



FCC EVALUATION REPORT FOR Certification of Conformity

KOREA Standard Technology

Test report No.: KST-FCC-080037

Applicant's Name : DOBESys Inc.
Applicant's Address : 276-4, Seongsu 2-Ga, Seongdong-Gu, Seoul 133-831 Korea
Manufacturer's Name : DOBESys Inc.
Manufacturer's Address : 276-4, Seongsu 2-Ga, Seongdong-Gu, Seoul 133-831 Korea

EUT's:

FCC ID : V6ADHS1000
Product Name : 1D Handheld Scanner
Model Number(s) : DHS1000
Product Options : None
Category : FCC Part15 Subpart B
Class B personal computers and peripherals

Supplementary Information

The device bearing the brand name and FCC ID specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with measurement procedures specified in ANSI C63.4-2003.

I attest to the accuracy of data and all measurements reported herein were performed by or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Test Date : April 17, 2008

Issued Date : April 18, 2008

Tested by:

Jeong, seok-jin

Approved by:

Hong, Jeung-Gil

Contents

1. Description of E.U.T
2. Test Facility
3. MAP
4. Test system configuration
5. Description of E.U.T.
6. Summary of test results.
7. Test results.
8. Photographs.

Appendix

EMI Test Report

Report No.: KST-FCC-080037

Page : 3 / 26

1. Description of E.U.T

- | | |
|-------------------------------|--|
| 1) Kind of equipment: | 1D Handheld Scanner |
| 2) FCC ID: | V6ADHS1000 |
| 3) Model Name: | DHS1000 |
| 4) Serial No.: | Prototype |
| 5) Type of Sample Tested: | Pre-production |
| 6) High Frequency Used: | 18.432 MHz, 20 MHz |
| 7) Adapter: | None |
| 8) Tested Power supply: | 5 V |
| 9) Date of Manufacture: | January, 2008 |
| 10) Manufacture: | DOBESys Inc. |
| 11) Description of Operating: | Displayed on the LCD Monitor scanning barcode data by EUT. |
| 12) Dates of Test: | April 17, 2008 |
| 13) Place of Tests: | KOSTEC Co., Ltd. EMC site |
| 14) Test Report No: | KST-FCC-080037 |

2. Test Facility

The open field test site and conducted measurement facility are used for these testing, where are located following address and drawing. This site was fully described in a report dated November 14, 2002, that was submitted to the FCC.

KOSTEC CO., LTD. (Korea Standard Technology)

Head office & Test Lab ;

