



## **SPECIFICATION FOR APPROVAL**

Customer. STD  
Description. DC BLOWER  
Part No. REV.  
Delta Model No. BFB04512HHA-DV52 REV. 00  
Sample Issue No.  
Sample Issue Date. AUG-16-2013

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

**APPROVED BY :**

DATE:

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

**Delta Electronics, Inc.  
HeTianXia High-Tech Industrial Park.  
Shi Jie Town, Dong Guan City.  
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STATEMENT OF DEVIATION  
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NONE

DESCRIPTION :

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SPECIFICATION FOR APPROVAL  
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Customer: STD

Description: DC BLOWER

Customer P/N: REV:

Delta Model No.: BFB04512HHA-DV52 Safety Delta Model No.: BFB04512HHA-C

Sample Rev: 00 Issue No:

Sample Issue Date: AUG-16-2013 Quantity:

1. SCOPE:

THIS SPECIFICATION DEFINES THE ELECTRICAL AND MECHANICAL CHARACTERISTICS OF THE DC BRUSHLESS BLOWER. THE BLOWER MOTOR IS WITH ONE PHASE AND FOUR POLES.

2. CHARACTERS:

ITEM	DESCRIPTION
RATED VOLTAGE	12 VDC
OPERATION VOLTAGE	5.0 - 13.5 VDC
INPUT CURRENT	0.14 (MAX. 0.26) A (SAFETY CURRENT 0.26A)
INPUT POWER	1.68 (MAX. 3.12) W
SPEED	6100±10% R.P.M.
MAX. AIR FLOW (AT ZERO STATIC PRESSURE)	0.102 (MIN. 0.083) M <sup>3</sup> / MIN. 3.602 (MIN. 2.931) CFM
MAX. AIR PRESSURE (AT ZERO AIRFLOW)	15.20 (MIN. 11.53) mmH <sub>2</sub> O 0.598 (MIN. 0.454) inchH <sub>2</sub> O
ACOUSTICAL NOISE (AVG.)	36.0 (MAX. 41.0) dB-A
INSULATION TYPE	UL: CLASS A

(continued)

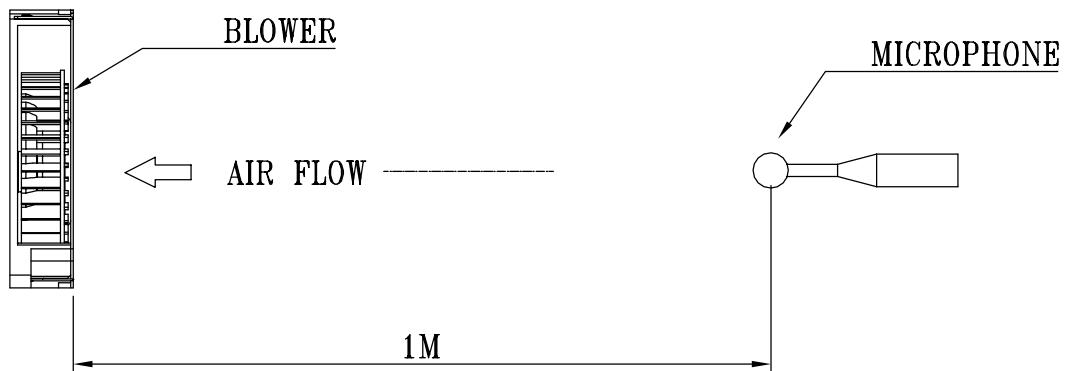
PART NO:

DELTA MODEL: BFB04512HHA-DV52

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 (L10) (AT LABEL VOLTAGE)	3,600 HOURS CONTINOUS OPERATION AT 70°C WITH 15%~65% RH.
ROTATION	COUNTERCLOCKWISE DIRECTION FROM FRONT VIEW OF AIR FLOW INLET
INSULATION TYPE	UL: CLASS A
LEAD WIRE	UL 10368 -F- AWG #32 RED WIRE POSITIVE(+) BLACK WIRE NEGATIVE(-) YELLOW WIRE (PWM SIGNAL) WHITE WIRE FREQUENCY(-FO0)

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.

