

# Specification

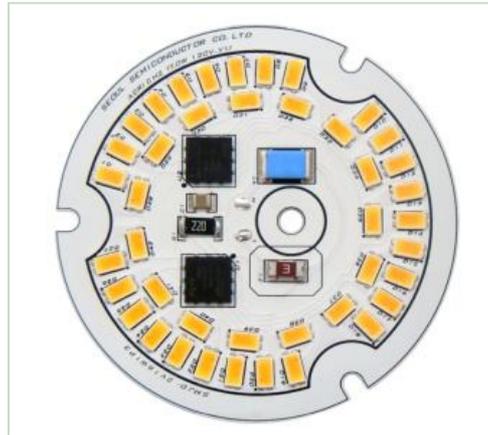
## Acrich2 – Downlight

**100V 17W**

**SMJD-1V16W1P2**

SSC		Customer
Drawn	Approval	Approval

## Acrich2 – 100V 17W Downlight



### 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.

## Acrich2

### 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

- Down light
- Factory Ceiling light
- Industrial Light

## Contents

1.	Characteristics of 100V 17W Downlight	4
2.	Thermal Resistance of 100V 17W Downlight	6
3.	Color spectrum	7
4.	Power characteristics	8
5.	Radiation pattern	9
6.	Color & Binning	10
7.	Marking	11
8.	Outline dimensions	12
9.	Circuit Drawing	13
10.	Packing	14
11.	Cautions for use	15
12.	Handling of silicone resin for LEDs	15
13.	Content regarding static electricity	16
14.	Content regarding storage and treatment	16

## 1. Characteristics of 100V 17W Downlight

### 1-1-1. Electro-Optical characteristics of SMJD-1V16W1P2-H rank

Parameter	Symbol	Value			Unit
		Min	Typ	Max	
Luminous Flux <sup>[2]</sup>	$\Phi_V$ <sup>[3]</sup>	1160	1200	-	lm
Correlated Color Temperature <sup>[4]</sup>	CCT	2600	2700	2900	K
CRI	$R_a$	80	82	-	-
Operating Voltage <sup>[5]</sup>	$V_{opt}$	100			Vrms <sup>[1]</sup>
Power Dissipation	$P_D$	-	17.0	-	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 SMJD-1V16W1P2-G rank

Parameter	Symbol	Value			Unit
		Min	Typ	Max	
Luminous Flux <sup>[2]</sup>	$\Phi_V$ <sup>[3]</sup>	1180	1220	-	lm
Correlated Color Temperature <sup>[4]</sup>	CCT	2900	3000	3200	K
CRI	$R_a$	80	82	-	-
Operating Voltage <sup>[5]</sup>	$V_{opt}$	100			Vrms <sup>[1]</sup>
Power Dissipation	$P_D$	-	170	-	W
Operating Frequency	Freq	50 / 60			Hz
Power Factor	PF	Over 0.95			-
View Angle	$2\theta$ 1/2	120			deg.

1-2 Absolute Maximum Ratings of 100V 17W Downlight

Parameter	Symbol	Value	Unit
<b>Max. Voltage</b>	$V_{opt}$	120	Vrms
<b>Power Dissipation</b>	$P_d$	23	W
<b>Operating Temperature</b>	$T_{opr}$	-30 ~ 85	°C
<b>Storage Temperature</b>	$T_{stg}$	-40 ~ 100	°C
<b>ESD Sensitivity</b>	-	±4,000V HBM	-

\* Notes :

[1] At 100V RMS,  $T_a=25^{\circ}\text{C}$

[2] Acrich 2 series maintain the tolerance of  $\pm 10\%$  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  $70^{\circ}\text{C}$ .

## 2. Thermal Resistance of 17W

Part	Package Power Dissipation [W]	Maximum Junction Temp[°C]	R <sub>θj-s</sub> [°C/W]
Acrich2 LED	SAW8KG0B Max 0.5	125	27
Acrich2 IC	Max 1.5	125	5.5

Acrich2 LED, which has 27 °C/W thermal resistance from junction to LED lead.

The maximum junction temperature of Acrich2 LED package is 125 °C. So permissible max lead temperature T<sub>s\_max</sub> is

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

$$= 125^{\circ}\text{C} - (27^{\circ}\text{C/W} * 0.5\text{W}) = 111.5^{\circ}\text{C}$$

But, Recommendation of LED lead temperature is under 70 °C

Acrich2 IC, which has 5.5 °C/W thermal resistance from junction to top surface.

