

## LNM/140X30/4R5W/XXX/120V/C100

- Compatible with most TRIAC dimmers
- High Power Conversion Efficiency (>0.85)
- High Power Factor (>0.99)
- Low THD (<20%)

## 1. Product description

### \* Description

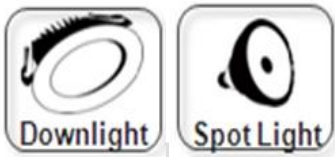
- The LNM series module is designed for the high power operation to get the high flux output applications.
- It incorporates the state of the art SMD LEDs with high reliability and semiconductor AC direct drive ICs.
- It is ideal for the indoor or down light applications.

### \* Features

- High performance, High brightness
- No emission of harmful short wavelength light(No UV radiation)
- High power conversion efficiency(>0.85)
- High power factor (>0.99)
- Low THD(< 20%)
- Low EMI
- Thermal shutdown function embedded(150°C)
- RoHS compliant

### \* Applications

- Down Light (Indoor Lighting)
- Spot Light



# LUMENS

## 2. Absolute maximum ratings

Parameters	Symbol	Min Value	Max Value	Unit
Maximum power dissipation	Pd	-	4.95	W
Maximum operation voltage	Vop	-	132	V
Operation temperature	Top	-30	+85	°C
Storage temperature	Tst	-40	+100	°C

- Operation temperature is not related to the lifetime.

### 3. Electro-optical characteristics (T<sub>c</sub>=25°C & 55°C.)

Parameters	Symbol	T <sub>c</sub> = 25°C			T <sub>c</sub> = 55°C			Unit	Condition
		Min.	Typ.	Max.	Min.	Typ.	Max.		
Luminous Flux	Φ <sub>v</sub>	356	396	-	339	376	-	lm	V <sub>op</sub> =120V,2700K,CRI80
		405	450	-	385	428	-		V <sub>op</sub> =120V,3000K,CRI80
		413	459	-	392	436	-		V <sub>op</sub> =120V,3500K,CRI80
		421	468	-	400	445	-		V <sub>op</sub> =120V,4000K,CRI80
		433	482	-	412	457	-		V <sub>op</sub> =120V,5000K,CRI80
		331	368	-	315	350	-		V <sub>op</sub> =120V,2700K,CRI90
		356	396	-	339	376	-		V <sub>op</sub> =120V,3000K,CRI90
		364	404	-	345	384	-		V <sub>op</sub> =120V,3500K,CRI90
		371	412	-	352	391	-		V <sub>op</sub> =120V,4000K,CRI90
		381	424	-	362	403	-		V <sub>op</sub> =120V,5000K,CRI90
Efficiency	lm/W	79	88	-	75	84	-	lm/W	V <sub>op</sub> =120V,2700K,CRI80
		90	100	-	86	95	-		V <sub>op</sub> =120V,3000K,CRI80
		92	102	-	87	97	-		V <sub>op</sub> =120V,3500K,CRI80
		94	104	-	89	99	-		V <sub>op</sub> =120V,4000K,CRI80
		96	107	-	91	102	-		V <sub>op</sub> =120V,5000K,CRI80
		74	82	-	70	78	-		V <sub>op</sub> =120V,2700K,CRI90
		79	88	-	75	84	-		V <sub>op</sub> =120V,3000K,CRI90
		81	90	-	77	85	-		V <sub>op</sub> =120V,3500K,CRI90
		82	92	-	78	87	-		V <sub>op</sub> =120V,4000K,CRI90
		85	94	-	81	89	-		V <sub>op</sub> =120V,5000K,CRI90

