

ACTIVA INC.

**SPECIFICATION
SHEET**



MODEL NO. :	D12038V48SHB-K-FG-PWM
DESCRIPTION :	DC COOLING FAN
VERSION :	A
RELEASED DATE :	2022.02.24

APPROVED BY	PREPARED BY
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2022.02.24	2022.02.24

SYMBANG



ACTIVA INC.

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PRODUCT SPECIFICATION

A. General Specification

Item		Specification	Condition
1	Model No.	D12038V48SHB-K-FG-PWM	
2	Outline Dimension	120 x 120 x 38 mm	
3	Rated Voltage	DC 48 V	
4	Operating Voltage Range	DC 28~56 V	
5	Start Voltage	DC 28 V	
6	Rated Current	0.6 A +10%	At Rated Voltage, 25°C, 65% RH, Free Air
7	Power Consumption	28.8 W +10%	
8	Rotating Speed	5200 RPM ±10%	At Rated Voltage, 25°C, 65% RH, Free Air
9	Max. Airflow	241.0 CFM 6.82 m ³ /min	At Rated Voltage AMCA 210 Standard At Rated Current
10	Max. Static Pressure	27.49 mmH ₂ O 1.08 inchH ₂ O	
11	Noise Level	57.0 (Max. 62) dB(A)	At Rated Voltage Measured in a non-echo Chamber CNS 8753 Standard ISO 3744 Test Condition
12	Life	50,000hrs at 25°C	
13	No. of Blade	7 Blades	
14	No. of Pole	4 Poles	
15	Rotating Direction	Clockwise View From Label Side	
16	Weight	280 g	
17	Motor Type	DC Brushless Fan Motor	
18	Speed Control	PWM Signal	
19	Signal Output	FG Signal	

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B. Main Materials / Parts Specification

Materials / Parts		Specification
1	Housing	Thermoplastic PBT, UL94V-0
2	Blade	Thermoplastic PBT, UL94V-0
3	Bearing	Ball Bearing
4	Termination	Lead Wires (+)Red, (-)Black, (FG)Yellow, (PWM)Blue UL1007 AWG#24 Length:300±10mm
5	Connector	N/A

C. Safety Approvals

Safety Approvals	UL	TUV	
File Number	N/A	N/A	

D. Environmental Specification

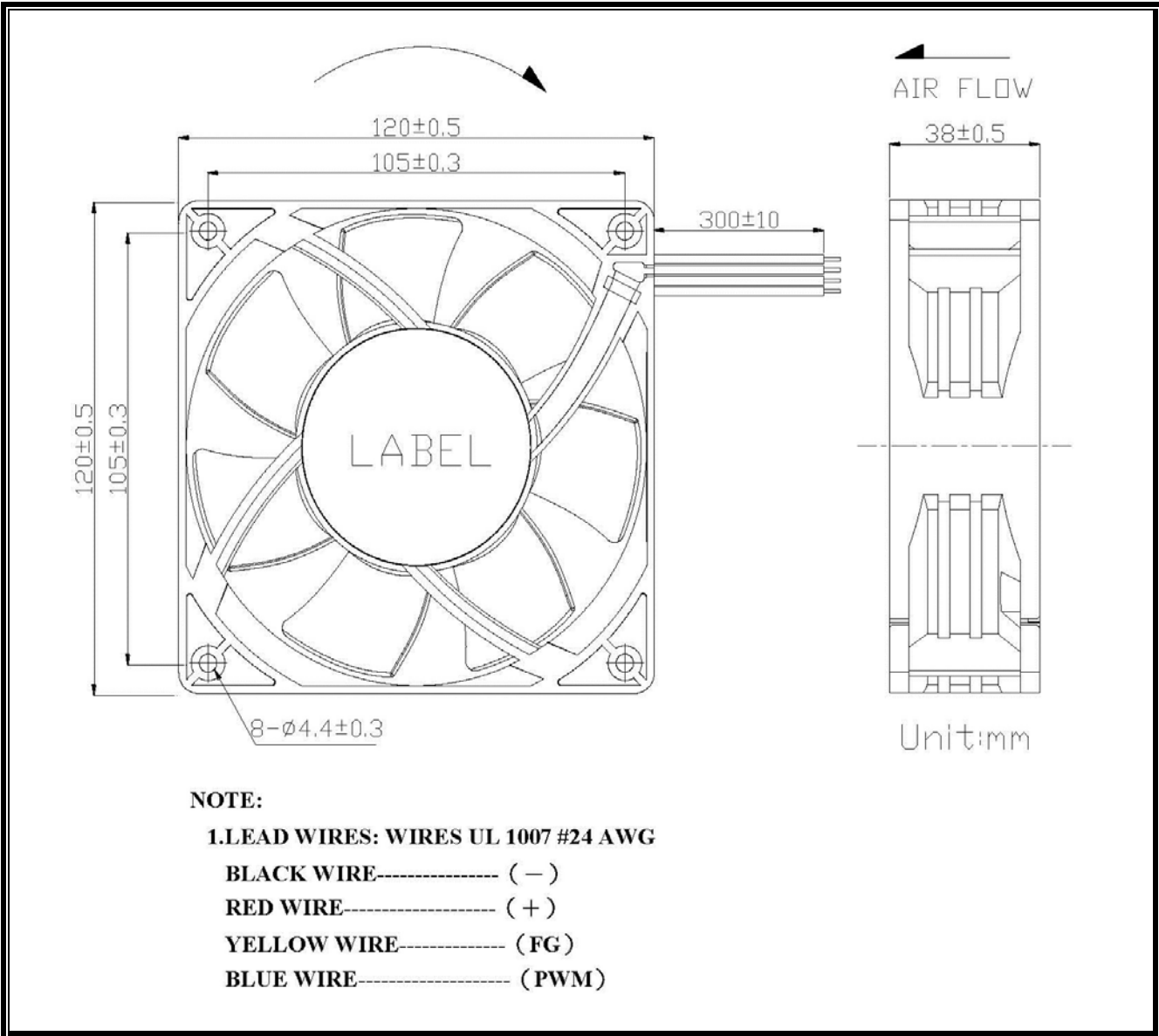
Item		Specification / Condition
1	Operating Temp. Range	Temperature : -10°C ~ + 70°C Humidity : 5% ~ 90% RH
2	Storage Temperature	All function shall be normal after 500 hours storage at -40°C to +75 °C with a 24 hour recovery period at room temperature. Humidity : 5% ~ 95% RH
3	Humidity Test	After 96 hours, 95% RH, 40+/-2°C per MIL-STD-202F, method 103B humidity test, the measured data on insulation resistance and dielectric strength shall meet the specification.
4	Thermal Shock	Per MIL-STD 202F Method 107D, Condition D
5	Insulation Shock	Class A

