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RoHS

# Specification

## Acrich2 – MR

## 100V  4.3W

### SMJP-1V04W1P1

| SSC | | Customer |
|-----|-----|----------|
| Drawn | Approval | Approval |
| | | |

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# Acrich2 - 100V  4.3W  MR
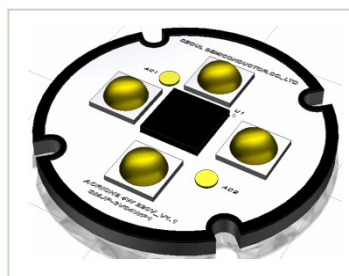
## Acrich2

## Description

The Acrich 2 series, which are designed for AC drive(or operation), do not need the standard converter essential for a conventional general lighting product.

The modules also have a high power factor which can contribute to high energy savings in many lighting applications.

Since there is no need for a converter, the Acrich 2 series lifetime can be estimated

closer to the LED because it is not as dependent on the other electronics in the system.

It also allows for better utilization of space without the converter.

## Features

- Connect using a AIC directly to AC power
- High Power Efficiency
- High Power Factor
- Low THD
- Long Life Time
- Simplest BOM
- Miniaturization
- Lead Free product
- RoHS compliant

## Applications

- Bulb light
- Down light
- Factory Ceiling light
- Industrial Light

\* The appearance and specifications of the product can be changed for improvement without notice.

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# [ Contents ]

# 1. Characteristics

### 1-1-1. Electro-Optical characteristics of SMJP-1V04W1P1-G rank

| Parameter | Symbol | Value | | | Unit |
|---|---|---|---|---|---|
| | | Min | Typ | Max | |
| Luminous Flux [2] | $\Phi_V$ [3] | 220 | 245 | - | lm |
| Correlated Color Temperature [4] | CCT | 2900 | 3000 | 3200 | K |
| CRI | $R_a$ | 80 | - | - | - |
| Operating Voltage [5] | $v_{opt}$ | 100 | | | V[RMS] |
| Power Dissipation | $P_D$ | 4.0 | 4.3 | 4.6 | W |
| Operating Frequency | Freq | 50 / 60 | | | Hz |
| Power Factor | PF | Over 0.95 | | | - |
| View Angle | $2\Theta$ 1/2 | 120 | | | deg. |

### 1-1-2. Electro-Optical characteristics of SMJP-1V04W1P1-H rank

| Parameter | Symbol | Value | | | Unit |
|---|---|---|---|---|---|
| | | Min | Typ | Max | |
| Luminous Flux [2] | $\Phi_V$ [3] | 220 | 245 | - | lm |
| Correlated Color Temperature [4] | CCT | 2600 | 2700 | 2900 | K |
| CRI | $R_a$ | 80 | - | - | - |
| Operating Voltage [5] | $v_{opt}$ | 100 | | | V[RMS] |
| Power Dissipation | $P_D$ | 4.0 | 4.3 | 4.6 | W |
| Operating Frequency | Freq | 50 / 60 | | | Hz |
| Power Factor | PF | Over 0.95 | | | - |
| View Angle | $2\Theta$ 1/2 | 120 | | | deg. |

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## 1-2 Absolute Maximum Ratings

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Max. Voltage | $v_{opt}$ | 120 | V[RMS] |
| Power Dissipation | $P_d$ | 5.7 | W |
| Operating Temperature | $T_{opr}$ | -30 ~ 85 | ºC |
| Storage Temperature | $T_{stg}$ | -40 ~ 100 | ºC |
| ESD Sensitivity | - | ± 4,000V HBM | - |

* Notes :
 [1] At 100V RMS, Ta=25ºC
 [2] Acrich 2 series maintain the tolerance of ±10% on flux and power measurements.
 [3] $\Phi_V$ is the total luminous flux output measured with an integrated sphere.
 [4] Correlated Color Temperature is derived from the CIE 1931 Chromaticity diagram.
 [5] Operating Voltage doesn't indicate the maximum voltage which customers use but
    means  tolerable voltage according to each country's voltage variation rate.
    It is recommended that the solder pad temperature should be below 70℃.

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## 2. Thermal Resistance

| Part | Package power dissipation [W] | Maximum Junction Temp[℃] | $R\theta_{j-s}$ [℃/W] |
|---|---|---|---|
| Acrich2 LED | AZ4 Max. 1.2 | 125 | 5.7 |
| Acrich2 IC | Max. 1.2 | 125 | 16.4 |

The Acrich2 LED has a thermal resistance of 27degC/W from junction to the LED lead.

The maximum junction temperature of Acrich2 LED package is 125degC, therefore the maximum

lead temperature $T_{s\_max}$ is

$T_{s\_max} = T_{j\_max} - (R\theta_{j-s} * P_D)$

$= 125℃ - (5.7℃/W * 1.2W) = 118.2℃$

Although this is the maximum lead temperature, it is recommended to keep the lead temperature

under 70degC

The Acrich2 IC has a 16.4degC/W thermal resistance from junction to the top surface.
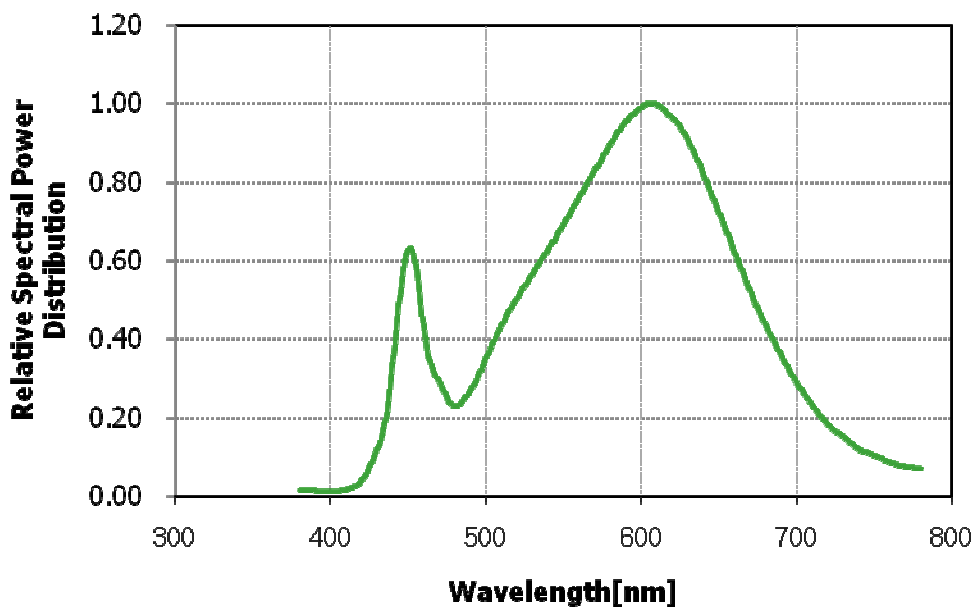
The maximum junction temperature ($T_{t\_max}$) of the IC is 125degC, therefore the maximum

