

AB-GES-L28212Wxx4T2

Features:

- 12W 1ft Linear AC LED light engine
- SimpleDrive® - 230V AC drive technology
- Zhaga user interface compliance
- Driver on Board structure
- Dimmable light engine
- Long life - No Electrolytic capacitors
- Easily integrated
- CE Compliance

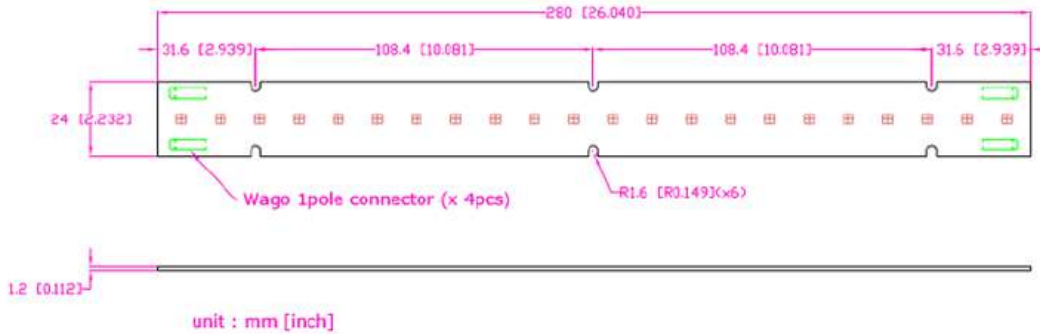
Applications:

- Refrigerator light
- Under-cabinet
- Ceiling light
- Vandal Proof Lights
- Wall Sconces



AB-GES-L28212Wxx4T2

Outline Dimensions



22 LEDs

Notes:

1. 4 individual connectors, 2 on each end, are used for the serial connection and No wire connected.
2. Thermal tape^[3] is on the back of module.
3. Thickness of PCB: 1.2mm
4. Tolerance of dimension: ± 0.1 mm
5. Tc point is in the center of AC DOB module. The Temperature of Tc & LED soldering pad (Ts) need to be lower than 75 °C and the temperature of top of IC needs to be lower than 110 °C^[2].
6. Please use plastic screw for passing the safety regulation.
7. IMPORTANT: In order to pass UL1598, add an insulating thermal pad with at least 1.0mm thickness to the module.



Characteristics

	Symbol	Rating	Unit
Input Voltage	V _{in}	230	Vac
LED Junction Temperature ^[2]	T _j	115	°C
Storage Temperature	T _{stg}	-40 ~ 85 °C	°C
Operation Temperature	T _{opr}	-40 ~ 45 °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 to protect circuit.

Electrical Characteristics, Ta=25°C

Parameter	Symbol	Min.	Typ.	Max.	Unit
Input Voltage	V _{in}	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=25°C

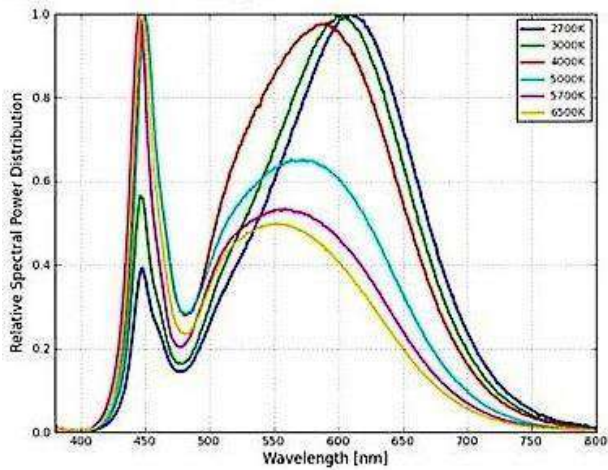
Model name	AC Power(W)			Color Temp (K)	Luminous Flux(lm)		CRI
	Min	Typ.	Max		Min	Typ	
AB-GES-L28212W304T2	10.5	12.0	13.5	3000	1230	1300	>80
AB-GES-L28212W404T2	10.5	12.0	13.5	4000	1300	1400	>80
AB-GES-L28212W504T2	10.5	12.0	13.5	5000	1300	1400	>80

