SPECIFICATION FOR APPROVAL

Customer.
Description. DC FAN
Part No. REV.
Delta Model No. AFB0412VHA-DU48 REV. 00
Sample Issue No.
Sample Issue Date. JUL-25-2013

PLEASE SEND ONE COPY OF THIS SPECIFICATION BACK AFTER YOU SIGNED APPROVAL FOR PRODUCTION PRE-ARRANGEMENT.

APPROVED BY :

DATE:

Delta Electronics, Inc.
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Shi Jie Town, Dong Guan City.
Guangdong Province, China. P. R. C.
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STATEMENT OF DEVIATION

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☑ NONE

☐ DESCRIPTION :

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SPECIFICATION FOR APPROVAL

Customer:

Description: DC FAN

Customer P/N: REV:

Delta Model NO.: AFB0412VHA-DU48 Safety Delta Model NO.: AFB0412VHA

Sample Rev: 00 Issue NO:

Sample Issue Date: JUL-25-2013 Quantity:

1. SCOPE:

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

2. CHARACTERS:

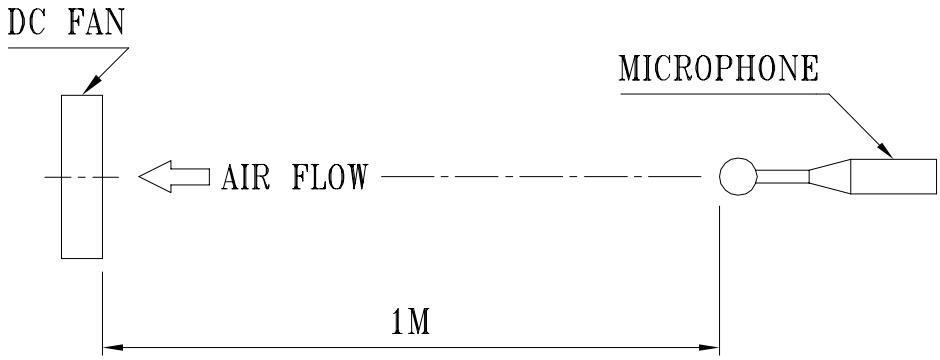
ITEM	DESCRIPTION
RATED VOLTAGE	12 VDC
OPERATION VOLTAGE	7.0 - 15.0 VDC
START VOLATGE (ENVIRONMENT TEMPERATURE AT 25°C)	7.0 VDC
INPUT CURRENT	0.09 (MAX. 0.12) A (SAFETY CURRENT ON LABEL: 0.12 A)
INPUT POWER	1.08 (MAX. 1.44) W
SPEED	8000±10% R.P.M. (AT 10MIN. RUNNING)
MAX. AIR FLOW (AT ZERO STATIC PRESSURE)	0.250 (MIN. 0.225) M^3/MIN. 8.812 (MIN. 7.931) CFM
MAX. AIR PRESSURE (AT ZERO AIRFLOW)	5.678 (MIN. 4.600) mmH_2O 0.224 (MIN. 0.181) $inchH_2O$
ACOUSTICAL NOISE (AVG.)	33.0 (MAX. 37.0) dB-A
INSULATION TYPE	UL: CLASS A

PART NO:

DELTA MODEL: AFB0412VHA-DU48

INSULATION STRENGTH	10 MEG OHM MIN. AT 500 VDC (BETWEEN FRAME AND (+) TERMINAL)
DIELECTRIC STRENGTH	5 mA MAX. AT 500 VAC 50/60 Hz ONE MINUTE, (BETWEEN FRAME AND (+) TERMINAL)
EXTERNAL COVER	OPEN TYPE
LIFE EXPECTANCE AT LABEL VOLTAGE	70,000 HOURS CONTINUOUS OPERATION AT 40 °C WITH 15 ~ 65 %RH.
ROTATION	CLOCKWISE VIEW FROM NAME PLATE SIDE
LEAD WIRE	UL 1061 -F- AWG #28 BLACK WIRE NEGATIVE(-) RED WIRE POSITIVE(+) BLUE WIRE FREQUENCY(-F00) YELLOW WIRE PWM CONTROL(PWM)

