

ELJU(9) Series

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Introduction

Everlight's JU(9) series is a ceramic substrate based COB LED achieving high efficiency at Energy Star / ANSI color temperature ranges.

Features

- ◆ High power DC COB & high efficiency
- ◆ Multi-Chip Solution
- ◆ Dimension: 15mm*12mm*1.25mm
- ◆ Main Parameters: Luminous Flux, Forward Voltage, Chromaticity and Color Rendering Index
- ◆ ESD protection
- ◆ RoHS compliant
- ◆ Energy Star / ANSI Compliant Binning Structure
- ◆ Reliability testing conforms to IESNA LM80 Lumen maintenance test method

Applications

- ◆ Indoor General Lighting
- ◆ Replacement Bulb
- ◆ Recessed Can
- ◆ Typical Viewing Angle 150°

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Product Nomenclature

The product name is designated as below:

ELJU(9) – ABCDE – FGHIJ – V1234

Family name

(9) = for customers identification voltage [1]

Designation:

AB = min. luminous flux (lm) or radiation power (mW) performance

C = radiation pattern [2]

D = color [3]

E = power consumption [4]

F = reserved for future product offerings

G = Internal code

H = packaging type [5]

IJ = internal code

V = forward voltage bin

1234 = color bin or CCT bin

Notes

1. Table of for customers identification voltage

Symbol	Description
(9)	9 V

2. Table of radiation patterns

Symbol	Description
0	No Lens

3. Table of color offerings:

Symbol	Color	Dominant wavelength range
R	Red	620~630nm
O	Orange	610~620nm
Y	Amber	585~595nm
G	Green	520~535nm
B	Blue	460~470nm
C	Cool-White	4745~7050K
N	Neutral-White	3710~4745K
M	Warm-White	2580~3710K

4. Table of power consumptions:

Symbol	Description
3	3~3.9W

5. Table of packaging types:

Symbol	Description
T	Tray

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Max. DC Forward Current (mA)	I_F	700 _[1]	mA
Max. Peak Pulse Current (mA)	I_{Pulse}	720 _[2]	mA
Power Dissipation	P_d	3.7	W
Thermal Resistance	R_{th}	2.4	K/W
Max. Junction Temperature	T_J	115	°C
Operating Temperature	T_{Opr}	-40 ~ +85	°C
Storage Temperature	T_{Stg}	-40 ~ +85	°C

Notes:

1. For optimal performance, Everlight recommends 400mA operation.
2. Duty cycle = 1/10@1KHZ
3. The ELJU(9) series LEDs are not designed for reverse bias use.

Typical Over Drive Electro-Optical Characteristic Table

Parameter/Forward Current	400mA	530mA	700mA	Unit
Power Consumption	3.7	5.1	7	W
Luminous Flux _[1]	350	470	595	lm
Forward Voltage _[1]	9.2	9.5	9.9	VF
Correlated Color Temperature _[1]	3000			K
Color Rendering Index _[1]	80			

Notes:

1. All values shown on this table are over drive references only.

PN of the ELJU(9) series: White LEDs



Color	Order Code of ELJU(9)	Minimum Luminous Flux (lm)	Typical Luminous Flux (lm)	CCT (K)	Forward Voltage (V)	Forward Current (mA)	CRI [1] (min.)
Warm White 2700	ELJU(9)-K40M3-0LTHE-R2700	300	327	27K-1~27K-4	8.4~10.2	400	80
Warm White 3000	ELJU(9)-K40M3-0LTHE-R3000	300	350	30K-1~30K-4	8.4~10.2	400	80
Neutral White 4000	ELJU(9)-K40M3-0LTHE-R4000	300	359	40K-1~40K-4	8.4~10.2	400	80
Cool White 5000	ELJU(9)-K60C3-0LTGE-R5000	350	398	50K-1~50K-4	8.4~10.2	400	70
Cool White 5700	ELJU(9)-K60C3-0LTGE-R5700	350	417	57K-1~57K-4	8.4~10.2	400	70
Cool White 6500	ELJU(9)-K60C3-0LTEE-R6500	350	407	65K-1~65K-4	8.4~10.2	400	70

Notes:

1. CRI measurement tolerance: ± 2 .
2. Luminous flux measurement tolerance: $\pm 10\%$.
3. The data of luminous flux measured at thermal pad=25°C
4. Typical luminous flux or light output performance is operated within the condition guided by this datasheet.

