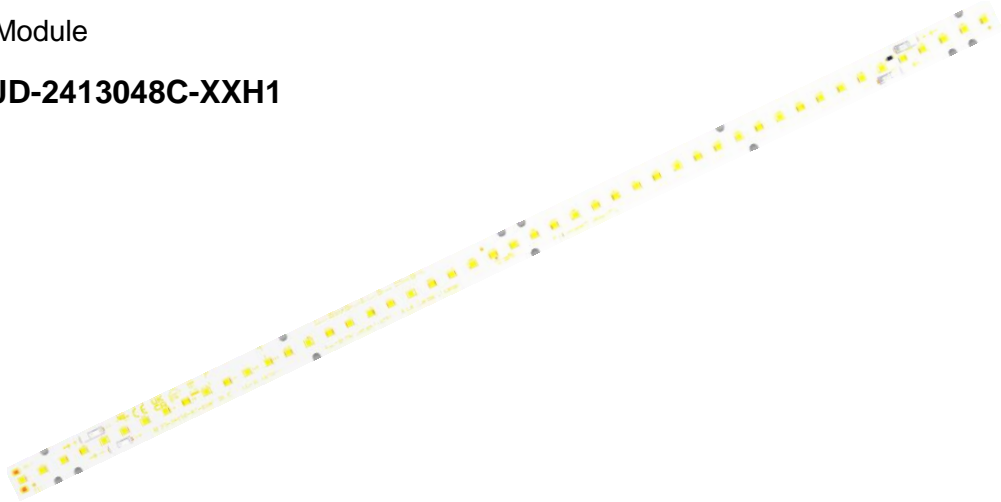


DC Module

**SMJD-2413048C-XXH1**



## Product Brief

### Description

- Multiple CCT is optional
- Modular design concept, easily expand to multitude application
- Poke-in connector in built

### Features and Benefits

- High Efficacy
- Long Life Time
- Simple BOM
- Lead Free Product
- RoHS Compliant

### Key Applications

- Linear lighting
- Decorative lighting
- Troffer

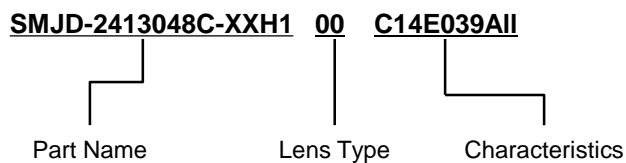
## Product Code Information

**Table 1. Order Code**

| CCT  | CRI | Lens type | Order Code                     |
|------|-----|-----------|--------------------------------|
| 6500 | 90  | -         | SMJD-2413048C-XXH100C02A039AII |
| 5700 | 90  | -         | SMJD-2413048C-XXH100C04B039AII |
| 5000 | 90  | -         | SMJD-2413048C-XXH100C14C039AII |
| 4500 | 90  | -         | SMJD-2413048C-XXH100C14D039AII |
| 4000 | 90  | -         | SMJD-2413048C-XXH100C14E039AII |
| 3500 | 90  | -         | SMJD-2413048C-XXH100C04F039AII |
| 3000 | 90  | -         | SMJD-2413048C-XXH100C04G039AII |
| 2700 | 90  | -         | SMJD-2413048C-XXH100B94H039AII |

**Notes:**

(1) Order code include 18D(Part Name) + 2D(lens Type) + 10D(Characteristics)



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## Performance Characteristics

**Table2. Electro Optical Characteristics,  $I_F = 600\text{mA}$ ,  $T_p=45^\circ\text{C}$ ,**

| Parameter                        | Symbol          | Value |      |      | Unit | Remark     |
|----------------------------------|-----------------|-------|------|------|------|------------|
|                                  |                 | Min.  | Typ. | Max. |      |            |
| Luminous Flux                    | $\Phi_V$ [2]    | 2040  | 2140 | -    | Lm   | C,D,E rank |
|                                  |                 | 1940  | 2040 | -    |      | B,F,G rank |
|                                  |                 | 1940  | 2020 |      |      | A rank     |
|                                  |                 | 1840  | 1940 | -    |      | H rank     |
| Luminous Efficiency              | LPW             |       | 162  |      | Lm/W | C,D,E rank |
|                                  |                 |       | 155  |      |      | B,F,G rank |
|                                  |                 |       | 153  |      |      | A rank     |
|                                  |                 |       | 147  |      |      | H rank     |
| Correlated Color Temperature [3] | CCT             | 6000  | 6500 | 7000 | K    | A rank     |
|                                  |                 | 5300  | 5700 | 6000 |      | B rank     |
|                                  |                 | 4700  | 5000 | 5300 |      | C rank     |
|                                  |                 | 4200  | 4500 | 4700 |      | D rank     |
|                                  |                 | 3700  | 4000 | 4200 |      | E rank     |
|                                  |                 | 3200  | 3500 | 3700 |      | F rank     |
|                                  |                 | 2900  | 3000 | 3200 |      | G rank     |
|                                  |                 | 2600  | 2700 | 2900 |      | H rank     |
| CRI                              | Ra              | 90    | -    | -    | -    |            |
| R9                               | R9              | 0     | -    | -    | -    |            |
| Color Consistency                |                 | -     | -    | 3    | SDCM |            |
| Input Voltage                    | $V_{in}$        | 21    | 22   | 23   | Vdc  |            |
| Forward Current                  | $I_F$           |       | 600  |      | mA   |            |
| Power Consumption                | P               | 12    | 13.2 | 14   | W    |            |
| Viewing Angle                    | $2\Theta_{1/2}$ |       | 120  |      | deg. |            |

