



ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR FCC CLASS B CERTIFICATION

Test report file number : E024R-062

Applicant : HANNAE Technology Co., Ltd.

Address : Hyunjin Bldg, 4th Fl 798-30, Yeoksam-Dong, Kangnam-Ku, Seoul, Korea

Manufacturer : IL JIN Telecom Electronics Co., Ltd.

Address : #San 26 Gusu-Ri, Baegkok-Myun, Jincheon-Kun, Chungbuk, Korea

Type of Equipment : IAD (Integrated Access Device)

FCC ID : QBXVDL7400S

Model / Type No. : VDL7400S

Serial number : N/A

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

Date of Incoming : April 1, 2002

Date of issuing : April 24, 2002

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: Yoon Koon Nam
Y. K. Nam / Assist. Chief Engineer
EMC Dept.

Approved by: Y. K. Kwon
Y. K. Kwon / Chief Engineer
EMC Dept.

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ONETECH Corp.

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1. VERIFICATION OF COMPLIANCE

APPLICANT : HANNAE Technology Co., Ltd.
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 CONTACT PERSON : Taesan Park / Team Manager
 TELEPHONE NO : +82-2-553-7802
 FCC ID : QBXVDL7400S
 MODEL NO/NAME : VDL7400S
 SERIAL NUMBER : N/A
 DATE : April 24, 2002

DEVICE TYPE	Peripheral Device for Class B Computing Device -Unintentional Radiator
E.U.T. DESCRIPTION	IAD (Integrated Access Device)
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 HANNAE Technology Co., Ltd., Model VDL7400S (referred to as the EUT in this report) is an IAD (Integrated Access Device) using G.SHDSL, which is provide high speed for network access solution by integrating multiple voice phone service and data service by using a pair of copper wire. This equipment is located on subscriber's party who requires voice or data. 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, 25.00MHz, 34.56MHz, 64.00MHz
POWER REQUIREMENT	AC100/240V, 50/60Hz, 0.4A, 33W/DC5,12,-30,-70V from AC/DC Adapter
DSL TYPE	G.SHDSL
NUMBER OF LAYERS	6 Layers
NO. OF EXTERNAL CONNECTOR	RJ-11 1Port, RS-232C 1Port, Ethernet 1Port, Phone 4Port

Model Differences:

-. None

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
VDL7400S	HANNAE Technology Co., Ltd.	QBXVDL7400S	IAD (Integrated Access Device) (EUT)	PC
PMR-2034AC	Power-M Co., Ltd.	N/A	AC/DC Adapter	EUT
Dream Book	Sambo Computer	DoC	Note PC	N/A
ADP-50SB	Asustek Computer Inc.	N/A	AC/DC Adapter	Note PC
2225C	HP	DSI6XU2225	PRINTER	PC
OK86670	Fujitsu Micro ELEC	N/A	Centrol Office (CO)	EUT
GS-460	LG Elec.	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-Si, Kyounggi-Do, 464-080, Korea. Description details of test facilities were submitted to the Commission on January 18, 2002. (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	Dae Duck Elec.	MMS-R2	N/A

3.2 EUT exercise Software

The connection status about each port on the EUT and peripheral equipments were follow as;

The line port on the EUT was connected to the Centrol Office device (CO), which was installed in the test room with other computer, and the Ethernet port on the EUT was connected to LAN port on the Note PC for data communication, and the RS-232C port on the EUT was connected to Com port on the Note PC, and a phone port was connected to a telephone and other 3 Phone ports on the EUT were terminated with 600 ohms. The data from CO and/or Note 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)
IAD (Integrated Access Device) (EUT)	N	N	1.5(P), 30.0(D)
AC/DC ADAPTER	N	N/A	1.0(P)
NOTE PC	N	-	1.5(P)
AC/DC ADAPTER	N	N/A	1.0(P)
TELEPHONE	N/A	N	1.2(D)
Centrol 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
IAD (Integrated Access Device) (EUT)	N	N/A	Y	EUT END
AC/DC ADAPTER	N	N/A	Y	EUT END
NOTE PC	N	N/A	-	-
AC/DC ADAPTER	Y	PC END	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 power of 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 Note 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 Note PC through EUT	X



document property name.

