

High Voltage LED Series
Chip on Board

COB D-Gen.3 Plus



High efficacy COB LED package
well-suited for use in spotlight applications

Features & Benefits

- Chip on Board (COB) solution makes it easy to design in
- Simple assembly reduces manufacturing cost
- Low thermal resistance
- InGaN/GaN MQW LED with long time reliability

Applications

- Spotlight / Downlight
- LED Retrofit Bulbs
- Outdoor Illumination



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1. Characteristics

a) Absolute Maximum Rating

Item	Symbol	Model	Rating	Unit	Condition
Ambient / Operating Temperature	T_a	-	-40 ~ +105	°C	-
Storage Temperature	T_{stg}	-	-40 ~ +120	°C	-
LED Junction Temperature	T_J	-	150	°C	-
Case Temperature	T_c	-	115	°C	-
		LC003D	180 / 6.6		-
		LC006D	360 / 13.2		-
		LC009D	540 / 19.8		-
		LC013D	720 / 26.4		-
		LC016D	900 / 33.0		-
Forward Current / Power Dissipation	I_F / P_D	LC019D	1080 / 39.5	mA / W	-
		LC026D	1440 / 52.7		-
		LC033D	1800 / 65.9		-
		LC040D	2160 / 79.1		-
		LC060D	2160 / 118.4		-
		LC080D	3240 / 177.6		-
ESD (HBM)	-	-	±2	kV	-

b) Electro-optical Characteristics (I_F = Sorting Current, T_J = 85 °C)

Item	Unit	Model	Rank	Min.	Typ.	Max.
Forward Voltage (V _F)	V	All model	YZ	30.9	33.7	36.6
			1Z	46.4	50.6	54.8
Color Rendering Index (R _a)	-	All model	3	70	-	-
			5	80	-	-
			7	90	-	-
			-	-	115	-
Nominal Power / Sorting Current	W / mA	LC003D	-	-	3.0 / 90	-
		LC006D	-	-	6.1 / 180	-
		LC009D	-	-	9.1 / 270	-
		LC013D	-	-	12.1 / 360	-
		LC016D	-	-	15.2 / 450	-
		LC019D	-	-	18.2 / 540	-
		LC026D	-	-	24.3 / 720	-
		LC033D	-	-	30.3 / 900	-
		LC040D	-	-	36.4 / 1080	-
		LC060D	-	-	54.6 / 1080	-
		LC080D	-	-	81.9 / 1620	-
		LC003D	-	-	2.43	-
		LC006D	-	-	1.41	-
		LC009D	-	-	0.94	-
LC013D	-	-	0.81	-		
Thermal Resistance (Junction to chip case)	°C/W	LC016D	-	-	0.64	-
		LC019D	-	-	0.57	-
		LC026D	-	-	0.45	-
		LC033D	-	-	0.38	-
		LC040D	-	-	0.30	-
		LC060D	-	-	0.23	-
		LC080D	-	-	0.15	-

Notes:

- 1) The COB is tested in pulsed condition at rated test current (10 ms pulse width) and rated temperature (T_J = T_C = T_a = 85 °C)
- 2) Samsung maintains measurement tolerance of: forward voltage = ±5 %, CRI = ±1
- 3) Refer to the derating curve, '3. Typical Characteristics Graph'designed within the range.

c) Luminous Flux Characteristics (I_F = Sorting Current)

Model	CRI (R _a)		Flux Rank	Flux@ T _J = 85 °C (lm)				
	Min.	Nominal CCT (K)		Min.	Typ.	Max.		
LC003DC	80	2700	DC	450	479	-		
		3000	DC	468	498	-		
		3500	DC	485	516	-		
		4000	DC	495	526	-		
		5000	DC	504	536	-		
		5700	DC	497	529	-		
		6500	DC	489	520	-		
	90	2700	DC	382	407	-		
		3000	DC	402	428	-		
		3500	DC	415	441	-		
		4000	DC	423	450	-		
		5000	DC	431	459	-		
		LC006DC	80	2700	DC	888	945	-
				3000	DC	924	983	-
3500	DC			960	1021	-		
4000	DC			976	1038	-		
5000	DC			993	1056	-		
5700	DC			976	1038	-		
6500	DC			960	1022	-		
90	2700	DC	748	796	-			
	3000	DC	787	838	-			
	3500	DC	813	865	-			
	4000	DC	831	884	-			
	5000	DC	848	902	-			

Notes:

- 1) The COB is tested in pulsed operating condition at rated test current (10 ms pulse width) and rated temperature (T_J = T_C = 85 °C).
- 2) Samsung maintains measurement tolerance of: Luminous flux = ±7 %, CRI = ±1

Model	CRI (R _a) Min.	Nominal CCT (K)	Flux Rank	Flux@ T _J = 85 °C (lm)		
				Min.	Typ.	Max.
LC009DC	70	3000	DC	1491	1586	-
		4000	DC	1513	1610	-
		5000	DC	1528	1625	-
	80	2700	DC	1322	1406	-
		3000	DC	1375	1463	-
		3500	DC	1428	1519	-
		4000	DC	1457	1550	-
		5000	DC	1481	1576	-
		5700	DC	1462	1555	-
	90	6500	DC	1437	1529	-
		2700	DC	1119	1190	-
		3000	DC	1179	1254	-
		3500	DC	1217	1294	-
		4000	DC	1243	1322	-
	LC013DC	70	5000	DC	1267	1348
3000			DC	1972	2098	-
4000			DC	2005	2133	-
80		5000	DC	2033	2162	-
		2700	DC	1757	1869	-
		3000	DC	1828	1945	-
		3500	DC	1899	2020	-
		4000	DC	1933	2056	-
		5000	DC	1965	2090	-
90		5700	DC	1934	2057	-
		6500	DC	1912	2034	-
		2700	DC	1484	1579	-
		3000	DC	1561	1661	-
		3500	DC	1609	1712	-
		90	4000	DC	1644	1748
	5000		DC	1684	1792	-

Notes:

- 1) The COB is tested in pulsed operating condition at rated test current (10 ms pulse width) and rated temperature (T_J = T_C = 85 °C).
- 2) Samsung maintains measurement tolerance of: Luminous flux = ±7 %, CRI = ±1

Model	CRI (R _a)		Flux Rank	Flux@ T _J = 85 °C (lm)		
	Min.	Nominal CCT (K)		Min.	Typ.	Max.
LC016DC	70	3000	DC	2563	2727	-
		4000	DC	2598	2763	-
		5000	DC	2629	2797	-
	80	2700	DC	2280	2426	-
		3000	DC	2373	2524	-
		3500	DC	2464	2621	-
		4000	DC	2509	2669	-
		5000	DC	2550	2713	-
		5700	DC	2510	2670	-
	90	6500	DC	2470	2627	-
		2700	DC	1924	2047	-
		3000	DC	2025	2154	-
		3500	DC	2089	2223	-
		4000	DC	2136	2273	-
		5000	DC	2189	2328	-
LC019DC	70	3000	DC	3087	3284	-
		4000	DC	3133	3332	-
		5000	DC	3167	3369	-
	80	2700	DC	2749	2925	-
		3000	DC	2861	3044	-
		3500	DC	2971	3161	-
		4000	DC	3025	3218	-
		5000	DC	3075	3271	-
		5700	DC	3024	3217	-
	90	6500	DC	2975	3164	-
		2700	DC	2321	2469	-
		3000	DC	2442	2597	-
		3500	DC	2519	2680	-
		4000	DC	2573	2738	-
		5000	DC	2636	2804	-

Notes:

- 1) The COB is tested in pulsed operating condition at rated test current (10 ms pulse width) and rated temperature (T_J = T_C = 85 °C).
- 2) Samsung maintains measurement tolerance of: Luminous flux = ±7 %, CRI = ±1

Model	CRI (R _a) Min.	Nominal CCT (K)	Flux Rank	Flux@ T _J = 85 °C (lm)		
				Min.	Typ.	Max.
LC026DC	70	3000	DC	4032	4289	-
		4000	DC	4086	4347	-
		5000	DC	4132	4396	-
	80	2700	DC	3587	3816	-
		3000	DC	3733	3971	-
		3500	DC	3877	4125	-
		4000	DC	3946	4198	-
		5000	DC	4012	4268	-
		5700	DC	3949	4201	-
	90	6500	DC	3885	4133	-
		2700	DC	3029	3222	-
		3000	DC	3185	3389	-
		3500	DC	3287	3496	-
		4000	DC	3358	3572	-
		5000	DC	3443	3663	-
LC033DC	70	3000	DC	4946	5261	-
		4000	DC	5017	5337	-
		5000	DC	5098	5424	-
	80	2700	DC	4405	4686	-
		3000	DC	4583	4875	-
		3500	DC	4760	5064	-
		4000	DC	4841	5150	-
		5000	DC	4926	5240	-
		5700	DC	4848	5158	-
	90	6500	DC	4784	5089	-
		2700	DC	3718	3955	-
		3000	DC	3911	4160	-
		3500	DC	4036	4293	-
		4000	DC	4123	4386	-
		5000	DC	4224	4493	-

Notes:

- 1) The COB is tested in pulsed operating condition at rated test current (10 ms pulse width) and rated temperature (T_J = T_C = 85 °C).
- 2) Samsung maintains measurement tolerance of: Luminous flux = ±7 %, CRI = ±1

Model	CRI (R _a) Min.	Nominal CCT (K)	Flux Rank	Flux@ T _j = 85 °C (lm)		
				Min.	Typ.	Max.
LC040DC	70	3000	DC	6060	6446	-
		4000	DC	6166	6560	-
		5000	DC	6241	6639	-
	80	2700	DC	5393	5737	-
		3000	DC	5610	5968	-
		3500	DC	5827	6199	-
		4000	DC	5932	6311	-
		5000	DC	6030	6414	-
		5700	DC	5934	6313	-
	90	6500	DC	5868	6242	-
		2700	DC	4565	4856	-
		3000	DC	4802	5108	-
		3500	DC	4944	5260	-
		4000	DC	5052	5374	-
		5000	DC	5177	5507	-
LC060DC	70	3000	DC	9010	9585	-
		4000	DC	9140	9723	-
		5000	DC	9278	9870	-
	80	2700	DC	8025	8537	-
		3000	DC	8349	8882	-
		3500	DC	8672	9225	-
		4000	DC	8820	9383	-
		5000	DC	8973	9546	-
		5700	DC	8832	9395	-
	90	6500	DC	8698	9253	-
		2700	DC	6773	7206	-
		3000	DC	7124	7579	-
		3500	DC	7351	7821	-
		4000	DC	7510	7990	-
		5000	DC	7695	8186	-

Notes:

- 1) The COB is tested in pulsed operating condition at rated test current (10 ms pulse width) and rated temperature (T_J = T_C = 85 °C).
- 2) Samsung maintains measurement tolerance of: Luminous flux = ±7 %, CRI = ±1

Model	CRI (R _a)		Flux Rank	Flux@ T _J = 85 °C (lm)		
	Min.	Nominal CCT (K)		Min.	Typ.	Max.
LC080DC	70	3000	DC	13242	14087	-
		4000	DC	13433	14290	-
		5000	DC	13582	14449	-
	80	2700	DC	11738	12487	-
		3000	DC	12211	12990	-
		3500	DC	12683	13492	-
		4000	DC	12911	13735	-
		5000	DC	13123	13961	-
		5700	DC	12941	13767	-
	90	6500	DC	12770	13585	-
		2700	DC	9955	10590	-
		3000	DC	10471	11139	-
		3500	DC	10805	11495	-
		4000	DC	11038	11743	-
		5000	DC	11255	11974	-

Notes:

- 1) The COB is tested in pulsed operating condition at rated test current (10 ms pulse width) and rated temperature (T_J = T_C = 85 °C).
- 2) Samsung maintains measurement tolerance of: Luminous flux = ±7 %, CRI = ±1

2. Product Code Information

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
S	P	H	W	H	A	H	D	N	G	2	5	Y	Z	W	3	D	C

Digit	PKG Information	Code	Specification
1 2 3	Samsung Package High Power	SPH	
4 5	Color	WH	White
6	Product Version	A	
7 8	Form Factor	HD	COB
9	Lens Type	N	No lens
10	Wattage or Model	A B C D E F G H K L M	LC003D LC006D LC009D LC013D LC016D LC019D LC026D LC033D LC040D LC060D LC080D
11	Internal Code	2	
12	CRI & Sorting Temperature	3 5 7	Min. 70 (85°C) Min. 80 (85°C) Min. 90 (85°C)
13 14	Forward Voltage (V)	YZ 1Z	30.9~36.6 46.4~54.8
15	CCT (K)	W V U T R Q P	2700K 3000K 3500K 4000K 5000K 5700K 6500K
16	MacAdam Step	1 2 3	MacAdam 1-step MacAdam 2-step MacAdam 3-step
17 18	Luminous Flux (Lm)	DC	COB D-series Gen.3 Plus

a) Binning Structure

※ LCo3D(I_F = 90 mA, T_J = 85 °C)

CRI(R _a) Min.	Nominal CCT(K)	Product Code	V _F Rank	Color Rank	Flux Rank	Flux Range (Φ _v , lm)
80	2700	SPHWAHDNA25YZW1DC	YZ	W1	DC	450~
		SPHWAHDNA25YZW2DC		W2		
		SPHWAHDNA25YZW3DC		W3		
	3000	SPHWAHDNA25YZV1DC	YZ	V1	DC	468~
		SPHWAHDNA25YZV2DC		V2		
		SPHWAHDNA25YZV3DC		V3		
	3500	SPHWAHDNA25YZU1DC	YZ	U1	DC	485~
		SPHWAHDNA25YZU2DC		U2		
		SPHWAHDNA25YZU3DC		U3		
	4000	SPHWAHDNA25YZT1DC	YZ	T1	DC	495~
		SPHWAHDNA25YZT2DC		T2		
		SPHWAHDNA25YZT3DC		T3		
	5000	SPHWAHDNA25YZR2DC	YZ	R2	DC	504~
		SPHWAHDNA25YZR3DC		R3		
	5700	SPHWAHDNA25YZQ2DC	YZ	Q2	DC	497~
		SPHWAHDNA25YZQ3DC		Q3		
	6500	SPHWAHDNA25YZP2DC	YZ	P2	DC	489~
		SPHWAHDNA25YZP3DC		P3		
90	2700	SPHWAHDNA27YZW1DC	YZ	W1	DC	382~
		SPHWAHDNA27YZW2DC		W2		
		SPHWAHDNA27YZW3DC		W3		
	3000	SPHWAHDNA27YZV1DC	YZ	V1	DC	402~
		SPHWAHDNA27YZV2DC		V2		
		SPHWAHDNA27YZV3DC		V3		
	3500	SPHWAHDNA27YZU1DC	YZ	U1	DC	415~
		SPHWAHDNA27YZU2DC		U2		
		SPHWAHDNA27YZU3DC		U3		
	4000	SPHWAHDNA27YZT1DC	YZ	T1	DC	423~
		SPHWAHDNA27YZT2DC		T2		
		SPHWAHDNA27YZT3DC		T3		
	5000	SPHWAHDNA27YZR2DC	YZ	R2	DC	431~
		SPHWAHDNA27YZR3DC		R3		

※ LC006D(I_F = 180 mA, T_J = 85 °C)

CRI(R _a) Min.	Nominal CCT(K)	Product Code	V _F Rank	Color Rank	Flux Rank	Flux Range (Φ _v , lm)
80	2700	SPHWAHADB25YZW1DC	YZ	W1	DC	888~
		SPHWAHADB25YZW2DC		W2		
		SPHWAHADB25YZW3DC		W3		
	3000	SPHWAHADB25YZV1DC	YZ	V1	DC	924~
		SPHWAHADB25YZV2DC		V2		
		SPHWAHADB25YZV3DC		V3		
	3500	SPHWAHADB25YZU1DC	YZ	U1	DC	960~
		SPHWAHADB25YZU2DC		U2		
		SPHWAHADB25YZU3DC		U3		
	4000	SPHWAHADB25YZT1DC	YZ	T1	DC	976~
		SPHWAHADB25YZT2DC		T2		
		SPHWAHADB25YZT3DC		T3		
	5000	SPHWAHADB25YZR2DC	YZ	R2	DC	993~
		SPHWAHADB25YZR3DC		R3		
		SPHWAHADB25YZQ2DC		Q2		
	5700	SPHWAHADB25YZQ3DC	YZ	Q3	DC	976~
		SPHWAHADB25YZP2DC		P2		
	6500	SPHWAHADB25YZP3DC	YZ	P3	DC	960~
SPHWAHADB27YZW1DC		YZ		W1		
2700	SPHWAHADB27YZW2DC		W2			
	SPHWAHADB27YZW3DC		W3			
	3000	SPHWAHADB27YZV1DC	YZ	V1	DC	787~
SPHWAHADB27YZV2DC		V2				
SPHWAHADB27YZV3DC		V3				
3500	SPHWAHADB27YZU1DC	YZ	U1	DC	813~	
	SPHWAHADB27YZU2DC		U2			
	SPHWAHADB27YZU3DC		U3			
4000	SPHWAHADB27YZT1DC	YZ	T1	DC	831~	
	SPHWAHADB27YZT2DC		T2			
	SPHWAHADB27YZT3DC		T3			
5000	SPHWAHADB27YZR2DC	YZ	R2	DC	848~	
	SPHWAHADB27YZR3DC		R3			

※ LCoogD(I_F = 270 mA, T_J = 85 °C)

CRI(R _a) Min.	Nominal CCT(K)	Product Code	V _F Rank	Color Rank	Flux Rank	Flux Range (Φ _v , lm)
70	3000	SPHWHAHDC23YZV2DC	YZ	V2	DC	1491~
		SPHWHAHDC23YZV3DC		V3		
	4000	SPHWHAHDC23YZT2DC	YZ	T2	DC	1513~
		SPHWHAHDC23YZT3DC		T3		
	5000	SPHWHAHDC23YZR2DC	YZ	R2	DC	1528~
		SPHWHAHDC23YZR3DC		R3		
80	2700	SPHWHAHDC25YZW1DC	YZ	W1	DC	1322~
		SPHWHAHDC25YZW2DC		W2		
		SPHWHAHDC25YZW3DC		W3		
	3000	SPHWHAHDC25YZV1DC	YZ	V1	DC	1375~
		SPHWHAHDC25YZV2DC		V2		
		SPHWHAHDC25YZV3DC		V3		
	3500	SPHWHAHDC25YZU1DC	YZ	U1	DC	1428~
		SPHWHAHDC25YZU2DC		U2		
		SPHWHAHDC25YZU3DC		U3		
	4000	SPHWHAHDC25YZT1DC	YZ	T1	DC	1457~
		SPHWHAHDC25YZT2DC		T2		
		SPHWHAHDC25YZT3DC		T3		
	5000	SPHWHAHDC25YZR2DC	YZ	R2	DC	1481~
		SPHWHAHDC25YZR3DC		R3		
	5700	SPHWHAHDC25YZQ2DC	YZ	Q2	DC	1462~
		SPHWHAHDC25YZQ3DC		Q3		
	6500	SPHWHAHDC25YZP2DC	YZ	P2	DC	1437~
		SPHWHAHDC25YZP3DC		P3		

※ LCoogD(I_F = 270 mA, T_J = 85 °C)

CRI(R _a) Min.	Nominal CCT(K)	Product Code	V _F Rank	Color Rank	Flux Rank	Flux Range (Φ _v , lm)
90	2700	SPHWHAHDC27YZW1DC	YZ	W1	DC	1119~
		SPHWHAHDC27YZW2DC		W2		
		SPHWHAHDC27YZW3DC		W3		
	3000	SPHWHAHDC27YZV1DC	YZ	V1	DC	1179~
		SPHWHAHDC27YZV2DC		V2		
		SPHWHAHDC27YZV3DC		V3		
	3500	SPHWHAHDC27YZU1DC	YZ	U1	DC	1217~
		SPHWHAHDC27YZU2DC		U2		
		SPHWHAHDC27YZU3DC		U3		
	4000	SPHWHAHDC27YZT1DC	YZ	T1	DC	1243~
		SPHWHAHDC27YZT2DC		T2		
		SPHWHAHDC27YZT3DC		T3		
	5000	SPHWHAHDC27YZR2DC	YZ	R2	DC	1267~
		SPHWHAHDC27YZR3DC		R3		

※ LCo13D(I_F = 360 mA, T_J = 85 °C)

CRI(R _a) Min.	Nominal CCT(K)	Product Code	V _F Rank	Color Rank	Flux Rank	Flux Range (Φ _v , lm)
70	3000	SPHWHHDND23YZV2DC	YZ	V2	DC	1972~
		SPHWHHDND23YZV3DC		V3		
	4000	SPHWHHDND23YZT2DC	YZ	T2	DC	2005~
		SPHWHHDND23YZT3DC		T3		
	5000	SPHWHHDND23YZR2DC	YZ	R2	DC	2033~
		SPHWHHDND23YZR3DC		R3		
80	2700	SPHWHHDND25YZW1DC	YZ	W1	DC	1757~
		SPHWHHDND25YZW2DC		W2		
		SPHWHHDND25YZW3DC		W3		
	3000	SPHWHHDND25YZV1DC	YZ	V1	DC	1828~
		SPHWHHDND25YZV2DC		V2		
		SPHWHHDND25YZV3DC		V3		
	3500	SPHWHHDND25YZU1DC	YZ	U1	DC	1899~
		SPHWHHDND25YZU2DC		U2		
		SPHWHHDND25YZU3DC		U3		
	4000	SPHWHHDND25YZT1DC	YZ	T1	DC	1933~
		SPHWHHDND25YZT2DC		T2		
		SPHWHHDND25YZT3DC		T3		
	5000	SPHWHHDND25YZR2DC	YZ	R2	DC	1965~
		SPHWHHDND25YZR3DC		R3		
	5700	SPHWHHDND25YZQ2DC	YZ	Q2	DC	1934~
		SPHWHHDND25YZQ3DC		Q3		
	6500	SPHWHHDND25YZP2DC	YZ	P2	DC	1912~
		SPHWHHDND25YZP3DC		P3		

※ LCo13D(I_F = 360 mA, T_J = 85 °C)

CRI(R _a) Min.	Nominal CCT(K)	Product Code	V _F Rank	Color Rank	Flux Rank	Flux Range (Φ _v , lm)
90	2700	SPHWAHDND27YZW1DC	YZ	W1	DC	1484~
		SPHWAHDND27YZW2DC		W2		
		SPHWAHDND27YZW3DC		W3		
	3000	SPHWAHDND27YZV1DC	YZ	V1	DC	1561~
		SPHWAHDND27YZV2DC		V2		
		SPHWAHDND27YZV3DC		V3		
	3500	SPHWAHDND27YZU1DC	YZ	U1	DC	1609~
		SPHWAHDND27YZU2DC		U2		
		SPHWAHDND27YZU3DC		U3		
	4000	SPHWAHDND27YZT1DC	YZ	T1	DC	1644~
		SPHWAHDND27YZT2DC		T2		
		SPHWAHDND27YZT3DC		T3		
	5000	SPHWAHDND27YZR2DC	YZ	R2	DC	1684~
		SPHWAHDND27YZR3DC		R3		

※ LCo16D(I_F = 450 mA, T_J = 85 °C)

CRI(R _a) Min.	Nominal CCT(K)	Product Code	V _F Rank	Color Rank	Flux Rank	Flux Range (Φ _v , lm)
70	3000	SPHWHAHANE23YZV2DC	YZ	V2	DC	2563~
		SPHWHAHANE23YZV3DC		V3		
	4000	SPHWHAHANE23YZT2DC	YZ	T2	DC	2598~
		SPHWHAHANE23YZT3DC		T3		
	5000	SPHWHAHANE23YZR2DC	YZ	R2	DC	2629~
		SPHWHAHANE23YZR3DC		R3		
80	2700	SPHWHAHANE25YZW1DC	YZ	W1	DC	2280~
		SPHWHAHANE25YZW2DC		W2		
		SPHWHAHANE25YZW3DC		W3		
	3000	SPHWHAHANE25YZV1DC	YZ	V1	DC	2373~
		SPHWHAHANE25YZV2DC		V2		
		SPHWHAHANE25YZV3DC		V3		
	3500	SPHWHAHANE25YZU1DC	YZ	U1	DC	2464~
		SPHWHAHANE25YZU2DC		U2		
		SPHWHAHANE25YZU3DC		U3		
	4000	SPHWHAHANE25YZT1DC	YZ	T1	DC	2509~
		SPHWHAHANE25YZT2DC		T2		
		SPHWHAHANE25YZT3DC		T3		
	5000	SPHWHAHANE25YZR2DC	YZ	R2	DC	2550~
		SPHWHAHANE25YZR3DC		R3		
	5700	SPHWHAHANE25YZQ2DC	YZ	Q2	DC	2510~
		SPHWHAHANE25YZQ3DC		Q3		
	6500	SPHWHAHANE25YZP2DC	YZ	P2	DC	2470~
		SPHWHAHANE25YZP3DC		P3		

※ LCo16D(I_F = 450 mA, T_J = 85 °C)

CRI(R _a) Min.	Nominal CCT(K)	Product Code	V _F Rank	Color Rank	Flux Rank	Flux Range (Φ _v , lm)
90	2700	SPHWAHDNE27YZW1DC	YZ	W1	DC	1924~
		SPHWAHDNE27YZW2DC		W2		
		SPHWAHDNE27YZW3DC		W3		
	3000	SPHWAHDNE27YZV1DC	YZ	V1	DC	2025~
		SPHWAHDNE27YZV2DC		V2		
		SPHWAHDNE27YZV3DC		V3		
	3500	SPHWAHDNE27YZU1DC	YZ	U1	DC	2089~
		SPHWAHDNE27YZU2DC		U2		
		SPHWAHDNE27YZU3DC		U3		
	4000	SPHWAHDNE27YZT1DC	YZ	T1	DC	2136~
		SPHWAHDNE27YZT2DC		T2		
		SPHWAHDNE27YZT3DC		T3		
	5000	SPHWAHDNE27YZR2DC	YZ	R2	DC	2189~
		SPHWAHDNE27YZR3DC		R3		

※ LCo19D(I_F = 540 mA, T_J = 85 °C)

CRI(R _a) Min.	Nominal CCT(K)	Product Code	V _F Rank	Color Rank	Flux Rank	Flux Range (Φ _v , lm)
70	3000	SPHWWAHDNF23YZV2DC	YZ	V2	DC	3087~
		SPHWWAHDNF23YZV3DC		V3		
	4000	SPHWWAHDNF23YZT2DC	YZ	T2	DC	3133~
		SPHWWAHDNF23YZT3DC		T3		
	5000	SPHWWAHDNF23YZR2DC	YZ	R2	DC	3167~
		SPHWWAHDNF23YZR3DC		R3		
80	2700	SPHWWAHDNF25YZW1DC	YZ	W1	DC	2749~
		SPHWWAHDNF25YZW2DC		W2		
		SPHWWAHDNF25YZW3DC		W3		
	3000	SPHWWAHDNF25YZV1DC	YZ	V1	DC	2861~
		SPHWWAHDNF25YZV2DC		V2		
		SPHWWAHDNF25YZV3DC		V3		
	3500	SPHWWAHDNF25YZU1DC	YZ	U1	DC	2971~
		SPHWWAHDNF25YZU2DC		U2		
		SPHWWAHDNF25YZU3DC		U3		
	4000	SPHWWAHDNF25YZT1DC	YZ	T1	DC	3025~
		SPHWWAHDNF25YZT2DC		T2		
		SPHWWAHDNF25YZT3DC		T3		
	5000	SPHWWAHDNF25YZR2DC	YZ	R2	DC	3075~
		SPHWWAHDNF25YZR3DC		R3		
	5700	SPHWWAHDNF25YZQ2DC	YZ	Q2	DC	3024~
		SPHWWAHDNF25YZQ3DC		Q3		
	6500	SPHWWAHDNF25YZP2DC	YZ	P2	DC	2975~
		SPHWWAHDNF25YZP3DC		P3		

※ LCo19D(I_F = 540 mA, T_J = 85 °C)

CRI(R _a) Min.	Nominal CCT(K)	Product Code	V _F Rank	Color Rank	Flux Rank	Flux Range (Φ _v , lm)
90	2700	SPHWAHDF27YZW1DC	YZ	W1	DC	2321~
		SPHWAHDF27YZW2DC		W2		
		SPHWAHDF27YZW3DC		W3		
	3000	SPHWAHDF27YZV1DC	YZ	V1	DC	2442~
		SPHWAHDF27YZV2DC		V2		
		SPHWAHDF27YZV3DC		V3		
	3500	SPHWAHDF27YZU1DC	YZ	U1	DC	2519~
		SPHWAHDF27YZU2DC		U2		
		SPHWAHDF27YZU3DC		U3		
	4000	SPHWAHDF27YZT1DC	YZ	T1	DC	2573~
		SPHWAHDF27YZT2DC		T2		
		SPHWAHDF27YZT3DC		T3		
	5000	SPHWAHDF27YZR2DC	YZ	R2	DC	2636~
		SPHWAHDF27YZR3DC		R3		

※ LCo26D(I_F = 720 mA, T_J = 85 °C)

CRI(R _a) Min.	Nominal CCT(K)	Product Code	V _F Rank	Color Rank	Flux Rank	Flux Range (Φ _v , lm)
70	3000	SPHWHHDNG23YZV2DC	YZ	V2	DC	4032~
		SPHWHHDNG23YZV3DC		V3		
	4000	SPHWHHDNG23YZT2DC	YZ	T2	DC	4086~
		SPHWHHDNG23YZT3DC		T3		
	5000	SPHWHHDNG23YZR2DC	YZ	R2	DC	4132~
		SPHWHHDNG23YZR3DC		R3		
80	2700	SPHWHHDNG25YZW1DC	YZ	W1	DC	3587~
		SPHWHHDNG25YZW2DC		W2		
		SPHWHHDNG25YZW3DC		W3		
	3000	SPHWHHDNG25YZV1DC	YZ	V1	DC	3733~
		SPHWHHDNG25YZV2DC		V2		
		SPHWHHDNG25YZV3DC		V3		
	3500	SPHWHHDNG25YZU1DC	YZ	U1	DC	3877~
		SPHWHHDNG25YZU2DC		U2		
		SPHWHHDNG25YZU3DC		U3		
	4000	SPHWHHDNG25YZT1DC	YZ	T1	DC	3946~
		SPHWHHDNG25YZT2DC		T2		
		SPHWHHDNG25YZT3DC		T3		
	5000	SPHWHHDNG25YZR2DC	YZ	R2	DC	4012~
		SPHWHHDNG25YZR3DC		R3		
	5700	SPHWHHDNG25YZQ2DC	YZ	Q2	DC	3949~
		SPHWHHDNG25YZQ3DC		Q3		
	6500	SPHWHHDNG25YZP2DC	YZ	P2	DC	3885~
		SPHWHHDNG25YZP3DC		P3		

※ LCo26D(I_F = 720 mA, T_J = 85 °C)

CRI(R _a) Min.	Nominal CCT(K)	Product Code	V _F Rank	Color Rank	Flux Rank	Flux Range (Φ _v , lm)
90	2700	SPHWHHDNG27YZW1DC	YZ	W1	DC	3029~
		SPHWHHDNG27YZW2DC		W2		
		SPHWHHDNG27YZW3DC		W3		
	3000	SPHWHHDNG27YZV1DC	YZ	V1	DC	3185~
		SPHWHHDNG27YZV2DC		V2		
		SPHWHHDNG27YZV3DC		V3		
	3500	SPHWHHDNG27YZU1DC	YZ	U1	DC	3287~
		SPHWHHDNG27YZU2DC		U2		
		SPHWHHDNG27YZU3DC		U3		
	4000	SPHWHHDNG27YZT1DC	YZ	T1	DC	3358~
		SPHWHHDNG27YZT2DC		T2		
		SPHWHHDNG27YZT3DC		T3		
	5000	SPHWHHDNG27YZR2DC	YZ	R2	DC	3443~
		SPHWHHDNG27YZR3DC		R3		

※ LCo33D(I_F = 900 mA, T_J = 85 °C)

CRI(R _a) Min.	Nominal CCT(K)	Product Code	V _F Rank	Color Rank	Flux Rank	Flux Range (Φ _v , lm)
70	3000	SPHWWAHDNH23YZV2DC	YZ	V2	DC	4946 ~
		SPHWWAHDNH23YZV3DC		V3		
	4000	SPHWWAHDNH23YZT2DC	YZ	T2	DC	5017 ~
		SPHWWAHDNH23YZT3DC		T3		
	5000	SPHWWAHDNH23YZR2DC	YZ	R2	DC	5098~
		SPHWWAHDNH23YZR3DC		R3		
80	2700	SPHWWAHDNH25YZW1DC	YZ	W1	DC	4405~
		SPHWWAHDNH25YZW2DC		W2		
		SPHWWAHDNH25YZW3DC		W3		
	3000	SPHWWAHDNH25YZV1DC	YZ	V1	DC	4583~
		SPHWWAHDNH25YZV2DC		V2		
		SPHWWAHDNH25YZV3DC		V3		
	3500	SPHWWAHDNH25YZU1DC	YZ	U1	DC	4760~
		SPHWWAHDNH25YZU2DC		U2		
		SPHWWAHDNH25YZU3DC		U3		
	4000	SPHWWAHDNH25YZT1DC	YZ	T1	DC	4841~
		SPHWWAHDNH25YZT2DC		T2		
		SPHWWAHDNH25YZT3DC		T3		
	5000	SPHWWAHDNH25YZR2DC	YZ	R2	DC	4926~
		SPHWWAHDNH25YZR3DC		R3		
	5700	SPHWWAHDNH25YZQ2DC	YZ	Q2	DC	4848~
		SPHWWAHDNH25YZQ3DC		Q3		
	6500	SPHWWAHDNH25YZP2DC	YZ	P2	DC	4784~
		SPHWWAHDNH25YZP3DC		P3		

※ LCo33D(I_F = 900 mA, T_J = 85 °C)

CRI(R _a) Min.	Nominal CCT(K)	Product Code	V _F Rank	Color Rank	Flux Rank	Flux Range (Φ _v , lm)
90	2700	SPHWAHDNH27YZW1DC	YZ	W1	DC	3718~
		SPHWAHDNH27YZW2DC		W2		
		SPHWAHDNH27YZW3DC		W3		
	3000	SPHWAHDNH27YZV1DC	YZ	V1	DC	3911~
		SPHWAHDNH27YZV2DC		V2		
		SPHWAHDNH27YZV3DC		V3		
	3500	SPHWAHDNH27YZU1DC	YZ	U1	DC	4036~
		SPHWAHDNH27YZU2DC		U2		
		SPHWAHDNH27YZU3DC		U3		
	4000	SPHWAHDNH27YZT1DC	YZ	T1	DC	4123~
		SPHWAHDNH27YZT2DC		T2		
		SPHWAHDNH27YZT3DC		T3		
	5000	SPHWAHDNH27YZR2DC	YZ	R2	DC	4224~
		SPHWAHDNH27YZR3DC		R3		

※ LCo4oD(I_F = 1080 mA, T_J = 85 °C)

CRI(R _a)	Nominal	Product Code	V _F	Color	Flux	Flux Range
Min.	CCT(K)		Rank	Rank	Rank	(Φ _v , lm)
70	3000	SPHWWAHDNK23YZV2DC	YZ	V2	DC	6060 ~
		SPHWWAHDNK23YZV3DC		V3		
	4000	SPHWWAHDNK23YZT2DC	YZ	T2	DC	6166~
		SPHWWAHDNK23YZT3DC		T3		
	5000	SPHWWAHDNK23YZR2DC	YZ	R2	DC	6241~
		SPHWWAHDNK23YZR3DC		R3		
80	2700	SPHWWAHDNK25YZW1DC	YZ	W1	DC	5393~
		SPHWWAHDNK25YZW2DC		W2		
		SPHWWAHDNK25YZW3DC		W3		
	3000	SPHWWAHDNK25YZV1DC	YZ	V1	DC	5610~
		SPHWWAHDNK25YZV2DC		V2		
		SPHWWAHDNK25YZV3DC		V3		
	3500	SPHWWAHDNK25YZU1DC	YZ	U1	DC	5827~
		SPHWWAHDNK25YZU2DC		U2		
		SPHWWAHDNK25YZU3DC		U3		
	4000	SPHWWAHDNK25YZT1DC	YZ	T1	DC	5932~
		SPHWWAHDNK25YZT2DC		T2		
		SPHWWAHDNK25YZT3DC		T3		
	5000	SPHWWAHDNK25YZR2DC	YZ	R2	DC	6030~
		SPHWWAHDNK25YZR3DC		R3		
	5700	SPHWWAHDNK25YZQ2DC	YZ	Q2	DC	5934~
		SPHWWAHDNK25YZQ3DC		Q3		
	6500	SPHWWAHDNK25YZP2DC	YZ	P2	DC	5868~
		SPHWWAHDNK25YZP3DC		P3		

※ LCo4oD(I_F = 1080 mA, T_J = 85 °C)

CRI(R _a) Min.	Nominal CCT(K)	Product Code	V _F Rank	Color Rank	Flux Rank	Flux Range (Φ _v , lm)
90	2700	SPHWAHDNK27YZW1DC	YZ	W1	DC	4565~
		SPHWAHDNK27YZW2DC		W2		
		SPHWAHDNK27YZW3DC		W3		
	3000	SPHWAHDNK27YZV1DC	YZ	V1	DC	4802~
		SPHWAHDNK27YZV2DC		V2		
		SPHWAHDNK27YZV3DC		V3		
	3500	SPHWAHDNK27YZU1DC	YZ	U1	DC	4944~
		SPHWAHDNK27YZU2DC		U2		
		SPHWAHDNK27YZU3DC		U3		
	4000	SPHWAHDNK27YZT1DC	YZ	T1	DC	5052~
		SPHWAHDNK27YZT2DC		T2		
		SPHWAHDNK27YZT3DC		T3		
	5000	SPHWAHDNK27YZR2DC	YZ	R2	DC	5177~
		SPHWAHDNK27YZR3DC		R3		

※ LCo6oD(I_F = 1080 mA, T_J = 85 °C)

CRI(R _a) Min.	Nominal CCT(K)	Product Code	V _F Rank	Chrom. Bin	Flux Rank	Flux Range (Φ _v , lm)
70	3000	SPHWWAHDNL231ZV2DC	1Z	V2	DC	9010 ~
		SPHWWAHDNL231ZV3DC		V3		
	4000	SPHWWAHDNL231ZT2DC	1Z	T2	DC	9140~
		SPHWWAHDNL231ZT3DC		T3		
	5000	SPHWWAHDNL231ZR2DC	1Z	R2	DC	9278~
		SPHWWAHDNL231ZR3DC		R3		
80	2700	SPHWWAHDNL251ZW1DC	1Z	W1	DC	8025~
		SPHWWAHDNL251ZW2DC		W2		
		SPHWWAHDNL251ZW3DC		W3		
	3000	SPHWWAHDNL251ZV1DC	1Z	V1	DC	8349~
		SPHWWAHDNL251ZV2DC		V2		
		SPHWWAHDNL251ZV3DC		V3		
	3500	SPHWWAHDNL251ZU1DC	1Z	U1	DC	8672~
		SPHWWAHDNL251ZU2DC		U2		
		SPHWWAHDNL251ZU3DC		U3		
	4000	SPHWWAHDNL251ZT1DC	1Z	T1	DC	8820~
		SPHWWAHDNL251ZT2DC		T2		
		SPHWWAHDNL251ZT3DC		T3		
	5000	SPHWWAHDNL251ZR2DC	1Z	R2	DC	8973~
		SPHWWAHDNL251ZR3DC		R3		
	5700	SPHWWAHDNL251ZQ2DC	1Z	Q2	DC	8832~
		SPHWWAHDNL251ZQ3DC		Q3		
	6500	SPHWWAHDNL251ZP2DC	1Z	P2	DC	8698~
		SPHWWAHDNL251ZP3DC		P3		

※ LCo6oD($I_F = 1080 \text{ mA}$, $T_J = 85 \text{ }^\circ\text{C}$)

CRI(R_a) Min.	Nominal CCT(K)	Product Code	V_F Rank	Chrom. Bin	Flux Rank	Flux Range (Φ_v, lm)
90	2700	SPHWAHDNL271ZW1DC	1Z	W1	DC	6773~
		SPHWAHDNL271ZW2DC		W2		
		SPHWAHDNL271ZW3DC		W3		
	3000	SPHWAHDNL271ZV1DC	1Z	V1	DC	7124~
		SPHWAHDNL271ZV2DC		V2		
		SPHWAHDNL271ZV3DC		V3		
	3500	SPHWAHDNL271ZU1DC	1Z	U1	DC	7351~
		SPHWAHDNL271ZU2DC		U2		
		SPHWAHDNL271ZU3DC		U3		
	4000	SPHWAHDNL271ZT1DC	1Z	T1	DC	7510~
		SPHWAHDNL271ZT2DC		T2		
		SPHWAHDNL271ZT3DC		T3		
	5000	SPHWAHDNL271ZR2DC	1Z	R2	DC	7695~
		SPHWAHDNL271ZR3DC		R3		

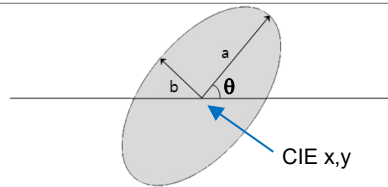
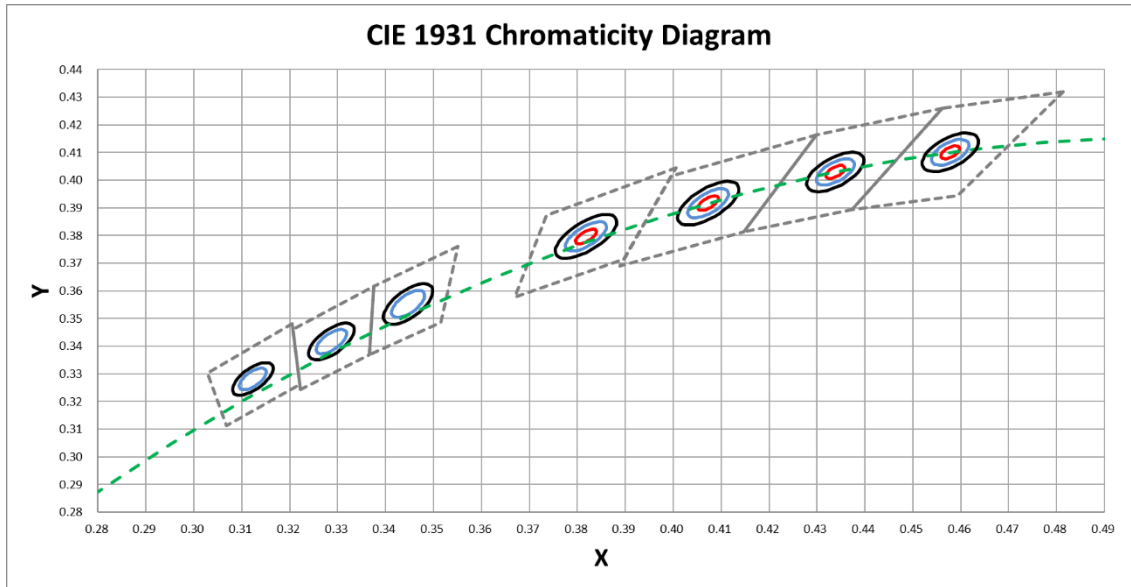
※ LCo8oD(I_F = 1620 mA, T_J = 85 °C)

