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ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR FCC CLASS B CERTIFICATION

Test report file number : E017R-024

Applicant : RECSOL I&C Co., Ltd.

Address : F6. Hanna B/D, 123 Kwangjang-Dong, Kwangjin-Gu, Seoul, 143-210, Korea

Manufacturer : HYUNDAI NETWORK, INC.

Address : San 136-1, Ami-Ri, Bubal-Eub, Icheon-Si, Kyungki-Do, Korea

Type of Equipment : ADSL MODEM

FCC ID : O7URECSPEED-8000E

Model / Type No. : RECSPEED-8000E

Serial number : N/A

Total page of Report : 13 pages (including this page)

Date of Incoming : July 12, 2001

Date of issuing : July 16, 2001

SUMMARY

The equipment complies with the regulation; *FCC CFR 47 PART 15 SUBPART B, Class B.*

This test report contains only the result of a single test of the sample supplied for the examination.

It is not a general valid assessment of the features of the respective products of the mass-production.

Reviewed by: 

Y. K. Nam / Assist. Chief Engineer
EMC Dept.

Approved by: 

Y. K. Kwon / Chief Engineer
EMC Dept.



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1. CERTIFICATION OF COMPLIANCE

APPLICANT : RECSOL I&C Co., Ltd.
ADDRESS : F6. Hanna B/D, 123 Kwangjang-Dong, Kwangjin-Gu, Seoul, 143-210, Korea
CONTACT PERSON : Jae-Ho, Shim / General Manager
TELEPHONE NO : 82-2-575-2700 (Ext:140)
FCC ID : O7URECSPEED-8000E
MODEL NO/NAME : RECSPEED-8000E
SERIAL NUMBER : N/A
DATE : July 16, 2001

DEVICE TYPE	Peripheral Device for Class B Computing Device -Unintentional Radiator
E.U.T. DESCRIPTION	ADSL MODEM
THIS REPORT CONCERNS	ORIGINAL GRANT
MEASUREMENT PROCEDURES	ANSI C63.4/1992
TYPE OF EQUIPMENT TESTED	PRE-PRODUCTION
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	CERTIFICATION
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC CFR47 PART 15 Section 15.101
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	No
FINAL TEST WAS CONDUCTED ON	3 METER OPEN AREA TEST SITE

The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.



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2. GENERAL INFORMATION**2.1 Product Description**

The RECSOL I&C Co., Ltd., Model RECSPEED-8000E (referred to as the EUT in this report) is an ADSL MODEM, which is provide high speed for internet and other multimedia service over the existing phone line and enables the user to access to the phone during the use of high speed internet service and simple to install and easy to connect with the service provider to get faster service. Product specification described herein was obtained from product data sheet or user's manual.

LIST OF EACH OSC. OR CRY. FREQ.(FREQ.>=1MHz)	20.00MHz, 35.328MHz, 5.0MHz
POWER REQUIREMENT	Input : AC 100V-240V, 1A, 50/60Hz, Output : DC 5V/1.5A, 12V/0.1A
NUMBER OF LAYERS	6 Layers
NO. OF EXTERNAL CONNECTOR	DC Input port for power, Console port for customer's maintenance, 10Base-T port for connect to LAN of PC, ADSL port for line and telephone

Model Differences:

- . The following list consists of added model name and their difference. The basic and added models are identical except for model name.

	Model Name	Model Difference
Basic Model Name	RECSPEED-8000E	N/A
Added Model Name	DW-8000E	Buyer name is Daewoo Corporation

2.2 Related Submittal(s) / Grant(s)

Original submittal only

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2.3 Test System Details

The model numbers for all the equipments which were used in the tested system is:

Model	Manufacturer	FCC ID	Description	Connected to
RECSPEED-8000E	RECSOL I&C Co., Ltd.	O7URECSPEED-8000E	ADSL MODEM (EUT)	PC
CP-407	Hyundai Network, Inc.	N/A	AC/DC Adapter	EUT
DCM	Dell Computer Corp	DoC	PC	N/A
AV-5T	KDS	EVOKD-1510T	MONITOR	PC
SKR-1032	SEJIN Elec	GJJSKR-1032B	KEYBOARD	PC
OK-520	A4-TECH	DOC	MOUSE	PC
2225C	HP	DSI6XU2225	PRINTER	PC
OK86670	Fujitsu Micro ELEC	N/A	Centrol Office (CO)	EUT
CK-2702S	JUNGPOONG	N/A	TELEPHONE	EUT

2.4 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4/1992. Radiated testing was performed at a distance of 3 meters from EUT to the antenna.

