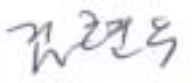
Korea Technology Institute Co., Ltd.

Test Report

Test Report No.:	**KTI04EF07005**		
Registration No.:	**99058**		
Applicant:	**Digitalway Co., Ltd.**		
Applicant Address:	**Korea Design Center, 344-1 Ya'tap 1-dong, Bundang-gu, Seongnam City Gyeonggi-do, 463-828 Korea**		
Product:	**Mass storage**		
FCC ID:	**RFSMPIO-HS200**	**Model No.**	**MPIO-HS200**
Receipt No.:	**04-0630**	**Date of receipt:**	**June 25, 2004**
Date of Issue:	**July 6, 2004**		
Testing location	**Korea Technology Institute Co., Ltd. 51-19, Sanglim3-Ri, Docheok-Myeun, Gwangju-Shi, Gyeungki-Do, Korea**		
Test Standards:	**FCC/ANSI. C63.4: 2001**		
Rule Parts: FCC	**Part 15, Class B**		
Equipment Class:	**Computing Device Peripheral**		
Test Result:	**The above-mentioned product has been tested with compliance.**		

Tested by: H. Kim
/ Engineer



Signature **Date**

Approved by: G. C. Min
/President



Signature **Date**

Other Aspects:	
Abbreviations:	*** OK, Pass=passed * Fail=failed * N/A=not applicable**

☞ **- This test report is not permitted to copy partly without our permission.**

- This test result is dependent on only equipment to be used.

- This test result is based on a single evaluation of one sample of the above mentioned.

- This test report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S Government.

- We certify this test report has been based on the measurement standards that is traceable to the national or international standards.

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1. General

This equipment has been shown to be capable of compliance with the applicable technical standards and was tested in accordance with the measurement procedures as indicated in this report.

We attest to the accuracy of data. Korea Technology Institute Co., Ltd. performed all measurements reported herein. And were made under Chief Engineer's supervisor.
We assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

2. Test Site

Korea Technology Institute Co., Ltd.

2.1 Location

51-19, Sanglim3-Ri, Docheok-Myeun, Gwangju-Shi, Gyeungki-Do, Korea

The Test Site is in compliance with ANSI C63.4/2001 for measurement of radio Interference.

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

- Conducted Emissions

Kind of Equipment	Type	S/N	Calibrated until
Spectrum Analyzer	R3261C	61720417	11.2004
Field Strength Meter	ESPC	832827/011	9.2004
LISN	KNW407	8-1157-2	10.2004
LISN	EM-7823	115019	4.2005
Conducted Cable	N/A	N/A	11.2004

- Radiated Emissions

Kind of Equipment	Type	S/N	Calibrated until
Field Strength Meter	ESIB40	100093	3.2005
Spectrum Analyzer	R3261C	61720417	11.2004
Pre Amplifier	8447D	2944A06874	11.2004
BiconiLog Antenna	3142B	1705	2.2005
Horn Antenna	3115	6443	6.2005
Open Site Cable	N/A	N/A	11.2004
Antenna Mast	DETT-03	N/A	N/A
Antenna & Turntable controller	DETT-04	91X519	N/A

2.3 Test Date

Date of Application: June 25, 2004

Date of Test: June 27, 2004

2.4 Test Environment

See each test item's description.

3. Description of the tested samples

The EUT is a Mass storage.

3.1. Rating and Physical Characteristics

Product Code	HS200
Capacity	4 GB
Interface	USB 2.0(compatible with USB 1.1)
Transfer Rate	Approx. 38Mbps
Operating Temperature Range	-5˚C ~ 45˚C
Dimensions (mm)	51.56(W)×56.5(H)×16.7(D)
Weight (g)	43g
Platform OS	Windows 98/SE/ME/2000/XP Macintosh OS Version 9.2 and higher

3.2 Submitted Documents

- User's Guide

- Block Diagram

4. Measurement Conditions

Testing Input Voltage: AC 220V

4.1 Modes of Operation

The EUT was in the following operation mode during all testing;

1) File transfer each disk.

4.2 Additional Equipment

DEVICE TYPE	Manufacturer	M/N	S/N	FCC ID
PC	COMPAQ COMPUTER CORPORATION	EvoD5M	6F28KN8ZH110	-
Monitor	Samsung Electronics	750S	P223HVAR502035	-
Keyboard	COMPAQ COMPUTER CORPORATION	KB-9963	B26960GBUKKOVW	-
Mouse	logitech	M-S69	3892D101	-
Mouse	SEJIN ELECTRON INC.	SMB-400	0CIM004047	GJJS965M3
Printer	HEWLETT PACKARD	C4569A	SG6A7160PJ	-

4.3 Uncertainty

1) Radiated disturbance

Uc (Combined standard Uncertainty) = ± 1.8dB

Expanded uncertainty U=KUc

K = 2

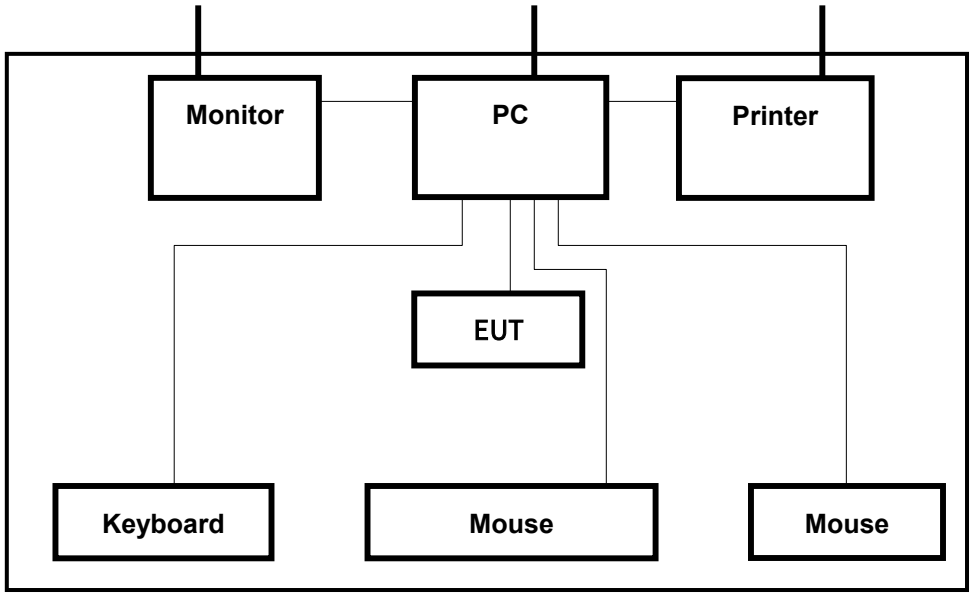
∴ U = ± 3.6dB

2) Conducted disturbance

Uc = ± 0.88dB

U = KUc=2 x Uc = ± 1.8dB

4.4 Test Setup



Signal Line

Power Line

5. EMISSION Test

5.1.Conducted Emissions

Result: Pass

The line-conducted facility is located inside a 2.3M x 3.5M x 5.5M shielded closure.

The shielding effectiveness of the shielded room is in accordance with MIL-Std-285 or NSA 605-05. A 1m x 1.5m wooden table 80cm high is placed 80cm away from the conducting ground plane and 40cm away from the sidewall of the shielded room. Electro-Metroics Model EM-7823 (9kHz-30MHz)50ohm/50 uH Line-Impedance Stabilization Networks (LISN) are bonded to the shielded room.

The EUT is powered from the Electro-Metroics LISN and the support equipment is powered from the Kyoritsu LISN. Power to the LISN are filtered by a high-current high-insertion loss shield enclosures power line filters (100dB 14kHz-1GHz).

The purpose of the filter is to attenuate ambient signal interference and this filter is also bonded to the shielded enclosure.

All electrical cables are shielded by copper pipe with inner diameter of 1".

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 Rohde & Schwarz LISN.

All interconnecting cables more than 1 meter were shortened by non-inductive bundling (serpentine fashion) to a 1-meter length.

Sufficient time for the EUT, Support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the spectrum analyzer to determine the frequency producing the maximum EME from the EUT. The frequency producing the maximum level was reexamined using EMI field Intensity meter (ESPC). The detector function was set to CISPR quasi-peak mode.

The bandwidth of the receiver was set to 10kHZ. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was maximized by: switching power lines; varying the mode of operation or resolution; clock or data exchange speed; if applicable; whichever determined the worst-case emission.

Photographs of the worst-case emission can be seen in photograph of conducted test.

Each EME reported was calibrated using self-calibrating mode.

Figure 1: Spectral Diagram, LINE-PE

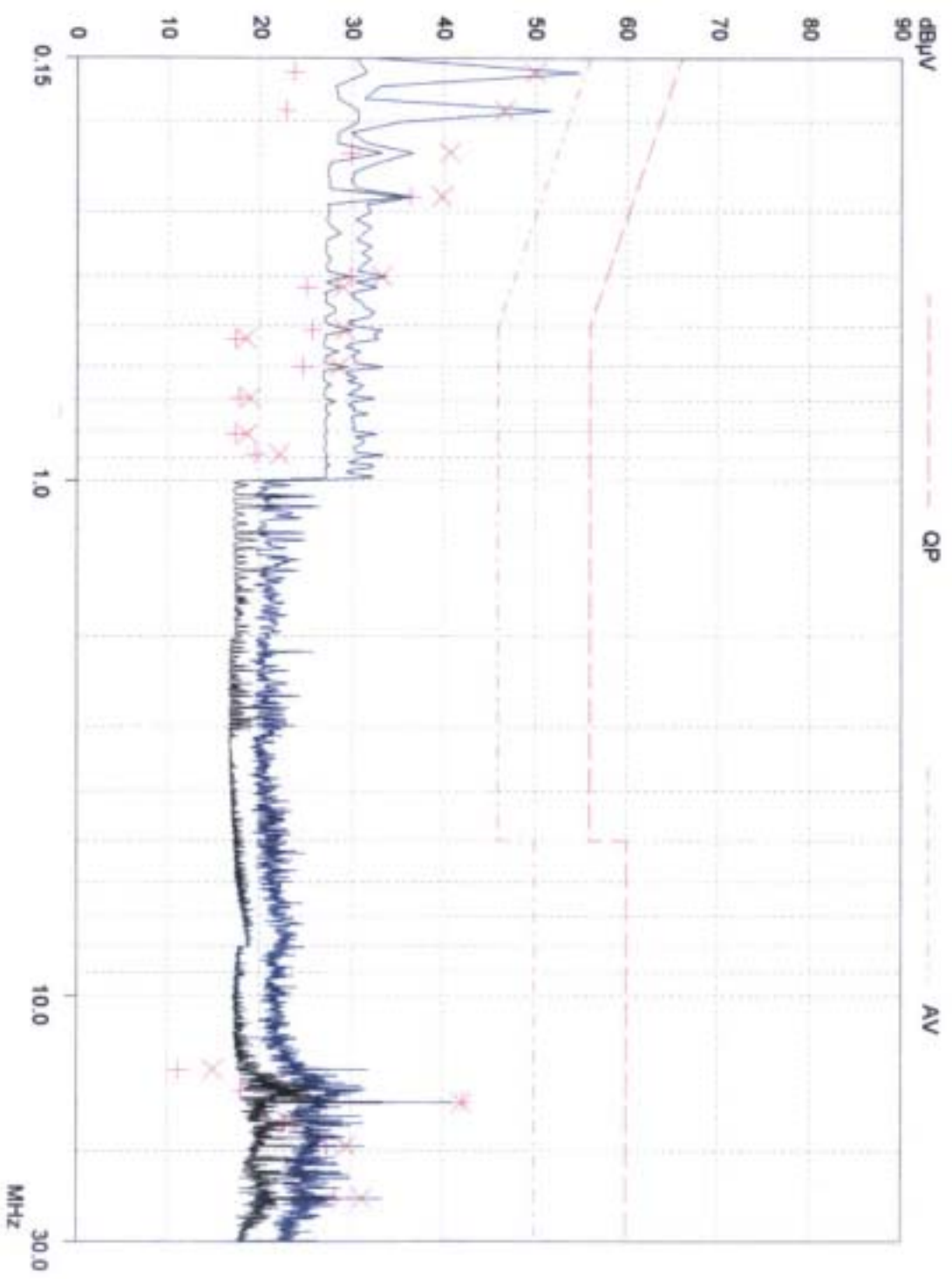


Figure 2: Spectral Diagram, NEUTRAL-PE

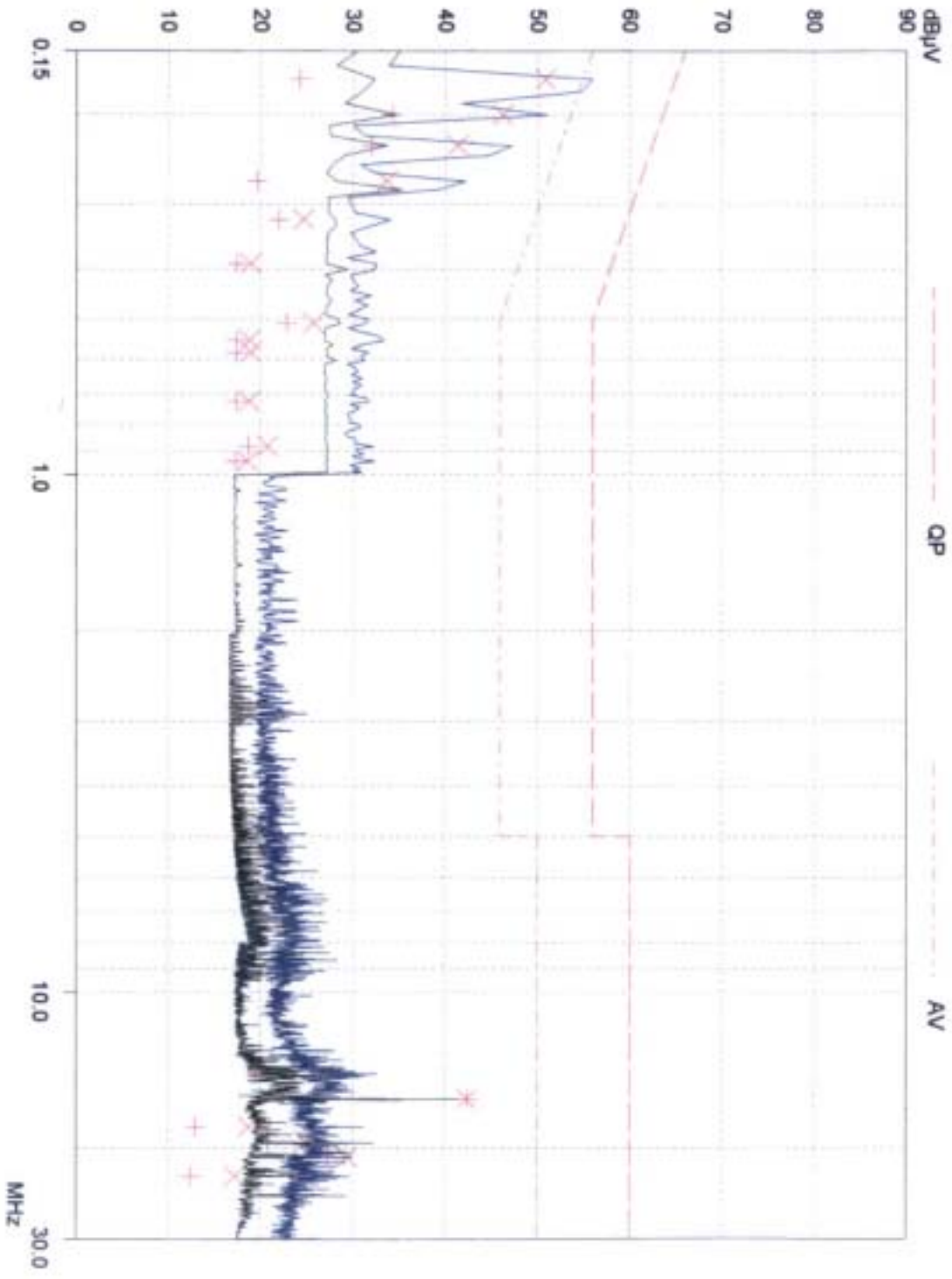


Table 2: Test Data, Conducted Emissions

Frequency (MHz)	(1) Reading (dBμV)	Line	(2)C/F (dB)	(3)Actual (dBμV)	(4) Limit (dBμV)	(5) Margin (dB)
0.16	50.11	L1	0.18	50.29	65.46	15.17
0.17	51.06	L2	0.17	51.23	64.96	13.73
0.19	46.81	L1	0.18	46.99	64.04	17.05
0.20	46.49	L2	0.17	46.66	63.61	16.95
0.28	39.83	L1	0.18	40.01	60.82	20.81
16.09	42.41	L2	0.54	42.95	60.00	17.05

NOTES:

1. All modes of operation were investigated
   And the worst-case emissions are reported.
2. All other emissions are non-significant.
3. All readings are calibrated by self-mode in receiver.
4. Measurements using CISPR Quasi-peak mode.
5. L1 = LINE-PE, L2 = NEUTRAL-PE
6. C/F = Correction Factor(LISN factor + Cable loss)
7. The limit for Class B digital device is 66dBuV to 56dBuV from 150KHz to 500KHz, 56dBuV from 500KHz to 5MHz, 60dBuV Above 5MHz.

♠ Margin Calculation

(5) Margin = (4) Limit – (3) Actual

[(3) Actual = (1) Reading + (2) C/F]

5.2 Radiated Emissions

Result: Pass

Preliminary measurements were made indoors at 1 meter using broadband antennas, broadband Amplifier, and spectrum analyzer to determine the frequency producing the maximum EME.
Appropriate precaution was taken to ensure that all EME from the EUT were maximized and Investigated. The system configurations, clock speed, mode of operation or video resolution, turntable azimuth with respect to the antenna were noted for each frequency found. The spectrum was scanned from 30MHz to 1GHz using BiconiLog Antenna. Above 1GHz, Double ridged horn Antenna was used.
Final measurements were made outdoors at 3-meter test range using EMCO antennas. The test equipment was placed on a wooden table situated on a 4x4 meter area adjacent to the measurement area. Turntable was to protect from weather in the dome that made with Polyethylene film. Sufficient time for the EUT, support 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 and investigated using EMI/Field Intensity Meter (ESIB40). The detector function was set to CISPR quasi-peak or peak mode as appropriate and the bandwidth of the receiver was set to 120kHz or 1 MHz depending on the frequency or type or signal.
The EUT, support equipment and interconnecting cables were re-configured to the set-up producing the maximum emission for the frequency and were placed on top of a 0.8meter high non-metallic 1 x 1.5 meter table.
The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each EME 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 or resolution; clock or data exchange speed, and/or support equipment, if applicable; and changing the polarity of the antenna and rotating the EUT in turns with three orthogonal axes for portable devices, whichever determined the worst-case emission.
Photographs of the worst-case emission can be seen in photograph of radiated emission test.
Each EME reported was calibrated using self-calibrating mode.

Table 3: Test Data, Radiated Emissions

Frequency (MHz)	Pol.	Height [m]	Angle [°]	(1) Reading (dBμV)	(2) AFCL (dB/m)	(3) Actual (dBμV/m)	(4) Limit (dBμV/m)	(5) Margin (dB)
114.52	V	1.15	10	21.53	9.72	31.25	43.50	12.25
199.80	V	1.15	10	19.76	12.29	32.05	43.50	11.45
400.88	H	1.25	25	20.05	20.00	40.50	46.00	5.50
501.12	H	1.25	10	17.50	23.50	41.00	46.00	5.00
584.96	V	1.30	0	14.85	26.30	41.15	46.00	4.85
751.20	V	1.30	10	14.84	27.42	42.00	46.00	4.00

Table. Radiated Measurements at 3-meters

Notes: 1.All modes of operation were investigated.
And the worst-case emission are reported.

2.All other emission is non-significant.

3.All readings are calibrated by self-mode in receiver.

4.Measurements using CISPR quasi-peak mode.

5.AFCL = Antenna factor and cable loss

6.H = Horizontal, V = Vertical Polarization

7. The limit for Class B digital device is 100uV(40dBuV) from 30MHz to 88MHz, 150 uV (43.5dBuV) from 88MHz to 216MHz, 200uV(46dBuV) from 216MHz to 960MHz and 500 uV (54dBuV) from above 960MHz.

♠ Margin Calculation

(5) Margin = (4) Limit – (3) Actual

[(3) Actual = (1) Reading + (2) AFCL]