

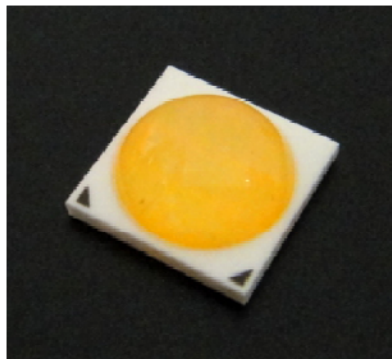


A6565-18070D-XZ-18B20

White LED

PRODUCT SPECIFICATION

CHIP-ARRAY-ON-CERAMIC TYPE SMD LED



Approved By Customer	Confirmed By ITC

1. Features

Dimensions: 6.5 × 6.5 × 2.75mm (L×W×H)

Package: Ceramic 6 chips Parallel and 3 Series Array with low thermal resistance

High power: 7W

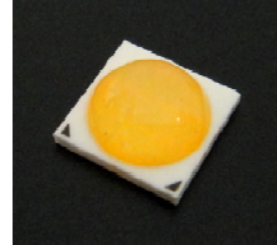
High efficacy: 86lm/W in Warm White

Color Rendering Index (CRI, Ra): 80 (min.) in Warm White/Neutral White
80 (typ.) in Cool White

Viewing angle: 130°

Emitting Color Temperature: Warm White/Neutral White/Cool White

Compliant with RoHS directive



2. Applications

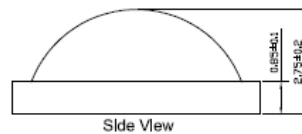
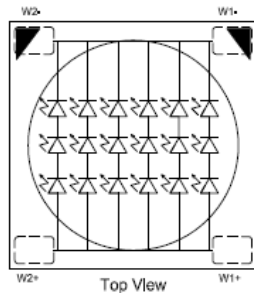
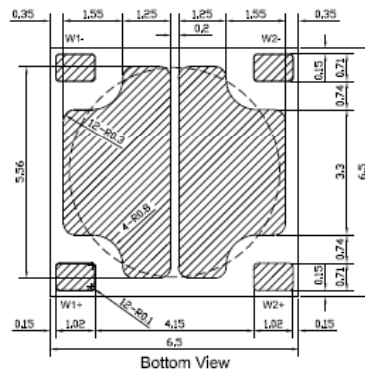
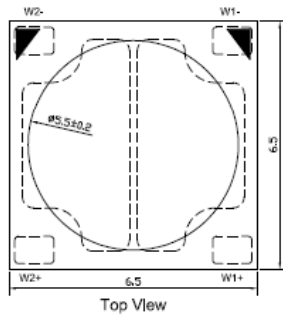
Indoor/Outdoor General Lighting

Signage

Portable Lighting

Electronic Equipment

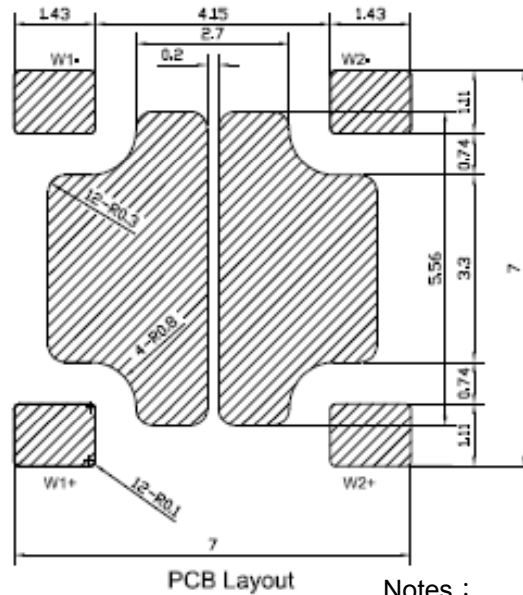
3. Mechanical Dimensions



Notes :

1. All dimensions are in millimeters.
2. Tolerance is ±0.2mm unless otherwise noted.

4. Recommended PCB layout



Notes :

1. Recommended stencil thickness 0.12 mm
2. Tolerance is ± 0.2 mm.

5. Absolute Maximum Ratings (@ Ta=25°C)

ITEM	SYMBOL	ABSOLUTE MAXIMUM RATING	UNIT
Power Dissipation	Pd	7	W
Reverse Voltage	Vr	5	V
D.C. Forward Current	If	700	mA
Pulse Forward Current (*1)	IfP	1000	mA
Operating Temperature	To	-40 ~ +85	°C
Storage Temperature	Ts	-40 ~ +100	°C
Junction Temperature	Tjmax	125	°C
Soldering Temperature	Tsld	250	°C
Soldering Temperature(Hand)	Tsld	350	°C

*1: Ifp conditions: 1/10 Duty Cycle & 0.1ms for pulse width.

6. Electrical & Optical Characteristics

ITEM	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Forward Voltage	V _f	I _f =700mA	V	9.0	9.8	10.8
Reverse Current	I _r	V _r =5V	μA			50
Viewing Angle	2θ _{1/2}	I _f =700mA	deg		130	
Color Rendering Index, CRI (Warm White/Neutral White)	R _a	I _f =700mA		80		
Color Rendering Index, CRI (Cool White)	R _a	I _f =700mA			80	
Thermal Resistance	R _{θj-c}	I _f =700mA	°C/W		4.5	
Luminous Flux	Φ	I _f =700mA	lm	460		820

*Measurement Uncertainty of the Luminous Intensity: ± 10%

*Measurement Uncertainty of the CRI: ± 2

7. Flux Binning

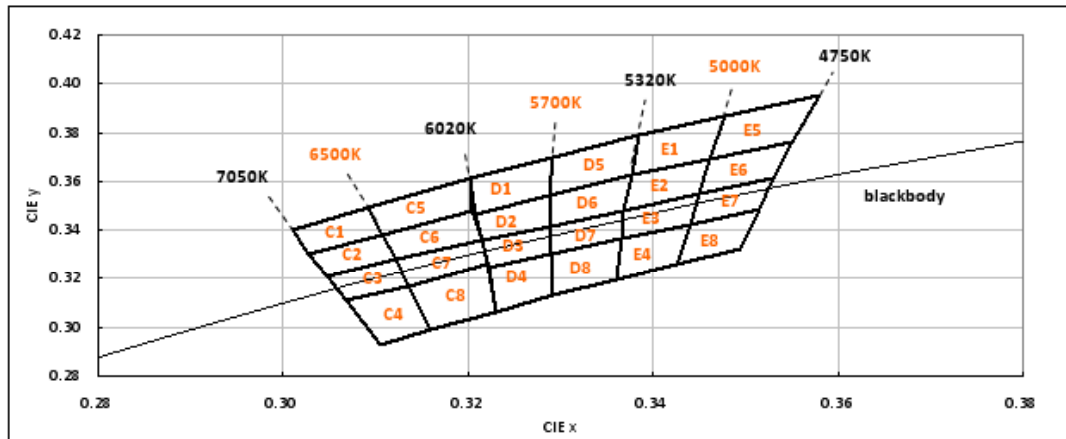
Emitting Color	Center CCT(K)	Flux Code	MIN.	MAX.	Model Name
Warm white	2700	F49	460	520	A6565-18070D-TZ-18B20
		F50	520	580	
		F51	580	650	
	3000	F50	520	580	A6565-18070D-RZ-18B20
		F51	580	650	
		F52	650	730	
Neutral white	4000	F50	520	580	A6565-18070D-PZ-18B20
		F51	580	650	
		F52	650	730	
Cool white	5000	F51	580	650	A6565-18070D-EZ-18B20
		F52	650	730	
		F53	730	820	

