

## FCC EVALUATION REPORT FOR CERTIFICATION

*Korea Standard Technology*

*Test report No.: KST-FCC0308*

**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** : 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.

**Date:** 2003.08.6

**Issue Date :** 2003.8.9

**Tested by:**



Kim, Ha-Hyoung

**Approved by:**



Lee, Woen-woo

# EMC TEST REPORT

Report reference No: KST-FCC0308



## 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-FCC0308

## 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
6) High Frequency Used:	25.000MHz 17.280MHz
7) Adapter	Model name: BPA-069A Manufacturer: InterCom Co.,Ltd. Serial no: BA32000567
8) Power Rating:	1phase AC100-240V, A, 50/60Hz Output: DC 5V, 1.2A
9) Tested Power supply:	1phase AC120V, 60Hz
10) Date of Manufacture:	August 2003
11) Manufacture:	Wellink Corporation
12) Description of Operating:	Use to hyper-terminal for data transmission
13) Dates of Test:	August 6, 2003
14) Place of Tests:	Korea Standard Technology EMC site
15) Test Report No:	KST-FCC0308

# EMC TEST REPORT



Report reference No: KST-FCC0308

## 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**

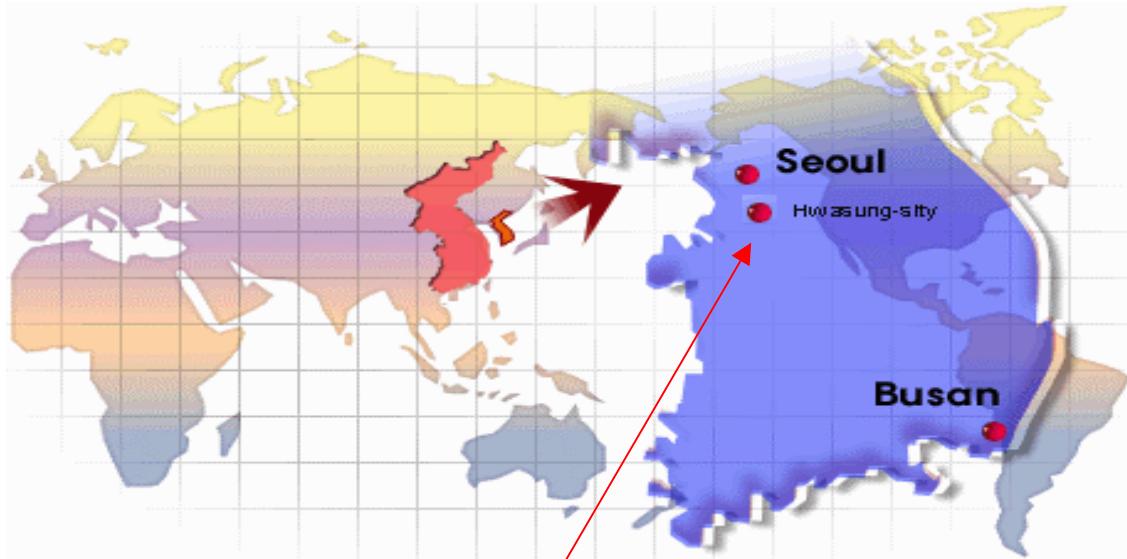
# EMC TEST REPORT



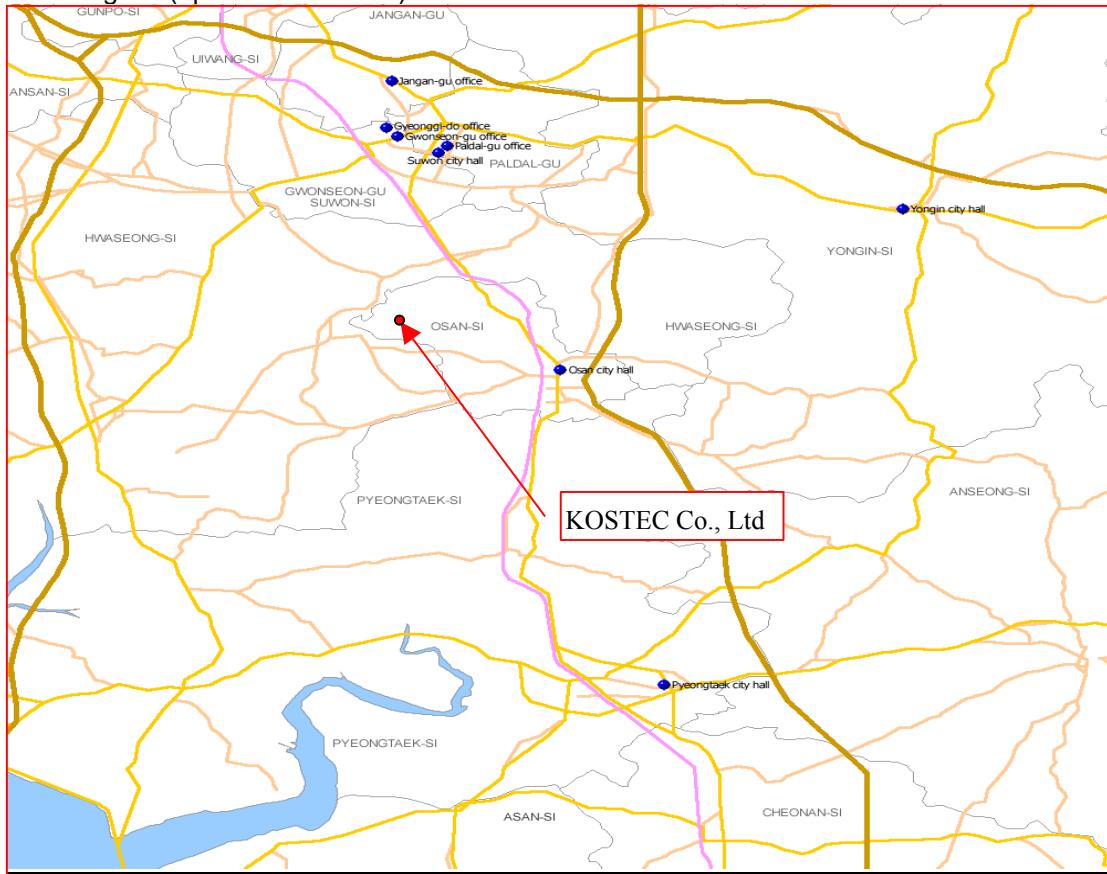
Report reference No: KST-FCC0308

## 3. MAP

Korea



Hwasung-shi (open area test site)



# EMC TEST REPORT



Report reference No: KST-FCC0308

## 4. . Facility Environment

### Operation Environment

Ambient	<u>Temperature</u> ( ° C )	<u>Humidity</u> ( % )	<u>Pressure</u> ( hPa )
10m Open Area site	28.1	45	1004
Shielded room:	24.5	42	1005

### 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

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

# EMC TEST REPORT



Report reference No: KST-FCC0308

## 5. Description of E.U.T.

### Product Description

Manufactured By:	<b>Wellink Corporation</b>
Address:	<b>201 A-Dong, Pundang Technopark 150, Yatop-Dong, Pundang-Gu, Seongnam-Shi, Kyunggi-Do, Korea</b>
Model:	<b>W202ER &amp; W202ES &amp; W202 &amp; W708EUR &amp; W708EU &amp; W708</b>
Serial Number:	<b>None</b>