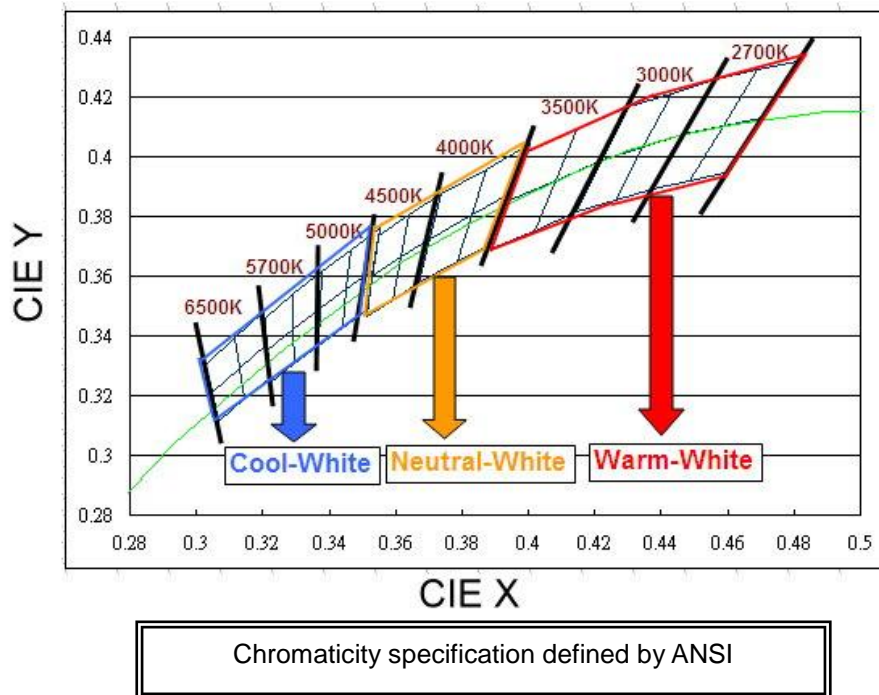
Product Binning

Luminous Flux Bins

Group	Bin	Minimum Photometric Flux (lm)	Maximum Photometric Flux (lm)
E	1	4	5
	2	5	6
	3	6	8
	4	8	10
	5	10	13
	6	13	17
	7	17	20
	8	20	23
	9	23	27
F	1	27	33
	2	33	39
	3	39	45
	4	45	52
	5	52	60
	6	60	70
	7	70	80
	8	80	90
	9	90	100

Group	Bin	Minimum Photometric Flux (lm)	Maximum Photometric Flux (lm)
J	1	100	110
	2	110	120
	3	120	130
	4	130	140
	5	140	150
	6	150	160
	7	160	180
	8	180	200
	9	200	225
K	1	225	250
	2	250	275
	3	275	300
	4	300	325
	5	325	350
	6	350	375
	7	375	400
	8	400	425
	9	425	450
N	1	450	475
	2	475	500
	3	500	525
	4	525	550

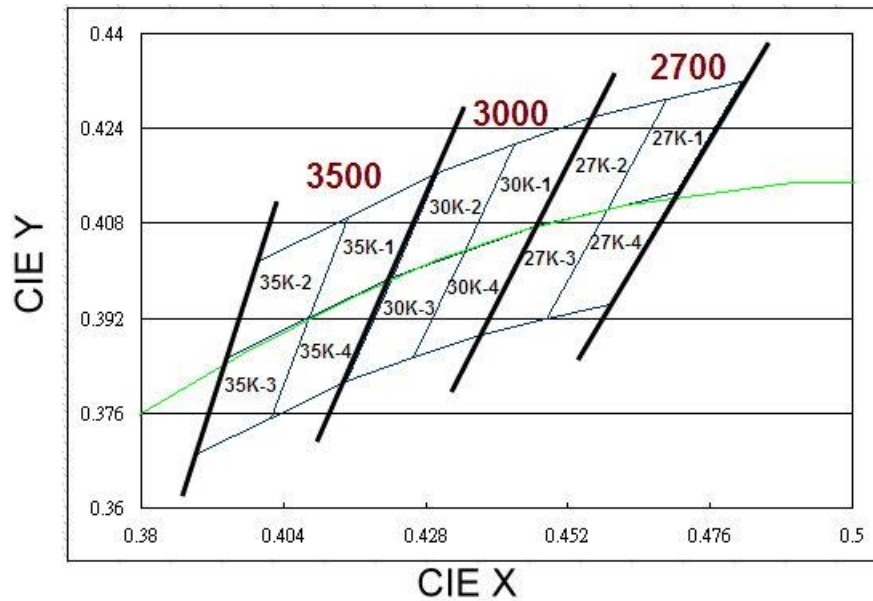
White Bin Structure



Notes:

1. The CCT range of Cool-White varies from 4745K to 7050K.
2. The CCT range of Neutral-White varies from 3710K to 4745K.
3. The CCT range of Warm-White varies from 2580K to 3710K
4. Color coordinates measurement allowance : ± 0.01
5. Color bins are defined at $I_f=400\text{mA}$ operation

Warm-White Bin Structure



Warm-White Bin Coordinates

2700K

Bin	CIE X	CIE Y
27K-1	0.469	0.429
	0.459	0.410
	0.470	0.413
	0.481	0.432
Reference Range: 2580~2700K		

Bin	CIE X	CIE Y
27K-2	0.456	0.426
	0.447	0.408
	0.459	0.410
	0.469	0.429
Reference Range: 2700~2870K		

Bin	CIE X	CIE Y
27K-4	0.459	0.410
	0.448	0.392
	0.459	0.394
	0.470	0.413
Reference Range: 2580~2700K		

Bin	CIE X	CIE Y
27K-3	0.447	0.408
	0.437	0.389
	0.448	0.392
	0.459	0.410
Reference Range: 2700~2870K		

3000K

Bin	CIE X	CIE Y
30K-1	0.443	0.421
	0.435	0.403
	0.447	0.408
	0.456	0.426
Reference Range: 2870~3000K		