NOTES:
1. ALL READINGS ARE MEASURED AFTER STABLY WARMING UP THROUGH 10 MINUTES.
2. STANDARD AIR PROPERTY IS AIR AT (Td) 25°C TEMPERATURE, (RH) 65% RELATIVE HUMIDITY, AND (Pb) 760 mmHg BAROMETRIC PRESSURE.
3. THE VALUES WRITTEN IN PARENS , ( ), ARE LIMITED SPEC.
4. ACOUSTICAL NOISE MEASURING CONDITION:



NOISE IS MEASURED AT RATED VOLTAGE IN FREE AIR IN ANECHOIC CHAMBER WITH B & K SOUND LEVEL METER WITH MICROPHONE AT A DISTANCE OF ONE METER FROM THE FAN INTAKE.

PART NO:

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3. MECHANICAL:

3-1. DIMENSIONS ---------- SEE DIMENSIONS DRAWING

3-2. FRAME ---------- PLASTIC UL: 94V-0

3-3. IMPELLER ---------- PLASTIC UL: 94V-0

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

3-5. WEIGHT ---------- 14.0 GRAMS (REF.)

4. ENVIRONMENTAL:

4-1. OPERATING TEMPERATURE ---------- -10 TO +70 DEGREE C

4-2. STORAGE TEMPERATURE ---------- -40 TO +80 DEGREE C

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

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

5. PROTECTION:

5-1. LOCKED ROTOR PROTECTION

IMPEDANCE OF MOTOR WINDING PROTECTS MOTOR FROM FIRE IN 96 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.

6. RE OZONE DEPLETING SUBSTANCES:

6-1. NO CONTAINING PBBs, PBBOs, CFCs, PBBEs, PBDPEs AND HCFCs.