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 : 40 %

Temperature : 21 °C

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

Type of Test : CLASS B

Result : PASSED BY -9.42 dB at 21.66 MHz

EUT : IAD (Integrated Access Device)

Date: April 15, 2002

Operating Condition : Continuously transferring data between Central Office and Note 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)
0.51	36.54	HOT	48.00	-11.46
0.77	30.94	NEUTRAL	48.00	-17.06
1.92	29.93	NEUTRAL	48.00	-18.07
8.71	36.69	NEUTRAL	48.00	-11.31
21.66	38.58	NEUTRAL	48.00	-9.42
29.79	36.77	HOT	48.00	-11.23

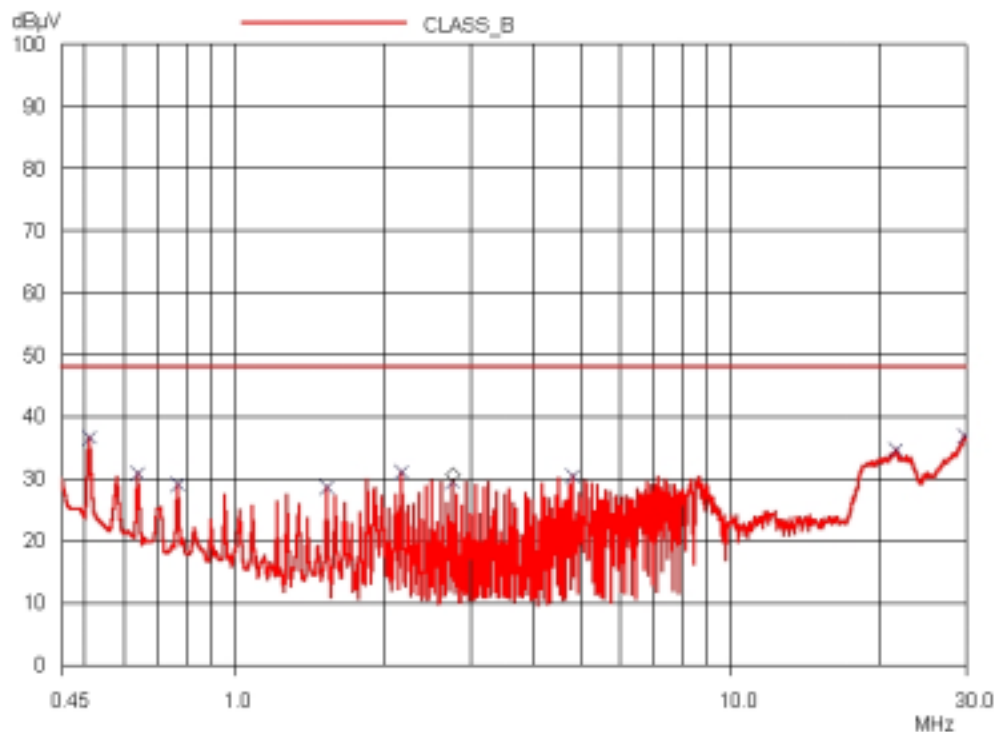
Line Conducted Emission Tabulated Data

document property name.