(1) At 120Vac, T<sub>c</sub> = 25 °C & 55°C

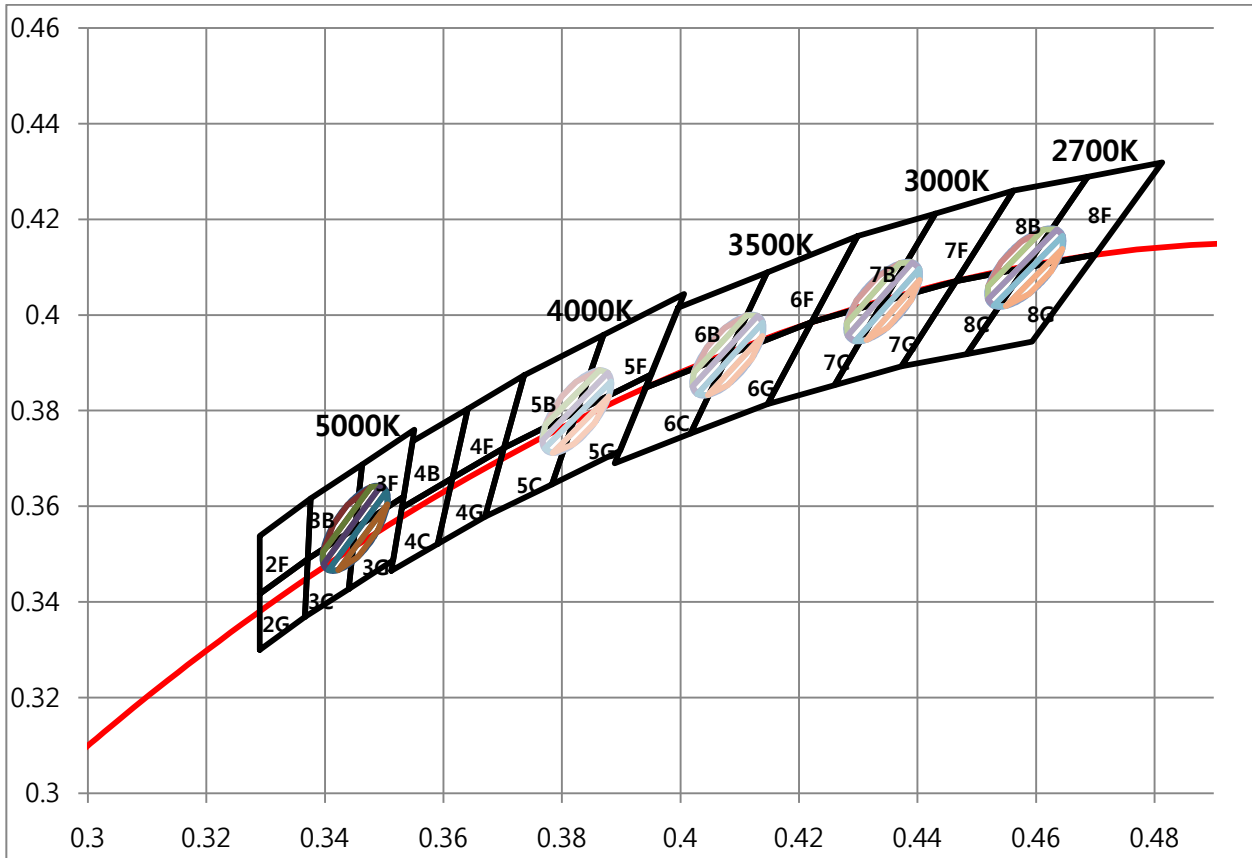
(2) Φ<sub>v</sub> is the total luminous flux output measured with an integrated sphere.

- Measurement accuracy : CRI(±3), Φ<sub>v</sub>(±3%), Vf(±3.0V)

(3) Correlated Color Temperature is derived from the CIE 1931 Chromaticity diagram.

Correlated Color Temperature	CCT	MacAdam 3Step			K	
Color Rendering Index	CRI	80/90	-	-	-	V <sub>op</sub> =120V
Viewing Angle FWHM	2θ1/2	110	120	130	deg	V <sub>op</sub> =120V
Operation Voltage	V <sub>op</sub>	108	120	132	V	
Power Dissipation	P <sub>d</sub>	4.05	4.5	4.95	W	V <sub>op</sub> =120V
Operation Frequency	F <sub>op</sub>	50 / 60			Hz	V <sub>op</sub> =120V
Power Factor	PF	Over 0.99			V	V <sub>op</sub> =120V
Current THD	ATHD	Less than 20%				V <sub>op</sub> =120V

