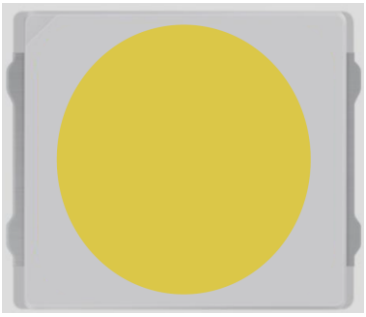
S P E C I F I C A T I O N S

Middle Power LED Series
2835 1.0W 9V Ra80 Room Temp
LM283B+ Round
SP rank



Designed for better lm/$ (Lamps)

Features & Benefits

- **0.9W Class mid power LED**
- **Standard form factor for design flexibility (2.8 × 3.5 x 0.68 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**	**R**	**2**	**2**	**9**	**A**	**D**	**5**	**S**	**G**	**R**	**0**	**S**	**P**

Digit	PKG Information	Code	Specification			
1 2 3	Dongbu Package Middle Power	SPM	Mddle power			
4 5	Color	WH	White			
6	Product Version	R	Round LES			
7 8 9	Form Factor	229	2.8 x 3.5 x 0.68 mm; 2 pads; 3chip;			
10	Sorting Current (mA)	A	100 mA			
11	Chromaticity Coordinates	D	Room Bin			
12	CRI	5	Min. 80			
13 14	Forward Voltage (V)	SG or SK	8.8 ~ 10.0	Bin Code	GZ	8.8 ~ 9.1
					G1	9.1 ~ 9.4
					G2	9.4 ~ 9.7
					G3	9.7 ~ 10.0
			SG : 4,000ea per reel, SK : 16,000ea per 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 bin)			
17 18	Luminous Flux	SP	Bin Code SP			

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_s = 25 ºC)

Item	Unit	Rank	Bin	Min.	Typ.	Max.
Forward Voltage (VF)	V	SG or SK	GZ	8.8		9.1
			G1	9.1		9.4
			G2	9.4		9.7
			G3	9.7		10.0
Color Rendering Index (Ra)		5		80	-	-
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

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

Item	CRI (Ra) Min.	Norminal CCT(K)	Bin	150mA Min.	150mA Max.
Luminous Flux (Φv)	80	2700	SP	132.0	142.0
		3000	SP	134.0	144.0
		3500	SP	137.0	147.0
		4000	SP	141.0	151.0
		5000	SP	144.0	154.0
		5700	SP	143.0	153.0
		6500	SP	141.0	151.0

* Note :

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

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

CRI (Ra) Min.	Nominal CCT (K)	Product Code	Flux Bin	Flux Range (Φ_v, lm)
80	2700	SPMWHR229AQ5SGW☆SP	SP	132.0 ~ 142.0
	3000	SPMWHR229AQ5SGV☆SP	SP	134.0 ~ 144.0
	3500	SPMWHR229AQ5SGU☆SP	SP	137.0 ~ 147.0
	4000	SPMWHR229AQ5SGT☆SP	SP	141.0 ~ 151.0
	5000	SPMWHR229AQ5SGR☆SP	SP	144.0 ~ 154.0
	5700	SPMWHR229AQ5SGQ☆SP	SP	143.0 ~ 153.0
	6500	SPMWHR229AQ5SGP☆SP	SP	141.0 ~ 151.0

* Note :

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

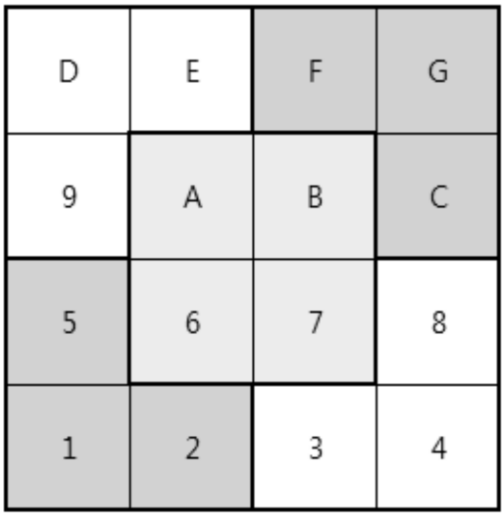
(5) Voltage Bins (I_F = 100 mA, T_s = 25 ºC)

CRI (Ra) Min.	Nominal CCT (K)	Product Code	Voltage Rank	Voltage Bin	Voltage Range (V)
			SG or SK	GZ	8.8 ~ 9.1
				G1	9.1 ~ 9.4
				G2	9.4 ~ 9.7
				G3	9.7 ~ 10.0

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 (GZ+GZ), (G1+G1), (G2+G2) or (G3+G3).
3. A Chromaticity Coordinates of kitting bin is mixed by kitting procedure.(below kitting simulation)

[Kitting example]



