



EMISSION TEST REPORT

Test report file No. : **02-IST-158/FB** Date of issue : Aug. 07, 2002.

Model / Type No. : DPD-100

Kind of product : Data Driver

Brand name : Data Driver

Applicant : Hyun Won Inc.

Manufacturer : Hyun Won Inc.

Address : 333-1, Shindae-Ri, Kumho-Eup, Youngcheon-City, Kyoungbuk, Korea.

Test result according to the regulation(s)

☒ Positive ☐ Negative

at page 3.

This test report without appendix consists of 16 pages.

It is not allowed to copy this report even partly without the allowance of the Test Laboratory.

This equipment is complied with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-1992.

DIRECTORY

A) Documentation.

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B) Test Data.

Conducted emissions (Mains)	: 450 kHz - 30 MHz	<u>11~13</u>
Radiated emissions	: 30 MHz – 1 GHz	<u>14~15</u>

C) Appendix

TEST REGULATIONS

The tests were performed according to the following regulations ;

-
- - FCC Part 15, Subpart B (Unintentional Radiators, Class B)

Information of Test Laboratory

IST EMC Lab.

San 21-8 Goan-Ri, Baekam-Myun, Yongin-Si, Kyunggi-Do, Korea
International - Tel : 82-31 - 333 - 4093. Fax : 82-31 - 333 - 4094.
Domestic - Tel : 031 - 333 - 4093. Fax : 031 - 333 - 4094.

ENVIRONMENTAL CONDITIONS

Temperature	<u>27</u>
Humidity	<u>44</u> %
Atmospheric pressure	<u>1002</u> mbar

TEST CONDITIONS

The **measurement of the conducted emissions (Interference voltage)** was performed in a shielded room.

Test location :

☒ Shielded room. No.1

☐ Compact chamber 2

Used testing instruments :

Name	Type	Manufacturer	Calibration. Date	Serial Number
ESH 3	Test Receiver	Rohde & Schwarz	Jul. 25, 2002	861742/015
3725/2	LISN	EMCO	Jul. 27, 2002	9101-2068
KNW-407	LISN	Hyup-Rip	Jul. 26, 2002	8-883-10
ESH 3-Z2	Pulse Limiter	Rohde & Schwarz	Jul. 25, 2002	357.8810.52

Test - accessories :

Type	Manufacturer
Aneroid Barometer	Sato
Hygrometer	Sato

Measurement Procedures :

Conducted emissions measurements were made in accordance with ANSI C-63.4-1992, "Method of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz". The measurement were performed over the frequency range of 0.45MHz to 30MHz using a 50Ω/50uH LISN as the input transducer to an EMI/Field Intensity Meter. The measurements were made with the detector set for "Peak" amplitude within an IF bandwidth of 10kHz or for "quasi-peak" within a bandwidth of 9kHz.

All used test-instruments as well as the test-accessories are calibrated regularly.

Test engineer :



Y.J.Kim / Research Engineer
IST EMC Lab.

The **measurement of the radiated emissions (Electric field)** in the frequency range from 30 MHz to 1GHz was performed in horizontal and vertical antenna polarization at a open-site which meet the site attenuation requirement of ANSI C63.4-1992 and a test distance of :

Location : ☒ Open Site No. 1 ☐ Open Site No. 2 ☐ Open Site No. 3
 Distance : ☒ 3 meters ☐ 10 meters

Used testing instruments :

Name	Type	Manufacturer	Calibration. Date	Serial Number
ESVP	Test Receiver	Rohde & Schwarz	Jul. 26, 2002	860688/011
VULB 9160	Antenna	Schwarzbeck	Jul. 10, 2002	3048

Test - accessories :

Type	Manufacturer
Aneroid Barometer	Sato
Hygrometer	Sato

Measurement procedures

Radiated measurements were in accordance with ANSI C63.4-1992 "Method of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz". The measurements were performed over the frequency range of 30MHz to 1GHz using antenna as the input transducer to a EMI/Field Intensity Meter. The measurements were made with the detector set for "quasi-peak" within a bandwidth of 120kHz.

