**Acrich**
semiconductor eco lighting

**SEOUL** | **SEOUL SEMICONDUCTOR**

**RoHS**

Preliminary

# Specification

## Acrich2 – Bulb

## 8.7W

## SMJE-3V08W2P4

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

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# Acrich2 - 8.7W  Bulb

**Acrich2**

## Description

Acrich 2 series designed for AC drive(or operation) doesn't need the converter which is essential for conventional general lighting. Also, its high power factor can show best energy saving effect in many lighting applications.

As there is no need of converter, Acrich 2 series can realize as close life-time as original LED and make a better use of a space in many applications.

## 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

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

# [ Contents ]

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# 1. Characteristics of 8.7W Bulb

### 1-1-1. Electro-Optical characteristics of SMJE-3V08W2P4 − 2700K

| Parameter | Symbol | Value | | | Unit |
| --- | --- | --- | --- | --- | --- |
| | | Min | Typ | Max | |
| Luminous Flux [1] | $\Phi_V$ [2] | 610 | 670 | | lm |
| Correlated Color Temperature [3] | CCT | | 2700 | | K |
| CRI | $R_a$ | 80 | - | - | - |
| Operating Voltage [4] | $v_{opt}$ | | 220 | | V[RMS] |
| Power Dissipation | $P_D$ | | 8.7 | | W |
| Operating Frequency | Freq | | 50 / 60 | | Hz |
| Power Factor | PF | | Over 0.97 | | - |
| View Angle | $2\Theta\ 1/2$ | | 120 | | deg. |

### 1-1-2. Electro-Optical characteristics of SMJE-3V08W2P4 − 3000K

| Parameter | Symbol | Value | | | Unit |
| --- | --- | --- | --- | --- | --- |
| | | Min | Typ | Max | |
| Luminous Flux [1] | $\Phi_V$ [2] | 620 | 670 | | lm |
| Correlated Color Temperature [3] | CCT | | 3000 | | K |
| CRI | $R_a$ | 80 | - | - | - |
| Operating Voltage [4] | $v_{opt}$ | | 220 | | V[RMS] |
| Power Dissipation | $P_D$ | | 8.7 | | W |
| Operating Frequency | Freq | | 50 / 60 | | Hz |
| Power Factor | PF | | Over 0.97 | | - |
| View Angle | $2\Theta\ 1/2$ | | 120 | | deg. |

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### 1-1-3. Electro-Optical characteristics of SMJE-3V08W2P4 – 5000K

| Parameter | Symbol | Value | | | Unit |
|---|---|---|---|---|---|
| | | Min | Typ | Max | |
| Luminous Flux [1] | $\Phi_V$ [2] | 640 | 690 | | lm |
| Correlated Color Temperature [3] | CCT | | 5000 | | K |
| CRI | $R_a$ | 80 | - | - | - |
| Operating Voltage [4] | $v_{opt}$ | | 220 | | V[RMS] |
| Power Dissipation | $P_D$ | | 8.7 | | W |
| Operating Frequency | Freq | | 50 / 60 | | Hz |
| Power Factor | PF | | Over 0.97 | | - |
| View Angle | 2Θ 1/2 | | 120 | | deg. |