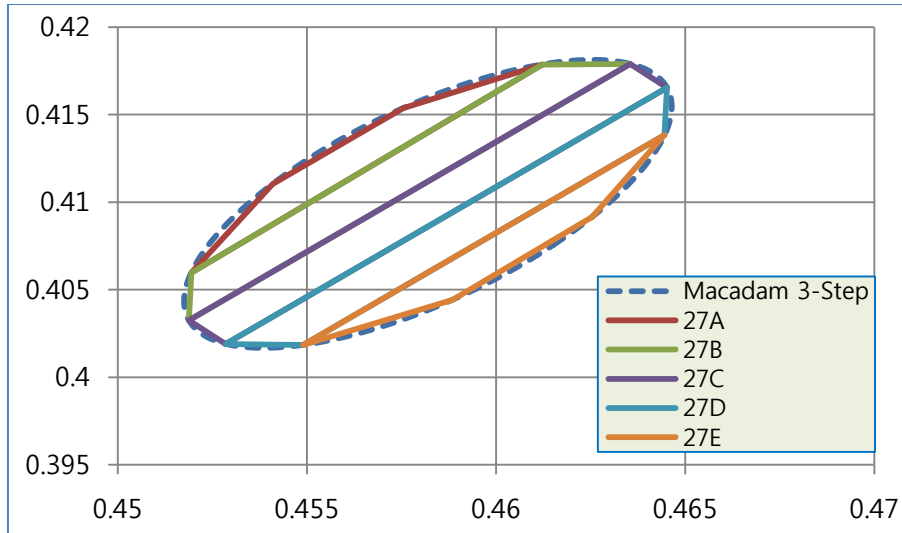
#### 4. CIE Chromaticity diagram



(1) Chromaticity coordinate groups are measured with an accuracy of  $\pm 0.01$

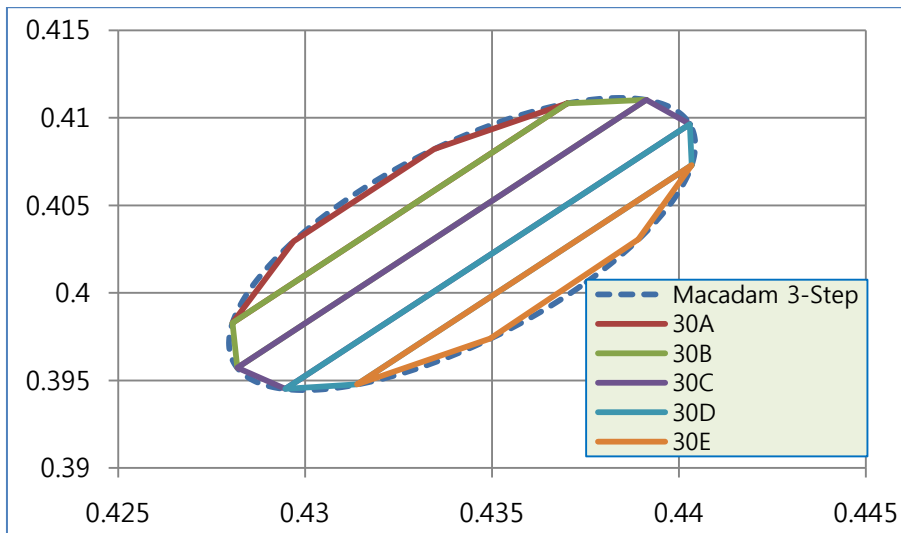
5. Chromaticity coordinates

5-1. 2700K



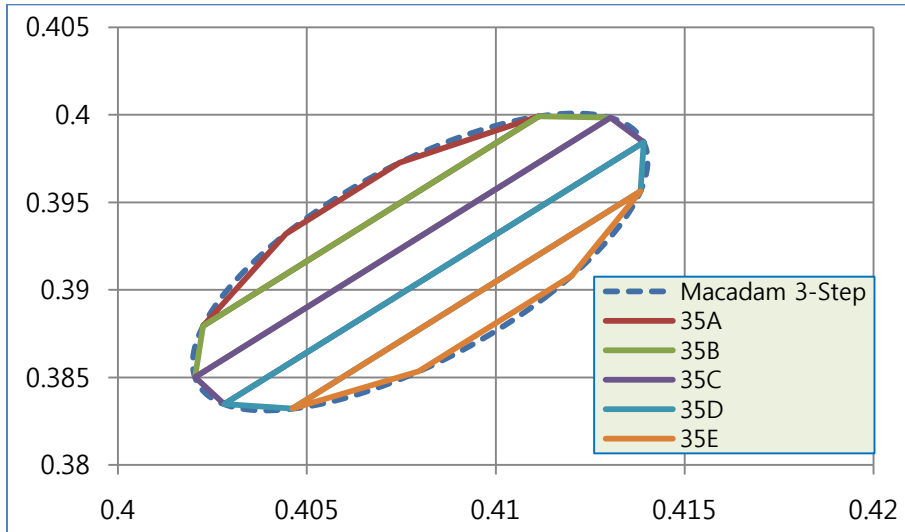
27A		27B		27C		27D		27E	
X	Y	X	Y	X	Y	X	Y	X	Y
0.4612	0.4179	0.4636	0.4179	0.4645	0.4165	0.4645	0.4138	0.4625	0.4092
0.4576	0.4154	0.4612	0.4179	0.4636	0.4179	0.4645	0.4165	0.4645	0.4138
0.4541	0.4110	0.4519	0.4060	0.4519	0.4033	0.4528	0.4019	0.4549	0.4018
0.4519	0.4060	0.4519	0.4033	0.4528	0.4019	0.4549	0.4018	0.4588	0.4044
0.4612	0.4179	0.4636	0.4179	0.4645	0.4165	0.4645	0.4138	0.4625	0.4092