*Measurement Uncertainty of the Luminous Intensity: ± 10%

8. Chromaticity Coordinates & Bin Grade Diagram

(IF=700mA, Ta=25°C, pulsed measurement)

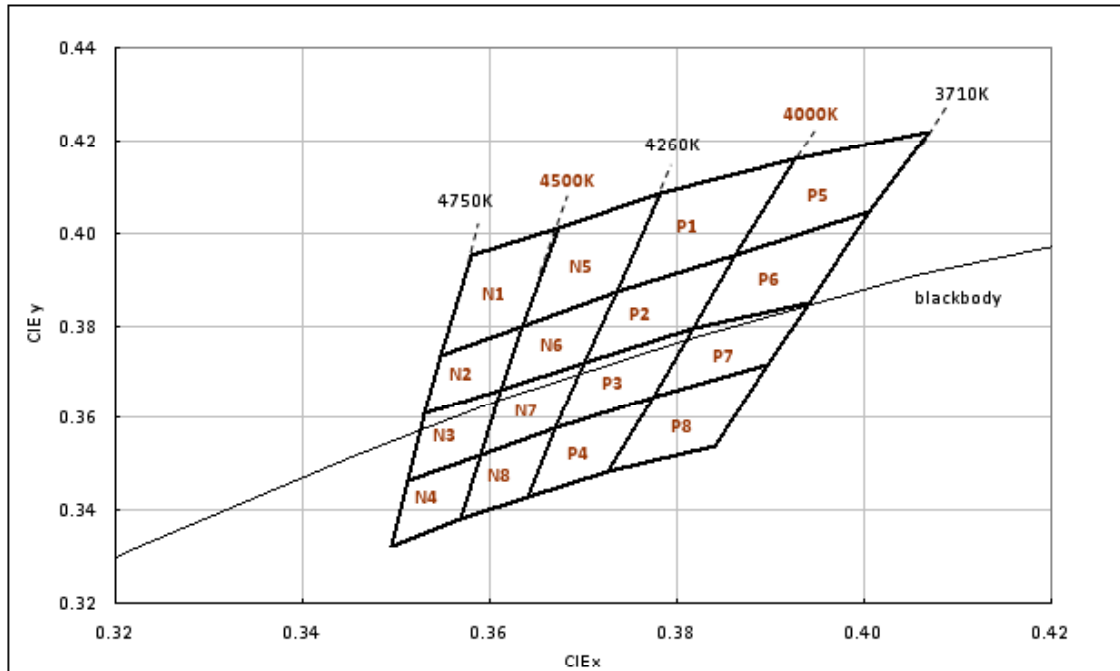
8-1. C.I.E Color Rank: Cool White – EZ(EY)



ITC Std Zone	Energy star ANSI	Rank	x1	y1	x2	y2	x3	y3	x4	y4	Center CCT(K)
CZ	CY	C2	0.3028	0.3304	0.3045	0.3210	0.3123	0.3282	0.3107	0.3380	6500
		C3	0.3045	0.3210	0.3072	0.3100	0.3136	0.3165	0.3123	0.3282	
		C6	0.3107	0.3380	0.3123	0.3282	0.3215	0.3360	0.3205	0.3481	
		C7	0.3123	0.3282	0.3136	0.3165	0.3222	0.3243	0.3215	0.3360	
	C1	0.3010	0.3400	0.3028	0.3304	0.3107	0.3380	0.3092	0.3495		
	C4	0.3072	0.3100	0.3105	0.2925	0.3160	0.2990	0.3136	0.3165		
	C5	0.3092	0.3495	0.3107	0.3380	0.3205	0.3481	0.3202	0.3610		
	C8	0.3136	0.3165	0.3160	0.2990	0.3230	0.3060	0.3222	0.3243		
DZ	DY	D2	0.3205	0.3481	0.3215	0.3360	0.3290	0.3417	0.3291	0.3560	5700
		D3	0.3215	0.3360	0.3222	0.3243	0.3290	0.3300	0.3290	0.3417	
		D6	0.3291	0.3560	0.3290	0.3417	0.3368	0.3480	0.3377	0.3625	
		D7	0.3290	0.3417	0.3290	0.3300	0.3366	0.3358	0.3368	0.3480	
	D1	0.3202	0.3610	0.3205	0.3481	0.3291	0.3560	0.3292	0.3700		
	D4	0.3222	0.3243	0.3230	0.3060	0.3292	0.3130	0.3290	0.3300		
	D5	0.3292	0.3700	0.3291	0.3560	0.3377	0.3625	0.3385	0.3790		
	D8	0.3290	0.3300	0.3292	0.3130	0.3360	0.3195	0.3366	0.3358		
EZ	EY	E2	0.3377	0.3625	0.3368	0.3480	0.3450	0.3550	0.3462	0.3693	5000
		E3	0.3368	0.3480	0.3366	0.3358	0.3437	0.3414	0.3450	0.3550	
		E6	0.3462	0.3693	0.3450	0.3550	0.3530	0.3610	0.3551	0.3760	
		E7	0.3450	0.3550	0.3437	0.3414	0.3512	0.3465	0.3530	0.3610	
	E1	0.3385	0.3790	0.3377	0.3625	0.3462	0.3693	0.3477	0.3870		
	E4	0.3366	0.3358	0.3360	0.3195	0.3425	0.3260	0.3437	0.3414		
	E5	0.3477	0.3870	0.3462	0.3693	0.3551	0.3760	0.3580	0.3950		
	E8	0.3437	0.3414	0.3425	0.3260	0.3495	0.3320	0.3512	0.3465		

