

## SPECIFICATION FOR APPROVAL

Description.	DCTAN		
Part No.		REV.	
Delta Model No.	EFB0412VHD-CP09	REV.	00
Sample Issue No.			
Sample Issue Date.	FEB-07-2012		
	ONE COPY OF THIS SPECIF OU SIGNED APPROVAL FO		
APPROVED B			
DATE:			

EFB0412VHD-CP09 Delta

Customer.

https://www.fansco.com/item/efb0412vhd-cp09-delta/

E-mail: sales@fansco.com

Delta Electronics, Inc. EFB0412VHD-CP09 Delta Datesheet fansco.com

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Guangdong Province, China. P. R. C.

## SPECIFICATION FOR APPROVAL

Customer:

Description: DC FAN

Customer P/N: REV:

Delta Model NO.: EFB0412VHD-CP09 Delta Safety Model NO.: EFB0412VHD

Sample Rev: 00 Issue N0:

Sample Issue Date: FEB-07-2012 Quantity:

### 1. SCOPE:

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

### 2. CHARACTERS:

(AT 12VDC, 25°C, DUTY CYCLE OF PWM SIGNAL = 100%)

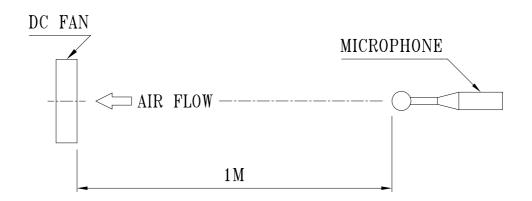
ITEM	DESCRIPTION				
RATED VOLTAGE	12 VDC				
OPERATION VOLTAGE	5.0 - 13.8 VDC				
INPUT CURRENT	0.12 (MAX. 0.18) A (SAFETY CURRENT 0.18A)				
INPUT POWER	1.44 (MAX. 2.16) W				
SPEED	9000±10% R.P.M.				
MAX. AIR FLOW (AT ZERO STATIC PRESSURE)	0.286 (MIN. 0.262) M <sup>3</sup> /MIN. 10.10 (MIN. 9.25) CFM				
MAX.AIR PRESSURE (AT ZERO AIR FLOW)	$\begin{array}{ccc} 10.57 \; (\mathrm{MIN.} & 8.76 \;) \; \mathrm{mmH_20} \\ 0.416 \; (\mathrm{MIN.} & 0.345 \;) \; \mathrm{inchH_20} \end{array}$				
ACOUSTICAL NOISE (AVG.)	34.5 (MAX. 38.5) dB-A				
INSULATION TYPE	UL: CLASS A				

(continued)

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INSULATION STRENGTH	10 MEG OHM MIN. AT 500 VDC (BETWEEN FRAME AND (+) TERMINAL)
DIELECTRIC STRENGTH	5 mA MAX. AT 500 VAC 60 Hz ONE MINUTE, (BETWEEN FRAME AND (+) TERMINAL)
EXTERNAL COVER	OPEN TYPE
LIFE EXPECTANCE (AT LABEL VOLTAGE)	70,000 HOURS CONTINOUS OPERATION 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 1061 -F- AWG #26  BLACK WIRE NEGATIVE (-)  YELLOW WIRE POSITIVE (+)  GREEN WIRE FREQUENCY (F00)  BLUE 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. 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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 Р	PART NO:										
DI	ELTA MO	DEL:	EFB0412VHD-CF								
3.	MECHA	NICAL:									
	3-1. D	IMENSIONS			SE	E DII	MEN	SIONS	S DI	RAW]	ING
	3-2. F	RAME					PLAS	STIC	UL:	94\	7-0
	3-3. IN	MPELLER					PLAS	STIC	UL:	94\	7-0
	3-4. B	EARING SY	STEM			T	WO	BALL	BE	ARIN	\left{GS}
	3-5. W	EIGHT						- <del>-</del> -	33	GRA	MS
4.	ENVIRO	ONMENTAL:									
	4-1. 0	PERATING	TEMPERATURE			-10	TO	+70	DEC	EREI	E C
	4-2. S'	TORAGE TE	MPERATURE			-40	TO	+75	DEG	REI	E C
	4-3. 0	PERATING	HUMIDITY				- —	5 TC	90	%	RH
	4-4. S'	TORAGE HU	JMIDITY					5 TO	95	%	RH
5.	PROTE	CTION:									
	5-1. L	OCKED ROT	OR PROTECTION	1							

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.

