

Specification for white LED

Ergon COB 1820

- ✧ 41W maximum power capability
- ✧ High brightness LED
- ✧ Dimension : 17.85 x 17.85 x 2.35 mm
- ✧ Precondition : JEDEC Level 2a
- ✧ Lead-free reflow soldering application
- ✧ RoHS compliant

Vendor		Customer
Written	Approval	Approval

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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 1,100mA
- Low thermal resistance as low as 0.87°C/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	41	W
Rated forward current	If	1,100	mA
Maximum junction temperature capability(1)	Tj	125	°C
Operating temperature	Top	- 40 ~ +85	°C
Storage temperature	Tst	- 40 ~ +100	°C

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

3. Electro-optical characteristics (Ta=25°C)

Parameters	Symbol	If(mA)	Typ.	Unit
Forward voltage	Vf	550	37.0	V
Viewing angle FWHM	2θ1/2	550	120	degrees
Thermal resistance junction to solder pad	Rthj-s		0.87	°C/W

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

4. Electro-optical chart (Ta=25°C)

CCT(K)	CRI	If(mA)	Vf(V)	Pd(W)	Typ. Φv(lm)	lm/W
2700	80	550	37.0	20.4	2080	102
3000		550	37.0	20.4	2240	110
3500		550	37.0	20.4	2330	114
4000		550	37.0	20.4	2385	117
5000		550	37.0	20.4	2420	119
2700	90	550	37.0	20.4	1755	86
3000		550	37.0	20.4	1830	90
3500		550	37.0	20.4	1895	93

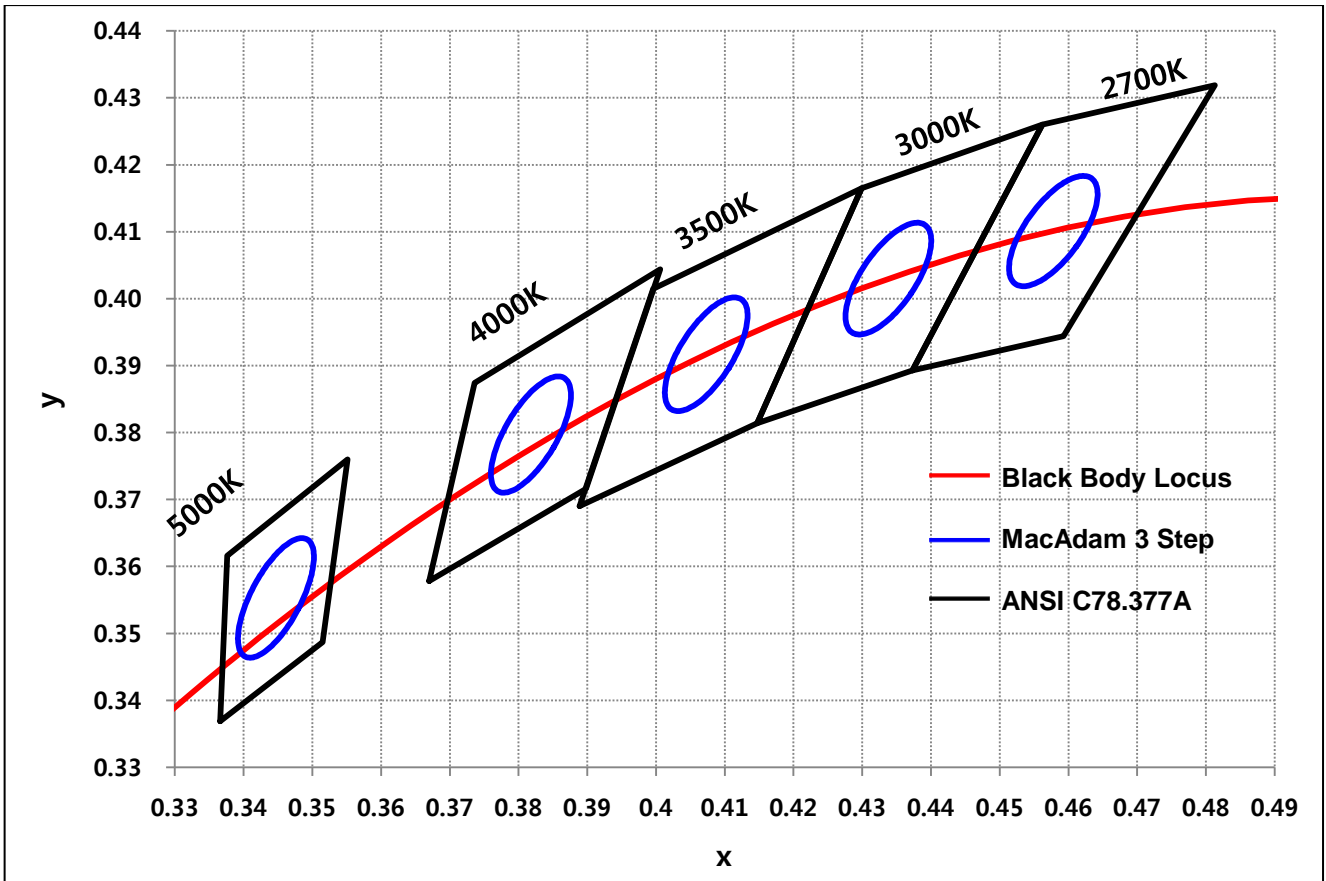
- Lumens maintains a tolerance of ±7% on flux measurements.
- Lumens maintains a tolerance of ±3% on forward voltage measurements.
- Lumens maintains a tolerance of ±2 on CRI measurements.

