SPECIFICATION FOR APPROVAL

Customer Name: _____

Customer P/N: _____

APPROVED DATE	CHECKED DATE	PREPARED DATE
台北研發 102.08.30 李名哲	台北研發 102.08.30 郭建宏 / 台北研發 102.08.30 童李銘	台北研發 102.08.30 楊朝傑

ADDA Model No.: AS08024HB389B00 P.S. _____

Description: DC FAN (RoHS) REV. A

ID No. _____

THIS OFFER IS MADE ACCORDING TO YOUR CURRENT INQUIRY. UNLESS OTHERWISE REVISED, THIS SPECIFICATION WILL BE FINAL FOR ALL FUTURE PRODUCTION OF ORDERS FROM YOUR RESPECTED COMPANY

KINDLY STUDY IN DETAILS AND RETURN TO US THE DUPLICATE DULY SIGNED AS YOUR CONFIRMATION OF SAME.

協禧電機股份有限公司 研發處 102.08.30 發行章

ADDA CORP.
REGISTERED TO ISO 9001
ISO/TS 16949
CERTIFICATE NO. A8035

ADDA CORPORATION

HISTORY:

A	**Approval SPEC Issued**	**2013.08.30**

Customer		Ref: (RoHS)
Adda Model No	AS08024HB389B00	
Sample Attached	Piece(s)	
Safety Approval	TUV CUL UL CE	

Specifications

Item	Specification / Condition
DIMENSIONS	80 x 80 x 38 mm
BEARING TYPE	BALL BEARING
RATED VOLTAGE	24 VDC
OPERATING VOLTAGE RANGE	14 VDC – 27 VDC
RATED CURRENT	1.12 (1.5MAX.) Amp.
RATED POWER	26.88 (36.0MAX.) Watt.
RATED SPEED : 100% Duty	9000 RPM ± 10 % (IN FREE AIR AT RATED VOLTAGE)
AIR FLOW	133.701 (120.330 MIN.) CFM 3.786 (3.407 MIN.) CMM
STATIC AIR PRESSURE	2.010 (1.628 MIN.) Inch-H20 500.398 (405.322 MIN.) Pa
NOISE LEVEL	64.6 (68.6 MAX.) dB-A
MOTOR PROTECTION	Auto Restart; Soft Start; Polarity Protection
LIFE EXPECTANCY	70000 Hours at 40^{o}C / 65%
NET WEIGHT	212 Grams.
PACKING	Pcs. Per Export Carton.

Unless otherwise stated, the relative humidity is 65%, and the temperature is 25^{o}C for the standard testing.
Should you have any doubt, please refer to the environmental conditions specified in the acknowledgement document.

1.0 SCOPE

1.1 If the information or other related document is inconsistent with this acknowledgment document, please refer to the acknowledge document.

1.2 This documentation defines the mechanical & electrical characteristics of DC brushless fans.

1.3 The specification of this product is described in details in the acknowledgement document. No guarantee is given to our product under the use of over specification.

1.4 For any change or amendment to the specifications, such change will be noticed in writing beforehand.

1.5 If the product is used on the MIS system, please specify the specification in the purchase order

2.0 MATERIAL

2.1 Frame : UL94V-0 Glass Filled Polyester (P.B.T)

2.2 Fan Blade : UL94V-0 Glass Filled Polyester (P.B.T)

2.3 Bearing Sys.: ( ) Sleeve, oil impregnated
(V) Two Ball Bearing
( ) One Ball One Sleeve
( ) Hypro Bearing
( ) FDB Bearing

2.4 RoHS : (V) YES

2.5 HF : ( ) YES

3.0 DIMENSIONS & CONSTRUCTION

All dimensions, direction of rotation and air flow were specified as per drawing attached.