E. Electrical Specification

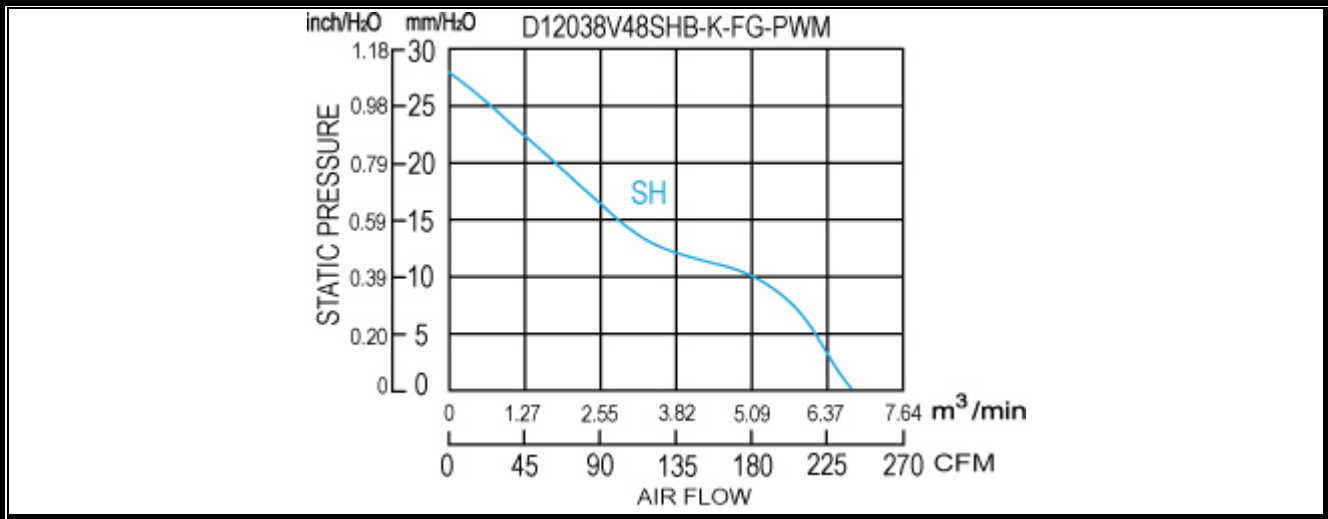
Item		Specification/Condition
1	Insulation Resistance	10MEGA OHM MIN. AT 500VDC (BETWEEN FRAME AND (+) TERMINAL)
2	Dielectric Strength	5mA MAX. AT 500 VAC 60Hz ONE MINUTE, (BETWEEN FRAME AND (+) TERMINAL)
3	Motor Safety Protection	Open circuit when VCC&GND are exchanged Circuit won't be burned within 5seconds when VCC&GND are exchanged
4	Locked rotor Protection	When the fan motor is locked, The device will cut off the drive current for a while and restart automatically later. If the lock situation is continued, The device will work as the above situation repeatedly till the lock is released.

