

## SPECIFICATION DATASHEET

### 3040H2

- 53.7W maximum power capability
- High brightness LED
- Dimension : 28.0 x 28.0 x 1.55 mm
- Precondition : JEDEC Level 2a
- Lead-free reflow soldering application
- RoHS compliant

3040H2xxxxxx

Copyright 20191218 / Ver. E



**LUMENS CO., LTD**

12, Wongomae-ro, Giheung-gu, Yongin-si, Gyeonggi-do, Korea  
<http://lumensleds.com>

## Table of Contents

1. Product description .....	3
2. Absolute maximum ratings .....	3
3. Electro-optical characteristics .....	4
4. Electro-optical chart .....	4
5. Luminous flux characteristics.....	5-6
6. Chromaticity diagram & coordinates .....	7
7. Characteristic Graphs .....	8-11
8. Outline Dimensions .....	12
9. Circuit Design .....	12
10. Packing .....	13-14
11. Label Format .....	15
12. Product Code .....	16-17
13. Reliability test items and conditions .....	17
14. Cautions .....	18-19

## 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 1,500mA
- Low thermal resistance as low as 0.85°C/W
- Viewing angle of 115 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	53.7	W
Rated forward current	If	1500	mA
Maximum junction temperature capability(1)	Tj	125	°C
Maximum case temperature capability(1)	Tc	105	°C
Operating temperature	Top	- 30 ~ +100	°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 (Tj=85°C)

Parameters	Symbol	If(mA)	Typ.	Unit
Forward voltage	Vf	1050	34.2	V
Viewing angle FWHM	2θ1/2	1050	115	degrees
Thermal resistance junction to solder pad	Rthj-a		0.85	°C/W

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

### 4. Electro-optical chart (Sorting current, If=1050mA)

Product Description	CRI (Ra)	CCT (K)	If (mA)	Vf(V), typ. at Tc=65°C	Pd(W), typ. at Tc=65°C	Φv(lm), typ. at Tc=25°C	lm/W, typ. at Tc=25°C	Φv(lm), typ. at Tc=65°C	lm/W, typ. at Tc=65°C
3040H2-827	80	2700	1050	34.2	35.9	6090	166	5520	154
3040H2-830		3000	1050	34.2	35.9	6430	175	5820	162
3040H2-835		3500	1050	34.2	35.9	6490	177	5880	164
3040H2-840		4000	1050	34.2	35.9	6640	181	6010	167
3040H2-850		5000	1050	34.2	35.9	6770	185	6130	171
3040H2-857		5700	1050	34.2	35.9	6670	182	6040	168
3040H2-927	90	2700	1050	34.2	35.9	5280	144	4780	133
3040H2-930		3000	1050	34.2	35.9	5550	151	5030	140
3040H2-935		3500	1050	34.2	35.9	5620	153	5090	142
3040H2-940		4000	1050	34.2	35.9	5870	160	5320	148
3040H2-950		5000	1050	34.2	35.9	6000	164	5430	151
3040H2-S27	95	2700	1050	34.2	35.9	4590	125	4160	116
3040H2-S30		3000	1050	34.2	35.9	4910	134	4450	124
3040H2-S35		3500	1050	34.2	35.9	4970	136	4500	125
3040H2-S40		4000	1050	34.2	35.9	5290	144	4790	133

- 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.
- Tc(Case temperature)=65 °C is equal to Tj(Junction temperature)=85 °C.

## 5. Luminous flux characteristics (Sub current, If=900mA & 1200mA & 1500mA)

Product Description	CRI (Ra)	CCT (K)	If (mA)	Vf(V), typ. at Tc=65°C	Pd(W), typ. at Tc=65°C	Φv(lm), typ. at Tc=25°C	lm/W, typ. at Tc=25°C	Φv(lm), typ. at Tc=65°C	lm/W, typ. at Tc=65°C
3040H2-827	80	2700	900	33.8	30.4	5300	171	4810	158
3040H2-830		3000	900	33.8	30.4	5600	180	5070	167
3040H2-835		3500	900	33.8	30.4	5650	182	5120	168
3040H2-840		4000	900	33.8	30.4	5780	186	5230	172
3040H2-850		5000	900	33.8	30.4	5900	190	5340	176
3040H2-857		5700	900	33.8	30.4	5810	187	5260	173
3040H2-927	90	2700	900	33.8	30.4	4600	148	4160	137
3040H2-930		3000	900	33.8	30.4	4830	156	4380	144
3040H2-935		3500	900	33.8	30.4	4890	157	4430	146
3040H2-940		4000	900	33.8	30.4	5110	165	4630	152
3040H2-950		5000	900	33.8	30.4	5220	168	4730	155
3040H2-S27	95	2700	900	33.8	30.4	4000	129	3620	119
3040H2-S30		3000	900	33.8	30.4	4270	138	3870	127
3040H2-S35		3500	900	33.8	30.4	4330	139	3920	129
3040H2-S40		4000	900	33.8	30.4	4610	148	4170	137

