

EMC TEST REPORT
for
JETWAY INFORMATION CO., LTD.

Motherboard
Model Number: NC81

Prepared for : JETWAY INFORMATION CO., LTD.
4F, NO.168, LITEHST, CHUNG HO CITY 235, TAIPEI
TAIWAN R.O.C.

Prepared By : Most Technology Service Co., Ltd.
No.5, 2nd Langshan Road, North District, Hi-tech Industrial
Park, Nanshan, Shenzhen, Guangdong, China
Tel: (0755) 86170306
Fax: (0755) 86170310

Date of Test : Sep. 17, 2008
Date of Report : Sep. 19, 2008

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APPENDIX I (Photos of the EUT)

(1 page)

TEST REPORT DECLARATION

Report Number		MTE/CYZ/8090932
Applicant	Company Name	JETWAY INFORMATION CO., LTD.
	Address	4F, NO.168, LITEHST, CHUNG HO CITY 235, TAIPEI TAIWAN R.O.C.
Manu- facturer1	Company Name	TOP WAY TECHNOLOGY CO., LTD.
	Address	Shang Jin Industrial Zone Jie Kou Village Chang An Town Dong Guan City Guang Dong Province P.R.C.
Manu- facturer2	Company Name	EVER ORIENT TECHNOLOGY CO., LTD.
	Address	Lian He Industrial Park, Nan Yue, Long Gong, ShenZhen, Guang Dong, China
Manu- facturer3	Company Name	RIGHT TRACK ELECTRONIC TECHNOLOGY CO., LTD.
	Address	No.2 West Wordshop, NO.1 District NanChang Industrial Zone, Gushu Village, XiXiang Town, BaoAn, ShenZhen, P.R. China.
Product	Product Name	Motherboard
	Model No.	NC81
	Power Supply	DC 12V From PC Input AC 230V/50Hz
	Remark	N/A
Test Result		The EUT was found compliant with the requirement(s) of the standards.
Standard		EN 55022: 2006, EN 61000-3-2: 2006, EN 61000-3-3:1995+A1:2001+A2:2005 EN 55024: 1998+A1:2001+A2: 2003 (IEC 61000-4-2: 2001, IEC 61000-4-3: 2006, IEC 61000-4-4: 2004, IEC 61000-4-5: 2005, IEC 61000-4-6: 2006, IEC 61000-4-11: 2004)
<p>*Note</p> <p>The above device has been tested by Most Technology Service Co., Ltd. To determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The test record, data evaluation & Equipment Under Test (EUT) configurations represented are contained in this test report and Most Technology Service Co., Ltd. Is assumed full responsibility for the accuracy and completeness of test. Also, this report shows that the EUT is technically compliant with the requirement of the above standards.</p> <p>This report applies to above tested sample only. This report shall not be reproduced except in full, without written approval of Most Technology Service Co., Ltd., this document may be altered or revised by Most Technology Service Co., Ltd., personal only, and shall be noted in the revision of the document.</p>		
Prepared by	<i>Candy</i>	
	Candy Zhang	
Reviewed by	<i>Sam</i>	
	Sam zhong	
Approved by	<i>Yvette</i>	
	Yvette zhou(Manager)	



1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description	: Motherboard
Model Number	: NC81
Brand Name	: N/A
Applicant	: JETWAY INFORMATION CO., LTD. 4F, NO.168, LITEHST, CHUNG HO CITY 235, TAIPEI TAIWAN R.O.C.
Manufacturer 1	: TOP WAY TECHNOLOGY CO., LTD. Shang Jin Industrial Zone Jie Kou Village Chang An Town Dong Guan City Guang Dong Province P.R.C.
Manufacturer 2	: EVER ORIENT TECHNOLOGY CO., LTD. Lian He Industrial Park, Nan Yue, Long Gong, ShenZhen, Guang Dong, China
Manufacturer 3	: RIGHT TRACK ELECTRONIC TECHNOLOGY CO., LTD. No.2 West Wordshop, NO.1 District NanChang Industrial Zone, Gushu Village, XiXiang Town, BaoAn, ShenZhen, P.R. China.
Date of Test	: Sep. 17, 2008

2. LABORATORY INFORMATION

2.1. Laboratory Name

Most Technology Service Co., Ltd.

2.2. Location

No.5, 2nd Langshan Road, North District, Hi-tech Industrial Park, Nanshan, Shenzhen, Guangdong, China

2.3. Test facility

- 3m Anechoic Chamber : May 1, 2007 File on Federal
Communication Commission
Registration Number:490827
- Certificated by VCCI, Japan Sep. 11, 2007
Registration No.:R-2622
- Shielding Room : Certificated by VCCI, Japan Sep.11, 2007
Registration No.:C-2865
- EMC Lab. : Accredited by TUV Rheinland Shenzhen
Audit Report: 17006916001
Sep. 18, 2007
- Accredited by Industry Canada
Registration Number: 7103A-1
May 31, 2007
- Accredited by TIMCO
Registration Number: Q1460
March 28, 2007

2.4. Measurement Uncertainty

No.	Item	Uncertainty
1.	Uncertainty for Conducted Disturbance Test	1.25dB
2.	Uncertainty for Radiated Disturbance Test	3.15dB

3. IMMUNITY PERFORMANCE CRITERIA

The test results shall be classified in terms of the loss of function or degradation of performance of the equipment under test, relative to a performance level by its manufacturer or the requestor of the test, or the agreed between the manufacturer and the purchaser of the product.

Definition related to the performance level:

Based on the used product standard

Based on the declaration of the manufacturer, requestor or purchaser

Criterion A:

The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

Criterion B:

After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test. If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect form the equipment if used as intended.

Criterion C:

Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

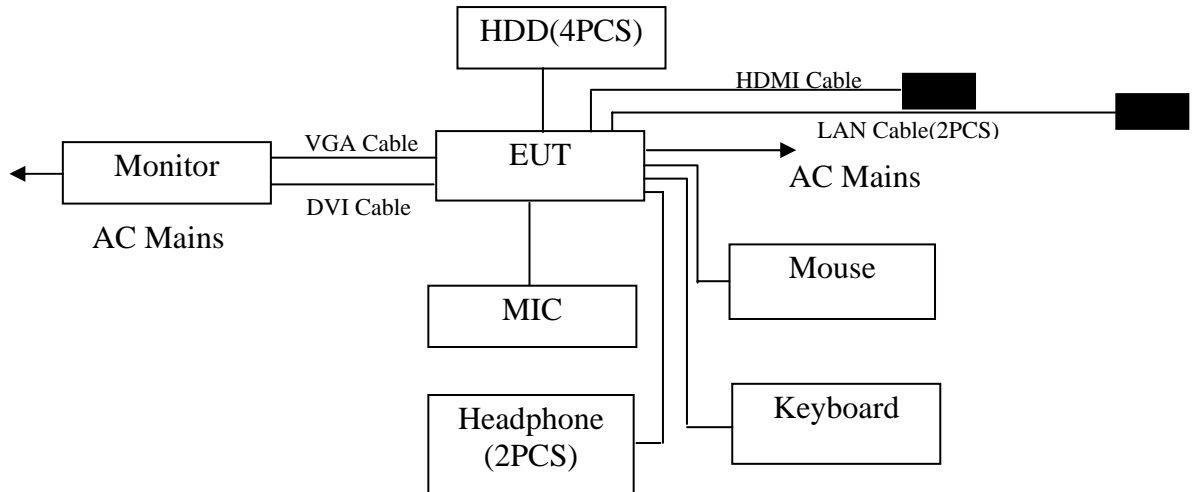
4. SUMMARY OF TEST RESULTS

EMISSION			
Test Item	Standard	Limits	Results
Conducted disturbance at mains terminals	EN 55022:2006	Class B	PASS
Radiated disturbance	EN 55022:2006	Class B	PASS
Harmonic current emissions	EN 61000-3-2:2006	Class D	PASS
Voltage fluctuations & flicker	EN 61000-3-3:1995 +A1:2001+A2:2005	-----	PASS
IMMUNITY (EN 55024+A1:2001+A2:2003)			
Test Item	Basic Standard	Performance Criteria	Results
Electrostatic discharge (ESD)	IEC 61000-4-2:2001	B	PASS
Radio-frequency, Continuous radiated disturbance	IEC 61000-4-3:2006	A	PASS
Electrical fast transient (EFT)	IEC 61000-4-4:2004	B	PASS
Surge (Input a.c. power ports)	IEC 61000-4-5:2005	B	PASS
Surge (Telecommunication ports)		B	N/A
Radio-frequency, Continuous conducted disturbance	IEC 61000-4-6:2006	A	PASS
Power frequency magnetic field	IEC 61000-4-8:2001	A	N/A
Voltage dips, >95% reduction	IEC 61000-4-11:2004	B	PASS
Voltage dips, 30% reduction		C	PASS
Voltage interruptions		C	PASS
N/A is an abbreviation for Not Applicable.			