:180-254, Annyung-dong, Hwasung-shi, Gyeonggi-do, Korea

Telephone Number : 82-31-222-4251

Facsimile Number: 82-31-222-4252

MIC(Ministry of Information and Communication) Number: **KR0041**

FCC Filing Number. : **525762**

VCCI Membership Number : **2005**

VCCI Registration Number : **R-1657 / C-1763**

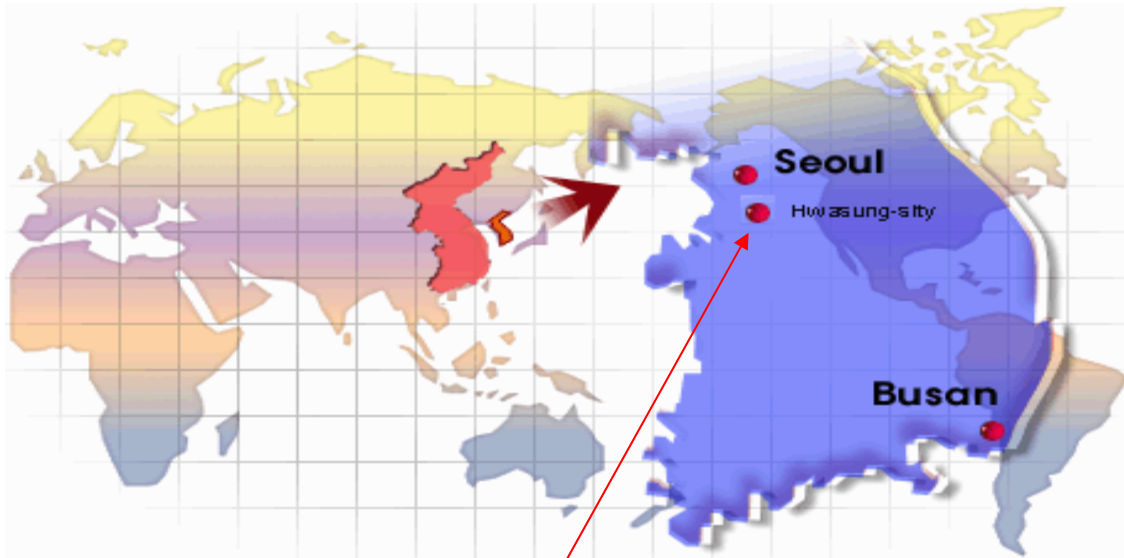
EMI Test Report

Report No.: KST-FCC-080037

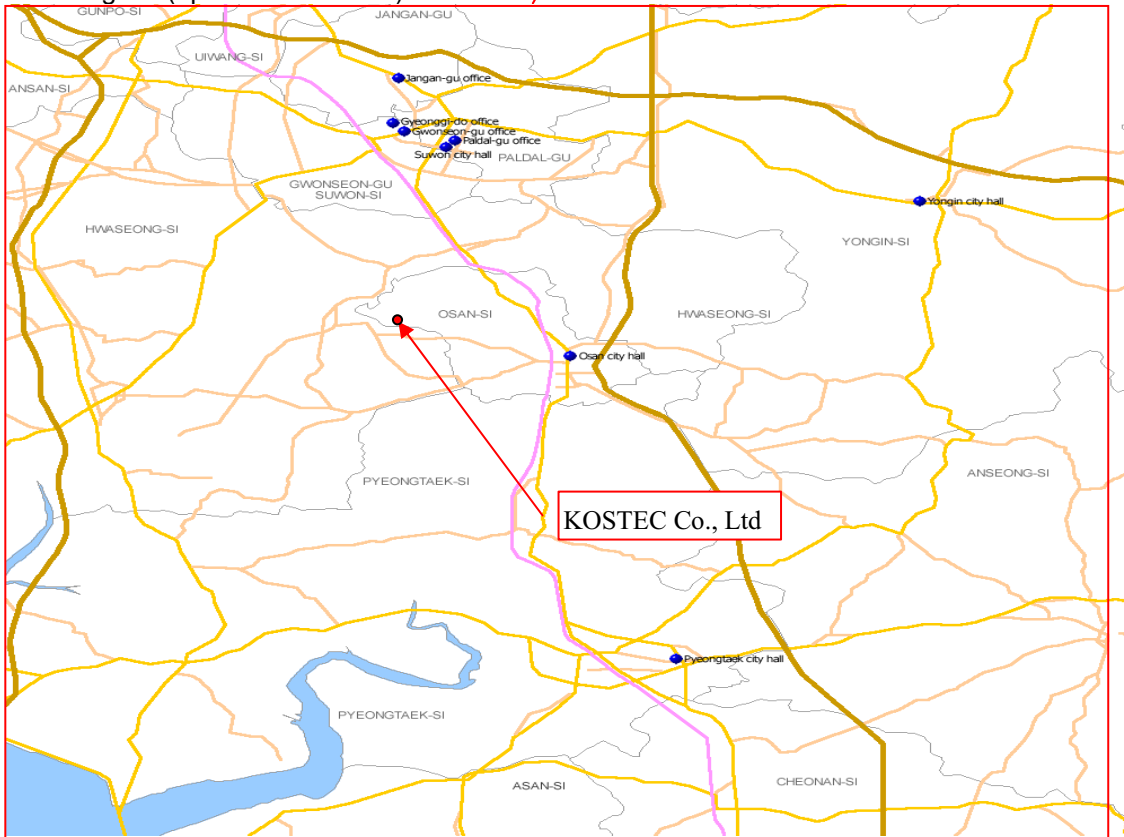
Page : 5 / 26

3. MAP

Korea



Hwasung-shi (open area test site)



4. TEST SYSTEM CONFIGURATION

Operation Environment

Ambient	<u>Temperature</u> (°C)	<u>Humidity</u> (%)	<u>Pressure</u> (kPa)
10 m Open Area site :	12	48	102.0
Shielded room :	18	44	102.0

Test site

These testing were performed following locations ;

Shielded room : Conducted Emission

10 m Open Area Site : Radiated Emission

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC.

The factors contributing to uncertainties are test receiver, Cable loss, antenna factor calibration, Antenna directivity, antenna factor variation with height, antenna phase center variation, antenna frequency interpolation, measurement distance variation, its imperfection, mismatch, and system repeatability.

Based on NIS 80,81, The measurement uncertainty level with a 95 % confidence level were applied.

sample calculation

Conducted emission

The field strength is calculated by adding the LISN factor, cable loss from the measured reading.

The sample calculation is as follows:

$$\begin{aligned}FS &= MR + LF + CL \\MR &= \text{Meter Reading} \\LF &= \text{LISN Factor} \\CL &= \text{Cable Loss}\end{aligned}$$

If MR is 30 dB, LISN Factor 1 dB, CL 1 dB

The result (MR) is

$$30 + 1 + 1 = 32 \text{ dB } \mu V$$

EMI Test Report

Report No.: KST-FCC-080037

Page : 7 / 26

5. Description of E.U.T.

Product Description

Manufactured By:	DOBESys Inc.
Address:	276-4, Seongsu 2-Ga, Seongdong-Gu, Seoul 133-831 Korea
Model:	DHS1000
Serial Number:	Prototype

Configuration of EUT

Description	Manufacturer	Model/Part #	Serial Number
Main board	DOBESys Inc.	DH10M_1	None
Connector board	DOBESys Inc.	DH10S_1	None
Handle board	DOBESys Inc.	DH10H_1	None

EUT Used cables

Cable Type	Shield	Length (m)	Ferrite	Connector	Connection Point 1	Connection Point 2
RJ-45 (PS/2 Type Cable)	Yes	2.1	No	Din	EUT	PC
RJ-45 (PS/2 Type Cable)	Yes	2.1	No	Din	EUT	Keyboard
RJ-45 (USB Type Cable)	Yes	2.0	No	USB	EUT	PC

Operating conditions

The operating mode/system was as follows in details:

The test was performed as following. The RJ-45 ports of E.U.T was connected two cables of each other. The termination equipment of two cables are different.

And then, the "memo pad : application software of PC" used for watching barcode data of E.U.T.

At this time E.U.T continuously scanned barcode.

1. PS/2 Type Cable : RJ-45 port of E.U.T connect PC and Keyboard
2. USB Type Cable : RJ-45 port of E.U.T connect PC

EMI Test Report

Report No.: KST-FCC-080037

Page : 9 / 26

7. TEST RESULTS

7.1 Conducted emission

Measurement procedure

Mains

The measurements were performed in a shielded room. EUT was placed on a non-metallic table height of 0.4 m above the reference ground plane. They were folded back and forth forming a bundle 30 cm to 40 cm long and were hanged at a 40 cm height to the ground plane.

Each EUT power lead, except ground (safety) lead, were individually connected through a LISN to input power source.

Both lines of power cord, hot and neutral, were measured.

Used equipment

Equipment	Model No.	Serial No.	Manufacturer	Next cal date	Used
Test receiver	ESPI3	100109	R&S	2009.03.03	●
L.I.S.N.	ESH2-Z5	100044	R&S	2008.04.30	●
	ESH3-Z5	100147	R&S	2008.08.06	●

Measurement uncertainty

Conducted Emission measurement : ± 2.4 dB (K=2)

Test Data

PS/2 Type Cable

< Class B >

FREQ. (MHz)	LEVEL (dB μ V)		LINE PoI	Loss (dB)	LIMIT (dB μ V)		MARGIN (dB)	
	QP	AV			QP	AV	QP	AV
0.170	45.69	40.81	L	0.08	64.96	54.96	19.19	14.07
0.190	48.24	39.53	N	0.08	64.04	54.04	15.72	14.43
0.262	39.94	35.44	L	0.29	61.37	51.37	21.14	15.64
0.510	39.29	31.81	L	0.90	56.00	46.00	15.81	13.29
0.870	37.26	28.31	N	0.43	56.00	46.00	18.31	17.26
0.926	36.87	27.17	N	0.43	56.00	46.00	18.70	18.40
16.038	39.76	34.17	L	1.77	60.00	50.00	18.47	14.06
19.986	36.56	28.99	L	1.77	60.00	50.00	21.67	19.24
23.950	35.30	25.36	L	2.08	60.00	50.00	22.62	22.56

* Level = test receiver reading value

* Loss = LISN insertion Loss + Cable Loss

EMI Test Report

Report No.: KST-FCC-080037

Page : 10 / 26

USB Type Cable

< Class B >

FREQ. (MHz)	LEVEL (dB μV)		LINE Pol	Loss (dB)	LIMIT (dB μV)		MARGIN (dB)	
	QP	AV			QP	AV	QP	AV
0.170	45.55	40.63	L	0.08	64.96	54.96	19.33	14.25
0.190	48.26	43.40	L	0.08	64.04	54.04	15.70	10.56
0.266	40.62	35.31	L	0.29	61.24	51.24	20.33	15.64
0.510	39.23	31.93	N	0.90	56.00	46.00	15.87	13.17
0.622	36.15	28.04	N	0.90	56.00	46.00	18.95	17.06
0.870	37.08	24.69	N	0.43	56.00	46.00	18.49	20.88
7.922	34.55	29.63	L	1.20	60.00	50.00	24.25	19.17
16.182	37.58	31.44	N	1.77	60.00	50.00	20.65	16.79
20.034	39.66	31.27	N	1.77	60.00	50.00	18.57	16.96

- * Level = test receiver reading value
- * Loss = LISN insertion Loss + Cable Loss

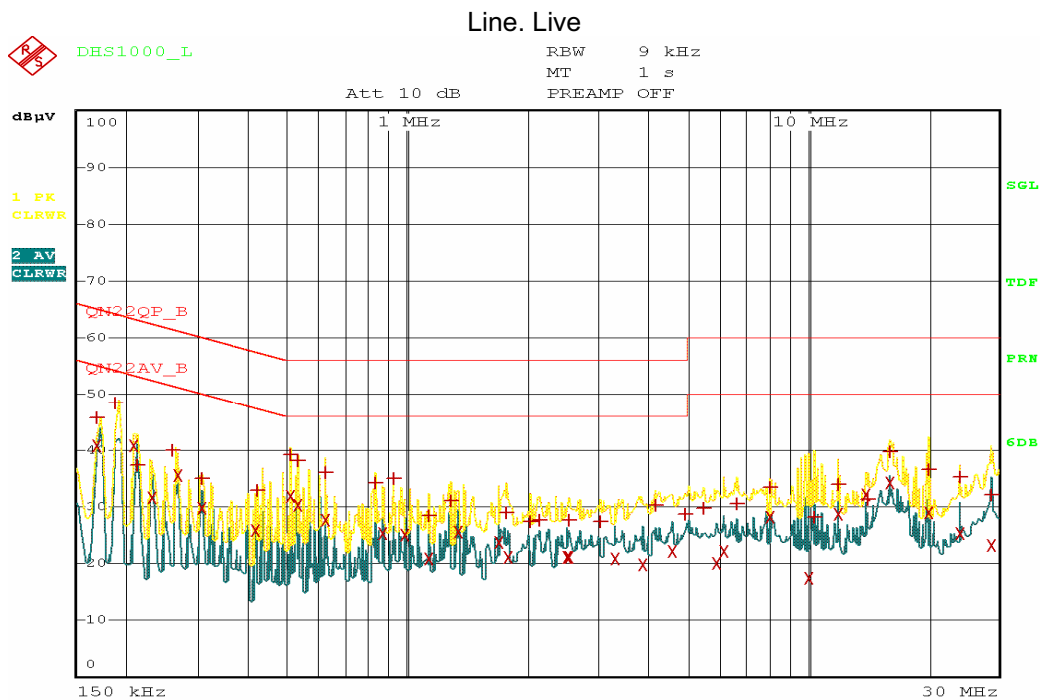
EMI Test Report

Report No.: KST-FCC-080037

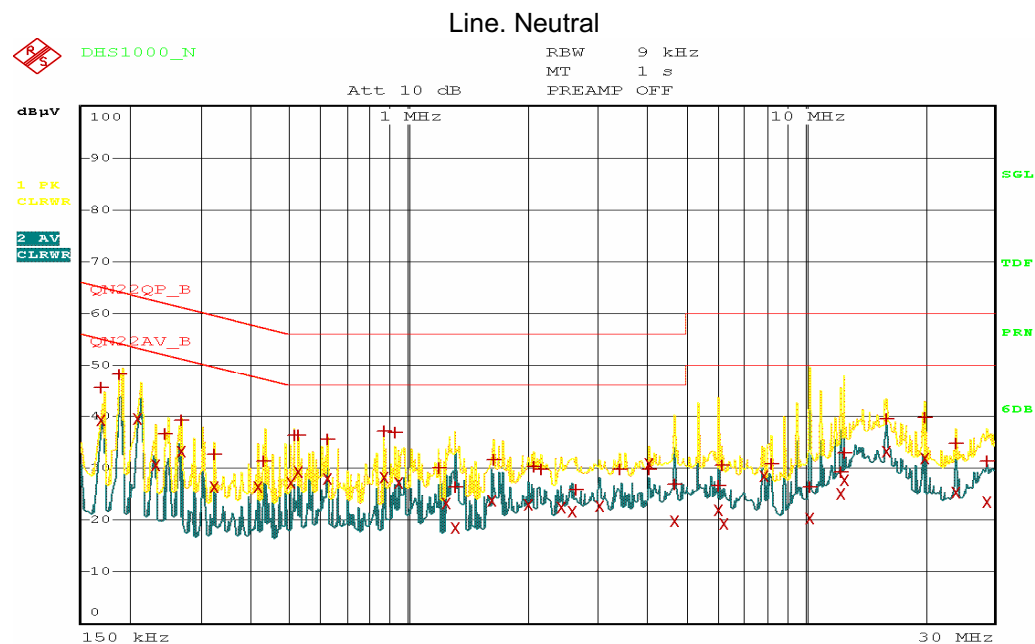
Page : 11 / 26

Conducted emission test graph

PS/2 Type Cable



Date: 17.APR.2008 23:06:44



Date: 17.APR.2008 23:15:44

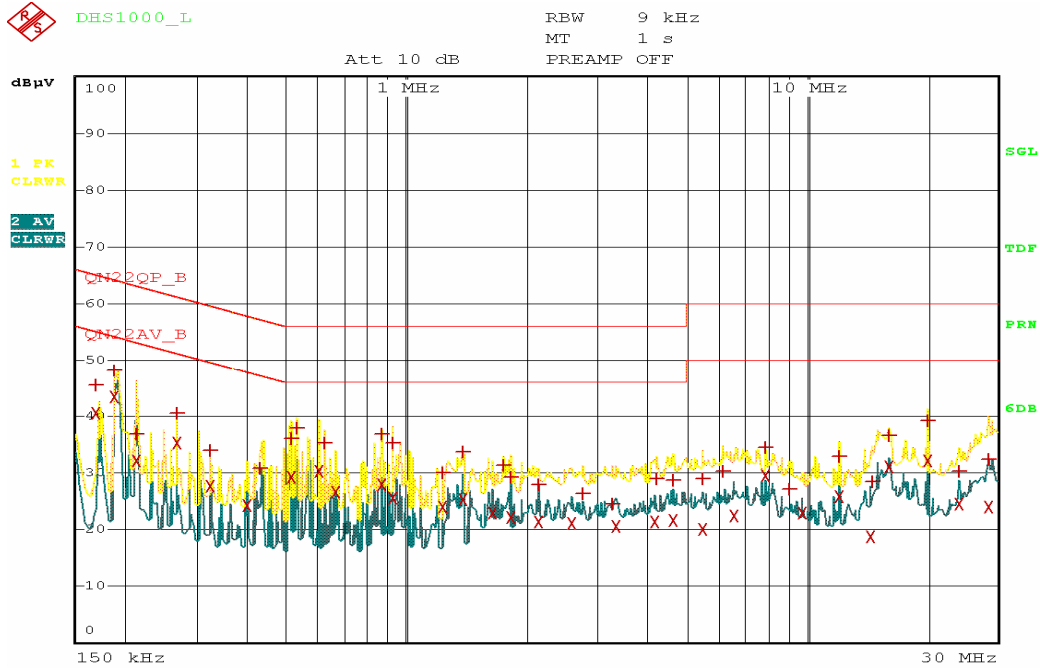
EMI Test Report

Report No.: KST-FCC-080037

Page : 12 / 26

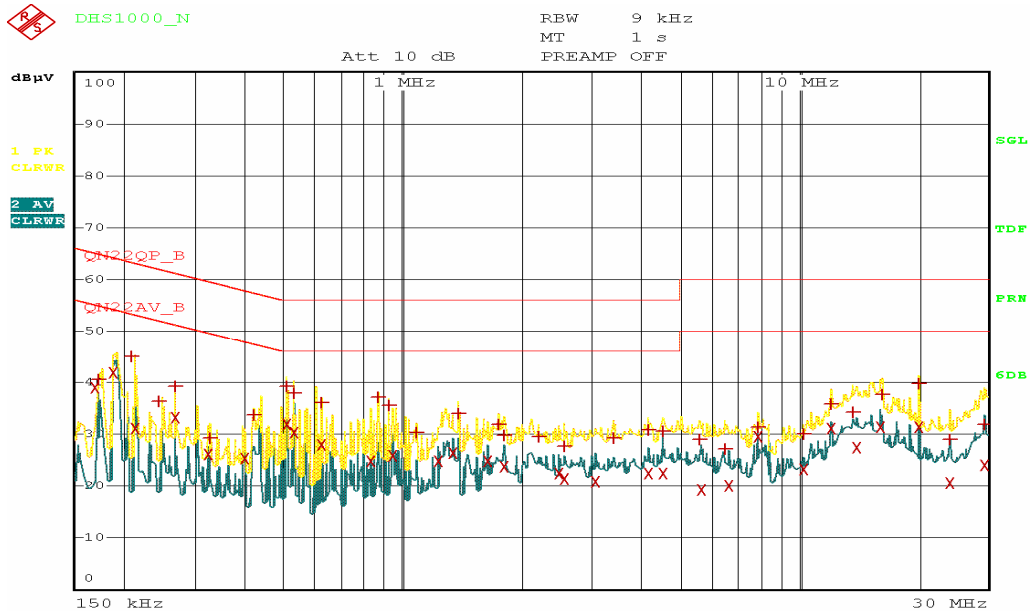
USB Type Cable

Line. Live



Date: 17.APR.2008 23:30:25

Line. Neutral



Date: 17.APR.2008 23:20:42

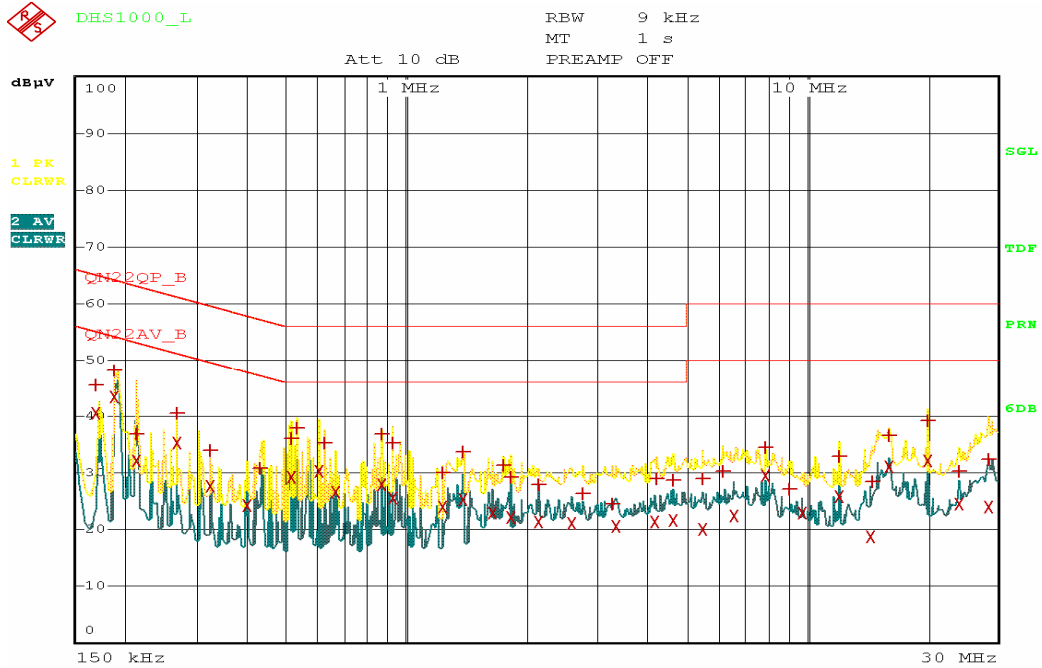
EMI Test Report

Report No.: KST-FCC-080037

Page : 12 / 26

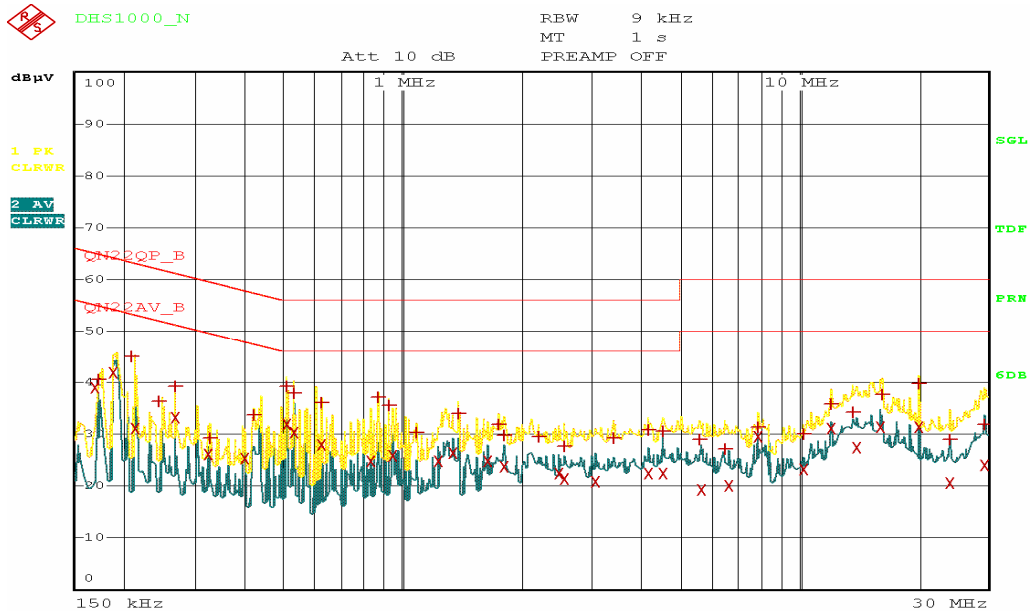
USB Type Cable

Line. Live



Date: 17.APR.2008 23:30:25

Line. Neutral



Date: 17.APR.2008 23:20:42

EMI Test Report

Report No.: KST-FCC-080037

Page : 13 / 26

7.2 Radiated Emission

Measurement procedure

A pretest was performed at 3 m distances in a semi-anechoic chamber for searching correct frequency. The final test was done at a 10 m open area test site with a quasi-peak detector. EUT was placed on a non-metallic table height of 0.8 m above the reference ground plane. Cables connected to EUT were fixed to cause maximum emission. Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

Used equipment

Equipment	Model No.	Serial No.	Manufacturer	Next cal	USED
Test receiver	ESCS30	100111	R&S	2009.03.07	●
Ultra broadband antenna	HL562	100075	R&S	2010.03.20	●
Antenna Mast	AT14	None	Daeil EMC	-	●
Turn Table	TT15	None	Daeil EMC	-	●
10m Open area site	None	None	KOSTEC Lab	-	●
Chamber (3 m)	None	None	FRANCONIA	-	-

Measurement uncertainty

Radiated Emission measurement : 30 – 300 MHz + 3.96 dB / -4.04 dB
300 – 1000 MHz + 3.04 dB / -3.00 dB

Test Data

PS/2 Type Cable

<Class B >

Freq (MHz)	Reading (dB μ V)	P (H/V)	H (m)	A (°)	Antenna (dB /m)	Cable Loss (dB)	Result (dB μ V /m)	Limit (dB μ V /m)	Margin (dB)
40.00	7.60	V	2.40	315	14.10	2.50	24.20	40.0	15.80
160.00	12.00	H	2.20	90	7.50	4.50	24.00	43.5	19.50
194.03	11.34	V	1.00	180	7.20	4.86	23.40	43.5	20.10
202.82	15.74	V	1.00	225	7.38	5.08	28.20	43.5	15.30
288.30	10.12	V	1.40	270	10.62	6.36	27.10	46.0	18.90
365.80	9.79	H	1.80	45	12.65	7.16	29.60	46.0	16.40
384.41	8.83	H	1.50	45	13.12	7.25	29.20	46.0	16.80
406.43	10.42	H	1.00	45	13.62	7.46	31.50	46.0	14.50

Reading = Test receiver reading / P = antenna Polarization / H = antenna Height

A = turn table Angle / Antenna = antenna factor / Cable loss = used cable loss

Result = reading + antenna + loss / Margin = Limit - result

* Receiving Antenna Mode : Horizontal, Vertical / * Test site : 10 m Open area site

EMI Test Report

Report No.: KST-FCC-080037

Page : 14 / 26

USB Type Cable

<Class B >

Freq (MHz)	Reading (dB μ V)	P (H/V)	H (m)	A (°)	Antenna (dB/m)	Cable Loss (dB)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
40.00	13.00	V	1.20	225	14.10	2.50	29.60	40.0	10.40
192.20	15.52	H	1.80	225	7.20	4.78	27.50	43.5	16.00
214.03	14.00	H	1.80	135	7.84	4.96	26.80	43.5	16.70
224.03	11.80	H	2.00	135	8.52	4.98	25.30	46.0	20.70
331.03	4.96	H	1.60	190	11.93	6.81	23.70	46.0	22.30
386.07	8.56	V	1.40	270	13.18	7.26	29.00	46.0	17.00
416.00	2.06	V	1.40	270	13.88	7.56	23.50	46.0	22.50
446.46	3.02	H	2.20	360	14.52	7.86	25.40	46.0	20.60

Reading = Test receiver reading / P = antenna Polarization / H = antenna Height

A = turn table Angle / Antenna = antenna factor / Cable loss = used cable loss

Result = reading + antenna + loss / Margin = Limit - result

* Receiving Antenna Mode : Horizontal, Vertical / * Test site : 10 m Open area site