Specification for white LED

Ergon COB 1507

- **15W maximum power capability**
- **High brightness LED**
- **Dimension : 15.85 x 15.85 x 2.35 mm**
- **Precondition : JEDEC Level 2a**
- **Lead-free reflow soldering application**
- **RoHS compliant**

Vendor		Customer
Written	Approval	Approval

Lumens CO., LTD.
12, Wongomae-ro, Giheung-gu, Yongin-si, Gyeonggi-do, Korea
http://www.lumens.co.kr

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1. Product description

(1) Description

- The Ergon series LED is designed for the high power operation to get the high flux output applications.
- It is ideal for the light source for general illumination applications, custom designed solutions.

(2) Features

- Maximum drive current up to 380mA
- Low thermal resistance as low as 1.6℃/W
- Viewing angle of 120 degrees
- Precondition JEDEC Level 2a
- RoHS compliant

(3) Applications

- Indoor lighting, Outdoor lighting, Industrial lighting

2. Absolute maximum ratings

Parameters	Symbol	Value	Unit
Power dissipated	Pd	15	W
Rated forward current	If	380	mA
Maximum junction temperature capability(1)	Tj	125	℃
Operating temperature	Top	- 40 ~ +85	℃
Storage temperature	Tst	- 40 ~ +100	℃

(1) Proper current derating must be observed to maintain junction temperature below the maximum.

3. Electro-optical characteristics (Ta=25℃)

Parameters	Symbol	If(mA)	Typ.	Unit
Forward voltage	Vf	200	37.5	V
Viewing angle FWHM	2θ1/2	200	120	degrees
Thermal resistance junction to solder pad	Rthj-s		1.6	℃/W

- Lumens maintains a tolerance of ±3% on forward voltage measurements.

4. Electro-optical chart (Ta=25℃)

CCT(K)	CRI	If(mA)	Vf(V)	Pd(W)	Typ. Φv(lm)	lm/W
2700	80	200	37.5	7.5	800	107
3000		200	37.5	7.5	850	113
3500		200	37.5	7.5	875	117
4000		200	37.5	7.5	900	120
5000		200	37.5	7.5	930	124
2700	90	200	37.5	7.5	670	89
3000		200	37.5	7.5	695	93
3500		200	37.5	7.5	720	96