temperature of the top of the IC is

$T_{t\_max} = T_{j\_max} - (\psi_{j-t} * P_D)$

$= 125℃ - (16.4℃/W * 1.2W) = 105.3℃$

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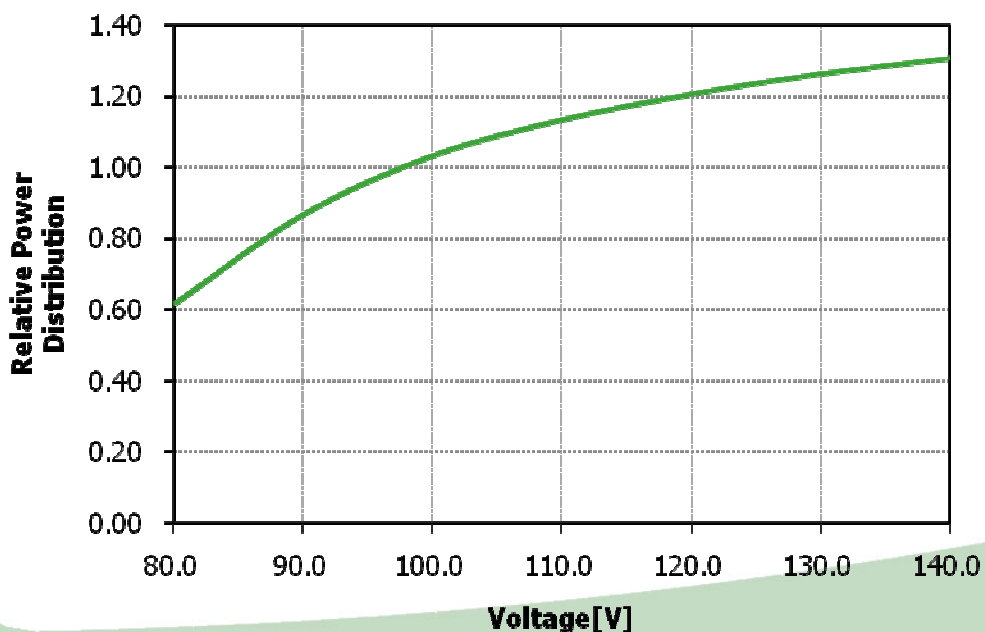
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# 3. Color spectrum

**Relative Spectral Power Distribution at Ta=25°C, 3000K**



# 4. Power characteristic

**Relative Power Distribution vs. Voltage at Ta=25°C**

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**Relative Luminous flux vs. Forward Voltage, Ta=25ºC**



## 5. Radiation Pattern

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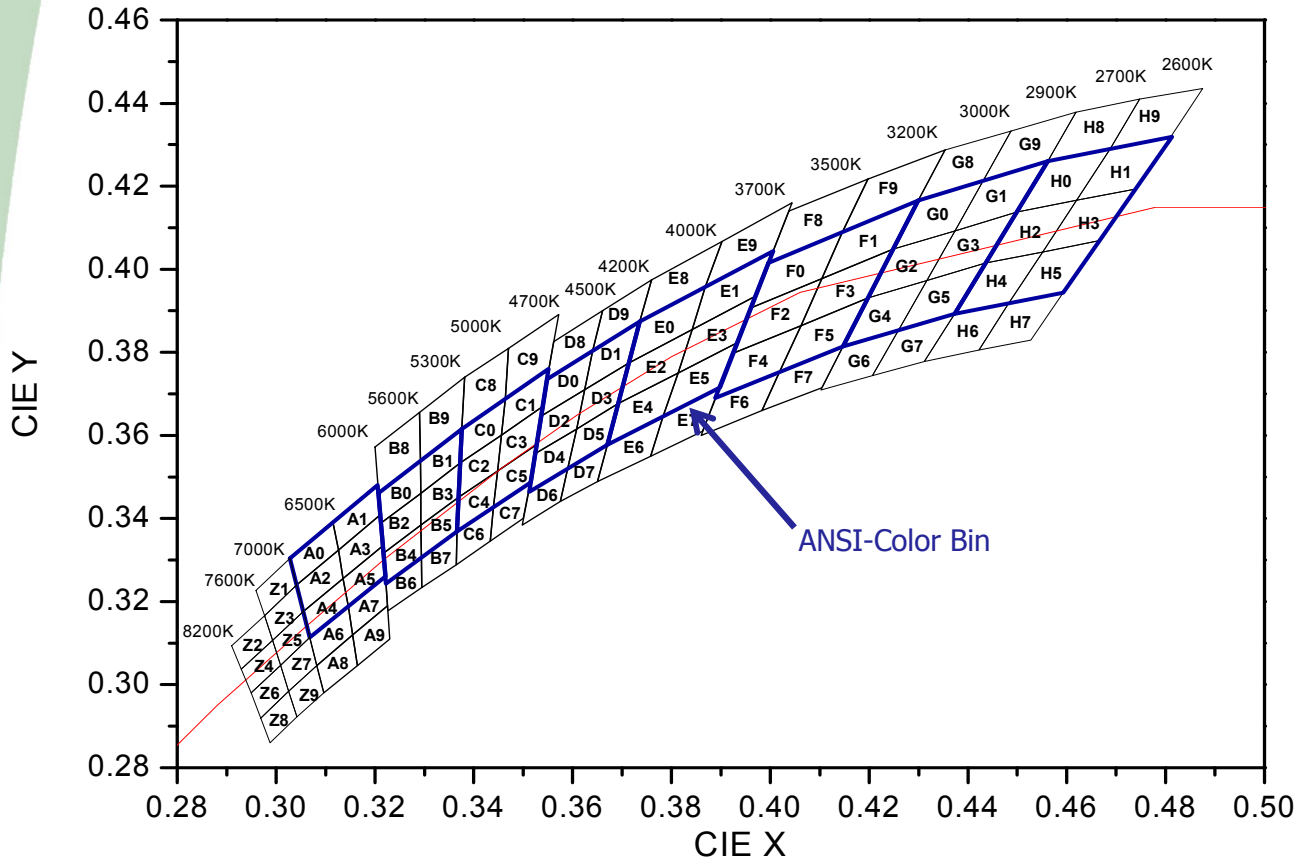semiconductor eco lighting