5-2. 3000K



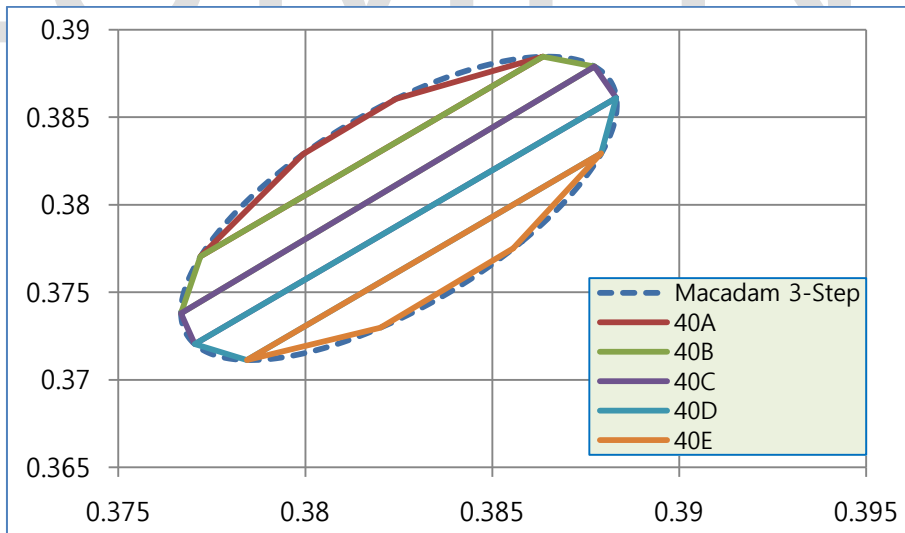
30A		30B		30C		30D		30E	
X	Y	X	Y	X	Y	X	Y	X	Y
0.4370	0.4108	0.4391	0.4110	0.4403	0.4097	0.4403	0.4073	0.4389	0.4031
0.4334	0.4082	0.4370	0.4108	0.4391	0.4110	0.4403	0.4097	0.4403	0.4073
0.4297	0.4030	0.4281	0.3983	0.4282	0.3957	0.4295	0.3945	0.4314	0.3948
0.4281	0.3983	0.4282	0.3957	0.4295	0.3945	0.4314	0.3948	0.4350	0.3974
0.4370	0.4108	0.4391	0.4110	0.4403	0.4097	0.4403	0.4073	0.4389	0.4031