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

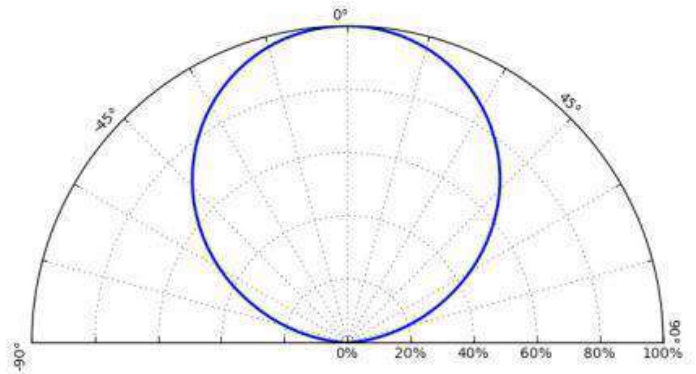
Thermal Resistance, Ta=25°C

Part	Min.	Typ.	Max.	Unit
LED		11	17	°C/W
IC	15		20	°C/W

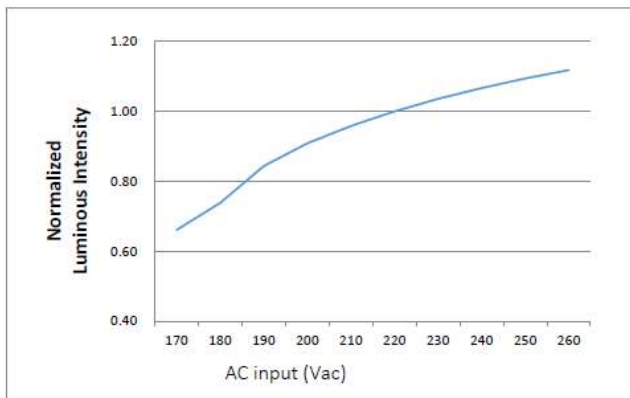
■ **Relative Spectrum of Emission (Ta=25°C, Test current=60mA)**



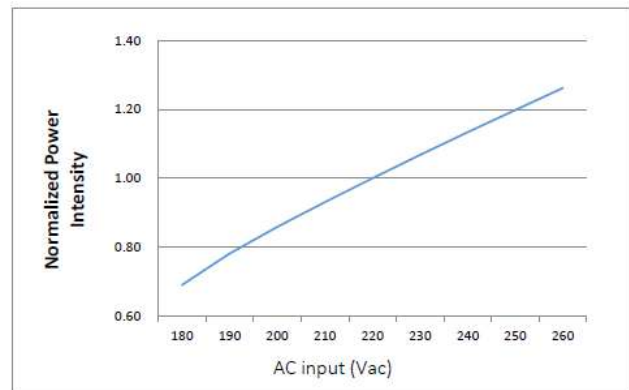
■ **Radiation Pattern (Tj=25 °C)**



■ **Relative power distribution vs. Input voltage (Ta=25°C)**

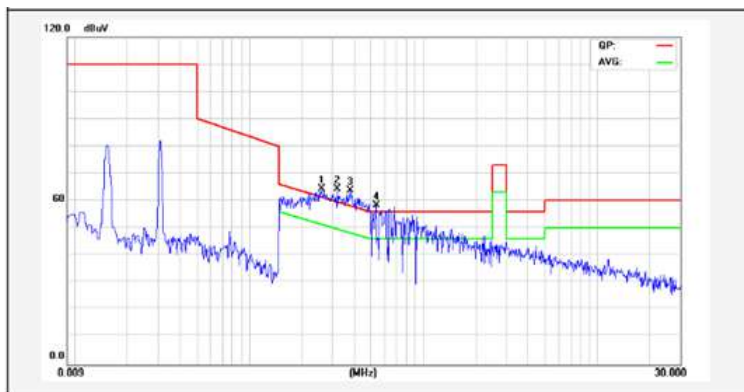


■ **Relative luminous output vs. Input voltage (Ta=25°C)**



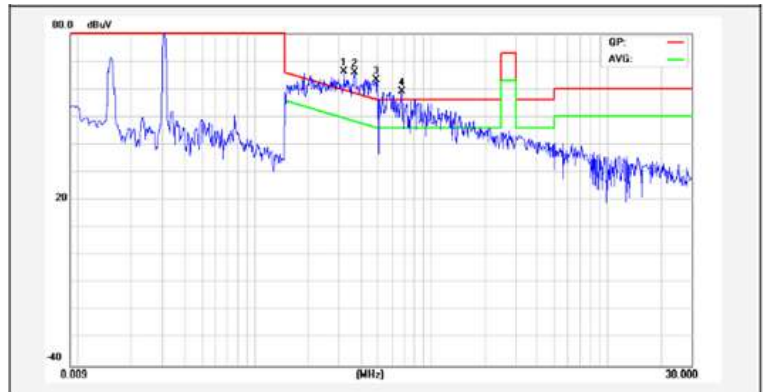
■ **Conduction Testing^[5] 1 (220Vac/60Hz)**

