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## Features

- Package : Top View LED in Slug Type
- Size : 1.8(W) X 1.8(L) X 0.8(T) mm
- Power : 2W (700mA, 2.9V)
- Viewing Angle : $2\theta_{1/2}$ = 120deg
- Color : White

## Description

AT18SNW Series are high power white LED devices which are materialized by combining blue chip and special phosphors. This feature makes the LED ideal for light guide application.

## Applications

- Coupling into light guides
- Optical indicator
- Interior automotive lighting
- Indoor General Lighting
- Retrofits and Fixtures

SMD 1818 Top View LED(White)
Device No. : AT18SNW

## Table of Contents






Document Revision V3. 2017.03.01

# 1. Specifications

## ■ Absolute Maximum Rating ($T_j$=85℃)

| Characteristics | Value | Unit |
|---|---|---|
| DC Forward Current | 1000 | mA |
| Power Dissipation | 3.4 | W |
| Peak Forward Current | 1500 | mA |
| DC Reverse Voltage | 5 | V |
| Storage Temperature | -40 ~ 125 | ℃ |
| Operating Temperature | -30 ~ 85 | ℃ |
| LED Junction Temperature | 150 | ℃ |

## ■ Product Characteristics

| Characteristics | Unit | Min. | Typ. | Max. |
|---|---|---|---|---|
| Thermal resistance, junction to solder point | ℃/W | | 10 | |
| Viewing angle(FWHM) | ° | | 115 | |
| Temperature coefficient of voltage | mV/℃ | | -2.5 | |
| DC forward current | mA | | 700 | 1000 |
| Reverse Current | mA | | | 5 |
| Forward voltage(@700mA) | V | | 3.0 | 3.4 |
| LED junction temperature Packaging (reflow) | ℃ | | | 150 |

## ■ Flux Characteristics – White

($T_j$=85℃)

| Color | CCT | | Base order codes minimum luminous flux@700mA | | Calculated minimum luminous flux(lm) |
|---|---|---|---|---|---|
| | Min. | Max. | Group | Flux(lm) @85℃ | 1000mA |
| 70 CRI Cool White | 6300K | 8000K | E12 | 230 | 305 |
| | | | E13 | 250 | 332 |
| | | | E14 | 270 | 359 |
| | | | E15 | 290 | 385 |
| 70 CRI Cool White | 4500K | 6000K | E12 | 230 | 305 |
| | | | E13 | 250 | 332 |
| | | | E14 | 270 | 359 |
| 80 CRI Cool White | 4500K | 6000K | E11 | 210 | 279 |
| | | | E12 | 230 | 305 |
| | | | E13 | 250 | 332 |
| 80 CRI Natural White | 3700K | 4500K | E11 | 210 | 279 |
| | | | E12 | 230 | 305 |
| | | | E13 | 250 | 332 |
| 80 CRI Warm White | 2600K | 3700K | E10 | 190 | 252 |
| | | | E11 | 210 | 279 |
| | | | E12 | 230 | 305 |

*Note

1) ALLIX maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity(CCx, CCy) measurements and ±2 on CRI measurements.
2) Calculated flux values are for reference only.

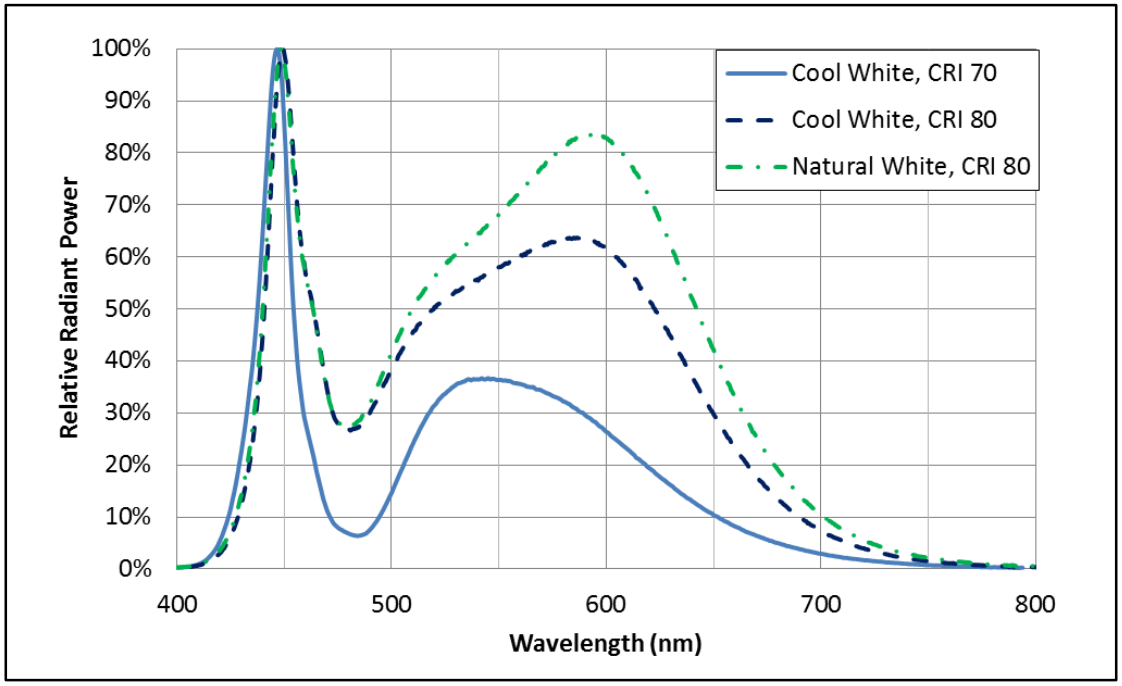
($T_j$=85℃)