All used test-instruments as well as the test-accessories are calibrated regularly.

Test engineer :



Y.J.Kim / Research Engineer
IST EMC Lab.

EQUIPMENT UNDER TEST

Equipment Description

The Equipment Under Test (EUT) is the **Data Driver of Hyun Won Inc.**

Outer dimensions	84.0(W) x 68.0(H) x 21.5(D) : (mm)
Weight	97g
Power requirements	DC 3.7V, 500mA
I/O port	USB, DC IN
Disk capacity	500MB
Life time	20 hour
USB speed	3 ~ 4MB
PC OS	Windows 98, ME, 2000, XP, Mc OS support

EUT Type :

- ☒ Table-Top.
☐ Floor-Standing.
☐ Table-Top and Floor-Standing(Combination).

Operation – mode of the E.U.T. :

The equipment under test was operated during the measurement under following conditions :

- ☐ Standby.
☒ Operational Condition : - Play mode

Configuration of the equipment under test :

Following peripheral devices and interface cables were connected during the measurement :

Equipment	Type	Brand	Serial No
Laptop	LIFE BOOK S5582	FUJITSU	4C4130341391
Printer	A0302384	Northern Telecom	26633S60168
Adaptor	SEB80N2-16.0	Samsung	01Y18078A
Mouse	M-S48a	HP	LZE01000039

Connecting Interface Cables :

- ☒ Unshielded USB cable : 1.2m
☒ Unshielded Adaptor cable : 1.7m
☐ Customer specific cables:

TEST RESULT

Conducted emissions : 450 kHz - 30 MHz

The requirements are.

☒ KEPT

☐ NOT KEPT

Min. limit margin

4.0 dB at 7.1642 MHz

Remarks : See test-graph to be attached at pages 13~15.

Radiated emissions (electric field) 30 MHz - 1000 MHz

The requirements are.

☒ KEPT

☐ NOT KEPT

Min. limit margin

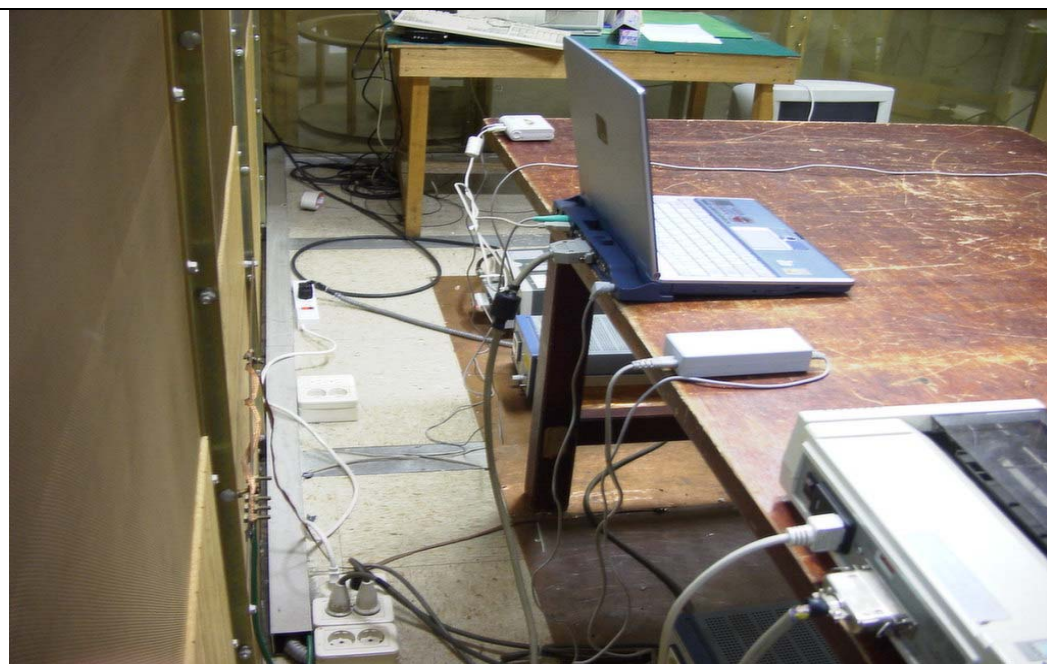
10.5 dB at 125.2 MHz

Remarks : See test-data at page 16~17.

