

FCC EVALUATION REPORT FOR CERTIFICATION

Korea Standard Technology

Test report No.: KST-FCC0408

Manufacturer's Name : Wellink Corporation
Manufacturer's Address : 201,A-Dong, PundangTechnopark, 150, YatapDong,
Pundang-Gu, Sungnam-Si, Kyungki-Do, Korea
EUT's :
FCC ID : PWVW202ER-4
Product Name : ADSL Modem
Model Number(s) : W202ER-4 & 202ER-4
Product Options : Request for enter a multi list of model name by
manufacturer.
Category : FCC Part 15 sub. part B Class B Digital Device

Supplementary Information

The device bearing the brand name and FCC ID specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with measurement procedures specified in ANSI C63.4-1992.

I attest to the accuracy of data and all measurements reported herein were performed by or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Issue Date : May 7, 2004

Tested by:



Chung, Suck-Jin

Approved by:



Lee, Woen-woo

Contents

1. Description of Device
2. Test Facility
3. MAP
4. Facility Environment
5. Description of E.U.T.
6. Summary of test results.
7. Test results.
8. Photographs.

Appendix. Sample Label

EMC TEST REPORT



Report reference No: KST-FCC0408

1. Description of Device

- | | |
|-------------------------------|--|
| 1) Kind of equipment: | ADSL MODEM |
| 2) FCC ID: | PWVW202ER-4 |
| 3) Model Name: | W202ER-4 & 202ER-4 |
| 4) Serial No.: | None |
| 5) Type of Sample Tested: | Pre-production
/ addition & alteration of parts(component) |
| 6) High Frequency Used: | 17.280 MHz
25.000 MHz |
| 7) Adapter | Model name: DSA-009F-09A
Manufacturer: DVE.
Serial no: 4603 |
| 8) Power Rating: | 1phase AC90-264V, 0.3A, 50/60Hz
Output: DC 9V, 1.0A, 9W |
| 9) Tested Power supply: | 1phase AC110V, 60Hz |
| 10) Date of Manufacture: | May 2004 |
| 11) Manufacture: | Wellink Corporation &
NETUS Technologies Co.,Ltd. |
| 12) Description of Operating: | Use to direct spread spectrum transmitters &
hyper-terminal for data transmission |
| 13) Dates of Test: | May 3 , 2004 |
| 14) Place of Tests: | Korea Standard Technology EMC site |
| 15) Test Report No: | KST-FCC0408 |

EMC TEST REPORT



Report reference No: KST-FCC0408

2. Test Facility

The open field test site and conducted measurement facility are used for these testing, where are located following address and drawing. This site was fully described in a report dated November 14, 2002, that was submitted to the FCC.

Korea Standard Technology (KOSTEC Co., Ltd)

Head office:

302 City Bild, 1600-3 Kwanyang-dong, Dongan-gu, Anyang-shi, Kyunggi-do, Korea

Telephone No : 82-31-388-2051

Facsimile No: 82-31-388-2052

Test Lab

:180-254, Annyung-Ri, Taeon-Yup, Hwasung-shi, Kyunggi-do, Korea

Telephone No : 82-31-222-4251

Facsimile No: 82-31-222-4252

MIC(Ministry of Information and Communication) No: **KR0042**

FCC Filing No. : **525762**

VCCI Membership Number : **2005**

VCCI Registration Number : **R-1657 / C-1763**

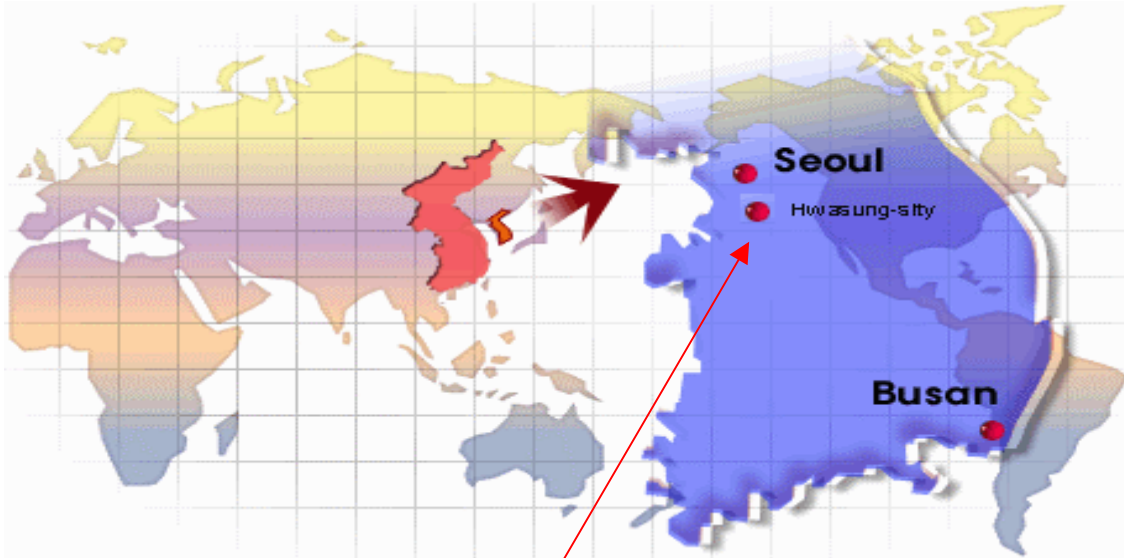
EMC TEST REPORT



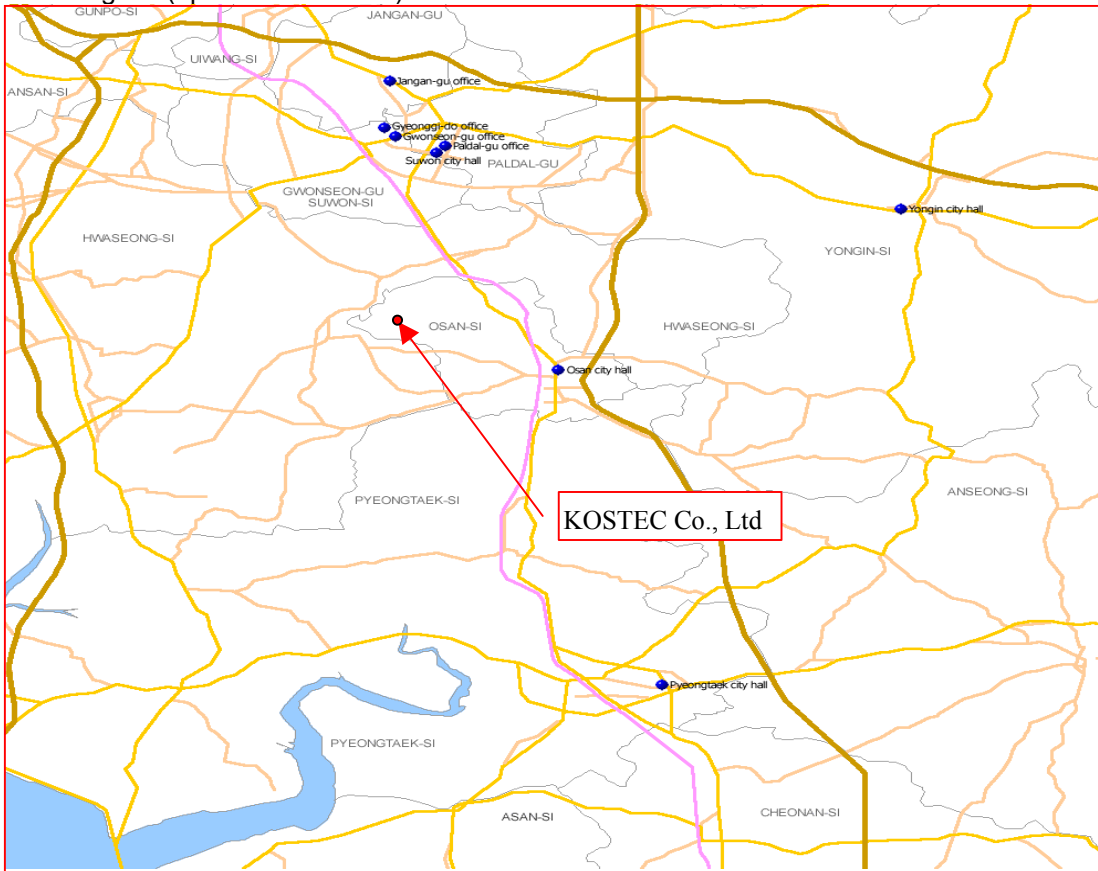
Report reference No: KST-FCC0408

3. MAP

Korea



Hwasung-shi (open area test site)



KOSTEC Co.,Ltd.
180-254,Annyung-Ri, Taeae-Yup, Hwasung-shi, Kyunggi-do, Korea
Tel : +82-31-222-4251 Fax: +82-31-222-4252
<http://www.kostecclab.com>

Page : 5 of 5
May 6, 2004

4. . Facility Environment

Operation Environment

Ambient	<u>Temperature</u> (° C)	<u>Humidity</u> (%)	<u>Pressure (hPa)</u>
10m Open Area site	14.9	45	1004
Shielded room:	21.1	43	1002

Test site

These testing were performed following locations ;

Shielded room : Conducted Emission,

10m Open Area Site: Radiated Emission

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC.

The factors contributing to uncertainties are test receiver, Cable loss, antenna factor calibration, Antenna directivity, antenna factor variation with height, antenna phase center variation, antenna frequency interpolation, measurement distance variation, ite imperfection, mismatch, and system repeatability.

Based on NIS 80,81, The measurement uncertainty level with a 95% confidence level were applied.

sample calculation

Conducted emission

The field strength is calculated by adding the LISN factor, cable loss from the measured reading.

The sample calculation is as follows:

$$\begin{aligned}FS &= MR + LF + CL \\MR &= \text{Meter Reading} \\LF &= \text{LISN Factor} \\CL &= \text{Cable Loss}\end{aligned}$$

If MR is 30dB, LISN Factor 1dB, CL 1dB

The result (MR) is

$$30 + 1 + 1 = 32\text{dBuV}$$

EMC TEST REPORT



Report reference No: KST-FCC0408

5. Description of E.U.T.

Product Description

Manufactured By:	Wellink Corporation
Address:	201 A-Dong, Pundang Technopark 150, Yatop-Dong, Pundang-Gu, Seongnam-Shi, Kyunggi-Do, Korea
Model:	W202ER-4 & 202ER-4
Serial Number:	None

Used Peripherals

Description	Manufacturer	Model / Part #	Serial Number
Personal computer	HP	Pabillion T212k	KRJ32101BH
Monitor	Samsung	PN17LT	P225HVB T600256
Keyboard	HP	5219	BN31719954
Mouse	HP	M042K0	30205141
Printer	HP	C2605A	SG42R1CO5B
Ac/dc adapter	HP	Deskwriter	None
ADSL Modem	Wellink Corporation	W202ER-4 & 202ER-4	None
Ac/dc adapter	DVE	DSA-009F-09A	4603
Telephone	BBK Electronics Corp.,Ltd.	TA318	None

Used cables

Cable Type	Shield	Length (m)	Ferrite	Connector	Connection Point 1	Connection Point 2
POWER	Yes	2.4	-	DC INLET	Ac/dc adapter	EUT
UTP	-	3.0	-	RJ-45	EUT	Hub
UTP	-	3.0	-	RJ-45	EUT	PC
UTP	-	0.8	-	RJ-11	EUT	Telephone
UTP	-	1.8	-	RJ-11	EUT	Tel line of Wall

EMC TEST REPORT



Report reference No: KST-FCC0408

7. TEST RESULTS

7.1 Conducted emission

Measurement procedure

Mains

The measurements were performed in a shielded room. EUT was placed on a non-metallic table height of 0.4m above the reference ground plane. They were folded back and forth forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane.