CRI(R _a) Min.	Nominal CCT(K)	Product Code	V _F Rank	Chrom. Bin	Flux Rank	Flux Range (Φ _v , lm)
70	3000	SPHWHAHDNM231ZV2DC	1Z	V2	DC	13242~
		SPHWHAHDNM231ZV3DC		V3		
	4000	SPHWHAHDNM231ZT2DC	1Z	T2	DC	13433~
		SPHWHAHDNM231ZT3DC		T3		
	5000	SPHWHAHDNM231ZR2DC	1Z	R2	DC	13582~
		SPHWHAHDNM231ZR3DC		R3		
80	2700	SPHWHAHDNM251ZW1DC	1Z	W1	DC	11738~
		SPHWHAHDNM251ZW2DC		W2		
		SPHWHAHDNM251ZW3DC		W3		
	3000	SPHWHAHDNM251ZV1DC	1Z	V1	DC	12211 ~
		SPHWHAHDNM251ZV2DC		V2		
		SPHWHAHDNM251ZV3DC		V3		
	3500	SPHWHAHDNM251ZU1DC	1Z	U1	DC	12683 ~
		SPHWHAHDNM251ZU2DC		U2		
		SPHWHAHDNM251ZU3DC		U3		
	4000	SPHWHAHDNM251ZT1DC	1Z	T1	DC	12911~
		SPHWHAHDNM251ZT2DC		T2		
		SPHWHAHDNM251ZT3DC		T3		
	5000	SPHWHAHDNM251ZR2DC	1Z	R2	DC	13123~
		SPHWHAHDNM251ZR3DC		R3		
	5700	SPHWHAHDNM251ZQ2DC	1Z	Q2	DC	12941~
		SPHWHAHDNM251ZQ3DC		Q3		
	6500	SPHWHAHDNM251ZP2DC	1Z	P2	DC	12770 ~
		SPHWHAHDNM251ZP3DC		P3		

※ LCo8oD(I_F = 1620 mA, T_J = 85 °C)

CRI(R _a) Min.	Nominal CCT(K)	Product Code	V _F Rank	Chrom. Bin	Flux Rank	Flux Range (Φ _v , lm)
90	2700	SPHWHAHDNM271ZW1DC	1Z	W1	DC	9955~
		SPHWHAHDNM271ZW2DC		W2		
		SPHWHAHDNM271ZW3DC		W3		
	3000	SPHWHAHDNM271ZV1DC	1Z	V1	DC	10471~
		SPHWHAHDNM271ZV2DC		V2		
		SPHWHAHDNM271ZV3DC		V3		
	3500	SPHWHAHDNM271ZU1DC	1Z	U1	DC	10805 ~
		SPHWHAHDNM271ZU2DC		U2		
		SPHWHAHDNM271ZU3DC		U3		
	4000	SPHWHAHDNM271ZT1DC	1Z	T1	DC	11038~
		SPHWHAHDNM271ZT2DC		T2		
		SPHWHAHDNM271ZT3DC		T3		
	5000	SPHWHAHDNM271ZR2DC	1Z	R2	DC	11255~
		SPHWHAHDNM271ZR3DC		R3		

b) Chromaticity Region & Coordinates (I_F = Sorting Current, T_J = 85 °C)



MacAdam Ellipse (W1, W2, W3)					
Step	CIE x	CIE y	θ	a	b
1-step	0.4578	0.4101	53.70	0.0027	0.0014
2-step	0.4578	0.4101	53.70	0.0054	0.0028
3-step	0.4338	0.4101	53.70	0.0081	0.0042

MacAdam Ellipse (V1, V2, V3)					
Step	CIE x	CIE y	θ	a	b
1-step	0.4338	0.4030	53.22	0.0028	0.0014
2-step	0.4338	0.4030	53.22	0.0056	0.0027
3-step	0.4338	0.4030	53.22	0.0083	0.0041

MacAdam Ellipse (U1, U2)					
Step	CIE x	CIE y	θ	a	b
1-step	0.4073	0.3917	54.00	0.0031	0.0014
2-step	0.4073	0.3917	54.00	0.0062	0.0028
3-step	0.4073	0.3917	54.00	0.0093	0.0041

MacAdam Ellipse (T1, T2, T3)					
Step	CIE x	CIE y	θ	a	b
1-step	0.3818	0.3797	53.72	0.0031	0.0013
2-step	0.3818	0.3797	53.72	0.0063	0.0027
3-step	0.3818	0.3797	53.72	0.0094	0.0040

MacAdam Ellipse (R2, R3)					
Step	CIE x	CIE y	θ	a	b
2-step	0.3447	0.3553	59.62	0.0055	0.0024
3-step	0.3447	0.3553	59.62	0.0082	0.0035

MacAdam Ellipse (Q2, Q3)					
Step	CIE x	CIE y	θ	a	b
2-step	0.3287	0.3417	59.10	0.0050	0.0021
3-step	0.3287	0.3417	59.10	0.0075	0.0032

MacAdam Ellipse (P2, P3)					
Step	CIE x	CIE y	θ	a	b
2-step	0.3123	0.3282	58.57	0.0045	0.0019
3-step	0.3123	0.3282	58.57	0.0067	0.0029

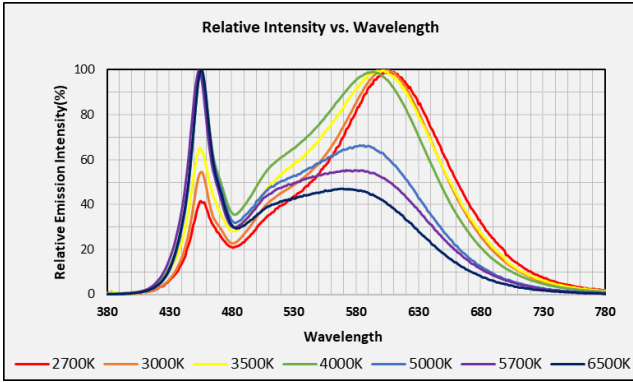
Note:

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

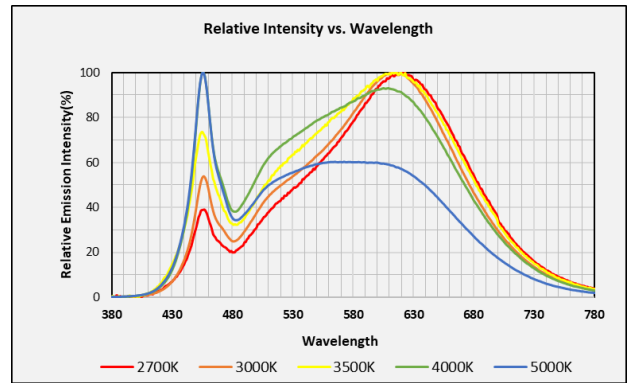
3. Typical Characteristics Graphs

a) Spectrum Distribution (I_F = Sorting Current, T_J = 85 °C)

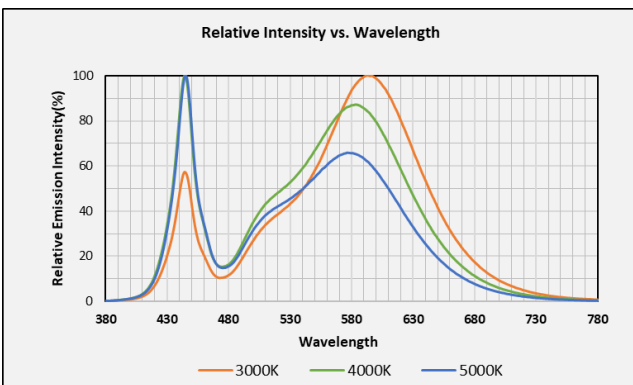
CRI Ra 80+



CRI Ra 90+

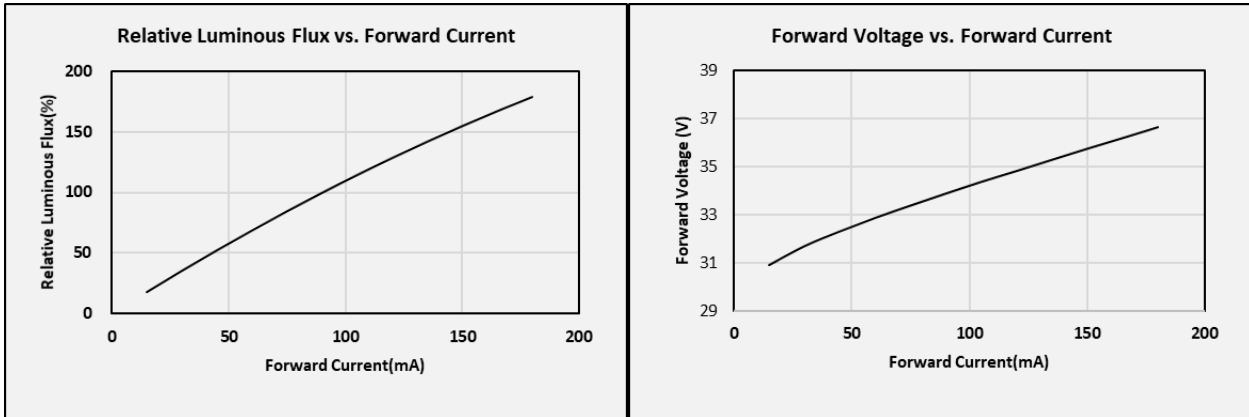


CRI Ra 70+

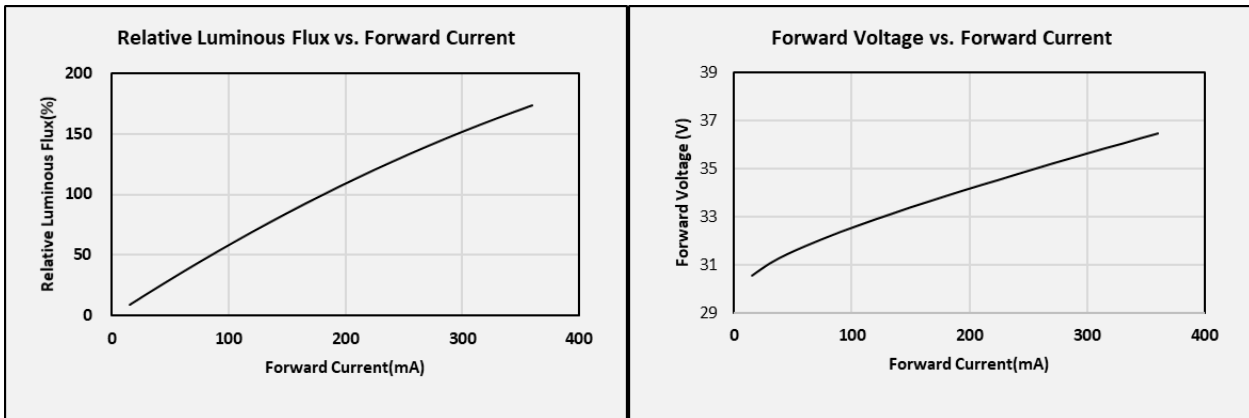


b) Forward Current Characteristics ($T_J = 85\text{ }^\circ\text{C}$)