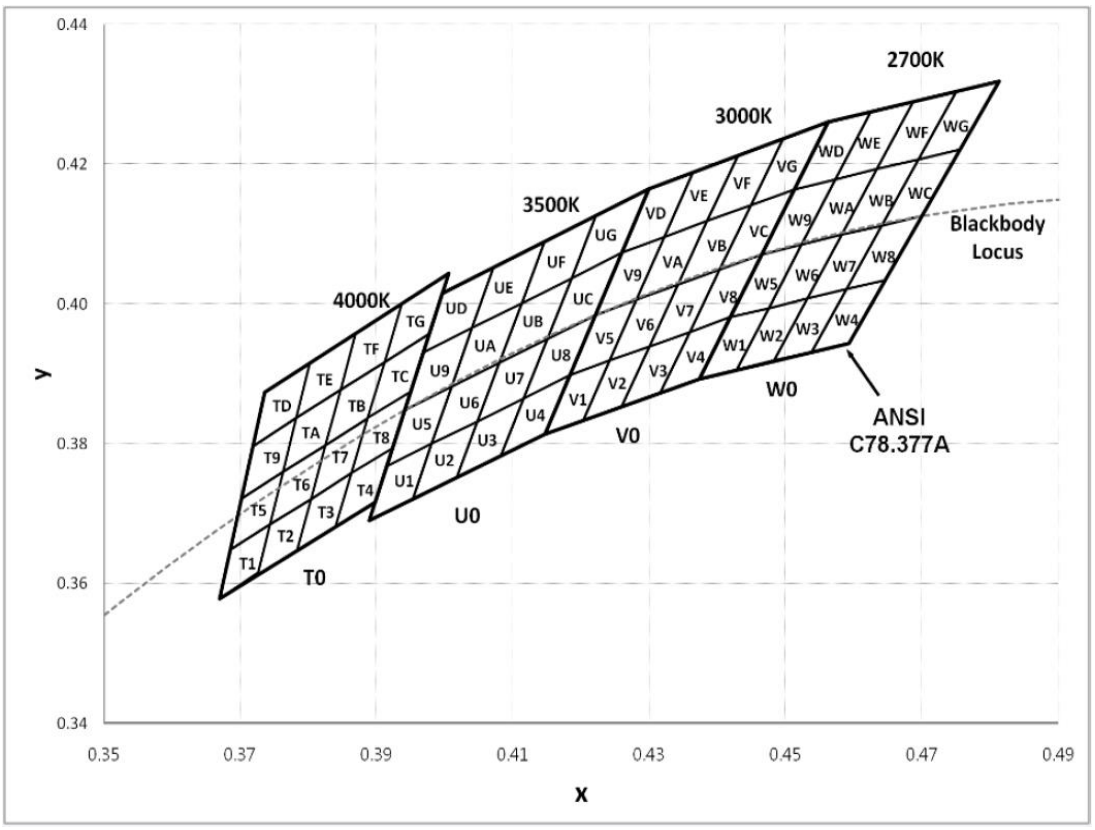
[Binning Information]

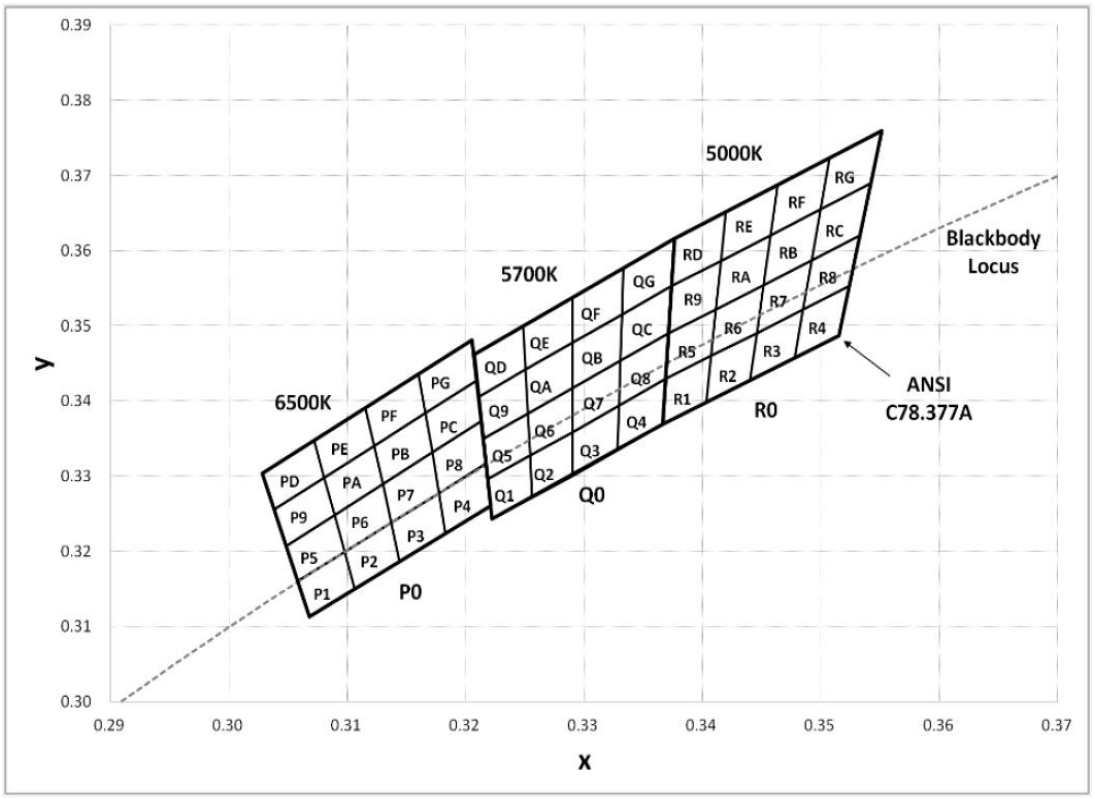
	Bin #1	Bin #2
VF	GZ	GZ
	G1	G1
	G2	G2
	G3	G3
CIE	1, 2, 5 bin	C, F, G bin
	6, 7, A, B bin	6, 7, A, B bin
	3, 4, 8 bin	9, D, E bin