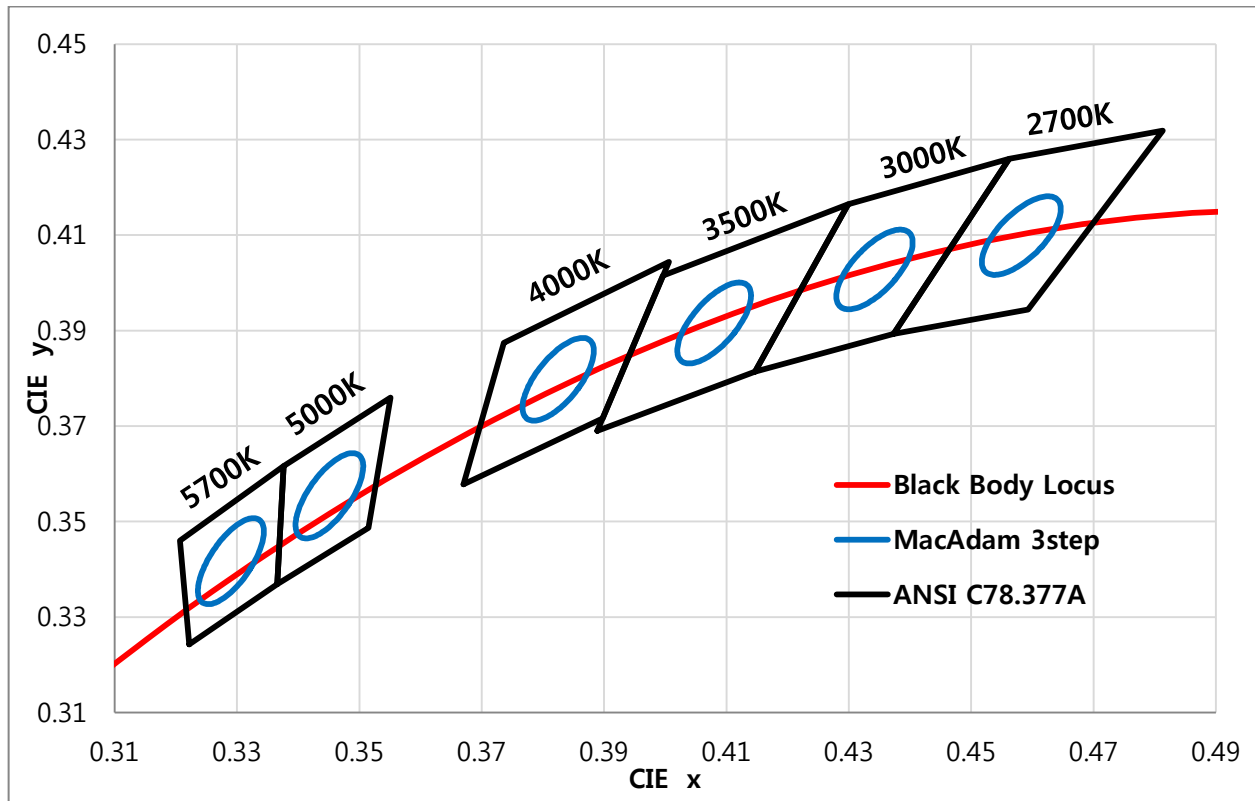
Product Description	CRI (Ra)	CCT (K)	If (mA)	Vf(V), typ. at Tc=65°C	Pd(W), typ. at Tc=65°C	Φv(lm), typ. at Tc=25°C	lm/W, typ. at Tc=25°C	Φv(lm), typ. at Tc=65°C	lm/W, typ. at Tc=65°C
3040H2-827	80	2700	1200	34.8	41.8	6840	161	6200	148
3040H2-830		3000	1200	34.8	41.8	7220	169	6540	157
3040H2-835		3500	1200	34.8	41.8	7290	171	6610	158
3040H2-840		4000	1200	34.8	41.8	7460	175	6750	162
3040H2-850		5000	1200	34.8	41.8	7610	179	6890	165
3040H2-857		5700	1200	34.8	41.8	7490	176	6790	163
3040H2-927	90	2700	1200	34.8	41.8	5930	139	5370	129
3040H2-930		3000	1200	34.8	41.8	6230	146	5650	135
3040H2-935		3500	1200	34.8	41.8	6310	148	5720	137
3040H2-940		4000	1200	34.8	41.8	6590	155	5980	143
3040H2-950		5000	1200	34.8	41.8	6740	158	6100	146
3040H2-S27	95	2700	1200	34.8	41.8	5160	121	4670	112
3040H2-S30		3000	1200	34.8	41.8	5520	130	5000	120
3040H2-S35		3500	1200	34.8	41.8	5580	131	5050	121
3040H2-S40		4000	1200	34.8	41.8	5940	139	5380	129

- 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  $\pm 2$  on CRI measurements.
- Tc(Case temperature)=65°C is equal to Tj(Junction temperature)=85°C.

Product Description	CRI (Ra)	CCT (K)	If (mA)	Vf(V), typ. at Tc=65°C	Pd(W), typ. at Tc=65°C	Φv(lm), typ. at Tc=25°C	lm/W, typ. at Tc=25°C	Φv(lm), typ. at Tc=65°C	lm/W, typ. at Tc=65°C
3040H2-827	80	2700	1500	35.8	53.7	8220	150	7450	139
3040H2-830		3000	1500	35.8	53.7	8680	159	7860	146
3040H2-835		3500	1500	35.8	53.7	8760	160	7940	148
3040H2-840		4000	1500	35.8	53.7	8970	164	8120	151
3040H2-850		5000	1500	35.8	53.7	9140	167	8280	154
3040H2-857		5700	1500	35.8	53.7	9010	165	8160	152
3040H2-927	90	2700	1500	35.8	53.7	7130	130	6450	120
3040H2-930		3000	1500	35.8	53.7	7490	137	6790	126
3040H2-935		3500	1500	35.8	53.7	7590	139	6870	128
3040H2-940		4000	1500	35.8	53.7	7930	145	7180	134
3040H2-950		5000	1500	35.8	53.7	8100	148	7330	136
3040H2-S27	95	2700	1500	35.8	53.7	6200	113	5620	105
3040H2-S30		3000	1500	35.8	53.7	6630	121	6010	112
3040H2-S35		3500	1500	35.8	53.7	6710	123	6080	113
3040H2-S40		4000	1500	35.8	53.7	7140	130	6470	120

- 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  $\pm 2$  on CRI measurements.
- Tc(Case temperature)=65 °C is equal to Tj(Junction temperature)=85 °C.

## 6. Chromaticity diagram & coordinates



- Lumens maintains a tolerance of  $\pm 0.005$  on chromaticity (CCx, CCy)