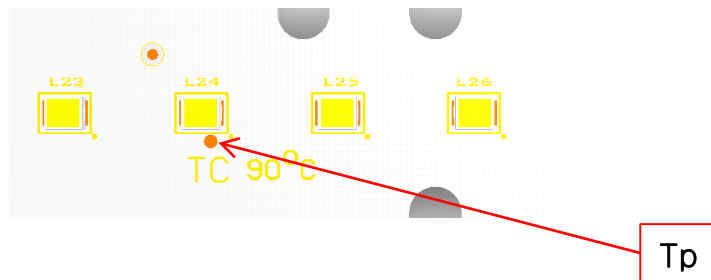
**Notes :**

- (1) The above data were tested at  $T_p=45^\circ\text{C}$ .
- (2)  $\Phi_V$  is the total luminous flux output measured with an integrated sphere, the tolerance is 7% .
- (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 datasheet.

## Absolute Maximum Ratings

**Table 3. Absolute Maximum Ratings,  $T_p = 45^\circ\text{C}$  <sup>(1)</sup>**

| Parameter                            | Symbol           | Unit             | Value      | Remark                           |
|--------------------------------------|------------------|------------------|------------|----------------------------------|
| Power Consumption                    | P                | W                | 18.5       | $P_{\text{Typ.}} = 13.2\text{W}$ |
| Driving Current <sup>(2)</sup>       | $I_F$            | mA               | 840        | $I_{F\_Typ.} = 600\text{mA}$     |
| Operating Temperature <sup>(3)</sup> | $T_p$            | $^\circ\text{C}$ | - 40 ~ 90  | Reference point                  |
| Storage Temperature                  | $T_{\text{stg}}$ | $^\circ\text{C}$ | - 40 ~ 100 | With no power                    |
| ESD Sensitivity                      | -                | KV               | $\pm 4$    | HBM                              |

**ILLUSTRATION 1: How to predict components temperature <sup>(4)</sup>**

**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 22VDC and  $V_{F\_MAX}$  is around 23VDC, respectively.
- (3) Operating temperature was tested at the assigned  $T_p$  point on the PCB.
- (4) To ensure the module works properly, DO NOT let the  $T_p$  upper than 90  $^\circ\text{C}$ ;

## Relative Spectral Distribution

Fig 1. Relative Spectral Distribution vs. Wavelength Characteristic

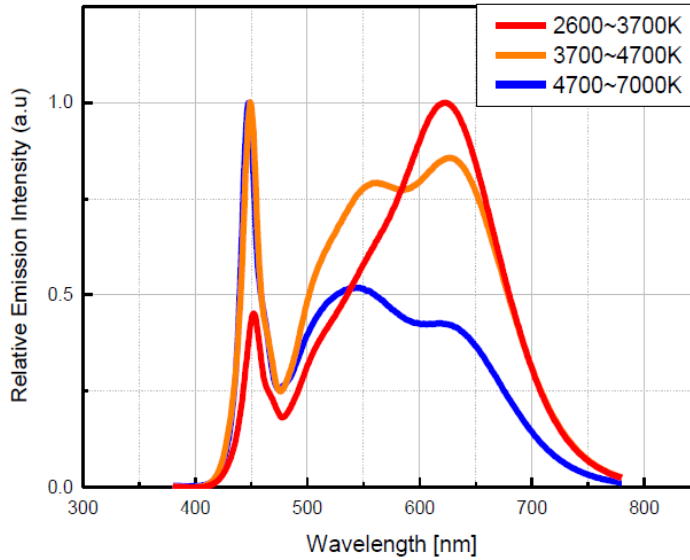
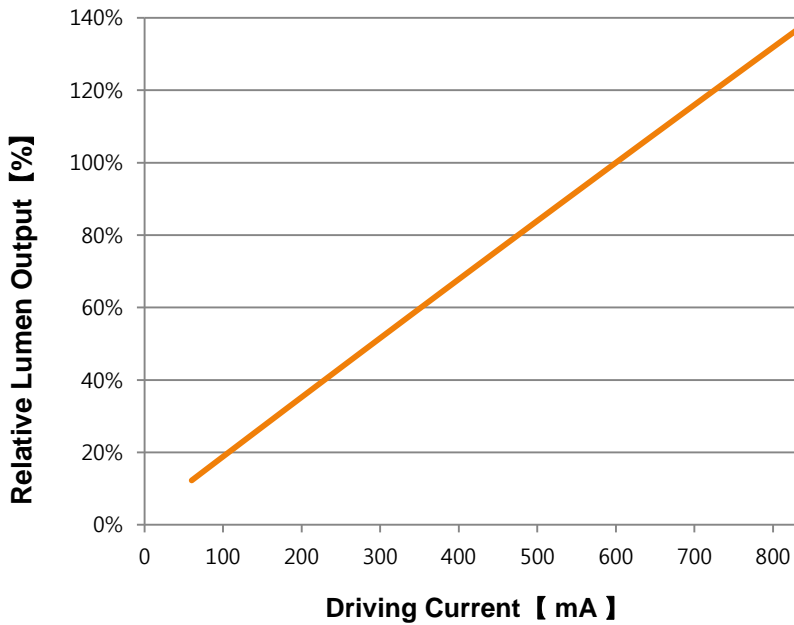
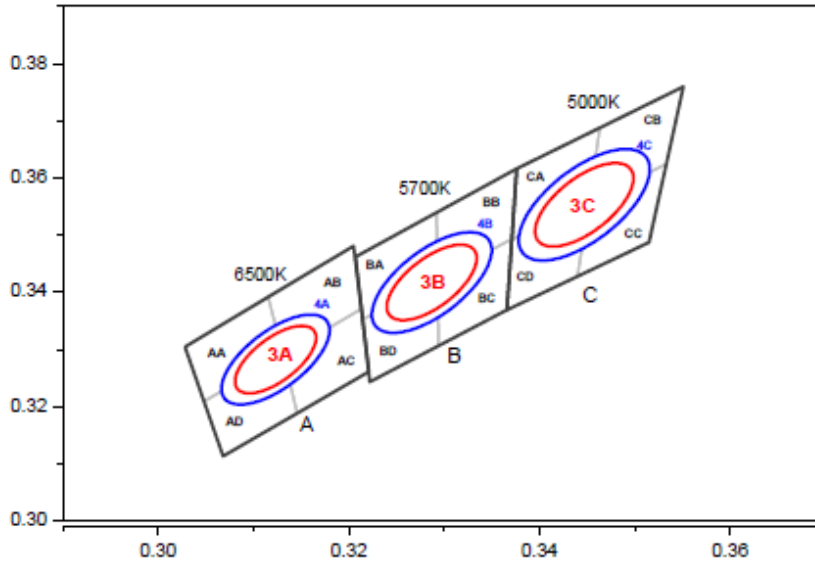


