



## SPECIFICATION FOR APPROVAL

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**Customer**

\_\_\_\_\_

**Description**

**DC FAN**

**Part No.**

\_\_\_\_\_

**Rev.**

\_\_\_\_\_

**Delta Model No.**

**PFB0412EHN-TP06**

**Rev.**

**00**

**Sample Issue No.**

\_\_\_\_\_

**Sample Issue Date.**

**Jul 29, 08**

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

**APPROVED BY : \_\_\_\_\_**

**DATE : \_\_\_\_\_**

SPECIFICATION FOR APPROVAL

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Customer:

Description: DC FAN

Customer P/N: REV:

Delta Model NO.: PFB0412EHN-TP06

Sample Rev: 00 Issue NO:

Sample Issue Date: Jul 29, 08 Quantity:

1. SCOPE:

THIS SPECIFICATION DEFINES THE ELECTRICAL AND MECHANICAL CHARACTERISTICS OF THE DC BRUSHLESS AXIAL FLOW FAN. THE FAN MOTOR IS WITH SINGLE PHASES AND FOUR POLES.

2. CHARACTERS:

| ITEM                                       | DESCRIPTION  |
|--|--|
| RATED VOLTAGE                              | 12 VDC   |
| OPERATION VOLTAGE                          | 10.8 - 13.2 VDC  |
| START VOLTAGE (VDC)                        | ≥ 10.8 VDC.  |
| INPUT CURRENT                              | 0.50 (MAX. 0.60) A   |
| INPUT POWER                                | 6.00 (MAX. 7.20) W   |
| SPEED                                      | 16000±10% R.P.M.   |
| MAX. AIR FLOW<br>(AT ZERO STATIC PRESSURE) | 0.618(MIN. 0.556) M <sup>3</sup> /MIN.<br>21.834 (MIN. 19.643 ) CFM                |
| MAX. AIR PRESSURE<br>(AT ZERO AIRFLOW)     | 36.334(MIN. 29.430) mmH <sub>2</sub> O<br>1.431 (MIN. 1.159 ) inchH <sub>2</sub> O |
| ACOUSTICAL NOISE (AVG.)                    | 54.5 ( MAX. 58.5 ) dB-A  |
| INSULATION TYPE                            | CLASS A  |
| CURRENT ON LABEL (A)                       | 0.72 A   |

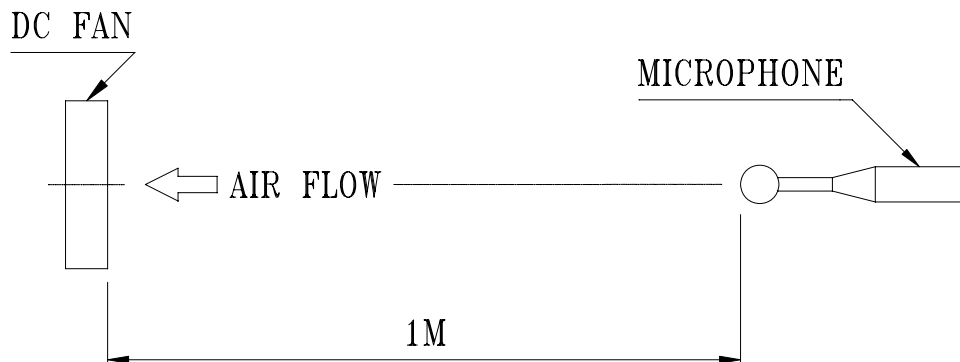
(continued)

PART NO:

DELTA MODEL: PFB0412EHN-TP06

|                        |   |
|------------------------|---|
| INSULATION STRENGTH    | 10 MEG OHM MIN. AT 500 VDC<br>(BETWEEN FRAME AND (+) TERMINAL)  |
| DIELECTRIC STRENGTH    | 5 mA MAX. AT 500 VAC 60 Hz<br>ONE MINUTE, (BETWEEN FRAME AND<br>(+) TERMINAL)   |
| EXTERNAL COVER         | OPEN TYPE   |
| LIFE EXPECTANCE        | 50,000 HOURS CONTINUOUS OPERATION<br>AT 40 °C WITH 15 ~ 65 %RH.   |
| ROTATION               | CLOCKWISE VIEW FROM NAME PLATE SIDE   |
| OVER CURRENT SHUT DOWN | THE CURRENT WILL SHUT DOWN WHEN<br>LOCKING ROTOR.   |
| LEAD WIRE              | UL 1061 AWG #26<br>BLACK WIRE NEGATIVE(-)<br>RED WIRE POSITIVE(+)<br>BLUE WIRE FREQUENCY(-F00)<br>YELLOW WIRE SPEED CONTROL(-PWM) |

- NOTES: 1. ALL READINGS ARE MEASURED AFTER STABLY WARMING UP THROUGH 10 MINUTES.  
2. THE VALUES WRITTEN IN PARENS , ( ), ARE LIMITED SPEC.  
3. THE CHARACTERS SHOWED IN PAGE 1 IS THE CONDITION OF BOTH FANS RUN.  
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.