### 1-2 Absolute Maximum Ratings of 8.7W Bulb

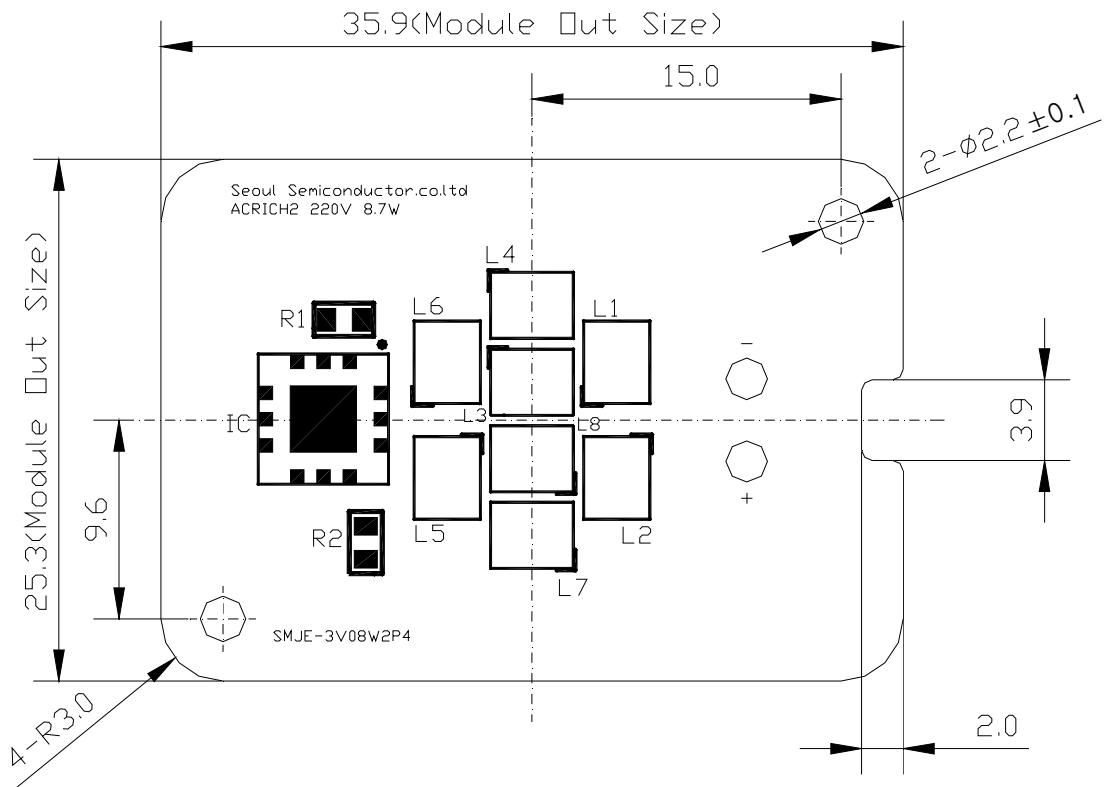| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Max. Voltage | $v_{opt}$ | 264 | V[RMS] |
| Power Dissipation | $P_d$ | 11.5 | W |
| Operating Temperature | $T_{opr}$ | -30 ~ 85 | ºC |
| Storage Temperature | $T_{stg}$ | -40 ~ 100 | ºC |
| ESD Sensitivity | - | ±4,000V HBM | - |

* Notes :
 [1] At 220V RMS, Ta=25ºC
    Acrich 2 series maintain the tolerance of ±10% on flux and power measurements.
 [2] $\Phi_V$ is the total luminous flux output measured with an integrated sphere.
 [3] Correlated Color Temperature is derived from the CIE 1931 Chromaticity diagram.
 [4] '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. Outline Dimension



35.9(Module Out Size)

15.0

2-Φ2.2 ±0.1

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25.3(Module Out Size)

9.6

3.9

L4
L6
L1
R1
L3
L8
IC
R2
L5
L2
L7

−

+

SMJE-3V08W2P4

4-R3.0

2.0

* Notes :