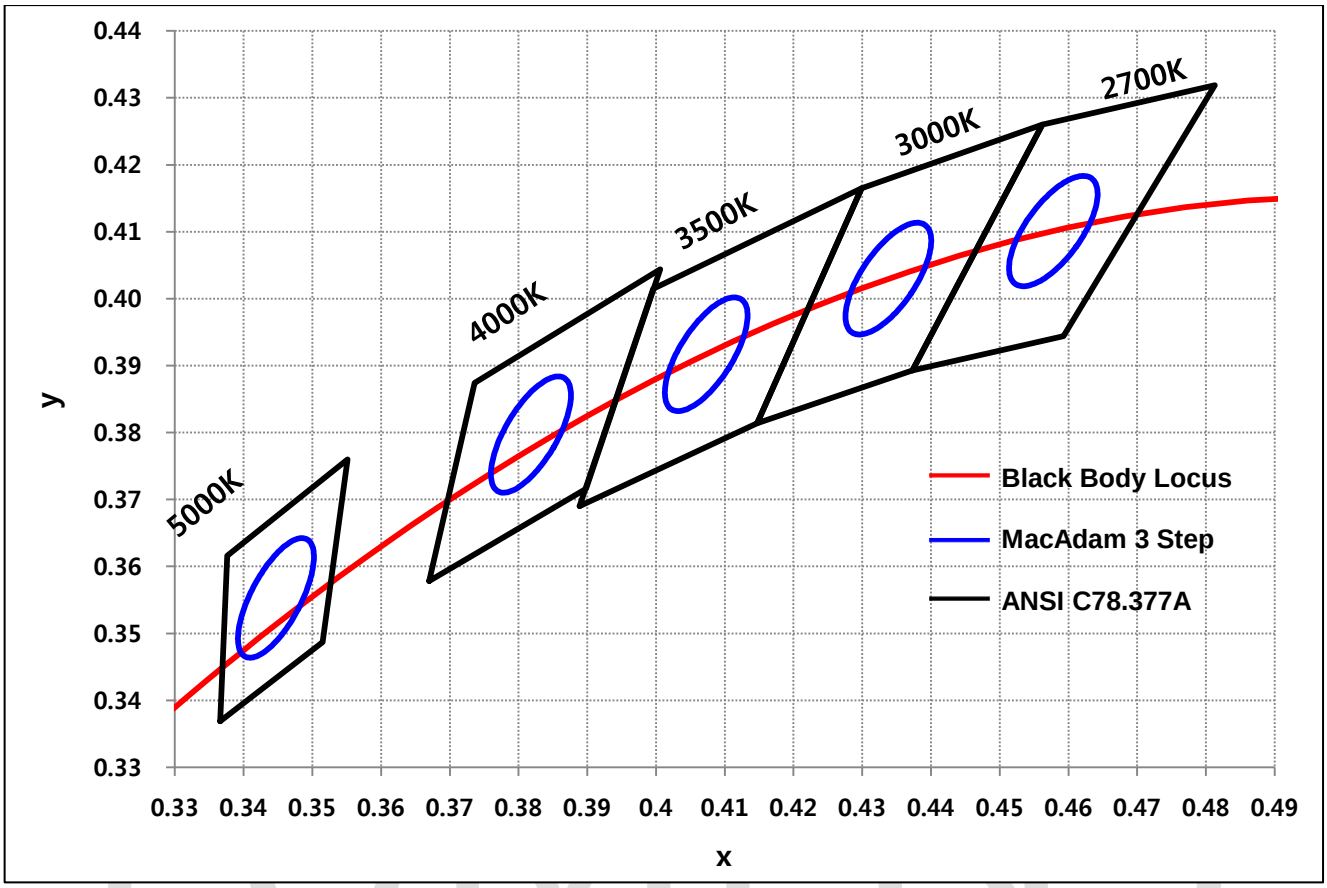
- Lumens maintains a tolerance of ±7% on flux measurements.
- Lumens maintains a tolerance of ±3% on forward voltage measurements.
- Lumens maintains a tolerance of ±2 on CRI measurements.

5. Ranks

Item	Symbol	CCT(K)	Min.	Typ.	Unit	CRI	If(mA)
Luminous Flux	Φv	2700	720	800	lm	80	200
		3000	770	850	lm		
		3500	790	875	lm		
		4000	810	900	lm		
		5000	840	930	lm		
		2700	600	670	lm	90	
		3000	630	695	lm		
		3500	650	720	lm		
Forward Voltage	Vf	-	37	37.5	V	-	

- Lumens maintains a tolerance of ±7% on flux measurements.
- Lumens maintains a tolerance of ±3% on forward voltage measurements.
- Lumens maintains a tolerance of ±2 on CRI measurements.

6. Chromaticity diagram & coordinates



- Lumens maintains a tolerance of ±0.005 on chromaticity (CCx, CCy)

