

DC type

Preliminary

SMJD-3625012F-XX



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 selection of component materials allow these products to perform with high reliability .

Features and Benefits

- High Intensity output and high luminance
- High Efficacy
- Zhaga complaint dimensions
- 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
4000	70	No lens	SMJD-3625012F-XX00E35E057ALL
3000	70	No lens	SMJD-3625012F-XX00E20G057ALL

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Performance Characteristics

Table2. Electro Optical Characteristics $T_j = 25^\circ\text{C}$, $I_F = 0.7\text{A}$

Parameter	Symbol	Value			Unit	Mark
		Min.	Typ.	Max.		
Luminous Flux	$\Phi_V^{[2]}$	4200	4350	-	lm	E35 (E Rank)
		4050	4200	-		E20 (G Rank)
Luminous Efficiency	LPW	-	173	-	Lm/W	E rank
		-	167	-		G Rank
Correlated Color Temperature ^[3]	CCT	3700	4000	4200	K	E05
		2900	3000	3200		G05
CRI	Ra	70	-	-	-	-
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.	-

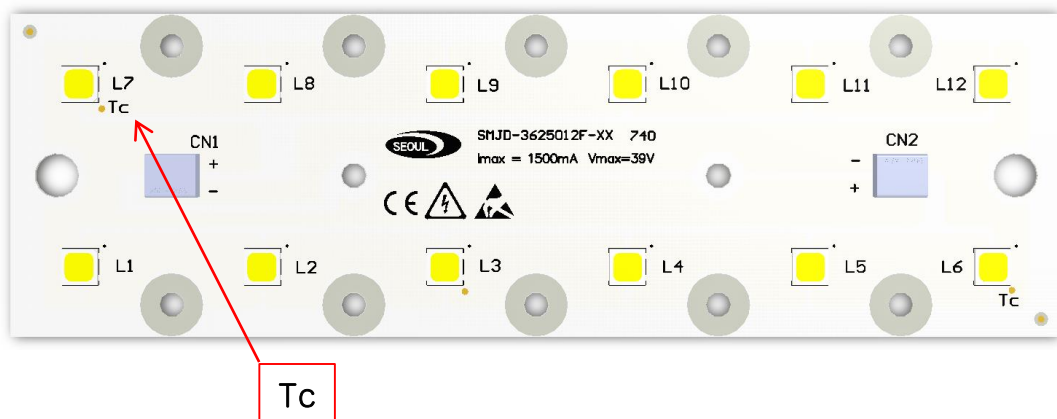
Notes :

1. Seoul Semiconductor maintains a measurement tolerance of
Luminous flux: $\pm 7\%$, CRI: ± 2.0 , Voltage: $\pm 0.3\text{V}$, Power Consumption: $\pm 0.3\text{W}$, CCT : x, y ± 0.005
2. Φ_V is the total luminous flux output measured with an integrated sphere.
3. Correlated Color Temperature is derived from the CIE 1931 Chromaticity diagram. CCT data at $T_j=85\text{C}$
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