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

CRI (Ra) Min.	Norminal CCT (K)	Product Code	Code Rank	Chromaticity Bins
80	2700	SPMWHR229AQ5SGW0SP	W0 (Whole bin)	W1,W2,W3,W4,W5,W6,W7,W8,W9,WA,WB,WC,WD,WE,WF,WG
		SPMWHR229AQ5SGWMSP	WM (Quarter bin)	W6, W7, WA, WB
		SPMWHR229AQ5SGWKSP	WK (K Kitting bin)	W1,W2,W3,W4,W5,W6,W7,W8,W9,WA,WB,WC,WD,WE,WF,WG
	3000	SPMWHR229AQ5SGV0SP	V0 (Whole bin)	V1,V2,V3,V4,V5,V6,V7,V8,V9,VA,VB,VC,VD,VE,VF,VG
		SPMWHR229AQ5SGVMSP	VM (Quarter bin)	V6, V7, VA, VB
		SPMWHR229AQ5SGVKSP	VK (K Kitting bin)	V1,V2,V3,V4,V5,V6,V7,V8,V9,VA,VB,VC,VD,VE,VF,VG
	3500	SPMWHR229AQ5SGU0SP	U0 (Whole bin)	U1,U2,U3,U4,U5,U6,U7,U8,U9,UA,UB,UC,UD,UE,UF,UG
		SPMWHR229AQ5SGUMSP	UM (Quarter bin)	U6, U7, UA, UB
		SPMWHR229AQ5SGUKSP	UK (K Kitting bin)	U1,U2,U3,U4,U5,U6,U7,U8,U9,UA,UB,UC,UD,UE,UF,UG
	4000	SPMWHR229AQ5SGT0SP	T0 (Whole bin)	T1,T2,T3,T4,T5,T6,T7,T8,T9,TA,TB,TC,TD,TE,TF,TG
		SPMWHR229AQ5SGTMSP	TM (Quarter bin)	T6, T7, TA, TB
		SPMWHR229AQ5SGTKSP	TK (K Kitting bin)	T1,T2,T3,T4,T5,T6,T7,T8,T9,TA,TB,TC,TD,TE,TF,TG
	5000	SPMWHR229AQ5SGR0SP	R0 (Whole bin)	R1,R2,R3,R4,R5,R6,R7,R8,R9,RA,RB,RC,RD,RE,RF,RG
		SPMWHR229AQ5SGRMSP	RM (Quarter bin)	R6, R7, RA, RB
		SPMWHR229AQ5SGRKSP	RK (K Kitting bin)	R1,R2,R3,R4,R5,R6,R7,R8,R9,RA,RB,RC,RD,RE,RF,RG
	5700	SPMWHR229AQ5SGQ0SP	Q0 (Whole bin)	Q1,Q2,Q3,Q4,Q5,Q6,Q7,Q8,Q9,QA,QB,QC,QD,QE,QF,QG
		SPMWHR229AQ5SGQMSP	QM (Quarter bin)	Q6, Q7, QA, QB
		SPMWHR229AQ5SGQKSP	QK (K Kitting bin)	Q1,Q2,Q3,Q4,Q5,Q6,Q7,Q8,Q9,QA,QB,QC,QD,QE,QF,QG
	6500	SPMWHR229AQ5SGP0SP	P0 (Whole bin)	P1,P2,P3,P4,P5,P6,P7,P8,P9,PA,PB,PC,PD,PE,PF,PG
		SPMWHR229AQ5SGPMSP	PM (Quarter bin)	P6, P7, PA, PB
		SPMWHR229AQ5SGPKSP	PK (K Kitting bin)	P1,P2,P3,P4,P5,P6,P7,P8,P9,PA,PB,PC,PD,PE,PF,PG

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

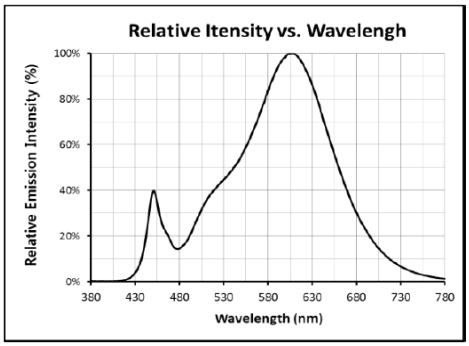
* Note :

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

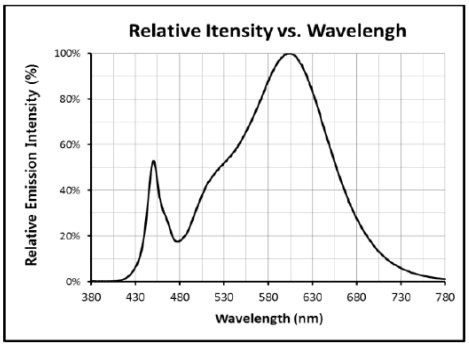
3. Typical Characteristics Graphs

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

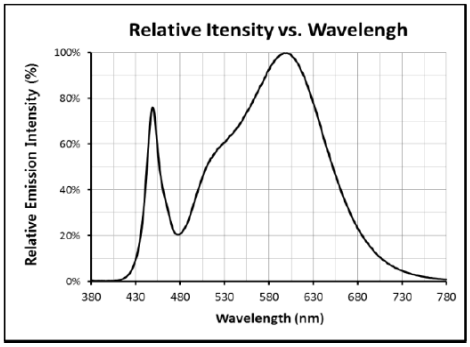
CCT : 2700 K (80 CRI)



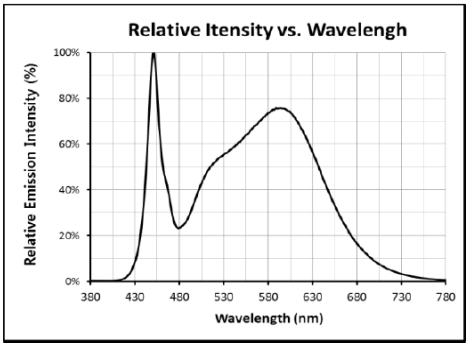
CCT : 3000 K (80 CRI)



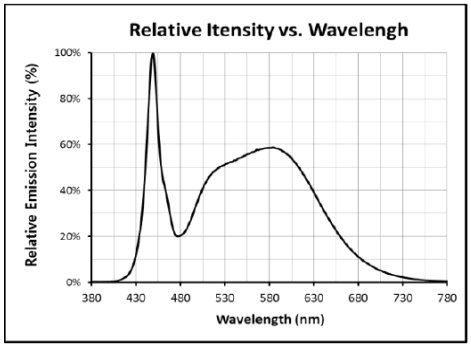
CCT : 3500 K (80 CRI)



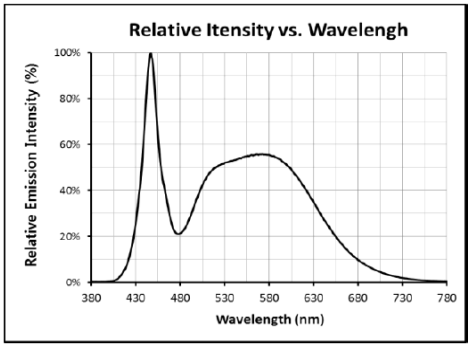
CCT : 4000 K (80 CRI)