5. BLOCK DIAGRAM OF TEST SETUP

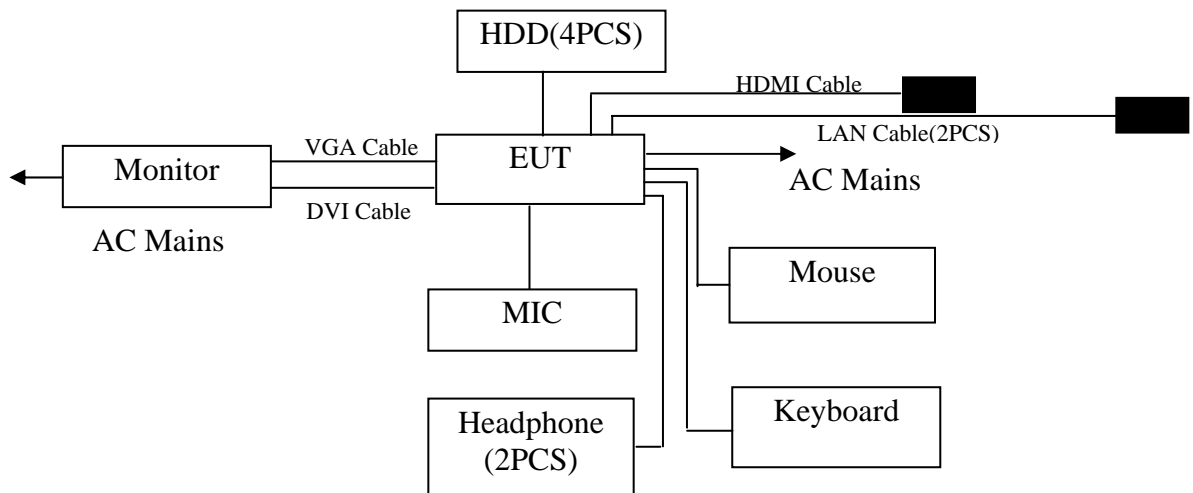
The equipments are installed test to meet EN55022 requirement and operating in a manner which tends to maximize its emission characteristics in a normal application. EUT was tested in normal configuration (Please See following Block diagrams)

5.1. Block Diagram of connection between EUT and simulation-EMI



(EUT: MOTHERBOARD)

5.2. Block Diagram of connection between EUT and simulation-EMS



(EUT: MOTHERBOARD)

6. TEST INSTRUMENT USED

6.1. For Conducted Disturbance at Mains Terminals Emission Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCI	100492	Mar. 15, 08	1 Year
2.	L.I.S.N.	Rohde & Schwarz	ENV216	100093	Mar. 15, 08	1 Year
3.	Coaxial Switch	Anritsu Corp	MP59B	6200283933	Mar. 15, 08	1 Year
4.	Terminator	Hubersuhner	50Ω	No.1	Mar. 15, 08	1 Year
5.	RF Cable	SchwarzBeck	N/A	No.1	Apr. 05, 08	1/2 Year

6.2. For Radiation Test (In Anechoic Chamber)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESPI	101202	Mar. 15, 08	1 Year
2.	Bilog Antenna	Sunol	JB3	A121206	Mar. 15, 08	1 Year
3.	Cable	Resenberger	N/A	NO.1	Apr. 05, 08	1 /2Year
4.	Cable	SchwarzBeck	N/A	NO.2	Apr. 05, 08	1 /2Year
5.	Cable	SchwarzBeck	N/A	NO.3	Apr. 05, 08	1 /2Year
6.	DC Power Filter	DuoJi	DL2×30B	N/A	N/A	N/A
7.	Single Phase Power Line Filter	DuoJi	FNF 202B30	N/A	N/A	N/A
8.	3 Phase Power Line Filter	DuoJi	FNF 402B30	N/A	N/A	N/A

6.3. For Harmonic / Flicker Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	AC Power Source	Kikusui	AC40MA	LM003232	Mar. 15, 08	1 Year
2.	Test Analyzer	Kikusui	KHA1000	LM003720	Mar. 15, 08	1 Year
3.	Line Impedance Network	Kikusui	LIN40MA-PCR-L	LM002352	Mar. 15, 08	1 Year

6.4. For Electrostatic Discharge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Tester	Kikusui	KES4021	LM003537	Mar. 15, 08	1 Year

6.5. For RF Strength Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Signal Generator	IFR	2032	203002/100	Mar. 15, 08	1 Year
2.	Amplifier	A&R	150W1000	301584	NCR	NCR
3.	Dual Directional Coupler	A&R	DC6080	301508	Mar. 15, 08	1 Year
4.	Power Sensor	A&R	PH2000	301193	Mar. 15, 08	1 Year
5.	Power Meter	A&R	PM2002	302799	Mar. 15, 08	1 Year
6.	Field Monitor	A&R	FM5004	300329	Mar. 15, 08	1 Year
7.	Field Probe	A&R	FP5000	300221	Mar. 15, 08	1 Year
8.	Log-periodic Antenna	A&R	AT1080	16512	Mar. 15, 08	1 Year
9.	RF Cable	MIYAZAKI	N/A	No.1/No.2	Apr. 05, 08	1/2 Year

6.6. For Electrical Fast Transient/Burst Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMCPRO System	EM Test	UCS-500-M4	V0648102026	Mar. 15, 08	1 Year

6.7. For Surge Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMCPRO System	EM Test	UCS-500-M4	V0648102026	Mar. 15, 08	1 Year

6.8. For Injected Currents Susceptibility Test

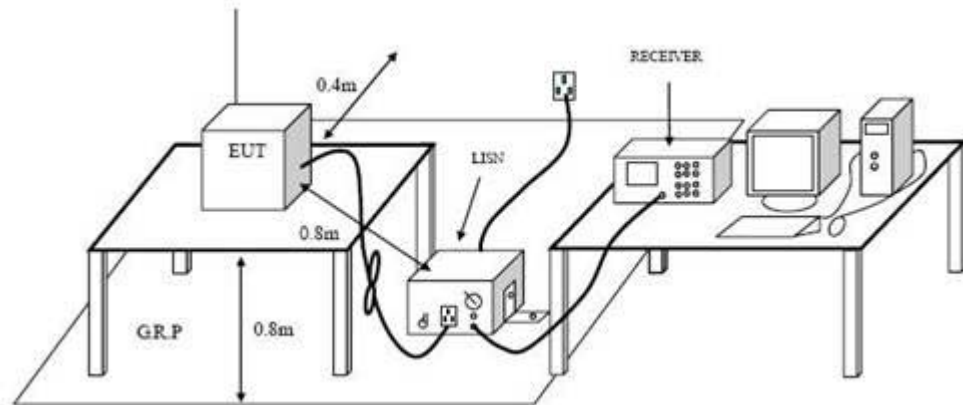
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Signal Generator	IFR	2032	203002/100	Mar. 15, 08	1 Year
2.	Amplifier	A&R	150W1000	301584	NCR	NCR
3.	CDN	FCC	FCC-801-M2-25	47	Mar. 15, 08	1 Year
4.	CDN	FCC	FCC-801-M3-25	107	Mar. 15, 08	1 Year
5.	EM Injection Clamp	FCC	F-203I-23mm	403	Mar. 15, 08	1 Year
6.	RF Cable	MIYAZAKI	N/A	No.1/No.2	Apr. 05, 08	1/2 Year

6.9. For Voltage Dips and Interruptions Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMCPRO System	EM Test	UCS-500-M4	V0648102026	Mar. 15, 08	1 Year

7. CONDUCTED DISTURBANCE AT MAINS TERMINALS TEST

7.1. Configuration of Test System



7.2. Test Standard

EN 55022: 2006

7.3. Power Line Conducted Disturbance at Mains Terminals Limit

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μ V)	Average Level dB(μ V)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. * Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

7.4. Operating Condition of EUT

7.4.1. Environmental Conditions:

Ambient Temperature: 26 °C, Relative Humidity: 60 %

7.4.2. Setup the EUT and the simulators as shown on Section 5.1.

7.4.3. Turn on the power of all equipments.

7.4.4. Let the EUT work in test mode (Running) and test it.

7.5. Test Procedure

The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power connected to the power mains through a line impedance stabilization network (L.I.S.N. 1#). This provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N.#2). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to EN 55022 Class B on conducted Disturbance test.