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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 \_\_\_\_\_ 47 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

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 OR TAIWAN.

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8.P & Q CURVE:



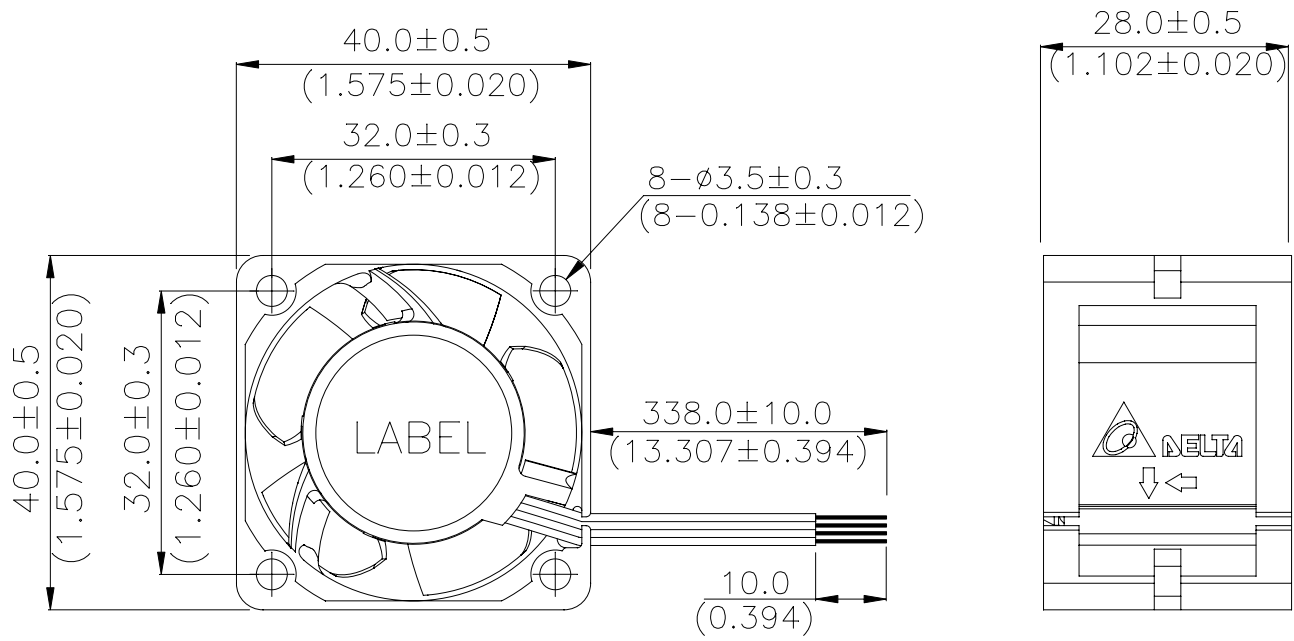
\* TEST CONDITION: INPUT VOLTAGE ——— OPERATION VOLTAGE  
TEMPERATURE ——— ROOM TEMPERATURE  
HUMIDITY ——— 65%RH

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9. DIMENSION DRAWING:

LABEL:



NOTES:

UNIT: MM(INCH)

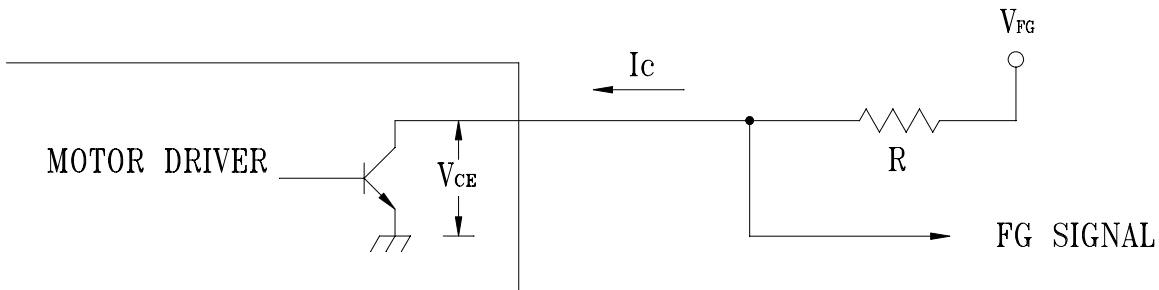
- 1.WIRE: UL1061 AWG#26  
BLACK WIRE NEGATIVE(-)  
RED WIRE POSITIVE(+)  
BLUE WIRE FREQUENCY(-F00)  
YELLOW WIRE SPEED CONTROL(-PWM)
- 2.THIS PRODUCT IS RoHS COMPLIANT