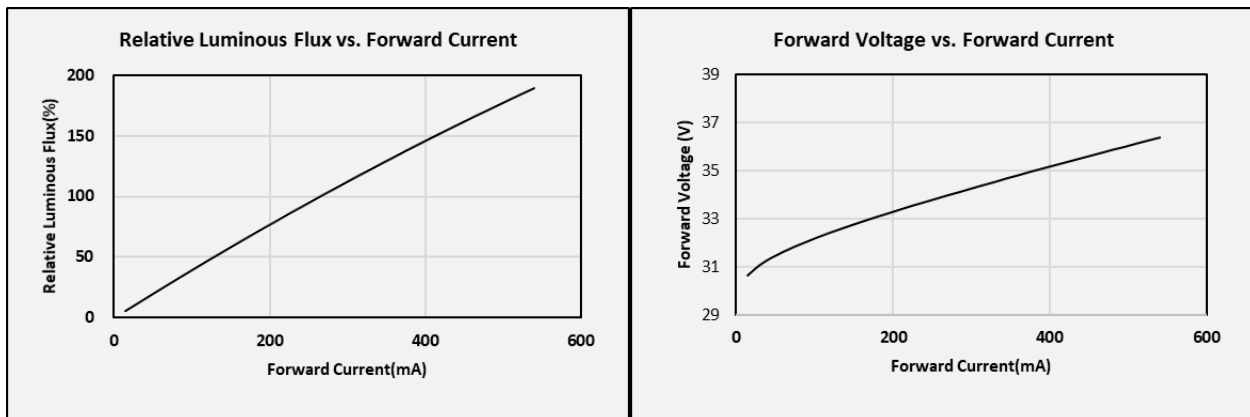
1) LC003D



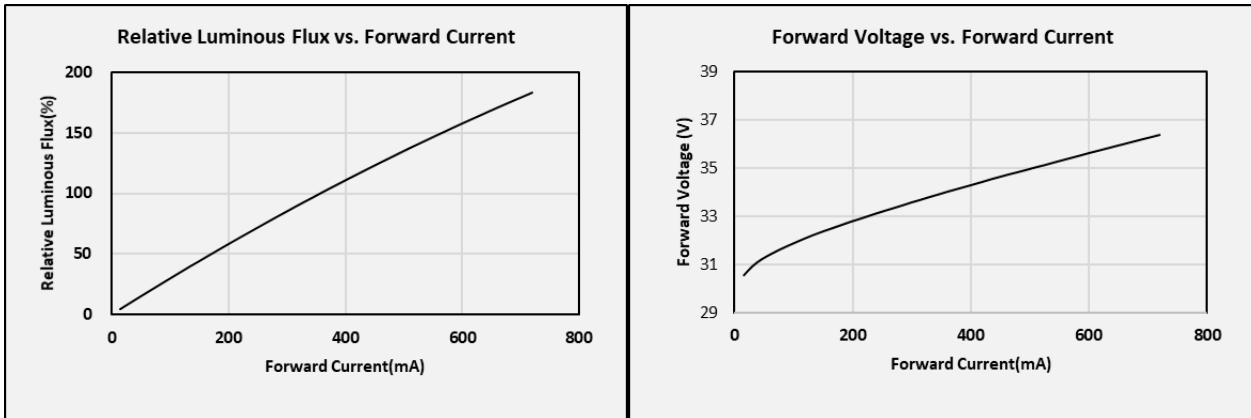
2) LC006D



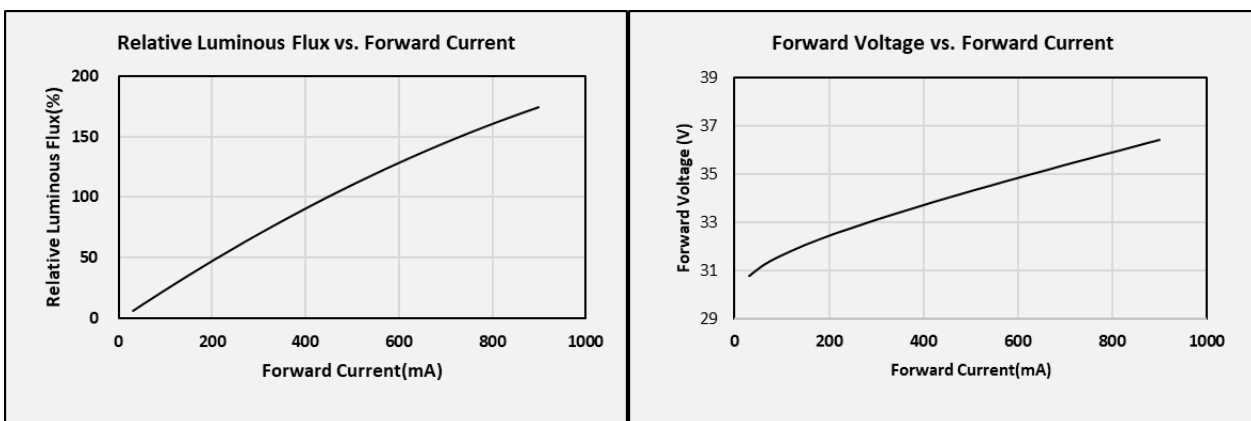
3) LC009D



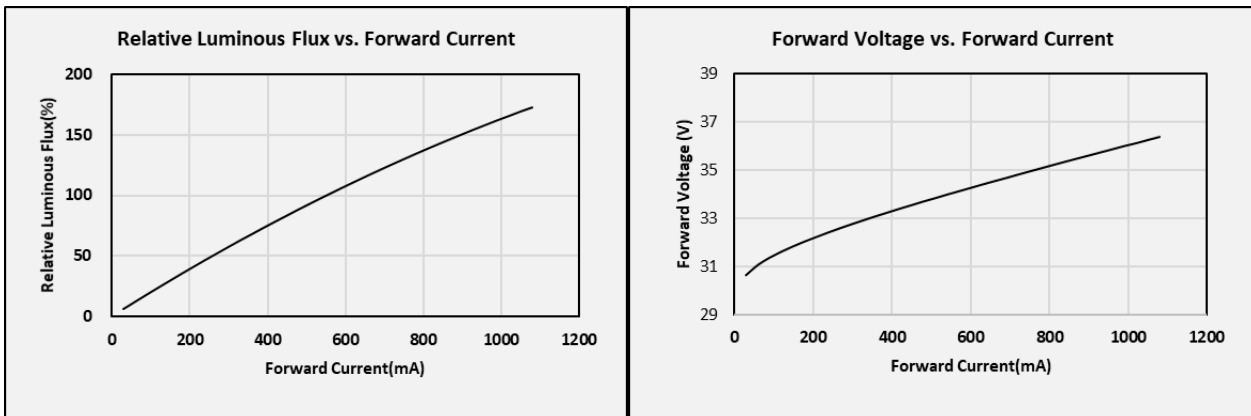
4) LC013D



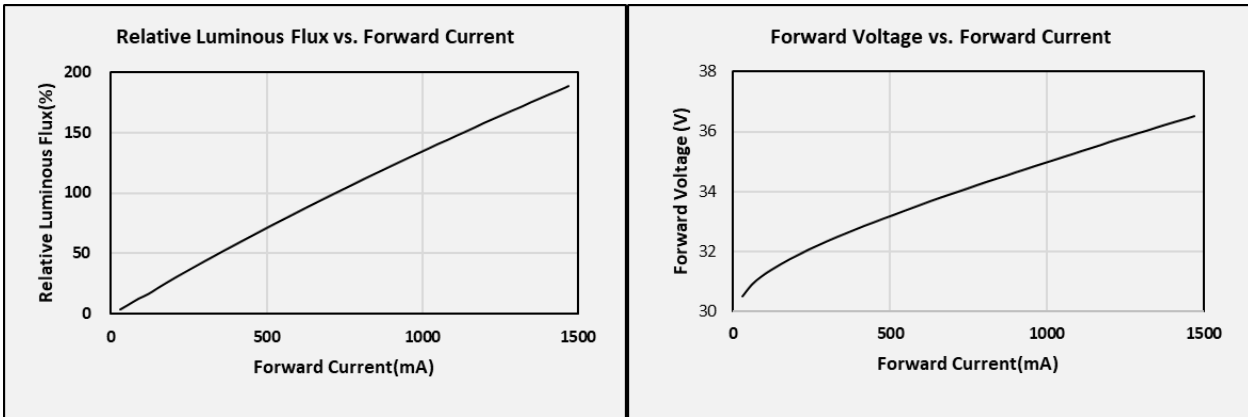
5) LC016D



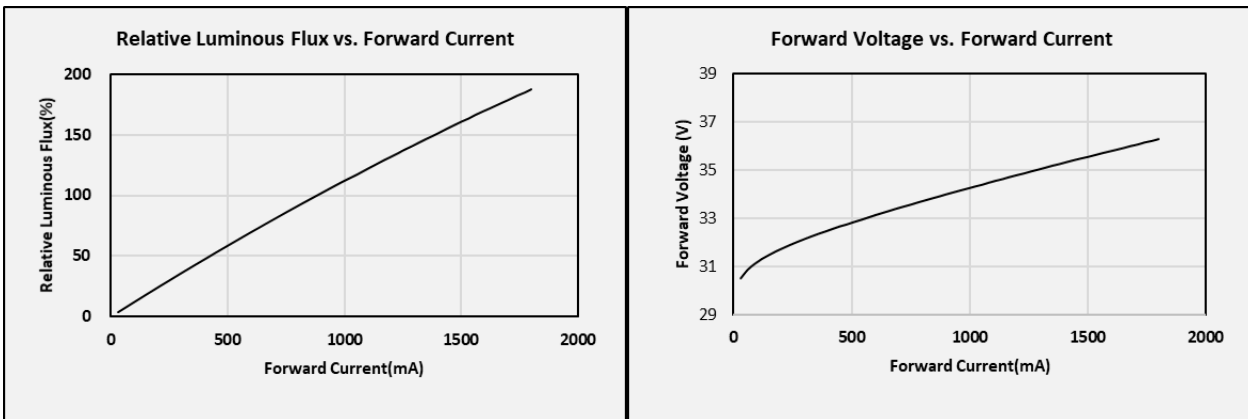
6) LC019D



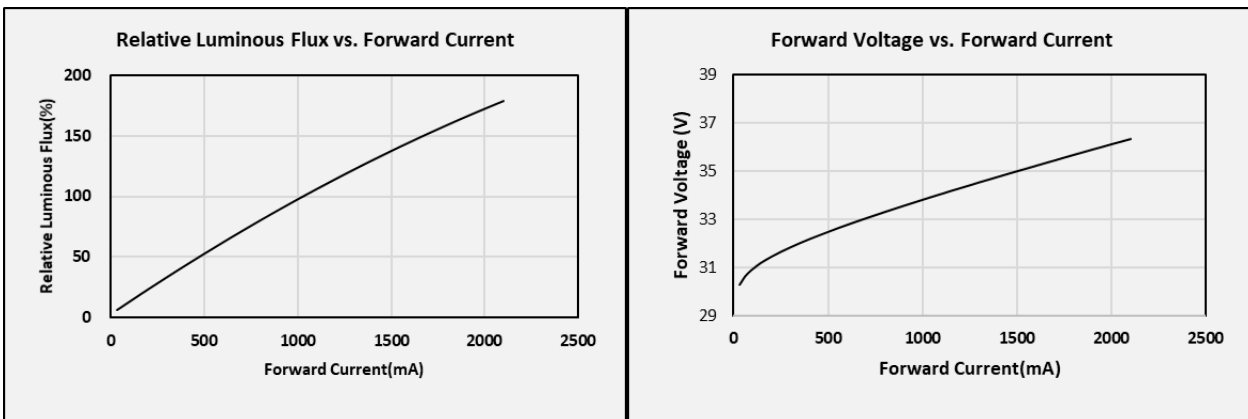
7) LC026D



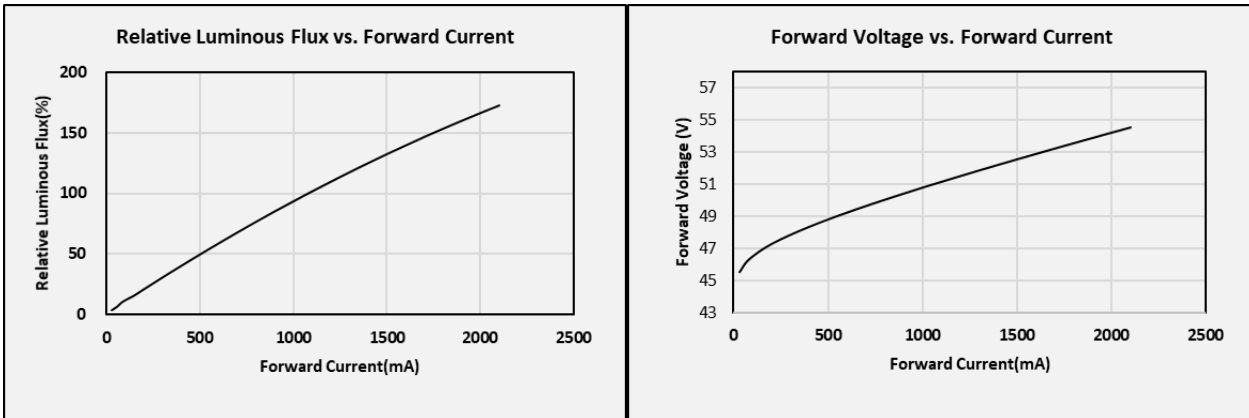
8) LC033D



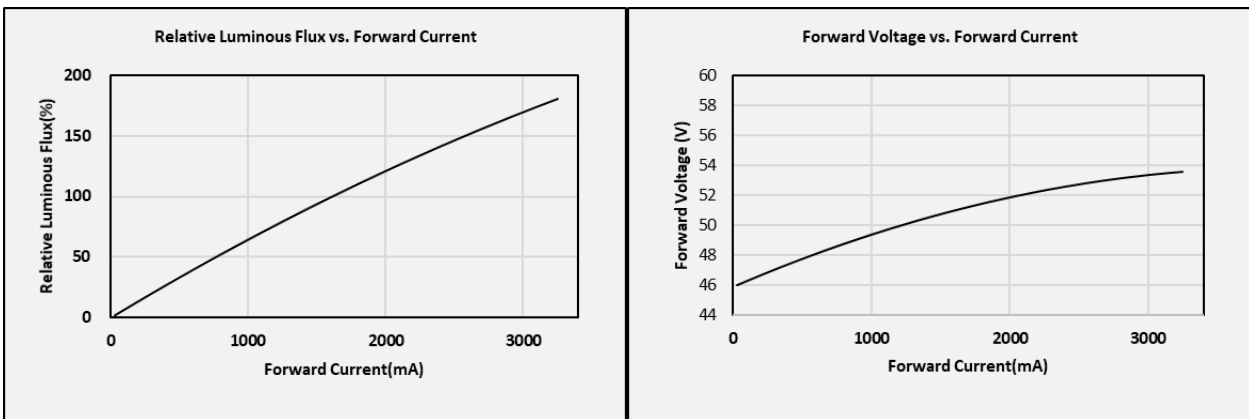
9) LC040D



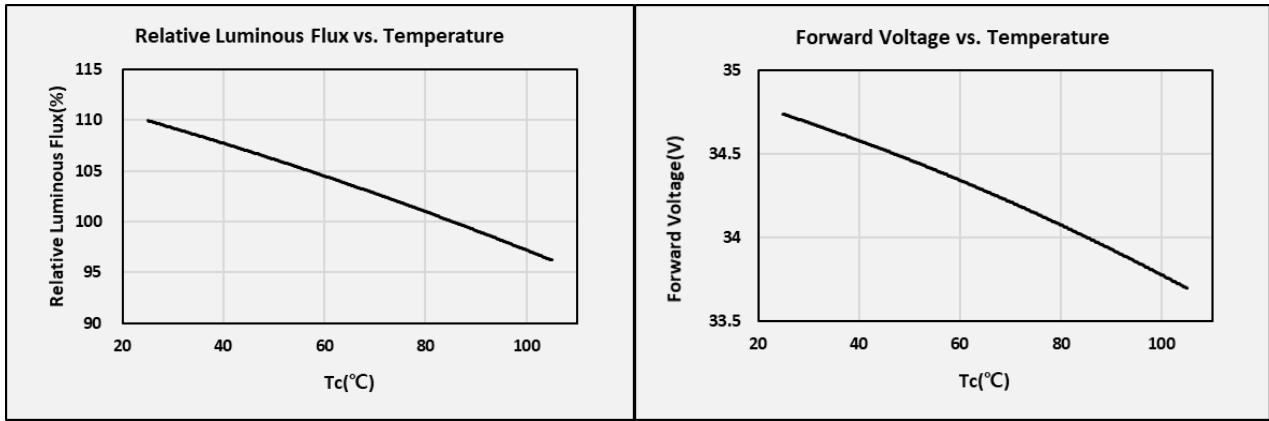
10) LC060D



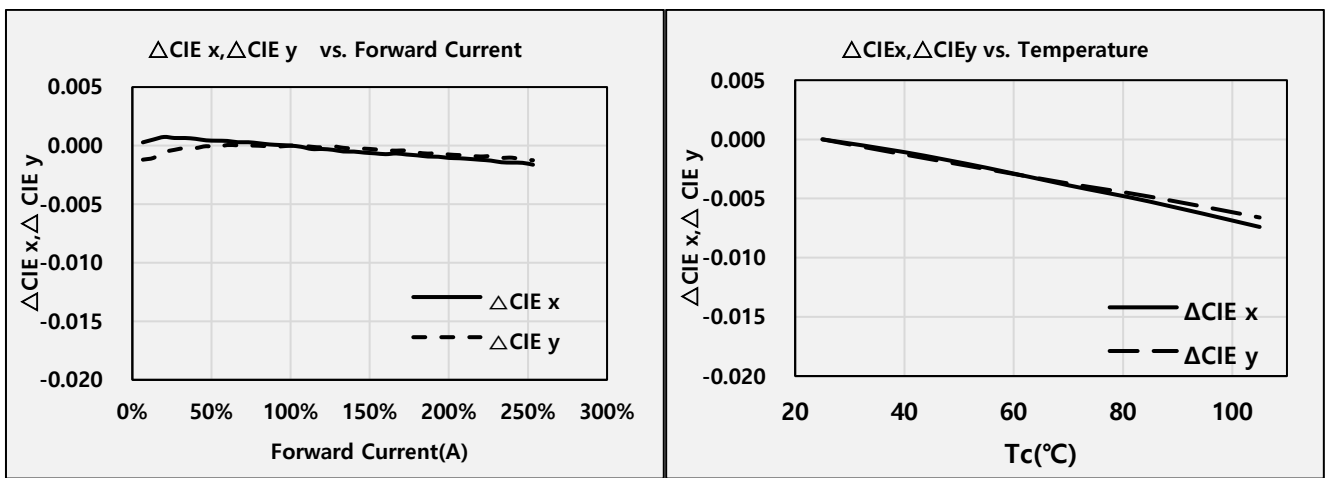
11) LC080D



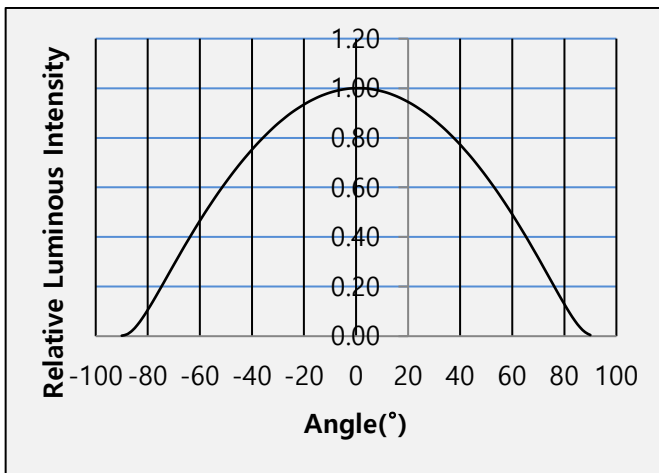
c) Temperature Characteristics (I_F = Sorting Current)



d) Color Shift Characteristics ($T_J = 85$ °C, I_F =Sorting Current, CRI = 80+)

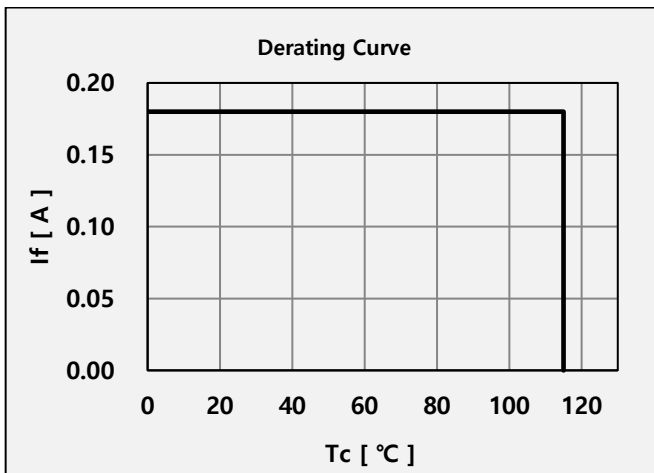


e) Beam Angle Characteristics (I_F = Sorting Current, $T_J = 85$ °C)