4.0 CHARACTERISTIC & DEFINITION

4.1 All rated characteristic were specified as per data sheet enclosed.

4.2 Rated Current: Rated current shall be measured after 3 minutes of continuous rotation at rated voltage

4.3 Rated Speed: Rated speed shall be measured after 3 minutes of continuous rotation at rated voltage.

4.4 Start Voltage: the voltage which is able to start the fan to operate by suddenly switching "ON".

4.5 Input Power: Input power shall be measured after 3 minutes of continuous rotation at rated voltage.

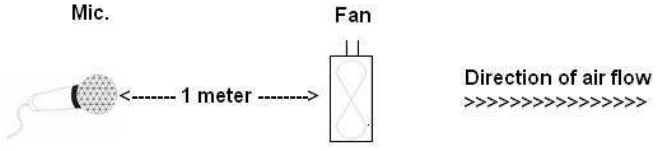
4.6 Locked Rotor Current: Locked current shall be measured within one minute of rotor locked, after 3 minutes of continuous rotation at rated voltage in clear air.

4.7 Air Flow & Static Pressure: The air flow data and static pressure should be determined in accordance with AMCA-210 standard or DIN24163 specification in a double chambers testing with intake—side measurement.

4.8 Balance value of Rotor compliance to ISO 1940 G6.3 .

4.9 Noise Level: the measurement of noise level is carried out with reference to CNS8753 in an anechoic chamber with the microphone positioned 1 meter room from the air intake. Testing fan shall be hung in clear air.

NOISE LEVEL MEASUREMENT



5.0 MECHANICAL INSPECTION

5.1 Rotation Direction
Counterclockwise when look into impeller side.

5.2 Protection
All fans have integrated protection against locked rotor conditions so that there will be no damage to winding or any electronic component.
Restarting is automatic as soon as any constraint to rotation has been released.
As fan placed at dead angle position, and the switch was changed from off to on.
Restarting was automatic normal as soon as and proved that this fan is good fan.

5.3 Locked Rotor Protection
No damage shall be found after 72 hours continuously at condition of rotation locked.
Restarting is automatic as soon as constraint to running has been released.

5.4 Avoid the damage, check the correct voltage and proper polarity before connecting with power.

5.5 Free Drop Shock
In minimum package condition, the fan should withstand drops on any three faces from a height of 30cm onto a wood board of 10mm thick

5.6 Please do not stick a grease and/or an oil to the fan housing or blade which may have a harmful influence by a chemical reaction at high humidity

5.7 If the fan is reinstalled, please pay special attention to the noise due to the vibration (or resonance).

5.8 During the testing of the fan, please make sure the finger guard is used for safety.

6.0 ELECTRICAL INSPECTION

6.1 Insulation Resistance
Not less than 10M ohm between housing and positive end of lead wire (red) at 500VDC.

6.2 Dielectric Strength
No damage should be found at 500 VAC for 60 seconds, measured with 1mA trip current between housing and positive end of lead wire.

6.3 Life Expectancy
The continuous duty life at given temperature after which, 90% of testing units shall still be running.

6.4 While the fan is running, do not intentionally lock the fan for a long time since the overheating of the motor produced by the long-time locking will damage the fan.

7.0 ENVIRONEMENTAL

7.1 Improper use such as disassembling the fan, being covered with dust, or dipping the fan in water that results in defects is not covered in the warranty. Do not use the fan in the environment with corrosive air or liquid.

7.2 Operating Temperature -10 to+ 70 degree c .

7.3 Storage Temperature -40 to+ 75 degree c .

7.4 Operating Humidity 5 to 90 % RH .

7.5 Storage Humidity 5 to 95 % RH .

7.6 Do not place or store the fan in the environment with high/low temperature/humidity. Do not store the fan for over 6 months; even if the fan is stored in room temperature for over 6 months, the fan may have electric current leakage.