[1] All dimensions are in millimeters.
[2] Scale : none

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# 3. Color spectrum

**Relative Spectral Power Distribution at Ta=25°C 2,700K, 3,000K**



**Relative Spectral Power Distribution at Ta=25°C 5,000K**

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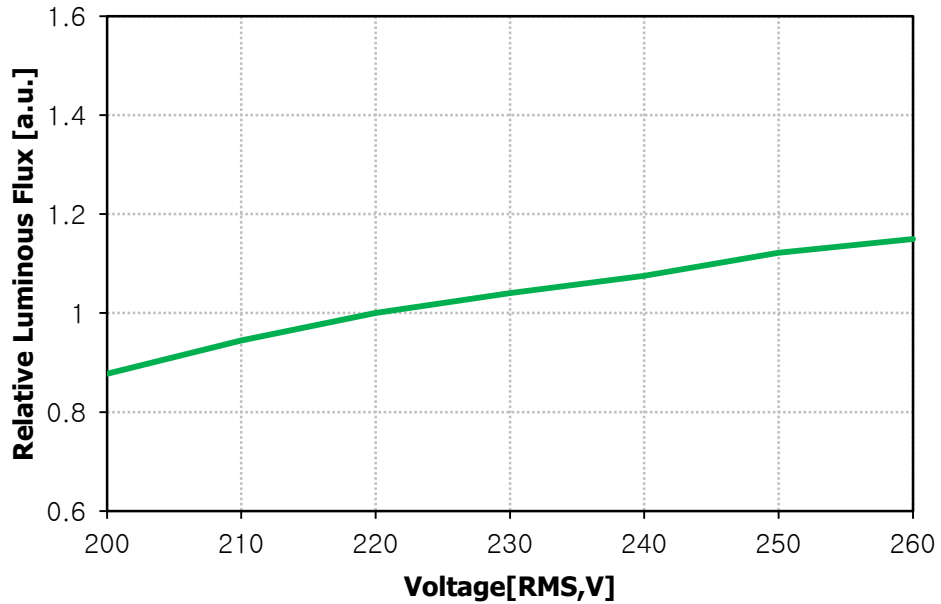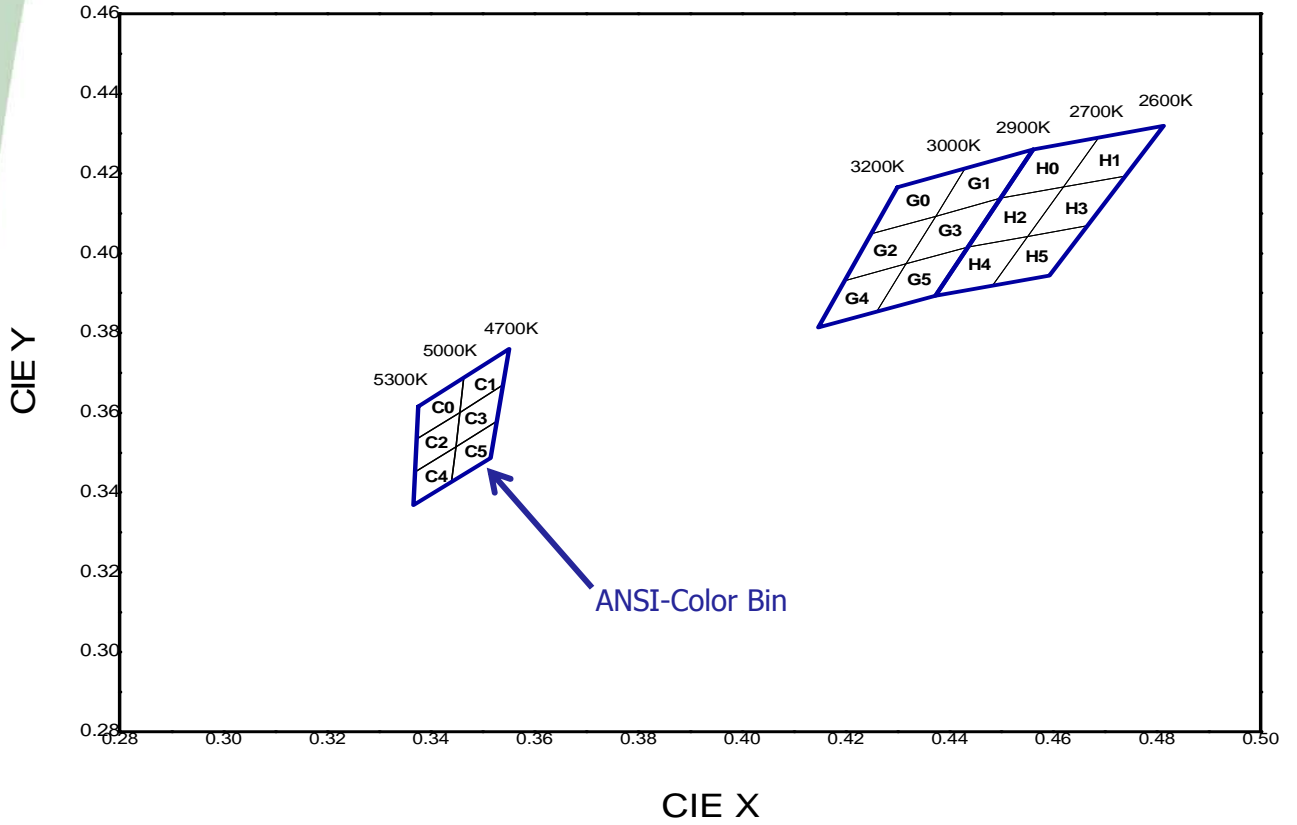SEOUL SEMICONDUCTOR
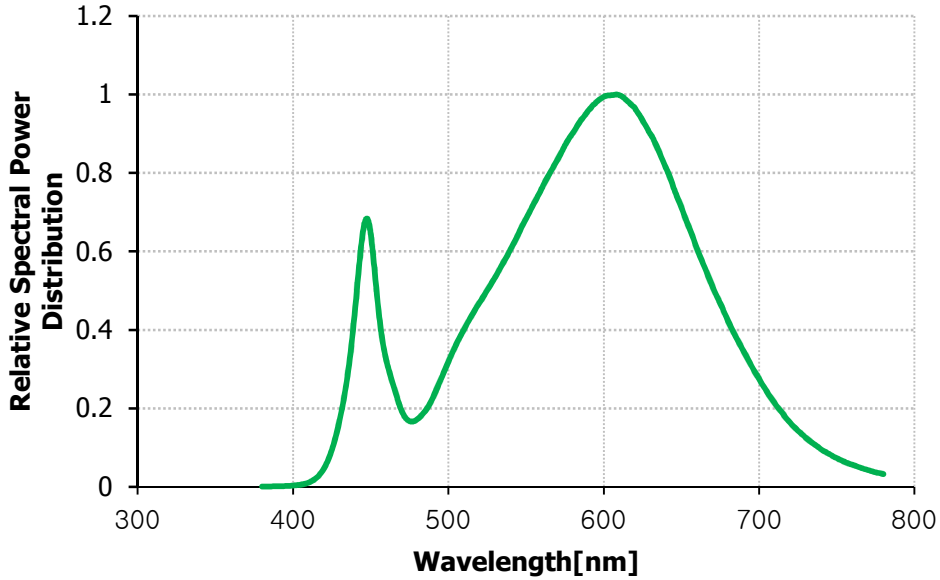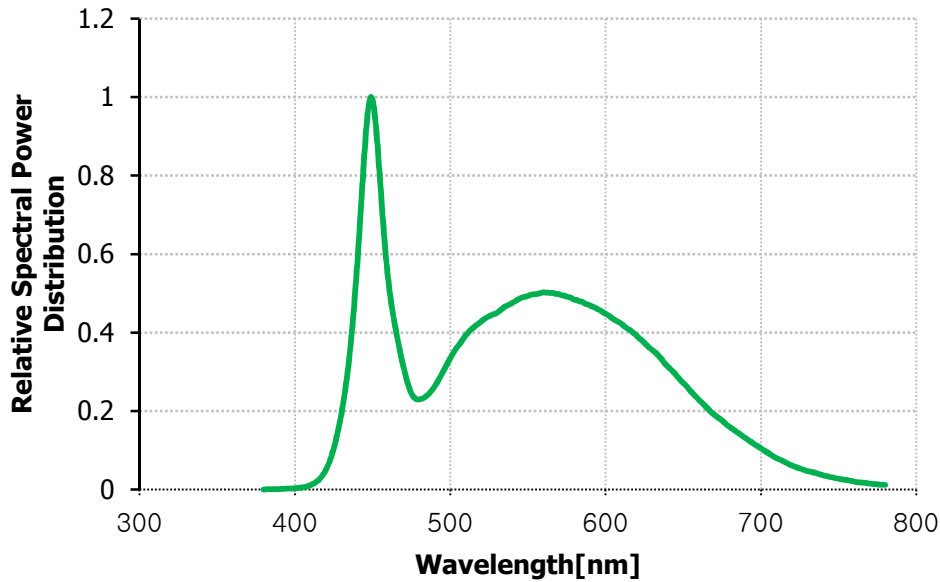
## 4. Power characteristic

