AMERICAN BRIGHT OPTOELECTRONICS CORP.
13815-C MAGNOLIA AVE., CHINO, CA 91710
TOLL-FREE: 888-LED-0800 TEL: 909-628-5050 FAX: 909-628-5006
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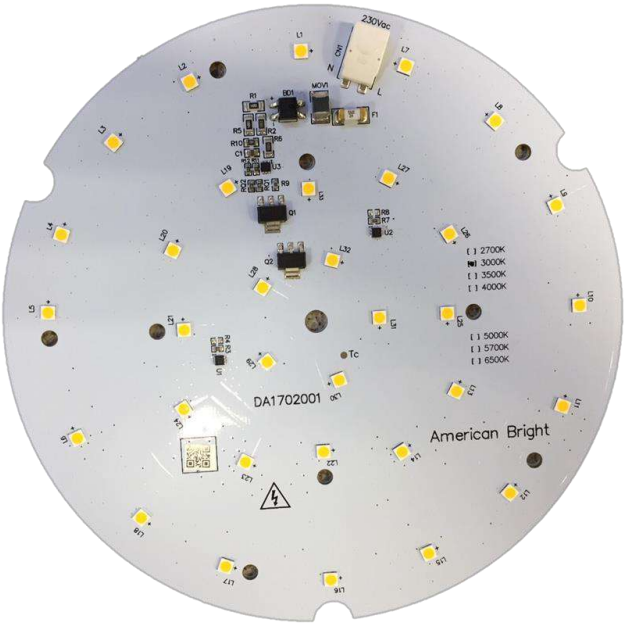
AB-GES-C14224Wxx1N2

Features:

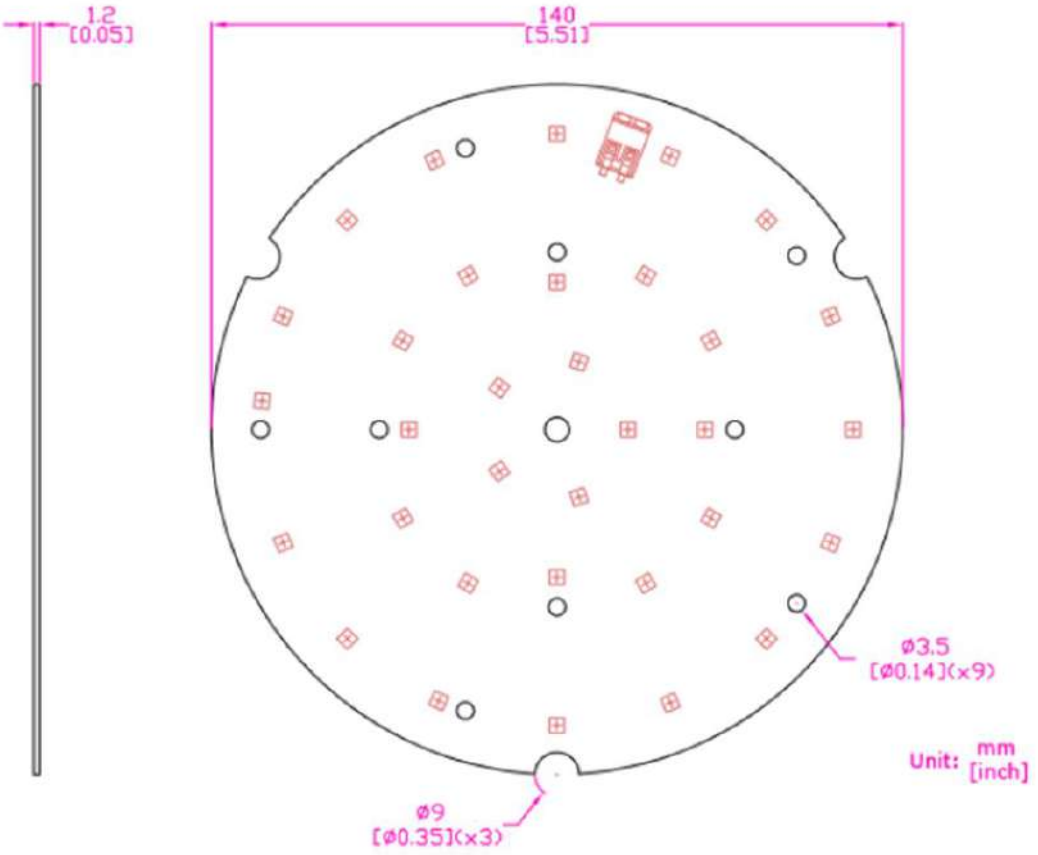
- 24W small size(140mm) circular AC LED light engine
- SimpleDrive® - 230V AC drive technology
- Driver on Board structure
- Long life - No Electrolytic capacitors
- Easily integrated
- CE Compliance

