

### EL TOP VIEW LED 67-11-C70100M-AM



#### Features

- Package : Cool White LED with PLCC 2 package
- Emitted Color : Cool White
- Typ. Luminance Intensity : 560 mcd @ 10mA
- Typ. Luminous Flux : 1 lm @ 20mA
- Viewing angle : 120°
- ESD : up to 8KV
- Qualifications : According to AEC-Q101
- Precondition: According to JEDEC J-STD 020D
- Compliance with RoHS and REACH
- Ag Plating L/F
- MSL 2

#### Applications

- Automotive Interior Lighting, Dashboard, Switch, Reading lamp, Audio and Car Infotainment, etc.
- Backlight: LCD, switches, symbol, mobile phone and illuminated advertising.
- Optical indicator.
- General applications.

## Contents

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# 1. Characteristics

| Parameter                                  |            | Symbol             | Min. | Typ. | Max. | Unit | Condition         |
|--|------------|--------------------|------|------|------|------|-------------------|
| Forward Current                            | Cool White | $I_F$              | 2    | 10   | 30   | mA   | ---               |
| Luminous Intensity                         | Cool White | $I_V$              | 224  | 450  | 710  | mcd  | $I_F=10\text{mA}$ |
| Forward Voltage                            | Cool White | $V_F$              | 2.75 | 3.1  | 3.75 | V    | $I_F=10\text{mA}$ |
| Viewing Angle                              | Cool White | $\phi$             | ---  | 120  | ---  | deg  | $I_F=10\text{mA}$ |
| Color                                      | Cool White | CIE x              | ---  | 0.3  | ---  | ---  | $I_F=10\text{mA}$ |
| Color                                      | Cool White | CIE y              | ---  | 0.3  | ---  | ---  | $I_F=10\text{mA}$ |
| Thermal Resistance<br>(Junction to Solder) | Real       | $R_{th\ JS\ real}$ | ---  | 130  | ---  | K/W  | $I_F=10\text{mA}$ |
|  | Electrical | $R_{th\ JS\ el}$   | ---  | 90   | ---  |      |                   |

## Notes:

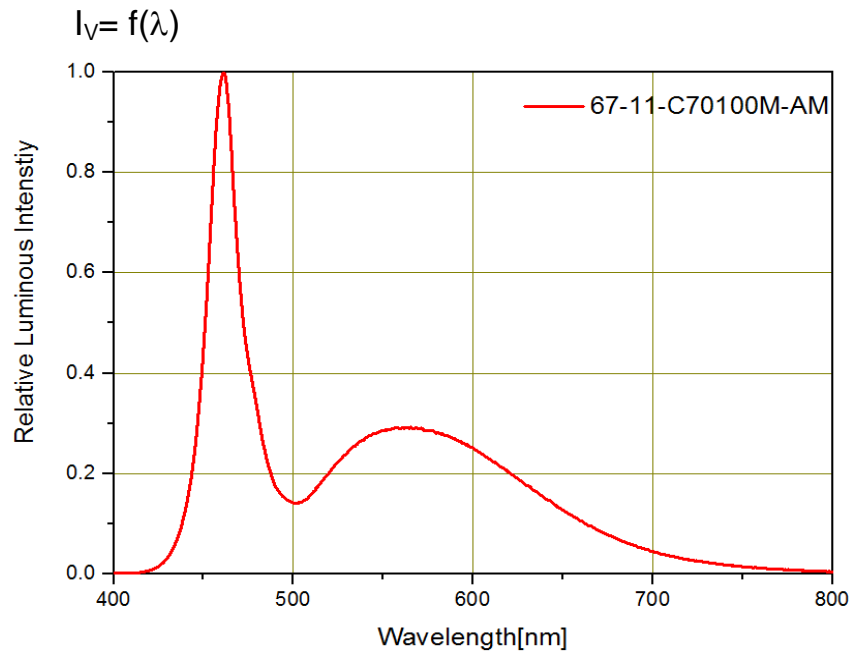
1. Luminous Intensity measurement tolerance:  $\pm 8\%$ .
2. The data of Luminous Intensity measured at thermal pad=25°C
3. Typical luminous Intensity or light output performance is operated within the condition guided by this datasheet.
4. Forward voltage measurement tolerance:  $\pm 0.05\text{V}$
5. The  $V_F$  range shown in the table above indicates 99% output.
6. Tolerance of Chromaticity Coordinates x,y:  $\pm 0.005$

## 2. Absolute Maximum Ratings

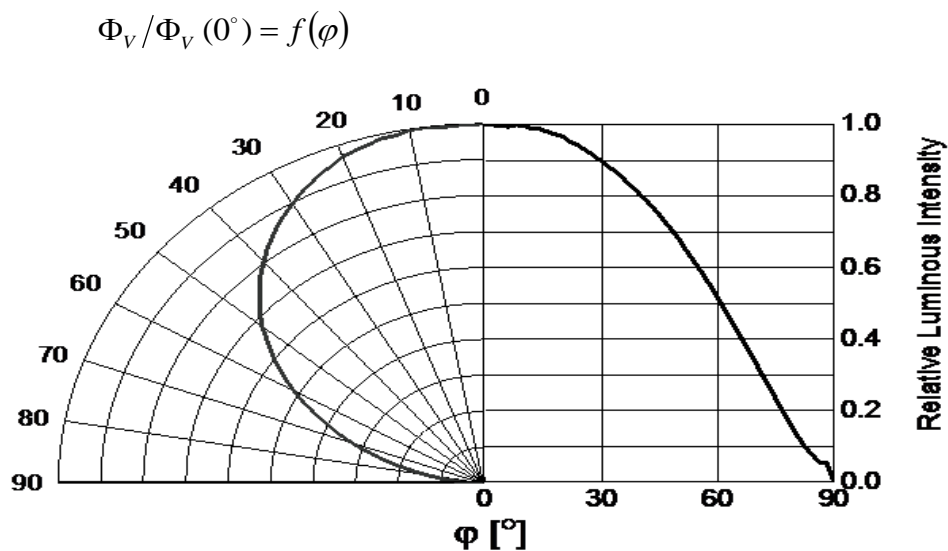
| Parameter   | Symbol      | Ratings                            | Unit       |
|---|-------------|------------------------------------|------------|
| Power Dissipation   | $P_d$       | 112                                | mW         |
| Forward Current   | $I_F$       | 2~30                               | mA         |
| Surge Current<br>( $t \leq 10 \mu s$ ; $D=0.005$ ; $T_s=25^\circ C$ ) | $I_{FM}$    | 250                                | mA         |
| Reverse Voltage   | $V_R$       | Not designed for reverse operation | V          |
| Junction Temperature  | $T_J$       | 125                                | $^\circ C$ |
| Operating Temperature   | $T_{opr}$   | -40 ~ +110                         | $^\circ C$ |
| Storage Temperature   | $T_{stg}$   | -40 ~ +110                         | $^\circ C$ |
| ESD Sensitivity<br>( $R=1.5k\Omega$ , $C=100pF$ )                     | $ESD_{HBM}$ | 8                                  | kV         |
| Soldering Temperature   | Reflow      | 260 $^\circ C$ for 30sec           | $^\circ C$ |

