SPECIFICATION FOR APPROVAL

Customer			
Description	DC FAN		
Part No.		**Rev.**	
Delta Model No.	EFB1324SHE-EP	**Rev.**	01
Sample Issue No.			
Sample Issue Date.	Aug 06, 2012		

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

APPROVED BY : _____

DATE : _____

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SPECIFICATION FOR APPROVAL
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Customer:

Description:	DC FAN	
Customer P/N:		REV:
Delta Model NO.:	EFB1324SHE-EP	Delta SAFETY Model NO.:EFB1324SHE
Sample Rev:	01	Issue NO:
Sample Issue Date:	Aug 06, 2012	Quantity:

1. SCOPE:

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

2. CHARACTERS:
   ALL CHARACTERS ARE MEASURED UNDER THE STANDARD ENVIRONMENTAL CONDITION (25°C AND 1 ATM).

ITEM	DESCRIPTION
RATED VOLTAGE	24 VDC
OPERATION VOLTAGE	18.0 - 28.0 VDC
INPUT CURRENT	0.75(MAX. 1.38) A (SAFETY CURRENT 1.38A)
INPUT POWER	18.00 (MAX. 33.12) W
SPEED	4600 ± 10% R.P.M.
MAX. AIR FLOW (AT ZERO STATIC PRESSURE)	5.663 (MIN. 5.100) M^3/MIN. 200.00 (MIN. 180.10) CFM
MAX. AIR PRESSURE (AT ZERO AIRFLOW)	19.23 (MIN. 15.58) mmH_2O 0.757 (MIN. 0.613) $inchH_2O$
ACOUSTICAL NOISE (AVG.)	58.5 (MAX. 62.5) dB-A
INSULATION TYPE	UL: CLASS A
INGRESS PROTECTION	IP56(IEC60529 STANDARD)
SALT FOG PROTECTION	30 DAYS (GR-487)

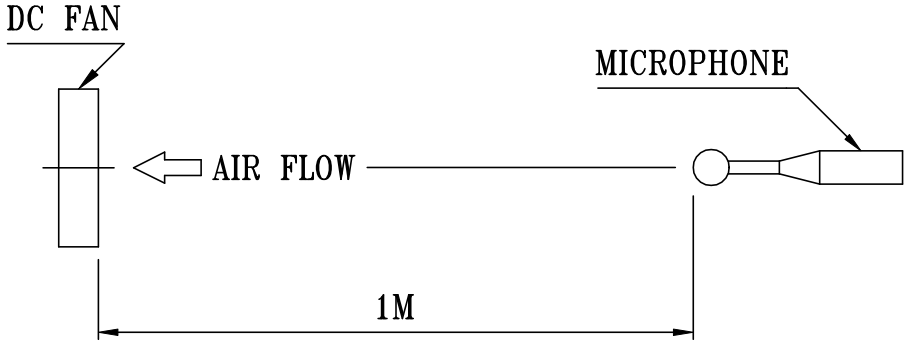
(continued)

PART NO:

DELTA MODEL: EFB1324SHE-EP

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)	L10, 70,000 HOURS AT 40 °C WITH 15 ~ 65 %RH.
ROTATION	CLOCKWISE VIEW FROM NAME PLATE SIDE
OVER CURRENT SHUT DOWN	THE CURRENT WILL SHUT DOWN WHEN LOCKING ROTOR
LEAD WIRE	UL 1007 AWG #24 BLACK WIRE NEGATIVE(-) RED WIRE POSITIVE(+) BLUE WIRE (F00) YELLOW WIRE (PWM SIGNAL)

NOTES: 1. ALL READINGS ARE MEASURED AFTER STABLY WARMING UP THROUGH 10 MINUTES.
2. THE VALUES WRITTEN IN PARENS , ( ), ARE LIMITED SPEC.
3. 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.

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 ——— 370 GRAMS

4. ENVIRONMENTAL:

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

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

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, THAILAND OR TAIWAN.

