S P E C I F I C A T I O N S

Middle Power LED Series
5630
LM561B Plus
CRI90

LM561C is highest performance and lm/W for fluorescent replacement



Features & Benefits

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

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Table of Contents

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

1. 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	P	7	W	A	R	0	S	0

Digit	PKG Information	Code	Specification		
1 2 3	Dongbu Package Middle Power	SPM	Mddle power		
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,		
10	Sorting Current (mA)	M	65 mA		
11	Chromaticity Coordinates	P	ANSI Standard		
12	CRI	7	Min. 90		
13 14	Forward Voltage (V)	WA	2.7~3.2 (2,500 pcs/Reel)		
15 16	CCT (K)	W☆	2700	Bin Code	W1, W2, W3, W4, W5, W6, W7, W8, W9, WA, WB, WC, WD, WE, WF, WG
		V☆	3000		V1, V2, V3, V4, V5, V6, V7, V8, V9, VA, VB, VC, VD, VE, VF, VG
		U☆	3500		U1, U2, U3, U4, U5, U6, U7, U8, U9, UA, UB, UC, UD, UE, UF, UG
		T☆	4000		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
		Q☆	5700		Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q9, QA, QB, QC, QD, QE, QF, QG
		P☆	6500		P1, P2, P3, P4, P5, P6, P7, P8, P9, PA, PB, PC, PD, PE, PF, PG
			☆ : "0" (Whole bin), "M" (Quarter bin), “K” (K Kitting) or “S”(S Kitting)		
17 18	Luminous Flux	S0	Bin Code		S1, S2, S3

2. Characteristrics

(1) Absolute Maximum Ratings

Item	Symbol	Rating	Unit	Condition
Ambient / Operating Temperature	T_a	-40 ~ +85	ºC	-
Storage Temperature	T_{stg}	-40 ~ +120	℃	-
LED Junction Temperature	T_j	110	℃	-
Forward Current	I_F	180	mA	-
Peak Pulsed Forward Current	I_{Fp}	300	mA	Duty 1/10, pulse width 10ms
Assembly Process Temperature	-	260<10	℃/S	-
ESD (HBM)	-	±5	KV	-

2. Characteristics

(2) Electro-optical Characteristics (I_F = 65 mA, T_s = 25 ºC)

Item	Unit	CRI(Ra) Min.	Norminal CCT(K)	Rank	Bin	Min.	Typ.	Max.
Forward Voltage (V_F)	V			WA	AZ	2.7	-	2.8
					A1	2.8	-	2.9
					A2	2.9	-	3.0
					A3	3.0	-	3.1
					A4	3.1	-	3.2
Luminous Flux (Φ_v)	lm	80	2700		S1	24.0		26.0
					S2	26.0		28.0
					S3	28.0		30.0
			3000		S1	24.5		26.5
					S2	26.5		28.5
					S3	28.5		30.5
			3500		S1	25.0		27.0
					S2	27.0		29.0
					S3	29.0		31.0
			4000		S1	26.0		28.0
					S2	28.0		30.0
					S3	30.0		32.0
			5000		S1	27.0		29.0
					S2	29.0		31.0
					S3	31.0		33.0
			5700		S1	26.5		28.5
					S2	28.5		30.5
					S3	30.5		32.5
			6500		S1	26.0		28.0
					S2	28.0		30.0
					S3	30.0		32.0
Reverse Voltage(@ 5 mA)	V					0.7	-	1.2
Color Rendering Index (R_a)	-					90	-	-
Special CRI (R9)	-					50	-	-
Thermal Resistance (junction to solder point)	ºC/W					-	15	-
Beam Angle	º					-	120	-

* Note :

Dongbu maintains measurement tolerance of: forward voltage = ±0.1V, luminous flux = ±5 %, CRI = ±3, R9 = ±6.5

(4) Luminous Flux Bins (I_F = 65 mA, T_s = 25ºC)

CRI (Ra) Min.	Nominal CCT (K)	Product Code	Flux Bin	Flux Range (Φ_v, lm)
90	2700	SPMWHT541MP7W◆W☆S0	S1	24.0 ~ 26.0
			S2	26.0 ~ 28.0
			S3	28.0 ~ 30.0
	3000	SPMWHT541MP7W◆V☆S0	S1	24.5 ~ 26.5
			S2	26.5 ~ 28.5
			S3	28.5 ~ 30.5
	3500	SPMWHT541MP7W◆U☆S0	S1	25.0 ~ 27.0
			S2	27.0 ~ 29.0
			S3	29.0 ~ 31.0
	4000	SPMWHT541MP7W◆T☆S0	S1	26.0 ~ 28.0
			S2	28.0 ~ 30.0
			S3	30.0 ~ 32.0
	5000	SPMWHT541MP7W◆R☆S0	S1	29.0 ~ 31.0
			S2	31.0 ~ 33.0
			S3	31.0 ~ 33.0
	5700	SPMWHT541MP7W◆Q☆S0	S1	26.5 ~ 28.5
			S2	28.5 ~ 30.5
			S3	30.5 ~ 32.5
	6500	SPMWHT541MP7W◆P☆S0	S1	26.0 ~ 28.0
			S2	28.0 ~ 30.0
			S3	30.0 ~ 32.0

* Note :

"◆" can be "A" (2,500pcs) of reel taping

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

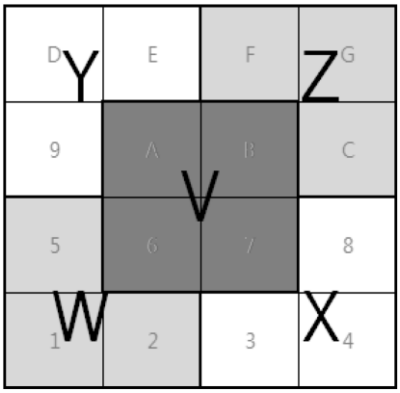
(6) Kitting rule

a) K Kitting bin Concept

1. Under agreement between customer and Dongbu LED, Dongbu can supply kitting bin (VF, Color, lm).
2. A forward voltage (VF) of kitting bin is combined by a pair of same VF rank such as (A1+A1), (A2+A2), (A3+A3), (A4+A4) or (AZ+AZ)
3. A Chromaticity Coordinates of kitting bin is mixed by kitting procedure.(below kitting simulation)
4. A luminous flux(lm) of kitting bin is combined by a pair of IV rank such as (S1+S1), (S2+S2) or (S3+S3).

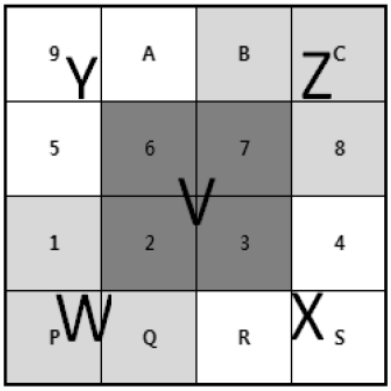
[Kitting example ; Warm white]

(2700K, 3000K, 3500K, 4000K)



[Kitting example ; Cool white]

(5000K, 5700K, 6500K)



[Binning Information]

	Warm white		Cool white	
	Bin #1	**Bin #2**	**Bin #1**	**Bin #2**
VF	AZ	AZ	AZ	AZ
	A1	A1	A1	A1
	A2	A2	A2	A2
	A3	A3	A3	A3
	A4	A4	A4	A4
CIE	W (1, 2, 5, 6)	Z (B, C, F, G)	W (1, 2, P, Q)	Z (7, 8, B, C)
	V (6, 7, A, B)	V (6, 7, A, B)	V (2, 3, 6, 7)	V (2, 3, 6, 7)
	X (3, 4, 7, 8)	Y (9, A, D, E)	X (3, 4, R, S)	Y (5, 6, 9, A)
IV	S1	S1	S1	S1
	S2	S2	S2	S2
	S3	S3	S3	S3

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

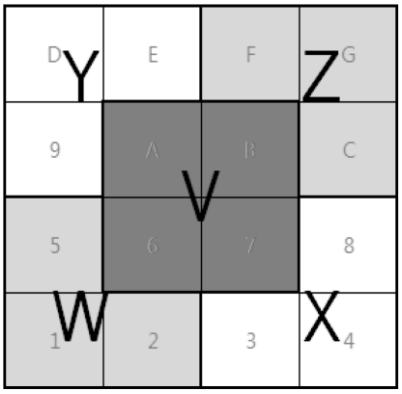
(6) Kitting rule

b) S Kitting bin Concept

1. Under agreement between customer and Dongbu LED, Dongbu can supply kitting bin (VF, Color, lm).
2. A forward voltage (VF) of kitting bin is combined by a pair of same VF rank such as (A1+A1), (A2+A2), (A3+A3), (A4+A4) or (AZ+AZ)
3. A Chromaticity Coordinates of kitting bin is mixed by kitting procedure.(below kitting simulation)
4. A luminous flux(lm) of kitting bin is combined by a pair of IV rank such as (S1+S1), (S2+S2) or (S3+S3).