### 3.Characteristics Graph

**Wavelength Characteristics Relative Spectral Distribution**  
@ Ts = 25°C, If=10mA, RH=30%



**Typical Diagram Characteristics of Radiation**

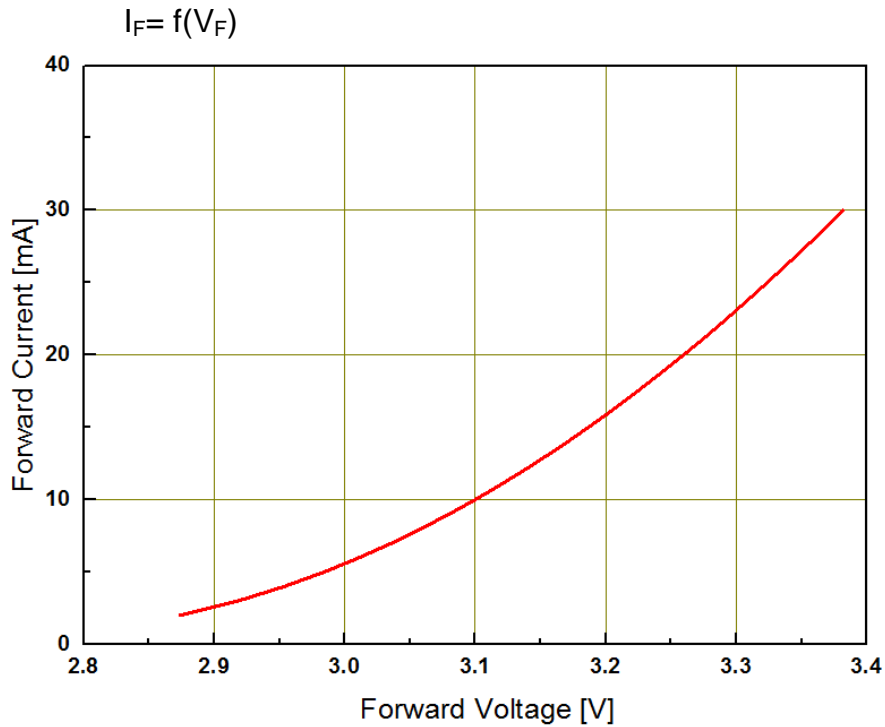


**Notes:**

1.  $\varphi$  is the off axis angle from lamp centerline where the luminous intensity is 1/2 of the peak value.

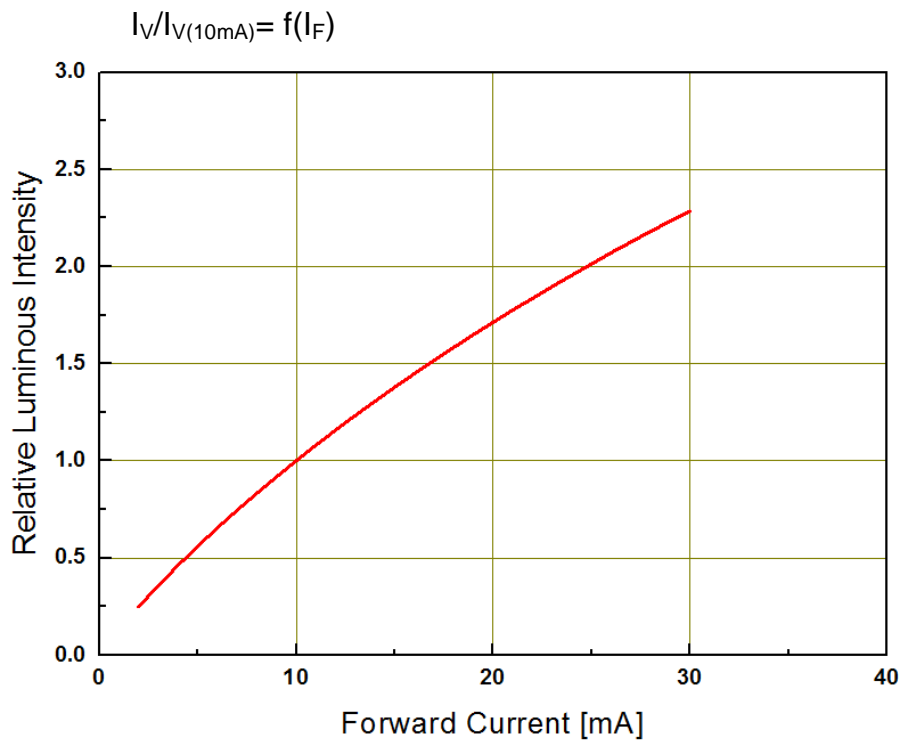
### Forward Current vs. Forward Voltage

@ Ts = 25°C



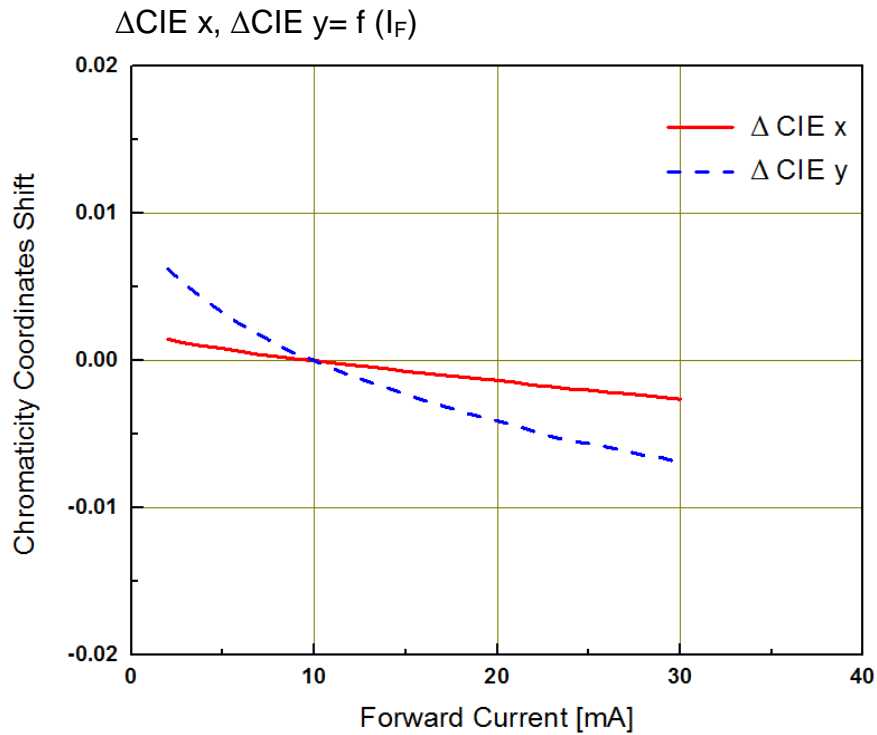
### Relative Luminous Intensity vs. Forward Current