**Test Set-Up
(Type : DPD-100)**



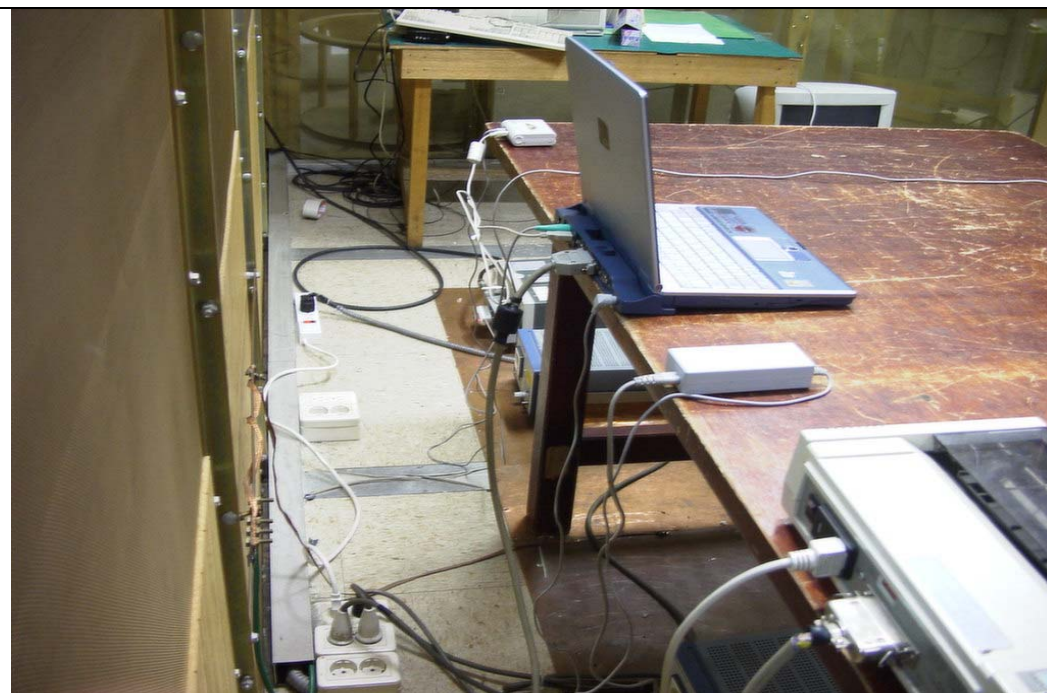
Conducted emission 450kHz ~ 30MHz

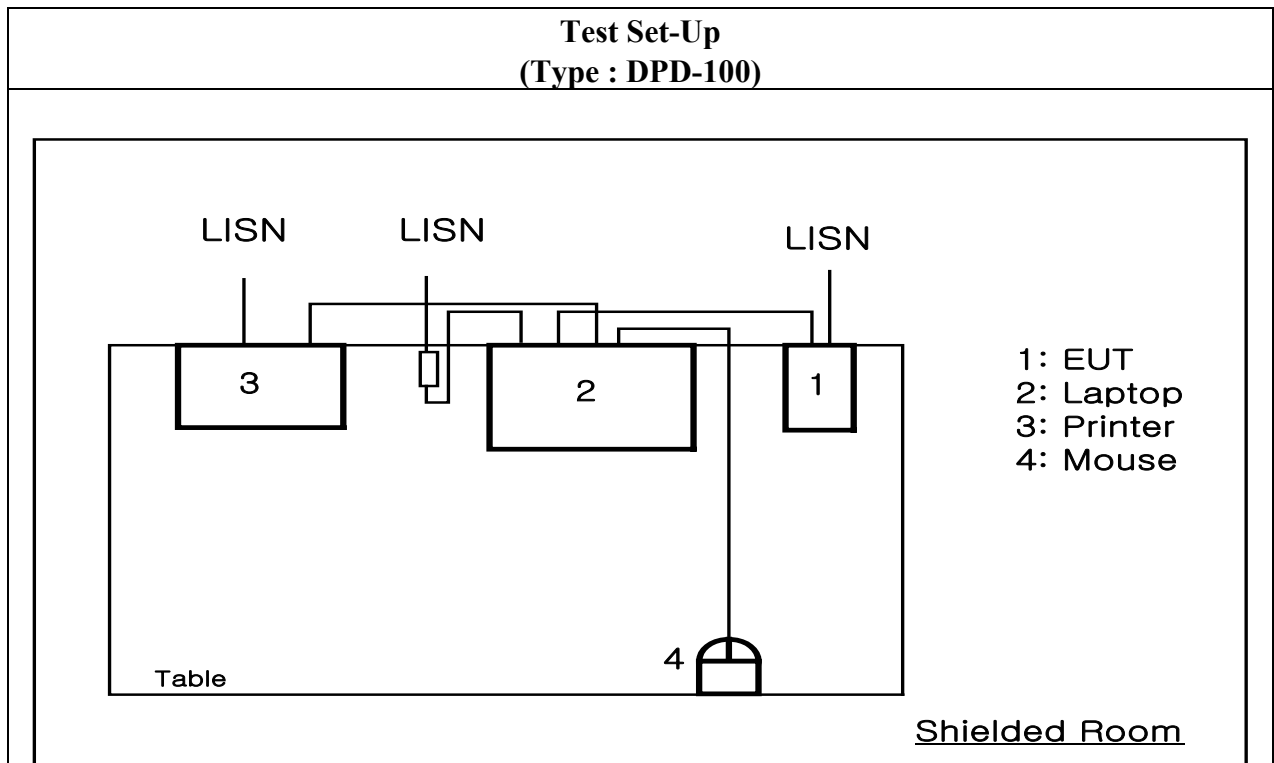


