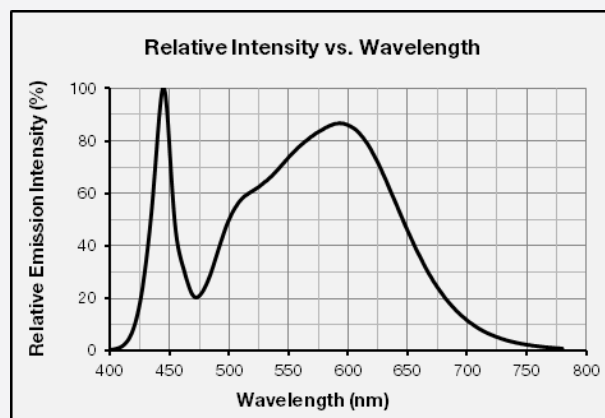
CCT: 3000 K



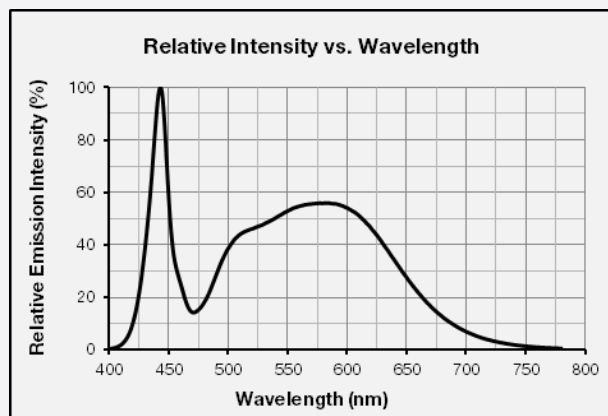
CCT: 3500 K



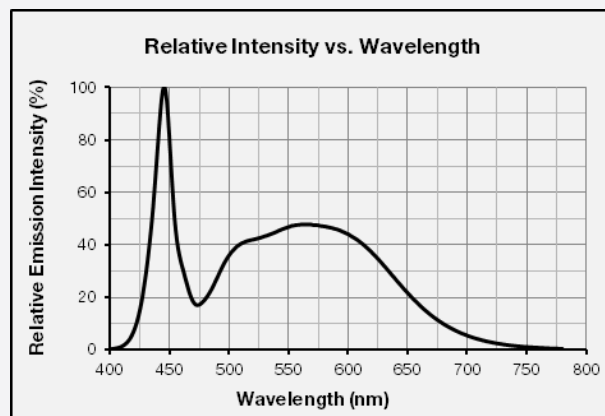
CCT: 4000 K



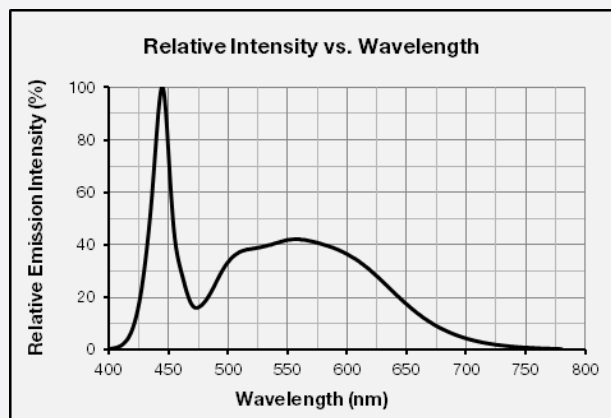
CCT: 5000 K



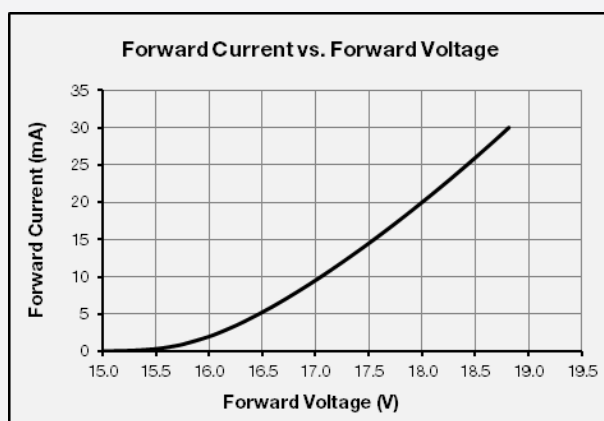