Bin	CIE X	CIE Y
30K-2	0.430	0.417
	0.422	0.399
	0.435	0.403
	0.443	0.421
Reference Range: 3000~3220K		

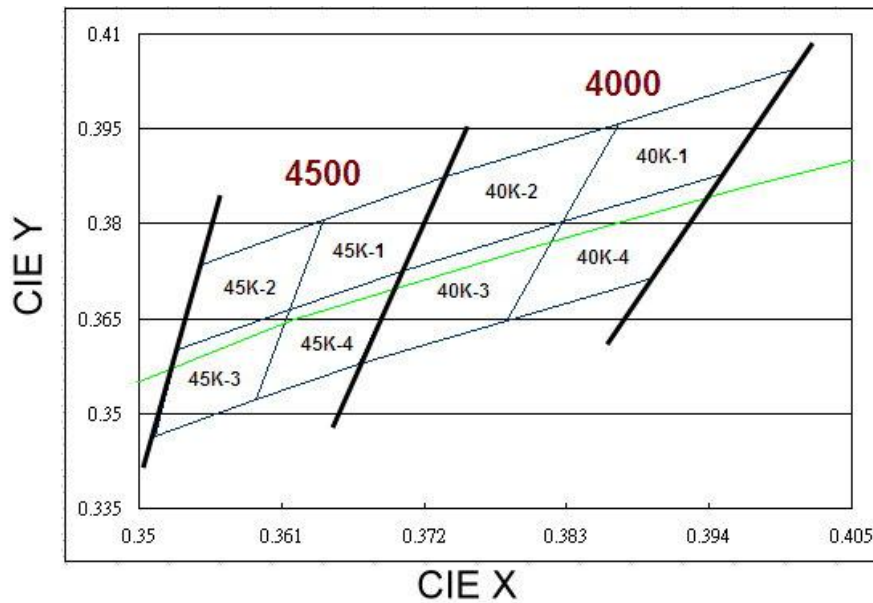
Bin	CIE X	CIE Y
30K-4	0.435	0.403
	0.426	0.385
	0.437	0.389
	0.447	0.408
Reference Range: 2870~3000K		

Bin	CIE X	CIE Y
30K-3	0.422	0.399
	0.415	0.381
	0.426	0.385
	0.435	0.403
Reference Range: 3000~3220K		

Notes:

1. Color coordinates measurement allowance : ± 0.01 .

Neutral-White Bin Structure



Neutral-White Bin Coordinates

4000K

Bin	CIE X	CIE Y
40K-1	0.387	0.396
	0.383	0.380
	0.395	0.388
	0.401	0.404
Reference Range: 3710~4000K		

Bin	CIE X	CIE Y
40K-2	0.374	0.387
	0.370	0.373
	0.383	0.380
	0.387	0.396
Reference Range: 4000~4260K		

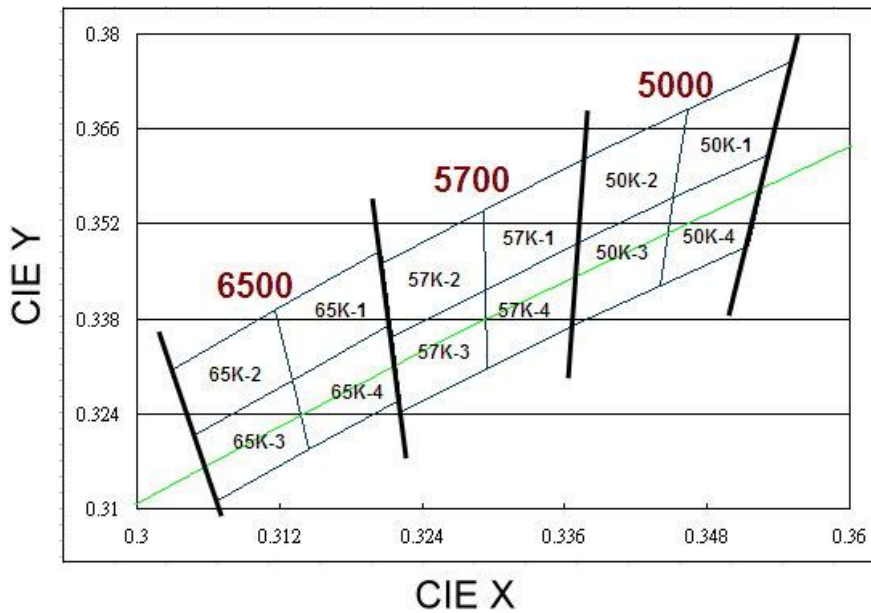
Bin	CIE X	CIE Y
40K-4	0.383	0.380
	0.378	0.365
	0.390	0.372
	0.395	0.388
Reference Range: 3710~4000K		

Bin	CIE X	CIE Y
40K-3	0.370	0.373
	0.367	0.358
	0.378	0.365
	0.383	0.380
Reference Range: 4000~4260K		

Notes:

1. Color coordinates measurement allowance : ± 0.01 .

Cool-White Bin Structure



Cool-White Bin Coordinates

5000K

Bin	CIE X	CIE Y
50K-1	0.346	0.369
	0.345	0.356
	0.353	0.362
	0.355	0.376
Reference Range: 4745~5000K		