5. Ranks

Item	Symbol	CCT(K)	Min.	Typ.	Unit	CRI	If(mA)
Luminous Flux	Φ_v	2700	1890	2080	lm	80	550
		3000	2010	2240	lm		
		3500	2100	2330	lm		
		4000	2150	2385	lm		
		5000	2180	2420	lm	90	
		2700	1580	1755	lm		
		3000	1650	1830	lm		
		3500	1710	1895	lm		
Forward Voltage	Vf	-	36.5	37.0	V	-	

- Lumens maintains a tolerance of $\pm 7\%$ on flux measurements.
- Lumens maintains a tolerance of $\pm 3\%$ 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)

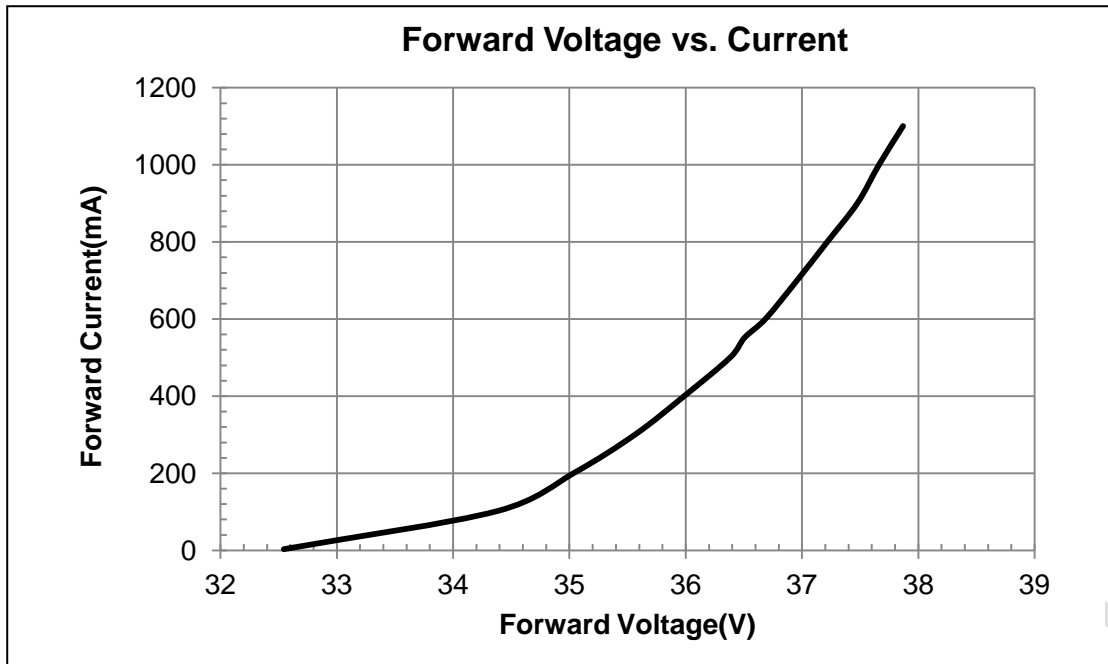
CCT(K)	x	y	CCT(K)	x	y	CCT(K)	x	y
5000K	0.3366	0.3369	3500K	0.3889	0.3690	2700K	0.4373	0.3893
	0.3376	0.3616		0.3996	0.4015		0.4562	0.4260
	0.3551	0.3760		0.4299	0.4165		0.4813	0.4319
	0.3515	0.3487		0.4147	0.3814		0.4593	0.3944
4000K	0.3670	0.3578	3000K	0.4147	0.3814			
	0.3736	0.3874		0.4299	0.4165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