The bandwidth of test receiver is set at 10kHz.

The frequency range from 150kHz to 30MHz is checked. The test result are reported on Section 7.6.

7.6. Conducted Disturbance at Mains Terminals Test Results

7.6.1. Test Results: **PASS**

7.6.2. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

7.6.3. Emission Level= Correct Factor + Reading Level.

7.6.4. All scanning waveforms and test data on the following pages.

7.6.5. Test Engineer: Jack, Test Date: Sep. 17, 2008

Conducted Emission Measurement



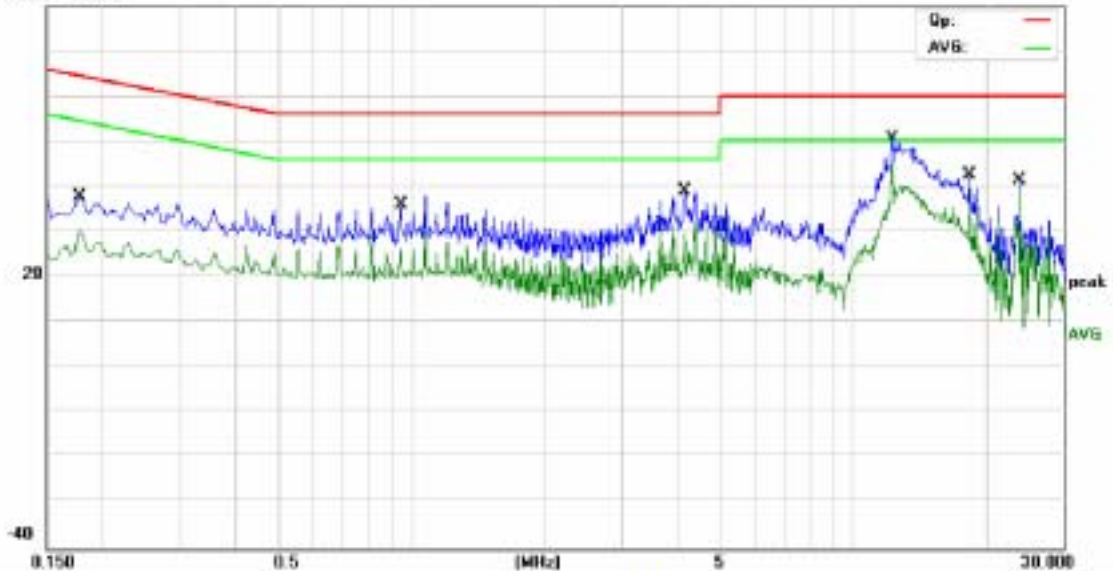
Site: site #1 Phase: **L1** Temperature: 26
 Limit: EN55022 Class B QP Power: DC 12V From PC input AC 230V/50Hz Humidity: 60 %
 EUT: Motherboard
 M/N: NC81
 Mode: Running
 Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1806	27.21	10.84	38.05	64.46	-26.41	QP	
2		0.1806	18.81	10.84	29.65	54.46	-24.81	AVG	
3		0.5580	24.87	10.00	34.87	56.00	-21.13	QP	
4		0.5580	11.21	10.00	21.21	46.00	-24.79	AVG	
5		4.4060	26.28	11.41	37.69	56.00	-18.31	QP	
6		4.4060	18.24	11.41	29.65	46.00	-16.35	AVG	
7		12.2620	40.90	9.00	49.90	60.00	-10.10	QP	
8	*	12.2620	36.60	9.00	45.60	50.00	-4.40	AVG	
9		18.3940	34.18	9.00	43.18	60.00	-16.82	QP	
10		18.3940	30.25	9.00	39.25	50.00	-10.75	AVG	
11		24.0020	31.69	9.00	40.69	60.00	-19.31	QP	
12		24.0020	29.92	9.00	38.92	50.00	-11.08	AVG	

*:Maximum data x:Over limit !:over margin

Conducted Emission Measurement

File: NC81 Data #1 Date: 2008/09/17 Time: 09:27:53



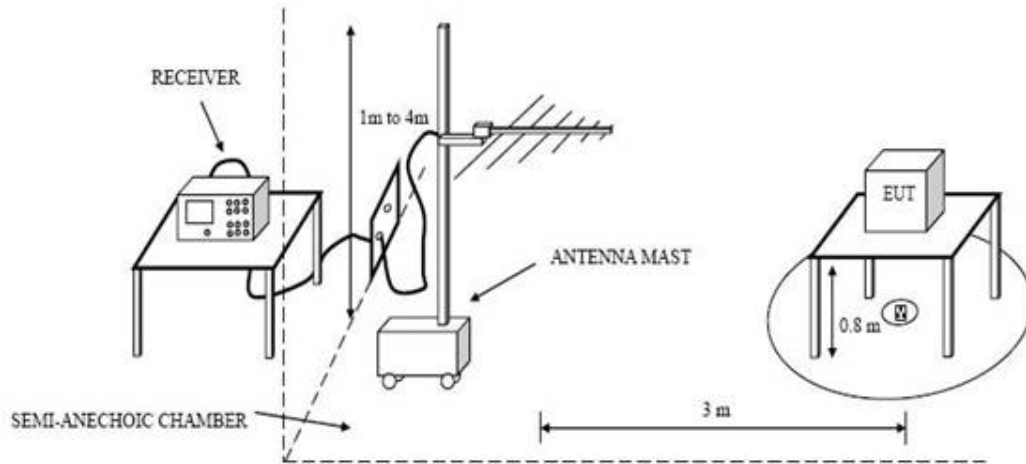
Site: site #1 Phase: **N** Temperature: 28
 Limit: EN55022 Class B QP Power: DC 12V From PC Input AC 230V/50Hz Humidity: 60 %
 EUT: Motherboard
 M/N: NC81
 Mode: Running
 Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1785	26.81	10.71	37.52	64.56	-27.04	QP	
2		0.1785	19.55	10.71	30.26	54.56	-24.30	AVG	
3		0.9460	24.54	10.00	34.54	56.00	-21.46	QP	
4		0.9460	14.89	10.00	24.89	46.00	-21.11	AVG	
5		4.1620	27.85	11.16	39.01	56.00	-16.99	QP	
6		4.1620	18.45	11.16	29.61	46.00	-16.39	AVG	
7		12.2620	41.10	9.00	50.10	60.00	-9.90	QP	
8	*	12.2620	36.20	9.00	45.20	50.00	-4.80	AVG	
9		18.3980	33.69	9.00	42.69	60.00	-17.31	QP	
10		18.3980	30.64	9.00	39.64	50.00	-10.36	AVG	
11		24.0020	32.59	9.00	41.59	60.00	-18.41	QP	
12		24.0020	30.65	9.00	39.65	50.00	-10.35	AVG	

*:Maximum data x:Over limit !:over margin

8. RADIATED DISTURBANCE TEST

8.1. Configuration of Test System



8.2. Test Standard

EN55022: 2006

8.3. Radiated Disturbance Limit

All emanations from Class B computing devices or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMITS (dB μ V/m)
30 ~ 230	3	40
230 ~ 1000	3	47

Note: 1. The lower limit shall apply at the transition frequencies.

2. Distance refers to the distance in meters between the test antenna and the closed point of any part of the EUT.

8.4. Operating Condition of EUT

8.4.1. Environmental Conditions:

Ambient Temperature: 26 °C, Relative Humidity: 60 %

8.4.2. Setup the EUT and the simulators as shown on Section 5.1.

8.4.3. Turn on the power of all equipments.

8.4.4. Let the EUT work in test mode (Running) and test it.

8.5. Test Procedure

The EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber. An antenna was located 10m from the EUT on an adjustable mast. A pre-scan was first performed in order to find prominent radiated emissions. For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to EN55022 Class B on Radiated Disturbance test.

The bandwidth setting on the test receiver is 120 kHz.

The frequency range from 30MHz to 1000MHz is checked. The test result are reported on Section 8.6.