@ Ts = 25°C



### Chromaticity Coordinates Shift vs. Forward Current

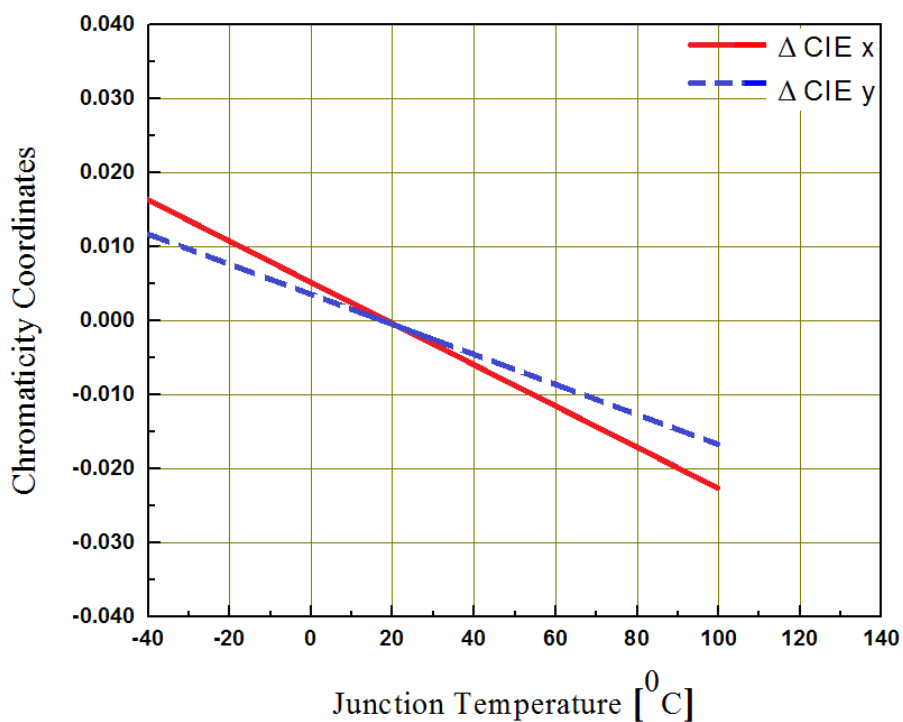
@  $T_s = 25^\circ\text{C}$



### Chromaticity Coordinates Shift vs. Junction Temperature

@  $I_F = 10\text{mA}$

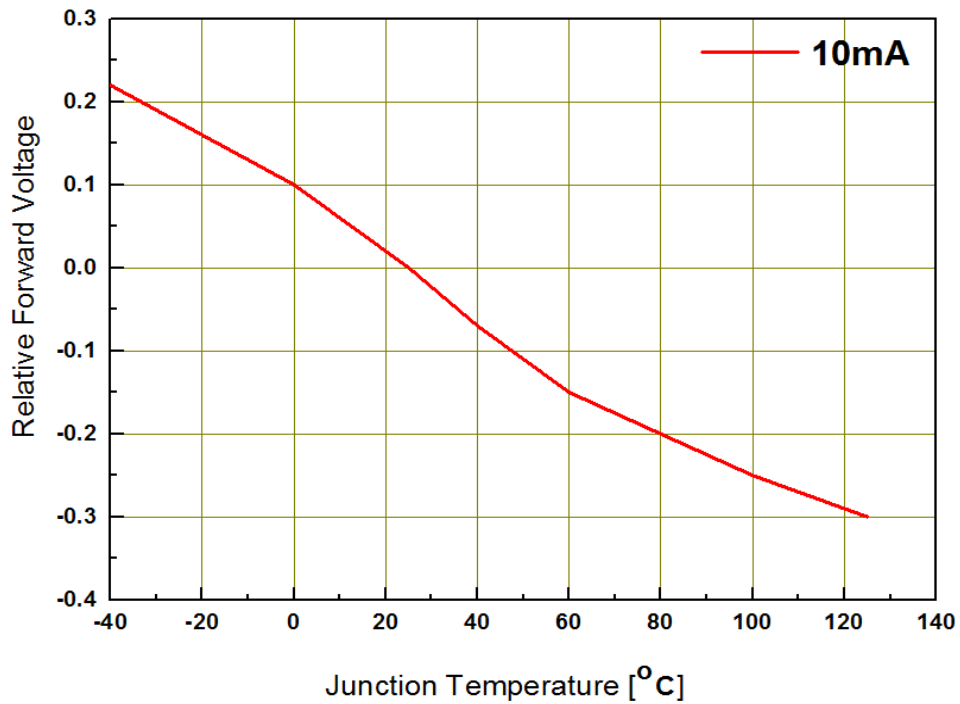
$\Delta\text{CIE } x, \Delta\text{CIE } y (T_{J,25^\circ\text{C}}) = f(T_J)$



### Relative Forward Voltage vs. Junction Temperature

@  $I_F=10\text{mA}$

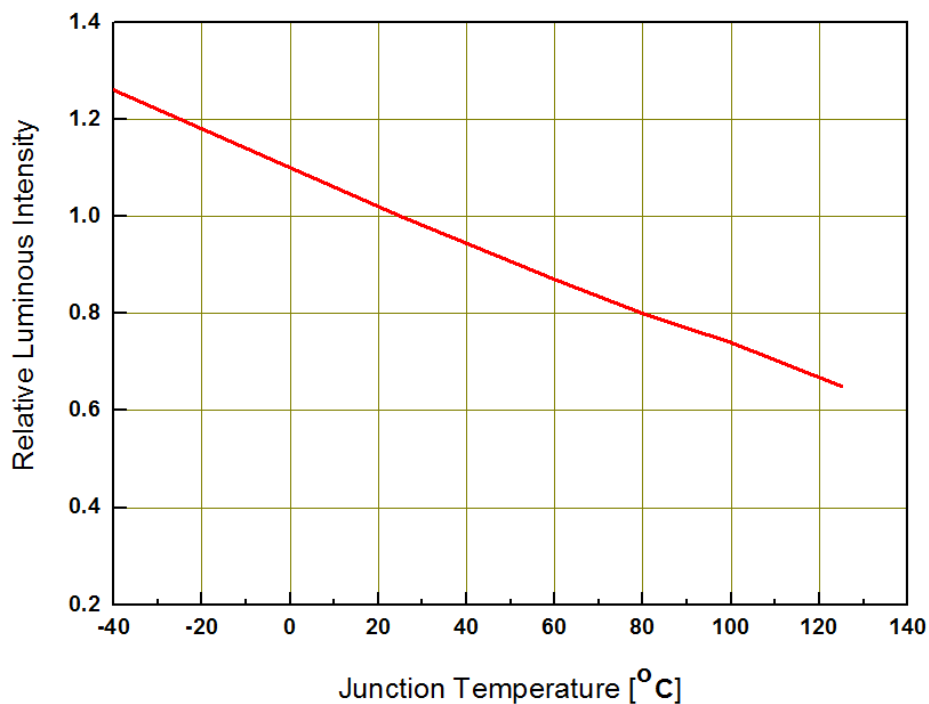
$$V_F - V_F(T_J, 25^\circ\text{C}) = f(T_J)$$