2.5 Test Facility

The open area test site and conducted measurement facilities are located on at 426-1 Daessangryung-Ri, Chowol-Myun, Kwangju-Kun, Kyunggi-Do 464-080 Korea. Description details of test facilities were submitted to the Commission on January 12, 1999. (Registration Number: 92819)



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3. SYSTEM TEST CONFIGURATION

3.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
Main Board	RECSOL I&C Co., Ltd.	3042000832	N/A

3.2 EUT exercise Software

The line port of the EUT was connected to the control office device(CO) which was installed in the test room, and the Ethernet 10Base-T port of the EUT was connected to the Personal Computer. The data from CO and/or PC were transmitted and received through the EUT using “ping-t” program during the testing.

3.3 Cable Description

	Power Cord Shielded (Y/N)	I/O cable Shielded (Y/N)	Length (M)
ADSL MODEM (EUT)	N	N	1.5(P), 30.0(D)
AC/DC ADAPTER	N	N/A	1.0(P)
PC	N	-	1.5(P)
MONITOR	N	Y	1.5(P), 1.8(D)
KEYBOARD	N/A	Y	1.5(D)
MOUSE	N/A	Y	1.5(D)
TELEPHONE	N/A	N	1.2(D)
Control Office (CO)	N	N	1.5(P), 30.0(D)
PRINTER	N	Y	1.5(P), 1.5(D)

* The marked “(P)” means the Power Cable, “(D)” means the Data cable.



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3.4 Noise Suppression Parts on Cable

	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
ADSL MODEM (EUT)	N	N/A	N	N/A
AC/DC ADAPTER	Y	EUT END	Y	EUT END
PC	N	N/A	-	-
MONITOR	N	N/A	Y	PC END
KEYBOARD	N	N/A	Y	PC END
MOUSE	N	N/A	Y	PC END
TELEPHONE	N	N/A	N	N/A
Control Office (CO)	N	N/A	N	N/A
PRINTER	N	N/A	Y	BOTH END

3.5 Equipment Modifications

To achieve compliance to CLASS B levels, the following change(s) was made by ONETECH Corp. during compliance testing:

“Not Applicable”

3.6 Configuration of Test System

Line Conducted Test: The AC/DC Adapter for the EUT was connected to LISN. All supporting equipments were connected to another LISN. Preliminary power line conducted emission test was performed by using the procedure in ANSI C63.4/1992 7.2.3 to determine the worse operating conditions.

Radiated Emission Test: Preliminary radiated emission test was conducted using the procedure in ANSI C63.4/1992 8.3.1.1 to determine the worse operating conditions. Final radiated emission test was conducted at 3 meters open area test site.



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4. PRELIMINARY TEST

4.1 AC Power line Conducted Emission Test

During Preliminary Test, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
Standby Mode	
Continuously transferring data between CO and PC through EUT	X

4.2 Radiated Emission Test

During Preliminary Test, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
Standby Mode	
Continuously transferring data between CO and PC through EUT	X



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5. FINAL RESULT OF MEASUREMENT

Preliminary test was done in normal operation mode. And the final measurement was selected for the maximized emission level

5.1 Conducted Emission Test

Humidity Level : 42 %

Temperature : 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.107

Type of Test : CLASS B

Result : PASSED BY -7.23 dB at 15.26 MHz

EUT : ADSL MODEM

Date: July 14, 2001

Operating Condition : Continuously transferring data between Central Office and PC through EUT

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

Power Line Conducted Emission			FCC CLASS B	
Frequency (MHz)	Amplitude (dBuV)	Conductor	Limit (dBuV)	Margin (dB)
0.52	34.34	HOT	48.00	-13.66
0.62	40.71	NEUTRAL	48.00	-7.29
2.07	35.97	NEUTRAL	48.00	-12.03
5.08	37.45	NEUTRAL	48.00	-10.55
15.26	40.77	HOT	48.00	-7.23
22.63	40.57	HOT	48.00	-7.43
29.45	39.13	NEUTRAL	48.00	-8.87