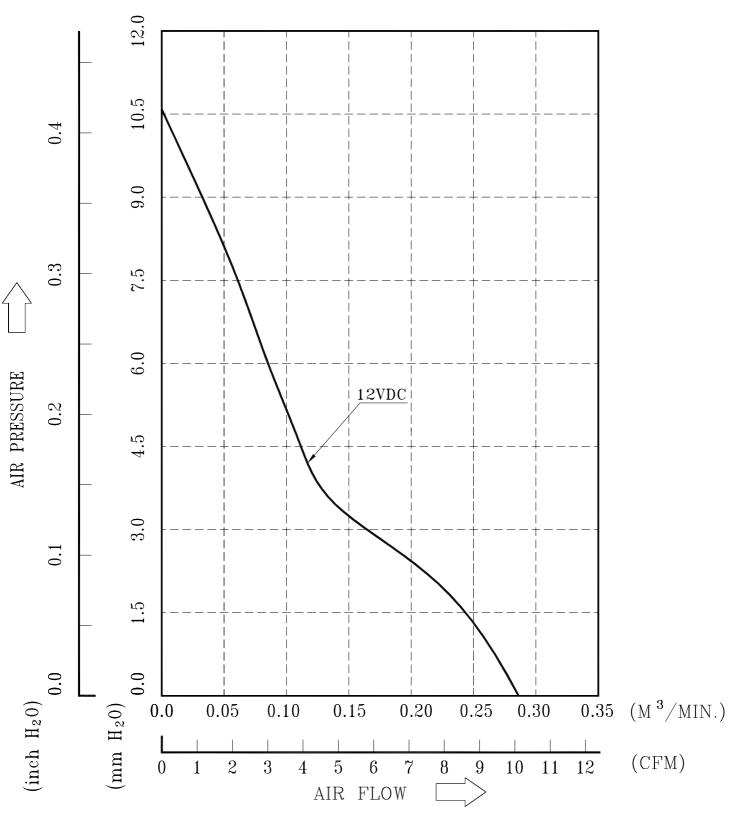
- 6. RE OZONE DEPLETING SUBSTANCES:
  - 6-1. NO CONTAINING PBBs, PBB0s, CFCs, PBBEs, PBDPEs AND HCFCs.
- 7. PRODUCTION LOCATION
  - 7-1. PRODUCTS WILL BE PRODUCED IN CHINA OR THAILAND.

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PART NO:

DELTA MODEL: EFB0412VHD-CP09

8. P & Q CURVE:



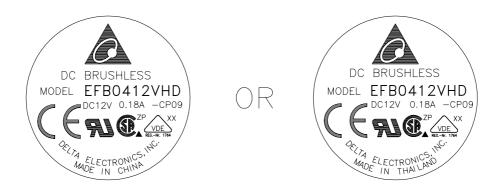
\* TEST CONDITION: INPUT VOLTAGE ------ OPERATION VOLTAGE TEMPERATURE ------ ROOM TEMPERATURE HUMIDITY ------ 65%RH

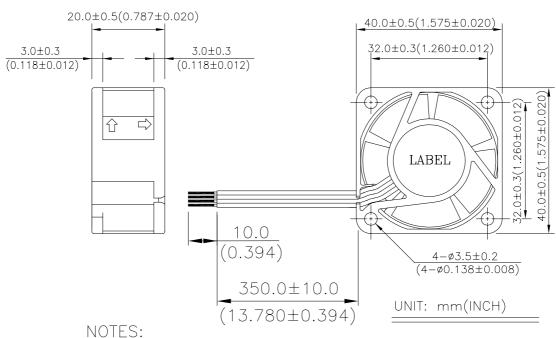
PART NO:

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### 9. DIMENSIONS DRAWING

### LABEL:





JILJ.