Fig 2. Forward Current vs. Relative Luminous Flux,  $T_p=45^\circ\text{C}$



## Color Bin Structure

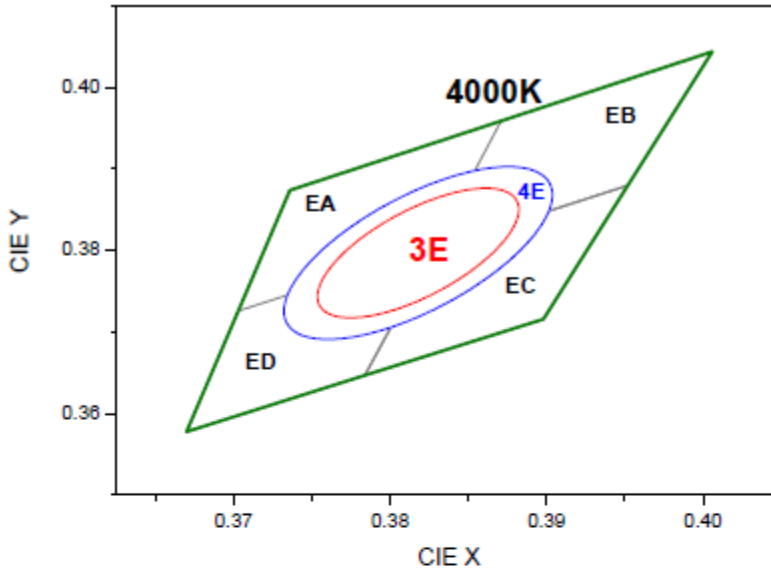
**Fig 3. CIE Chromaticity Diagram**


| 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           | 0.00669         | Major Axis a           | 0.00746         | Major Axis a           | 0.00822         |
| Minor Axis b           | 0.00285         | Minor Axis b           | 0.00320         | Minor Axis b           | 0.00354         |
| Ellipse Rotation Angle | 58.57           | Ellipse Rotation Angle | 59.09           | Ellipse Rotation Angle | 59.62           |

| 6500K 4Step            |                 | 5700K 4Step            |                 | 5000K 4Step            |                 |
|------------------------|-----------------|------------------------|-----------------|------------------------|-----------------|
| 4A                     |                 | 4B                     |                 | 4C                     |                 |
| Center point           | 0.3123 : 0.3282 | Center point           | 0.3287 : 0.3417 | Center point           | 0.3447 : 0.3553 |
| Major Axis a           | 0.00892         | Major Axis a           | 0.00995         | Major Axis a           | 0.01096         |
| Minor Axis b           | 0.00380         | Minor Axis b           | 0.00427         | Minor Axis b           | 0.00472         |
| Ellipse Rotation Angle | 58.57           | Ellipse Rotation Angle | 59.09           | Ellipse Rotation Angle | 59.62           |

