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

TEL : 886-(0)3-3591968
FAX : 886-(0)3-3591991

SPECIFICATION FOR APPROVAL

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Customer:		
Description:	DC BLOWER	
Customer P/N:		REV:
Delta Model NO.:	BFB0512VHD-F00	
Sample Rev:	02	Issue NO:
Sample Issue Date:	AUG.24.2005.	Quantity:

1. SCOPE:

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

2. CHARACTERS:

ITEM	DESCRIPTION
RATED VOLTAGE	12 VDC
OPERATION VOLTAGE	5.0 - 13.8 VDC
INPUT CURRENT	0.23(MAX. 0.28) A
INPUT POWER	2.76 (MAX. 3.36) W
SPEED	5300 R.P.M. (REF.)
MAX. AIR FLOW (AT ZERO STATIC PRESSURE)	0.191 (MIN. 0.172) M^3/MIN. 6.75 (MIN. 6.08) CFM
MAX.AIR PRESSURE (AT ZERO AIRFLOW)	18.60 (MIN. 15.07) mmH_2O 0.732 (MIN. 0.593) $inchH_2O$
ACOUSTICAL NOISE (AVG.)	38.5 (MAX. 42.5) dB-A
INSULATION TYPE	UL: CLASS A

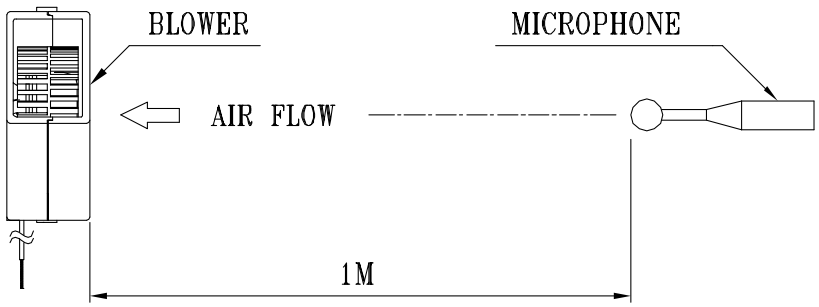
(continued)

PART NO:

DELTA MODEL: BFB0512VHD-F00

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.

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 ---------- 35 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.

8. BASIC RELIABILITY REQUIREMENT :

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

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

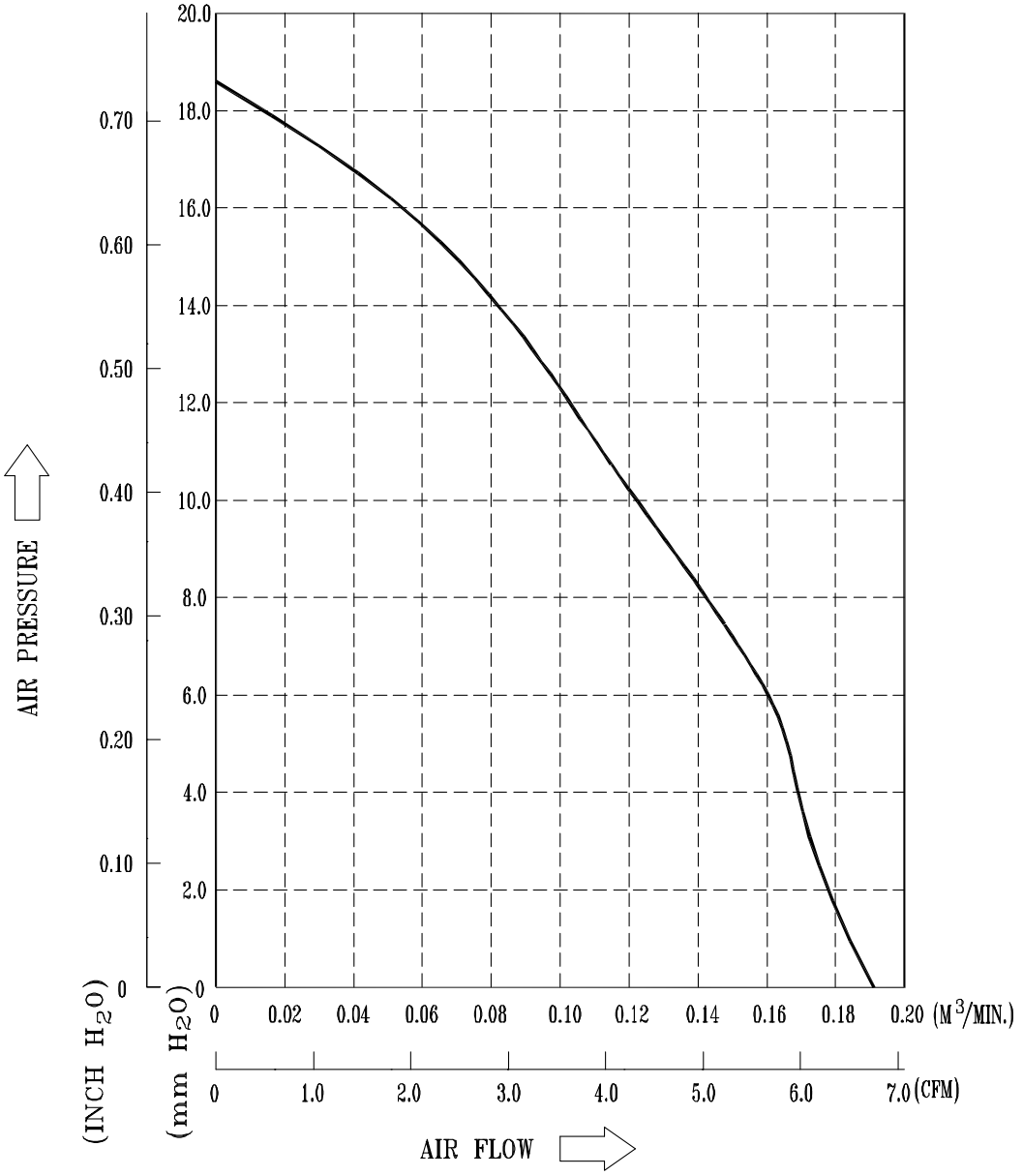
8-4. MECHANICAL SHOCK
TEMPERATURE: +20°C
ORIENTATION: X, Y, Z
POWER: NON-OPERATING
ACCELERATION: 20 G MIN.
PULSE: 11 ms HALF-SINE WAVE
NUMBER OF SHOCKS: 5 SHOCKS
FOR EACH DIRECTION

