

## Reference Module - HE Series

The HE Series utilizes Seoul's flagship high efficacy 5630 LEDs to deliver efficacies up to 202 Lm/W at typical driving currents. This solution features uniformity of light and color and enables easy installation with a Zhaga compatible mounting pattern.



### Applications:



### Features:

- High efficacy, long life
- Industry standard mechanical attributes
- Optimized for industry standard power supplies
- 3 SDCM
- ROHS Compliant
- Both 560mm and 1120mm lengths available

### Key Applications:

- Troffer Retrofit
- High Bay
- LED Panel
- Channel

### Product Selection: SMJD-3606036B-XXN1 $I_F = 195\text{mA}$ , $T_c = 25^\circ\text{C}$

CCT	CRI	Flux		Dimension	Order Code
		Min.	Typ.		
3000	80	1190	1280	560*20	SMJD-3606036B-XXN1 00B28G038AII
3500			1240		SMJD-3606036B-XXN1 00B28F038AII
4000		1330	SMJD-3606036B-XXN1 00B33E038AII		
5000		SMJD-3606036B-XXN1 00B33C038AII			

### Product Selection: SMJD-3611060B-XXN1 $I_F = 325\text{mA}$ , $T_c = 25^\circ\text{C}$

CCT	CRI	Flux		Dimension	Order Code
		Min.	Typ.		
3000	80	1980	2130	560*20	SMJD-3611060B-XXN1 00C13G038AII
3500			2060		SMJD-3611060B-XXN1 00C13F038AII
4000		2210	SMJD-3611060B-XXN1 00C21E038AII		
5000		SMJD-3611060B-XXN1 00C21C038AII			

### Product Selection: SMJD-3622120B-XXN1 $I_F = 650\text{mA}$ , $T_c = 25^\circ\text{C}$

CCT	CRI	Flux		Dimension	Order Code
		Min.	Typ.		
3000	80	3960	4260	1120*20	SMJD-3622120B-XXN1 00E26G038AII
3500			4110		SMJD-3622120B-XXN1 00E26F038AII
4000		4420	SMJD-3622120B-XXN1 00E42E038AII		
5000		SMJD-3622120B-XXN1 00E42C038AII			

**Electro Optical Characteristics: SMJD-3606036B-XXN1  $I_F = 195\text{mA}$ ,  $T_c = 25^\circ\text{C}$** 

Parameter	Symbol	Value			Unit	Remark
		Min.	Typ.	Max.		
Luminous Flux	$\Phi_V$ [2]	1190	1280	-	lm	F,G
		1240	1330	-		C,E
Correlated Color Temperature [3]	CCT	4745	5028	5311	K	C
		3710	3985	4260		E
		3200	3500	3700		F
		2870	3045	3220		G
CRI	Ra	80	-	-	-	-
Input Voltage	$V_F$	32.4	33.6	34.8	$V_{DC}$	@195mA
Power Consumption	P	6.3	6.6	6.8	W	
Efficiency	LPW	-	195	-	Lm/W	F,G
		-	202	-		C,E

**Electro Optical Characteristics: SMJD-3611060B-XXN1  $I_F = 325\text{mA}$ ,  $T_c = 25^\circ\text{C}$** 

Parameter	Symbol	Value			Unit	Remark
		Min.	Typ.	Max.		
Luminous Flux	$\Phi_V$ [2]	1980	2130	-	lm	F,G
		2060	2210	-		C,E
Correlated Color Temperature [3]	CCT	4745	5028	5311	K	C
		3710	3985	4260		E
		3200	3500	3700		F
		2870	3045	3220		G
CRI	Ra	80	-	-	-	-
Input Voltage	$V_F$	32.4	33.6	34.8	$V_{DC}$	@325mA
Power Consumption	P	10.5	10.9	11.3	W	
Efficiency	LPW	-	195	-	Lm/W	F,G
		-	202	-		C,E

**Notes:**

[1] Above data tested with constant typical current at  $T_c = 25^\circ\text{C}$ .

[2]  $\Phi_V$  is the total luminous flux output measured with an integrated sphere.

[3] Correlated Color Temperature is derived from the CIE 1931 Chromaticity diagram.

[4] To use the module properly, recommend to drive the module by a Constant Current Source (CCS). But the Maximum output voltage of the CCS should be limited by referring this sheet.