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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 BEARING
3-5. WEIGHT	18.1 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, PBB0s, CFCs, PBBEs, PBDPEs AND HCFCs.

7. PRODUCTION LOCATION

7-1. PRODUCTS WILL BE PRODUCED IN CHINA.

8. POWER COMSUMPTION (REF)

8-1. WHEN 0% DUTY CYCLE INPUT ,THE ROTOR WILL STOP SPIN . THE POWER CONSUMPTION OF FAN IS ABOUT 0.12W (MAX. 0.14W) AT THIS TIME.

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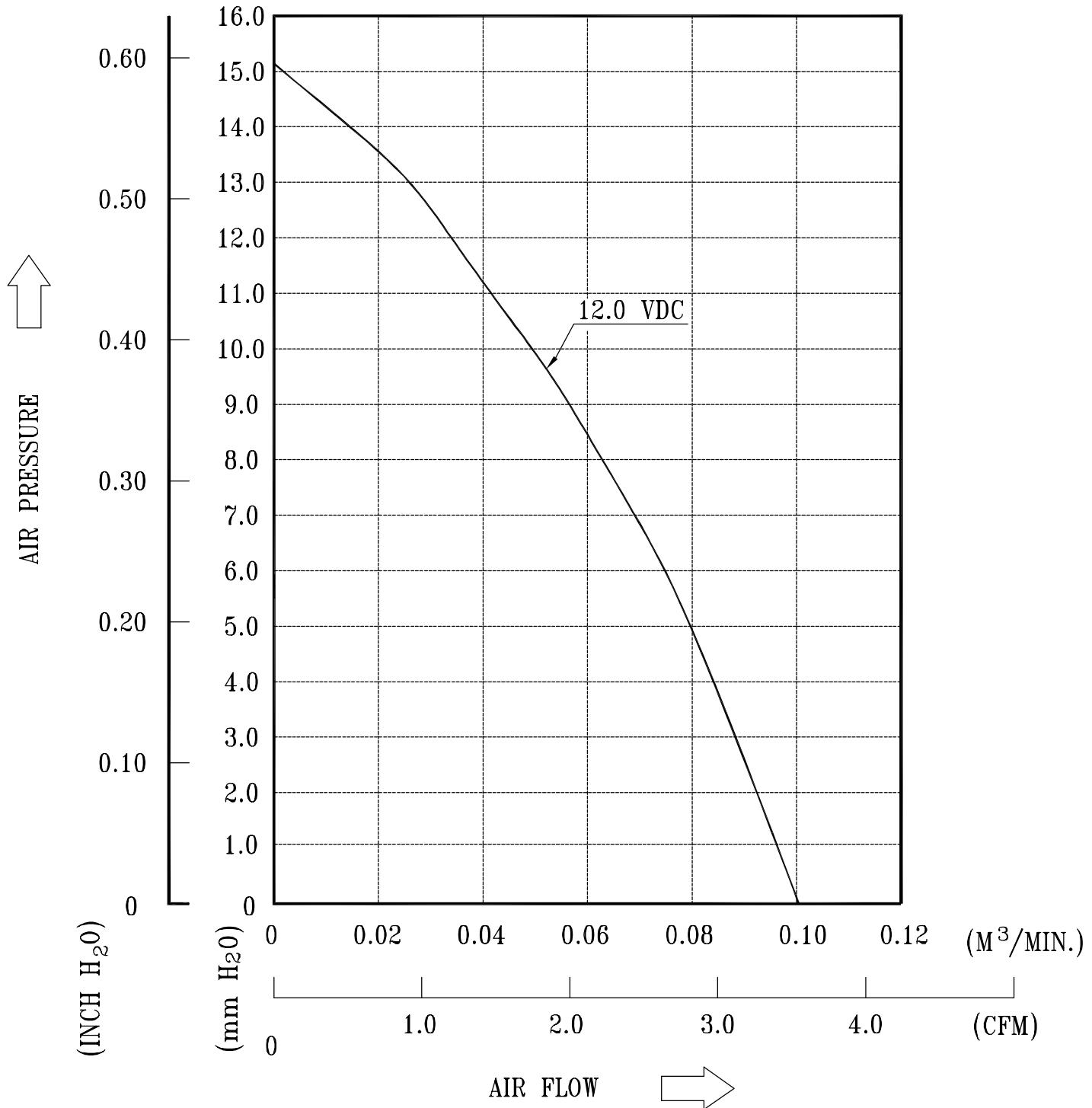
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9. P & Q CURVE:



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

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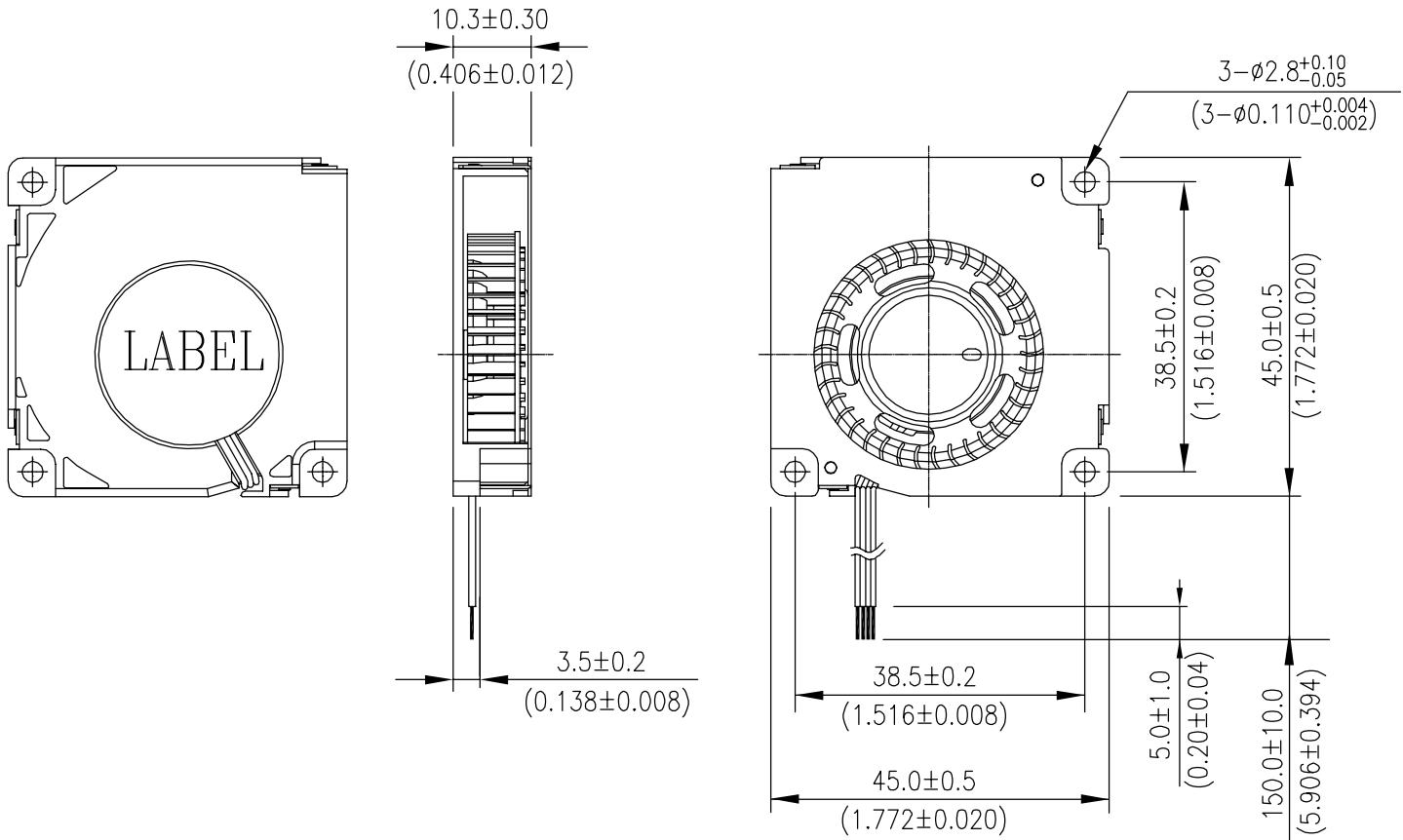
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10. DIMENSION DRAWING:

LABEL:



NOTES:

1. LEAD WIRE: UL10368 AWG#32

UNIT:  $\frac{\text{mm}}{(\text{INCH})}$

RED WIRE -----(+)

BLACK WIRE -----(-)

YELLOW WIRE -----(PWM)

WHITE WIRE -----(-FO0)

2. THIS PRODUCT IS RoHS COMPLIANT

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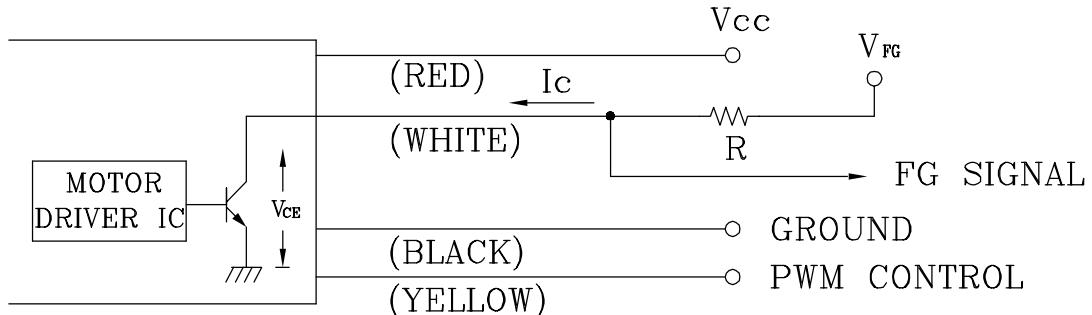
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## 11. FREQUENCY GENERATOR (FG) SIGNAL:

### 11.1. OUTPUT CIRCUIT – OPEN COLLECTOR MODE:



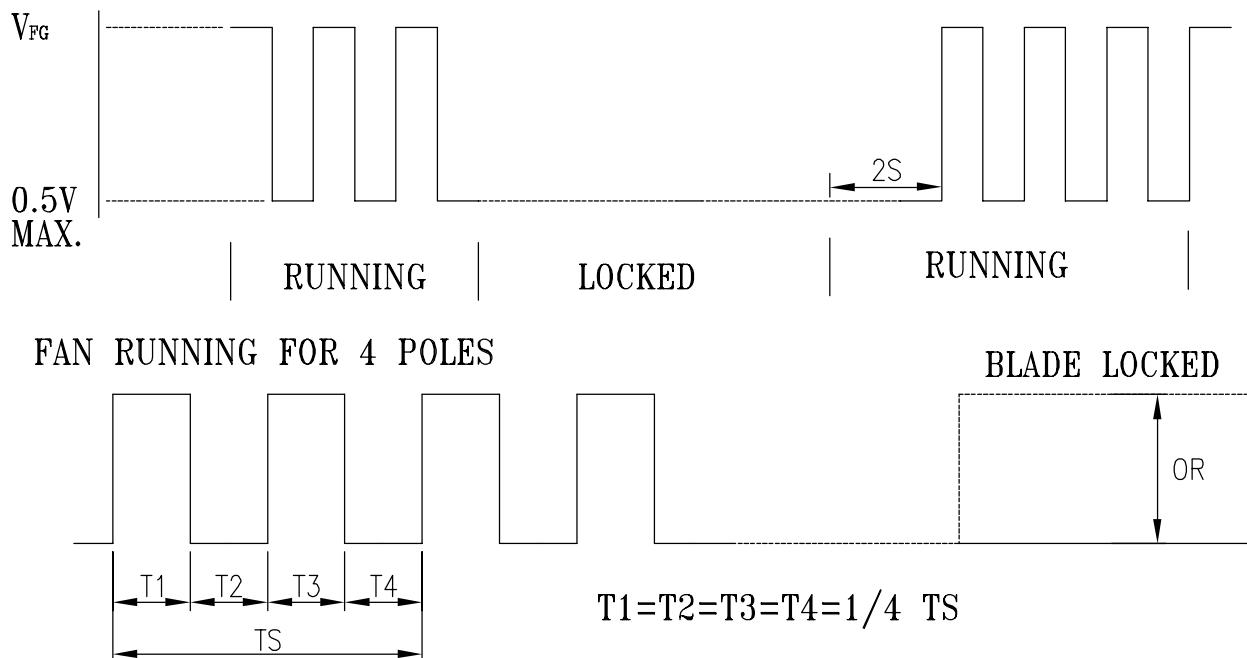
CAUTION: THE FG SIGNAL LEAD WIRE MUST BE KEPT AWAY FROM  
"+" LEAD WIRE & "-" LEAD WIRE.

