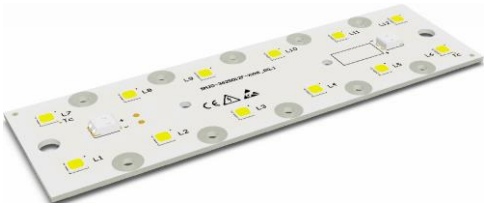
DC Type

SMJD-3625012F-XXN1



LM-80 CE RoHS

Product Brief

Description

- This Customized module is based on White Colored surface-mount LED comes in standard package dimension. Package Size : 5.0x5.0x0.70mm
- The package design coupled with careful sele ction of component materials allow these pro ducts to perform with high reliability .

Features and Benefits

- High Intensity output and high luminance
- High Efficacy
- Compatible with 3rd party optics
- Lead free product
- RoHS compliant

Key Applications

- Street Lighting
- Area Lighting
- Residential Lighting
- Urban Lighting

Table 1. Order Code

Nominal CCT (K)	CRI	Lens Type	Order Code
6500	70	No lens	SMJD-3625012F-XXN100E40A057ALL
5700		No lens	SMJD-3625012F-XXN100E40B057ALL
5000		No lens	SMJD-3625012F-XXN100E56C057ALL
4000		No lens	SMJD-3625012F-XXN100E56E057ALL
3000		No lens	SMJD-3625012F-XXN100E40G057ALL
2700		No lens	SMJD-3625012F-XXN100E02H057ALL
2200		No lens	SMJD-3625012F-XXN100D43K057ALL
6500	80	No lens	SMJD-3625012F-XXN100E40A058ALL
5700		No lens	SMJD-3625012F-XXN100E40B058ALL
5000		No lens	SMJD-3625012F-XXN100E40C058ALL
4000		No lens	SMJD-3625012F-XXN100E40E058ALL
3000		No lens	SMJD-3625012F-XXN100E02G058ALL
2700		No lens	SMJD-3625012F-XXN100E02K058ALL

Table 2. Life Time Against Tc Temperature

Product	Current	Tc(˚C)	Time Standard (hrs)	L70B10 Calculated (hrs)
SMJD-3625012F-XXN1	800mA/per chip	85C	9,000	>100,000

Table of Contents

Performance Characteristics

Table 3-1. Electro Optical Characteristics T_C = 25°C, I_F = 0.7A

Parameter	Symbol	Value			Unit	Mark	Mark 2
		Min.	Typ.	Max.			
Luminous Flux	Φ_V [2]	4090	4400	-	lm	A, B, G rank	CRI70
		4240	4560	-		C,E rank	
		3740	4020	-		H rank	
		3190	3430	-		K rank	
		4090	4400	-		A,B,C,E rank	CRI80
		3740	4020	-		G,H rank	
Luminous Efficiency	LPW	-	175	-	Lm/W	A, B, G rank	CRI70
			181			C,E rank	
			160			H rank	
			136			K rank	
		-	175	-		A,B,C,E rank	CRI80
		-	160	-		G,H rank	
Correlated Color Temperature [3]	CCT	6000	6500	7000	K	A05	
		5300	5700	6000		B05	
		4700	5000	5300		C05	
		3700	4000	4200		E05	
		2900	3000	3200		G05	
		2600	2700	2900		H05	
		2100	2200	2300		K05	
CRI	Ra	70	-	-	-		CRI70
		80	-	-	-		CRI80
Color Consistency	-	-	-	5	SDCM		
Input Voltage [4]	V_{in}	34	36	39	Vdc		
Input Current	I_F	-	0.7	-	A		
Power	P		25.2		W		
Viewing Angle	$2\Theta_{1/2}$		120		deg.		

Performance Characteristics

Table 3-2. Electro Optical Characteristics T_C= 85°C, I_F = 0.7A

Parameter	Symbol	Value			Unit	Mark	Mark 2
		Min.	Typ.	Max.			
Luminous Flux	Φ_V [2]	3680	3960	-	lm	A, B, G rank	CRI70
		3810	4100	-		C,E rank	
		3370	3620	-		H rank	
		2870	3080	-		K rank	
		3680	3960	-		A,B,C,E rank	CRI80
		3370	3620	-		G,H rank	
Input Voltage	V_{in}	32	34	36	Vdc		
Power	P		23.8		W		

Notes :

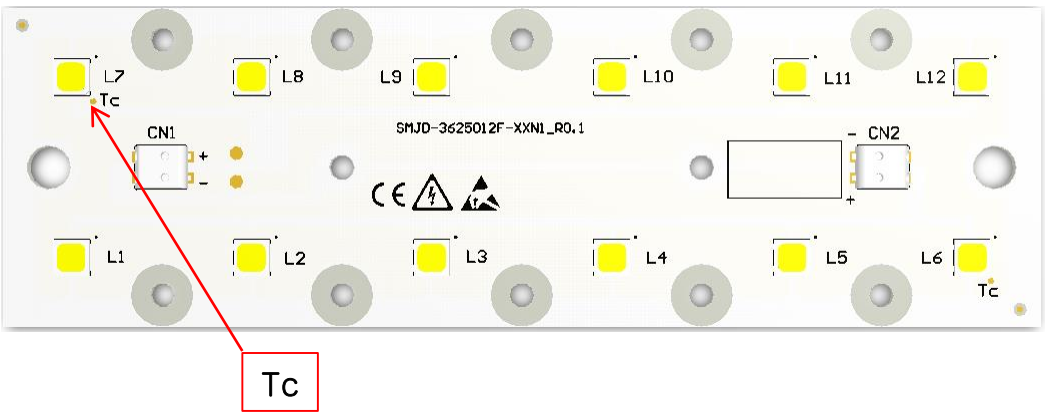
1. The above data were tested at Tc= 25/85ºC.
2. ΦV is the total luminous flux output measured with an integrated sphere.
3. Correlated Color Temperature is derived from the CIE 1931 Chromaticity diagram.
4. To use the module properly, recommend to drive the module by a Constant Current Source (CCS). But the Maximum output voltage of the CCS should be limited by referring this sheet

Absolute Maximum Ratings

Table4. Absolute Maximum Ratings, T_c= 25ºC

Parameter	Symbol	Unit	Value	Remark
Power Consumption	P	W	50.4	$P_{\_Typ.}$= 25.2W
Driving Current(2)	I_F	A	1.4	$I_{F\_Typ.}$ = 0.7A
Operating Temperature(3)	T_c	ºC	- 40 ~ 85	Reference point
Storage Temperature	T_{stg}	ºC	- 40 ~ 100	With no power
ESD Sensitivity	-	KV	±4	Class 2 JESD22-A114-E

ILLUSTRATION 1: How to predict components temperature (4)



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 around 36VDC and V_{F_MAX} is around 39VDC, respectively.

(3) Operating temperature was tested at the assigned Tc point on the PCB.

(4) To ensure the module works properly, DO NOT let the Tc upper than 85 ºC;

Characteristic Graph

Fig 1. Relative Spectral Distribution vs. Wavelength Characteristic

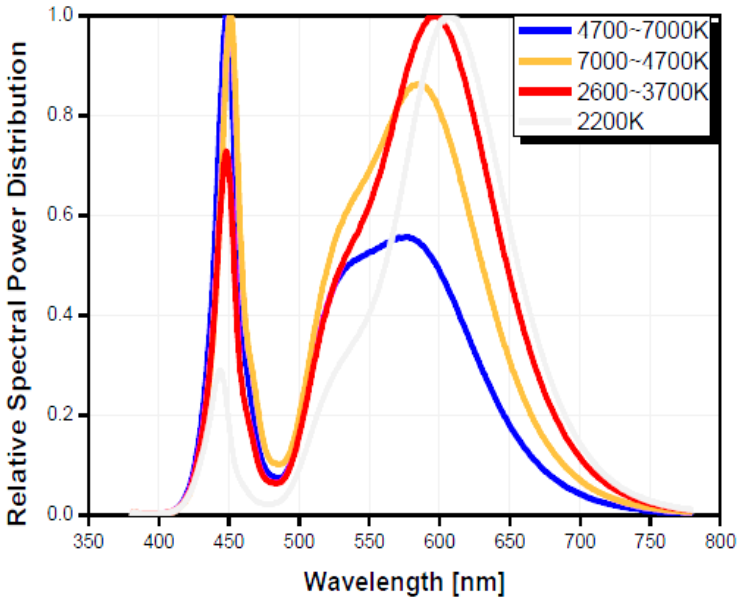
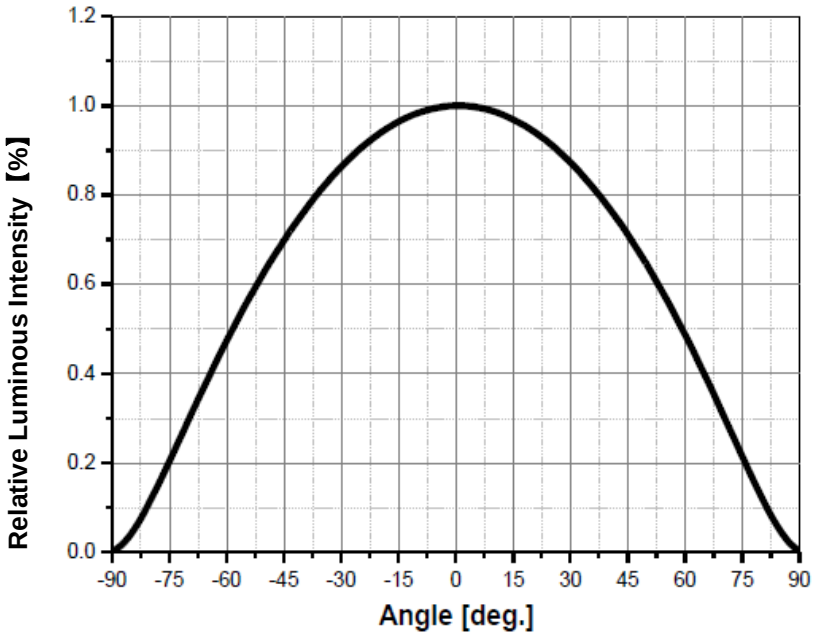


Fig 2. Typical Spatial Distribution



Angular Displacement【degrees】

Characteristic Graph

Fig 3. Flux and Efficacy vs. T_C Temperature (at I_F=700mA)

T_C [ºC]	Flux[%]	Efficacy[%]
25	100	100
45	97	98
65	94	95
85	90	92

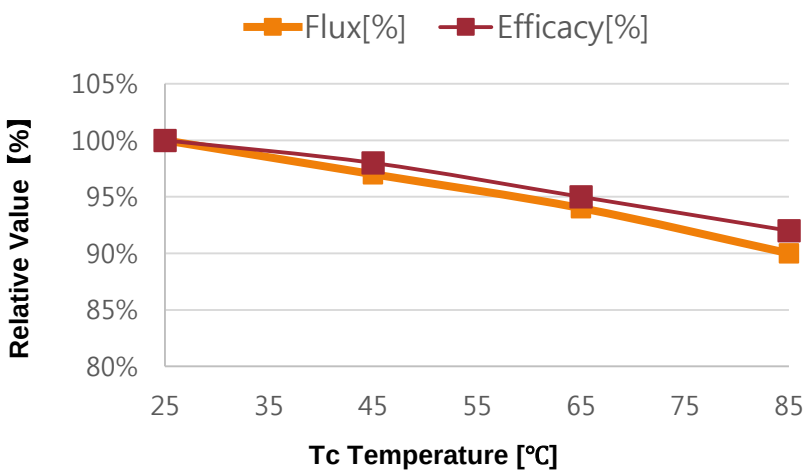
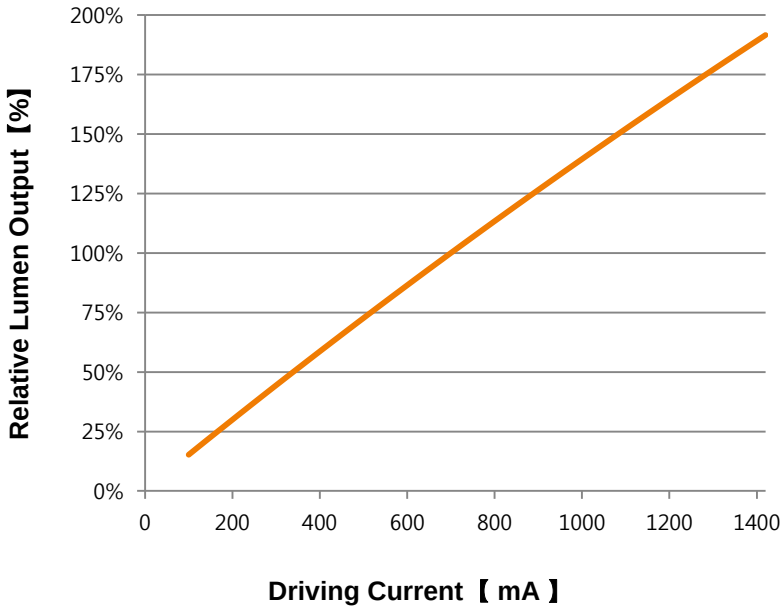
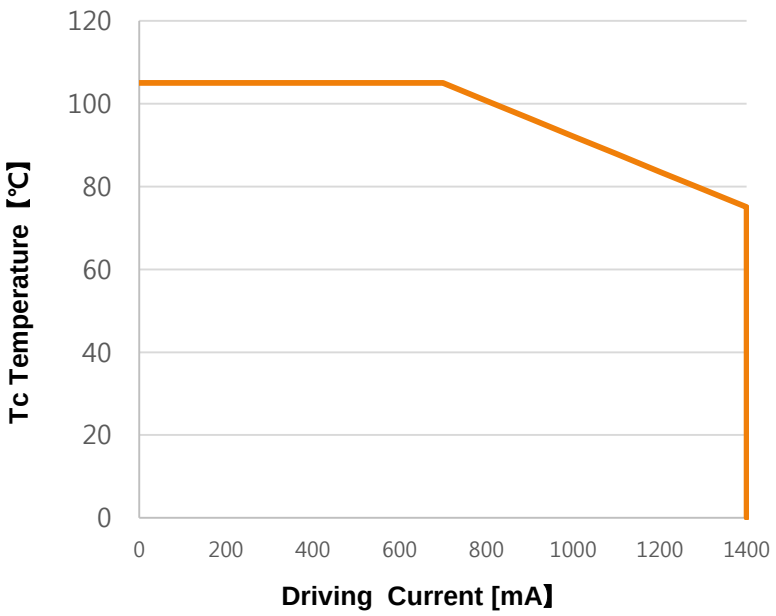


Fig 4. Forward Current vs. Relative Luminous Flux, Tc=25℃



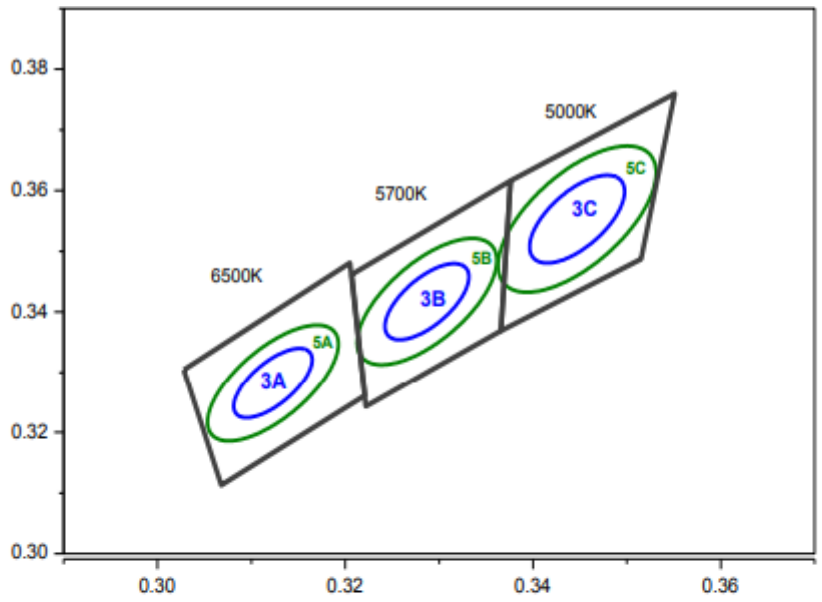
Characteristic Graph

Fig 5. Derating Curve-Tc temperature vs. Driving Current



Color Bin Structure

Fig 6. CIE Chromaticity Diagram

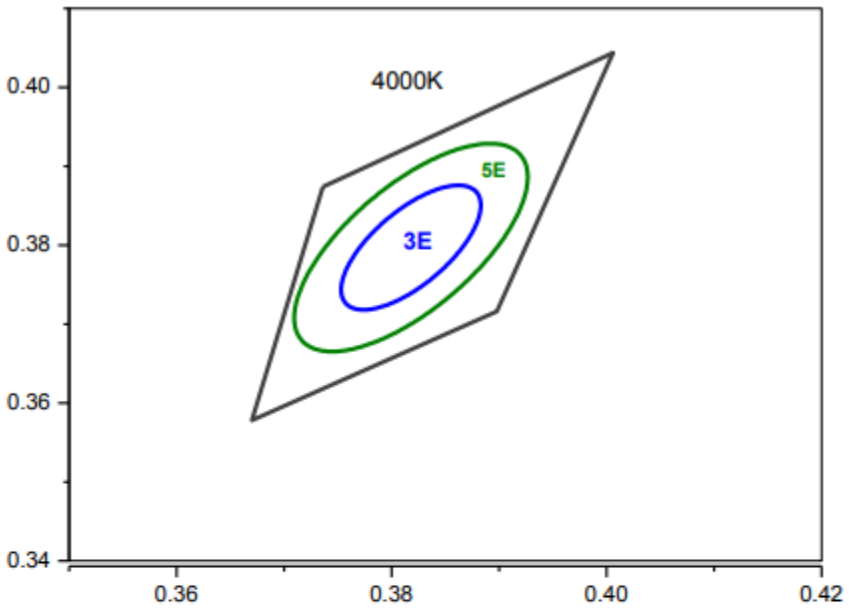


6500K 3Step		5700K 3Step		5000K 3Step	
3A		3B		3C	
Center point	0.3123 : 0.3282	Center point	0.3287 : 0.3417	Center point	0.3447 : 0.3553
Major Axis a	0.0066	Major Axis a	0.0071	Major Axis a	0.0081
Minor Axis b	0.0027	Minor Axis b	0.003	Minor Axis b	0.0035
Ellipse Rotation Angle	58	Ellipse Rotation Angle	59	Ellipse Rotation Angle	60

6500K 5Step		5700K 5Step		5000K 5Step	
5A		5B		5C	
Center point	0.3123 : 0.3282	Center point	0.3287 : 0.3417	Center point	0.3447 : 0.3553
Major Axis a	0.0110	Major Axis a	0.0118	Major Axis a	0.0135
Minor Axis b	0.0045	Minor Axis b	0.0050	Minor Axis b	0.0058
Ellipse Rotation Angle	58	Ellipse Rotation Angle	59	Ellipse Rotation Angle	60

Color Bin Structure

Fig 7. CIE Chromaticity Diagram



4000K 3Step

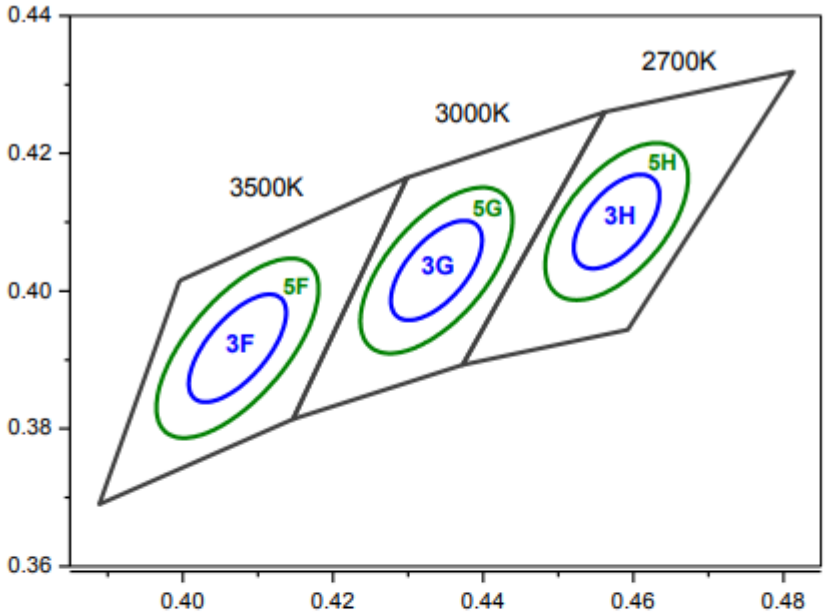
3E	
Center point	0.3818 : 0.3797
Major Axis a	0.00940
Minor Axis b	0.00400
Ellipse Rotation Angle	53

4000K 5Step

5E	
Center point	0.3818 : 0.3797
Major Axis a	0.0157
Minor Axis b	0.0067
Ellipse Rotation Angle	53

Color Bin Structure

Fig 8. CIE Chromaticity Diagram

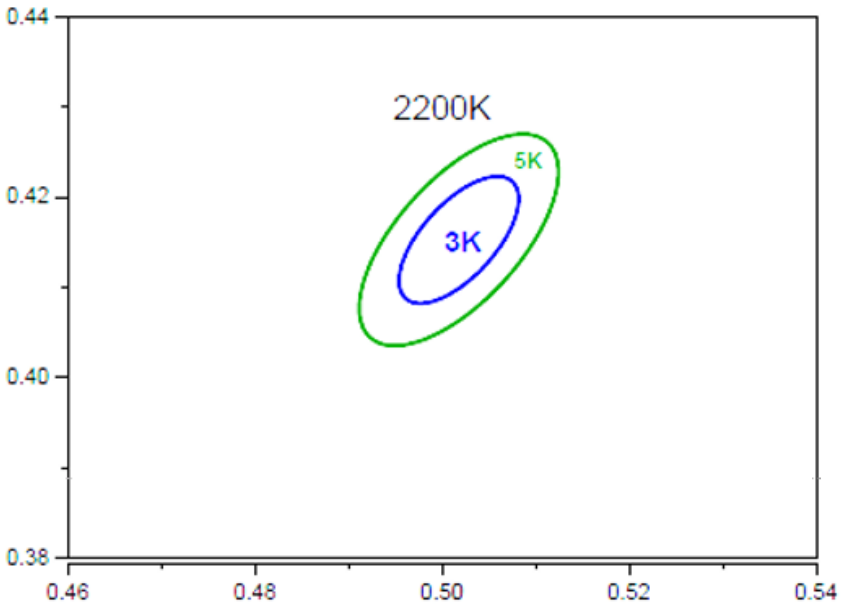


3500K 3Step		3000K 3Step		2700K 3Step	
3F		3G		3H	
Center point	0.4073 : 0.3917	Center point	0.4338 : 0.4030	Center point	0.4578 : 0.4101
Major Axis a	0.0093	Major Axis a	0.0085	Major Axis a	0.0079
Minor Axis b	0.0041	Minor Axis b	0.0041	Minor Axis b	0.0041
Ellipse Rotation Angle	53	Ellipse Rotation Angle	53	Ellipse Rotation Angle	54

3500K 5Step		3000K 5Step		2700K 5Step	
5F		5G		5H	
Center point	0.4073 : 0.3917	Center point	0.4338 : 0.4030	Center point	0.4578 : 0.4101
Major Axis a	0.0155	Major Axis a	0.0142	Major Axis a	0.0132
Minor Axis b	0.0068	Minor Axis b	0.0068	Minor Axis b	0.0068
Ellipse Rotation Angle	53	Ellipse Rotation Angle	53	Ellipse Rotation Angle	54

Color Bin Structure

Fig 9. CIE Chromaticity Diagram



2200K 3Step

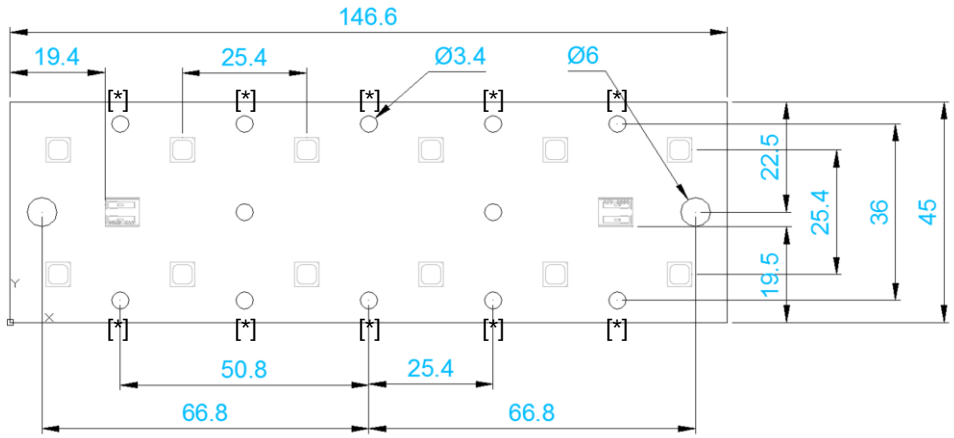
3K	
Center point	0.5018 : 0.4153
Major Axis a	0.00863
Minor Axis b	0.00398
Ellipse Rotation Angle	49

2200K 5Step

5K	
Center point	0.5018 : 0.4153
Major Axis a	0.01438
Minor Axis b	0.00663
Ellipse Rotation Angle	49

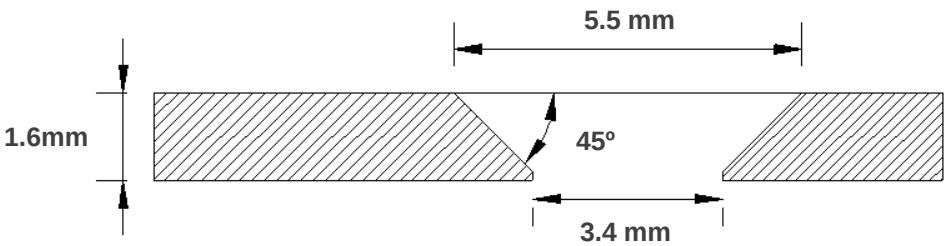
Mechanical Dimensions

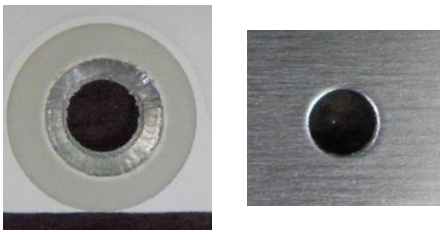
Fig 10. Mechanical Diagram



(1) All dimensions are in mm
(2) Not to Scale
(3) Module thickness 1.6 ± 0.1 mm
(4) [*] Marked Φ3.4 (10 holes /PCB) holes are working to countersunk

[*] Countersunk Hole



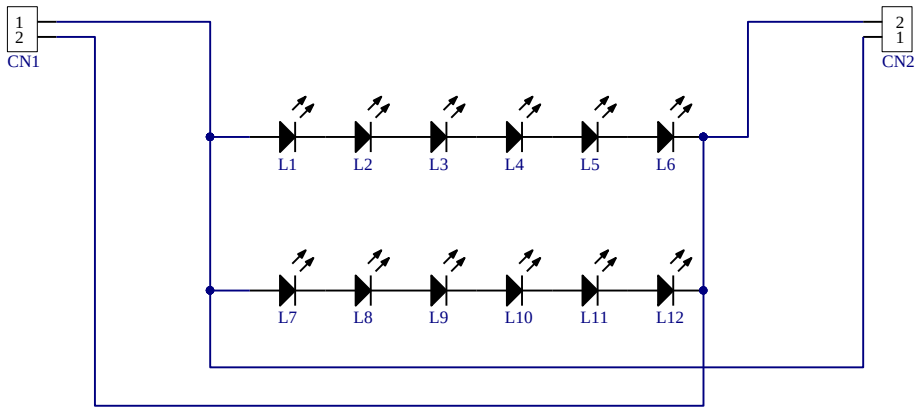


<Top view> <Bottom view>

(1) Working used Φ6 bit for reference
(2) Burr is not allowed
(3) Tolerance is ±0.1mm

Circuit Drawing

Fig 11. Schematic Diagram



Product Nomenclature

Product Name Rule:

S M J D - 36 25 012 F - XX N 1

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

① : SMJD – Seoul DC Module
② ~ ⑧ : Refer to below table

Voltage				Power				LED Qty.						LED Type		Customer (Free)		Lens			
②				③				④						⑤		⑥		⑦		⑧	
3		6		2		5		0		1		2		F		XX		N		1	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	F	5050	XX	Reference	N	Normal	1	Version
1	10V	1	1V	1	10W	1	1W	1	100EA	1	10EA	1	1EA					D	Dimming		
2	20V	2	2V	2	20W	2	2W	2	200EA	2	20EA	2	2EA								
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																
…	…			…	…																
Z	350V			Z	350W																

Comments Rule:

(00 WN 70)

A B C

Lens Type		CCT		CRI	
A		B		C	
00		WN		70	
00	No lens	W0	6500K	70	CRI70
			5700K	80	CRI80
			5000K		
		WN	4000K		
		WW	3000K		
			2700K		
			2200k		

Product Nomenclature

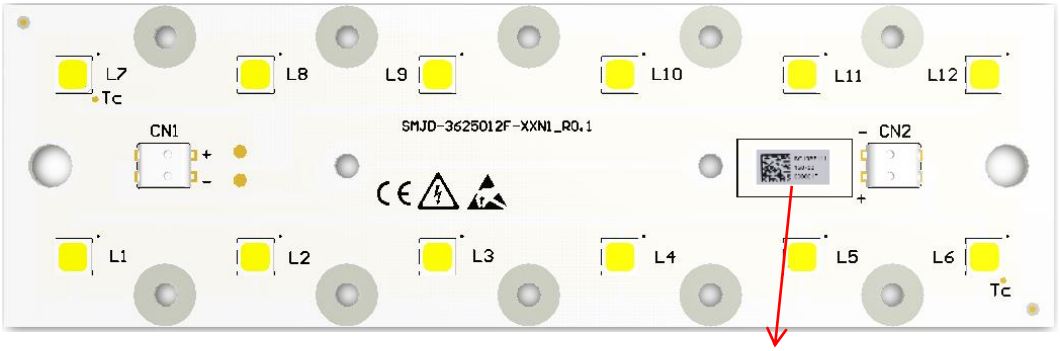
Characteristics Rule:

00	E56	E05	7	ALL
A	B	C	D	E

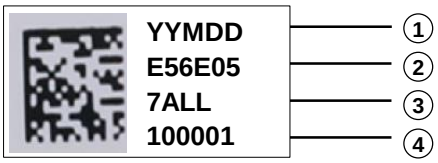
Lens type		Flux bin		CCT bin		CRI bin		VF Bin(1)	
A		B		C		D		E	
00		E56		E05		7		ALL	
00	No lens	E56	4560 lm	A05	6500K 5-step	7	CRI70	ALL	DC 34~39V
		E40	4400 lm	B05	5700K 5-step	8	CRI80		
		D43	3430 lm	C05	5000K 5-step				
		E02	4020 lm	E05	4000K 5-step				
				G05	3000K 5-step				
				H05	2700K 5-step				
				K05	2200K 5-step				

Marking Information

Fig 12. Marking Point



QR Code Information



	QR Code Information							
Items	Factory	SAP Code	SMT Date	Rank Information	Line No.	Lot No.	Product	Notes
Digits	1 Digit	7 Digit	5 Digit	10 Digit	1 Digit	1 Digit	5 Digit	In Total 30 Digits
Information	*	*******	YYMDD	E56E05 7ALL	1~9, A~Z	1~9, A~Z	00001	

Plain Code Information

No.	Item	Information		Digits	Remark
①	Date	YYMDD		5Digit	SMT date
②	Flux(1)	E56		3Digit	E56=4560lm
		E40			E40=4400lm
		E02			E02=4020lm
		D43			D43=3430lm
	CCT	X05	5-step	3Digit	X=A,B,C,E,H,G,K
③	CRI	7		1Dight	CRI=70
		8			CRI=80
	V_F	ALL		3Digit	
④	Lot No.	1		1 Digit	0~9,A~Z
	Sequence No.	00001		5 Digit	00001 ~ 99999

Part List

Table 5. Part List Table

No	Part	Specification	Q'ty
1	LED	STW0L8PA/STW8L8PA	12
2	MCPCB	Metal (Al), 146.6 x 45 x 1.6mm	1
3	CN 1, CN 2	Wago2059-302/998-403	2

Label Information

PO Number	**XXXXXX**
Supplier Part Number	**SMJD-3625012F-CSN100E56E057ALL(1)**
Bin Code	**E56E057ALL (2)**
Quantity	**XX**
Country of Origin	**XX (3)**
Date Code	**YYYYWW (4)**
Lot Code	**YYMDDXXXXX- XXXXXXX (5)**
SEOUL	**SEOUL SEMICONDUCTOR CO.,LTD.**

Notes

(1) Please refer to SPEC page 16-17 (30 digit code)
(2) Please refer to SPEC page 17
(3) Country of Origin: 2 digit code . For example : KR : Korea, CN : China, VN : Vietnam
(4) Date Code : YYYYWW : Packing Date: Year + Week
(5) Lot Code :
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 SAP Code
(6) It is attached to the top left corner of the box.