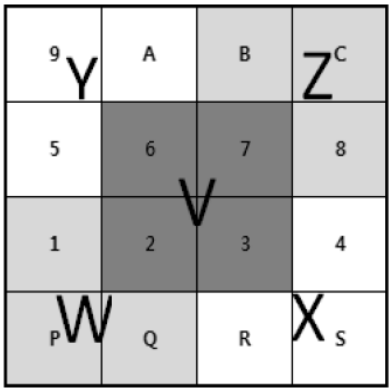
[Kitting example ; Warm white]

(2700K, 3000K, 3500K, 4000K)



[Kitting example ; Cool white]

(5000K, 5700K, 6500K)



[Binning Information]

	Warm white		Cool white	
	Bin #1	**Bin #2**	**Bin #1**	**Bin #2**
VF	AZ	AZ	AZ	AZ
	A1	A1	A1	A1
	A2	A2	A2	A2
	A3	A3	A3	A3
	A4	A4	A4	A4
CIE	W (1, 2, 5)	B	W (1, P, Q)	7
	X (3, 4, 8)	A	X (4, R, S)	6
	Y (9, D, E)	7	Y (5, 9, A)	3
	Z (C, F, G)	6	Z (8, B, C)	2
	6	6	2	2
	7	7	3	3
	A	A	6	6
	B	B	7	7
	V (6, 7, A, B)	V (6, 7, A, B)	V (2, 3, 6, 7)	V (2, 3, 6, 7)
IV	S1	S1	S1	S1
	S2	S2	S2	S2
	S3	S3	S3	S3

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

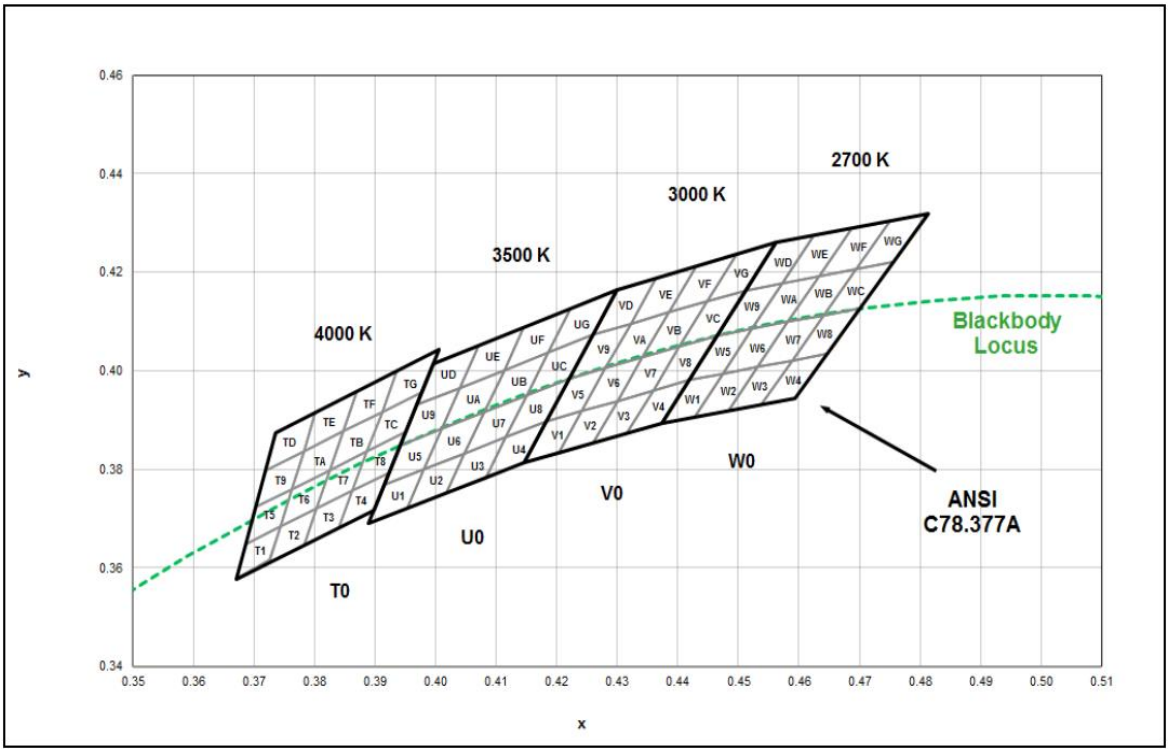
(7) Color Bins (I_F = 65 mA, T_s = 25 ºC)

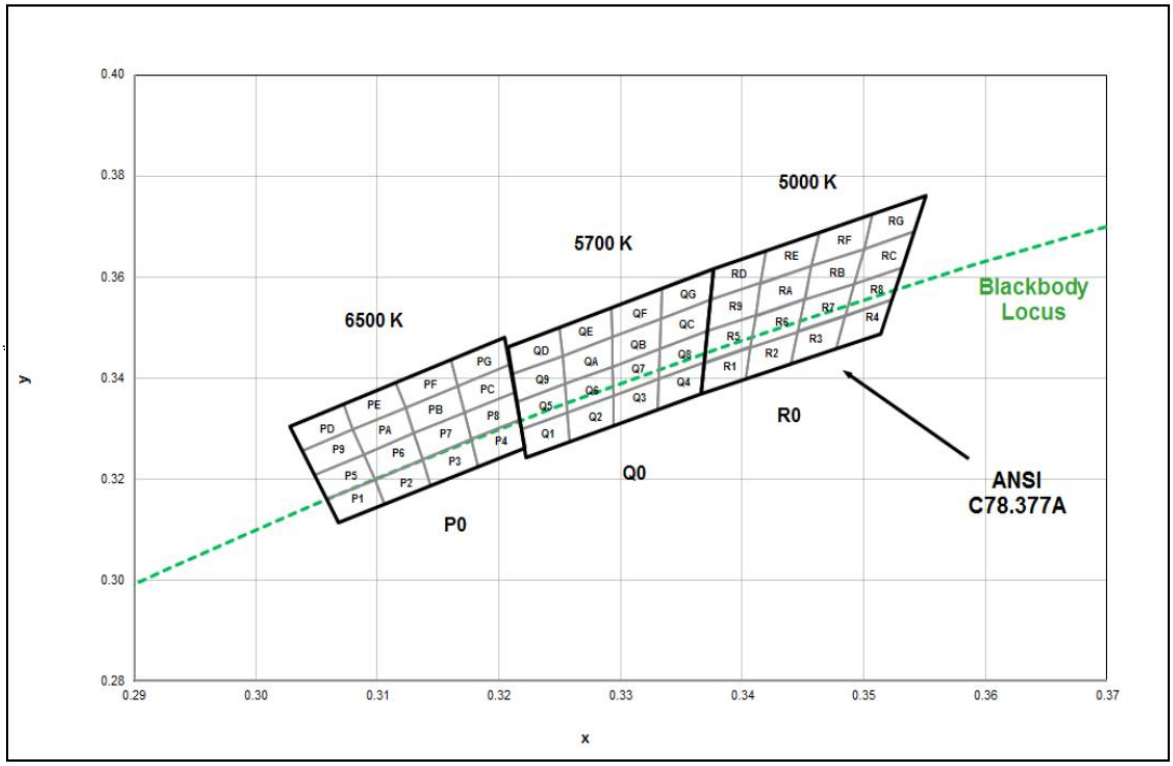
CRI (Ra) Min.	Norminal CCT (K)	Product Code	Code Rank	Chromaticity Bins
90	2700	SPMWHT541MP7WAW0S0	W0 (Whole bin)	W1,W2,W3,W4,W5,W6,W7,W8,W9,WA,WB,WC,WD,WE,WF,WG
		SPMWHT541MP7WAWMS0	WM (Quarter bin)	W6, W7, WA, WB
		SPMWHT541MP7WAWSS0	WS (S Kitting)	W6, W7, WA, WB , WV, WW, WX, WY, WZ
		SPMWHT541MP7WAWKS0	WK (K Kitting)	WV, WW, WX, WY, WZ
	3000	SPMWHT541MP7WAV0S0	V0 (Whole bin)	V1,V2,V3,V4,V5,V6,V7,V8,V9,VA,VB,VC,VD,VE,VF,VG
		SPMWHT541MP7WAVMS0	VM (Quarter bin)	V6, V7, VA, VB
		SPMWHT541MP7WAVSS0	VS (S Kitting)	V6, V7, VA, VB , VV, VW, VX, VY, VZ
		SPMWHT541MP7WAVKS0	VK (K Kitting)	VV, VW, VX, VY, VZ
	3500	SPMWHT541MP7WAU0S0	U0 (Whole bin)	U1,U2,U3,U4,U5,U6,U7,U8,U9,UA,UB,UC,UD,UE,UF,UG
		SPMWHT541MP7WAUMS0	UM (Quarter bin)	U6, U7, UA, UB
		SPMWHT541MP7WAUSS0	US (S Kitting)	U6, U7, UA, UB , UU, UW, UX, UY, UZ
		SPMWHT541MP7WAUKS0	UK (K Kitting)	UV, UW, UX, UY, UZ
	4000	SPMWHT541MP7WAT0S0	T0 (Whole bin)	T1,T2,T3,T4,T5,T6,T7,T8,T9,TA,TB,TC,TD,TE,TF,TG
		SPMWHT541MP7WATMS0	TM (Quarter bin)	T6, T7, TA, TB
		SPMWHT541MP7WATSS0	TS (S Kitting)	T6, T7, TA, TB , TT, TW, TX, TY, TZ
		SPMWHT541MP7WATKS0	TK (K Kitting)	TV, TW, TX, TY, TZ
	5000	SPMWHT541MP7WAR0S0	R0 (Whole bin)	R1,R2,R3,R4,R5,R6,R7,R8,R9,RA,RB,RC,RD,RE,RF,RG
		SPMWHT541MP7WARMS0	RM (Quarter bin)	R6, R7, RA, RB
		SPMWHT541MP7WARSS0	RS (S Kitting)	R6, R7, RA, RB , RR, RW, RX, RY, RZ
		SPMWHT541MP7WARKS0	RK (K Kitting)	RV, RW, RX, RY, RZ
	5700	SPMWHT541MP7WAQ0S0	Q0 (Whole bin)	Q1,Q2,Q3,Q4,Q5,Q6,Q7,Q8,Q9,QA,QB,QC,QD,QE,QF,QG
		SPMWHT541MP7WAQMS0	QM (Quarter bin)	Q6, Q7, QA, QB
		SPMWHT541MP7WAQSS0	QS (S Kitting)	Q6, Q7, QA, QB , QQ, QW, QX, QY, QZ
		SPMWHT541MP7WAQKS0	QK (K Kitting)	QV, QW, QX, QY, QZ
	6500	SPMWHT541MP7WAP0S0	P0 (Whole bin)	P1,P2,P3,P4,P5,P6,P7,P8,P9,PA,PB,PC,PD,PE,PF,PG
		SPMWHT541MP7WAPMS0	PM (Quarter bin)	P6, P7, PA, PB
		SPMWHT541MP7WAPSS0	PS (S Kitting)	P6, P7, PA, PB , PP, PW, PX, PY, PZ
		SPMWHT541MP7WAPKS0	PK (K Kitting)	PV, PW, PX, PY, PZ