Table3. Absolute Maximum Ratings, $T_j = 25^\circ\text{C}$

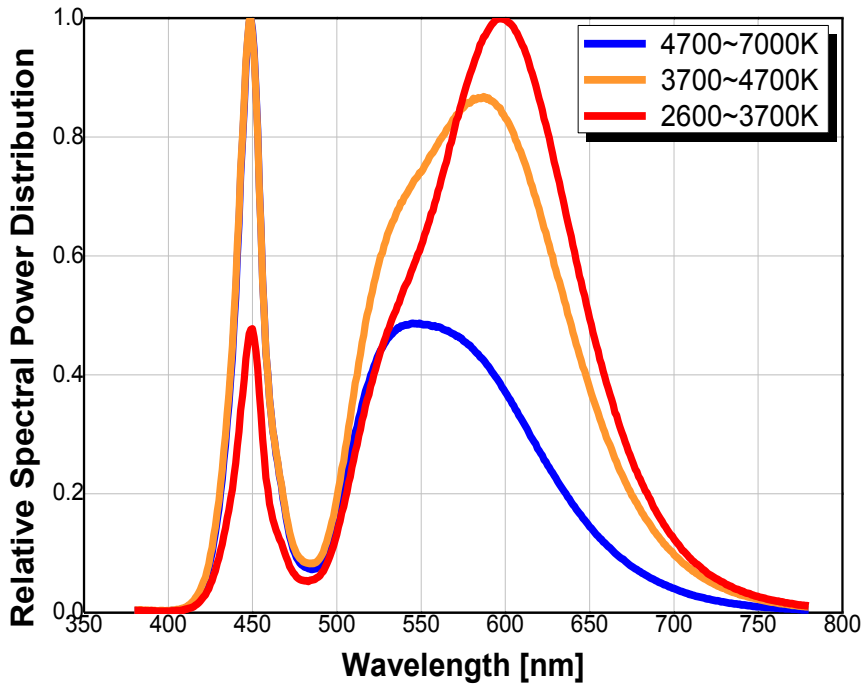
Parameter	Symbol	Unit	Value	Remark
Power Consumption	P	W	54	$P_{\text{Typ.}} = 25.2\text{W}$
Driving Current ⁽²⁾	I_F	A	1.5	$I_{F_Typ.} = 0.7\text{A}$
Operating Temperature ⁽³⁾	T_c	$^\circ\text{C}$	- 40 ~ 105	Reference point
Storage Temperature	T_{stg}	$^\circ\text{C}$	- 40 ~ 105	With no power
ESD Sensitivity	-	-	$\pm 4,000\text{V HBM}$	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 T_c point on the PCB.
- (4) To ensure the module works properly, DO NOT let the T_c upper than 105°C ;

