

DELTA ELECTRONICS, INC.
 252, SHANG YING ROAD, KUEI SAN
 TAOYUAN HSIEN 333, TAIWAN, R. O .C.

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SPECIFICATION FOR APPROVAL

Customer:

Description:	DC FAN
Customer P/N:	REV:
Delta Model NO.:	AFB0412LB-R00
Sample Rev:	01
Sample Issue Date:	MAY.26.2006.
Issue NO:	Quantity:

1. SCOPE:

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

2. CHARACTERS:

ITEM	DESCRIPTION
RATED VOLTAGE	12 VDC
OPERATION VOLTAGE	7.0 - 13.8 VDC
INPUT CURRENT	0.06 (MAX. 0.09) A
INPUT POWER	0.72 (MAX. 1.08) W
SPEED	5000 R.P.M.
MAX. AIR FLOW (AT ZERO STATIC PRESSURE)	0.184 (MIN. 0.166) M ³ /MIN. 6.50 (MIN. 5.86) CFM
MAX. AIR PRESSURE (AT ZERO AIRFLOW)	3.67 (MIN. 2.97) mmH ₂ O 0.144 (MIN. 0.117) inchH ₂ O
ACOUSTICAL NOISE (AVG.)	18.5 (MAX. 23.5) dB-A
INSULATION TYPE	UL: CLASS A

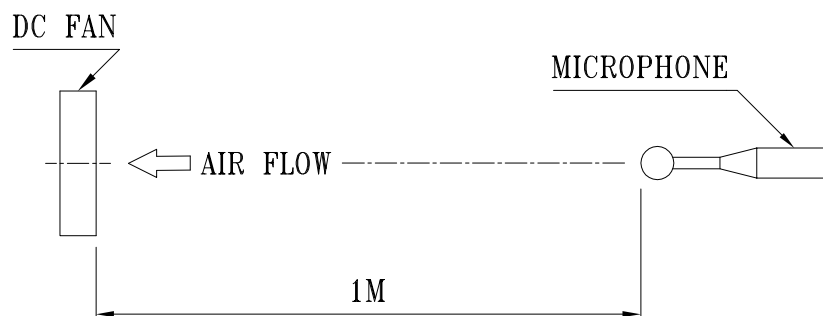
(continued)

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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	70,000 HOURS CONTINUOUS OPERATION AT 40 °C WITH 15 ~ 65 %RH.
ROTATION	CLOCKWISE VIEW FROM NAME PLATE SIDE
LEAD WIRE	UL 1007 -F- AWG #24 BLACK WIRE NEGATIVE(-) RED WIRE POSITIVE(+) BLUE WIRE LOCK SIGNAL(-R00)

- 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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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 ----- 25.0 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. BASIC RELIABILITY REQUIREMENT:

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

8-2. HUMIDITY TEMPERATURE: +25°C ~ +65°C
 EXPOSURE 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

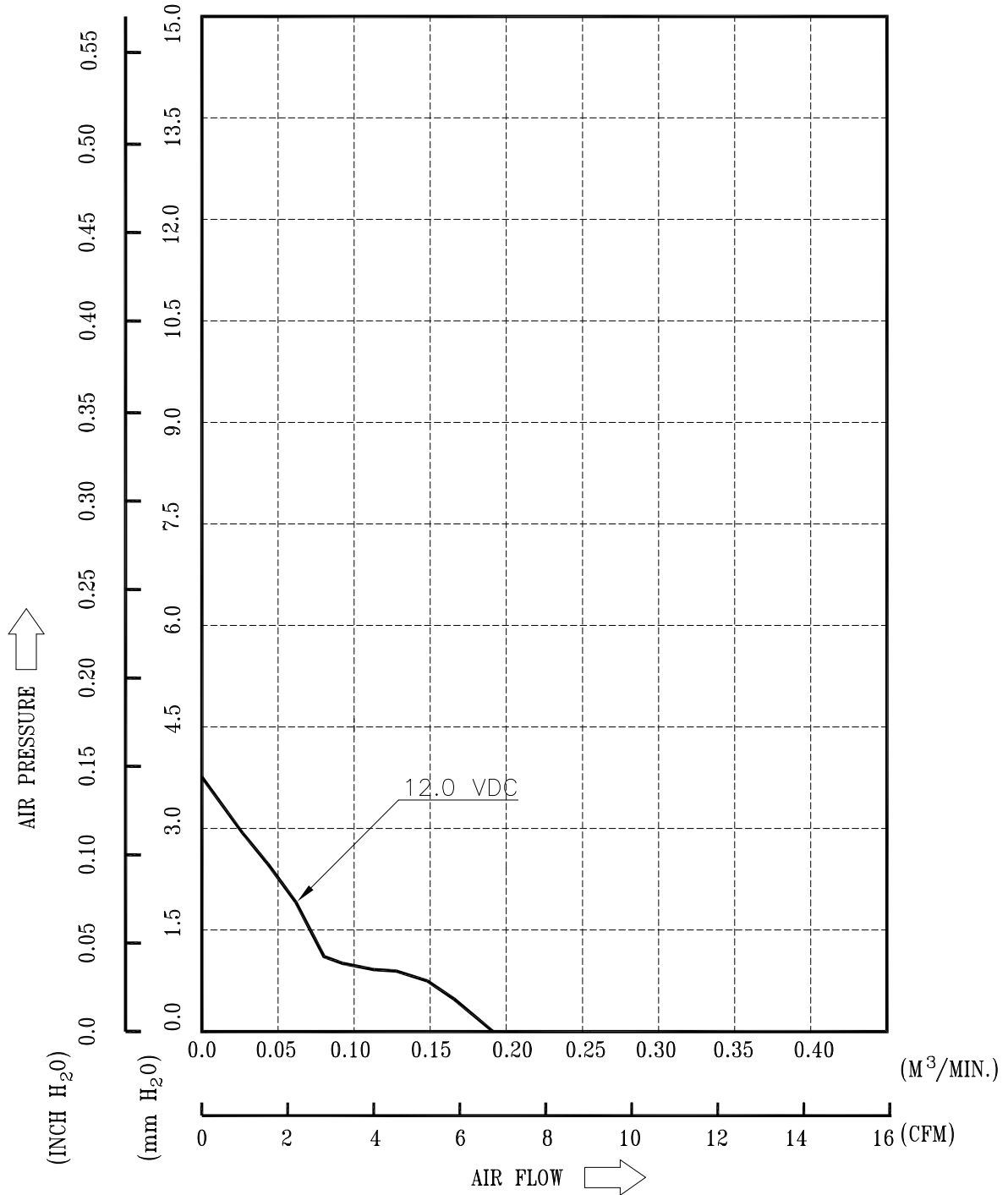
8-4. MECHANICAL TEMPERATURE: +20°C
 SHOCK ORIENTATION: X, Y, Z
 POWER: NON-OPERATING
 ACCELERATION: 20 G MIN.
 PULSE: 11ms HALF-SINE WAVE
 NUMBER OF SHOCKS: 5 SHOCKS
 FOR EACH DIRECTION

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

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9. P & Q CURVE:



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

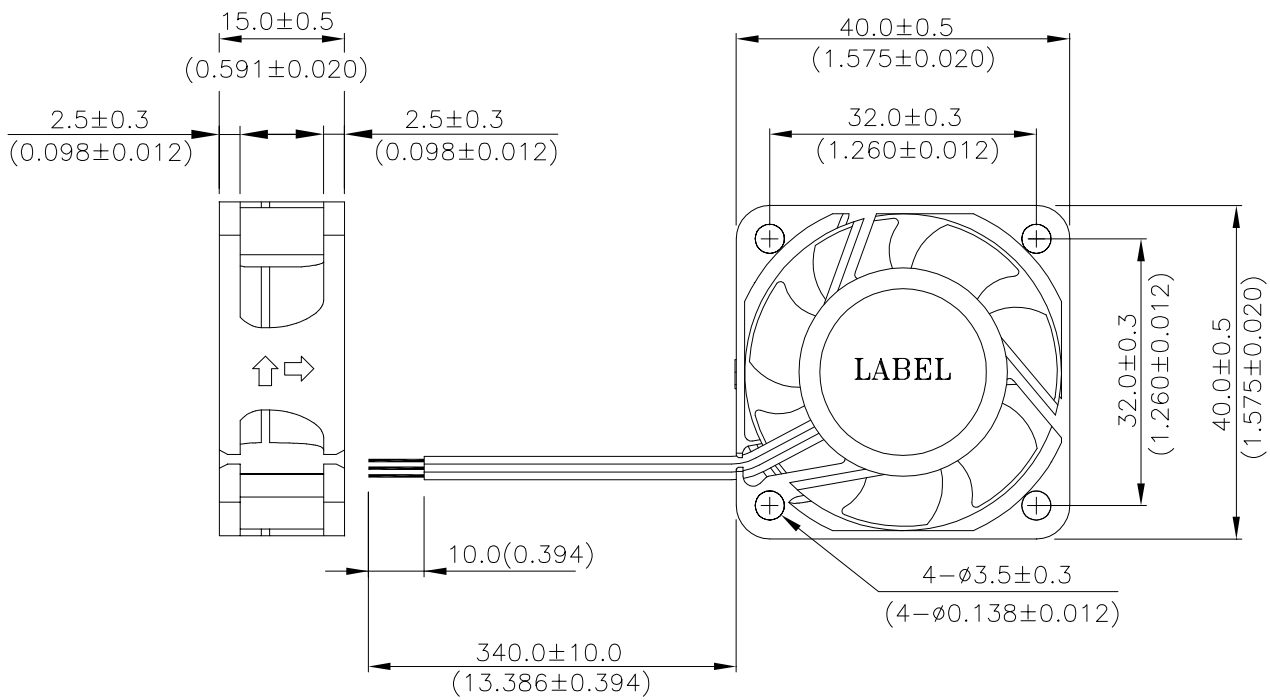
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10. DIMENSION DRAWING:

LABEL:



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

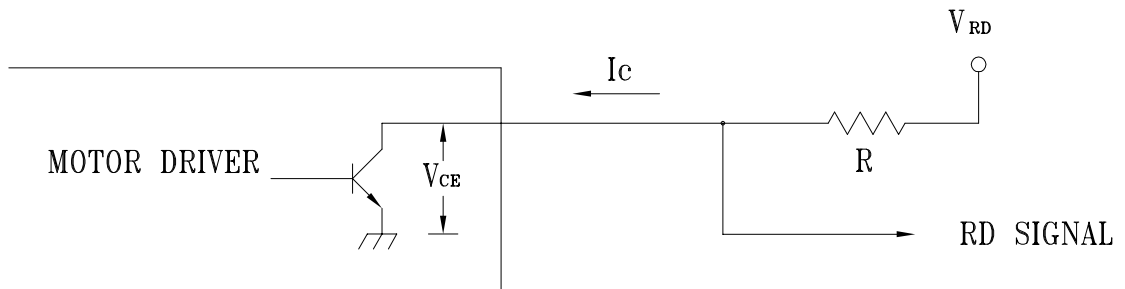
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11. ROTATION DETECT (RD) SIGNAL:

1. OUTPUT CIRCUIT - OPEN COLLECTOR MODE:



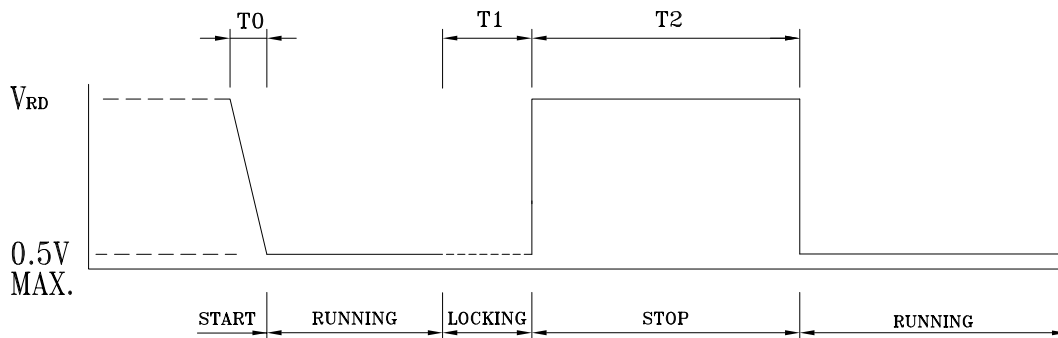
CAUTION:

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

2. SPECIFICATION:

$V_{CE(sat)} = 0.5V$ MAX. $V_{RD} = 15V$ MAX.
 $I_c = 5mA$ MAX. $R \geq V_{RD} / I_c$

3. ROTATION DETECT WAVEFORM:



$T_0 = 60ns$ TYP.

$T_1 = 5.5 \pm 0.4 \mu s$

$T_2 = 1.30 \pm 0.4s$

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Descriptions:

- 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 fans are 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, as there is no foolproof method to protect against such error.**
- 7. Delta fans 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 relative (ambient) temperature and humidity conditions of 25°C, 65%. The test value is only for fan performance itself.**
- 13. Be certain to connect an “over 4.7µF” capacitor to the fan externally when the application calls for using multiple fans in parallel, to avoid any unstable power.**



GPWV2.E132003

Fans, Electric - Component

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Fans, Electric - Component

[See General Information for Fans, Electric - Component](#)

DELTA ELECTRONICS INC

E132003

31-1 SHIEN PAN RD

KUEI SHAN INDUSTRIAL ZONE

TAOYUAN HSIEN, TAIWAN

Model AFB followed by 0405, followed by HA, HHA, LA or MA, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0505, followed by HB, LB or MB, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0512, followed by HB, HHB, LB or MB, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0605, followed by H, L or M, followed by R00, R05, RR0 or RR05, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0805, followed by H, L or M; Model AFB followed by 0612, 0624, followed by EH, SH VH; Model AFB0612LB followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AFB followed by 0612, 0624, 0812, 0824, 0912 or 0924, followed by H, HB, HH, HHB, LB, LLB, MB, SHB or VHB, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Models ASB0412MA, ASB0412LA, ASB0405MA; Model ASB followed by 0405, 0412, followed by HA, HHA, LA or MA, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model ASB followed by 0505, followed by HB, LB or MB, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model ASB followed by 0512, 0524, followed by HB, HHB, LB or MB, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model ASB followed by 0812, 0824, followed by HB, HHB, LB, LLB, MB, SHB or VHB, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model ASB followed by 0612 or 0624, followed by H, HH, L or M, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model ASB followed by 0812, followed by L or M; Model ASB followed by 0912 or 0924, followed by H, L or M, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AUB followed by 0505, 0512 or 0524, followed by HB, HHB, LB or MB, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AUB followed by 0612, 0624, followed by H, HH, L or M, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AUB followed by 0912, 0924, followed by H, HH, L, M or VH, followed by (Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank; Model AUB followed by 0612 or 0624, followed by L, M, H

HH, VH, SH; Model EUB or ESB followed by 0912 or 0924, followed by L, M, H, HH, VH.

Models TYF 300, BFB followed by 0712, followed by HD(Y) or LD(Y), where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank.

Models X0405Y(Y), X0412Q(Y), ASB0405Y(Y), ASB0412Y(Y), EFB0412MA-SM(Y). where X may be EFB, ESB or EUB, Y may be HA, HHA, LA or MA, Q may be HA, HHA, LA, MA or VHA, (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank.

Models X0405Y, X0412R, Z0424R, X04505LA, X04505MA, X04512LA, X04512MA, X04512HA, where X may be AFB, ASB or AUB, Y may be HB, HHB, LB or MB, R may be HB, HHB, LB, MB, SHB or VHB.

Model 5F175.

Models AFB0712X, AFB0724X, where X may be HC, HHC, LC or MC; Models Y0712Q, Y0724Q, where Y may be AFB, ASB or AUB, Q may be HB, HHB, LB, LLB or MB.