**Electro Optical Characteristics: SMJD-3622120B-XXN1  $I_F=650\text{mA}$ ,  $T_c=25^\circ\text{C}$** 

Parameter	Symbol	Value			Unit	Remark
		Min.	Typ.	Max.		
Luminous Flux	$\Phi_v$ [2]	3960	4260	-	lm	F,G
		4160	4420	-		C,E
Correlated Color Temperature [3]	CCT	4745	5028	5311	K	C
		3710	3985	4260		E
		3200	3500	3700		F
		2870	3045	3220		G
CRI	Ra	80	-	-	-	-
Input Voltage	$V_F$	32.4	33.6	34.8	$V_{DC}$	@650mA
Power Consumption	P	21.1	21.8	22.6	W	
Efficiency	LPW	-	195	-	Lm/W	F,G
		-	202	-		C,E

**Absolute Maximum Operating Specification:  $T_c=25^\circ\text{C}$** 

Model	Parameter	Symbol	Unit	Value	Remark
SMJD-3606036B-XXN1	Power Consumption	P	W	14.5	
	Forward Voltage	$V_F$	V	37.1	
	Driving Current [2]	$I_F$	mA	390	
SMJD-3611060B-XXN1	Power Consumption	P	W	24.1	
	Forward Voltage	$V_F$	V	37.1	
	Driving Current [2]	$I_F$	mA	650	
SMJD-3622120B-XXN1	Power Consumption	P	W	48.2	
	Forward Voltage	$V_F$	V	37.1	
	Driving Current [2]	$I_F$	mA	1300	
All	Operating Temperature [3]	$T_c$	$^\circ\text{C}$	-40 ~ 100	Reference point
	Storage Temperature	$T_{ctg}$	$^\circ\text{C}$		With no power
All	Thermal resistance ( $T_c$ to base)	$R_{th(Tc-base)}$	$^\circ\text{C}/\text{W}$	0.3	
	ESD Sensitivity	-	KV	±8	IEC Air
±4				HBM	

**Notes:**

[1] Above data tested with constant typical current at  $T_c = 25^\circ\text{C}$ .

[2]  $\Phi_v$  is the total luminous flux output measured with an integrated sphere.

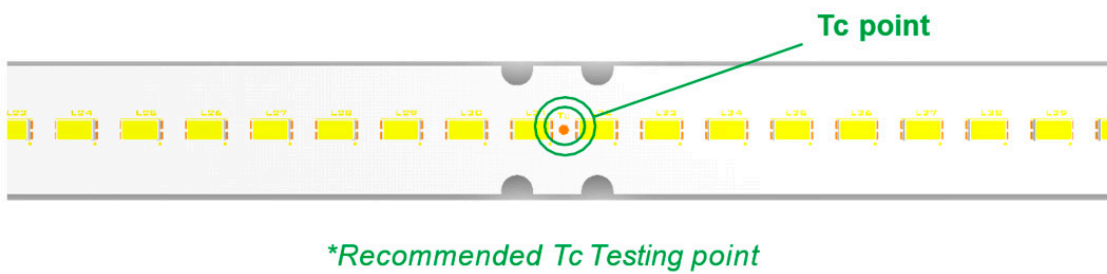
[3] Correlated Color Temperature is derived from the CIE 1931 Chromaticity diagram.

[4] To use the module properly, recommend to drive the module by a Constant Current Source (CCS). But the Maximum output voltage of the CCS should be limited by referring this sheet.

**Notes:**

\*Colors fully compliant with the CIE requested color temperatures on the following table:

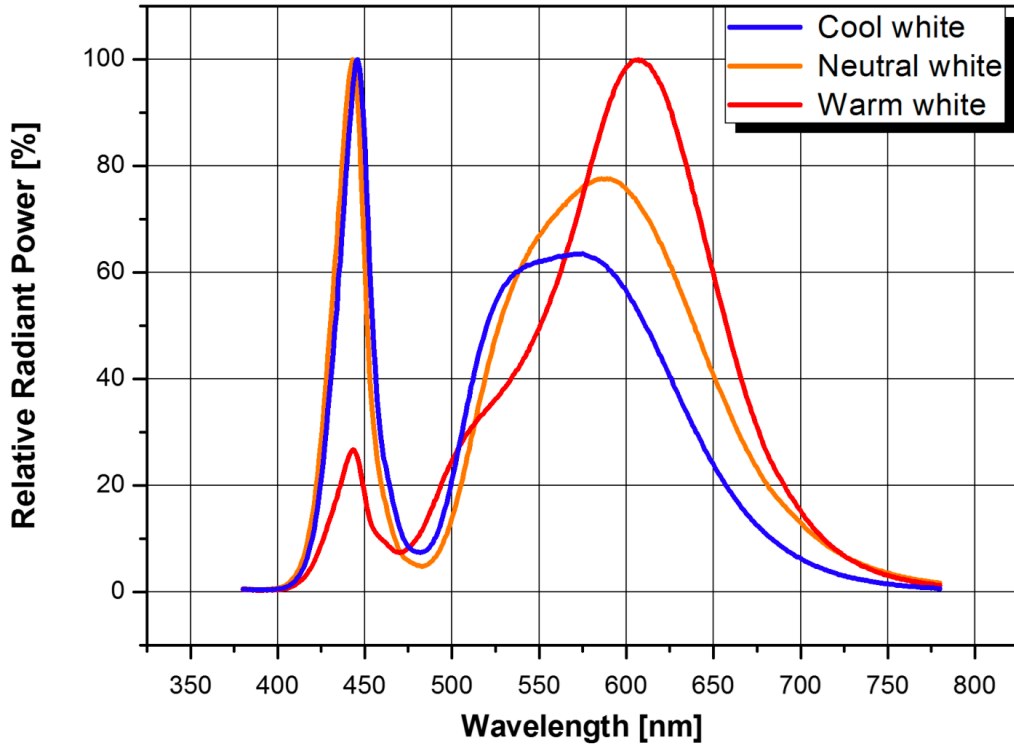
Correlated Color Temperature	Nominal CCT	CCT (K)
C	5000 K	5028 ± 283
E	4000 K	3985 ± 275
F	3500 K	3465 ± 245
G	3000 K	3045 ± 175

