

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 BLOWER
Customer P/N:	REV:
Delta Model NO.:	BFB0512HH-F00
Smample Rev:	00 Issue NO:
Sample Issue Date:	JUL.02.2004. Quantity:

1. SCOPE:

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

2. CHARACTERS:

ITEM	DESCRIPTION
RATED VOLTAGE	12 VDC
OPERATION VOLTAGE	10.0 - 13.8 VDC
INPUT CURRENT	0.21 (MAX. 0.32) A
INPUT POWER	2.52 (MAX. 3.84) W
SPEED	6500 R.P.M. (REF.)
MAX. AIR FLOW (AT ZERO STATIC PRESSURE)	0.130 (MIN. 0.095) M ³ /MIN. 4.59 (MIN. 3.99) CFM
MAX.AIR PRESSURE (AT ZERO AIRFLOW)	22.0 (MIN. 15.72) mmH ₂ O 0.866 (MIN. 0.619) inchH ₂ O
ACOUSTICAL NOISE (AVG.)	45.0 (MAX. 48.0) dB-A
INSULATION TYPE	UL: CLASS A

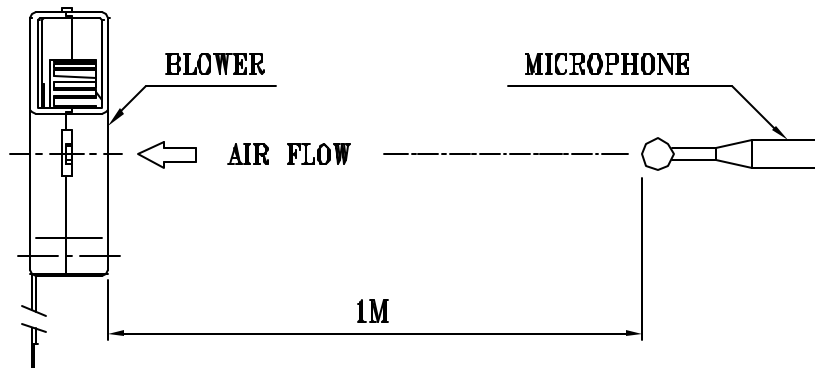
(continued)

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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	50,000 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
INSULATION TYPE	UL: CLASS A
LEAD WIRE	UL 1061 -F- AWG #26 BLACK WIRE NEGATIVE(-) RED WIRE POSITIVE(+) BLUE WIRE FREQUENCY(-F00)

- 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 BEARING
- 3-5. WEIGHT ----- 28 ±5 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 $g_{RMS}=3.2$