Models HUB0705Y, HUB0712Q, HUB0724Q, HUB0805Y, HUB0812Q, HUB0824Q, where Y may be H, L or M, Q may be H, HH, L or M.

Models AFC12(X)(W)E(Y), AFC1212DE-SP(Y) series, where (X) may be 12, 24, 48, (W) may be A, B or D, (Y) may be xxxxx where x may be A through Z, 0 through 9, "-" or blank.

Models AFB0605(X)C, AFB06(Y)(Z)C series, where(X) may be L, M, H, (Y) may be 12, 24, (Z) may be L, M, H, HH, VH.

Models AUB12(X)(Y), ASB12(X)(Y) series, where (X) may be 12 or 24, (Y) may be L, M, H, HH, VH.

Models GFB0405Y, GSB0405Y, GUB0405Y, GFB0412Q, GSB0412Q, GUB0412Q, GFB0424Q, GSB0424Q, GUB0424Q, where Y may be HF, HHF or MF, Q may be HF, HHF, MF or VHF, may be suffixed with alphanumeric characters.

Models GFC0812CG, GSC0812CG, GUC0812CG, GFC0824CG, GSC0824CG, GUC0824CG, GSB0812Y, GFB0812Y, GUB0812Y, GSB0824Y, GFB0824Y, GUB0824Y, where Y may be HHG, SHG or VHG.

Models FFC0912D(Y), FFC0924A (Y), FFC0924B (Y), FFB0912HH (Y), FFB0912VH (Y), FFB0912SH (Y), FFB0924HH (Y), FFB0924VH (Y), FFC0948B(Y), FFB0948HH (Y), FFB0948VH (Y) series, where (Y) may be xxxxx, where x may be A through Z, 0 through 9, "-" or blank.

Models EFC0912BF, EFC0924AE, EFC0924BE.

Model BFC0848D.

Model (X)09(Y)(Z), where (X) may be AFB, AUB or ASB, (Y) may be 12 or 24,(Z) may be LD, MD, HD, HHD or VHD.

Model EFC1748DG-S41P.



CERTIFICATION RECORD

The company named below has been authorized by CSA International to represent the products listed in this record as "CSA Certified" and to affix the CSA Mark to these products according to the terms and conditions of the CSA Service Agreement and applicable CSA program requirements (including additional Markings).

File No: 091949_0_000
Class No: 3812 01 FANS AND BLOWERS

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Co., Ltd.
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Bangna-Trad Road, Bangpakong

ASB0712HB	12	330	STD, F00, R00
ASB0712HHB	12	450	STD, F00, R00
ASB0724LLB	24	100	STD, F00, R00
ASB0724LB	24	110	STD, F00, R00
ASB0724MB	24	140	STD, F00, R00
ASB0724HB	24	210	STD, F00, R00
ASB0724HHB	24	250	STD, F00, R00
ASB0724LLB	24	100	STD, F00, R00
ASB0724LB	24	110	STD, F00, R00
ASB0724MB	24	140	STD, F00, R00
ASB0724HB	24	210	STD, F00, R00
ASB0724HHB	24	250	STD, F00, R00
AUB0712LLB	12	120	STD, F00, R00
AUB0712LB	12	140	STD, F00, R00
AUB0712MB	12	240	STD, F00, R00
AUB0712HB	12	330	STD, F00, R00
AUB0712HHB	12	450	STD, F00, R00
AUB0724LLB	24	100	STD, F00, R00
AUB0724LB	24	110	STD, F00, R00
AUB0724MB	24	140	STD, F00, R00
AUB0724HB	24	210	STD, F00, R00
AUB0724HHB	24	250	STD, F00, R00
AFB0405LB	5	200	STD, F00, R00
AFB0405MB	5	250	STD, F00, R00
AFB0405HB	5	380	STD, F00, R00
AFB0405HHB	5	450	STD, F00, R00
AFB0412LB	12	90	STD, F00, R00
AFB0412MB	12	130	STD, F00, R00
AFB0412HB	12	160	STD, F00, R00
AFB0412HHB	12	200	STD, F00, R00
AFB0412VHB	12	240	STD, F00, R00
AFB0412SHB	12	350	STD, F00, R00
AFB0424LB	24	80	STD, F00, R00
AFB0424MB	24	90	STD, F00, R00
AFB0424HB	24	120	STD, F00, R00
AFB0424HHB	24	130	STD, F00, R00
AFB0424VHB	24	150	STD, F00, R00
AFB0424SHB	24	180	STD, F00, R00
AUB0405LB	5	200	STD, F00, R00
AUB0405MB	5	250	STD, F00, R00

