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 PRODUCTION PRE-ARRANGEMENT.

APPROVED BY :

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.

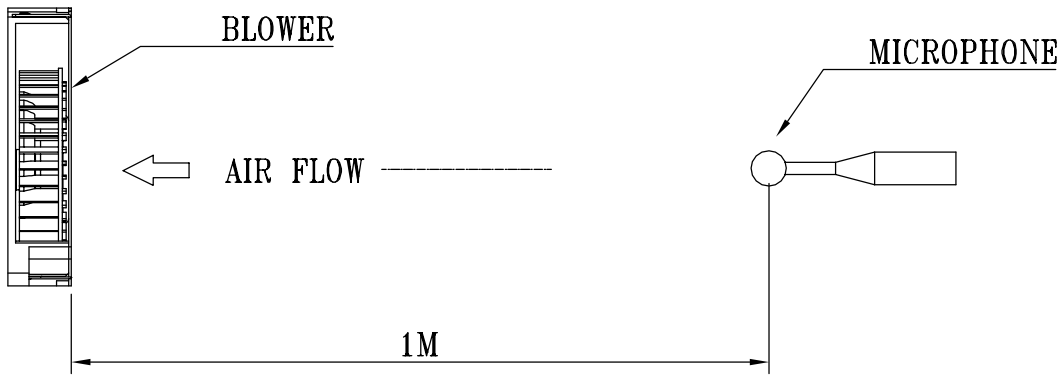
2. CHARACTERS:

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^3/ MIN. 3.602 (MIN. 2.931) CFM
MAX.AIR PRESSURE (AT ZERO AIRFLOW)	15.20 (MIN. 11.53) mmH_2O 0.598 (MIN. 0.454) $inchH_2O$
ACOUSTICAL NOISE (AVG.)	36.0 (MAX. 41.0) dB-A
INSULATION TYPE	UL: CLASS A

(continued)

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(-F00)

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.

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, PBBOs, CFCs, PBBEs, PBDPEs AND HCFCs.

7. PRODUCTION LOCATION

7-1. PRODUCTS WILL BE PRODUCED IN CHINA.

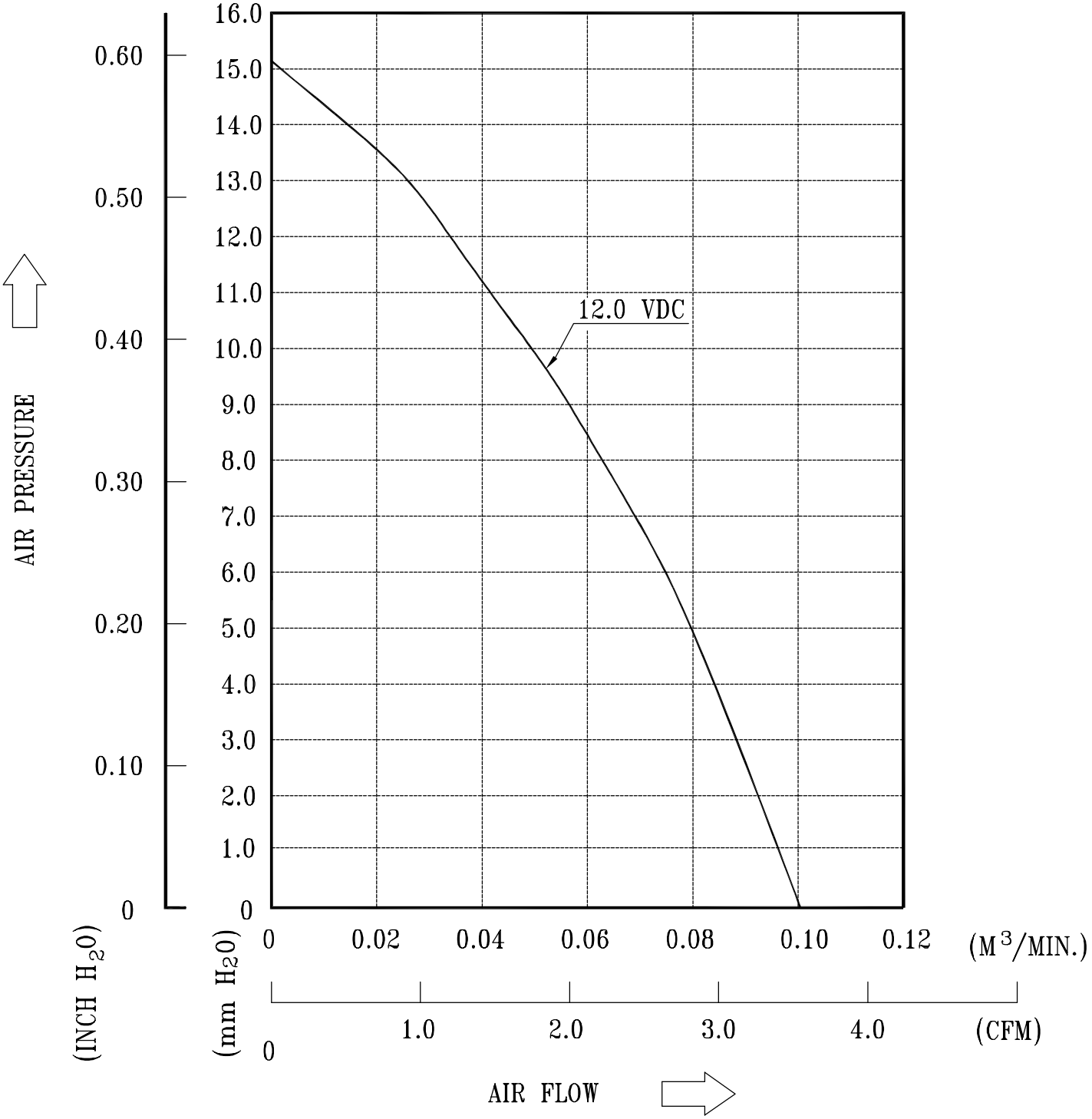
8. POWER COMSUMPTION (REF)