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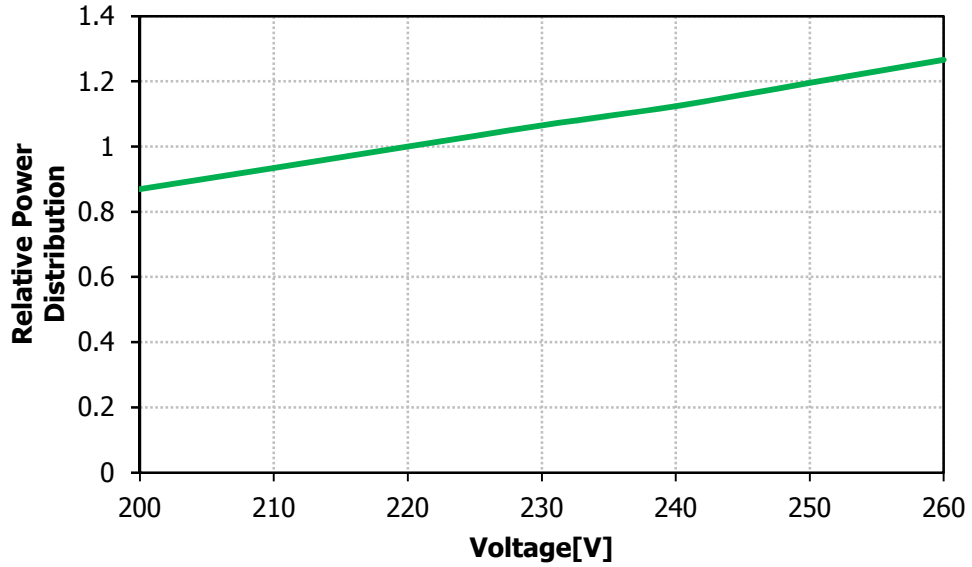