| AA     |        | AB     |        | AC     |        | AD     |        |
|--------|--------|--------|--------|--------|--------|--------|--------|
| CIE X  | CIE Y  | CIE X  | CIE Y  | CIE X  | CIE Y  | CIE X  | CIE Y  |
| 0.3028 | 0.3304 | 0.3115 | 0.3393 | 0.3131 | 0.329  | 0.3048 | 0.3209 |
| 0.3048 | 0.3209 | 0.3131 | 0.329  | 0.3146 | 0.3187 | 0.3068 | 0.3113 |
| 0.3131 | 0.329  | 0.3213 | 0.3371 | 0.3221 | 0.3261 | 0.3146 | 0.3187 |
| 0.3115 | 0.3393 | 0.3205 | 0.3481 | 0.3213 | 0.3371 | 0.3131 | 0.329  |
| BA     |        | BB     |        | BC     |        | BD     |        |
| CIE X  | CIE Y  | CIE X  | CIE Y  | CIE X  | CIE Y  | CIE X  | CIE Y  |
| 0.3207 | 0.3462 | 0.3292 | 0.3539 | 0.3293 | 0.3423 | 0.3215 | 0.3353 |
| 0.3215 | 0.3353 | 0.3293 | 0.3423 | 0.3294 | 0.3306 | 0.3222 | 0.3243 |
| 0.3293 | 0.3423 | 0.3371 | 0.3493 | 0.3366 | 0.3369 | 0.3294 | 0.3306 |
| 0.3292 | 0.3539 | 0.3376 | 0.3616 | 0.3371 | 0.3493 | 0.3293 | 0.3423 |
| CA     |        | CB     |        | CC     |        | CD     |        |
| CIE X  | CIE Y  | CIE X  | CIE Y  | CIE X  | CIE Y  | CIE X  | CIE Y  |
| 0.3376 | 0.3616 | 0.3463 | 0.3687 | 0.3452 | 0.3558 | 0.3371 | 0.3493 |
| 0.3371 | 0.3493 | 0.3452 | 0.3558 | 0.344  | 0.3428 | 0.3366 | 0.3369 |
| 0.3452 | 0.3558 | 0.3533 | 0.3624 | 0.3514 | 0.3487 | 0.344  | 0.3428 |
| 0.3463 | 0.3687 | 0.3551 | 0.376  | 0.3533 | 0.3624 | 0.3452 | 0.3558 |

## Color Bin Structure

**Fig 4. CIE Chromaticity Diagram**

**4000K 3Step**
**3E**

|                           |                 |
|---------------------------|-----------------|
| Center point              | 0.3818 : 0.3797 |
| Major Axis a              | 0.00939         |
| Minor Axis b              | 0.00402         |
| Ellipse<br>Rotation Angle | 53.72           |

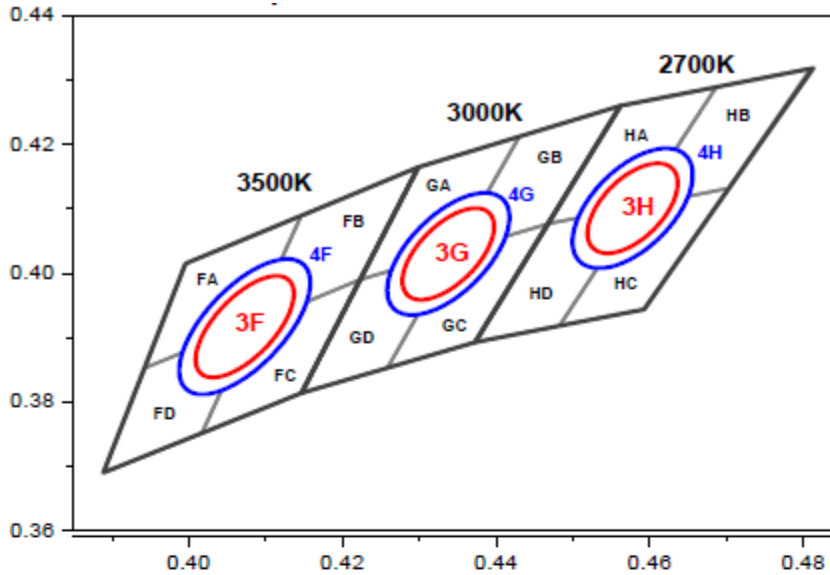
**4000K 4Step**
**4E**

|                           |                 |
|---------------------------|-----------------|
| Center point              | 0.3818 : 0.3797 |
| Major Axis a              | 0.01252         |
| Minor Axis b              | 0.00536         |
| Ellipse<br>Rotation Angle | 53.72           |

| EA     |        | EB     |        | EC     |        | ED     |        |
|--------|--------|--------|--------|--------|--------|--------|--------|
| CIE X  | CIE Y  | CIE X  | CIE Y  | CIE X  | CIE Y  | CIE X  | CIE Y  |
| 0.3736 | 0.3874 | 0.3871 | 0.3959 | 0.3828 | 0.3803 | 0.3703 | 0.3726 |
| 0.3703 | 0.3726 | 0.3828 | 0.3803 | 0.3784 | 0.3647 | 0.367  | 0.3578 |
| 0.3828 | 0.3803 | 0.3952 | 0.388  | 0.3898 | 0.3716 | 0.3784 | 0.3647 |
| 0.3871 | 0.3959 | 0.4006 | 0.4044 | 0.3952 | 0.388  | 0.3828 | 0.3803 |