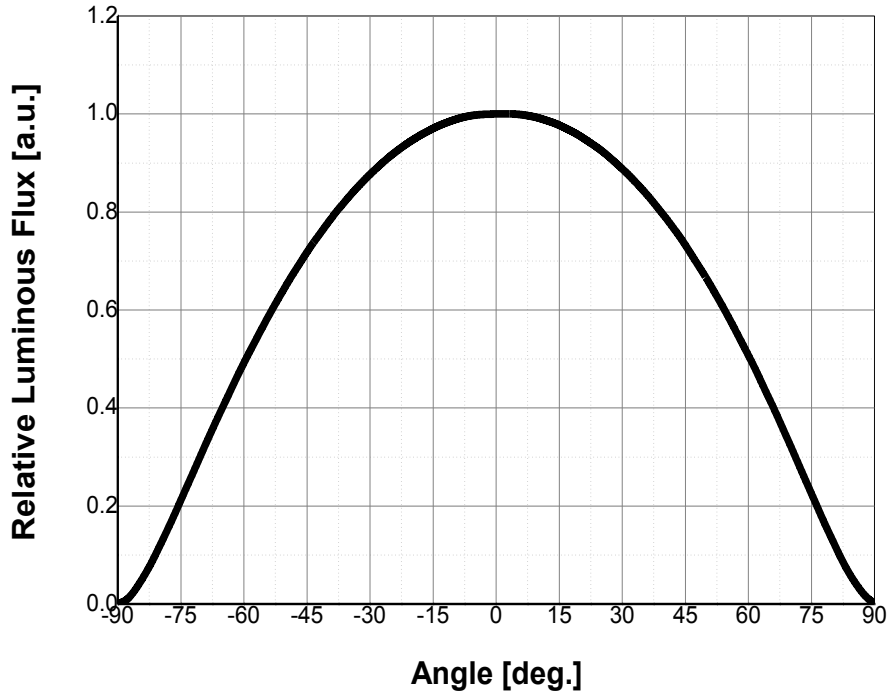
Characteristic Graph

Fig 1. Relative Spectral Distribution vs. Wavelength Characteristic

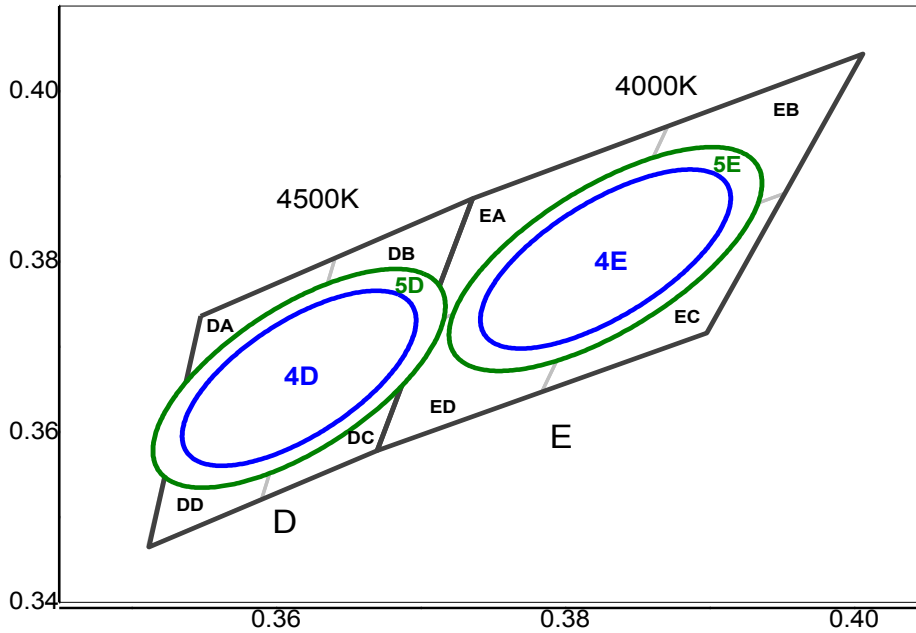


Relative Spectral Distribution

Fig 2. Typical Spatial Distribution

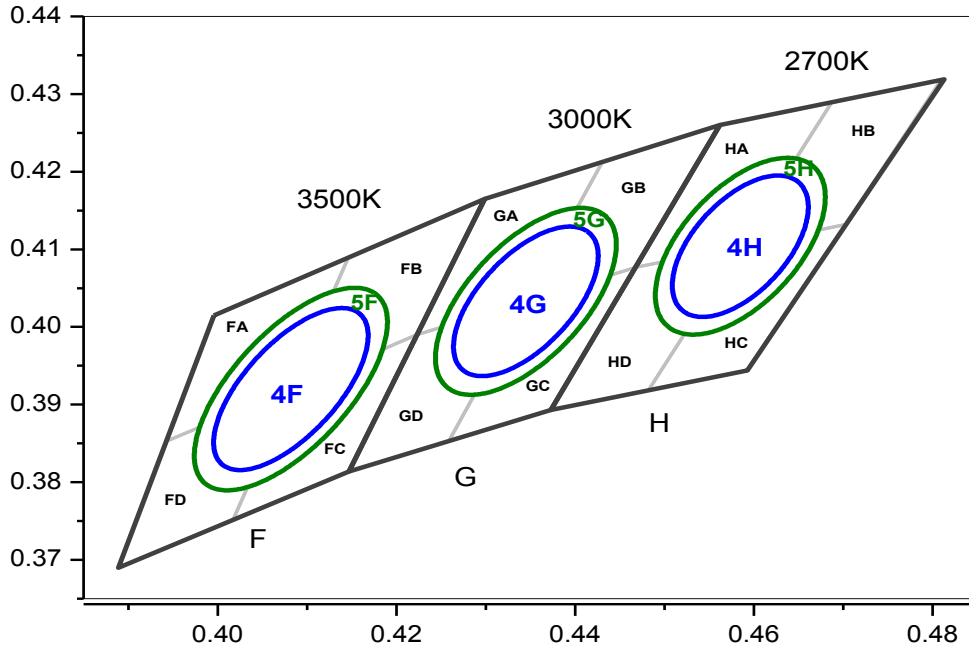


Color Bin Structure

Fig 3. CIE Chromaticity Diagram

4000K 5Step

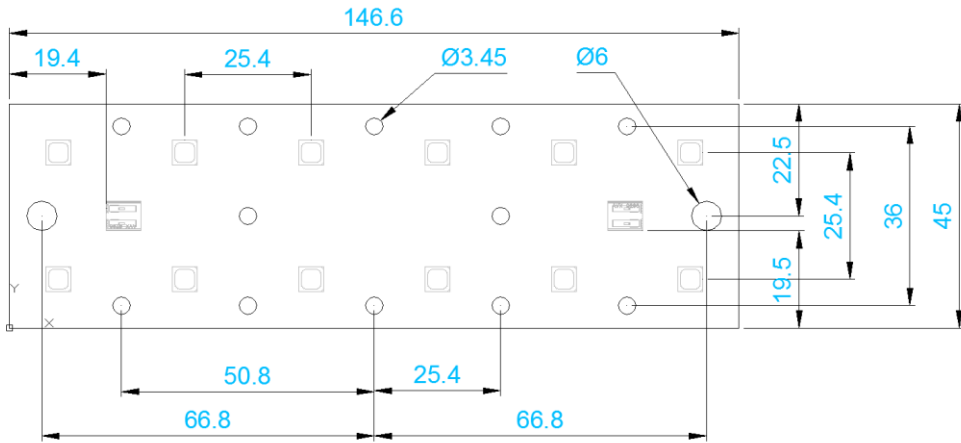
5E	
Center point	0.3818 : 0.3797
Major Axis a	0.0157
Minor Axis b	0.0067
Ellipse Rotation Angle	53

Color Bin Structure

Fig 4. CIE Chromaticity Diagram

3000K 5Step

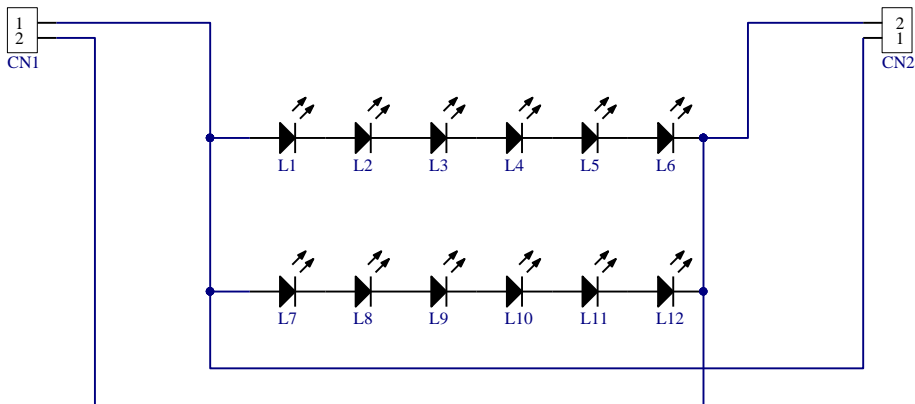
5G	
Center point	0.4338 : 0.4030
Major Axis a	0.0142
Minor Axis b	0.0068