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F. Outline Dimension



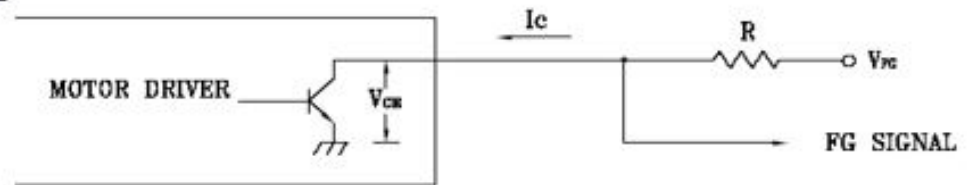
G. Airflow Performance



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H. Frequency Generator (FG) Signal:

H-1. SCHEMATIC



CAUTION:

CAUTION:

THE LEAD WIRE OF FG SIGNAL CAN NOT TOUCH
THE LEAD WIRE OF POSITIVE OR NEGATIVE

H-2. SIGNAL SPECIFICATION:

OUTPUT TYPE: OPEN COLLECT

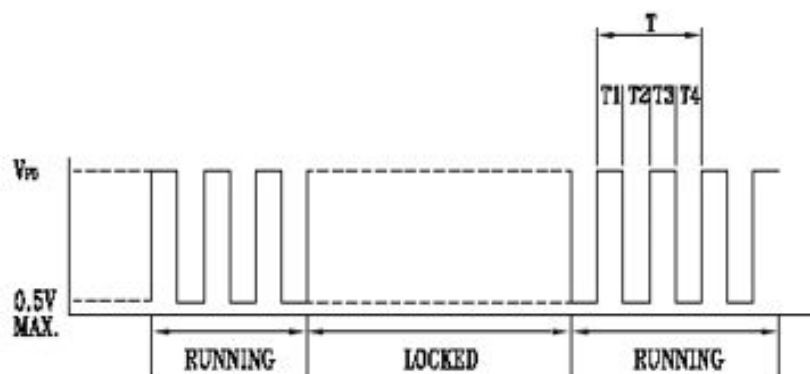
V_{FG} MAXIMUM VOLTAGE= 12V

I_C MAXIMUM CURRENT= 5mA

LOW LEVEL VOLTAGE= 0.5V MAX

$R \geq V_{FG} / I_C$

H-3 FREQUENCY GENERATOR WAVEFORM



$$T = T_1 + T_2 + T_3 + T_4 = 60/N(\text{Sec})$$

N: SPEED (RPM)

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I. PWM Speed Control

I-1 SIGNAL DESCRIPTION

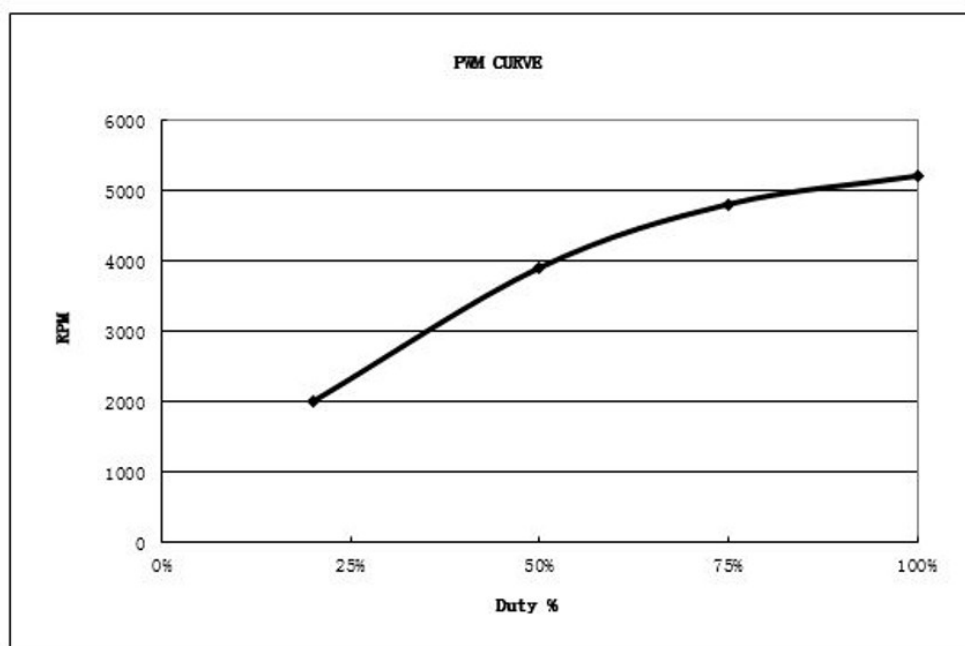
1. CONTROL SIGNAL: PWM CONTROL
2. SIGNAL TYPE:
INPUT HIGH LEVEL VOLTAGE: MIN. >2.6V , MAX.<5V
INPUT LOW LEVEL VOLTAGE: MAX.<0.5V
3. PWM FREQUENCY RANGE: 1KHZ~100KHZ
4. MAX. SINK CURRENT: 8mA

