

# Specification

**Acrich2**

**120V 17W**

**SMJD-2V16W2P3**

SSC		Customer
Drawn	Approval	Approval

## Acrich2 120V 17W Module



### 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.

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

## 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

- Flush mount
- Down light
- Factory Ceiling light
- Industrial Light

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## 1. Characteristics of SMJD-2V16W2P3

### 1-1-1. Electro-Optical characteristics of SMJD-2V16W2P3 – 5000K

Parameter	Symbol	Value			Unit
		Min	Typ	Max	
Luminous Flux <sup>[1]</sup>	$\Phi_V$ <sup>[2]</sup>	1300	1440	-	lm
Correlated Color Temperature <sup>[3]</sup>	CCT	-	5000	-	K
CRI	$R_a$	80	-	-	-
Operating Voltage <sup>[4]</sup>	$V_{opt}$	120			Vrms
Power Dissipation	$P_D$	16.6	-	-	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 SMJD-2V16W2P3 – 3000K

Parameter	Symbol	Value			Unit
		Min	Typ	Max	
Luminous Flux <sup>[1]</sup>	$\Phi_V$ <sup>[2]</sup>	1240	1370	-	lm
Correlated Color Temperature <sup>[3]</sup>	CCT	-	3000	-	K
CRI	$R_a$	80	-	-	-
Operating Voltage <sup>[4]</sup>	$V_{opt}$	120			Vrms
Power Dissipation	$P_D$	16.6	-	-	W
Operating Frequency	Freq	50 / 60			Hz
Power Factor	PF	Over 0.97			-
View Angle	$2\theta$ 1/2	120			deg.

**1-1-3. Electro-Optical characteristics of SMJD-2V16W2P3 – 2700K**

Parameter	Symbol	Value			Unit
		Min	Typ	Max	
Luminous Flux <sup>[1]</sup>	$\Phi_V$ <sup>[2]</sup>	1230	1360	-	lm
Correlated Color Temperature <sup>[3]</sup>	CCT	-	2700	-	K
CRI	$R_a$	80	-	-	-
Operating Voltage <sup>[4]</sup>	$V_{opt}$	120			Vrms
Power Dissipation	$P_D$	16.6	-	-	W
Operating Frequency	Freq	50 / 60			Hz
Power Factor	PF	Over 0.97			-
View Angle	$2\theta$ 1/2	120			deg.

**1-2 Absolute Maximum Ratings**

Parameter	Symbol	Value	Unit
Max. Voltage	$V_{opt}$	140	V[RMS]
Power Dissipation	$P_d$	23	W
Operating Temperature	$T_{opr}$	-30 ~ 85	°C
Storage Temperature	$T_{stg}$	-40 ~ 100	°C
ESD Sensitivity	-	±4,000V HBM	-

\* Notes :

[1] At 120V RMS,  $T_a=25^\circ\text{C}$

Acrich 2 series maintain the tolerance of  $\pm 10\%$  on flux and power measurements.

[2]  $\Phi_V$  is the total luminous flux output measured with an integrated sphere.

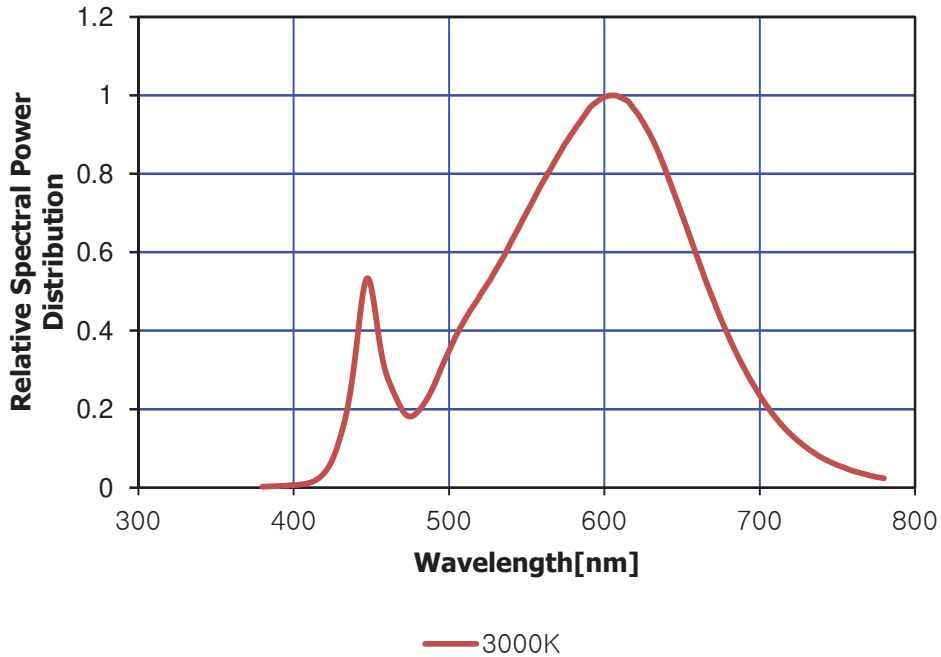
[3] Correlated Color Temperature is derived from the CIE 1931 Chromaticity diagram.

[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  $70^\circ\text{C}$ .

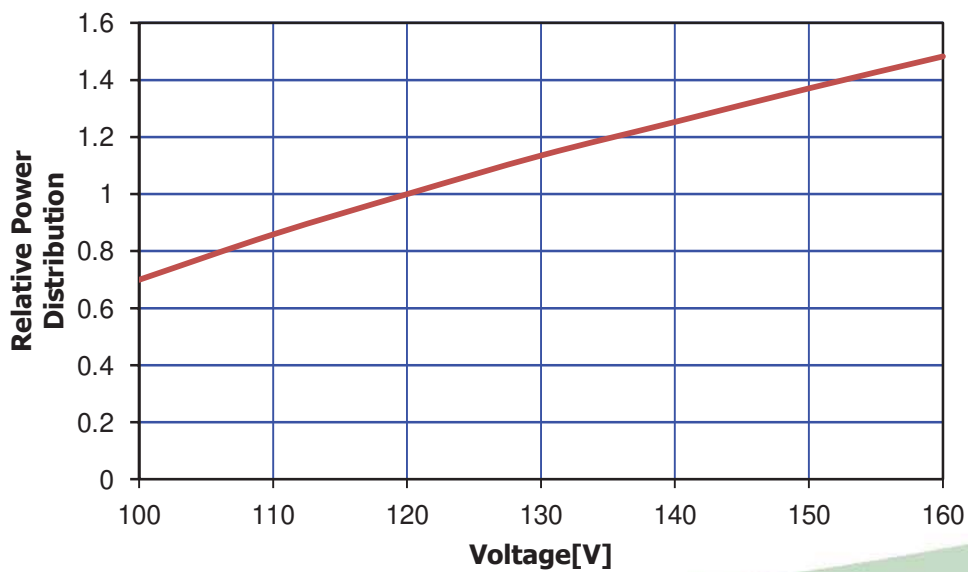
## 2. Color spectrum

Relative Spectral Power Distribution at Ta=25°C

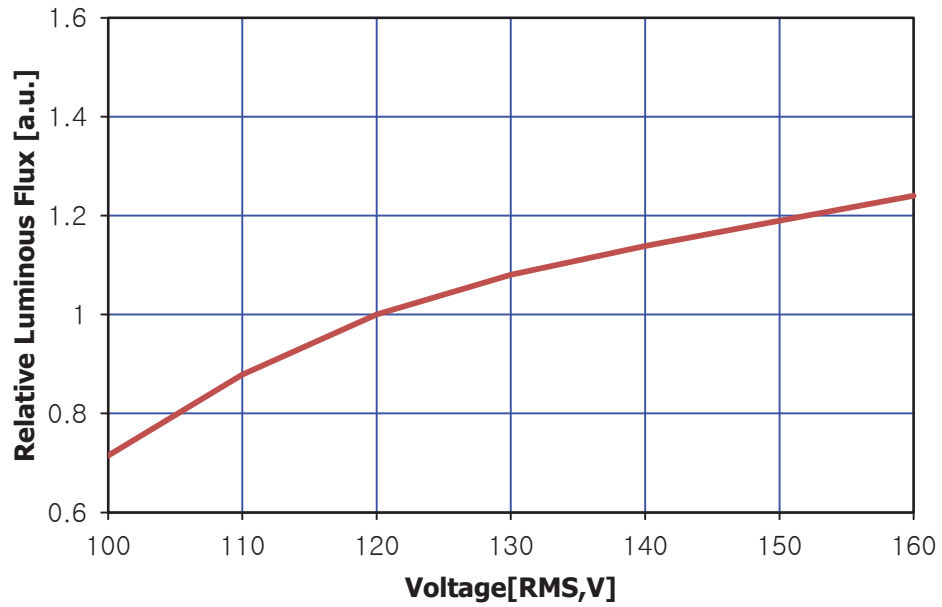


## 3. Power characteristic

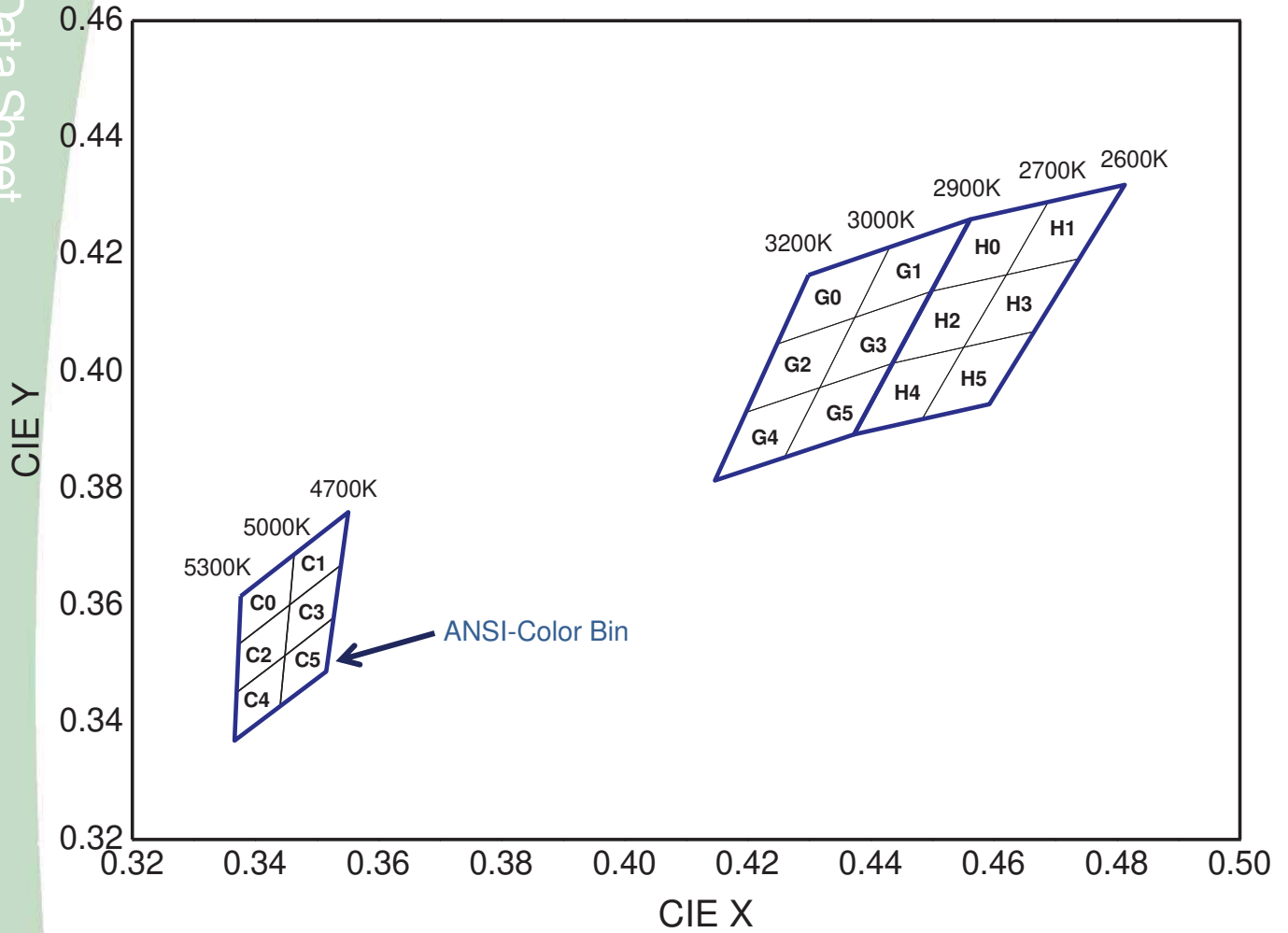
Relative Power Distribution vs. Voltage at Ta=25°C



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



## 4. Color & Binning



\* Measurement Uncertainty of the Color Coordinates :  $\pm 0.01$



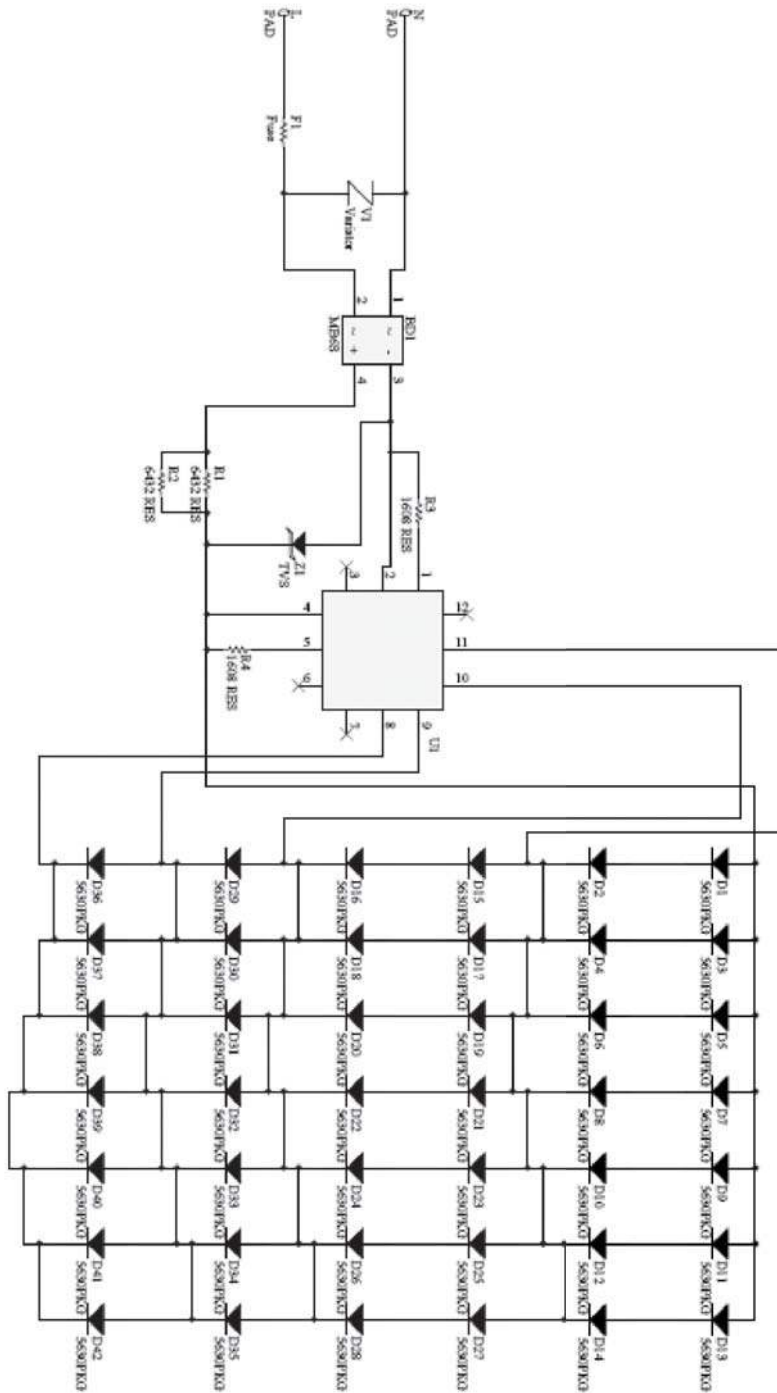
▷ **COLOR RANK**

Rank	Bin	CIE X		CIE Y		Bin	CIE X		CIE Y		Bin	CIE X		CIE Y		
C	C0	X1	0.3376	Y1	0.3616	C1	X1	0.3463	Y1	0.3687	C2	X1	0.3373	Y1	0.3534	
		X2	0.3373	Y2	0.3534		X2	0.3456	Y2	0.3601		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	
	C3	Bin	CIE X		CIE Y		Bin	CIE X		CIE Y		Bin	CIE X		CIE Y	
		X1	0.3456	Y1	0.3601	C4	X1	0.3369	Y1	0.3451	C5	X1	0.3448	Y1	0.3514	
		X2	0.3448	Y2	0.3514		X2	0.3366	Y2	0.3369		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			

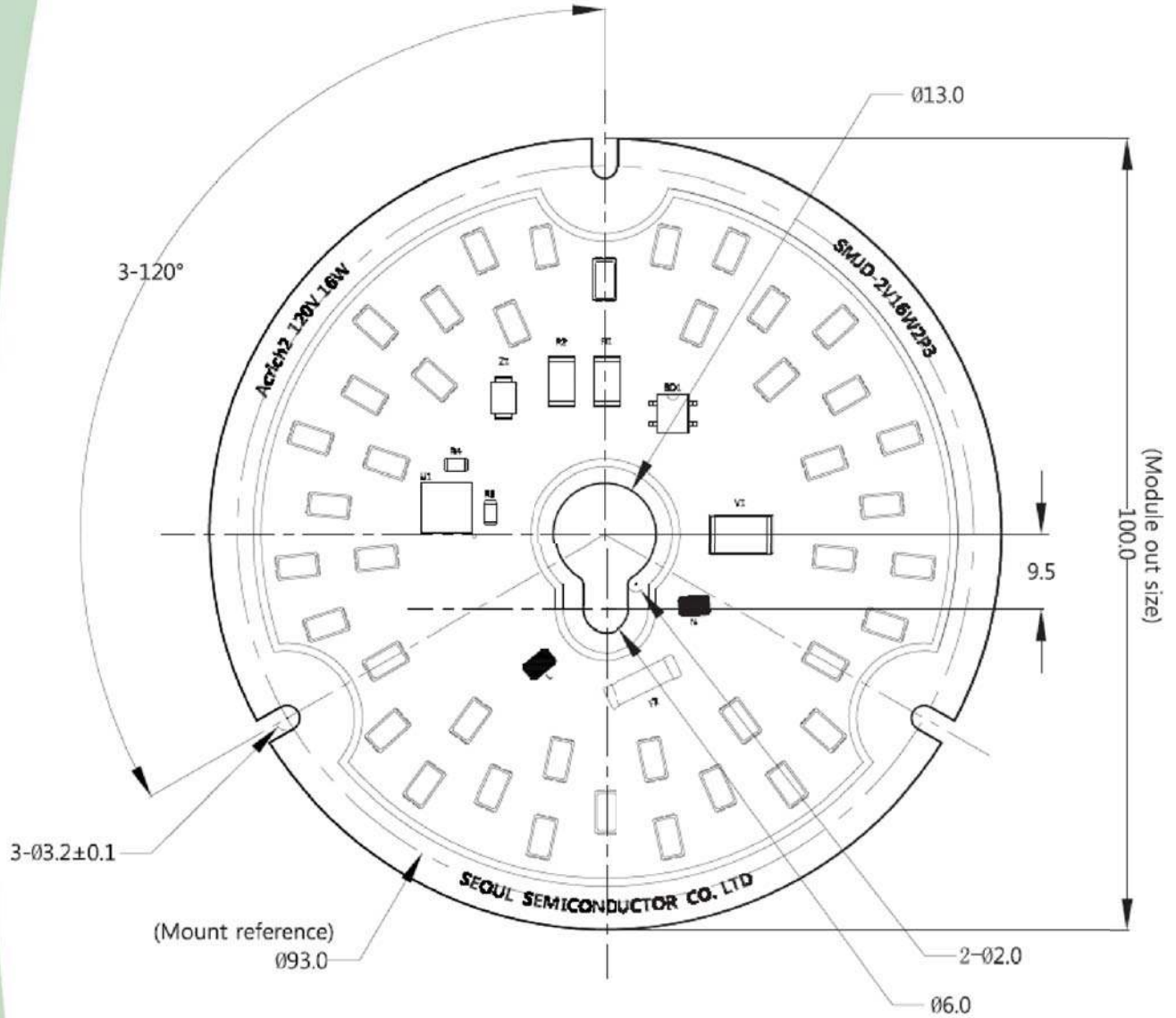
Rank	Bin	CIE X		CIE Y		Bin	CIE X		CIE Y		Bin	CIE X		CIE Y		
G	G0	X1	0.4299	Y1	0.4165	G1	X1	0.4430	Y1	0.4212	G2	X1	0.4248	Y1	0.4048	
		X2	0.4248	Y2	0.4048		X2	0.4374	Y2	0.4093		X2	0.4198	Y2	0.3931	
		X3	0.4374	Y3	0.4093		X3	0.4499	Y3	0.4138		X3	0.4317	Y3	0.3973	
		X4	0.4430	Y4	0.4212		X4	0.4562	Y4	0.4260		X4	0.4374	Y4	0.4093	
	G3	Bin	CIE X		CIE Y		Bin	CIE X		CIE Y		Bin	CIE X		CIE Y	
		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	
	H3	Bin	CIE X		CIE Y		Bin	CIE X		CIE Y		Bin	CIE X		CIE Y	
		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			

## 5. Circuit Drawing



## 6. Outline dimensions



\* Notes :

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

## 7. Part List

No.	List	Silk	Specifications	Q'ty	Remark
1	PCB	-	Metal(AI) 100Φ 1.6T	1	
2	LED	-	SSC SAW8KG0B	42	
3	Fuse	F1	Littelfuse443 (250V 1A)	1	
4	Varistor	V1	Maida8S17SM251 (330V DC/250V AC)	1	
5	Bridge Diode	BD1	KEC MB6S	1	
6	Resistor	R1	6432 91Ω J	1	
7	Resistor	R2		1	
8	TVS	Z1	Littelfuse/Vishay P6SMB-440A	1	
9	IC	U1	Acrich2 DMB社 B type	1	
10	Resistor	R3	1608 4.32KΩ 1%	1	
11	Resistor	R4	1608 1KΩ 5%	1	

## 8. 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
- 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.
- 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>, NOX, etc)

## 9. 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.

## 10. 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.

## 11. 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.
- 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.