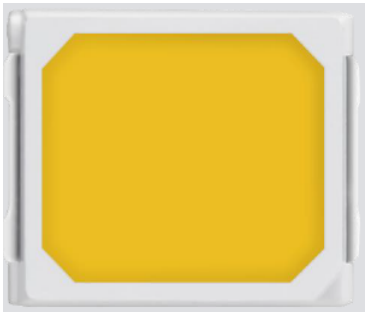
S P E C I F I C A T I O N S

Middle Power LED Series
2835 1.0W 9V Hot bin
LM283B+
SQ rank



Designed for better lm/$ (Lamps)

Features & Benefits

- **0.9W Class mid power LED**
- **Standard form factor for design flexibility (2.8 × 3.5 mm)**

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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	1	2	2	9	A	Q	5	S	G	R	0	S	Q

Digit	PKG Information	Code	Specification			
1 2 3	Dongbu Package Middle Power	SPM	Mddle power			
4 5	Color	WH	White			
6	Product Version	1	1st verison			
7 8 9	Form Factor	229	2.8 x 3.5 x 0.7 mm; 2 pads; 3chip;			
10	Sorting Current (mA)	A	100 mA			
11	Chromaticity Coordinates	Q	Hot Bin			
12	CRI	5	Min. 80			
		7	Min. 90			
13 14	Forward Voltage (V)	SG or SK	8.8 ~ 10.0	Bin Code	GY	8.5 ~ 8.8
					GZ	8.8 ~ 9.1
					G1	9.1 ~ 9.4
					G2	9.4 ~ 9.7
			SG : 4,000ea per reel, SK : 16,000ea per reel			
		V☆	3000		V1, V2, V3, V4, V5, V6, V7, V8, V9, VA, VB, VC VD, VE, VF, VG	
15 16	CCT (K)	D☆	2200	Bin Code	D1, D2, D3, D4, D5, D6, D7, D8, D9, DA, DB, DC, DD, DE, DF, DG	
		V☆	3000		V1, V2, V3, V4, V5, V6, V7, V8, V9, VA, VB, VC VD, VE, VF, VG	
		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 bin), “Y”(Y Kitting bin) or “U” (Mac3 only)			
17 18	Luminous Flux	SQ		Bin Code	SQ	

2. Characteristics

(1) Absolute Maximum Ratings

Item	Symbol	Rating	Unit	Condition
Ambient / Operating Temperature	T_a	-40 ~ +85	ºC	
Storage Temperature	T_{stg}	-40 ~ +85	℃	
LED Junction Temperature	T_j	125	℃	
Forward Current	I_F	110	mA	
Peak Pulsed Forward Current	I_{Fp}	200	mA	Duty 1/10, pulse width 10ms
Assembly Process Temperature		260<10	℃/S	
ESD (HBM)		2	KV	

* Note

Proper current derating must be observed to maintain junction temperature below the maximum at all time.

(2) Electro-optical Characteristics (I_F = 100 mA, T_a = 25 ºC)

Item	Unit	Rank	Bin	Min.	Typ.	Max.
Forward Voltage (VF)	V	SG or SK	GY	8.5		8.8
			GZ	8.8		9.1
			G1	9.1		9.4
			G2	9.4		9.7
		SN or SM	GZ	8.8		9.1
			G1	9.1		9.4
Color Rendering Index (Ra)		5		80	-	-
		7		90	-	-
Special CRI (R9)	For Ra 90			50		
Thermal Resistance (junction to solder point)	ºC/W			-	15	-
Beam Angle	°			-	120	-

* Note

Dongbu maintains measurement tolerance of: forward voltage = ±0.2 V, CRI = ±3, R9 = ±6.5

(3) Luminous Flux Bins (I_F = 100 mA, T_a = 25ºC)

Item	CRI (Ra) Min.	Norminal CCT(K)	Bin	150mA Min.	150mA Max.
Luminous Flux (Φv)	80	2200	SQ	119.0	129.0
		2700	SQ	138.0	148.0
		3000	SQ	145.0	155.0
		3500	SQ	149.0	159.0
		4000	SQ	152.0	162.0
		5000	SQ	152.0	162.0
		5700	SQ	150.0	160.0
		6500	SQ	149.0	159.0
	90	2200	SQ	100.0	110.0
		2700	SQ	116.0	126.0
		3000	SQ	122.0	132.0
		3500	SQ	126.0	136.0
		4000	SQ	127.0	137.0
		5000	SQ	127.0	137.0
		5700	SQ	127.0	137.0
		6500	SQ	126.0	136.0

* Note :

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

(4) Luminous Flux Bins (I_F = 100 mA, T_a = 25ºC)

CRI (Ra) Min.	Nominal CCT (K)	Product Code	Flux Bin	Flux Range (Φ_v, lm)
80	2200	SPMWH1229AQ5SGD★SQ	SQ	119.0 ~ 129.0
	2700	SPMWH1229AQ5SGW★SQ	SQ	138.0 ~ 148.0
	3000	SPMWH1229AQ5SGV★SQ	SQ	145.0 ~ 155.0
	3500	SPMWH1229AQ5SGU★SQ	SQ	149.0 ~ 159.0
	4000	SPMWH1229AQ5SGT★SQ	SQ	152.0 ~ 162.0
	5000	SPMWH1229AQ5SGR★SQ	SQ	152.0 ~ 162.0
	5700	SPMWH1229AQ5SGQ★SQ	SQ	150.0 ~ 160.0
	6500	SPMWH1229AQ5SGP★SQ	SQ	149.0 ~ 159.0
90	2200	SPMWH1229AQ7SGD★SQ	SQ	100.0 ~ 110.0
	2700	SPMWH1229AQ7SGW★SQ	SQ	116.0 ~ 126.0
	3000	SPMWH1229AQ7SGV★SQ	SQ	122.0 ~ 132.0
	3500	SPMWH1229AQ7SGU★SQ	SQ	126.0 ~ 136.0
	4000	SPMWH1229AQ7SGT★SQ	SQ	127.0 ~ 137.0
	5000	SPMWH1229AQ7SGR★SQ	SQ	127.0 ~ 137.0
	5700	SPMWH1229AQ7SGQ★SQ	SQ	127.0 ~ 137.0
	6500	SPMWH1229AQ7SGP★SQ	SQ	126.0 ~ 136.0

* Note :

"★" can be "0" (Whole bin), "M" (Quarter bin), “K” (K Kitting bin) of the color binning

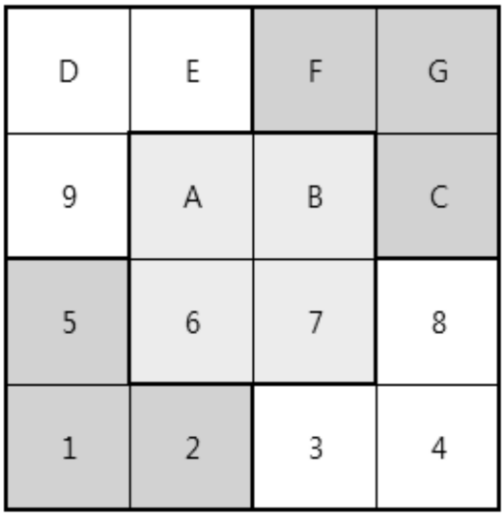
(5) Voltage Bins (I_F = 100 mA, T_a = 25 ºC)

CRI (Ra) Min.	Nominal CCT (K)	Product Code	Voltage Rank	Voltage Bin	Voltage Range (V)
			SG or SK	GY	8.5 ~ 8.8
				GZ	8.8 ~ 9.1
				G1	9.1 ~ 9.4
				G2	9.4 ~ 9.7

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 (GY+GY), (GZ+GZ), (G1+G1) or (G2+G2).
3. A Chromaticity Coordinates of kitting bin is mixed by kitting procedure.(below kitting simulation)

[Kitting example]



[Binning Information]

	Bin #1	Bin #2
VF	GY	GY
	GZ	GZ
	G1	G1
	G2	G2
CIE	1, 2, 5 bin	C, F, G bin
	6, 7, A, B bin	6, 7, A, B bin
	3, 4, 8 bin	9, D, E bin