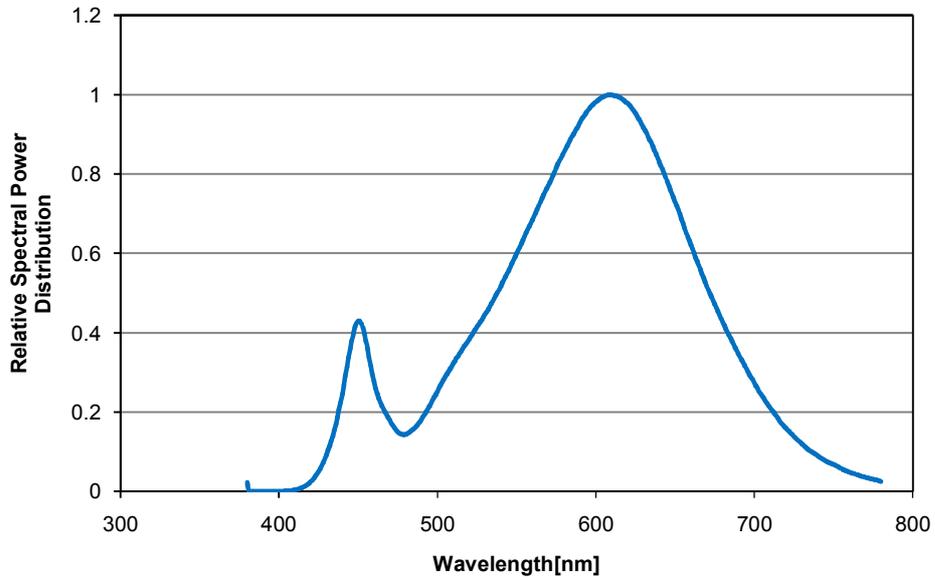
The maximum junction temperature of its IC is 125 °C. So allowable Acrich2 IC top surface temperature (T<sub>t\_max</sub>) is

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

$$= 125^{\circ}\text{C} - (5.5^{\circ}\text{C/W} * 1.5\text{W}) = 116.8^{\circ}\text{C}$$

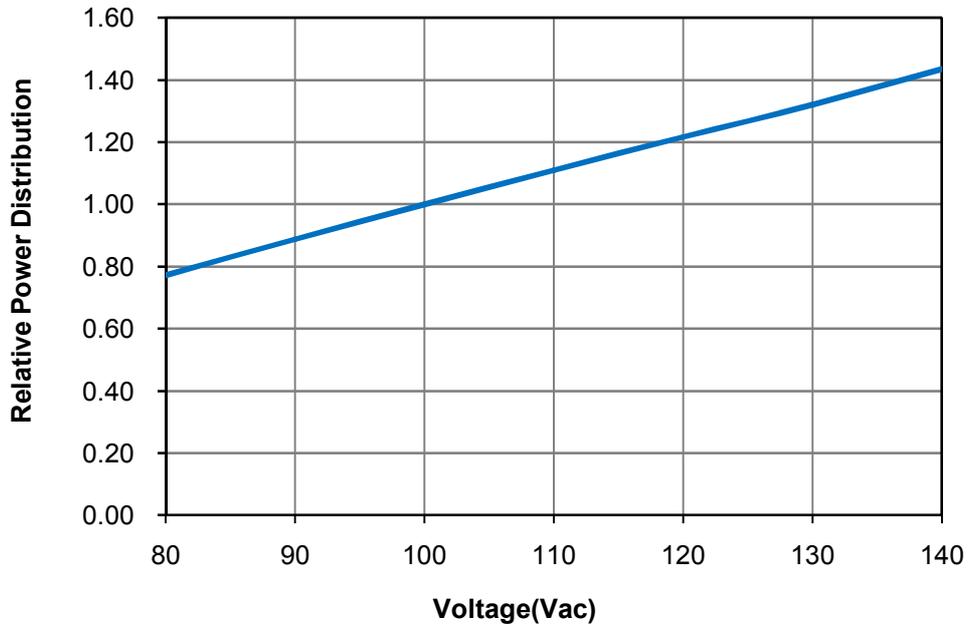
### 3. Color spectrum

Warm White Relative Spectral Distribution vs. Wavelength Characteristic

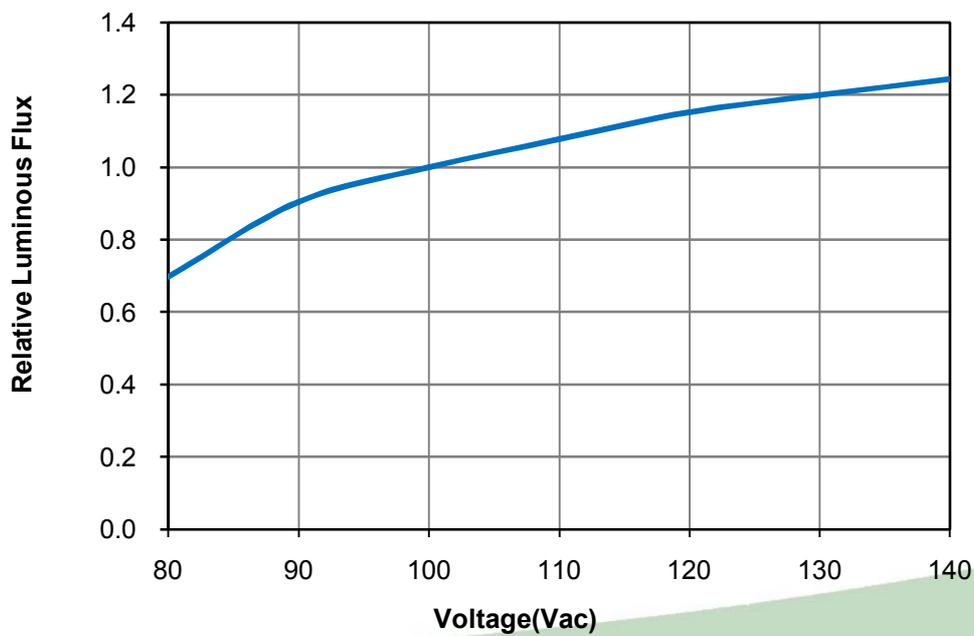


## 4. Power characteristic

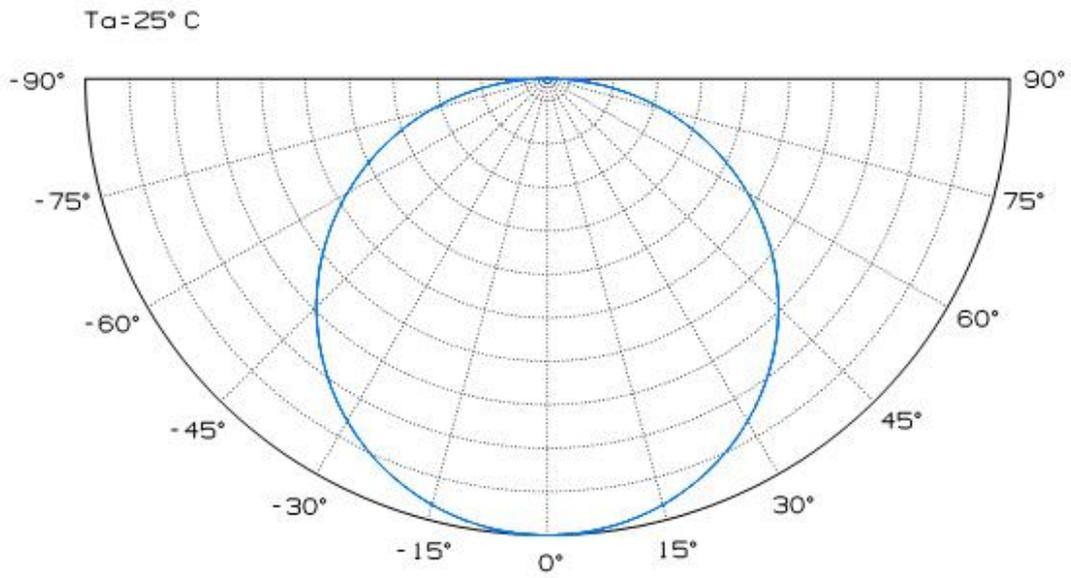
Relative Power Distribution vs. Voltage at Ta=25°C



Relative Luminous Flux vs. Voltage at Ta=25°C

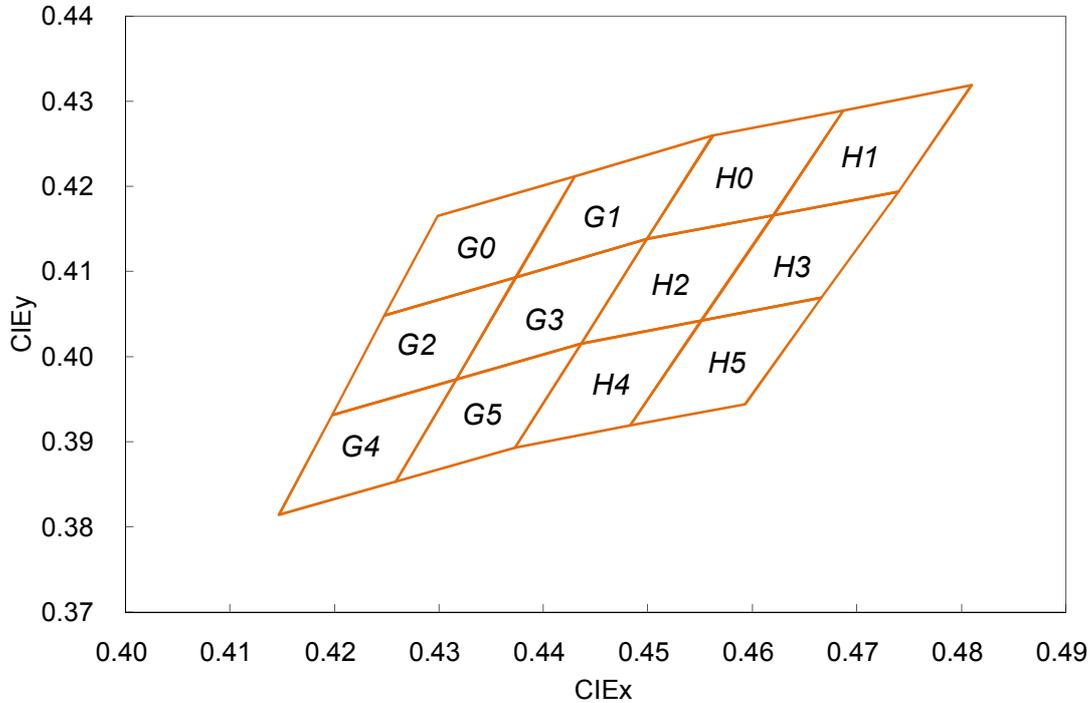


## 5. Radiation Pattern



## 6. Color & Binning

### 6-1. Warm White Ansi binning structure range 2,600K(H) to 3,200K(G)



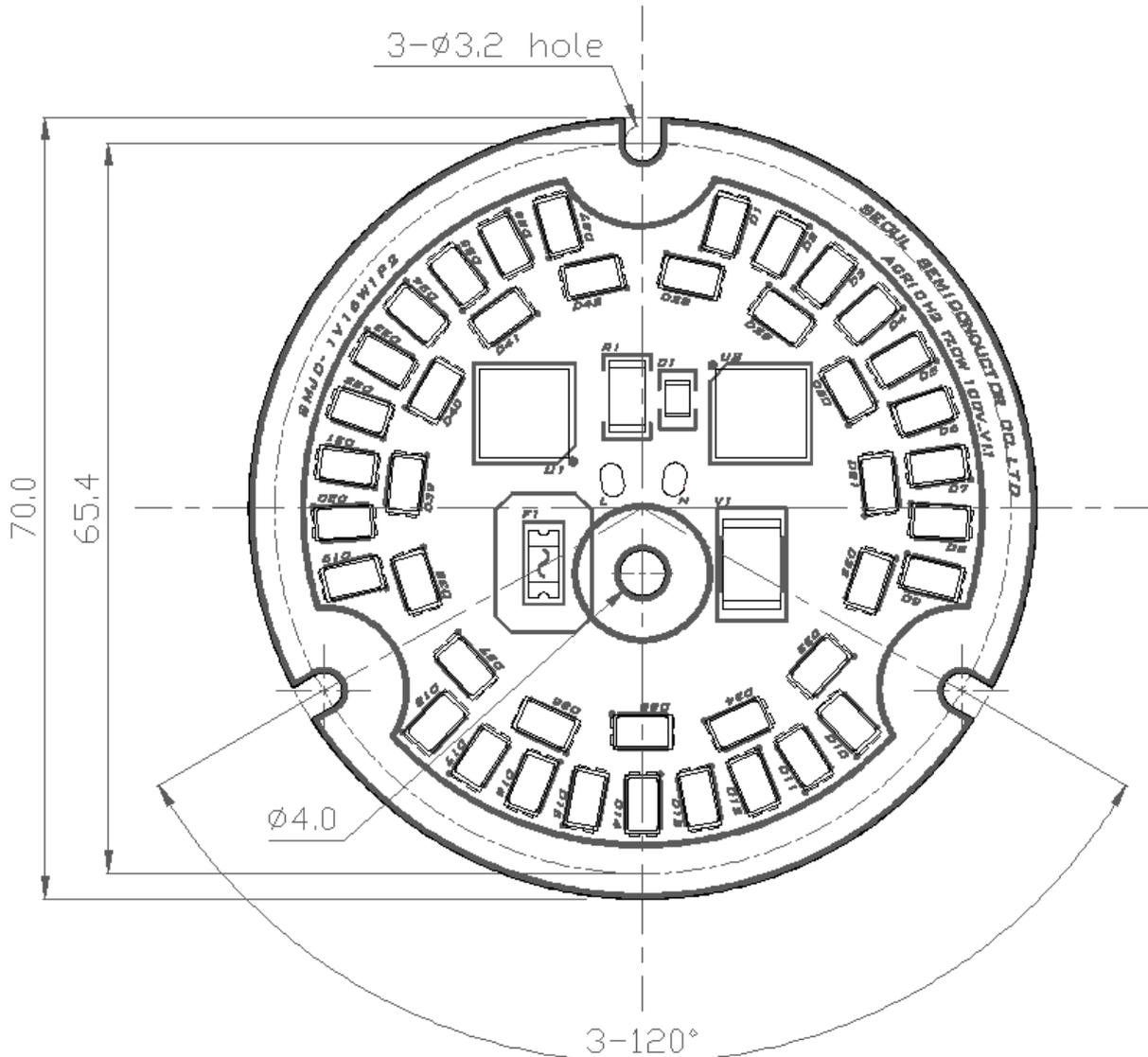
Bin code	X	Y	Bin code	X	Y	Bin code	X	Y
G0	0.4299	0.4165	G1	0.4430	0.4212	G2	0.4248	0.4048
	0.4248	0.4048		0.4374	0.4093		0.4198	0.3931
	0.4374	0.4093		0.4499	0.4138		0.4317	0.3973
	0.4430	0.4212		0.4562	0.4260		0.4374	0.4093
G3	0.4374	0.4093	G4	0.4198	0.3931	G5	0.4317	0.3973
	0.4317	0.3973		0.4147	0.3814		0.4259	0.3853
	0.4436	0.4015		0.4259	0.3853		0.4373	0.3893
	0.4499	0.4138		0.4317	0.3973		0.4436	0.4015
H0	0.4562	0.4260	H1	0.4687	0.4289	H2	0.4499	0.4138
	0.4499	0.4138		0.4620	0.4166		0.4436	0.4015
	0.4620	0.4166		0.4740	0.4194		0.4551	0.4042
	0.4687	0.4289		0.4810	0.4319		0.4620	0.4166
H3	0.4620	0.4166	H4	0.4436	0.4015	H5	0.4551	0.4042
	0.4551	0.4042		0.4373	0.3893		0.4483	0.3919
	0.4666	0.4069		0.4483	0.3919		0.4593	0.3944
	0.4740	0.4194		0.4551	0.4042		0.4666	0.4069

## 7. Marking



YYMMDD - Year / Month / date  
AABB - LED PKG Flux Rank / Color Bin Rank

## 8. Outline dimensions – 100V 17W Downlight

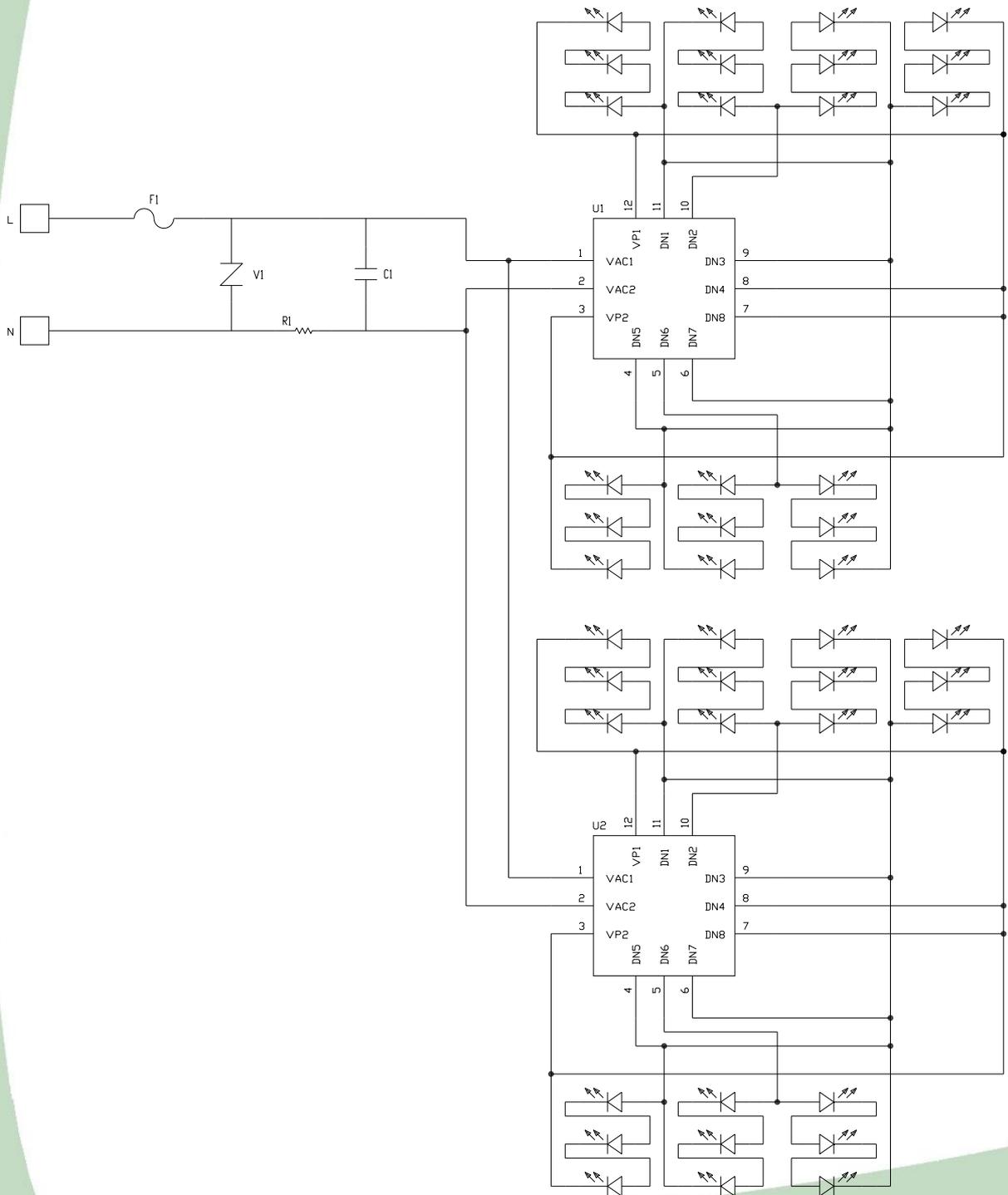


\* Notes :

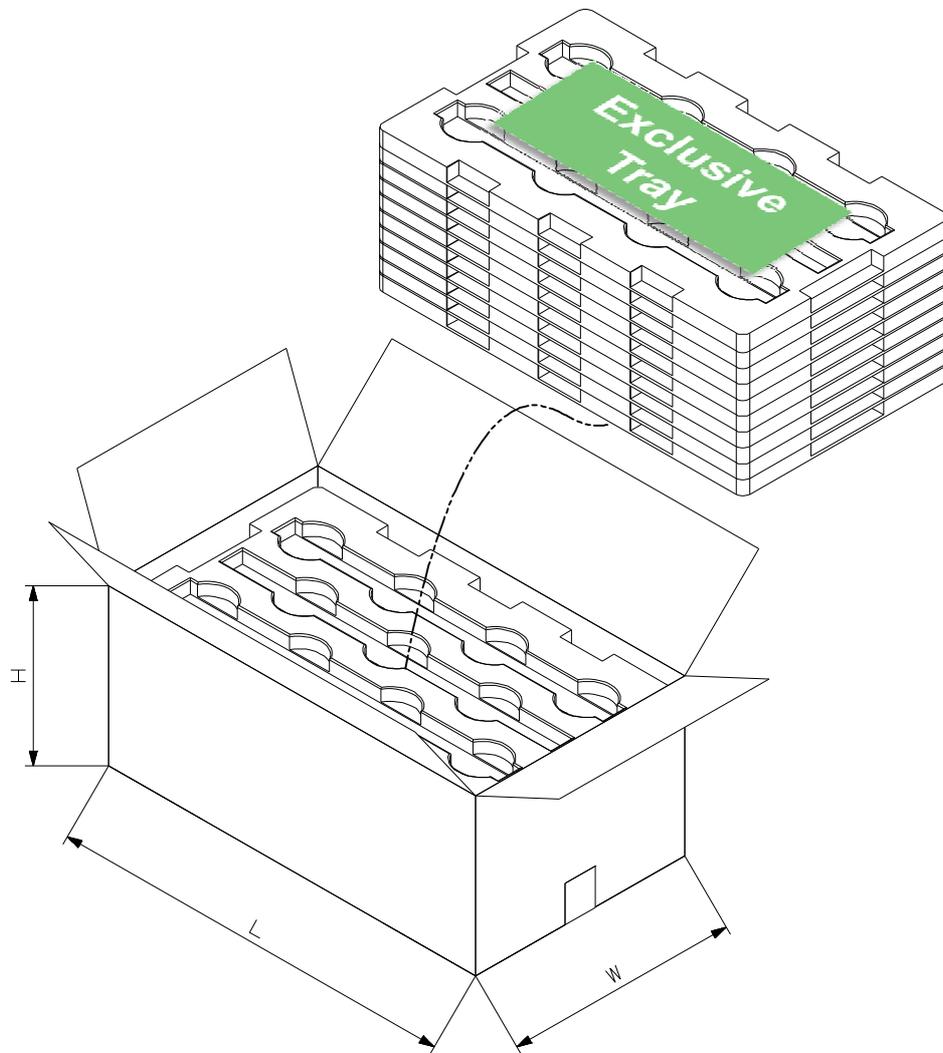
[1] All dimensions are in millimeters. (Tolerance :  $\pm 0.2$ )

[2] Scale : none

## 9. Circuit Drawing



## 10. Packing



▪ 1Box : 20 PCS per tray x Max 10 layer = Max 200 PCS

about 6.5kg

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

## 11. Cautions for use

- Please attach a varistor for protecting surge according to the application note
- Please attach a resistance according to the application note
- Please note Acrich runs on high voltage so use caution when near the leads or if a dome is inadvertently removed while circuit is active
- Please do not touch any of the circuit board, components or terminals with bare hands or metal while circuit is electrically active.
- Please do not add or change wires while Acrich circuit is active
- Please do not touch wire on solder pad at driving AC source
- Long time exposure of sunlight or occasional UV exposure will cause lens discoloration.
- Attaching LEDs, do not use adhesives 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, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, NO<sub>x</sub>, 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.

### 13. Content regarding static electricity

- Acrich2 control IC is installed in this product. This kind of package could get damaged when it is exposed to static electricity. So, please, wear equipment to prevent it from static electricity.

Moreover, be cautious not to touch each exposed package and AC PAD on top of product with bare hands.

When installing the product on user's Main heat sink, should wear some equipment to prevent static electricity.

### 14. Content regarding storage and treatment

- Do not impact or pressure on this product since this product get damaged easily by small amount of impact. Moreover, it should avoid high temperature, high humidity, and direct sunlight in order to function properly since LED PKG is sensitive to temperature and humidity, when storing or operating it.

Criteria are here as below.

(1) Please, confirm to next lists, 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.