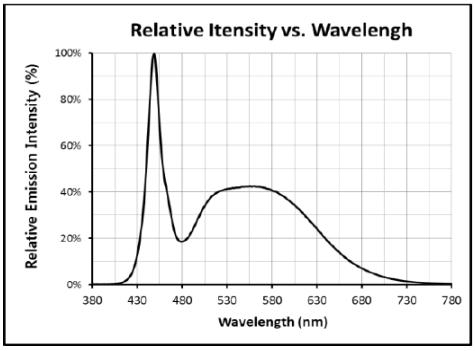
CCT : 5000 K (80 CRI)



CCT : 5700 K (80 CRI)

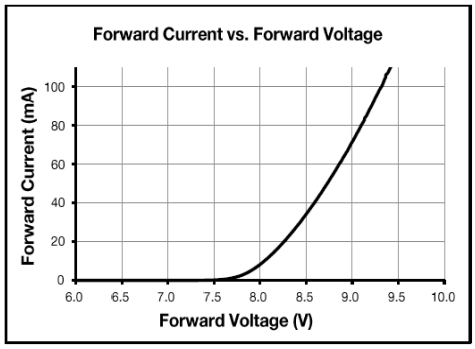


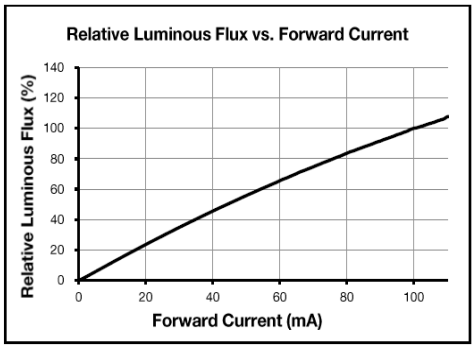
CCT : 6500 K (80 CRI)



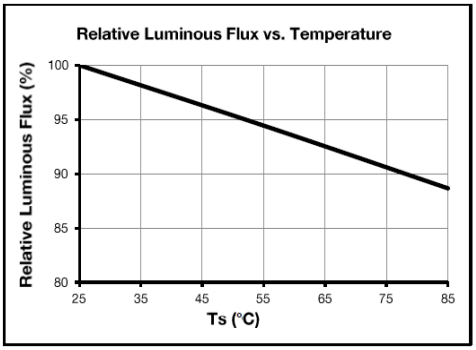
3. Typical Characteristics Graphs

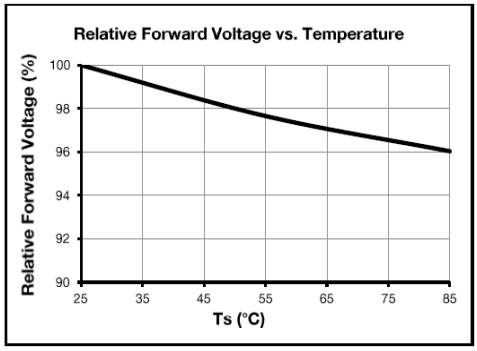
(2) Forward Current Characteristics (T_s=25 ºC)



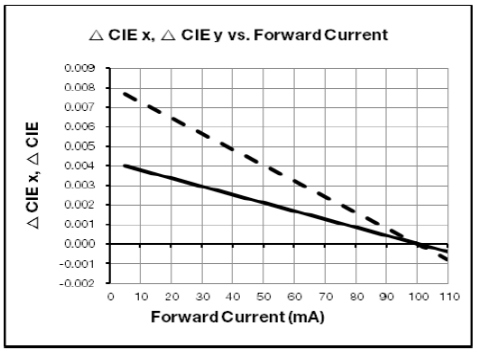


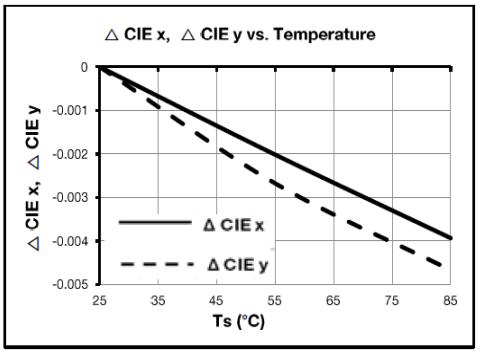
(3)Temperature Characteristics (I_F=100 mA)



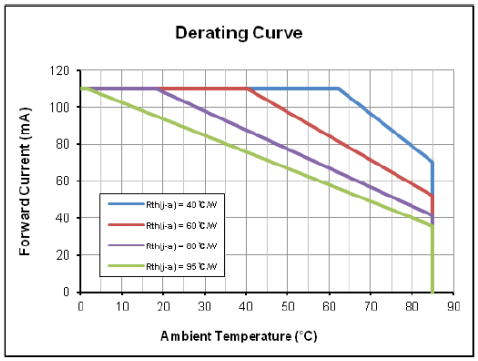


(4) Color Shift Characteristics (I_F=100 mA, T_s=25 ºC)