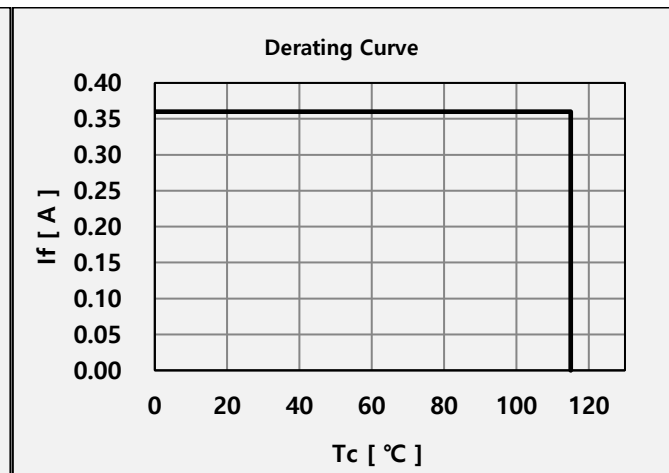


f) Derating Characteristics

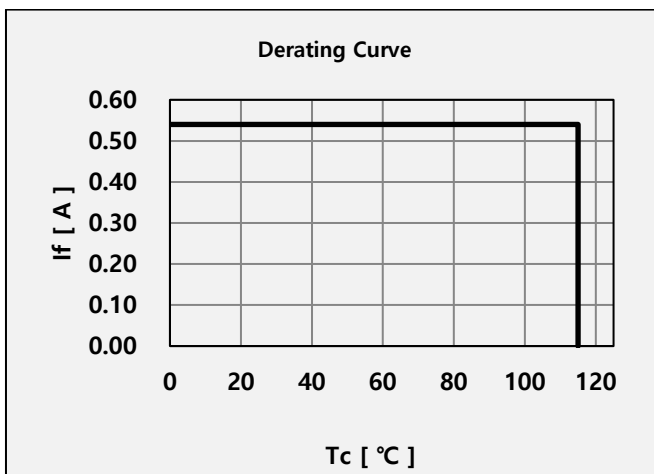
1) LC003D



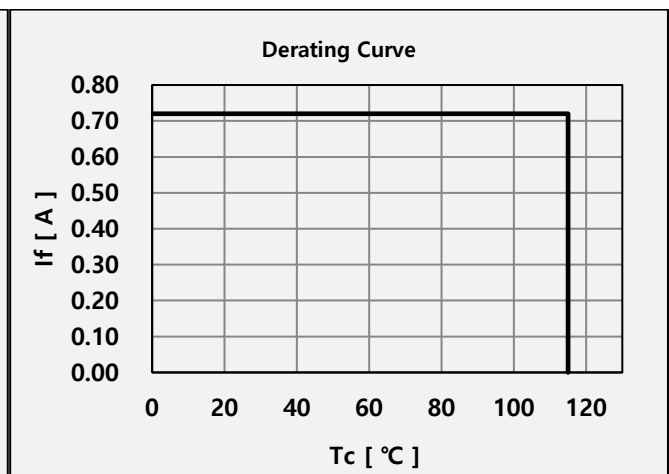
2) LC006D



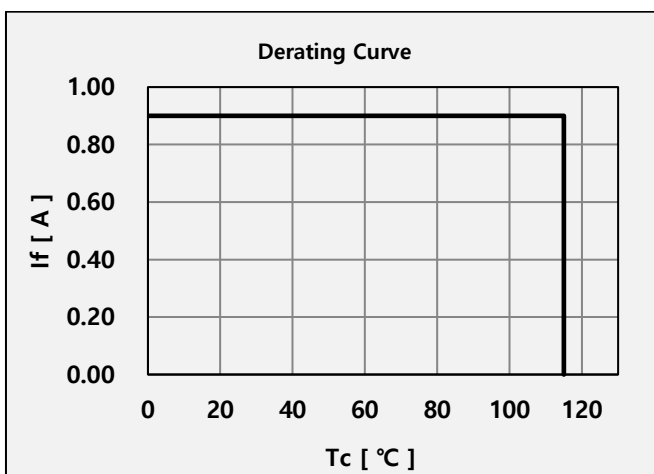
3) LC009D



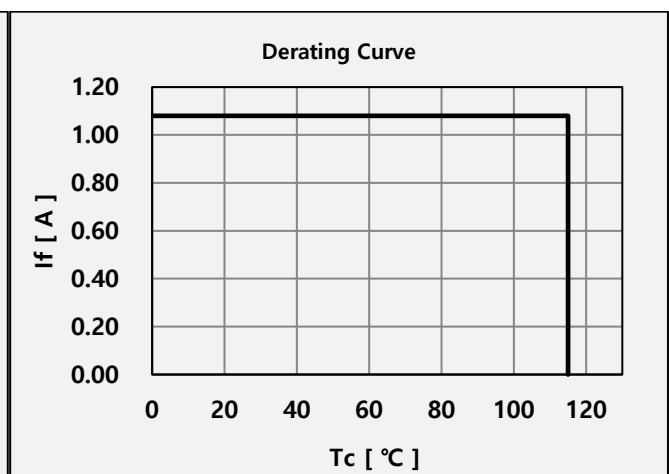
4) LC0013D



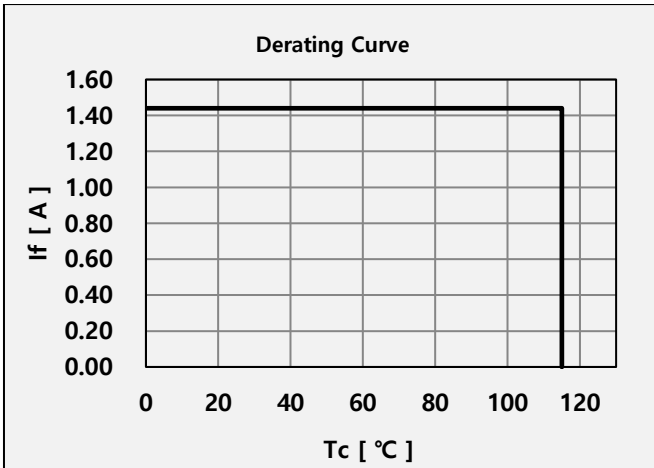
5) LC016D



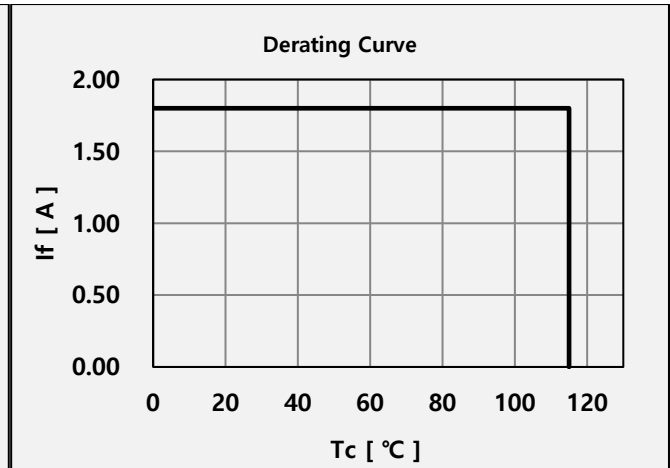
6) LC0019D



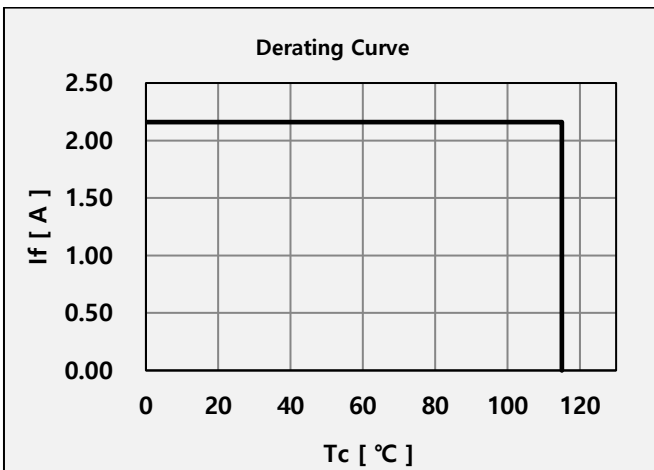
7) LC026D



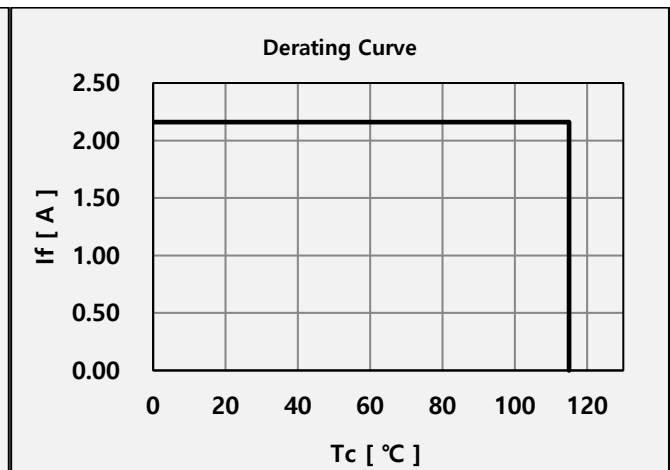
8) LC0033D



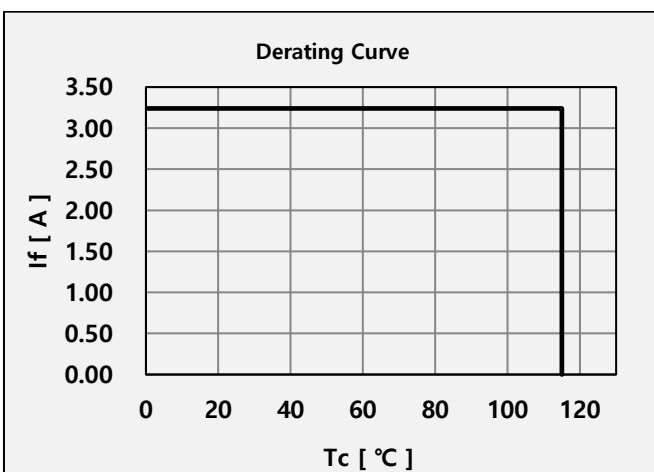
9) LC040D



10) LC060D

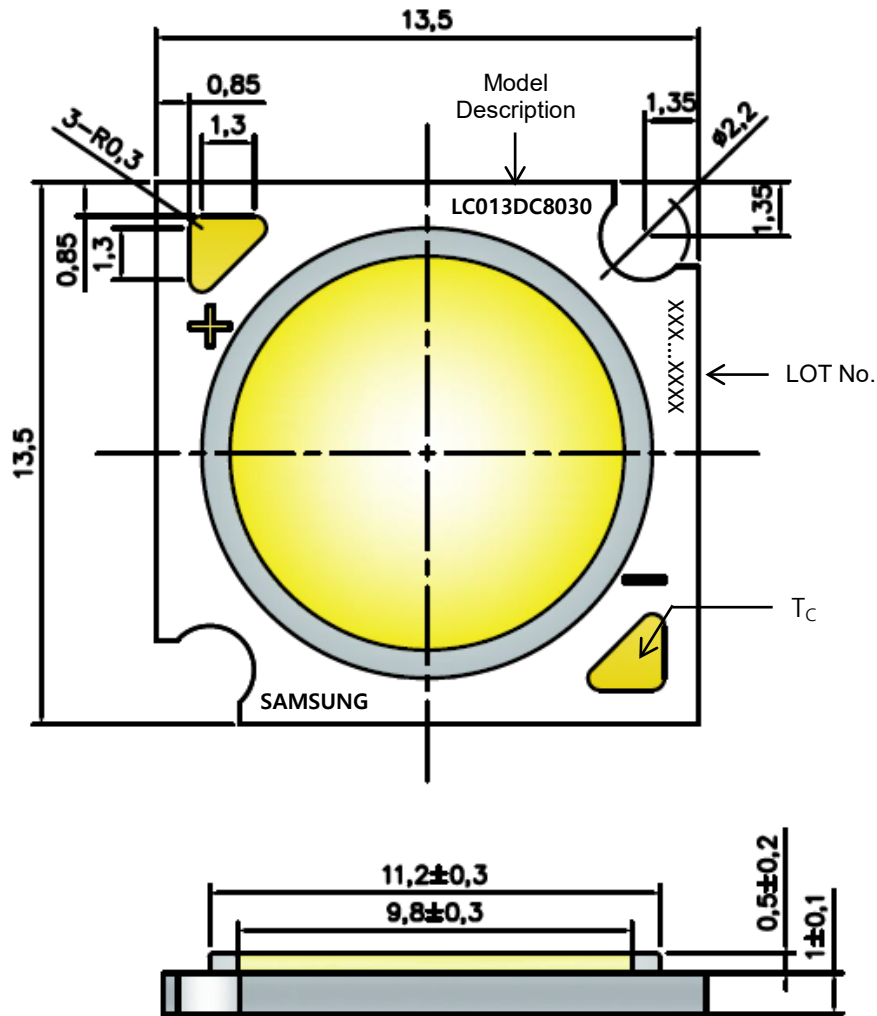


11) LC080D



4. Outline Drawing & Dimension

※ Model : LC003D, LC006D, LC009D, LC013D

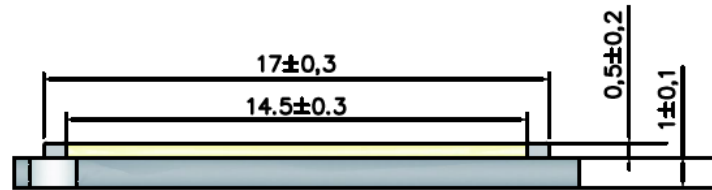
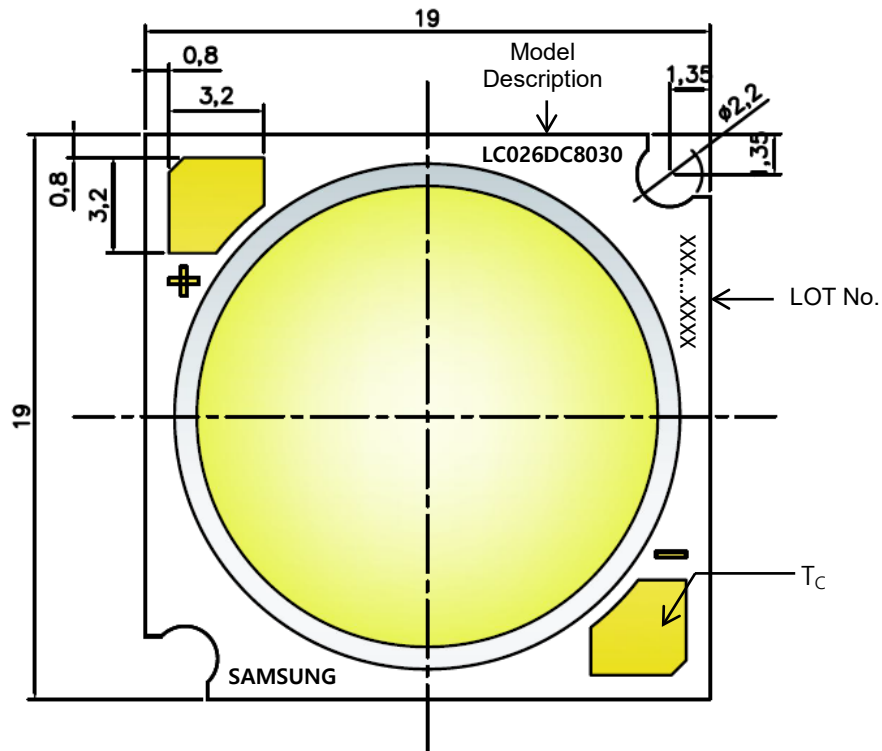


- 1. Unit: mm
- 2. Tolerance: ± 0.3 mm

Item	Dimension	Tolerance	Unit
Length	13.5	±0.15	mm
Width	13.5	±0.15	mm
Height	Dam	±0.20	mm
	Substrate	±0.10	mm
LES Diameter	Light Emitting Surface	±0.30	mm

Note: Denoted product information above is only an example (LC013DC8030 :LC013D, Gen3 Plus, Ra80, 3000K)

※ Model : LC016D, LC019D, LC026D, LC033D

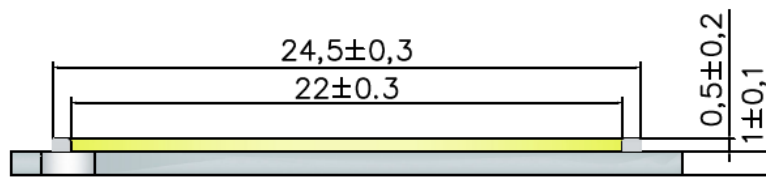
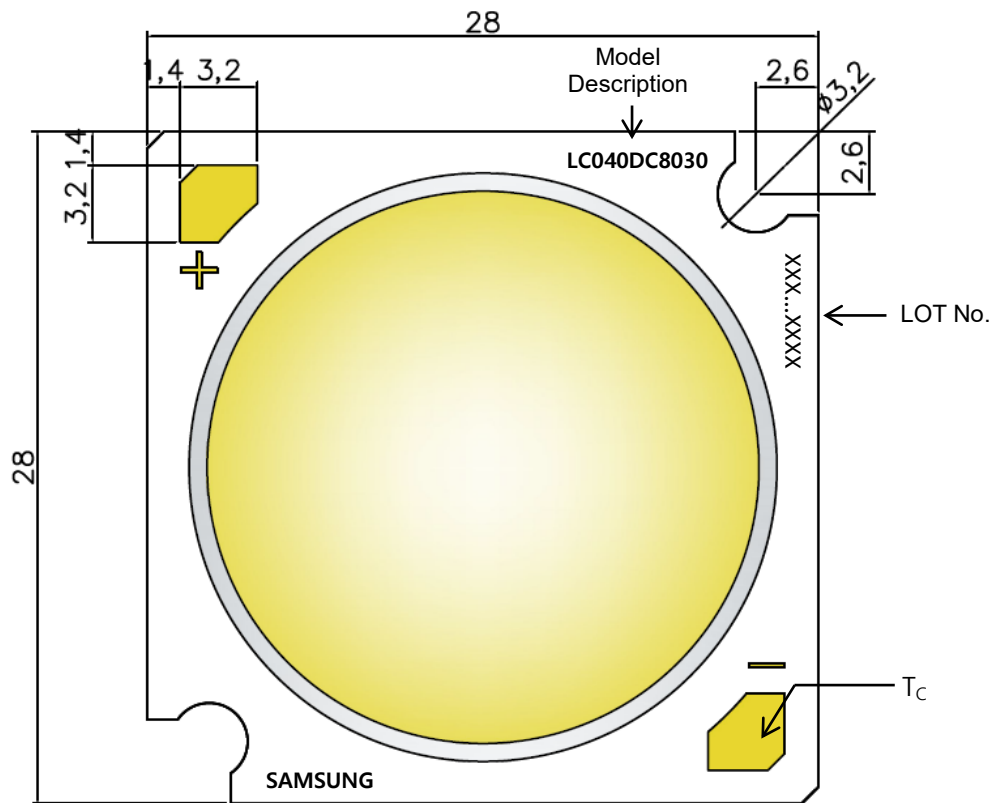


- 1. Unit: mm
- 2. Tolerance: ± 0.3 mm

Item	Dimension	Tolerance	Unit
Length	19.0	± 0.15	mm
Width	19.0	± 0.15	mm
Height	Dam	± 0.20	mm
	Substrate	± 0.10	mm
LES Diameter	Light Emitting Surface	± 0.30	mm

Note: Denoted product information above is only an example
 (LC026DC8030 : LC026D, Gen3 Plus, CRI80+, 3000K)

※ Model : LC040D, LC060D, LC080D



- 1. Unit: mm
- 2. Tolerance: ± 0.3 mm

Item	Dimension	Tolerance	Unit	
Length	28.0	±0.15	mm	
Width	28.0	±0.15	mm	
Height	Dam	0.5	±0.20	mm
	Substrate	1.0	±0.10	mm
LES Diameter	Light Emitting Surface	22.0	±0.30	mm