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## 6. Color & Binning



ANSI-Color Bin
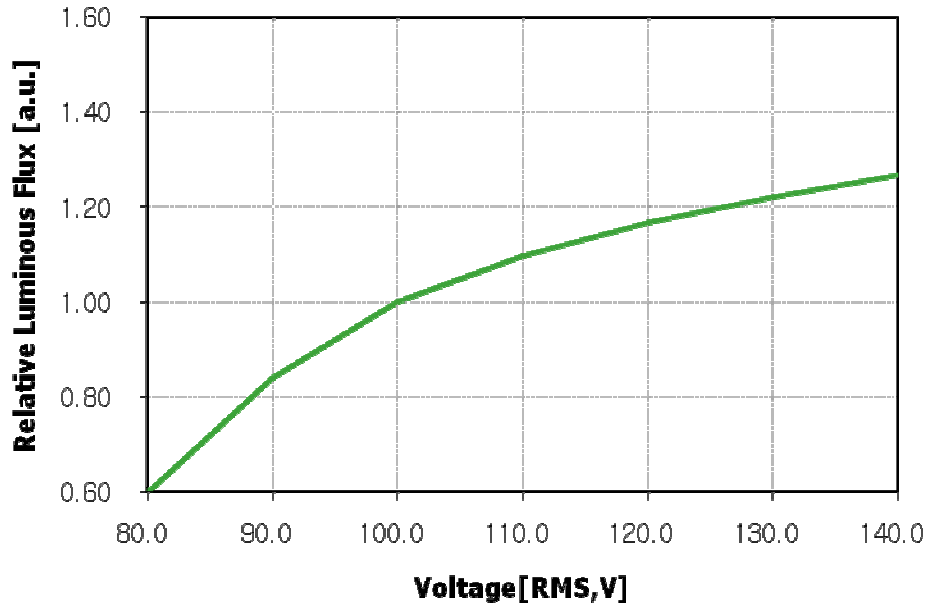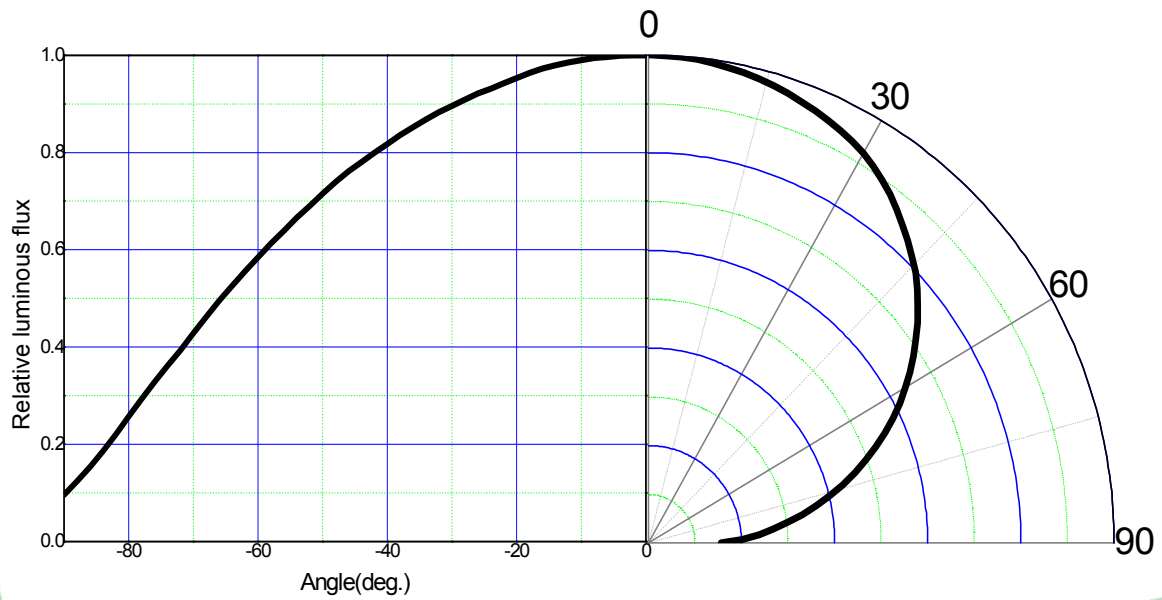
*Notes : For more detailed information on Acrich binning see the "Acrich Binning and Labeling"
         document at www.Acrich.com

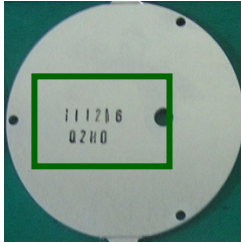* Measurement Uncertainty of the Color Coordinates : ± 0.01

## ▷ COLOR RANK

| Rank | Bin | CIE X | | CIE Y | | Bin | CIE X | | CIE Y | | Bin | CIE X | | CIE Y | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **G** | G0 | X1 | 0.4299 | Y1 | 0.4165 | G1 | X1 | 0.4430 | Y1 | 0.4212 | G2 | X1 | 0.4248 | Y1 | 0.4048 |
| | | X2 | 0.4248 | Y2 | 0.4048 | | X2 | 0.4374 | Y2 | 0.4093 | | X2 | 0.4198 | Y2 | 0.3931 |
| | | X3 | 0.4374 | Y3 | 0.4093 | | X3 | 0.4499 | Y3 | 0.4138 | | X3 | 0.4317 | Y3 | 0.3973 |
| | | X4 | 0.4430 | Y4 | 0.4212 | | X4 | 0.4562 | Y4 | 0.4260 | | X4 | 0.4374 | Y4 | 0.4093 |
| | Bin | CIE X | | CIE Y | | Bin | CIE X | | CIE Y | | Bin | CIE X | | CIE Y | |
| | G3 | X1 | 0.4374 | Y1 | 0.4093 | G4 | X1 | 0.4198 | Y1 | 0.3931 | G5 | X1 | 0.4317 | Y1 | 0.3973 |
| | | X2 | 0.4317 | Y2 | 0.3973 | | X2 | 0.4147 | Y2 | 0.3814 | | X2 | 0.4259 | Y2 | 0.3853 |
| | | X3 | 0.4436 | Y3 | 0.4015 | | X3 | 0.4259 | Y3 | 0.3853 | | X3 | 0.4373 | Y3 | 0.3893 |
| | | X4 | 0.4499 | Y4 | 0.4138 | | X4 | 0.4317 | Y4 | 0.3973 | | X4 | 0.4436 | Y4 | 0.4015 |

| Rank | Bin | CIE X | | CIE Y | | Bin | CIE X | | CIE Y | | Bin | CIE X | | CIE Y | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **H** | H0 | X1 | 0.4562 | Y1 | 0.4260 | H1 | X1 | 0.4687 | Y1 | 0.4289 | H2 | X1 | 0.4499 | Y1 | 0.4138 |
| | | X2 | 0.4499 | Y2 | 0.4138 | | X2 | 0.4620 | Y2 | 0.4166 | | X2 | 0.4436 | Y2 | 0.4015 |
| | | X3 | 0.4620 | Y3 | 0.4166 | | X3 | 0.4740 | Y3 | 0.4194 | | X3 | 0.4551 | Y3 | 0.4042 |
| | | X4 | 0.4687 | Y4 | 0.4289 | | X4 | 0.4810 | Y4 | 0.4319 | | X4 | 0.4620 | Y4 | 0.4166 |
| | Bin | CIE X | | CIE Y | | Bin | CIE X | | CIE Y | | Bin | CIE X | | CIE Y | |
| | H3 | X1 | 0.4620 | Y1 | 0.4166 | H4 | X1 | 0.4436 | Y1 | 0.4015 | H5 | X1 | 0.4551 | Y1 | 0.4042 |
| | | X2 | 0.4551 | Y2 | 0.4042 | | X2 | 0.4373 | Y2 | 0.3893 | | X2 | 0.4483 | Y2 | 0.3919 |
| | | X3 | 0.4666 | Y3 | 0.4069 | | X3 | 0.4483 | Y3 | 0.3919 | | X3 | 0.4593 | Y3 | 0.3944 |
| | | X4 | 0.4740 | Y4 | 0.4194 | | X4 | 0.4551 | Y4 | 0.4042 | | X4 | 0.4666 | Y4 | 0.4069 |

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# 7. Marking

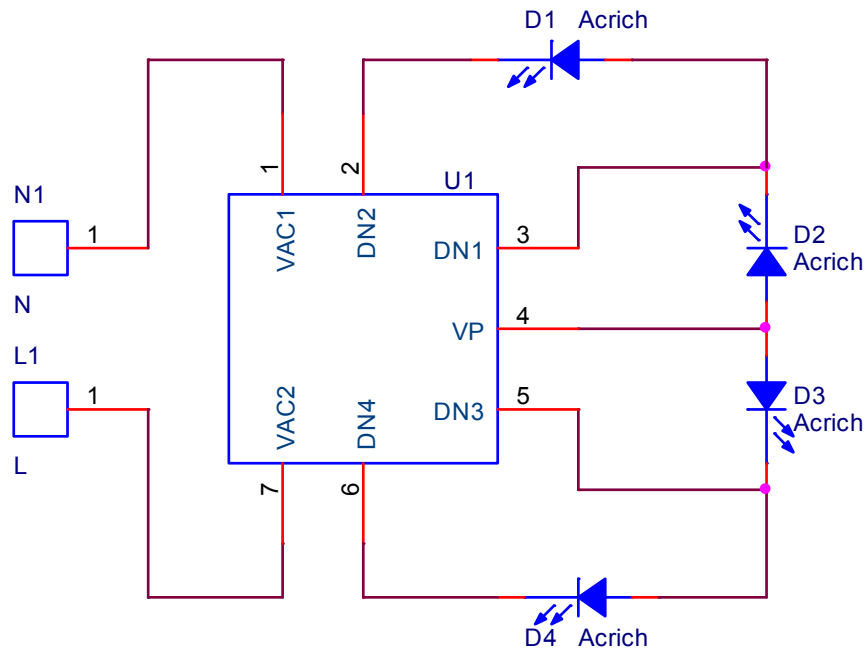YYMMDD: Production Date
XXXX – LED PKG Flux Rank / Color Bin Rank