8. BASIC RELIABILITY REQUIREMENT:

8-1. THERMAL CYCLING
LOW TEMPERATURE: -40°C
HIGH TEMPERATURE: +80°C
SOAK TIME: 30 MINUTES
TRANSITION TIME < 5 MINUTES
DUTY CYCLES: 5

8-2. HUMIDITY EXPOSURE
TEMPERATURE: +25°C ~ +65°C
HUMIDITY: 90-98% RH @ +65°C
FOR 4 HOURS/CYCLE
POWER: NON-OPERATING
TEST TIME: 168 HOURS

8-3. VIBRATION
TEMPERATURE: +25°C
ORIENTATION: X, Y, Z
POWER: NON-OPERATING
VIBRATION LEVEL: OVERALL gRMS=3.2

FREQUENCY(Hz)	PSD(G^2/Hz)
10	0.040
20	0.100
40	0.100
800	0.002
1000	0.002

TEST TIME: 2 HOURS ON EACH ORIENTATION

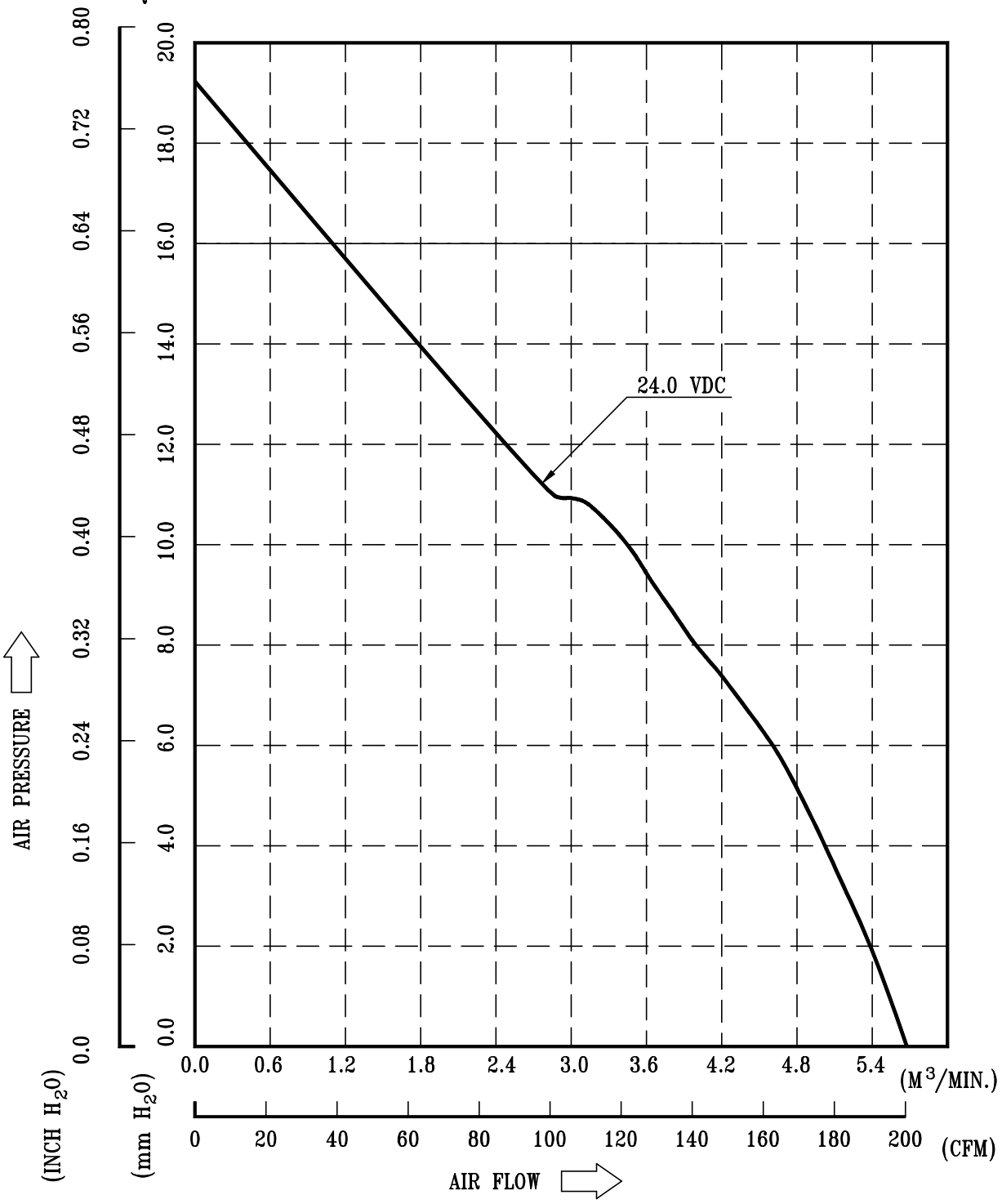
8-4. MECHANICAL SHOCK
TEMPERATURE: +20°C
ORIENTATION: X, Y, Z
POWER: NON-OPERATING
ACCELERATION: 20 G MIN.
PULSE: 11 ms HALF-SINE WAVE
NUMBER OF SHOCKS: 5 SHOCKS
FOR EACH DIRECTION