Note: Denoted product information above is only an example
 (LC040DC8030 : LC040D, Gen3 Plus, CRI80+, 3000K)

5. Reliability Test Items & Conditions

a) Test Items

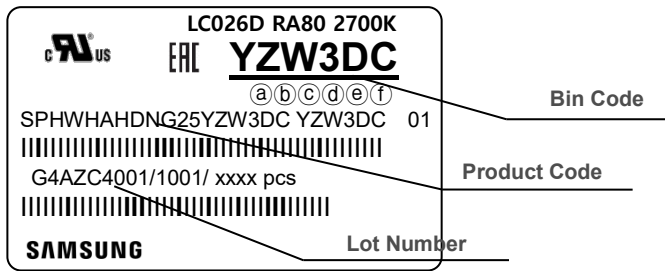
Test Item	Test Condition	Test Hour / Cycle
High Temperature Humidity Life Test	60 °C, 90 % RH,, DC Derating, I _F	1000 h
High Temperature Life Test	85 °C, DC Derating, I _F	1000 h
Low Temperature Life Test	-40 °C, DC, Derating I _F	1000 h
High Temperature Storage	120 °C	1000 h
Low Temperature Storage	-40 °C	1000 h
Temperature Humidity Storage	60 °C, 90% RH	1000h
Thermal shock	-40 °C to 125 °C, Transfer Time : < 20 seconds	200 cycles
ESD (HBM)	R1: 10 MΩ R2: 1.5 kΩ C: 100 pF V: ±2kV	5 times
Vibration Test	20~80 Hz(displacement: 0.06 inch, max. 20 g) 80 ~ 2 kHz (max. 20 g) min. frequency ↔max. frequency 4 min transfer	4 times
Mechanical Shock Test	1500g, 0.5 ms each of the 6 surfaces (3axis x 2 sides)	5 times
Sulfur Resistance	25 °C, 75%, H2S 15 ppm	504h
High Temperature Humidity Life Test	60 °C, 90 % RH,, DC Derating, I _F	1000 h

b) Criteria for Judging the Damage

Item	Symbol	Test Condition (T _c = 25 °C)	Limit	
			Min.	Max.
Forward Voltage	V _F	I _F = Sorting Current	L.S.L. * 0.9	U.S.L. * 1.1
Luminous Flux	Φ _v	I _F = Sorting Current	L.S.L. * 0.7	U.S.L. * 1.3

6. Label Structure

a) Label Structure



Note: Denoted bincode and product code above is only an example (see description on page 5)

Bin Code:

ⒶⒷ: Forward Voltage bin (refer to page 9)

ⒸⒹ: Chromaticity bin (refer to page 21)

ⒺⒻ: Luminous Flux bin (refer to page 5-8)

b) Lot Number

The lot number is composed of the following characters:



① ③④⑤⑥⑦⑧⑨ / 1ⒶⒷⒸ / xxxx pcs

① : Production site (S: Giheung, Korea, G: Tianjin, China)

② : 4(LED)

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

④ : Year (D: 2019, E: 2020, F: 2021...)

