ERI EMC Research Institute
66-6, Jeil-RI, Yangji-Myun, Yongin-City
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TEL:+82-31-336-9286 FAX:+82-31-335-9786

EMC TEST REPORT

Emission and Immunity of electromagnetic disturbance

Test Report No. : **ERI-FCC05-0048**
Equipment : **Fingerprint Recognition Mouse**
Name of basic model : **MFDU03**
Family model : **None**
Manufacturer : **NITGEN Co., Ltd (Guro Factory)**
Applicant : **NITGEN Co., Ltd (Head Office)**
Date of receipt EUT : **2005. 11. 02**
Tested date : **2005. 11. 03 ~ 11. 16**
Issued date : **2005. 11. 22**
Test results : **PASS**
Test Standards : **FCC Part 15 Subpart B (Class B)**
/ Class B digital devices, peripherals

Affirmation	Measurements performed by Name : Kim, Kyung-il (signature)	Approved by Title : Manager Name: Rim, Uk-Cho (signature)

ERI EMC Research Institute President

Nov 22, 2005

CONTENTS

1. CLIENT INFORMATION

The EUT has been tested by request of :

Company : NITGEN Co., Ltd (Head Office)

Address : Korea Sanhak Foundation Bldg.5F, 1337-31, Seocho-dong,Seocho-gu, Seoul, 137-860

Name of contact : Moon Yong Geun

Telephone : +82-2-3415-1635

Facsimile : +82-2-3415-1629

2. LABORATORY INFORMATION

The 10m full-anechoic chamber and/or EMC facilities are used for these testing. These facilities were accredited by KOLAS, EK, MIC of Korea and FCC of USA.

Address

ELECTROMAGNETIC RESEARCH INSTITUTE.

66-6, Jeil-ri, Yangji-myun, Youngin-si, Gyeonggi-do, Korea.

Telephone No. : +82-31-336-1186~7

Facsimile No. : +82-31-336-1184

Registered No.

KOLAS : 111

EK : J

MIC : KR0030

FCC Filing No. : 302567

3. EQUIPMENT UNDER TEST INFORMATION(EUT)

3.1 Identification of the EUT

Type of equipment : Fingerprint Recognition Mouse

Model name : MFDU03

Brand name : NONE

Manufacturer : NITGEN Co., Ltd (Guro Factory)

Address : Ace Techno-Tower ‖ #105, 197-7, Guro-dong, Guro-gu, Seoul, 152-766.

Telephone : +82-2-3415-1635

Facsimile : +82-2-3415-1629

Country of origin : KOREA

Rating : DC 5 V

3.2 Additional information about the EUT

Class B, Family Models List

Basic Model	Variant Model	Differential point
MFDU03	None	None

3.3 Peripheral equipment

Equipment needed for correct operation of the EUT is given below.

Description	Model No.	Serial No.	Manufacture
PC	MTC2	PSZS91S	Dell
Monitor	PN15VT	P181H80R907989	Chung Wha
Printer	C6427A	CN13V1B1RY	JIT Electronics
Mouse	MFDU03	-	NITGEN
Keyboard	SK-8110	-	SILTEK YET FOUNDATE
Earphone/MIKE	JPC-199MV	-	TSOUND

4. TEST SPECIFICATIONS

4.1 Standards

The standard for a EUT is given below.

Standard	Remark
ANSI 63.4: 2003	Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz

5. TEST RESULTS SUMMARY

5.1 Test Results

Standards	Test items / Frequency	Result
ANSI 63.4: 2003	1. Main Terminal disturbance voltage(150kHz~30MHz)	**Pass**
	2. Radiated disturbance(30MHz ~ 1000MHz)	**Pass**

5.2 Measurement Uncertainty

Although the measured emissions indicate that the EUT complies with required limits, some measurements are close to these limits. When the uncertainty of measurement is considered, there is some possibility that the EUT may not be compliant

Compliance or non-compliance with a disturbance limit shall be determined in the following manner.