**Test Set-Up
(Type : DPD-100)**

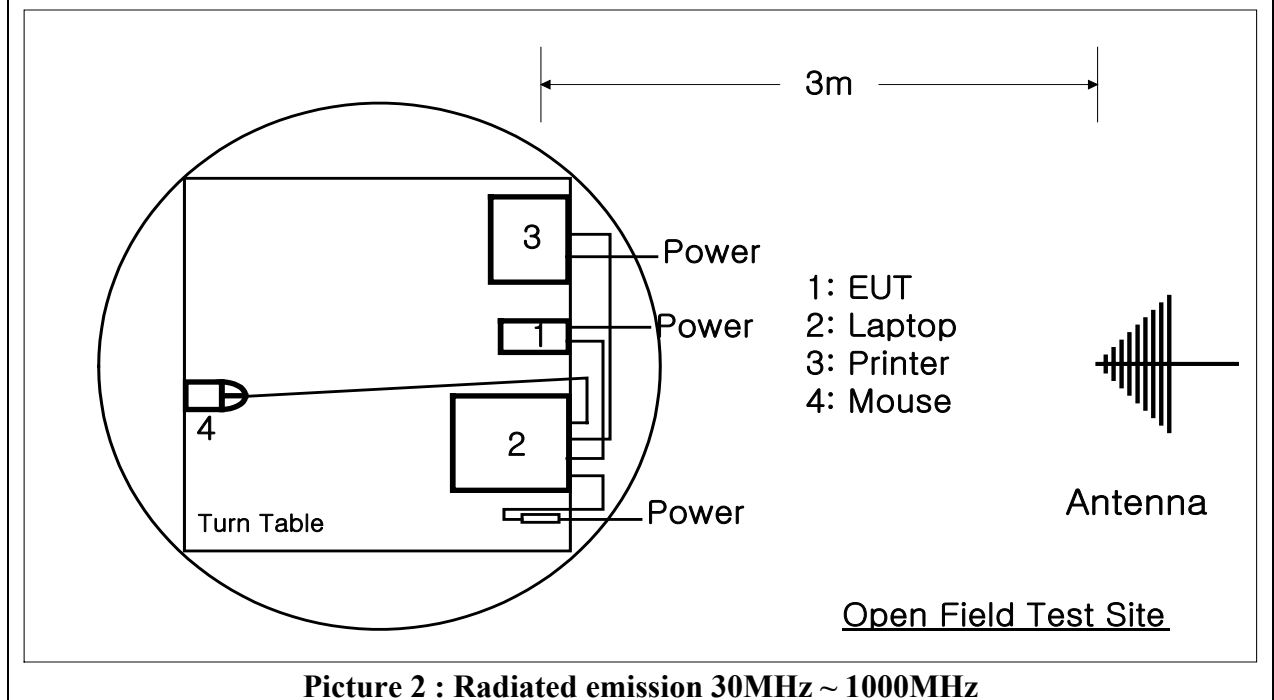


Radiated emission 30MHz ~ 1000MHz