**Relative Luminous flux vs. Forward Voltage, Ta=25°C**

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# 5. Color & Binning



CIE Y (vertical axis) vs CIE X (horizontal axis)

ANSI-Color Bin

## ▷ COLOR RANK

| Rank | Bin | CIE X | | CIE Y | | Bin | CIE X | | CIE Y | | Bin | CIE X | | CIE Y | |
|------|-----|-------|---|-------|---|-----|-------|---|-------|---|-----|-------|---|-------|---|
| | | X1 | 0.3376 | Y1 | 0.3616 | | X1 | 0.3463 | Y1 | 0.3687 | | X1 | 0.3373 | Y1 | 0.3534 |
| | C0 | X2 | 0.3373 | Y2 | 0.3534 | C1 | X2 | 0.3456 | Y2 | 0.3601 | C2 | X2 | 0.3369 | Y2 | 0.3451 |
| | | X3 | 0.3456 | Y3 | 0.3601 | | X3 | 0.3539 | Y3 | 0.3669 | | X3 | 0.3448 | Y3 | 0.3514 |
| | | X4 | 0.3463 | Y4 | 0.3687 | | X4 | 0.3552 | Y4 | 0.3760 | | X4 | 0.3456 | Y4 | 0.3601 |
| C | Bin | CIE X | | CIE Y | | Bin | CIE X | | CIE Y | | Bin | CIE X | | CIE Y | |
| | | X1 | 0.3456 | Y1 | 0.3601 | | X1 | 0.3369 | Y1 | 0.3451 | | X1 | 0.3448 | Y1 | 0.3514 |
| | C3 | X2 | 0.3448 | Y2 | 0.3514 | C4 | X2 | 0.3366 | Y2 | 0.3369 | C5 | X2 | 0.3440 | Y2 | 0.3428 |
| | | X3 | 0.3526 | Y3 | 0.3578 | | X3 | 0.3440 | Y3 | 0.3428 | | X3 | 0.3514 | Y3 | 0.3487 |
| | | X4 | 0.3539 | Y4 | 0.3669 | | X4 | 0.3448 | Y4 | 0.3514 | | X4 | 0.3526 | Y4 | 0.3578 |