Line Conducted Emission Tabulated Data



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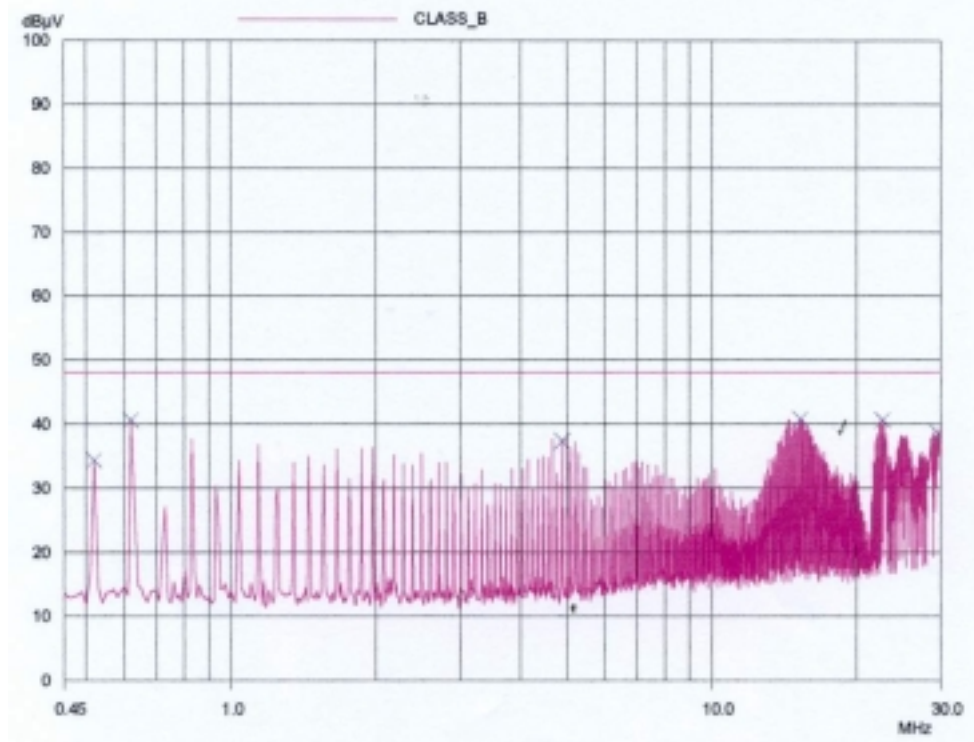
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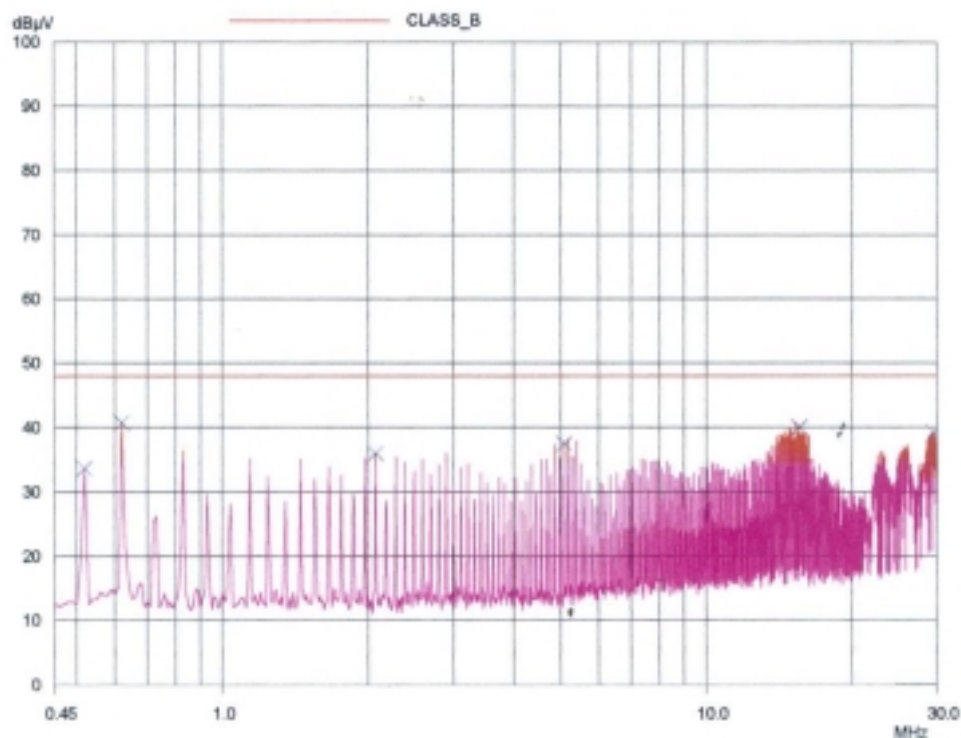
Tested by: Seung-Hyun, Nam / Test Engineer