8-5. LIFE
TEMPERATURE: MAX , OPERATING TEMPERATURE
POWER: OPERATING
DURATION: 1000 HOURS MIN.

PART NO:

DELTA MODEL: EFB1324SHE-EP

9. P & Q CURVE:



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

A00

PART NO:

DELTA MODEL: EFB1324SHE-EP

10. DIMENSION DRAWING:

LABEL:

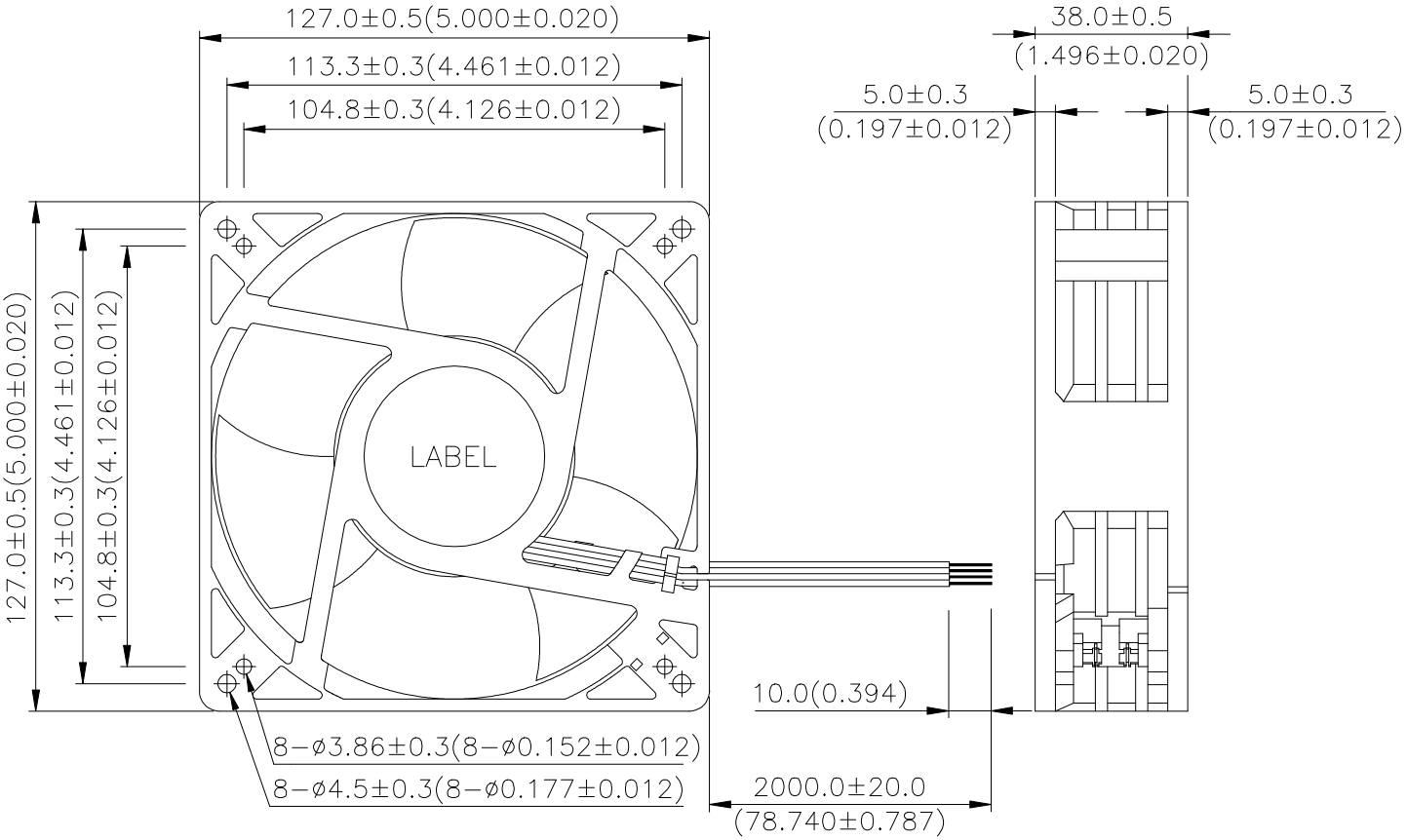


OR



OR





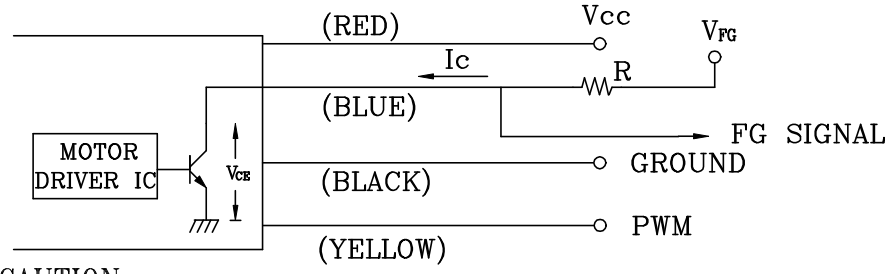