*Measurement Uncertainty of the Color Coordinates : ± 0.01

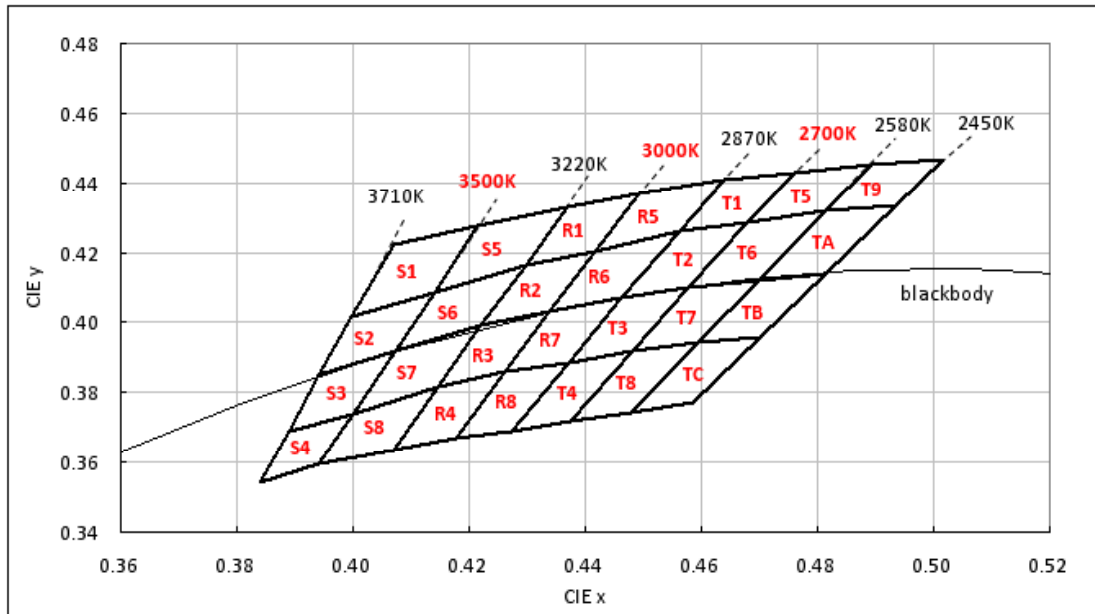
8-2. C.I.E Color Rank: Neutral White – PZ(PY)



ITC Std Zone	Energy star ANSI	Rank	x1	y1	x2	y2	x3	y3	x4	y4	Center CCT(K)
NZ	NY	N2	0.3551	0.3760	0.3530	0.3610	0.3611	0.3660	0.3640	0.3825	4500
		N3	0.3530	0.3610	0.3512	0.3465	0.3590	0.3520	0.3611	0.3660	
		N6	0.3640	0.3825	0.3611	0.3660	0.3700	0.3720	0.3740	0.3888	
		N7	0.3611	0.3660	0.3590	0.3520	0.3670	0.3568	0.3700	0.3720	
		N1	0.3580	0.3950	0.3551	0.3760	0.3640	0.3825	0.3673	0.4010	
		N4	0.3512	0.3465	0.3495	0.3320	0.3568	0.3380	0.3590	0.3520	
		N5	0.3673	0.4010	0.3640	0.3825	0.3740	0.3888	0.3783	0.4085	
		N8	0.3590	0.3520	0.3568	0.3380	0.3640	0.3430	0.3670	0.3568	
PZ	PY	P2	0.3740	0.3888	0.3700	0.3720	0.3818	0.3795	0.3863	0.3950	4000
		P3	0.3700	0.3720	0.3670	0.3568	0.3770	0.3630	0.3818	0.3795	
		P6	0.3863	0.3950	0.3818	0.3795	0.3941	0.3850	0.3996	0.4015	
		P7	0.3818	0.3795	0.3770	0.3630	0.3889	0.3690	0.3941	0.3850	
		P1	0.3783	0.4085	0.3740	0.3888	0.3863	0.3950	0.3926	0.4160	
		P4	0.3670	0.3568	0.3640	0.3430	0.3727	0.3482	0.3770	0.3630	
		P5	0.3926	0.4160	0.3863	0.3950	0.3996	0.4015	0.4070	0.4220	
		P8	0.3770	0.3630	0.3727	0.3482	0.3840	0.3540	0.3889	0.3690	

*Measurement Uncertainty of the Color Coordinates : ± 0.01

8-3. C.I.E Color Rank: Warm White - RZ(RY)&TZ(TY)



ITC Std Zone	Energy star ANSI	Rank	x1	y1	x2	y2	x3	y3	x4	y4	Center CCT(K)
SZ	SY	S2	0.3996	0.4015	0.3941	0.3850	0.4073	0.3917	0.4140	0.4086	3500
		S3	0.3941	0.3850	0.3889	0.3690	0.4000	0.3740	0.4073	0.3917	
		S6	0.4140	0.4086	0.4073	0.3917	0.4220	0.3990	0.4299	0.4165	
		S7	0.4073	0.3917	0.4000	0.3740	0.4147	0.3814	0.4220	0.3990	
	S1	0.4070	0.4220	0.3996	0.4015	0.4140	0.4086	0.4215	0.4276		
	S4	0.3889	0.3690	0.3840	0.3540	0.3942	0.3595	0.4000	0.3740		
	S5	0.4215	0.4276	0.4140	0.4086	0.4299	0.4165	0.4370	0.4332		
	S8	0.4000	0.3740	0.3942	0.3595	0.4070	0.3636	0.4147	0.3814		
RZ	RY	R2	0.4299	0.4165	0.4220	0.3990	0.4338	0.4030	0.4417	0.4200	3000
		R3	0.4220	0.3990	0.4147	0.3814	0.4260	0.3845	0.4338	0.4030	
		R6	0.4417	0.4200	0.4338	0.4030	0.4463	0.4070	0.4562	0.4260	
		R7	0.4338	0.4030	0.4260	0.3845	0.4371	0.3885	0.4463	0.4070	
	R1	0.4370	0.4332	0.4299	0.4165	0.4417	0.4200	0.4493	0.4370		
	R4	0.4147	0.3814	0.4070	0.3636	0.4178	0.3670	0.4260	0.3845		
	R5	0.4493	0.4370	0.4417	0.4200	0.4562	0.4260	0.4640	0.4410		
	R8	0.4260	0.3845	0.4178	0.3670	0.4273	0.3690	0.4371	0.3885		
TZ	TY	T2	0.4562	0.4260	0.4463	0.4070	0.4578	0.4101	0.4680	0.4285	2700
		T3	0.4463	0.4070	0.4371	0.3885	0.4482	0.3920	0.4578	0.4101	
		T6	0.4680	0.4285	0.4578	0.4101	0.4700	0.4120	0.4813	0.4319	
		T7	0.4578	0.4101	0.4482	0.3920	0.4593	0.3944	0.4700	0.4120	
	T1	0.4640	0.4410	0.4562	0.4260	0.4680	0.4285	0.4760	0.4430		
	T4	0.4371	0.3885	0.4273	0.3690	0.4376	0.3720	0.4482	0.3920		
	T5	0.4760	0.4430	0.4680	0.4285	0.4813	0.4319	0.4892	0.4450		
	T8	0.4482	0.3920	0.4376	0.3720	0.4480	0.3745	0.4593	0.3944		
	T9	0.4892	0.4450	0.4813	0.4319	0.4935	0.4335	0.5017	0.4465		
	TA	0.4813	0.4319	0.4700	0.4120	0.4815	0.4140	0.4935	0.4335		
	TB	0.4700	0.4120	0.4593	0.3944	0.4702	0.3960	0.4815	0.4140		
	TC	0.4593	0.3944	0.4480	0.3745	0.4585	0.3770	0.4702	0.3960		

