Technical Data Sheet

Acriche
semiconductor eco lighting

SEOUL SEMICONDUCTOR

RoHS

Specification

SMJEA5020220

SSC		Customer
Drawn	Approval	Approval

Rev. 00
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www.Acrich.com

SMJEA5020220

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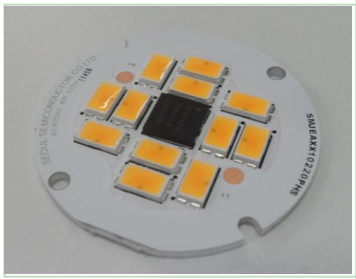


Features

- 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

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.

Applications

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

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

[Contents]

1. Characteristics of SMJEA5020220

1. Electro-Optical characteristics at 220V , Ta=25ºC

Parameter	Symbol	Value			Unit
		Min	Typ	Max	
Luminous Flux [1]	Φ_V [2]	330	370	-	lm
Correlated Color Temperature [3]	CCT	4700	5000	5300	K
CRI	R_a	80	-	-	-
Operating Voltage [4]	v_{opt}	220/230/240			V[RMS]
Power Dissipation	P_D	4.1	4.4	4.7	W
Operating Frequency	Freq	50 / 60			Hz
Power Factor	PF	Over 0.95			-
View Angle	2Θ 1/2	120			deg.

1-2 Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Max. Voltage	v_{opt}	264	V[RMS]
Power Dissipation	P_d	5.5	W
Operating Temperature	T_{opr}	-30 ~ 85	ºC
Storage Temperature	T_{stg}	-40 ~ 100	ºC
ESD Sensitivity	-	± 4,000V HBM	-

* Notes :

[1] Acrich 2 series maintain the tolerance of ±10% on flux and power measurements.

[2] Φ_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℃.

2. Thermal Resistance of SMJEA5010220

Part	Package Power Dissipation [W]	Maximum Junction Temp. [℃]	$R\theta_{j-s}$ [℃/W]
Acrich2 IC	Max. 0.5	150	40 (Junction to Top surface)
Acrich2 LED	Max. 1.0	125	27 (Junction to Lead)

Acrich2 LED, which has 27℃/W thermal resistance from junction to LED lead.
The maximum junction temperature of Acrich2 LED package is 125℃. So permissible max lead temperature T_{s_max} is

$T_{s\_max} = T_{j\_max} - (R\theta_{j-s} * P_D)$
$= 125℃ - (27℃/W * 0.5W) = 111.5℃$

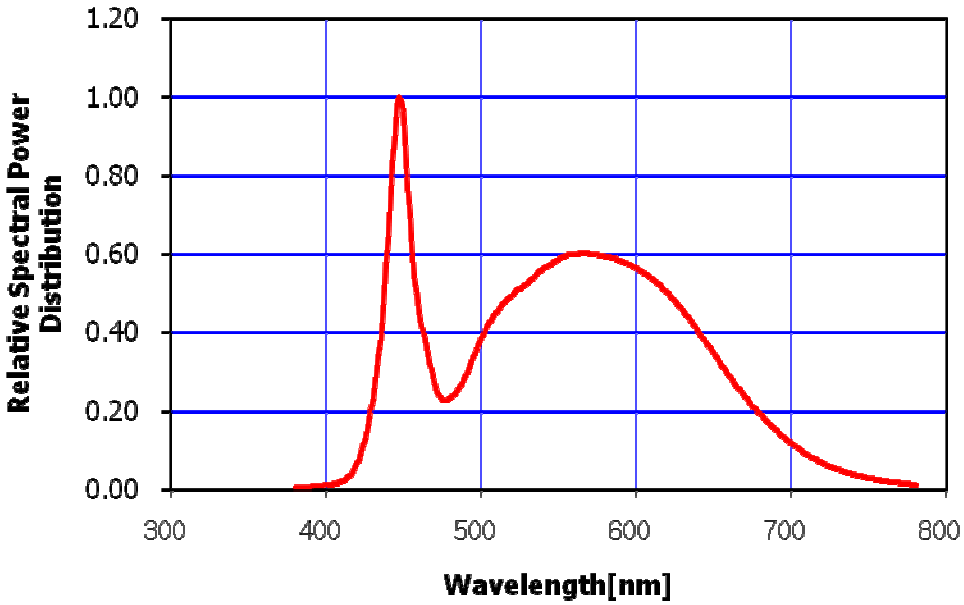
But, Recommendation of LED lead temperature is under 70℃