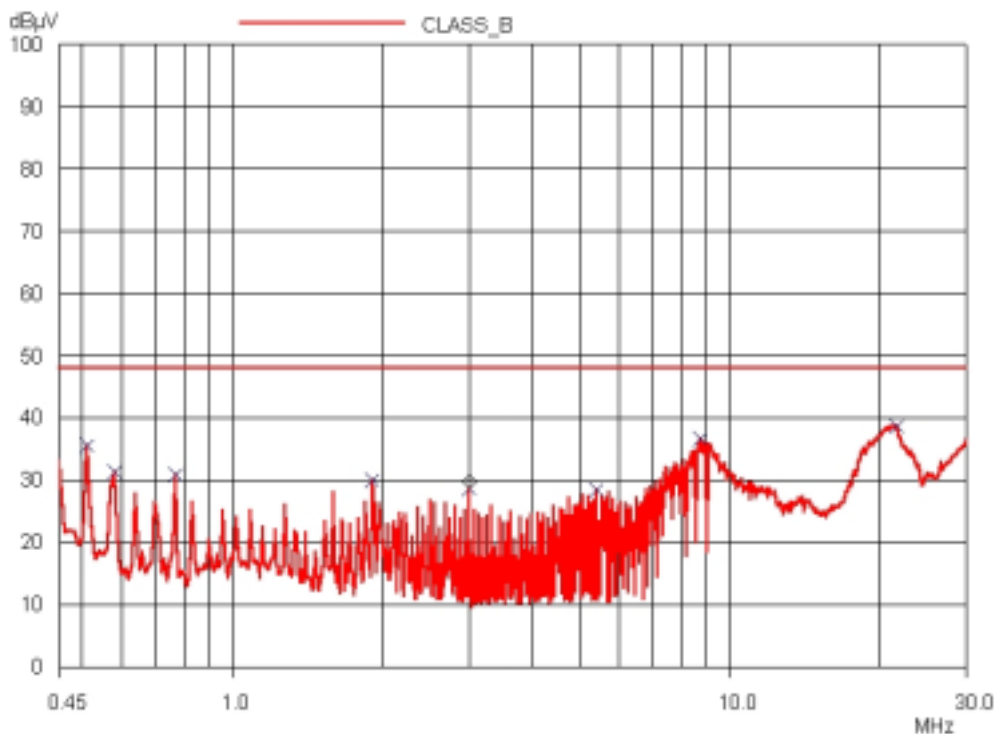
Tested by: Seung-Hyun, Nam / Test Engineer



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HOT LINE



NEUTRAL LINE

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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 : 41 % Temperature : 21 °C
 Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109
 Type of Test : CLASS B
 Result : PASSED BY – 4.46 dB at 34.55 MHz

EUT : IAD (Integrated Access Device) Date: April 15, 2002
 Operating Condition : Continuously transferring data between Central Office and Note 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)
34.55	23.50	V	11.24	0.80	35.54	40.00	-4.46
56.00	23.00	V	10.45	0.98	34.43	40.00	-5.57
141.90	20.30	V	13.06	1.32	34.68	43.50	-8.82
168.50	18.10	V	15.57	1.42	35.09	43.50	-8.41
239.80	25.70	H	11.43	1.78	38.91	46.00	-7.09
312.00	20.80	H	14.82	2.07	37.69	46.00	-8.31
336.40	20.30	H	15.49	2.21	38.00	46.00	-8.00
360.40	19.10	H	15.76	2.33	37.19	46.00	-8.81
407.60	20.50	H	16.32	2.45	39.27	46.00	-6.73
431.80	21.30	H	17.41	2.50	41.21	46.00	-4.79
455.80	21.90	H	16.78	2.56	41.24	46.00	-4.76
528.00	15.60	H	17.77	2.73	36.10	46.00	-9.90

Radiated Emission Tabulated Data

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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

$$\begin{aligned}
 &+ \text{ Meter reading} && (\text{dBuV}) \\
 &+ \text{ Cable Loss} && (\text{dB}) \\
 &+ \text{ Antenna Factor (Loss)} && (\text{dB/meter}) \\
 \hline
 &= \text{ Corrected Reading} && (\text{dBuV/meter}) \\
 &- \text{ Specification Limit} && (\text{dBuV/meter}) \\
 &= \text{ dB Relative to Spec} && (+/- \text{ dB})
 \end{aligned}$$

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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/01	12MONTH	■
2.	Test receiver	R/S	ESHS10	834467/007	APR/02	12MONTH	■
3.	Spectrum analyzer	HP	8568B	3026A0226	APR/02	12MONTH	■
4.	RF preselector	HP	85685A	3107A01264	APR/02	12MONTH	■
5.	Quasi-Peak Adapter	HP	85650A	3107A01542	APR/02	12MONTH	■
6.	Dipole Antenna	EMCO	3121C	9107-745	JUN/01	12MONTH	
7.	Biconical antenna	EMCO	3104C	9109-4441 9109-4443 9109-4444	APR/02	12MONTH	■
8.	Log Periodic antenna	EMCO	3146	9109-3213 9109-3214 9109-3217	APR/02	12MONTH	■
9.	LISN	EMCO	3825/2	9109-1867 9109-1869	JUL/01	12MONTH	■
10.	RF Amplifier	HP	8447F	3113A04554	JUN/01	N/A	
11.	Spectrum Analyzer	HP	8591A	3131A02312	APR/02	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.