* 3-step MacAdam Ellipse Color Definition

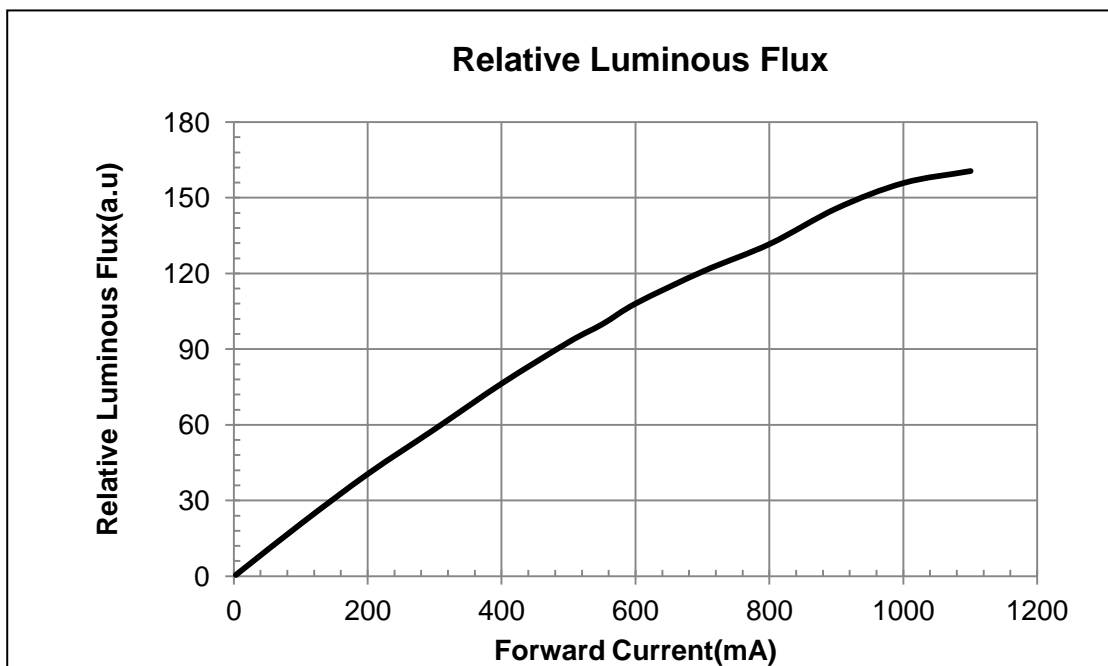
CCT(K)	Center		Ellipse Parameter		
	x	y	Axis a	Axis b	Angle(°)
5000K	0.3447	0.3553	0.00822	0.00354	59.6
4000K	0.3818	0.3797	0.00939	0.00402	53.7
3500K	0.4073	0.3917	0.00927	0.00414	54.0
3000K	0.4338	0.4030	0.00834	0.00408	53.2
2700K	0.4578	0.4101	0.00810	0.00420	53.7