(8) Voltage Bins (I_F = 65 mA, T_s = 25 ºC)

CRI (R_a) Min.	Nominal CCT (K)	Product Code	Voltage Rank	Voltage Bin	Voltage Range (V)
90	-	-	WA	AZ	2.7 ~ 2.8
				A1	2.8 ~ 2.9
				A2	2.9 ~ 3.0
				A3	3.0 ~ 3.1
				A4	3.1 ~ 3.2

(8) Chromaticity Region & Coordinates (I_F = 65 mA, T_s = 25 ºC)





(9) Chromaticity Region & Coordinates (I_F = 65 mA, T_s = 25 ºC)

Region	CIE x	CIE y	Region	CIE x	CIE y	Region	CIE x	CIE y	Region	CIE x	CIE y
W Rank (2700K)						V Rank (3000K)					
W1	0.4373	0.3893	W9	0.4465	0.4071	V1	0.4147	0.3814	V9	0.4221	0.3984
	0.4418	0.3981		0.4513	0.4164		0.4183	0.3898		0.4259	0.4073
	0.4475	0.3994		0.4573	0.4178		0.4242	0.3919		0.4322	0.4096
	0.4428	0.3906		0.4523	0.4085		0.4203	0.3833		0.4281	0.4006
W2	0.4428	0.3906	WA	0.4523	0.4085	V2	0.4203	0.3833	VA	0.4281	0.4006
	0.4475	0.3994		0.4573	0.4178		0.4242	0.3919		0.4322	0.4096
	0.4532	0.4008		0.4634	0.4193		0.4300	0.3939		0.4385	0.4119
	0.4483	0.3919		0.4582	0.4099		0.4259	0.3853		0.4342	0.4028
W3	0.4483	0.3919	WB	0.4582	0.4099	V3	0.4259	0.3853	VB	0.4342	0.4028
	0.4532	0.4008		0.4634	0.4193		0.4300	0.3939		0.4385	0.4119
	0.4589	0.4021		0.4695	0.4207		0.4359	0.3960		0.4449	0.4141
	0.4538	0.3931		0.4641	0.4112		0.4316	0.3873		0.4403	0.4049
W4	0.4538	0.3931	WC	0.4641	0.4112	V4	0.4316	0.3873	VC	0.4403	0.4049
	0.4589	0.4021		0.4695	0.4207		0.4359	0.3960		0.4449	0.4141
	0.4646	0.4034		0.4756	0.4221		0.4418	0.3981		0.4513	0.4164
	0.4593	0.3944		0.4700	0.4126		0.4373	0.3893		0.4465	0.4071
W5	0.4418	0.3981	WD	0.4513	0.4164	V5	0.4183	0.3898	VD	0.4259	0.4073
	0.4465	0.4071		0.4562	0.4260		0.4221	0.3984		0.4299	0.4165
	0.4523	0.4085		0.4624	0.4274		0.4281	0.4006		0.4364	0.4188
	0.4475	0.3994		0.4573	0.4178		0.4242	0.3919		0.4322	0.4096
W6	0.4475	0.3994	WE	0.4573	0.4178	V6	0.4242	0.3919	VE	0.4322	0.4096
	0.4523	0.4085		0.4624	0.4274		0.4281	0.4006		0.4364	0.4188
	0.4582	0.4099		0.4687	0.4289		0.4342	0.4028		0.4430	0.4212
	0.4532	0.4008		0.4634	0.4193		0.4300	0.3939		0.4385	0.4119
W7	0.4532	0.4008	WF	0.4634	0.4193	V7	0.4300	0.3939	VF	0.4385	0.4119
	0.4582	0.4099		0.4687	0.4289		0.4342	0.4028		0.4430	0.4212
	0.4641	0.4112		0.4750	0.4304		0.4403	0.4049		0.4496	0.4236
	0.4589	0.4021		0.4695	0.4207		0.4359	0.3960		0.4449	0.4141
W8	0.4589	0.4021	WG	0.4695	0.4207	V8	0.4359	0.3960	VG	0.4449	0.4141
	0.4641	0.4112		0.4750	0.4304		0.4403	0.4049		0.4496	0.4236
	0.4700	0.4126		0.4813	0.4319		0.4465	0.4071		0.4562	0.4260
	0.4646	0.4034		0.4756	0.4221		0.4418	0.3981		0.4513	0.4164

(9) Chromaticity Region & Coordinates

Region	CIE x	CIE y	Region	CIE x	CIE y	Region	CIE x	CIE y	Region	CIE x	CIE y
U Rank (3500K)						T Rank (4000K)					
U1	0.3889	0.3690	U9	0.3941	0.3848	T1	0.3670	0.3578	T9	0.3702	0.3722
	0.3915	0.3768		0.3968	0.3930		0.3726	0.3612		0.3763	0.3760
	0.3981	0.3800		0.4040	0.3966		0.3744	0.3685		0.3782	0.3837
	0.3953	0.3720		0.4010	0.3882		0.3686	0.3649		0.3719	0.3797
U2	0.3953	0.3720	UA	0.4010	0.3882	T2	0.3726	0.3612	TA	0.3763	0.3760
	0.3981	0.3800		0.4040	0.3966		0.3783	0.3646		0.3825	0.3798
	0.4048	0.3832		0.4113	0.4001		0.3804	0.3721		0.3847	0.3877
	0.4017	0.3751		0.4080	0.3916		0.3744	0.3685		0.3782	0.3837
U3	0.4017	0.3751	UB	0.4080	0.3916	T3	0.3783	0.3646	TB	0.3825	0.3798
	0.4048	0.3832		0.4113	0.4001		0.3840	0.3681		0.3887	0.3836
	0.4116	0.3865		0.4186	0.4037		0.3863	0.3758		0.3912	0.3917
	0.4082	0.3782		0.4150	0.3950		0.3804	0.3721		0.3847	0.3877
U4	0.4082	0.3782	UC	0.4150	0.3950	T4	0.3840	0.3681	TC	0.3887	0.3837
	0.4116	0.3865		0.4186	0.4037		0.3898	0.3716		0.3950	0.3875
	0.4183	0.3898		0.4259	0.4073		0.3924	0.3794		0.3978	0.3958
	0.4147	0.3814		0.4221	0.3984		0.3863	0.3758		0.3912	0.3917
U5	0.3915	0.3768	UD	0.3968	0.3930	T5	0.3686	0.3649	TD	0.3719	0.3797
	0.3941	0.3848		0.3996	0.4015		0.3744	0.3685		0.3782	0.3837
	0.4010	0.3882		0.4071	0.4052		0.3763	0.3760		0.3802	0.3916
	0.3981	0.3800		0.4040	0.3966		0.3702	0.3722		0.3736	0.3874
U6	0.3981	0.3800	UE	0.4040	0.3966	T6	0.3744	0.3685	TE	0.3782	0.3837
	0.4010	0.3882		0.4071	0.4052		0.3804	0.3721		0.3847	0.3877
	0.4080	0.3916		0.4146	0.4089		0.3825	0.3798		0.3869	0.3958
	0.4048	0.3832		0.4113	0.4001		0.3763	0.3760		0.3802	0.3916
U7	0.4048	0.3832	UF	0.4113	0.4001	T7	0.3804	0.3721	TF	0.3847	0.3877
	0.4080	0.3916		0.4146	0.4089		0.3863	0.3758		0.3912	0.3917
	0.4150	0.3950		0.4222	0.4127		0.3887	0.3836		0.3937	0.4001
	0.4116	0.3865		0.4186	0.4037		0.3825	0.3798		0.3869	0.3958
U8	0.4116	0.3865	UG	0.4186	0.4037	T8	0.3863	0.3758	TG	0.3912	0.3917
	0.4150	0.3950		0.4222	0.4127		0.3924	0.3794		0.3978	0.3958
	0.4221	0.3984		0.4299	0.4165		0.3950	0.3875		0.4006	0.4044
	0.4183	0.3898		0.4259	0.4073		0.3887	0.3836		0.3937	0.4001