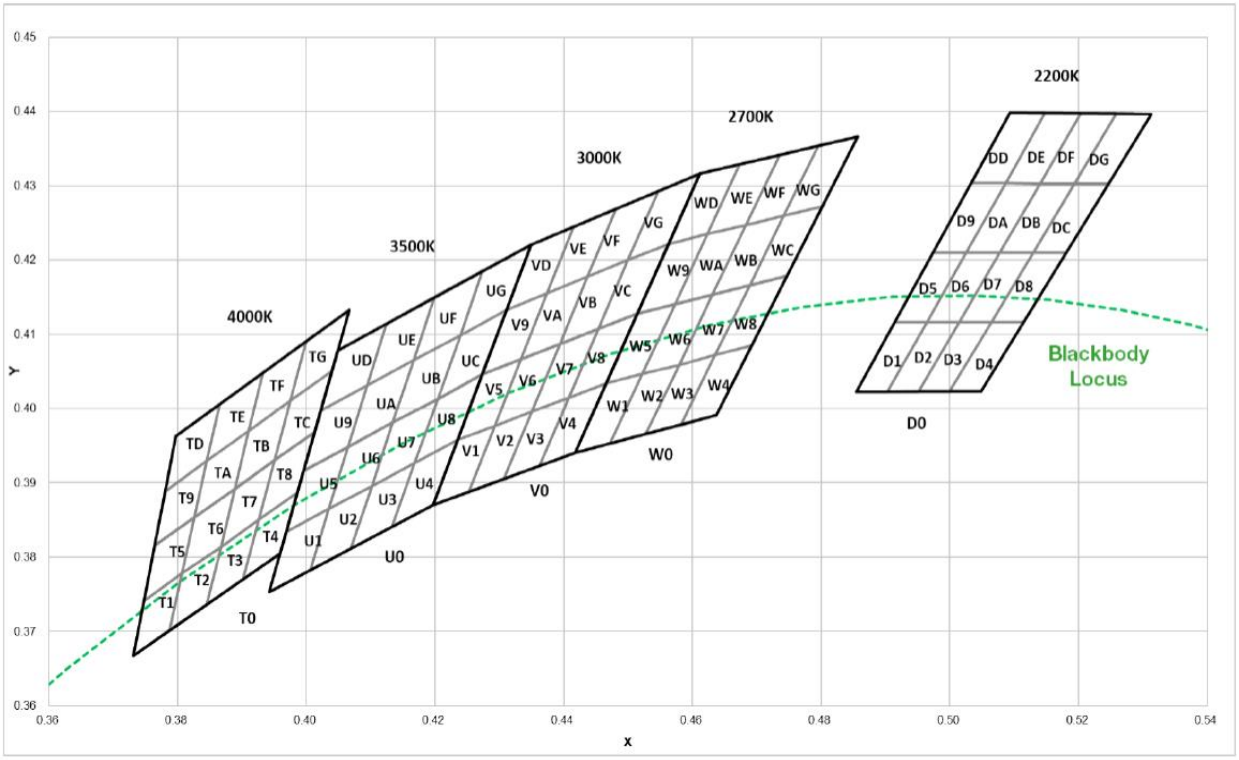
(7) Color Bins (I_F = 100 mA, T_a = 25 ºC)

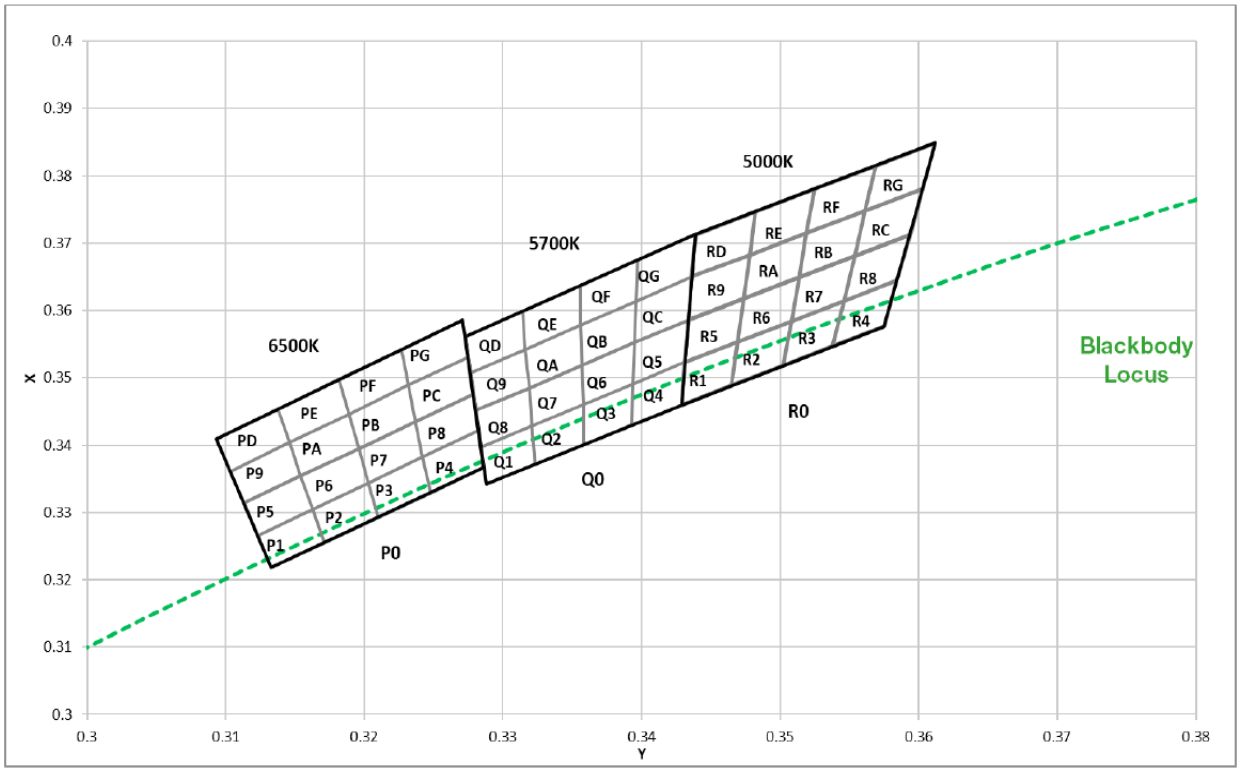
CRI (Ra) Min.	Norminal CCT (K)	Product Code	Code Rank	Chromaticity Bins
80 or 90	2200	SPMWH1229AQ☆SGD0SQ	D0 (Whole bin)	D1,D2,D3,D4,D5,D6,D7,D8,D9,DA,DB,DC,DD,DE,DF,DG
		SPMWH1229AQ☆SGDMSQ	DM (Quarter bin)	D6, D7, DA, DB
		SPMWH1229AQ☆SGDKSQ	DK (K Kitting bin)	D1,D2,D3,D4,D5,D6,D7,D8,D9,DA,DB,DC,DD,DE,DF,DG
	2700	SPMWH1229AQ☆SGW0SQ	W0 (Whole bin)	W1,W2,W3,W4,W5,W6,W7,W8,W9,WA,WB,WC,WD,WE,WF,WG
		SPMWH1229AQ☆SGWMSQ	WM (Quarter bin)	W6, W7, WA, WB
		SPMWH1229AQ☆SGWKSQ	WK (K Kitting bin)	W1,W2,W3,W4,W5,W6,W7,W8,W9,WA,WB,WC,WD,WE,WF,WG
	3000	SPMWH1229AQ☆SGV0SQ	V0 (Whole bin)	V1,V2,V3,V4,V5,V6,V7,V8,V9,VA,VB,VC,VD,VE,VF,VG
		SPMWH1229AQ☆SGVMSQ	VM (Quarter bin)	V6, V7, VA, VB
		SPMWH1229AQ☆SGVKSQ	VK (K Kitting bin)	V1,V2,V3,V4,V5,V6,V7,V8,V9,VA,VB,VC,VD,VE,VF,VG
	3500	SPMWH1229AQ☆SGU0SQ	U0 (Whole bin)	U1,U2,U3,U4,U5,U6,U7,U8,U9,UA,UB,UC,UD,UE,UF,UG
		SPMWH1229AQ☆SGUMSQ	UM (Quarter bin)	U6, U7, UA, UB
		SPMWH1229AQ☆SGUKSQ	UK (K Kitting bin)	U1,U2,U3,U4,U5,U6,U7,U8,U9,UA,UB,UC,UD,UE,UF,UG
	4000	SPMWH1229AQ☆SGT0SQ	T0 (Whole bin)	T1,T2,T3,T4,T5,T6,T7,T8,T9,TA,TB,TC,TD,TE,TF,TG
		SPMWH1229AQ☆SGTMSQ	TM (Quarter bin)	T6, T7, TA, TB
		SPMWH1229AQ☆SGTKSQ	TK (K Kitting bin)	T1,T2,T3,T4,T5,T6,T7,T8,T9,TA,TB,TC,TD,TE,TF,TG
	5000	SPMWH1229AQ☆SGR0SQ	R0 (Whole bin)	R1,R2,R3,R4,R5,R6,R7,R8,R9,RA,RB,RC,RD,RE,RF,RG
		SPMWH1229AQ☆SGRMSQ	RM (Quarter bin)	R6, R7, RA, RB
		SPMWH1229AQ☆SGRKSQ	RK (K Kitting bin)	R1,R2,R3,R4,R5,R6,R7,R8,R9,RA,RB,RC,RD,RE,RF,RG
	5700	SPMWH1229AQ☆SGQ0SQ	Q0 (Whole bin)	Q1,Q2,Q3,Q4,Q5,Q6,Q7,Q8,Q9,QA,QB,QC,QD,QE,QF,QG
		SPMWH1229AQ☆SGQMSQ	QM (Quarter bin)	Q6, Q7, QA, QB
		SPMWH1229AQ☆SGQKSQ	QK (K Kitting bin)	Q1,Q2,Q3,Q4,Q5,Q6,Q7,Q8,Q9,QA,QB,QC,QD,QE,QF,QG
	6500	SPMWH1229AQ☆SGP0SQ	P0 (Whole bin)	P1,P2,P3,P4,P5,P6,P7,P8,P9,PA,PB,PC,PD,PE,PF,PG
		SPMWH1229AQ☆SGPMSQ	PM (Quarter bin)	P6, P7, PA, PB
		SPMWH1229AQ☆SGPKSQ	PK (K Kitting bin)	P1,P2,P3,P4,P5,P6,P7,P8,P9,PA,PB,PC,PD,PE,PF,PG