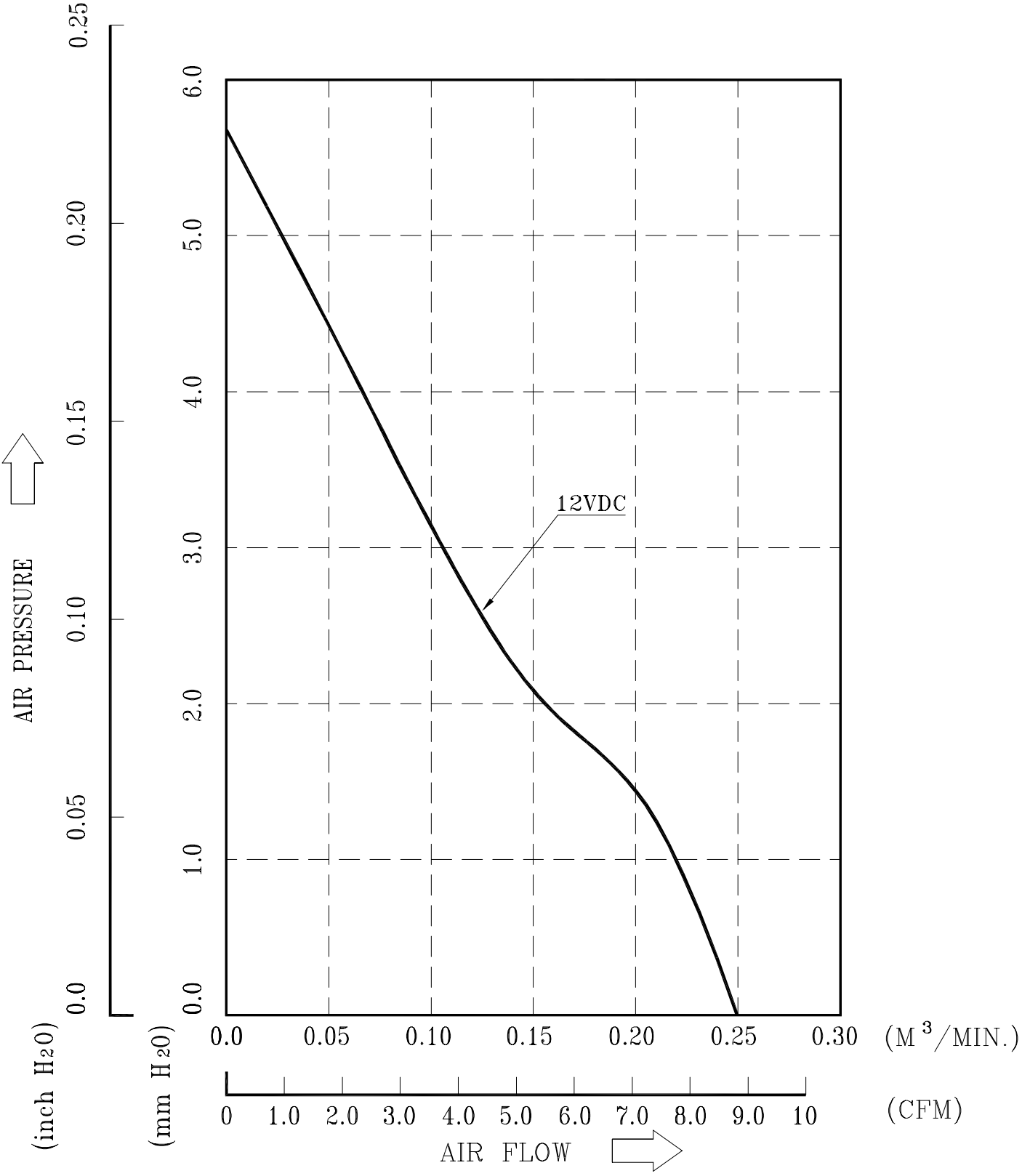
7. PRODUCTION LOCATION

7-1. PRODUCTS WILL BE PRODUCED IN CHINA OR THAILAND.

PART NO:

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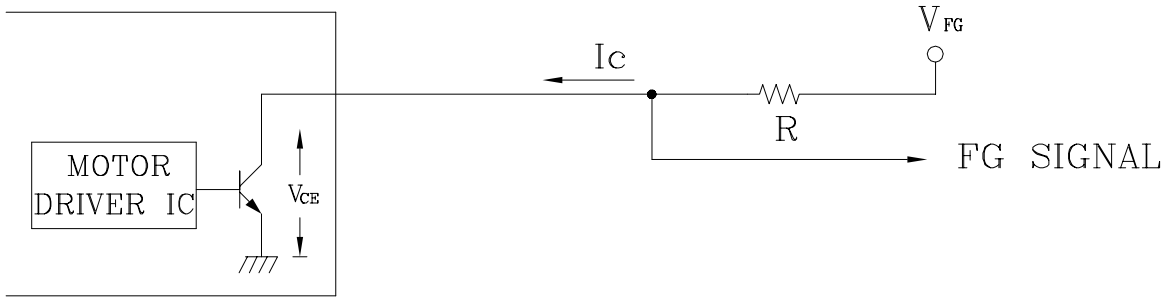
8. P & Q CURVE:



* TEST CONDITION: INPUT VOLTAGE ----- OPERATION VOLTAGE
TEMPERATURE ------ ROOM TEMPERATURE
HUMIDITY ---------- 65%RH

10. FREQUENCY GENERATOR (FG) SIGNAL:

1. OUTPUT CIRCUIT - OPEN COLLECTOR MODE:



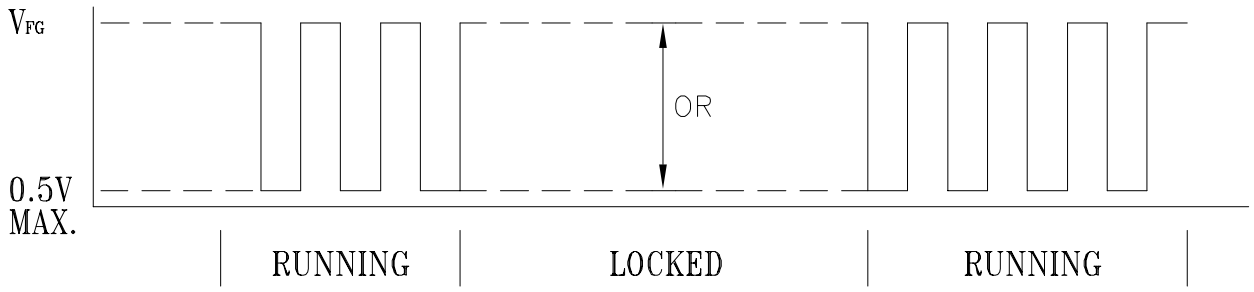
CAUTION: THE FG SIGNAL LEAD WIRE MUST BE KEPT AWAY FROM "+" LEAD WIRE & "−" LEAD WIRE.

2. SPECIFICATION:

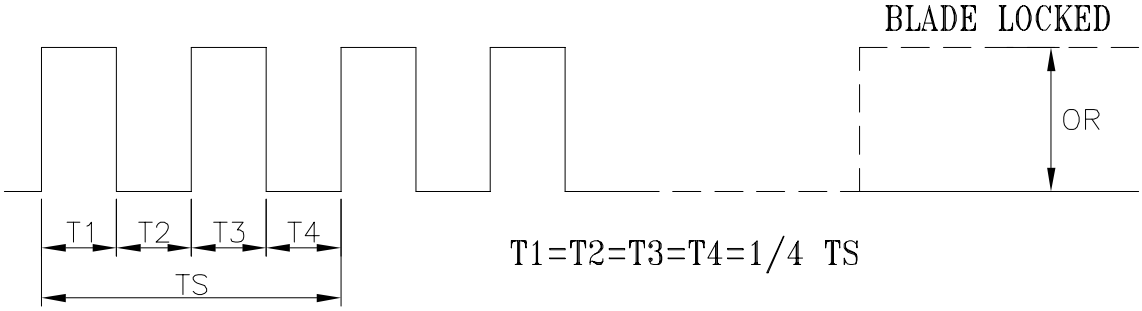
$V_{CE}(sat)$=0.5V MAX V_{FG} =15.0V MAX

I_C =5mA MAX. $R \geq V_{FG}/I_C$

3. FREQUENCY GENERATOR WAVEFORM:



2 PULSES PER ROTATION



T1=T2=T3=T4=1/4 TS

N=R.P.M

TS=60/N(SEC)