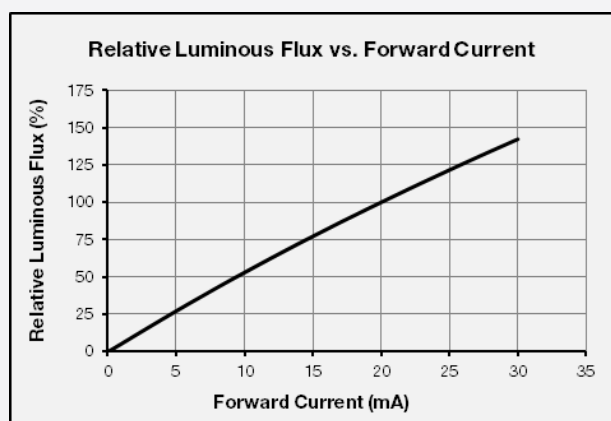
CCT: 5700 K



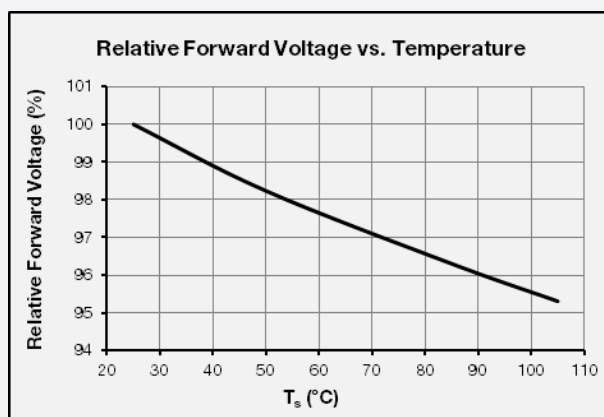
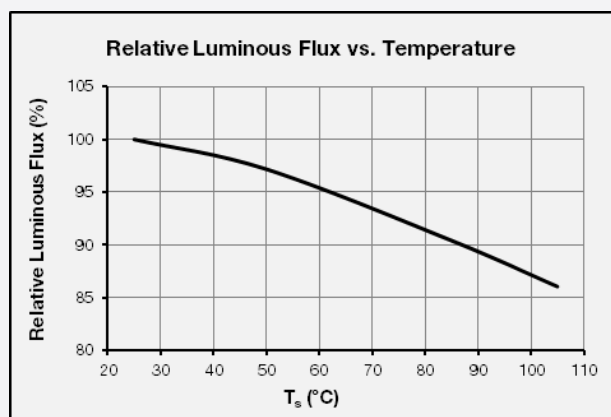
CCT: 6500 K



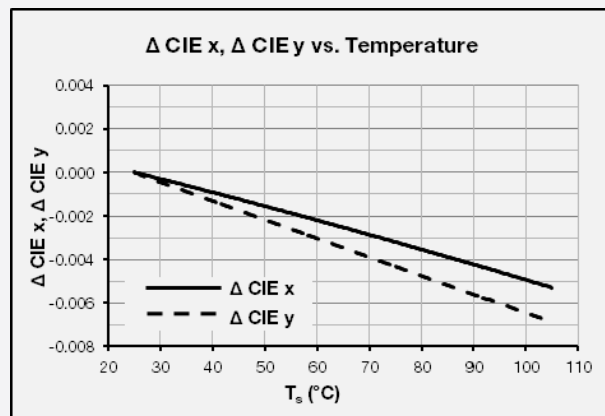
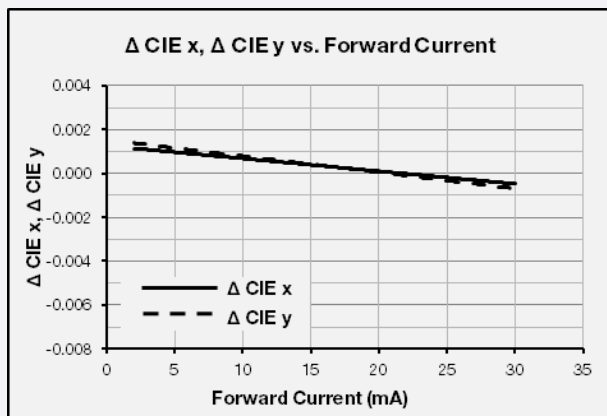
b) Forward Current Characteristics ($T_s = 25^\circ\text{C}$)