8.6. Radiated Disturbance Test Results

8.6.1. Test Results: **PASS**

8.6.2. Emission Level= Correct Factor + Reading Level.

8.6.3. All reading are Quasi-Peak values.

8.6.4. All scanning waveforms and test data on the following pages.

8.6.5. Test Engineer: Jack, Test Date: Sep. 17, 2008

Radiated Emission Measurement

File: NC81 Data #16 Date: 2008/09/17 Time: 13:08:52



Site: site MOST 3M Polarization: **Horizontal** Temperature: 26
 Limit: EN 55022 Class A 3M Radiation Power: DC 12V From PC Input AC 230V/50Hz Humidity: 60 %
 EUT: Motherboard Distance: 3m
 M/N: NC81
 Mode: Running
 Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Detector	Comment
1		64.9200	19.69	9.29	28.98	50.00	-21.02			QP	
2	*	134.7598	23.56	15.46	39.02	50.00	-10.98			QP	
3		245.3400	26.94	14.40	41.34	57.00	-15.66			QP	
4		400.5400	26.98	18.71	45.69	57.00	-11.31			QP	
5		480.0799	23.82	21.70	45.52	57.00	-11.48			QP	
6		920.4600	17.52	27.67	45.19	57.00	-11.81			QP	

*:Maximum data x:Over limit !:over margin

Radiated Emission Measurement

File: NC81 Data #15 Date: 2009/09/17 Time: 13:07:27



Site: site MOST 3M

Polarization: **Vertical**

Temperature: 26

Limit: EN 55022 Class A 3M Radiation

Power: DC 12V From PC Input AC 230V/50Hz Humidity: 60 %

EUT: Motherboard

Distance: 3m

M/N: NC81

Mode: Running

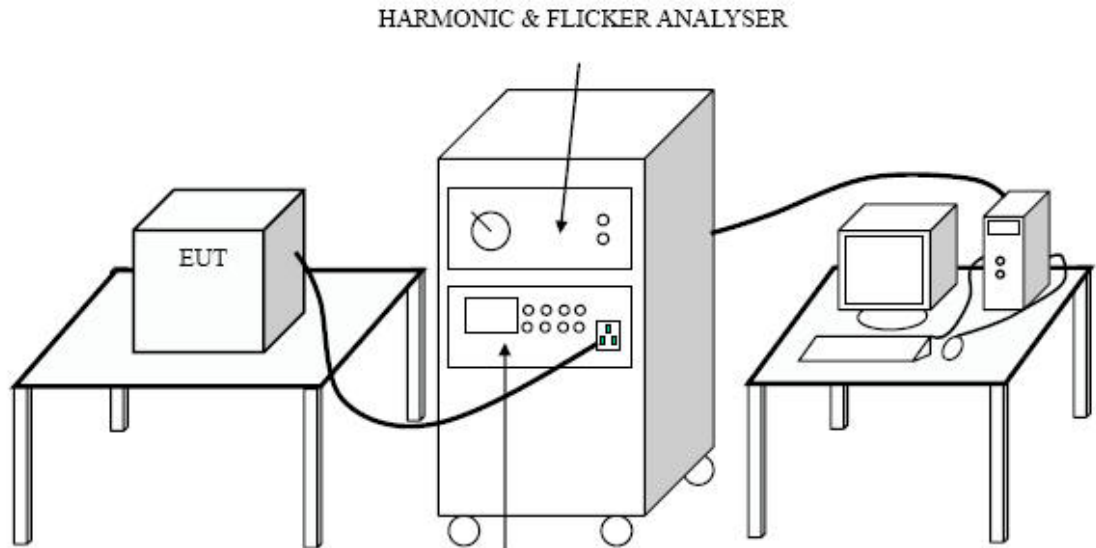
Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Antenna Height cm	Table Degree degree	Comment
1		31.9400	16.60	20.50	37.10	50.00	-12.90	QP			
2	*	43.5800	31.13	12.51	43.64	50.00	-6.36	QP			
3		92.0799	22.95	9.67	32.62	50.00	-17.38	QP			
4		243.4000	18.03	14.34	32.37	57.00	-24.63	QP			
5		480.0800	27.73	21.70	49.43	57.00	-7.57	QP			
6		920.4600	19.51	27.67	47.18	57.00	-9.82	QP			

*:Maximum data x:Over limit !:over margin

9. HARMONIC CURRENT TEST

9.1. Configuration of Test System



9.2. Test Standard

EN61000-3-2: 2006; Class D

9.3. Operating Condition of EUT

9.3.1.Environmental Conditions:

Ambient Temperature: 23 , Relative Humidity: 56 %

9.3.2.Setup the EUT and the simulators as shown on Section 5.1.

9.3.3.Turn on the power of all equipments.

9.3.4.Let the EUT work in test mode (Running) and test it

9.4. Test Results

9.4.1.Test Results: **PASS**

9.4.2.Test data on the following pages.

9.4.3.Test Engineer: Yuan , Test Date: Sep. 17, 2008

HARMONICS CURRENT TEST REPORT

Company	JETWAY	Test Engineer	Yuan
Model name	Motherboard		
Type	NC81		
Serial No.		Type of test	EN61000-3-2:2000/A2:2005 *IEC61000-3-2 Ed2 (2004)
Operating mode	Running		EN61000-4-7:2002 *IEC61000-4-7(2002)
Date of test	2008/09/17 11:18:00	Classification	Class D
Climatic condition	T:23, H:56	Power analyzer	KHA1000, Ver1.50
Memo		Supply Source	AC 230V/50Hz
		Reference Impedance	

Test Data of Current Harmonics

FINAL TEST RESULT **PASS**

Voltage	230.28V
Current	0.366A
Power	60.41W

Apparent Power	84.3VA
----------------	--------

THC	0.252A
POHCLIMIT	0.010A/ 0.020A *3
Nominal	230V/ 60Hz
Fundamental current	0.265A
Measuring period	150s
Margin	100%

Harm Order	Limit1(A rms)	Limit2(A rms)	Ave(A rms)	Max(A rms)	Judge
2	----	----	0.0043	0.010	N/A
3	0.2054	0.308	0.1720	0.212	N/A
4	----	----	0.0028	0.006	N/A
5	0.1148	0.172	0.1038	0.122	N/A
6	----	----	0.0011	0.003	N/A
7	0.0604	0.090	0.0451	0.048	N/A
8	----	----	0.0011	0.002	N/A
9	0.0302	0.045	0.0221	0.024	N/A
10	----	----	0.0010	0.002	N/A
11	0.0211	0.031	0.0172	0.020	N/A
12	----	----	0.0010	0.002	N/A
13	0.0179	0.026	0.0099	0.010	N/A
14	----	----	0.0010	0.001	N/A
15	0.0155	0.023	0.0090	0.010	N/A
16	----	----	0.0010	0.001	N/A
17	0.0137	0.020	0.0070	0.007	N/A
18	----	----	0.0010	0.001	N/A
19	0.0122	0.018	0.0040	0.005	N/A
20	----	----	0.0010	0.001	N/A
21	0.0166	0.016	0.0050	0.006	N/A
22	----	----	0.0010	0.001	N/A
23	0.0152	0.015	0.0040	0.004	N/A
24	----	----	0.0010	0.001	N/A
25	0.0140	0.014	0.0020	0.003	N/A
26	----	----	0.0010	0.001	N/A
27	0.0129	0.012	0.0040	0.004	N/A
28	----	----	0.0010	0.001	N/A
29	0.0120	0.012	0.0020	0.002	N/A
30	----	----	0.0010	0.001	N/A
31	0.0113	0.011	0.0020	0.003	N/A
32	----	----	0.0010	0.002	N/A
33	0.0106	0.010	0.0030	0.003	N/A
34	----	----	0.0010	0.001	N/A
35	0.0100	0.010	0.0017	0.002	N/A
36	----	----	0.0010	0.001	N/A
37	0.0094	0.009	0.0011	0.002	N/A
38	----	----	0.0010	0.001	N/A
39	0.0089	0.008	0.0020	0.002	N/A
40	----	----	0.0010	0.001	N/A

Type of equipment behaviour: Quasi-Stationary

*3. When the POHC value does not exceed the POHC Limit, 150% of the Limit1 value is applied to each Limit1 value.

10. VOLTAGE FLUCTUATIONS & FLICKER TEST

10.1. Configuration of Test System

Same as Section 9.1.

10.2. Test Standard

EN61000-3-3:1995+A1:2001+2005

10.3. Operating Condition of EUT

Same as Section 9.3.