Bin	CIE X	CIE Y
50K-2	0.338	0.362
	0.337	0.349
	0.345	0.356
	0.346	0.369
Reference Range: 5000~5310K		

Bin	CIE X	CIE Y
50K-4	0.345	0.356
	0.344	0.343
	0.352	0.349
	0.353	0.362
Reference Range: 4745~5000K		

Bin	CIE X	CIE Y
50K-3	0.337	0.349
	0.337	0.337
	0.344	0.343
	0.345	0.356
Reference Range: 5000~5310K		

5700K

Bin	CIE X	CIE Y
57K-1	0.329	0.354
	0.329	0.342
	0.337	0.349
	0.338	0.362
Reference Range: 5310~5700K		

Bin	CIE X	CIE Y
57K-2	0.321	0.346
	0.322	0.335
	0.329	0.342
	0.329	0.354
Reference Range: 5700~6020K		

Bin	CIE X	CIE Y
57K-4	0.329	0.342
	0.329	0.331
	0.337	0.337
	0.337	0.349
Reference Range: 5310~5700K		

Bin	CIE X	CIE Y
57K-3	0.322	0.335
	0.322	0.324
	0.329	0.331
	0.329	0.342
Reference Range: 5700~6020K		

6500K

Bin	CIE X	CIE Y
65K-1	0.312	0.339
	0.313	0.329
	0.321	0.337
	0.321	0.348
Reference Range: 6020~6500K		

Bin	CIE X	CIE Y
65K-2	0.303	0.330
	0.305	0.321
	0.313	0.329
	0.312	0.339
Reference Range: 6500~7050K		

Bin	CIE X	CIE Y
65K-4	0.313	0.329
	0.315	0.319
	0.322	0.326
	0.321	0.337
Reference Range: 6020~6500K		

Bin	CIE X	CIE Y
65K-3	0.305	0.321
	0.307	0.311
	0.315	0.319
	0.313	0.329
Reference Range: 6500~7050K		

Notes:

1. Color coordinates measurement allowance : ± 0.01 .

Forward Voltage Bins

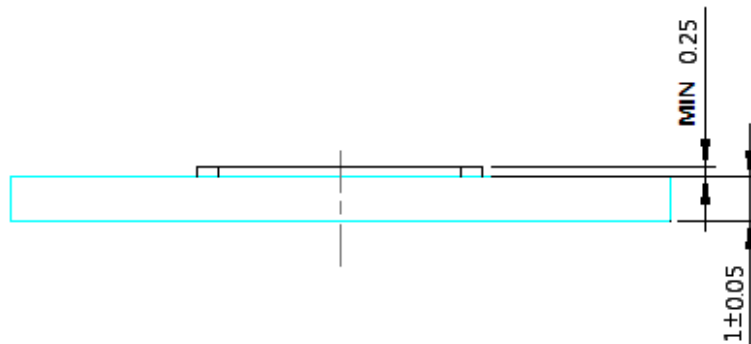
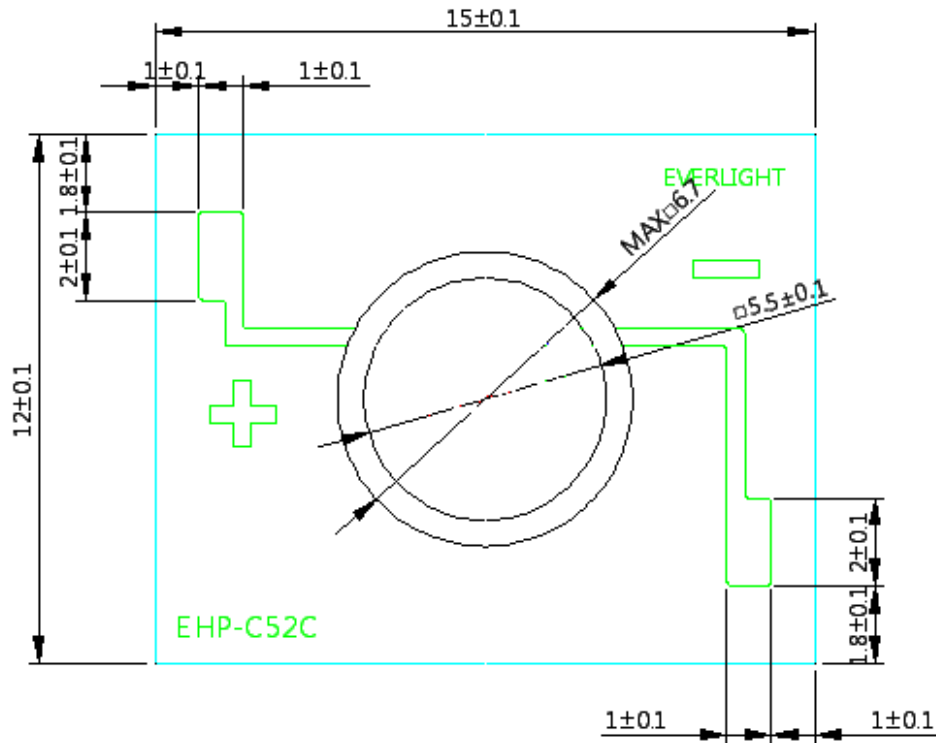
Group Name	Bins
R	R1+R2+R3