### Relative Luminous Intensity vs. Junction Temperature

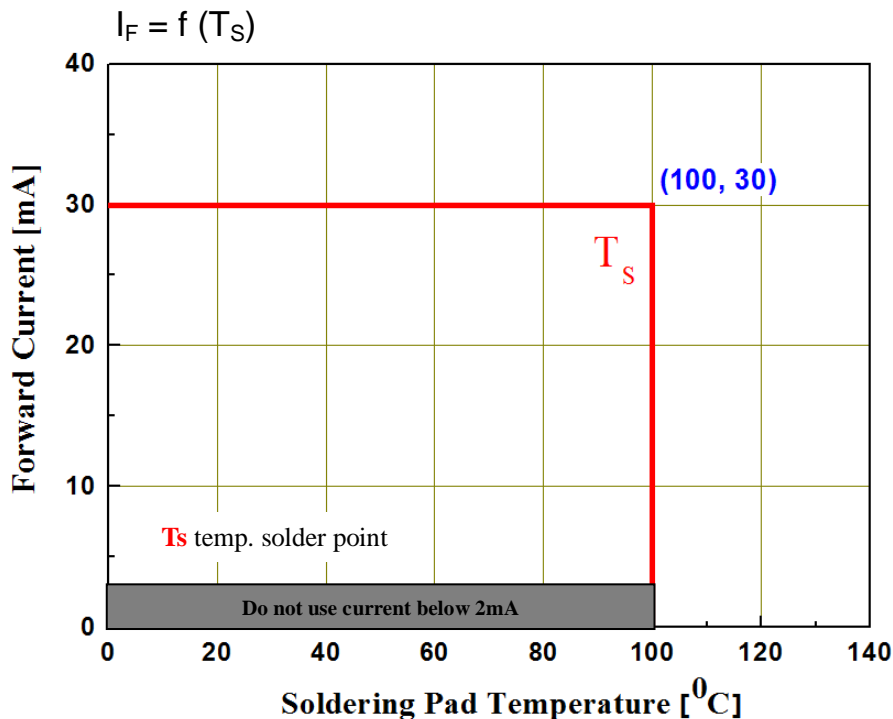
@  $I_F=10\text{mA}$

$$I_V / I_V(T_J, 25^\circ\text{C}) = f(T_J)$$



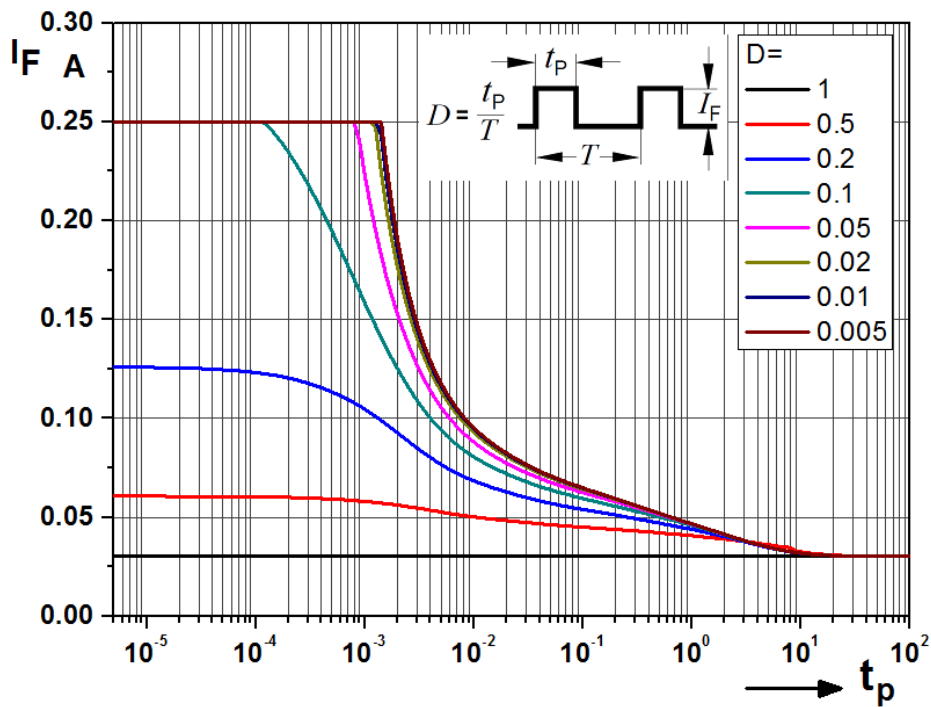


### Forward Current Derating Curve



### Permissible Pulse Handling Capability

$I_F = f(t_p)$ ;  $D$ =Duty cycle;  $T_A=25^{\circ}$ C



## 4. Binning Information

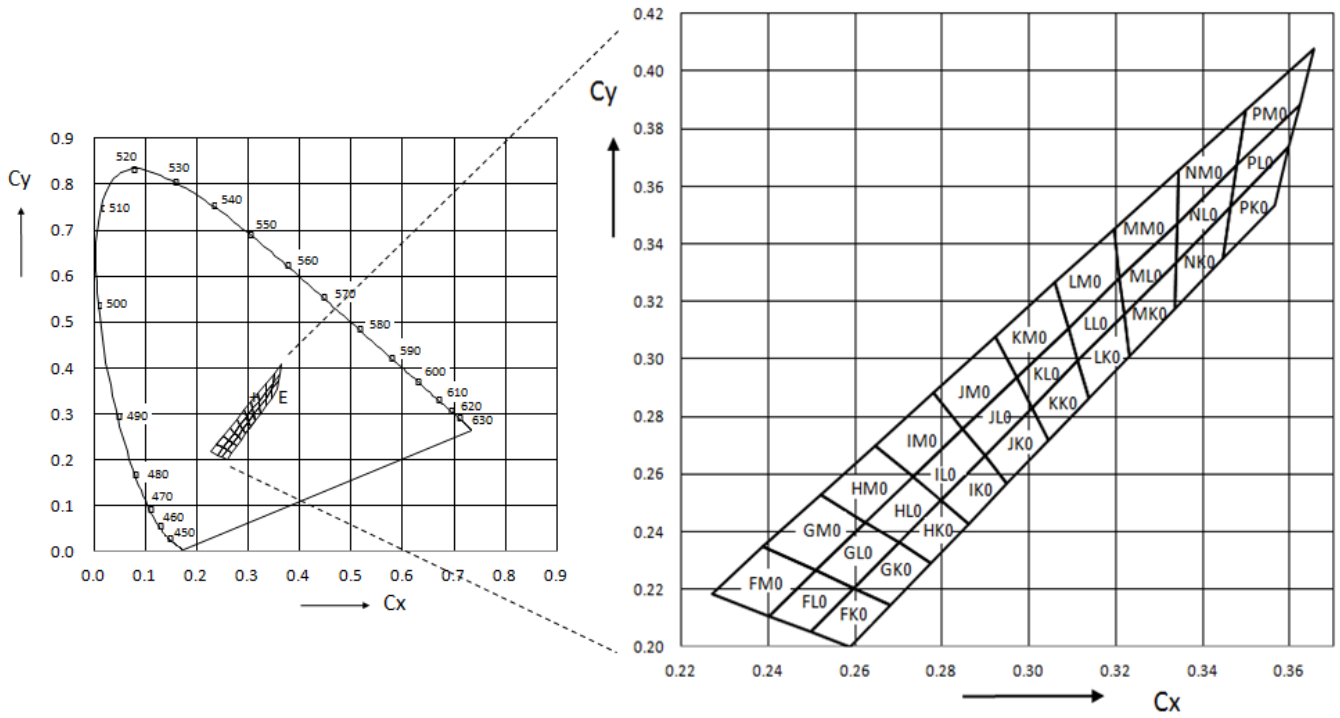
### Luminous Intensity Bins

| Group Bin | Minimum Luminous Intensity (mcd) | Maximum Luminous Intensity (mcd) |
|-----------|----------------------------------|----------------------------------|
| L1        | 11.2                             | 14                               |
| L2        | 14                               | 18                               |
| M1        | 18                               | 22.4                             |
| M2        | 22.4                             | 28                               |
| N1        | 28                               | 35.5                             |
| N2        | 35.5                             | 45                               |
| P1        | 45                               | 56                               |
| P2        | 56                               | 71                               |
| Q1        | 71                               | 90                               |
| Q2        | 90                               | 112                              |
| R1        | 112                              | 140                              |
| R2        | 140                              | 180                              |
| S1        | 180                              | 224                              |
| S2        | 224                              | 280                              |
| T1        | 280                              | 355                              |
| T2        | 355                              | 450                              |
| U1        | 450                              | 560                              |
| U2        | 560                              | 710                              |
| V1        | 710                              | 900                              |
| V2        | 900                              | 1120                             |
| AA        | 1120                             | 1400                             |
| AB        | 1400                             | 1800                             |
| BA        | 1800                             | 2240                             |
| BB        | 2240                             | 2800                             |
| CA        | 2800                             | 3550                             |
| CB        | 3550                             | 4500                             |