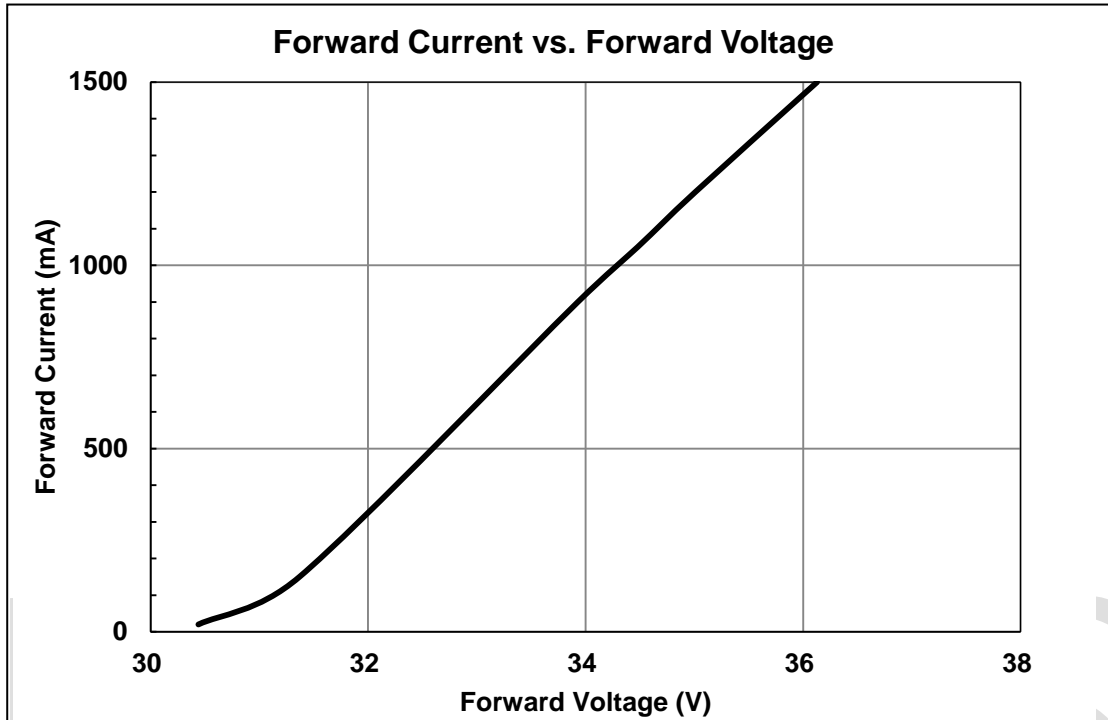
CCT(K)	x	y	CCT(K)	x	y	CCT(K)	x	y
5700K	0.3222	0.3243	4000K	0.3670	0.3578	3000K	0.4147	0.3814
	0.3207	0.3462		0.3736	0.3874		0.4299	0.4165
	0.3376	0.3616		0.4006	0.4044		0.4562	0.4260
	0.3366	0.3369		0.3898	0.3716		0.4373	0.3893
5000K	0.3366	0.3369	3500K	0.3889	0.3690	2700K	0.4373	0.3893
	0.3376	0.3616		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

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

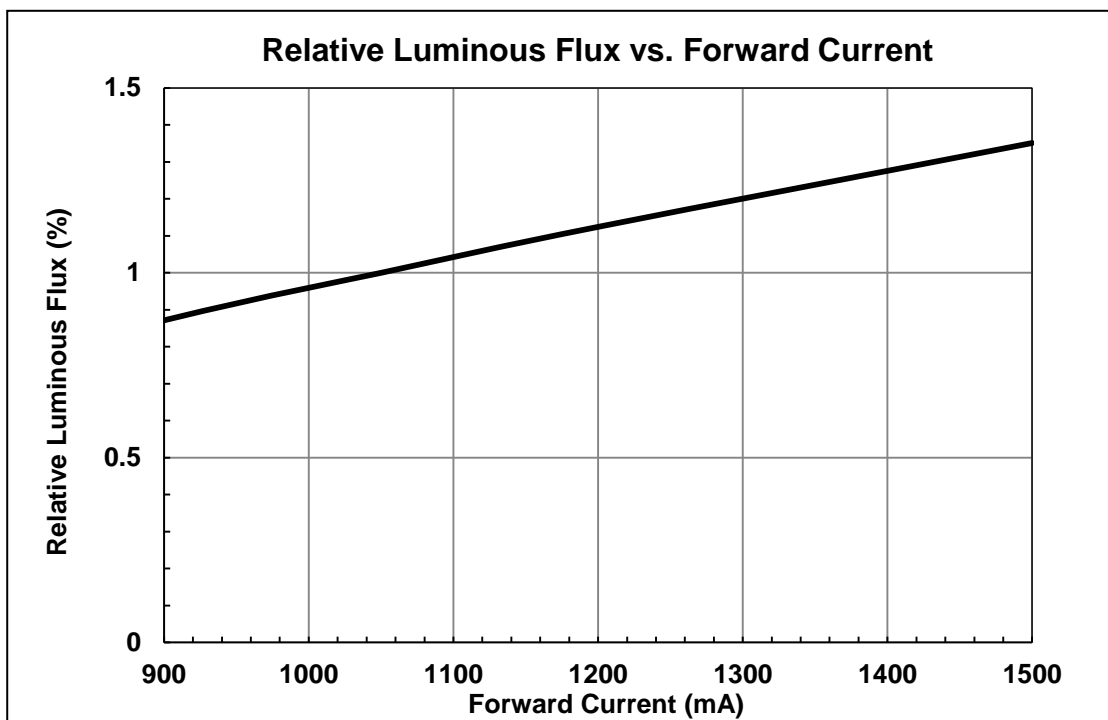
CCT(K)	Center		Ellipse Parameter		
	x	y	Axis a	Axis b	Angle(°)
5700K	0.3287	0.3417	0.00745	0.00320	59.1
5000K	0.3447	0.3553	0.00822	0.00354	59.6
4000K	0.3818	0.3797	0.00939	0.00402	53.7
3500K	0.4073	0.3917	0.00927	0.00414	54.0
3000K	0.4338	0.4030	0.00834	0.00408	53.2
2700K	0.4578	0.4101	0.00810	0.00420	53.7

## 7. Characteristic Graphs (T<sub>j</sub>=85°C)

(1) Typical Forward Current vs. Forward Voltage

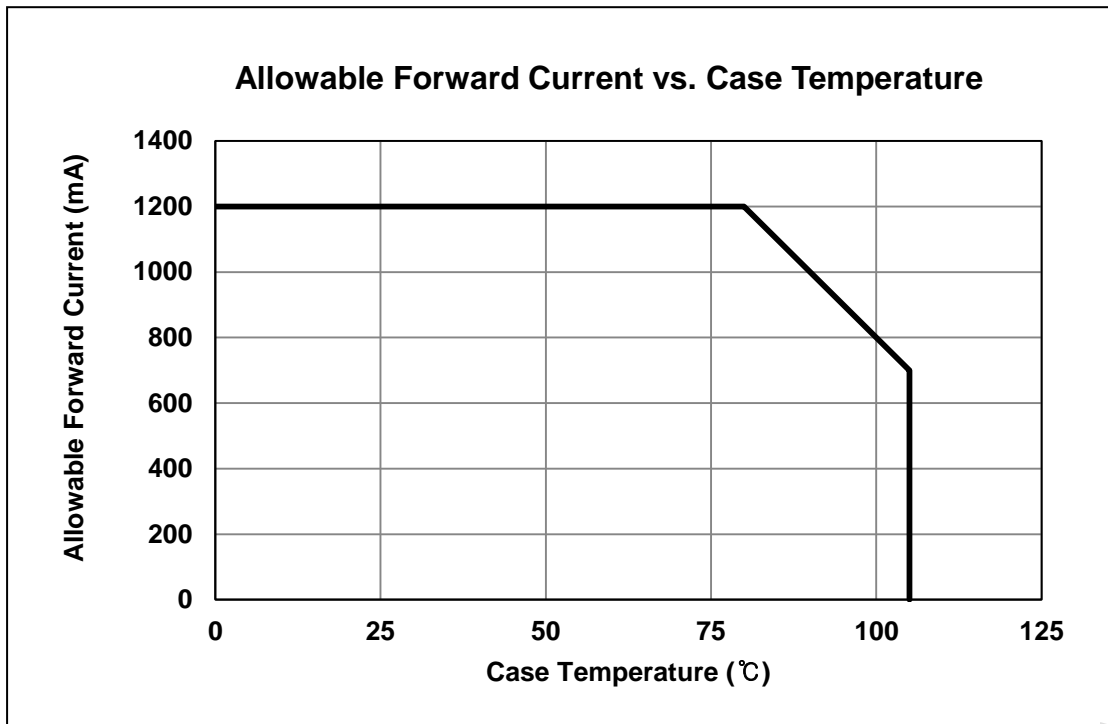


(2) Typical Relative Luminous Flux vs. Forward Current

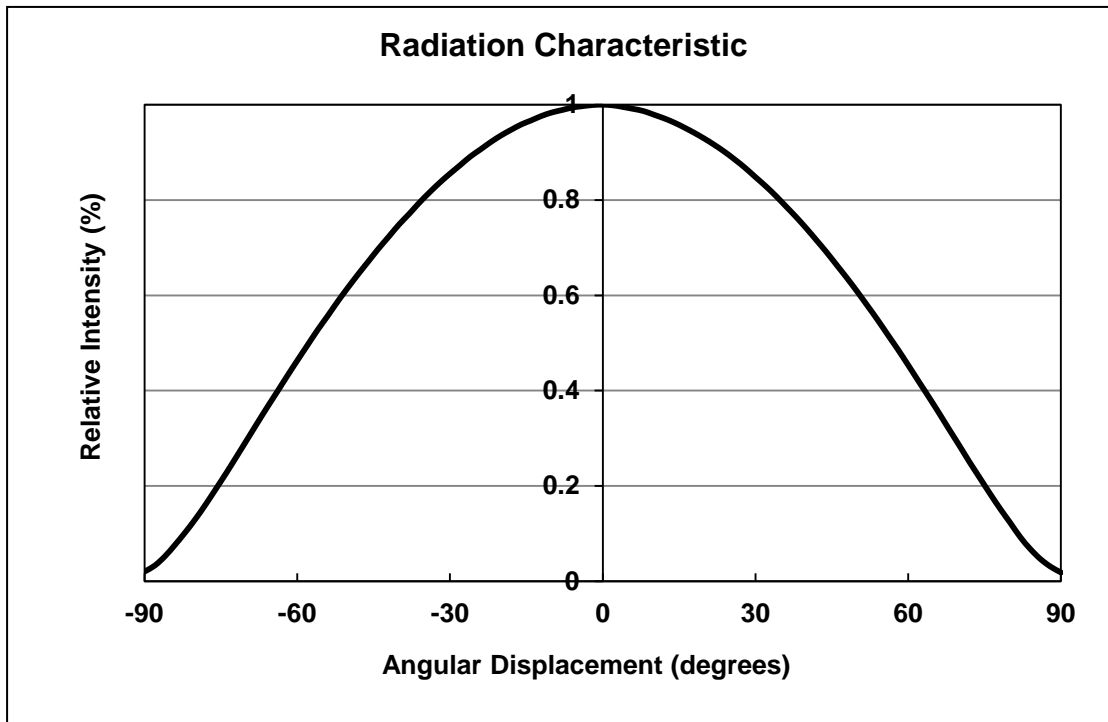




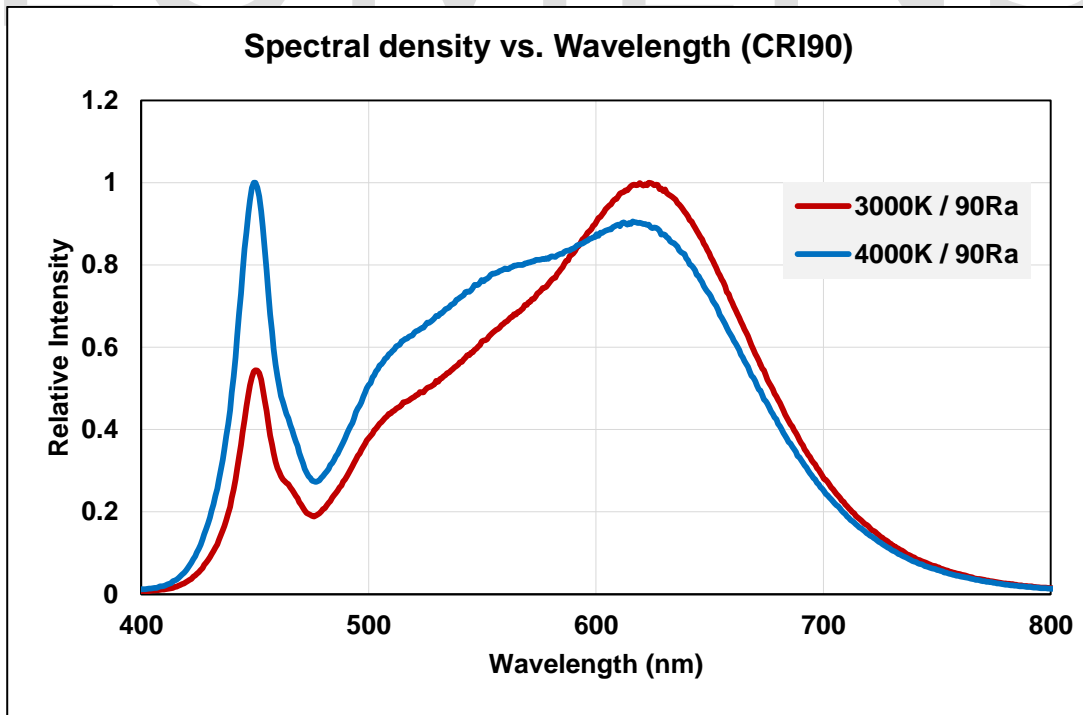
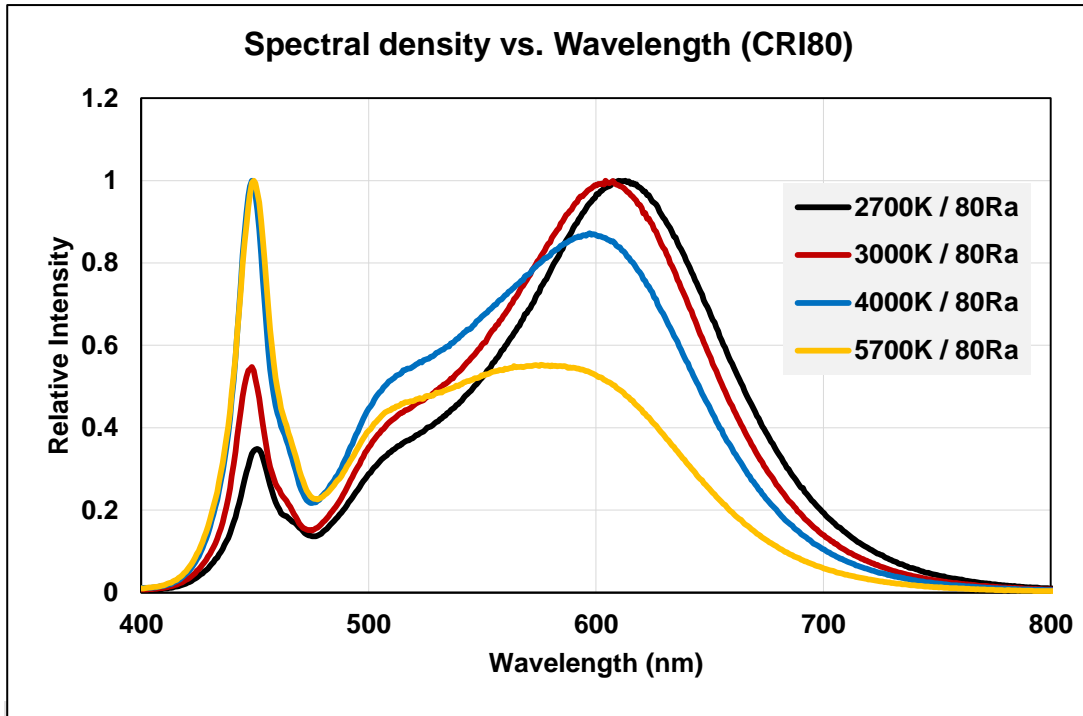
### (3) Typical Allowable Forward Current with Ambient Temperature

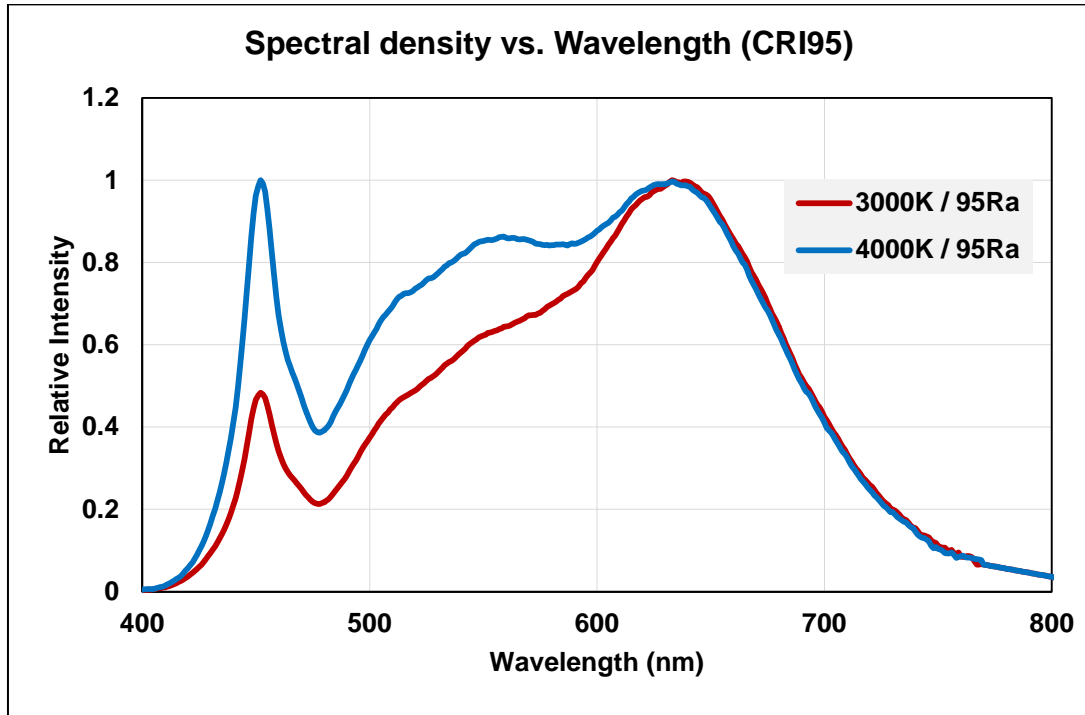


### (4) Typical Spatial Radiation Characteristic



## (5) Spectrum



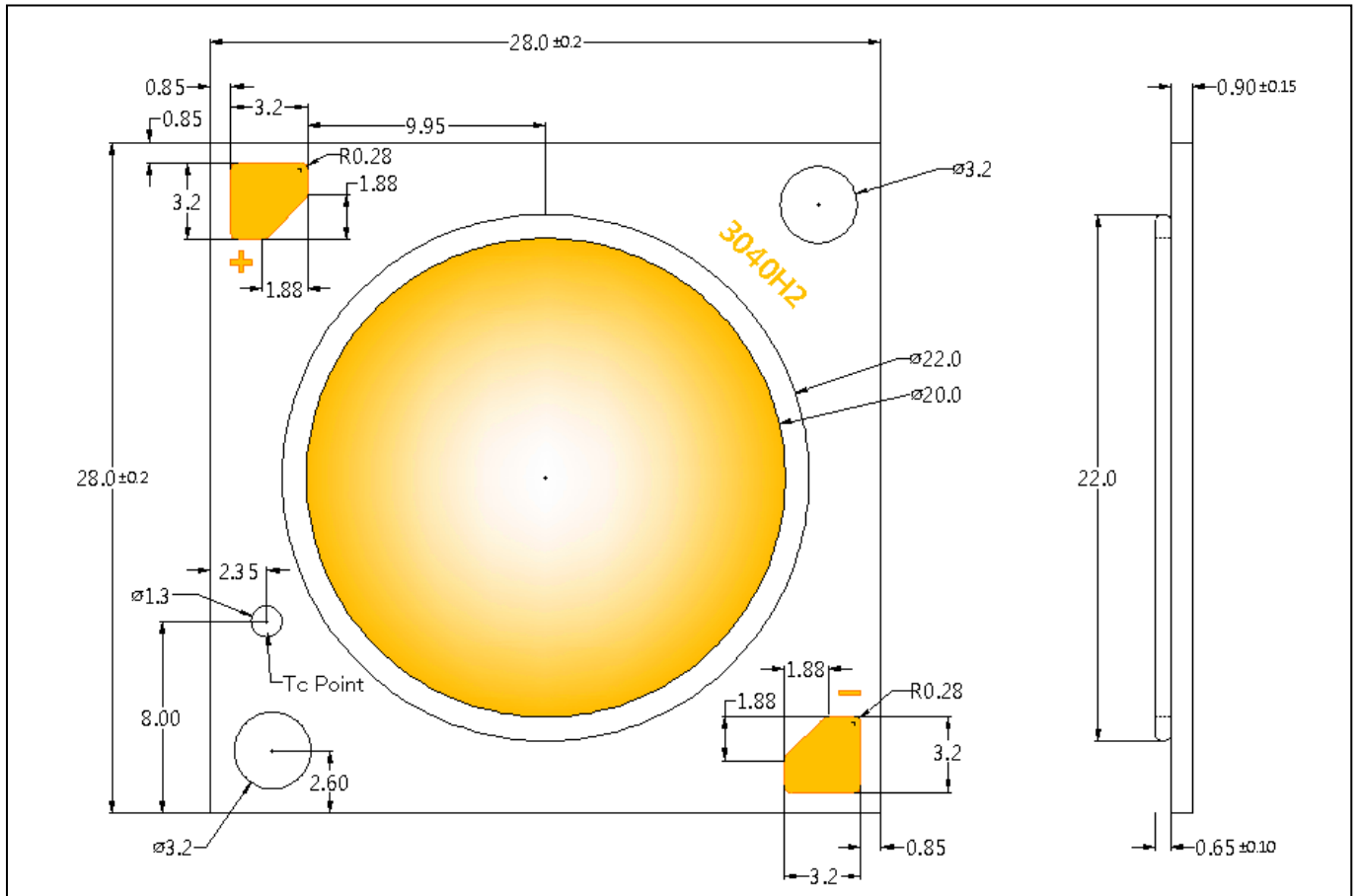


# LUMENS

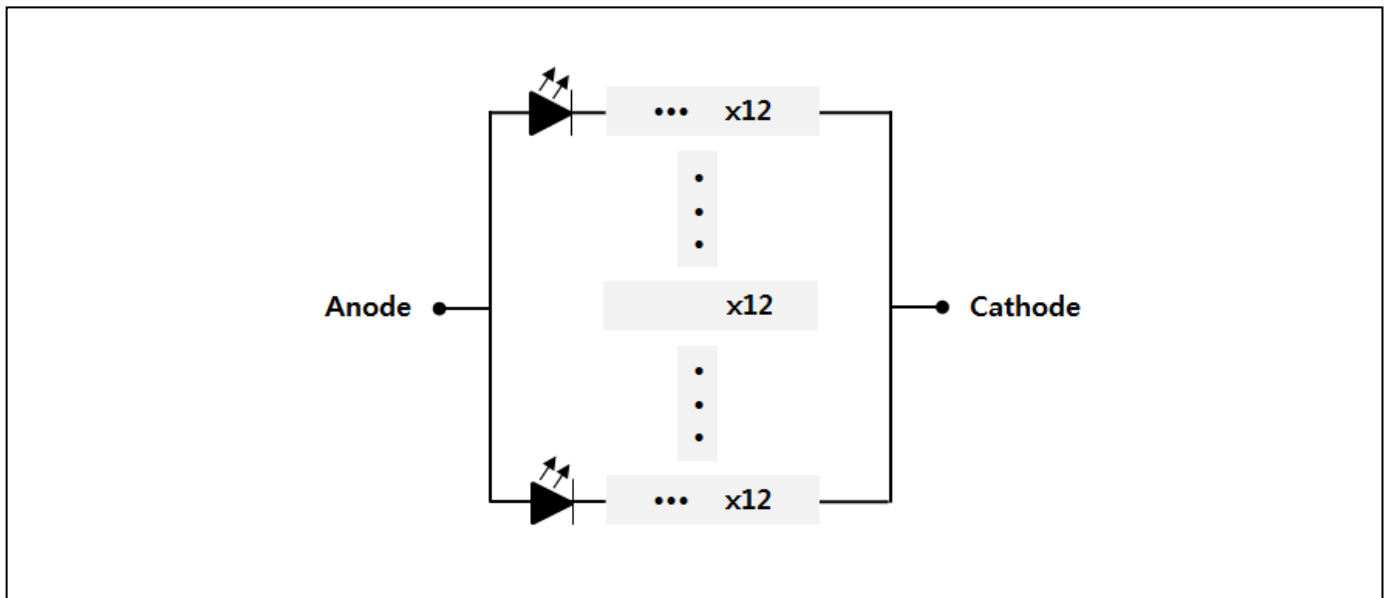
## 8. Outline Dimensions

- Package outline (Width x Length x Height) of 28.0 x 28.0 x 1.55mm
- Undefined tolerance is  $\pm 0.2$  mm

(Unit : mm)

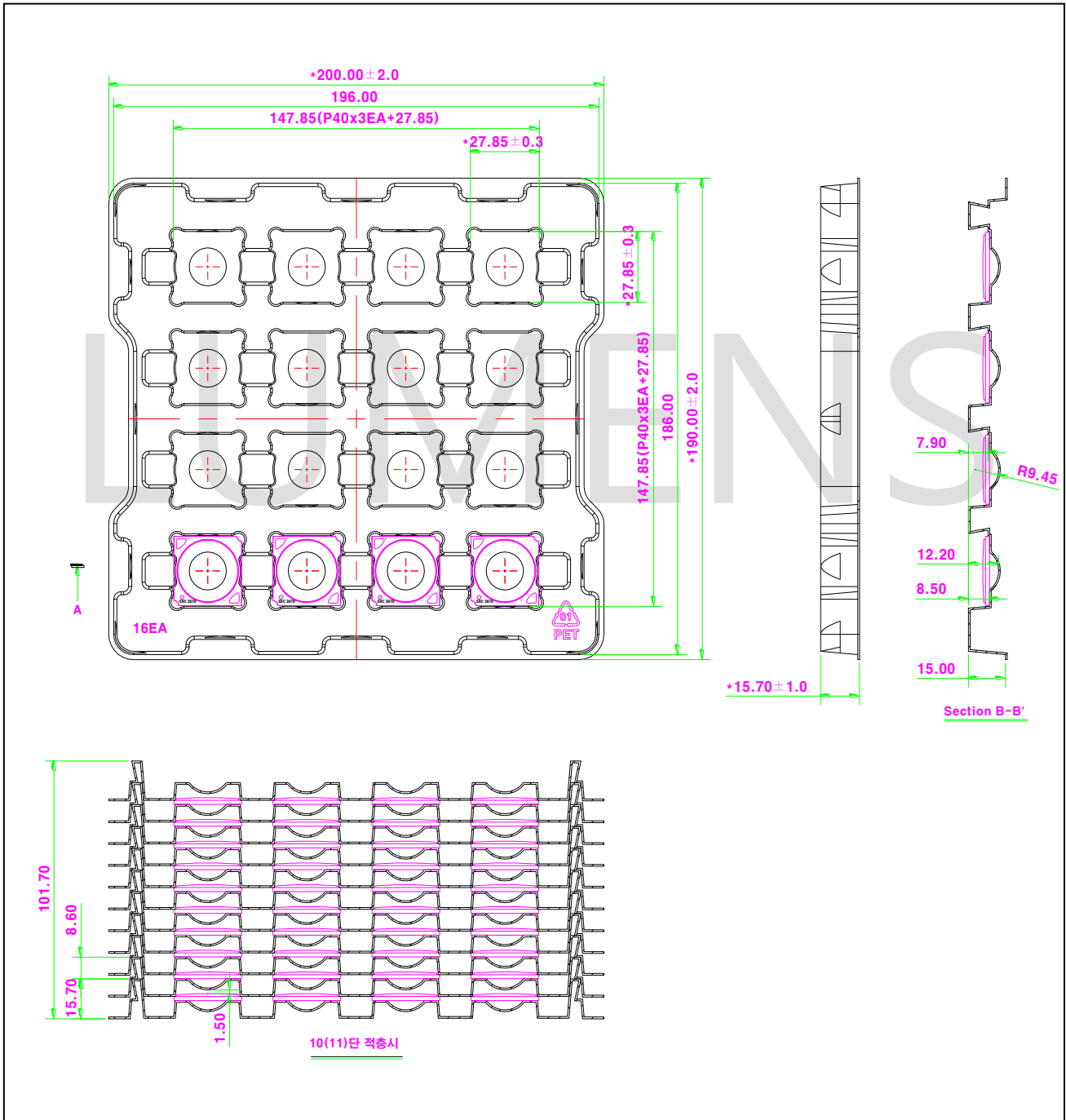


## 9. Circuit Design



## 10. Packing

- 16pcs modules per tray
- 10 trays in one Carton
- Tray Size : L x W=200 x 190(mm), 4x4=16pcs
- Carton Size : 215mm x 205mm x 150mm
- Undefined tolerance is  $\pm 2$  mm



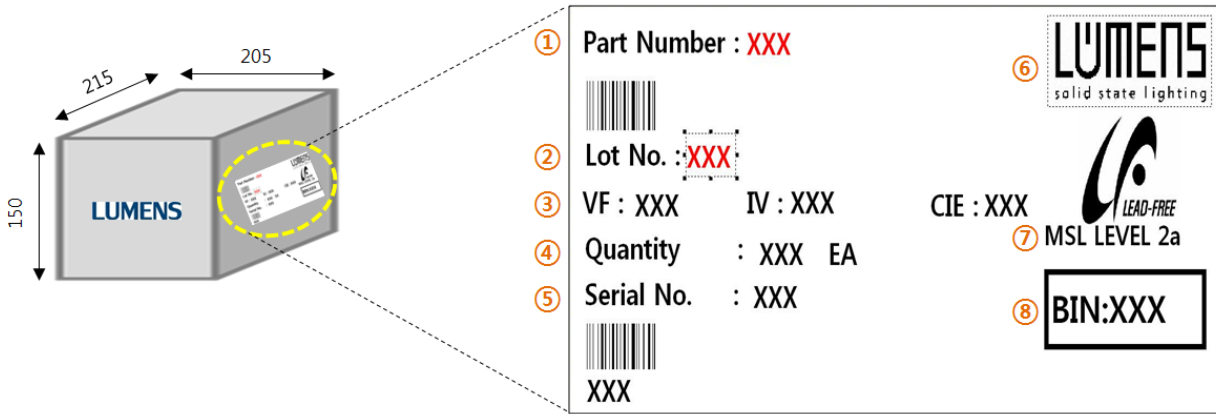
- 1Tray unit = 16pcs (4x4 Array)
- Tray Size = 200mm(L) \* 190mm(W)

- 1Set = 11Tray (10Tray+1Cover)
- Total size = 200mm(L)\*190mm(W)\*103mm(H)
- Quantity = 16\*10=160pcs

- Box size = 215mm(L)\*205mm(W)\*150mm(H)
- Attached label : Production Info.
- Quantity = 160pcs

- Poly-bag size = 275\*435\*160mm
- 1Set + Dry-Pack + Humidity Indicator
- Quantity = 160pcs

## 11. Label Format



No.	ITEM	REMARK	DESCRIPTION
①	PART NUMBER (Product Code)	XXXXH2xxxxxx	H2 COB (Size, Watt, Type, CRI, CCT, Version)
②	LOT NUMBER	xx-xxx – YYMMDDW -Lxxx	Production Input (Input date, Product model size, Lot no. ) Y(Year), M(Month), D(Day)
③	VF / IV / CIE	VF : Forward voltage IV : Luminous flux CIE : CRI + CCT	VF : xx - xx IV : xx - xx CIE : 827 (80Ra + 2700K)
④	QUANTITY	xxx EA	Total Q'ty
⑤	SERIAL NUMBER	xxx-YYMMDD	Y(Year), M(Month), D(Day)
⑥	COMPANY LOGO	LOGO	-
⑦	MSL LEVEL	Moisture Sensitivity Level	ex) MSL1 ~ 6
⑧	BIN No.	00xx ~ 90xx	TEST Bin No.