Ellipse Rotation Angle	53

Mechanical Dimensions



- (1) All dimensions are in mm
- (2) Not to Scale
- (3) Module thickness 1.6 ± 0.1 mm

Circuit Drawing



Product Nomenclature

Product Name Rule:

S M J D - 36 25 012 F - XX 0 0
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧

① : SMJD – Seoul Outdoor 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	0	0										
0	0	0	0	0	0	0	0	0	0	0	0	0	F	5050	XX	Reference	0	No lens	0	No lens
1	10V	1	1V	1	10W	1	1W	1	100EA	1	10EA	1	1EA							
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	WN	4000K	70	CRI70
		WW	3000K		

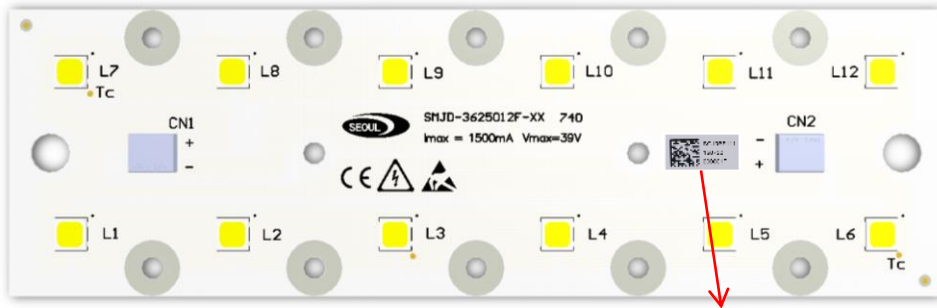
Product Nomenclature

Characteristics Rule:

00 E35 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		E35		E05		7		ALL	
00	No lens	E35	4350 lm	E05	4000K 5-step	7	CRI70	ALL	DC 34~39V
		E20	4200 lm	G05	3000K 5-step				

Marking Information

Fig 9. Marking Point


QR Code Information



YYMDD	①
E35E05	②
7ALL	③
100001	④

Marking point

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	D35E05 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⁾	E35	3Digit	E35=4350lm
		E20		E20=4200lm
③	CCT	X05	3Digit	X=E,G
	CRI	7	1Digit	CRI=70
④	V _F	ALL	3Digit	
	Lot No.	1	1 Digit	0~9,A~Z
	Sequence No.	00001	5 Digit	00001 ~ 99999

Part List

Table 4. Part List Table

No	Part	Specification	Q'ty
1	LED	STW0L6PA	12
2	MCPCB PCB	Metal (Al), 146.6 x 45 x 1.6mm	1
3	CN 1, CN 2	AVX 00-9296-002-202-906	2

Label Information


Model No.	SMJD-3625012F-XX00 ⁽¹⁾
Rank	E35E057ALL ⁽²⁾
Type	5-step ⁽³⁾
Quantity	XX
Lot No.	YYMDDXXXXX-XXXXXXX
	SEOUL SEMICONDUCTOR CO.,LTD.

Notes

- (1) The model number designation is explained as follow

SMJD : Seoul Semiconductor internal code	36 : Input Voltage
25 : Power	012 : LED Quantity
F : LED type	XX : Customer Initial
- (2) It represents the LED module rank.

E35 : Luminous Flux Bin (E35 or E20)	E : CCT Bin (E or G)
05 : Mixing CCT Bin	7 : CRI Bin
ALL : LED Vf	
- (3) It represents the Mac Adam 5-step.
- (4) It is attached to the top of a sealing pack & the bottom right corner of the box

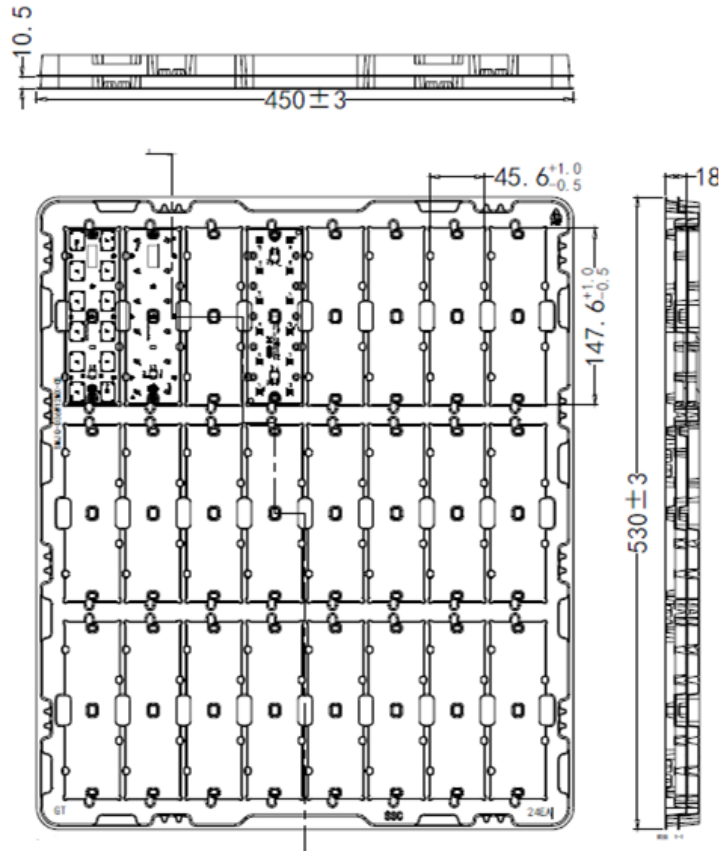
TOTAL Quantity
XX
 SEOUL SEMICONDUCTOR CO.,LTD.