Bin	Minimum Forward Voltage (V)	Maximum Forward Voltage (V)
R1	8.0	9.0
R2	9.0	10.0
R3	10.0	11.0

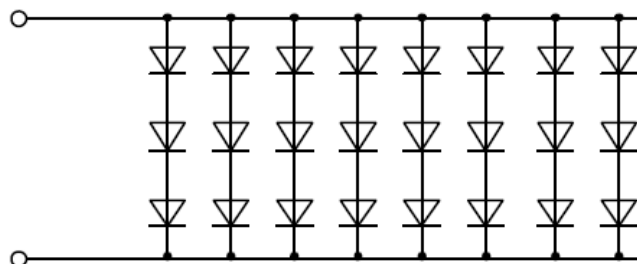
Notes:

1. Forward voltage measurement tolerance: $\pm 0.2V$.
2. Forward voltage bins are defined at $I_f=400mA$ operation.
3. Other Forward Voltage bins for White LEDs available upon request. Please contact your local Everlight sales office.

Mechanical Dimension



Chip Configuration

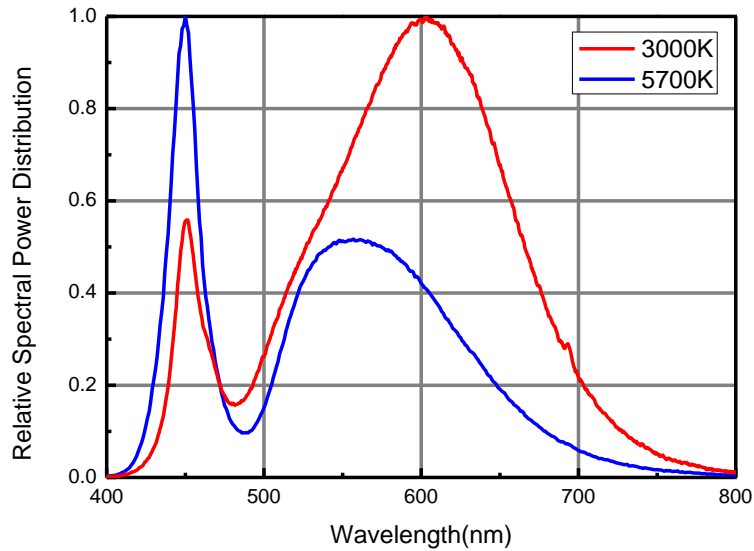


Notes:

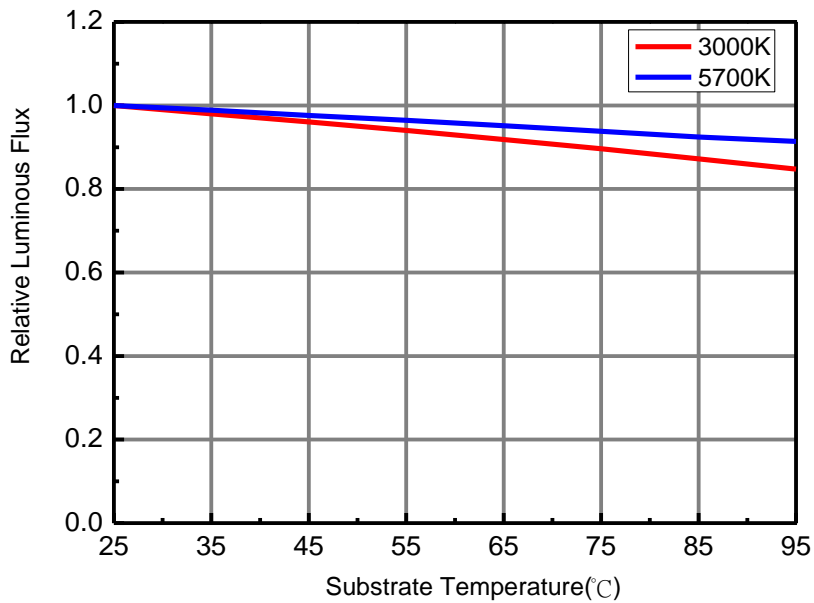
1. Dimensions are in millimeters.
2. Tolerances unless mentioned are ± 0.05 mm

Typical Electro-Optical Characteristic Curve

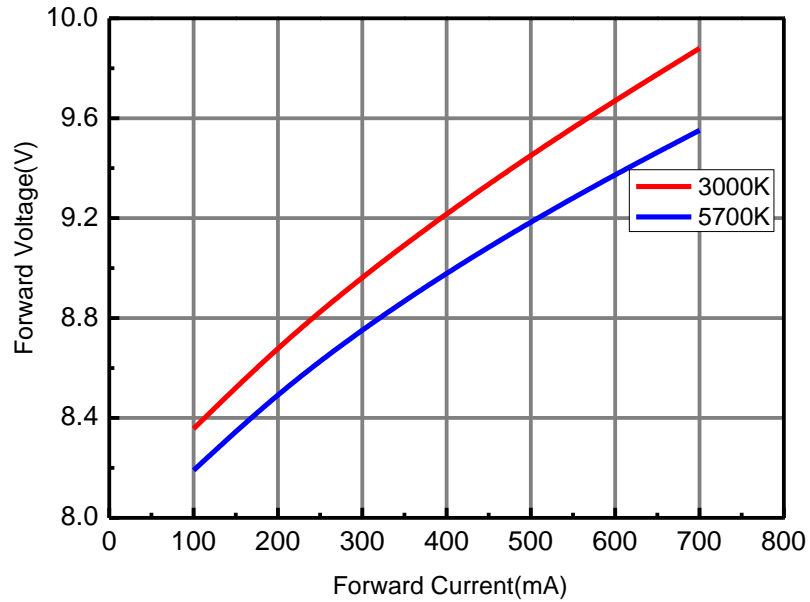
Relative Spectral Power Distribution
@ Substrate Temperature = 25°C



