IST EMC LAB.

EMISSION TEST REPORT

Test report file No. : **02-IST-077/FB** Date of issue : May. 10, 2002.

Model / Type No. : FD-100

Kind of product : Flash Disk

Brand name : Hansol Microsystem

Applicant : Hansol Microsystem Co., Ltd.

Manufacturer : Hansol Microsystem Co., Ltd.

Address : Suite 410-2 Building #D, Bundang Techno-Park
151 Yatap-Dong, Bundang-Gu, Sungnam City, Kyung-Gi Do, 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.

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.

DIRECTORY

A) Documentation.

	Page
Directory	2
Test regulations	3
Environmental Conditions	3
Test Conditions	4~5
Equipment under Test	6
Test Result	7
Test-setups (Photos)	8~9
Test-setup (Figures)	10
Summary	16

B) Test Data.

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

C) Appendix

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.

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	19
Humidity	41 %
Atmospheric pressure	1000 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	Jun. 16, 2001	861742/015
3725/2	LISN	EMCO	Jul. 30, 2001	9101-2068
KNW-407	LISN	Hyup-Rip	Jul. 26, 2001	8-883-10
ESH 3-Z2	Pulse Limiter	Rohde & Schwarz	Jul. 13, 2001	357.8810.52

Test - accessories :

Type	Manufacturer
Aneroid Barometer	Sato
Hygrometer	Sato

Measurement Procedures :

Conducted emissions measurments were made in accordance with ANSI G63.4-1992, "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 50? /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.

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.

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	Jun. 12, 2001	861744/018
VULB 9160	Antenna	Schwarzbeck	Jun. 04, 2001	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.

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.

EQUIPMENT UNDER TEST

Equipment Description

The Equipment Under Test (EUT) is the **Flash Disk of Hansol Microsystem Co., Ltd.**

Outer dimensions	22.7(W) x 12.2(H) x 72.35(L) : (mm)
Weight	16g
Power requirements	DC 5.0V(Draw power directly from USB port)
Read and Write SMC card capacity	16/32/64/128MB
SMC card format support	SSFDC format ✍ When driver Install
Etc.	UFI(USB Floppy Interface) protocol application USB high-speed transfer read/write function (Read transfer rate: 6MB, Write transfer rate: 3MB)
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 : - Download files from PC to EUT.

Configuration of the equipment under test :

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

Equipment	Type	Brand	Serial No
PC	Brio BA600/550	HP	SG01603779
Monitor	529B	Daewoo	GC95510039
Keyboard	SK-2502C	HP	M000456820
Mouse	M-S48a	HP	LZA01051466

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.

TEST RESULT

Conducted emissions : 450 kHz - 30 MHz

The requirements are. ☒ KEPT ☐ NOT KEPT

Min. limit margin 4.1 dB at 2.1784 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 14.2 dB at 47.5 MHz

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

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.

Test Set-Up
(Type : FD-100)