Each EUT power lead, except ground (safety) lead, were individually connected through a LISN to input power source.

Both lines of power cord, hot and neutral, were measured.

Used equipment

Equipment	Model no.	Serial no.	Makers	Next cal date	Used
Test receiver	ESPI3	100109	R&S	2005.03.15	●
L.I.S.N.	ESH2-Z5	100044	R&S	2005.04.23	●
	ESH2-Z5	100147	R&S	2005.04.23	●

measurement uncertainty

Conducted Emission measurement : ± 2.4 (K=2)

Test Data

FREQ. (MHz)	LEVEL(dB μ V)		LINE Pol	Loss (dB)	LIMIT(dB μ V)		MARGIN(dB μ V)	
	QP	AV			QP	AV	QP	AV
0.202	50.61	42.45	L	0.29	65.57	55.57	15.25	13.41
0.494	45.02	35.52	N	0.29	61.89	51.89	17.16	16.66
0.506	47.28	40.29	L	0.90	56.00	46.00	9.62	6.61
0.802	46.35	36.19	L	0.43	56.00	46.00	10.08	10.24
1.098	46.22	18.34	L	0.44	56.00	46.00	10.22	28.10
5.314	32.80	14.97	N	0.75	60.00	50.00	27.95	35.78
25.002	37.14	32.67	N	2.32	60.00	50.00	25.18	19.65