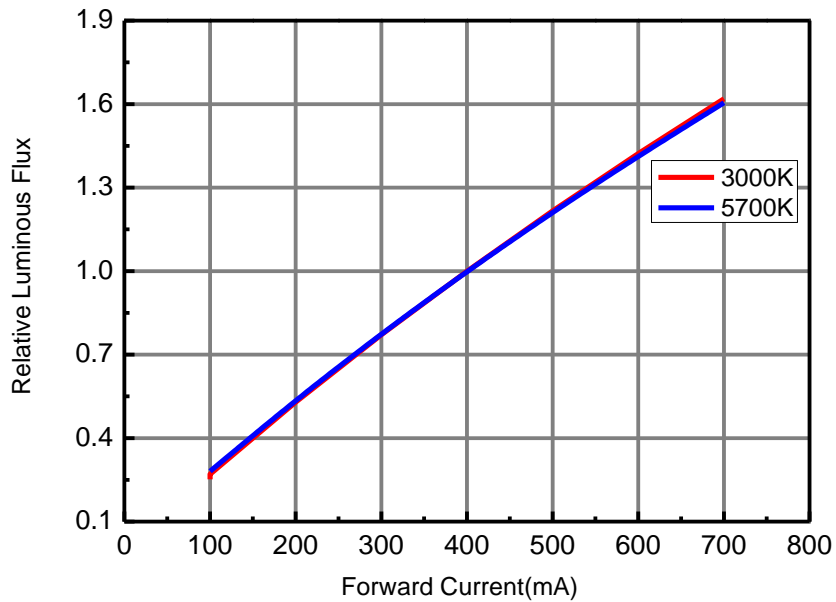
Relative Luminous Flux vs. Substrate Temperature
@Forward Current = 400mA



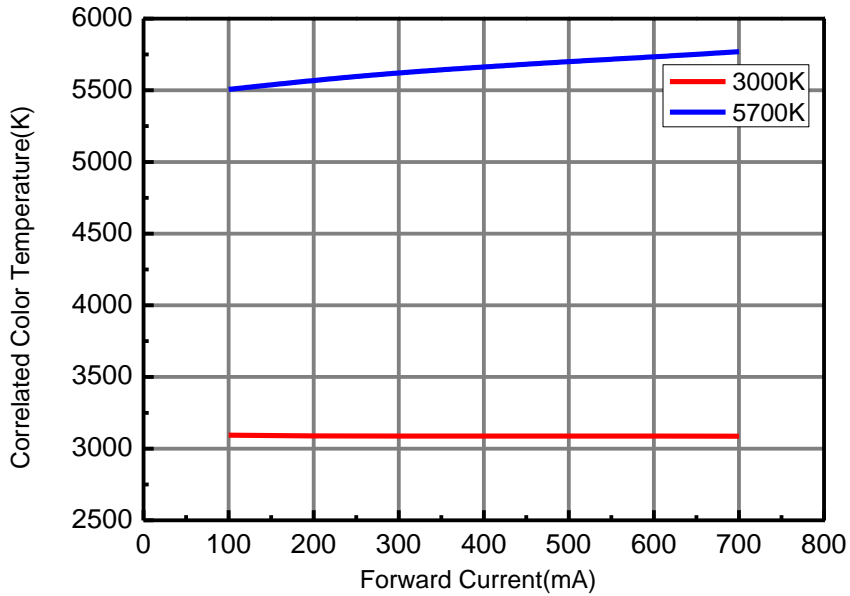
Forward Voltage vs. Forward Current @ Substrate Temperature = 25°C



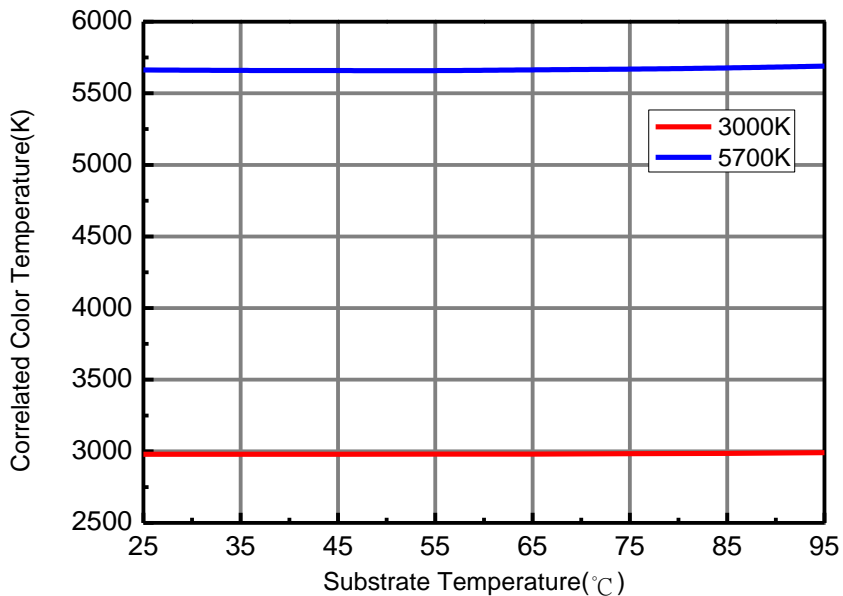
Relative Luminous Flux vs. Forward Current @ Substrate Temperature = 25°C