Conducted emission 450kHz ~ 30MHz

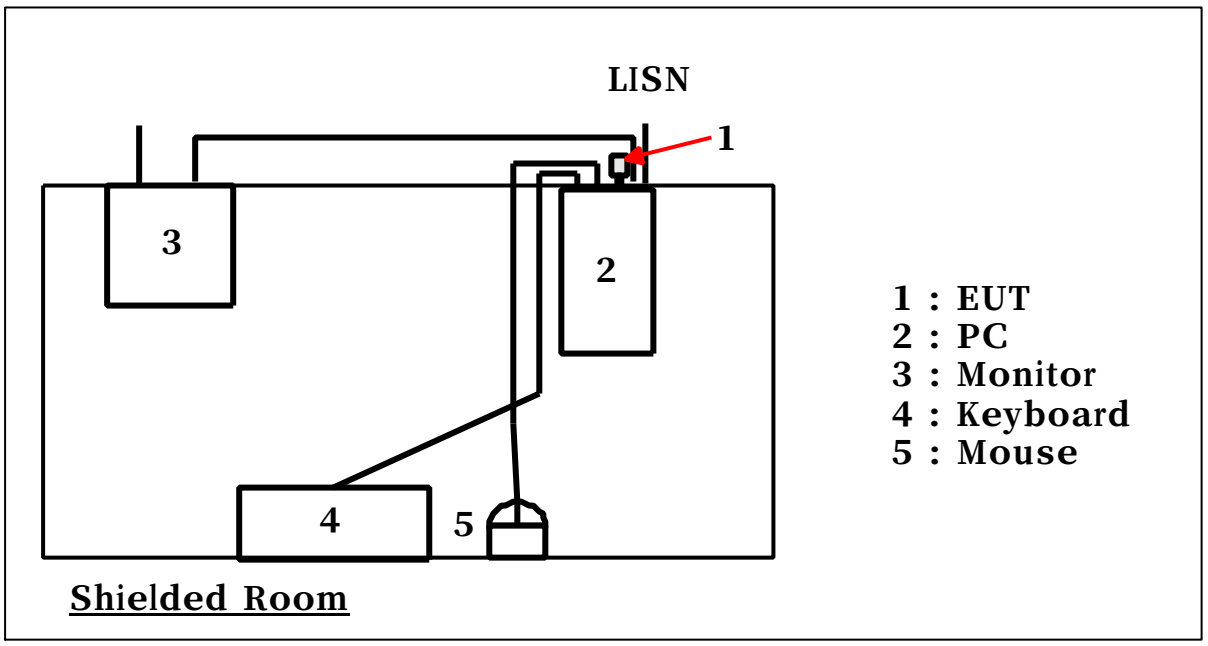
IST EMC Lab. San 21-8 Goan-Ri, Baekam-Myun, Yongin-Si, Kyunggi-Do, KOREA
International - Tel : 82-31 - 333 - 4093. Fax : 82-31 - 333 - 4094.
Domestic - Tel : 031 - 333 - 4093. Fax : 031 - 333 - 4094.

Test Set-Up
(Type : FD-100)

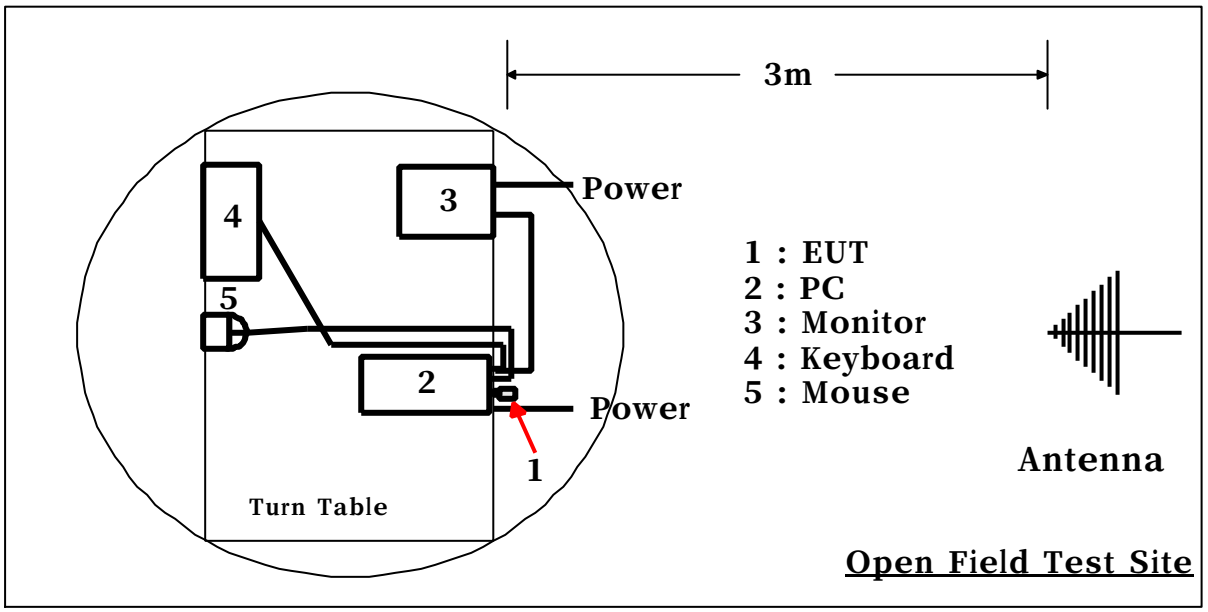
Radiated emission 30MHz ~ 1000MHz

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.

Test Set-Up
(Type : FD-100)



Picture 1 : Conducted emission 450kHz ~ 30MHz



Picture 2 : Radiated emission 30MHz ~ 1000MHz

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.

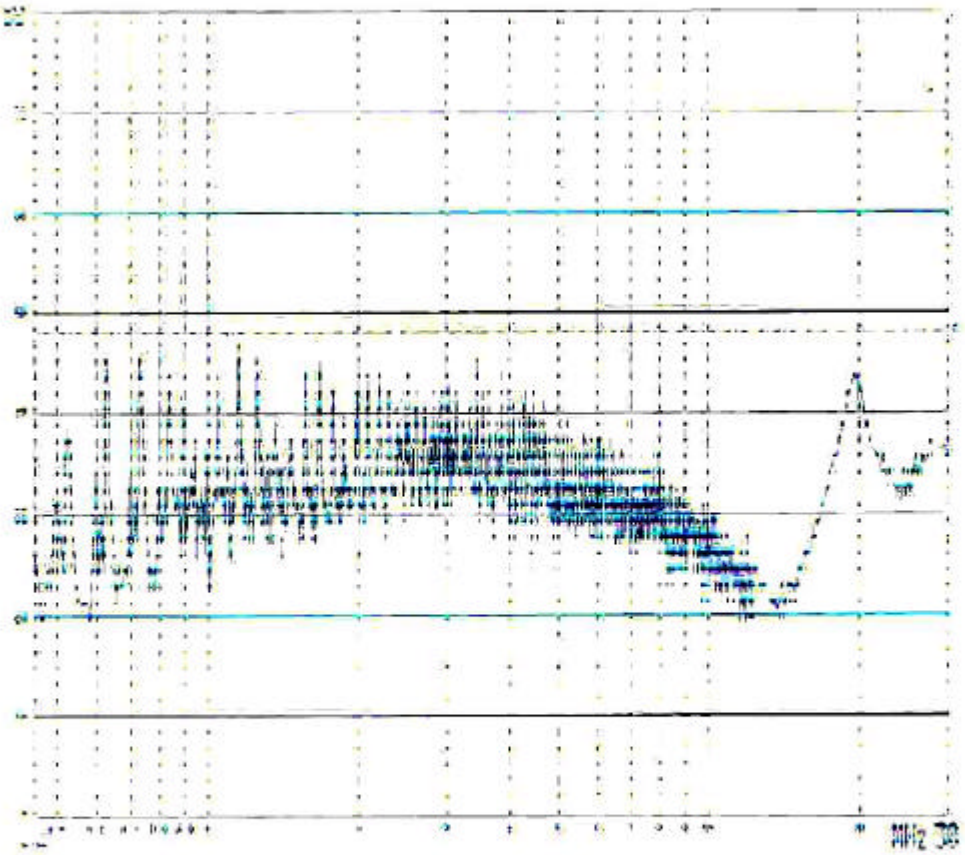
Conducted Emission Test Data

Type : FD-100
Manufacturer : Hansol Microsystem Co., Ltd.
Operation mode : Download files from PC to EUT
Date : May. 08, 2002

Frequency [MHz]	Reading [dB? V]	Insertion loss [dB]	Phase (L1/N)	Result [dB? V]	Limit [dB? V]	Margin [dB]
0.7276	42.8	0.8	L1	43.6	48.0	4.4
1.1389	41.8	0.8		42.6	48.0	5.4
1.2445	41.3	0.8		42.1	48.0	5.9
2.0793	41.3	0.8		42.1	48.0	5.9
2.1786	41.4	0.8		42.2	48.0	5.8
19.4300	41.3	0.8		42.1	48.0	5.9
0.7275	43.0	0.8	N	43.8	48.0	4.2
1.1390	42.3	0.8		43.1	48.0	4.9
1.2446	42.2	0.8		43.0	48.0	5.0
2.0794	42.3	0.8		43.1	48.0	4.9
2.1784	43.1	0.8		43.9	48.0	4.1
19.4300	42.0	0.8		42.8	48.0	5.2
Cable loss are less than 0.1 dB						

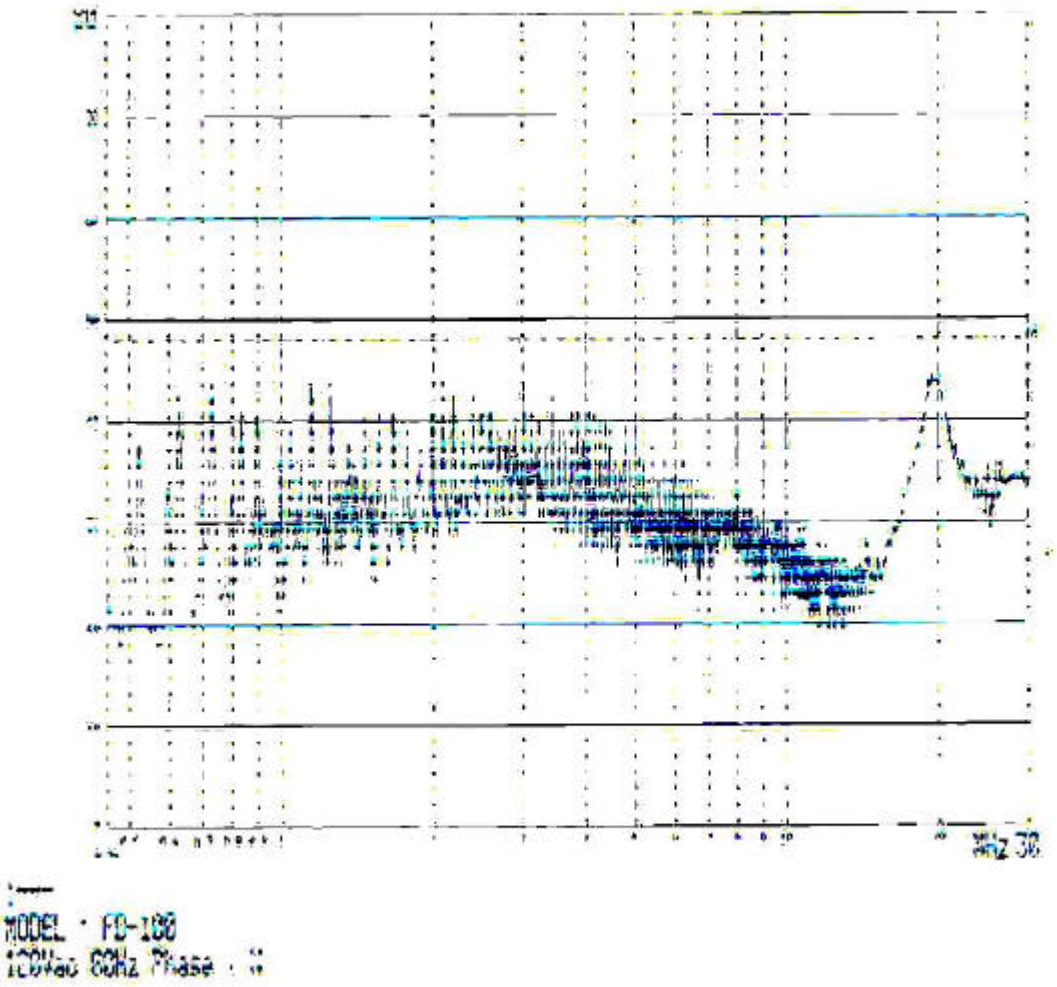
*L1 : Live Line
**N : Neutral Line
*** **Please refer to data graphs at page 12 ~ 13**

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.



MODEL : FD-188
120Vac 60Hz Phase : L1

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.



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.