*VOLTAGE LEVEL AFTER BLADE LOCKED

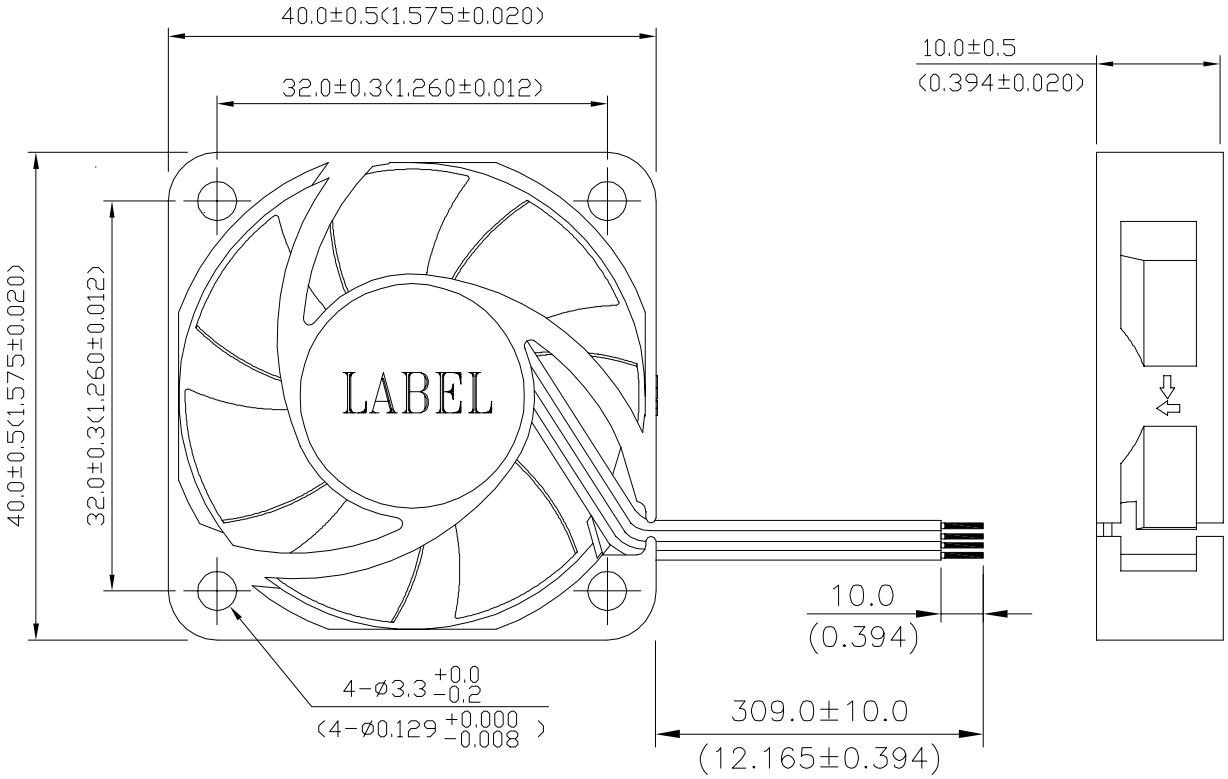
PART NO:

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9. DIMENSION DRAWING:

LABEL:



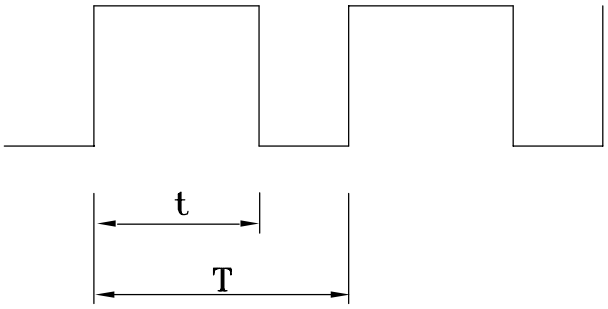


UNIT:mm(INCH)

NOTES:

1. LEAD WIRE UL 1061 -F- AWG #28
   - RED WIRE ----(+)
   - BLACK WIRE ----(-)
   - BLUE WIRE ----(F00)
   - YELLOW WIRE ----(PWM)
2. THIS PRODUCT IS RoHS COMPLIANT.

11. PWM CONTROL SIGNAL: (AT RATED VOLTAGE 12V ; 25 DEGREE C)
SIGNAL VOLTAGE RANGE: 0~15VDC



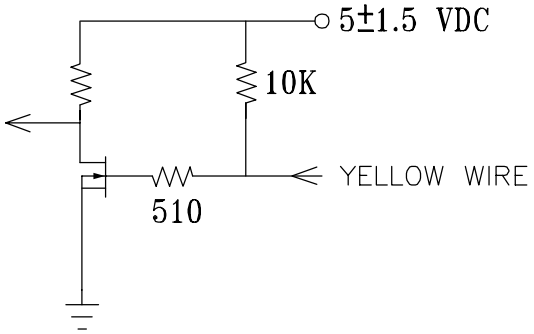
$$\text{DUTY CYCLE} = \frac{t}{T} * 100(\%)$$