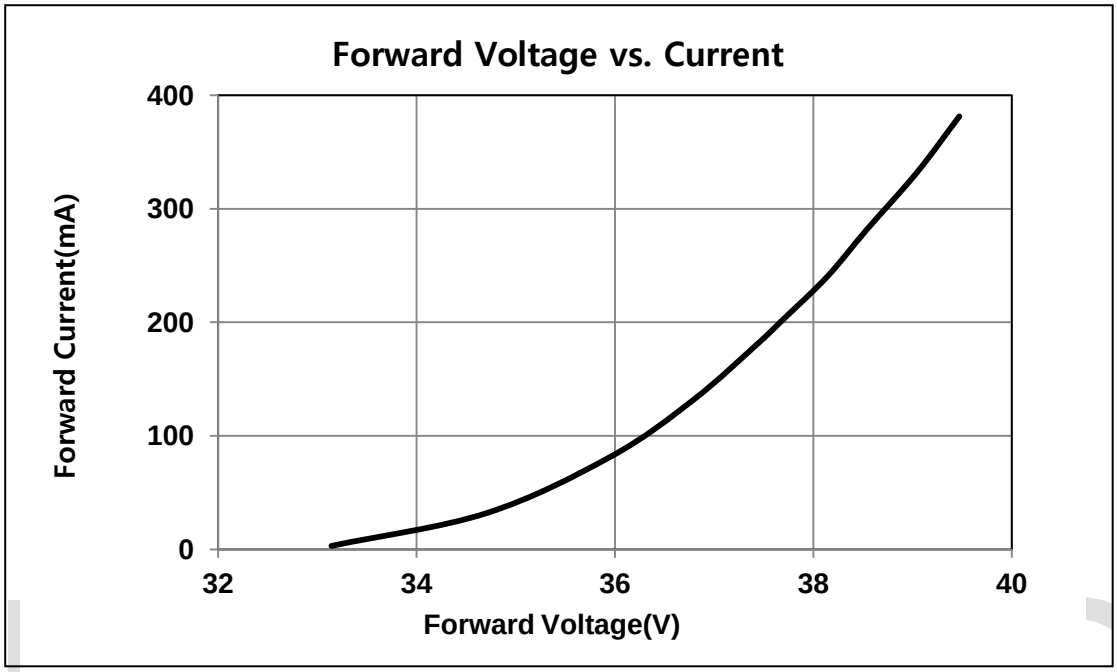
CCT(K)	x	y	CCT(K)	x	y	CCT(K)	x	y
5000K	0.3366	0.3369	3500K	0.3889	0.3690	2700K	0.4373	0.3893
	0.3376	0.3616		0.3996	0.4015		0.4562	0.4260
	0.3551	0.3760		0.4299	0.4165		0.4813	0.4319
	0.3515	0.3487		0.4147	0.3814		0.4593	0.3944
4000K	0.3670	0.3578	3000K	0.4147	0.3814			
	0.3736	0.3874		0.4299	0.4165			
	0.4006	0.4044		0.4562	0.4260			
	0.3898	0.3716		0.4373	0.3893			

*** 3-step MacAdam Ellipse Color Definition**

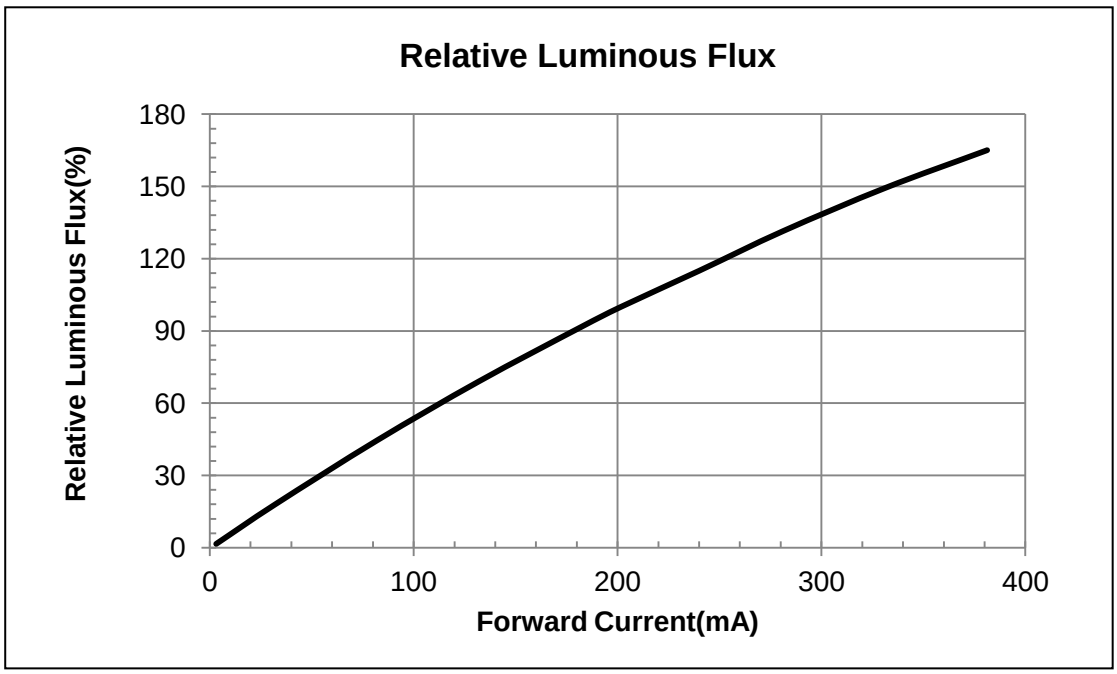
CCT(K)	Center		Ellipse Parameter		
	x	y	Axis a	Axis b	Angle(°)
5000K	0.3447	0.3553	0.00822	0.00354	59.6
4000K	0.3818	0.3797	0.00939	0.00402	53.7
3500K	0.4073	0.3917	0.00927	0.00414	54.0
3000K	0.4338	0.4030	0.00834	0.00408	53.2
2700K	0.4578	0.4101	0.00810	0.00420	53.7