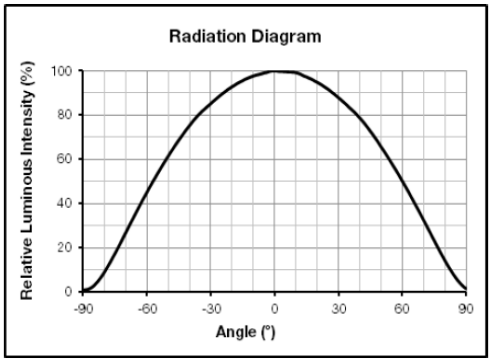




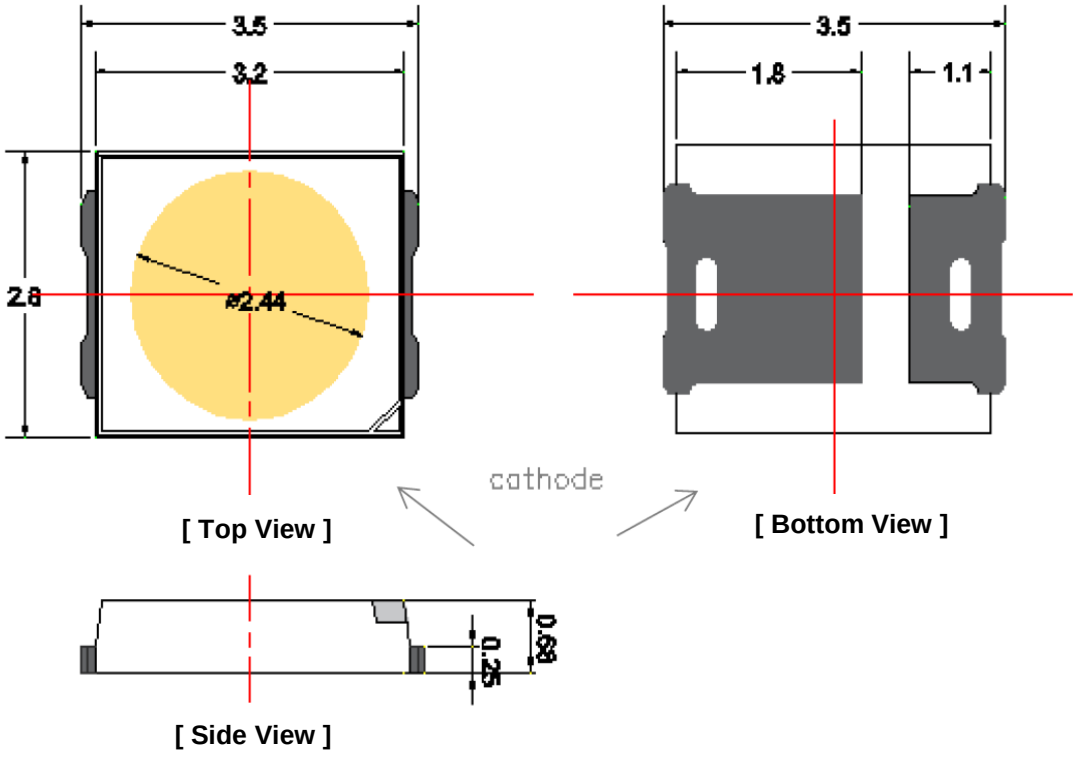
(5) Derating Curve



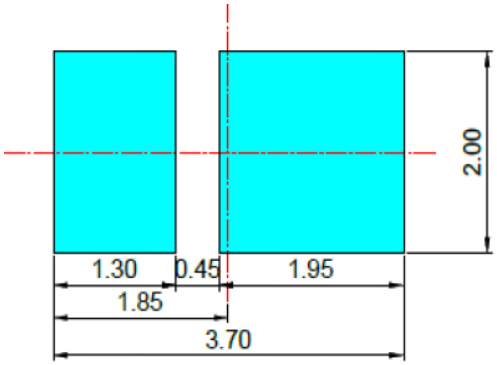
(6) Beam Angle Characteristics (I_F=100 mA, T_a=25 ºC)



4. Outline Drawing & Dimension



[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.

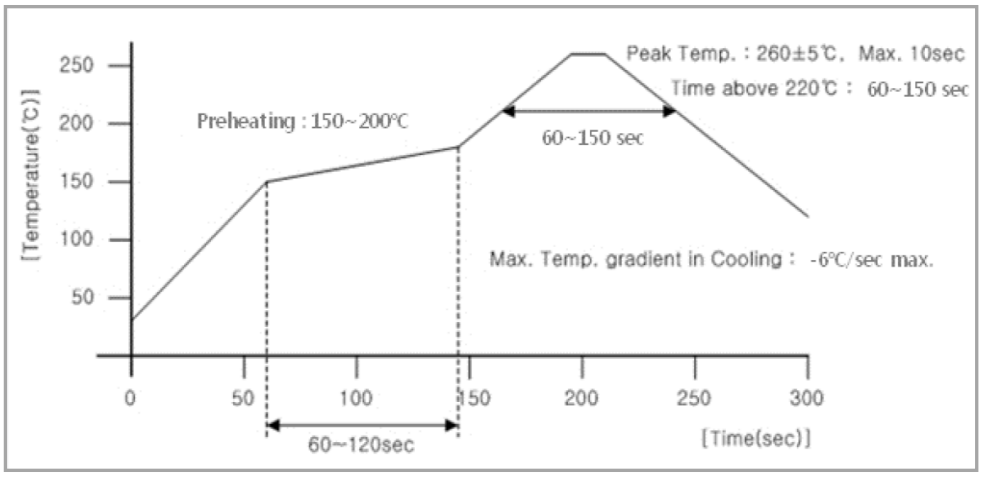
2) Re-soldering should not be done after the LEDs have been soldered. If re-soldering is unavoidable, LED`s characteristics should be carefully checked before and after such repair.

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.