UNIT: mm(INCH)

NOTES:

1. WIRE: UL1007 AWG#24
   RED WIRE-----(+)
   BLACK WIRE-----(-)
   BLUE WIRE-----(-F00)
   YELLOW WIRE-----(-PWM)
2. THIS PRODUCT IS RoHS COMPLIANT

11. FREQUENCY GENERATOR (FG) SIGNAL:

1. OUTPUT CIRCUIT - OPEN COLLECTOR MODE:



CAUTION:

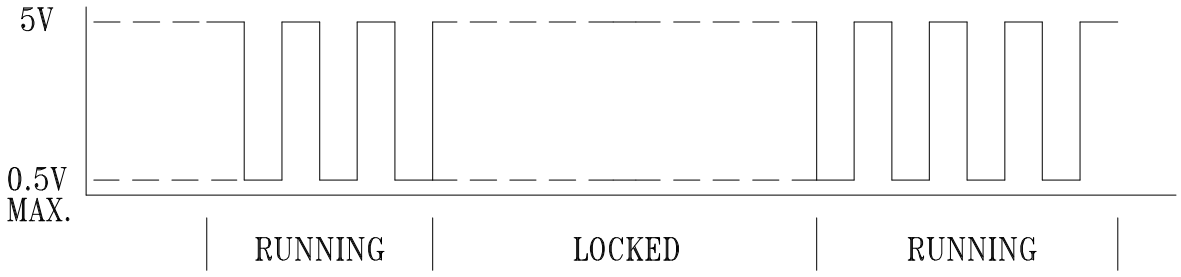
THE LEAD WIRE OF FG SIGNAL CAN NOT TOUCH
THE LEAD WIRE OF POSITIVE OR NEGATIVE.