Acrich2 IC, which has 40℃/W thermal resistance from junction to top surface.
The maximum junction temperature of its IC is 150℃. So allowable Acrich2 IC top surface temperature (T_{t_max}) is

$T_{t\_max} = T_{j\_max} - (\psi_{j-t} * P_D)$
$= 150℃ - (40℃/W * 1.0W) = 110℃$

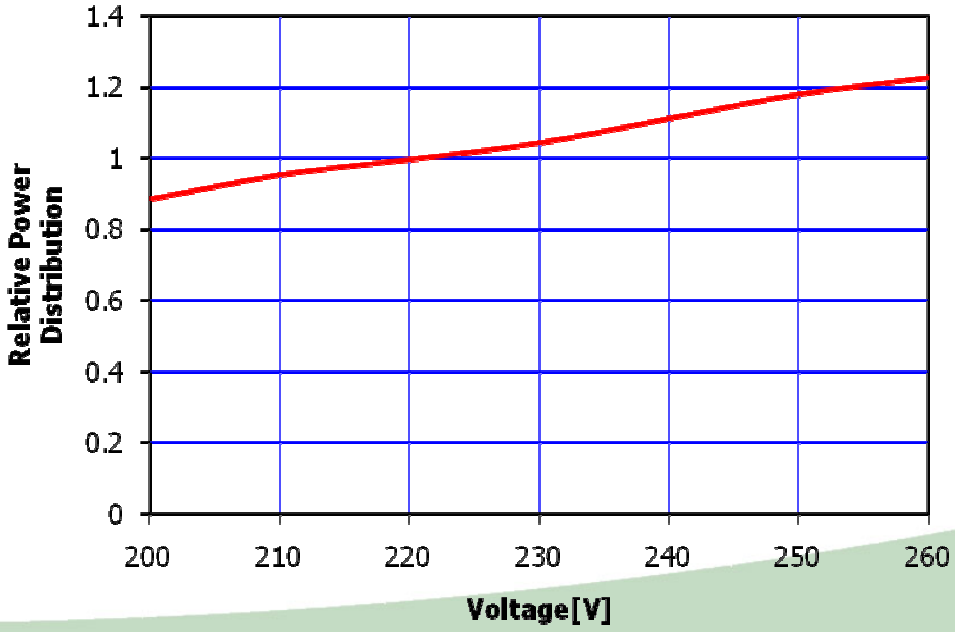
3. Color spectrum

Relative Spectral Power Distribution at Ta=25°C

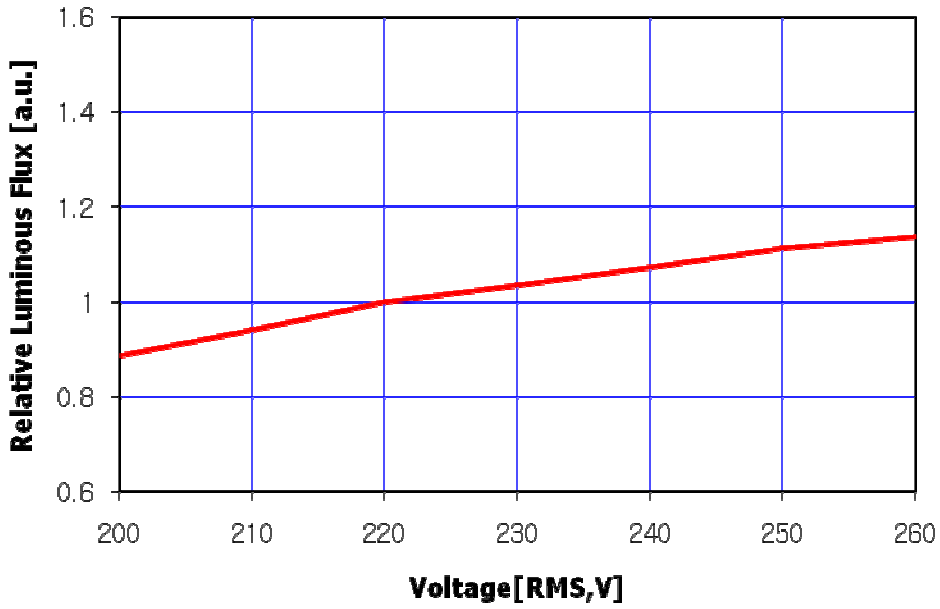


4. Power characteristic

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

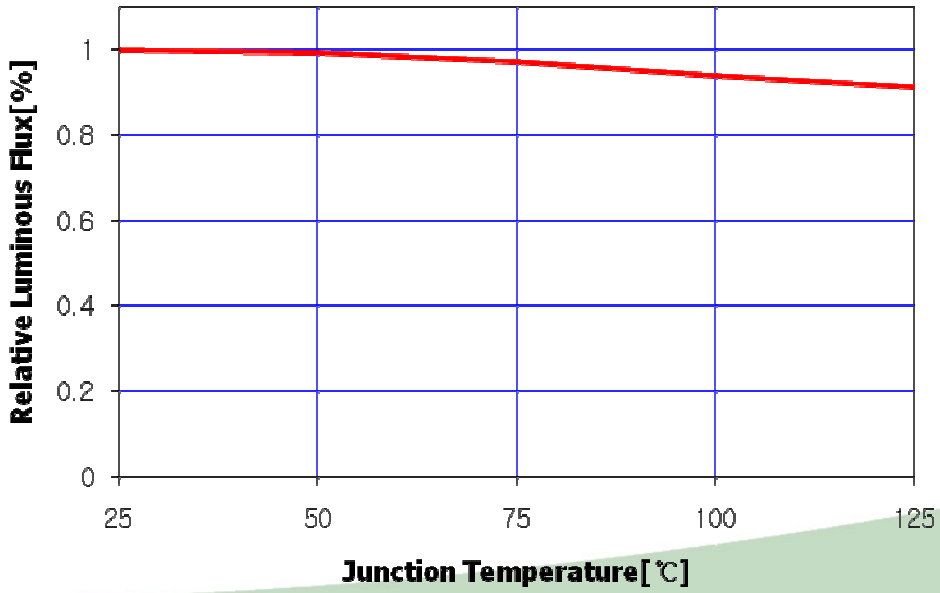