1. LEAD WIRE: UL1061 AWG#26

BLACK WIRE---(-)

YELLOW WIRE---(+)

GREEN WIRE---(FOO)

BLUE WIRE---(PWM)

2. THIS PRODUCT IS ROHS COMPLIANT

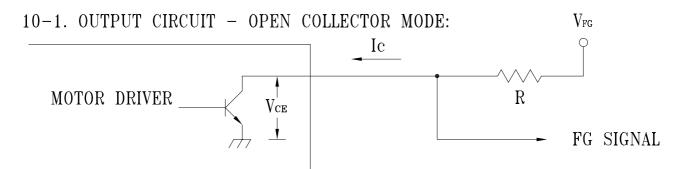
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PART NO:

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### 10. FREQUENCY GENERATOR (FG) SIGNAL:



**CAUTION:** 

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

### 10−2. SPECIFICATION:

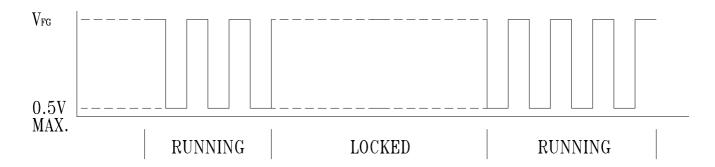
 $V_{CE}$  (sat)=0.5V MAX.

 $V_{FG} = 13.8 \text{VDC MAX}.$ 

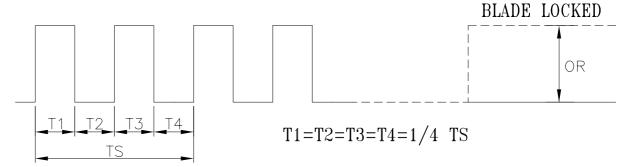
 $I_c = 5 \text{mA MAX}.$ 

 $R \ge V_{FG} / I_{C}$ 

### 10-3. FREQUENCY GENERATOR WAVEFORM:



### FAN RUNNING FOR 4 POLES



N=R.P.M

TS=60/N(SEC)

\*VOLTAGE LEVEL AFTER BLADE LOCKED

\*4 POLES

### DELTA MODEL: EFB0412VHD-CP09

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### 11. PWM CONTROL SIGNAL:

SIGNAL VOLTAGE RANGE: 0 ~ 13.8 VDC

----- HIGH LEVEL: 13.8 VDC MAX.
2.8 VDC MIN.

----- LOW LEVEL: 0.8 VDC MAX.
0 VDC MIN.

- DUTY CYCLE =  $\frac{t}{\top}$  \*100(%)
- THE FREQUENCY FOR CONTROL SINGAL OF THE FAN SHALL BE ABLE TO ACCEPT 30 ~ 50K HZ.
- FOR REDUCING THE SWITCHING NOISE, THE PREFERRED OPERATING POINT FOR THE FAN IS 25K HZ.
- AT 100% DUTY CYCLE, THE ROTOR WILL SPIN AT MAXIMUM SPEED.
- AT 0% DUTY CYCLE, THE ROTOR WILL STOP SPIN .
- WITH CONTROL SIGNAL LEAD DISCONNECTED, THE FAN WILL SPIN AT MAXIMUN SPEED.

### 12. SPEED VS PWM CONTROL SIGNAL:

(AT 25°C, RATED VOLTAGE & PWM SIGNAL AS FOLLOW)

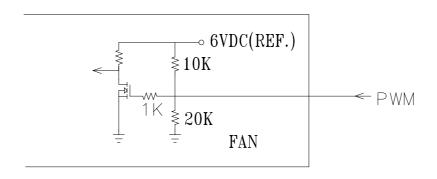
DUTY CYCLE (%)	SPEED R.P.M.	CURRENT (A) TYP.
100	9000±10%	0.12
55	5000±10%	0.05
25	2000±250	0.03
0	0	0.02

- \* PWM SIGNAL
  PWM FREQUENCY = 25KHz

  -- 5 VDC

  -- 0 VDC
- MIN. START DUTY CYCLE: 25%.
  WHEN DUTY CYCLE IS SET FOR MORE THAN 25%, THE FAN WILL BE ABLE TO START FROM A DEAD STOP.

### 13. PWM CONTROL LEAD WIRE INPUT IMPEDANCE:



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# **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.

Doc. No: FMBG-ES Form 001 Rev. 0001 Date: June 24, 2009