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

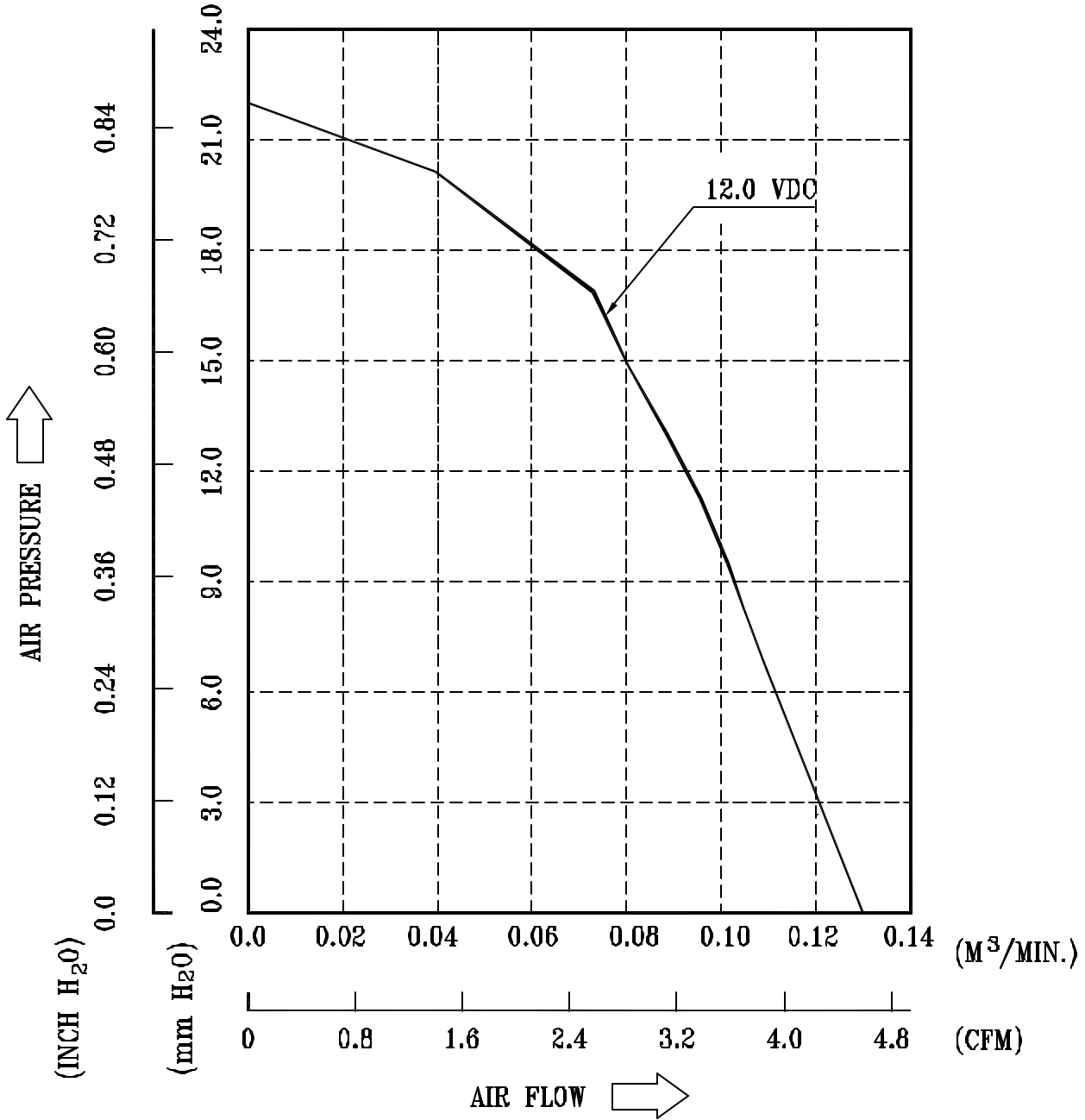
8-4. MECHANICAL TEMPERATURE: +20°C
SHOCK ORIENTATION: X, Y, Z
 POWER: NON-OPERATING
 ACCELERATION: 20 G MIN.
 PULSE: 11 ms HALF-SINE WAVE
 NUMBER OF SHOCKS: 5 SHOCKS
 FOR EACH DIRECTION

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

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9. P & Q CURVE:



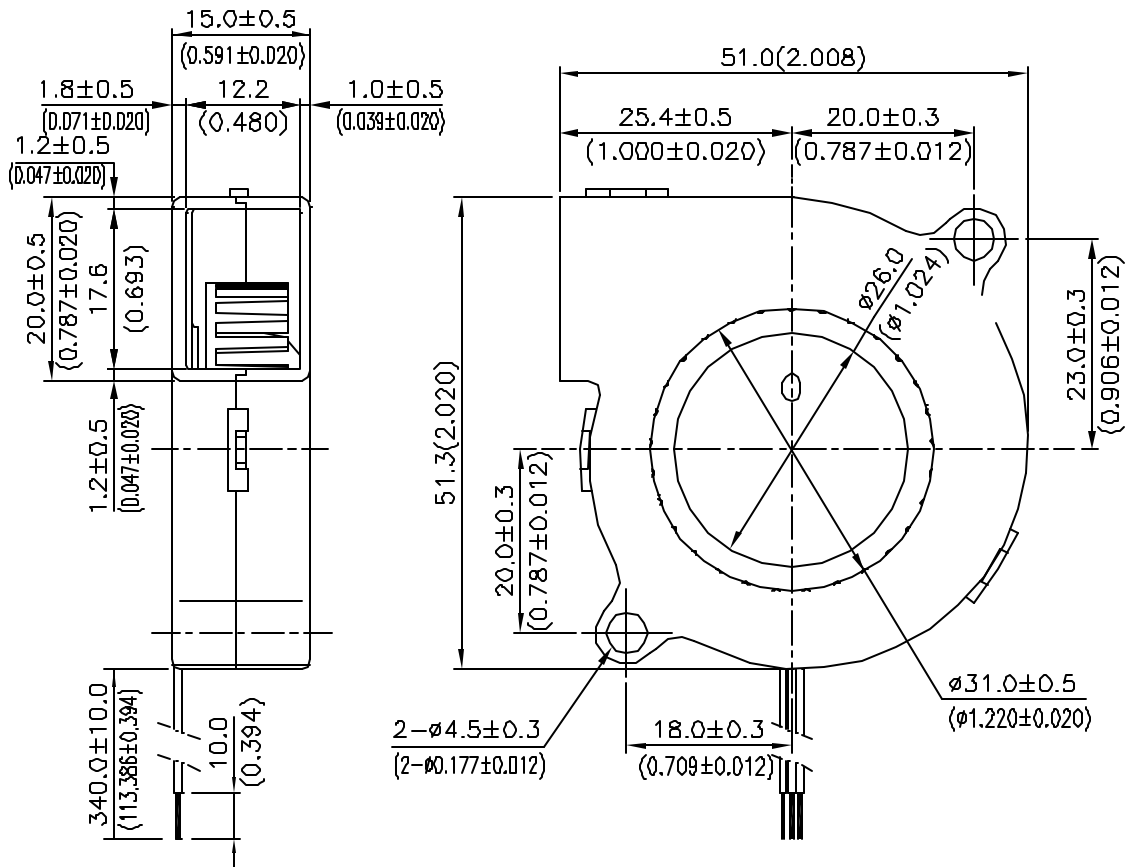
* TEST CONDITION: INPUT VOLTAGE ----- OPERATION VOLTAGE
TEMPERATURE ----- ROOM TEMPERATURE
HUMIDITY ----- 65%RH

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10. DIMENSION DRAWING:

LABEL:



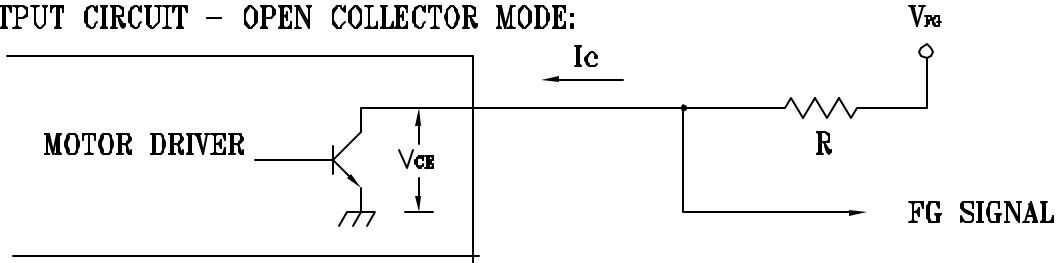
UNIT: MM(INCH)

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11. 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:

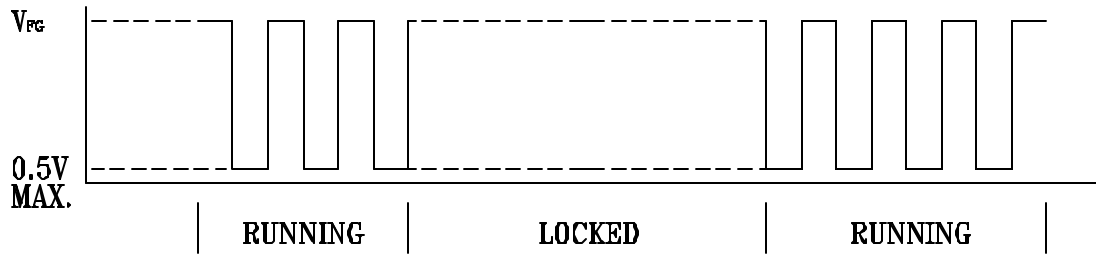
$V_{CE}(\text{sat}) = 0.5\text{V MAX.}$

$V_{FG} = 15\text{VDC MAX.}$

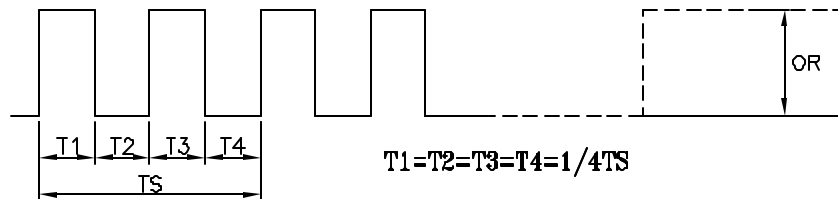
$I_c = 5\text{mA MAX.}$

$R \geq V_{FG} / I_c$

3. FREQUENCY GENERATOR WAVEFORM:



FAN RUNNING FOR 4 POLES



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

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

*VOLTAGE LEVEL AFTER BLADE LOCKED

*4 POLES



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.**

Model AFC followed by 0512 , 0612, 0712, 0812, 0824, 0912 or 0924, followed by "A", "AB" , "AD", "B", "BB" , "BD" or "C"; Model AFC followed by 0912, followed by "A" or "B", followed by -(H), -(HH), -(M); Model ASC followed by 0612, 0812, 0912 followed by "A" or "B".

Model ASB followed by 0605, followed by H, L, M; Model ASB followed by 0612, followed by H-SB, L-SB or M-SB; Model ASB followed by 0812 or 0824, followed by H, HH, L, LL or M; Model ASB followed by 0912, 0924, followed by H, HH, L, L-V, M; Model ASB followed by 0924 followed by H, HH, L or M, Model ASB0812L-SB, H-SB or M-SB; Model ASB0912L-SB, H-SB or M-SB; Model DSB followed by 0612, 0812, followed by H, H-N, L, L-N, M, M-N.

Model AFB followed by 0612, followed by H, HH, L, M, followed by SB; Model AFB followed by 0812, followed by H, L or M, followed by SB; Model AFB followed by 0912, followed by H, L or M, followed by SB.

Model AFB followed by 1212, followed by HE, HHE, LE, ME, SHE VHE; Model AFB followed by 1224, followed by HE, HHE, LE, ME, SHE, VHE; Model AFB followed by 1248, followed by HE, HHE, LE, ME, VHE; Model EFB followed by 1212, followed by HE, HHE, LE, ME, SHE, VHE; Model EFB followed by 1224, followed by HE, HHE, LE, ME, SHE, VHE; Model EFB followed by 1248, followed by HE, HHE, LE, ME, SHE, VHE.

Model BFB followed by 1012, followed by H, HH, L, LL or M; Model BFB followed by 1024, followed by H, HH, L, LL or M; Model BFB followed by 1212, followed by H, HH, L, LL, M or VH; Model BFB followed by 1224, followed by H, HH, L, LL or M; Model BFB followed by 1248, followed by H, HH, L, LL or M.

Model BFB followed by 1212, 1224, followed by HE, HHE, LE, ME or VH; Model BFB followed by 1248, followed by HE, LE or ME; Model BFB followed by 1612, followed by H, L or M; Model BFB followed by 1624, followed by H, L or M; Model BFB followed by 1648, followed by H, L or M.

Models BFB0405HE, -LE, -ME, BFB0412HE, -HHE, -LE, -ME.

Models AUB0812H, -HH, -L, -LB, -M, -SHB, -VH, AUB0824H, -HH, -L, -LB, -M, -SHB, -VH.

Model BFB followed by 0505, 0512, 0524, followed by H, HH, L or M; Model BSB followed by 0505, 0512, 0524, followed by H, HH, L or M.

Models EFB1212 -H, -HF, -HH, -HHF, -L, -LF, -M, -MF, -SH, -VH, -VHF, EFB1224 -H, -HF, -HH, -HHF, -L, -LF, -M, -MF, -SH, -VH, -VHF, EFB1248-H, -HH, -L, -M, -SH, -VH.

Model EFB followed by 0405, followed by HD, HHD, LD, LLD, MD VHD; Model EFB followed by 0412, followed by HD, HHD, LD, LLD, MD, VHD; Model EFB followed by 0424, followed by HD, HHD, LD, LLD, MD, VHD.

Models BFB0305HA, -HHA, -LA, -MA, BFB0312HA, -HHA, -LA, -MA.

Models AFB1512H, -L, -M, AFB1548H, -L, -M, AFB1712H, -L, -M, AFB1748H, -L, -M, EFB1248HF, -HHF, -LF, -MF, -VHF, EFB1548HG, -HHG, -LG, -MG, -VHG, EFB1748HG, -HHG, -