5-3. 3500K



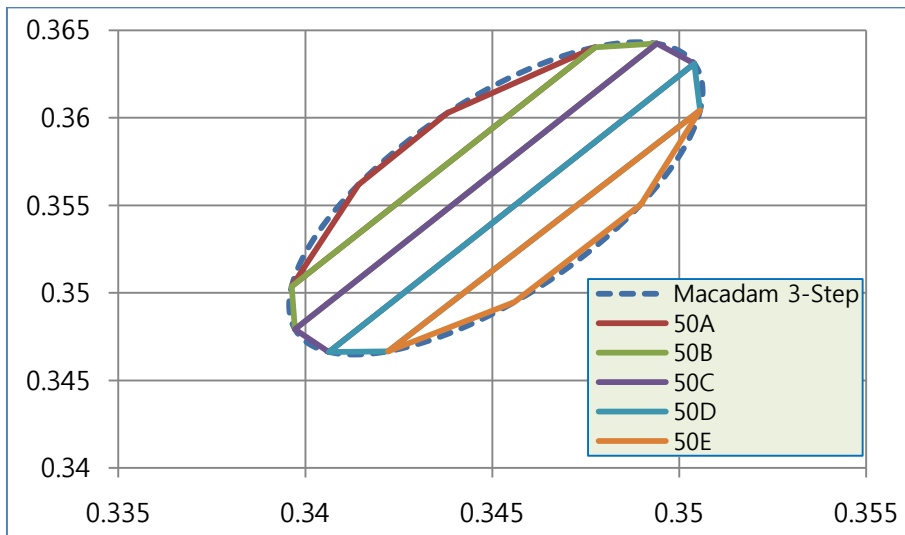
35A		35B		35C		35D		35E	
X	Y	X	Y	X	Y	X	Y	X	Y
0.4111	0.3999	0.4130	0.3998	0.4139	0.3984	0.4138	0.3956	0.4120	0.3908
0.4075	0.3973	0.4111	0.3999	0.4130	0.3998	0.4139	0.3984	0.4138	0.3956
0.4044	0.3932	0.4023	0.3879	0.4020	0.3850	0.4028	0.3835	0.4046	0.3832
0.4023	0.3879	0.4020	0.3850	0.4028	0.3835	0.4046	0.3832	0.4080	0.3853
0.4111	0.3999	0.4130	0.3998	0.4139	0.3984	0.4138	0.3956	0.4120	0.3908

5-4. 4000K



40A		40B		40C		40D		40E	
X	Y	X	Y	X	Y	X	Y	X	Y
0.3864	0.3885	0.3877	0.3879	0.3883	0.3861	0.3879	0.3829	0.3856	0.3775
0.3824	0.3861	0.3864	0.3885	0.3877	0.3879	0.3883	0.3861	0.3879	0.3829
0.3799	0.3829	0.3772	0.3771	0.3767	0.3738	0.3770	0.3720	0.3784	0.3711
0.3772	0.3771	0.3767	0.3738	0.3770	0.3720	0.3784	0.3711	0.3820	0.3730
0.3864	0.3885	0.3877	0.3879	0.3883	0.3861	0.3879	0.3829	0.3856	0.3775

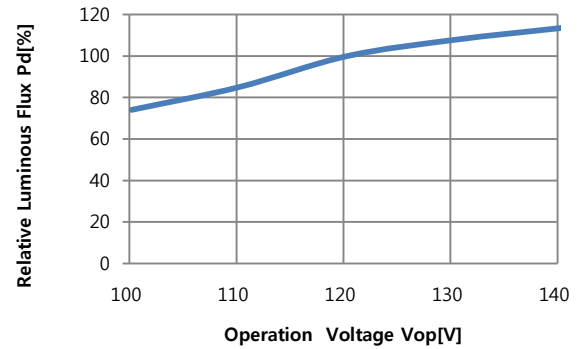
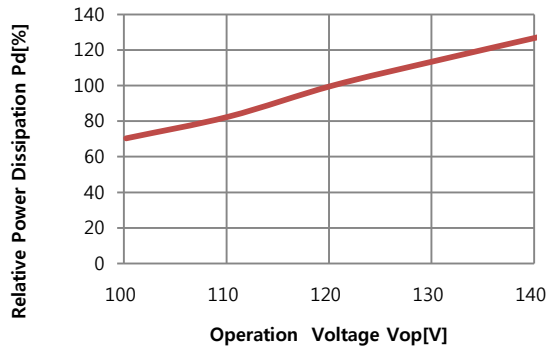
5-5. 5000K



50A		50B		50C		50D		50E	
X	Y	X	Y	X	Y	X	Y	X	Y
0.3478	0.3640	0.3494	0.3642	0.3504	0.3631	0.3506	0.3604	0.3490	0.3550
0.3438	0.3603	0.3478	0.3640	0.3494	0.3642	0.3504	0.3631	0.3506	0.3604
0.3414	0.3562	0.3396	0.3504	0.3397	0.3479	0.3406	0.3466	0.3422	0.3467
0.3396	0.3504	0.3397	0.3479	0.3406	0.3466	0.3422	0.3467	0.3456	0.3495
0.3478	0.3640	0.3494	0.3642	0.3504	0.3631	0.3506	0.3604	0.3490	0.3550

