Customer No.:	0350501A0108
AVC Model:	DBTB0428B2UP322

* History

REV.	DESCRIPTION	DATE
A	ISSUE SPEC.	02/20'19

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Rev. A

SPECIFICATION FOR APPROVAL

1. SCOPE:

THIS SPECIFICATION DEFINES THE ELECTRICAL AND MECHANICAL CHARACTERISTICS OF THE DC BRUSHLESS FAN.

2. CHARACTERS:

(AT Ta=25°C)

	ITEM	SPEC.
2-1.	RATED VOLTAGE	12 VDC
2-2.	OPERATION VOLTAGE	8.0 ~ 14.0 VDC
2-3.	RATED CURRENT (IN FREE AIR)	0.35 (0.48 MAX.) A (AVERAGE)
2-4.	CURRENT ON LABEL	0.48 A
2-5.	RUNNING PEAK (IN FREE AIR)	0.60 (0.75 MAX.) A
2-6.	START UP PEAK (IN FREE AIR)	0.85 (1.0 MAX.) A
2-7.	RATED POWER (IN FREE AIR)	4.20 (5.76 MAX.) W
2-8.	SPEED (IN FREE AIR)	16000±5% R.P.M
2-9.	SPEED CONTROL TYPE	PWM CONTROLLER
2-10.	SIGNAL OUTPUT	FREQUENCY GENERATOR (FG)
2-11.	MAX. AIR FLOW (AT ZERO STATIC PRESSURE)	0.589 (0.560 MIN.) M^3/MIN 20.80 (19.76 MIN.) CFM
2-12.	MAX. AIR PRESSURE (AT ZERO FLOW)	46.96 (42.38 MIN.) mm−H_2O 1.849 (1.669 MIN.) inch−H_2O
2-13.	ACOUSTICAL NOISE	50.5 (55.5 MAX.) dB−A

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2-14. INSULATION RESISTANCE —— 10 MEG OHM MIN. AT 500 VDC
(BETWEEN FRAME AND (+) TERMINAL)

2-15. DIELECTRIC STRENGTH ——— 5 mA MAX. AT 500 VAC 60Hz ONE MINUTE,
(BETWEEN FRAME AND (+) TERMINAL)

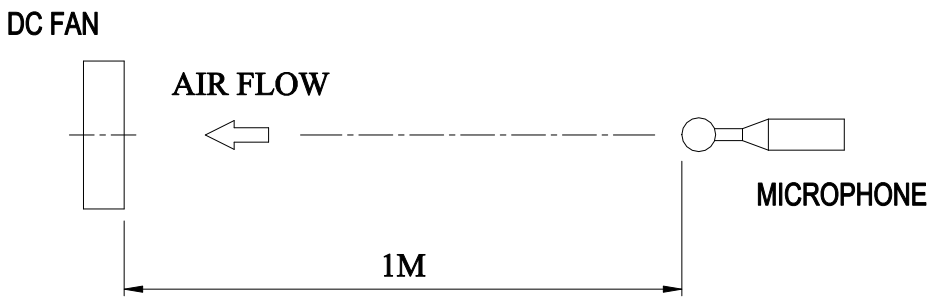
2-16. LIFE EXPECTANCE ———— 70,000 HOURS AT 40°C ROOM, AMBIENT 15%~65%RH

2-17. INSULATION CLASS ———— UL: CLASS A

NOTE:

A. THE VALUES WRITTEN IN PARENTHESIS, ( ), ARE LIMITED SPEC.

B. ACOUSTICAL NOISE MEASURING CONDITION:



NOISE IS MEASURED AT RATED VOLTAGE IN FREE AIR IN ACOUSTICAL CHAMBER WITH LARSON DAVIS TYPE 824S SOUND LEVEL METER.

C. THE AIR FLOW AND AIR PRESSURE MEASURED AT RATED VOLTAGE IN DOUBLE CHAMBER IS MEASURED ACCORDING TO AMCA STANDARD 210-99.