**Illustration: How to predict components temperature**

**Notes:**

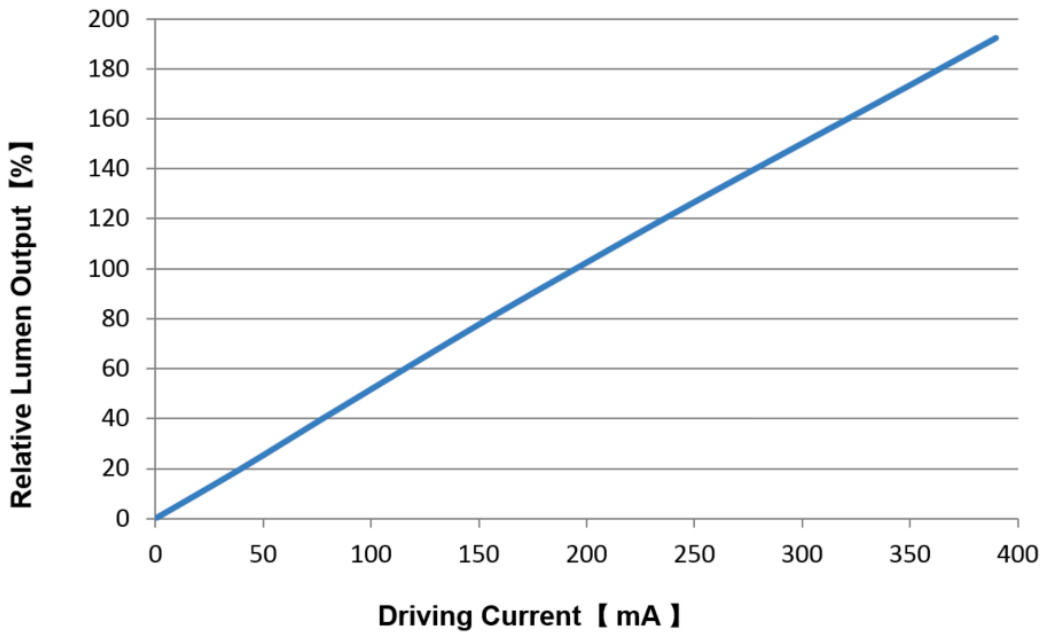
- [1] All guarantee are based on the Absolute Maximum Ratings listed.
- [2] Please use a Constant Current Source (CCS) to drive the module, the typical  $V_F$  of module is 33.6 VDC and  $V_{F\_MAX}$  is 34.8 VDC, respectively.
- [3] Operating temperature was tested at the assigned  $T_c$  point on the PCB.
- [4] To ensure the module works properly,  $T_c$  should refer to "Absolute Maximum Operating Specification".