## 12. Product Code

Color Code	Product Code					Remark
827	1309H2827xxx	1318H2827xxx	2025H2827xxx	2032H2827xxx	3040H2827xxx	CRI80
830	1309H2830xxx	1318H2830xxx	2025H2830xxx	2032H2830xxx	3040H2830xxx	
835	1309H2835xxx	1318H2835xxx	2025H2835xxx	2032H2835xxx	3040H2835xxx	
840	1309H2840xxx	1318H2840xxx	2025H2840xxx	2032H2840xxx	3040H2840xxx	
850	1309H2850xxx	1318H2850xxx	2025H2850xxx	2032H2850xxx	3040H2850xxx	
857	1309H2857xxx	1318H2857xxx	2025H2857xxx	2032H2857xxx	3040H2857xxx	
927	1309H2927xxx	1318H2927xxx	2025H2927xxx	2032H2927xxx	3040H2927xxx	CRI90
930	1309H2930xxx	1318H2930xxx	2025H2930xxx	2032H2930xxx	3040H2930xxx	
935	1309H2935xxx	1318H2935xxx	2025H2935xxx	2032H2935xxx	3040H2935xxx	
940	1309H2940xxx	1318H2940xxx	2025H2940xxx	2032H2940xxx	3040H2940xxx	
S27	1309H2S27xxx	1318H2S27xxx	2025H2S27xxx	2032H2S27xxx	3040H2S27xxx	CRI95
S30	1309H2S30xxx	1318H2S30xxx	2025H2S30xxx	2032H2S30xxx	3040H2S30xxx	
S35	1309H2S35xxx	1318H2S35xxx	2025H2S35xxx	2032H2S35xxx	3040H2S35xxx	
S40	1309H2S40xxx	1318H2S40xxx	2025H2S40xxx	2032H2S40xxx	3040H2S40xxx	

### ● Product Code Nomenclature detail

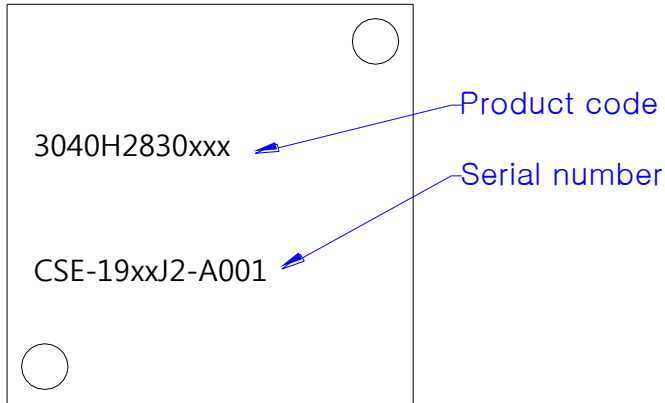
Size + Watt (2) (2)	Type (2)	CRI (1)	CCT (2)	Version (3)
XXXX	H2	8 : 80Ra	27 : 2700K	xxx
		9 : 90Ra	30 : 3000K	
		S : 95Ra	35 : 3500K	
			40 : 4000K	
			50 : 5000K	
			57 : 5700K	

### ● Serial number Nomenclature detail

Item (1)	Product (1)	Type (1)	Date (YYMM) (4)	Input # (2)	Machine (1)	Lot number (3)
C : COB	A	A	1910	AX : A1~A9	A	001
	B	B		BX : B1~B9	B	002
	C	C		CX : C1~C9	C	003
	D	D		DX : D1~D9	D	004
	⋮	⋮		⋮	⋮	⋮
	Z	Z		ZX : Z1~Z9	Z	999



## ● Marking



## 13. 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
Room temperature Operating Life Test	Internal Reference	Ta = 25°C, If = Maximum current	1,000 Hours
High Temperature Operating Life Test	Internal Reference	Ta = 85°C, If = Sorting current	1,000 Hours
High Temperature High Humidity Life Test	Internal Reference	Ta = 85°C, 85% RH	1,000 Hours
Low Temperature Storage Test	Internal Reference	Ta = -40°C	1,000 Hours
High Temperature Storage Test	Internal Reference	Ta = 100°C	1,000 Hours

### (1) Criteria for judging the damage

Item	Symbol	Condition	Criteria for Judgment	
			MIN	MAX
Forward Voltage	Vf	If = 1050mA	-	USL (1) × 1.1
Luminous Intensity	Φv	If = 1050mA	LSL (2) × 0.7	-

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

## 14. 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.

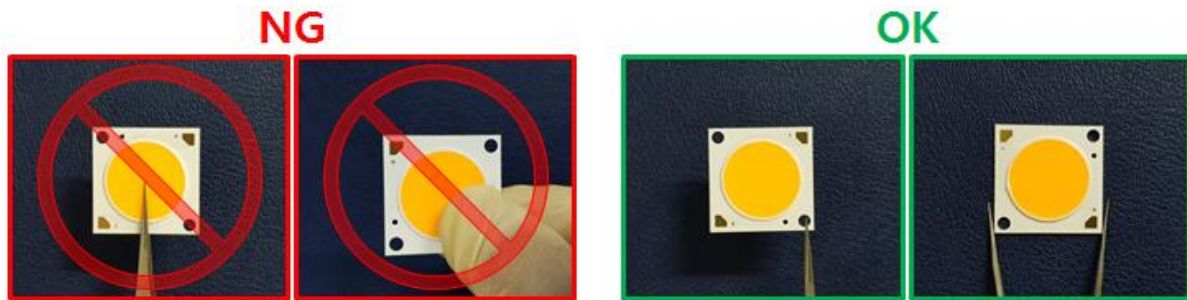
### (3) Storage Conditions

- 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.

# LUMENS

### **NOTE :**

All the information published is considered to be reliable. However, Lumens does not assume any liability arising out of the application or use of any product described herein.

Lumens reserves the right to make changes at any time without notice to any products in order to improve reliability, function or design.

Lumens products are not authorized for use as critical components in life support devices or systems without the express written approval from the managing director of Lumens.