(9) Chromaticity Region & Coordinates

Region	CIE x	CIE y	Region	CIE x	CIE y	Region	CIE x	CIE y	Region	CIE x	CIE y
R Rank (5000K)						Q Rank (5700K)					
R1	0.3366	0.3369	R9	0.3374	0.3554	Q1	0.3218	0.3298	Q9	0.3211	0.3407
	0.3369	0.3431		0.3371	0.3493		0.3222	0.3243		0.3215	0.3353
	0.3407	0.3460		0.3411	0.3522		0.3258	0.3275		0.3254	0.3388
	0.3403	0.3398		0.3415	0.3587		0.3256	0.3331		0.3252	0.3444
R2	0.3403	0.3398	RA	0.3415	0.3587	Q2	0.3256	0.3331	QA	0.3252	0.3444
	0.3407	0.3460		0.3411	0.3522		0.3258	0.3275		0.3254	0.3388
	0.3446	0.3491		0.3451	0.3554		0.3294	0.3306		0.3293	0.3423
	0.3440	0.3427		0.3457	0.3621		0.3294	0.3364		0.3293	0.3481
R3	0.3446	0.3491	RB	0.3451	0.3554	Q3	0.3294	0.3364	QB	0.3293	0.3481
	0.3440	0.3427		0.3457	0.3621		0.3294	0.3306		0.3293	0.3423
	0.3477	0.3458		0.3500	0.3655		0.3330	0.3338		0.3332	0.3458
	0.3485	0.3522		0.3492	0.3587		0.3331	0.3398		0.3333	0.3518
R4	0.3485	0.3522	RC	0.3492	0.3587	Q4	0.3331	0.3398	QC	0.3333	0.3518
	0.3477	0.3458		0.3500	0.3655		0.3330	0.3338		0.3332	0.3458
	0.3514	0.3487		0.3542	0.3690		0.3366	0.3369		0.3371	0.3493
	0.3524	0.3554		0.3533	0.3620		0.3369	0.3431		0.3374	0.3554
R5	0.3371	0.3493	RD	0.3376	0.3616	Q5	0.3215	0.3353	QD	0.3207	0.3462
	0.3369	0.3431		0.3374	0.3554		0.3218	0.3298		0.3211	0.3407
	0.3407	0.3460		0.3415	0.3587		0.3256	0.3331		0.3252	0.3444
	0.3411	0.3522		0.3420	0.3652		0.3254	0.3388		0.3250	0.3501
R6	0.3407	0.3460	RE	0.3415	0.3587	Q6	0.3254	0.3388	QE	0.3250	0.3501
	0.3411	0.3522		0.3420	0.3652		0.3256	0.3331		0.3252	0.3444
	0.3451	0.3554		0.3463	0.3687		0.3294	0.3364		0.3293	0.3481
	0.3446	0.3491		0.3457	0.3621		0.3293	0.3423		0.3292	0.3539
R7	0.3446	0.3491	RF	0.3457	0.3621	Q7	0.3293	0.3423	QF	0.3292	0.3539
	0.3451	0.3554		0.3463	0.3687		0.3294	0.3364		0.3293	0.3481
	0.3492	0.3587		0.3507	0.3724		0.3331	0.3398		0.3333	0.3518
	0.3485	0.3522		0.3500	0.3655		0.3332	0.3458		0.3334	0.3578
R8	0.3485	0.3522	RG	0.3500	0.3655	Q8	0.3332	0.3458	QG	0.3334	0.3578
	0.3492	0.3587		0.3507	0.3724		0.3331	0.3398		0.3333	0.3518
	0.3533	0.3620		0.3551	0.3760		0.3369	0.3431		0.3374	0.3554
	0.3524	0.3554		0.3542	0.3690		0.3371	0.3493		0.3376	0.3616

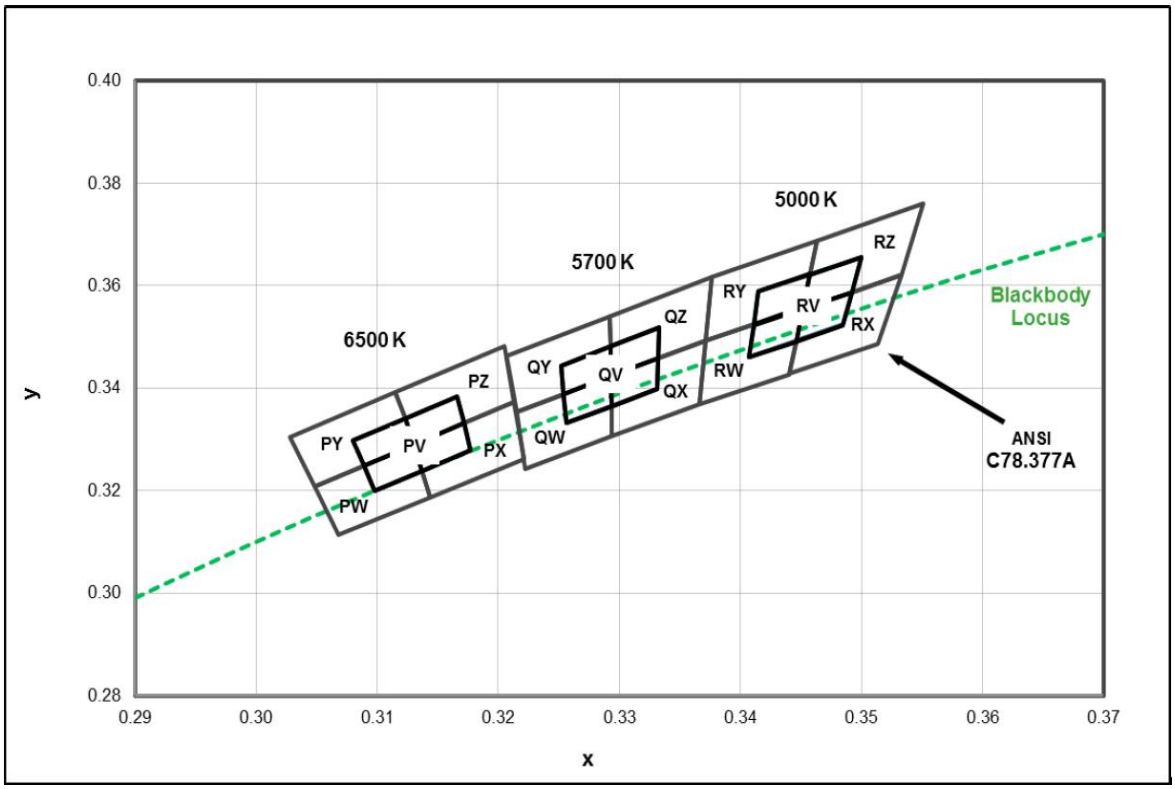
(9) Chromaticity Region & Coordinates

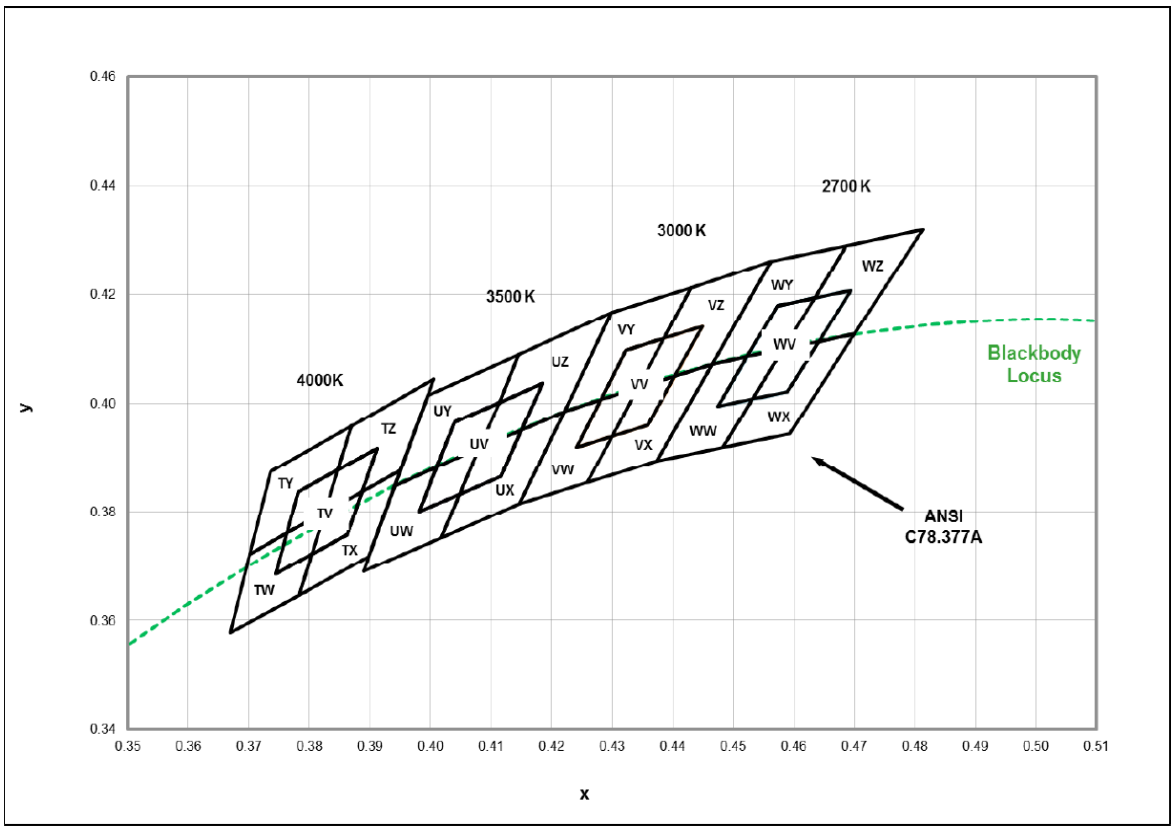
Region	CIE x	CIE y	Region	CIE x	CIE y
P Rank (6500K)					
P1	0.3068	0.3113	P9	0.3048	0.3207
	0.3106	0.3150		0.3089	0.3249
	0.3098	0.3199		0.3080	0.3298
	0.3058	0.3160		0.3038	0.3256
P2	0.3106	0.3150	PA	0.3089	0.3249
	0.3144	0.3186		0.3130	0.3290
	0.3137	0.3238		0.3123	0.3341
	0.3098	0.3199		0.3080	0.3298
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		0.3214	0.3373
	0.3218	0.3317		0.3210	0.3427
	0.3177	0.3278		0.3166	0.3384
P5	0.3058	0.3160	PD	0.3038	0.3256
	0.3098	0.3199		0.3080	0.3298
	0.3089	0.3249		0.3072	0.3348
	0.3048	0.3207		0.3028	0.3304
P6	0.3098	0.3199	PE	0.3080	0.3298
	0.3137	0.3238		0.3123	0.3341
	0.3130	0.3290		0.3115	0.3391
	0.3089	0.3249		0.3072	0.3348
P7	0.3137	0.3238	PF	0.3123	0.3341
	0.3177	0.3278		0.3166	0.3384
	0.3172	0.3332		0.3160	0.3436
	0.3130	0.3290		0.3115	0.3391
P8	0.3177	0.3278	PG	0.3166	0.3384
	0.3218	0.3317		0.3210	0.3427
	0.3214	0.3373		0.3206	0.3481
	0.3172	0.3332		0.3160	0.3436

* Note :

Dongbu maintains measurement tolerance of: Cx, Cy = ±0.005

(10) Kitting Chromaticity Region & Coordinates (I_F = 65 mA, T_s = 25 ºC)





(9) Kitting Chromaticity Region & Coordinates (I_F = 65 mA, T_s = 25 ºC)

Region	CIE x	CIE y	Region	CIE x	CIE y	Region	CIE x	CIE y	Region	CIE x	CIE y
W Rank (2700K)						V Rank (3000K)					
WV	0.4475	0.3994				VV	0.4242	0.3919			
	0.4589	0.4021					0.4359	0.3960			
	0.4695	0.4207					0.4449	0.4141			
	0.4573	0.4178					0.4322	0.4096			
WW	0.4373	0.3893	WY	0.4465	0.4071	VW	0.4147	0.3814	VY	0.4221	0.3984
	0.4483	0.3919		0.4582	0.4099		0.4259	0.3853		0.4342	0.4028
	0.4582	0.4099		0.4687	0.4289		0.4342	0.4028		0.4430	0.4212
	0.4465	0.4071		0.4562	0.4260		0.4221	0.3984		0.4299	0.4165
WX	0.4483	0.3919	WZ	0.4582	0.4099	VX	0.4259	0.3853	VZ	0.4342	0.4028
	0.4593	0.3944		0.4700	0.4126		0.4373	0.3893		0.4465	0.4071
	0.4700	0.4126		0.4813	0.4319		0.4465	0.4071		0.4562	0.4260
	0.4582	0.4099		0.4687	0.4289		0.4342	0.4028		0.4430	0.4212

Region	CIE x	CIE y	Region	CIE x	CIE y	Region	CIE x	CIE y	Region	CIE x	CIE y
U Rank (3500K)						T Rank (4000K)					
UV	0.3981	0.3800				TV	0.3744	0.3685			
	0.4116	0.3865					0.3863	0.3758			
	0.4186	0.4037					0.3912	0.3917			
	0.4040	0.3966					0.3782	0.3837			
UW	0.3889	0.3690	UY	0.3941	0.3848	TW	0.3670	0.3578	TY	0.3702	0.3722
	0.4017	0.3751		0.4080	0.3916		0.3783	0.3646		0.3825	0.3798
	0.4080	0.3916		0.4146	0.4089		0.3825	0.3798		0.3869	0.3958
	0.3941	0.3848		0.3996	0.4015		0.3702	0.3722		0.3736	0.3874
UX	0.4017	0.3751	UZ	0.4080	0.3916	TX	0.3783	0.3646	TZ	0.3825	0.3798
	0.4147	0.3814		0.4221	0.3984		0.3898	0.3716		0.3950	0.3875
	0.4221	0.3984		0.4299	0.4165		0.3950	0.3875		0.4006	0.4044
	0.4080	0.3916		0.4146	0.4089		0.3825	0.3798		0.3869	0.3958

* Note :

Dongbu maintains measurement tolerance of: Cx, Cy = ±0.005

(9) Kitting Chromaticity Region & Coordinates (I_F = 65 mA, T_a = 25 ºC)

Region	CIE x	CIE y	Region	CIE x	CIE y	Region	CIE x	CIE y	Region	CIE x	CIE y
R Rank (5000K)						Q Rank (5700K)					
RV	0.3407	0.3460				QV	0.3256	0.3331			
	0.3485	0.3524					0.3331	0.3398			
	0.3500	0.3655					0.3333	0.3518			
	0.3415	0.3588					0.3252	0.3444			
RR	0.3366	0.3369	RY	0.3371	0.3493	QW	0.3222	0.3243	QY	0.3215	0.3353
	0.3440	0.3427		0.3451	0.3554		0.3294	0.3306		0.3293	0.3423
	0.3451	0.3554		0.3463	0.3687		0.3293	0.3423		0.3292	0.3539
	0.3371	0.3493		0.3376	0.3616		0.3215	0.3353		0.3207	0.3462
RX	0.3440	0.3428	RZ	0.3457	0.3621	QX	0.3294	0.3306	QZ	0.3293	0.3423
	0.3514	0.3487		0.3500	0.3655		0.3366	0.3369		0.3371	0.3493
	0.3533	0.3620		0.3492	0.3587		0.3371	0.3493		0.3376	0.3616
	0.3451	0.3554		0.3533	0.3620		0.3293	0.3423		0.3292	0.3539

Region	CIE x	CIE y	Region	CIE x	CIE y
P Rank (6500K)					
PV	0.3098	0.3199			
	0.3177	0.3278			
	0.3166	0.3384			
	0.3080	0.3298			
PW	0.3068	0.3113	PY	0.3048	0.3207
	0.3144	0.3186		0.3130	0.3290
	0.3130	0.3290		0.3115	0.3391
	0.3048	0.3207		0.3028	0.3304
PX	0.3144	0.3186	PZ	0.3130	0.3290
	0.3221	0.3261		0.3213	0.3373
	0.3213	0.3373		0.3205	0.3481
	0.3130	0.3290		0.3115	0.3391

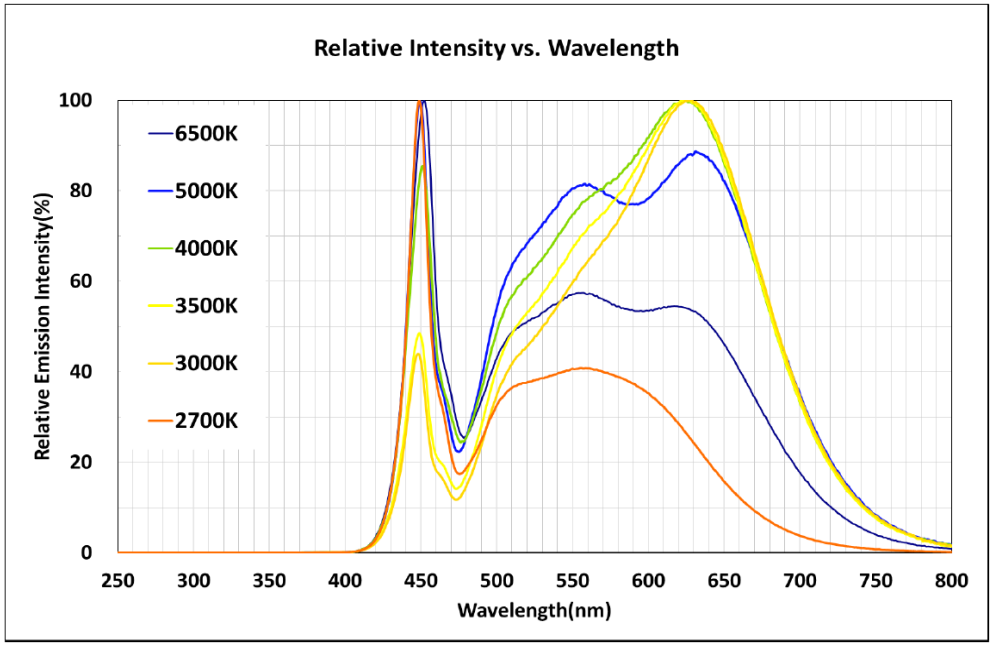
* Note :

Dongbu maintains measurement tolerance of: Cx, Cy = ±0.005

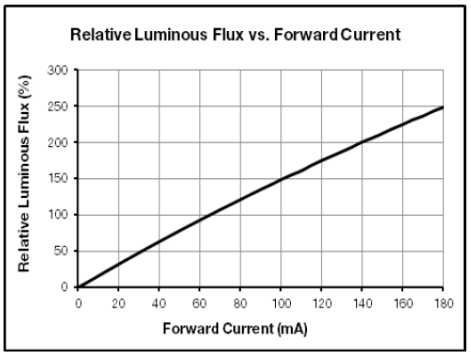
3. Typical Characteristics Graphs

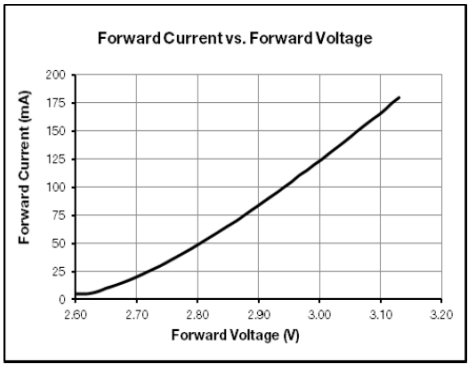
(1) Spectrum Distribution (I_F = 65 mA, T_s = 25 ºC)

CRI Ra 90+



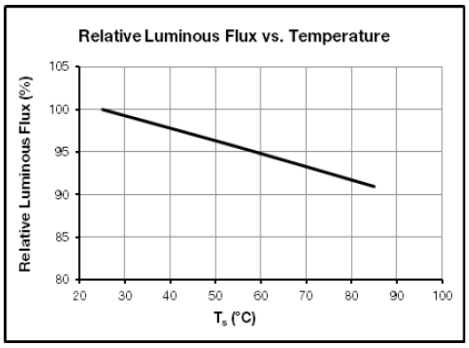
(2) Forward Current Characteristics (T_s=25 ºC)

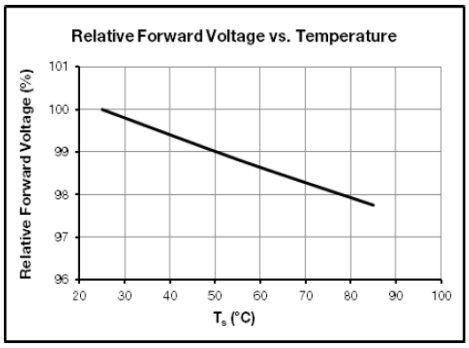




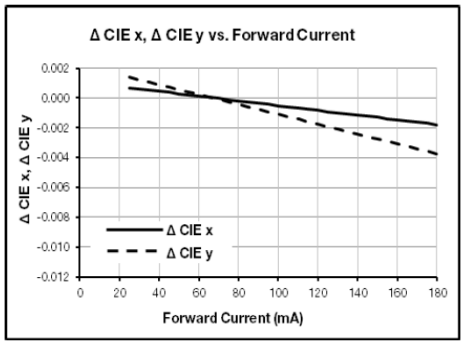
3. Typical Characteristics Graphs

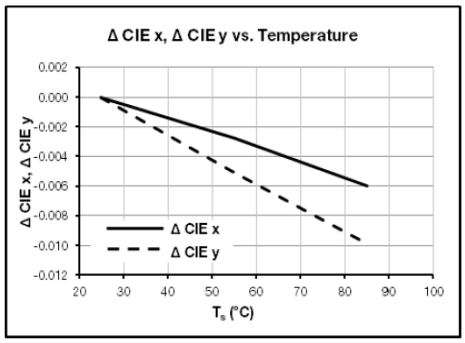
(3)Temperature Characteristics (I_F=65 mA)



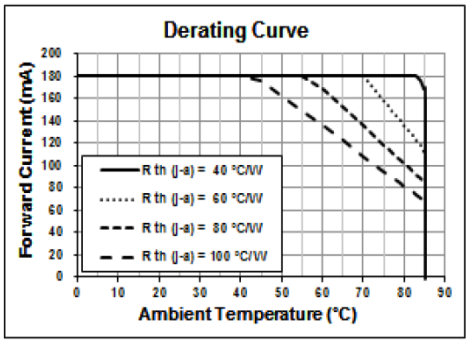


(4) Color Shift Characteristics (I_F=65 mA, T_S=25 ºC)

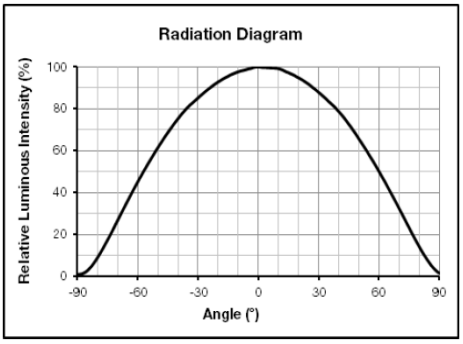




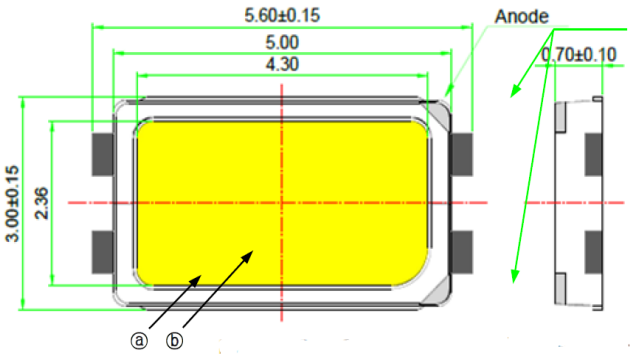
(5) Derating Curve



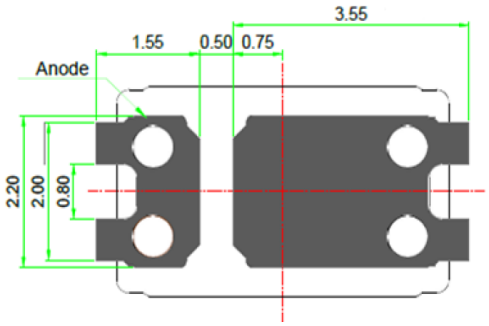
(6) Beam Angle Characteristics (I_F=65 mA, T_S=25 ºC)



4. Outline Drawing & Dimension



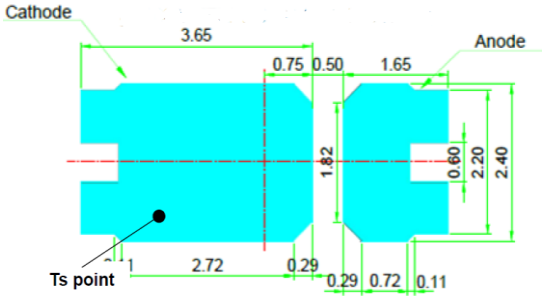
[Top View] [Side View]



[Bottom View]



[Recommended PCB Solder Pad]



- Measurement unit : mm
- Tolerance : ± 0.1mm
- Maximum compressing force is 15 N on the body ⓐ
- Do not place pressure on the encapsulation resin ⓑ

* Note :

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.

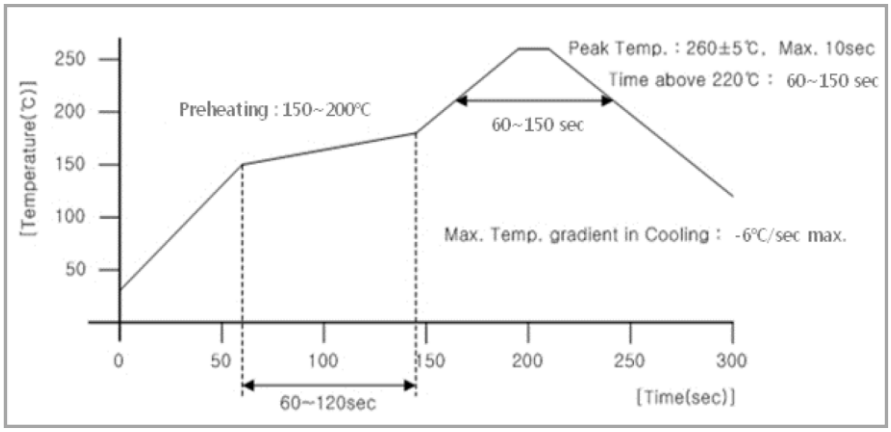
2) Re-soldering should not be done after the LEDs have been soldered. If re-soldering is unavoidable, LED`s characteristics should be carefully checked before and after such repair.

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. Soldering Conditions

(1) Reflow Conditions (Pb free)

Reflow frequency: 2 times max.