### 11-2. SPECIFICATION:

$$V_{CE} \text{ (sat)} = 0.5V \text{ MAX.} \quad V_{FG} = 5.0V \text{ TYP.} (V_{CC} \text{ MAX.})$$

$$I_c = 5\text{mA MAX.} \quad R \geq V_{FG} / I_c$$

### 11-3. FREQUENCY GENERATOR WAVEFORM:



$$N = \text{R.P.M}$$

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

\*VOLTAGE LEVEL AFTER BLADE LOCKED

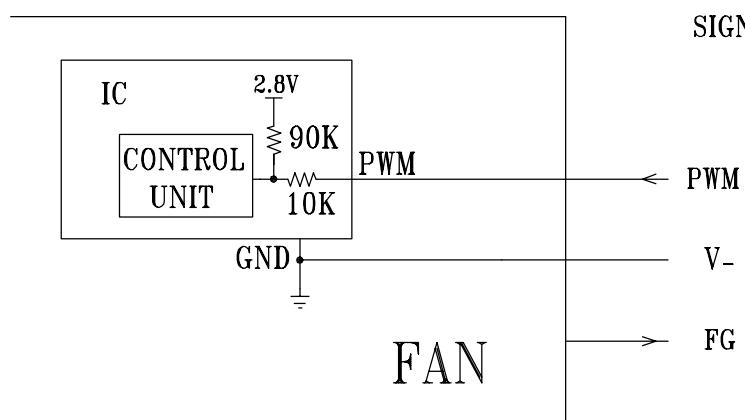
\*4 POLES

PART NO:

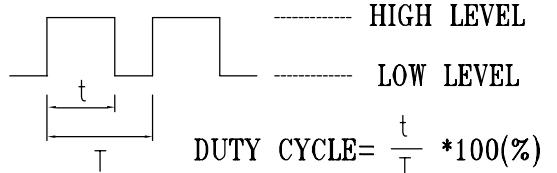
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## 12.PWM CONTROL FUNCTION

### 12-1. PWM CONTROL INTERFACE



SIGNAL VOLTAGE RANGE:  $0 \sim (V_{CC} + 0.3)$  VDC



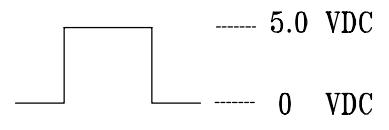
- HIGH LEVEL :  $(V_{CC} + 0.3)$  VDC max.  
2.5 VDC min.
- LOW LEVEL : 0.8 VDC max.  
0 VDC min.

- THE PREFERRED OPERATING FREQUENCY OF PWM SIGNAL IS 25K Hz.
- AT 100% DUTY CYCLE, THE ROTOR WILL SPIN AT MAXIMUM SPEED.
- AT 0% DUTY CYCLE, THE ROTOR WILL STOP SPIN.  
NO MATTER WHEN THE MIN. STARTED DUTY CYCLE INPUT ,  
THE ROTOR WILL START UP IMMEDIATELY.
- WHEN THE PWM CONTROL LEAD WIRE IS DISCONNECTED, THE ROTOR  
WILL SPIN AT MAXIMUM SPEED.

### 12-2. FAN CHARACTERISTICS

- FUNCTION GENERATOR TEST SIGNAL

PWM FREQUENCY = 25K Hz



DUTY CYCLE (%)	SPEED R.P.M. (REF.)	CURRENT (A) TYP.
100	$6100 \pm 10\%$	0.14
32	$1800 \pm 300$	0.02
0	0	0.01

- MIN. STARTED DUTY CYCLE(at 25°C, 12.0VDC):MAX. 35 %  
WHEN DUTY CYCLE IS SET FOR MORE THAN 35 %, THE FAN WILL BE ABLE TO  
START FROM A DEAD STOP.



## **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.