If U_{lab} is less than or equal to U_{cispr}

- compliance is deemed to occur if no measured disturbance exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance exceeds the disturbance limit

If U_{lab} is greater than U_{cispr}

- compliance is deemed to occur if no measured disturbance, increased by (U_{lab}-U_{cispr}), exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance, increased by (U_{lab}-U_{cispr}), exceeds the disturbance limit;

- **Measurement uncertainty for Test Items**

- **Conducted disturbance(150 kHz ~ 30 MHz) : ± 3.0 dB(k=2)**
- **Radiated disturbance(30 MHz ~ 300 MHz) : ± 4.6 dB(k=2)**
- **Radiated disturbance (300 MHz ~ 1 000 MHz) : ± 4.7 dB(k=2)**

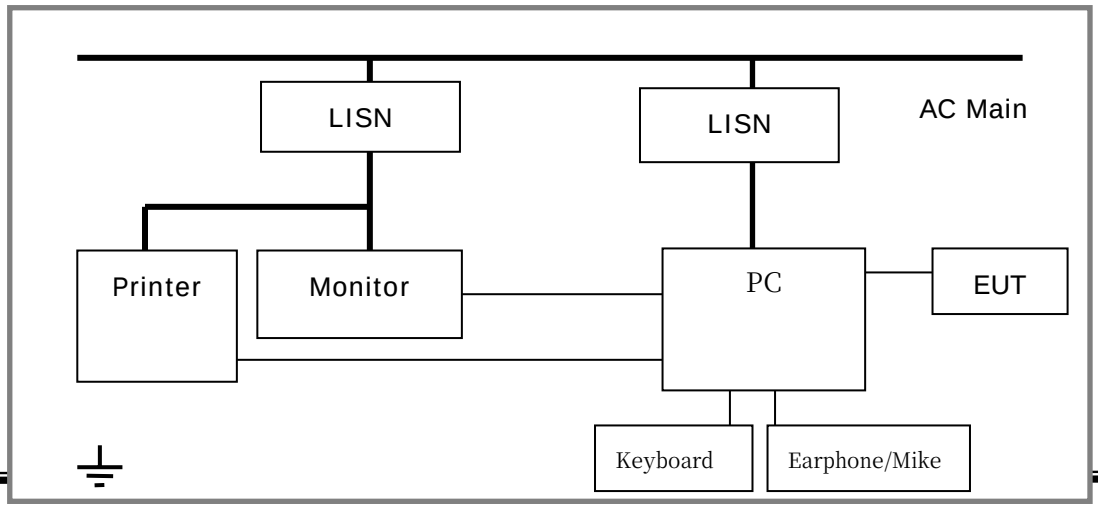
6, TEST RESULTS

6.1 CONTINUOUS DISTURBANCE VOLTAGE, MAIN TERMINAL
: Frequency range 0.15 MHz to 30 MHz

6.1.1 Operating environment

Temperature : (22.0 ± 0.7) ℃
Relative Humidity : (30.0 ± 4.5) %
Atmospheric pressure : (1006.00 ± 0.25) hPa

6.1.2 Test set-up and test procedures



The mains terminal disturbance voltage was measured with the equipment under test(EUT) in a shield room. The EUT was connected to an artificial mains network(LISN) placed on the floor. The EUT was placed on non-metallic table 0.8m above the metallic, grounded floor. The distance to other metallic surface was at least 0.8m.
Amplitude measurements were performed with a quasi-peak detector and an average detector.

Operation condition: This device is PC peripheral FRD (Fingerprint Recognition Device) through USB interface. This device can identify an individual by measuring their physical uniqueness, and comparing it to those on record.