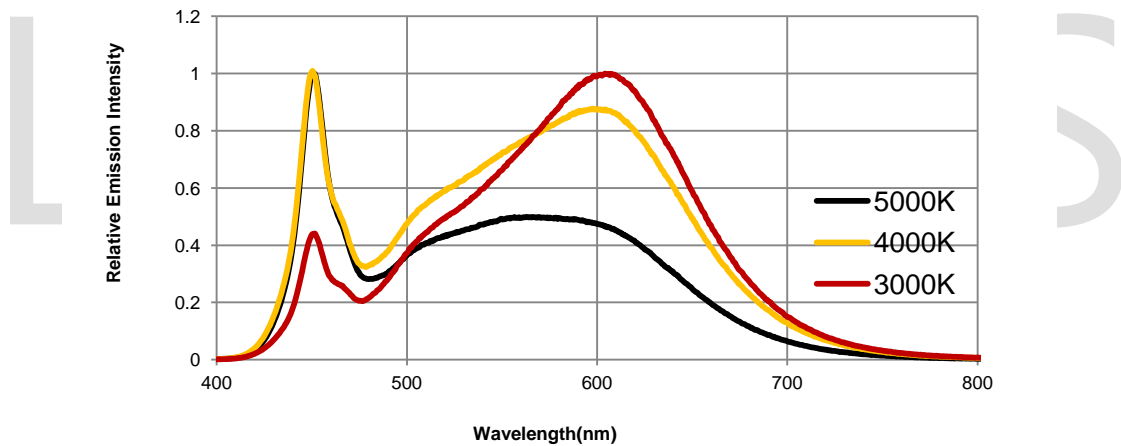
## 6. Characteristic Graphs

### 6-1 Voltage Characteristics(Ta=25°C)

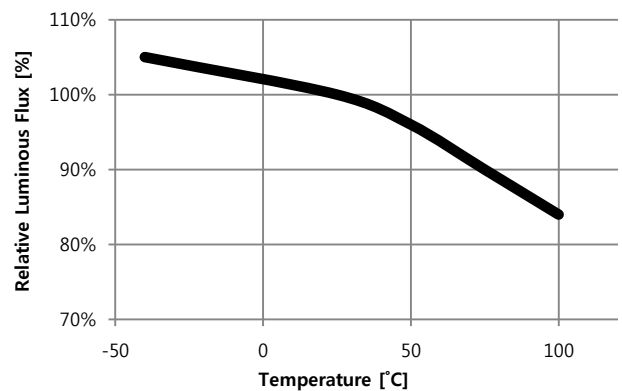
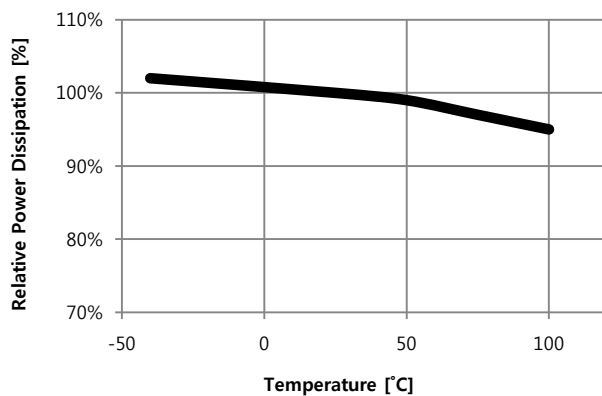