Applications:

- Downlight (Diffused type)
- Can Lights
- Track Lights
- Wall Sconces
- In Ground Lights
- Spot Lights
- Vandal Proof Lights
- Ceiling Lights



Outline Dimensions



40 LEDs

Notes:

1. Terminal block is used and No wire connected.
2. Thickness of PCB is 1.2mm, there's the thermal tape in the back side of module.
3. Tolerance of dimension is ±0.1mm

Characteristics

	Symbol	Rating	Unit
Input Voltage	Vin	230	Vac
LED Junction Temperature[2]	T_J	115	°C
Storage Temperature	T_{stg}	-40 ~ 100 °C	°C
Operation Temperature	T_{opr}	-40 ~ 85 °C	°C

■ Absolute Maximum Ratings

- Proper current rating must be observed to maintain junction temperature below maximum at all time. For this product, we suggest to keep the Temperature of TC point under 75°C, and the temperature of Top IC surface under 110°C. After passing the maximum temperature of IC, the rating current will be lower automatically for protecting the whole circuit.

■ Electrical Characteristics, Ta=25ºC

Parameter	Symbol	Min.	Typ.	Max.	Unit
Input Voltage	Vin	210		250	Vac
Input Frequency	Freq.	50/60			Hz
Power Factor	PF	0.9		0.95	-
Flicker %[1]		100%			
Flicker Index[1]		0.3			