6.1.3 Test instrument

Instrument	Model No	Serial No.	Makers	Next cal.date	Used
Test receiver	ESCS30	100021	R&S	2006. 2. 6	O
L.I.S.N.	ESH3-Z5	827246/008	R&S	2006. 3. 31	O
	ESH3-Z5	831887/018	R&S	2006. 3. 31	O
Shield room	8 × 6 × 3.3m/H	-	-	-	O

6.1.4 Test results
Date of test: 2005. 11. 16
An overview sweep performed with peak detector & average detector are included in the report **as test reports.**

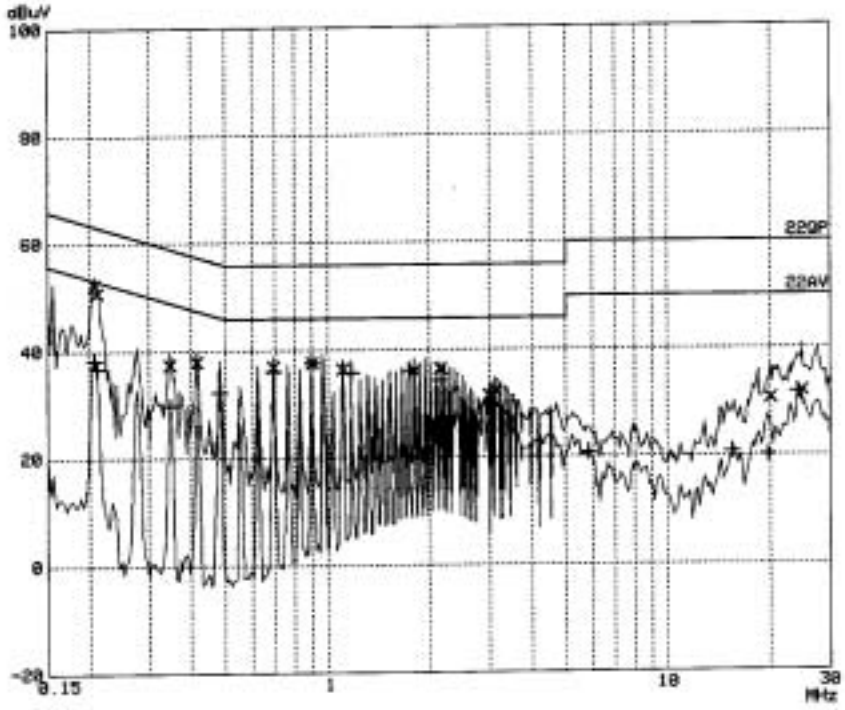
CONTINUOUS DISTURBANCE VOLTAGE

Op Cond: L
Operator: ERI
Date: 16. Nov 05 17:44

Scan Settings (2 Ranges)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	3M	3k	9k	PK+AV	5ms	AUTO LN	ON
3M	30M	10k	9k	PK+AV	5ms	AUTO LN	ON

Final Measurement: x QP / + AV
Meas Time: 1 s
Subranges: 16
Acc Margin: 30dB



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[Live line]

CONTINUOUS DISTURBANCE VOLTAGE

Op Cond: L
Operator: ERI
Date: 16. Nov 05 17:44

Final Measurement Results:

Indicated Phase/PE shows Configuration of max. Emission

Frequency MHz	QP Level dBuV	Delta Limit dB	Phase -	PE -
0.20700	52.5	-10.8	N	gnd
0.21000	50.9	-12.2	L1	gnd
0.34500	37.5	-21.6	L1	gnd
0.41400	38.0	-19.5	N	gnd
0.69000	36.9	-19.0	N	gnd
0.90000	37.7	-18.2	L1	gnd
1.10700	36.4	-19.5	N	gnd
1.80000	36.1	-19.8	N	gnd
2.14800	36.4	-19.5	N	gnd
2.98200	31.5	-24.4	L1	gnd
3.12000	32.2	-23.7	N	gnd
20.02000	30.7	-29.2	N	gnd
24.76000	32.0	-27.9	N	gnd

