

Middle Power LED PLCC Series

P-Series

0.2W White

SPMWHT523MA7

CR190



Features

- Package : Ag Plated 2 pad design package with silicone resin
- Dimension : 5.6 mm x 3.0 mm
- Technology : Epi-up
- Chip Configuration : 1 chip
- ESD Voltage : Up to 5 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 3B)
- Viewing Angle : 120°
- Qualifications : The product qualification test based on the guidelines of AEC-Q102
- Application : Automotive Interior

Table of Contents

1.	Characteristics	-----	3
2.	Product Code Information	-----	4
3.	Typical Characteristics Graphs	-----	11
4.	Soldering Temperature Location	-----	16
5.	Mechanical Dimension	-----	17
6.	Soldering Conditions	-----	18
7.	Tape & Reel	-----	19
8.	Label Structure	-----	20
9.	Packing Structure	-----	21
10.	Precautions in Handling & Use	-----	22
11.	Company Information	-----	23

1. Characteristics

a) Typical Characteristics

[$T_s = 25^\circ\text{C}$] [1]

Item	Symbol	Value	Unit
Luminous Flux ($I_F = 65 \text{ mA}$) [1]	Φ	Typ. 29.0	lm
Forward Voltage ($I_F = 65 \text{ mA}$) [1]	V_F	Typ. 2.8	V
Viewing Angle	φ	Typ. 120	Deg
Reverse Current	I_R	10	μA
Real Thermal Resistance (Junction to Solder point)	$R_{th-J-S} (\text{Real})$	Typ. 39 Max. 53	K/W
Electrical Thermal Resistance (Junction to Solder point)	$R_{th-J-S} (\text{Elec.})$	Typ. 17 Max. 23	K/W
Radian Surface	A	12.00	mm^2

Notes:

[1] The measurement condition means that temperature dependence is excluded by applying pulse current for typically 25ms.

b) Absolute Maximum Rating

Item	Symbol	Rating	Unit
Ambient / Operating Temperature	T_a	-40 ~ +110	$^\circ\text{C}$
Storage Temperature	T_{stg}	-40 ~ +110	$^\circ\text{C}$
LED Junction Temperature	T_j	125	$^\circ\text{C}$
Maximum Forward current [2] ($T_s: 25^\circ\text{C}$) [3]	I_F	180	mA
Minimum Forward current [2] ($T_s: 25^\circ\text{C}$) [3]	I_F	10	mA
Maximum Reverse current		Do not apply for reverse current	
ESD Sensitivity [4]	-	$\pm 5 \text{ HBM}$	kV

Notes:

[2] Driving the product at forward current (I_F) below Min. IF or above Max. IF may result in unpredictable behavior of the product.

[3] The measurement condition means that temperature dependence is excluded by applying pulse current for typically 25ms.

[4] It is recommended to use the LED with additional protection device (for example Zener diode) to protect it against ESD.

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	2	3	M	A	7	A	B	C	D	E	F
Digit	PKG Information																
1 2	company name and Samsung LED PKG (SP for Samsung PKG)																
3	power variant (M for automotive middle power)																
4 5	color variant (WH for automotive white color)																
6	LED PKG version (T for initial version)																
7 8 9	product configuration and type (523 for automotive 5630 PKG)																
10	operating condition (M for 65mA)																
11	specific property (A for Automotive)																
12	CRI variant (7 for CRI Min. 90)																
13 14	forward voltage property																
15 16	CIE coordination property																
17 18	luminous flux property																

a) Luminous Flux Bins [5] (I_F= 65 mA, T_s= 25°C)

Nominal CCT (K)	Product Code	Symbol	Bin Code	Flux Range (lm)	
				Min	Max
6500K	SPMWHT523MA7V0P0DB	Φ	D4	26.5	28.5
5700K	SPMWHT523MA7V0Q0DB		D5	28.5	30.5
5000K	SPMWHT523MA7V0R0DB		D6	30.5	32.5
4500K	SPMWHT523MA7V0S0DB				
4000K	SPMWHT523MA7V0T0DB				
3500K	SPMWHT523MA7V0U0DB				

Nominal CCT (K)	Product Code	Symbol	Bin Code	Flux Range (lm)	
				Min	Max
3000K	SPMWHT523MA7V0V0DA	Φ	D3	24.5	26.5
2700K	SPMWHT523MA7V0W0DA		D4	26.5	28.5
			D5	28.5	30.5

b) Voltage Bins (I_F= 65 mA, T_s= 25 °C)

Voltage Code	Symbol	Bin Code	Voltage Range (V)	
			Min	Max
V0	V _F	V1	2.7	2.8
		V2	2.8	2.9
		V3	2.9	3.0

Notes:

[5] Luminous intensity measuring equipment: CAS140CT Φ_V and V_F tolerances are ±7% and ±0.1V, respectively.

Given tolerances are valid for typical conditions.

c) Color Bins [6] (If= 65 mA, Ts= 25 °C)

Region	CIE x	CIE y	Region	CIE x	CIE y
W rank (2700K)					
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 (3000K)					
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 (3500K)					
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
	0.3953	0.3720		0.4010	0.3882
U2	0.3981	0.3800	UA	0.4040	0.3966
	0.4048	0.3832		0.4113	0.4001
	0.4017	0.3751		0.4080	0.3916
	0.4017	0.3751		0.4080	0.3916
U3	0.4048	0.3832	UB	0.4113	0.4001
	0.4116	0.3865		0.4186	0.4037
	0.4082	0.3782		0.4150	0.3950
	0.4082	0.3782		0.4150	0.3950
U4	0.4116	0.3865	UC	0.4186	0.4037
	0.4183	0.3898		0.4259	0.4073
	0.4147	0.3814		0.4221	0.3984
	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 (4000K)					
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
	0.3726	0.3612		0.3763	0.3760
T2	0.3783	0.3646	TA	0.3825	0.3798
	0.3804	0.3721		0.3847	0.3877
	0.3744	0.3685		0.3782	0.3837
	0.3783	0.3646		0.3825	0.3798
T3	0.3840	0.3681	TB	0.3887	0.3836
	0.3863	0.3758		0.3912	0.3917
	0.3804	0.3721		0.3847	0.3877
	0.3840	0.3681		0.3887	0.3837
T4	0.3898	0.3716	TC	0.3950	0.3875
	0.3924	0.3794		0.3978	0.3958
	0.3863	0.3758		0.3912	0.3917
	0.3686	0.3649	TD	0.3719	0.3797
T5	0.3744	0.3685		0.3782	0.3837
	0.3763	0.3760		0.3802	0.3916
	0.3702	0.3722		0.3736	0.3874
	0.3744	0.3685	TE	0.3782	0.3837
T6	0.3804	0.3721		0.3847	0.3877
	0.3825	0.3798		0.3869	0.3958
	0.3763	0.3760		0.3802	0.3916
	0.3804	0.3721	TF	0.3847	0.3877
T7	0.3863	0.3758		0.3912	0.3917
	0.3887	0.3836		0.3937	0.4001
	0.3825	0.3798		0.3869	0.3958
	0.3863	0.3758	TG	0.3912	0.3917
T8	0.3924	0.3794		0.3978	0.3958
	0.3950	0.3875		0.4006	0.4044
	0.3887	0.3836		0.3937	0.4001