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3. MECHANICAL

3-1. DIMENSION ——— SEE DIMENSION DRAWING

3-2. FRAME ——— THERMOPLASTIC OF UL 94V-0

3-3. FAN BLADE ——— THERMOPLASTIC OF UL 94V-0

3-4. BEARING SYSTEM ——— TWO BALL BEARINGS

3-5. WEIGHT ——— 45 g

4. ENVIRONMENTAL

4-1. OPERATING TEMPERATURE ——— -10 TO +70 °C

4-2. STORAGE TEMPERATURE ——— -40 TO +75 °C

4-3. OPERATING HUMIDITY ——— 5 TO 90 % RH

4-4. STORAGE HUMIDITY ——— 5 TO 95 % RH

4-5. DROP TEST ———
IN MINIMUM PACKAGING CONDITION FAN WITHSTAND EACH ONE DROP OF THREE FACES FROM 30cm DISTANCE HEIGHT ONTO 10mm THICKNESS OF WOODEN BOARD

4-6. VIBRATION TEST ———
SINEWAVE
DISPLACEMENT AMPLITUDE: 0.75 mm (EQUIVALENT 10G)
FREQUENCY RANGE: 10Hz - 55 Hz / 30 SEC. 55Hz - 10 Hz / 30 SEC.
LINEAR SCANNING 120 CYCLE
ENDURANCE TIMER PER AXIS: 2 HOURS
ORIENTATION: X,Y,Z

4-7. SHOCK TEST ———
APPLY PEAK ACCELERATION 50 G AND KEEP DURATION OF THE PLUSES FOR 11mS (HALF SINE WAVE)

4-8. RoHS COMPLIANCE ——— SEE RoHS STANDARD

5. PROTECTION

5-1. LOCKED ROTOR PROTECTION ———
IMPEDANCE OF MOTOR WINDING PROTECTS MOTOR FROM DAMAGE IN 72 HOURS OF LOCKED ROTOR CONDITION AT THE RATED VOLTAGE

5-2. POLARITY PROTECTION ———
BE CAPABLE OF WITHSTANDING IF REVERSE CONNECTION FOR POSITIVE AND NEGATIVE LEADS

5-3. HOT SWAP PROTECTION ———
THIS FAN HAS NO HOT SWAP FUNCTION.

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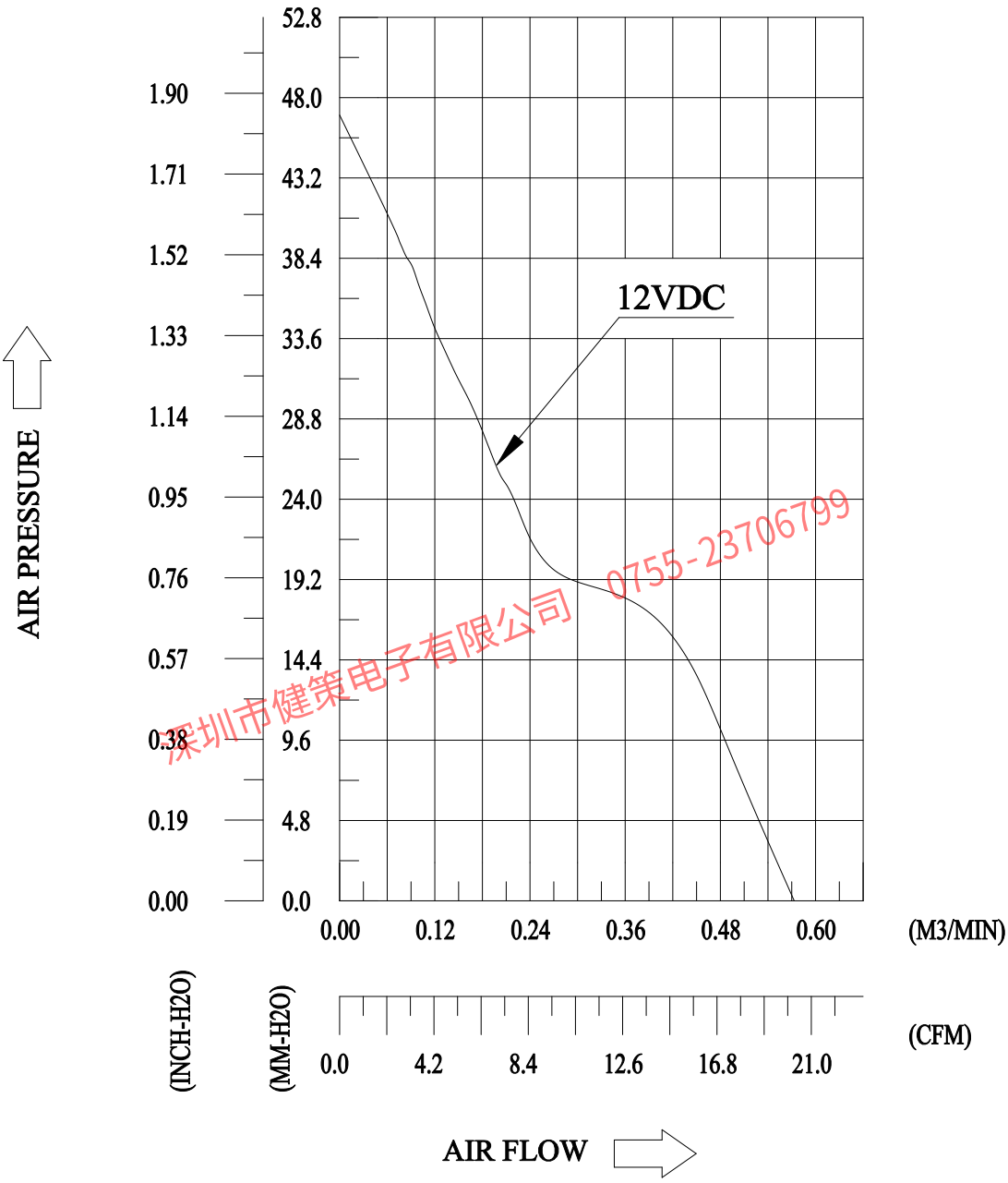
6. P & Q CURVE



* TEST CONDITION:

INPUT VOLTAGE	———	OPERATION VOLTAGE
TEMPERATURE	·····	ROOM TEMPERATURE
HUMIDITY	·····	65%RH

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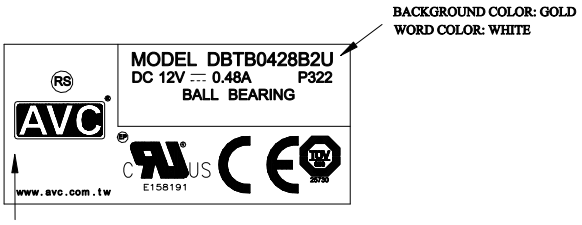
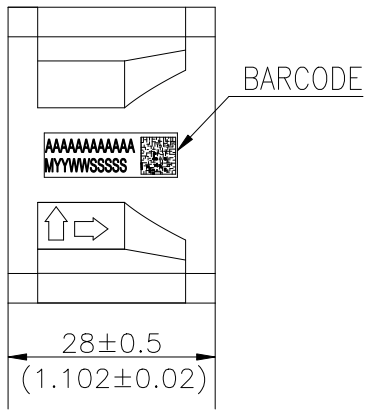
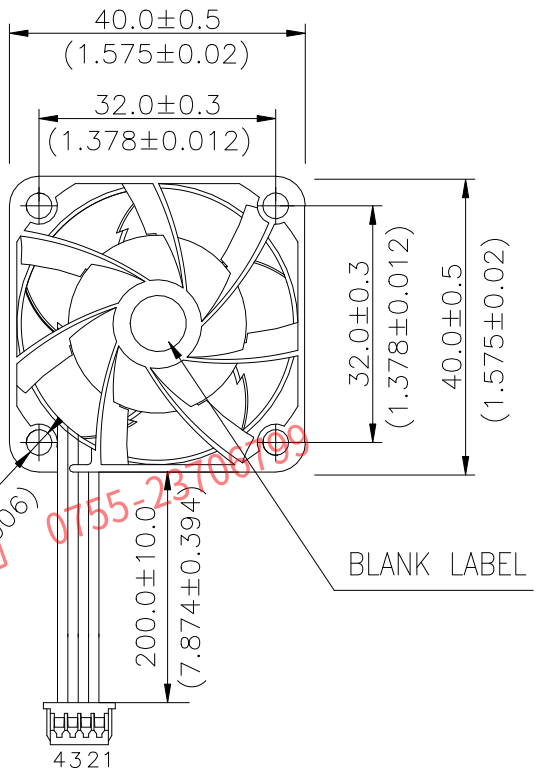
7. DIMENSION DRAWING