Picture 1 : Conducted emission 450kHz ~ 30MHz



Picture 2 : Radiated emission 30MHz ~ 1000MHz

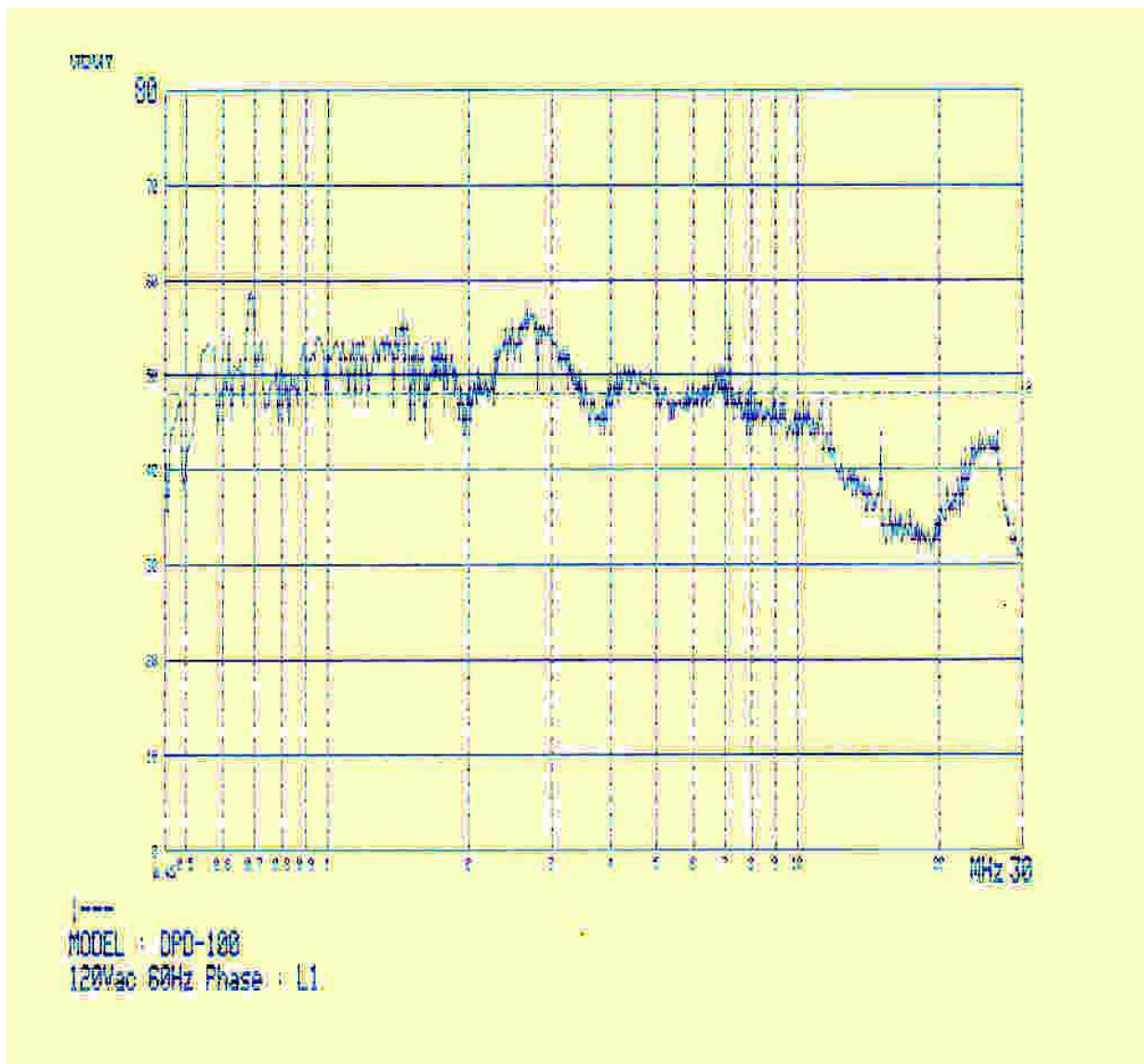
Conducted Emission Test Data

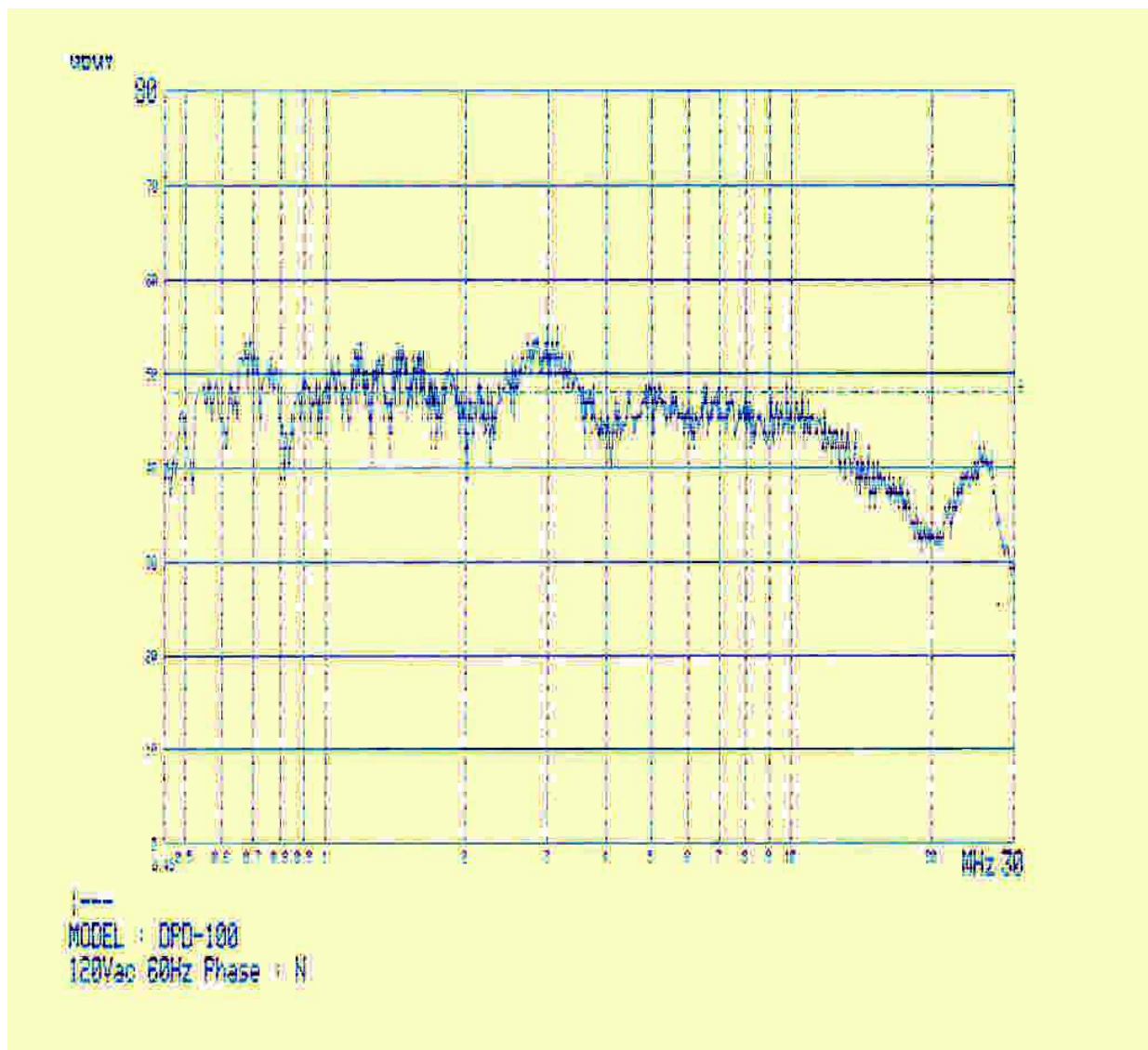
Type : DPD-100
 Manufacturer : Hyun Won Inc.
 Operation mode : Play mode
 Date : Jul. 29, 2002

Frequency [MHz]	QP-1 [dBμV]	AV [dBμV]	QP-2 [dBμV]	Insertion loss [dB]	Phase (L1/N)	Result [dBμV]	Limit [dBμV]	Margin [dB]
0.6148	50.6	30.4	37.6	0.8	L1	38.4	48.0	9.6
0.6872	55.4	36.6	42.4	0.8		43.2	48.0	4.8
1.4389	50.7	32.4	37.7	0.8		38.5	48.0	9.5
2.6611	53.8	34.8	40.8	0.8		41.6	48.0	6.4
4.3686	51.9	30.9	38.9	0.8		39.7	48.0	8.3
7.1642	43.2	-	-	0.8		44.0	48.0	4.0
0.6874	55.2	35.0	42.2	0.8	N	43.0	48.0	5.0
1.1896	49.6	28.5	36.6	0.8		37.4	48.0	10.6
1.4406	50.3	30.0	37.3	0.8		38.1	48.0	9.9
2.7289	51.2	31.3	38.2	0.8		39.0	48.0	10.6
2.9844	50.9	30.2	37.9	0.8		38.7	48.0	9.3
3.1239	47.5	28.8	34.5	0.8		35.3	48.0	12.7
Cable loss are less than 0.1 dB								

Note;

- *QP-1 means reading value at test receiver.
- *QP-2 means reduced value by 13dB
according to the FCC part15 section 15.107(d).
- *L1 : Live Line
- *N : Neutral Line
- *Please refer to data graphs at page 12 ~ 13



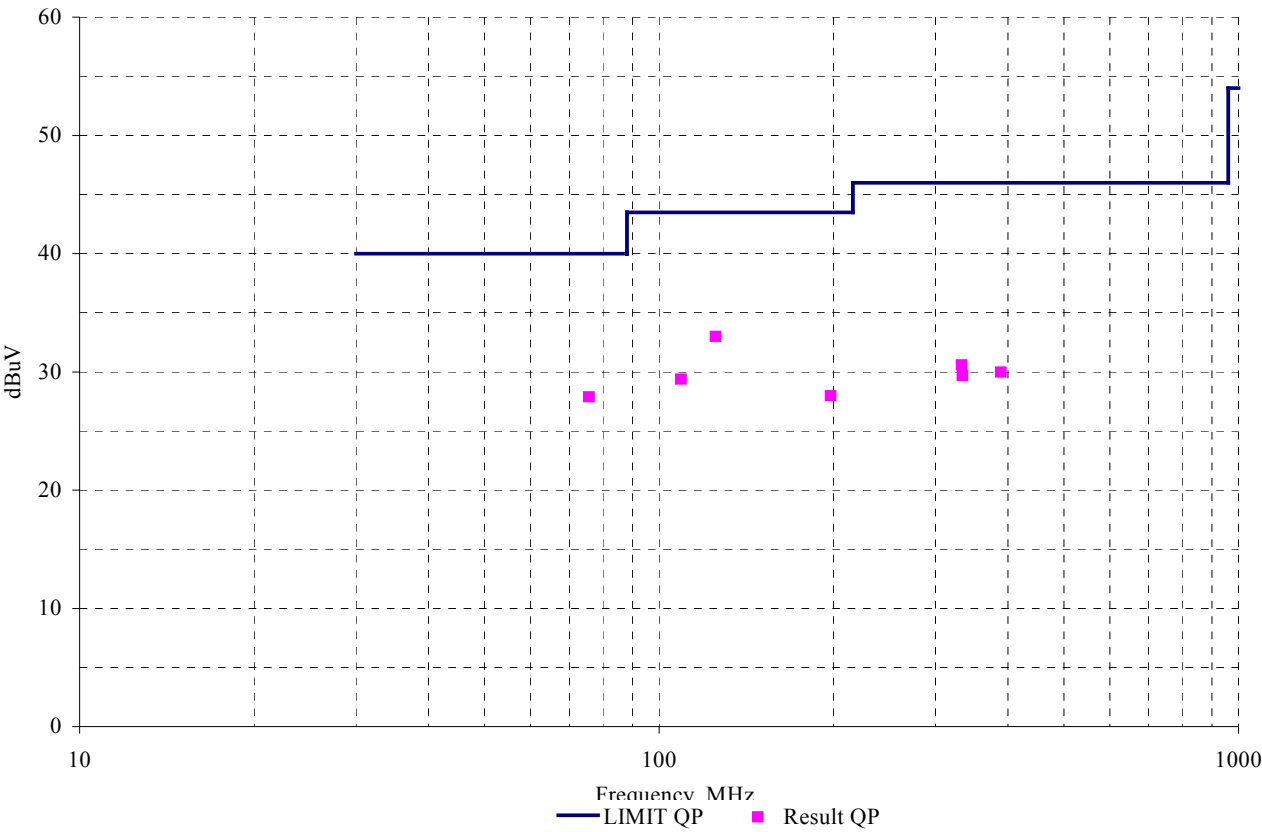


Radiation Test Data

Type : DPD-100
 Manufacturer : Hyun Won Inc.
 Operation mode : Play mode
 Test distance : 3 m
 Antenna : VULB9160
 Date : Jul. 30, 2002.

Freq. [MHz]	Reading [dBuV]	Antenna Factor [dB]	Cable Loss [dB]	Angle [deg]	Height [cm]	Polar [H/V]	Result [dBuV]	Limit [dBuV]	Margin [dB]
75.7	17.6	8.7	1.6	168	112	V	27.9	40.0	12.1
109.1	18.3	9.2	1.9	186	106	V	29.4	43.5	14.1
125.2	20.4	10.5	2.1	174	123	V	33.0	43.5	10.5
197.8	16.8	8.7	2.5	181	134	V	28.0	43.5	15.5
332.9	15.4	11.7	3.5	0	276	H	30.6	46.0	15.4
333.9	14.5	11.7	3.5	0	247	H	29.7	46.0	16.3
389.1	13.0	12.9	4.1	12	130	V	30.0	46.0	16.0

MEASUREMENT OF DISTURBANCE RADIATION



SUMMARY

GENERAL REMARKS :

The equipment is not modified anything, mechanical or circuit to improve EMI status during a measurement and complied the regulation "Part 15 subpart B Class B of CFR 47"

FINAL JUDGMENT :

The requirements according to the technical regulations are

☒ Kept ☐ Not kept

The equipment under test does

☒ Fulfill the general approval requirements mentioned on page 3.
☐ Not fulfill the general approval requirements mentioned on page 3.

Begin of testing : Jul. 29, 2002

End of testing : Jul. 30, 2002

Reviewed by :



Joon H. Lee, EMC Manager
IST EMC Lab.

Approved by :



G. Chung, Chief of EMC Lab.