Frequency MHz	AV Level dBuV	Delta Limit dB	Phase -	PE -
0.20700	38.3	-15.0	N	gnd
0.21000	36.8	-16.4	N	gnd
0.34500	29.8	-19.3	L1	gnd
0.48300	32.3	-13.9	N	gnd
0.69000	36.1	-9.8	N	gnd
0.90000	37.6	-8.3	N	gnd
1.17600	35.8	-10.1	N	gnd
1.73100	36.0	-10.0	N	gnd
2.14800	34.2	-11.7	N	gnd
2.98200	29.8	-16.1	N	gnd
3.05000	29.3	-16.7	N	gnd
5.83000	20.9	-29.0	N	gnd
15.42000	20.8	-29.1	N	gnd
19.60000	20.1	-29.8	N	gnd
24.02000	31.8	-18.1	L1	gnd

* limit exceeded

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[Live line]

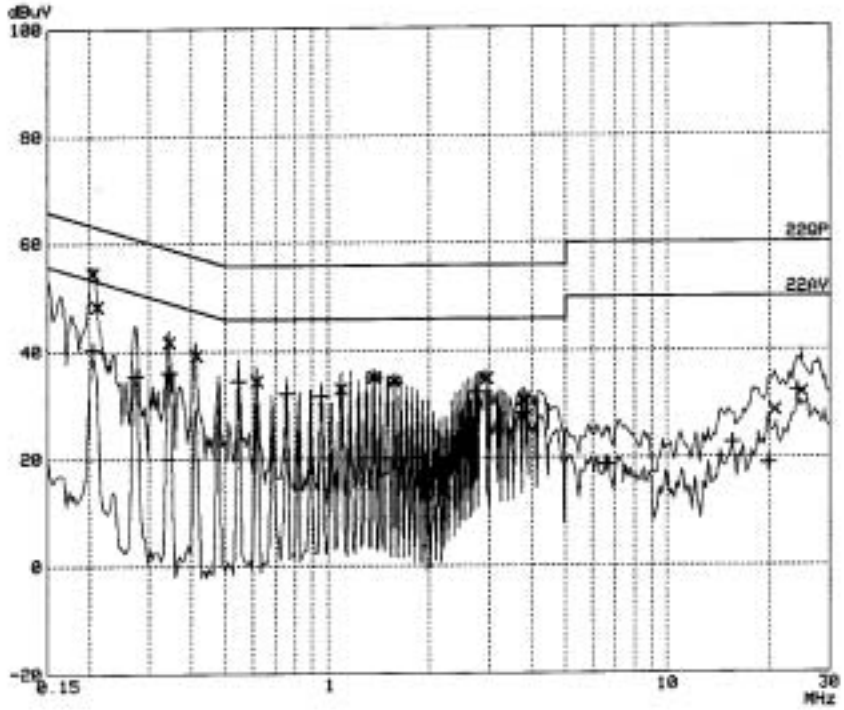
CONTINUOUS DISTURBANCE VOLTAGE

Op Cond: N
Operator: ERI
Date: 16. Nov 05 17:36

Scan Settings (2 Ranges)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	3M	3k	9k	PK+AV	5ms AUTO	LN	ON
3M	30M	10k	9k	PK+AV	5ms AUTO	LN	ON

Final Measurement: x QP / + AV
Meas Time: 1 s
Subranges: 16
Acc Margin: 30dB



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[Neutral line]

CONTINUOUS DISTURBANCE VOLTAGE

Op Cond: N
Operator: ERI
Date: 16. Nov 05 17:36

Final Measurement Results:

Indicated Phase/PE shows Configuration of max. Emission

Frequency MHz	QP Level dBuV	Delta Limit dB	Phase -	PE -
0.20400	54.6	-8.8	N	gnd
0.21000	48.5	-14.7	L1	gnd
0.34200	41.8	-17.3	N	gnd
0.41100	39.4	-18.2	N	gnd
0.61500	34.5	-21.4	N	gnd
1.09200	32.9	-23.0	N	gnd
1.36800	35.2	-20.8	N	gnd
1.57500	34.3	-21.6	N	gnd
2.94600	34.9	-21.0	N	gnd
3.77000	30.8	-25.1	N	gnd
20.66000	28.8	-31.1	L1	gnd
24.69000	32.1	-27.8	N	gnd