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.

PART NO:

DELTA MODEL: BFB04512HHA-DV52

9. P & Q CURVE:



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

A00

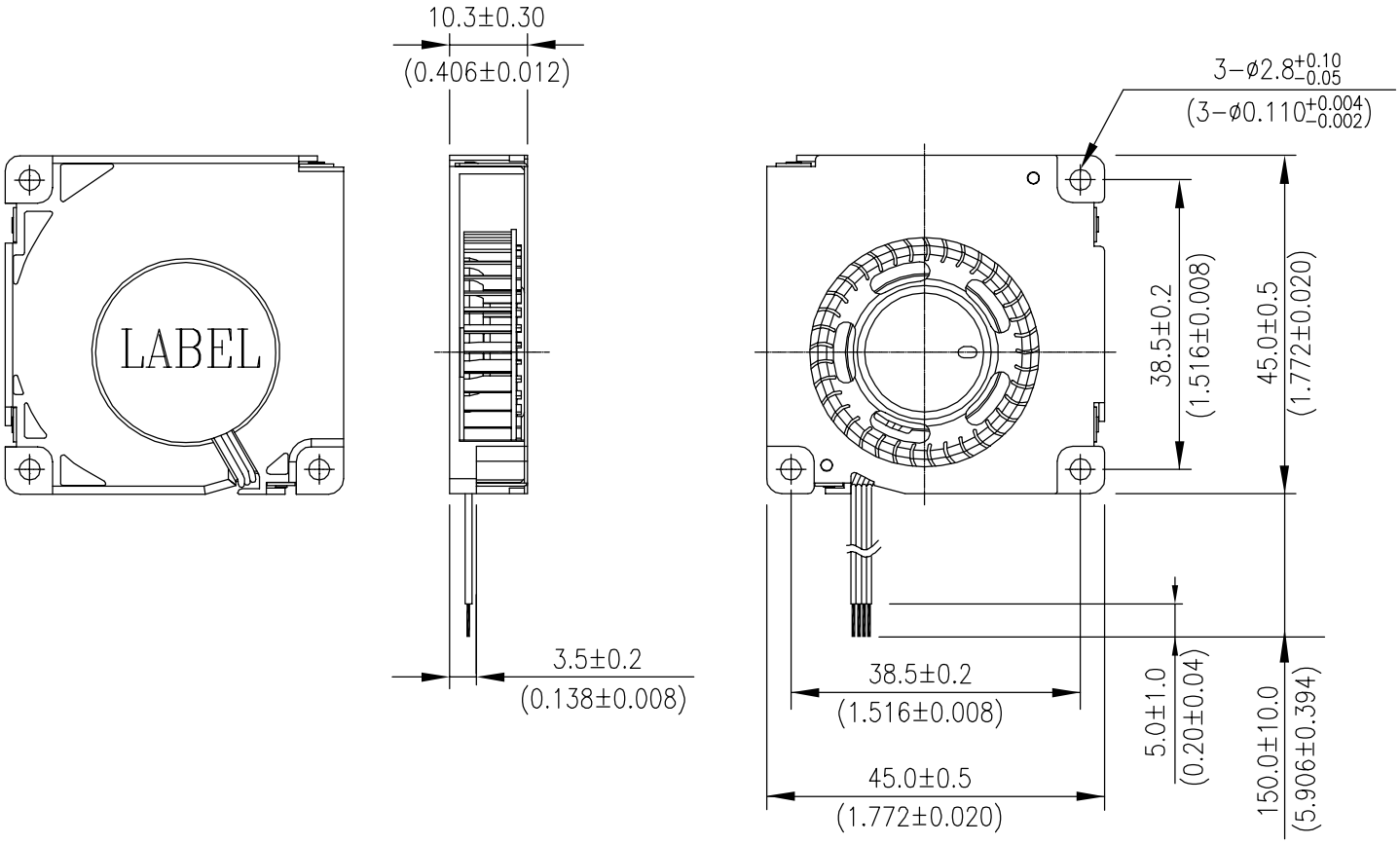
PART NO:

DELTA MODEL: BFB04512HHA-DV52

10. DIMENSION DRAWING:

LABEL:





NOTES:

UNIT: mm (INCH)

1.LEAD WIRE: UL10368 AWG#32

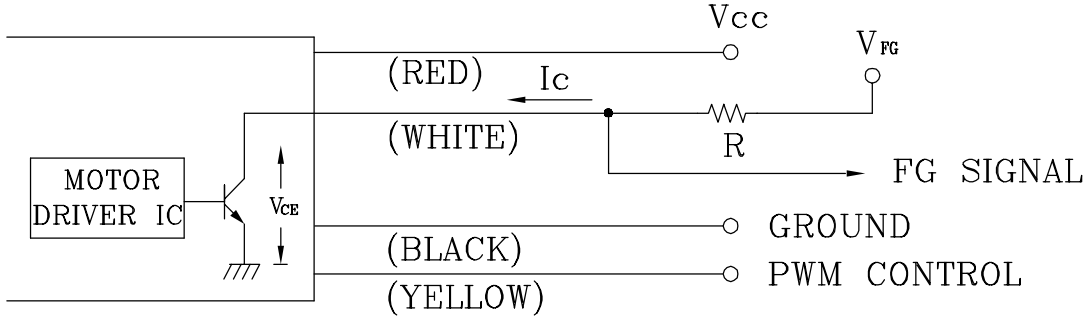
RED WIRE -----(+)
BLACK WIRE -----(-)
YELLOW WIRE -----(PWM)
WHITE WIRE -----(-F00)