(2) Manual Soldering Conditions

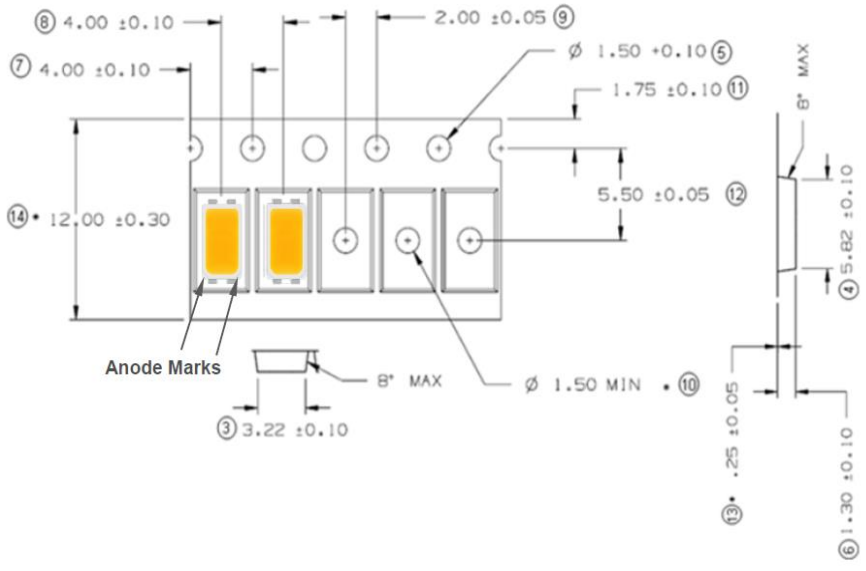
Not more than 5 seconds @ max. 300 ºC, under soldering iron.

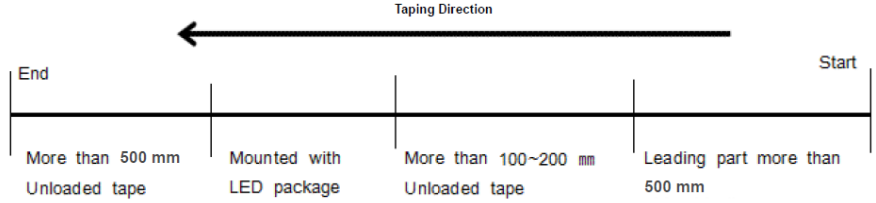
6. Tape & Reel

nm

(1) Taping Dimension

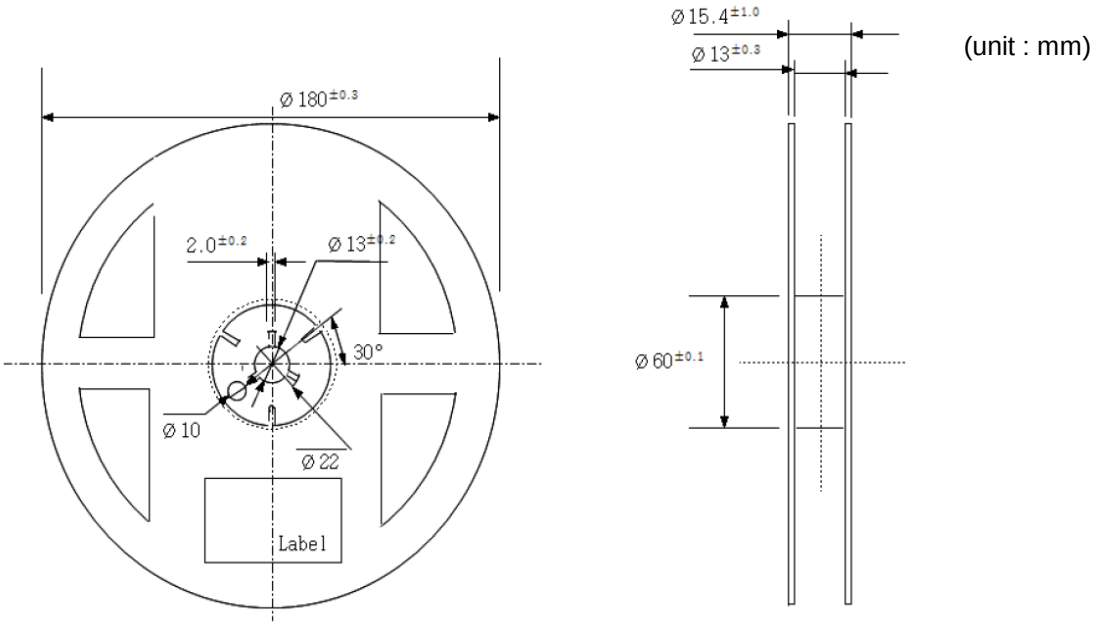
(unit : mm)





6. Tape & Reel

(2) Reel Dimension (Max 2,500 pcs)



(unit : mm)

*** Notes :**

1) Quantity: The quantity/reel is 2,500 pcs

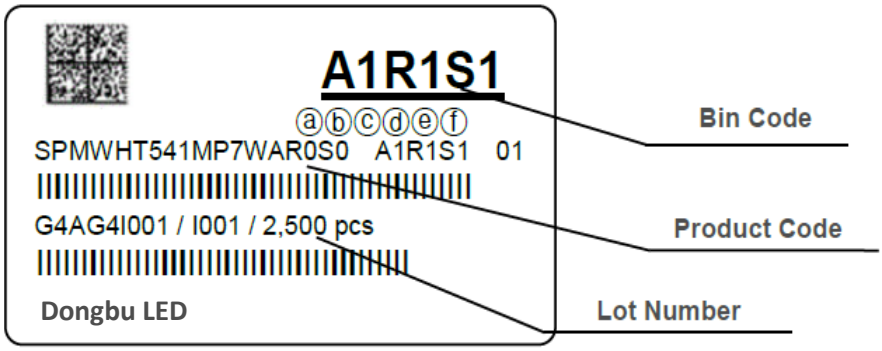
2) Cumulative Tolerance: Cumulative tolerance / 10 pitches is ±0.2 mm

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

7. Label Structure

(1) Label Structure



*** Note : Denoted bin code and product code above is only an example (see description on page 3)**

Bin Code

ⓐⓑ: Forward Voltage bin (refer to page 9)

ⓒⓓ: Chromaticity bin (refer to page 10)

ⓔⓕ: Luminous Flux bin (refer to page 5)

(2) Lot Number

The lot number is composed of the following characters:



①②③④⑤⑥⑦⑧⑨ / Ⅰⓐⓑⓒ / 2,500 pcs

①② : Production site (China, G3: Shenzhen, China, G4 : Guangzhou, China)

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

④ : Year (F: 2021, G: 2022, H:2023, I:2024...)

⑤ : Month (1~9, A, B, C)

⑥ : Day (1~9, A, B~V)

⑦⑧⑨ : Product serial number (001~999)

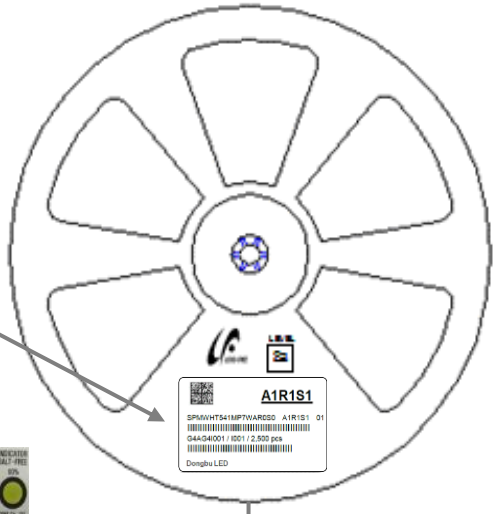
ⓐⓑⓒ : Reel number (001~999)

8. Packing Structure

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

Reel







Aluminum Vinyl Packing Bag

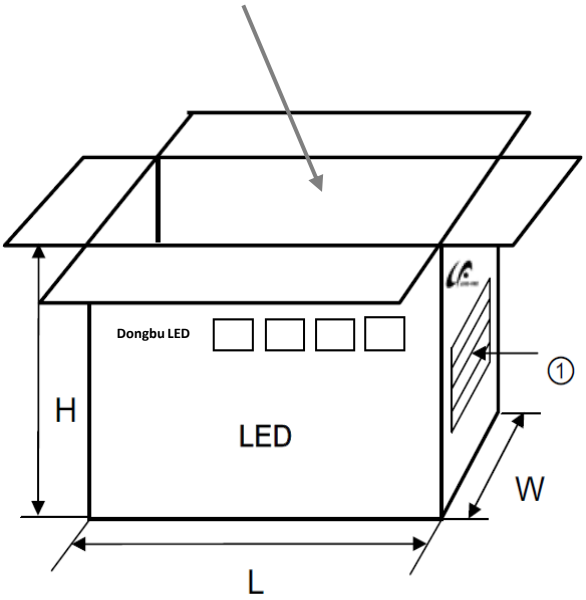




Outer Box

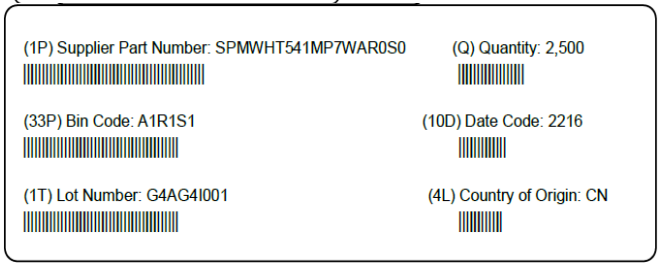
Material: Paper (SW3B(B))

Type	Size (mm)			Note
	L	W	H	
7 inch L	245 ± 5	220 ± 5	182 ± 5	Up to 10 reels
7 inch S	245 ± 5	220 ± 5	86 ± 5	Up to 5 reels