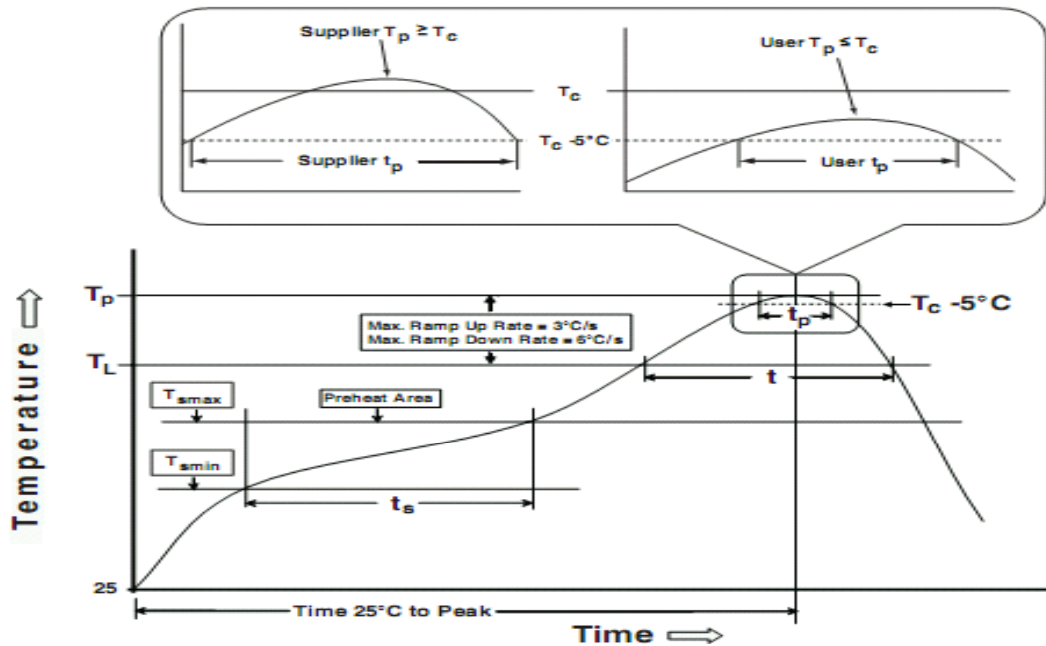
*Measurement Uncertainty of the Color Coordinates : ± 0.01

9. Soldering Characteristics

9-1. Reflow soldering: Follow JEDEC-J-STD-020D-01

As a general guideline, ITC recommends that users follow the recommended soldering profile provided by the manufacturer of solder paste used.

Note that this general guideline may not apply to all PCB designs and configurations of reflow Soldering equipment.



Profile Feature	Lead-Base Solder	Lead-Free Solder
Average Ramp-up rate (T _{smax} to T _p)	3°C/second max.	3°C/second max.
Preheat - Temperature min (T _{smin}) - Temperature min (T _{smax}) - Time (T _{smin} to T _{smax}) (t _s)	100°C 150°C 60-120 seconds	150°C 200°C 60-120 seconds
Time maintained above: - Temperature (T _L) - Time (t _L)	183°C 60-150 seconds	217°C 60-150 seconds
Peak Temperature (T_p)	220°C	250°C
Time within 5°C of actual Peak Temperature (t_p)	10 seconds Max.	10 seconds Max.
Ramp-down Rate	6°C/second max.	6°C/second max.
Time 25°C to Peak Temperature	6 minutes max.	8 minutes max.

Note : All temperatures refer to topside of the package, measured on the package body surface.

9-2. Manual Iron Soldering (NOT RECOMMENDED)

Use SN60 solder of solder with silver content.

Use 25W soldering iron at 350°C Max for 3 seconds or less.

The soldering time and temperature will be different according with different LED thermal dissipation base. Must not touch top resin portion of SMD LED by heated soldering iron. Repairing should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used. It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.

10. Cautions

10-1. Moisture Proof Package

When moisture is absorbed into the SMT package it may vaporize and expand during soldering. There is a possibility that this can cause exfoliation of the contacts and affect the optical characteristics of the LEDs. For this reason, a moisture proof package is used to keep moisture to a minimum in the package.

10-2. Storage

Recommended storage environment:

Temperature: 5°C ~ 30°C (41°F ~ 86°F)

Humidity: 60% RH Max.

Use within 7 days after opening of sealed vapor/ESD barrier bags.

If LEDs remain unused, they should be stored in moisture proof packages, such as sealed containers with packages of moisture absorbent material.

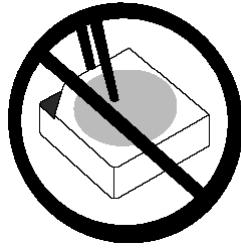
10-3. Heat Generation

Thermal design of the end product is of paramount importance. Heat generated by the LED must be considered in system design. The coefficient of temperature increase per input electric power is affected by the thermal resistance of the circuit board and density of LED placement on the board, as well as other components. It is necessary to avoid intense heat generation and operate within the maximum ratings given in this specification.

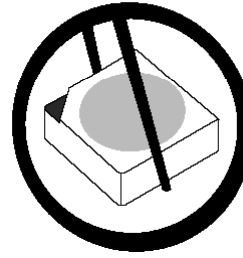
The operating current should be derated if ambient temperature is to exceed recommended value in this datasheet.

10-4. Handling Instructions of Silicone Resin LEDs

Mechanical stress on the surface should be minimized as much as possible during handling. Sharp objects of all types should not be used to avoid piercing the sealing compound.



