



VERIFICATION OF COMPLIANCE

This Verification of Compliance is hereby issued to the below named company. The test results of this report relate only to the tested sample identified in this report.

Technical Standard: R&TTE DIRECTIVE 1999/5/EC

General Information

Applicant: Billion Electric Co., Ltd
8F., No. 192, Sec. 2, Chung-Hsing Rd.,
Hsin-Tien City, Taipei Hsien, Taiwan, R.O.C

Product Description

EUT Description: VoIP/ (802.11g) ADSL2 + Router
Model Number: BiPAC 7300VGP
Data Applies to: BiPAC 7300VP, BiPAC7300VG, BiPAC 7300V,
BiPAC 7301VGP, BiPAC7301VP, BiPAC 7301VG,
BiPAC7301V

Measurement Standard

EMC

EN 301 489-01 V1.4.1 (2002)
EN 301 489-17 V1.2.1 (2002)

Safety

EN 60950-1 (2001)

Radio Spectrum

EN 300 328-1 V1.6.1 (2004)

Measurement Facilities

Laboratory Name: **Compliance Certification Services Inc. (Hsin-Chu Lab).**
Rm. 258, Bldg. 17, NO.195, Sec.4 Chung Hsing Rd.,
ChuTung Chen, Hsinchu, Taiwan 310, R.O.C
Tel: +886-3-5910068 / Fax: +886-3-5825720

This device has been shown to be in compliance with and was tested in accordance with the measurement procedures specified in the Standards & Specifications listed above and as indicated in the measurement report number: [60306301-RE/RT](#)

C. F. Wu
C. F. Wu / Certification Manager



Date: March 30, 2006



EC-Declaration of Conformity

For the following equipment:
VoIP/ (802.11g) ADSL2 + Router

(Product Name)

BiPAC 7300VGP

(Model Designation / Trade Name)

BiPAC 7300VP, BiPAC7300VG, BiPAC 7300V,
BiPAC 7301VGP, BiPAC7301VP, BiPAC 7301VG , BiPAC7301V

(Data Applies to)

Billion Electric Co., Ltd

(Company Name)

8F., No. 192, Sec. 2, Chung-Hsing Rd., Hsin-Tien City, Taipei Hsien, Taiwan, R.O.C.

(Company Address)

The below mentioned product has been tested in typical configuration by **Compliance Certification Services Inc.** and was found to comply with the essential requirement of " DIRECTIVE 1999/5/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of conformity" . The following standards are applied:



EMC

EN 301 489-01 V1.4.1 (2002)

EN 301 489-17 V1.2.1 (2002)



Radio Spectrum

EN 300 328-1 V1.6.1 (2004)



Safety

EN 60950-1 (2001)

This product follows the provisions of R&TTE Directive 1999/5/EC.

The following manufacturer / importer or authorized representative established within the EUT is responsible for this declaration:

(Company Name)

(Company Address)

Person responsible for making this declaration:

(Name, Surname)

(Position / Title)

(Place)

(Date)

(Legal Signature)



CE EMC

TEST REPORT

For

VoIP/ (802.11g) ADSL2 + Router

Model : BiPAC 7300VGP

**Data Applies to : BiPAC 7300VP, BiPAC7300VG, BiPAC 7300V, BiPAC 7301VGP,
BiPAC7301VP, BiPAC 7301VG, BiPAC7301V**

Issued for

Billion Electric Co., Ltd.

**8F., NO.192, SEC.2, CHUNG HSING ROAD, HSIN TIEN CITY, TAIPEI HSIEN,
TAIWAN, R.O.C.**

Issued by

Compliance Certification Services Inc.

Hsinchu Lab.

Rm. 258, Bldg. 17, NO.195, Sec.4 Chung HsingRd.,
ChuTung Chen, Hsinchu, Taiwan 310, R.O.C

TEL: (03) 591-0068

FAX: (03) 582-5720



NVLAP LAB CODE 200118-0



Testing Laboratory
0240

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TEST REPORT CERTIFICATION

1. TEST REPORT CERTIFICATION

Applicant : Billion Electric Co., Ltd.

Address : 8F., NO.192, SEC.2, CHUNG HSING ROAD, HSIN
TIEN CITY, TAIPEI HSIEN, TAIWAN, R.O.C.

Equipment Under Test : VoIP/ (802.11g) ADSL2 + Router

Model : BiPAC 7300VGP

Data Applies to : BiPAC 7300VP, BiPAC7300VG, BiPAC 7300V,
BiPAC 7301VGP, BiPAC7301VP,
BiPAC 7301VG, BiPAC7301V

Tested Date : March 06 ~ 17, 2006

APPLICABLE STANDARD	
ETSI EN 301 489-1 V1.4.1:2002	
ETSI EN 301 489-17 V1.2.1:2002	
Emission Standard	Test Result
EN 55022:1998+A1:2000+A2:2003	No non-compliance noted
EN 61000-3-2:2000	No non-compliance noted
EN 61000-3-3+A1:2001	No non-compliance noted
Immunity Standard	Test Result
EN 61000-4-2+A2:2001	No non-compliance noted
EN 61000-4-3+A1:2002	No non-compliance noted
EN 61000-4-4+A2:2001	No non-compliance noted
EN 61000-4-5+A1:2001	No non-compliance noted
EN 61000-4-6+A1:2001	No non-compliance noted
EN 61000-4-11+A1:2001	No non-compliance noted

Approved by:

Reviewed by:

C. F. Wu

C. F. Wu
 Manager of Hsinchu Laboratory
 Compliance Certification Services Inc.



Daniel Chao

Daniel Chao
 Test Engineer of Hsinchu Laboratory
 Compliance Certification Services Inc.

WE HEREBY CERTIFY THAT: The measurements shown in the attachment were made in accordance with the procedures indicated, and the energy emitted by the equipment was found to be within the limits applicable. We assume full responsibility for the accuracy and completeness of these measurements and vouch for the qualifications of all persons taking them.



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1. EUT DESCRIPTION

1.1 DESCRIPTION OF EUT & POWER

Product Name	VoIP/ (802.11g) ADSL2 + Router
Model Number	BiPAC 7300VGP
Data Applies to	BiPAC 7300VP, BiPAC7300VG, BiPAC 7300V, BiPAC 7301VGP, BiPAC7301VP, BiPAC 7301VG, BiPAC7301V
Frequency Range	802.11b /g : 2412MHz to 2472MHz
Transmit Power (mean EIRP)	802.11b mode :19.87dBm 802.11g mode :17.40dBm
Channel Spacing	5MHz
Channel Number	802.11b /g : 13 Channels
Air Data Rate	802.11b mode : 1, 2, 5.5, 11Mbps 802.11g mode : 6, 9, 12, 18, 24, 36, 48, 54Mbps
Type of Modulation	802.11b:DSSS(CCK, DQPSK, DBPSK) 802.11g:OFDM(64QAM, 16AQM, QPSK, BPSK)
Frequency Selection	by software / firmware
Antenna Type	Dipole Antenna, Antenna Gain : 2.0 dBi
Power Source	DC12V / 1.2A (From Power Adapter)
Temperature Range	0 ~ +55
I/O Port	LAN Port x4, RJ11 Port x2 , ADSL Port x1, LINE Port x 1

Remark : For more details, please refer to the User's manual of the EUT.

Power Adapter

No.	Manufacturer	Model No.	Input Power	Output Power
1	HON-KWANG	HKA-12120EC-230	230V~50Hz	12V,1200mA,14.4VA

The difference of the series model

Mode Number	FXS	FXO	Support 802.11g
BiPAC 7300VGP	2 FXS	1 FXO	O
BiPAC 7300VP	2 FXS	1 FXO	X
BiPAC7300VG	2 FXS	X	O
BiPAC 7300V	2 FXS	X	X
BiPAC 7301VGP	1 FXS	1FXO	O
BiPAC7301VP	1 FXS	1 FXO	X
BiPAC 7301VG	1 FXS	X	O
BiPAC7301V	1 FXS	X	X



2. TEST METHODOLOGY

According to its specifications, the EUT must comply with the requirements of the following standards :

ETSI EN 301 489-1 V1.4.1 (2002)– Electromagnetic compatibility and Radio spectrum Matters (ERM) ; Electro Magnetic Compatibility (EMC) standard for radio equipment and services ; Part 1 : Common technical requirements.

ETSI EN 301 489-17 V1.2.1 (2002) – Electromagnetic compatibility and Radio spectrum Matters (ERM) ; Electro Magnetic Compatibility (EMC) standard for radio equipment and services ; Part 17 : Specific conditions for 2, 4 GHz wideband transmission systems and 5 GHz high performance RLAN equipment.

3. FACILITIES AND ACCREDITATIONS

3.1 FACILITIES

All measurement facilities used to collect the measurement data are located at Rm.258, Bldg.17, NO.195 , Sec. 4, Chung Hsing Rd., Chu-Tung Chen. Hsin-Chu, Taiwan 310 R.O.C.

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

3.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with preselectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.





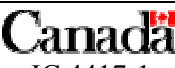
Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

3.3 LABORATORY ACCREDITATIONS LISTINGS

The test facilities used to perform radiated and conducted emissions tests are accredited by National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code: 200118-0 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government. In addition, the test facilities are listed with Federal Communications Commission (registration no: 90585 and 90584).

3.4 TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	NVLAP	EN 55014-1, AS/NZS 1044, CNS 13783-1, IEC/CISPR 14-1, IEC/CISPR 22, EN 55022, EN 61000-3-2, EN 61000-3-3, ANSI C63.4, AS/NZS CISPR 22, AS/NZS 3548, IEC 61000-4-2/3/4/5/6/8/11	 200118-0
USA	FCC	3/10 meter Open Area Test Sites to perform FCC Part 15/18 measurements	 90585, 90584
Japan	VCCI	3/10 meter Open Area Test Sites to perform conducted/radiated measurements	VCCI R-1229/1189 C-1250/1294
Taiwan	CNLA	FCC Method-47 CFR Part 15 Subpart C,D,E CISPR 11, FCC METHOD-47 CFR Part 18, EN 55011, CNS 13803, CISPR 13, CNS 13439, FCC Method-47 CFR Part 15 Subpart B, CISPR 14-1, EN 55014-1, CNS 13783-1, EN 55015, CNS 14115, CISPR 22, EN 55022, VCCI CNS 13438, EN 61000-4-2/3/4/5/6/8/11	 Testing Laboratory 0240
Taiwan	BSMI	CNS 13803, CNS 13438, CNS 13439, CNS 13783-1, CNS 14115	 SL2-IS-E-0002 SL2-IN-E-0002 SL2-A1-E-0002 SL2-R1-E-0002 SL2-R2-E-0002 SL2-L1-E-0002
Canada	Industry Canada	RSS212, Issue 1	 IC 4417-1

** No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government.*



4. CALIBRATION AND UNCERTAINTY

4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 1000 MHz	+/- 3.2 dB
Radiated Emission, 1 to 26.5 GHz	+/- 3.2 dB
Power Line Conducted Emission	+/- 2.9 dB

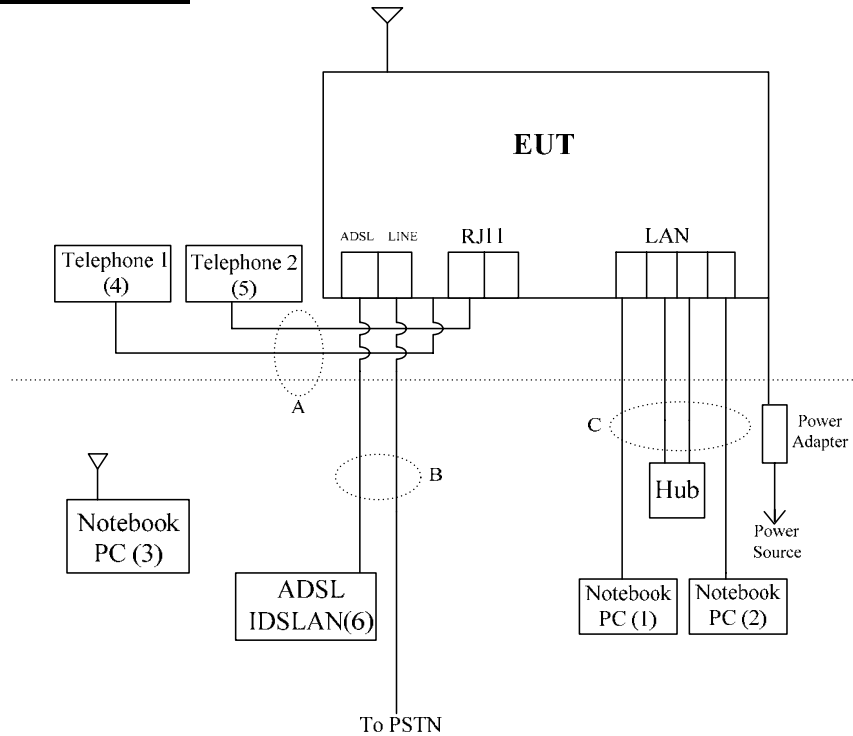
Uncertainty figures are valid to a confidence level of 95%

5. SETUP OF EQUIPMENT UNDER TEST

SUPPORT EQUIPMENT

No.	Product	Manufacturer	Model No.	Serial No.	FCC ID
1	Notebook P.C.	DELL	PP01L	CN-09C748-48155-1AP-6630	DOC
2	Notebook P.C.	COMPAQ	N 800V	5Y33KSQZMOXV1YR	DOC
3	Notebook P.C.	HP	HSTNN-105C	CNU543274R	CNTWM3B 2200BGA
4	Telephone	Sweetone	RS-802HF	0305012781	-----
5	Telephone	Sweetone	RS-802HF	0305012786	-----
6	ADSL IDSLAM	TECOM	M801	HIL0017	DOC

SETUP DIAGRAM FOR TESTS



No.	Signal cable description
A	Telephone cable , 1.5m x 2
B	Telephone cable , 20m x 2
C	Ethernet cable , 20m x 4

EUT OPERATING CONDITION

1. Setup all computers like the setup diagram.
2. Notebook (1) ping 192.168.1.254 -t to EUT.
3. Notebook (1) ping 192.168.1.100 -t to Notebook (2)
4. Notebook (2) ping 192.168.1.101 -t to EUT.
5. All of the function are under run.
6. Start test.



6. EMISSION TEST

6.1. RADIATED EMISSIONS

LIMITS

All emanation from a class B computing device or system , including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below :

Frequency (MHz)	Distance (METERS)	Field Strengths(dB μ V/m)	
		CLASS A	CLASS B
30 – 230	10	40	30
230 – 1000	10	47	37

Note : (1) The tighten limit shall apply at the edge between two frequency bands.

(2) Distance refers to the distance in meters between the measuring instrument antenna and the closest point of any part of the device or system.

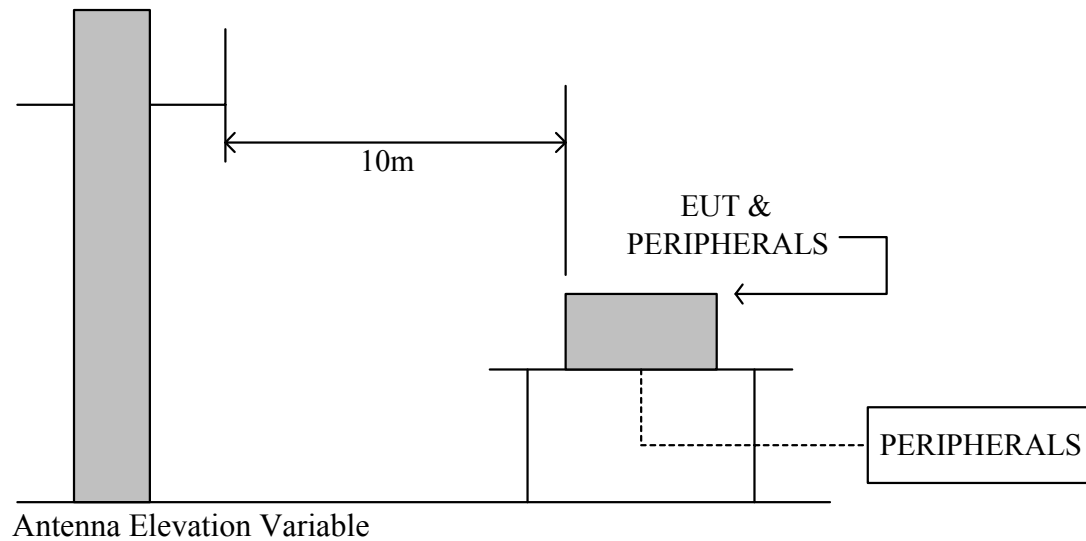
TEST EQUIPMENTS

The following test equipments are utilized in making the measurements contained in this report.

Manufacturer or Type	Model No.	Serial No.	Date of Calibration	Calibration Period	Remark
CHASE BI-LOG ANTENNA	CBL6112B	2817	March 22, 2006	1 Year	FINAL
R/S TEST RECEIVER	ESCS30	835418/008	August 05, 2005	1 Year	FINAL
OPEN SITE	-----	No.2	May 07, 2005	1 Year	FINAL
N TYPE COAXIAL CABLE	9913-30M	-----	July 28, 2005	1 Year	FINAL

TEST SETUP

The diagram below shows the test setup which is utilized to make these measurements.



TEST PROCEDURE

The devices under test were placed on a rotatable table top 0.8 meter above ground. The table was rotated 360 degrees to determine the position of the highest radiation. EUT is set 10 meters from the interference receiving antenna which is mounted on the top of a variable height mast. The antenna height is varied between one meter and four meters above ground to find the maximum value of the field strength. Both horizontal polarization and vertical polarization of the antenna are set to make the measurement. The bandwidth setting on the E.M.I. meter (R/S TEST RECEIVER) is 120 KHz.

The levels are quasi peak value readings. The frequency spectrum from 30MHz to 1000MHz was investigated.

TEST RESULTS

No non-compliance noted



Product Name	VoIP/ (802.11g) ADSL2 + Router	Test Date	2006/03/17
Model Name	BiPAC 7300VGP	Test By	Daniel Chao
Test Mode	Normal operating	TEMP&Humidity	27.3 °C, 71%

Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading at 10m(dBμV)		Limits (dBμV/m)	Emission Level at 10m(dBμV/m)	
			Horizontal	Vertical		Horizontal	Vertical
133.33	11.47	1.54	9.50	15.40	30.00	22.51	28.41
188.42	9.34	1.77	9.30	10.00	30.00	20.41	21.11
266.66	13.00	2.18	9.20	9.00	37.00	24.38	24.18
355.55	14.96	2.51	14.70	18.20	37.00	32.16	35.66
400.00	16.20	2.60	10.00	10.20	37.00	28.80	29.00
666.66	19.07	3.47	11.00	7.50	37.00	33.54	30.04
933.33	21.03	4.32	9.10	4.00	37.00	34.45	29.35
975.00	21.45	4.25	2.00	2.30	37.00	27.70	28.00

Remark: Emission level (dBμV/m) = Antenna Factor (dB/m) + Cable loss (dB) + Meter Reading (dBμV).



6.2 POWERLINE CONDUCTED EMISSIONS

LIMITS

Frequency (MHz)	Maximum Rf Line Voltage (dB μ V)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

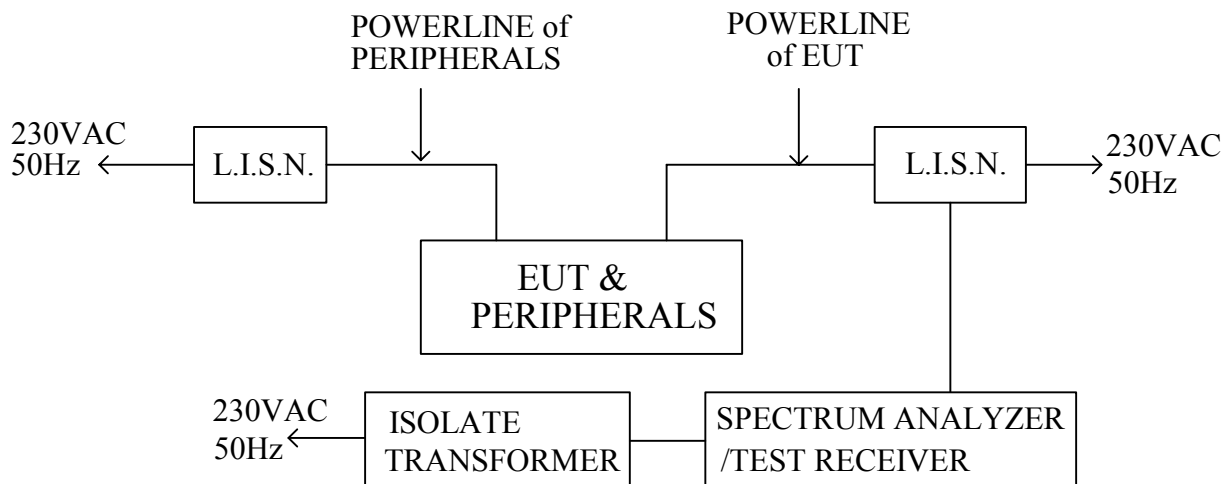
* Decreasing linearly with the logarithm of the frequency

TEST EQUIPMENTS

The following test equipments are used during the conducted powerline tests :

Manufacturer or Type	Model No.	Serial No.	Date of Calibration	Calibration Period	Remark
HP SPECTRUM ANALYZER	8594E	3801A05627	April 28, 2005	1 Year	PRETEST
SOLAR ISOLATION TRANSFORMER	7032-1	N/A	N/A	N/A	FINAL
EMCO L.I.S.N.	3850/2	9311-1025	January 16, 2006	1 Year	FINAL
CHASE L.I.S.N	NNLK 8129	8129118	January 16, 2006	1 Year	FINAL
R/S TEST RECEIVER	ESCS30	835418/008	August 05, 2005	1 Year	FINAL
KEENE SHIELDED ROOM	5983	No.1	N/A	N/A	FINAL
R & S PULSE LIMIT	EHS3Z2	357.8810.52	July 10, 2005	1 Year	FINAL
N TYPE COAXIAL CABLE	-----	-----	July 10, 2005	1 Year	FINAL
50 Ω TERMINATOR	-----	-----	July 10, 2005	1 Year	FINAL

TEST SETUP



TEST PROCEDURE

The test procedure is performed in a 12ft×12ft×8ft(L×W×H) shielded room.

The EUT along with its peripherals were placed on a 1.0m(W)× 1.5m(L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane. The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room. All peripherals were connected to the second LISN and the chassis ground also bounded to the horizontal ground plane of shielded room. The excess power cable between the EUT and the LISN was bundled. The power cables of peripherals were unbundled. All connecting cables of EUT and peripherals were moved to find the maximum emission.

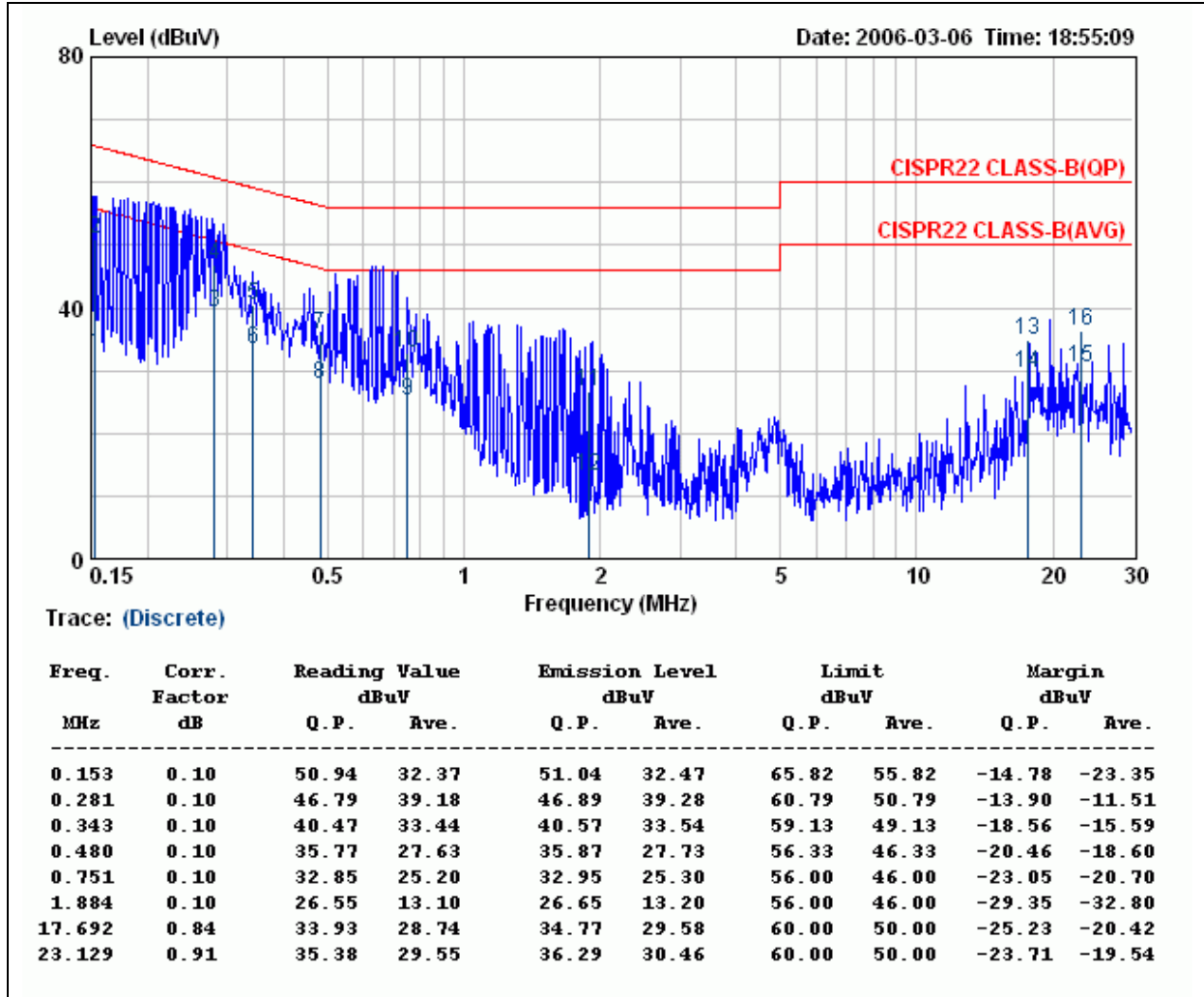
TEST RESULTS

No non-compliance noted



Product Name	VoIP/ (802.11g) ADSL2 + Router	Test Date	2006/03/17
Model Name	BiPAC 7300VGP	Test By	Daniel Chao
Test Mode	Normal operating	TEMP&Humidity	25°C, 52%

LINE

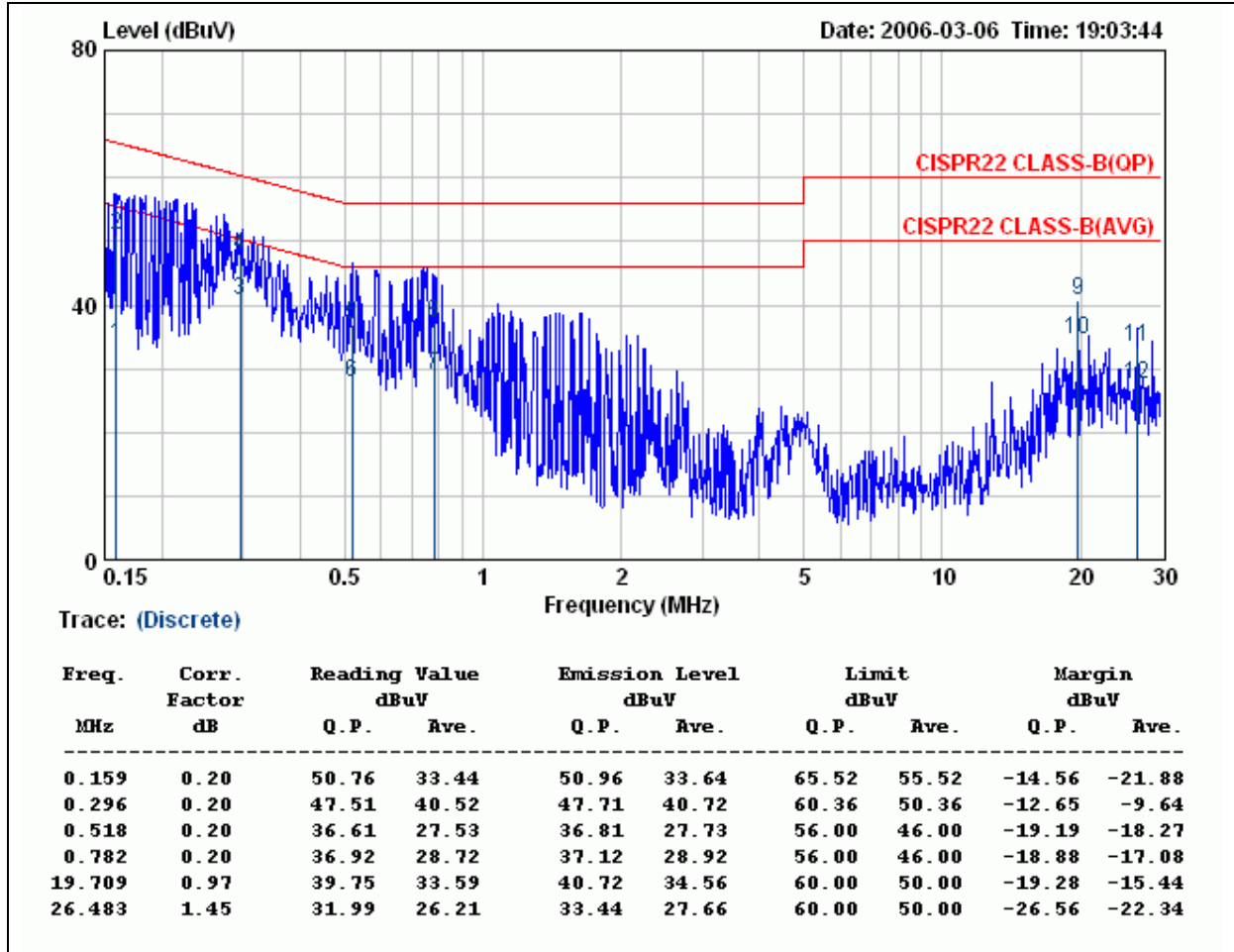
**Remark:**

1. Correction Factor = Insertion loss + cable loss
2. Margin value = Emission level – Limit value



Product Name	VoIP/ (802.11g) ADSL2 + Router	Test Date	2006/03/06
Model Name	BiPAC 7300VGP	Test By	Daniel Chao
Test Mode	Normal operating	TEMP&Humidity	25°C, 52%

NEUTRAL

**Remark:**

1. Correction Factor = Insertion loss + cable loss
2. Margin value = Emission level – Limit value



6.3 CURRENT HARMONIC TEST

TEST EQUIPMENTS

Manufacturer or Type	Model No.	Serial No.	Date of Calibration	Calibration Period
EMC PARTNER	HARMONIC-1000	071	September 28, 2005	1 Year

TEST REQUIREMENT AND PROCEDURE

The test standard was based on EN 61000-3-2 (2000)

MEASUREMENT UNCERTAINTY OF CURRENT HARMONIC TEST

Total harmonic distortion : $\pm 5.9\%$

**SUMMARY OF TEST**

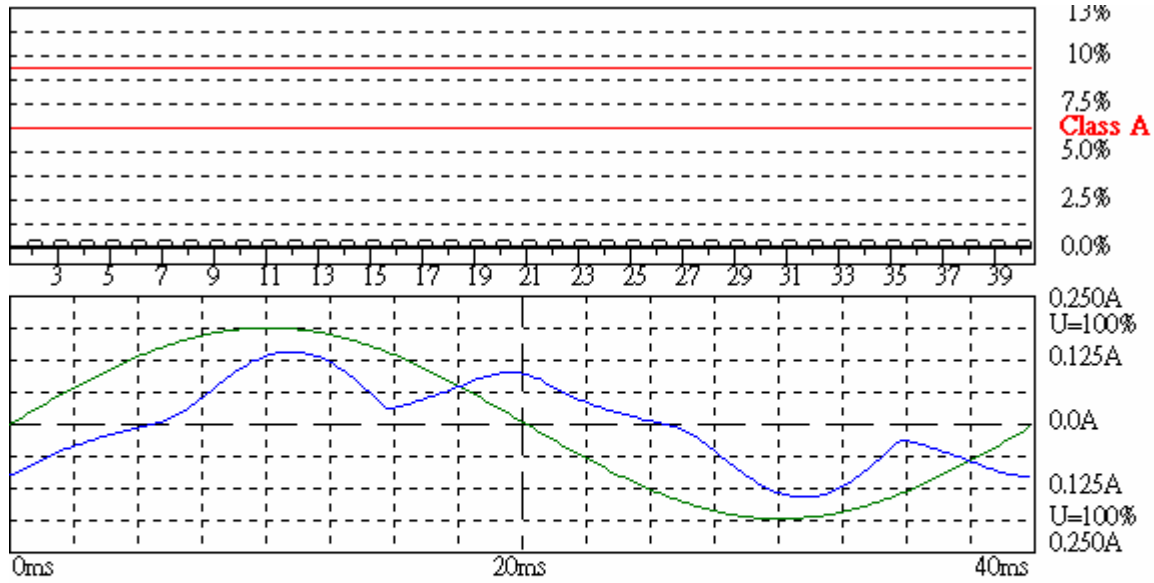
Date : 2006/3/21 AM 11:28:3 V3.15

Urms =	230.1V	Freq =	49.987	Range:	0.25 A
Irms =	0.081A	Ipk =	0.145A	cf =	1.778
P =	13.39W	Pap =	18.74VA	pf =	0.715
THDi =	41.9 %	THDu =	0.10 %	Class A	

Test - Time : 5min (100 %)

Test completed, Result: PASSED

Order	Freq. [Hz]	Iavg [A]	Iavg%L [%]	Imax [A]	Imax%L [%]	Limit [A]	Status
1	50	0.0808		0.1992			
2	100	0.0000	0.0000	0.0002	0.0212	1.0800	
3	150	0.0277	1.2048	0.0277	1.2054	2.3000	
4	200	0.0000	0.0000	0.0001	0.0319	0.4300	
5	250	0.0198	1.7360	0.0198	1.7360	1.1400	
6	300	0.0000	0.0000	0.0000	0.0153	0.3000	
7	350	0.0000	0.0000	0.0017	0.2259	0.7700	
8	400	0.0000	0.0000	0.0000	0.0133	0.2300	
9	450	0.0000	0.0000	0.0019	0.4807	0.4000	
10	500	0.0000	0.0000	0.0000	0.0083	0.1840	
11	550	0.0000	0.0000	0.0022	0.6658	0.3300	
12	600	0.0000	0.0000	0.0000	0.0000	0.1533	
13	650	0.0000	0.0000	0.0012	0.5668	0.2100	
14	700	0.0000	0.0000	0.0000	0.0000	0.1314	
15	750	0.0000	0.0000	0.0008	0.5086	0.1500	
16	800	0.0000	0.0000	0.0000	0.0000	0.1150	
17	850	0.0000	0.0000	0.0006	0.4496	0.1324	
18	900	0.0000	0.0000	0.0000	0.0000	0.1022	
19	950	0.0000	0.0000	0.0006	0.4768	0.1184	
20	1000	0.0000	0.0000	0.0000	0.0000	0.0920	
21	1050	0.0000	0.0000	0.0003	0.3133	0.1071	
22	1100	0.0000	0.0000	0.0000	0.0000	0.0836	
23	1150	0.0000	0.0000	0.0004	0.3899	0.0978	
24	1200	0.0000	0.0000	0.0000	0.0000	0.0767	
25	1250	0.0000	0.0000	0.0003	0.3052	0.0900	
26	1300	0.0000	0.0000	0.0000	0.0000	0.0708	
27	1350	0.0000	0.0000	0.0003	0.3296	0.0833	
28	1400	0.0000	0.0000	0.0000	0.0000	0.0657	
29	1450	0.0000	0.0000	0.0002	0.2753	0.0776	
30	1500	0.0000	0.0000	0.0000	0.0000	0.0613	
31	1550	0.0000	0.0000	0.0002	0.2733	0.0726	
32	1600	0.0000	0.0000	0.0000	0.0000	0.0575	
33	1650	0.0000	0.0000	0.0002	0.2686	0.0682	
34	1700	0.0000	0.0000	0.0000	0.0000	0.0541	
35	1750	0.0000	0.0000	0.0002	0.2374	0.0643	
36	1800	0.0000	0.0000	0.0000	0.0000	0.0511	
37	1850	0.0000	0.0000	0.0001	0.2258	0.0608	
38	1900	0.0000	0.0000	0.0000	0.0000	0.0484	
39	1950	0.0000	0.0000	0.0001	0.2116	0.0577	
40	2000	0.0000	0.0000	0.0000	0.0000	0.0460	



Harmonic Emission - IEC 61000-3-2 , EN 61000-3-2 , (EN60555-2) 2006/3/21 AM 11:28:3

U_{rms} = 230.1 V P = 13.39 W THC = 0.034 A
I_{rms} = 0.081 A pf = 0.715

Range: 0.25 A
V_{nom}: 230 V
TestTime: 5 min (100%)

Test completed, Result: PASSED



8.4 VOLTAGE FLUCTUATION AND FLICKER TEST

TEST EQUIPMENTS

Manufacturer or Type	Model No.	Serial No.	Date of Calibration	Calibration Period
EMC PARTNER	HARMONIC-1000	071	September 28, 2005	1 Year

TESTING REQUIREMENT AND PROCEDURE

The test standard was based on EN 61000-3-3+A1:2001

MEASUREMENT UNCERTAINTY OF VOLTAGE FLUCTUATION AND FLICKER TEST

Pst : $\pm 5.9\%$



SUMMARY OF TEST

Date : 2006/3/21 AM 11:47:1 V3.15

Urms =	230.1V	Freq =	49.987	Range:	0.25 A
Irms =	0.081A	Ipk =	0.144A	cf =	1.772
P =	13.38W	Pap =	18.71VA	pf =	0.715

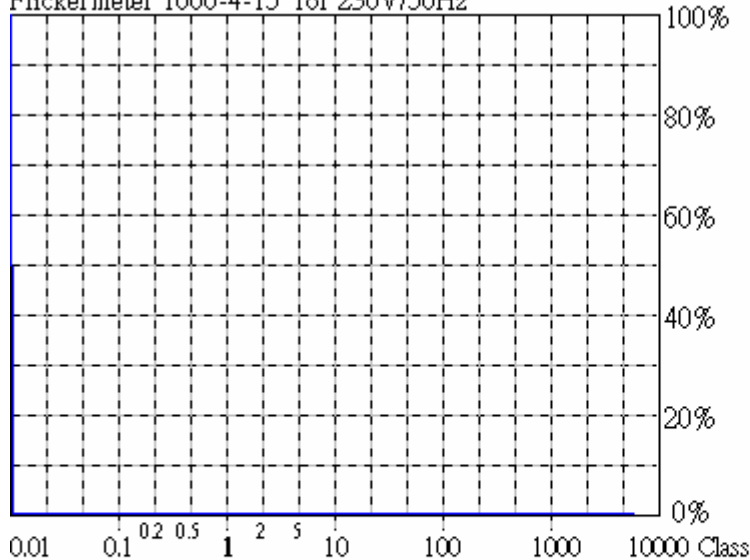
Test - Time : 1 x 10min = 10min (100 %)

LIN (Line Impedance Network) : SLIN 0.24ohm +j0.18ohm N:0.16ohm +j0.12ohm

Limits :	Plt :	0.65	Pst :	1.00
	dmax :	4.00 %	dc :	3.30 %
	dtLim:	3.30 %	dt>Lim:	500ms

Test completed, Result: PASSED

Flickermeter 1000-4-15 for 230V/50Hz



Actual Flicker (Fli): 0.00
Short-term Flicker (Ps): 0.07
 Limit (Pst): 1.00
Long-term Flicker (Plt): 0.07
 Limit (Plt): 0.65
Maximum Relative Volt. Change (dmax): 0.00%
 Limit (dmax): 4.00%
Relative Steady-state Voltage Change (dc): 0.00%
 Limit (dc): 3.30%
Maximum Interval exceeding 3.30% (dt): 0.00ms
 Limit (dt>Lim): 500ms

Flicker Emission - IEC 61000-3-3 , EN 61000-3-3 , (EN60555-3)

2006/3/21 AM 11:47:1

Urms =	230.1 V	P =	13.38 W
Irms =	0.081 A	pf =	0.715

Range:	0.25 A
V-nom:	230 V
TestTime:	10 min (100%)

Test completed, Result: PASSED



7. IMMUNITY TEST

TEST EQUIPMENT

Use	Manufacturer or Type	Model No.	Date of Calibration
√	HP VEI8 PIII	DPTC-17	N/A
√	HP VGA Monitor	D1193A	N/A
√	HP Keyboard	C1405B #ABO	N/A
√	HP VE 4/66 Computer	VE 4/66	N/A
√	IBM VGA Monitor	2248-002	N/A
√	HP Keyboard	C1405B#ABO	N/A
√	KeyTek Control Center	E-CLASS SERIES-100	N/A
	Pacific Programmable Controller	ERI3	June 01, 2005
	Pacific AC Power Source	EP74	June 01, 2005
√	KeyTek Control Center	E-CLASS SERIES-100	N/A
√	KeyTek EFT/B Source	E421	March 10, 2005
√	KeyTek Surge Network	E510,E503	March 10, 2005
√	KeyTek EFT/B & Surge Coupler/Decoupler	E4552	March 10, 2005
√	KeyTek Swell/Dip Interrupt Source	EP62	November 28, 2005
	Noise Lightning Surge Simulator	LSS-712	March 10, 2005
	Noiseken	FNS-105L-50	June 01, 2005
	Noise Impulse Noise Simulator	INS-410	June 17, 2005
√	NoiseKen ESD Simulator	ESS-2000	March 25, 2005
	KeyTek Surge Network	E503, E510A, E505A, E4554	June 01, 2005
√	SCHWARZBGCK Bilog Antenna	VULB 9163	June 29, 2005
√	R&S Signal Generator Freq. Range : 9KHz ~ 2.08GHz	SMY02	December 12, 2005
√	Boonton RF Voltmeter	9200B	December 15, 2005
	HOLADAY FIELD PROBE	HI-4422	August 30, 2005
	SCHAFFNER Coupling Decoupling Network Freq. range : 150KHz ~ 230MHz	CDN M325	July 11, 2005
√	SCHAFFNER Coupling Decoupling Network Freq. range : 150KHz ~ 230MHz	CDN M225	July 19, 2005
√	AR Amplifier Freq. Range : 10KHz ~ 220MHz	200W/150L	N/A
√	AR Amplifier Freq. Range : 25MHz ~ 1000MHz	100W1000M1A	N/A
√	DANA TORINO-ITALY Power Frequenty Magnetic Field	DAS-G60 DAS 1S 1000	August 24, 2005
√	SCHAFFNER EM CLAMP	KEMZ 801	November 12, 2005
√	MILMEGA LINEAR AMPLIFIER Freq. range : 0.8 ~ 2.5 GHz	AS0825-35	N/A

Performance Criteria Description

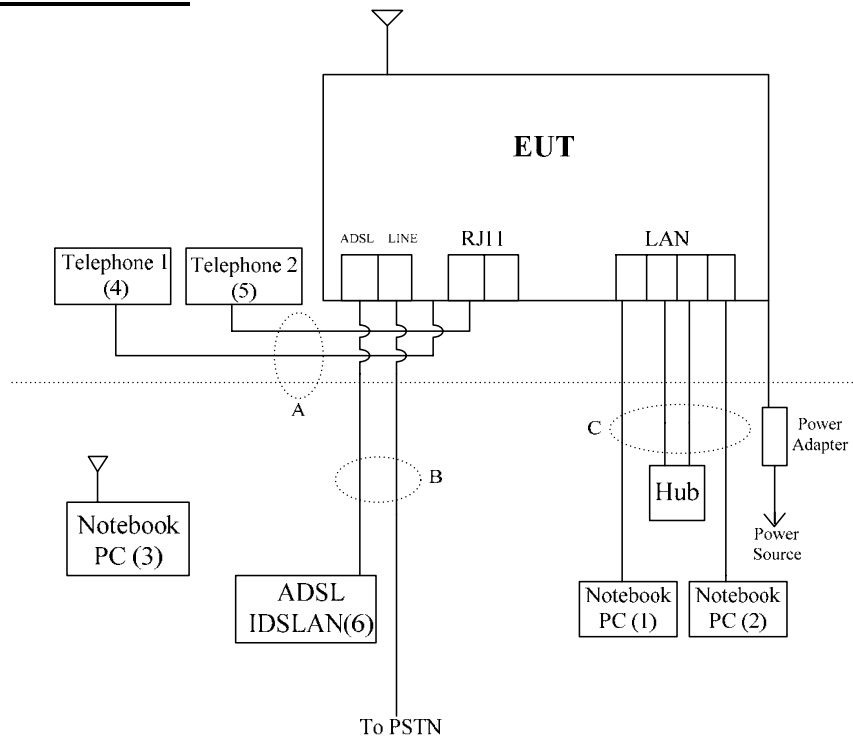
Criteria	During test	After test
A	Shall operate as intended. May show degradation of performance (see note 1). Shall be no loss of function. Shall be no unintentional transmission.	Shall operate as intended. Shall be no degradation of performance (see note 2). Shall be no loss of function. Shall be no loss of stored data or user programmable functions.
B	May show loss of function (one or more). May show degradation of performance (see note 1). No unintentional transmission.	Functions shall be self-recoverable. Shall operate as intended after recovering. Shall be no degradation of performance (see note 2). Shall be no loss of stored data or user programmable functions.
C	May be loss of function (one or more).	Functions shall be recoverable by the operator. Shall operate as intended after recovering. Shall be no degradation of performance (see note2).
<p>Note 1 : Degradation of performance during the test is understood as a degradation to a level not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance.</p> <p>If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonable expect from the apparatus if used as intended.</p> <p>Note 2 : No degradation of performance after the test is understood as no degradation below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. After the test no change of actual operating data or user retrievable data is allowed. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonable expect from the apparatus if user as intended.</p>		

DESCRIPTION OF PERIPHERALS

SUPPORT EQUIPMENT

No.	Product	Manufacturer	Model No.	Serial No.	FCC ID
1	Notebook P.C.	DELL	PP01L	CN-09C748-48155-1AP-6630	DOC
2	Notebook P.C.	COMPAQ	N 800V	5Y33KSQZMOXV1YR	DOC
3	Notebook P.C.	HP	HSTNN-105C	CNU543274R	CNTWM3B 2200BGA
4	Telephone	Sweetone	RS-802HF	0305012781	-----
5	Telephone	Sweetone	RS-802HF	0305012786	-----
6	ADSL IDSLAM	TECOM	M801	HIL0017	DOC

SETUP DIAGRAM FOR TESTS



No.	Signal cable description
A	Telephone cable , 1.5m x 2
B	Telephone cable , 20m x 2
C	Ethernet cable , 20m x 4

EUT OPERATING CONDITION

7. Setup all computers like the setup diagram.
8. Notebook (1) ping 192.168.1.254 -t to EUT.
9. Notebook (1) ping 192.168.1.100 -t to Notebook (2)
10. Notebook (2) ping 192.168.1.101 -t to EUT.
11. All of the function are under run.
12. Start test.



7.1 ELECTROSTATIC DISCHARGE TEST

CLIMATIC CONDITIONS

Ambient temperature : 24 °C ~ 26 °C

Relative humidity : 55 % ~ 60 % RH

Atmospheric pressure : 99.2 kpa

TEST REQUIREMENT AND PROCEDURE

The test standard was based on ETSI EN 301 489-17 (2002) , ETSI EN 300 386 V1.3.1 (2001) and EN 61000-4-2+A2 (2001)

TEST CONDITIONS

Source voltage / frequency : 230VAC/50Hz, Single phase

R-C network : 330 Ω, 150 PF.

Test Level :

Air Discharge : 2 , 4 , 8 KV

Contact Discharge : 2 , 4 KV

HCP Discharge : 2 , 4 KV

VCP Discharge : 2 , 4 KV

Polarity : Positive / Negative

Number of test :

10 Discharges / Sensitive Polarity for Air Discharge.

25 Discharges / Sensitive Polarity for Contact, HCP and VCP Discharge.

Time between test : 1 Sec.

MEASUREMENT UNCERTAINTY OF ELECTROSTATIC DISCHARGE TEST

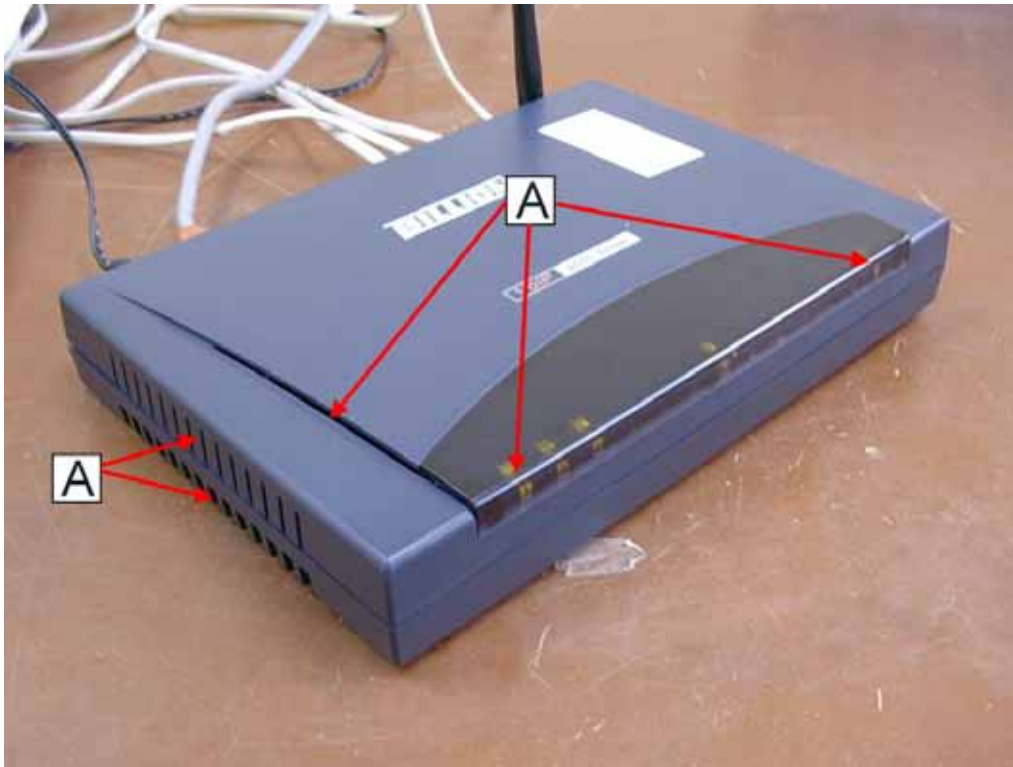
The uncertainty of output voltage indication was ± 13.4%

TEST RESULTS

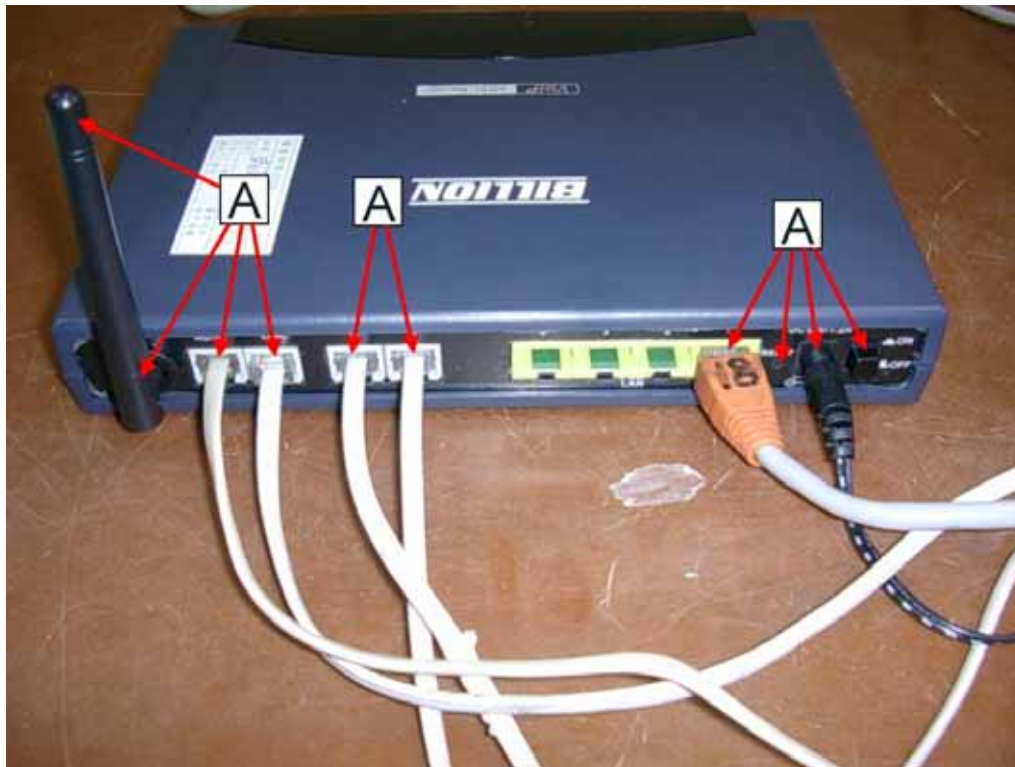
Test Requirement Severity Level \ Polarity		EN 55024:1998 + A1:2001 + A2:2003 requirement			Performance verification (criteria)			Test results
		Air discharge	HCP discharge	VCP discharge	Air discharge	HCP discharge	VCP discharge	
2 KV	+	B	B	B	A	A	A	PASS
	-	B	B	B	A	A	A	PASS
4 KV	+	B	B	B	A	B	A	PASS
	-	B	B	B	A	B	A	PASS
8 KV	+	B	NR	NR	B	NR	NR	PASS
	-	B	NR	NR	B	NR	NR	PASS

Note : NR means there is no requirement.

THE TESTED POINTS OF EUT



A : Air Discharge



A : Air Discharge

7.2 RADIATED SUSCEPTIBILITY TEST

CLIMATIC CONDITIONS

Ambient temperature : 24 °C ~ 26 °C

Relative humidity : 55 % ~ 65 % RH

Atmospheric pressure : 99.0 kpa

TEST REQUIREMENT AND PROCEDURE

The test standard was based on ETSI EN 301 489-17 (2002) , ETSI EN 300 386 V1.3.1 (2001) and EN 61000-4-3+A1 (2002)

TEST CONDITIONS

Source voltage / frequency : 230VAC/50Hz, Single phase

Sweeping frequency : 80 MHz ~ 1000MHz

Test Level : 3V/m.

Measuring distance : 3 meters

The four sides of EUT are tested (Front, Rear, Left, Right).

Antenna Polarization : Horizontal and Vertical polarizations.

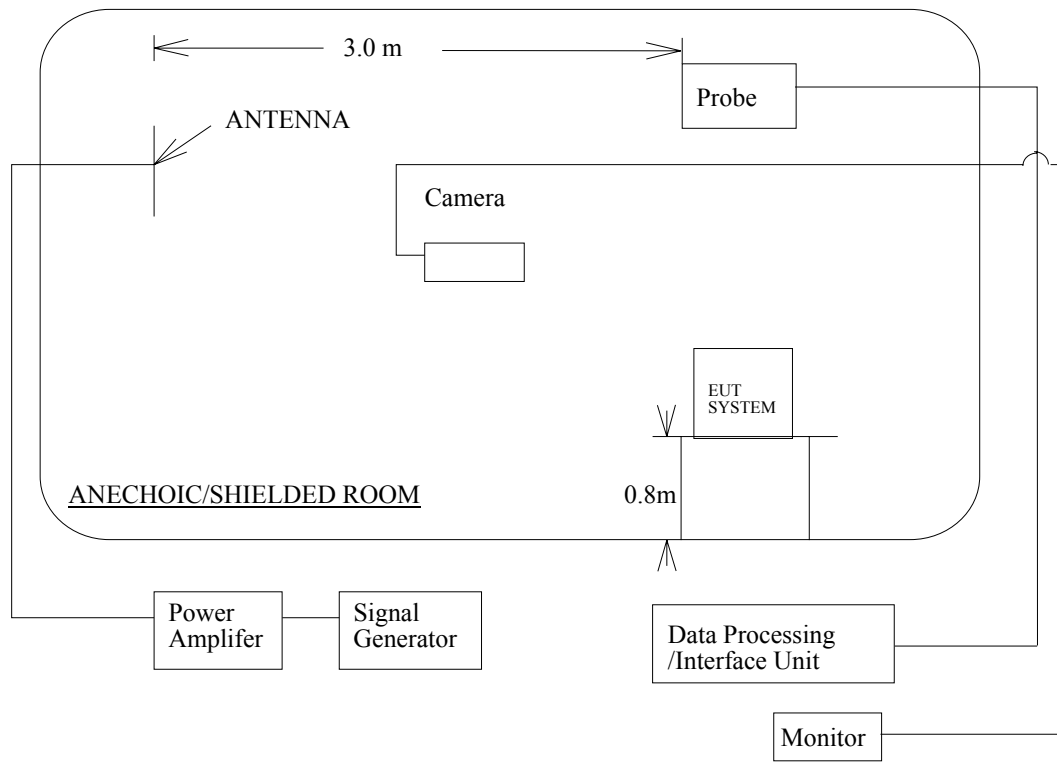
The generated signal amplitude was 80% AM (1KHz) amplitude modulated, the step size was 1% and test duration time was 1000ms.

MEASUREMENT UNCERTAINTY OF RADIATED SUSCEPTIBILITY TEST

The uncertainty of radiated susceptibility was ± 4.3 dB

STRUCTURE OF THE TEST

Setup configuration



TEST RESULT

Frequency range : 80MHz ~ 1GHz

Severity level (V/m)	EN 55024:1998 + A1:2001 + A2:2003 requirement	Performance Verification (criteria)	Test results
3	A	A	PASS

7.3 ELECTRICAL FAST TRANSIENT/BURST TEST

CLIMATIC CONDITIONS

Ambient temperature : 24 °C ~ 26 °C

Relative humidity : 55 % ~ 65 % RH

Atmospheric pressure : 99.0 kpa

TEST REQUIREMENT AND PROCEDURE

The test standard was based on ETSI EN 301 489-17 (2002) , ETSI EN 300 386 V1.3.1 (2001) and EN 61000-4-4+A2 (2001)

TEST CONDITIONS

Source voltage / frequency : 230VAC/50Hz, Single phase

Pulse risetime / duration : 5 ns / 50 ns.

Pulse repetition : 5 KHz.

Polarity : Positive and Negative, 1 times / each condition.

Burst duration / period : 15ms / 300ms.

Test duration : 1 min.

Time between test : 10 sec.

Severity levels : 0.5 , 1 KV for AC line

Coupling of ac line : L , N , L + N

MEASUREMENT UNCERTAINTY OF ELECTRICAL FAST TRANSIENT/BURST TEST

The uncertainty of open circuit output voltage was ± 12.2%

TEST RESULTS

Test Requirement Severity Level \ Polarity		EN 55024:1998 + A1:2001 + A2:2003 requirement		Performance verification (criteria)		Test results
		AC Line	I/O Line	AC Line	I/O Line	
0.5 KV	+	B	B	B	B	PASS
	-	B	B	B	B	PASS
1 KV	+	B	B	B	B	PASS
	-	B	B	B	B	PASS

7.4 SURGE TEST

CLIMATIC CONDITION

Ambient temperature : 24 °C ~ 26 °C

Relative humidity : 55 % ~ 65 % RH

Atmospheric pressure : 99.0 kpa

TEST REQUIREMENT AND PROCEDURE

The test standard was based on ETSI EN 301 489-17 (2002) , ETSI EN 300 386 V1.3.1 (2001) and EN 61000-4-5+A1 (2001)

TEST CONDITIONS

Source voltage and frequency : 230VAC/50Hz, Single phase

Waveform of surge :

Combination wave (1.2/50 μ s, 8/20 μ s)

Output impedance : 2 Ω for differential mode.

Polarity : Positive / Negative, 1 times / each condition.

Phase angle : 0, 90, 270 degrees

Pulse repetition rate : 30 sec

Coupling mode : L \rightarrow N for differential mode

Severity levels step : 0.5, 1 KV for differential mode

Waveform of surge : 10/700 μ s (for K.21)

Polarity : Positive and Negative, \pm 5 times / each condition.

Pulse repetition rate : 50 sec

Coupling mode : Tip \rightarrow Ring, Ring \rightarrow Tip ; Tip + Ring \rightarrow GND

Severity levels step : 6 KV for Tip \rightarrow Ring, Ring \rightarrow Tip ; 6 KV for Tip + Ring \rightarrow GND

MEASUREMENT UNCERTAINTY OF SURGE TEST

The uncertainty of open circuit output voltage \pm 42.1%

**TEST RESULTS**

Test Requirement Severity Level / Polarity		EN 55024:1998 + A1:2001 + A2:2003 requirement		Performance verification (criteria)		Test results
		Differential mode	Telephone mode	Differential mode	Telephone mode	
0.5 KV	+	B	B	A	A	PASS
	-	B	B	A	A	PASS

Note : NR means there is no requirement.

Test Requirement Severity Level / Polarity		ITU-T Recommendation K.21 (2003)	
		Tip → Ring, Ring → Tip	Tip + Ring → GND
6 KV	+	PASS	PASS
	-	PASS	PASS

7.5 CONDUCTED SUSCEPTIBILITY TEST

CLIMATIC CONDITIONS

Ambient temperature : 24 °C ~ 26 °C

Relative humidity : 55 % ~ 65 % RH

Atmospheric pressure : 99.0 kpa

TEST REQUIREMENT AND PROCEDURE

The test standard was based on ETSI EN 301 489-17 (2002) , ETSI EN 300 386 V1.3.1 (2001) and EN 61000-4-6+A1 (2001)

TEST CONDITIONS

Source voltage / frequency : 230VAC/50Hz, Single phase

Sweeping frequency : 150 KHz ~ 80 MHz.

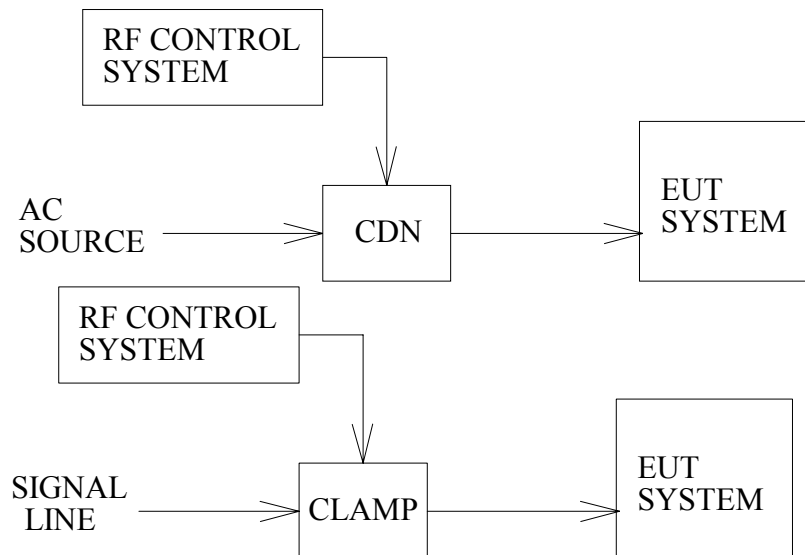
Test Level : 3Vrms.

The generated signal amplitude was 80% AM (1KHz) amplitude modulated, the step size was 1% and test duration time was 1000ms.

MEASUREMENT UNCERTAINTY OF C.S.

The uncertainty of C.S was ± 4.1 dB

STRUCTURE OF THE TEST



TEST RESULT

Sweeping frequency range :150KHz ~ 80MHz

Severity level (Vrms)	EN 55024:1998+A1:2001+A2:2003 requirement		Performance verification (criteria)		Test results
	AC Line	I/O Line	AC Line	I/O Line	
3	A	A	A	A	PASS

7.6 VOLTAGE DIP AND INTERRUPTION TEST

CLIMATIC CONDITIONS

Ambient temperature : 24 °C ~ 26 °C

Relative humidity : 55 % ~ 65 % RH

Atmospheric pressure : 99.0 kpa

TEST REQUIREMENT AND PROCEDURE

The test standard was based on ETSI EN 301 489-17 (2002) , ETSI EN 300 386 V1.3.1 (2001) and EN 61000-4-11+A1 (2001)

TEST CONDITIONS

Source voltage / frequency : 230VAC/50Hz, Single phase

Phase angles : 0, 45, 90, 135, 180, 225, 270, 315 degrees.

Time of interval : 10 sec.

Number of test : Sequence of 3 dips/interrupts

Voltage rise (and fall) time : 1 ~ 5 μ s.

Test severity :

Voltage dip and Interrupt reduction (%)	Test Duration (ms)
30	500
100	10
100	5000

TEST RESULTS

Voltage dip and Interrupt reduction (%)	Test duration (ms)	EN 55024:1998 + A1: 2001 + A2:2003 requirement	Performance verification (criteria)	Test results
30	500	C	A	PASS
100	10	B	A	PASS
100	5000	C	C	PASS

APPENDIX SETUP PHOTOS

RADIATED EMISSION MEASUREMENT SETUP



POWERLINE CONDUCTED EMISSION MEASUREMENT SETUP



CURRENT HARMONIC SETUP



VOLTAGE FLUCTUATION AND FLICKER SETUP



ELECTROSTATIC DISCHARGE SETUP



VOLTAGE DIP AND INTERRUPTION SETUP



RADIATED ELECTROMAGNETIC FIELD SETUP



ELECTRICAL FAST TRANSIENT/BURST SETUP



SURGE SETUP



CONDUCTED SUSCEPTIBILITY SETUP



I/O



VOLTAGE DIP AND INTERRUPTION SETUP



External Photo





Internal Photo



