EMI TEST REPORT

FCC EVALUATION REPORT FOR CERTIFICATION

Korea Standard Technology

Test report No.: KST-FCC0402

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**
Product Name	**:**	**ADSL Modem**
Model Number(s)	**:**	**W202ER & W202ES & W202 & W708EUR & W708EU & W708**
Product Options	**:**	**Class II Permissive Change of Presently Authorized Equipment**
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 : January 17 , 2004

Tested by: Kim, Ha-Hyoung

Approved by: Lee, Woen-woo

Contents

1. Description of Device

1) Kind of equipment:	ADSL Modem
2) FCC ID:	PWVW202ER
3) Model Name:	W202ER & W202ES & W202 W708EUR & W708EU & W708
4) Serial No.:	None
5) Type of Sample Tested:	Pre-production / addition & alteration of parts(component)
6) High Frequency Used:	25.000MHz 17.280MHz
7) Adapter	Model name: DSA-009F-09A Manufacturer: DVE. Serial no: 4303
8) Power Rating:	1phase AC100-240V, A, 50/60Hz Output: DC 5V, 1.2A
9) Tested Power supply:	1phase AC110V, 60Hz
10) Date of Manufacture:	January 2004
11) Manufacture:	Wellink Corporation
12) Description of Operating:	Use to direct spread spectrum transmitters & hyper-terminal for data transmission
13) Dates of Test:	January 12, 2004
14) Place of Tests:	Korea Standard Technology EMC site
15) Test Report No:	KST-FCC0402

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, Taean-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**

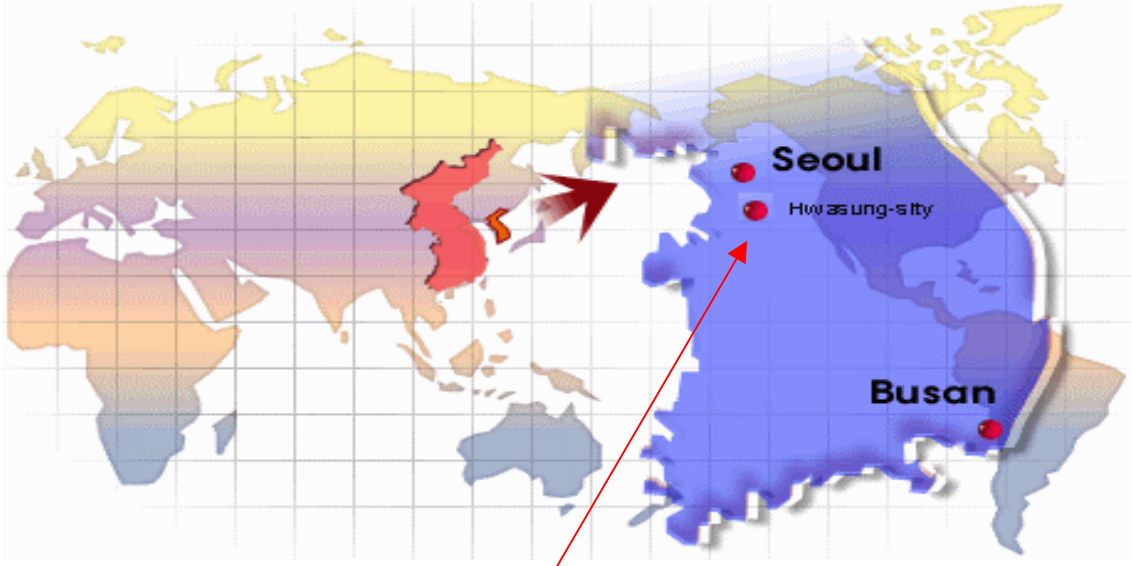
FCC Filing No. : **525762**

VCCI Membership Number : **2005**

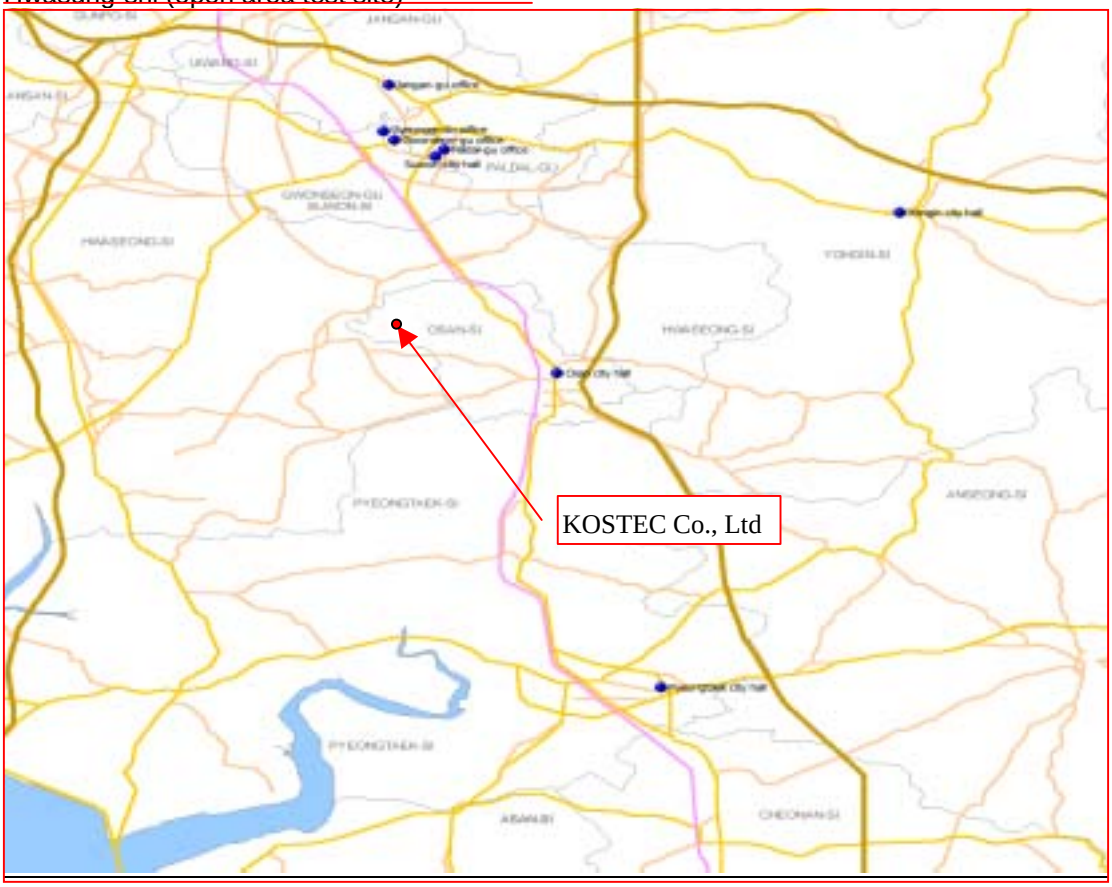
VCCI Registration Number : **R-1657 / C-1763**

3. MAP

Korea



Hwasung-shi (open area test site)



4. . Facility Environment

Operation Environment

Ambient	Temperature (° C)	Humidity (%)	Pressure (hPa)
10m Open Area site	2.5	34	1020
Shielded room:	16.9	39	1019

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:

FS = MR + LF + CL
MR = Meter Reading
LF = LISN Factor
CL = Cable Loss

If MR is 30dB, LISN Factor 1dB, CL 1dB
The result (MR) is
30 + 1 + 1 = 32dBuV

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 & W202ES & W202 & W708EUR & W708EU & W708**
Serial Number:	**None**

Used Peripherals

Description	Manufacturer	Model / Part #	Serial Number
Personal computer	HP	Pabilion T212k	KRJ32101BH
Monitor	Samsung	PN17LT	P225HVBT600318
Keyboard	HP	5219	BN31719954
Mouse	HP	M042K0	30205141
Printer	HP	C2644A	SG55M1BORN
Ac/dc adapter	Samsung Electronics	YK-30083K	None
ADSL Modem	**Wellink Corporation**	**W708EUR**	**None**
Ac/dc adapter	DVE	DSA-009F-09A	4303
Telephone	BBK Electronics Corp.,Ltd.	TA318	None

Used cables

Cable Type	Shield	Length (m)	Ferrite	Connector	Connection Point 1	Connection Point 2
POWER	Yes	1.0	-	DC INLET	Ac/dc adapter	EUT
UTP	-	3.0	yes	RJ-45	EUT	Hub
USB	Yes	1.2	-	USB	EUT	PC
UTP	-	1.5	-	RJ-11	EUT	Telephone
UTP	-	3.0	-	RJ-11	EUT	Tel line of Wall

4.3 Operating conditions

The operating mode/system were as follows in details:

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	2004.03.11	●
L.I.S.N.	ESH2-Z5	100044	R&S	2004.04.25	●
	ESH2-Z5	100147	R&S	2004.04.25	●

measurement uncertainty

Conducted Emission measurement : ± 2.4 (K=2)

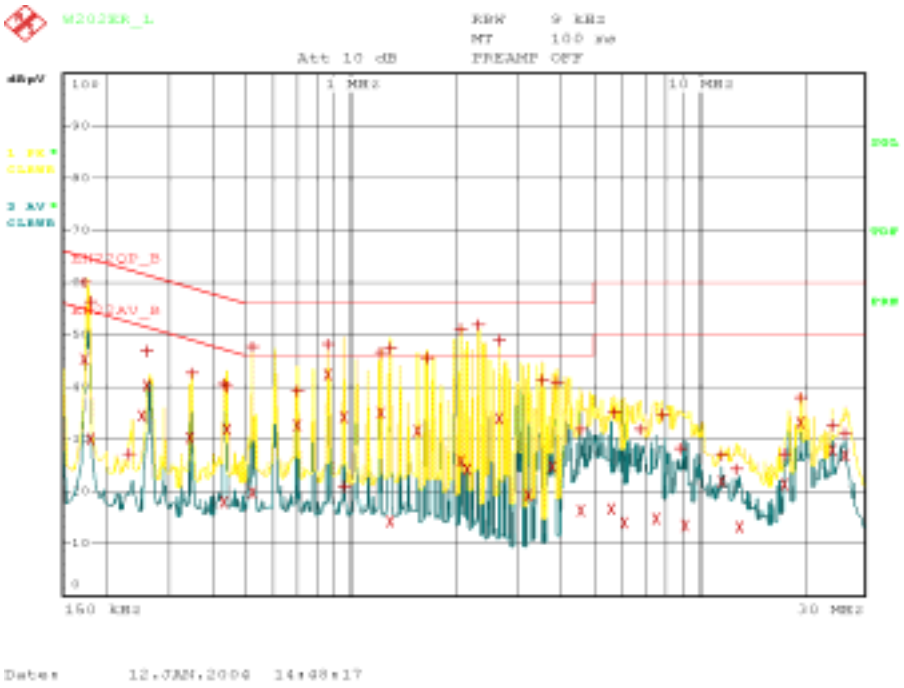
Test Data

FREQ.	LEVEL(dBμV)		LINE	Loss	LIMIT(dBμV)		MARGIN(dBμV)	
(MHz)	QP	AV	Pol	(dB)	QP	AV	QP	AV
0.174	59.90	45.10	L	0.08	65.57	55.57	5.75	10.55
0.262	46.78	40.39	L	0.29	61.89	51.89	15.40	11.79
0.442	45.60	38.54	N	0.29	59.66	49.66	14.35	11.41
1.234	48.89	14.66	N	0.44	56.00	46.00	7.55	31.78
2.334	51.82	33.10	L	0.57	56.00	46.00	4.75	13.47
7.442	36.33	16.95	N	1.20	60.00	50.00	24.87	34.25
19.710	37.99	34.15	L	1.77	60.00	50.00	23.78	17.62

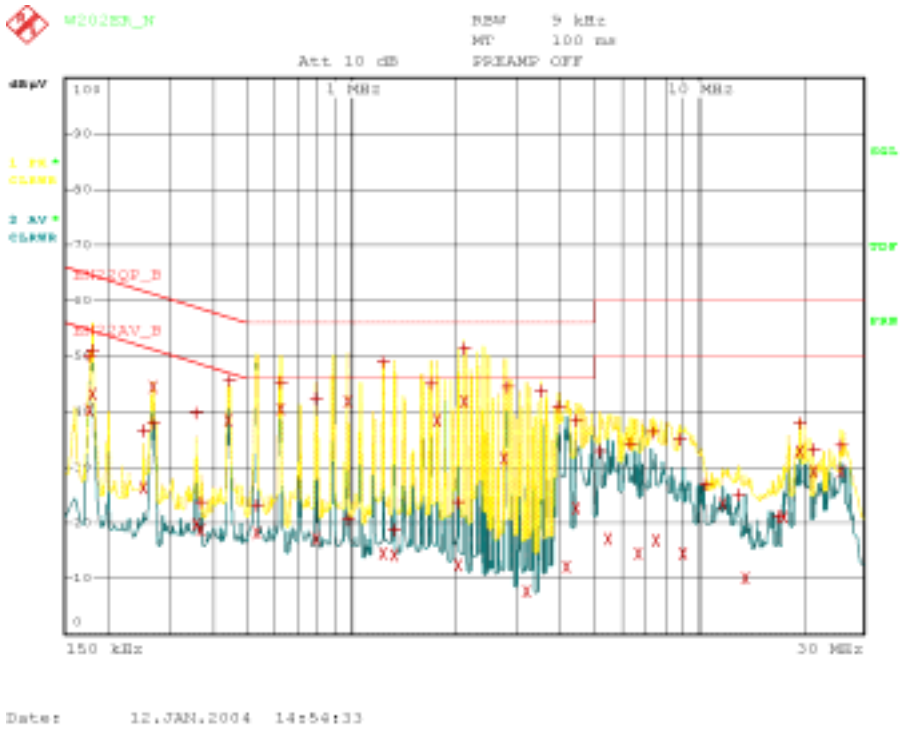
* Level = test receiver reading value
* Loss = LISN insertion Loss + Cable Loss

Conducted emission test graph

Line. Live



Line. Neutral



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	2004.03.17
Ultra broadband antenna	HL562	100075	R&S	2004.03.18
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	17.40	V	1.50	90	7.70	2.70	27.80	40.0	12.20
75.00	24.00	V	1.50	100	7.70	3.00	34.70	40.0	5.30
125.00	20.60	H	3.60	90	9.20	3.90	33.70	43.5	9.80
225.00	21.20	H	3.50	90	8.60	5.00	34.80	46.0	11.20
275.00	21.13	H	3.30	180	10.20	6.17	37.50	46.0	8.50
325.00	16.90	H	3.20	90	11.75	6.75	35.40	46.0	10.60
500.00	12.70	H	2.60	270	15.50	7.60	35.80	46.0	10.20

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