| DA        | 4500                             | 5600                             |
| DB        | 5600                             | 7100                             |
| EA        | 7100                             | 9000                             |
| EB        | 9000                             | 11200                            |
| FA        | 11200                            | 14000                            |
| FB        | 14000                            | 18000                            |
| GA        | 18000                            | 22400                            |

**Notes:**

1. Luminous flux measurement tolerance:  $\pm 8\%$ .
2. Highlighted Black Box is available bins.

### White Color Bin Structure



**White Color Bin Coordinates**

| Bin Code | CIE_x  | CIE_y  | Bin Code | CIE_x  | CIE_y  |
|----------|--------|--------|----------|--------|--------|
| FK0      | 0.2589 | 0.2000 | NK0      | 0.3339 | 0.3336 |
|          | 0.2498 | 0.2053 |          | 0.3335 | 0.3172 |
|          | 0.2597 | 0.2204 |          | 0.3447 | 0.3347 |
|          | 0.2682 | 0.2146 |          | 0.3465 | 0.3530 |
| GK0      | 0.2682 | 0.2146 | PK0      | 0.3465 | 0.3530 |
|          | 0.2597 | 0.2204 |          | 0.3447 | 0.3347 |
|          | 0.2700 | 0.2361 |          | 0.3567 | 0.3535 |
|          | 0.2775 | 0.2292 |          | 0.3599 | 0.3735 |
| HK0      | 0.2775 | 0.2292 | FL0      | 0.2498 | 0.2053 |
|          | 0.2700 | 0.2361 |          | 0.2402 | 0.2108 |
|          | 0.2797 | 0.2509 |          | 0.2509 | 0.2264 |
|          | 0.2861 | 0.2427 |          | 0.2597 | 0.2204 |
| IK0      | 0.2861 | 0.2427 | GL0      | 0.2597 | 0.2204 |
|          | 0.2797 | 0.2509 |          | 0.2509 | 0.2264 |
|          | 0.2898 | 0.2664 |          | 0.2624 | 0.2431 |
|          | 0.2950 | 0.2568 |          | 0.2700 | 0.2361 |
| JK0      | 0.2950 | 0.2568 | HL0      | 0.2700 | 0.2361 |
|          | 0.2898 | 0.2664 |          | 0.2624 | 0.2431 |
|          | 0.3007 | 0.2830 |          | 0.2733 | 0.2590 |
|          | 0.3045 | 0.2717 |          | 0.2797 | 0.2509 |
| KK0      | 0.3045 | 0.2717 | IL0      | 0.2797 | 0.2509 |
|          | 0.3007 | 0.2830 |          | 0.2733 | 0.2590 |
|          | 0.3113 | 0.2992 |          | 0.2848 | 0.2757 |
|          | 0.3138 | 0.2862 |          | 0.2898 | 0.2664 |
| LK0      | 0.3138 | 0.2862 | JL0      | 0.2898 | 0.2664 |
|          | 0.3113 | 0.2992 |          | 0.2848 | 0.2757 |
|          | 0.3219 | 0.3154 |          | 0.2971 | 0.2935 |
|          | 0.3231 | 0.3008 |          | 0.3007 | 0.2830 |
| MK0      | 0.3339 | 0.3336 | KL0      | 0.3007 | 0.2830 |
|          | 0.3219 | 0.3154 |          | 0.2971 | 0.2935 |
|          | 0.3231 | 0.3008 |          | 0.3090 | 0.3108 |
|          | 0.3335 | 0.3172 |          | 0.3113 | 0.2992 |