BFB0405ME	5	200	F00 R00 STD
BFB0412HE	12	100	F00 R00 STD
BFB0412HHE	12	160	F00 R00 STD
BFB0412LE	12	60	F00 R00 STD
BFB0412ME	12	80	F00 R00 STD
BFB0505L	5	210	F00 R00 STD
BFB0505M	5	450	F00 R00 STD
BFB0512L	12	100	F00 R00 STD
BFB0512M	12	150	F00 R00 STD
BFB0512H	12	240	F00 R00 STD
BFB0512HH	12	320	F00 R00 STD
BFB0524L	24	80	F00 R00 STD
BFB0524M	24	100	F00 R00 STD
BFB0524H	24	140	F00 R00 STD
BFB0524HH	24	160	F00 R00 STD
BFB0712H	12	360	F00 RR0 STD
BFB0712L	12	100	F00 RR0 STD
BFB0712M	12	200	F00 RR0 STD
BFB0724H	24	200	F00 RR0 STD
BFB0724L	24	90	F00 RR0 STD
BFB0724M	24	120	F00 RR0 STD
BFB1012H	12	1200	STD R00 F00
BFB1012HH	12	1650	STD R00 F00
BFB1012L	12	480	STD R00 F00
BFB1012LL	12	300	STD R00 F00
BFB1012M	12	850	STD R00 F00
BFB1024H	24	600	STD R00 F00
BFB1024HH	24	850	STD R00 F00
BFB1024L	24	250	STD R00 F00

VDE Prüf- und Zertifizierungsinstitut

Gutachten mit Fertigungsüberwachung

Ausweis-Nr. /
Licence No. 001764 ÜG

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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

Akzeichen / File ref.

11641-2611-0001 / 32Y3F F13 / SFK

letzte Änderung / updated

2001-06-05

Datum / Date

1994-06-08

Dieses Blatt gilt nur in Verbindung mit Blatt 1 des Gutachtens mit Fertigungsüberwachung Nr. 001764 ÜG.
This supplement is only valid in conjunction with page 1 of the Licence No. 001764 ÜG.

Jahresgebühren-Einheiten /
Annual fee units

BFB1212LE/ME/HHE(-F00/R00)	DC 12 V	3,00
AFB0605LB/MB/HB	DC 5 V	3,00
AFB0512LB/MB/HB/HHB	DC 12 V	4,00
BFB0505L/M	DC 5 V	2,00
BFB0512L/M/H/HH	DC 12 V	4,00
AFB0605LA/MA/HA	DC 5 V	3,00
AFB03505LA/MA/HA	DC 5 V	3,00
AFB1212SHE	DC 12 V	1,00
AFB1224SHE	DC 24 V	1,00
AFB1248LE/ME/HE/HHE/VHE	DC 48 V	5,00
EFB0512LA/MA/HA	DC 12 V	3,00
AFB0748L/M/H/HH	DC 48 V	4,00
AFB0848L/M/H/HH	DC 48 V	4,00
AFB0948L/M/H/HH	DC 48 V	4,00
AFC0824A/B	DC 24 V	2,00
AFC0924A/B	DC 24 V	2,00
AFB03512LA/MA/HA	DC 12 V	3,00
BFB1212HH/VH	DC 12 V (neue Ausführung / new design)	2,00
BFB1224HH/VH	DC 24 V (neue Ausführung / new design)	2,00
BFB1248LL/L/M/H/HH	DC 48 V	5,00
AFB0605L/M/H-R00	DC 5 V	3,00
AFB0605L/M/H-R05	DC 5 V	3,00
AFB0605L/M/H-RR0	DC 5 V	3,00
AFB0605L/M/H-RR05	DC 5 V	3,00
BFB0405LE/ME/HE	DC 5 V	3,00
BFB0412LE/ME/HE/HHE	DC 12 V	4,00
BFB1612L/M/H	DC 12 V	3,00
BFB1624L/M/H	DC 24 V	3,00
BFB1648L/M	DC 48 V	2,00
AFB0648L/M/H/HH	DC 48 V	4,00
AFB0405HHD	DC 5 V	2,00
AUB0812L/M/H/HH/VH	DC 12 V	4,00
AUB0824L/M/H/HH/VH	DC 24 V	4,00
AFB02505HHA	DC 5 V	2,00
EFB1212LE/ME/HE/HHE/VHE/SHE	DC 12 V	6,00
EFB1224LE/ME/HE/HHE/VHE/SHE	DC 24 V	6,00
EFB1248LE/ME/HE/HHE/VHE/SHE	DC 48 V	6,00
AFB0812LLB/LB/MB/HB/HHB/VHB/SHB	DC 12 V	7,00
AFB0824LLB/LB/MB/HB/HHB/VHB/SHB	DC 24 V	7,00
AFC0812C	DC 12 V	1,00

Fortsetzung siehe Blatt 8 /