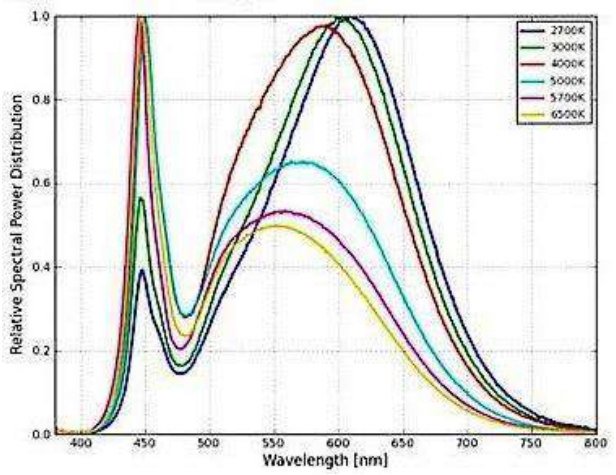
- Surge protection is up to 0.5KV

■ Optical Characteristics (V_{in}=120V), Ta=25ºC

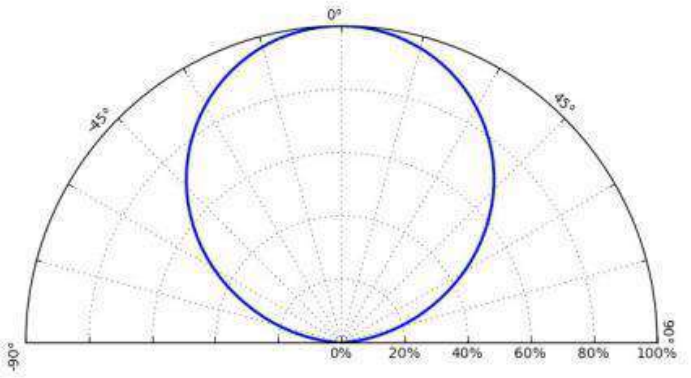
Model name	AC Power(W)			Color Temp	Luminous Flux(lm)		CRI
	Min	Typ.	Max	(K)	Min	Typ	
AB-GES-C14124W301N2	20.4	24.0	27.6	3000K	2260	2400	>80
AB-GES-C14124W401N2	20.4	24.0	27.6	4000K	2480	2700	>80
AB-GES-C14124W501N2	20.4	24.0	27.6	5000K	2480	2700	>80

- Correlated color temperature is derived from the CIE 1931 Chromaticity diagram.
- The luminous flux tolerance is ± 10%.
- This CRI value tolerance is ± 2.
- Calibration accuracy of CIEx and CIEy : ±0.007 ;
- Calibration error CCT 3000K ±175K ; 4000K ±300K ; 6500K ±400K

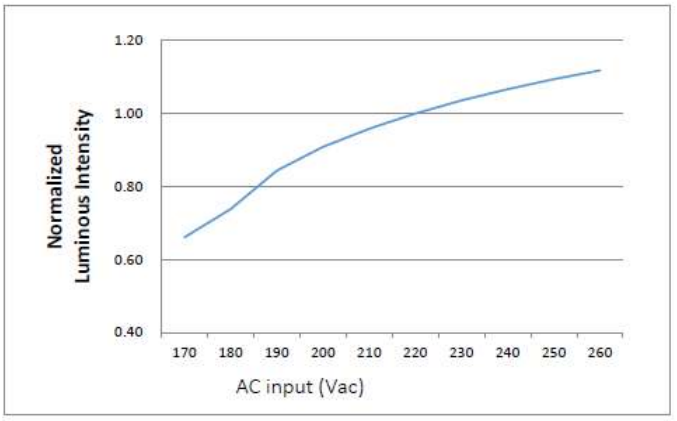
■ Relative Spectrum of Emission (Ta=25ºC, Test current=60mA)



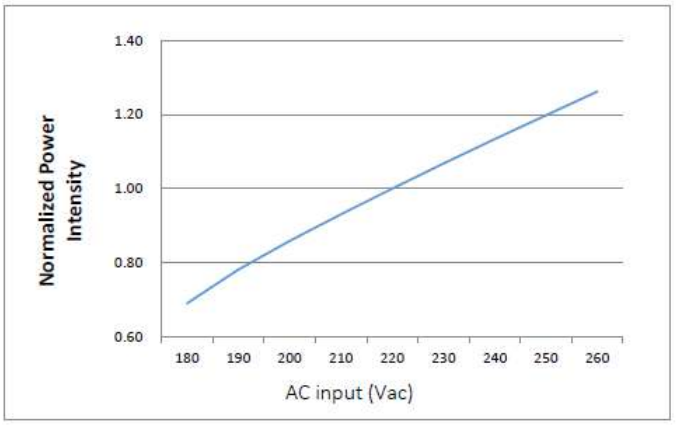
■ Radiation Pattern (Tj=25 ºC)



■ Relative power distribution vs. Input voltage (Ta=25ºC)

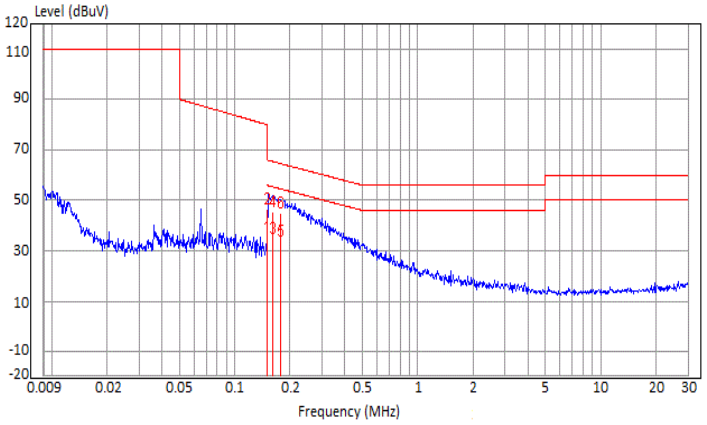


■ Relative luminous output vs. Input voltage (Ta=25ºC)