7. Characteristic Graphs(Ta=25℃)

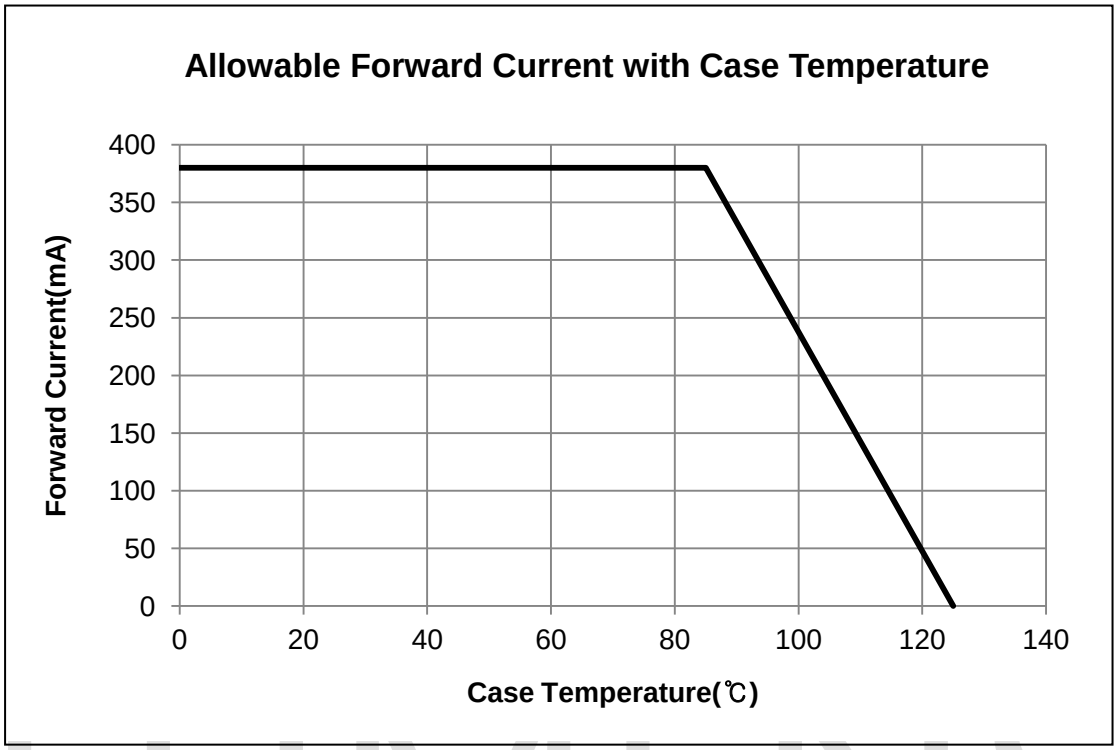
(1) Typical Forward Current vs. Forward Voltage