* Note :

"☆"can be “5”(Ra 80) or “7”(Ra 90)

(8) Chromaticity Region & Coordinates for whole bin or quarter bin or K kitting bin (I_F = 100 mA, T_a = 25 ºC)





(9) Chromaticity Region & Coordinates

Region	CIE x	CIE y	Region	CIE x	CIE y	Region	CIE x	CIE y	Region	CIE x	CIE y
D Rank (2200K)						W Rank (2700K)					
D1	0.4854	0.4022	D9	0.4974	0.4210	W1	0.4417	0.3940	W9	0.4515	0.4128
	0.4914	0.4116		0.5033	0.4304		0.4472	0.3953		0.4573	0.4141
	0.4964	0.4116		0.5087	0.4304		0.4522	0.4047		0.4623	0.4235
	0.4903	0.4022		0.5025	0.4210		0.4466	0.4034		0.4563	0.4222
D2	0.4903	0.4022	DA	0.5025	0.4210	W2	0.4472	0.3953	WA	0.4573	0.4141
	0.4964	0.4116		0.5087	0.4304		0.4527	0.3966		0.4631	0.4153
	0.5014	0.4116		0.5140	0.4303		0.4579	0.4059		0.4683	0.4247
	0.4952	0.4023		0.5077	0.4210		0.4522	0.4047		0.4623	0.4235
D3	0.4952	0.4023	DB	0.5077	0.4210	W3	0.4527	0.3966	WB	0.4631	0.4153
	0.5014	0.4116		0.5140	0.4303		0.4582	0.3978		0.4689	0.4166
	0.5065	0.4116		0.5194	0.4303		0.4635	0.4072		0.4742	0.4260
	0.5000	0.4023		0.5129	0.4210		0.4579	0.4059		0.4683	0.4247
D4	0.5000	0.4023	DC	0.5129	0.4210	W4	0.4582	0.3978	WC	0.4689	0.4166
	0.5065	0.4116		0.5194	0.4303		0.4637	0.3991		0.4747	0.4179
	0.5115	0.4116		0.5247	0.4303		0.4692	0.4085		0.4802	0.4272
	0.5049	0.4023		0.5181	0.4210		0.4635	0.4072		0.4742	0.4260
D5	0.4914	0.4116	DD	0.5033	0.4304	W5	0.4466	0.4034	WD	0.4563	0.4222
	0.4974	0.4210		0.5033	0.4398		0.4522	0.4047		0.4623	0.4235
	0.5025	0.4210		0.5148	0.4398		0.4573	0.4141		0.4673	0.4329
	0.4964	0.4116		0.5087	0.4304		0.4515	0.4128		0.4612	0.4316
D6	0.4964	0.4116	DE	0.5087	0.4304	W6	0.4522	0.4047	WE	0.4623	0.4235
	0.5025	0.4210		0.5148	0.4398		0.4579	0.4059		0.4683	0.4247
	0.5077	0.4210		0.5203	0.4397		0.4631	0.4153		0.4735	0.4341
	0.5014	0.4116		0.5140	0.4303		0.4573	0.4141		0.4673	0.4329
D7	0.5014	0.4116	DF	0.5140	0.4303	W7	0.4579	0.4059	WF	0.4683	0.4247
	0.5077	0.4210		0.5203	0.4397		0.4635	0.4072		0.4742	0.4260
	0.5129	0.4210		0.5258	0.4397		0.4689	0.4166		0.4796	0.4354
	0.5065	0.4116		0.5194	0.4303		0.4631	0.4153		0.4735	0.4341
D8	0.5065	0.4116	DG	0.5194	0.4303	W8	0.4635	0.4072	WG	0.4742	0.4260
	0.5129	0.4210		0.5258	0.4397		0.4692	0.4085		0.4802	0.4272
	0.5181	0.4210		0.5313	0.4396		0.4747	0.4179		0.4857	0.4366
	0.5115	0.4116		0.5247	0.4303		0.4689	0.4166		0.4796	0.4354

(9) Chromaticity Region & Coordinates

Region	CIE x	CIE y	Region	CIE x	CIE y	Region	CIE x	CIE y	Region	CIE x	CIE y
V Rank (3000K)						U Rank (3500K)					
V1	0.4197	0.3870	V9	0.4273	0.4046	U1	0.3942	0.3753	U9	0.3995	0.3916
	0.4252	0.3888		0.4333	0.4066		0.4006	0.3782		0.4065	0.3948
	0.4293	0.3977		0.4374	0.4155		0.4035	0.3865		0.4094	0.4031
	0.4235	0.3958		0.4311	0.4133		0.3969	0.3834		0.4022	0.3997
V2	0.4252	0.3888	VA	0.4333	0.4066	U2	0.4006	0.3782	UA	0.4065	0.3948
	0.4307	0.3905		0.4394	0.4087		0.4069	0.3812		0.4134	0.3981
	0.4350	0.3996		0.4437	0.4178		0.4102	0.3896		0.4167	0.4065
	0.4293	0.3977		0.4374	0.4155		0.4035	0.3865		0.4094	0.4031
V3	0.4307	0.3905	VB	0.4394	0.4087	U3	0.4069	0.3812	UB	0.4134	0.3981
	0.4362	0.3923		0.4454	0.4107		0.4133	0.3841		0.4204	0.4013
	0.4408	0.4015		0.4500	0.4200		0.4168	0.3927		0.4239	0.4099
	0.4350	0.3996		0.4437	0.4178		0.4102	0.3896		0.4167	0.4065
V4	0.4362	0.3923	VC	0.4454	0.4107	U4	0.4133	0.3841	UC	0.4204	0.4013
	0.4417	0.3940		0.4515	0.4128		0.4197	0.3870		0.4273	0.4046
	0.4466	0.4034		0.4563	0.4222		0.4235	0.3958		0.4311	0.4133
	0.4408	0.4015		0.4500	0.4200		0.4168	0.3927		0.4239	0.4099
V5	0.4235	0.3958	VD	0.4311	0.4133	U5	0.3969	0.3834	UD	0.4022	0.3997
	0.4293	0.3977		0.4374	0.4155		0.4035	0.3865		0.4094	0.4031
	0.4333	0.4066		0.4415	0.4245		0.4065	0.3948		0.4124	0.4114
	0.4273	0.4046		0.4349	0.4221		0.3995	0.3916		0.4049	0.4078
V6	0.4293	0.3977	VE	0.4374	0.4155	U6	0.4035	0.3865	UE	0.4094	0.4031
	0.4350	0.3996		0.4437	0.4178		0.4102	0.3896		0.4167	0.4065
	0.4394	0.4087		0.4481	0.4269		0.4134	0.3981		0.4199	0.4150
	0.4333	0.4066		0.4415	0.4245		0.4065	0.3948		0.4124	0.4114
V7	0.4350	0.3996	VF	0.4437	0.4178	U7	0.4102	0.3896	UF	0.4167	0.4065
	0.4408	0.4015		0.4500	0.4200		0.4168	0.3927		0.4239	0.4099
	0.4454	0.4107		0.4546	0.4292		0.4204	0.4013		0.4274	0.4185
	0.4394	0.4087		0.4481	0.4269		0.4134	0.3981		0.4199	0.4150
V8	0.4408	0.4015	VG	0.4500	0.4200	U8	0.4168	0.3927	UG	0.4239	0.4099
	0.4466	0.4034		0.4563	0.4222		0.4235	0.3958		0.4311	0.4133
	0.4515	0.4128		0.4612	0.4316		0.4273	0.4046		0.4349	0.4221
	0.4454	0.4107		0.4546	0.4292		0.4204	0.4013		0.4274	0.4185

