



**MSI**  
MICRO-STAR INTERNATIONAL

*Link to the Future*

# CE TEST REPORT

## According To

European Standard EN 55022:1998+A1:2000 +A2:2003 Class B  
EN61000-3-2:2000, EN61000-3-3:1995+A1:2001 and  
EN55024:1998+A1:2001+A2:2003( EN61000-4-2:2001,  
EN61000-4-3:2002:+A1:2002, EN61000-4-4:2004, EN61000-4-5:2001,  
EN61000-4-6:2003+A1:2004, EN61000-4-8:2001, EN61000-4-11:2004)

<b>EQUIPMENT :</b>	<b>MOTHER BOARD</b>
<b>MODEL NO :</b>	<b>MS-7276 G965MDH</b>
<b>APPLICANT :</b>	<b>MICRO-STAR INT'L CO., LTD</b>
<b>ADDRESS :</b>	<b>NO.69,LI-DE ST,JUNG-HE CITY, TAIPEI HSIEN, TAIWAN</b>
<b>Date of Test :</b>	<b>2006/09/19</b>
<b>Date of Report :</b>	<b>2006/09/26</b>
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*This test has been operated by*

*QuieTek Corporation.*

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# TEST REPORT VERIFICATION

Applicant : MICRO-STAR INT'L CO., LTD  
Manufacturer : MICRO-STAR INT'L CO., LTD  
EUT Description : Motherboard  
MODEL NO : MS-7276 G965MDH  
SERIAL NO : N/A  
POWER SUPPLY :AC 230V/50Hz

**Measurement Procedure Used:**

**EN 55022:1998+A1:2000+A2:2003 Class B**

**EN 55024 :1998+A1:2001+A2:2003**

The device described above was tested by MICRO-STAR INT'L CO., LTD . to determine the maximum emission levels emanating from the device and the severity levels of the device can stay and it's performance criterion. The measurement results are contained in this test report and MICRO-STAR INT'L CO., LTD. is assumed full responsibility for the accuracy and compliance with EN 55022 : 1998 + A 1 : 2000 + A 2 : 2003 CLASS B AND EN 55024 : 1998 + A 1 : 2001 + A 2 : 2003 official limits.

This report applies to above tested sample only and shall not be reproduced in part without written approve of MICRO-STAR INT'L CO., LTD

**Date Of Test :** Sep . 19 2006 ~ Sep . 26 2006

**Prepared By :** Free wang  
**Free wang**

**Test Engineer :** Bruce Tsai  
**Bruce Tsai**

**Approve & Authorized Signer :** Jeremy Hsieh  
**Jeremy Hsieh**



## 1. General Description

### 1.1 Applicant

MICRO-STAR INT'L CO., LTD.

No. 69, Li-De St., Jung-He City, Taipei Hsien, Taiwan

### 1.2 Manufacturer

MICRO-STAR INT'L CO., LTD.

No. 69, Li-De St., Jung-He City, Taipei Hsien, Taiwan

### 1.3 Basic EUT Description

Equipment : Motherboard

Model No : MS-7276 G965MDH

**2. Tested Support Device List****Host PC Devices :**

No	Equipment	Type	Model	Serial	FCC/BSMI ID	Trade Name
1.	HDD	80G/7200RPM	ST3808110AS	9BD131-135	DoC	Seagate
2.	Power Supply	350W	DPS-350TBF	N/A	DoC	DELTA
4.	CPU	2.8GHz	P4	N/A	N/A	Intel
5.	RAM	512MB	DDR667 PC5300	N/A	N/A	MICRON

**Peripherals Devices :**

No	Equipment	Model	Serial	FCC/BSMI ID	Trade Name	Data Cable	Power Cord
1.	PS/2 Mouse	M-S36	LZA138043	DZL211029	LOGITECH	Shielded, 1.8m	N/A
2.	PS/2 Keyboard	Y-SP29	SYU2503872 9	BSMI ID: 3902C736	LOGITECH	Shielded, 1.8m	N/A
3.	Player	HS-100	N/A	N/A	SANSUI	Unshielded, 1.4m	N/A
4.	USB 2.0 HDD	ME-911	N/A	D33031	PORTABLE	shielded, 1.4m	Unshielded,1. 8m with a core
5.	USB 2.0 HDD	ME-911	N/A	D33031	PORTABLE	shielded, 1.4m	Unshielded,1. 8m with a core
6.	USB 2.0 HDD	ME-911	N/A	D33031	PORTABLE	shielded, 1.4m	Unshielded,1. 8m with a core
7.	USB 2.0 HDD	ME-911	N/A	D33031	PORTABLE	shielded, 1.4m	Unshielded,1. 8m with a core
8.	IEEE 1394 HDD	F12-UF	N/A	BSMI ID:4912A002	TeraSys	shielded 1.8m	Unshielded,1.8 m
9.	Ear. & Mic.	AXIS-301	N/A	N/A	LABTEC	Unshielded,1.8m	N/A
10	Speaker	FS530	012345678916 4	DoC	MSI	Shielded, 1.8m	Unshielded,1. 8m with a core
11	Modem	5JEG4033 -MKO	L0063CG2D00 -7186	5RJTAI-3550 0-M5-E	TOP- SOLUTION	shielded 0.9m	Unshielded,1. 8m with a core
12	Monitor	1900FP	N/A	DoC	DELL	shielded 1.8m with a core	Unshielded,1. 8m with a core
13.	Print	EPSONSTY L USC20SX	EW4E126644	DoC	EPSON	shielded 1.8m	Unshielded,1. 8m