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

PART NO:

DELTA MODEL: BFB0512VHD-F00

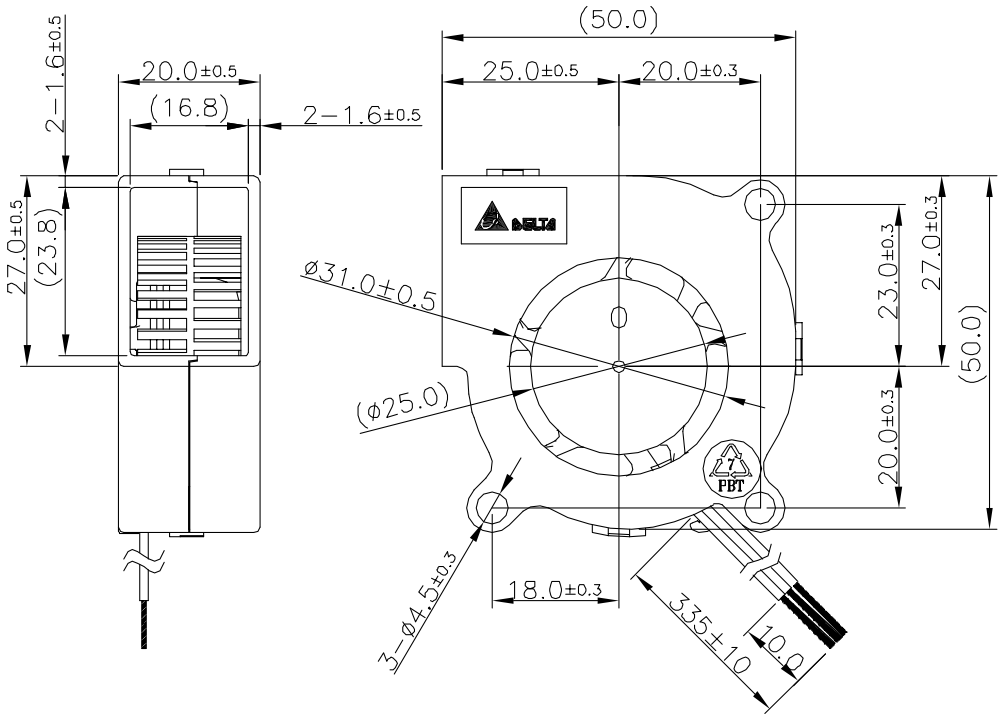
8. P & Q CURVE:



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

9. DIMENSION DRAWING:

LABEL:



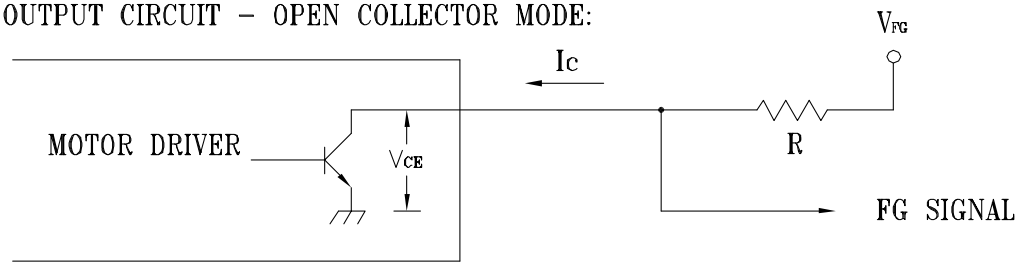
DIMENSION UNIT: MM

PART NO:

DELTA MODEL: BFB0512VHD-F00

11. FREQUENCY GENERATOR (FG) SIGNAL:

1. OUTPUT CIRCUIT – OPEN COLLECTOR MODE:



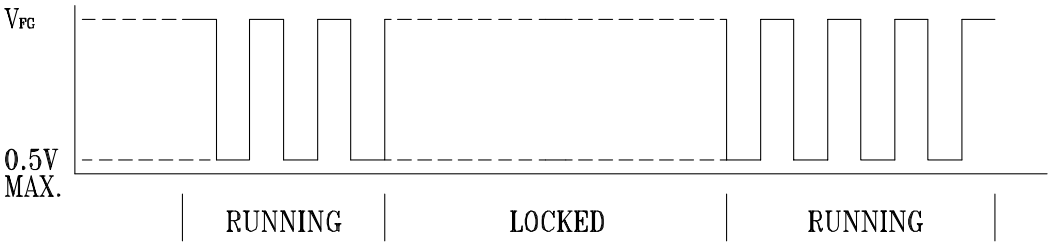
CAUTION:
THE LEAD WIRE OF FG SIGNAL CAN NOT TOUCH
THE LEAD WIRE OF POSITIVE OR NEGATIVE.

2. SPECIFICATION:

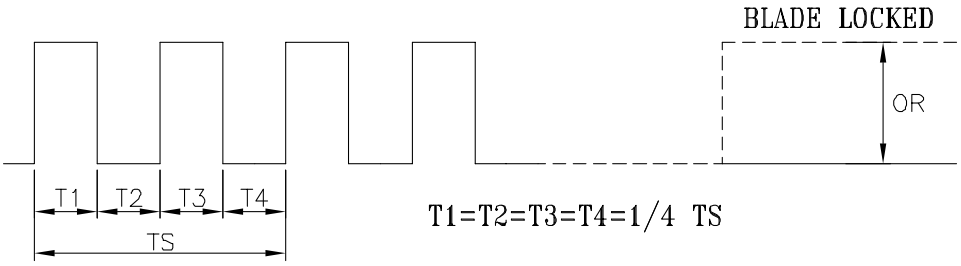
V_{CE} (sat)=0.5V MAX. V_{FG} =15VDC MAX.

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

3. FREQUENCY GENERATOR WAVEFORM:



FAN RUNNING FOR 4 POLES



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

N=R.P.M
TS=60/N(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.**

DELTA ELECTRONICS, INC.

Statement of Compliance

Project No: LR 91949C –121
Report No:LR 91949C-132
Date: Mar. 30, 2004

Issued from: Delta Electronics, Inc.
Address: No. 31-1, Shien Pam Road, Kuei Shan Ind. Zone, Taoyuan, Taiwan, R.O.C.

Subject: Components DC Fans BFB0512LD/MD/HD/HHD/VHD
(Optional suffixes A-Z, 0-9, or blank may be added)

The subject equipment has been evaluated in accordance with CSA's Category Certification program and has been found to comply with the following requirements.

C22.2 No. 0-M91 – General Requirements – Canadian Electronical Code, Part II
CSA Standard C22.2 No. 113-M1984 – Fan and Ventilators
Technical Information Letter G-37B

By the authority of CSA, this equipment is immediately to bear the CSA mark.

In accordance with the Category Certification Procedure, the evaluation and testing of this equipment is subject to final validation by CSA.

Issued by

Peggy Tsai

Peggy Tsai
Safety Engineer
CPBG QE

cc: CSA Pacific/Central/Easten Region Office

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Underwriters Laboratories Inc.®

香港商優力安全測驗有限公司台灣分公司
UL International Services Ltd. Taiwan Branch
台北市112北投區大業路260號1樓
1st Fl 260 Da-Yeh Road Peitou Taipei City Taiwan 112
tel: 886-2-2896-7790 fax: 886-2-2891-7644
http://www.ul.com

NOTICE OF AUTHORIZATION TO APPLY THE UL MARK

TAIWAN OFFICE - May 14, 2004

TO : Delta Electronics Inc.
14th Fl 266 2nd Wen-Hwa Rd Sec 1 Linkou
Taipei Hsien Taiwan 244
Attention: Ms. Peggy Tsai
Our Reference: File E132003, Project 04CA15931
Product: DC Component Fans, Models as below:
Item 1. Models AFC1212DE-SP(Y);
Item 2. Models GFB1248SHG(Y);
Item 3. Models BFB0512(X)D(Y);
Item 4. Models TFB0912(W)HE(Y);
where (X) may be VH, HH, H, M, or L; (W) may be E, G or U; (Y) may be xxxxx where x may be A through Z, 0 through 9, "-" or blank.

Gentlemen:

This letter is sent on behalf of Underwriters Laboratories Inc. pursuant to the Corporate Services Agreement between UL International Services Ltd. - Taiwan Branch and UL.

UL's investigation of your products has been completed under the above project number and the subject products were determined to comply with the applicable requirements.

This letter temporarily supplements the UL Follow-Up Services Procedure and serves as authorization to apply the UL Recognized Marking and/or Recognized Component Mark only at the factory under UL's Follow-Up Services Program to the subject products which are constructed as described below:

Identical to above models submitted to UL for this investigation. The UL records covering the products will be in the Follow-Up Services Procedure, File E132003, Volume 1, Sec. 69, 88, 98 and 107 respectively.

To provide the manufacturer with the intended authorization to use the UL Marks, the addressee must send a copy of this Notice and all attached material to each manufacturing location as currently authorized in File E132003, Volume 1.

This authorization is effective from the date of this Notice and only for products at the indicated manufacturing locations. Records in the Follow-Up Services Procedure covering the products are now being prepared and will be sent to the indicated manufacturing locations in the near future. Please note that Follow-Up Services Procedures are sent to the manufacturers only unless the Applicant specifically requests this document.

Products that bear the UL Mark shall be identical to those that were evaluated by UL and found to comply with UL's requirements. If changes in construction are discovered, appropriate action will be taken for products not in conformance with UL's requirements and continued use of the UL Mark may be withdrawn.

Very truly yours,

Jamie Yu INK

Jamie Yu (Ext. 62238)
Conformity Assessment Specialist
Conformity Assessment Services, 3000ATPI

Reviewed by:

Simon Lin INK

Simon Lin (Ext. 62221)
Project Engineer
Conformity Assessment Services, 3000ATPI

Übereinstimmungserklärung

Statement of Compliance

Ausgestellt für:.
Issued to:

Delta Electronics Inc.
186 Ruey Kuang Road Neihu, 114 Taipei , Taiwan

Fertigungsstätte(n):
Place(s) of manufacture:

1. **Delta Electronics Yueyun Central Road, 523308 Dong Guan,China**
2. **Delta Electronics Ltd. Wujiang City, China**
3. **Delta Electronics (Thailand) , Amphur, Bangpakong 04, Thailand**

Erzeugnis:
Product:

Fan for IT equipments (building in)
Type BFB0512LD/MD/HD/HHD/VHD

Prüfnorm(en):
Standard(s) used:

DIN EN 60950-1 (VDE 0805 Teil 1):2003-03; EN 60950-1 (ed.1) :2001-12
IEC 60950-1(ed.1) + corr.1

Das betreffende Erzeugnis ist in Übereinstimmung mit der(den) genannten Norm(en). Das Erzeugnis kann deshalb unter Berücksichtigung des voraus-gegangenen Schriftverkehrs mit dem(der)
The subject product complies with the referenced Standard(s). The product is therefore eligible to bear the

☐ **VDE-Zeichen**
VDE-Mark

☐ **VDE-GS-Zeichen**
VDE-GS-Mark

☒ **VDE Reg. Nr...**
VDE-Reg. No.

☐ **VDE-EMV-Zeichen**
VDE-EMC-Mark.

gekennzeichnet werden. Diese Berechtigung gilt für 60 Tage ab Ausstellungsdatum. Die Zeichengenehmigung wird innerhalb der nächsten Wochen ausge
stellt, vorbehaltlich der abschließenden Beurteilung des Prüfberichtes.
In accordance with instructions contained in previous correspondence. This authorization is effective for 60 days only from the date of this notice. The VDE-Marks Licence will be issued and sent out in the next few weeks subject to the final check of the test report.

Ausgestellt durch: VDE Prüf- und Zertifizierungsinstitut, Fachgebiet FG13
Issued by department

Aktenzeichen: 1164100-2611-0009/ 42733
Reference No.

Datum: 01.04.2004
Date issued

Unterschrift:
Signature

Klaus Dornieden