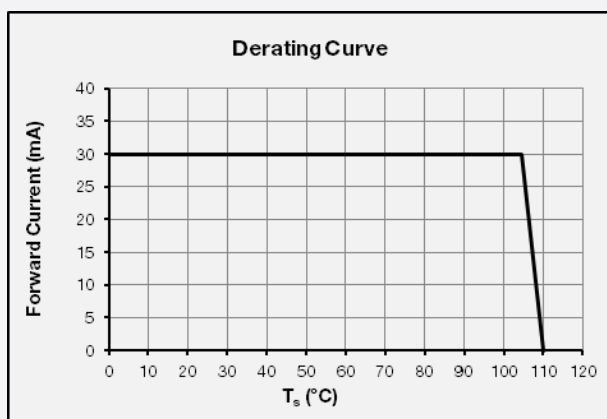
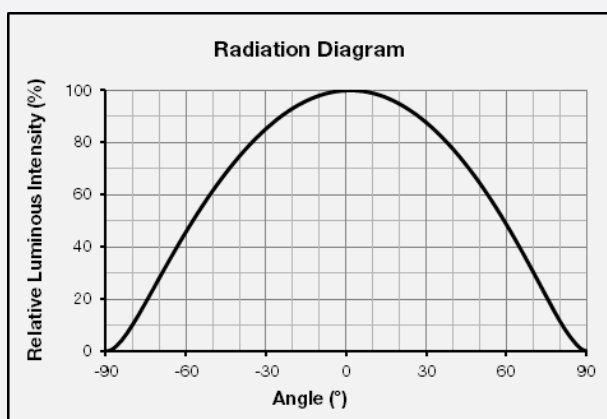
c) Temperature Characteristics ($I_f = 20\text{ mA}$)



d) Color Shift Characteristics

 $T_s = 25^\circ\text{C}$ $I_F = 20\text{ mA}$ 

e) Derating Curve

f) Beam Angle Characteristics ($I_F = 20\text{ mA}$, $T_s = 25^\circ\text{C}$)

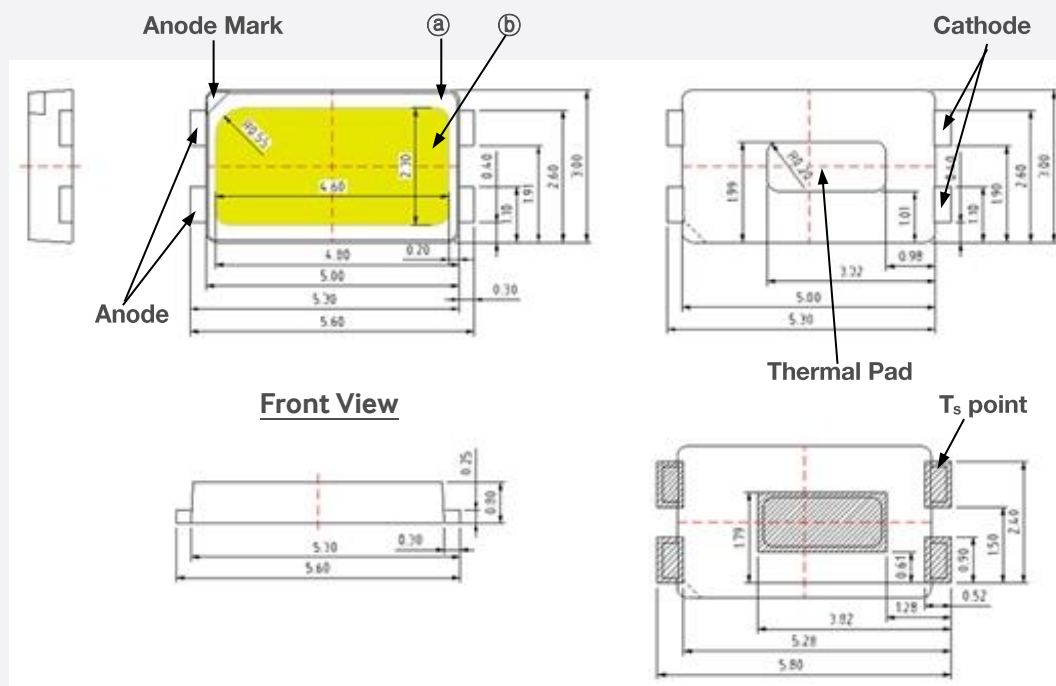
4. Outline Drawing & Dimension

- Measurement unit: mm
- Tolerance: ± 0.10 mm
- Maximum compressing force is 15 N on the body ①
- Do not place pressure on the encapsulation resin ②