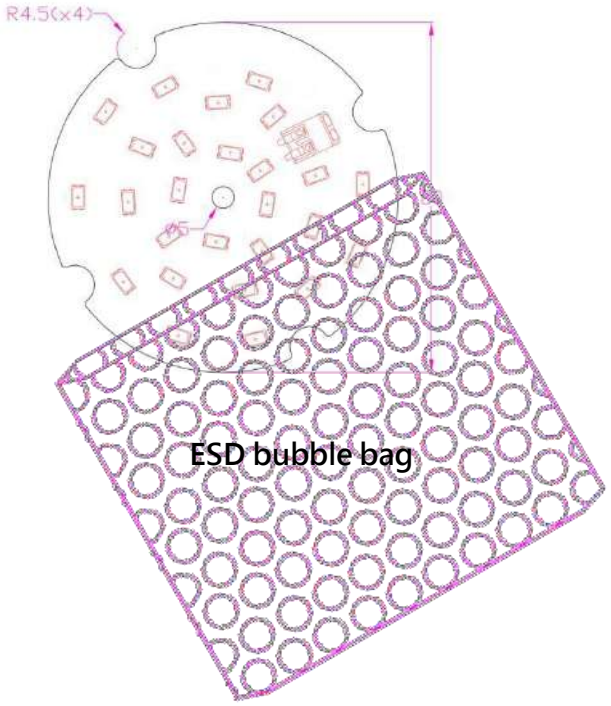
■ Conduction Testing[4] (220Vac/60Hz)

Standard: EN 55015 (QP), Temp. (C)/Hum.(%): 25°C/57%)



Packaging

1. ESD bubble bag.



2 items per bag

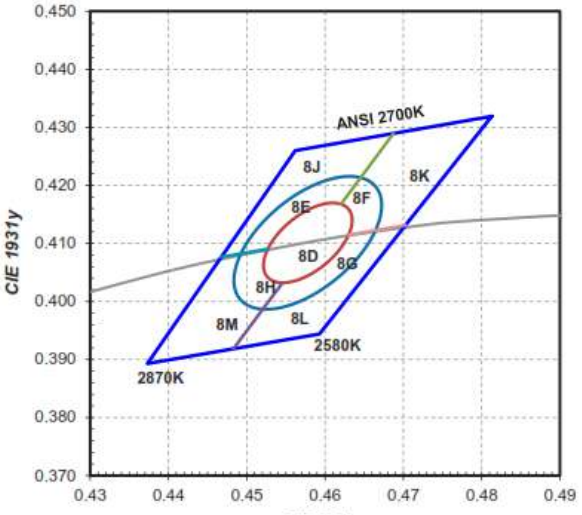
1 Box = 100 PCS (about 2 Kgs)