Relative Luminous flux vs. Forward Voltage, Ta=25°C

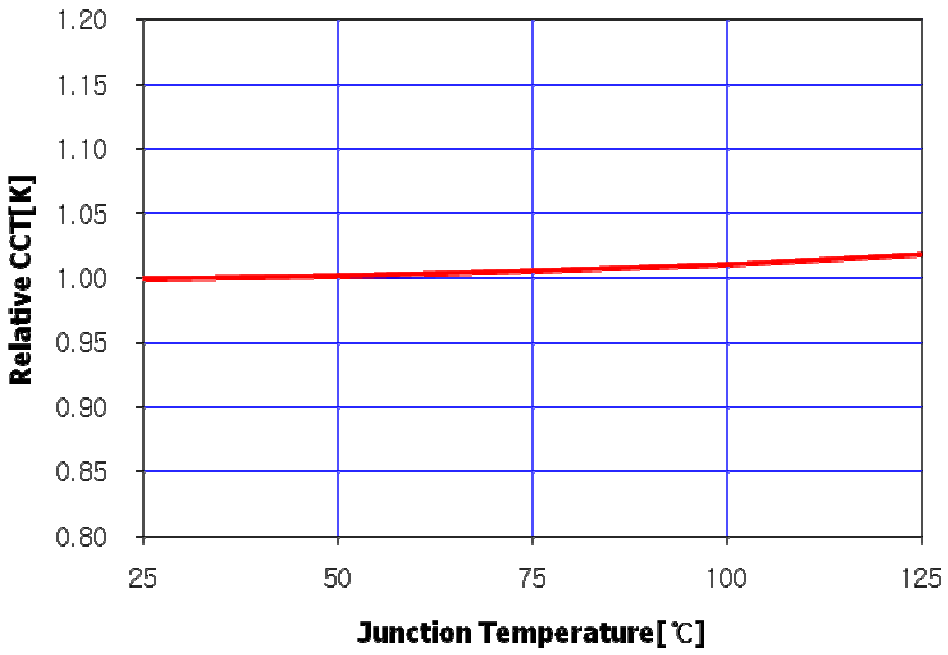


5. Junction Temperature Characteristics

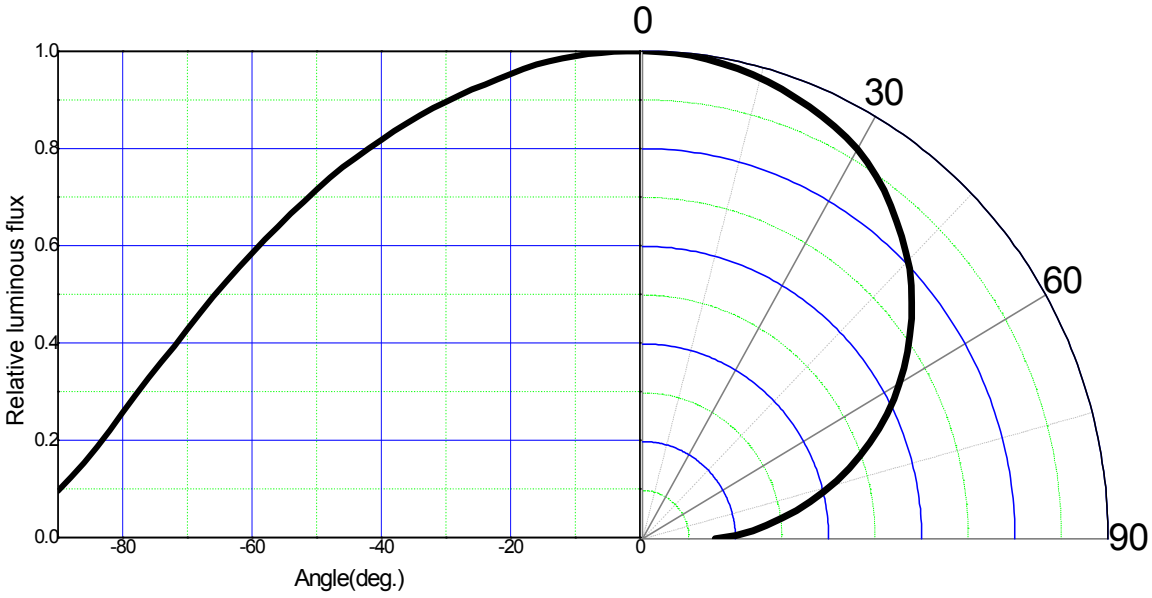
Relative Luminous Flux[%] vs. Junction Temperature, 220 Voltage