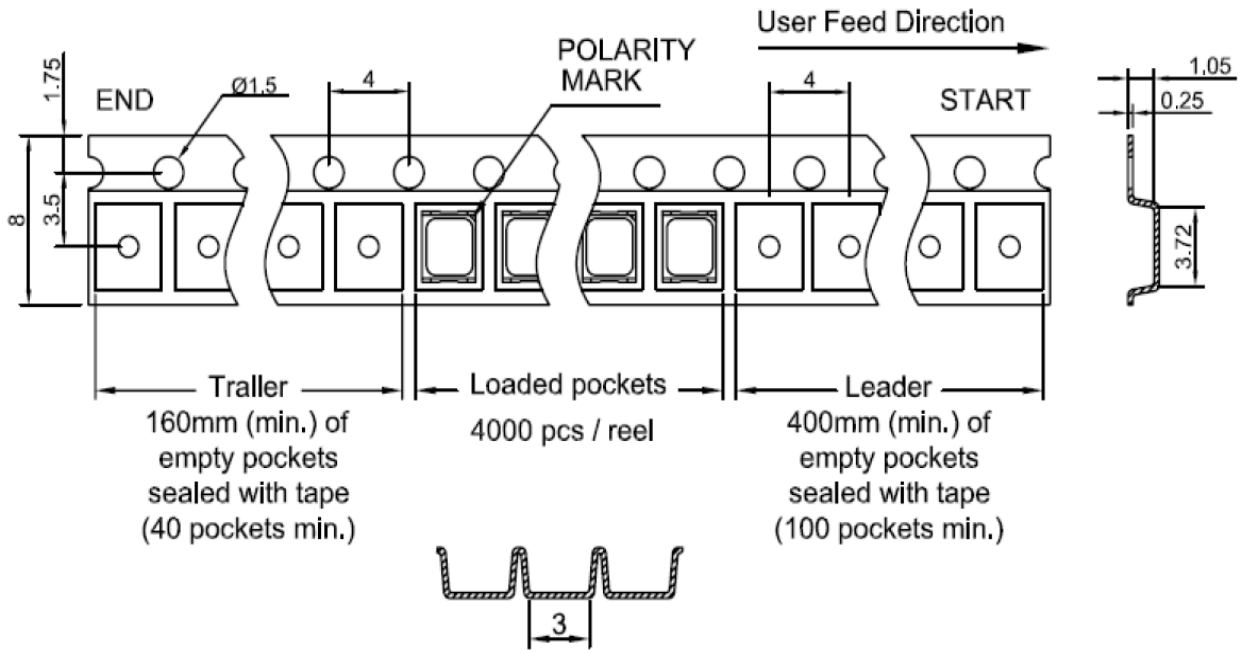
(2) Manual Soldering Conditions

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

6. Tape & Reel

(1) Taping Dimension

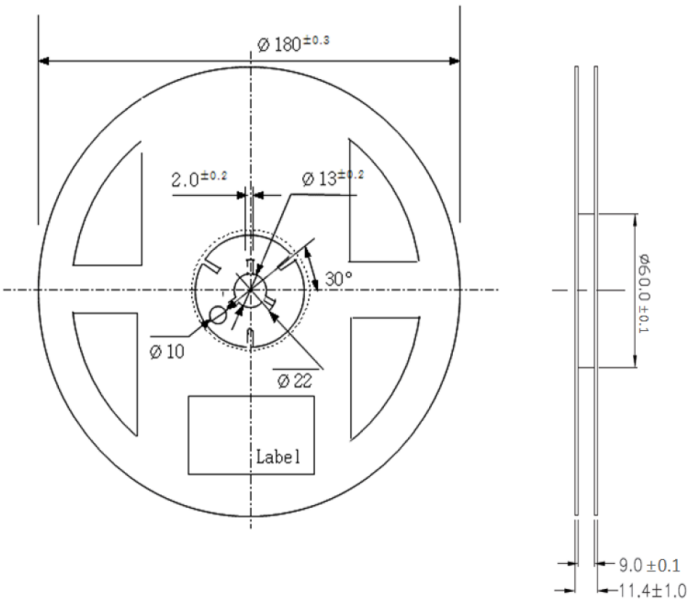
(unit : mm)



6. Tape & Reel

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

(unit : mm)



*** Note :**

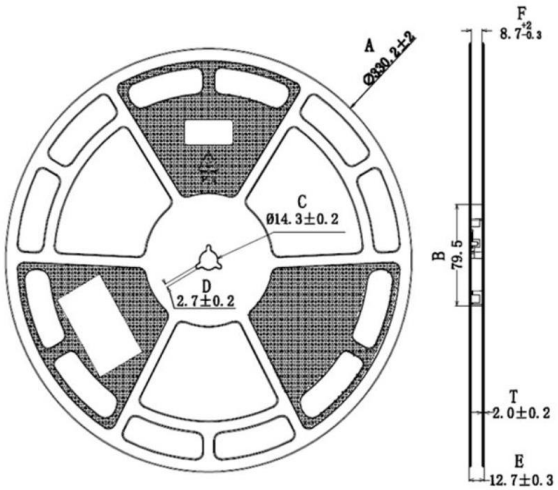
1) Quantity: The quantity/reel is 4,000 pcs

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)

(unit : mm)



A±2	B±0.5	C±0.2	D±0.2	E±0.3	F +2 −0.3	T±0.2
Ø330.2	Ø79.5	Ø14.3	2.7	12.7	8.7	2.0

*** Note :**

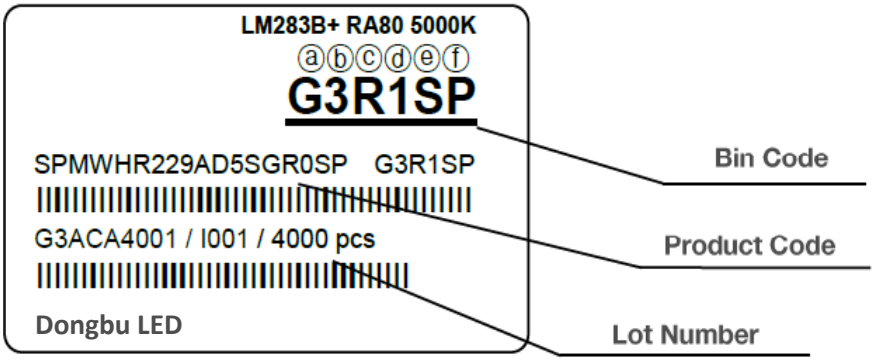
1) Quantity: The quantity/reel is 16,000 pcs

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

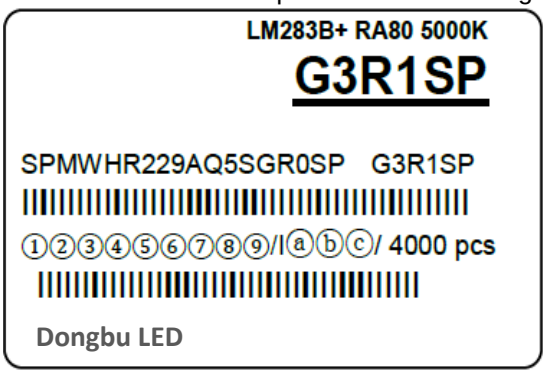
ⓐⓑ: Forward Voltage bin (refer to page 5)

ⓒⓓ: Chromaticity bin (refer to page 7)

ⓔⓕ: Luminous Flux bin (refer to page 6)

(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)

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)