### White Color Bin Coordinates

| Bin Code | CIE_x  | CIE_y  | Bin Code | CIE_x  | CIE_y  |
|----------|--------|--------|----------|--------|--------|
| LL0      | 0.3113 | 0.2992 | IM0      | 0.2733 | 0.2590 |
|          | 0.3090 | 0.3108 |          | 0.2646 | 0.2700 |
|          | 0.3209 | 0.3281 |          | 0.2780 | 0.2883 |
|          | 0.3219 | 0.3154 |          | 0.2848 | 0.2757 |
| ML0      | 0.3341 | 0.3472 | JM0      | 0.2848 | 0.2757 |
|          | 0.3209 | 0.3281 |          | 0.2780 | 0.2883 |
|          | 0.3219 | 0.3154 |          | 0.2922 | 0.3077 |
|          | 0.3339 | 0.3336 |          | 0.2971 | 0.2935 |
| NL0      | 0.3341 | 0.3472 | KM0      | 0.2971 | 0.2935 |
|          | 0.3339 | 0.3336 |          | 0.2922 | 0.3077 |
|          | 0.3465 | 0.3530 |          | 0.3060 | 0.3266 |
|          | 0.3479 | 0.3673 |          | 0.3090 | 0.3108 |
| PL0      | 0.3479 | 0.3673 | LM0      | 0.3090 | 0.3108 |
|          | 0.3465 | 0.3530 |          | 0.3060 | 0.3266 |
|          | 0.3599 | 0.3735 |          | 0.3196 | 0.3451 |
|          | 0.3623 | 0.3882 |          | 0.3209 | 0.3281 |
| FM0      | 0.2388 | 0.2348 | MM0      | 0.3345 | 0.3654 |
|          | 0.2269 | 0.2185 |          | 0.3196 | 0.3451 |
|          | 0.2402 | 0.2108 |          | 0.3209 | 0.3281 |
|          | 0.2509 | 0.2264 |          | 0.3341 | 0.3472 |
| GM0      | 0.2509 | 0.2264 | NM0      | 0.3345 | 0.3654 |
|          | 0.2388 | 0.2348 |          | 0.3341 | 0.3472 |
|          | 0.2520 | 0.2527 |          | 0.3479 | 0.3673 |
|          | 0.2624 | 0.2431 |          | 0.3498 | 0.3863 |
| HM0      | 0.2624 | 0.2431 | PM0      | 0.3498 | 0.3863 |
|          | 0.2520 | 0.2527 |          | 0.3479 | 0.3673 |
|          | 0.2646 | 0.2700 |          | 0.3623 | 0.3882 |
|          | 0.2733 | 0.2590 |          | 0.3655 | 0.4079 |

### Forward Voltage Bins

| Bin code | Forward Voltage [V] |
|----------|---------------------|
| 10       | 1.00                |
| 12       | 1.25                |
| 15       | 1.50                |
| 17       | 1.75                |
| 20       | 2.00                |
| 22       | 2.25                |
| 25       | 2.50                |
| 27       | 2.75                |
| 30       | 3.00                |
| 32       | 3.25                |
| 35       | 3.50                |
| 37       | 3.75                |
| 40       | 4.00                |
| 42       | 4.25                |
| 45       | 4.50                |
| 47       | 4.75                |
| 50       | 5.00                |
| 52       | 5.25                |
| 55       | 5.50                |
| 57       | 5.75                |
| 60       | 6.00                |
| 62       | 6.25                |
| 65       | 6.50                |
| 67       | 6.75                |
| 70       | 7.00                |

**Notes:**

1. Forward voltage measurement tolerance:  $\pm 0.05V$ .
2. Forward voltage bins are defined at  $I_F = 10mA$  operation.

## 5.Part Number

### 67-11-C70100M-AM

Part number is designated with below details.

67-11 = Product family name.

C = Color <sup>[1]</sup>

7 = CRI (0=N/A; >70%=7; >80%=8; >90%=9)

010 = Test current [mA]

0 = Lead Frame Type (0=Ag; 1=Au)

M = Brightness Level (H=High; M=Medium ; L=Low)

AM = Automotive application

Note

<sup>[1]</sup> Color :

| Symbol | Description              |
|--------|--------------------------|
| C      | Cool White               |
| N      | Neutral White            |
| W      | Warm White               |
| PA     | Phosphor Converted Amber |
| PR     | Phosphor Converted Red   |
| UB     | Blue                     |
| IB     | Ice Blue                 |
| SB     | Sky Blue                 |
| UG     | Green                    |
| UY     | Yellow                   |
| UA     | Amber                    |
| UR     | Red                      |
| SR     | Super Red                |
| RGB    | RGB-Color                |

## 6. Ordering Information

### 67-11-C70100M-**ABCDEFGHIJKLMNO**-PQ-AM

| Part Number of the 67-11           | Order Code                         |
|------------------------------------|------------------------------------|
| 67-11-C70100M-AM                   | 67-11-C70100M-PM0FK0S2U22737-2T-AM |
|                                    | 67-11-C70100M-HM0FLOs2U22737-2T-AM |
|                                    | 67-11-C70100M-JM0HLOs2U22737-2T-AM |
|                                    | 67-11-C70100M-MM0KLOs2U22737-2T-AM |
|                                    | 67-11-C70100M-PM0MLOs2U22737-2T-AM |
|                                    | 67-11-C70100M-HL0FK0S2U22737-2T-AM |
|                                    | 67-11-C70100M-JL0HK0S2U22737-2T-AM |
|                                    | 67-11-C70100M-ML0KK0S2U22737-2T-AM |
|                                    | 67-11-C70100M-PL0MK0S2U22737-2T-AM |
|                                    | 67-11-C70100M-HM0FM0S2U22737-2T-AM |
|                                    | 67-11-C70100M-KM0IM0S2U22737-2T-AM |
|                                    | 67-11-C70100M-NM0LM0S2U22737-2T-AM |
|                                    | 67-11-C70100M-HL0FLOs2U22737-2T-AM |
|                                    | 67-11-C70100M-KL0ILOs2U22737-2T-AM |
|                                    | 67-11-C70100M-NL0LLOs2U22737-2T-AM |
|                                    | 67-11-C70100M-HK0FK0S2U22737-2T-AM |
|                                    | 67-11-C70100M-KK0IK0S2U22737-2T-AM |
| 67-11-C70100M-NK0LK0S2U22737-2T-AM |                                    |

Order code contains information with below details :

ABCDEF = min/max wavelength or CCT

GHJK = min./max. luminous flux in [lm] or luminous intensity in [mcd]

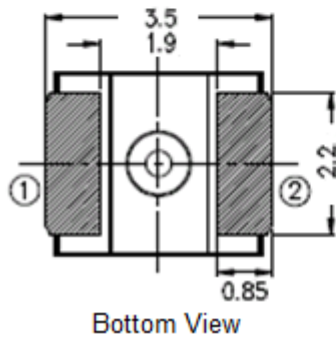
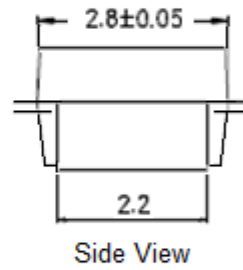
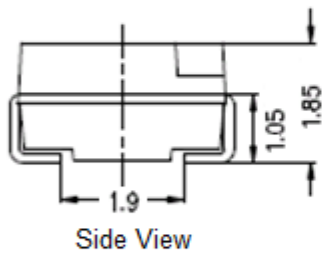
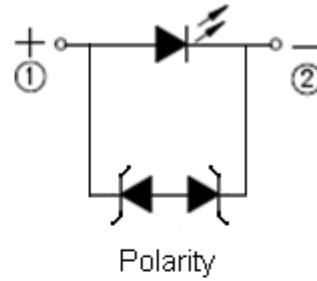
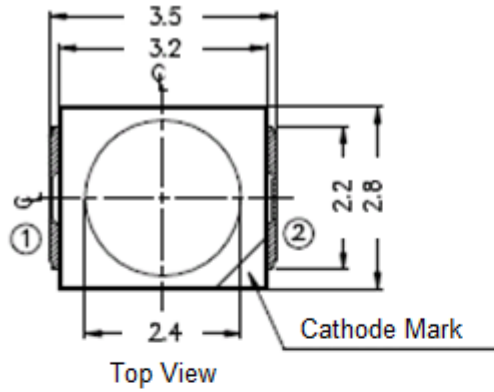
LMNO = min./max. forward voltage