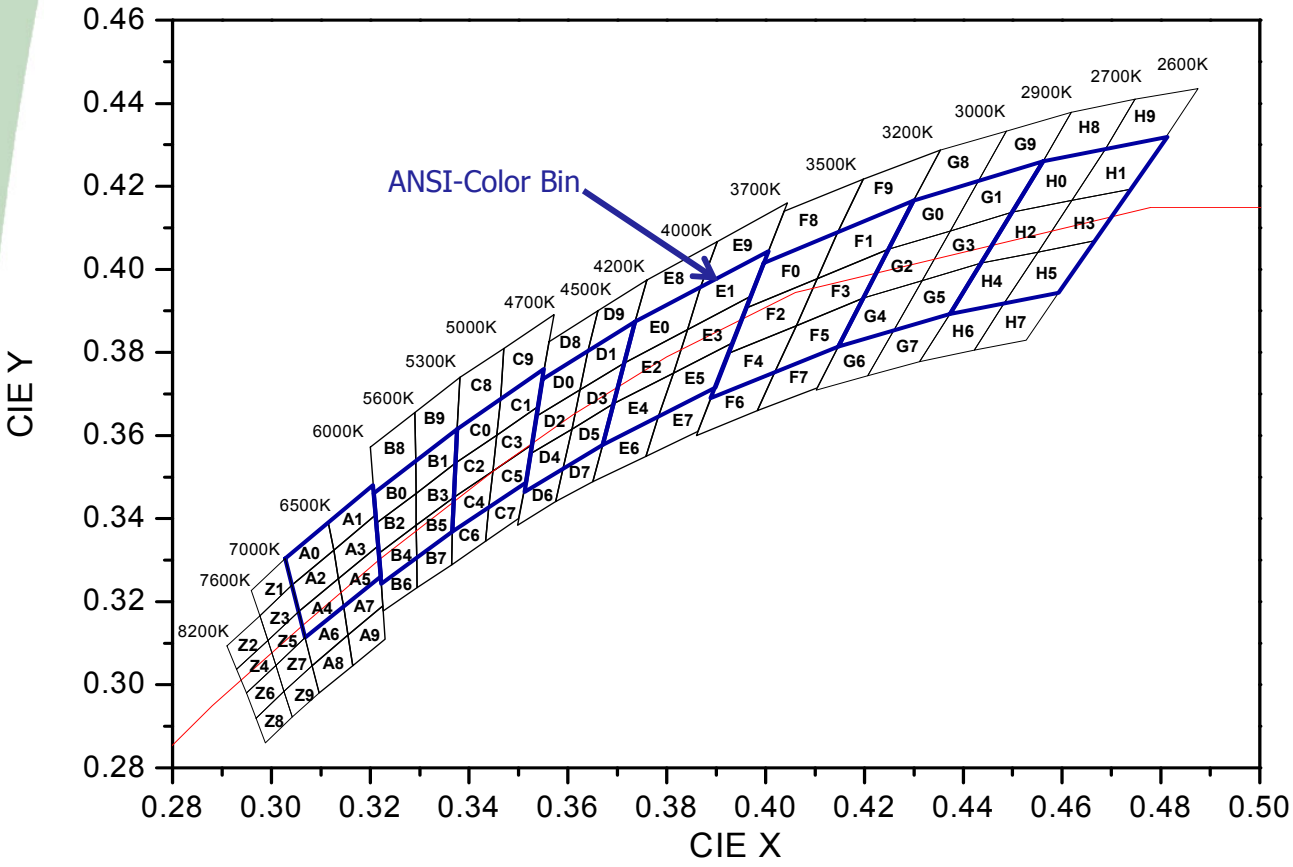
Relative CCT vs. Junction Temperature



6. Radiation Pattern

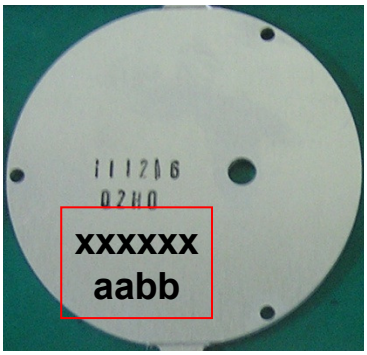


7. Binning Structure



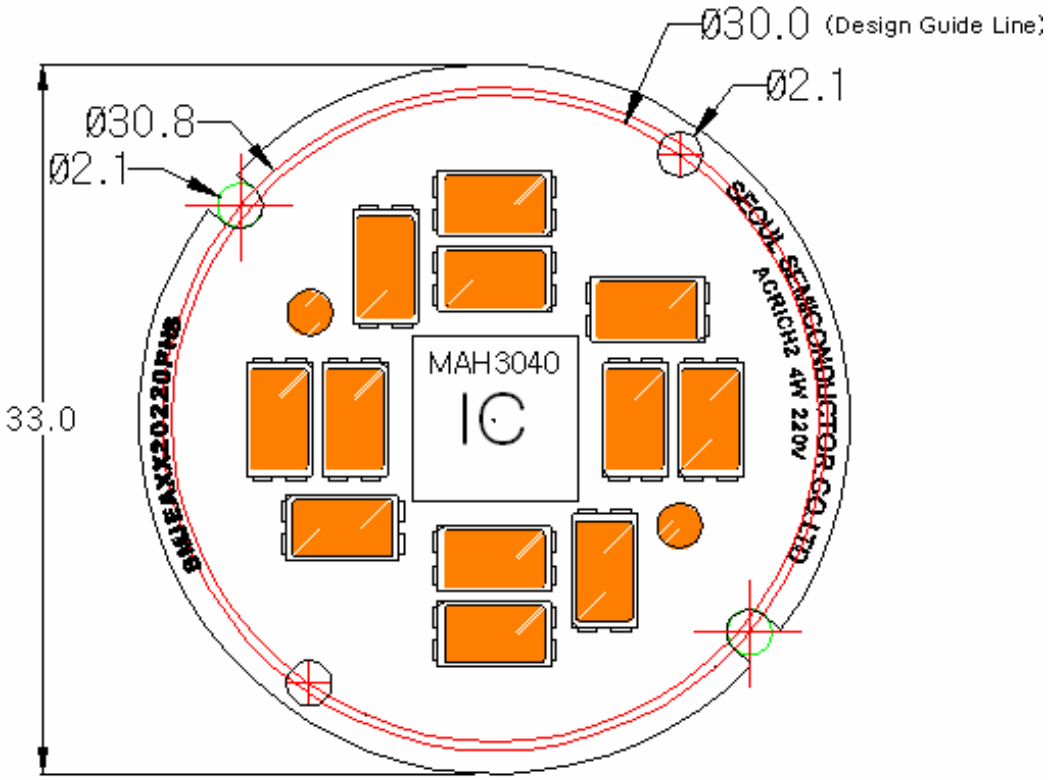
Bin	CIE x / CIE y	x1 / x3	y1 / y3	x2 / x4	y2 / y4	Bin	CIE x / CIE y	x1 / x3	y1 / y3	x2 / x4	y2 / y4
B rank	**B0**	0.3207	0.3462	0.3212	0.3389	C rank	**C0**	0.3376	0.3616	0.3373	0.3534
		0.3293	0.3461	0.3292	0.3539			0.3456	0.3601	0.3463	0.3687
	B1	0.3292	0.3539	0.3293	0.3461		**C1**	0.3463	0.3687	0.3456	0.3601
		0.3373	0.3534	0.3376	0.3616			0.3539	0.3669	0.3552	0.3760
	B2	0.3212	0.3389	0.3217	0.3316		**C2**	0.3373	0.3534	0.3369	0.3451
		0.3293	0.3384	0.3293	0.3461			0.3448	0.3514	0.3456	0.3601
	B3	0.3293	0.3461	0.3293	0.3384		**C3**	0.3456	0.3601	0.3448	0.3514
		0.3369	0.3451	0.3373	0.3534			0.3526	0.3578	0.3539	0.3669
	B4	0.3217	0.3316	0.3222	0.3243		**C4**	0.3369	0.3451	0.3366	0.3369
		0.3294	0.3306	0.3293	0.3384			0.3440	0.3428	0.3448	0.3514