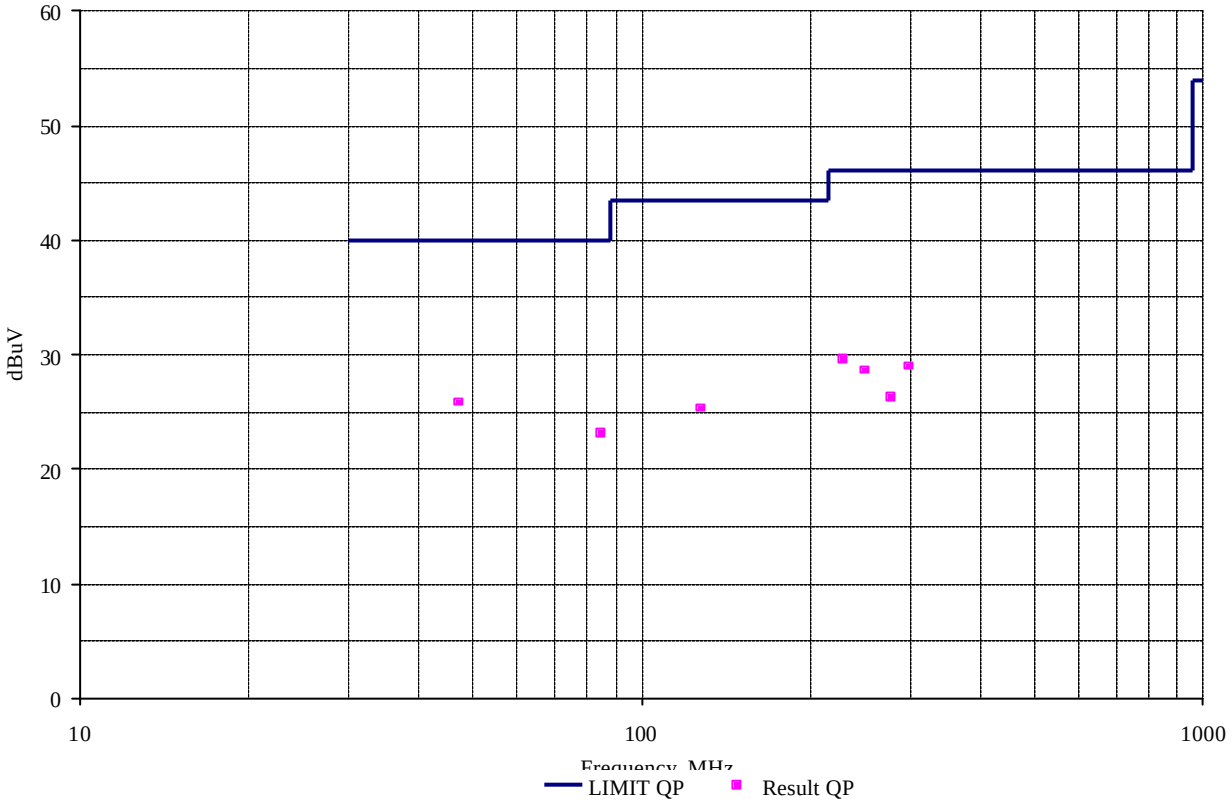
Radiation Test Data

Type : FD-100
Manufacturer : Hansol Microsystem Co., Ltd.
Operation mode : Download files from PC to EUT
Test distance : 3 m
Antenna : VULB9160
Date : May. 09, 2002.

Freq. [MHz]	Reading [dBuV]	Antenna Factor [dB]	Cable Loss [dB]	Angle [deg]	Height [cm]	Polar [H/V]	Result [dBuV]	Limit [dBuV]	Margin [dB]
47.5	14.3	10.2	1.3	170	122	V	25.8	40.0	14.2
84.6	14.2	7.3	1.6	178	121	V	23.1	40.0	16.9
128.1	12.7	10.5	2.1	354	129	V	25.3	43.5	18.2
229.1	17.5	9.3	2.8	180	234	H	29.6	46.0	16.4
250.4	15.0	10.8	2.8	0	178	V	28.6	46.0	17.4
278.1	11.3	11.8	3.1	179	148	V	26.2	46.0	19.8
300.5	14.0	11.7	3.3	169	121	V	29.0	46.0	17.0

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.

MEASUREMENT OF DISTURBANCE RADIATION



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.

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 : May. 08, 2002

End of testing : May. 09, 2002

Reviewed by :

Joon H. Lee, EMC Manager
IST EMC Lab.

Approved by :

G. Chung, Chief of EMC Lab.

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.