10.4. Test Results

10.4.1. Test Results: **PASS**

10.4.2. Test data on the following pages.

10.4.3. Test Engineer: Yuan, Test Date: Sep. 17, 2008

Voltage Fluctuation and Flicker TEST REPORT

Company	JETWAY	Test Engineer	Yuan
Model name	Motherboard		
Type	NC81		
Serial No.		Type of test	EN61000-3-3:1995/A2(2005) *IEC61000-3-3 Ed1.2(2005)
Operating mode	Running		EN61000-4-15:1998/A1(2003) *IEC61000-4-15 Ed1.1(2003)
Date of test	2008/09/17 11:32:25		
Climatic condition	T:23, H:56		
Memo		Power analyzer	KHA1000,Ver1.50
		Supply Source	AC 230V/50Hz
		Reference Impedance	

Test Data of Voltage Fluctuation and Flicker

FINAL TEST RESULT	PASS *1
Nominal Voltage	230V
Nominal Frequency	60Hz
Plt Test duration	600s
Flicker Margin	100%
d Measurement Margin	100%

	Pst	dc(%)	dmax(%)	d(t)>3.3%(ms)	Judge
Limit	1.000	3.300	4.000	500	
Seg. 1	0.007	0.004	0.030	0	Pass
Seg. 2	---	---	---	---	
Seg. 3	---	---	---	---	
Seg. 4	---	---	---	---	
Seg. 5	---	---	---	---	
Seg. 6	---	---	---	---	
Seg. 7	---	---	---	---	
Seg. 8	---	---	---	---	
Seg. 9	---	---	---	---	
Seg.10	---	---	---	---	
Seg.11	---	---	---	---	
Seg.12	---	---	---	---	

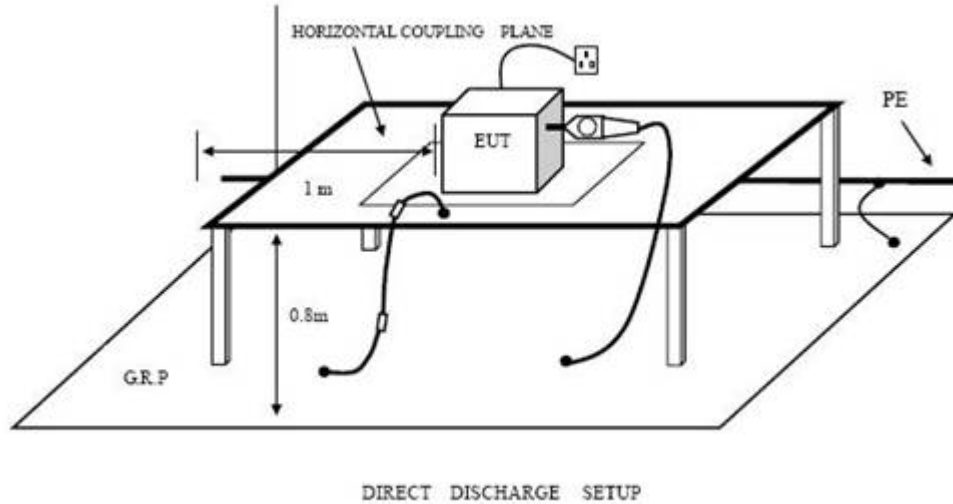
	Plt	Judge
Limit	0.650	
Measurement	0.003	Pass

*1 Limits apply for the result at the condition of nominal voltage 230V and nominal frequency 50Hz.

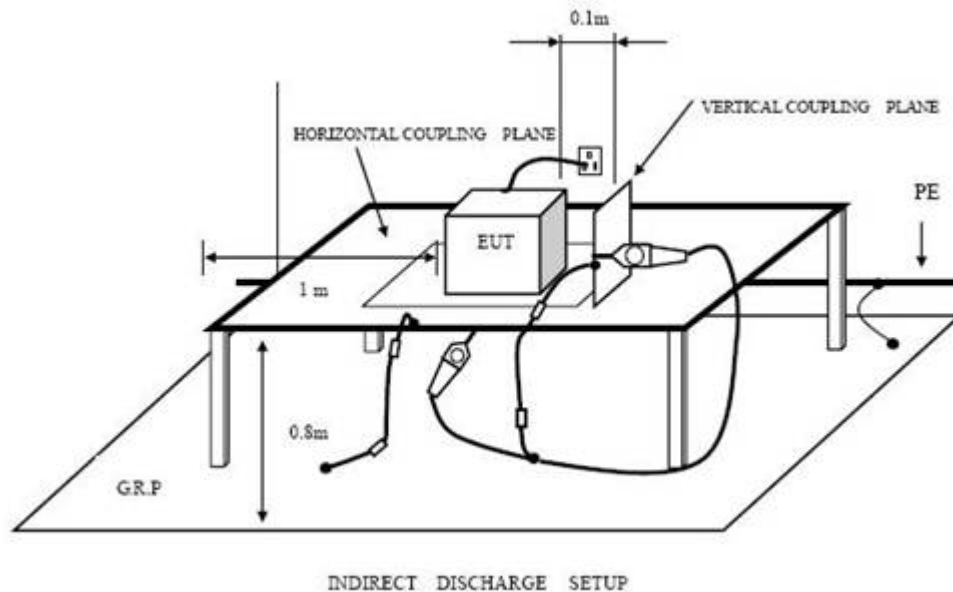
11. ELECTROSTATIC DISCHARGE IMMUNITY TEST

11.1. Configuration of Test System

11.1.1. Configuration of ESD Test System(Direct Discharge)



11.1.2. Configuration of ESD Test System(Indirect Discharge)



11.2. Test Standard

EN 55024: 1998+A1:2001+A2: 2003 (IEC 61000-4-2: 2001)
(Severity Level 3 for Air Discharge at 8KV,
Severity Level 3 for Contact Discharge at 6KV)

11.3. Severity Levels and Performance Criterion

11.3.1. Severity level

Level	Test Voltage Contact Discharge (KV)	Test Voltage Air Discharge (KV)
1.	2	2
2.	4	4
3.	6	8
4.	8	15
X	Special	Special

11.3.2. Performance criterion : **B**

11.4. Operating Condition of EUT

11.4.1.Environmental Conditions:

Ambient Temperature: 24 , Relative Humidity: 55 %

11.4.2.Setup the EUT and the simulators as shown on Section 5.2.

11.4.3.Turn on the power of all equipments.

11.4.4.Let the EUT work in test mode (Running) and test it.

11.5. Test Procedure

11.5.1.Air Discharge:

The test was applied on non-conductive surfaces of EUT. The round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT. After each discharge, the discharge electrode was removed from the EUT. The generator was re-triggered for a new single discharge and repeated 20 times for each pre-selected test point. This procedure was repeated until all the air discharge completed

11.5.2. Contact Discharge:

All the procedure was same as Section 11.5.1. except that the generator was re-triggered for a new single discharge and repeated 50 times for each pre-selected test point. the tip of the discharge electrode was touch the EUT before the discharge switch was operated.

11.6. Test Results

11.6.1.Test Results: **PASS**

11.6.2.Test data on the following pages.

Electrostatic Discharge Test Results

Most Technology Service Co., Ltd.

Date : 17/09/2008

<i>Applicant</i> :	JETWAY	<i>Test Date</i> :	Sep. 17, 2008
<i>EUT</i> :	Motherboard	<i>M/N</i> :	NC81
<i>Power Supply</i> :	DC 12V From PC Input AC 230V/50Hz	<i>Test Mode</i> :	Running
<i>Test Engineer</i> :	Ariel	<i>Criterion</i> :	B
<p><i>Air Discharge: ±8KV</i> # For Air Discharge each Point Positive 10 times and negative 10 times discharge.</p> <p><i>Contact Discharge: ±6KV</i> # For Contact Discharge each point positive 25 times and negative 25 times discharge</p>			
<i>Test Results Description</i>			
Location	Kind A-Air Discharge C-Contact Discharge	Result	
<i>Ports</i>	A	PASS	
<i>Slots</i>	A	PASS	
<i>HCP</i>	C	PASS	
<i>VCP of Front</i>	C	PASS	
<i>VCP of Rear</i>	C	PASS	
<i>VCP of Left</i>	C	PASS	
<i>VCP of Right</i>	C	PASS	
<i>Remark :</i>			