### 6-2 Spectrum Characteristics(Ta=25°C)

Spectral Density vs. Wavelength

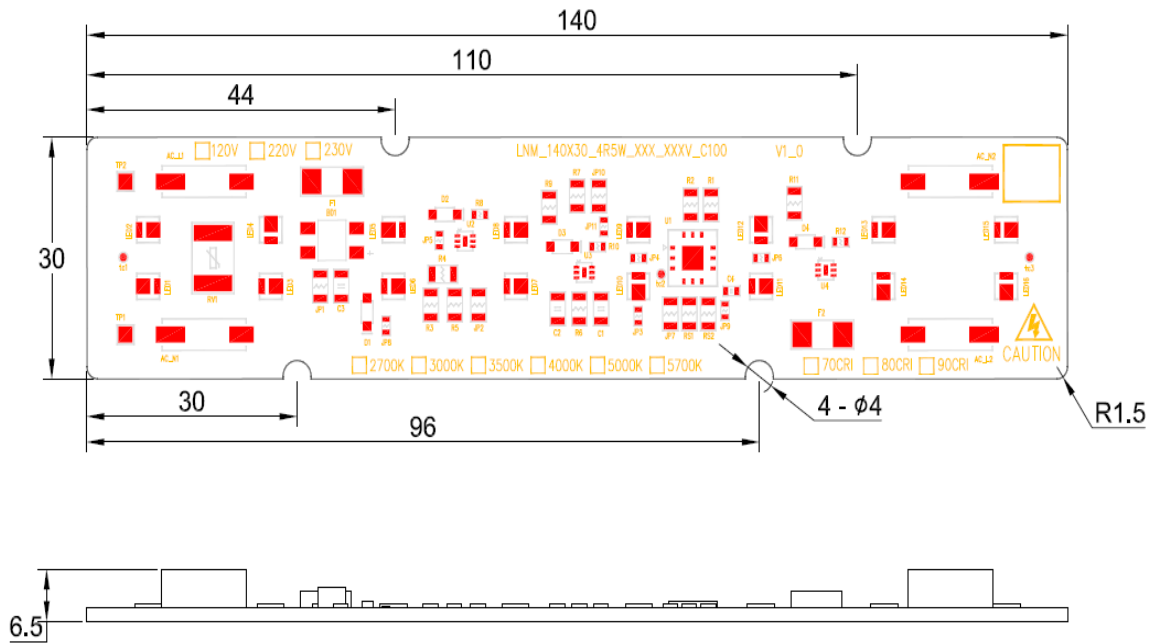


### 6-3 Temperature Characteristics





## 7. Outline Dimensions

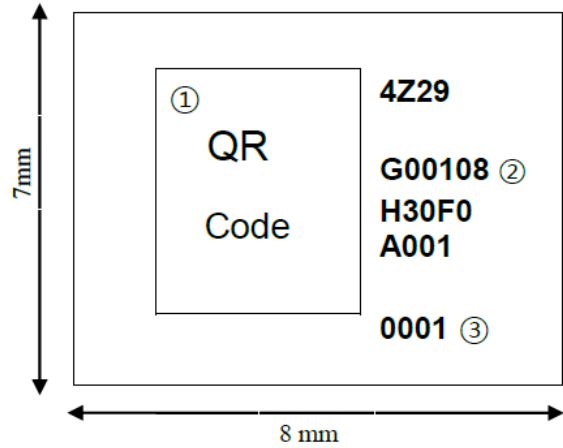
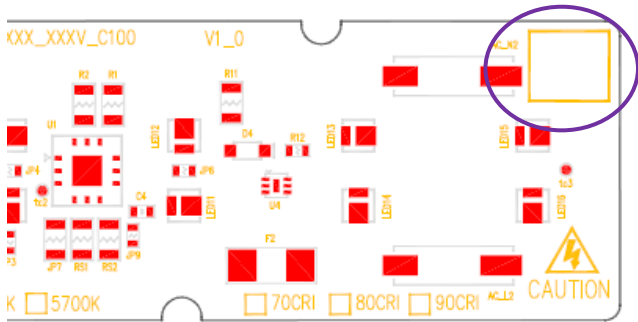


Unit : mm

- 1) Outline Diameter : 140X30mm Height(max) : 6.5mm
- 2) Tolerance - All measurements are  $\pm 0.1$  mm unless otherwise indicated.

## 8. EDC Module Marking

- A. Information Identification by report on the PCB (Silk)
  - Module Identification Code
- B. LED Module Label



1	QR Code
2	Traceability Code
3	Serial No.

B-1 Traceability Code Table

No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Marking	4	8	1	5	T	9	9	9	1	8	H	3	0	C	0	A	0	0	1	0	0	0	1
Meaning	SMT Year/Month/Day				SMT Site	Group No.			Watt	CRI	CCT	Volt	Default	LOT Serial No.				SMT Serial No.					
Ciphers	4				1	3			2	1	2	1		4				4					
How to Use	1st: Last No. of Year 2nd: Month (1~9,X,Y,Z) 3rd~4th: Day				T: PST	999			18	H	30	C		A001				0001					

B-2 Traceability Code Marking Table

**SMT Year/Month**

code	Year
4	2014
5	2015
6	2016

Month	1	2	3	4	5	6	7	8	9	
Code	1	2	3	4	5	6	7	8	9	
Month	10	11	12							
Code	X	Y	Z							