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



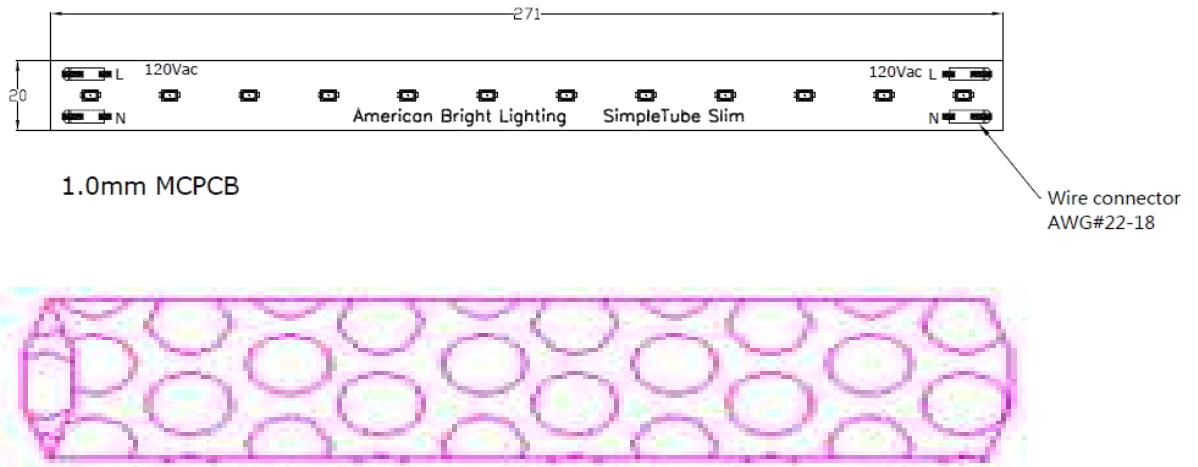
■ **Conduction Testing^[5] 2 (220Vac/60Hz)**

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



Packaging

1. ESD bubble bag



2 items per bag

1 Box = 200 PCS (about 4 Kgs)



Color Bin Code

Chromaticity Coordinates as per CIE 1931 Chromaticity Chart.