## Color Bin Structure

**Fig 5. CIE Chromaticity Diagram**


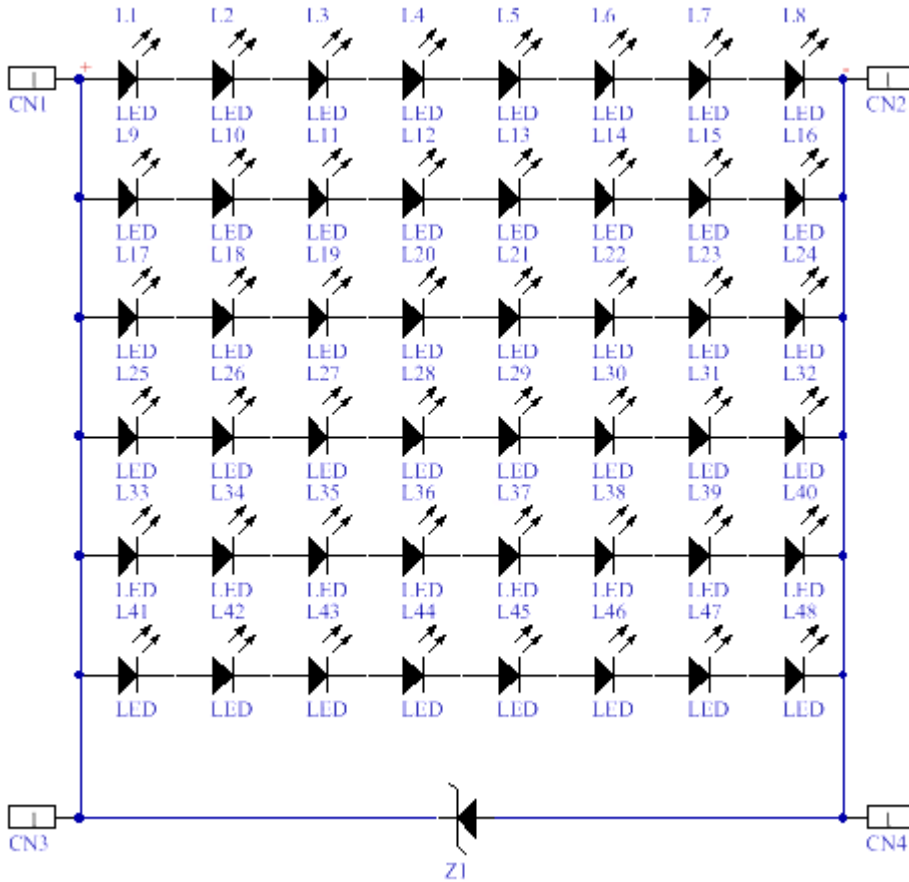
| 3500K 3Step            |                 | 3000K 3Step            |                 | 2700K 3Step            |                 |
|------------------------|-----------------|------------------------|-----------------|------------------------|-----------------|
| 3 Step                 |                 | 3 Step                 |                 | 3 Step                 |                 |
| Center point           | 0.4073 : 0.3917 | Center point           | 0.4338 : 0.4030 | Center point           | 0.4578 : 0.4101 |
| Major Axis a           | 0.00927         | Major Axis a           | 0.00834         | Major Axis a           | 0.00810         |
| Minor Axis b           | 0.00414         | Minor Axis b           | 0.00408         | Minor Axis b           | 0.00420         |
| Ellipse Rotation Angle | 54.00           | Ellipse Rotation Angle | 53.22           | Ellipse Rotation Angle | 53.70           |

| 3500K 4Step            |                 | 3000K 4Step            |                 | 2700K 4Step            |                 |
|------------------------|-----------------|------------------------|-----------------|------------------------|-----------------|
| 4 Step                 |                 | 4 Step                 |                 | 4 Step                 |                 |
| Center point           | 0.4073 : 0.3917 | Center point           | 0.4338 : 0.4030 | Center point           | 0.4578 : 0.4101 |
| Major Axis a           | 0.01236         | Major Axis a           | 0.01112         | Major Axis a           | 0.01080         |
| Minor Axis b           | 0.00552         | Minor Axis b           | 0.00544         | Minor Axis b           | 0.00560         |
| Ellipse Rotation Angle | 54.00           | Ellipse Rotation Angle | 53.22           | Ellipse Rotation Angle | 53.70           |