## Relative Spectral Distribution

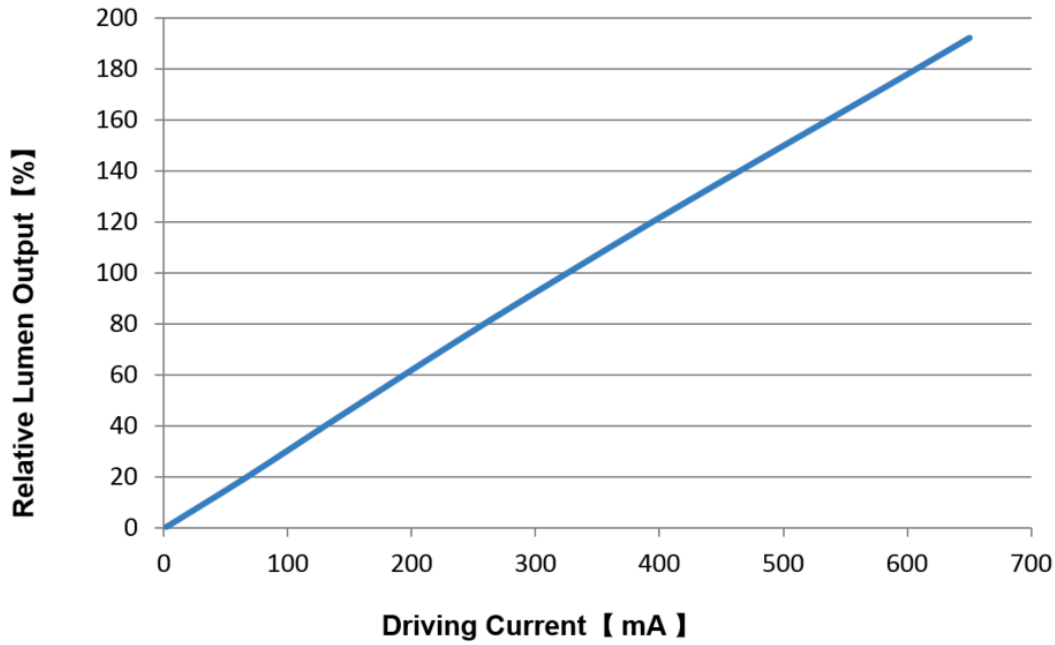
- Relative Spectral Distribution vs. Wavelength



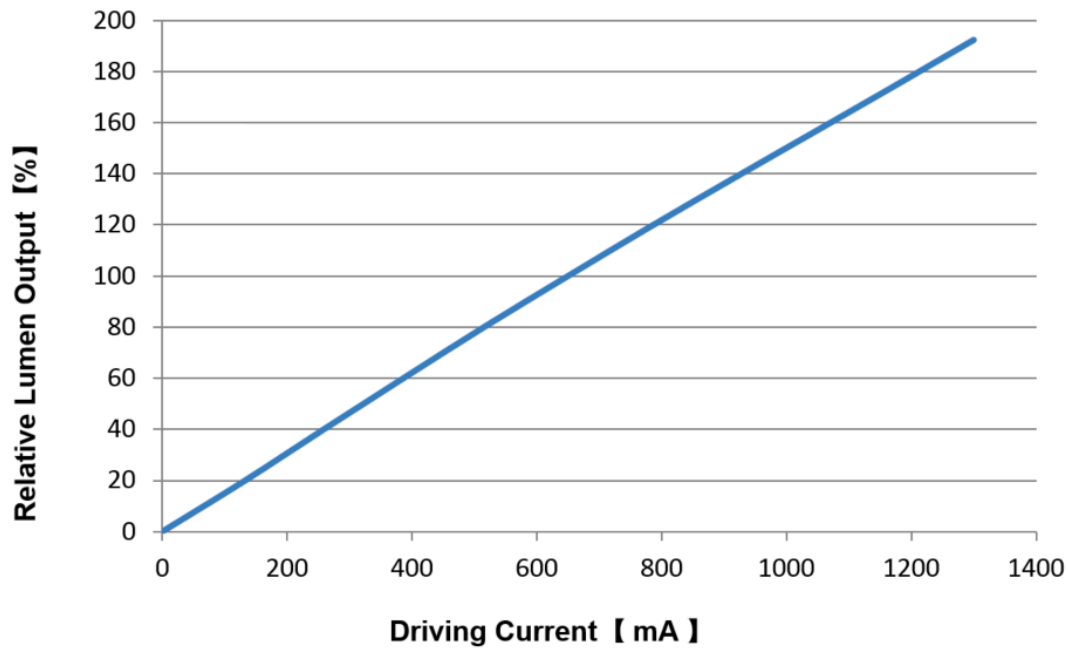
Scale ratio curve for related lumen output VS driving current,  $T_c = 25^\circ\text{C}$   
**SMJD-3606036B-XXN1**



Scale ratio curve for related lumen output VS driving current,  $T_c = 25^\circ\text{C}$   
**SMJD-3611060B-XXN1**

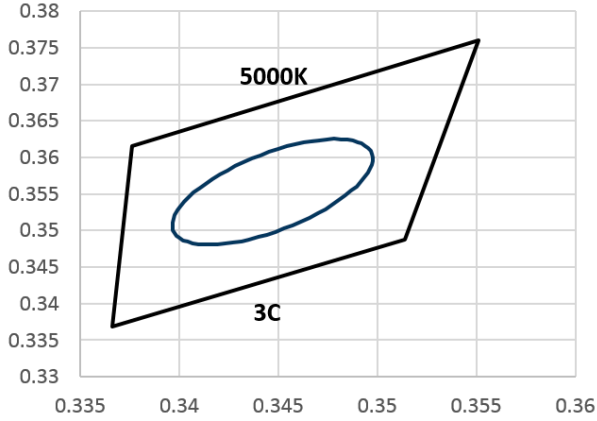


Scale ratio curve for related lumen output VS driving current,  $T_c = 25^\circ\text{C}$   
**SMJD-3622120B-XXN1**