	B5	0.3293	0.3384	0.3294	0.3306		**C5**	0.3448	0.3514	0.3440	0.3428
		0.3366	0.3369	0.3369	0.3451			0.3514	0.3487	0.3526	0.3578
G rank	**G0**	0.4299	0.4165	0.4248	0.4048	D rank	**H0**	0.4562	0.4260	0.4499	0.4138
		0.4374	0.4093	0.4430	0.4212			0.4620	0.4166	0.4687	0.4289
	G1	0.4430	0.4212	0.4374	0.4093		**H1**	0.4687	0.4289	0.4620	0.4166
		0.4499	0.4138	0.4562	0.4260			0.4740	0.4194	0.4810	0.4319
	G2	0.4248	0.4048	0.4198	0.3931		**H2**	0.4499	0.4138	0.4436	0.4015
		0.4317	0.3973	0.4374	0.4093			0.4551	0.4042	0.4620	0.4166
	G3	0.4374	0.4093	0.4317	0.3973		**H3**	0.4620	0.4166	0.4551	0.4042
		0.4436	0.4015	0.4499	0.4138			0.4666	0.4069	0.4740	0.4194
	G4	0.4198	0.3931	0.4147	0.3814		**H4**	0.4436	0.4015	0.4373	0.3893
		0.4259	0.3853	0.4317	0.3973			0.4483	0.3919	0.4551	0.4042
	G5	0.4317	0.3973	0.4259	0.3853		**H5**	0.4551	0.4042	0.4483	0.3919
		0.4373	0.3893	0.4436	0.4015			0.4593	0.3944	0.4666	0.4069