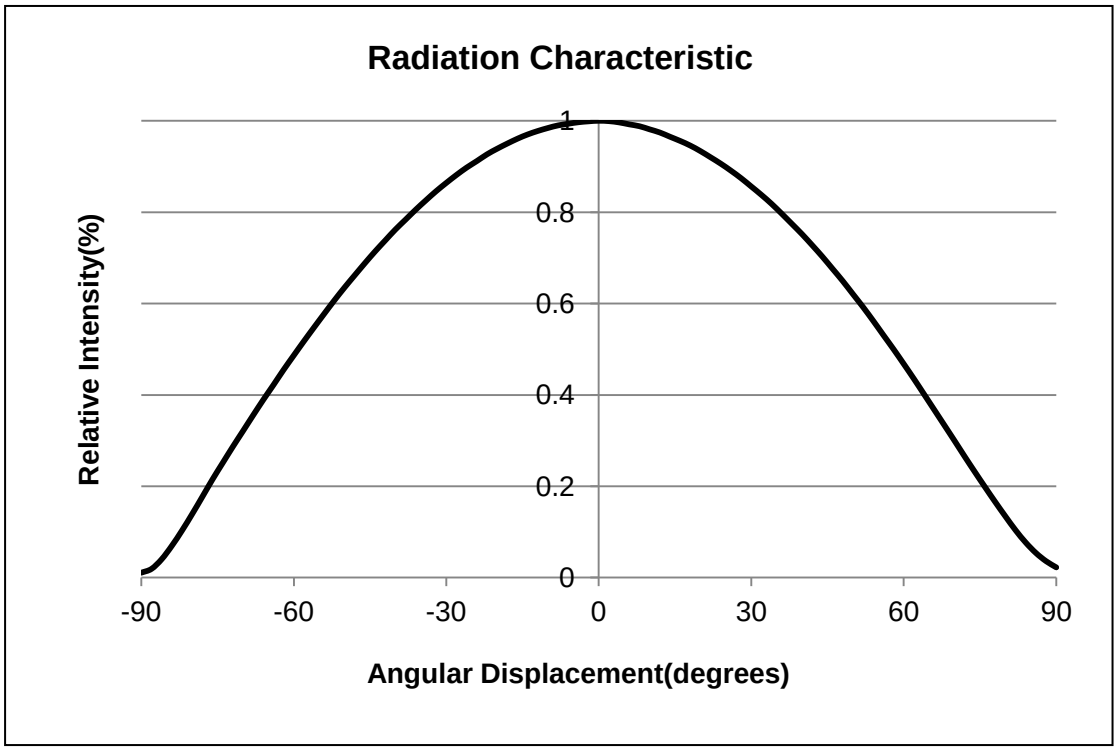
(2) Typical Relative Luminous Flux vs. Forward Current



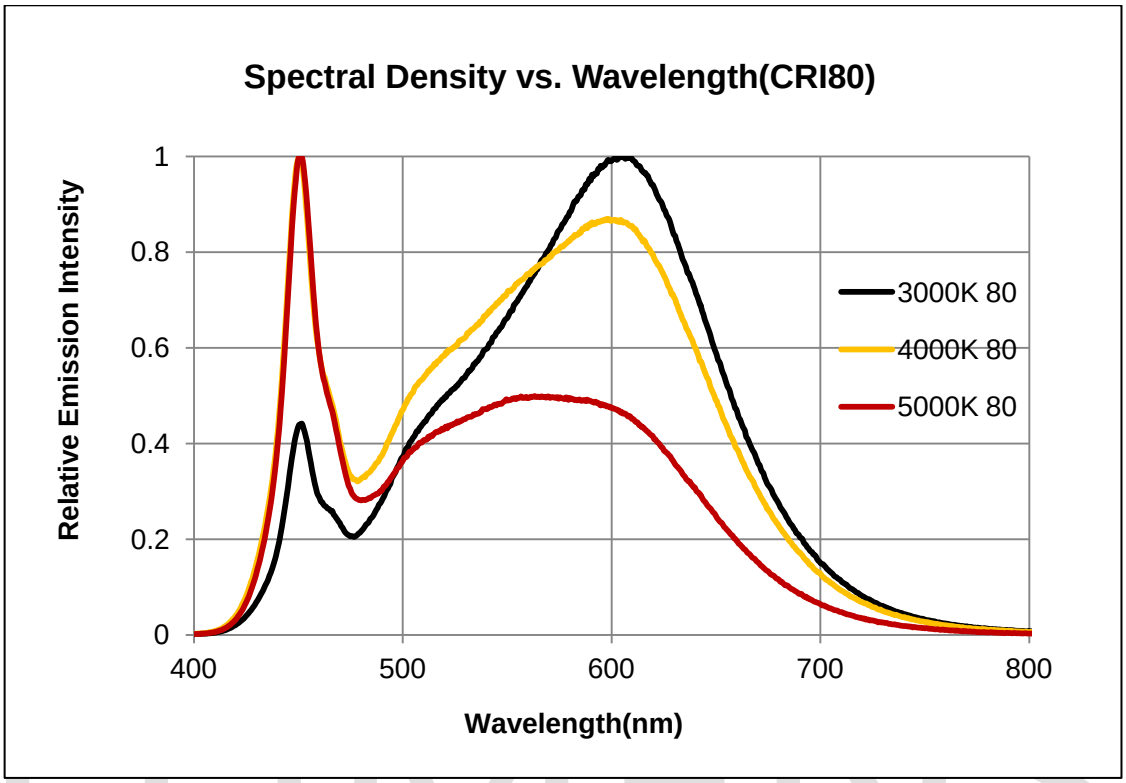
(3) Typical Allowable Forward Current with Ambient Temperature