PQ = internal code

AM = Automotive Application



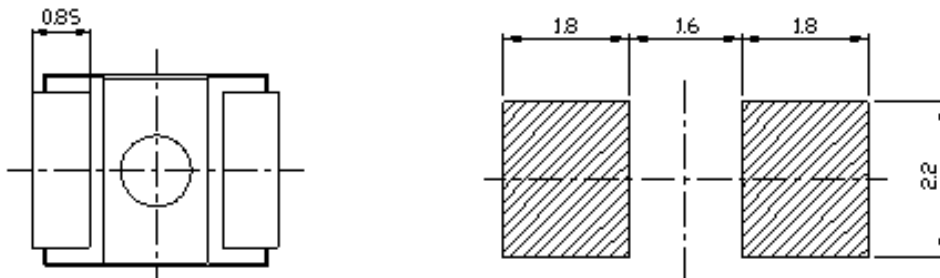
## 7. Mechanical Dimension



**Notes:**

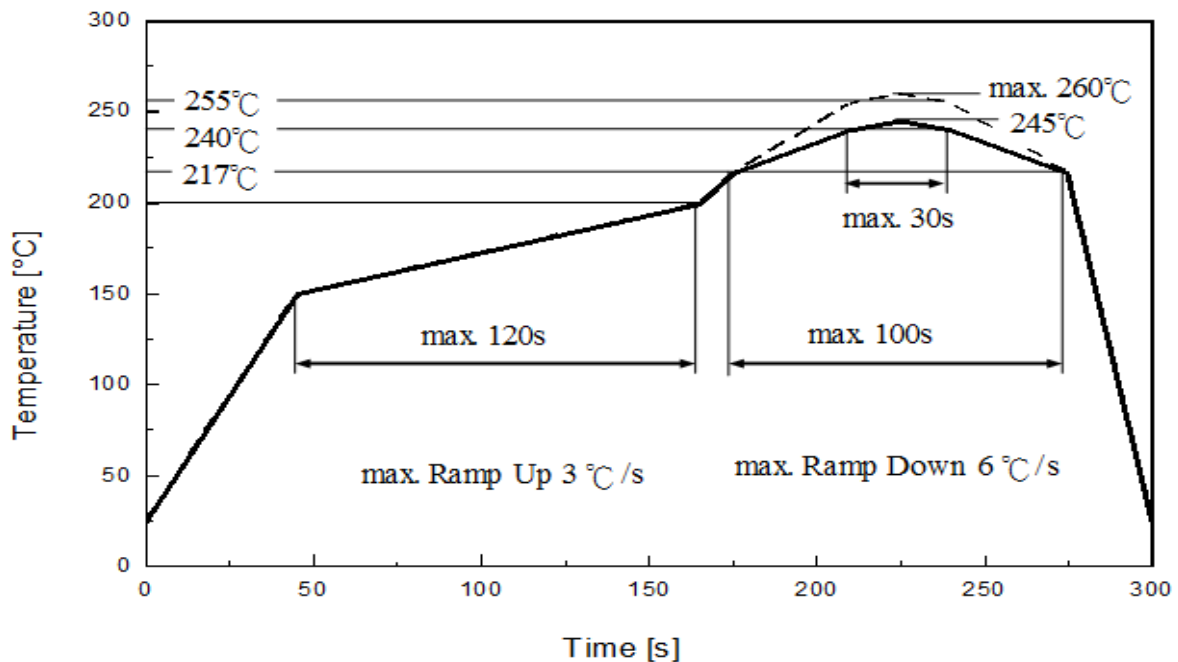
1. Dimensions are in millimeters.
2. Tolerances unless mentioned are  $\pm 0.1\text{mm}$ .

## 8.Recommended Soldering Pad



## 9.Reflow Soldering Profile

Soldering Condition (Reference: IPC/JEDEC J-STD-020D)



| Profile Feature                                      | Pb-Free Assembly | Unit    |
|--|------------------|---------|
|  | Recommendation   |         |
| Ramp-up rate to preheat<br>25 °C to 150 °C           | 3                | °C /sec |
| Time of soaking zone<br>150 °C to 200 °C             | 120              | sec     |
| Ramp-up rate to peak                                 | 3                | °C /sec |
| Liquidus temperature                                 | 217              | °C      |
| Time above liquidus temperature                      | 100              | sec     |
| Peak temperature (max.)                              | 260              | °C      |
| Time within 5°C of the specified peak<br>temperature | 30               | sec     |
| Ramp-down Rate (max.)                                | 6                | °C /sec |

## 10. Packaging Information

### ● Product Labeling

RoHS **(Pb) EVERLIGHT** 5

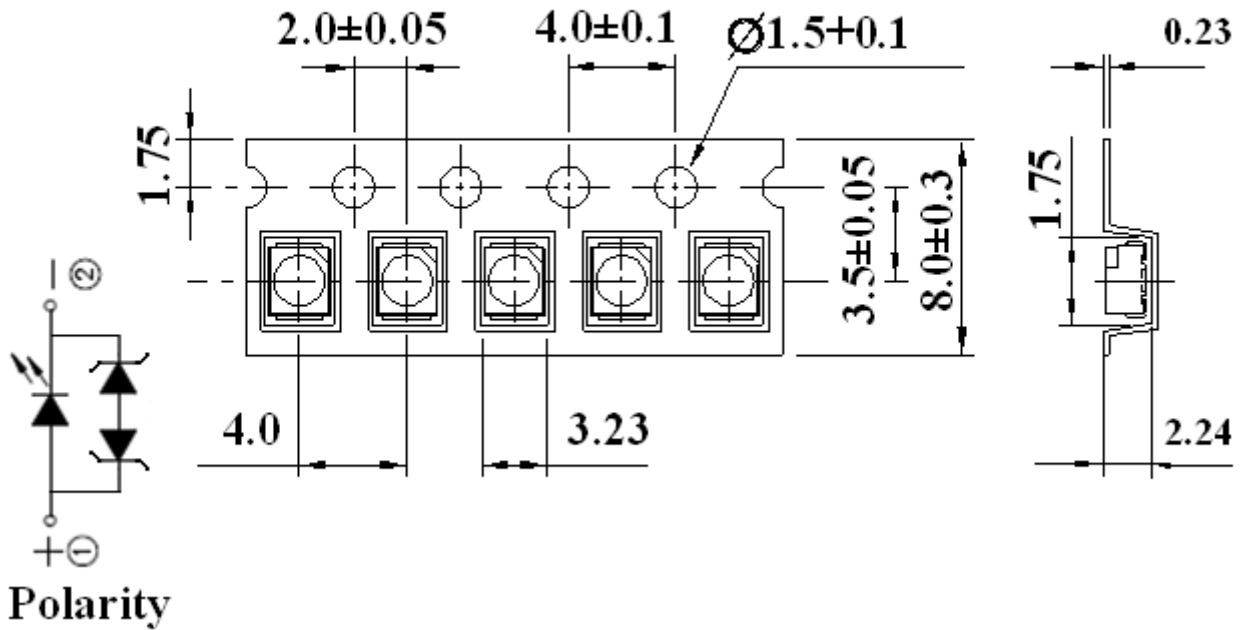
CPN: XXXXXXXXXXXXXXXXXXXX  
 XXXXXXXXXXXX-XXXXXXXXXX-XXXXXXXXXX-XXXXXX  
 P/N: XXXXXXXXXXXX  
 XXXXXXXXXXXX-XXXXXXXXXX-XXXXXXXXXX-XXXXXX  
 LOT No: Y150716XXX-XXXXXXXXXX-XXXXXXXXXX  
 QTY: 0123456789 HUE: XXXXXXXXXXXX  
 CAT: XXXXXXXXXXXX REF: XXXXXXXXXXXX  
 REFERENCE: BTPYMMDDXXXXX  
 MSL-X MADE IN XXXXXXX