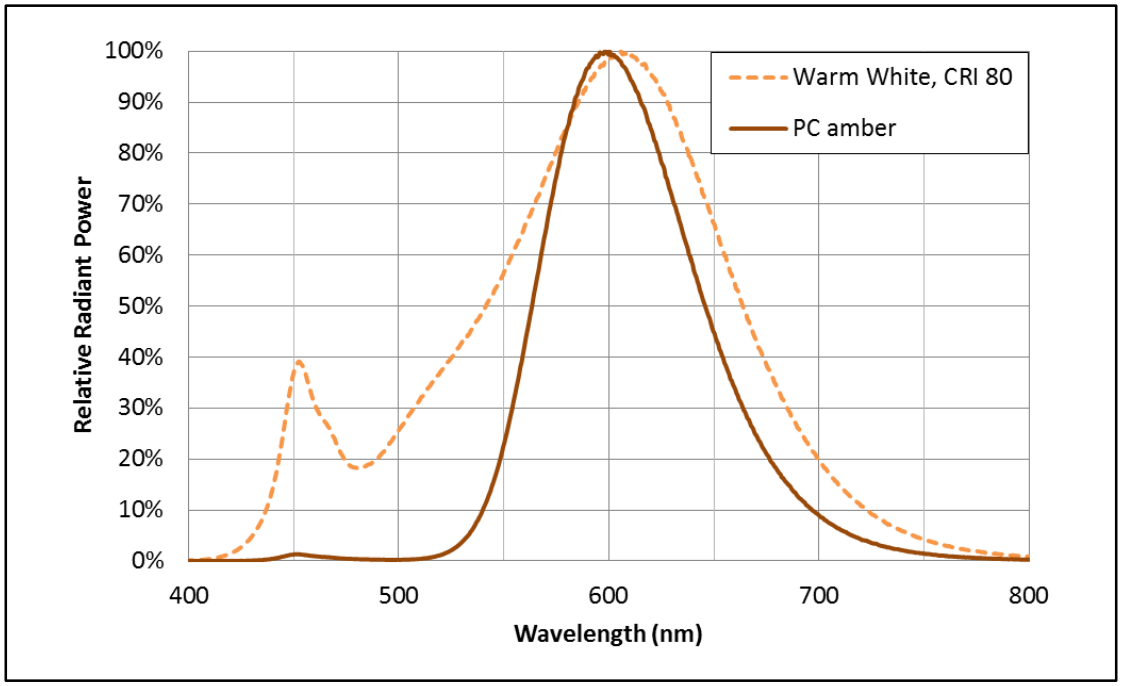
| Color | CCT | | Base order codes minimum luminous flux@700mA | | Calculated minimum luminous flux(lm) |
|---|---|---|---|---|---|
| | Min. | Max. | Group | Flux(lm) @85℃ | 1000mA |
| PC Amber | 1700K | 2000K | E07 | 130 | 167 |
| | | | E08 | 150 | 193 |

*Note
1) ALLIX maintains a tolerance of ±7% on flux and power measurements, ±0.005 on chromaticity(CCx, CCy) measurements and ±2 on CRI measurements.
2) Calculated flux values are for reference only.z