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10.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:

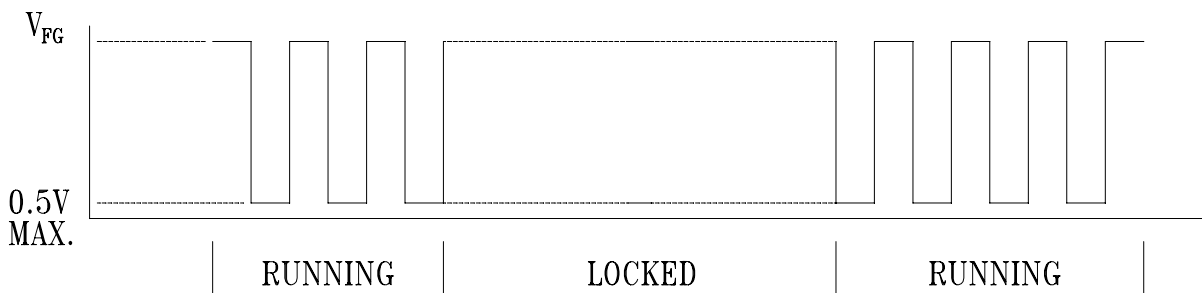
$$V_{CE(sat)} = 0.5V \text{ MAX}$$

$$V_{FG} = 13.2V \text{ MAX}$$

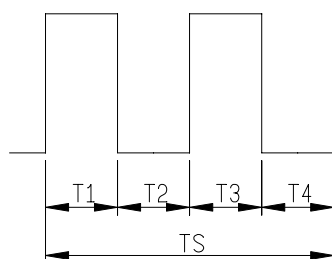
$$I_c = 5mA \text{ MAX.}$$

$$R \geq V_{FG} / I_c$$

3. FREQUENCY GENERATOR WAVEFORM:

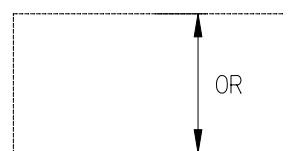


FAN RUNNING FOR 4 POLES



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

BLADE LOCKED



$$N = R.P.M$$

$$TS = 60 / N (\text{SEC})$$

\*VOLTAGE LEVEL AFTER BLADE LOCKED

\*4 POLES

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11. PWM CONTROL SIGNAL:

SIGNAL VOLTAGE RANGE: -0.8~20VDC



HIGH SIGNAL: 20 VDC MAX.  
2.8 VDC MIN.

LOW SIGNAL: 0.8 VDC MAX.  
-0.8 VDC MIN.

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

- THE FREQUENCY FOR CONTROL SIGNAL OF THE FAN SHALL BE ABLE TO ACCEPT A 30HZ~300K HZ.
- THE PREFERRED OPERATING POINT FOR THE FAN IS 25K HZ.
- AT 100% DUTY CYCLE,THE ROTOR WILL SPIN AT MAXIMUM SPEED.
- WITH CONTROL SIGNAL LEAD DISCONNECTED,THE FAN WILL SPIN AT MAXIMUM SPEED.
- AT 12V 25K HZ 30% DUTY CYCLE ,THE FAN WILL BE ABLE TO START FROM A DEAD STOP .

12. SPEED VS PWM CONTROL SIGNAL: (AT RATED VOLTAGE & PWM FREQUENCY=25KHZ)

| DUTY CYCLE (%) | SPEED R.P.M. (REF.) |
|----------------|---------------------|
| 100            | 16000±10%           |
| 0 ~ 20         | 1900±300            |

13. PWM CONTROL LEAD WIRE INPUT IMPEDANCE:



13-1. THE FAN SPEED WILL DEFAULT TO MAXIMUM WHEN THE SPEED CONTROL INPUT IS LEFT UNCONNECTED.