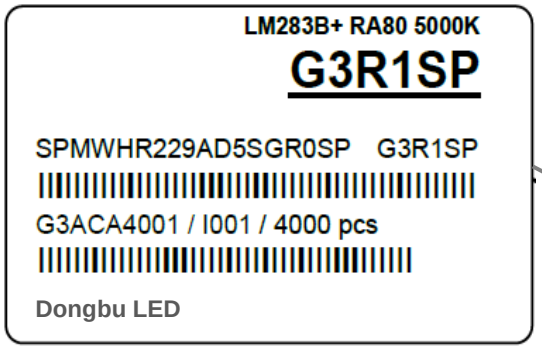
⑥ : Day (1~9, A, B~V)

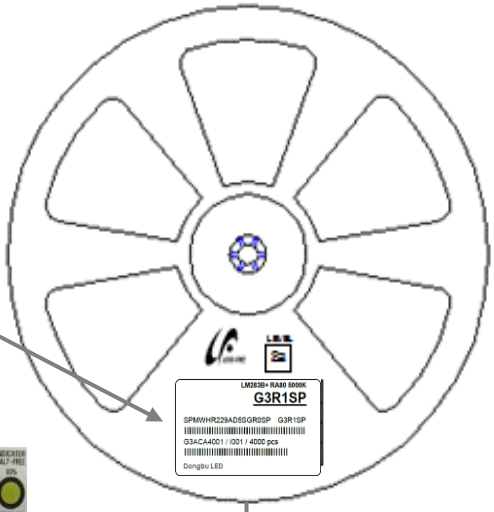
⑦⑧⑨ ⓐⓑⓒ : Product serial number

8. Packing Structure

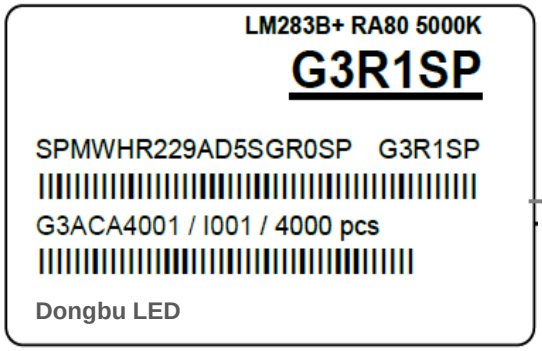
(1) Packing Process (The quantity of PKG on the Reel to be Max 4,000 pcs)