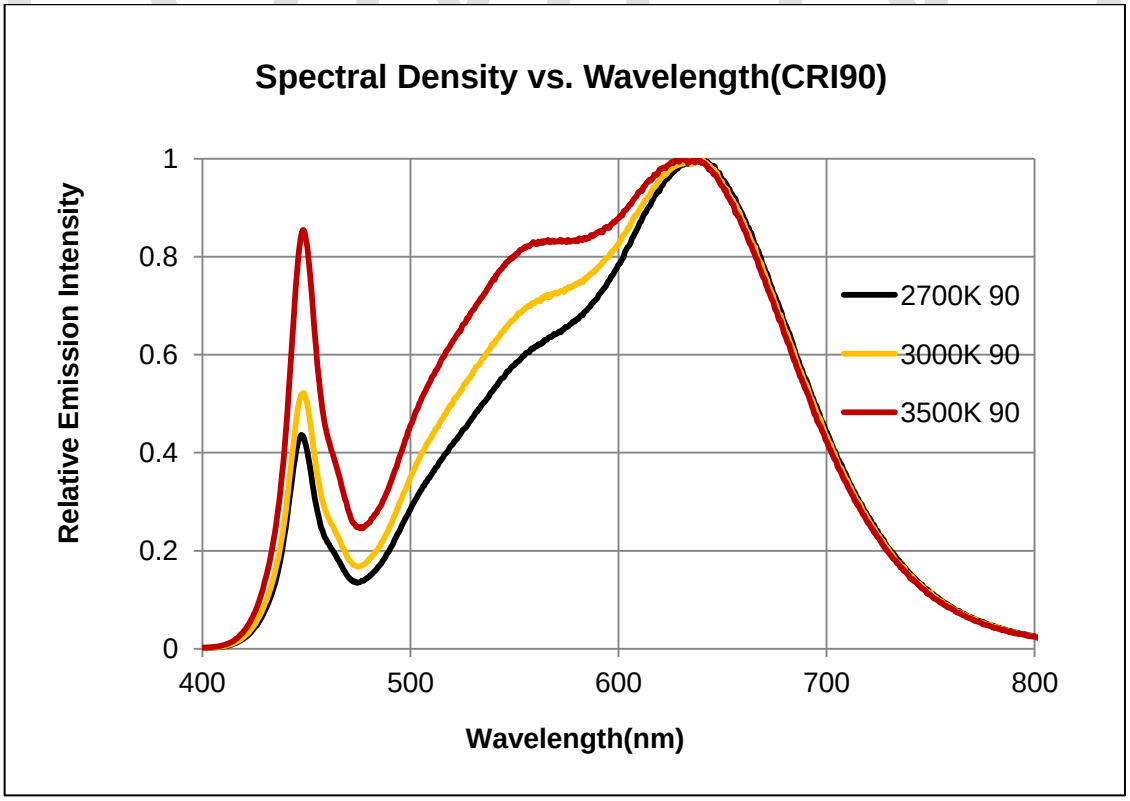


(4) Typical Spatial Radiation Characteristic



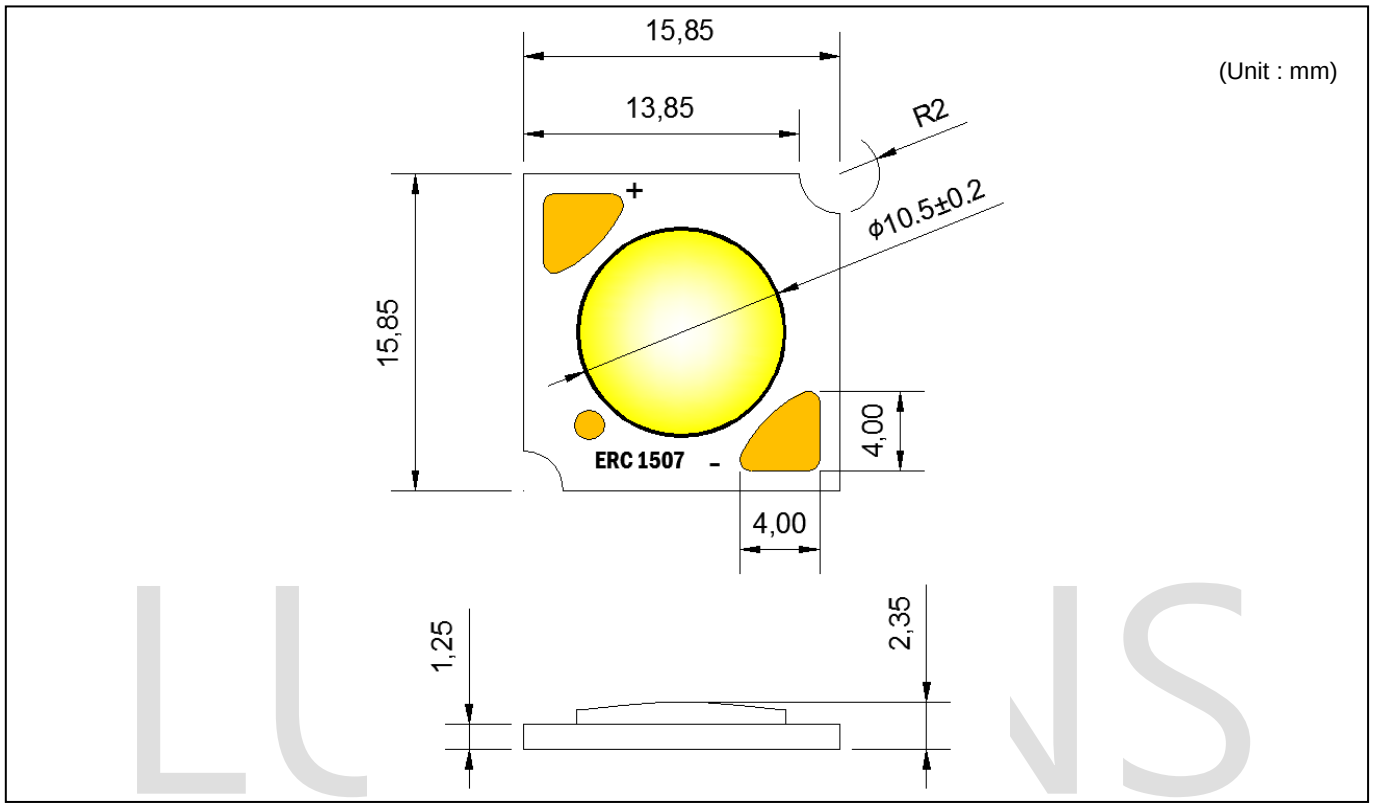
(5) Spectrum


Spectral Density vs. Wavelength(CRI80)
Relative Emission Intensity
1
0.8
0.6
0.4
0.2
0
400
500
600
700
800
Wavelength(nm)
3000K 80
4000K 80
5000K 80