Color Ranks - Warm White

Rank sw27				
x	0.4373	0.4562	0.4813	0.4593
y	0.3893	0.4260	0.4319	0.3944

Rank sw30				
x	0.4147	0.4299	0.4562	0.4373
y	0.3814	0.4165	0.4260	0.3893

Rank sw35				
x	0.3898	0.3996	0.4299	0.4147
y	0.3716	0.4015	0.4165	0.3814

Rank sw40				
x	0.3670	0.3736	0.3996	0.3898
y	0.3578	0.3874	0.4015	0.3716

Rank sw45				
x	0.3515	0.3548	0.3736	0.3670
y	0.3487	0.3736	0.3874	0.3578

Color Ranks - Cool White

Rank b3				
x	0.2870	0.2830	0.3040	0.3070
y	0.2950	0.3050	0.3300	0.3150

Rank b4				
x	0.3070	0.3040	0.3300	0.3300
y	0.3150	0.3300	0.3600	0.3390

Rank b5				
x	0.2960	0.2870	0.3070	0.3110
y	0.2760	0.2950	0.3150	0.2940

Rank b6				
x	0.3110	0.3070	0.3300	0.3300
y	0.2940	0.3150	0.3390	0.3180

Rank c1				
x	0.3300	0.3300	0.3610	0.3570
y	0.3390	0.3600	0.3850	0.3610

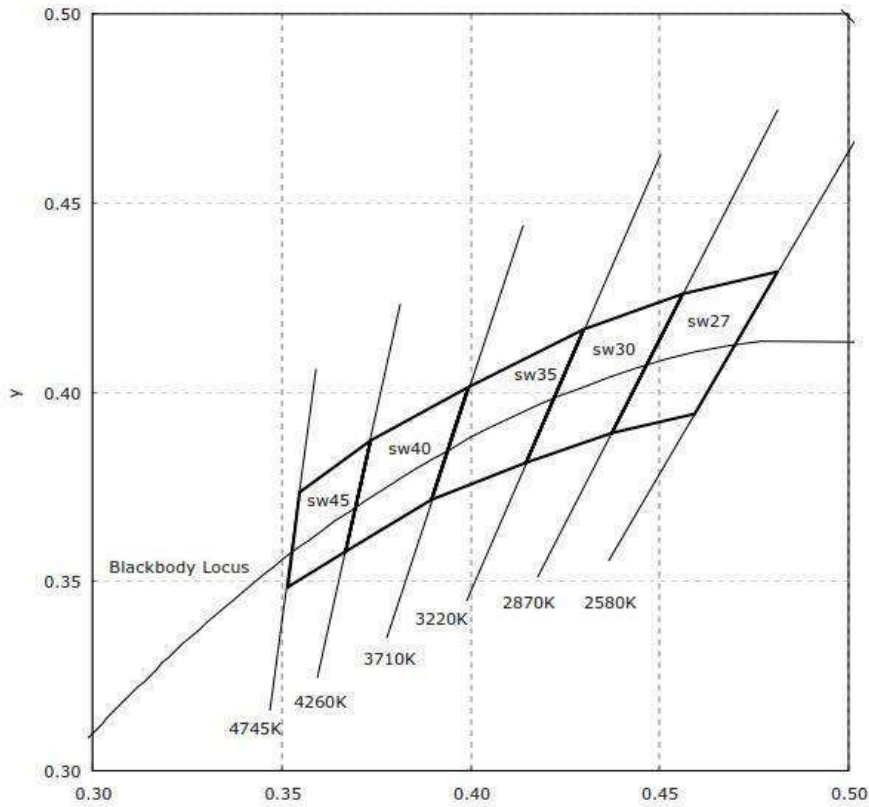
Rank c2				
x	0.3300	0.3300	0.3570	0.3560
y	0.3180	0.3390	0.3610	0.3510

Rank sw50				
x	0.3366	0.3376	0.3548	0.3515
y	0.3369	0.3616	0.3736	0.3487

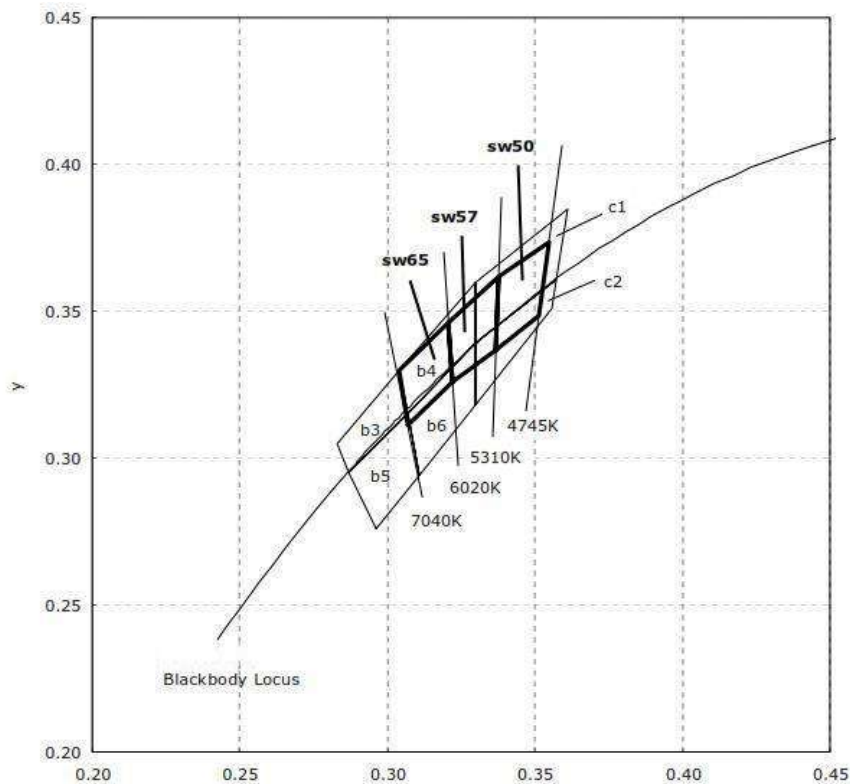
Rank sw57				
x	0.3221	0.3207	0.3376	0.3366
y	0.3261	0.3462	0.3616	0.3369