Region	CIE x	CIE y	Region	CIE x	CIE y
S rank (4500K)					
S1	0.3511	0.3465	S9	0.3530	0.3601
	0.3551	0.3493		0.3573	0.3632
	0.3562	0.3562		0.3584	0.3701
	0.3520	0.3533		0.3539	0.3668
S2	0.3551	0.3493	SA	0.3573	0.3632
	0.3590	0.3521		0.3616	0.3663
	0.3603	0.3592		0.3628	0.3733
	0.3562	0.3562		0.3584	0.3701
S3	0.3590	0.3521	SB	0.3616	0.3663
	0.3630	0.3550		0.3659	0.3694
	0.3645	0.3622		0.3674	0.3767
	0.3603	0.3592		0.3628	0.3733
S4	0.3630	0.3550	SC	0.3659	0.3694
	0.3670	0.3578		0.3703	0.3726
	0.3687	0.3652		0.3720	0.3800
	0.3645	0.3622		0.3674	0.3767
S5	0.3520	0.3533	SD	0.3539	0.3668
	0.3562	0.3562		0.3584	0.3701
	0.3573	0.3632		0.3595	0.3770
	0.3530	0.3601		0.3548	0.3736
S6	0.3562	0.3562	SE	0.3584	0.3701
	0.3603	0.3592		0.3628	0.3733
	0.3616	0.3663		0.3641	0.3804
	0.3573	0.3632		0.3595	0.3770
S7	0.3603	0.3592	SF	0.3628	0.3733
	0.3645	0.3622		0.3674	0.3767
	0.3659	0.3694		0.3689	0.3839
	0.3616	0.3663		0.3641	0.3804
S8	0.3645	0.3622	SG	0.3674	0.3767
	0.3687	0.3652		0.3720	0.3800
	0.3703	0.3726		0.3736	0.3874
	0.3659	0.3694		0.3689	0.3839

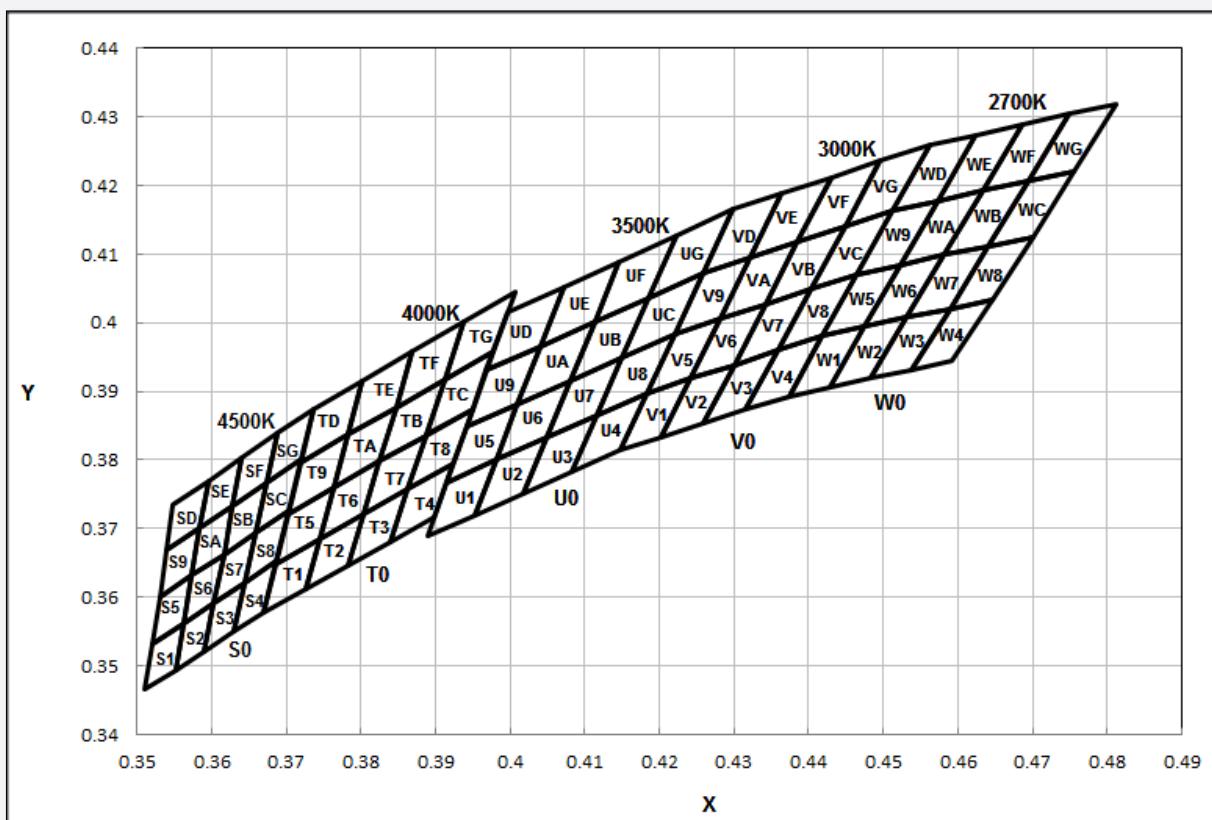
Region	CIE x	CIE y	Region	CIE x	CIE y
R rank (5000K)					
R1	0.3366	0.3369	R9	0.3371	0.3490
	0.3369	0.3430		0.3374	0.3553
	0.3407	0.3460		0.3415	0.3587
	0.3403	0.3398		0.3411	0.3522
R2	0.3403	0.3398	RA	0.3411	0.3522
	0.3407	0.3460		0.3415	0.3587
	0.3446	0.3491		0.3457	0.3621
	0.3440	0.3427		0.3451	0.3554
R3	0.3440	0.3427	RB	0.3451	0.3554
	0.3446	0.3491		0.3457	0.3621
	0.3485	0.3522		0.3500	0.3655
	0.3478	0.3457		0.3492	0.3587
R4	0.3478	0.3457	RC	0.3492	0.3587
	0.3485	0.3522		0.3500	0.3655
	0.3524	0.3554		0.3542	0.3690
	0.3515	0.3487		0.3533	0.3620
R5	0.3369	0.3430	RH	0.3364	0.3292
	0.3371	0.3490		0.3400	0.3320
	0.3411	0.3522		0.3403	0.3398
	0.3407	0.3460		0.3366	0.3369
R6	0.3407	0.3460	RJ	0.3400	0.3320
	0.3411	0.3522		0.3434	0.3345
	0.3451	0.3554		0.3440	0.3427
	0.3446	0.3491		0.3403	0.3398
R7	0.3446	0.3491	RK	0.3434	0.3345
	0.3451	0.3554		0.3468	0.3371
	0.3492	0.3587		0.3477	0.3458
	0.3485	0.3522		0.3440	0.3427
R8	0.3485	0.3522	RL	0.3468	0.3371
	0.3492	0.3587		0.3504	0.3398
	0.3533	0.3620		0.3514	0.3487
	0.3524	0.3554		0.3477	0.3458

Region	CIE x	CIE y	Region	CIE x	CIE y
Q rank (5700K)					
Q1	0.3222	0.3243	Q9	0.3215	0.335
	0.3219	0.3297		0.3211	0.3406
	0.3254	0.3328		0.3251	0.3442
	0.3256	0.3272		0.3253	0.3384
Q2	0.3256	0.3272	QA	0.3253	0.3384
	0.3254	0.3328		0.3251	0.3442
	0.329	0.3359		0.329	0.3478
	0.329	0.33		0.329	0.3417
Q3	0.329	0.33	QB	0.329	0.3417
	0.329	0.3359		0.329	0.3478
	0.3329	0.3394		0.3332	0.3515
	0.3328	0.3335		0.3331	0.3454
Q4	0.3328	0.3335	QC	0.3331	0.3454
	0.3329	0.3394		0.3332	0.3515
	0.3369	0.343		0.3374	0.3553
	0.3366	0.3369		0.3371	0.349
Q5	0.3219	0.3297	QH	0.3226	0.318
	0.3215	0.335		0.3258	0.3207
	0.3253	0.3384		0.3256	0.3272
	0.3254	0.3328		0.3222	0.3243
Q6	0.3254	0.3328	QJ	0.3258	0.3207
	0.3253	0.3384		0.329	0.3233
	0.329	0.3417		0.329	0.33
	0.329	0.3359		0.3256	0.3272
Q7	0.329	0.3359	QK	0.329	0.3233
	0.329	0.3417		0.3326	0.3263
	0.3331	0.3454		0.3328	0.3335
	0.3329	0.3394		0.329	0.33
Q8	0.3329	0.3394	QL	0.3326	0.3263
	0.3331	0.3454		0.3364	0.3292
	0.3371	0.349		0.3366	0.3369
	0.3369	0.343		0.3328	0.3335

Notes:

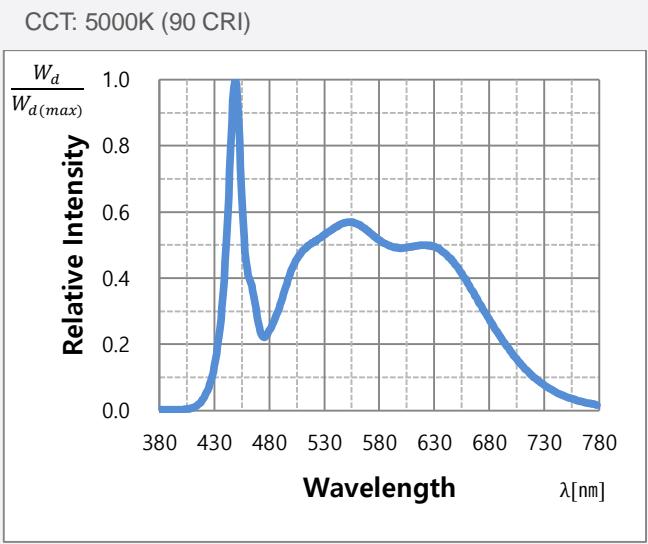
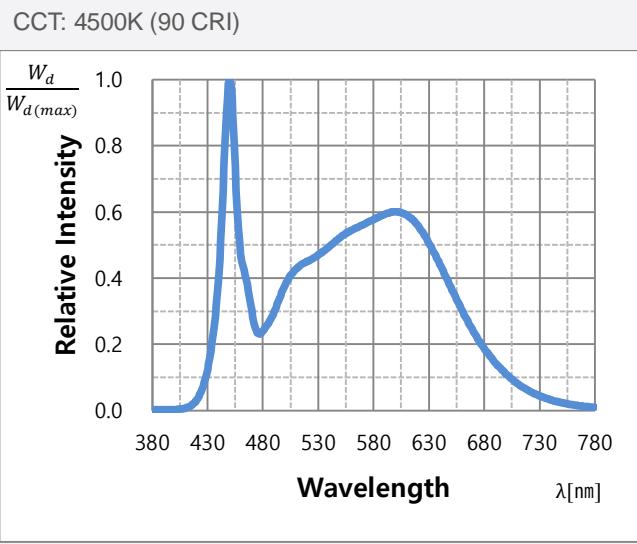
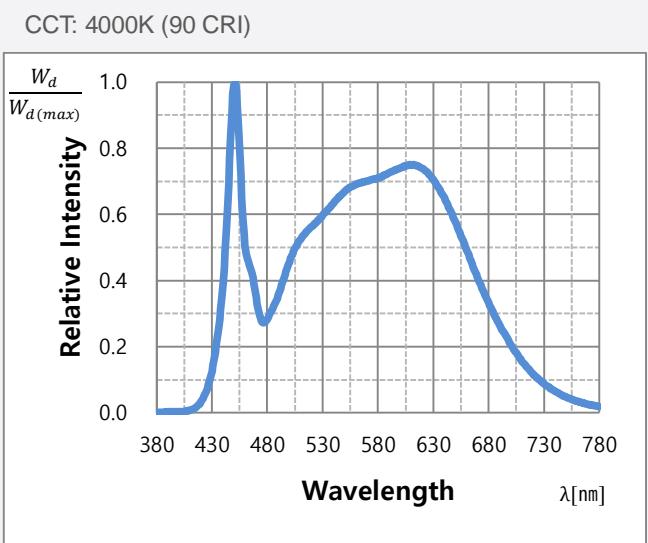
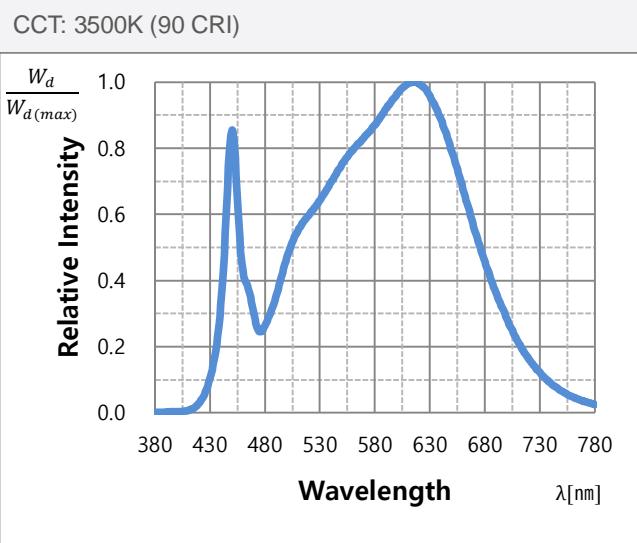
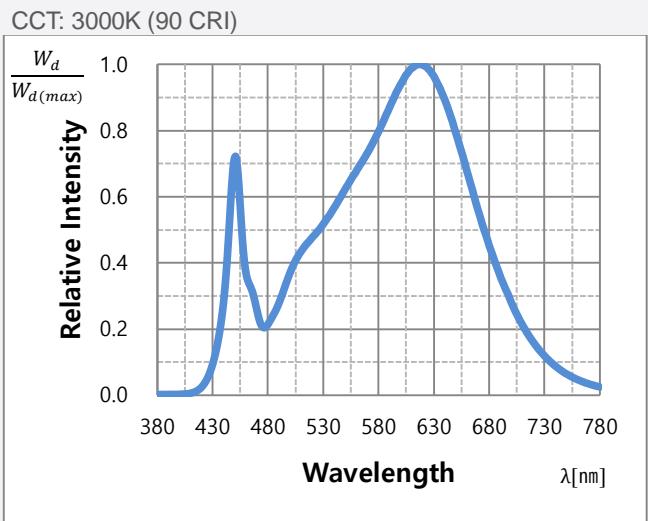
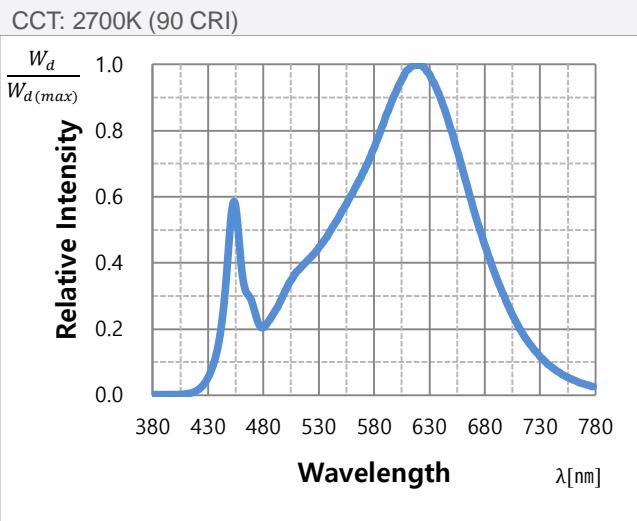
[6] Chromaticity coordinates: C_x, C_y according to CIE 1931. C_x and C_y tolerances are ±0.007, respectively.

Region	CIE x	CIE y	Region	CIE x	CIE y
P rank (6500K)					
P1	0.3068	0.3113	P9	0.3048	0.3207
	0.3106	0.3150		0.3089	0.3249
	0.3098	0.3199		0.3080	0.3298
	0.3058	0.3160		0.3038	0.3256
P2	0.3106	0.3150	PA	0.3089	0.3249
	0.3144	0.3186		0.3130	0.3290
	0.3137	0.3238		0.3123	0.3341
	0.3098	0.3199		0.3080	0.3298
P3	0.3144	0.3186	PB	0.3130	0.3290
	0.3183	0.3224		0.3172	0.3332
	0.3177	0.3278		0.3166	0.3384
	0.3137	0.3238		0.3123	0.3341
P4	0.3183	0.3224	PC	0.3172	0.3332
	0.3221	0.3261		0.3213	0.3373
	0.3217	0.3317		0.3209	0.3427
	0.3177	0.3278		0.3166	0.3384
P5	0.3058	0.3160	PH	0.3079	0.3060
	0.3098	0.3199		0.3115	0.3098
	0.3089	0.3249		0.3106	0.3150
	0.3048	0.3207		0.3068	0.3113
P6	0.3098	0.3199	PJ	0.3115	0.3098
	0.3137	0.3238		0.3152	0.3133
	0.3130	0.3290		0.3144	0.3186
	0.3089	0.3249		0.3106	0.3150
P7	0.3137	0.3238	PK	0.3152	0.3133
	0.3177	0.3278		0.3190	0.3170
	0.3172	0.3332		0.3183	0.3224
	0.3130	0.3290		0.3144	0.3186
P8	0.3177	0.3278	PL	0.3190	0.3170
	0.3217	0.3317		0.3225	0.3200
	0.3213	0.3373		0.3221	0.3261
	0.3172	0.3332		0.3183	0.3224