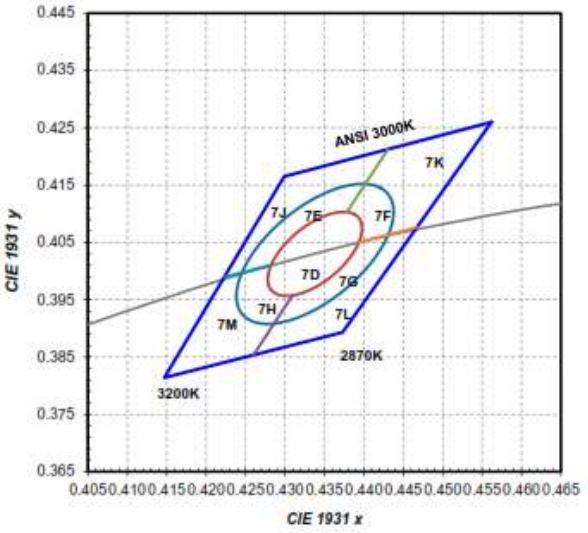
Color Bin Code

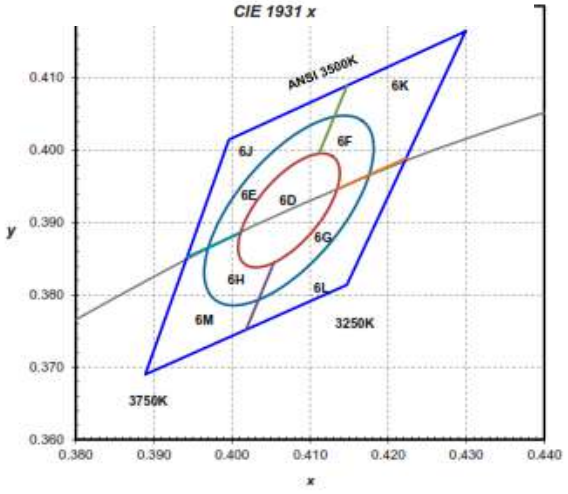
Color region stays within Macadam "3-Step" ellipse from the chromaticity center. The chromaticity center refers to ANSI C78.377:2008.

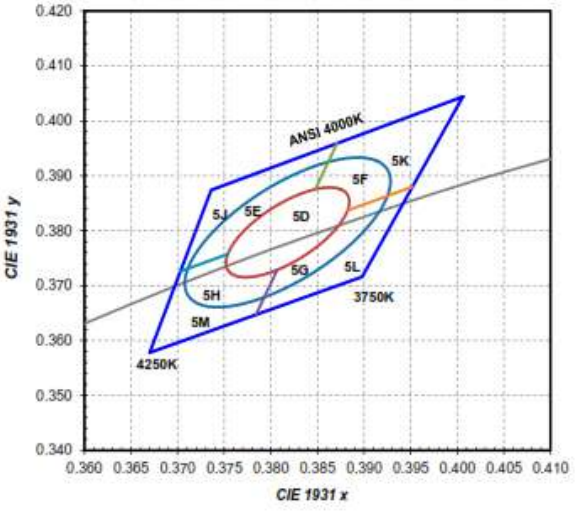
Please refer to ANSI C78.377 for the chromaticity center.

CC	Steps	Cx	Cy	a	b	theta
2700K	3	0.4578	0.4101	0.00810	0.00420	53.7
3000K	3	0.4338	0.4030	0.00834	0.00408	53.2
3500K	3	0.4073	0.3917	0.00927	0.00414	54.0
4000K	3	0.3818	0.3797	0.00939	0.00402	53.7
5000K	3	0.3447	0.3553	0.00822	0.00354	59.6
5700K	3	0.3287	0.3417	0.00746	0.00320	59.0
6500K	3	0.3123	0.3282	0.00669	0.00285	58.5