* Level = test receiver reading value

* Loss = LISN insertion Loss + Cable Loss

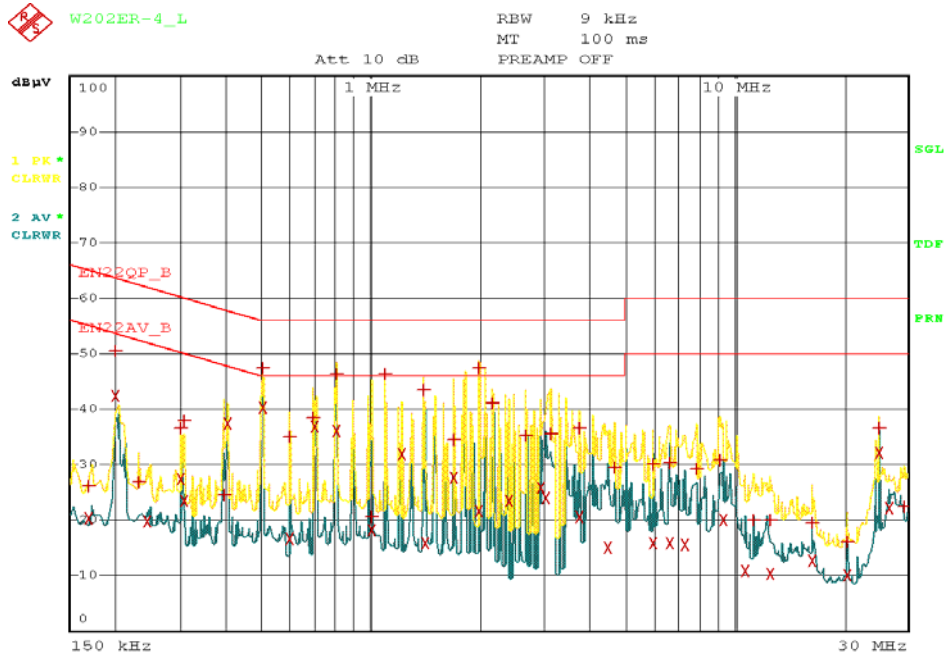
EMC TEST REPORT



Report reference No: KST-FCC0408

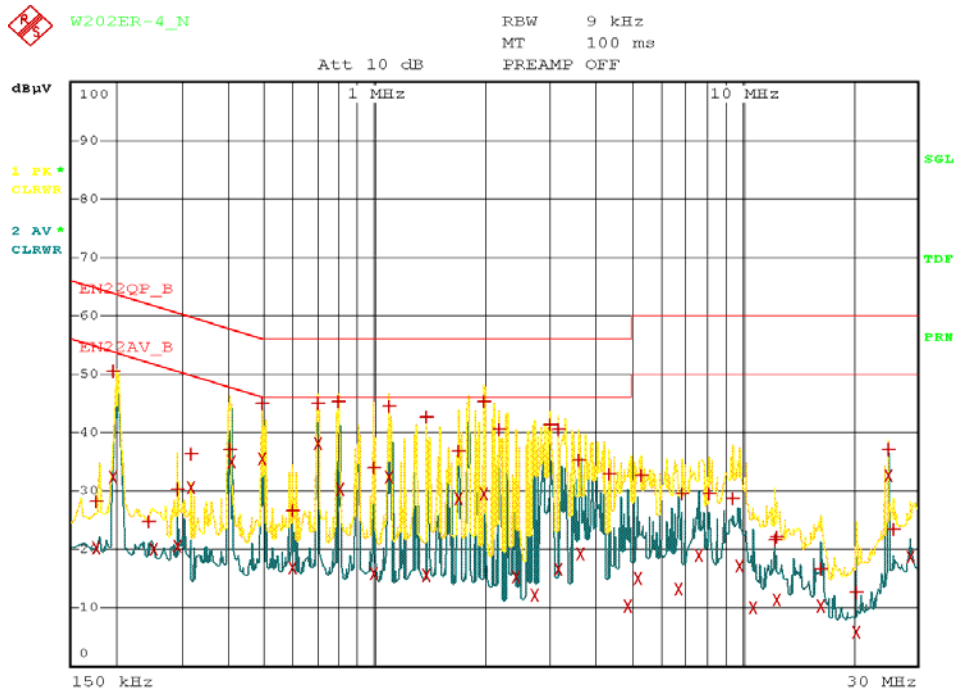
Conducted emission test graph

Line. Live



Date: 3.MAY.2004 12:07:39

Line. Neutral



Date: 3.MAY.2004 12:00:55

EMC TEST REPORT



Report reference No: KST-FCC0408

7.2 Radiated Emission

Measurement procedure

A pretest was performed at 3m distances in a semi-anechoic chamber for searching correct frequency. The final test was done at a 10m open area test site with a quasi-peak detector. EUT was placed on a non-metallic table height of 0.8m above the reference ground plane. Cables connected to EUT were fixed to cause maximum emission. Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

Used equipment

Equipment	Model no.	Serial no.	Makers	Next cal date
Test receiver	ESCS30	100111	R&S	2005.03.17
Ultra broadband antenna	HL562	100075	R&S	2005.03.16
Antenna Mast	AT14	none	Daeil EMC	-
Turn Table	TT15	none	Daeil EMC	-
10m Open area site	none	none	KOSTEC Lab	-
chamber(3m)	none	none	FRANCONIA	-

measurement uncertainty

Radiated Emission measurement : 30-300MHz +3.96dB / -4.04dB
300-1000MHz +3.04dB / -3.00dB

Test Data

Freq (MHz)	Reading (dBuV/m)	P (H/V)	H (m)	A (°)	Antenna (dB)	Cable Loss (dB)	Result (dBuV/m)	Limit (dB)	Margin (dB)
50.00	26.90	V	1.50	90	7.70	2.70	37.30	40.0	2.70
150.00	26.70	H	2.10	180	7.50	4.20	38.40	43.5	5.10
200.00	16.50	H	1.80	360	7.30	5.10	28.90	43.5	14.60
325.00	19.60	H	2.10	120	11.75	6.75	38.10	46.0	7.90
425.00	16.50	H	1.50	180	14.05	7.65	38.20	46.0	7.80
500.00	6.20	H	1.80	180	15.50	7.60	29.30	46.0	16.70
775.00	4.80	V	1.60	120	19.20	10.80	34.80	46.0	11.20

Reading = Test receiver reading / P= antenna Polarization / H=antenna Height

A=turn table Angle / Antenna = antenna factor / Cable loss = used cable loss

Result = reading + antenna + loss / Margin = Limit - result

* Receiving Antenna Mode: Horizontal, Vertical / Test site: 10m Open area site