Notes

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

Packaging Specification

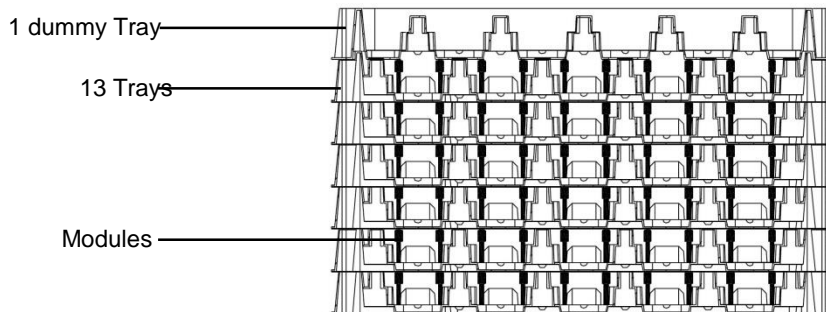
1. Tray information



Notes:

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

2. Tray stack and taping

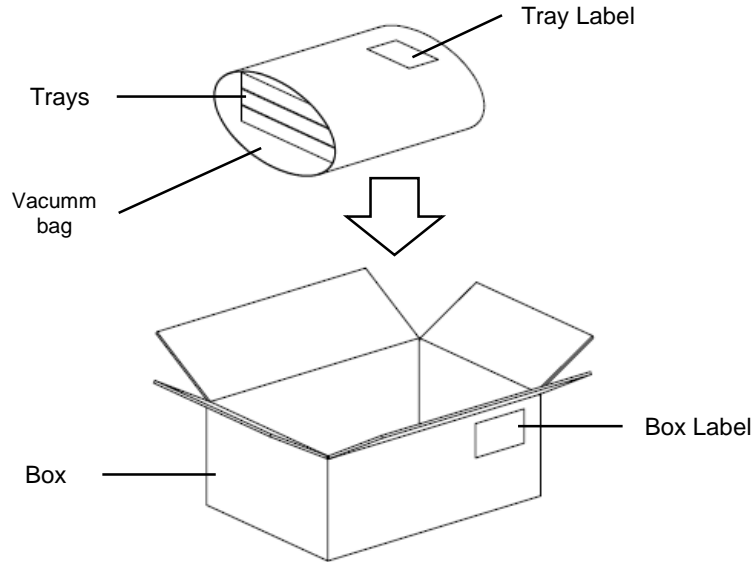


Notes:

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

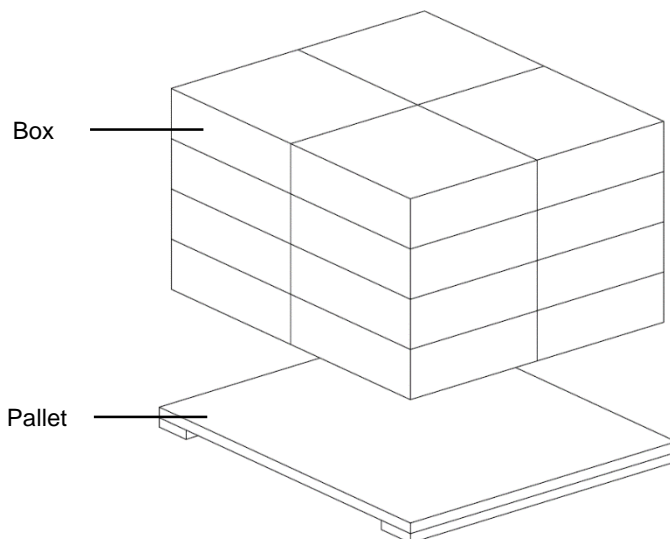
Packaging Specification

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 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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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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