| FA     |        | FB     |        | FC     |        | FD     |        |
|--------|--------|--------|--------|--------|--------|--------|--------|
| CIE X  | CIE Y  | CIE X  | CIE Y  | CIE X  | CIE Y  | CIE X  | CIE Y  |
| 0.3996 | 0.4015 | 0.4146 | 0.4089 | 0.4082 | 0.392  | 0.3943 | 0.3853 |
| 0.3943 | 0.3853 | 0.4082 | 0.392  | 0.4017 | 0.3751 | 0.3889 | 0.369  |
| 0.4082 | 0.392  | 0.4223 | 0.399  | 0.4147 | 0.3814 | 0.4017 | 0.3751 |
| 0.4146 | 0.4089 | 0.4299 | 0.4165 | 0.4223 | 0.399  | 0.4082 | 0.392  |
| GA     |        | GB     |        | GC     |        | GD     |        |
| CIE X  | CIE Y  | CIE X  | CIE Y  | CIE X  | CIE Y  | CIE X  | CIE Y  |
| 0.4299 | 0.4165 | 0.443  | 0.4212 | 0.4345 | 0.4033 | 0.4223 | 0.399  |
| 0.4223 | 0.399  | 0.4345 | 0.4033 | 0.4259 | 0.3853 | 0.4147 | 0.3814 |
| 0.4345 | 0.4033 | 0.4468 | 0.4077 | 0.4373 | 0.3893 | 0.4259 | 0.3853 |
| 0.443  | 0.4212 | 0.4562 | 0.426  | 0.4468 | 0.4077 | 0.4345 | 0.4033 |
| HA     |        | HB     |        | HC     |        | HD     |        |
| CIE X  | CIE Y  | CIE X  | CIE Y  | CIE X  | CIE Y  | CIE X  | CIE Y  |
| 0.4562 | 0.426  | 0.4687 | 0.4289 | 0.4585 | 0.4104 | 0.4468 | 0.4077 |
| 0.4468 | 0.4077 | 0.4585 | 0.4104 | 0.4483 | 0.3919 | 0.4373 | 0.3893 |
| 0.4585 | 0.4104 | 0.4703 | 0.4132 | 0.4593 | 0.3944 | 0.4483 | 0.3919 |
| 0.4687 | 0.4289 | 0.481  | 0.4319 | 0.4703 | 0.4132 | 0.4585 | 0.4104 |



# Circuit Drawing



## Product Nomenclature

Product Name Rule:

**S M J D - 24 13 048 C - XX H 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) |           | Dimming |                    | Etc. (Free) |         |
|---------|------|-----|-----|-------|------|-----|-----|----------|--------|-----|------|-----|-----|----------|------|-----------------|-----------|---------|--------------------|-------------|---------|
| ②       |      | ③   |     | ④     |      | ⑤   |     | ⑥        |        | ⑦   |      | ⑧   |     |          |      |                 |           |         |                    |             |         |
| 2       | 4    | 1   | 3   | 0     | 4    | 8   | C   | XX       | H      | 1   |      |     |     |          |      |                 |           |         |                    |             |         |
| 0       | 0    | 0   | 0   | 0     | 0    | 0   | 0   | 0        | 0      | 0   | 0    | 0   | 0   | C        | 3528 | XX              | Reference | H       | STW9A2P<br>D-E1(H) | 1           | Version |
| 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 90 )**  
**A            B            C**

| Lens Type |         | CCT |       | CRI |       |
|-----------|---------|-----|-------|-----|-------|
| A         |         | B   |       | C   |       |
| 00        |         | WN  |       | 90  |       |
| 00        | No lens | W0  | 6500K | 90  | CRI90 |
|           |         |     | 5700K |     |       |
|           |         |     | 5000K |     |       |
|           |         | WN  | 4500K |     |       |
|           |         |     | 4000K |     |       |
|           |         | WW  | 3500K |     |       |
|           |         |     | 3000K |     |       |
|           |         |     | 2700K |     |       |

## Product Nomenclature

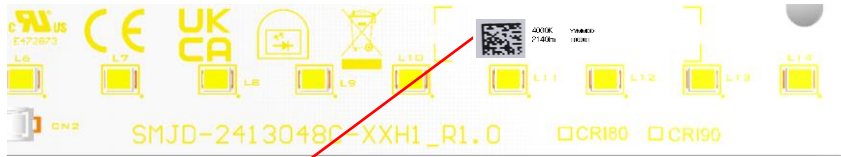
Characteristics Rule:

00    C14    E03    9    All  
**A**    **B**    **C**    **D**    **E**

| Lens type |         | Flux bin |         | CCT bin |                 | CRI bin |       | VF bin |              |
|-----------|---------|----------|---------|---------|-----------------|---------|-------|--------|--------------|
| A         |         | B        |         | C       |                 | D       |       | E      |              |
| 00        |         | C14      |         | E03     |                 | 9       |       | All    |              |
| 00        | No lens | C14      | 2140 lm | A03     | 6500K<br>3-step | 9       | CRI90 | All    | DC<br>21~23V |
|           |         | C04      | 2040 lm | B03     | 5700K<br>3-step |         |       |        |              |
|           |         | C02      | 2020 lm | C03     | 5000K<br>3-step |         |       |        |              |
|           |         | B94      | 1940 lm | D03     | 4500K<br>3-step |         |       |        |              |
|           |         |          |         | E03     | 4000K<br>3-step |         |       |        |              |
|           |         |          |         | F03     | 3500K<br>3-step |         |       |        |              |
|           |         |          |         | G03     | 3000K<br>3-step |         |       |        |              |
|           |         |          |         | H03     | 2700K<br>3-step |         |       |        |              |

## Marking Information

### Marking Point



**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  | 6 Digit    | 10 Digit                      | 1 Digit     | 1 Digit     | 5 Digit | In Total 31 Digits |
| Information         | *       | *****    | YYMMD<br>D | C14E03<br>9ALL <sup>(1)</sup> | 1~9,<br>A~Z | 1~9,<br>A~Z | 00001   |                    |