### Used Peripherals

Description	Manufacturer	Model / Part #	Serial Number
Personal computer	Hanmi	TH-901	None
LCD Monitor	Shenyang Bigtide Direction Group Co.,Ltd.	HL1530A	DRSN1032700002
Keyboard	Samsung	SEM-DT35	19063587
Mouse	Logitech	M-S48a	HCA13088418
Printer	HP	C2644A	SG55M1BORN
Ac/dc adapter	Samsung Electronics	YK-30083K	None
<b>ADSL Modem</b>	<b>Wellink Corporation</b>	<b>202ER</b>	<b>None</b>
Ac/dc adapter	Shenzhen Huill Electronic Co.,Ltd.	FSP048-1AD101C	H0045355
Ac/dc adapter	InterCom Co.,Ltd.	BPA-069A	BA32000567
Telephone	BBK Electronics Corp.,Ltd.	TA318	None

### Used cables

Cable Type	Shield	Length (m)	Ferrite	Connector	Connection Point 1	Connection Point 2
POWER Line	Yes	1.0	-	DC INLET	Ac/dc adapter	EUT
UTP	-	3.0	yes	RJ-45	EUT	Hub
UTP	-	1.2	-	RJ-45	EUT	PC
Signal	Yes	1.0	-	RS232	EUT	PC
UTP	-	1.5	-	RJ-11	EUT	Telephone
UTP	-	3.0	-	RJ-11	EUT	Tel line of Wall

# EMC TEST REPORT



Report reference No: KST-FCC0308

## 4.3 Operating conditions

The operating mode/system were as follows in details:

Operating : After Connected from Hub to LAN port of E.U.T. by UTP cable(RJ-45 to RJ-45) And connected from E.U.T to PC by Serial cable & UTP cable(RJ-45). And connected from TEL line of wall to E.U.T. by UTP cable(RJ-11) And connected from E.U.T to Telephone by UTP cable(RJ-11). And then use to hyper-terminal program for data transmission.

## 4.4 Test Configuration of E.U.T. (Example)



## 6. Summary of Test Results

Modification to the E.U.T.

- None.

Result : - **PASS**

# EMC TEST REPORT



Report reference No: KST-FCC0308

## 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 :  $\pm 2.4$  (K=2)

#### Test data

FREQ. (MHz)	LEVEL(dB $\mu$ N)		LINE Pol	Loss (dB)	LIMIT(dB $\mu$ N)		MARGIN(dB $\mu$ N)	
	QP	AV			QP	AV	QP	AV
0.198	49.73	44.71	L	0.08	65.57	55.57	15.92	10.94
0.266	45.62	43.39	L	0.29	61.89	51.89	16.56	8.79
0.462	40.76	38.78	N	0.29	59.66	49.66	19.19	11.17
2.050	44.34	41.99	L	0.57	56.00	46.00	12.23	4.58
3.306	44.01	42.76	L	0.62	60.00	50.00	16.61	7.86
7.070	39.30	36.20	L	1.20	60.00	50.00	21.90	15.00
23.202	38.22	27.83	N	2.08	60.00	50.00	23.86	24.25