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10-5. Cleaning

It is recommended that isopropyl alcohol be used as a solvent for cleaning the LEDs. When using other solvents, it should be confirmed beforehand whether the solvents will damage the LED.

Avoid using organic solvents. Surface condition of this device may change when organic solvents such as trichloroethylene or acetone is applied.

Do not clean the LEDs by the ultrasonic method. When it is absolutely necessary, the effect of ultrasonic cleaning on the LEDs depends on factors such as ultrasonic power, baking time and assembled condition. Before cleaning, a pre-test should be done to confirm whether any damage to the LEDs will occur.

10-6. Other

Not responsible for any damage caused due to using the LEDs at conditions exceeding our specifications.

These LEDs are designed and manufactured for use in typical consumer applications. It is recommended to consult us in advance if user's application requires any particular quality or reliability which concerns human life. Examples would be medical equipment, aerospace applications, traffic signals, safety system equipment and so on.

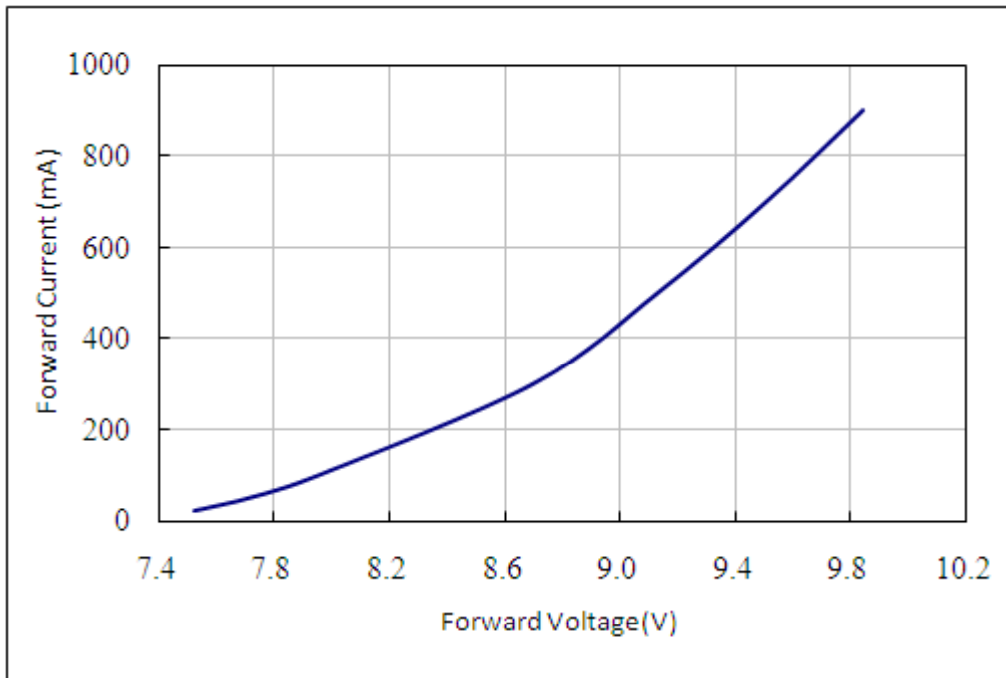
Care must be taken to ensure that the reverse voltage will not exceed the absolute maximum rating when using the LEDs with matrix drive.

The LED light output is strong enough to injure human eyes. Precautions must be taken to prevent looking directly at the LEDs with unprotected eyes for more than a few seconds.

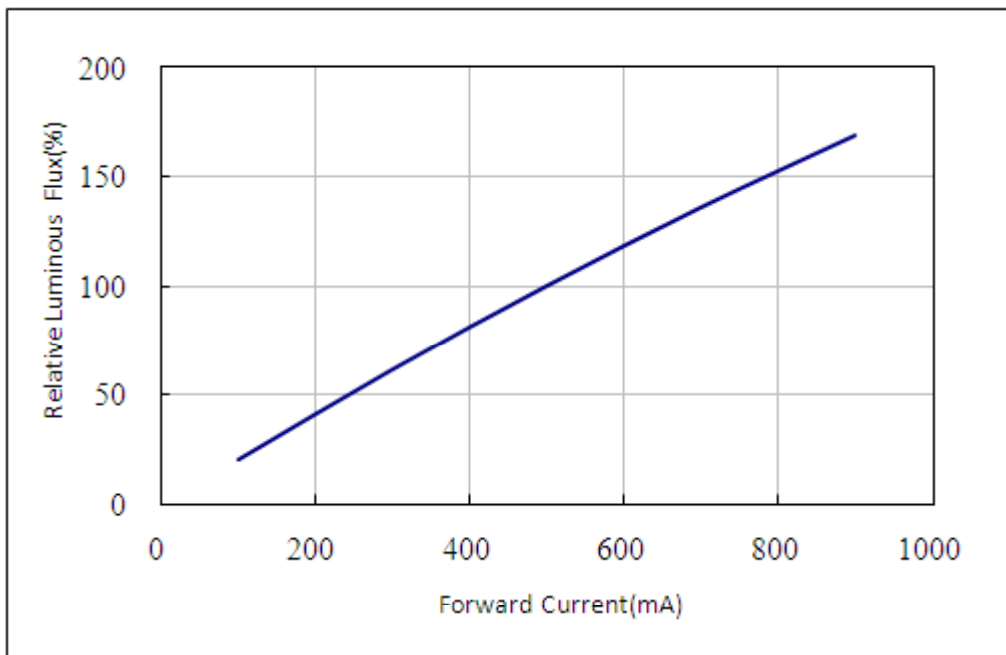
The appearance and specifications of the product may be modified for improvement without notice.