### Plain Code Information

| No. | Item         | Information | Digits  | Remark         |
|-----|--------------|-------------|---------|----------------|
| ①   | CCT          | 4000K       | 5Digit  | Refer to Page4 |
|     | Date         | YYMMDD      | 6Digit  | SMT date       |
| ②   | Flux         | 2140lm      | 6Digit  | Refer to Page4 |
|     | Lot No.      | 1           | 1 Digit | 0~9,A~Z        |
|     | Sequence No. | 00001       | 5 Digit | 00001 ~ 99999  |

### Notes :

(1) Module Flux code rule as below table

| Symbol | Im    | Symbol | Im    | Symbol | Im    | Symbol | Im    |
|--------|-------|--------|-------|--------|-------|--------|-------|
| D91    | 3910  | O50    | 14500 | R50    | 17500 | U50    | 20500 |
| M20    | 12200 | P50    | 15500 | S50    | 18500 | V20    | 21200 |
| N00    | 13000 | Q50    | 16500 | T50    | 19500 | W00    | 22000 |

## Label Information

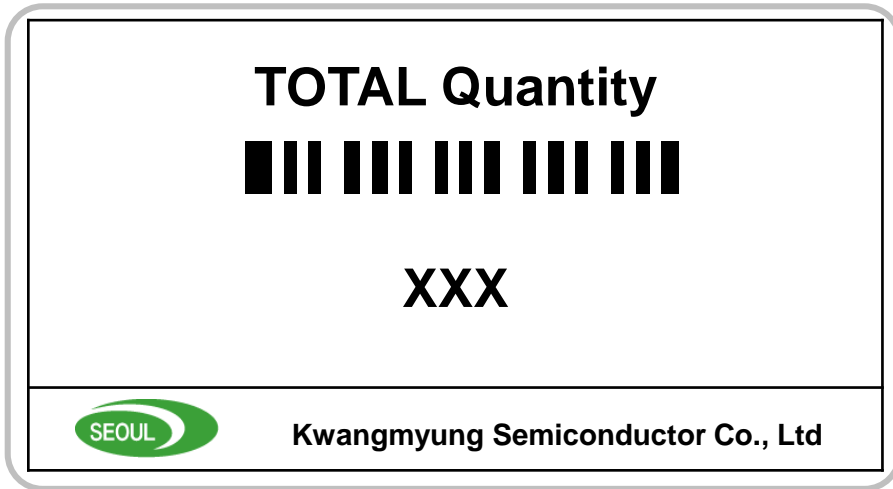
|                              |   |
|------------------------------|---|
| <b>(K)PO Number</b>          | <b>XXXXXX</b><br>IIII II IIII III                                       |
| <b>(1P)Supplier P/N</b>      | <b>SMJD-2413048C-XXH100C14E039ALL<sup>(1)</sup></b><br>IIII II IIII III |
| <b>(33P)Bin Code</b>         | <b>C14E039ALL<sup>(2)</sup></b><br>IIII II IIII III                     |
| <b>(Q)Quantity</b>           | <b>XX</b><br>IIII II IIII III   |
| <b>(4L)Country of Origin</b> | <b>XX<sup>(3)</sup></b><br>IIII II IIII III                             |
| <b>(10D)Date Code</b>        | <b>YYWW<sup>(4)</sup></b><br>IIII II IIII III                           |
| <b>(1T)Lot Code</b>          | <b>YYMDDXXXXX- XXXXXXXX<sup>(5)</sup></b><br>IIII II IIII III           |


**Kwangmyung Semiconductor Co., Ltd**
**Notes**

- (1) Please refer to SPEC page 12 (30 digit code)
- (2) Please refer to SPEC page 13
- (3) Country of Origin: 2 digit code . For example : Chinese Code: CN
- (4) Date Code : YYWW : 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.  
 XXXXXXXX : SSC SAP Code
- (6) Please refer to the font and size requirement for the label  
**the label must be clear , visible and scannable**
- (7) It is attached to the top left corner of the box.

| Code 128                      | Length mm     | Height | Font  | Size |
|-------------------------------|---------------|--------|-------|------|
| PO Number                     | 0.17 mm       | 3.0mm  | Arial | 7    |
| Supplier                      | 0.17 mm       | 3.0mm  | Arial | 7    |
| Bin Code                      | 0.17 mm       | 3.0mm  | Arial | 7    |
| Qty                           | 0.17 mm       | 3.0mm  | Arial | 7    |
| Country of Origin             | 0.17 mm       | 3.0mm  | Arial | 7    |
| Date Code                     | 0.17 mm       | 3.0mm  | Arial | 7    |
| Lot Code                      | 0.17 mm       | 3.0mm  | Arial | 7    |
| White space(TOP)              | 2-4mm         |        |       |      |
| White space(Under)            | 17mm          |        |       |      |
| White space(Left)             | 2-4mm         |        |       |      |
| End Left Text ~ Start Barcode | 5-10mm        |        |       |      |
| Text Width(PGM)               | 100%          |        |       |      |
| Spacing                       | 0%            |        |       |      |
| Company Text                  |               |        | Arial | 9.5  |
| Logo                          | Width 22-16mm | 9-6mm  |       |      |
| Label size                    | 100mm         | 70mm   |       |      |