- CPN : Customer's Product Number
- P/N : Everlight Part Number
- QTY : Packing Quantity
- CAT : Luminous Flux (Brightness) Bin
- HUE : Color Bin
- REF : Forward Voltage Bin
- LOT No : Lot Number

### ● Packing: Loaded Quantity 2000 pcs Per Reel

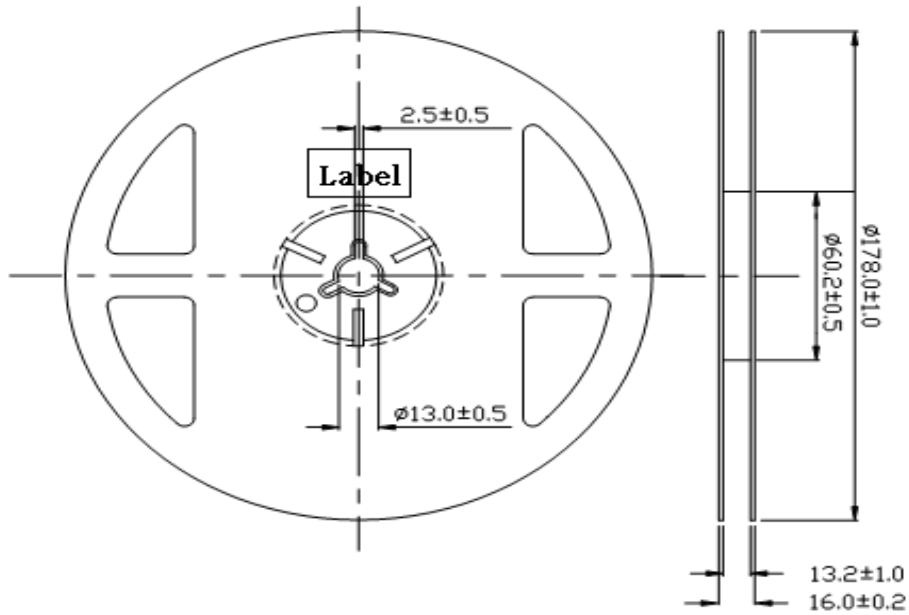
Progressive direction



#### Notes:

1. Dimensions are in millimeters.
2. Tolerances for fixed dimensions are ±0.2mm.

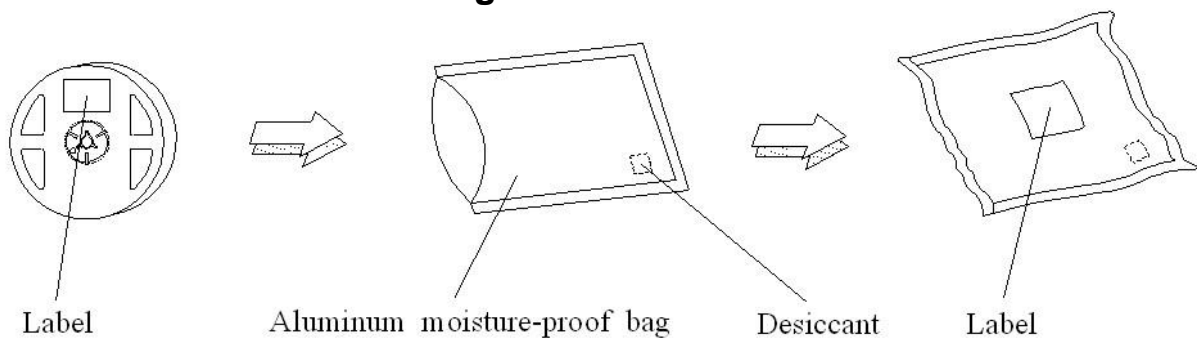
### ● Reel Dimensions



**Notes:**

1. Dimensions are in millimeters.
2. Tolerances unless mentioned are  $\pm 0.2$ mm.

### ● Moisture Resistant Packing Process



**Notes:**

1. Dimensions are in millimeters.
2. Tolerances unless mentioned are  $\pm 0.2$ mm.

## 11. Precaution for Use

### 1. Over-current-proof

Customer must apply resistors for protection; otherwise slight voltage shift will cause big current change (burn out will happen).

### 2. Assemblies

Do not stack assemblies containing LEDs to prevent damage to the optical surface of LEDs. Forces applied to the optical surface may result in the surface being damaged.

### 3. Soldering Condition

3.1 When soldering, do not put stress on the LEDs during heating.

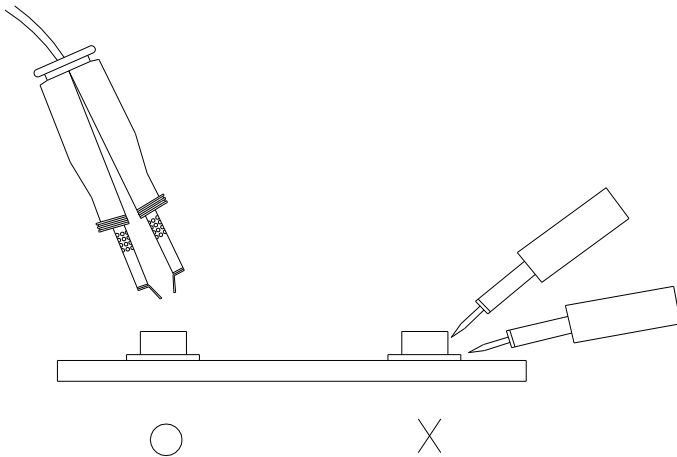
3.2 After soldering, do not warp the circuit board.

### 4. Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 350°C for 3 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.

### 5. Repairing

Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.



## Revision History

Current version: May.25.2017

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Version: 4

Created by: Tini Lin

| Rev. | Subjects (major change in previous version)                       | Modified date |
|------|---|---------------|
| 1    | Preliminary   | 2016/10/14    |
| 2    | Approved  | 2016/11/22    |
| 3    | Part Number is 67-11-C70100M-AM                                   | 2016/12/30    |
| 4    | Add MSL, surge current, Permissible Pulse Handling Capability fig | 2017/05/25    |
|      |   |               |
|      |   |               |