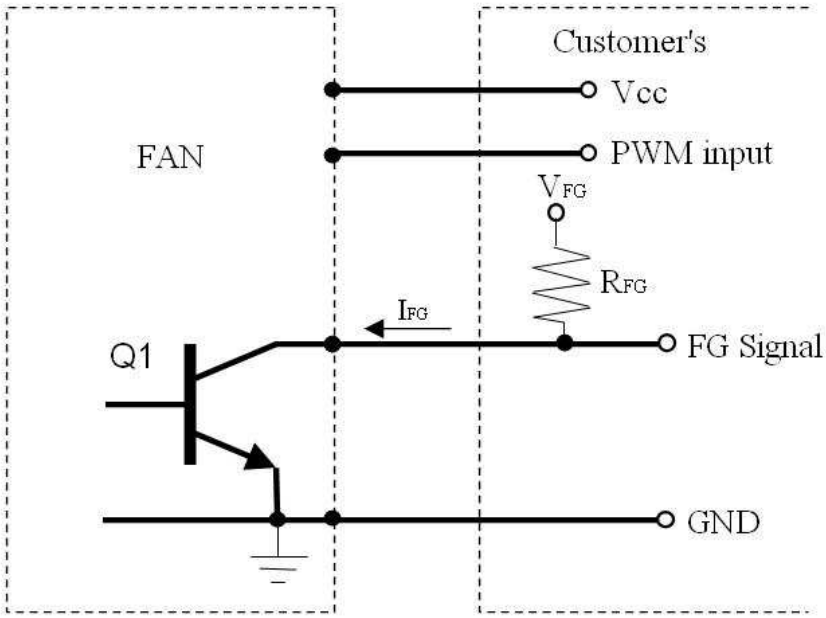
8.0 REMARKS

8.1 Material and construction are subject to change without advance notice. The changes should be within specification.

8.2 All fan shall meet the quality inspection under sampling plan MIL-STD-105E as follow:
Critical 0.25%
Major 1.00%
Minor 2.50%

9.0 FG(Frequency Generator) Signal External Circuit:

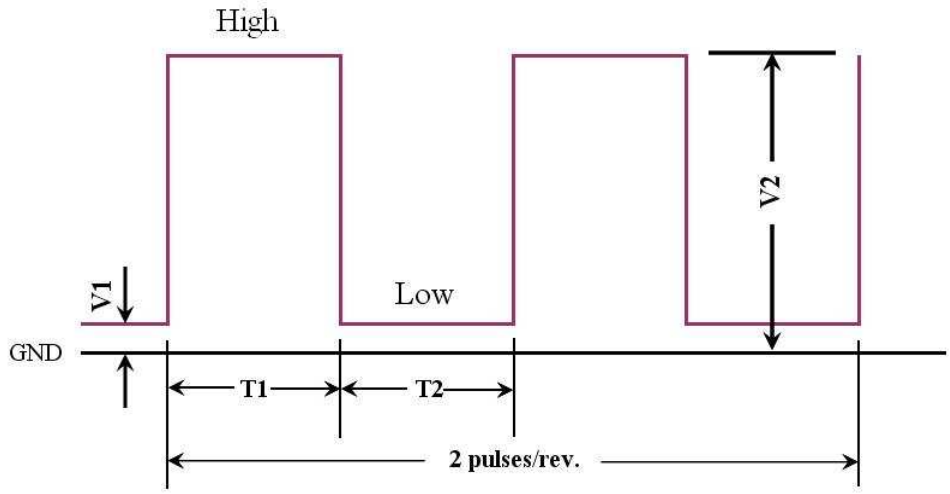
Open-collector output for rotation frequency detection



Note: V_{FG} **= 27 VDC (Max.) ; Ic = 10mA (Max.)**
$R_{FG} > V_{FG} / I_{FG}$ **; V_{CE}(sat.) = 0.4V (Max.)**