2. THIS PRODUCT IS RoHS COMPLIANT

A00

11. FREQUENCY GENERATOR (FG) SIGNAL:

11.1. OUTPUT CIRCUIT - OPEN COLLECTOR MODE:



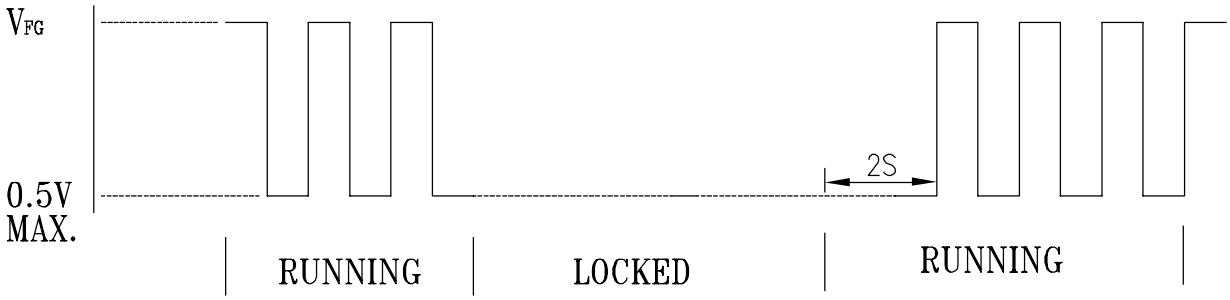
CAUTION: THE FG SIGNAL LEAD WIRE MUST BE KEPT AWAY FROM "+" LEAD WIRE & "−" LEAD WIRE.

11-2. SPECIFICATION:

V_{CE} (sat)=0.5V MAX. V_{FG} =5.0V TYP.(Vcc MAX.)

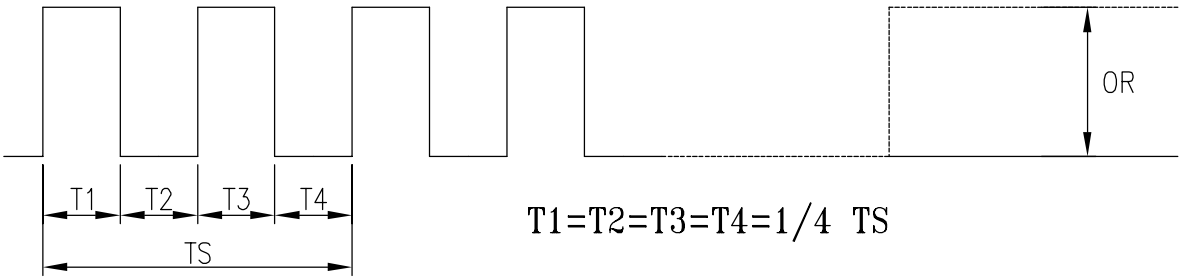
I_C =5mA MAX. $R \geq V_{FG}/I_C$

11-3. FREQUENCY GENERATOR WAVEFORM:



FAN RUNNING FOR 4 POLES

BLADE LOCKED



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

N=R.P.M

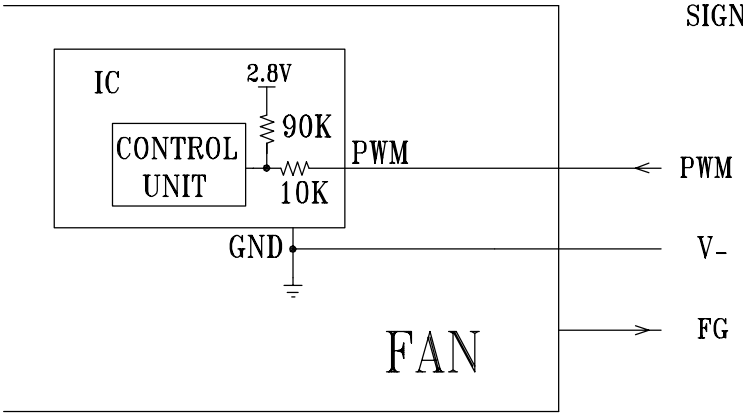
TS=60/N(SEC)

*VOLTAGE LEVEL AFTER BLADE LOCKED

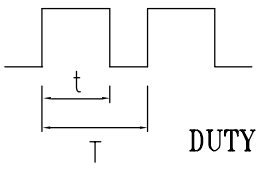
*4 POLES

12.PWM CONTROL FUNCTION

12-1. PWM CONTROL INTERFACE



SIGNAL VOLTAGE RANGE: 0 ~ (V_{CC} + 0.3) VDC



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

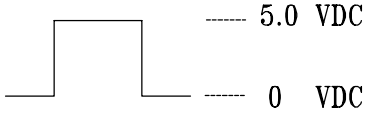
- HIGH LEVEL : (V_{CC} + 0.3) VDC max.
  2.5 VDC min.
- LOW LEVEL : 0.8 VDC max.
  0 VDC min.

- 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±10%	0.14
32	1800±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.

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DELTA Electronics:

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