8. Marking



XXXXXX : (Production date) Year/Month/date
aa : LED PKG Flux rank
bb : Color bin

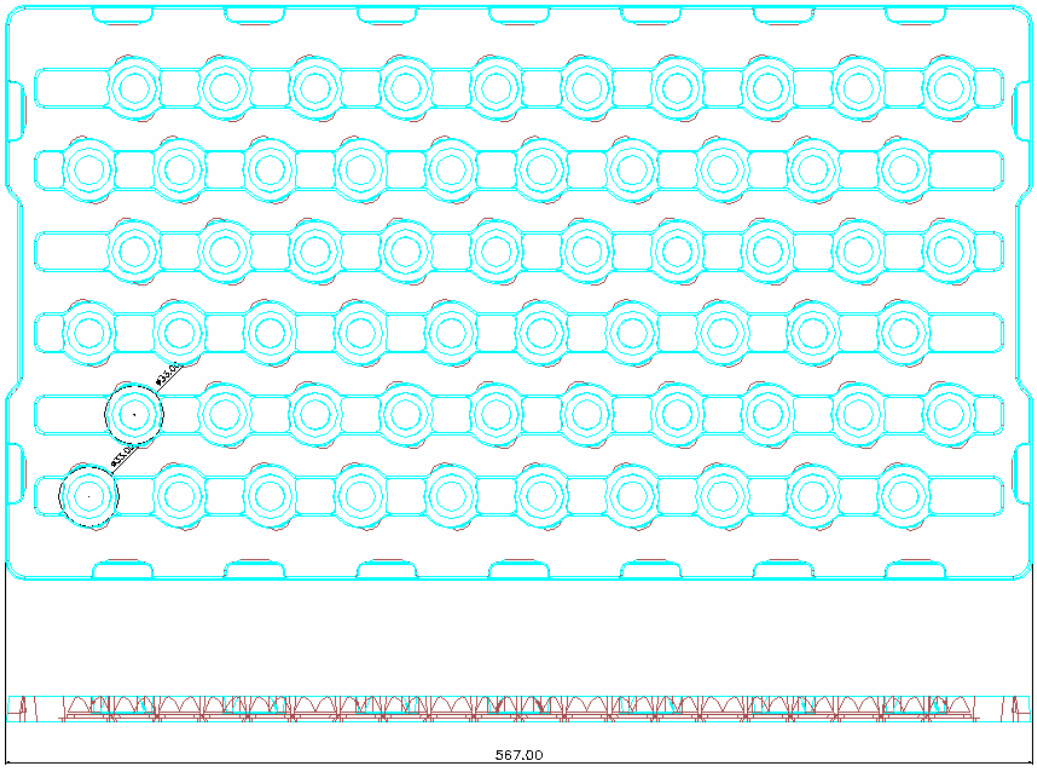
9. Outline dimensions



* 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

10. Tray Packing



1Box = (20PCS per tray) x 25 layer =1500 PCS
about 13kgs

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

11. Precautions 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.

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.