## Label Information

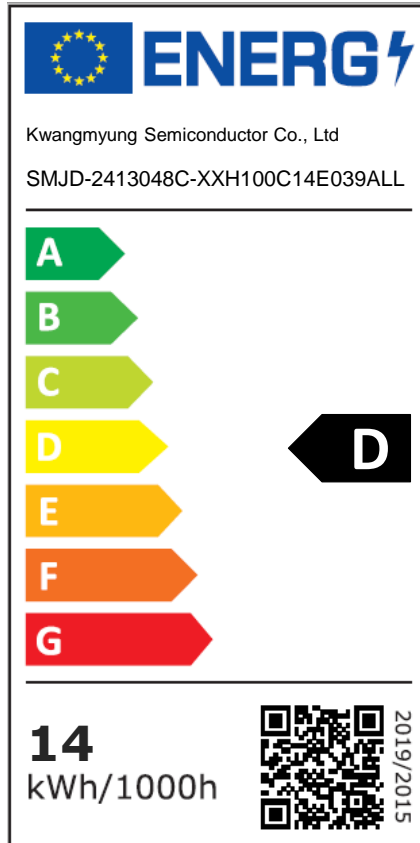


### Notes

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



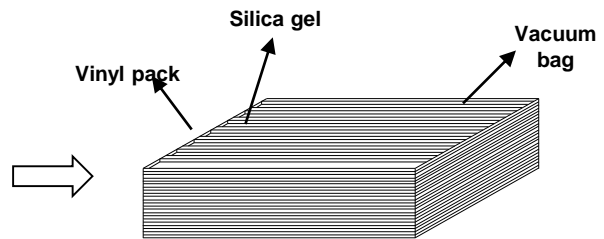
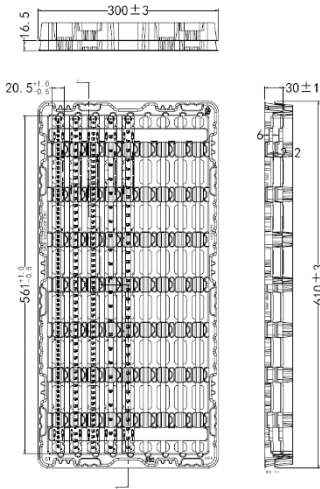
## Label Information


**Notes**

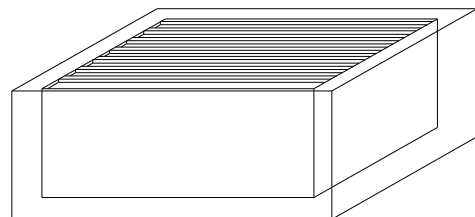
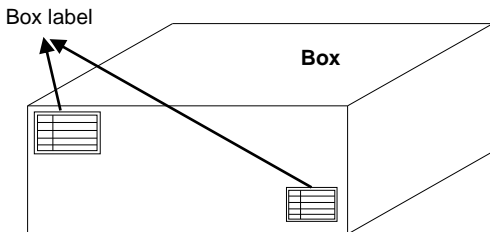
- (1) The above is just an example, and the correct label must be downloaded from EPREL system
- (2) The label size should be 72mm\*36mm
- (3) The background of the label shall be 100% white.
- (4) The typefaces shall be Verdana and Calibri.
- (5) Colours shall be CMYK – cyan, magenta, yellow and black, following this example: 0-70-100-0: 0 % cyan, 70 % magenta, 100 % yellow, 0 % black.
- (6) It is attached to the top right corner of the box.

# Packaging Specification

| Model              | Tray           |                    | Box             |                   | Pallet        |                     |
|--------------------|----------------|--------------------|-----------------|-------------------|---------------|---------------------|
|                    | Size (mm)      | Q'ty per tray (ea) | Size (mm)       | Q'ty per box (ea) | Size (mm)     | Q'ty per pallet(ea) |
| SMJD-2413048C-XXH1 | 610 x 300 x 30 | 18                 | 625 x 325 x 220 | 180               | 1100x1100x150 | 4320                |



**Vinyl pack = 10(11) Trays = 180bars(MAX)**  
**(Top tray is used as a rid.)**



**1 Box = 10(11) Trays = 180bars (MAX)**

## 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

### Published by

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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.

### 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   | 2020-05-20 | All    | Preliminary data sheet for SMJD-2413048C-XXH1          |
| Rev0.2   | 2020-06-15 | 10,16  | Update mechanical drawing and packing                  |
| Rev0.3   | 2020-07-08 | All    | Update Tp temperature                                  |
| Rev0.4   | 2020-08-12 | 4,5,15 | Add R9 requirement and update Tp temperature and label |
| Rev0.5   | 2020-09-10 | 11     | Update circuit drawing                                 |
| Rev0.6   | 2021-06-30 | 14,16  | Add UKCA logo and update QR construction               |
| Rev0.7   | 2021-08-22 | 14,16  | Update energy efficiency level due to "NDLS"           |
| Rev0.8   | 2021-12-03 | 15,16  | Update label format                                    |