11. Typical Electrical & Optical Characteristic Curves

11-1. Electrical Characteristics (Ta=25°C, pulsed measurement)

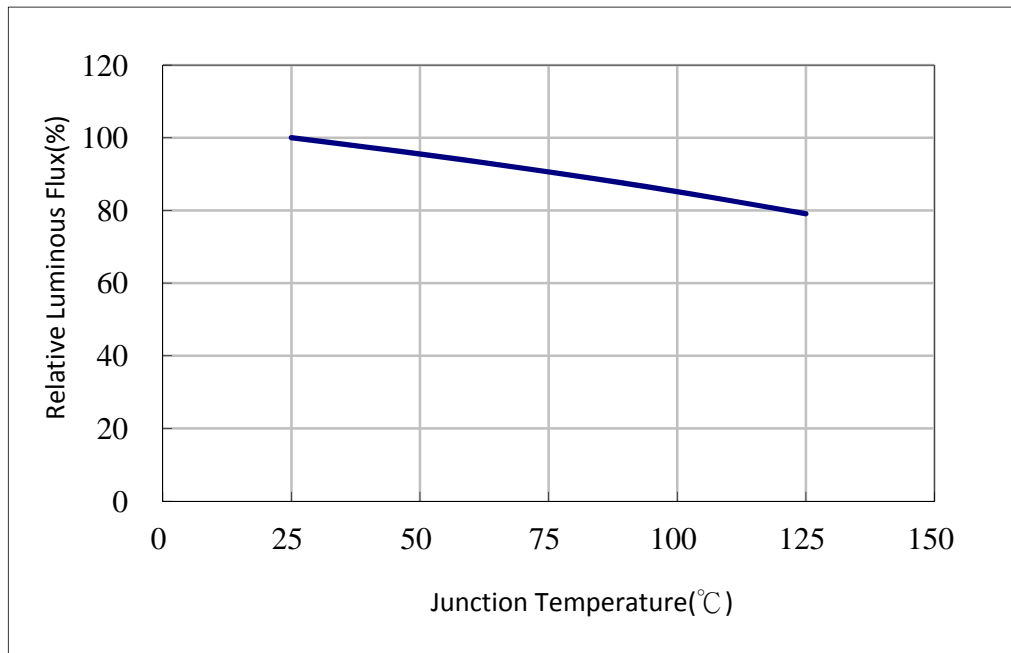


11-2. Relative Flux vs Forward Current (Ta=25°C, pulsed measurement)

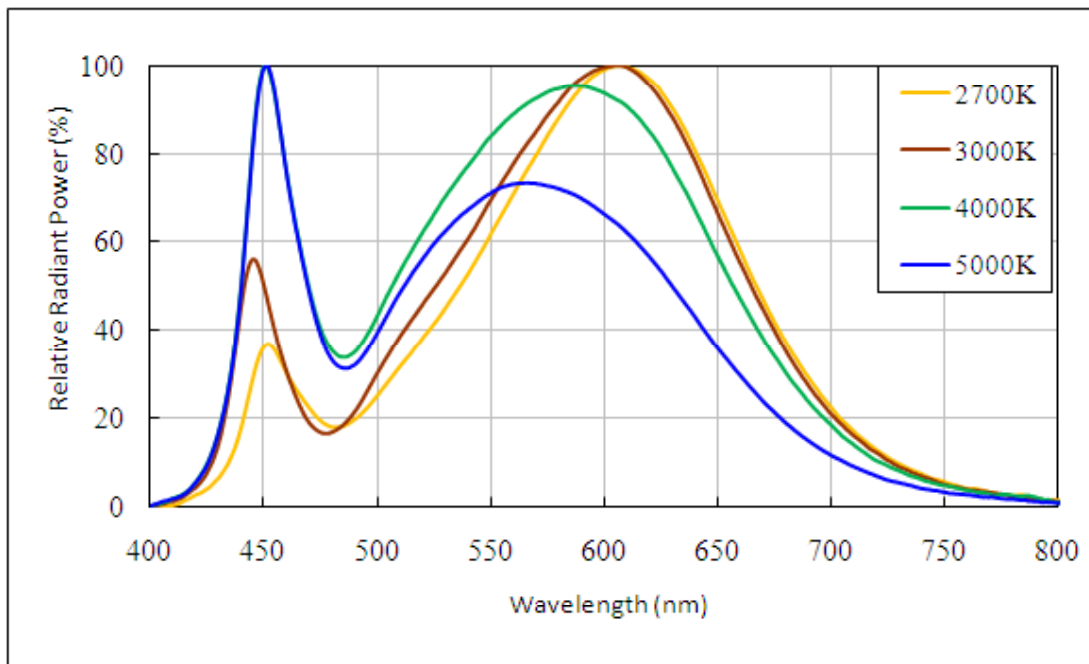


11. Typical Electrical & Optical Characteristic Curves:

11-3. Relative Flux vs Junction Temperature (IF=700mA)

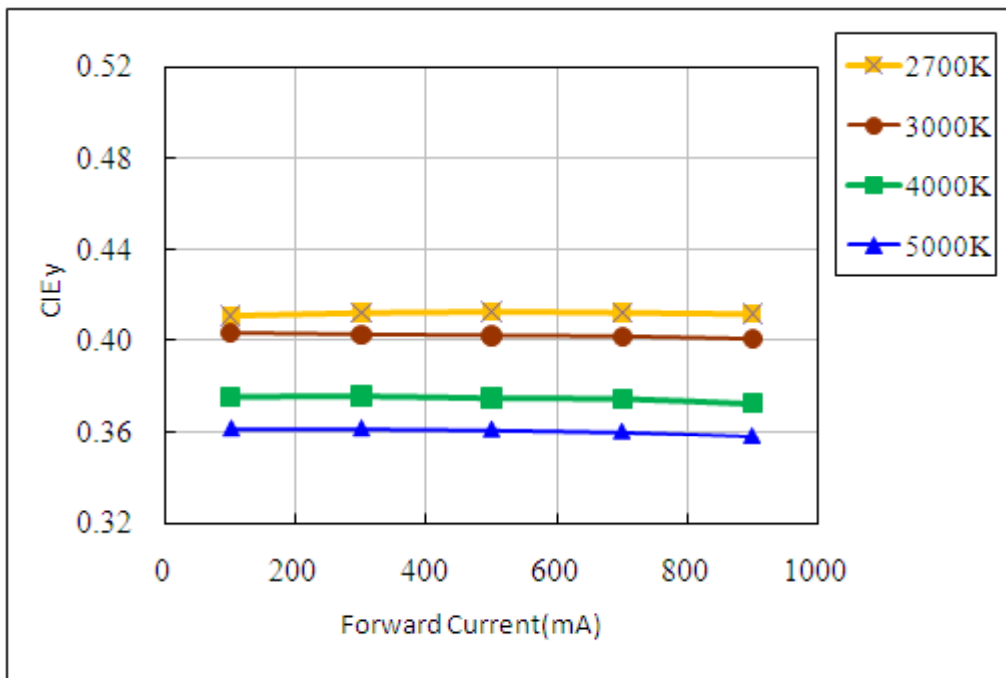
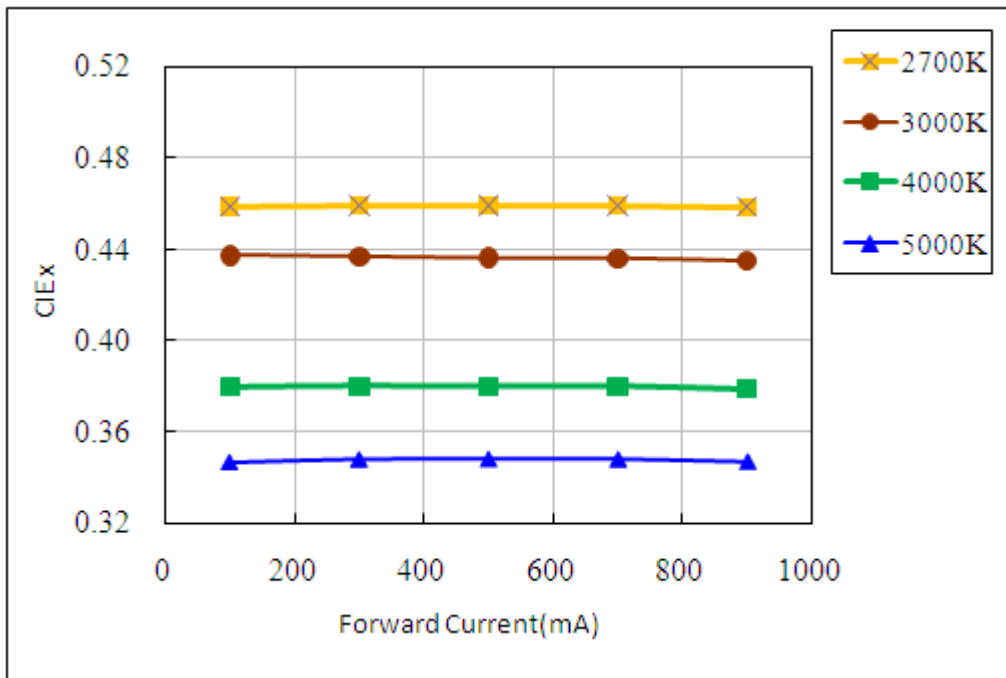