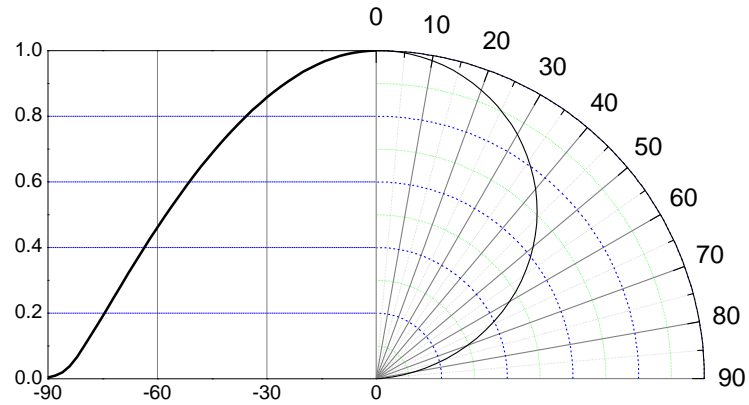
Correlated Color Temperature vs. Forward Current @ Substrate Temperature = 25°C



Correlated Color Temperature vs. Substrate Temperature @ Forward Current = 400mA



Typical Diagram Characteristics of Radiation Patterns



Notes:

1. $2\theta_{1/2}$ is the off axis angle from lamp centerline where the luminous intensity is 1/2 of the peak value.
2. View angle tolerance is $\pm 5^\circ$.

Product Labeling

Label Explanation

CPN: Customer Specification (when required)

P/N : Everlight Production Number

QTY: Packing Quantity

CAT: Luminous Flux (Brightness) Bin

HUE: Color Bin

REF: Forward Voltage Bin

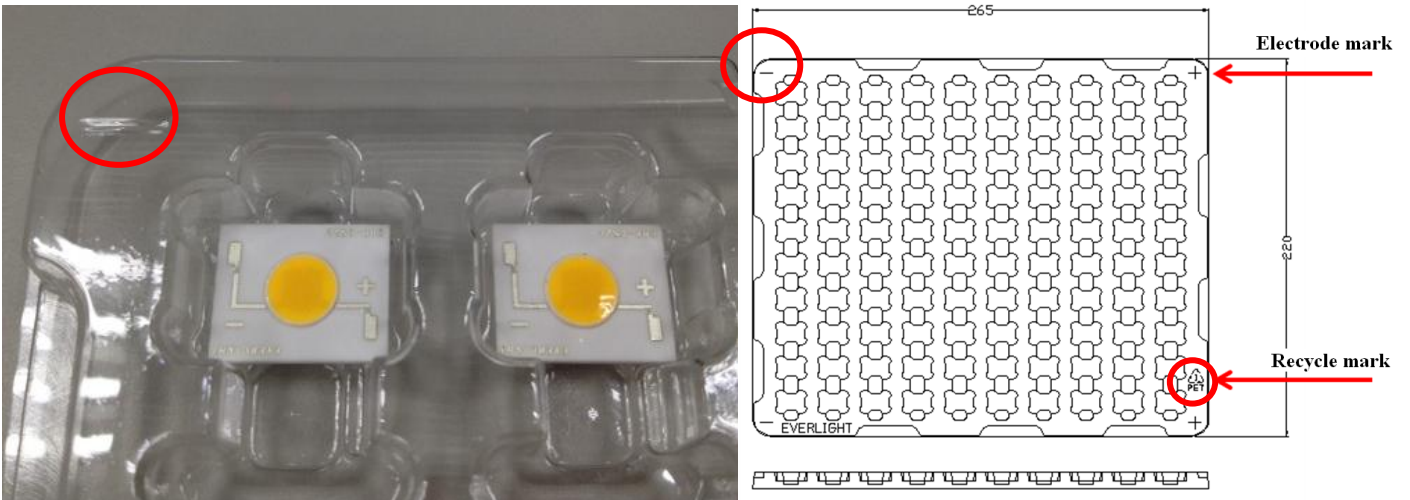
LOT No: Lot Number

MADE IN TAIWAN: Production Place



Carrier Tray Specification

Loaded Quantity: 100 PCS Per Tray



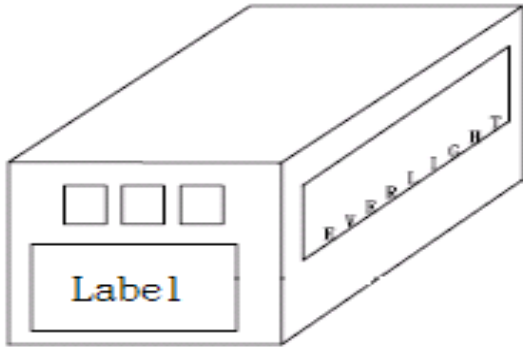
Notes:

1. Dimensions are in millimeters.
2. Tolerances unless mentioned are $\pm 0.1\text{mm}$

LED Direction

- The **Recycle mark** on the LEDs will be toward the **Anode mark** on the carrier tray.