2. SPECIFICATION:

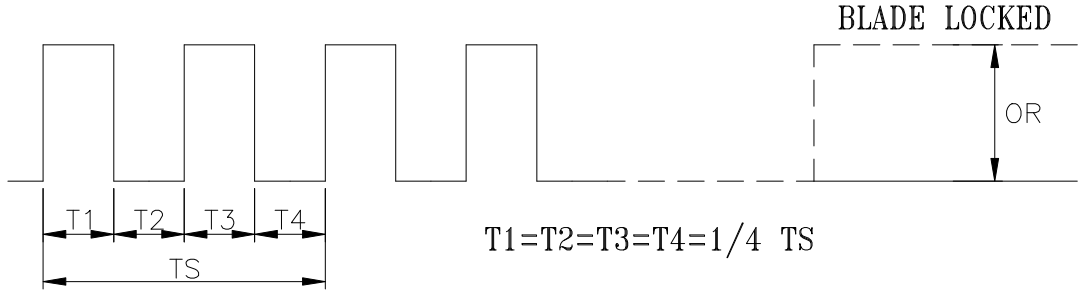
V_{CE} (sat)=0.5V MAX. V_{FG} =28.0VDC MAX.

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

3. FREQUENCY GENERATOR WAVEFORM:



FAN RUNNING FOR 4 POLES



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

N=R.P.M

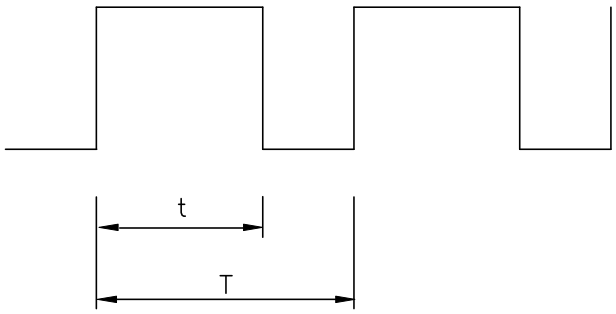
TS=60/N(SEC)

*VOLTAGE LEVEL AFTER BLADE LOCKED

*4 POLES

12. PWM CONTROL SIGNAL:

SIGNAL VOLTAGE RANGE: 0 ~ 20VDC



HIGH SIGNAL: 20 VDC MAX. / 2.8 VDC MIN.

LOW SIGNAL: 0.8 VDC MAX. / 0 VDC MIN.

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

- THE PREFERRED OPERATING POINT FOR THE FAN IS 50HZ.
- AT 100% DUTY CYCLE,THE ROTOR WILL SPIN AT MAXIMUM SPEED.
- AT 0% DUTY CYCLE,THE ROTOR WILL STOP THE SPIN.
- WITH CONTROL SIGNAL LEAD DISCONNECTED,THE FAN WILL SPIN AT MAXIMUM SPEED.
- AT RATED VOLTAGE ,50HZ ,30% DUTY CYCLE ,THE FAN WILL BE ABLE TO START FROM A DEAD STOP .

13. SPEED VS PWM CONTROL SIGNAL: (AT RATED VOLTAGE & PWM FREQUENCY=50HZ)

DUTY CYCLE (%)	SPEED R.P.M. (REF.)	CURRENT (A) TYP.
100	4600±10%	0.75
60	3080±10%	0.27
0	0	0.01

14. THE FAN SPEED WILL DEFAULT TO MAXIMUM WHEN THE SPEED CONTROL INPUT IS LEFT UNCONNECTED.

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^{0}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:

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