# 8. Outline dimensions
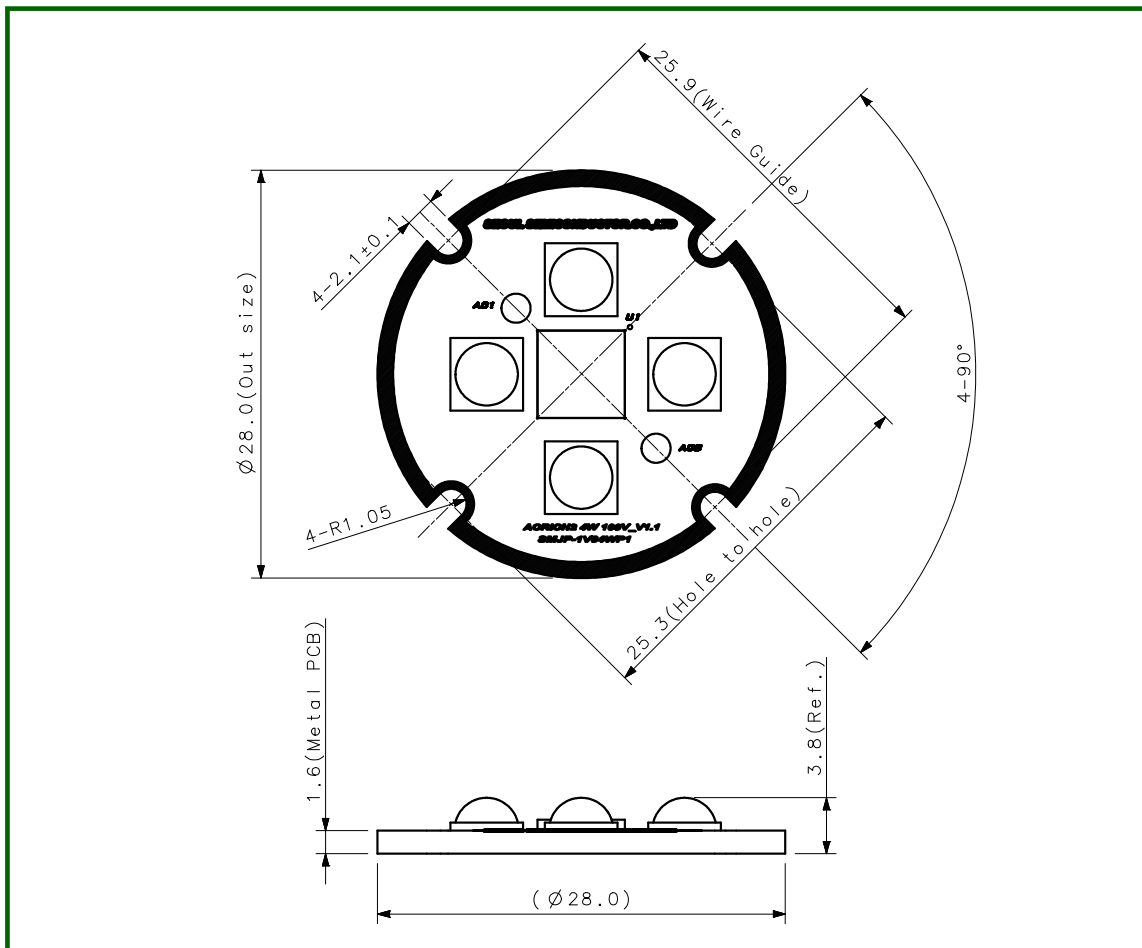

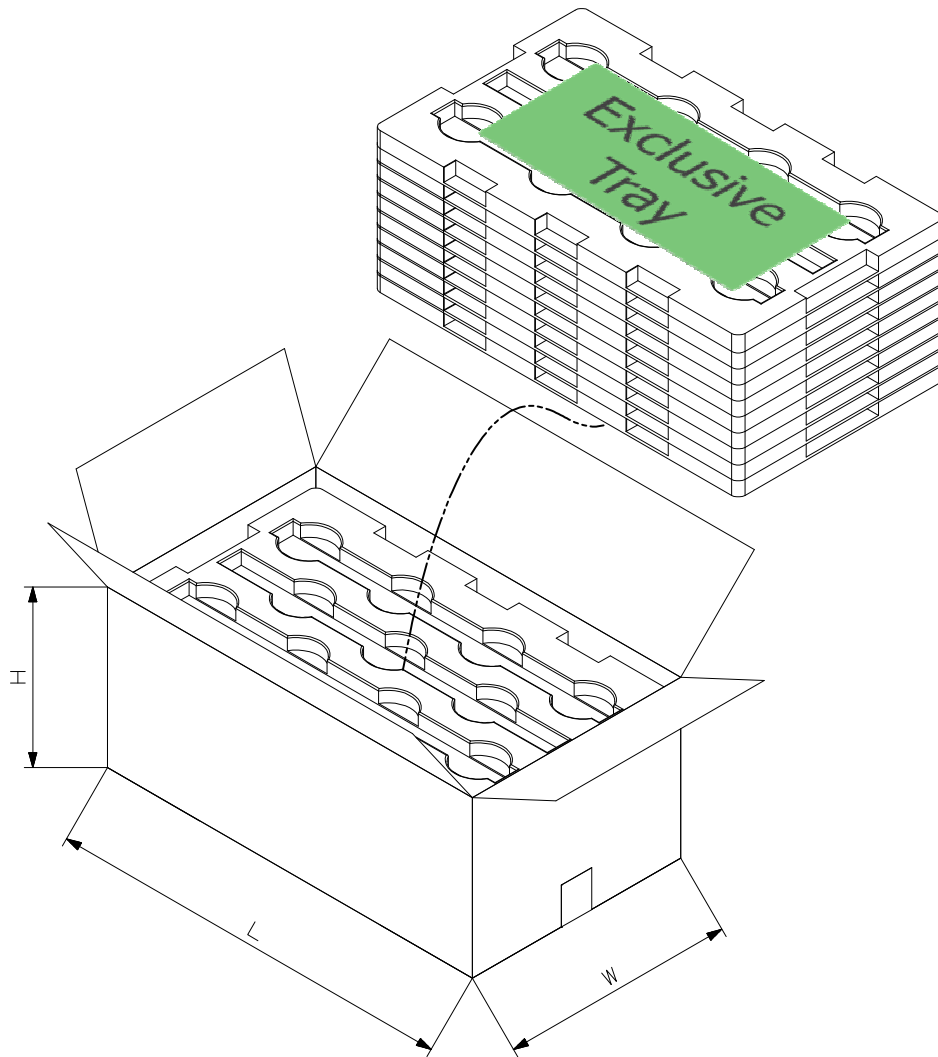
\* Notes :

[1] All dimensions are in millimeters. (Tolerance : ± 0.2)
[2] Scale :  none
[3] The appearance and specifications of the product may be changed for improvement  without notice

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## 9. Circuit Drawing

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## 10. Packing

Exclusive Tray

⊙ **1Box : 100 PCS per tray x Max.10 layer = Max.1000 PCS**

   **about 6kg**


⊙ **Box size( L x W x H ) = 590 x 330 x 260**

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## 11. Usage precautions

- Please review the Acrich2 Module Application Note for protective circuitry component usage.
- Please note, the Acrich products run on high voltage so use caution when near the the device which the circuit is active.
- DO NOT touch any of the circuit board, components or terminals with body or metal while circuit is active.
- Please do not add or change wires while Acrich circuit is active
- The appearance and specifications of the product may be modified for improvement without  notice.
- Long time exposure of sunlight or occasional UV exposure will cause lens discoloration.
- Please do not use adhesives to attach the LED that outgas organic vapor.
- Please do not use together with the materials containing Sulfur
- Please do not assemble under the condition of moisture and oxidizing gas in the air(Cl, H2S,NH3,SO2,NOX,etc)

## 12. Handling of silicone resin for LEDs

- Acrich series is encapsulated with silicone resin for high optical efficiency.
- Please do not touch the silicone resin area with sharp objects such as pincette(tweezers).
- Finger prints on silicone resin area may affect the performance.
- Please store LEDs in covered containers as it is dust sensitive.
- Excessive force more than 3000gf to the silicone lens can result in fatal or permanent damage with LEDs.
- Please do not cover the silicone resin area with any other resins such as epoxy, urethane, etc.

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## 13. Handling with regards to static electricity

• The Acrich2 modules use an integrated circuit (IC) which can be damaged when exposed to static electricity.  Please handle using equipment that prevents static electricity. Do not touch unless ESD protection is used.
• The Acrich2 modules should also not be installed in end equipment with out ESD protection.

## 14. Storage before use

• 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.

(1) Please, confirm the lists below, when storing it in a long term.

* It should be stored in the anti-static bag that Seoul-Semiconductor packed without opening it.

* If you opened it in order to prevent humidity, you should seal it and not let the air and humidity into the bag.