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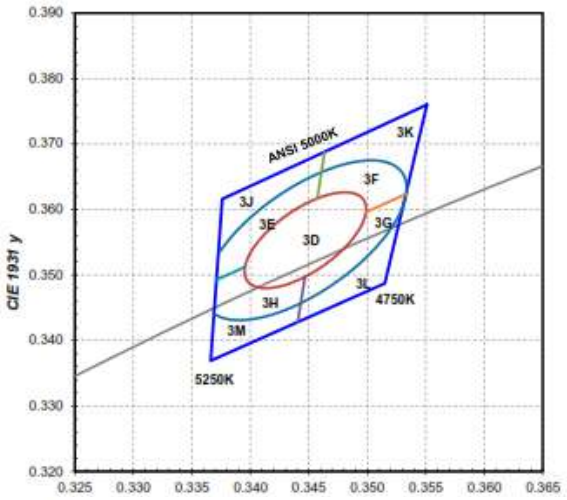
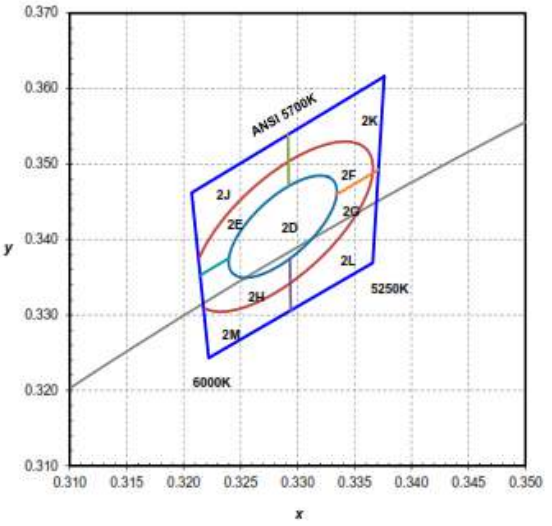
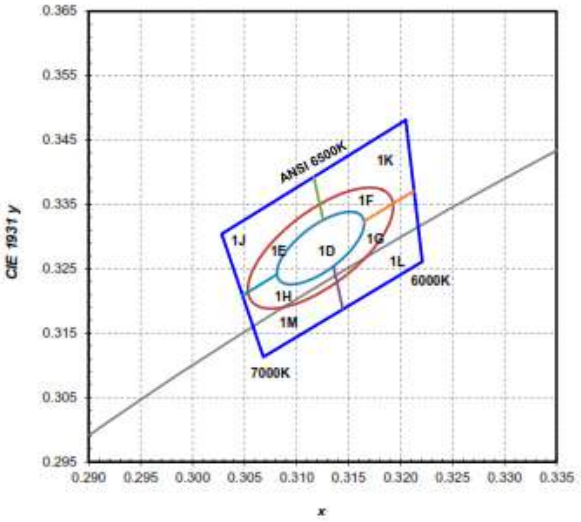
AC Module Flicker







Junction Temperature (T_J) & Solder Point Temperature (T_S)

Flicker for AC driven LED modules can be measured in two different manners, Percent and Index.

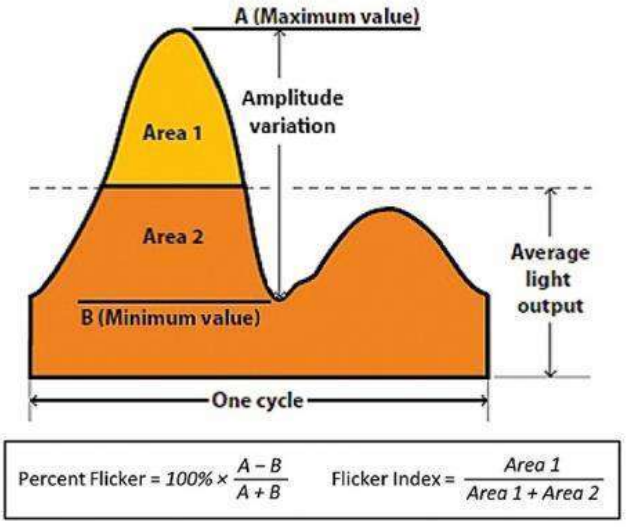
Percent - Older more common metric that measures peak to peak amplitude. No other attributes of the AC wave are taken into account. Measurements of percent range from 0%-100%

AC Module Flicker	100%
Any LED system with Electrolytic Capacitor	2%-90%

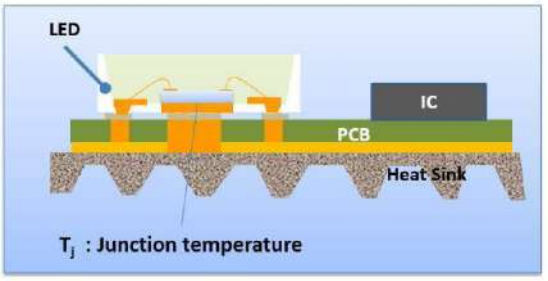
Index - A metric defined by the IES (Illuminating Engineering Society) that measures the shape, duty cycle, and peak to peak amplitude. This is a true measure of eye response to flicker.
Measurement of index range from 1-1.0.