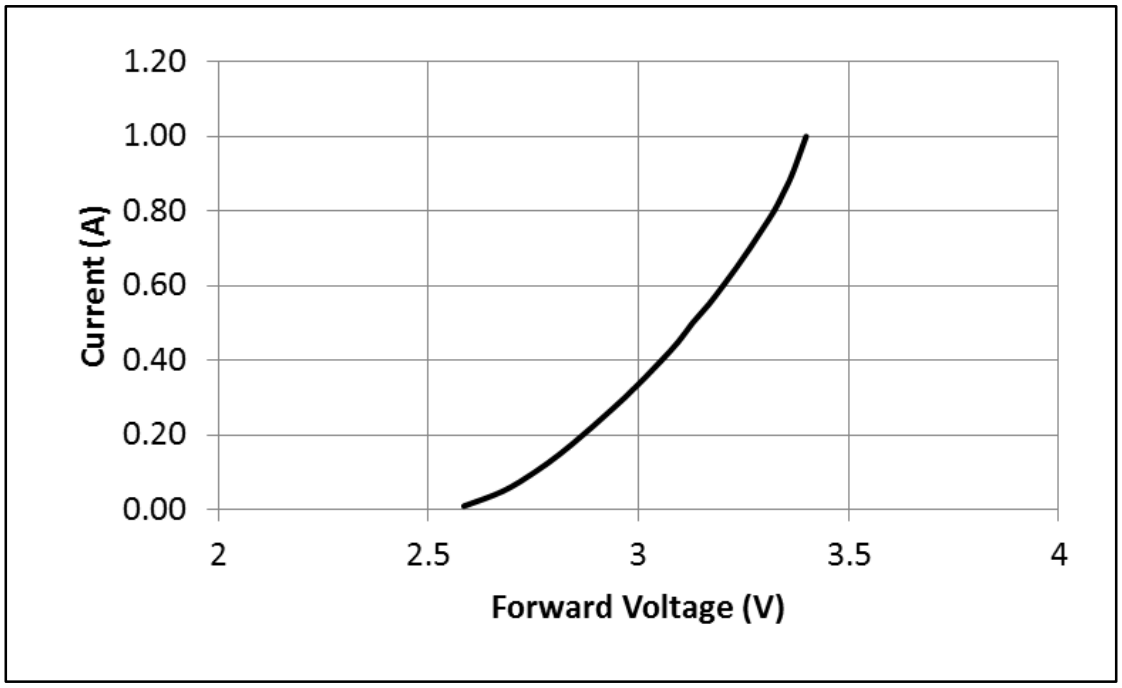
# 2. Characteristics Diagrams

## ■ Relative Spectral Power Distribution

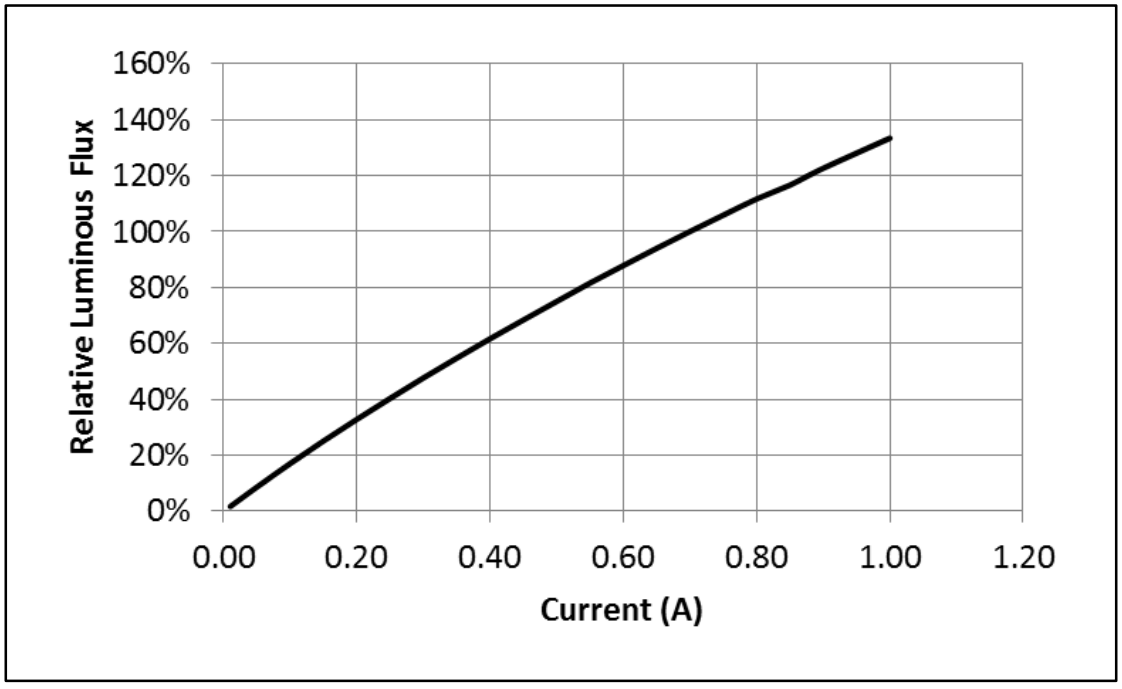


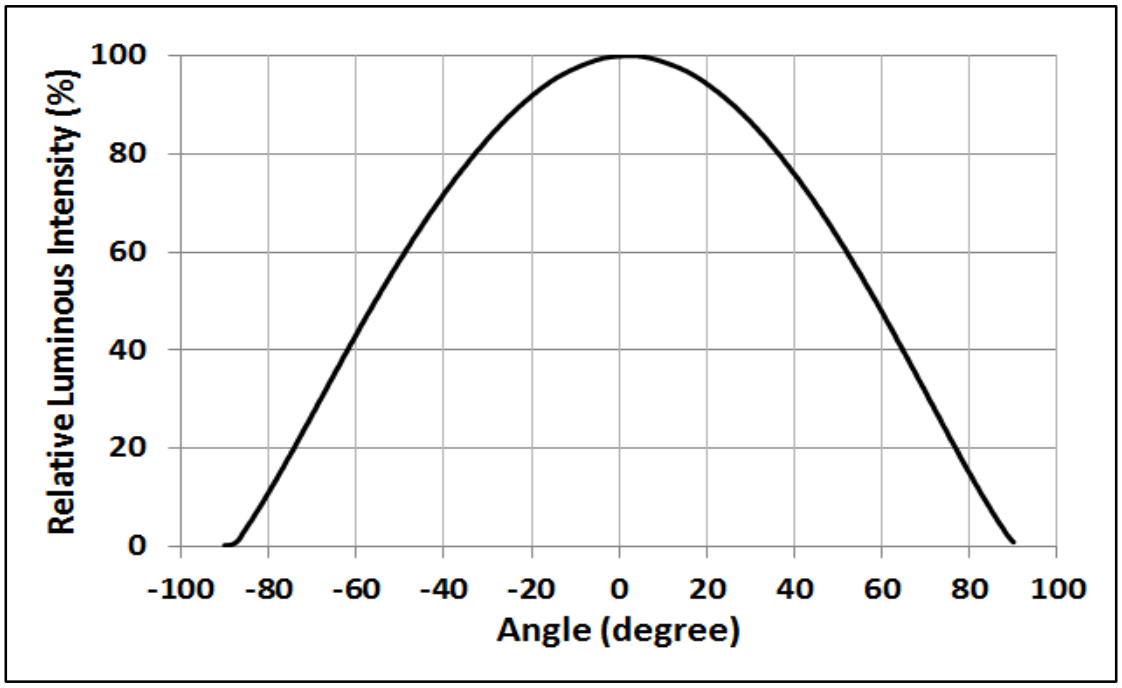
- **Electrical Characteristic ($T_j$=85℃)**



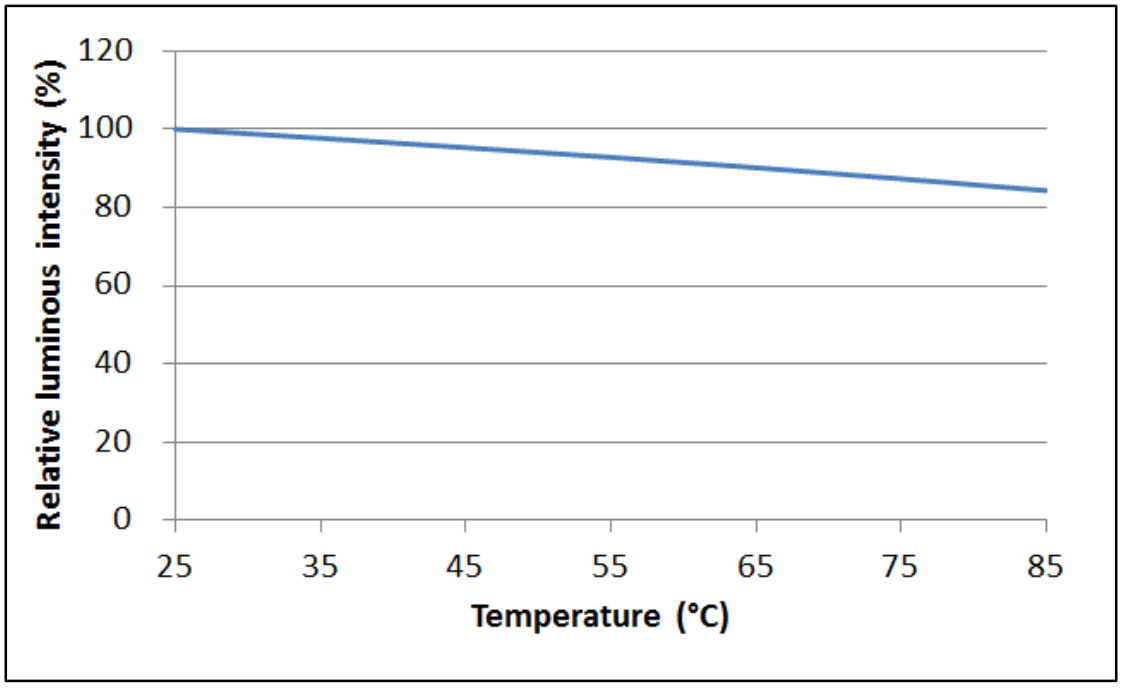

- **Relative Luminous Flux VS. Current ($T_j$=85℃)**



## ■ Typical Spatial Distribution




## ■ Relative Luminous Intensity VS. Temperature (If=700mA)



# 3. Color Rank

■ **Performance Groups – Brightness ($T_j$=85℃)**

| Group code | Min. Luminous Flux(lm) | Max. Luminous Flux(lm) |
|---|---|---|
| E07 | 130 | 150 |
| E08 | 150 | 170 |
| E09 | 170 | 190 |
| E10 | 190 | 210 |
| E11 | 210 | 230 |
| E12 | 230 | 250 |
| E13 | 250 | 270 |
| E14 | 270 | 290 |
| E15 | 290 | 310 |

■ **Performance Groups – Forward voltage ($T_j$=85℃)**

| Group code | Min. Luminous Flux(lm) | Max. Luminous Flux(lm) |
|---|---|---|
| M9 | 2.8 | 3.0 |
| MA | 3.0 | 3.2 |
| MB | 3.2 | 3.4 |

## ■ Performance Groups – Chromaticity

| Bin code | CCT | Bin | x1 | y1 | x2 | y2 | x3 | y3 | x4 | y4 |
|---|---|---|---|---|---|---|---|---|---|---|
| AA | 6300K-7000K | AAA | 0.3150 | 0.3440 | 0.3090 | 0.3385 | 0.3099 | 0.3329 | 0.3155 | 0.3385 |
| | | AAB | 0.3155 | 0.3385 | 0.3099 | 0.3329 | 0.3108 | 0.3273 | 0.3160 | 0.3330 |
| | | AAC | 0.3090 | 0.3385 | 0.3030 | 0.3330 | 0.3043 | 0.3273 | 0.3099 | 0.3329 |
| | | AAD | 0.3099 | 0.3329 | 0.3043 | 0.3273 | 0.3055 | 0.3215 | 0.3108 | 0.3273 |

| Bin code | CCT | Bin | X1 | y1 | x2 | y2 | X3 | y3 | x4 | y4 |
|---|---|---|---|---|---|---|---|---|---|---|
| AB | 6300K-7000K | ABA | 0.3160 | 0.3330 | 0.3108 | 0.3273 | 0.3116 | 0.3211 | 0.3165 | 0.3265 |
| | | ABB | 0.3165 | 0.3265 | 0.3116 | 0.3211 | 0.3125 | 0.3150 | 0.3170 | 0.3200 |
| | | ABC | 0.3108 | 0.3273 | 0.3055 | 0.3215 | 0.3068 | 0.3158 | 0.3116 | 0.3211 |
| | | ABD | 0.3116 | 0.3211 | 0.3068 | 0.3158 | 0.3080 | 0.3100 | 0.3125 | 0.3150 |

| Bin code | CCT | Bin | X1 | y1 | x2 | y2 | X3 | y3 | x4 | y4 |
|---|---|---|---|---|---|---|---|---|---|---|
| BA | 7000K-8000K | BAA | 0.3030 | 0.3330 | 0.2975 | 0.3270 | 0.2990 | 0.3216 | 0.3043 | 0.3273 |
| | | BAB | 0.3043 | 0.3273 | 0.2990 | 0.3216 | 0.3005 | 0.3163 | 0.3055 | 0.3215 |
| | | BAC | 0.3055 | 0.3215 | 0.3005 | 0.3163 | 0.3020 | 0.3109 | 0.3068 | 0.3158 |
| | | BAD | 0.3068 | 0.3158 | 0.3020 | 0.3109 | 0.3035 | 0.3055 | 0.3080 | 0.3100 |
| | | BAE | 0.2975 | 0.3270 | 0.2920 | 0.3210 | 0.2938 | 0.3160 | 0.2990 | 0.3216 |
| | | BAF | 0.2990 | 0.3216 | 0.2938 | 0.3160 | 0.2955 | 0.3110 | 0.3005 | 0.3163 |
| | | BAG | 0.3005 | 0.3163 | 0.2955 | 0.3110 | 0.2973 | 0.3060 | 0.3020 | 0.3109 |
| | | BAH | 0.3020 | 0.3109 | 0.2973 | 0.3060 | 0.2990 | 0.3010 | 0.3035 | 0.3055 |

| Bin code | Sub bin | X | y |
|---|---|---|---|
| 57 | 57A | 0.3215 | 0.3350 |
| | | 0.3290 | 0.3417 |
| | | 0.3290 | 0.3300 |
| | | 0.3222 | 0.3243 |
| | 57B | 0.3207 | 0.3462 |
| | | 0.3290 | 0.3538 |
| | | 0.3290 | 0.3417 |
| | | 0.3215 | 0.3350 |

| Bin code | Sub bin | X | y |
|---|---|---|---|
| 57 | 57C | 0.3290 | 0.3538 |
| | | 0.3376 | 0.3616 |
| | | 0.3371 | 0.3490 |
| | | 0.3290 | 0.3417 |
| | 57D | 0.3290 | 0.3417 |
| | | 0.3371 | 0.3490 |
| | | 0.3366 | 0.3369 |
| | | 0.3290 | 0.3300 |

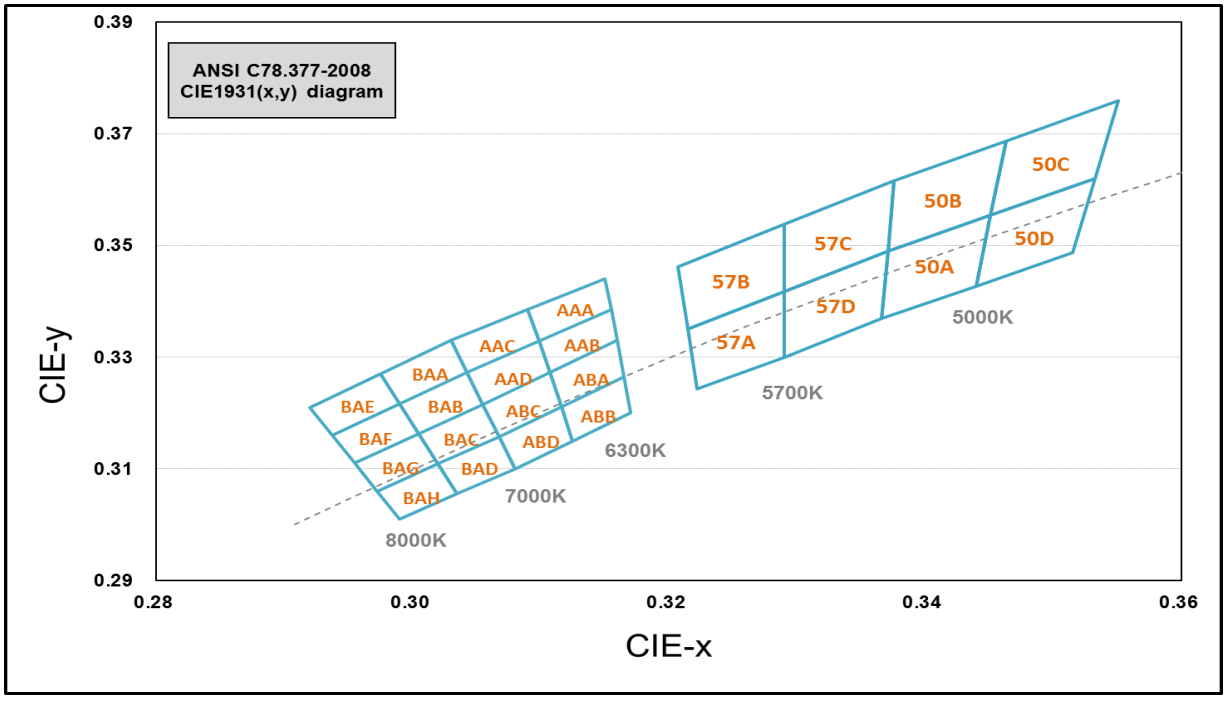
| Bin code | Sub Bin | X | y |
|---|---|---|---|
| 50 | 50A | 0.3371 | 0.3490 |
| | | 0.3451 | 0.3554 |
| | | 0.3440 | 0.3427 |
| | | 0.3366 | 0.3369 |
| | 50B | 0.3376 | 0.3616 |
| | | 0.3463 | 0.3687 |
| | | 0.3451 | 0.3554 |
| | | 0.3371 | 0.3490 |

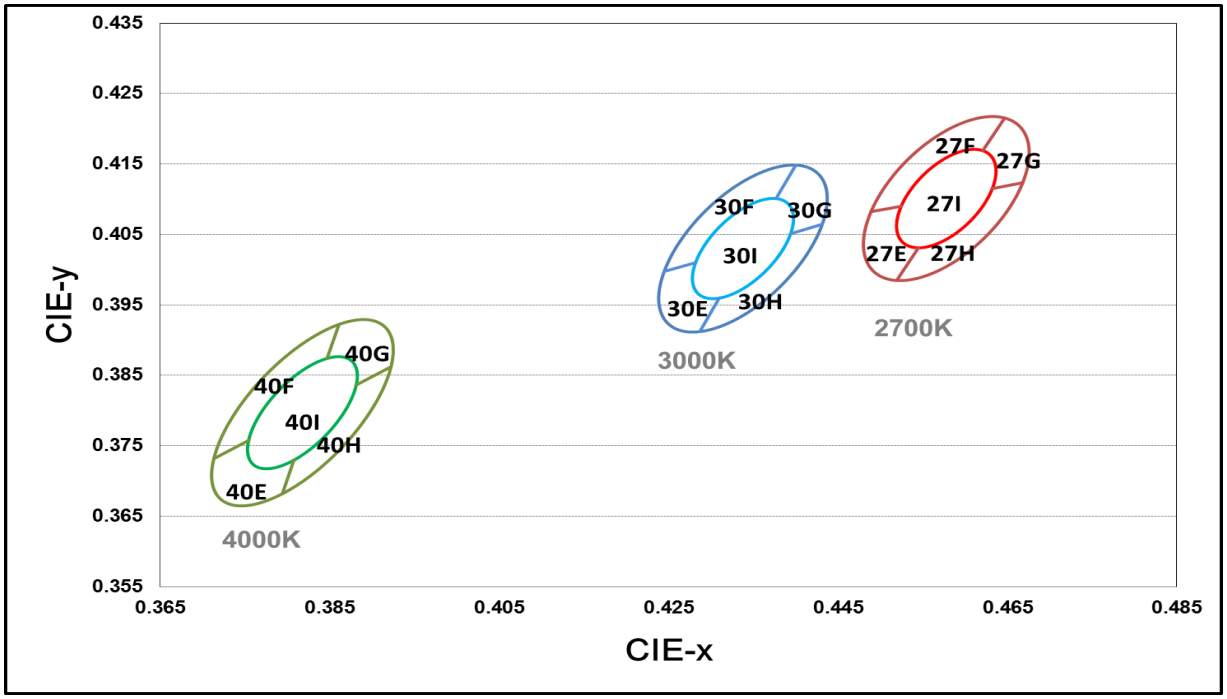
| Bin code | Sub bin | X | y |
|---|---|---|---|
| 50 | 50C | 0.3463 | 0.3687 |
| | | 0.3551 | 0.3760 |
| | | 0.3533 | 0.3620 |
| | | 0.3451 | 0.3554 |
| | 50D | 0.3451 | 0.3554 |
| | | 0.3533 | 0.3620 |
| | | 0.3515 | 0.3487 |
| | | 0.3440 | 0.3427 |

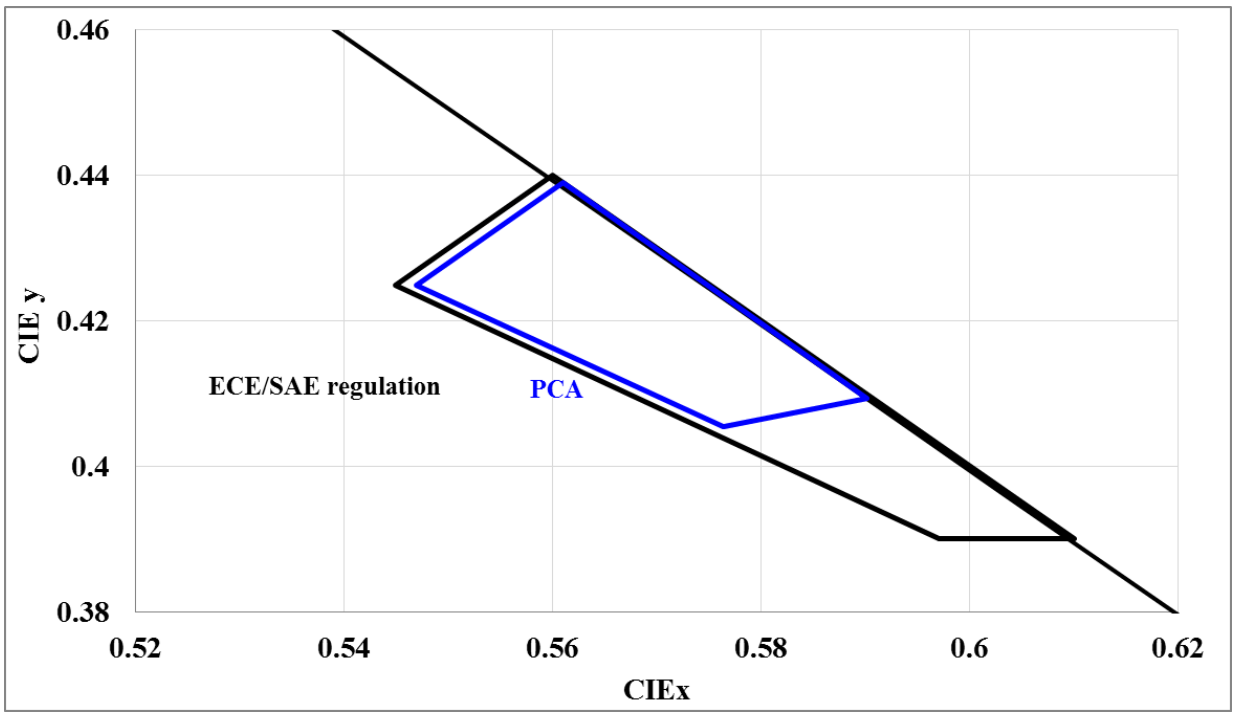
| CCT | MacAdam Ellipse | Center-x | Center-y | a | b | Theta |
|---|---|---|---|---|---|---|
| 4000K | 3 step | 0.3818 | 0.3797 | 0.00939 | 0.00402 | 53.72 |
| | 5 step | 0.3818 | 0.3797 | 0..01565 | 0.00670 | 53.72 |
| 3000K | 3 step | 0.4338 | 0.4030 | 0.00834 | 0.00408 | 53.22 |
| | 5 step | 0.4338 | 0.4030 | 0.01390 | 0.00680 | 53.22 |
| 2700K | 3 step | 0.4578 | 0.4101 | 0.00810 | 0.00420 | 53.70 |
| | 5 step | 0.4578 | 0.4101 | 0.01350 | 0.00700 | 53.70 |

| Bin Code | x | y |
|---|---|---|
| PC Amber | 0.5763 | 0.4054 |
| | 0.5901 | 0.4094 |
| | 0.5610 | 0.4390 |
| | 0.5469 | 0.4249 |

## ■ ALLIX standard white chromaticity regions plotted on the 1931 CIE curve





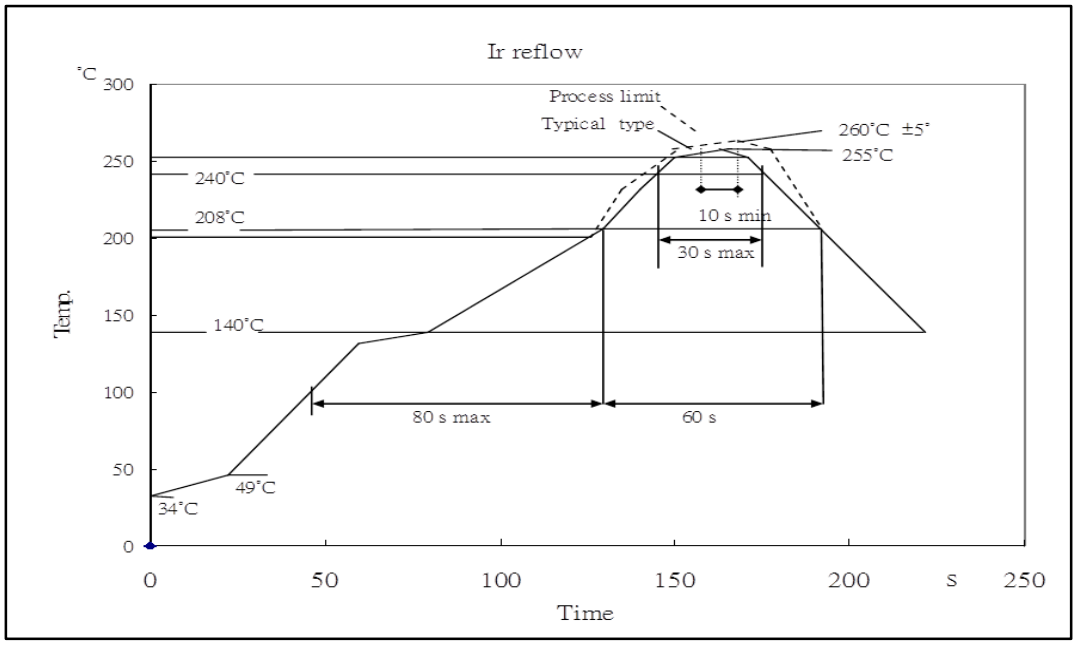
# 4. Reliability

| Test item | Test Condition | | Test Period | Ac/Re |
|---|---|---|---|---|
| Room Temperature Operating Life(RTOL) | If=700mA DC | | 1000 hrs | 0/1 |
| Wet High Temperature Operating Life(WHTOL) | Ta=85˚C<br>85% humidity<br>If=700mA DC | | 1000 hrs | 0/1 |
| High Temperature Operating Life(HTOL) | Ta=85˚C<br>If=700mA DC | | 1000 hrs | 0/1 |
| Thermal Cycle | -40˚C | 125˚C | 1000 cycle | 0/1 |
| | 30 min. | 30 min. | | |
| Reflow Soldering | Tmax.=260˚C | | 3 times | 0/1 |

*Note

1) No catastrophic (LED fail)
2) Lumen maintenance > 90%
3) Change in Vf < 10%
4) Change in white color point △x △y ± 0.01
5) No corrosion
6) Moisture sensitivity level 2 (IPC/JEDEC J-STD-020)

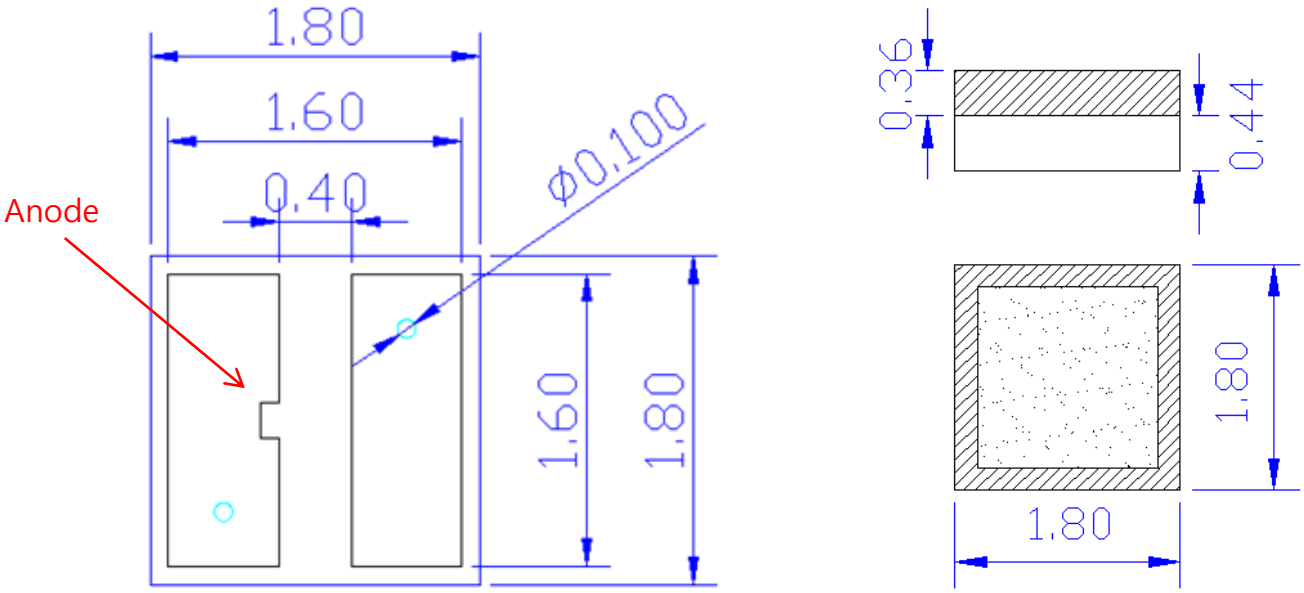
# 5. Reflow soldering characteristic



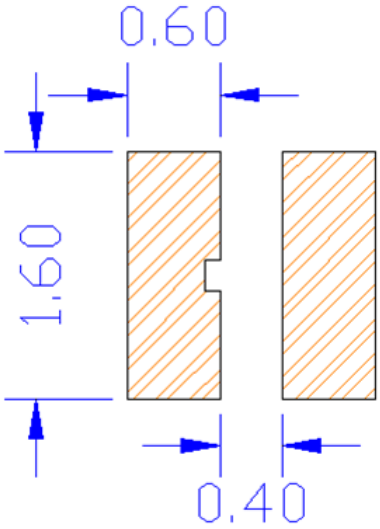
# 6. Outline Dimension

## ■ Outline Dimension

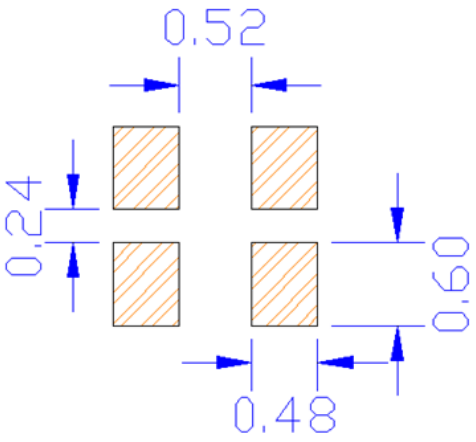
*Unit : mm
* Measurement tolerances :
0 : ± 0.13
0.0 : ± 0.1




## ■ Recommended Solder Pad




Recommended solder pad



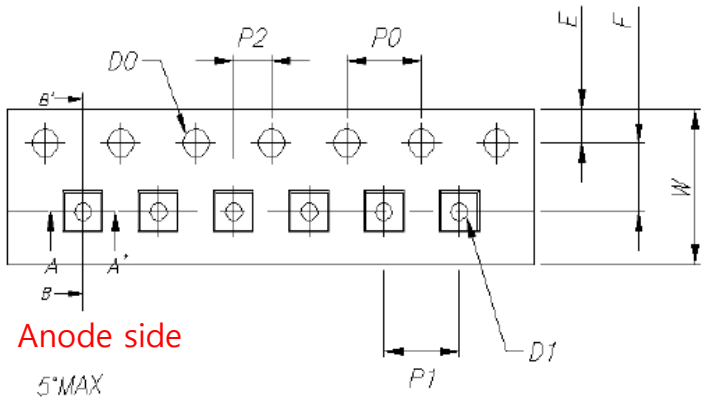

Recommended stencil pattern
(hatched area is opening)

# 7. Taping

## ■ Tape and Reel

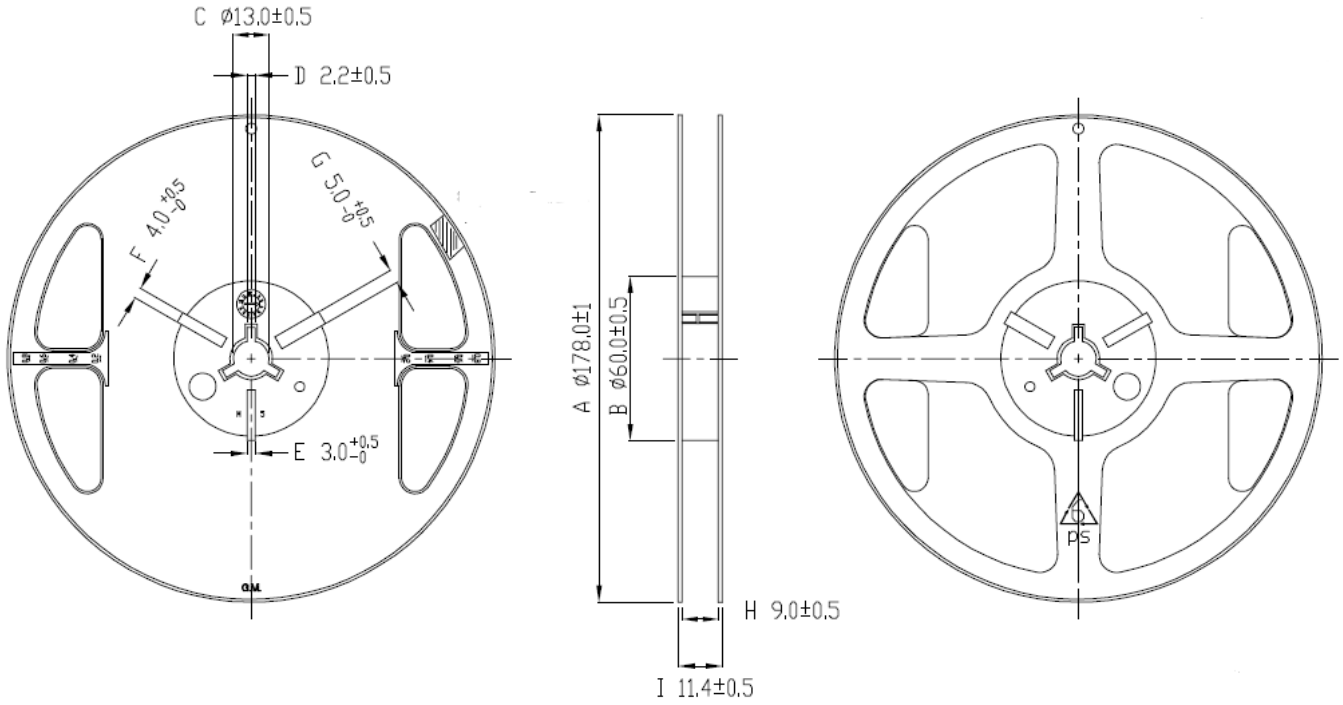
*Unit : mm

Cathode side



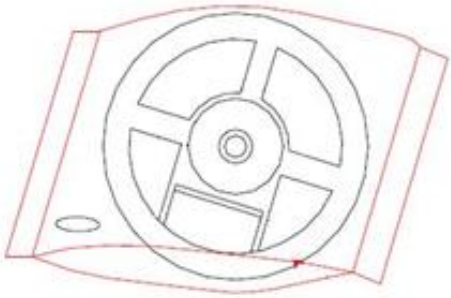

| Item | Specification | Tol. (+/-) |
|---|---|---|
| W | **8.00** | ± 0.20 |
| E | **1.75** | ± 0.10 |
| F | **3.50** | ± 0.05 |
| D0 | **1.50** | +0.10, -0 |
| D1 | **1.00** | ± 0.10 |
| P0 | **4.00** | ± 0.10 |
| P1 | **4.00** | ± 0.10 |
| P2 | **2.00** | ± 0.10 |
| P0 x 10 | **40.00** | ± 0.20 |
| | | |

| | | |
|---|---|---|
| t | **0.20** | ± 0.05 |
| A0 | **2.00** | ± 0.10 |
| B0 | **2.00** | ± 0.10 |
| K0 | **0.90** | ± 0.10 |

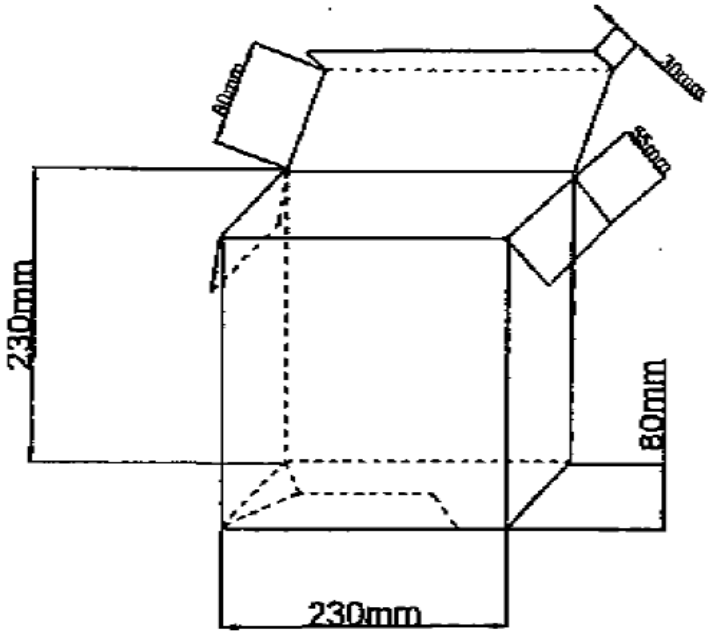


# 8. Packing

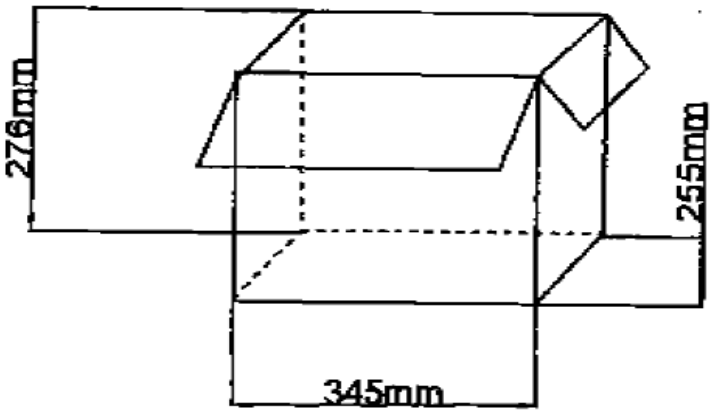
## ■ Packing



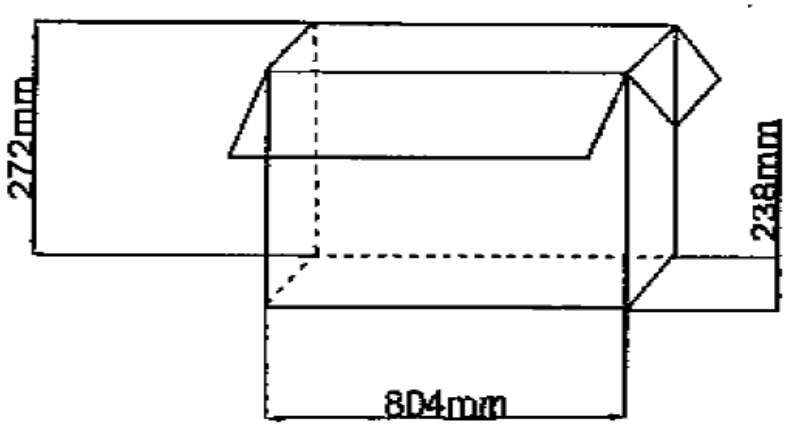
1 Anti-static reel in 1 moisture-proof foil bag
(within moisture absorbent material)




4 moisture-proof foil bags in box




4 moisture-proof foil bags in box




50 moisture-proof foil bags in box

# 9. Precautions

### 1. Moisture Sensitivity

In testing, ALLIX has found AT35SNW LEDs to have 1 year floor life in condition <,=30C°/ 60% relative humidity(RH). Moisture testing included a 168-hr soak at 85C°/60% RH followed by 3 times reflow cycles, with visual and electrical inspections at each stage.

ALLIX recommends keeping AT35SNW LEDs in their sealed moisture-barrier packaging until immediately prior to use. ALLIX also recommends returning any unusual LEDs to the re-sealable moisture-barrier bag and closing the bag immediately after use.

### 2. Handling Precautions

Do not handle LEDs with bare hands, it may contaminate the LED surface and affect optical characteristics. In the worst case, catastrophic failure from excess pressure through wire-bond breaks and package damage may result.
Do not stack assembled PCBs together. Failure to comply can cause the resin portion of the product to be cut, chipped, delaminated and/or deformed. It may cause wire to break, leading to catastrophic failures.

### 3. Eye safety

Warning : do not look at exposed lamp in operation. Eye injury can result.

### 4. Static Electricity

Wristbands and anti-electrostatic gloves are strongly recommended and all devices, equipment and machinery must be properly grounded when handling the LEDs, which are sensitive against static electricity and surge.

Precautions are to be taken against surge voltage to the equipment that mounts the LEDs. Unusual characteristics such as significant increase of current leakage, decrease of turn-on voltage or non-operation at a low current can occur when the LED is damaged.