BARCODE SPEC. :

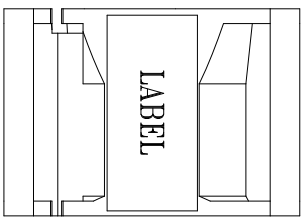
AAAAAAAAAAA: ZTE project number(中興專案號碼)
M: factory id(供應商代碼)(A:AVC OR AVCCN)
YY: years(年碼)(13：2013年)
WW: week of manufacture code(週碼)
　　中興標準是星期一為每周的第一天，星期日為每周的最後一天.
SSSSS: sequential count code(產品流水碼)
　　(當序列號碼超過99999,第一個數字改為英文字母A~Z代替)







AIR FLOW



NOTES:

1. LEAD WIRES: PVC WIRES UL1061 AWG#28
   PIN1: RED WIRE ..... (+)
   PIN2: YELLOW WIRE ..... (PWM)
   PIN3: BLUE WIRE ..... (FG)
   PIN4: BLACK WIRE ..... (-)
2. CONNECTORS
   HOSING: MOLEX 51021-0400
   TERMINAL: MOLEX 50079-8000
3. BARCODE LABEL SHOWS TRACEABLE INFO. IT IS NOT AVAILABLE ON ENGINEERING SAMPLE

UNIT: mm
(inch)

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8. SPEED CONTROL FUNCTION

8-1. PWM SIGNAL DESCRIPTION :

1. CONTROL SIGNAL: PWM CONTROL
2. THE RANGE OF SIGNAL VOLTAGE: LOW LEVEL VOLTAGE: MIN. > -0.8V , MAX. <0.8V
   HIGH LEVEL VOLTAGE: MIN. >2.8V , MAX.<14V
3. THE FREQUENCY OF PWM SINGAL SHALL BE ABLE TO ACCEPT A 100HZ~100KHZ
4. INPUT IMPEDANCE : 20K OHM MIN.

8-2. FAN SPEED CONTROL DESCRIPTION

1. FAN INPUT VOLTAGE (POSITIVE) : 12VDC
2. PWM FREQUENCY : 25KHZ
3. THE FAN SPEED WILL SPIN AT MAXIMUM WHEN THE DUTY CYCLE IS 100%.
4. THE FAN SPEED WILL SPIN AT MINIMUM WHEN THE DUTY CYCLE IS 0%~25%.
5. THE FAN SPEED WILL SPIN AT 2500~16000 RPM WHEN THE DUTY CYCLE IS 25%~100%.
6. THE FAN SPEED WILL SPIN AT MAXIMUM WHEN THE LEAD WIRE OF PWM SIGNAL DISCONNECTED.