### Color Bin Structure

CIE Chromaticity Diagram (Cool white),  $T_c=25^\circ\text{C}$

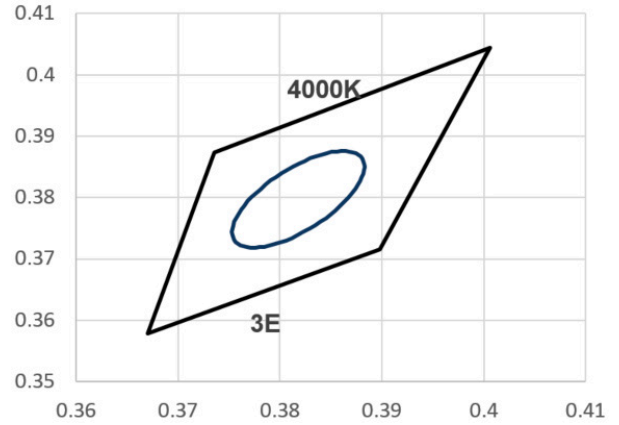


5000K 3 Step Ellipse

3C				
x	y	a	b	theta
0.3447	0.3553	0.0081	0.0035	60

x	y	a	b	theta
0.3447	0.3553	0.0081	0.0035	60

CIE Chromaticity Diagram (Nature white),  $T_c=25^\circ\text{C}$

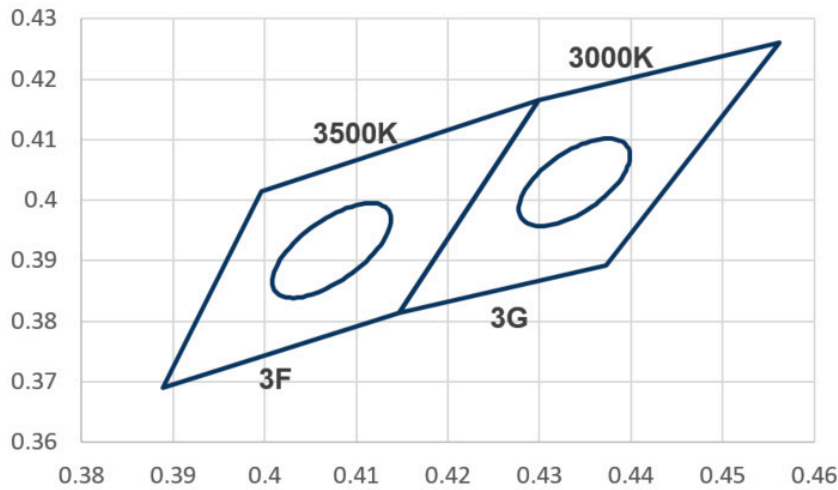


4000K 3 Step Ellipse

3E				
x	y	a	b	theta
0.3818	0.3797	0.0094	0.004	53

x	y	a	b	theta
0.3818	0.3797	0.0094	0.004	53

CIE Chromaticity Diagram (Warm white),  $T_c=25^\circ\text{C}$



3500K 3 Step Ellipse

3F				
x	y	a	b	theta
0.4073	0.3917	0.0093	0.0041	53

x	y	a	b	theta
0.4073	0.3917	0.0093	0.0041	53

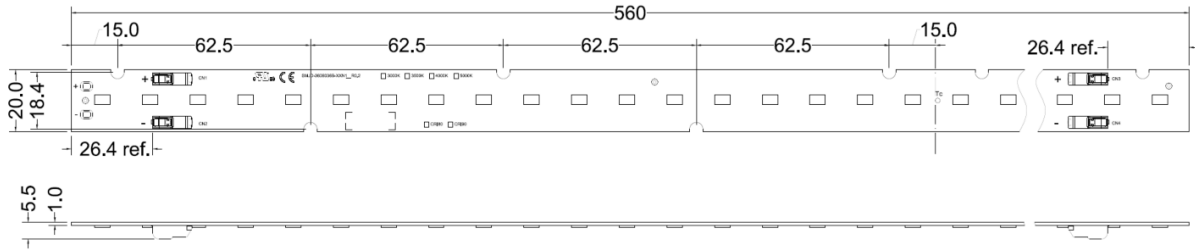
3000K 3 Step Ellipse

3G				
x	y	a	b	theta
0.4338	0.4030	0.0085	0.0041	53

x	y	a	b	theta
0.4338	0.4030	0.0085	0.0041	53

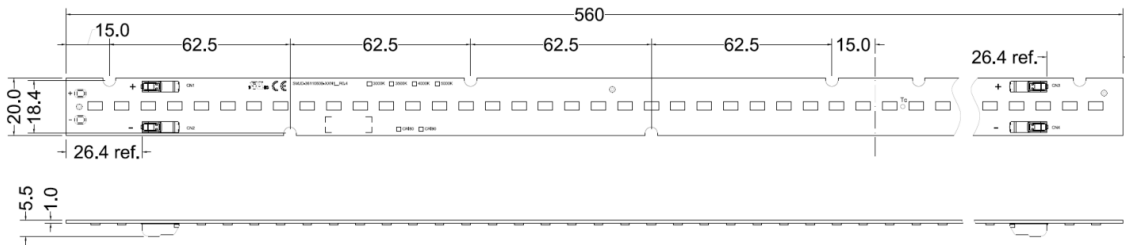
## Mechanical Dimensions

### SMJD-3606036B-XXN1



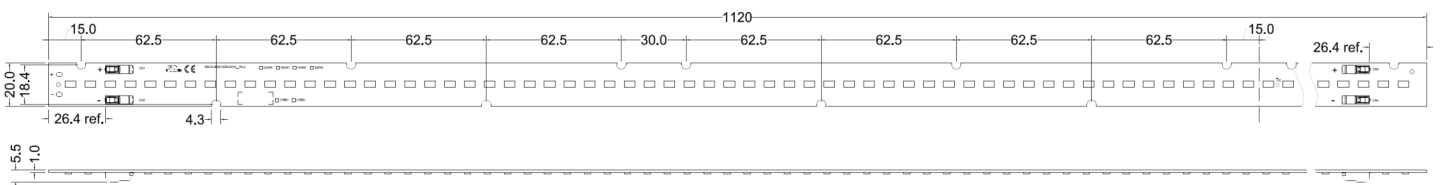
Dimension	Specification	Tolerance	Unit
Module Length	560	±0.5	mm
Module Width	20	±0.3	
Module Height	5.5	±0.3	
PCB Thickness	1.0	±0.1	