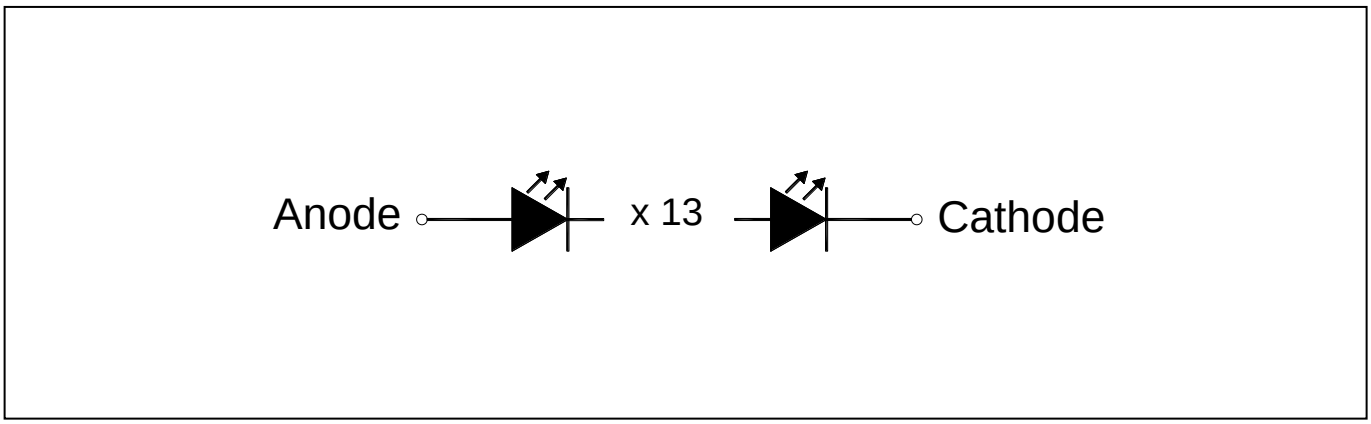

Spectral Density vs. Wavelength(CRI90)
Relative Emission Intensity
1
0.8
0.6
0.4
0.2
0
400
500
600
700
800
Wavelength(nm)
2700K 90
3000K 90
3500K 90

8. Outline Dimensions

- Package outline (Width x Length x Height) of 15.85 x 15.85 x 2.35mm
- Undefined tollerance is ± 0.2 mm



9. Circuit Design



10. Reliability test items and conditions

Item	Reference	Test Conditions	Duration Cycle
Thermal Shock	EIAJ ED-4701	Ta = - 40℃ (30min) ~ 100℃ (30min)	100 Cycle
Operating Endurance Test	Internal Reference	Ta =25℃, IF = 200mA	1000 Hours
High Temperature High Humidity Life Test	Internal Reference	85℃, 85% RH	500 Hours
Low Temperature Storage Test	Internal Reference	Ta = -40℃	1000 Hours
High Temperature Storage Test	Internal Reference	Ta = 100℃	1000 Hours

(1) Criteria for judging the damage

Item	Symbol	Condition	Criteria for Judgment	
			MIN	MAX
Forward Voltage	Vf	If = 200mA	-	USL (1) × 1.1
Luminous Intensity	Φv	If = 200mA	LSL (2) × 0.7	-

- USL : Upper Standard Level
- LSL : Lower Standard Level

11. Cautions

(1) Moisture-Proof Package

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

1.2 A package of a moisture-absorbent material (silica gel) is inserted into the shielding bag. The silica gel changes its color from blue to pink as it absorbs moisture.

(2) Current limiting

A resistor should be used to limit current spikes that can be caused by voltage fluctuations.
Otherwise damage could occur.

(3) Storage Conditions

3.1 Before opening the package: The LEDs should be kept at 30℃ or less and 90%RH or less. The LEDs should be used within a year. When storing the LEDs, moisture-proof packaging with moisture-absorbent material (silica gel) is recommended.

3.2 After opening the package: The LEDs should be kept at 30℃ or less and 70%RH or less. The LEDs should be soldered within 168 hours (7 days) after opening the package. If unused LEDs remain, they should be stored in moisture-proof packages, such as sealed containers with packages of moisture-absorbent material (silica gel). It is also recommended to return the LEDs to the original moisture-proof bag and to reseal the moisture-proof bag again.

3.3 If the moisture-absorbent material (silica gel) has faded away or the LEDs have exceeded the recommended storage time, baking treatment should be performed using the following conditions.
Baking treatment: more than 24 hours at 65±5℃

3.4 Lumens LED electrode sections are comprised of a silver-plated copper alloy. The silver surface may be affected by environments which contain corrosive gases and so on. Please avoid condition which may cause difficulty environments during soldering operations. It is recommended that the user uses the LEDs as soon as possible.

3.5 Please avoid rapid transitions in ambient temperature, especially in high humidity environments where condensation can occur.

(4) Handling of Silicone (Lens) LEDs

4.1 Avoid silicone resin parts especially with sharp tools such as tweezers.

4.2 Avoid leaving fingerprints on silicone lens part.

(5) Usage

5.1 Do not exceed the values given in this specification.

NOTE :

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