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HOT LINE



NEUTRAL LINE

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FCC-004 (Rev.0)

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(TEL: 82-31-746-8500 FAX: 82-31-746-8700)

EMC Testing Dept : 426-1 Daeangryong-Ri Chowol-Myun Kwangju-Kun Kyunggi-Do 464-860 Korea (TEL: 82-31-765-8289 FAX: 82-31-766-2904)



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5.2 Radiated Emission Test

The following table shows the highest levels of radiated emission on both polarizations of horizontal and vertical.

Humidity Level : 45 % Temperature : 25 °C
 Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109
 Type of Test : CLASS B
 Result : PASSED BY – 5.15dB at 53.65 MHz

EUT : ADSL MODEM Date: July 12, 2001
 Operating Condition : Continuously transferring data between Central Office and PC through EUT
 Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)
 Distance : 3 Meter

Radiated Emission		Ant	Correction Factors		Total	FCC CLASS B	
Freq. (MHz)	Amp. (dBuV)	Pol.	Ant. (dBuV/m)	Cable (dB)	Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
53.65	23.00	V	10.88	0.97	34.85	40.00	-5.15
62.15	21.50	V	9.18	0.99	31.67	40.00	-8.33
100.61	19.00	V	11.90	1.15	32.05	43.50	-11.45
130.25	19.40	V	12.99	1.26	33.65	43.50	-9.85
135.47	20.40	V	12.81	1.29	34.50	43.50	-9.00
151.85	17.40	V	13.54	1.36	32.30	43.50	-11.20
248.40	18.60	H	12.34	1.82	32.76	46.00	-13.24

Radiated Emission Tabulated Data

Tested by: Seung-Hyun, Nam / Test Engineer



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6. FIELD STRENGTH CALCULATION

Meter readings are compared to the specification limit correcting for antenna and cable losses

+ Meter reading (dBuV)

+ Cable Loss (dB)

+ Antenna Factor (Loss) (dB/meter)

= Corrected Reading (dBuV/meter)

- Specification Limit (dBuV/meter)

= dB Relative to Spec (+/- dB)



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7. LIST OF TEST EQUIPMENT

No.	EQUIPMENTS	MFR.	MODEL	SER. NO.	LAST CAL	DUE CAL	USE
1.	Test receiver	R/S	ESVS 10	827864/005	OCT/00	12MONTH	
2.	Test receiver	R/S	ESHS10	834467/007	APR/01	12MONTH	
3.	Spectrum analyzer	HP	8568B	3026A0226	SEP/00	12MONTH	
4.	RF preselector	HP	85685A	3107A01264	SEP/00	12MONTH	
5.	Quasi-Peak Adapter	HP	85650A	3107A01542	SEP/00	12MONTH	
6.	Dipole Antenna	EMCO	3121C	9107-745	JUN/00	12MONTH	
7.	Biconical antenna	EMCO	3104C	9109-4441 9109-4443 9109-4444	MAR/01	12MONTH	
8.	Log Periodic antenna	EMCO	3146	9109-3213 9109-3214 9109-3217	JUN/01	12MONTH	
9.	LISN	EMCO	3825/2	9109-1867 9109-1869	JUN/01	12MONTH	
10.	RF Amplifier	HP	8447F	3113A04554	JUN/01	N/A	
11.	Spectrum Analyzer	HP	8591A	3131A02312	APR/01	12MONTH	
12.	Computer System	HP	98581C	98543A	N/A	N/A	
	Hard disk drive		9153C	CMC762Z9153	N/A	N/A	
13.	Plotter	HP	7475A	30052 22986	N/A	N/A	
14.	Position Controller	EMCO	1090	9107-1038	N/A	N/A	
15.	Turn Table	EMCO	1080-1.21	9109-1576	N/A	N/A	
16.	Antenna Master	EMCO	1070-1	9109-1624	N/A	N/A	

Remark: "■" means used equipment.