### SMJD-3611060B-XXN1



Dimension	Specification	Tolerance	Unit
Module Length	560	±0.5	mm
Module Width	20	±0.3	
Module Height	5.5	±0.3	
PCB Thickness	1.0	±0.1	

### SMJD-3622120B-XXN1



Dimension	Specification	Tolerance	Unit
Module Length	1120	±0.6	mm
Module Width	20	±0.3	
Module Height	5.5	±0.3	
PCB Thickness	1.0	±0.1	



## Product Nomenclature:

\*Please refer to the following chart

**S M J D - 36 11 060 B - XX N 1**

Seoul DC Module      **(A)**   **(B)**   **(C)**   **(D)**   **(E)**   **(F)**   **(G)**

Voltage		Power		LED Qty			Type	Custom	Dimming	Etc
3	6	1	1	0	6	0	B	XX	N	1
0 0V	0 0V	0 0W	0 0W	0 0ea	0 0ea	0 0ea	B 5630D	XX ref	N Norm	1 vers
1 10V	1 1V	1 10W	1 1W	1 100ea	1 10ea	1 1ea			D Dim	
2 20V	2 2V	2 20W	2 2W	2 200ea	2 20ea	2 2ea			E etc	
3 30V	3 3V	3 30W	3 3W	3 300ea	3 30ea	3 3ea				
-	-	-	-	-	-	-				
9 90V	9 9V	9 90W	9 9W	9 900ea	9 90ea	9 9ea				
A 100V		A 100W		A 1000ea						
B 110V		B 110W		B 1100ea						
-		-		-						
Z 350V		Z 350W		Z 3500ea						

## Product Nomenclature: Binning

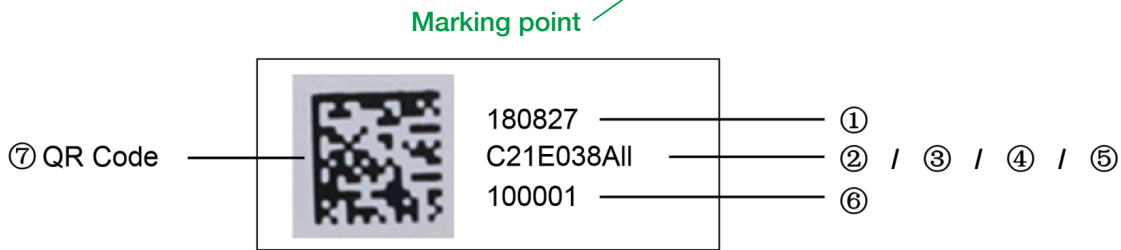
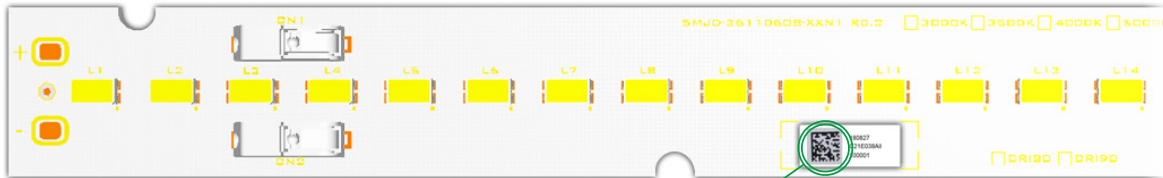
\*Please refer to the following chart