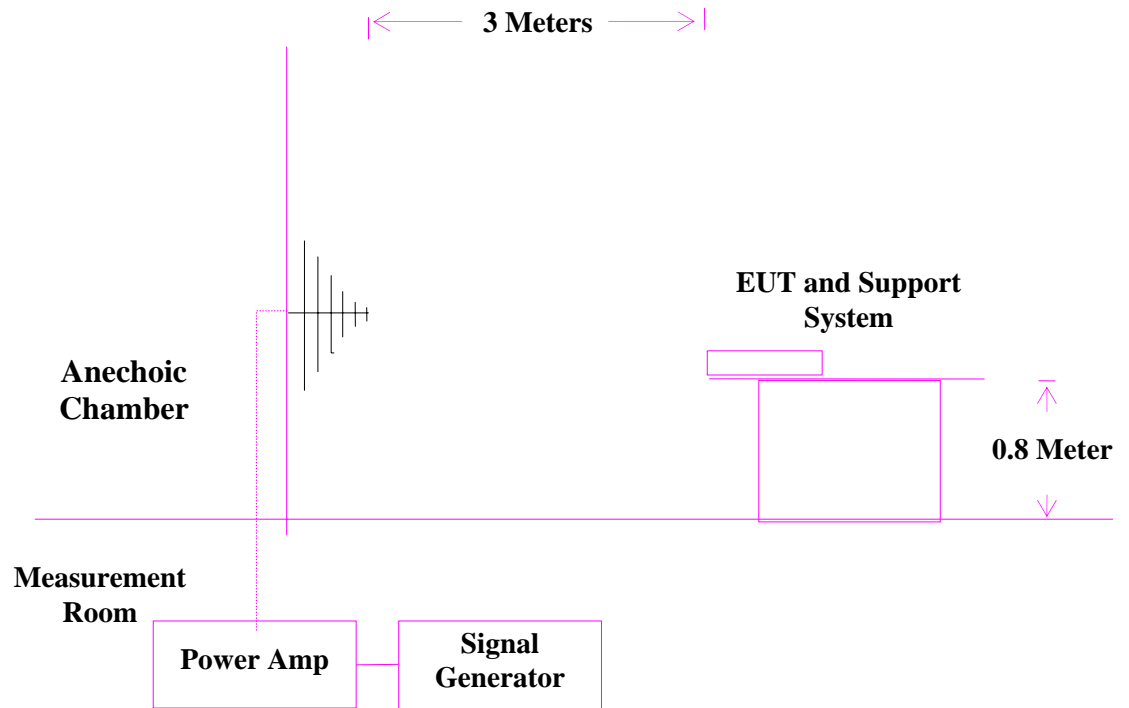
Discharge was considered on Contact and Air and Horizontal Coupling Plane (HCP) and Vertical Coupling Plane (VCP).

Reviewer :



12. RF FIELD STRENGTH SUSCEPTIBILITY TEST

12.1. Configuration of Test System



12.2. Test Standard

EN 55024: 1998+A1:2001+A2: 2003 (IEC 61000-4-3: 2006)
(Severity Level: 2 at 3V / m)

12.3. Severity Levels and Performance Criterion

12.3.1. Severity level

Level	Test Field Strength V/m
1.	1
2.	3
3.	10
X	Special

12.3.2. Performance criterion : A

12.4. Operating Condition of EUT

12.4.1.Environmental Conditions:

Ambient Temperature: 24 , Relative Humidity: 53 %

12.4.2.Setup the EUT and the simulators as shown on Section 5.2.

12.4.3.Turn on the power of all equipments.

12.4.4.Let the EUT work in test mode (Running) and test it.

12.5. Test Procedure

Testing was performed in a Fully anechoic chamber as recommended by IEC 61000-4-3. The EUT was placed on an 80 cm high non-conductive table located in the area of field uniformity. The radiating antenna was placed 3m in front of the EUT and Support system, and dwell time of the radiated interference was controlled by an automated, computer-controlled system. The signal source was stepped through the applicable frequency range at a rate no faster than 1% of the fundamental. The signal was amplitude modulated 80% over the frequency range 80 MHz to 1GHz at a level of 3 V/m. The dwell time was set at 1.5 s. Field presence was monitored during testing via a field probe placed in close proximity to the EUT. Throughout testing, the EUT was closely monitored for signs of susceptibility. The test was performed with the antennae oriented in both a horizontal and vertical polarization.

All the scanning conditions are as follows :

Condition of Test	Remarks
1. Test Fielded Strength	3 V/m (Severity Level 2)
2. Radiated Signal	80% amplitude modulated with a 1kHz sine wave
3. Scanning Frequency	80 - 1000 MHz
4. Sweeping time of radiated	0.0015 decade/s
5. Dwell Time	1.5 Sec.

12.6. Test Results

12.6.1.Test Results: **PASS**

12.6.2.Test data on the following pages.

RF Field Strength Susceptibility Test Results

Most Technology Service Co., Ltd.

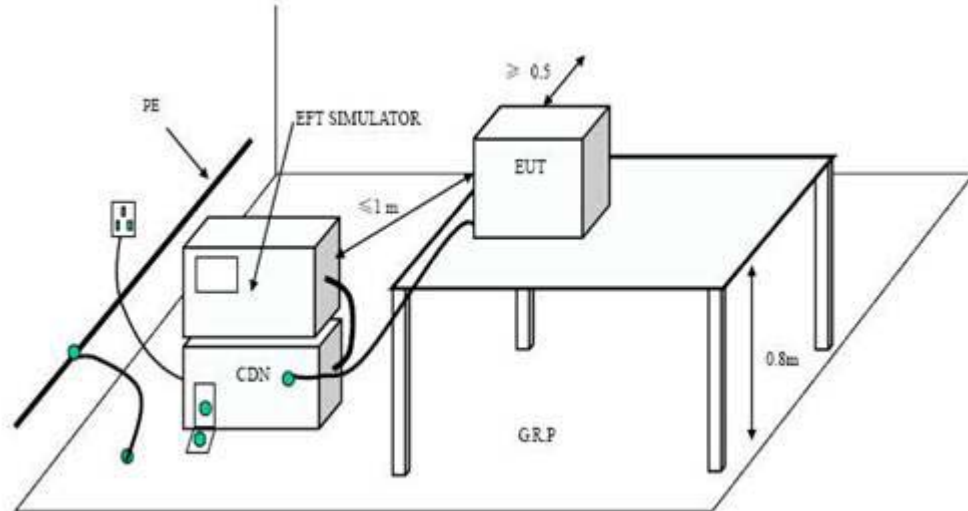
Date : 17/09/2008

Applicant :	JETWAY	Test Date :	Sep. 17, 2008
EUT :	Motherboard	M/N :	NC81
Field Strength :	3 V/m	Criterion :	A
Power Supply :	DC 12V From PC Input AC 230V/50Hz	Frequency Range:	80-1000MHz
Test Engineer :	Ariel	Test Mode:	Running
Modulation: <input checked="" type="checkbox"/> AM <input type="checkbox"/> Pulse <input type="checkbox"/> none 1 kHz 80%			
<i>Test Results Description</i>			
<i>Frequency Rang 1: 80MHz - 1000 MHz</i>			
<i>Steps</i>	<i>1%</i>		<i>1%</i>
	<i>Horizontal</i>		<i>Vertical</i>
<i>Front</i>	<i>PASS</i>		<i>PASS</i>
<i>Right</i>	<i>PASS</i>		<i>PASS</i>
<i>Rear</i>	<i>PASS</i>		<i>PASS</i>
<i>Left</i>	<i>PASS</i>		<i>PASS</i>
<i>Note: No function loss</i>			

Reviewer : 

13. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

13.1. Configuration of Test System



13.2. Test Standard

EN 55024: 1998+A1:2001+A2: 2003 (IEC 61000-4-4:2004)
 (Severity Level 2 at 1KV, Severity Level 2 at 0.5KV)

13.3. Severity Levels and Performance Criterion

13.3.1. Severity level

Open Circuit Output Test Voltage $\pm 10\%$		
Level	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines
1.	0.5 KV	0.25 KV
2.	1 KV	0.5 KV
3.	2 KV	1 KV
4.	4 KV	2 KV
X	Special	Special

13.3.2. Performance criterion : **B**

13.4. Operating Condition of EUT

13.4.1.Environmental Conditions:

Ambient Temperature: 24 , Relative Humidity: 51 %

13.4.2.Setup the EUT and the simulators as shown on Section 5.2.

13.4.3.Turn on the power of all equipments.

13.4.4.Let the EUT work in test mode (Running) and test it.