11-4. Spectrum (IF=700mA, Ta=25°C)



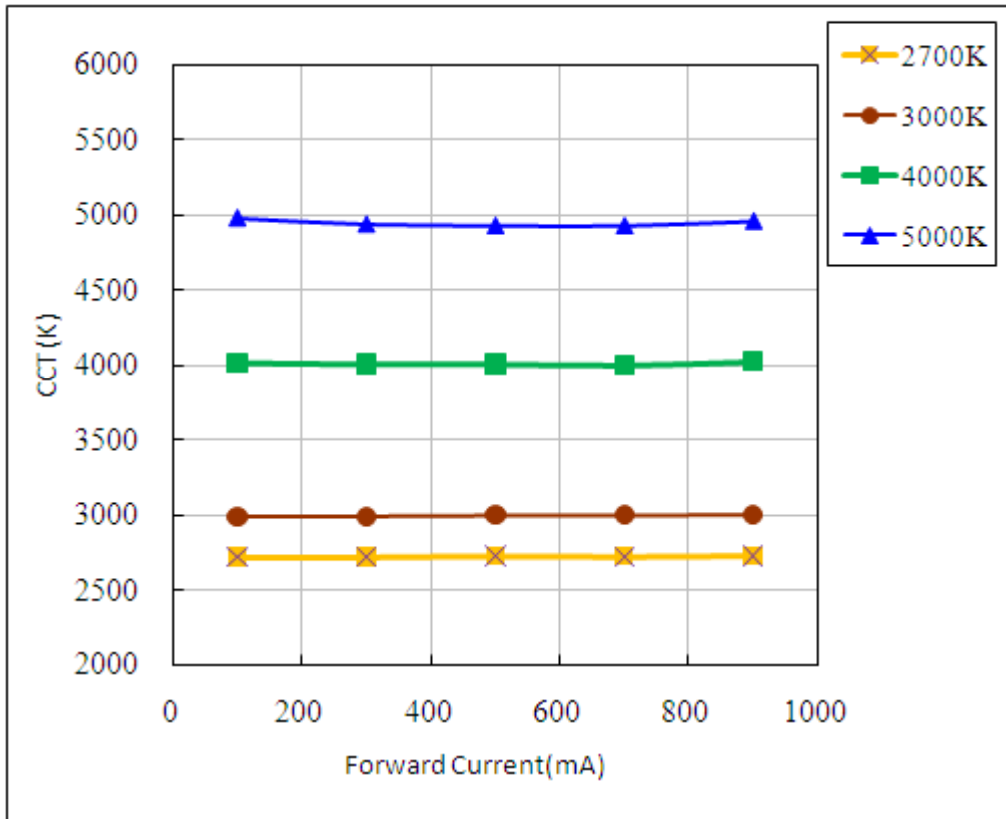
11. Typical Electrical & Optical Characteristic Curves:

11-5. Forward current vs CIE (x,y)@ 25°C

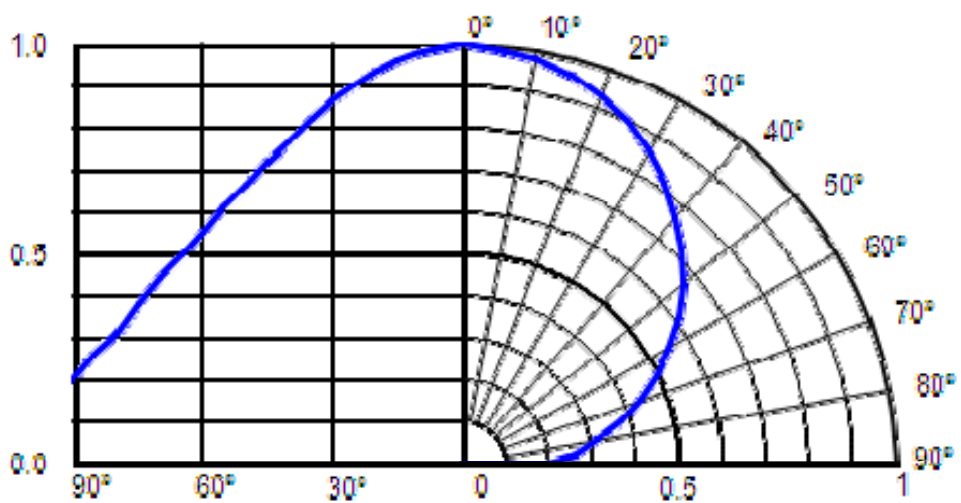


11. Typical Electrical & Optical Characteristic Curves:

11-6. Forward current vs CCT (K)@ 25°C



11-7. Radiant Angle & Pattern (@25°C, 700mA)