(9) Chromaticity Region & Coordinates

Region	CIE x	CIE y	Region	CIE x	CIE y	Region	CIE x	CIE y	Region	CIE x	CIE y
T Rank (4000K)						R Rank (5000K)					
T1	0.3731	0.3667	T9	0.3764	0.3815	R1	0.3429	0.3459	R9	0.3434	0.3586
	0.3788	0.3702		0.3826	0.3854		0.3465	0.3489		0.3474	0.3618
	0.3807	0.3778		0.3845	0.3930		0.3469	0.3553		0.3478	0.3682
	0.3748	0.3741		0.3781	0.3889		0.3431	0.3523		0.3436	0.3650
T2	0.3788	0.3702	TA	0.3826	0.3854	R2	0.3465	0.3489	RA	0.3474	0.3618
	0.3845	0.3736		0.3889	0.3892		0.3502	0.3518		0.3514	0.3649
	0.3867	0.3814		0.3910	0.3970		0.3508	0.3584		0.3519	0.3715
	0.3807	0.3778		0.3845	0.3930		0.3469	0.3553		0.3478	0.3682
T3	0.3845	0.3736	TB	0.3889	0.3892	R3	0.3502	0.3518	RB	0.3514	0.3649
	0.3902	0.3771		0.3951	0.3931		0.3538	0.3547		0.3554	0.3681
	0.3926	0.3851		0.3975	0.4011		0.3546	0.3614		0.3561	0.3748
	0.3867	0.3814		0.3910	0.3970		0.3508	0.3584		0.3519	0.3715
T4	0.3902	0.3771	TC	0.3951	0.3931	R4	0.3538	0.3547	RC	0.3554	0.3681
	0.3959	0.3805		0.4013	0.3969		0.3575	0.3576		0.3594	0.3713
	0.3986	0.3887		0.4040	0.4051		0.3584	0.3644		0.3603	0.3781
	0.3926	0.3851		0.3975	0.4011		0.3546	0.3614		0.3561	0.3748
T5	0.3748	0.3741	TD	0.3781	0.3889	R5	0.3431	0.3523	RD	0.3436	0.3650
	0.3807	0.3778		0.3845	0.3930		0.3469	0.3553		0.3478	0.3682
	0.3826	0.3854		0.3865	0.4006		0.3474	0.3618		0.3482	0.3747
	0.3764	0.3815		0.3797	0.3963		0.3434	0.3586		0.3439	0.3713
T6	0.3807	0.3778	TE	0.3845	0.3930	R6	0.3469	0.3553	RE	0.3478	0.3682
	0.3867	0.3814		0.3910	0.3970		0.3508	0.3584		0.3519	0.3715
	0.3889	0.3892		0.3932	0.4048		0.3514	0.3649		0.3525	0.3781
	0.3826	0.3854		0.3865	0.4006		0.3474	0.3618		0.3482	0.3747
T7	0.3867	0.3814	TF	0.3910	0.3970	R7	0.3508	0.3584	RF	0.3519	0.3715
	0.3926	0.3851		0.3975	0.4011		0.3546	0.3614		0.3561	0.3748
	0.3951	0.3931		0.4000	0.4091		0.3554	0.3681		0.3569	0.3815
	0.3889	0.3892		0.3932	0.4048		0.3514	0.3649		0.3525	0.3781
T8	0.3926	0.3851	TG	0.3975	0.4011	R8	0.3546	0.3614	RG	0.3561	0.3748
	0.3986	0.3887		0.4040	0.4051		0.3584	0.3644		0.3603	0.3781
	0.4013	0.3969		0.4067	0.4133		0.3594	0.3713		0.3612	0.3849
	0.3951	0.3931		0.4000	0.4091		0.3554	0.3681		0.3569	0.3815

(9) Chromaticity Region & Coordinates

Region	CIE x	CIE y	Region	CIE x	CIE y	Region	CIE x	CIE y	Region	CIE x	CIE y
Q Rank (5700K)						P Rank (6500K)					
Q1	0.3288	0.3342	Q9	0.3280	0.3452	P1	0.3133	0.3218	P9	0.3113	0.3314
	0.3323	0.3372		0.3319	0.3485		0.3171	0.3255		0.3154	0.3354
	0.3321	0.3429		0.3316	0.3542		0.3163	0.3305		0.3146	0.3404
	0.3284	0.3397		0.3276	0.3507		0.3123	0.3266		0.3103	0.3361
Q2	0.3323	0.3372	QA	0.3319	0.3485	P2	0.3171	0.3255	PA	0.3154	0.3354
	0.3358	0.3401		0.3357	0.3519		0.3210	0.3292		0.3196	0.3395
	0.3358	0.3460		0.3356	0.3578		0.3203	0.3343		0.3189	0.3446
	0.3321	0.3429		0.3316	0.3542		0.3163	0.3305		0.3146	0.3404
Q3	0.3358	0.3401	QB	0.3357	0.3519	P3	0.3210	0.3292	PB	0.3196	0.3395
	0.3393	0.3430		0.3395	0.3553		0.3248	0.3329		0.3237	0.3435
	0.3394	0.3491		0.3396	0.3614		0.3242	0.3382		0.3232	0.3489
	0.3358	0.3460		0.3356	0.3578		0.3203	0.3343		0.3189	0.3446
Q4	0.3393	0.3430	QC	0.3395	0.3553	P4	0.3248	0.3329	PC	0.3237	0.3435
	0.3429	0.3459		0.3434	0.3586		0.3286	0.3366		0.3279	0.3476
	0.3431	0.3523		0.3436	0.3650		0.3282	0.3421		0.3275	0.3531
	0.3394	0.3491		0.3396	0.3614		0.3242	0.3382		0.3232	0.3489
Q5	0.3284	0.3397	QD	0.3276	0.3507	P5	0.3123	0.3266	PD	0.3103	0.3361
	0.3321	0.3429		0.3316	0.3542		0.3163	0.3305		0.3146	0.3404
	0.3319	0.3485		0.3314	0.3599		0.3154	0.3354		0.3138	0.3453
	0.3280	0.3452		0.3273	0.3561		0.3113	0.3314		0.3093	0.3409
Q6	0.3321	0.3429	QE	0.3316	0.3542	P6	0.3163	0.3305	PE	0.3146	0.3404
	0.3358	0.3460		0.3356	0.3578		0.3203	0.3343		0.3189	0.3446
	0.3357	0.3519		0.3356	0.3637		0.3196	0.3395		0.3182	0.3498
	0.3319	0.3485		0.3314	0.3599		0.3154	0.3354		0.3138	0.3453
Q7	0.3358	0.3460	QF	0.3356	0.3578	P7	0.3203	0.3343	PF	0.3189	0.3446
	0.3394	0.3491		0.3396	0.3614		0.3242	0.3382		0.3232	0.3489
	0.3395	0.3553		0.3397	0.3675		0.3237	0.3435		0.3227	0.3542
	0.3357	0.3519		0.3356	0.3637		0.3196	0.3395		0.3182	0.3498
Q8	0.3394	0.3491	QG	0.3396	0.3614	P8	0.3242	0.3382	PG	0.3232	0.3489
	0.3431	0.3523		0.3436	0.3650		0.3282	0.3421		0.3275	0.3531
	0.3434	0.3586		0.3439	0.3713		0.3279	0.3476		0.3271	0.3586
	0.3395	0.3553		0.3397	0.3675		0.3237	0.3435		0.3227	0.3542

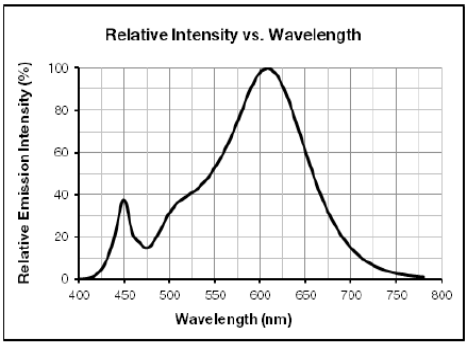
* Note :

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

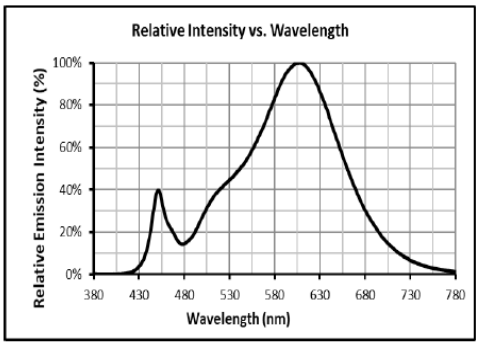
3. Typical Characteristics Graphs

(1) Spectrum Distribution (I_F = 100 mA, T_a = 25 ºC)

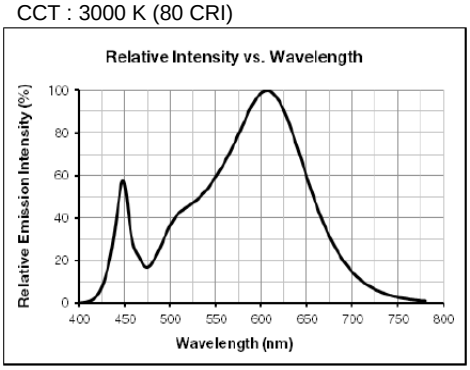
CCT : 2200 K (80 CRI)



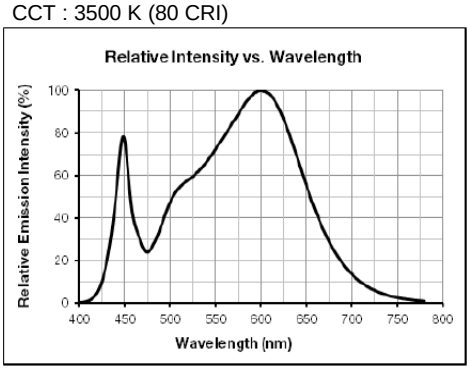
CCT : 2700 K (80 CRI)



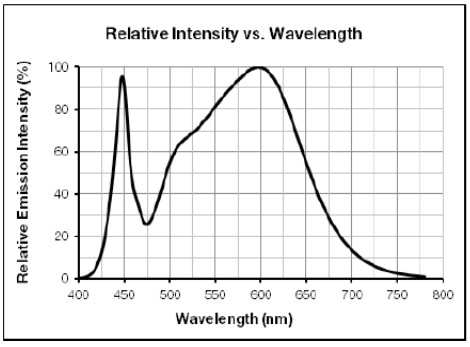
CCT : 3000 K (80 CRI)



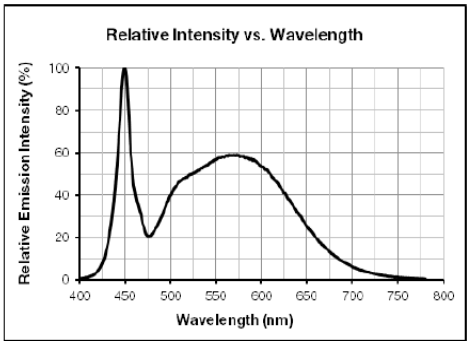
CCT : 3500 K (80 CRI)



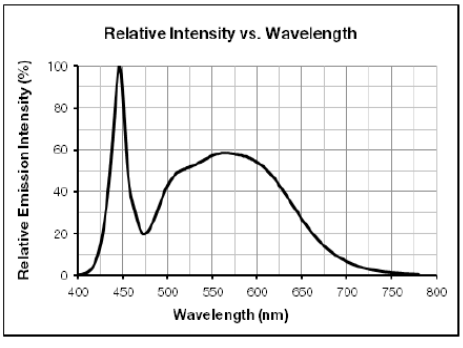
CCT : 4000 K (80 CRI)



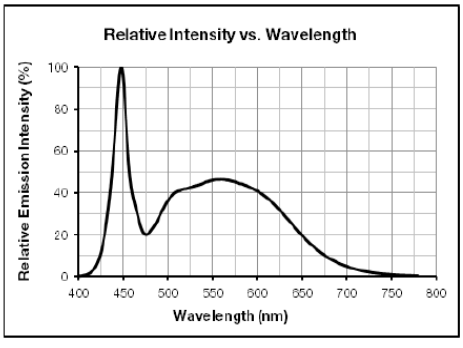
CCT : 5000 K (80 CRI)



CCT : 5700 K (80 CRI)



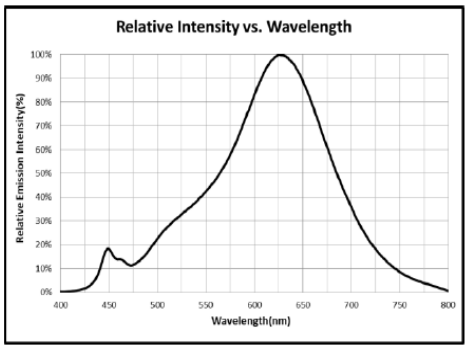
CCT : 6500 K (80 CRI)



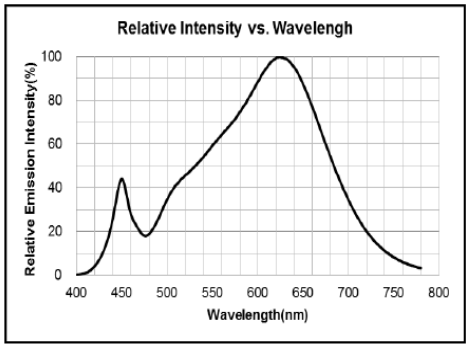
3. Typical Characteristics Graphs

(1) Spectrum Distribution (I_F = 100 mA, T_a = 25 ºC)

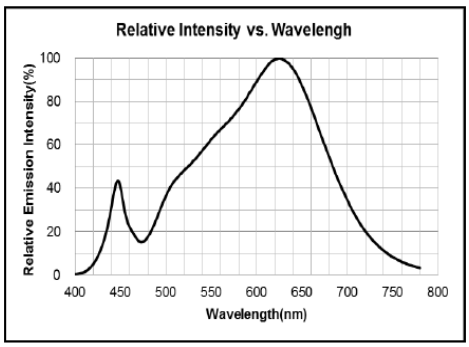
CCT : 2200 K (90 CRI)



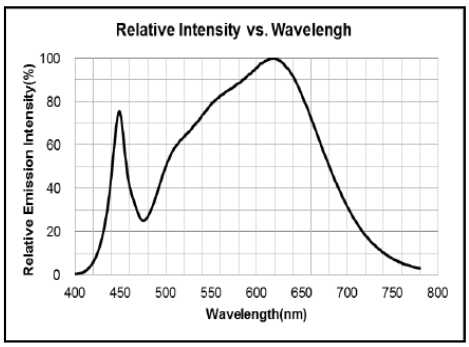
CCT : 2700 K (90 CRI)



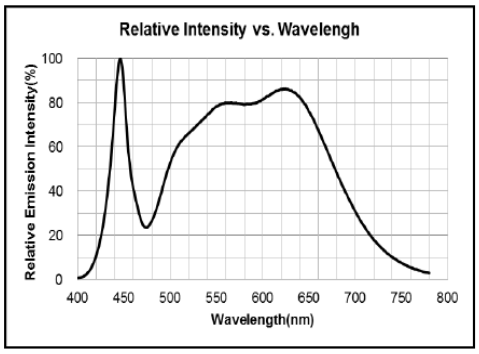
CCT : 3000 K (90 CRI)



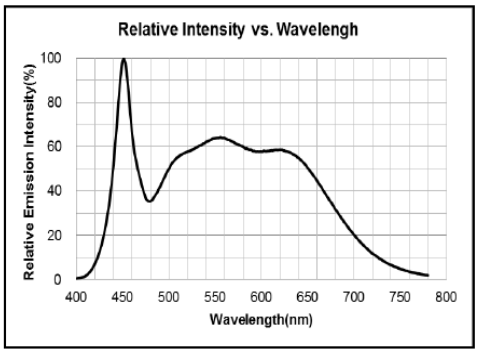
CCT : 3500 K (90 CRI)



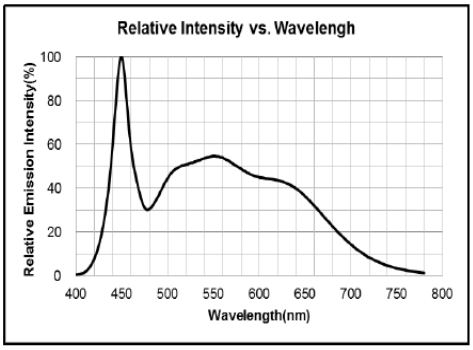
CCT : 4000 K (90 CRI)



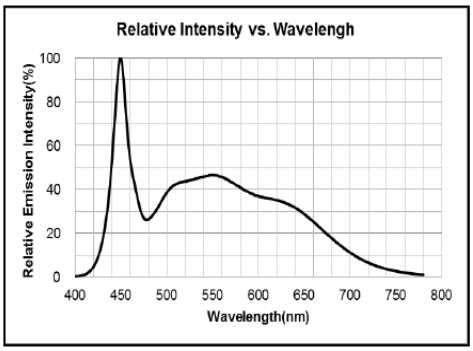
CCT : 5000 K (90 CRI)



CCT : 5700 K (90 CRI)

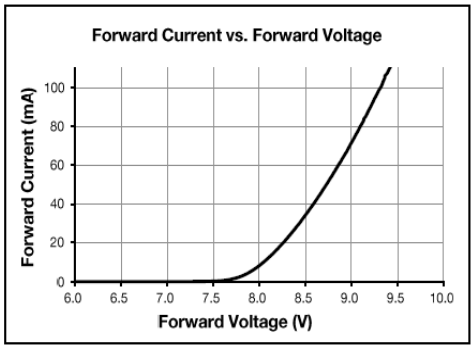


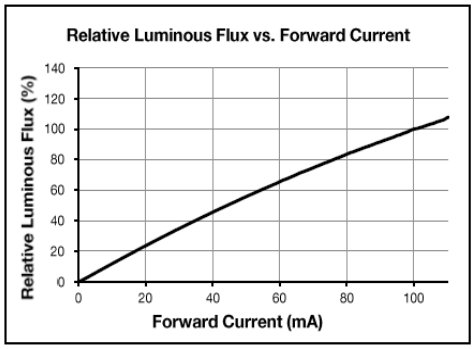
CCT : 6500 K (90 CRI)



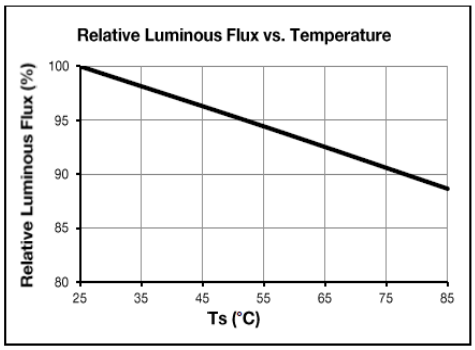
3. Typical Characteristics Graphs

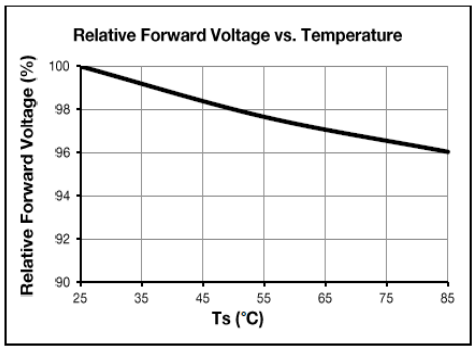
(2) Forward Current Characteristics (T_a=25 ºC)



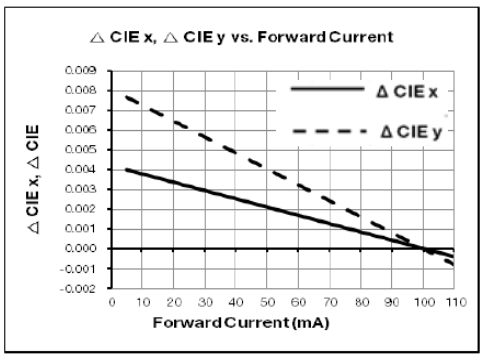


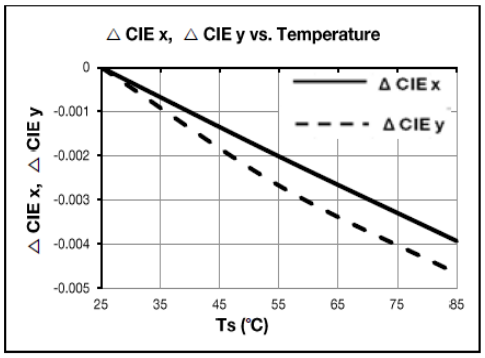
(3)Temperature Characteristics (I_F=100 mA)



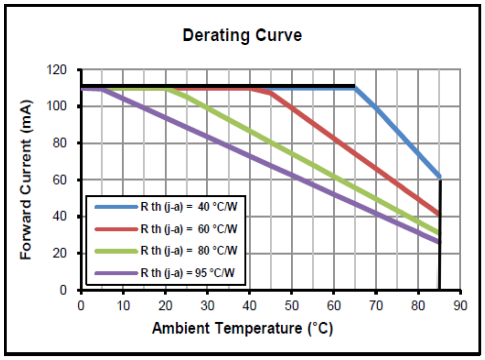


(4) Color Shift Characteristics (I_F=100 mA, T_a=25 ºC)

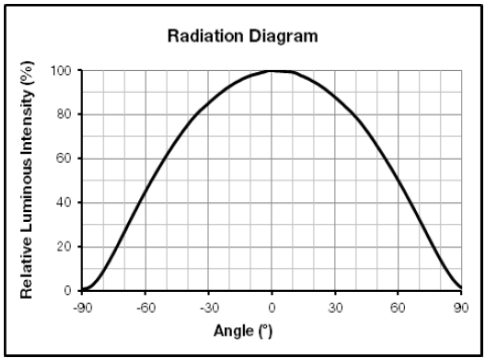




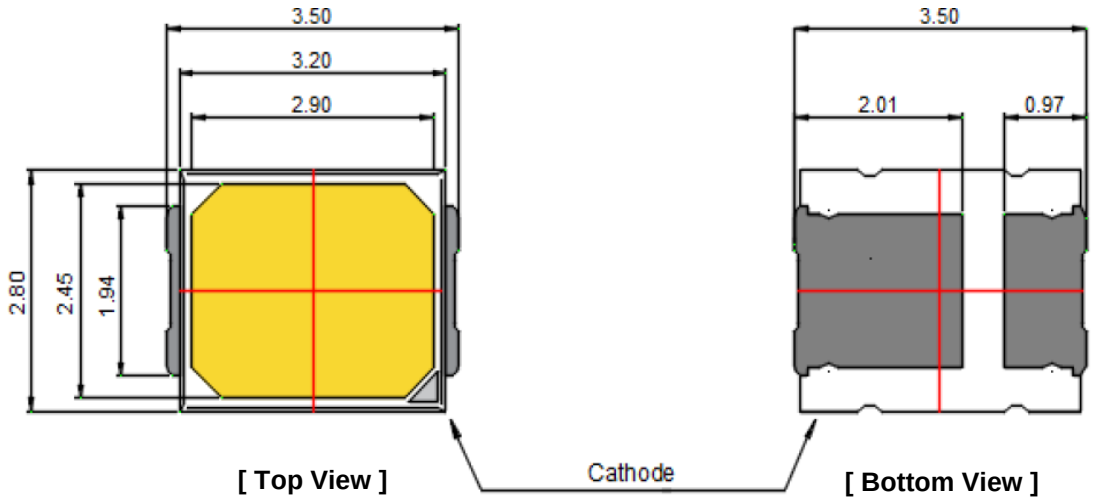
(5) Derating Curve

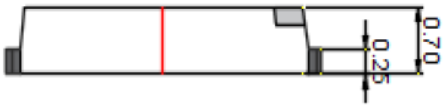


(6) Beam Angle Characteristics (I_F=100 mA, T_a=25 ºC)



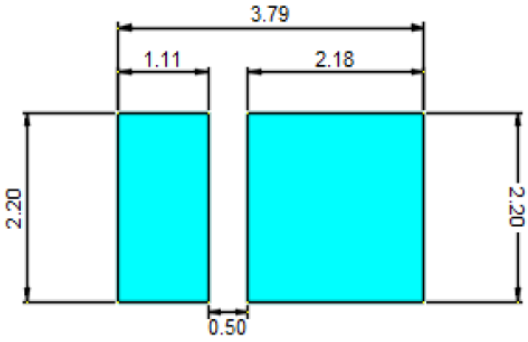
4. Outline Drawing & Dimension





[Side View]

[Recommended PCB Solder Pad]



- Measurement unit : mm
- Tolerance : ± 0.1mm

* Note :

1) 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.

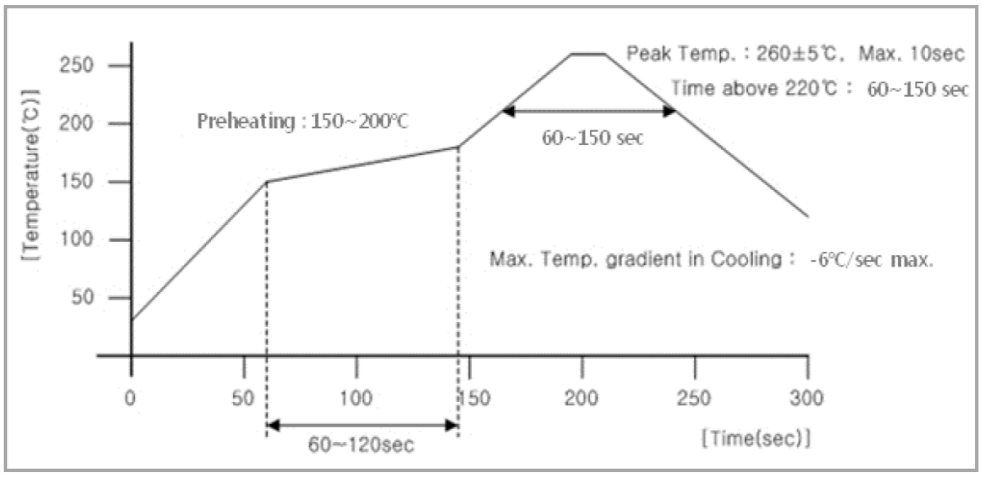
2) Re-soldering should not be done after the LEDs have been soldered. If re-soldering is unavoidable, LED`s characteristics should be carefully checked before and after such repair.

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.



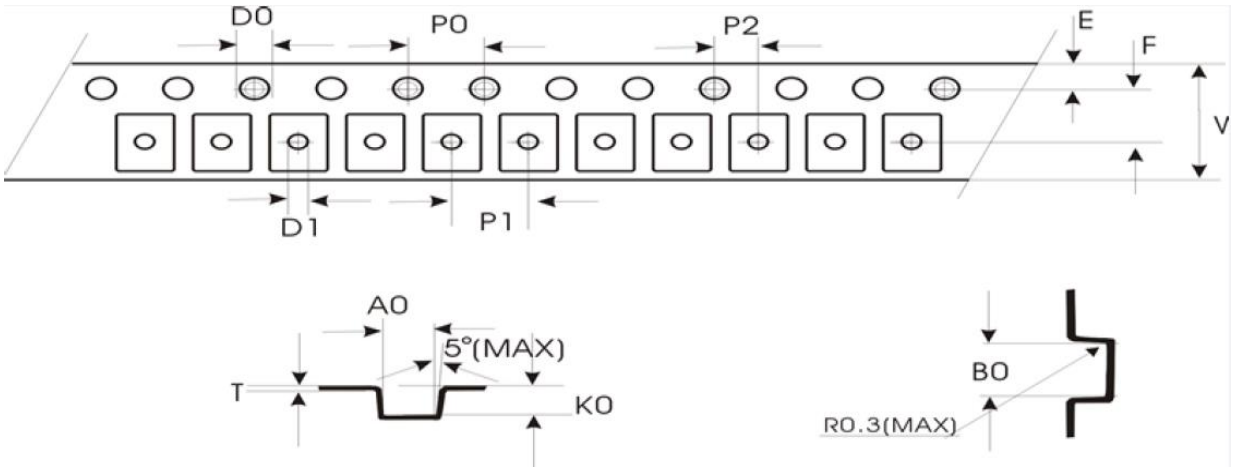
(2) Manual Soldering Conditions

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

6. Tape & Reel

(1) Taping Dimension

(unit : mm)

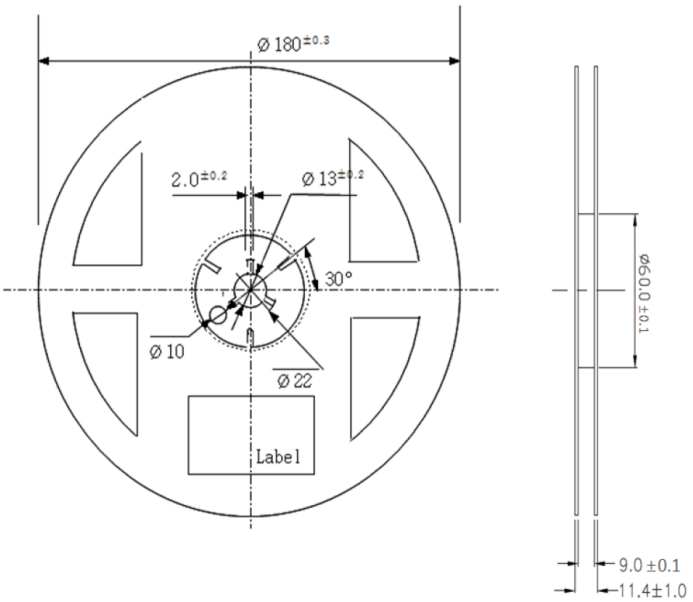


A0	3.10±0.1	P0	4.00±0.1	T	0.20±0.05	D0	1.60(MAX)
B0	3.70±0.1	P1	4.00±0.1	E	1.75±0.1	D1	1.05(MIN)
K0	1.00±0.1	P2	2.00±0.1	F	3.50±0.05	V	8.00±0.1

6. Tape & Reel

(2) Reel Dimension (Max 4,000 pcs)

(unit : mm)



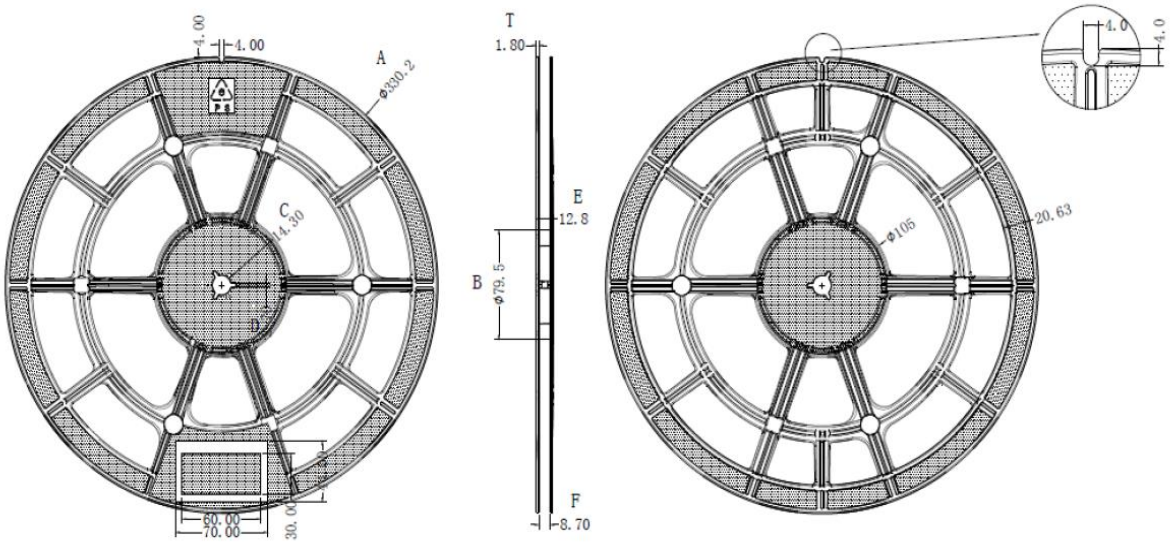
*** Note :**

1) Quantity: The quantity/reel is 4,000 pcs

2) All dimensions are millimeters (tolerance : ±0.2mm)

3) Packaging: P/N, Manufacturing data code no. and quantity are indicated on the aluminum packing bag

(3) Reel Dimension (Max 16,000 pcs)



A±2	B±0.5	C±0.2	D±0.2	E±0.5	$F^{+2}_{-0.3}$	T±0.2
Ø330.2	Ø79.5	Ø14.3	2.7	12.8	8.7	1.8

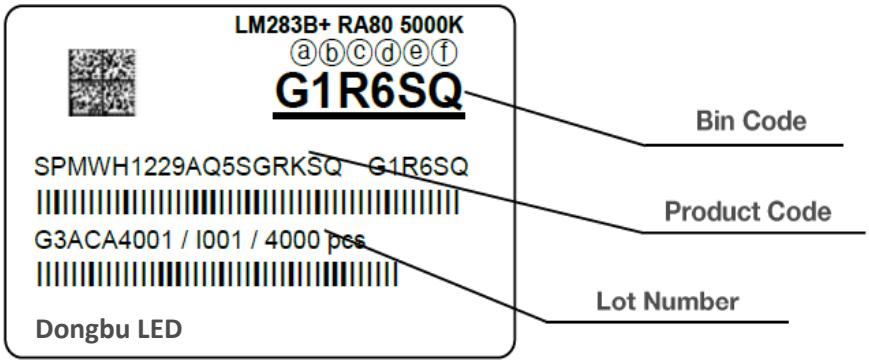
1) Quantity: The quantity/reel is 16,000 pcs

2) All dimensions are millimeters (tolerance : ±0.2mm)

3) 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 10)

ⓒⓓ: Chromaticity bin (refer to page 11-18)

ⓔⓕ: Luminous Flux bin (refer to page 7)

(2) Lot Number

The lot number is composed of the following characters:



①②③④⑤⑥⑦⑧⑨ / Ⅰⓐⓑⓒ / 4,000 pcs

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

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

④ : Year (C: 2018, D: 2019, E: 2020, F: 2021, G: 2022…)

⑤ : Month (1~9, A, B, C)

⑥ : Day (1~9, A, B~V)

⑦⑧⑨ ⓐⓑⓒ : Product serial number

8. Packing Structure

(1) Packing Process (The quantity of PKG on the Reel to be Max 4,000 pcs)

Reel





Aluminum Vinyl Packing Bag



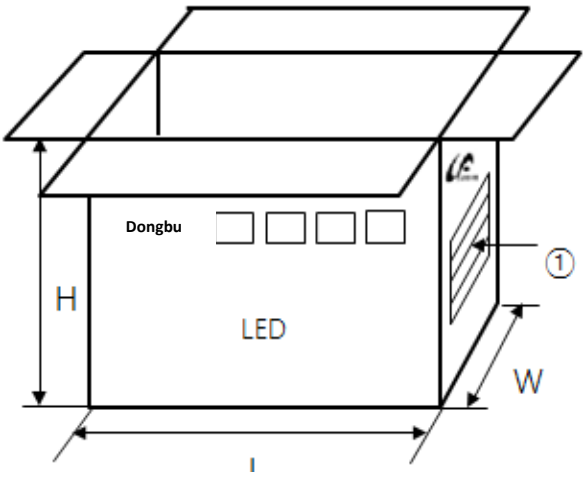




Outer Box

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



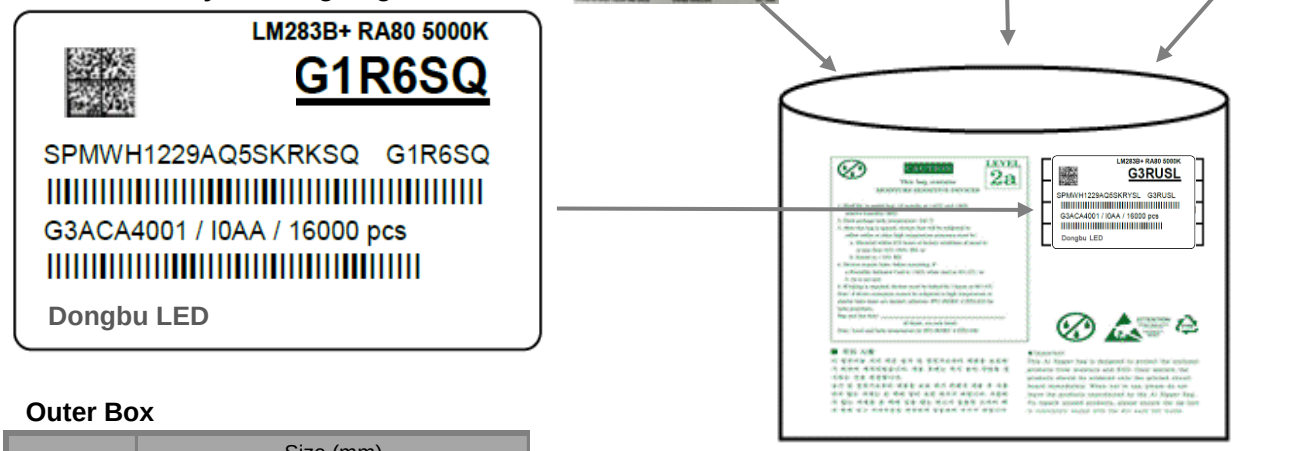
8. Packing Structure

(2) Packing Process (The quantity of PKG on the Reel to be Max 16,000 pcs)