13.5. Test Procedure

The EUT and its simulators were placed on a the ground reference plane and were insulated from it by an wood support 0.1m \pm 0.01m thick. The ground reference plane was 1m*1m metallic sheet with 0.65mm minimum thickness. This reference ground plane was project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane was more than 0.5m. All cables to the EUT was placed on the wood support, cables not subject to EFT/B was routed as far as possible from the cable under test to minimize the coupling between the cables.

13.5.1. For input and AC power ports:

The EUT was connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both positive transients and negative transients of test voltage was applied during compliance test and the duration of the test can't less than 2mins.

13.5.2. For signal lines and control lines ports:

It's unnecessary to test.

13.5.3.For DC input and DC output power ports:

It's unnecessary to test.

13.6. Test Results

13.6.1.Test Results: **PASS**

13.6.2.Test data on the following pages.

Electrical Fast Transient/Burst Test Results

Most Technology Service Co., Ltd..

Date : 17/09/2008

<i>Applicant</i> :	JETWAY	<i>Test Date</i> :	Sep. 17, 2008
<i>EUT</i> :	Motherboard	<i>M/N</i> :	NC81
<i>Power Supply</i> :	DC 12V From PC Input AC 230V/50Hz	<i>Test Mode</i> :	Running
<i>Test Engineer</i> :	Ariel	<i>Criterion</i> :	B

Test Results Description

Inject Line	Voltage KV	Inject Time(s)	Inject Method	Results	Inject Line	Voltage KV	Inject Time(s)	Inject Method	Results
L	±1	120	Direct	PASS					
N	±1	120	Direct	PASS					
PE	±1	120	Direct	PASS					
LN	±1	120	Direct	PASS					
LPE	±1	120	Direct	PASS					
NPE	±1	120	Direct	PASS					
LNPE	±1	120	Direct	PASS					

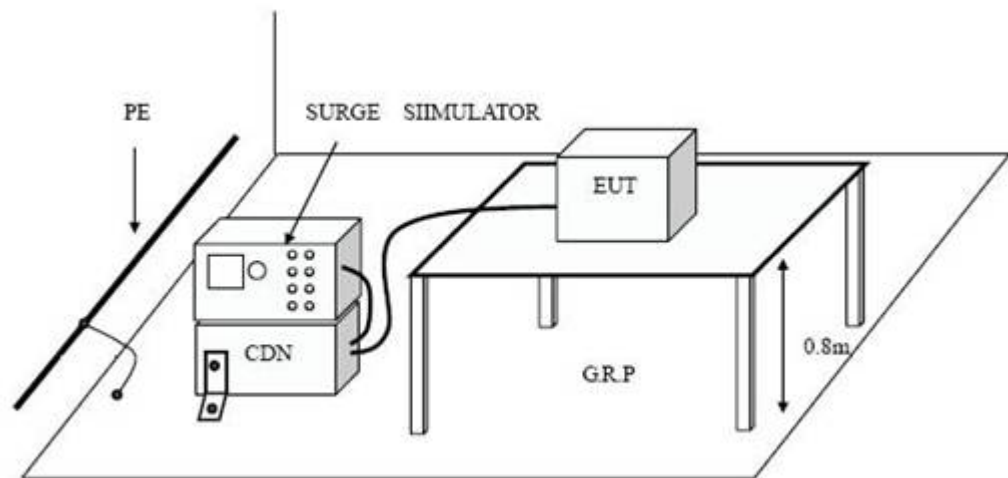
Remark:

Reviewer :



14. SURGE TEST

14.1. Configuration of Test System



14.2. Test Standard

EN 55024: 1998+A1: 2001+A2: 2003 (IEC 61000-4-5: 2005)
(Severity Level : Line to Line was Level 2 at 1KV)

14.3. Severity Levels and Performance Criterion

14.3.1. Severity level

Severity Level	Open-Circuit Test Voltage KV
1	0.5
2	1.0
3	2.0
4	4.0
*	Special

14.3.2. Performance criterion : **B**

14.4. Operating Condition of EUT

14.4.1.Environmental Conditions:

Ambient Temperature: 24 , Relative Humidity: 51 %

14.4.2.Setup the EUT and the simulators as shown on Section 5.2.

14.4.3.Turn on the power of all equipments.

14.4.4. Let the EUT work in test mode (Running) and test it.

14.5. Test Procedure

14.5.1.Set up the EUT and test generator as shown on Section 14.1.

14.5.2.For line to line coupling mode, provide a 1KV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points, and for active line / neutral line to ground are same except test level is 2KV.

14.5.3. At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are applied during test.

14.5.4.Different phase angles are done individually.

14.5.5. Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

14.6. Test Results

14.6.1.Test Results: **PASS**

14.6.2.Test data on the following pages.

Surge Immunity Test Results

Most Technology Service Co., Ltd.

Date : 17/09/2008

Applicant :	JETWAY	Test Date :	Sep. 17, 2008
EUT :	Motherboard	M/N :	NC81
Power Supply :	DC 12V From PC Input AC 230V/50Hz	Test Mode :	Running
Test Engineer :	Ariel	Criterion :	B

Test Results Description

Location	Polarity	Phase Angle	No of Pulse	Pulse Voltage (KV)	Result
L-N	±	0	5	1.0	PASS
	±	90	5	1.0	PASS
	±	180	5	1.0	PASS
	±	270	5	1.0	PASS
L-PE	±	0	5	2.0	PASS
	±	90	5	2.0	PASS
	±	180	5	2.0	PASS
	±	270	5	2.0	PASS
N-PE	±	0	5	2.0	PASS
	±	90	5	2.0	PASS
	±	180	5	2.0	PASS
	±	270	5	2.0	PASS

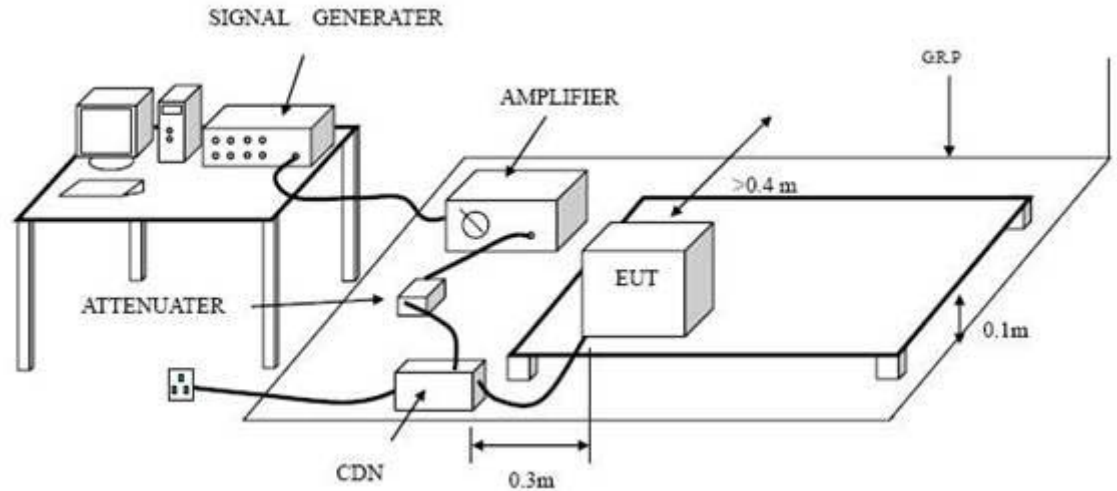
Remark:

Reviewer :



15. INJECTED CURRENTS SUSCEPTIBILITY TEST

15.1. Configuration of Test System



15.2. Test Standard

EN55024: 1998+A1:2001+A2: 2003 (IEC61000-4-6:2006)
 (Severity Level 2 at 3V (r.m.s.) and frequency is from 0.15MHz to 80MHz)

15.3. Severity Levels and Performance Criterion

15.3.1. Severity level

Level	Voltage Level (e.m.f.) V
1.	1
2.	3
3.	10
X	Special

15.3.2. Performance criterion: **A**

15.4. Operating Condition of EUT

15.4.1. Environmental Conditions:

Ambient Temperature: 24 °C, Relative Humidity: 55 %

15.4.2. Setup the EUT and the simulators as shown on Section 5.2.

15.4.3. Turn on the power of all equipments.

15.4.4. Let the EUT work in test mode (Running) and test it.

15.5. Test Procedure

- 15.5.1. Set up the EUT, CDN and test generators as shown on Section 15.1.
- 15.5.2. Let the EUT work in test mode and test it.
- 15.5.3. The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 15.5.4. The disturbance signal description below is injected to EUT through CDN.
- 15.5.5. The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 15.5.6. The frequency range is swept from 0.150MHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1KHz sine wave.
- 15.5.7. The rate of sweep shall not exceed 1.5×10^{-3} decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- 15.5.8. Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

15.6. Test Results

15.6.1. Test Results: **PASS**

15.6.2. Test data on the following pages.

Injected Currents Susceptibility Test Results

Most Technology Service Co., Ltd.