Frequency MHz	AV Level dBuV	Delta Limit dB	Phase -	PE -
0.20400	40.4	-13.0	L1	gnd
0.27300	35.5	-15.4	L1	gnd
0.34200	36.2	-12.9	L1	gnd
0.54600	34.4	-11.5	N	gnd
0.75300	32.2	-13.7	N	gnd
0.95700	31.7	-14.2	N	gnd
1.36800	35.0	-11.0	N	gnd
1.57500	34.1	-11.8	L1	gnd
2.73900	32.3	-13.6	N	gnd
3.77000	28.5	-17.4	N	gnd
6.58000	19.0	-31.0	N	gnd
15.45000	22.8	-27.1	N	gnd
19.72000	19.1	-30.8	N	gnd
24.02000	32.5	-17.4	L1	gnd

* limit exceeded

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[Neutral Line]

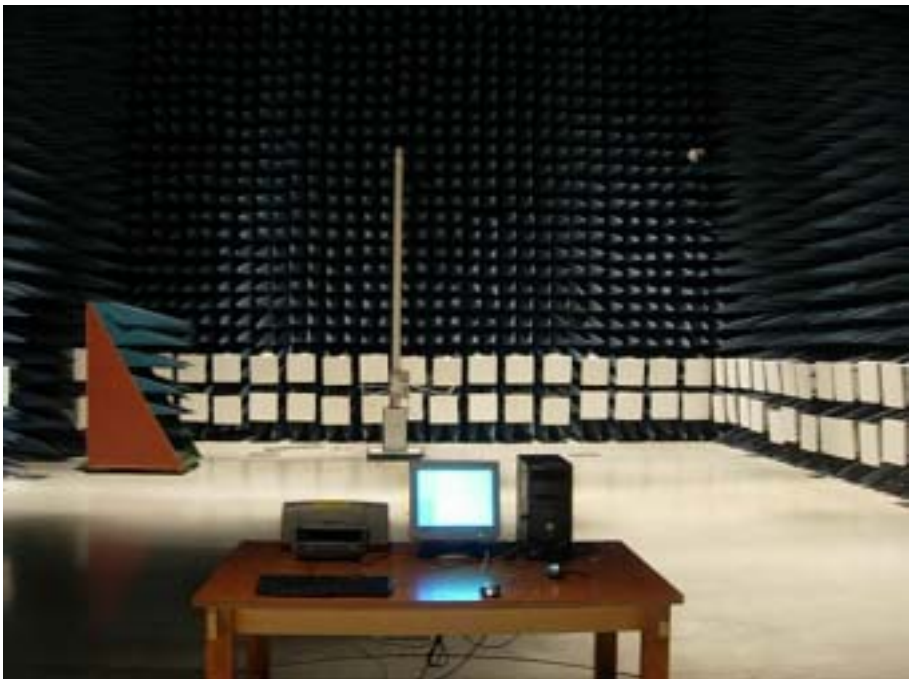
6.2. RADIATED DISTURBANCE
: 30MHz – 1000MHz