⑤ : Month (1~9, A, B, C)

⑥⑦⑧⑨ : Day (1~9, A, B~V)

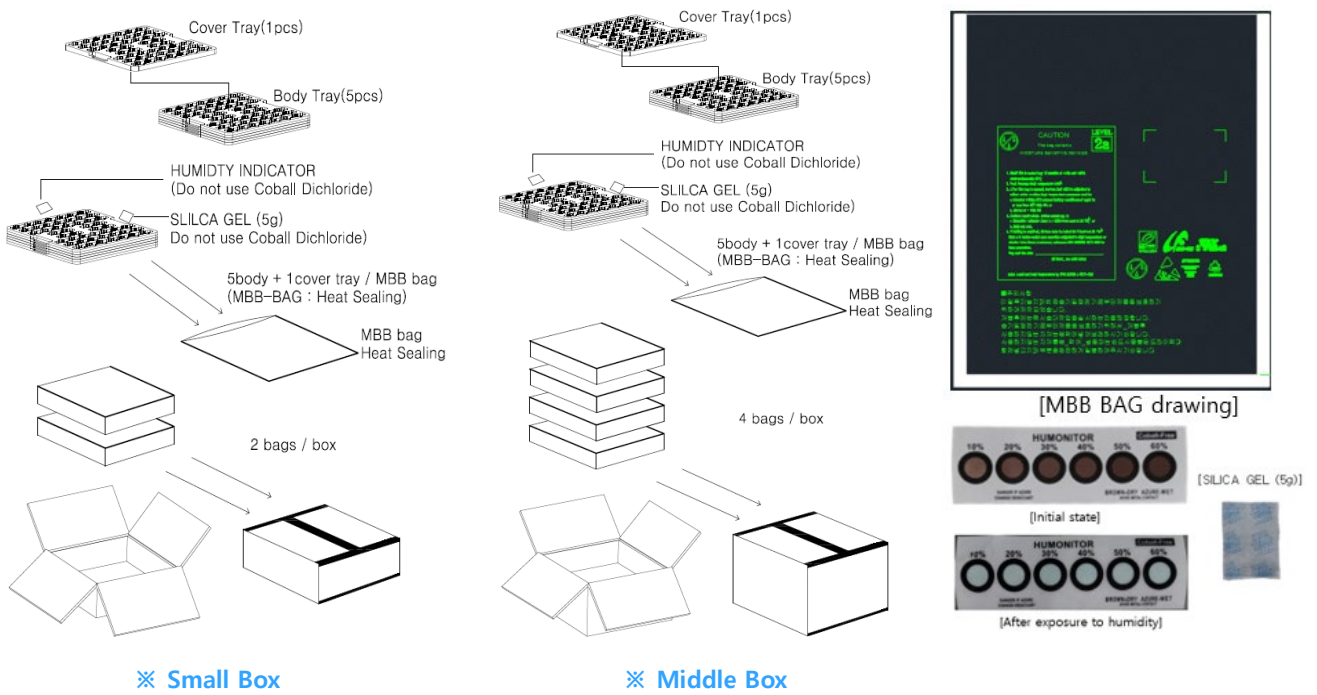
ⒶⒷⒸ : Product serial number (001 ~ 999)

7. Packing Structure

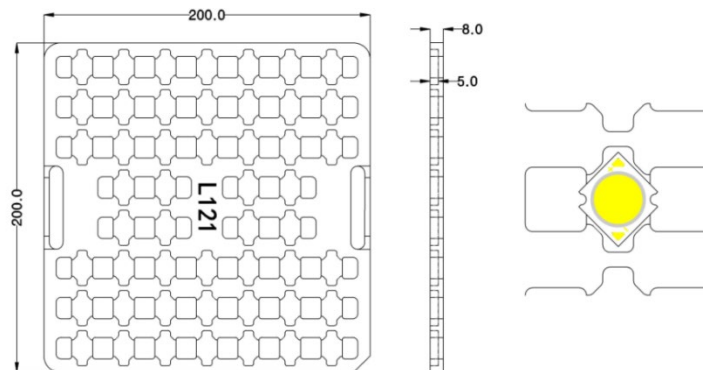
※ Model : LC003D, LC006D, LC009D, LC013D

Packing material	Max. quantity in pcs of COB	Dimension(mm)			
		Length	Width	Height	Tolerance
Tray	50	200	200	8	1
Anti-Static Bag	250 (5 trays)	320	270	-	+/- 0.5
Outer Box (Small)	500 (2 bags)	225	225	65	5
Outer Box (Middle)	1000 (4 bags)	225	225	130	5

a) Packing Structure



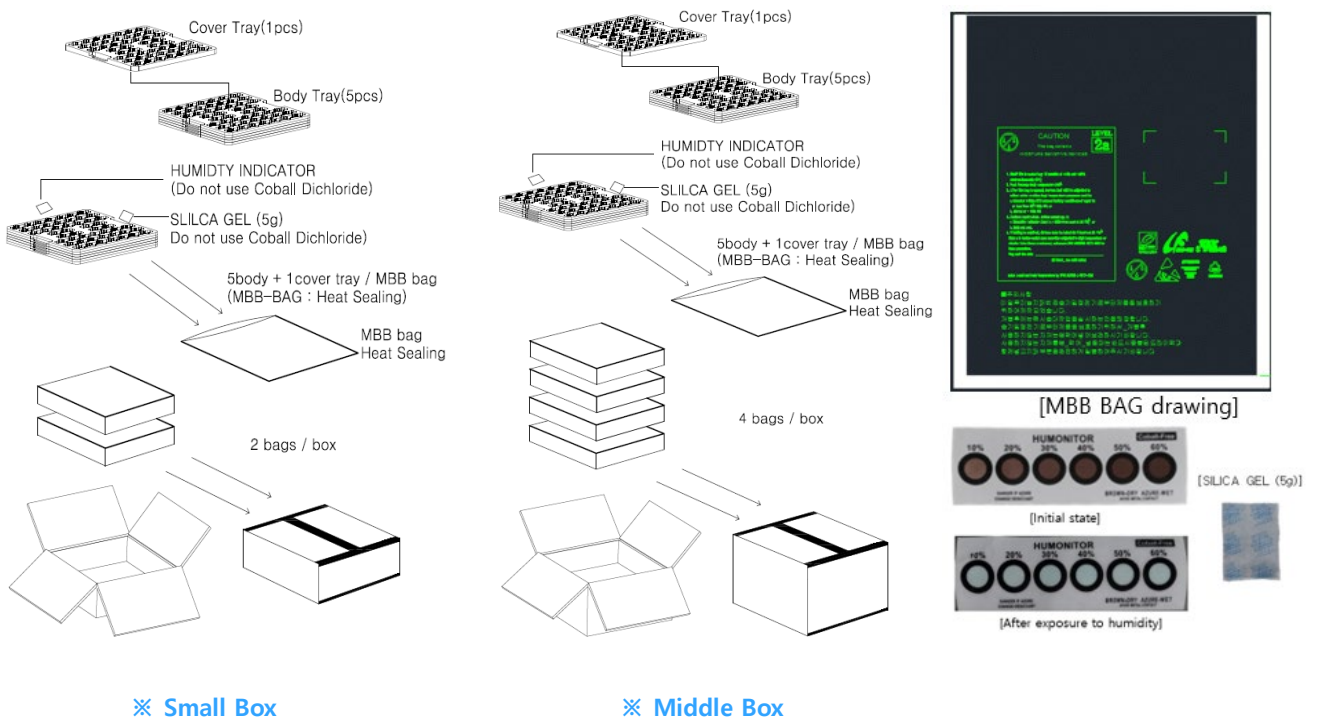
b) Tray



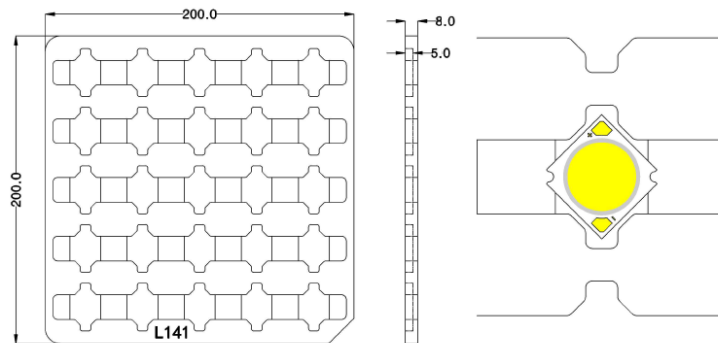
※ Model : LC016D, LC019D, LC026D, LC033D

Packing material	Max. quantity in pcs of COB	Dimension(mm)			
		Length	Width	Height	Tolerance
Tray	25	200	200	8	1
Anti-Static Bag	125 (5 trays)	320	270	-	+/- 0.5
Outer Box (Small)	250 (2 bags)	225	225	65	5
Outer Box (Middle)	500 (4 bags)	225	225	130	5

a) Packing Structure



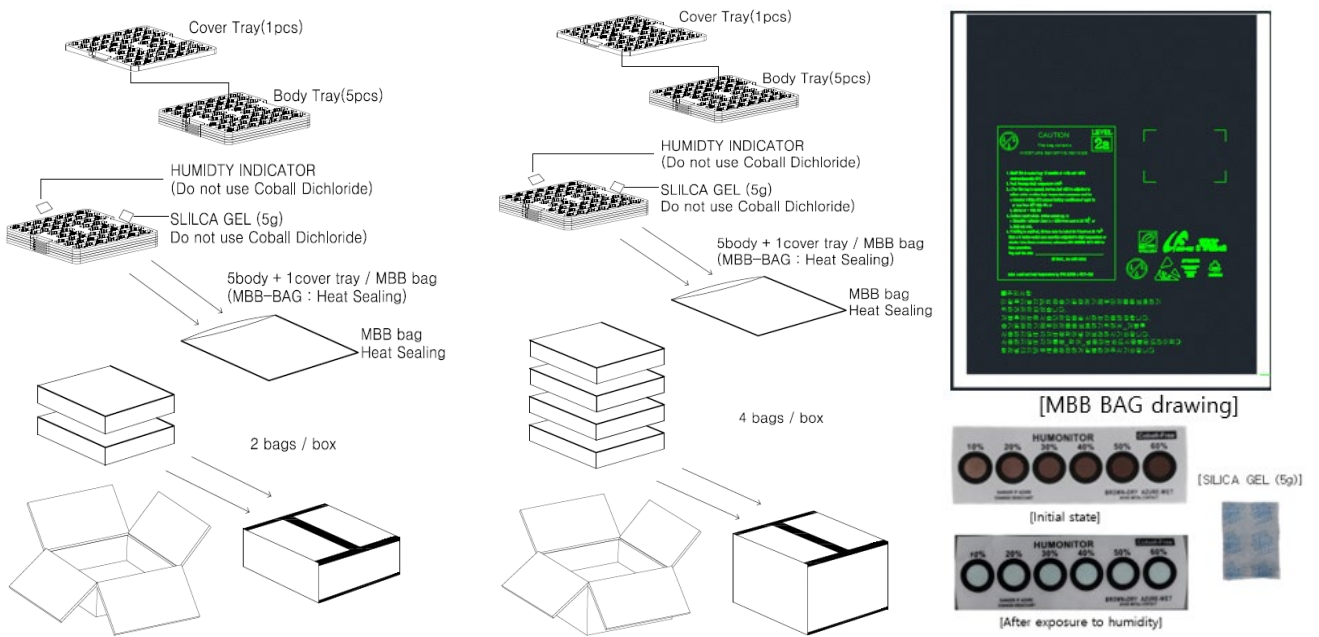
b) Tray



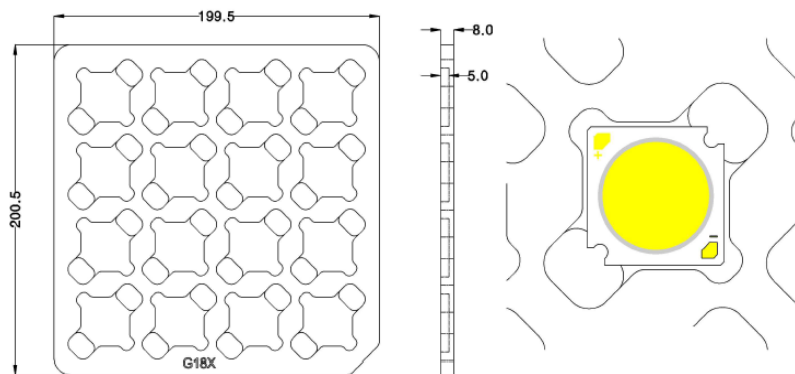
※ Model : LC040D, LC060D, LC080D

Packing material	Max. quantity in pcs of COB	Dimension(mm)			
		Length	Width	Height	Tolerance
Tray	16	200	200	8	1
Anti-Static Bag	80 (5 trays)	320	270	-	+/- 0.5
Outer Box (Small)	160 (2 bags)	225	225	65	5
Outer Box (Middle)	320 (4 bags)	225	225	130	5

a) Packing Structure

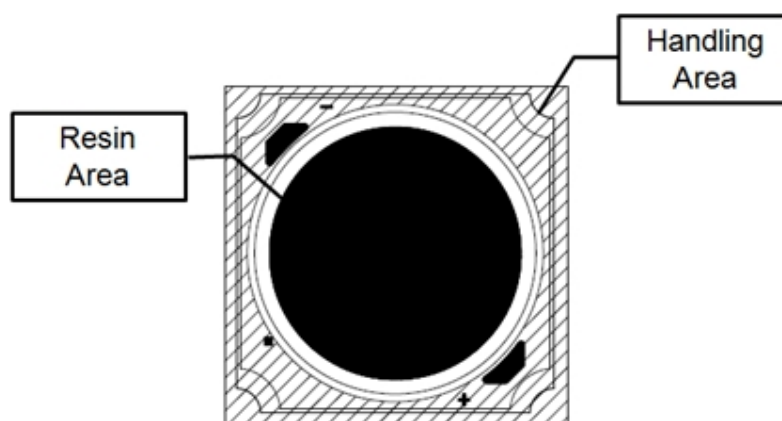


b) Tray



8. Precautions in Handling & Use

- 1) This device should not be used in any type of fluid such as water, oil, organic solvent, etc. Some solvent-based cleaning agent may damage the silicone resins used in the device.
- 2) LEDs must be stored in a clean environment. Shelf life of sealed bags is 12 months at temperature 0~40 °C, 0~90 % RH.
- 3) After storage bag is opened, device subjected to soldering, solder reflow, or other high temperature processes must be:
 - a. Mounted within 672 hours (28 days) at an assembly line with a condition of no more than 30 °C / 60 % RH, or
 - b. Stored at <10 % RH
- 4) Repack unused products with anti-moisture packing, fold to close any opening and then store in a dry place.
- 5) Devices require baking before mounting, if humidity card reading is >60 % at 23 ± 5 °C.
- 6) Devices must be baked for 1 hour at 60 ± 5 °C, if baking is required.
- 7) 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.
- 8) The thermal management is one of the most critical factors for the LED lighting system. Especially the LED junction temperature should not exceed the absolute maximum rating while operation of LED lighting system.
For more information, please refer to Application Note 'Mechanical & Thermal Guide for COB'.
- 9) In case of driving LEDs around the minimum current level (I_{f_min}), chips might exhibit different brightness due to the variation in I-V characteristics of each one. This is normal and does not adversely affect the performance of product.
- 10) VOCs (Volatile Organic Compounds) can be generated from adhesives, flux, hardener or organic additives used in luminaires (fixtures). Transparent LED silicone encapsulant is permeable to those chemicals and they may lead to a discoloration of encapsulant when they exposed to heat or light. This phenomenon can cause a significant loss of light emitted (output) from the luminaires. In order to prevent these problems, we recommend users to know the physical properties of materials used in luminaires and they must be carefully selected.
- 11) The resin area is very sensitive, please do not handle, press, touch, rub, clean, or pick by with tweezers on it. Instead, please pick at the handling area as indicated below.



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