**SMT Day**

Day	1	2	3	4	5	6	7	8	9	10	11
Code	01	02	03	04	05	06	07	08	09	10	11
Day	12	13	14	15	16	17	18	19	20	21	22
Code	12	13	14	15	16	17	18	19	20	21	22
Day	23	24	25	26	27	28	29	30	31		
Code	23	24	25	26	27	28	29	30	31		

**SMT Site**

SMT Site	D	L	B	K	Y	W	H	G	T
Code	1 <sup>st</sup> Vendor	2 <sup>nd</sup> Vendor	3 <sup>rd</sup> Vendor	4 <sup>th</sup> Vendor	5 <sup>th</sup> Vendor	6 <sup>th</sup> Vendor	7 <sup>th</sup> Vendor	8 <sup>th</sup> Vendor	9 <sup>th</sup> Vendor

**Watt**

Watt	1	2	3	4	5	6	7	8	9	10	...	99
Code	01	02	03	04	05	06	07	08	09	10	...	99
Watt	100	101	...	110	111	...	330	331	...	338	339	etc.
Code	A0	A1	...	B0	B1	...	Z0	Z1	...	Z8	Z9	ZZ

\* AO:100, BO:110, CO:120, DO:130, EO:140, FO:150, GO:160, HO:170, JO:180, KO:190, LO:200, MO:210  
 NO:220, PO:230, QO:240, RO:250, SO:260, TO:270, UO:280, VO:290, WO:300, XO:310, YO:320, ZO:330

**CRI**

CRI	Under 70	Min 70	Min 75	Min 80	Min 85	Min 90
Code	L	N	M	H	V	U

**CCT**

CCT	2700K	3000K	3500K	4000K	4500K	5000K	5700K	6500K
Code	27	30	35	40	45	50	57	65

**Volt**

Volt	100V	110V	120V	200V	220V	230V	240V	250V	277V	347V	DC	etc.
Code	A	B	C	D	E	F	G	H	J	K	X	Z

## 9. Cautions

- ◆ The LED Module itself and all its components may not be mechanically stressed.
- ◆ Make sure proper discharge prior to starting work.
- ◆ DO NOT touch any of the circuit board, components or terminals with body or metal while circuit is active.
- ◆ Installation of LED Module needs to be made with regard to all applicable electrical and safety standards. Only qualified personnel should be allowed to perform installation.
- ◆ DO NOT add or change wires while circuit is active.
- ◆ DO NOT make any modification on module.
- ◆ DO NOT use adhesives to attach the LED that outgas organic vapor.
- ◆ DO NOT use together with the materials containing Sulfur.
- ◆ The LED Module needs to be mounted on a heat sink providing adequate thermal dissipation.
- ◆ DO NOT exceed the values given in this specification
- ◆ Be cautious when soldering to board so as not to create a short between different trace patterns.
- ◆ Keep cautions not to apply higher voltage above the maximum rating. Otherwise damage may occur.
- ◆ Pay attention not to exceed the maximum operation temperature of 65°C at the Tc Point when the modules are used in an enclosed environment.  
(  $T_c + 30^\circ\text{C} \approx \text{Maximum LES temperature}(T_j)$  ) : Depends on specification of heat sink
- ◆ DO NOT assemble in conditions of high moisture and/or oxidizing gas such as Cl, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, NO<sub>x</sub>, etc.
- ◆ The module should also not be installed in end equipment without ESD (Electrical Static Discharge) protection.
- ◆ Damage by corrosion will not be allowed as defect claim. Lumens LED Module is recommended for Indoor use only.
- ◆ Great care should be taken not to see directly the operated lighting LED. If not the intense light should cause the damage to eye. Use proper goggles to protect your eyes during operation.
- ◆ Long time exposure to sunlight or UV can cause the lens to discolor.
- ◆ Moisture-Proof package
  1. When moisture is absorbed into the LED light engine it may vaporize and expand products during manufacturing. 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 pack is used to keep moisture to a minimum in the package.
  2. A pack 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.
- ◆ Storage Conditions
  1. Before opening the package: The LED light engines should be kept at 30°C or less and 90% RH or less. The LED light engines should be used within a year. When storing the LED light engines, moisture-proof packaging with moisture-absorbent material (silica gel) is recommended.
  2. After opening the package: The LED light engines 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 LED light engines 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 LED light engines to the original moisture-proof bag and to reseal the moisture-proof bag again.
  3. Please avoid rapid transitions in ambient temperature, especially in high humidity environments where condensation can occur.

### NOTE :

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