**00 C21 E03 8 ALL**

**(A)**   **(B)**   **(C)**   **(D)**   **(E)**

Lens Type	Flux Bin	CCT Bin	CRI Bin	VF Bin
00	C21	E03	8	ALL
00 No Lens	C21 2210 lm	G03 3000k - 3 step	8 CRI 80	All 32.4 ~ 34.8V <sub>DC</sub>
		F03 3500k - 3 step		
		E03 4000k - 3 step		
		C03 5000k - 3 step		

## Marking Information



No.	Item	Information	Digits	Remark
①	Date	YYMMDD	6 Digit	SMT date
②	Flux <sup>(1)</sup>	C21	3 Digit	C21=2210lm
③	CCT	X03   3-step Mixing	3 Digit	X=C,E,F,G
④	CRI	8	1 Digit	CRI=80
⑤	V <sub>F</sub>	All	3 Digit	
⑥	Lot No.	1	1 Digit	0~9,A~Z
	Sequence No.	00001	5 Digit	00001 ~ 99999
⑦	QR Code	QR Code	-	Please refer to below table

**Note:**

\*Flux Bin - please refer to following chart for definitions:

### Flux Bin Definitions

Symbol	lm	Symbol	lm	Symbol	lm	Symbol	lm
A50	500	D50	3500	G50	6500	J50	9500
B50	1500	E50	4500	H50	7500	K20	10200
C50	2500	F50	5500	I50	8500	L00	11000

## Module QR Code Information

QR Code Information								
Items	Factory	SAP Code	SMT Date	MP Information	Line No.	Lot No.	Product	Note
Digits	1 Digit	7 Digits	6 Digits	10 Digits	1 Digit	1 Digit	5 Digits	Total count is 31 Digits
Information	*	*****	YYMMDD	C21E038ALL	1~9, A~Z	1~9, A~Z	00001	

**Notes:**

- [1] The QR code information is comprised of characters explained in the table above.
- [2] The size of the QR code shall be no smaller than 4.5mm x 4.5mm and have a minimum QR code grade of 'C'.  
Please note that QR code grade 'A' is preferred.
- [3] If the component is too small to have a full label, the QR code may be printed on a label with a minimum size of 6mm X 6mm.
- [4] The length of the QR code is 31 digits and includes all characters combined without spaces.  
Example: \*\*\*\*\*180827C21E038ALL1100001

## Label Information

Model No.	SMJD-3611060B-XXN1 <sup>[1]</sup> 
Rank	C21E038ALL <sup>[2]</sup> 
Type	Standard
Quantity	XXX 
Lot No.	YYMDDXXXX- XXXXXXX <sup>[3]</sup> 
	SEOUL SEMICONDUCTOR CO.,LTD.

**Notes:**

- [1] & [2] Please refer to page 9
- [3] Initial of manufacture is refer to the 2D code rule.  
YYMDD : Packing Date (Oct. : A, Nov. : B, Dec. : C)  
**X** = Initial of Manufacturer  
**XXXX** = Sealing Pack No.  
**XXXXXXX** = SSC Code
- [4] It is attached to the top left corner of the carton box