TOTAL Quantity

XXX

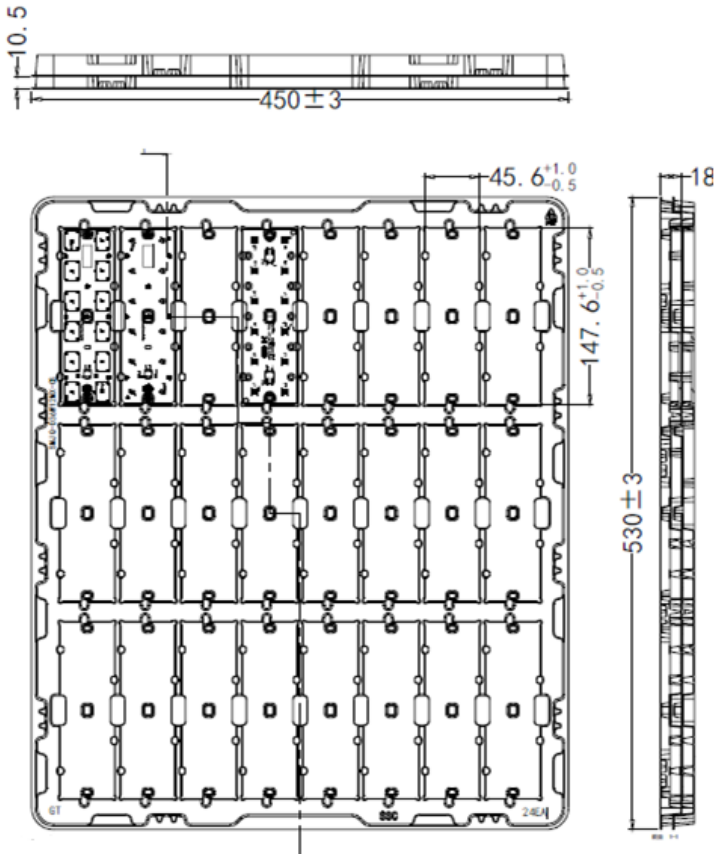
SEOUL **SEOUL SEMICONDUCTOR CO.,LTD.**

Notes

(1) It is attached to the bottom right corner of the box.

Packaging Specification

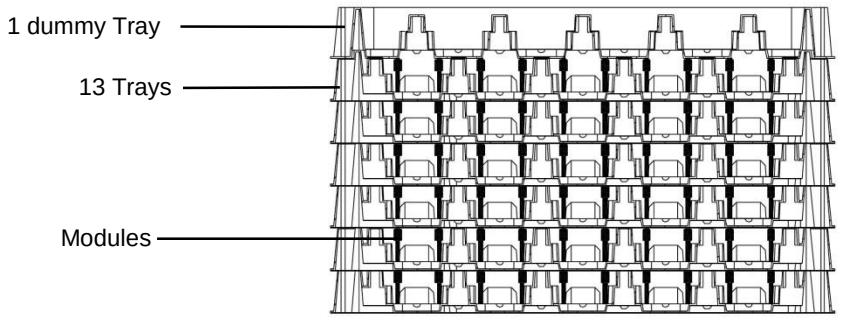
1. Tray information



Notes:

(1) Quantity : 24 pcs/Tray
(2) All dimensions are in millimeters (tolerance : ±0.3)
(3) Scale none

2. Tray stack and taping

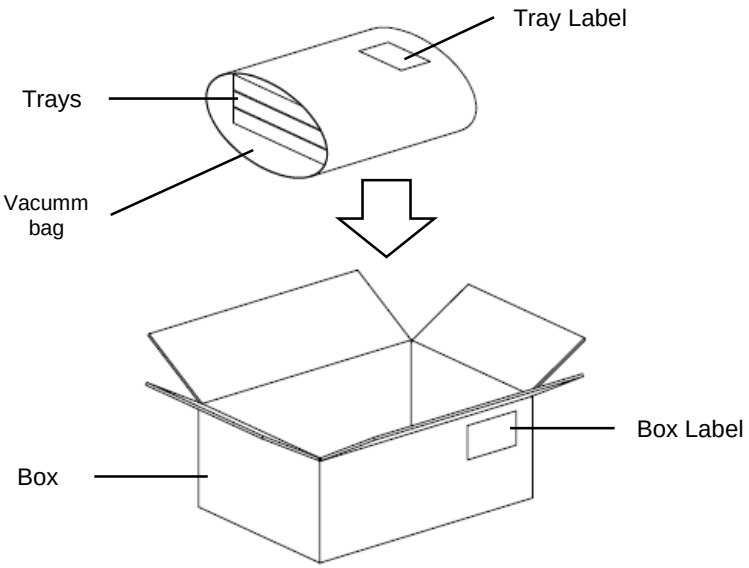


Notes:

(1) 13 Trays and additional 1 dummy tray up of box

Packaging Specification

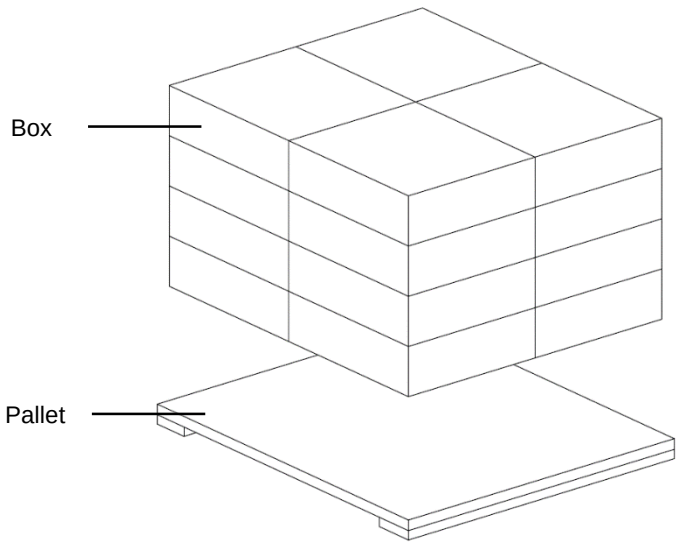
3. Box information & packing



Notes:

(1) Quantity : 13 Trays (13*24=312pcs) / Box
(2) Box size : 545*465*165 mm

4. Pallet information & packing



Notes:

(1) Vessel Quantity: 1 Pallet = 28 Boxes = 364 Trays = 8736 Modules
(2) Air Quantity : 1 Pallet = 24 Boxes = 312 Trays = 7488 Modules
(3) Pallet size: 1100*1100 mm

Precaution for Use

(1) Check the appearance of module before wiring/ assembly, DO NOT use the LED cracked or PCB damaged module.
(2) The module was designed to be driven with DC source, recognize the polarities of the module was necessity.
(3) It was SELV module, DO NOT connect the LED directly to main power during wiring.
(4) DO NOT let the LED packages contacted with any hard matters.
(5) There was no current regulator built in module, unevenly load between different parallel modules may occur due to the modules V_F variance .
(6) Please do not use together with the materials containing Sulfur.
(7) Please do not make any modification on module.

Precaution for Use

(8) LEDs are sensitive to Electro-Static Discharge (ESD) and Electrical Over Stress (EOS).
Below is a list of suggestions that Seoul Semiconductor purposes to minimize these effects.

a. ESD (Electro Static Discharge)
Electrostatic discharge (ESD) is the defined as the release of static electricity when two objects come into contact. While most ESD events are considered harmless, it can be an expensive problem in many industrial environments during production and storage. The damage from ESD to an LEDs may cause the product to demonstrate unusual characteristics such as:

- Increase in reverse leakage current lowered turn-on voltage
- Abnormal emissions from the LED at low current

The following recommendations are suggested to help minimize the potential for an ESD event:
One or more recommended work area suggestions:

- Ionizing fan setup
- ESD table/shelf mat made of conductive materials
- ESD safe storage containers

One or more personnel suggestion options:

- Antistatic wrist-strap
- Antistatic material shoes
- Antistatic clothes

Environmental controls

- Humidity control (ESD gets worse in a dry environment)

b. EOS (Electrical Over Stress)
Electrical Over-Stress (EOS) is defined as damage that may occur when an electronic device is subjected to a current or voltage that is beyond the maximum specification limits of the device.
The effects from an EOS event can be noticed through product performance like:
Changes to the performance of the LED package (If the damage is around the bond pad area and since the package is completely encapsulated the package may turn on but flicker show severe performance degradation.)
Changes to the light output of the luminaire from component failure
Components on the board not operating at determined drive power
Failure of performance from entire fixture due to changes in circuit voltage and current across total circuit causing trickle down failures
It is impossible to predict the failure mode of every LED exposed to electrical overstress as the failure modes have been investigated to vary, but there are some common signs that will indicate an EOS event has occurred.

- Damaged may be noticed to the bond wires (appearing similar to a blown fuse).
- Damage to the bond pads located on the emission surface of the LED package (shadowing can be noticed around the bond pads while viewing through a microscope).
- Anomalies noticed in the encapsulation and phosphor around the bond wires.
- This damage usually appears due to the thermal stress produced during the EOS event.

c. To help minimize the damage from an EOS event Seoul Semiconductor recommends utilizing

- qualified LED driver with no big over shoot out put
- Isolated driver that to prevent harmful peaks passed to module.
- A current limiting device

Storage before use

(1) Do not impact or place pressure on this product because even a small amount of pressure can damage the product. The product should also not be placed in high temperatures, high humidity or direct sunlight since the device is sensitive to these conditions.

(2) 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.

Guidelines for properly working with Module

(1) Discharge the lighting system a minimum of 2-3 times prior to working with the module.
(2) Use only properly rated test equipment and tools for the rated voltage and current of the product being tested.
(3) It is strongly suggested to wear rubber insulated gloves and rubber bottom shoes.
(4) Do not wear any conductive items (such as jewelry) which could accidentally contact electric circuits.
(5) Perform several tests with power off and the lighting system unplugged.
(6) Faults, lightning, or switching transients can cause voltage surges in excess of the normal ratings.
(7) Internal component failure can cause excessive voltages.
(8) Stored or residual electricity in long wire could be hazardous.
(9) Make sure proper discharge prior to starting work.

Company Information

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Seoul Semiconductor (SeoulSemicon.com) manufacturers 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 it's 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.

Legal Disclaimer

Information in this document is provided in connection with Seoul Semiconductor products. With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, Seoul Semiconductor hereby disclaims any and all warranties and liabilities of any kind, including without limitation, warranties of non-infringement of intellectual property rights of any third party. The appearance and specifications of the product can be changed to improve the quality and/or performance without notice.

Revision History

Revision	Date	Page	Remarks
Rev0.1	2019-08-02	All	Preliminary data sheet for SMJD-3625012F-XXN1
Rev0.2	2019-08-26	All	Added CCT 2200K information
Rev0.3	2019-09-26	6,7	Added the graph for flux and efficacy versus current Added the graph for flux versus temperature
Rev0.4	2019-09-29	5	Update the maximum current
Rev0.5	2020-03-11	2,8	Add life time against Tc temperature Add the graph for Tc temperature versus If current
R0.6	2020-06-22	All	Add Ra80 parameters