\* Level = test receiver reading value

\* Loss = LISN insertion Loss + Cable Loss

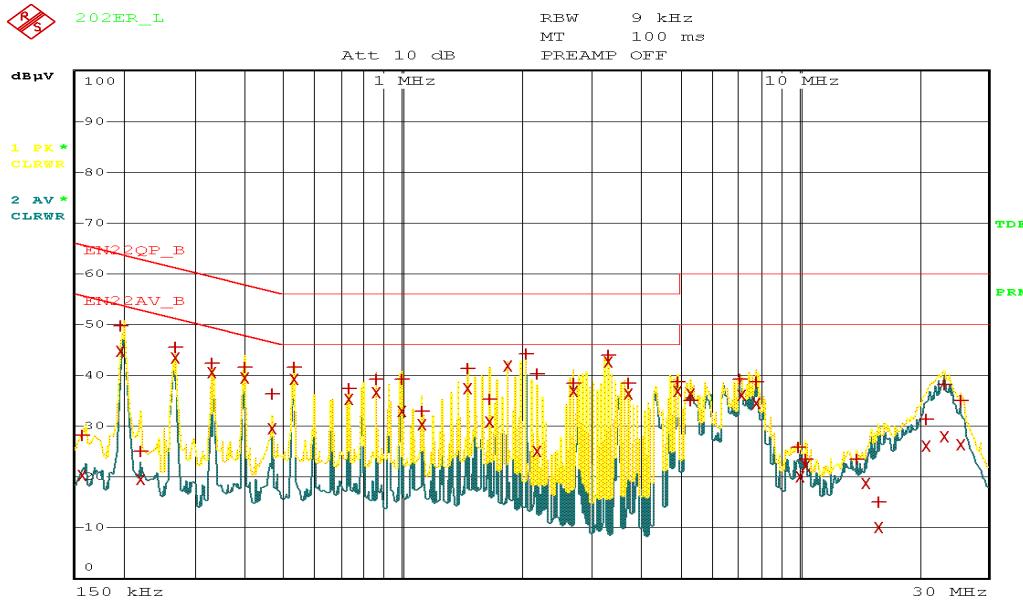
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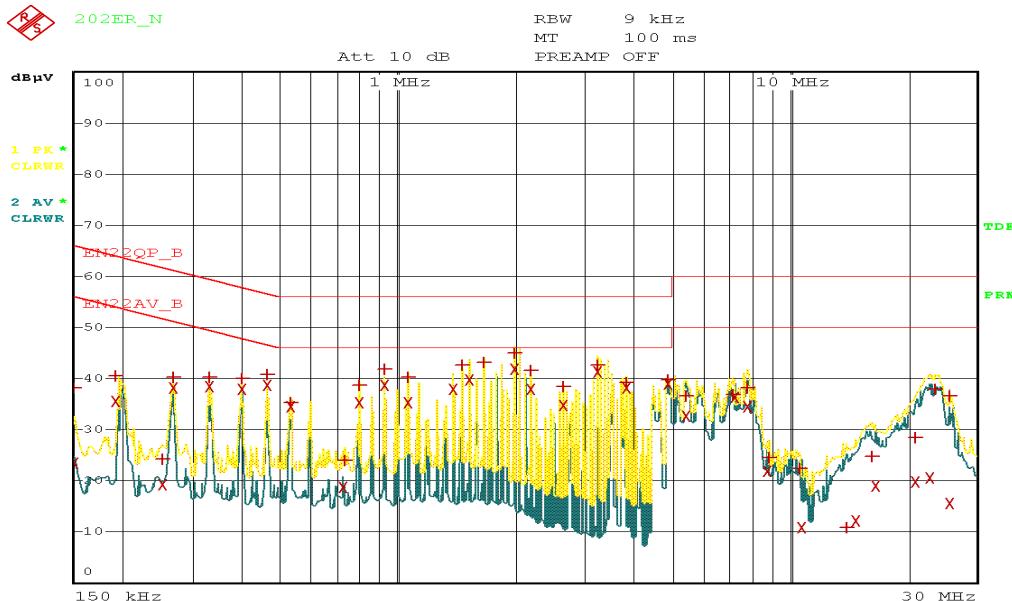
Report reference No: KST-FCC0308

## Conducted emission test graph

Line. Live



Line. Neutral



# EMC TEST REPORT



Report reference No: KST-FCC0308

## 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 chamber(3m)	none	none	KOSTEC Lab	-
	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)
47.98	19.00	H	3.80	90	9.40	2.70	31.10	40.0	8.90
129.86	22.04	H	3.70	270	8.80	4.06	34.90	43.5	8.60
199.80	21.96	V	1.80	260	7.28	5.06	34.30	43.5	9.20
240.44	21.60	V	2.00	250	9.10	5.20	35.90	46.0	10.10
367.49	16.96	H	3.30	270	12.67	7.17	36.80	46.0	9.20
400.90	17.90	H	3.00	90	13.50	7.40	38.80	46.0	7.20
668.17	12.08	H	2.60	90	18.14	9.68	39.90	46.0	6.10

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