<b>TOTAL Quantity</b>  <b>XX</b>
<b>SEOUL SEMICONDUCTOR CO.,LTD.</b>

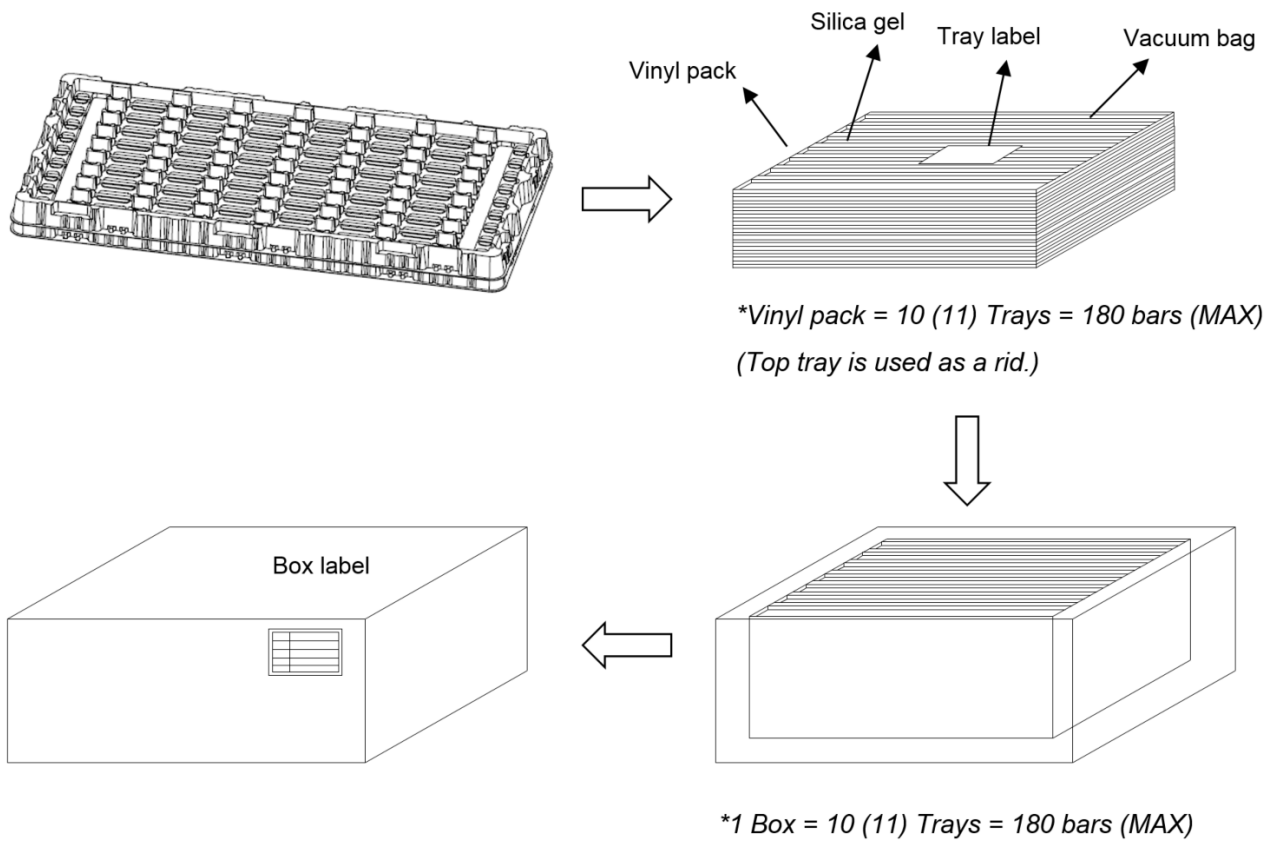
**Notes:**

- [1] Attached to the bottom right corner of the carton box.

## Packaging Specification

*\*Packaging specification subject to change*

Model	Tray		Box		Pallet	
	Size (mm)	Q'ty per tray	Size (mm)	Q'ty per box	Size (mm)	Q'ty per pallet
SMJD-3606036B-XXN1	610*300*30	18	625*315*215	180	1000*1000	3600
SMJD-3611060B-XXN1						
SMJD-3622120B-XXN1	1230*285*30	16	1245*300*133	80	1300*1100	1920



**Storage before use**

1. When storing devices for a long period of time before usage, please following these guidelines.
  - *The devices should be stored in the anti-static bag that it was shipped in from Seoul-Semiconductor with opening*
  - *If the anti-static bag has been opened, re-seal preventing air and moisture from being present in the bag.*

**SEOUL SEMICONDUCTOR****Company Information**

Seoul Semiconductor (SeoulSemicon.com) manufactures and packages a wide selection of light emitting diodes (LEDs) for the automotive, general illumination/lighting, appliance, signage and back lighting markets. The company is the world's fifth largest LED supplier, holding more than 10,000 patents globally, while offering a wide range of LED technology and production capacity in areas such as "nPola", deep UV LEDs, "Acrich", the world's first commercially produced AC LED, and "Acrich MJT - Multi-Junction Technology", a proprietary family of high-voltage LEDs. The company's broad product portfolio includes a wide array of package and device choices such as Acrich, high-brightness LEDs, mid-power LEDs, side-view LEDs, through-hole type LED lamps, custom displays, and sensors. The company is vertically integrated from epitaxial growth and chip manufacture in its fully owned subsidiary, Seoul Viosys, through packaged LEDs and LED modules in three Seoul Semiconductor manufacturing facilities. Seoul Viosys also manufactures a wide range of unique deep-UV wavelength devices.

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