VDE Prüf- und Zertifizierungsinstitut Zeichengenehmigung

Ausweis-Nr. / Blatt /
Licence No. / page
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Name und Sitz des Genehmigungs-Inhabers / *Name and registered seat of the Licence holder*
Delta Electronics Inc., 186 Ruey Kuang Road, NEIHU TAIPEI (114), TAIWAN

Aktenzeichen / *File ref.*
1164100-2611-0003 / 50141 / FG13 / S

letzte Änderung / *updated* Datum / *Date*
2004-09-30 2000-05-26

Dieses Blatt gilt nur in Verbindung mit Blatt 1 des Zeichengenehmigungsausweises Nr. 128374.
This supplement is only valid in conjunction with page 1 of the Licence No. 128374.

FFC1248DE	DC 48V	
FFC1248CE	DC 48V	
BFC1212C-STD/F00/F05/F05R	DC 12V	
BFC1212C-R00/R05/R05R/RR0/RR05/RR05R	DC 12V	DC 12V
BFC1224C-STD/F00/F05/F05R	DC 24V	
BFC1224C-R00/R05/R05R/RR0/RR05/RR05R	DC 24V	DC 24V
BFC1248C-STD/F00/F05/F05R	DC 48V	
BFC1248C-R00/R05/R05R/RR0/RR05/RR05R	DC 48V	DC 48V
AFB0605LC/MC/HC	DC 5V	
AFB0612LC/MC/HC/HHC/VHC	DC 12V	
AFB0624LC/MC/HC/HHC/VHC	DC 24V	
EUB/ESB0912L/M/H/HH/VH	DC 12V	
EUB/ESB0924L/M/H/HH/VH	DC 24V	
AUB/ASB1212L/M/H/HH/VH/SH	DC 12V	
AUB/ASB1224L/M/H/HH/VH/SH	DC 24V	
AFB/AUB/ASB0405LB/MB/HB/HHB	DC 5V	
AFB/AUB/ASB0412LB/MB/HB/HHB/VHB/SHB	DC 12V	DC 12V
AFB/AUB/ASB0424LB/MB/HB/HHB/VHB/SHB	DC 24V	DC 24V
AFB/AUB/ASB04505LA/MA	DC 5V	
AFB/AUB/ASB04512LA/MA/HA	DC 12V	
EFB/EUB/ESB0405LA/MA/HA/HHA	DC 5V	
EFB/EUB/ESB0412LA/MA/HA/HHA/VHA	DC 12V	DC 12V
HUB0705/0805L/M/H	DC 5V	
HUB0712/0812L/M/H/HH	DC 12V	
HUB0724/0824L/M/H/HH	DC 24V	
KFB1012MS/HS/HHS	DC 12V	
KFB1024MS/HS/HHS	DC 24V	
KFB1048MS/HS/HHS	DC 48V	
KFC1012DS	DC 12V	
KFC1024DS	DC 24V	
KFC1048DS	DC 48V	
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AFB0724LLB/LB/MB/HB/HHB/LC/MC/HC/HHC	DC 24V	DC 24V
AUB/ASB0712LLB/LB/MB/HB/HHB	DC 12V	
AUB/ASB0724LLB/LB/MB/HB/HHB	DC 24V	
AFC1212/AE/BE/DE	DC 12V	
AFC1224/AE/BE/DE	DC 24V	
AFC1248/AE/BE/DE	DC 48V	
GFB0405MF/HF/HHF	DC 5V	
GSB0405MF/HF/HHF	DC 5V	
GUB0405MF/HF/HHF	DC 5V	

Fortsetzung siehe Blatt 5 /
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