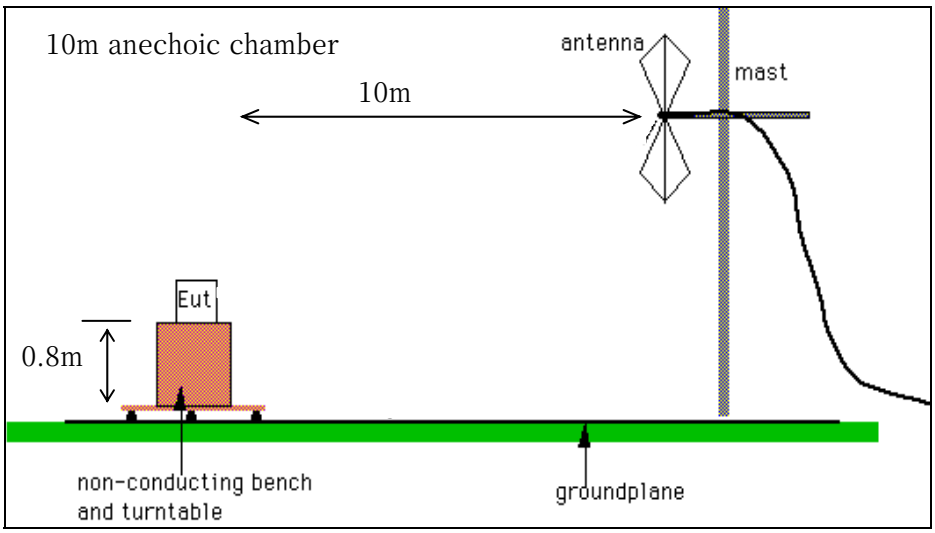
6.2.1 Operating environment

Temperature : (19.0 ± 0.7) ℃
Relative Humidity : (45.0 ± 4.5) %
Atmospheric pressure : (1007.00 ± 0.25) hPa

6.2.2 Test set-up

The frequency range investigated was 30 MHz to 1000MHz.
All readings are quasi-peak unless stated otherwise.
The half-wave dipole antenna was tuned to the frequency found during Preliminary radiated measurements. The EUT, support equipment and Interconnecting cables were re-configured to the set-up to the producing the Maximum emission for the frequency and were placed on top of a 0.8 meter 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.
And this device(EUT) was tested in 3 orthogonal planes.
The antenna measured both horizontal and vertical polarization.





<General test set-up for radiated emissions>

6.2.3 Operation Conditions

This device is PC peripheral FRD (Fingerprint Recognition Device) through USB interface. This device can identify an individual by measuring their physical uniqueness, and comparing it to those on record.

6.2.4 Test instrument

Instrument	Model No.	Serial No.	Makers	Next cal.date	Used
Test receiver	ESCS30	100021	R&S	2006. 2. 6	O
L.I.S.N.	ESH3-Z5	827246/008	R&S	2006. 3. 31	
	ESH3-Z5	831887/018	R&S	2006. 3. 31	
Biconical Antenna	VHA9103	91031950	Schwarzbeck	2006. 2. 4	O
Log-Periodic Antenna	UHALP9108A	0392	Schwarzbeck	2006. 2. 4	O
Antenna Mast	MA240	N/A	HD	-	O
Turn Table	DT430S	N/A	HD	-	O

6.2.5 Test results

Date of test: 2005. 11. 03

Freq (MHz)	Reading (dBuV)	Ant POL	AF (dB/m)	CL (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
153.53	10.16	V	15.29	1.49	26.9	30	3.06
205.50	8.25	V	16.38	1.82	26.5	30	3.55
227.10	7.58	H	17.18	1.92	26.7	30	3.32
259.50	6.79	H	17.79	2.03	26.6	37	3.39
415.50	10.72	H	16.28	2.43	29.4	37	7.57
420.75	10.75	H	16.33	2.46	29.5	37	7.46
518.75	8.83	H	17.54	2.85	29.2	37	7.78
529.25	8.75	H	17.60	2.88	29.2	37	7.77
720.00	10.29	V	20.21	3.43	33.9	37	3.07
746.25	9.26	H	20.50	3.48	33.2	37	3.76

* <5 : mean less than 5dB
Note : Reading = Test Receiver meter, P= Polarization → POL H = Horizontal POL V = Vertical A = Angle, AF = Antenna Factor CL = Cable Loss Result = Field Strength(AF + CL+ Reading)

Result: Pass

The measured emissions level of the EUT have found the below of the specified limit.

7. PRODUCT PHOTOGRAPHS

7.1 Front Photograph of EUT

7.2 Rear Photograph of EUT

7.3 Inner Photograph of EUT