12. Reliability Test Item and Criteria

NO	Test Item	Test Condition	
		Condition	Note
1	JEDEC Level 1 MSL Solder Heat Resistance(SHR)	Followed by Pb free Reflow Solder profile after Preconditioning at 85°C/85%RH for 168 hours. First Reflow needs to be completed between 15 minutes and 4hours, 260°C/10 sec follow JEDEC_020C	
2	Thermal Shock	-40°C~125°C 15min dwell., 10sec transfer	500 cycles
3	Steady State Operating of High Temperature	Ta=85°C, IF= 500mA	1000 hrs
4	Steady State Operating of High Temperature	Ta=85°C, IF= 700mA	1000 hrs
5	Steady State Operating of High Humidity Heat	Ta=60°C, RH=90%IF=500mA	1000 hrs
6	Steady State Operating of High Humidity Heat	Ta=60°C, RH=90%IF=700mA	1000 hrs

Criteria for Failure :

* Luminous Flux(lm) = 0.85 * initial flux @ rated current

* Vf = Initial Vf * 1.10 @ rated current

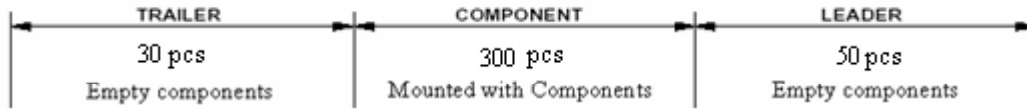
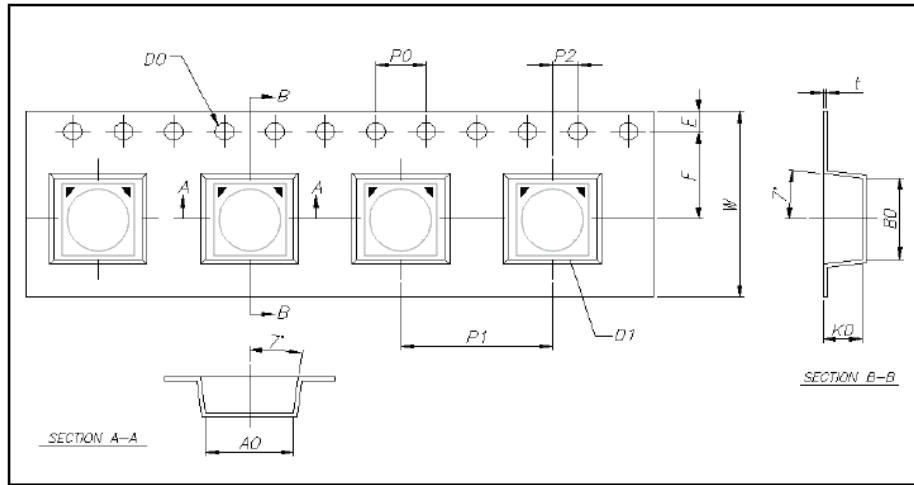
13.Model name Rule

	EA	6565		-	04	040	D	-	XZ	-	01	B	2	0
1	2	3	4	-	5	6	7	-	8	-	9	10	11	12

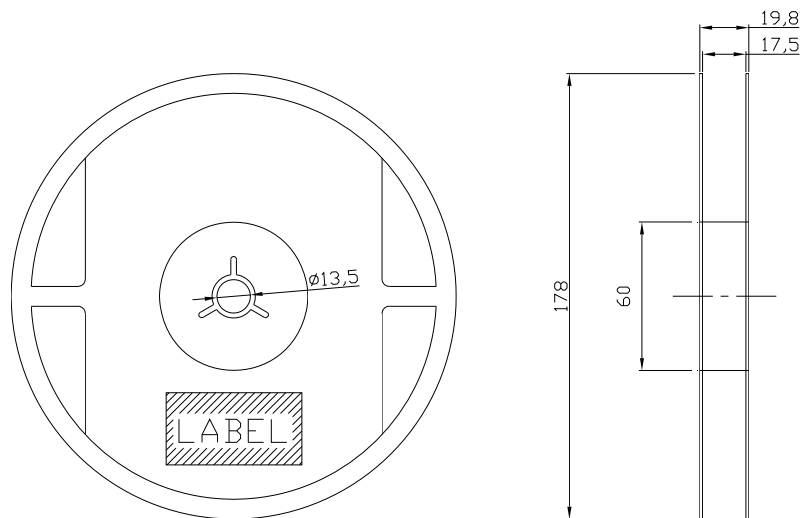
<p>1. Component type: AC: AC LED package Empty: Normal DC Package</p>																													
<p>2. Package type: C: Cetus series(Multi cavity) A: Apus series(Single Cavity) EA: EMMA DC High voltage Apus series (70V above) EC: EMMA DC High voltage Cetus series (70V above)</p>																													
<p>3. Dimension: Length x Width Ex: 6565 as 6.5mmx6.5mm</p>																													
<p>4. Specific code: Customer code or others</p>																													
<p>5. Chip number: Chip/Component</p>																													
<p>6. Power dissipation: Pd(W), Ex: 4W as 040</p>																													
<p>7. Process: Optical consideration Ex. Empty: No Dome Lens D: Dome Lens</p>																													
<p>8. CCT: Ex. TZ or TY: 2700K (Energy Star ANSI CIE specification) Tt: 2700K (IEC CIE & color specification) XRRZ or XRRY: Direct color package (ex. XR: Direct Red)</p> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>TZ</th> <th>RZ</th> <th>SZ</th> <th>PZ</th> <th>NZ</th> <th>EZ</th> <th>DZ</th> <th>CZ</th> <th>BZ</th> <th>AZ</th> </tr> </thead> <tbody> <tr> <td>2700</td> <td>3000</td> <td>3500</td> <td>4000</td> <td>4500</td> <td>5000</td> <td>5700</td> <td>6500</td> <td>8100</td> <td>11000</td> </tr> </tbody> </table>										TZ	RZ	SZ	PZ	NZ	EZ	DZ	CZ	BZ	AZ	2700	3000	3500	4000	4500	5000	5700	6500	8100	11000
TZ	RZ	SZ	PZ	NZ	EZ	DZ	CZ	BZ	AZ																				
2700	3000	3500	4000	4500	5000	5700	6500	8100	11000																				
<p>9. Electrical Connecting Ex. 01:4 2 chips Parallel and 2 Series</p>																													
<p>10. View Angle Ex. 9: 110° A: 120° B: 130°</p>																													
<p>11. CRI respent Ex. 1: 75 3: 90 2: 80</p>																													
<p>12. With Zener number Ex. 0: Without zener 1: With one zener</p>																													

14. Packaging

14-1. Carrier & Tape



14-2. Reel



Notes :

1. All dimensions are in millimeters.
2. Tolerance is ± 0.5 mm

14. Packaging

14-3. Drying Package & Labeling