① Side Label





8. Packing Structure

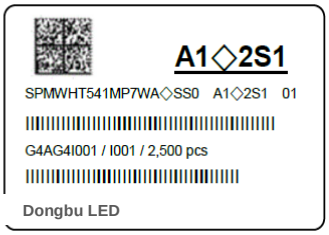
(3) Packing Process for kitting (The quantity of PKG on the Reel to be Max 2,500 pcs)

Reel

Kitting 'A'

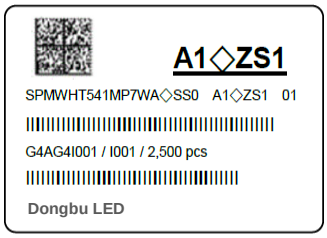


Kitting 'B'

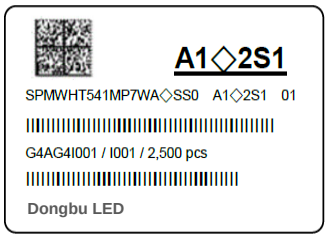


Aluminum Vinyl Packing Bag

Kitting 'A'

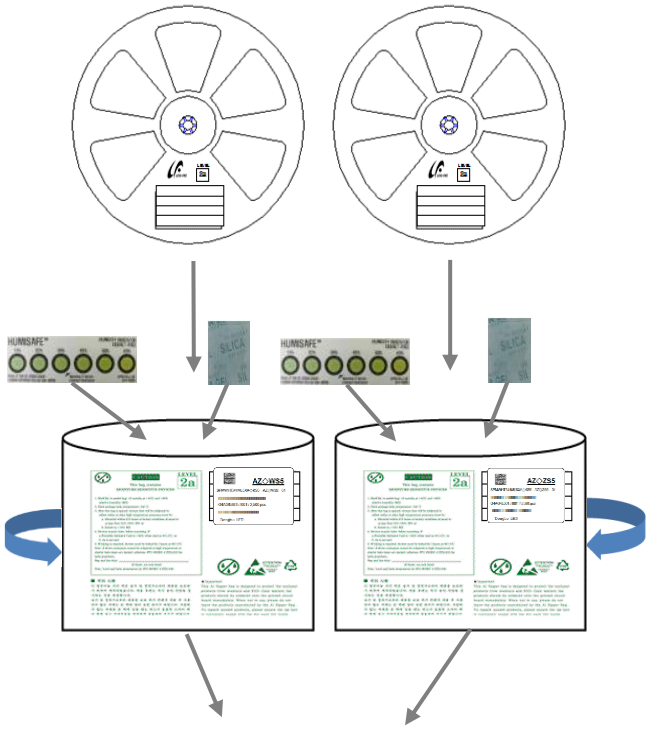


Kitting 'B'



Note: "◇" can be Nominal CCT code.

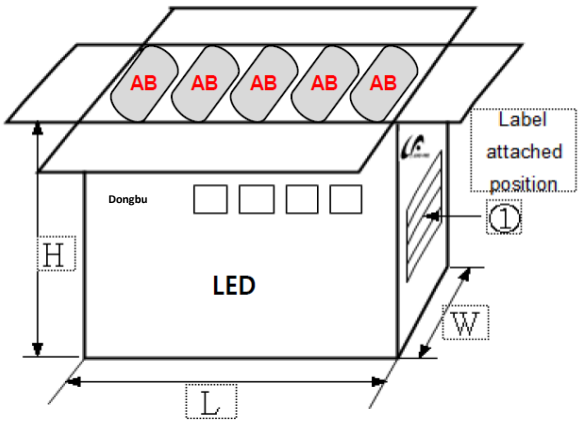
Kitting 'A' Kitting 'B'



Outer Box

Material : Paper (SW3B(B))

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



(1P) Supplier Part Number: SPMWHT541MP7WARSS0 (Q) Quantity: 12,500

(33P) Bin Code: A1RZS1 (10D) Date Code: 2216

(1T) Lot Number: G4AG4I001 (4L) Country of Origin: CN

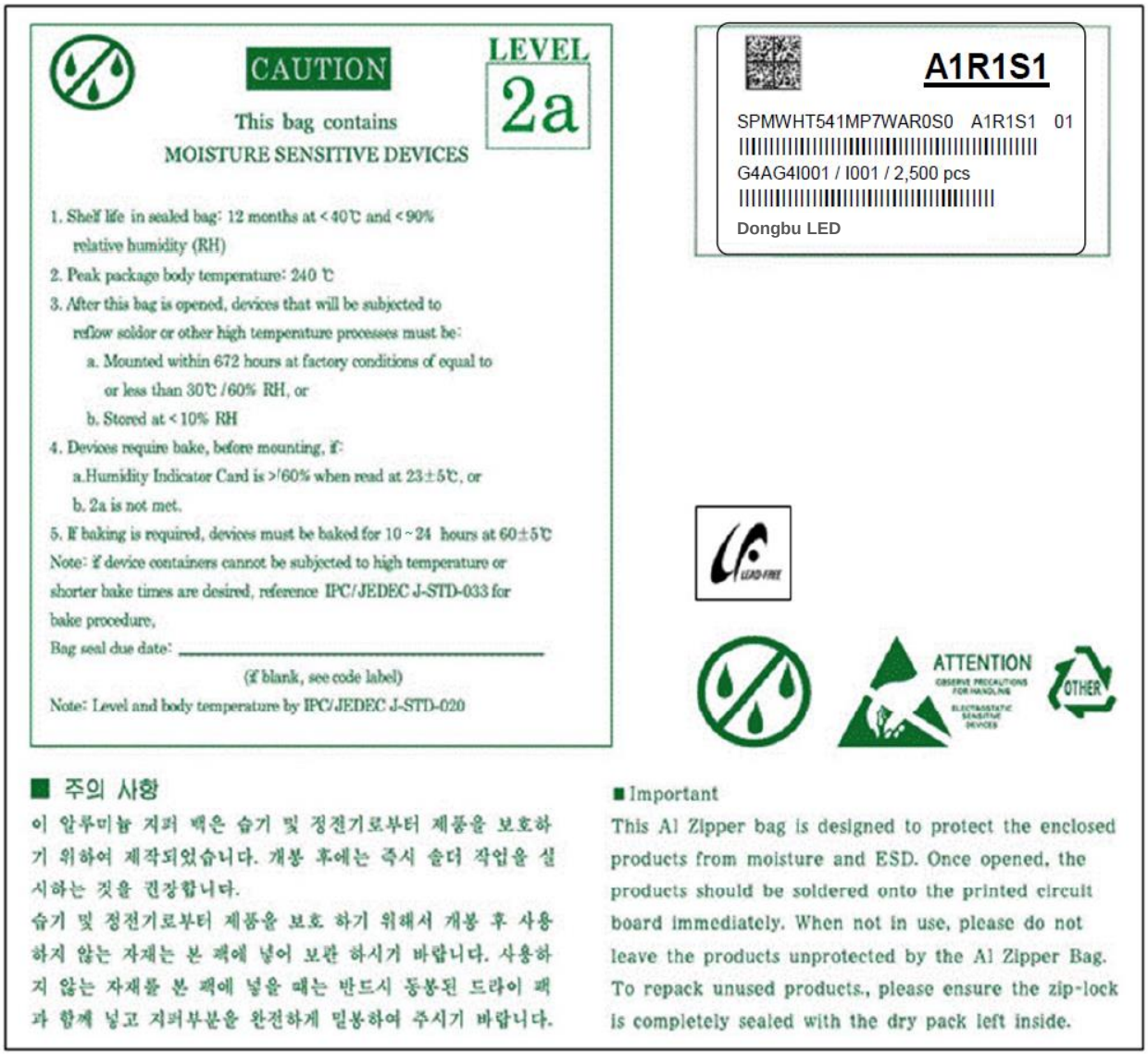
(1P) Supplier Part Number: SPMWHT541MP7WARSS0 (Q) Quantity: 12,500

(33P) Bin Code: A1R2S1 (10D) Date Code: 2216

(1T) Lot Number: G4AG4I001 (4L) Country of Origin: CN

8. Packing Structure

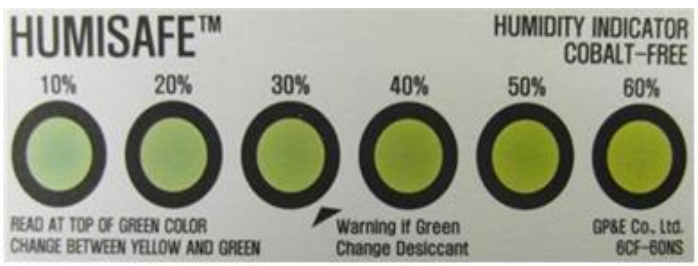
(5) Aluminum Vinyl Packing Bag



(6) Silica Gel & Humidity Indicator Card inside Aluminum Vinyl Bag

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





9. 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 ºC, 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 ºC / 60 % RH*$_{Note\ 1}$, or
b. Mounted within 24 hours (1 day) at an assembly line with a condition of more than 30 ºC / 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 Humity						Temperature
		40%	50%	60%	70%	80%	90%	
Body Thickness <2.1mm	Level2a	∞	∞	28	1	1	1	30℃
		∞	∞	∞	2	1	1	25℃
		∞	∞	∞	2	2	1	20℃

(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 ºC.

(9) Devices must be baked for 10~24 hours at 60 ± 5 ºC, 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.

9. Precautions in Handling & Use

(12) Risk of sulfurization (or tarnishing)

The LED from Dongbu 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.