Rank sw65				
x	0.3070	0.3040	0.3207	0.3221
y	0.3113	0.3300	0.3462	0.3261

Chromaticity Diagram - Warm White



Chromaticity Diagram - Cool White



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AC Module Flicker

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

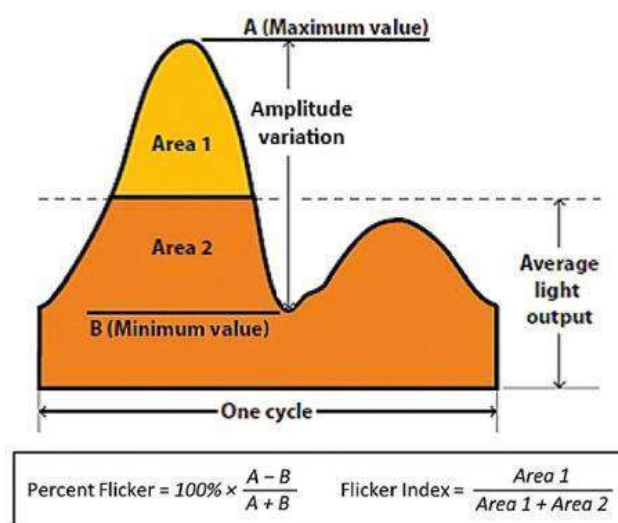
Percent - Older more common metric that measures peak to peak amplitude. No other attributes of the AC wave are taken into account. Measurements of percent range from 0%-100%

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.

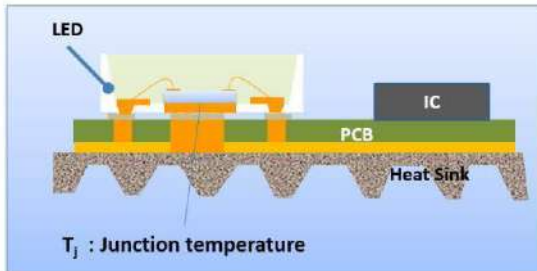
AC Module Index	<0.3
Any LED system with Electrolytic Capacitor	.02~0.2

Graph showing measurement differences



Junction Temperature (T_j) & Solder Point Temperature (T_s)

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



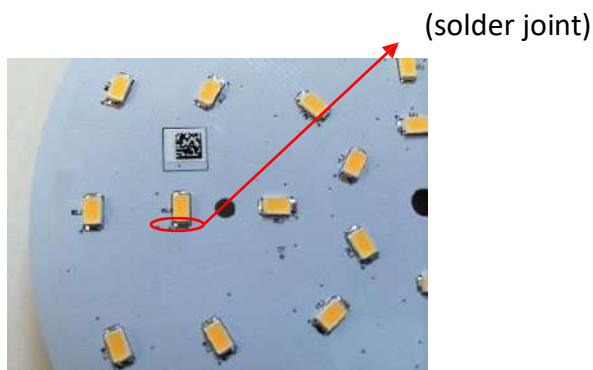
If the thermal dissipation is good enough, the junction temperature will be lower and the lifetime performance will be better.

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

How to monitor the junction temperature?

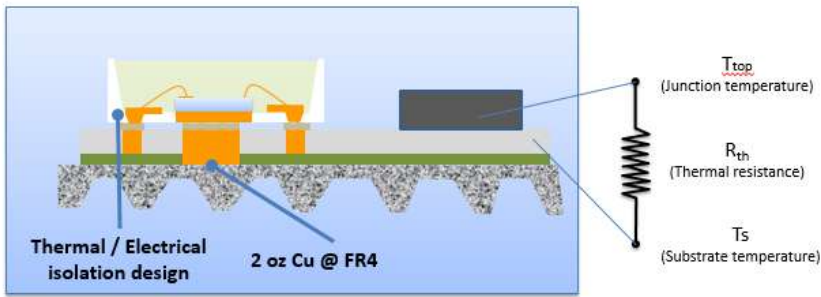
You need to measure the T_s point.

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



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 T_s . 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}= 11 °C/W) at 40°C?

T_s=40°C, LED P_D=0.5W, LED R_{th}= 11 °C/W (typical)

★T_{j,LED}= 40 + 0.5*11 = 45.5°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

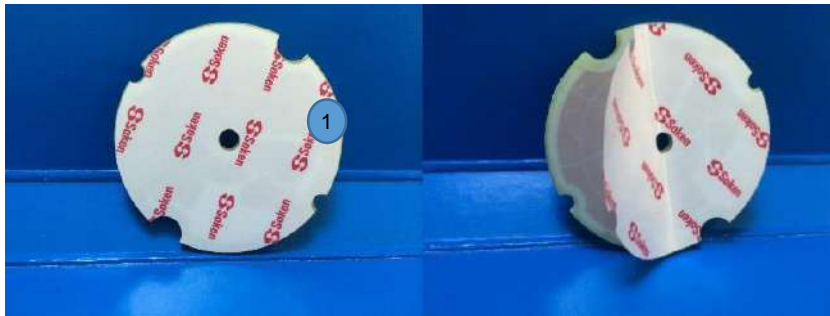
Examples:

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] Dimmer list, please refer to page 13.
- [5] 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.

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