- PWM SIGNAL WITH 10 VDC TTL OR CMOS LEVELS. THE PREFERRED OPERATING POINT FOR THE FAN IS 2k HZ, AND DUTY CYCLE FORM 0% TO 100%.
- AT 12V , 100% DUTY CYCLE,THE ROTOR WILL SPIN AT MAXIMUM SPEED.
- AT 12V , 0% DUTY CYCLE,THE ROTOR WILL STOP.
- WITH CONTROL SIGNAL LEAD DISCONNECTED,THE FAN WILL SPIN AT MAXIMUM SPEED.
- WHEN THE ROTOR IS HALTED , IT WILL SPIN BY MORE THAN 20% DUTY CYCLE.

12. SPEED VS PWM CONTROL SIGNAL: (AT RATED VOLTAGE 12V ; 25 DEGREE C ; PWM SIGNAL WITH 10 VDC TTL OR CMOS LEVELS & 2 KHZ)

DUTY CYCLE (%)	SPEED R.P.M. (REF.)	CURRENT (A)
100	8000 ± 10%	0.09
50	5300 ± 10%	0.06
0	0	0.02

13. PWM CONTROL LEAD WIRE INPUT IMPEDANCE:



A00

Application Notice

1. Delta will not guarantee the performance of the products if the application condition falls outside the parameters set forth in the specification.
2. A written request should be submitted to Delta prior to approval if deviation from this specification is required.
3. Please exercise caution when handling fans. Damage may be caused when pressure is applied to the impeller, if the fans are handled by the lead wires, or if the fan was hard-dropped to the production floor.
4. Except as pertains to some special designs, there is no guarantee that the products will be free from any such safety problems or failures as caused by the introduction of powder, droplets of water or encroachment of insect into the hub.
5. The above-mentioned conditions are representative of some unique examples and viewed as the first point of reference prior to all other information.
6. It is very important to establish the correct polarity before connecting the fan to the power source. Positive (+) and Negative (-). Damage may be caused to the fans if connection is with reverse polarity, if there is no foolproof method to protect against such error specifically mentioned in this spec.
7. Delta fans without special protection are not suitable where any corrosive fluids are introduced to their environment.
8. Please ensure all fans are stored according to the storage temperature limits specified. Do not store fans in a high humidity environment. We highly recommend performance testing is conducted before shipping, if the fans have been stored over 6 months.
9. Not all fans are provided with the Lock Rotor Protection feature. If you impair the rotation of the impeller for the fans that do not have this function, the performance of those fans will lead to failure.
10. Please be cautious when mounting the fan. Incorrect mounting of fans may cause excess resonance, vibration and subsequent noise.
11. It is important to consider safety when testing the fans. A suitable fan guard should be fitted to the fan to guard against any potential for personal injury.
12. Except where specifically stated, all tests are carried out at room (ambient) temperature and relative humidity conditions of 25°C, 65% RH. The test value is only for fan performance itself.
13. Be certain to connect an " 4.7μF or greater" capacitor to the fan externally when the application calls for using multiple fans in parallel, to avoid any unstable power.

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DELTA Electronics:

FFB1224SHE PMT-48V75W2BA 15GENG3E M55339/14-00306 S24SP05012PDFA 02BEEG3H 03GEEG3E DSOL-0844-24 FFB0912HHE SK-1015-STD PM05S050A ACS3-CNTB0600 CTA4100A MDS-400APB24AA 06AN2 06BEEG3G AFB0624VH-A BFB1248GH-A DSOL-1341-12 DTC1000C PJT-12V40WBAA PL01S4805A AFL12AUHE-C ASB02505SHA-AY6B PMC-24V075W1AA PFB1224UHEP0 30DPGS5C AFB0524HHD AFB0724VH-AF00 FFB0824SHE-F00