AC Module Index	<0.3
Any LED system with Electrolytic Capacitor	.02~0.2

Graph showing measurement differences



Junction Temperature is the most important factor of LED. Different life performance will be impacted by different junction temperature.



If the thermal dissipation is good enough, the junction temperature will be lower and the lifetime performance will be better.

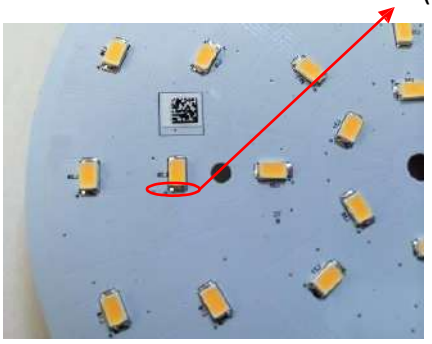
If the junction temperature is higher than 120°C, the LED will deteriorate quickly.

How to monitor the junction temperature?

You need to measure the T_S point.

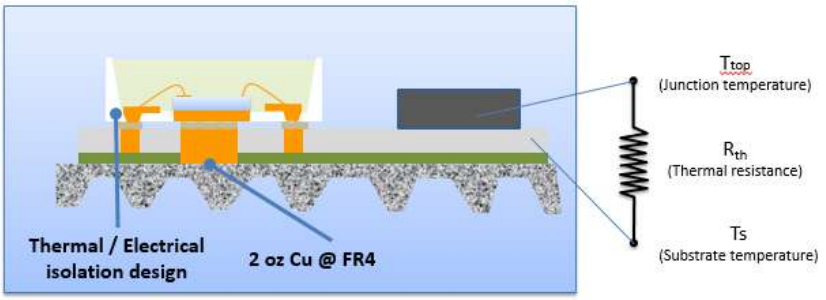
A solder point temperature is a temperature at the measurable point nearest to the junction. Typically this point is at the solder joint.

(solder joint)



You can use the high-temperature thermal conductivity glue (Such as SatlonD-3/606...etc.) to fix the thermal couple to the solder joint then measure the temperature. Once you got the T_S temperature measurement data, you can calculate the junction temperature based on the measurement data of the Ts. The details of the calculation method are shown in the following page:

Calculate the Junction temperature of LED



$$T_{j,LED} = T_s + R_{th} * P_D$$

The junction temperature should be calculated by the Substrate temperature (T_s) and the thermal resistance of Substrate (R_{th}).

Examples:

What is the T_j of LED (R_{th}= 12 °C/W) at 40°C?

T_s=40°C, LED P_D=0.5W, LED R_{th}= 12 °C/W (typical)

☆$T_{j,LED}$= 40 + 0.5*12 = 46°C (Normal $T_{j\ LED}$ limitation is 110°C)

Calculate the Junction temperature of IC

$T_{j,IC} = T_s + R_{th,IC} * P_D$

The junction temperature should be calculated by the Substrate temperature (T_s) and the Thermal resistance of Substrate (R_{th})

IC	IC power consumption	$R_{th,ic}$
	AC input	
	100V-220V	15

Thermal resistance of IC under different AC input

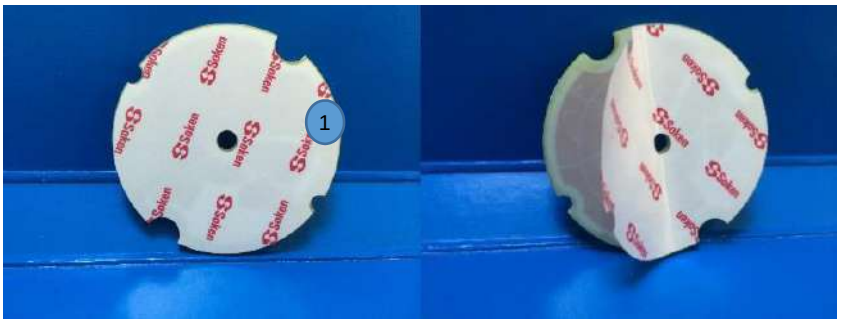
Examples:

What is the T_J of IC (R_{th}= 15 °C/W) at 40°C?

T_s=40°C, IC P_D=1.68W, IC R_{th}= 15 °C/W (minimum)

☆$T_{j\ IC}$= 40 + 1.68*15 = 65.2°C (Normal $T_{j\ IC}$ limitation is 110°C)

Backside of AC LED module



Picture of the backside of module

Items:

Warning:

Remember to remove the protective paper on the thermal insulating tape from the backside of the module

Warning:

AC LED modules must be attached by an additional connection, not only the tape

Specification of the Thermal tape

Thickness	**mm**	**0.25**
Adhesive force	T_0 (0 hrs)	4.0
	T_{24} (24 hrs)	4.6
Thermal conductivity	W / m •K	0.7
Thermal resistance	cm^2 °C/W	3.6
Fire ret ardency	UL94	V0
Isolation strength	DC (kV)	>10
	AC (kV)	4.4

Installation Instructions

Installation:

1. Remove the protective paper on the back side of AC LED module
2. Adjust the AC LED module to the desired position
3. Using a screw driver, attach the AC LED module
4. Select the proper wire

If a connector is going to be used with the AC Module, please follow the instructions below

	WAGO	BJB
Photo		
Conductor size	Solid: 0.2-0.75mm^2 Fine stranded: 0.2-0.75mm^2	Solid: 0.34-0.75mm^2
Conductor size (AWG)	18-24	18-24

Connector spec summary

Reference Information

[1] Flicker information, please refer to page 8.

[2] Junction Temperature (Tj) & Ts Point information please refer to page 9.

[3] Thermal tape information, please refer to page 11.

[4] The primary goal of **EMC testing** is to identify the sources of electromagnetic energy emitted from an electronic device in an effort to reduce potential interference to other equipment, as well as determine the susceptibility of the equipment from electromagnetic energy emitted from other electronic devices nearby.

Warranty

American Bright Optoelectronics Corp., warrants that its AC LED MODULES will be free from defects in material and workmanship from the date of manufacture by American Bright Optoelectronics Corp. for a period of 5 years (LED light generation module case temperature(s) not to exceed 75°C, IC temperature(s) not to exceed 110˚C). The AC LED MODULES consists of a LED lighting components and the driver circuit (collectively, the "Power circuit"). This limited warranty only applies when the American Bright Optoelectronics Corp. LED module is properly connected and installed on the luminaire; operated within the electrical values recommended by American Bright Optoelectronics Corp.; and used in situations approved for the application and in the environmental conditions (temperature, humidity) within the normal specified operating range of the system.

This warranty is further conditioned upon proper storage, installation, use and maintenance. This warranty is not applicable to any Product which is not installed and operated in accordance with the current edition of The National Electric Code (NEC), the Standards for Safety of Underwriters' Laboratory, Inc. (UL), the Standards for the American National Standards Institute (ANSI), and with American Bright Optoelectronics Corp.'s instructions and guidelines for the Product. This warranty is not applicable to any Product or component subjected to abnormal stresses and operating conditions. Replacement of the American Bright Optoelectronics Corp. Product with LED components of other manufacturers will void the entire warranty.

THE WARRANTIES AND REMEDIES SET FORTH HEREIN ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES WHETHER, EXPRESS OR IMPLIED, INCLUDING ALL WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND ALL WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OR TRADE. Purchaser's exclusive remedy, for any nonconformity or defect in any product shall be only those explicitly set forth herein.