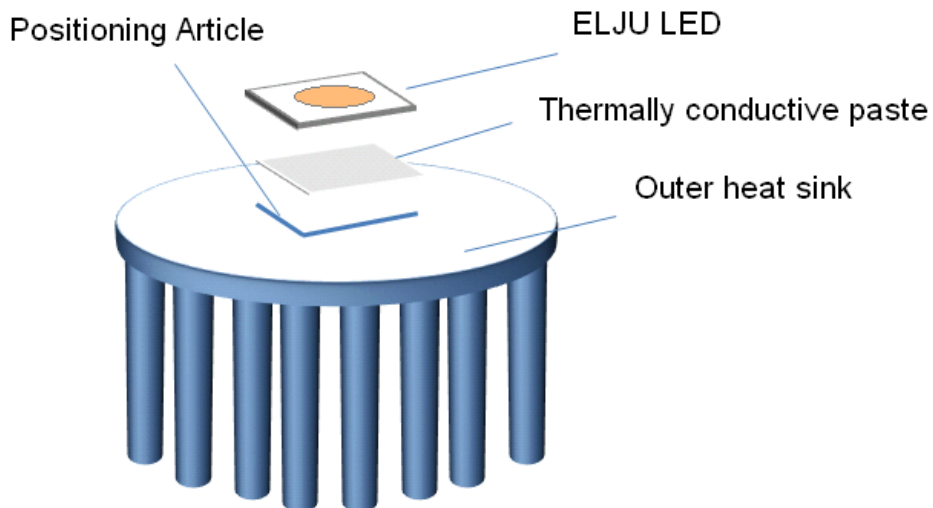
Outside Carton



Packaging Quantity

- 100 PCS Per Tray
- 10 Trays Per Outside Carton

Recommended Installation Screw Pitch



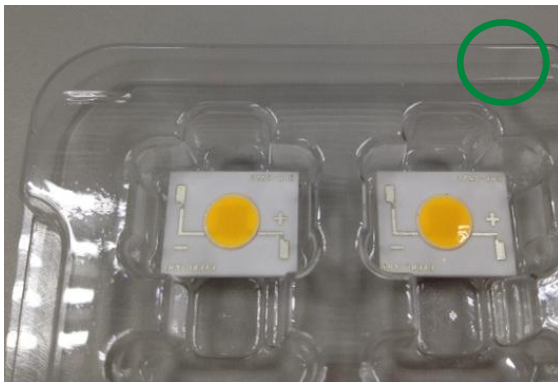
Precautions of Use

Over-Current-Proof

- Though the ELJU(9) has a conducted ESD protection mechanism, customers must not use the device in reverse and should apply resistors for extra protection. Otherwise slight voltage shift may cause significant current changes and burn out failure may happen.

Storage Conditions

- Before the package is opened: The LEDs should be stored at 30°C or less and 50%RH or less after being shipped from Everlight and the storage life limit is 6 months. If the LEDs are stored for 6 months or more, they should be stored in a sealed container with a nitrogen atmosphere and moisture absorbent material.
- After opening the package: The LED should be stored under 30°C or less and 30%RH or less. The LED should be used within 168hrs (7days) after opening the package. If unused LEDs remain, it should be stored in moisture proof packages.
- Do not stack assemblies.

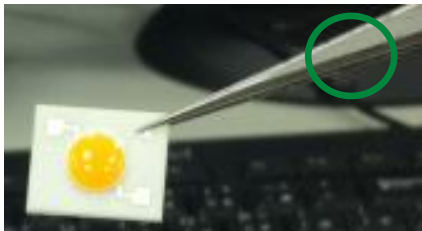


Handling

- Do not put mechanical stress on the LED.
- Never touch the optical surface with finger or sharp object. The LED surface could be soiled or damaged, which could affect the optical performance of the LED.
- In low-humidity work environment, please keep handling the LEDs with appropriate ESD grounding.
- It is recommended to handle the LED with powder-less latex gloves.

Manual Handling

- When handling the product, do not apply direct pressure on the optical surface.
- Do not touch the resin with tweezers to avoid scratching or other damage.



Thermal Management

- Sufficient thermal management must be implemented. Substrate of the positive in temperature must be kept under 105°C at the driving current of 400mA. Otherwise, the junction temperature of die may exceed the limit at high current driving conditions and the LEDs' lifetime may be decrease dramatically.

Revision History

Current version: **2012/05/24**

Previous version: **N/A**

Device No. DHE-0001857

Rev. Ver. 2

Page	Subjects (major change in previous version)	Date of change
	Create new - Neutral-White& Cool White	2012/06/18