8-3. PWM DUTY CYCLE VS. RPM (AT Ta=25°C)

DUTY CYCLE(%)	R.P.M(REF)	TYPICAL CURRENT(A)	MAXIMUM CURRENT(A)
0% ~ 25%	2500±5%	0.06	0.08
50%	7000±5%	0.1	0.14
75%	11500±5%	0.2	0.28
100%	16000±5%	0.35	0.48

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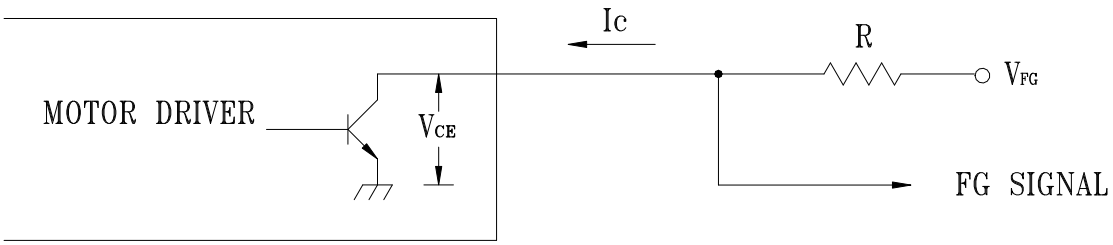
9. FREQUENCY GENERATOR (FG) SIGNAL

9-1. SCHEMATIC:



CAUTION:

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

9-2. SIGNAL SPECIFICATION:

OUTPUT TYPE: OPEN COLLECTOR

V_{FG} MAXIMUM VOLTAGE = 14V

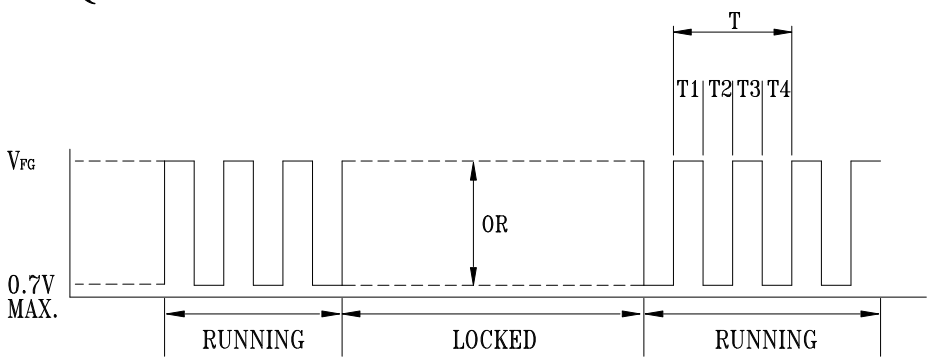
V_{FG} MINIMUM VOLTAGE = 2.8V

I_C MAXIMUM CURRENT =5mA

LOW LEVEL VOLTAGE = 0.7V MAX.

$R \geq V_{FG} / I_C$

9-3. FREQUENCY GENERATOR WAVEFORM:



T=T1+T2+T3+T4=60/N (Sec) N: SPEED (RPM)

FAN INSTALLATION INSTRUCTIONS:

1. In case of using bolt-nut fasteners, the flatness of chassis mating surfaces should be kept below 0.1mm.

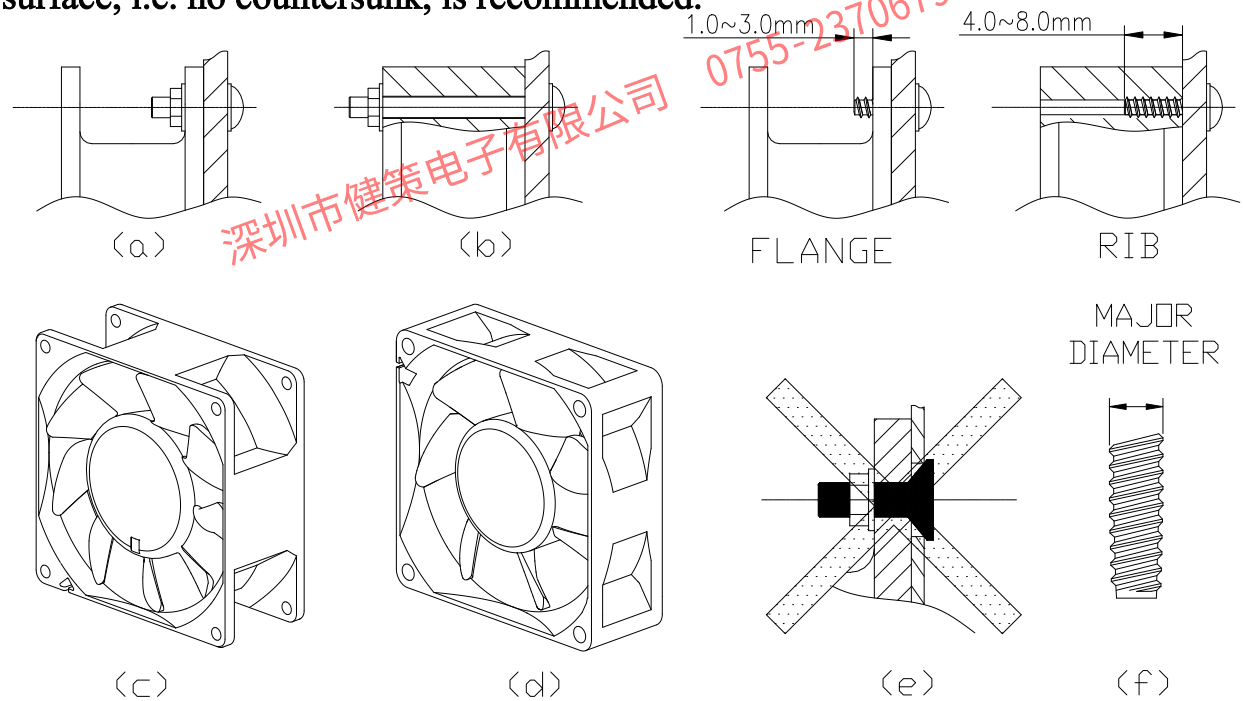
2. How to fasten the frames of different types:

   A. Flange type : Screw the bolt and nut together from the inlet or outlet.
   The torque should not exceed 4.3 kgf-cm [figure(a)]

   B. Rib type : Screw the bolt through the rib.
   The torque should not exceed 7.0 kgf-cm [figure(b)]

3. In case of using self-tapping screws, appropriate screws according to JIS B 1122 Type 2 should be used. The dimensional details of the self-tapping screws recommended are shown in Table(a). Each fastener hole should only be tightened once or slippage may occur. In addition, the torque to be applied to the self-tapping screws must not exceed the values stated in Table(a).

4. The countersunk part of fastener head should not interfere with the frame or there would be a risk of breakage [figure(e)]. Fastener head with flat inner surface, i.e. no countersunk, is recommended.



MOUNTING HOLE DIAMETER	SCREW SPEC.	MAJOR DIAMETER [Fig.(f)]		MOUNTING HOLE THICKNESS(mm)		**RECOMMENDED MAX. TORQUE (kgf-cm)	
		MAXIMUM	MINIMUM	FLANGE TYPE FRAME	RIB TYPE FRAME	FLANGE TYPE FRAME	RIB TYPE FRAME
ø2.5	ST3.0 X 1.35	3.0	2.89				7.0
ø3.5	ST4.0 X 1.41	4.0	3.85	5.0	9.0(min)	4.3	7.0
*ø4.3	ST4.8 X 1.59	4.8	4.65	4.0	9.0(min)	4.8	7.0
				6.0	9.0(min)	5.5	7.0
ø4.5	ST5.0 X 1.59	5.0	4.85	5.0	9.0(min)	5.0	7.0

* Non JIS B 1122 spec.
** A lower torque than the recommended value should be used if slippage is observed.

TABLE (a)