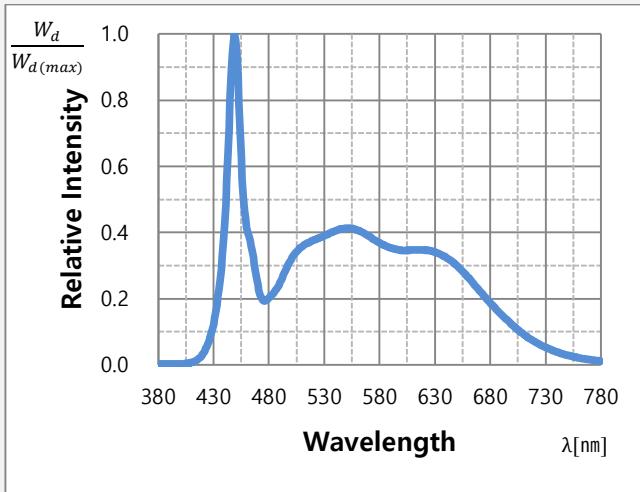


3. Typical Characteristics Graphs

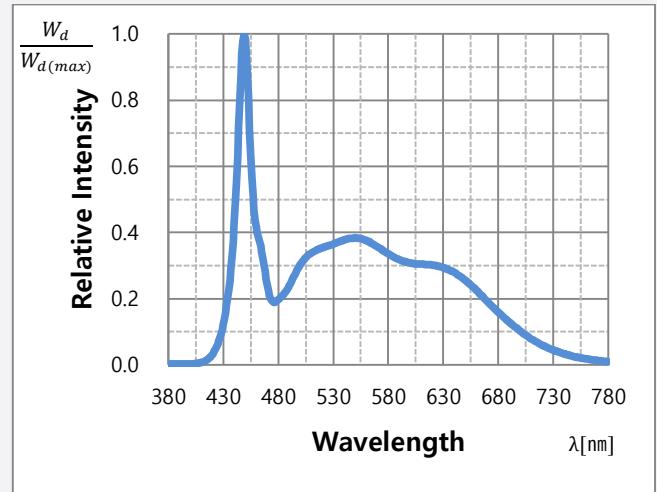
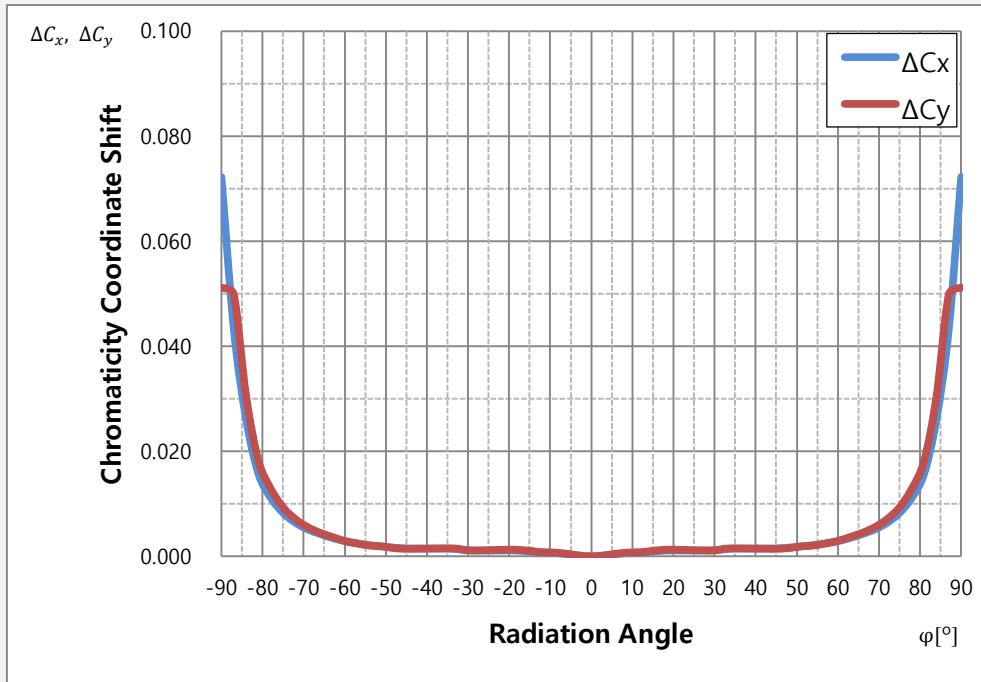
a) Spectrum Distribution ($I_F = 65 \text{ mA}$, $T_s = 25^\circ\text{C}$)^[7]



CCT: 5700K (90 CRI)

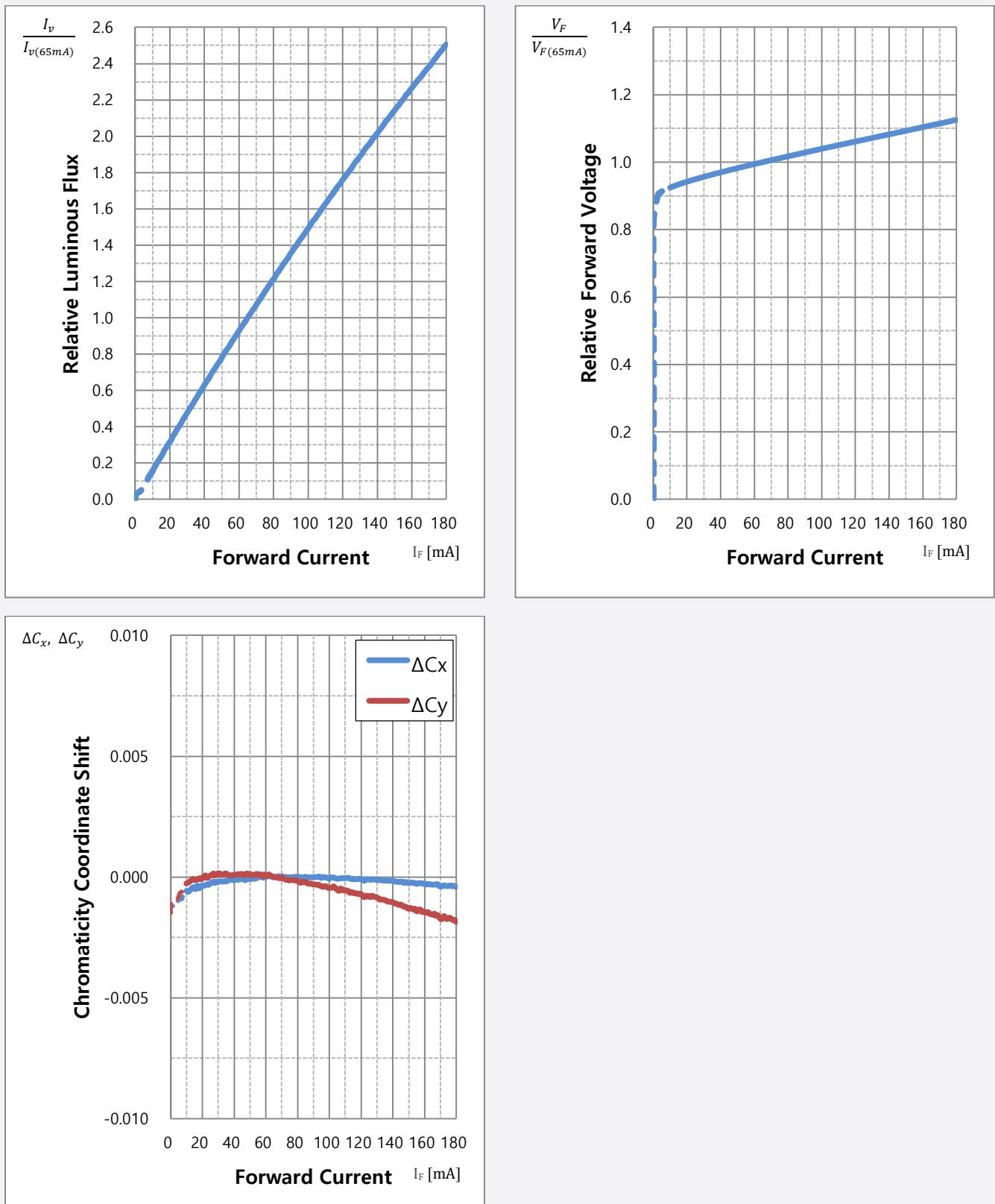


CCT: 6500K (90 CRI)

b) Typical Chromaticity Coordinate Shift vs Radiation Angle ($I_F = 65 \text{ mA}$, $T_s = 25^\circ\text{C}$)^[7]**Notes:**

[7] The measurement condition means that temperature dependence is excluded by applying pulse current for typically 25ms.

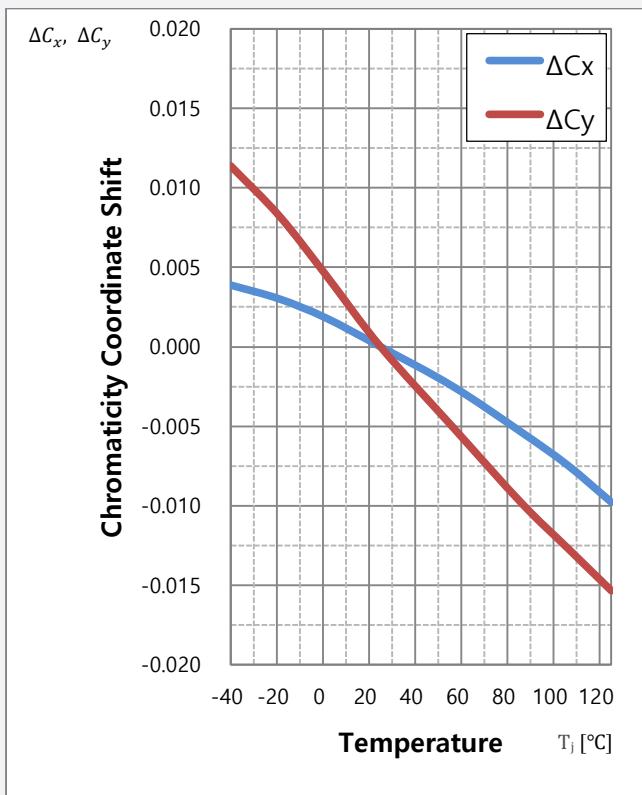
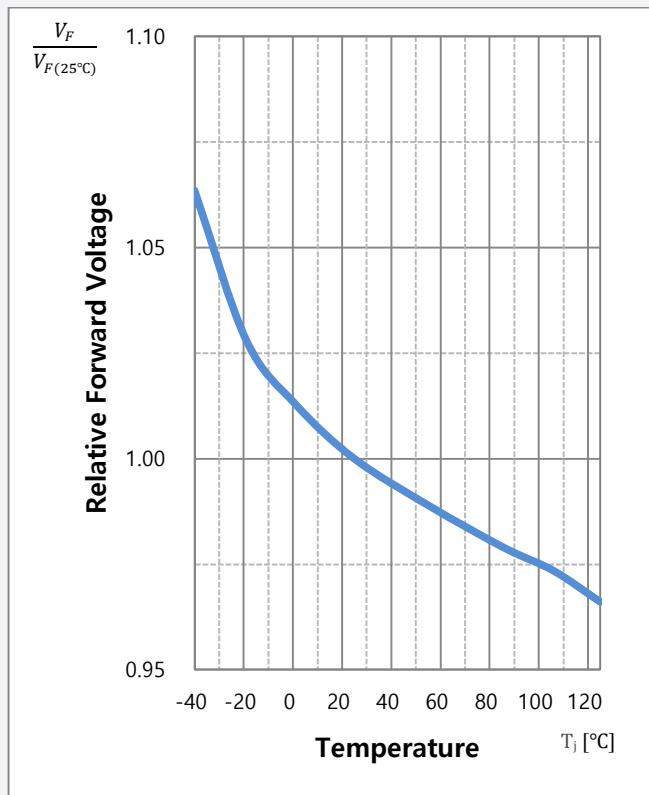
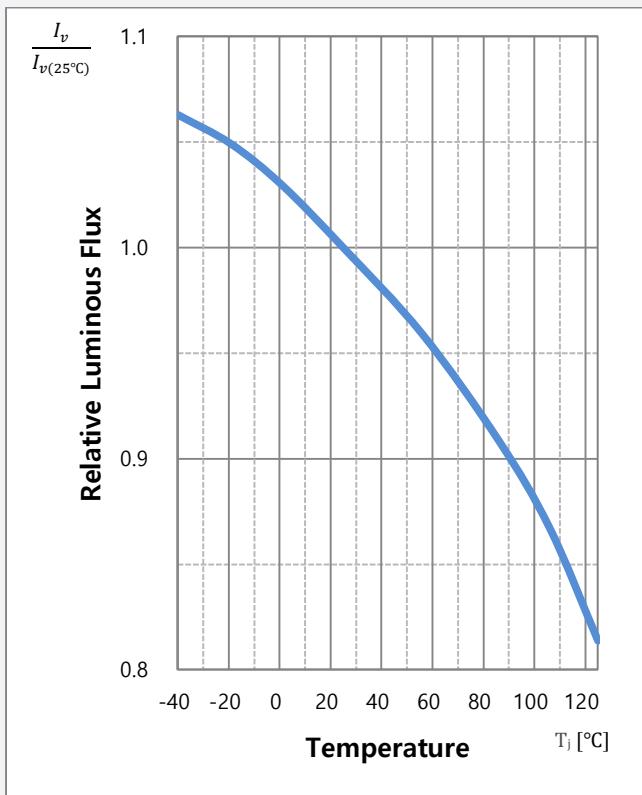
c) Forward Current Characteristics ($T_s = 25^\circ\text{C}$)^[8]



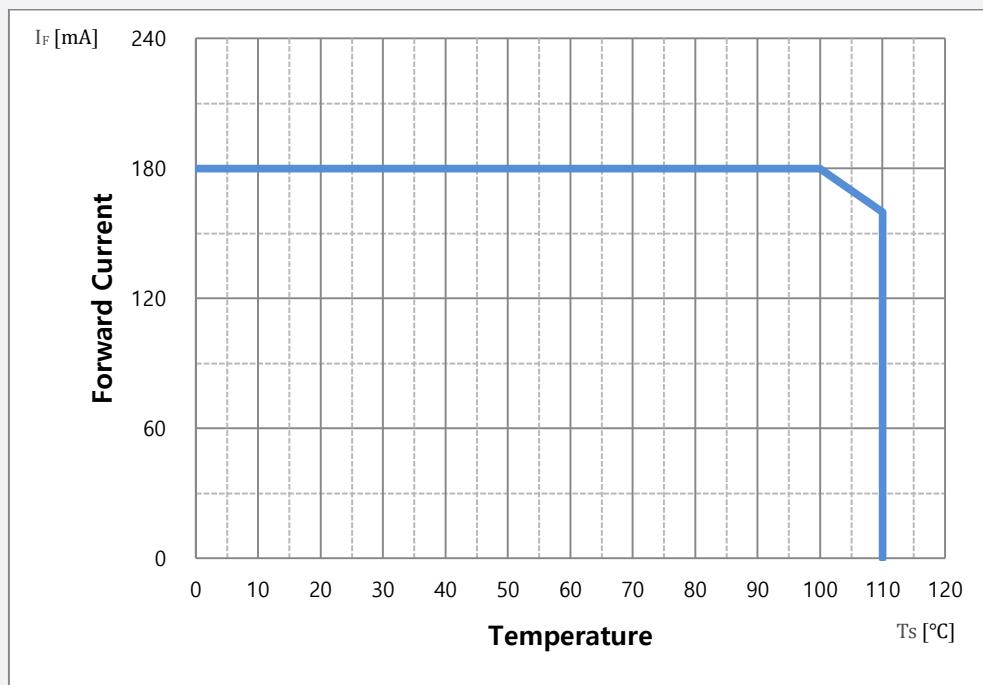
Notes:

[8] The measurement condition means that temperature dependence is excluded by applying pulse current for typically 25ms.

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



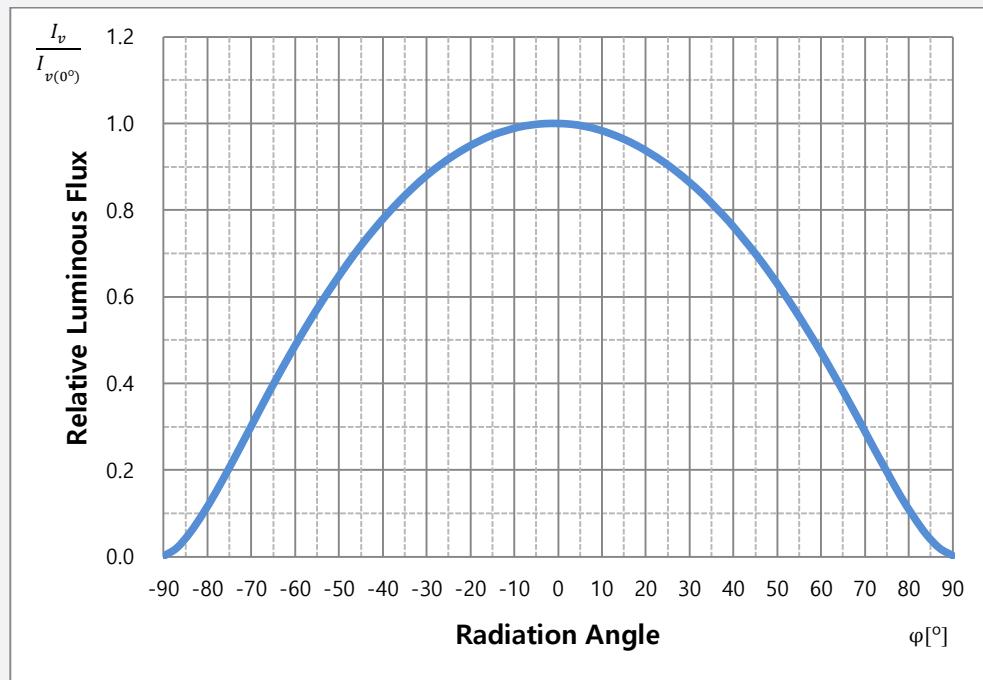
e) Derating Curve [9]



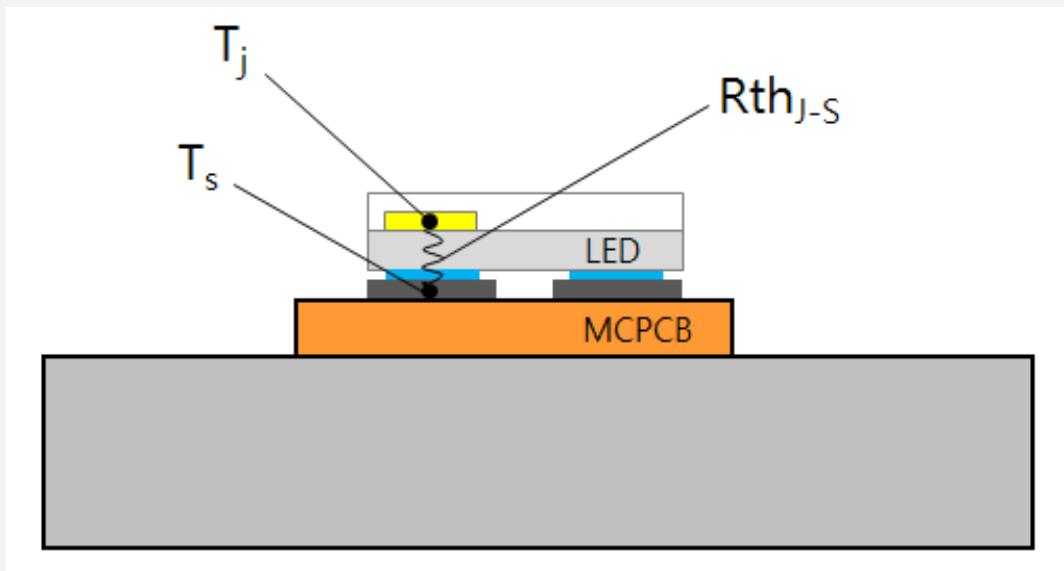
Notes:

[9] The measurement condition means that temperature dependence is excluded by applying pulse current for typically 25ms.

f) Beam Angle Characteristics ($I_F = 65$ mA, $T_s = 25$ °C)



4. Soldering Temperature Location

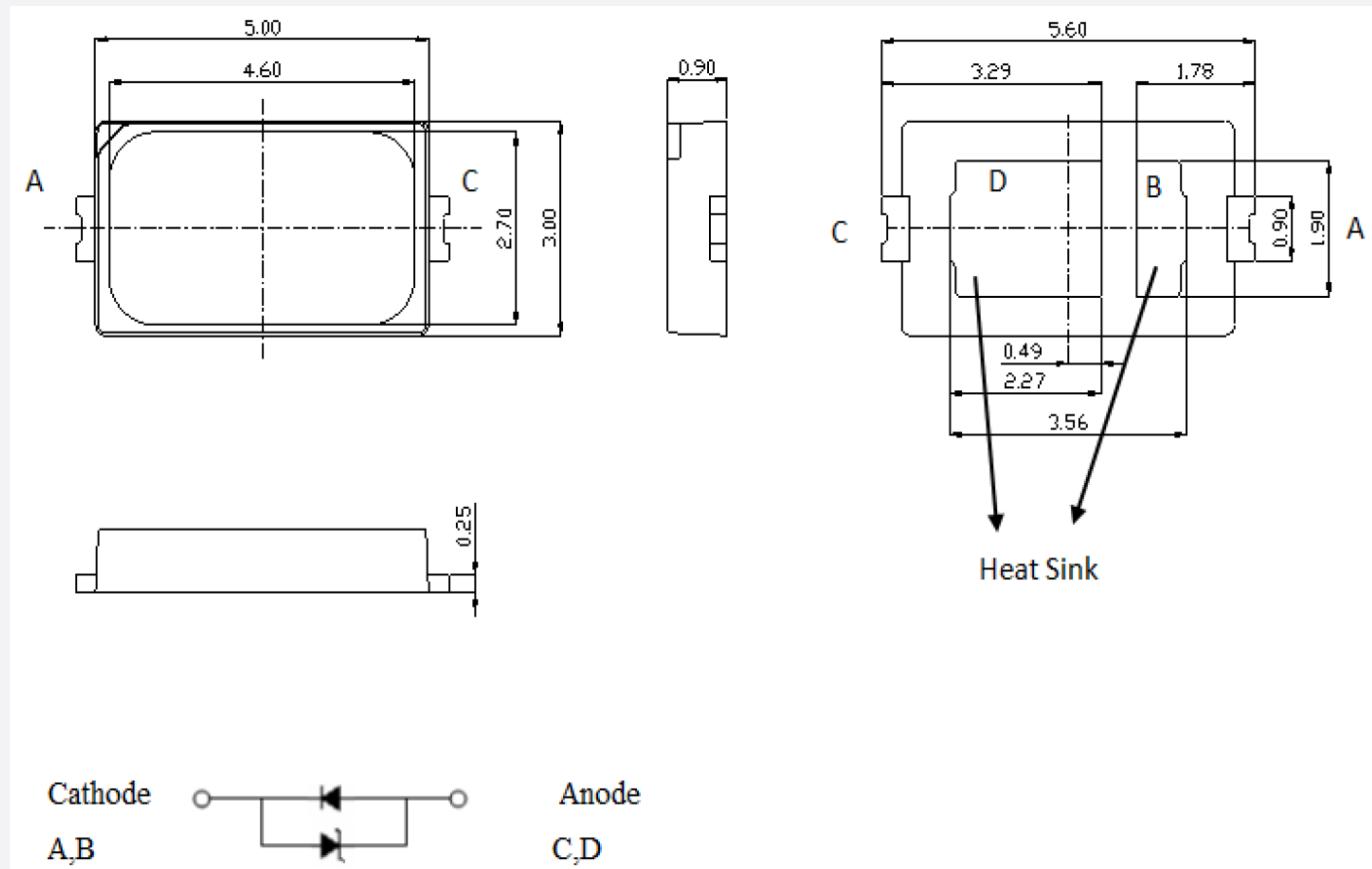


T_j : Temperature of Junction

T_s : Temperature of Solder Pad

R_{thJ-S} : Thermal Resistance from Junction to Solder Pad

5. Mechanical Dimension



Notes:

Unit: mm, Tolerance: ± 0.1 mm Approximate Weight : 36mg

a) Pick and Place

Do not place pressure on the resin lens (hatch area)

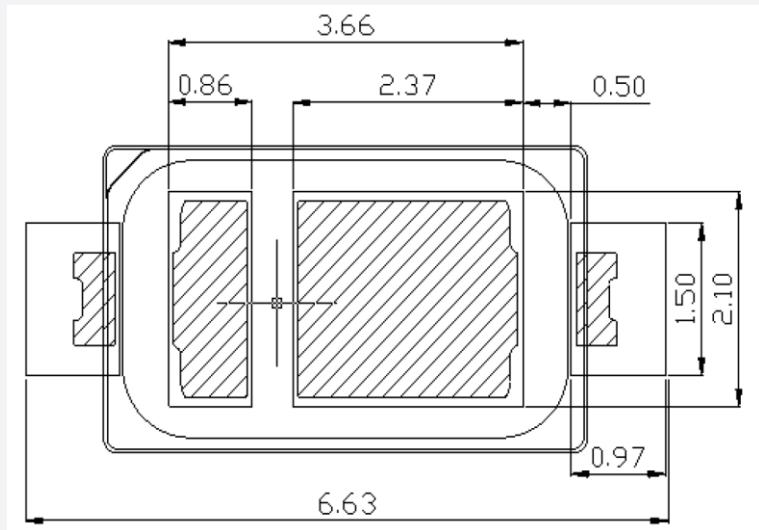
The maximum compressing force is 15N in the polymer

b) Material Information

Description	Material
Lead Frame	PLCC
LED Die	Epi-up
Wire	Au
Resin Mold	Silicone

6. Soldering Conditions

a) Pad Configuration & Solder Pad Layout

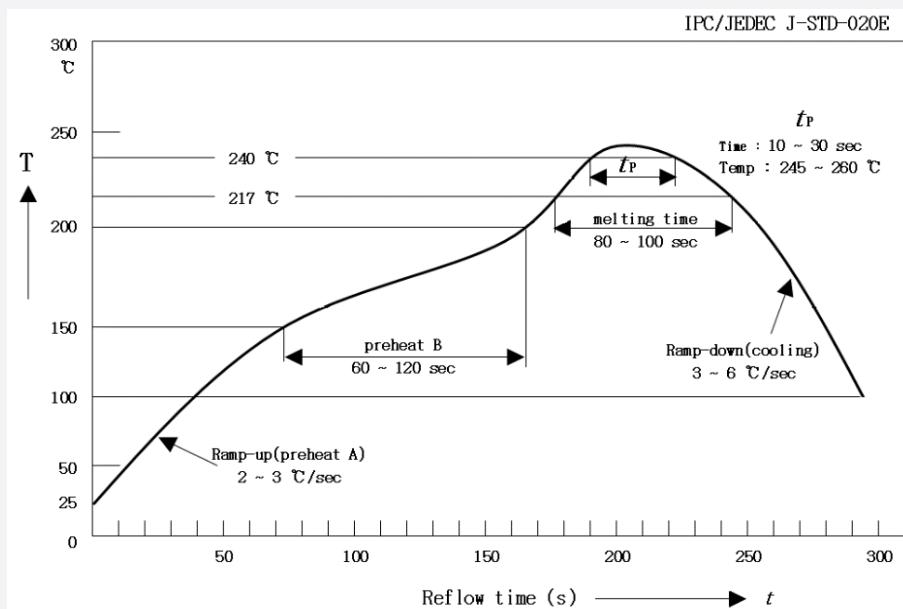


Notes:

Unit: mm, Tolerance: $\pm 0.1\text{mm}$

b) Reflow Conditions (Pb free)

Reflow frequency: 2 times max.



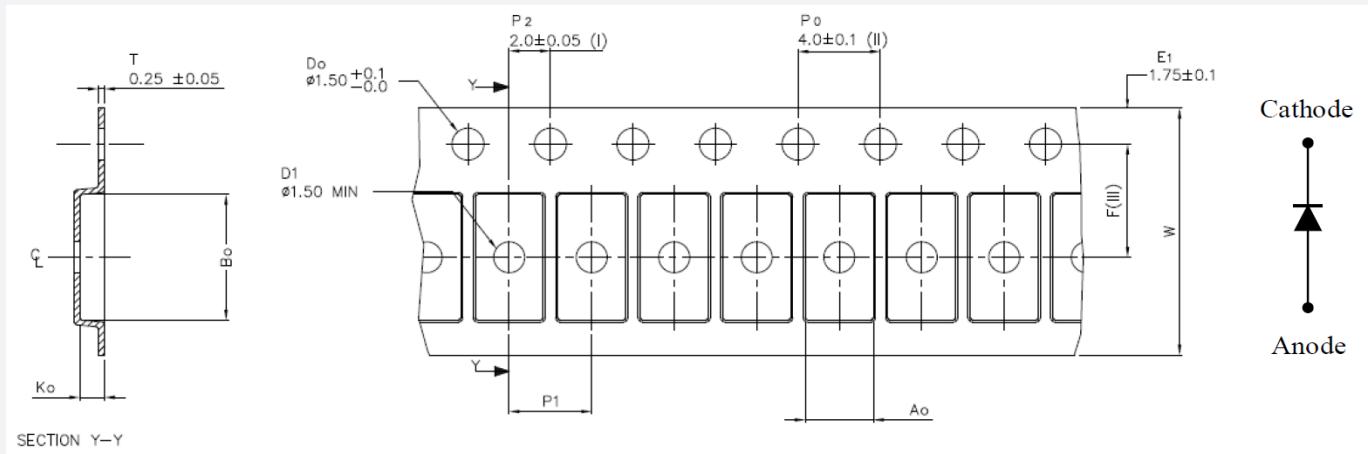
※ All temperature refer to the pad of package.

c) Manual Soldering Conditions

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

7. Tape & Reel

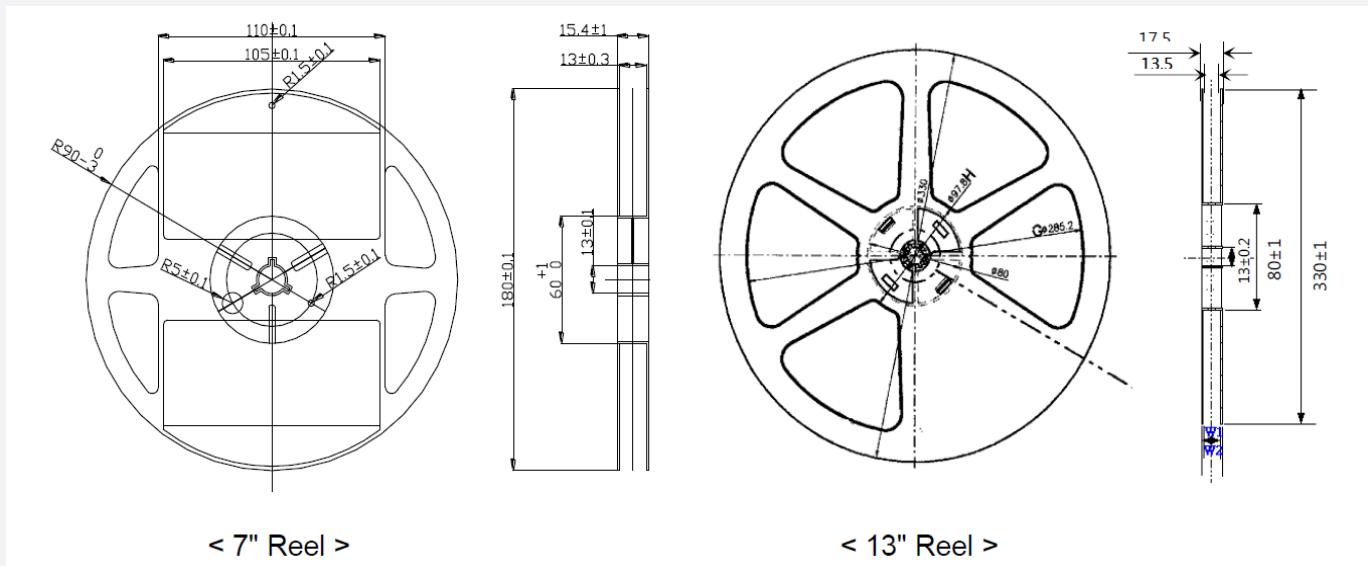
a) Taping Dimension



Notes:

Unit: mm, LED taping quantity: 1,000EA / 7" Reel
5,000EA or 10,000EA / 13" Reel

b) Reel Dimension



Notes:

Unit: mm, Tolerance: ±0.2mm

8. Label Structure

a) Product Labeling Information



N.B) Denoted rank is the only example.

b) Bin Code Structure

AB: Forward Voltage (V_F) Bin (refer to page. 5)

CD: Color (Cx, Cy) Bin (refer to page. 6~10)

EF: Luminous Flux (I_v) Bin (refer to page. 5)

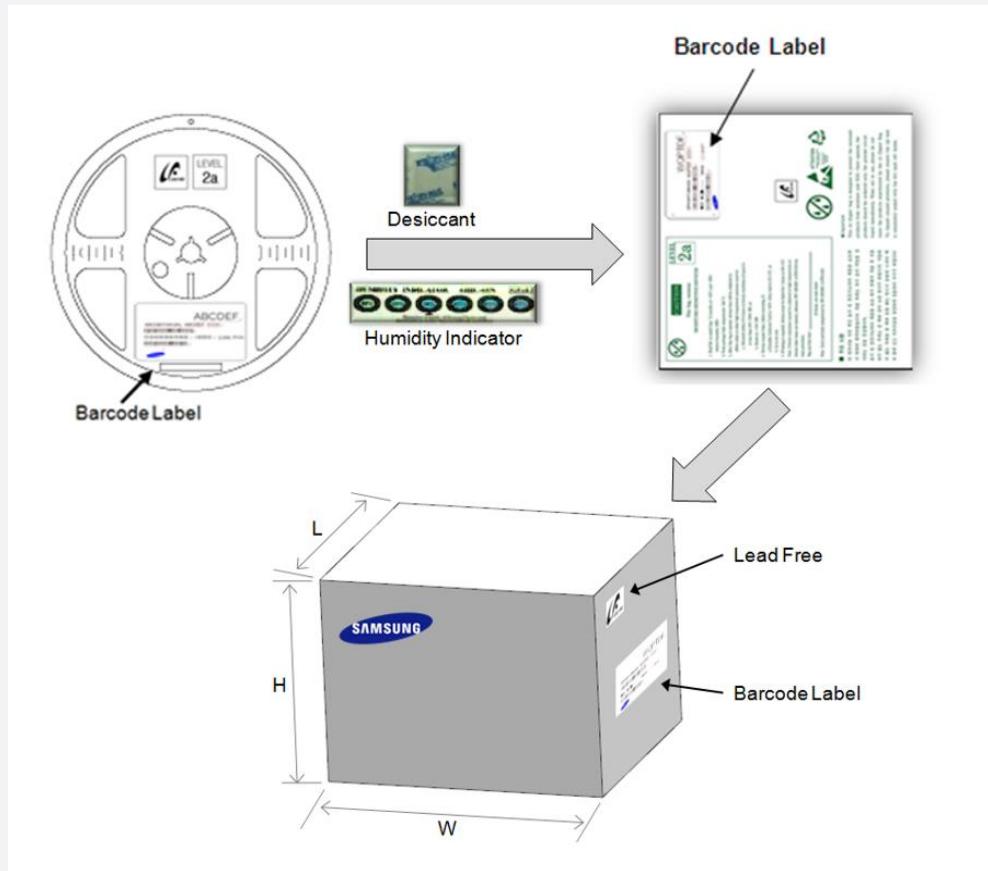
c) Lot Number Structure

The lot number is composed of the following characters:

No.	Information
1,2	Production Site SL : SAMSUNG LED, GL : GOSIN CHINA, EL/EM : KOREA
3	Product State A : Normality, B : Bulk, C : First Production, R : Reproduction, S : Sample
4	Year C:2018, D : 2019, E : 2020 ...
5	Month : 1 ~ 9, A, B
6	Day : 1 ~ 9, A, B ~ V
789	Product number : 1 ~ 999
abc	Reel Number : 1 ~ 999

9. Packing Structure

a) Packing Process



Dimension of Transportation Box in mm

Width	Length	Height
220	245	182

Notes:

Will be changed oval mark to letter mark



SAMSUNG

10. Handling and use precautions

- 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 Electronics, they should be packed by a sealed container with nitrogen gas injected.(Shelf life of sealed bags: 12 months, temp. ~40°C, ~90% RH)
- 5) After storage bag is open, 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.
 - b. Stored at <10% RH.
- 6) Repack unused products using anti-moisture packing, fold to close any openings and store in a dry place with <10% RH
- 7) Devices require baking before mounting, if humidity card reading is >60% at 23±5°C.
- 8) Devices must be baked for 1 day at 60±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.
- 10) VOCs (volatile organic compounds) may be occurred by adhesives, flux, hardener or organic additives which are used in luminaires (fixture) and LED silicone bags are permeable to it. It may lead a discoloration when LED expose to heat or light. This phenomenon can give a significant loss of light emitted (output) from the luminaires (fixtures). In order to prevent these problems, we recommend you to know the physical properties for the materials used in luminaires, it requires selecting carefully.
- 11) To avoid risk of sulfurization (or tarnishing), do not use or store LEDs near materials containing sulfur, fluorine, chlorine, bromine, iodine or other halogens or compounds that can potentially react with the LED's silver plated lead frame. Examples of these materials include: various rubbers, paper products, certain solder pastes, cleaning solutions, adhesives, etc. or may be present in certain environments in form of fertilizers, lubricants, etc. This reaction can result into the lead frame darkening when exposed to such compounds, resulting in degradation of intensity, change in forward voltage, chromaticity coordinate shift and it may go as far as becoming an open circuit in more extreme cases.

11. Company Information



US

Samsung Semiconductor, Inc.
11800 Amber park Drive #225 Alpharetta, GA 30004 USA
Tel : +1 678 892 7385

Europe

Samsung Semiconductor Europe GmbH,
Einsteinstrasse 174, 81677 Munich, Germany
Tel : +49 6196 66 3902

Japan

Samsung Japan Corporation
10F, Shinagawa Grand Central Tower 2-16-4, Kounan, Minato-ku, Tokyo
108-8240, Japan
Tel : +81 3 6369 6267

China(Shenzhen)

Samsung Electronics Co., Ltd.
25F/26F, SCC building A, No.88, Haide Yi Road, Nanshan District,
518026, Shenzhen China
Tel : +86 21 2325 3551

China(Shanghai)

Samsung Electronics Co., Ltd.
Building B, No 1065 Zhongshan RD(W), Changning District, Shanghai,
China
Tel : +86 21 2325 3504

India

Samsung Electronics
Suite #006 Ground Floor, Copia Corporate Suites, Jasola, New Delhi
110025, India, Delhi, IND
Tel : +91 9600003320

Copyright @1995-2020 All rights reserved

Samsung Electronics LED BUSINESS

1, Samsung-ro Giheung-gu
Yongin-si, Gyeonggi-do 17113 Korea

<http://www.samsung.com/led>

Sales Contact

leedw007@samsung.com
cpim@samsung.com



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.

Copyright © 2020 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.

1, Samsung-ro

Giheung-gu

Yongin-si, Gyeonggi-do, 446-711

KOREA

www.samsung.com/led

SAMSUNG