Reel

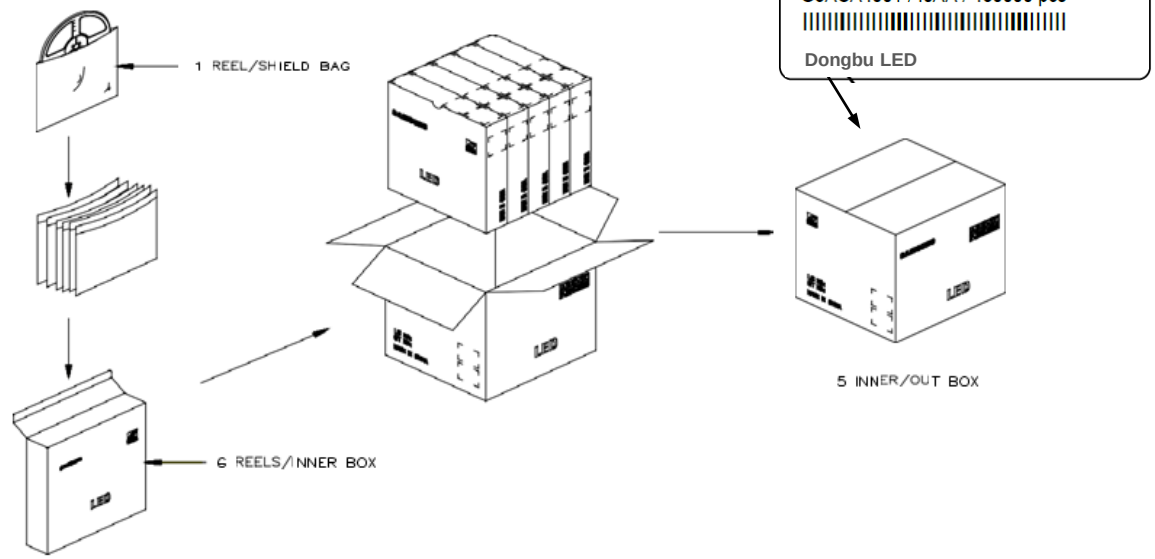


Aluminum Vinyl Packing Bag



Outer Box

Type	Size (mm)		
	L	W	H
Inner	340 ± 5	370 ± 5	80 ± 5
Outer	345 ± 5	378 ± 5	405 ± 5



8. Packing Structure

(3) Packing Process for kitting (The quantity of PKG on the Reel to be Max 4,000 pcs)

Reel

Kitting 'A'



Kitting 'B'



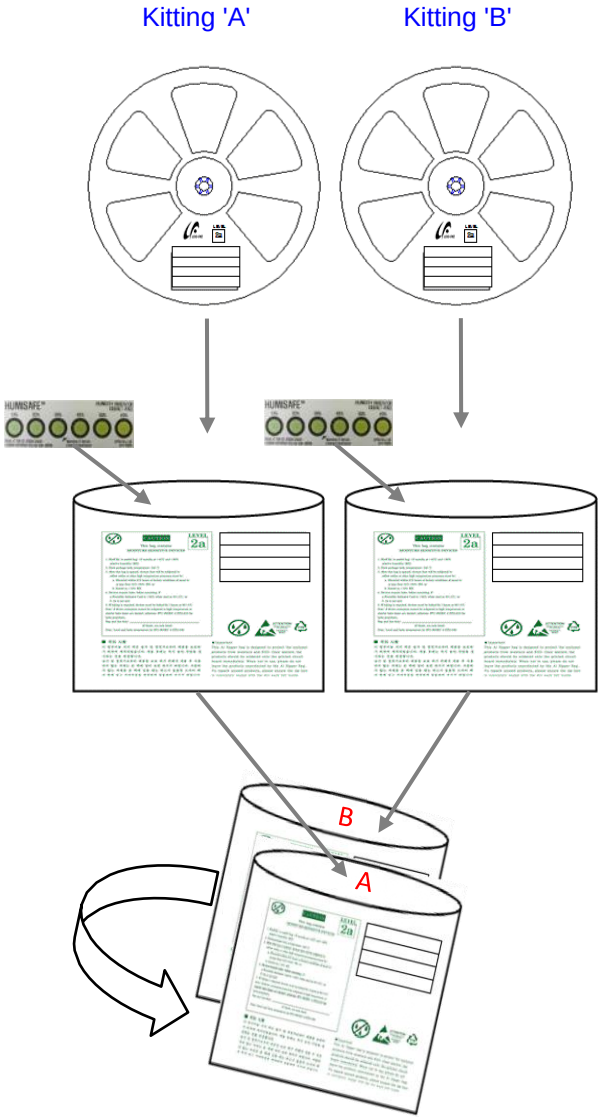
Aluminum Vinyl Packing Bag

Kitting 'A'



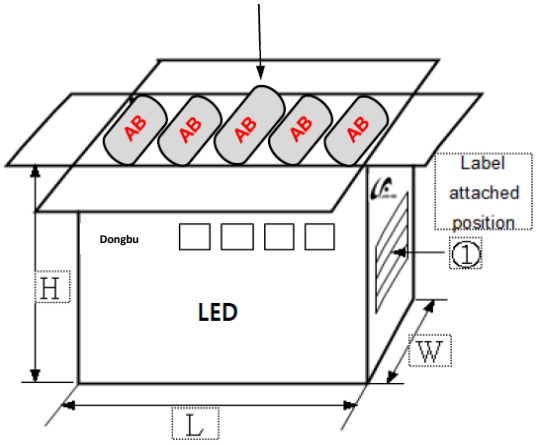
Kitting 'B'





Material : Paper (SW3B(B))

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



8. Packing Structure

(4) Packing Process for kitting (The quantity of PKG on the Reel to be Max 16,000 pcs)

Reel

Kitting 'A'



Kitting 'B'



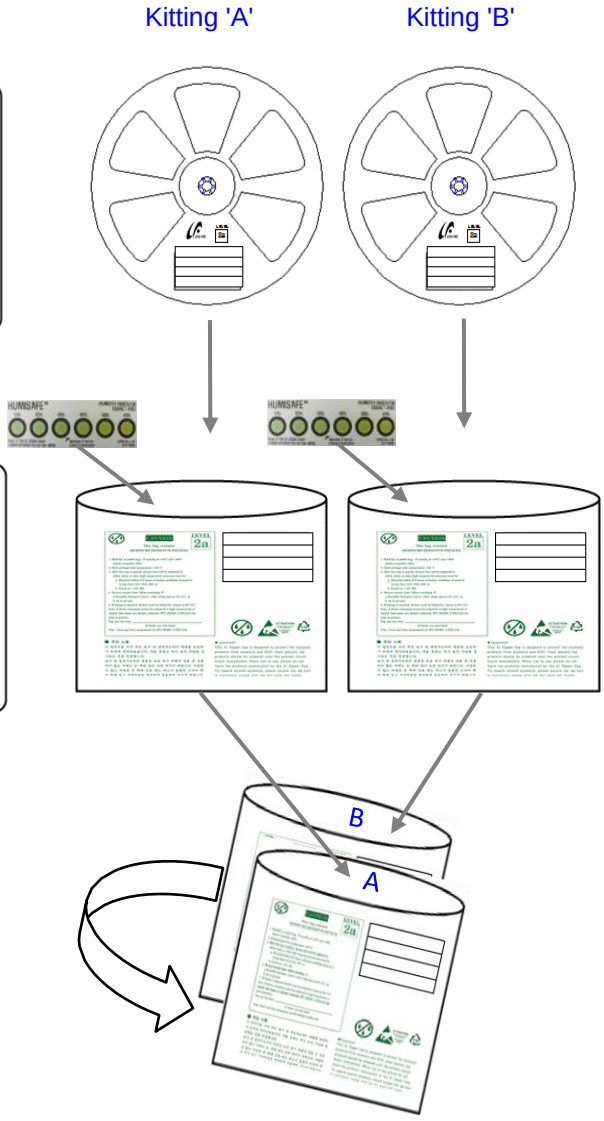
Aluminum Vinyl Packing Bag

Kitting 'A'



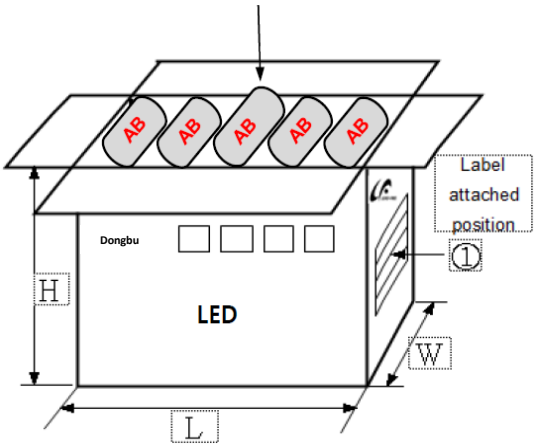
Kitting 'B'





Material : Paper (SW3B(B))

Type	Size (mm)			Note
	L	W	H	
13 inch L	378 ± 5	345 ± 5	405 ± 5	Up to 10 reels

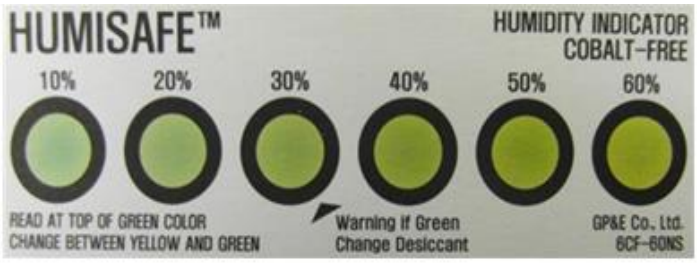


8. Packing Structure

(5) Aluminum Vinyl Packing Bag



(6) Example of Humidity Indicator Card inside Aluminum Vinyl Bag



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) LEDs must be stored in a clean environment.
(shelf life of sealed bags is 12 months at temperature 0~40 ºC, 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 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℃

(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 ºC.

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

9. Precautions in Handling & Use

(11) 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.