10.0 FG (Frequency Generator) TYPE OUTPUT WAVEFORM:

10.1 Motor rotating condition (at 25°C , Vcc = 24VDC)

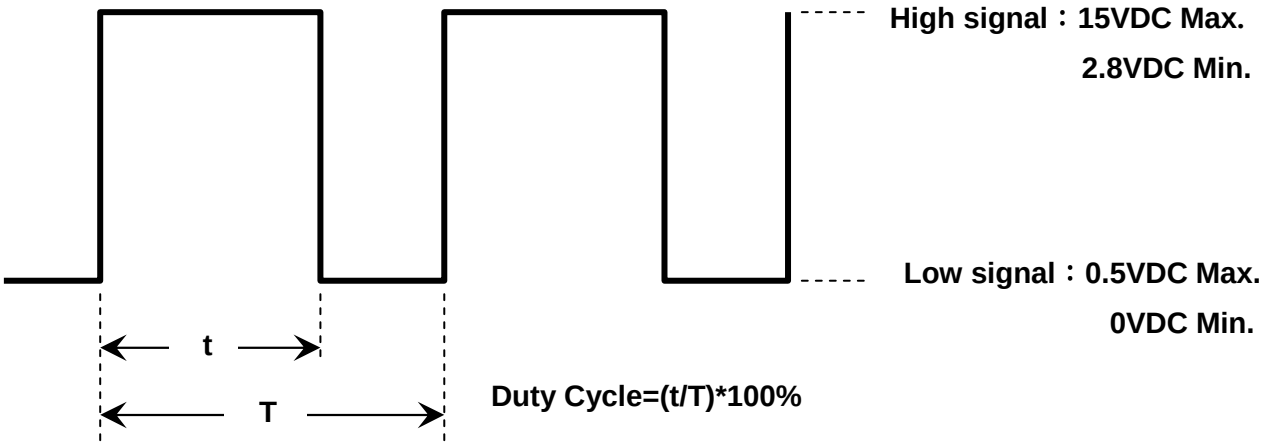


V1: V_{CE}(sat.) ≦ 0.4V
V2: V_{FG}, FG signal output voltage, maximum rating: 27VDC
Duty = T1 / (T1+T2) x 100 = 50% ± 20% (measured between 0.3*V2 ~ 0.7*V2)
V1 – V2 rise time: less than 1.0ms
V2 – V1 fall time: less than 1.0ms
Rotation Speed (RPM) = (60/2) x f_{FG} = 30 x f_{FG}
f_{FG}: Frequency of FG signal output waveform (Hz)