Left Side View

Top View

Bottom View



Recommended Soldering Pattern

Notes:

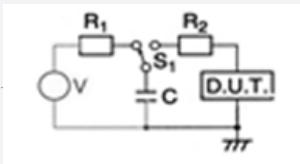
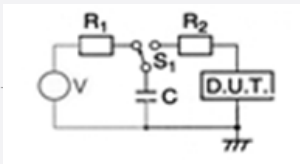
- 1) This LED has built-in ESD protection device(s) connected in parallel to LED chip(s).
- 2) T_s point and measurement method:
 - ① Measure at one of the cathode pads, if necessary remove PSR of PCB to reach T_s point.
 - ② Thermal pad must be soldered to the PCB to dissipate heat properly, otherwise the LED can be damaged.
- 3) The thermal pad is electrically connected to the cathode contact pads.

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
MSL Test	125 °C 24 h drying → 60 °C, 60 % RH 120 h → 260 °C 10 s 3 cycles	1 cycle	11
Room Temperature Life Test	25 °C, DC 30 mA	1000 h	22
High Temperature Life Test	85 °C, DC 30 mA	1000 h	22
High Temperature Humidity Life Test	85 °C, 85 % RH, DC 30 mA	1000 h	22
Low Temperature Life Test	-40 °C, DC 30 mA	1000 h	22
Powered Temperature Cycle Test	-45 °C / 20 min ↔ 85 °C / 20 min, sweep 100 min cycle on/off: each 5 min, DC 30 mA	100 cycles	22
Thermal Shock	-45 °C / 15 min ↔ 125 °C / 15 min → Hot plate 180 °C	800 cycles	100
High Temperature Storage	120 °C	1000 h	11
Low Temperature Storage	-40 °C	1000 h	11
ESD (HBM)	 R₁: 10 MΩ R₂: 1.5 kΩ C: 100 pF V: ±5 kV	5 times	5
ESD (MM)	 R₁: 10 MΩ R₂: 0 C: 200 pF V: ±0.5 kV	5 times	5
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

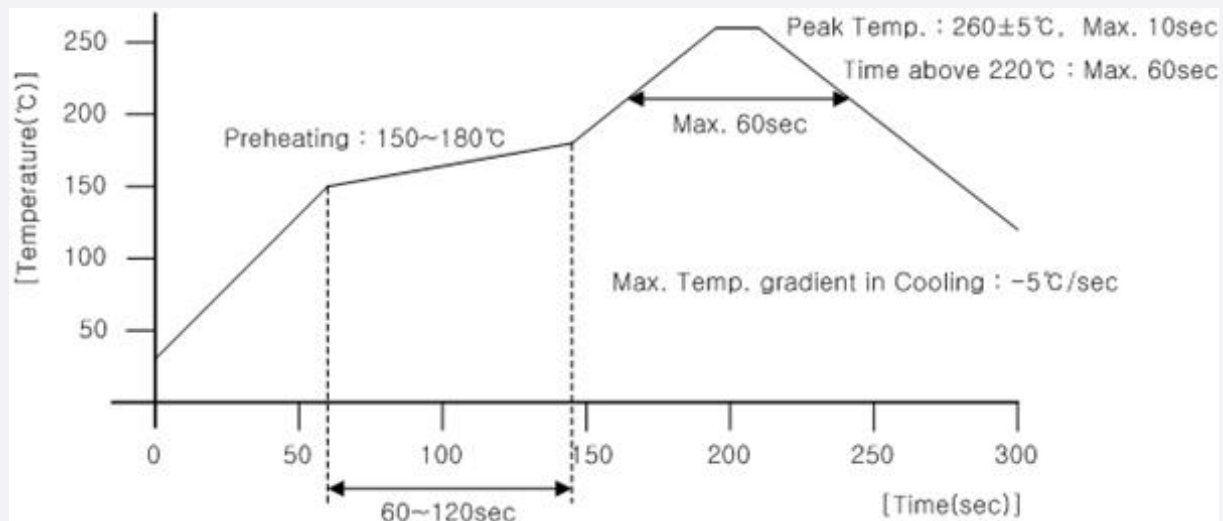
b) Criteria for Judging the Damage

Item	Symbol	Test Condition (T _s = 25 °C)	Limit	
			Min.	Max.
Forward Voltage	V _F	I _F = 20 mA	Init. Value * 0.9	Init. Value * 1.1
Luminous Flux	Φ_v	I _F = 20 mA	Init. Value * 0.7	Init. Value * 1.2

6. Soldering Conditions

a) Reflow Conditions (Pb free)

Reflow frequency: 2 times max.



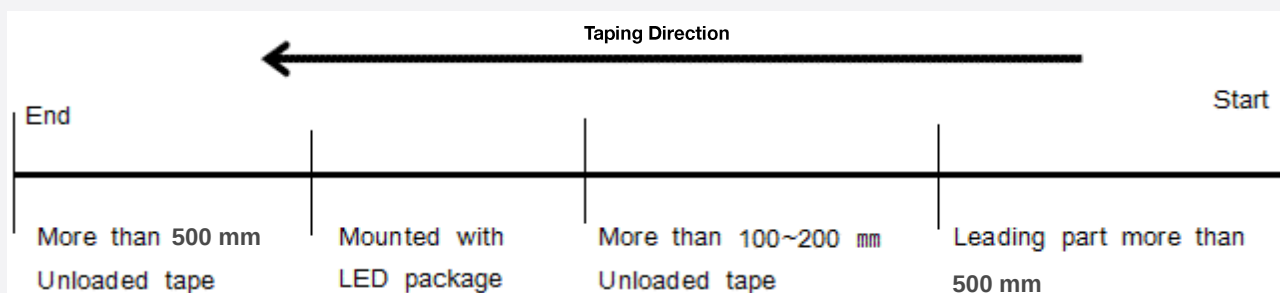
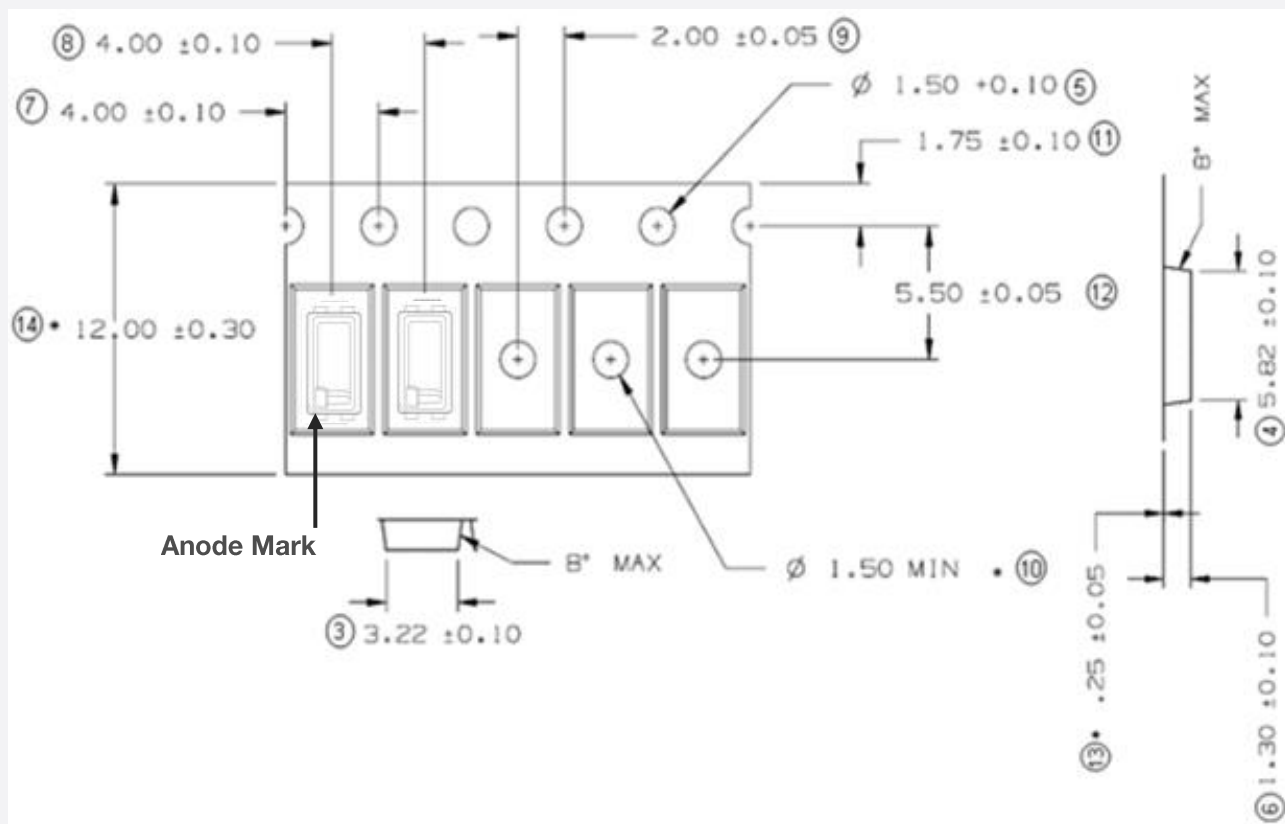
b) Manual Soldering Conditions

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

7. Tape & Reel

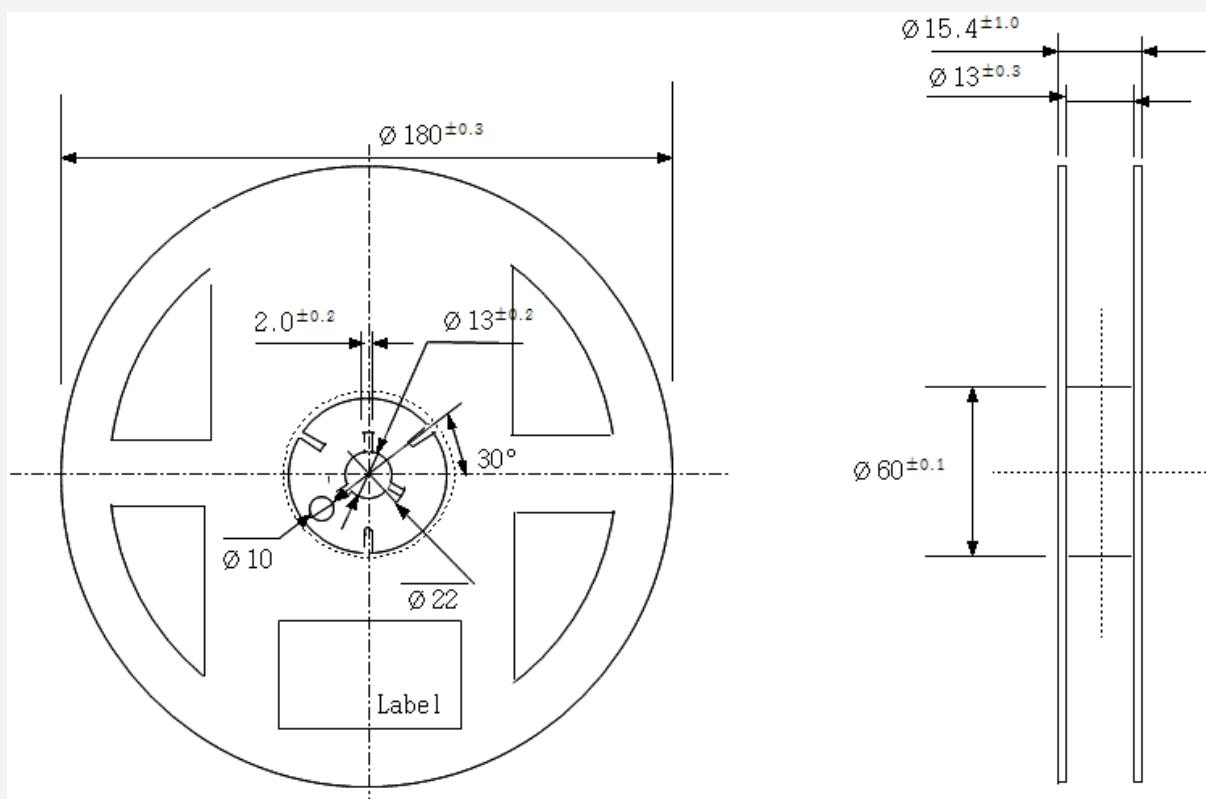
a) Taping Dimension

(unit: mm)



b) Reel Dimension

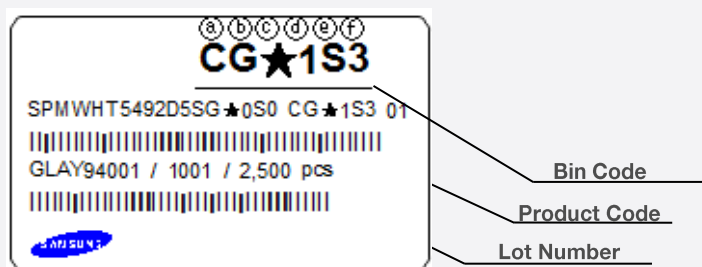
(unit: mm)

**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



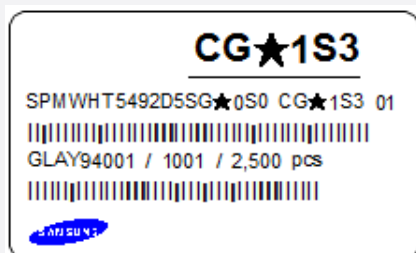
Note: Denoted bin code and product code above is only an example (see description on page 6)

Bin Code:

- ⒶⒷ: Forward Voltage bin (refer to page 9)
- ⒸⒹ: Chromaticity bin (refer to page 11~14)
- ⒺⒻ: Luminous Flux bin (refer to page 7)

b) Lot Number

The lot number is composed of the following characters:



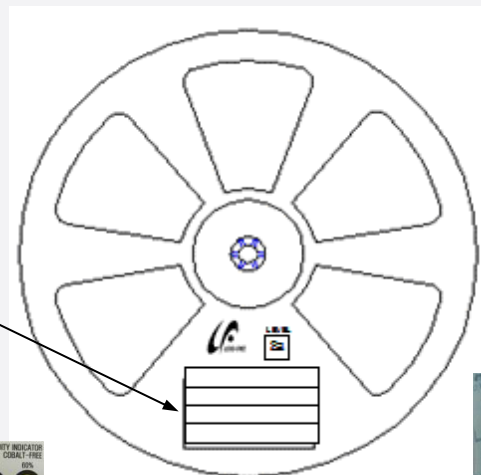
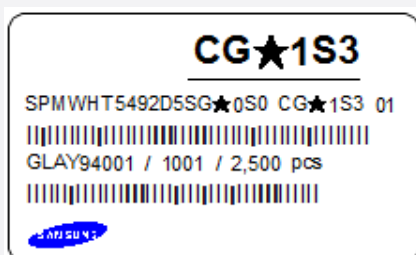
①②③④⑤⑥⑦⑧⑨ / 1ⒶⒷⒸ / 2,500 pcs

- ① : Production site (S: Giheung, Korea, G: Tianjin, China)
- ② : L (LED)
- ③ : Product state (A: Normal, B: Bulk, C: First Production, R: Reproduction, S: Sample)
- ④ : Year (Y: 2014, Z: 2015, A: 2016, ...)
- ⑤ : Month (1~9, A, B, C)
- ⑥ : Day (1~9, A, B~V)
- ⑦⑧⑨ : Product serial number (001 ~ 999)
- ⒶⒷⒸ : Reel number (001 ~ 999)

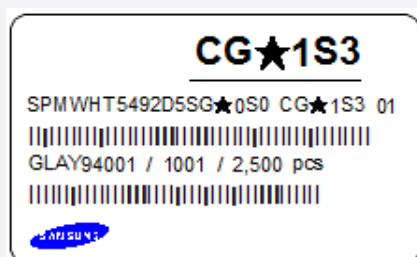
9. Packing Structure

a) Packing Process

Reel



Aluminum Vinyl Packing Bag

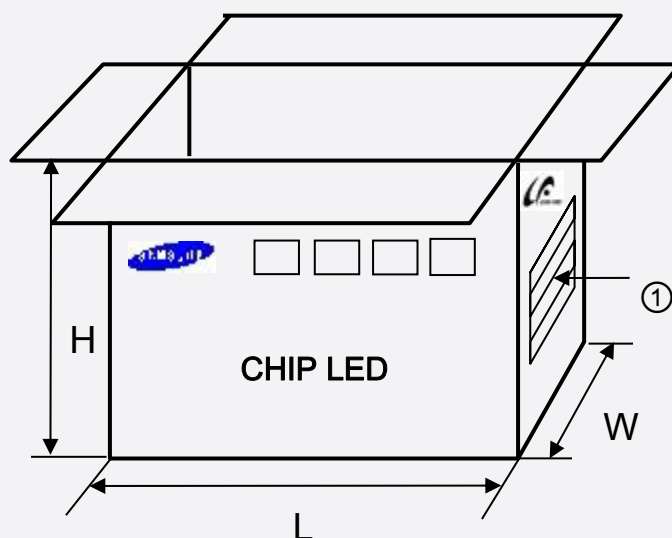
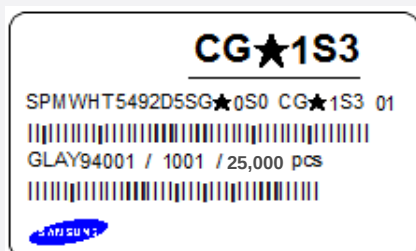


Outer Box

Material: Paper (SW3B(B))

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

① Side Label



b) Aluminum Vinyl Packing Bag



CAUTION

This bag contains
MOISTURE SENSITIVE DEVICES

LEVEL
2a

- Shelf life in sealed bag: 12 months at <40°C and <90% relative humidity (RH)
- Peak package body temperature: 240 °C
- After this bag is opened, devices that will be subjected to reflow solder or other high temperature processes must be:
 - Mounted within 672 hours at factory conditions of equal to or less than 30°C /60% RH, or
 - Stored at < 10% RH
- Devices require bake, before mounting, if:
 - Humidity Indicator Card is > 65% when read at 23±5°C, or
 - 2a is not met.
- If baking is required, devices must be baked for 1 hours at 60±5°C

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

CG★1S3
 SPMWHT5492D5SG★0S0 CG★1S3 01
 GLAY94001 / 1001 /25,000 pcs




ATTENTION
OBSERVE PRECAUTIONS
FOR HANDLING
ELECTROSTATIC
SENSITIVE
DEVICES



주의 사항

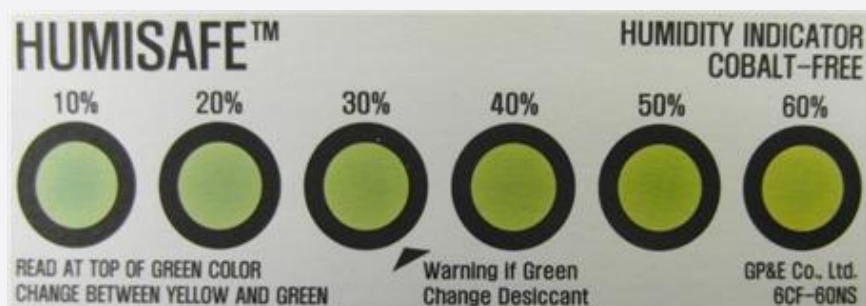
이 알루미늄 지퍼 백은 습기 및 정전기로부터 제품을 보호하기 위하여 제작되었습니다. 개봉 후에는 즉시 솔더 작업을 실시하는 것을 권장합니다.

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.

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 °C, 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 °C / 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 °C.
- 8) Devices must be baked for 1 hour at 60 ± 5 °C, 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.
- 11) 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.

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We are also leading in the Internet of Things space through, among others, our Digital Health and Smart Home initiatives. We employ 307,000 people across 84 countries. To discover more, please visit our official website at www.samsung.com and our official blog at global.samsungtomorrow.com.

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