7. Characteristic Graphs(Ta=25°C)

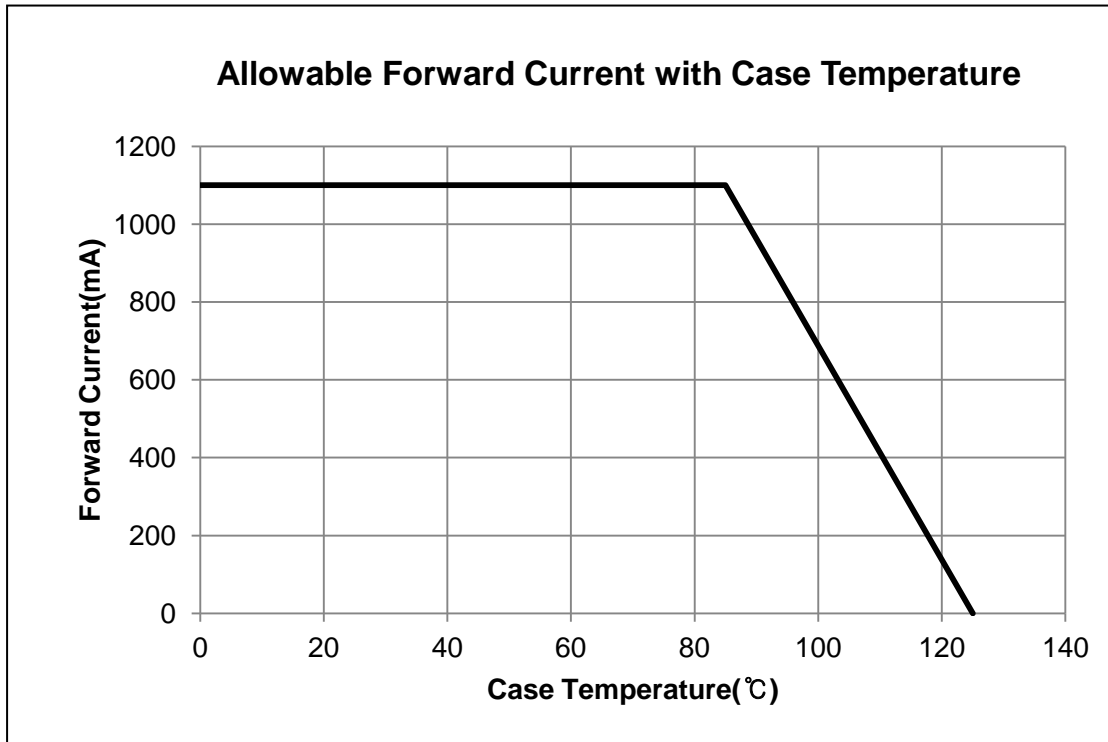
(1) Typical Forward Current vs. Forward Voltage



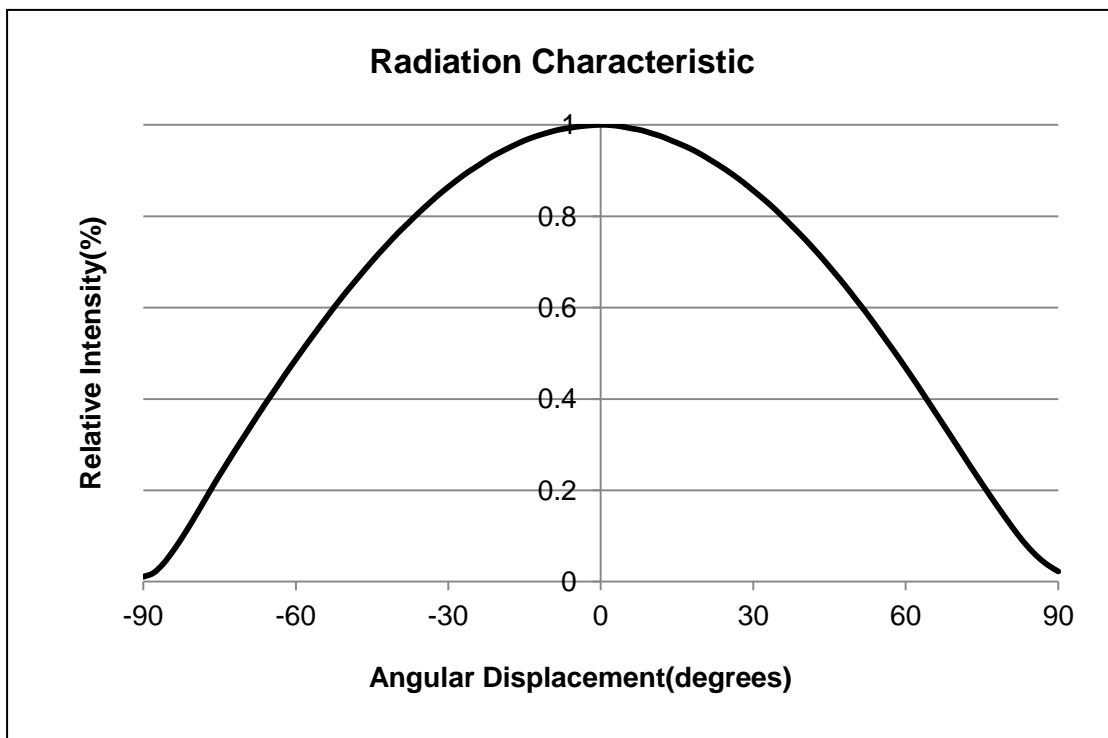
(2) Typical Relative Luminous Flux vs. Forward Current



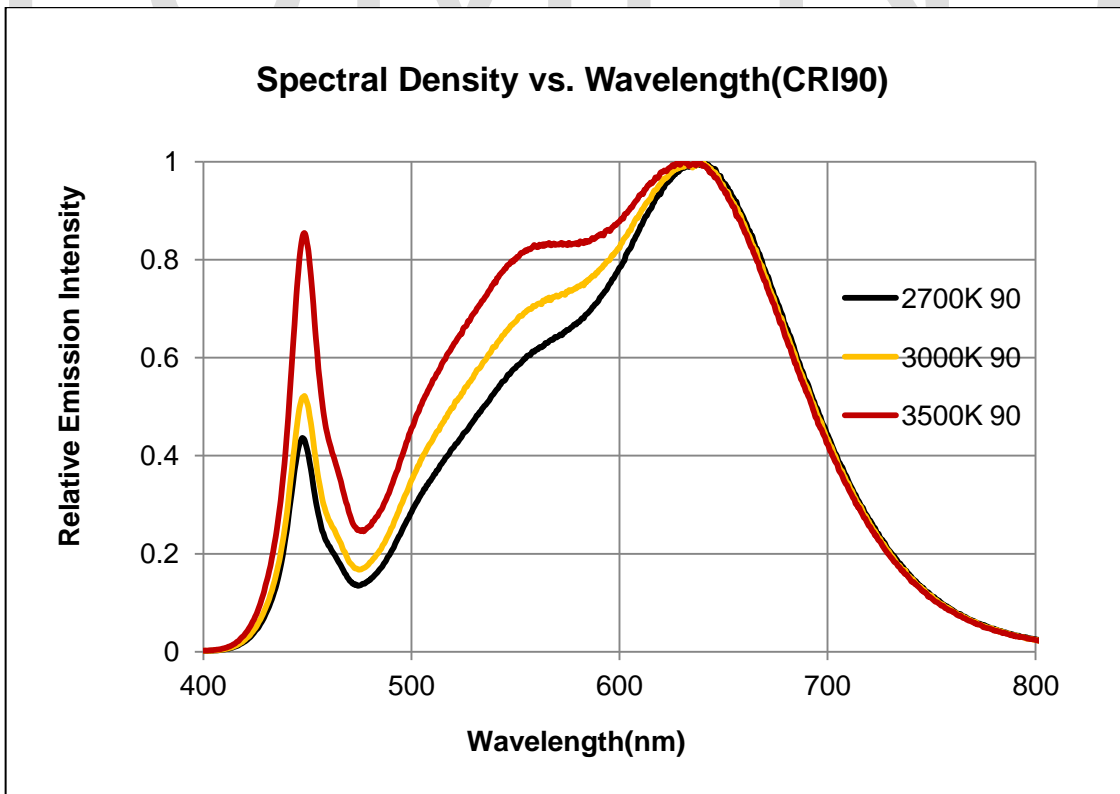
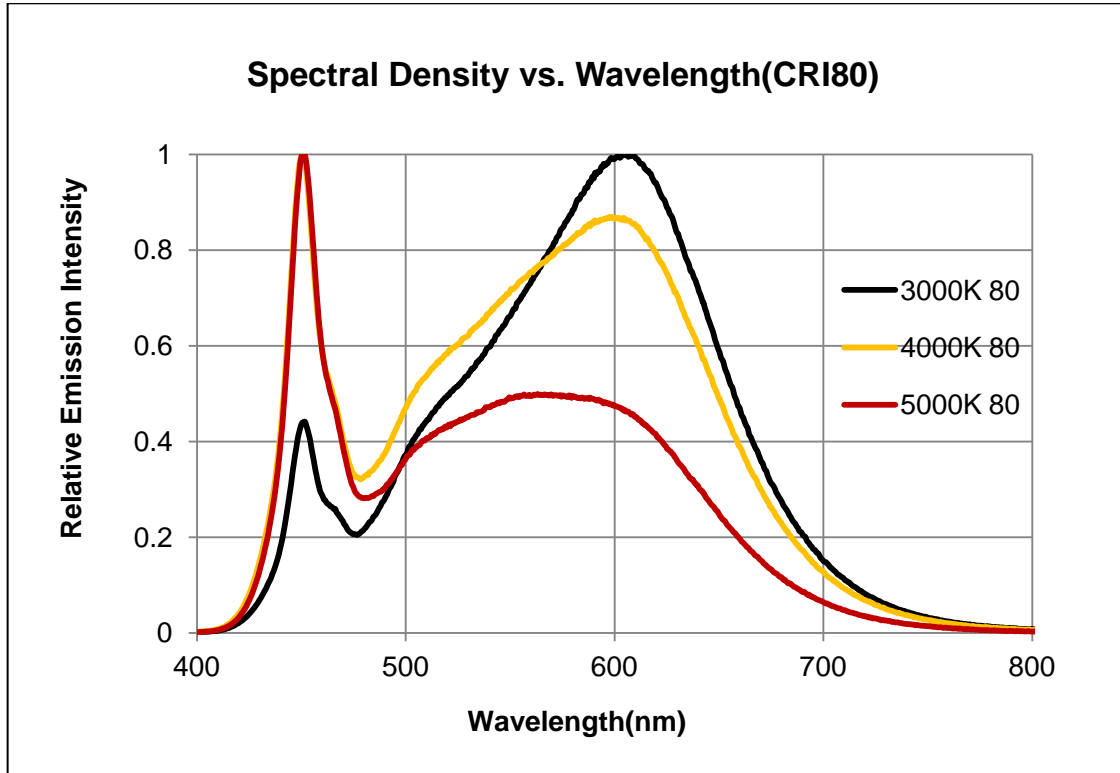
(3) Typical Allowable Forward Current with Ambient Temperature



(4) Typical Spatial Radiation Characteristic

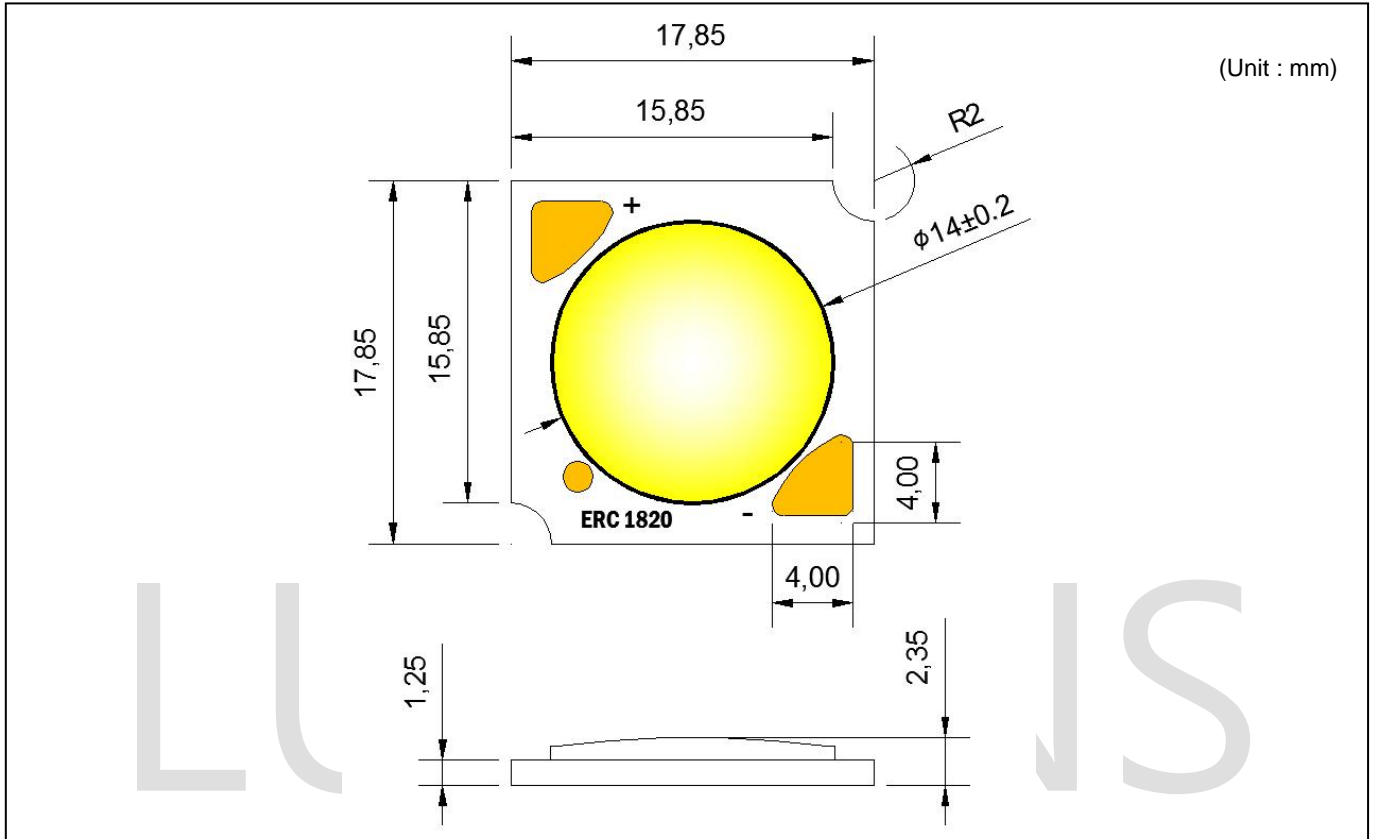


(5) Spectrum

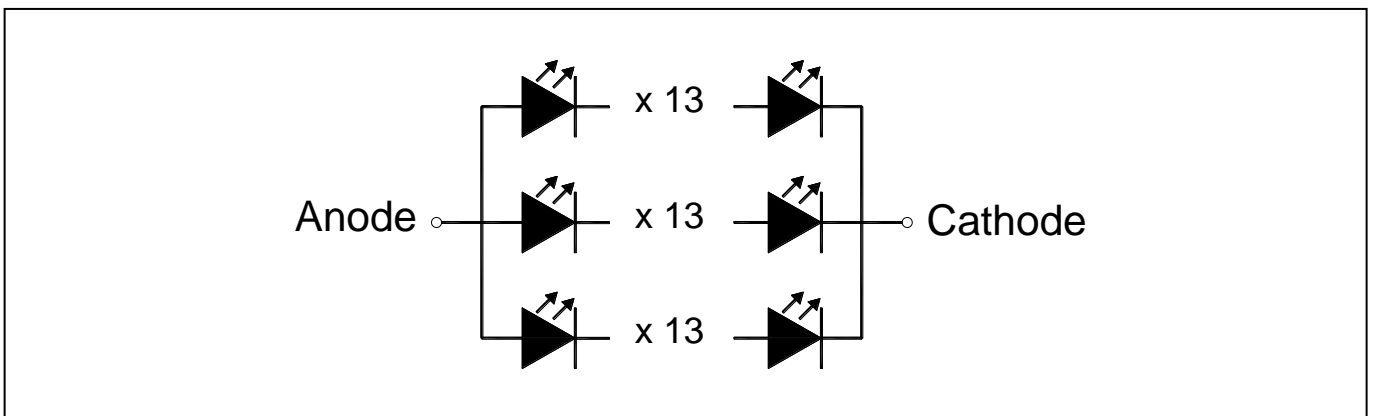


8. Outline Dimensions

- Package outline (Width x Length x Height) of 17.85 x 17.85 x 2.35mm
- Undefined tolerance 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°C (30min) ~ 100°C (30min)	100 Cycle
Operating Endurance Test	Internal Reference	Ta =25°C, IF = 550mA	1000 Hours
High Temperature High Humidity Life Test	Internal Reference	85°C, 85% RH	500 Hours
Low Temperature Storage Test	Internal Reference	Ta = -40°C	1000 Hours
High Temperature Storage Test	Internal Reference	Ta = 100°C	1000 Hours

(1) Criteria for judging the damage

Item	Symbol	Condition	Criteria for Judgment	
			MIN	MAX
Forward Voltage	Vf	If = 550mA	-	USL (1) × 1.1
Luminous Intensity	Φv	If = 550mA	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°C 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°C 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°C
- 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.

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