10.2 Motor locked condition (at Vcc = 24VDC)
Output is fixed at low or high when motor is locked.

11.0 PWM CONTROL SIGNAL:

Signal Voltage Range: 0 VDC ~~ 15 VDC

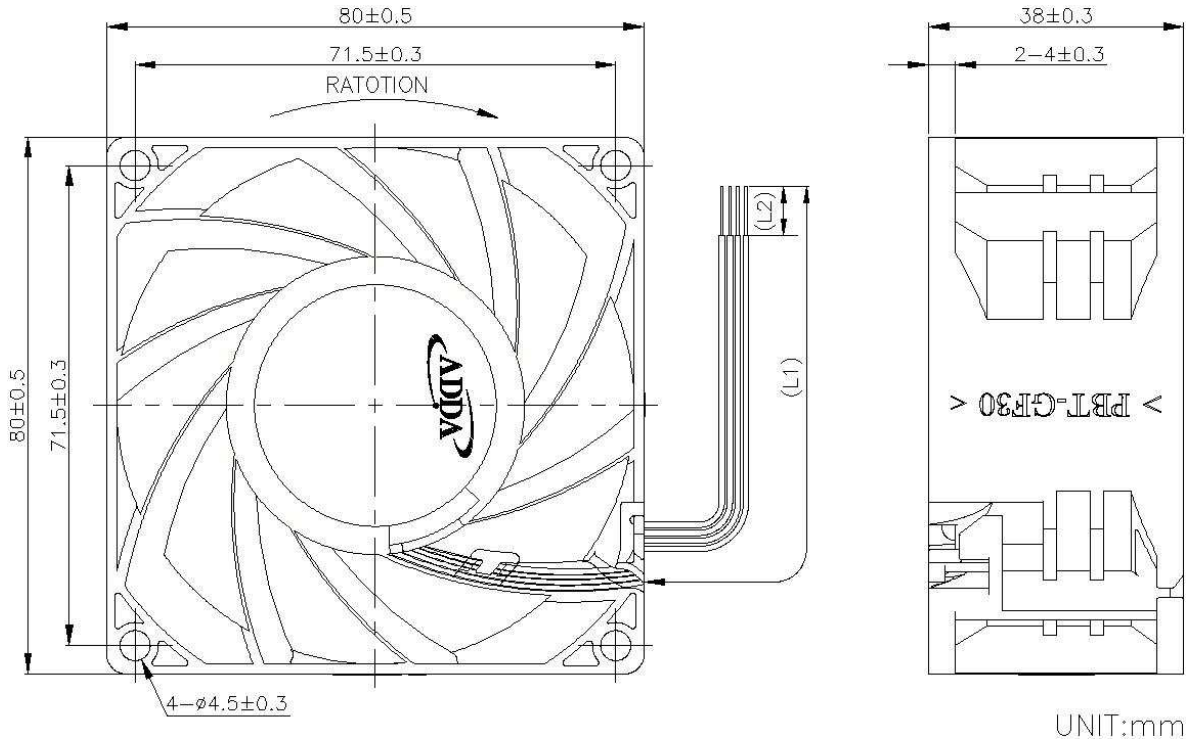


11.1 The preferred operating frequency for the fan is 25KHz.
11.2 PWM signal frequency range from 60Hz~100KHz.
11.3 At 100% duty cycle, the fan will operate at maximum speed.
11.4 At 0% duty cycle, the fan is not rotate.
11.5 The fan will default to operate at maximum speed when the speed control input is left connected.

12.0 PWM Duty Cycle vs. Speed (at 25KHz, Vcc = 24VDC):

PWM Duty Cycle	0%	20%	50%	100%
Ref. Speed (RPM)	0	1800 ± 20%	4500 ± 15%	9000 ± 10%

13.0 OUTLINE STYLING & DIMENSIONS:



13.1 Lead Wire : UL 1430 , AWG # 24 , L1 = 300 ± 10 mm
PIN 1 : BLACK WIRE------(GND, -)
PIN 2 : RED WIRE----------(Vcc, +)
PIN 3 : YELLOW WIRE----(FG)
PIN 4 : BLUE WIRE--------(PWM)
13.2 Housing : N/A , L2= 10 mm
13.3 PFrame : PBT + 30% GF
13.4 Impeller : PBT + 30% GF
13.5 Bearing : Ball Bearing

14.0 NOTES:

14.1 Please do not touch and push Fan Blade with fingers or others, fan blade and ball bearings may be damaged and it causes noise defect.
14.2 Do not carry the fan by its lead wires.
14.3 If the fan does not have the polarity protection function, the connection of the colored wires should be red + red, and black + black, or else the fan will be damaged in no time.
14.4 For the models without reverse connection of polarity protection, please do not connect the lead wire in reverse.
14.5 Please do not install this fan in series with 2X voltage inputs. For example, if a single fan rated at 12V, then do not install two of them in series with 24V input.
14.6 Every specific fan is designed for its certain application (project). Therefore, if you want to use this fan in other application (project), please inform ADDA first so that we can confirm whether there is any issue which might be incurred from the reason of this different application (project) or not.
14.7 The"Life Expectancy" of this fan has not been evaluated for use in combination with any end application. Therefore,the Life Expectancy in the Test Reports(L10 and MTTF Report) that relate to this fan is for reference only and shall not construe any kind of warranty of ADDA to the life of any specific fan,either expressed or implied.
14.8 The period of product warranty,unless otherwise agreed by ADDA in written,shall be 12 months staring from the date of production.

15.0 P-O CURVE AT 100% DUTY CYCLE: