

# Certification of Compliance

## CFR 47 Part 15 Subpart B

**Test Report File No.** : 04-IST-0202      **Date of Issue** : July 30, 2004

**Model(s)** : HD-35

**Kind of Product** : Mobile DISC & MPEG4 Player

**Applicant** : DTS Infocom Co., Ltd.

**Address** : RM #C-409, Bundang Techno-park, 145, Yatap-dong, Bundang-gu, Sungnam City, Kyungki-do, Koera.

**Manufacturer** : DTS Infocom Co., Ltd.

**Address** : RM #C-409, Bundang Techno-park, 145, Yatap-dong, Bundang-gu, Sungnam City, Kyungki-do, Koera.

### Test Result

☒ Positive

☐ Negative

Reviewed By

Approved By



J. H. Lee / EMC Group Manager



G. Chung / Chief

### Comment(s)

- Investigations requested : Measurement to the relevant clauses of FCC rules and regulations Part 15 Subpart B - Unintentional Radiators, Class B.
- The test report with appendix consists of 20 pages.
- The test result only responds to the tested sample.
- It is not allowed to copy this report even partly without the allowance of IST EMC Laboratory.
- This equipment as for has been shown to be capable of continued compliance 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 2001.



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### ■ Test Conditions and Data - Emissions

◆ Conducted Emissions	0.15MHz - 30MHz	Applicable
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◆ Radiated Emissions	30MHz - 1GHz	Applicable
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Note:

## INFORMATIONS OF TEST LABORATORY

EMC LABORATORY of IST Co., Ltd. (*FCC Filing Lab.*)

San 21-8, Goan-Ri, Baekam-Myun, Yongin-City

Kyonggi-Do, 449-860, Korea

TEL : +82 31 333 4093

FAX : +82 31 333 4094

## ENVIRONMENTAL CONDITIONS

Temperature 22.1 °C

Humidity 56 %

Atmospheric pressure 1014 mbar

## POWER SUPPLY SYSTEM USED

Power supply system AC 120Vac, 60Hz

(Refer to the product information)

## PRODUCT INFORMATION

Storage capacity 2 Tera(=2000GB) hard drive

Interface to Computer USB 2.0 standard, USB 1.1 compatible

Music Playback MP3 decoding 30 to 320 kbits/s, CBR & VBR

Photo Viewing JPEG files, any size

Video Playback Up to 1,920x1080i pixels @ 25 frames/sec(NTSC/PAL)  
/MPEG-4 Simple Profile compliant. AVI(DivX\*3.11,  
4.0&5.0&XviD) MP3 stereo or AC-3 sound tracks,  
near DVD picture quality.

Audio Output Stereo analog Line-Out/Digital Line-Out(SPDIF) via  
optical SPDIF

Video Output Component (Pr/Pb/Y), S-Video output, Composite  
video(for television), NTSC or PAL TV standard.

Power Supply Adapter Marker - Dee Van Electronics Co., Ltd.

Model - DSA-342

AC Input - 100~240Vac, 47~63Hz

DC Input - 12Vdc, 2A

Dimensions 203 x 115 x 47 mm

Weight 550g

- EMC suppression device is not used during the test.
- Please refer to user's manual.

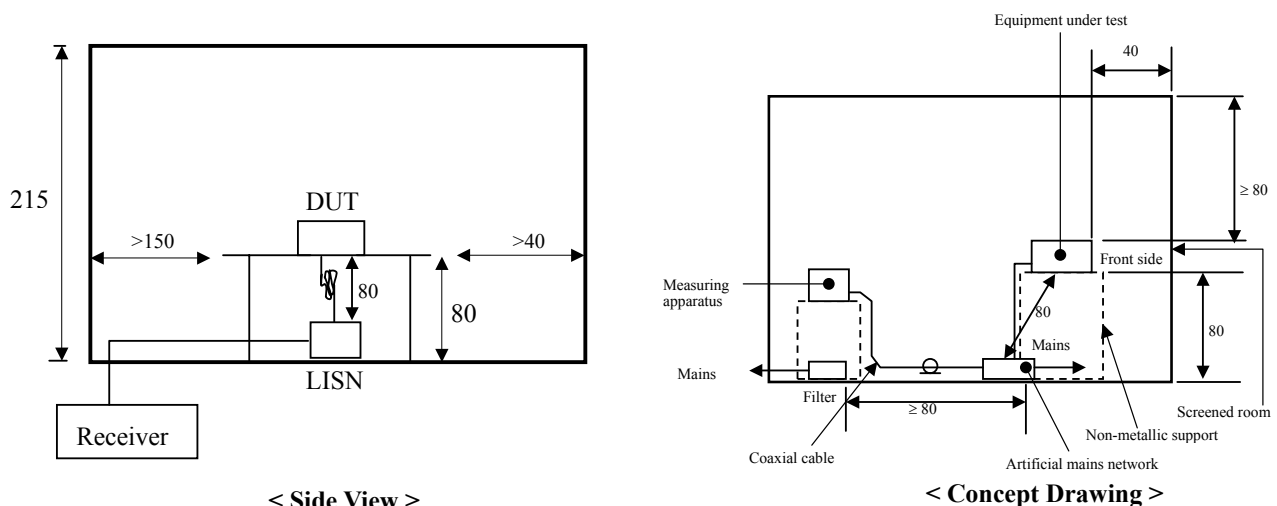
## DESCRIPTIONS OF TEST

### Conducted Emissions:

The measurement were performed over the frequency range of 0.15MHz to 30MHz using a  $50\Omega/50\mu\text{H}$  LISN as the input transducer to a Spectrum Analyzer or a Field Intensity Meter. The measurements were made with the detector set for "Peak" amplitude within a bandwidth of 10KHz or for "quasi-peak" & "Average" within a bandwidth of 9KHz.

#### -Procedure of Test

The line-conducted facility is located inside a shielded room No.1. A 1m X 1.5m wooden table 80cm height is placed 40cm away from the vertical wall and 1.5m away from the other wall of the shielded room. The R/S ESH3-Z5 and EMCO 3825/2 LISN are bonded to bottom of the shielded room. The EUT is located on the wooden table with distance more than 80cm from the LISN and powered from the EMCO LISN .The peripheral equipment is powered from the other LISN. Power to the LISNs are filtered by a noise cut power line filters. All electrical cables are shielded by braided tinned steel tubing with inner  $\phi$  1.2cm. If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and this supply lines will be connected to the EMCO LISN. All interconnecting cables more than 1m were shortened by non-inductive bundling to a 1m length. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating conditions. The RF output of the LISN was connected to the R/S receiver to determine the frequency producing the maximum emission from the EUT. The frequency producing the maximum level was reexamined using Quasi-Peak mode by manual measurement, after scanned by automatic Peak mode for frequency range from 0.15 to 30MHz. The bandwidth of the receiver was set to 10kHz. The EUT, peripheral equipment, and interconnecting cables were arranged and manipulated to maximize each EME emission.



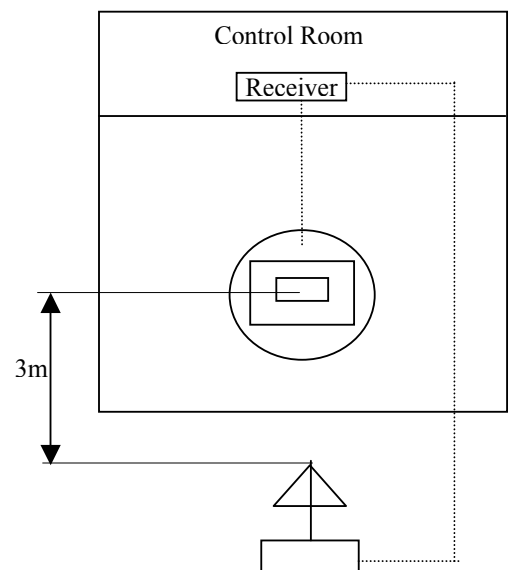
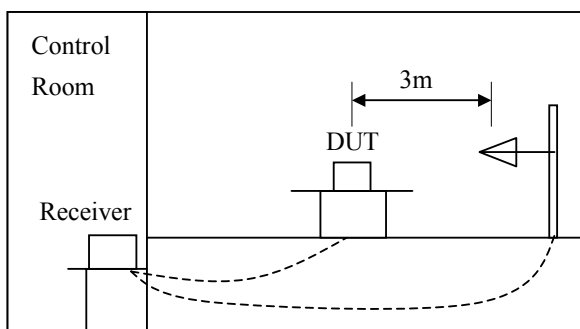
## DESCRIPTION OF TEST

### Radiated Emissions:

The measurement was performed over the frequency range of 30MHz to 1GHz using antenna as the input transducer to a Spectrum analyzer or a Field Intensity Meter. The measurement was made with the detector set for "quasi-peak" within a bandwidth of 120KHz.

#### -Procedure of Test

Preliminary measurements were made at 3 meter using bi-conical and log-periodic antennas, and spectrum analyzer to determine the frequency producing the max. emission in anechoic chamber. Appropriate precaution was taken to ensure that all emission from the EUT were maximized and investigated. The system configuration, mode of operation, turn-table azimuth and height with respect to the antenna were noted for each frequency found. The spectrum was scanned from 30MHz to 300MHz using S/B bi-conical antenna and 300 to 1000MHz using S/B log-periodic antenna. Above 1GHz, linearly polarized double ridge horn antennas were used. Final measurements were made at open site with 3-meters test distance using S/B bi-log antenna or horn antenna. The OATS have been verified in regular for its normalized site attenuation. The test equipment was placed on a wooden table. Sufficient time for the EUT, peripheral equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined by manual. The detector function was set to CISPR quasi-peak mode and the bandwidth of the receiver was set to 120kHz or 1MHz depending on the frequency of type of signal. The EUT, peripheral equipment and interconnecting cables were re-configured to the set-up producing the max. emission for the frequency and were placed on top of a 0.8-meter high nonmetallic 1 x 1.5 meter table. The EUT, peripheral equipment, and interconnecting cables were re-arranged and manipulated to maximize each emission. The turntable containing the system was rotated; the antenna height was varied 1 to 4 meters and stopped at the azimuth or height producing the maximum emission. Each emission was maximized by: varying the mode of operation to the EUT and/or peripheral equipment and changing the polarity of the antenna, whichever determined the worst-case emission.



## Equipment Under Test

### 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 Mode  
☒ Operational Condition : ☒ File Playback mode  
☒ File Up/Download mode

### Configuration of the equipment under test :

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

Equipment	Type	Brand	Serial No.
PC	Vectra VL420 MT	HP	SG01301176
Keyboard	SK-2502C	HP	M000375059
PS/2 Mouse	M-S48A	HP	LZA00850320
Printer	A0302384	Northern Telecom	26633S60168
Serial Mouse	M-M28	Logitech	LCA53305547
LCD Monitor	SL703C	Daewoo Electronics	N/A
TV	14C5T BLU	Daewoo Electronics	N/A

#### Connecting Interface Cables :

- Unshielded AC power cable : 1.8 m
- Shielded monitor's signal cable (with two ferrite core) : 1.6 m
- Shielded Printer's signal cable (with two ferrite core) : 1.8 m
- Unshielded RCA cable : 1.2 m
- Unshielded USB cable : 1.5 m

Note :

## SUMMARY

### Emissions

#### ■ Conducted Emission

The requirements are ☒ MET ☐ Not MET  
Minimum limit margin 7.0 dB at 12.288 MHz  
Maximum limit exceeding

**Remarks : With neutral phase, for average detect mode.(File Playback mode)**  
Find the test data in following pages 9 to 12.

#### ■ Radiated Emission

The requirements are ☒ MET ☐ Not MET  
Minimum limit margin 3.3 dB at 166.2 MHz  
Maximum limit exceeding

**Remarks : File Up/Download mode.**  
Find the test data in following page 14.

Prepared By

Note :

- ■ means the test is applicable,
- □ is not applicable.



S.M.Kim / Research Engineer

## TEST CONDITIONS AND DATA

### Conducted Emissions

[Applicable]

#### ◆ Test Equipment Used

Model Name	Description	Manufacture	Calibration Date	Serial Number
ESH 3	Test Receiver	Rohde & Schwarz	Jul. 15, 2004	892108/018
3725/2	LISN	EMCO	Jul. 15, 2004	9101-2068
KNW-407	LISN	Hyup-Rip	Jul. 15, 2004	8-883-10
ESH 3-Z2	Pulse Limiter	Rohde & Schwarz	Jul. 15, 2004	357.8810.52

#### ◆ Test Accessories Used

Type	Manufacturer
Aneroid Barometer	Sato
Hygrometer	Sato

◆ Test Program      File Playback Mode  
                         File Up/Download Mode

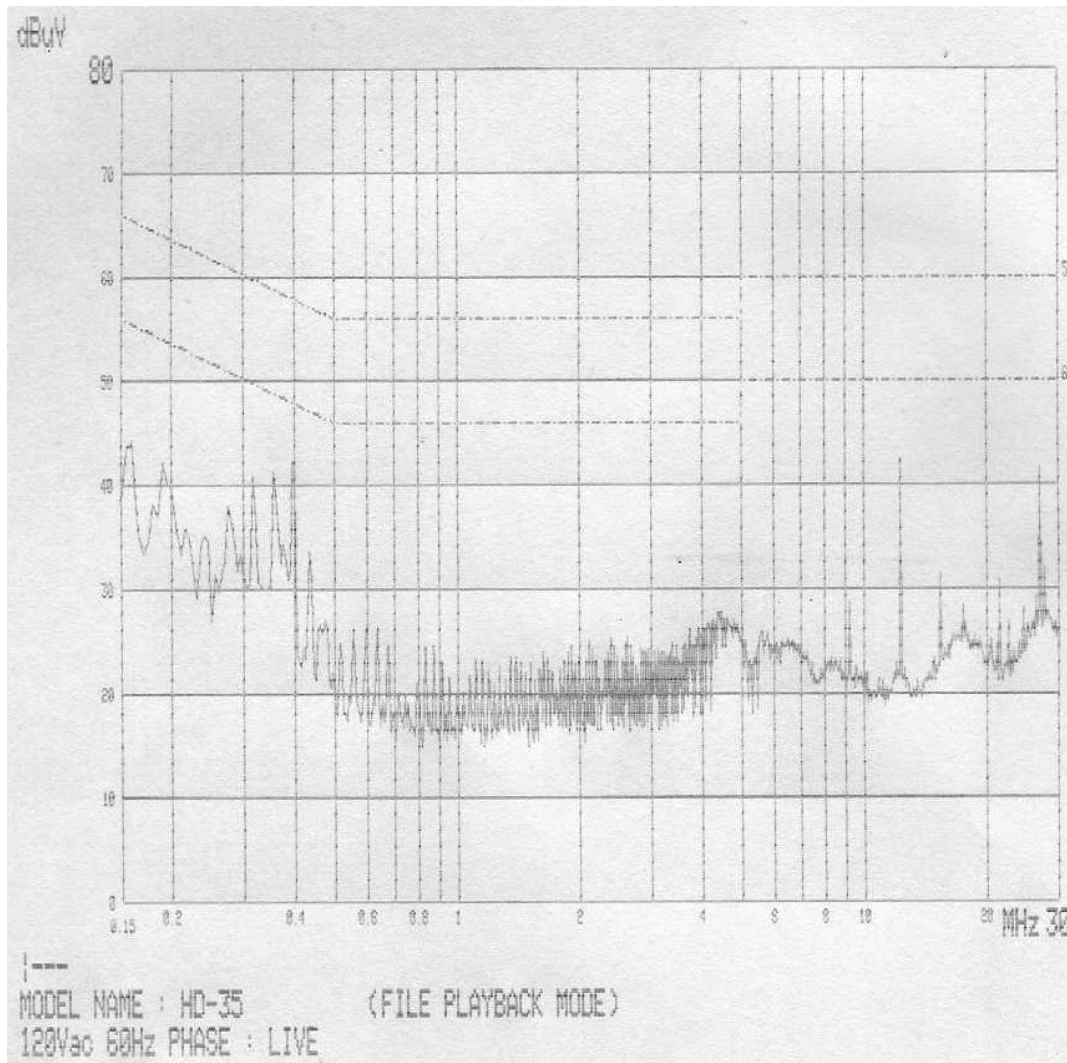
◆ Test Date            July 20, 2004

◆ Test Area            Shielded room No.1

Note :                The equipment used is calibrated in regular for every year.



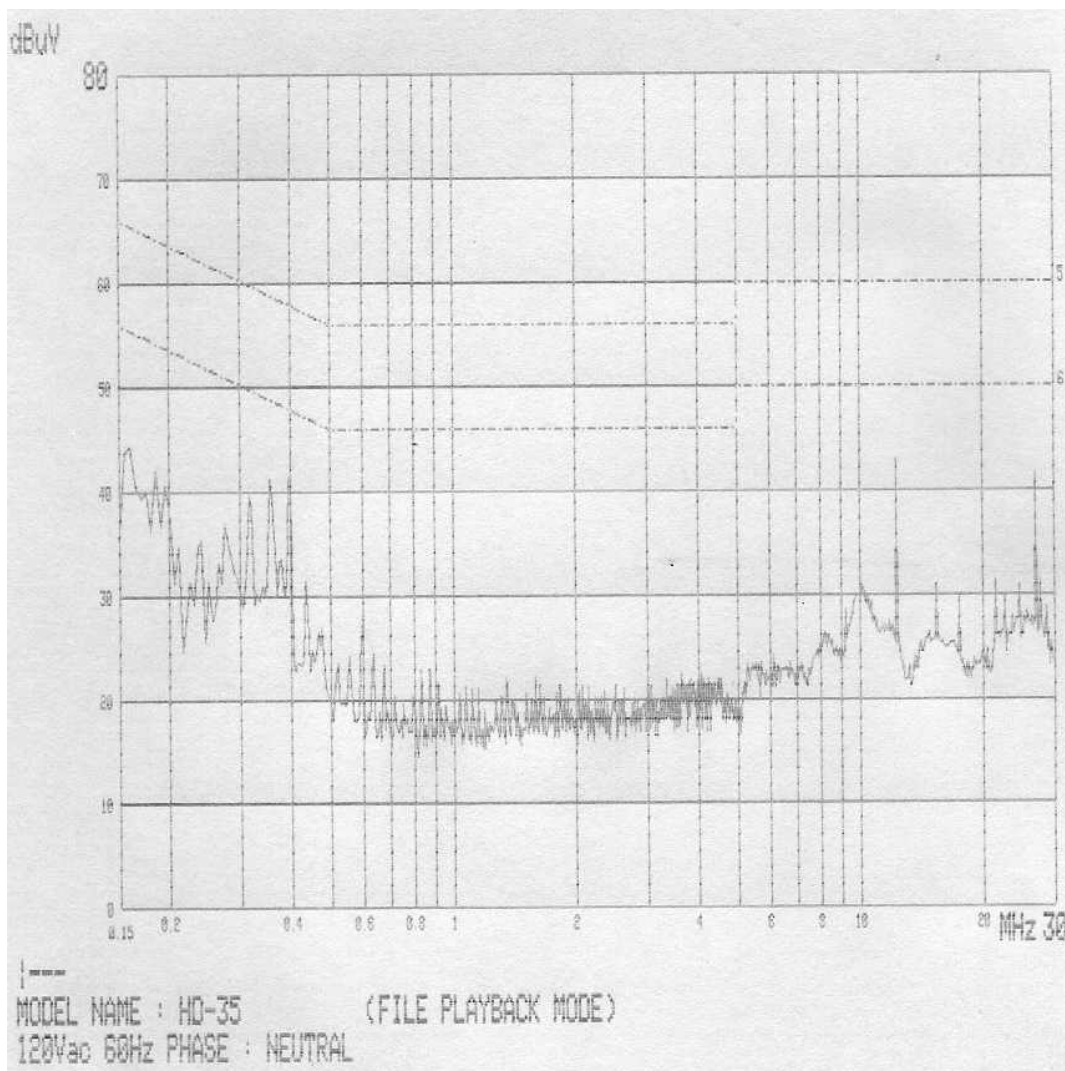
# Conducted Emissions



Freq. [MHz]	Measurement [dB $\mu$ V]		Limit [dB $\mu$ V]		Insertion Loss	Cable Loss	Result [dB $\mu$ V]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	[dB]	[dB $\mu$ V]	Q-peak	Average	Q-peak	Average
0.158	43.6	38.0	65.6	55.6	0.1	0.5	44.2	38.6	21.4	17.0
0.396	41.5	38.2	57.9	47.9	0.1	0.4	42.0	38.7	15.9	9.2
0.595	24.7	22.0	56.0	46.0	0.1	0.4	25.2	22.5	30.8	23.5
4.441	25.0	21.8	56.0	46.0	0.1	0.4	25.5	22.3	30.5	23.7
12.288	43.3	42.1	60.0	50.0	0.1	0.6	44.0	42.8	16.0	7.2
26.999	41.4	38.2	60.0	50.0	0.2	0.7	42.3	39.1	17.7	10.9

Note :

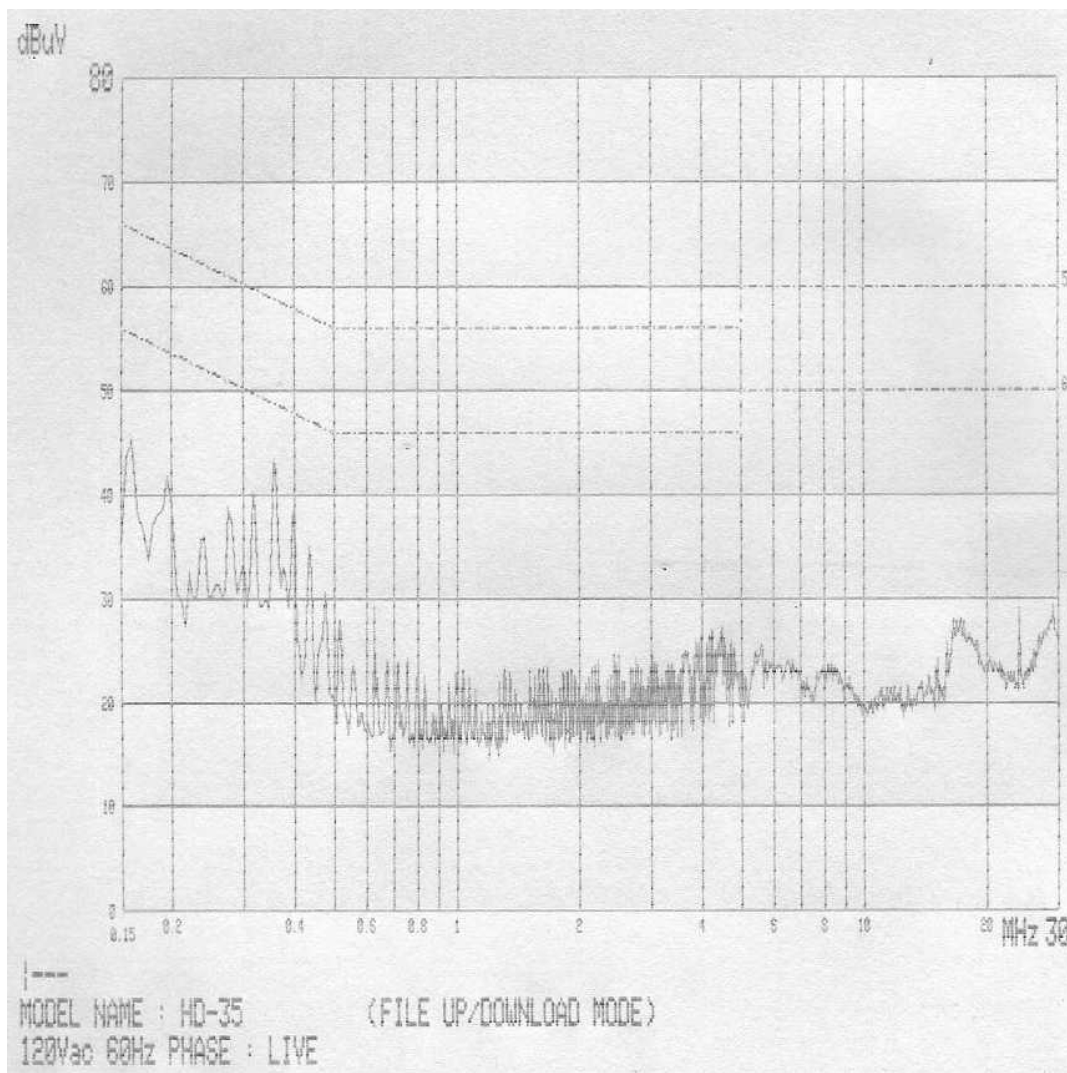
# Conducted Emissions



Freq. [MHz]	Measurement [dB $\mu$ V]		Limit [dB $\mu$ V]		Insertion Loss	Cable Loss	Result [dB $\mu$ V]		Margin [dB]	
	Q-peak	Average	Q-peak	Average			Q-peak	Average	Q-peak	Average
0.160	43.6	38.0	65.5	55.5	0.1	0.5	44.2	38.6	21.3	16.9
0.397	41.3	38.0	57.9	47.9	0.1	0.4	41.8	38.5	16.1	9.4
0.595	23.5	20.7	56.0	46.0	0.1	0.3	23.9	21.1	32.1	24.9
3.608	18.0	13.2	56.0	46.0	0.1	0.4	18.5	13.7	37.5	32.3
12.288	43.5	42.3	60.0	50.0	0.1	0.6	44.2	43.0	15.8	7.0
26.999	41.6	38.5	60.0	50.0	0.3	0.7	42.6	39.5	17.4	10.5

Note :

# Conducted Emissions

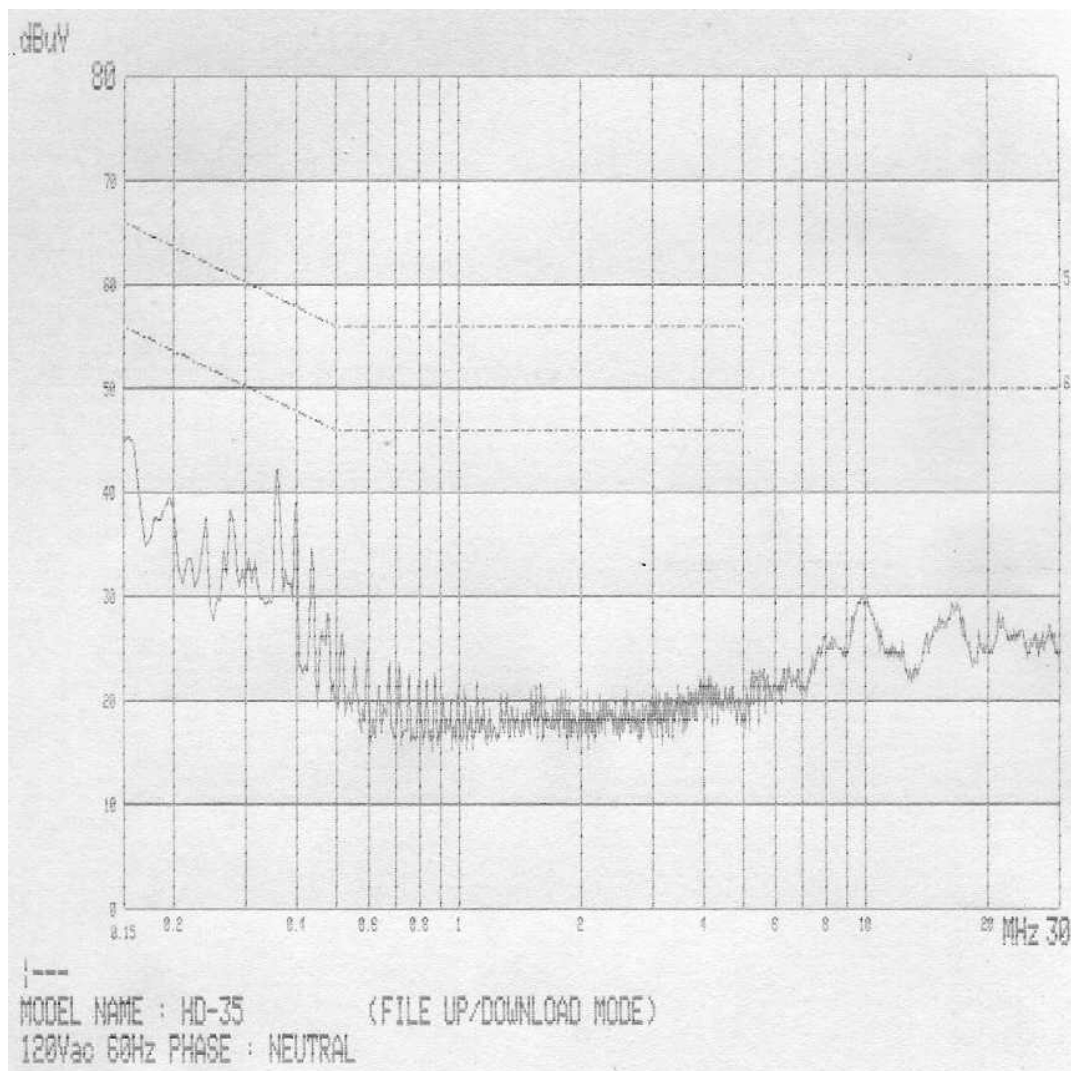


Freq. [MHz]	Measurement [dB $\mu$ V]		Limit [dB $\mu$ V]		Insertion Loss [dB]	Cable Loss [dB $\mu$ V]	Result [dB $\mu$ V]		Margin [dB]	
	Q-peak	Average	Q-peak	Average			Q-peak	Average	Q-peak	Average
0.159	44.1	39.7	65.5	55.5	0.1	0.5	44.7	40.3	20.8	15.2
0.356	41.8	38.3	58.8	48.8	0.1	0.4	42.3	38.8	16.5	10.0
0.557	21.8	16.7	56.0	46.0	0.1	0.4	22.3	17.2	33.7	28.8
4.445	24.4	22.5	56.0	46.0	0.1	0.4	24.9	23.0	31.1	23.0
24.006	27.1	24.3	60.0	50.0	0.2	0.7	28.0	25.2	32.0	24.8
29.124	23.4	15.9	60.0	50.0	0.2	0.7	24.3	16.8	35.7	33.2

Note :



# Conducted Emissions



Freq. [MHz]	Measurement [dB $\mu$ V]		Limit [dB $\mu$ V]		Insertion Loss	Cable Loss	Result [dB $\mu$ V]		Margin [dB]	
	Q-peak	Average	Q-peak	Average			Q-peak	Average	Q-peak	Average
0.159	43.8	39.3	65.5	55.5	0.1	0.5	44.4	39.9	21.1	15.6
0.357	41.0	37.5	58.8	48.8	0.1	0.4	41.5	38.0	17.3	10.8
0.516	24.6	22.0	56.0	46.0	0.1	0.3	25.0	22.4	31.0	23.6
4.129	17.8	13.9	56.0	46.0	0.1	0.4	18.3	14.4	37.7	31.6
9.769	27.4	22.2	60.0	50.0	0.1	0.6	28.1	22.9	31.9	27.1
16.797	26.1	20.6	60.0	50.0	0.2	0.7	27.0	21.5	33.0	28.5

Note :

## TEST CONDITIONS AND DATA

### Radiated Emission

[Applicable]

#### ◆ Test Equipment Used

Name	Type	Manufacturer	Calibration. Date	Serial Number
ESVP	Test Receiver	Rohde & Schwarz	Jul. 15, 2004	861744/004
VULB 9160	Antenna	Schwarzbeck	Jun. 10, 2004	3047

#### ◆ Test Accessories Used

Type	Manufacturer
Aneroid Barometer	Sato
Hygrometer	Sato

◆ Test Program      File Playback Mode  
                         File Up/Download Mode

◆ Test Date            July 22, 2004

◆ Test Area            Open site   No.2

*Note : The equipment used is calibrated in regular for every year.*

### **Radiated Emissions**

Mode	Freq. [MHz]	Reading [dBuV]	Antenna Factor [dB/m]	Cable Loss [dB]	Polar. [H/V]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]
File Playback mode	33.8	22.1	13.3	1.0	V	36.4	40.0	3.6
	69.8	15.3	9.7	1.5	V	26.5	40.0	13.5
	138.4	25.4	11.2	2.1	H	38.7	43.5	4.8
	189.6	17.2	9.2	2.4	H	28.8	43.5	14.7
	216.8	14.2	8.4	2.6	V	25.2	46.0	20.8
	242.3	18.7	10.2	2.9	H	31.8	46.0	14.2
	270.0	16.9	11.6	3.0	H	31.5	46.0	14.5
	297.0	17.8	11.7	3.2	H	32.7	46.0	13.3
	323.9	18.1	11.7	3.3	H	33.1	46.0	12.9
	414.0	20.4	13.4	4.3	H	38.1	46.0	7.9
	458.7	16.3	14.0	4.5	H	34.8	46.0	11.2
	505.7	12.1	15.1	4.8	H	32.0	46.0	14.0
	723.6	11.4	18.9	5.0	H	35.3	46.0	10.7
File Up/Download mode	119.2	19.4	9.7	1.9	H	31.0	43.5	12.5
	157.0	18.4	12.2	2.3	H	32.9	43.5	10.6
	166.2	25.6	12.3	2.3	H	40.2	43.5	3.3
	199.4	16.3	8.5	2.5	V	27.3	43.5	16.2
	240.3	8.6	10.2	2.9	H	21.7	46.0	24.3
	287.6	9.7	11.8	3.1	H	24.6	46.0	21.4
	340.0	9.9	11.7	3.5	H	25.1	46.0	20.9
	479.6	15.2	14.5	4.8	V	34.5	46.0	11.5
	501.0	14.3	15.1	4.8	V	34.2	46.0	11.8

Note:

**Appendix A. The Photos of Test Setup**



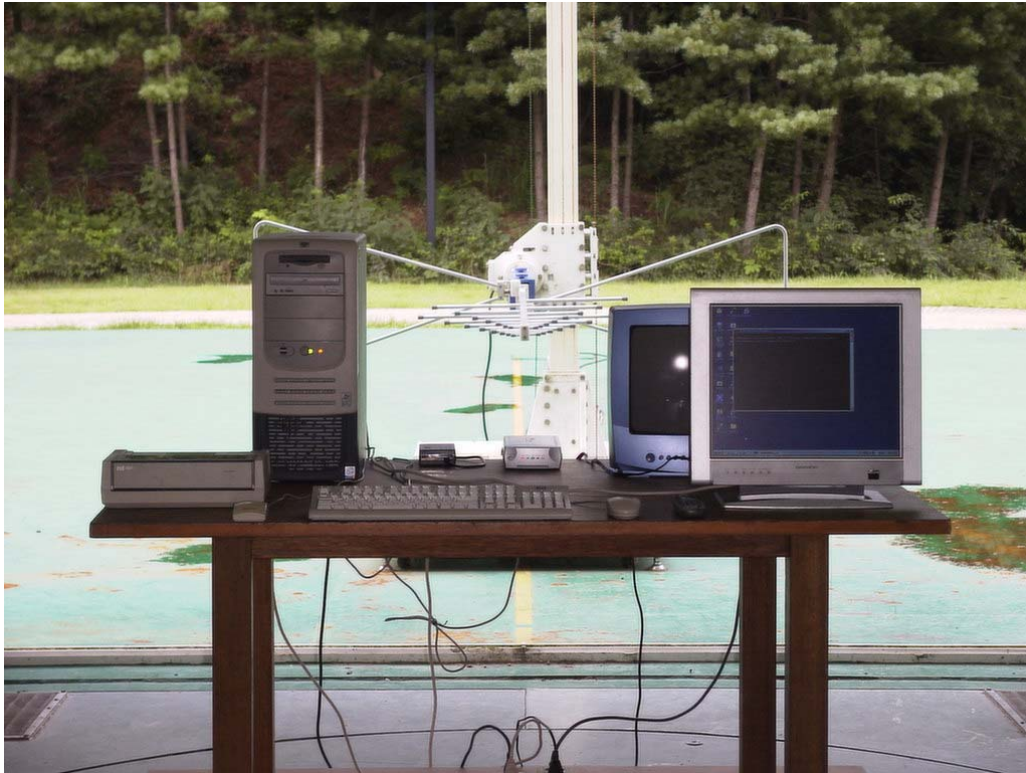
**Conducted Emissions - Front View**



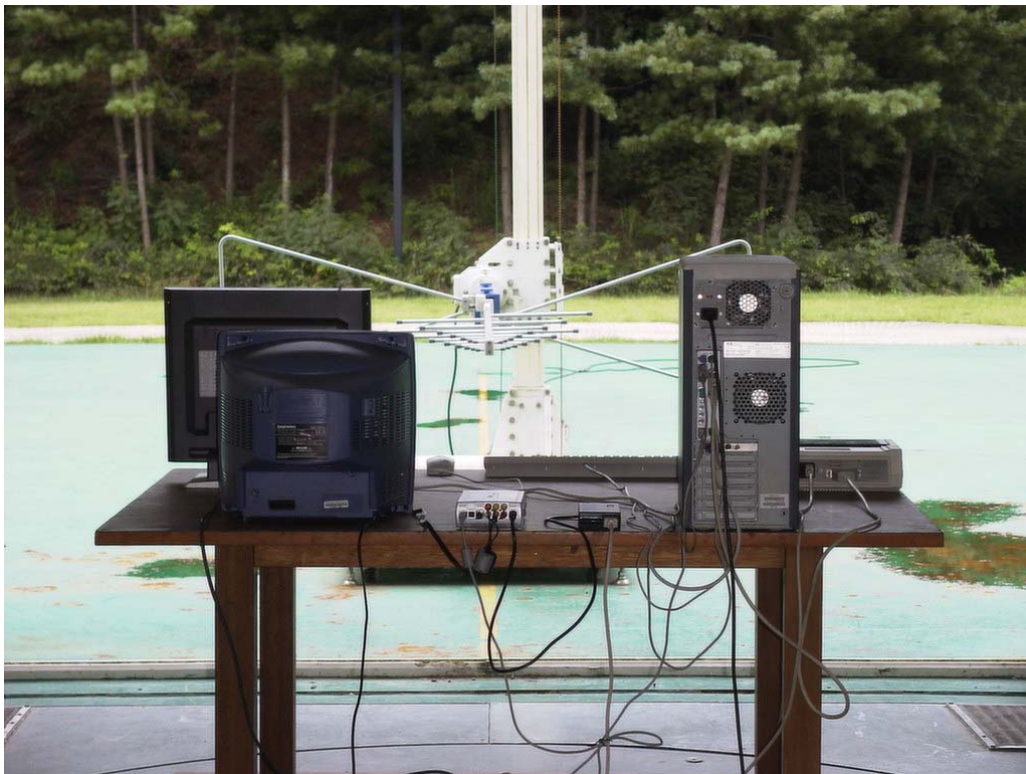
**Conducted Emissions - Rear View**



**Appendix A. The Photos of Test Setup**



**Radiated Emissions - Front View**



**Radiated Emissions - Rear View**



Appendix B. The Photos of Equipment Under Test



Front View



Rear View

Appendix B. The Photos of Equipment Under Test



Adapter



Adapter Label

**Appendix B. The Photos of Equipment Under Test**



Remote Controller



RCA Cable

**Appendix B. The Photos of Equipment Under Test**



USB Cable