I-2. FAN SPEED CONTROL

1. INPUT VOLTAGE: 5 VDC
2. PWM FREQUENCY : 25 KHZ
3. THE FAN SPEED SHOULD RUN AT FULL SPEED GIVEN PWM 100% DUTY CYCLE INPUT.
4. THE FAN SPEED SHOULD RUN AT ZERO SPEED GIVEN BELOW PWM 0 % DUTY CYCLE INPUT.
5. THE FAN WILL GO TO FULL SPEED WHEN IF THE CONTROL SIGNAL IS DISCONNECTED.

I-3. PWM DUTY VS RPM CURVED VS PWM CONTROL CHART.

Duty (%)	20%	50%	75%	100%
Speed R.P.M (REF)	2000 ± REF	3900 ± 25%	4800 ± 20%	5200 ± 10%



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J. Notes:

1. All specifications are measured after 5 min. rotating. Activa will not assume responsibility for Performance of products if application condition is outside of parameters stated forth in the specification.
2. A written request should be submitted to Activa prior to approval if abnormality and deviation from This specification is required.
3. Please be cautious when fan is being exercised or handled. Applying pressure to the impeller, handling The fan by lead wire or dropping the fans to the production platform is resulting in damage.
4. The operating voltage and temperature were defined after fan rotating continually at rated voltage.
5. If fan was stocked at an ambient temperature under 5°C and over 24 hrs. Please stock fans to an Ambient temperature over 20°C and remained over 24 hrs before using. All specifications include Abnormal noise has to be measured after 30 minute running.
6. Noise Level is different from abnormal noise. Please send abnormal samples to Activa to analyze. We estimate noise level by equation when noise level is lower than background noise (17dB).
7. Starting Voltage was defined on power on/off condition. Rotational speed was defined on full speed By it's rated value.
8. The correct polarity, Positive (+) and Negative (-), has to be clearly identified before connecting the fan to the power. Be aware of the connection with reverse polarity may lead to damage since no effective Protection can be introduced against such errors.
9. L10 of Life test is a deductive value under statistical method and it is different from product warranty.
10. All general specifications and quality values are measured under condition of free air and fan vertical Set up. Activa highly suggests practicing a test when fan apply to a special application.
11. with exception of suitability of some particular designs, any failure and problems regarding safety of The product caused by the introduction of powder, droplets of water or encroachment of insert in the Hub is not guaranteed.
12. Activa fans are not well suited for corrosive environments. This includes liquids, gases, or matters.
13. Except for the feature of the Lock Rotor Protection specifically stated, this feature is not applied to all Fans. Activa highly suggests not stopping the impellers of the working fans such interruption will Cause adverse effect.
14. Fans are to be stored in a dry/cool place. High levels of humidity are harmful to products.
15. Please be cautious. Activa is not responsible for any excess resonance, vibration and subsequent noise caused by incorrect mounting of fans.
16. Take necessary precaution handling fans when in operation. Finger guards are recommended to Prevent personal injury.
17. All test environments are conducted under the condition of relative (ambient) temperature and humidity At 25°C, 65%. The test result stated above is effective only for unique fan performance.
18. To avoid any unstable power, an "over 4.7 μF" capacitor has definitely be connected to fan externally Whatever multiple fans are applied in parallel.
19. The above conditions are examples of extreme application. However they are very important and Should receive top priority.
20. Activa Inc has reserves the right to substitute the specification without prior notice.