| 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 |

* Measurement Uncertainty of the Color Coordinates : ± 0.01

# 6. Circuit Drawing

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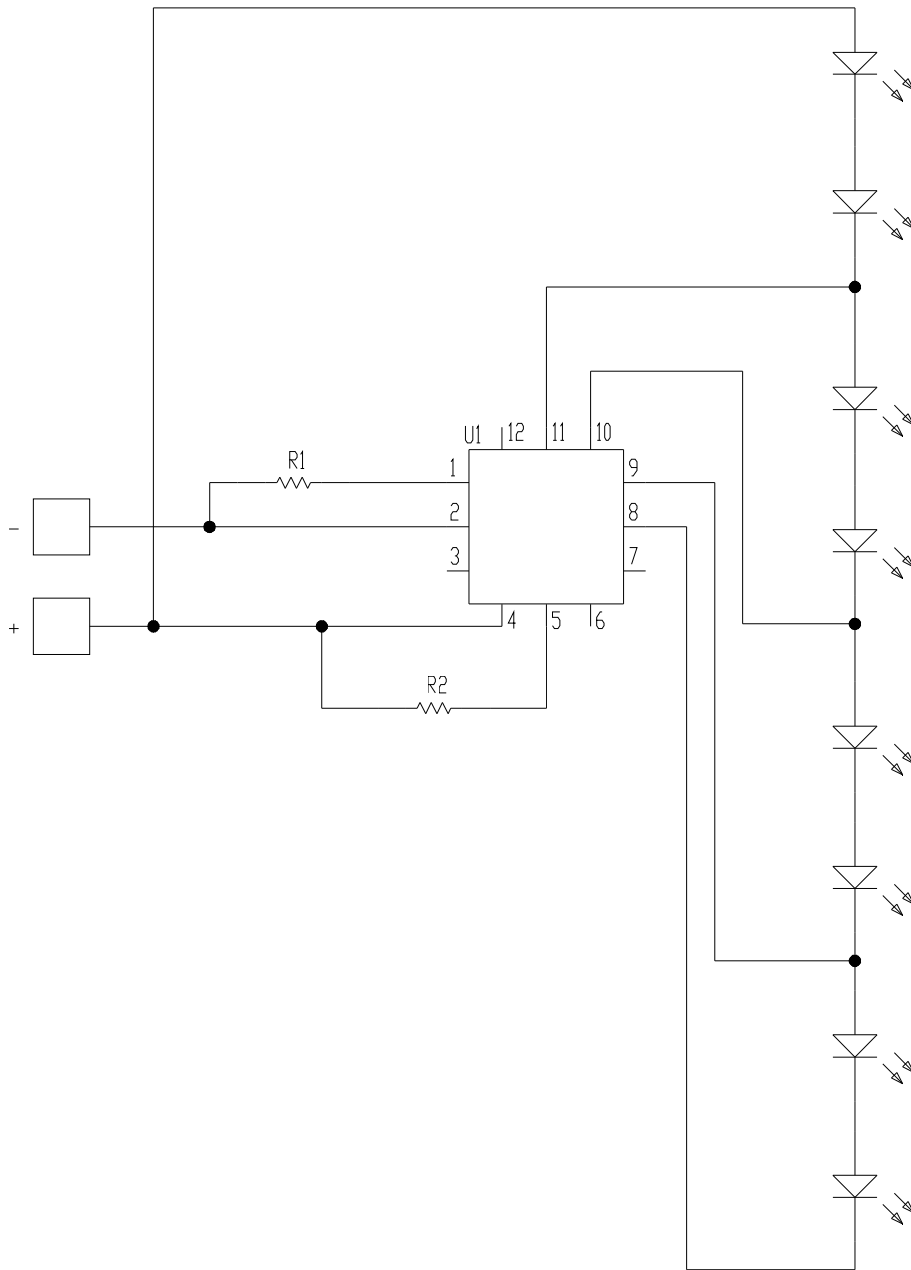
# 7. Usage precautions

- 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
- 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)

# 8. 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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## 9. 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.

## 10. 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.

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## 11. Guidelines for Acrich module work

• Discharge the lighting system minimum 2~3 times prior to starting work.

• Use only the tested instruments, and insulated tools rated for the voltage and current specified.

• Wear rubber made gloves and rubber bottom shoes or sneakers.

• Do not wear any conductive items (such as jewelry) which could accidentally contact electric circuits.

• Perform several tests with power off and the lighting system unplugged.

• Faults, lightning, or switching transients can cause voltage surges in excess of the normal ratings.

• Internal component failure can cause excessive voltages.

• Stored or residual electricity in long wire could be hazardous. Make sure proper discharge prior to starting work.