Date : 17/09/2008

<i>Applicant</i> :	<i>JETWAY</i>	<i>Test Date</i> :	<i>Sep. 17, 2008</i>
<i>EUT</i> :	<i>Motherboard</i>	<i>M/N</i> :	<i>NC81</i>
<i>Power Supply</i> :	<i>DC 12V From PC Input AC 230V/50Hz</i>	<i>Test Mode</i> :	<i>Running</i>
<i>Test Engineer</i> :	<i>Ariel</i>	<i>Criterion</i> :	<i>A</i>

Test Results Description

<i>Frequency Range (MHz)</i>	<i>Injected Position</i>	<i>Voltage Level (e.m.f.)</i>	<i>Criterion</i>	<i>Result</i>
<i>0.15 ~ 80</i>	<i>AC Mains</i>	<i>3V(rms), Unmodulated</i>	<i>A</i>	<i>PASS</i>

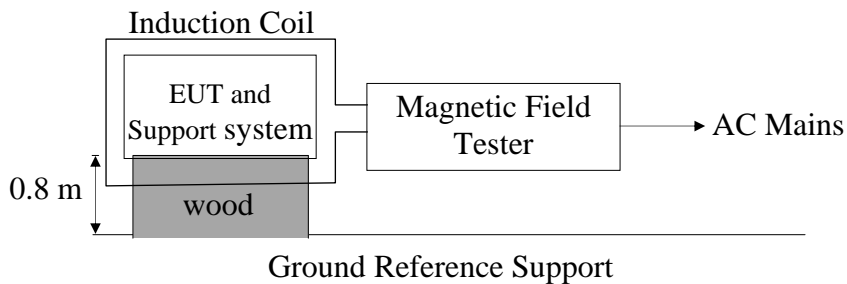
Remark : No function loss

Reviewer :



16. MAGNETIC FIELD IMMUNITY TEST

16.1. Configuration of Test System



16.2. Test Standard

EN 55024: 1998+A1: 2001+A2: 2003 (IEC 61000-4-8: 2001)
(Severity Level 1 at 1A/m)

16.3. Severity Levels and Performance Criterion

16.3.1. Severity level

Level	Magnetic Field Strength A/m
1.	1
2.	3
3.	10
4.	30
5.	100
X.	Special

16.3.2. Performance criterion : A

16.4. Operating Condition of EUT

16.4.1. Environmental Conditions:

Ambient Temperature: 22 °C, Relative Humidity: 56 %

16.4.2. Setup the EUT and the simulators as shown on Section 5.2.

16.4.3. Turn on the power of all equipments.

16.4.4. Let the EUT work in test mode (Running) and test it.

16.5. Test Procedure

The EUT was subjected to the test magnetic field by using the induction coil of standard dimensions (1m*1m) and shown in Section 16.1.. The induction coil was then rotated by 90° in order to expose the EUT to the test field with different orientations.

16.6. Test Results

16.6.1. Test Results: **PASS**

16.6.2. Test data on the following pages.

Magnetic Field Immunity Test Results

Most Technology Service Co., Ltd.

Date :17/09/2008

<i>Applicant</i> :	<i>JETWAY</i>	<i>Test Date</i> :	<i>Sep. 17, 2008</i>
<i>EUT</i> :	<i>Motherboard</i>	<i>M/N</i> :	<i>NC81</i>
<i>Power Supply</i> :	<i>DC 12V From PC Input AC 230V/50Hz</i>	<i>Test Mode</i> :	<i>Running</i>
<i>Test Engineer</i> :	<i>Ariel</i>	<i>Criterion</i> :	<i>A</i>

Test Results Description

<i>Test Level</i>	<i>Testing Duration</i>	<i>Coil Orientation</i>	<i>Criterion</i>	<i>Result</i>
<i>1A/m</i>	<i>5 mins</i>	<i>X</i>	<i>A</i>	<i>PASS</i>
<i>1A/m</i>	<i>5 mins</i>	<i>Y</i>	<i>A</i>	<i>PASS</i>
<i>1A/m</i>	<i>5 mins</i>	<i>Z</i>	<i>A</i>	<i>PASS</i>

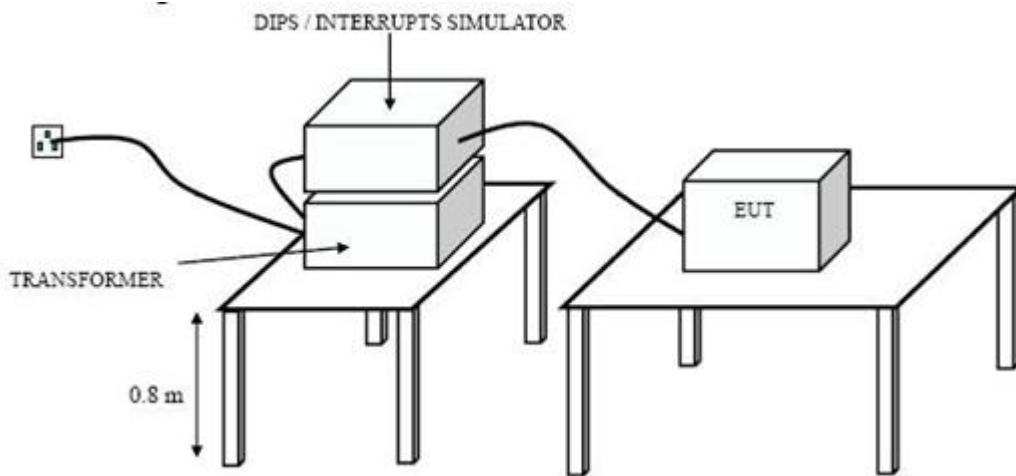
Remark: No function loss

Reviewer :



17. VOLTAGE DIPS AND INTERRUPTIONS TEST

17.1. Configuration of Test System



17.2. Test Standard

EN 55024: 1998+A1: 2001+A2: 2003 (IEC 61000-4-11: 2004)

17.3. Severity Levels and Performance Criterion

17.3.1. Severity level

Test Level $\%U_T$	Voltage dip and short interruptions $\%U_T$	Performance Criterion	Duration (in period)
0	100	C	250
0	100	B	0.5
70	30	C	25

17.3.2. Performance criterion : **B & C**

17.4. Operating Condition of EUT

17.4.1. Environmental Conditions:

Ambient Temperature: 24 °C, Relative Humidity: 54 %

17.4.2. Setup the EUT and the simulators as shown on Section 5.2.

17.4.3. Turn on the power of all equipments.

17.4.4. Let the EUT work in test mode (Running) and test it.

17.5. Test Procedure

17.5.1. Let the EUT work in test mode (Running) and test it. The EUT and test generator were setup as shown on Section 17.1.

17.5.2. The EUT and test generator were setup as shown on Section 17.1.

17.5.3. The interruptions is introduced at selected phase angles with specified duration.

17.5.4. Record any degradation of performance.

17.6. Test Results

17.6.1. Test Results: **PASS**

17.6.2. Test data on the following pages.

Voltage Dips And Interruptions Test Results

Most Technology Service Co., Ltd.

Date: 17/09/2008

<i>Applicant</i> :	JETWAY	<i>Test Date</i> :	Sep. 17, 2008
<i>EUT</i> :	Motherboard	<i>M/N</i> :	NC81
<i>Power Supply</i> :	DC 12V From PC Input AC 230V/50Hz	<i>Test Mode</i> :	Running
<i>Test Engineer</i> :	Ariel	<i>Criterion</i> :	B&C

Test Results Description

Test Level % U_T	Voltage Dips & Short Interruptions % U_T	Duration (in period)	Phase Angle	Criterion	Result
0	100	250P	0°~360°	C	PASS
70	30	10P	0°~360°	C	PASS
0	100	0.5P	0°~360°	B	PASS

Remark: U_T is the rated voltage for the equipment.

Reviewer :



APPENDIX I

(Photos of the EUT)

Figure 1
General Appearance of the EUT



Figure 2
General Appearance of the EUT