Reel





Aluminum Vinyl Packing Bag



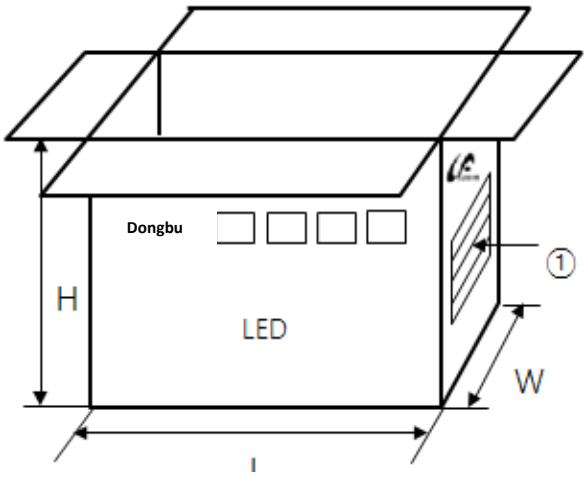




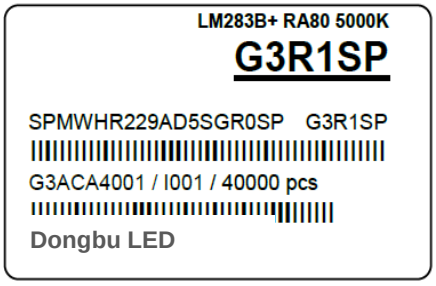
Outer Box

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

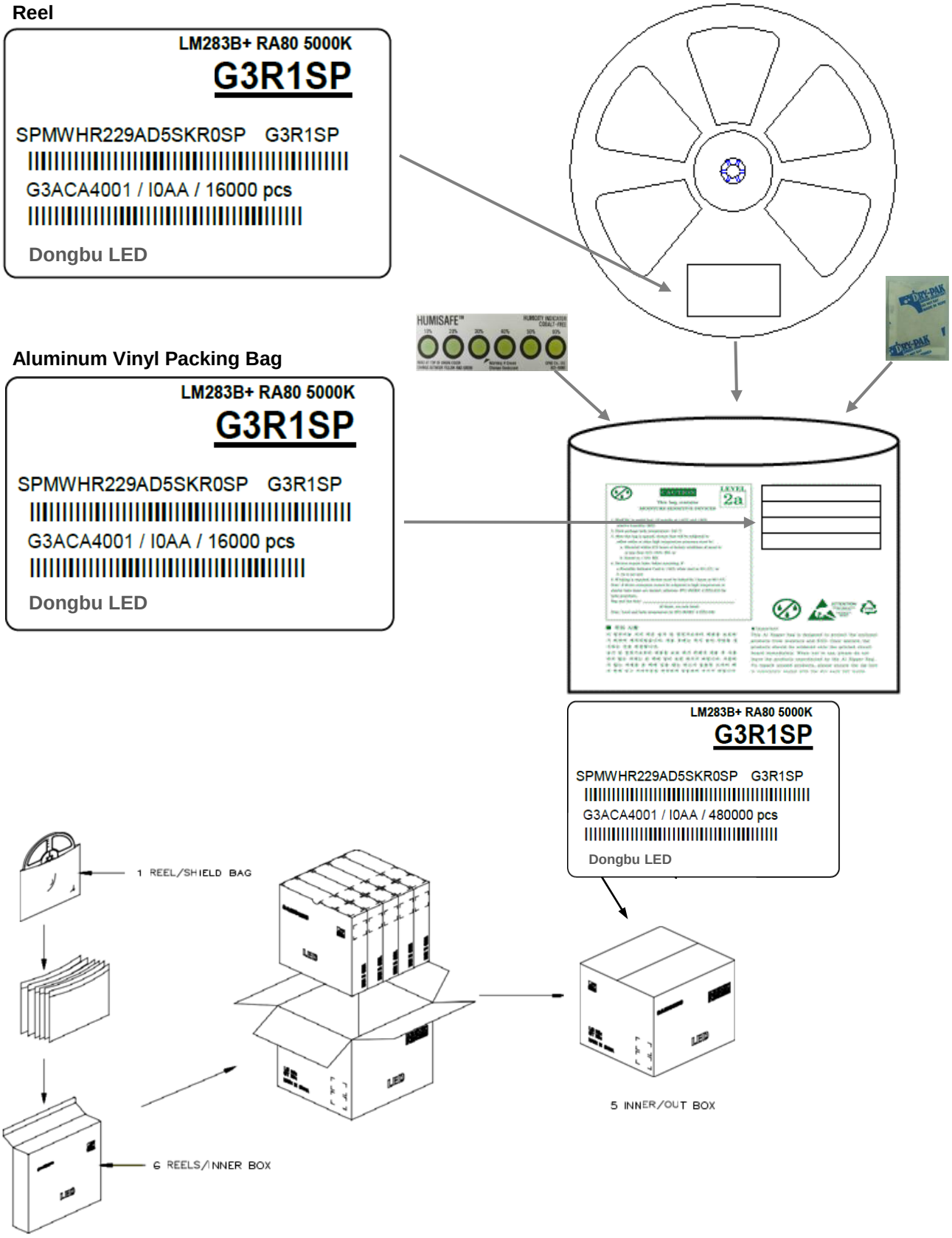


① Side Label



8. Packing Structure

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



8. Packing Structure

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

Reel

Kitting 'A'

LM283B+ RA80 ★K
G3★1SP
SPMWHR229AD5SG★KSP G3★1SP
G3ACA001 / I0AA / 4000 pcs
Dongbu LED

Kitting 'B'

LM283B+ RA80 ★K
G3★CSP
SPMWHR229AD5SG★KSP G3★CSP
G3ACA4001 / I0AA / 4000 pcs
Dongbu LED

Aluminum Vinyl Packing Bag

Kitting 'A'

LM283B+ RA80 ★K
G3★1SP
SPMWHR229AD5SG★KSP G3★1SP
G3ACA4001 / I0AA / 4000 pcs
Dongbu LED

Kitting 'B'

LM283B+ RA80 ★K
G3★CSP
SPMWHR229AD5SG★KSP G3★CSP
G3ACA4001 / I0AA / 4000 pcs
Dongbu LED

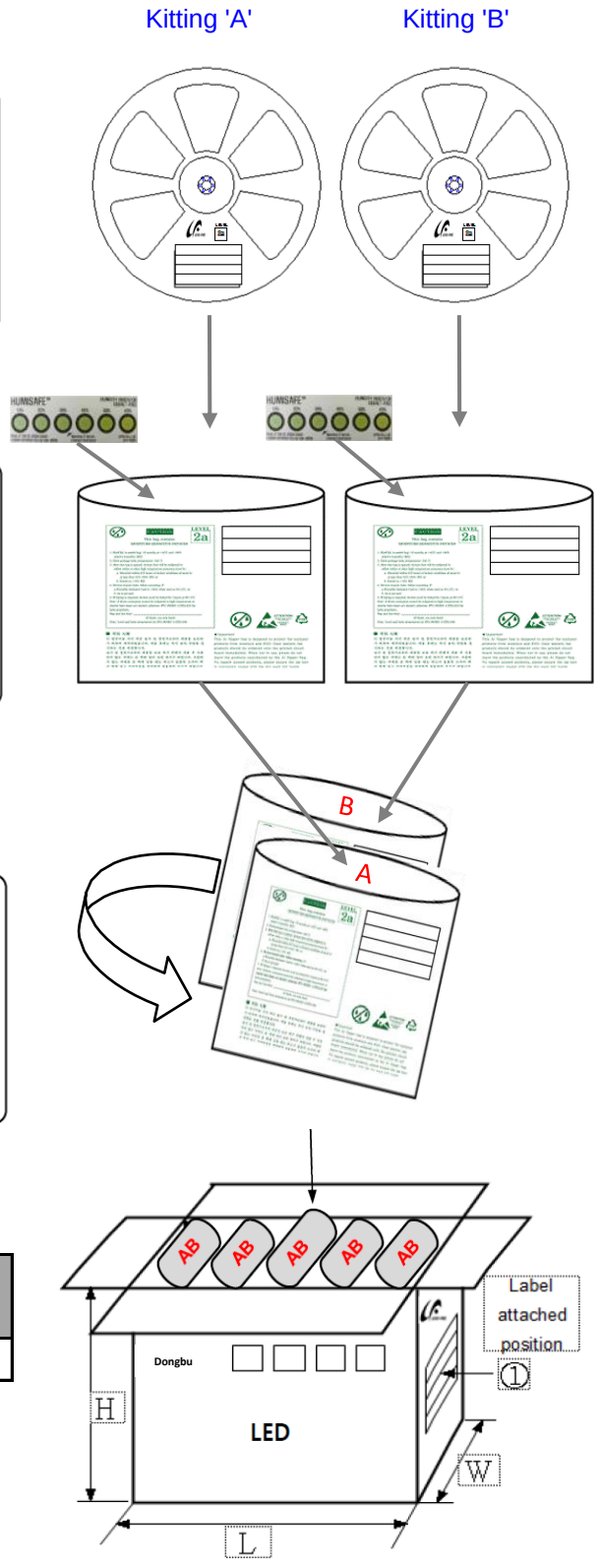
Aluminum Vinyl Packing Bag

Kitting 'A'

LM283B+ RA80 ★K
G3★1SP
SPMWHR229AD5SG★KSP G3★1SP
G3ACA4001 / I0AA / 20000 pcs
Dongbu LED

Kitting 'B'

LM283B+ RA80 ★K
G3★CSP
SPMWHR229AD5SG★KSP G3★CSP
G3ACA4001 / I0AA / 20000 pcs
Dongbu LED



Material : Paper (SW3B(B))

Type	Size (mm)			Note
	L	W	H	
13 inch L	345 ± 5	378 ± 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.