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### 3. Operating Condition Of EUT

Two programs,EMITEST.EXE under WINXP, which generates a complete line of continuously repeating "H" character were used as the test software

- 3.1 Turn on the power of all equipment.
- 3.2 The PC reads the test program from the floppy disk drive and runs it.
- 3.3 The PC sends "H" messages to the monitor, and the monitor displays "H" patterns on the screen.
- 3.4 The PC sends "H" messages to the printer ,then the printer prints them on the paper.
- 3.5 The PC sends "H" messages to the modem.
- 3.6 The PC sends "H" messages to the internal Hard Disk ,and the Hard Disk reads and writes the messages .
- 3.7 Repeat the steps from 3-2 to 3-6

At the same time, the following programs were executed:

- Test Mode 1 executed " CD player" to play music.
- Test Mode 2 executed " DVD player" to play digital audio and video.
- Test Mode 3 executed " Copy.exe" to read data from EUT.
- Test Mode 4 executed " Easy CD creator" to write the data to the CD.

## 4. Conducted Powerline

Conducted Emissions were measured from 150 KHz to 30 MHz with a bandwidth of 9 KHz on the 230V AC power and return leads of the EUT according to the methods defined in European Standard EN-55022 Clause 9 .The EUT was placed on a nonmetallic stand in a shielded room 80 cm above the ground plane as show in figure 4-1.2.

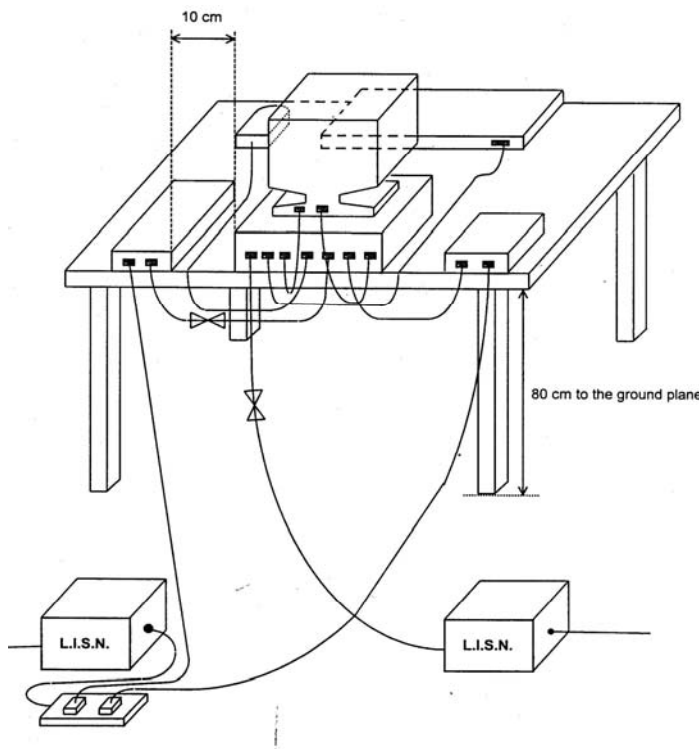
### 4-1 Test Construction

#### 4.1.1 Test Equipment List

The following test equipments are used during the conducted emission test:

Item	Instrument	Manufacturer	Type No./Serial No.	Cal.Date	Remark
1	Test Receiver	R & S	ESCS 30 / 100091	July.,2006	
2	L.I.S.N.	R & S	ESH3-Z5 / 100129	feb,2006	
3	L.I.S.N.	R & S	ESH3-Z5 / 100129	july,2006	
4	Pulse Limiter	R & S	ESH3-Z2 / 100092	sept,2005	
5	No.2 Shielded Room			N/A	

#### 4.1.2 Test Setup







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## 4-2 Test Procedures

- A. The EUT was placed on a desk 80 CM height from the metal ground plane and 40 cm from the conducting wall of the shielding room and it was kept at least 80 cm from any other grounded conducting surface.
- B. Connect EUT to the power mains through a line impedance stabilization network (LISN).
- C. All the support units are connect to the other LISN.
- D. The LISN provides 50 ohm coupling impedance for the measuring instrument.
- E. The CISPR states that 50 ohm ,50 microhenry LISN should be used.
- F. Both sides of AC line were checked for maximum conducted interference.
- G. The frequency range from 150 KHz to 30 MHz was searched.
- H. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- I. If the emission level of the EUT in peak mode was 6 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported , otherwise , the emission which do not have 6 dB margin will be retested one by one using the quasi-peak method and/or average methods and reported.



### 4-3 Test Results Of AC Powerline Conducted Emission

MICRO\_STAR INT, L CO; LTD  
CISPR 22 CLASS B

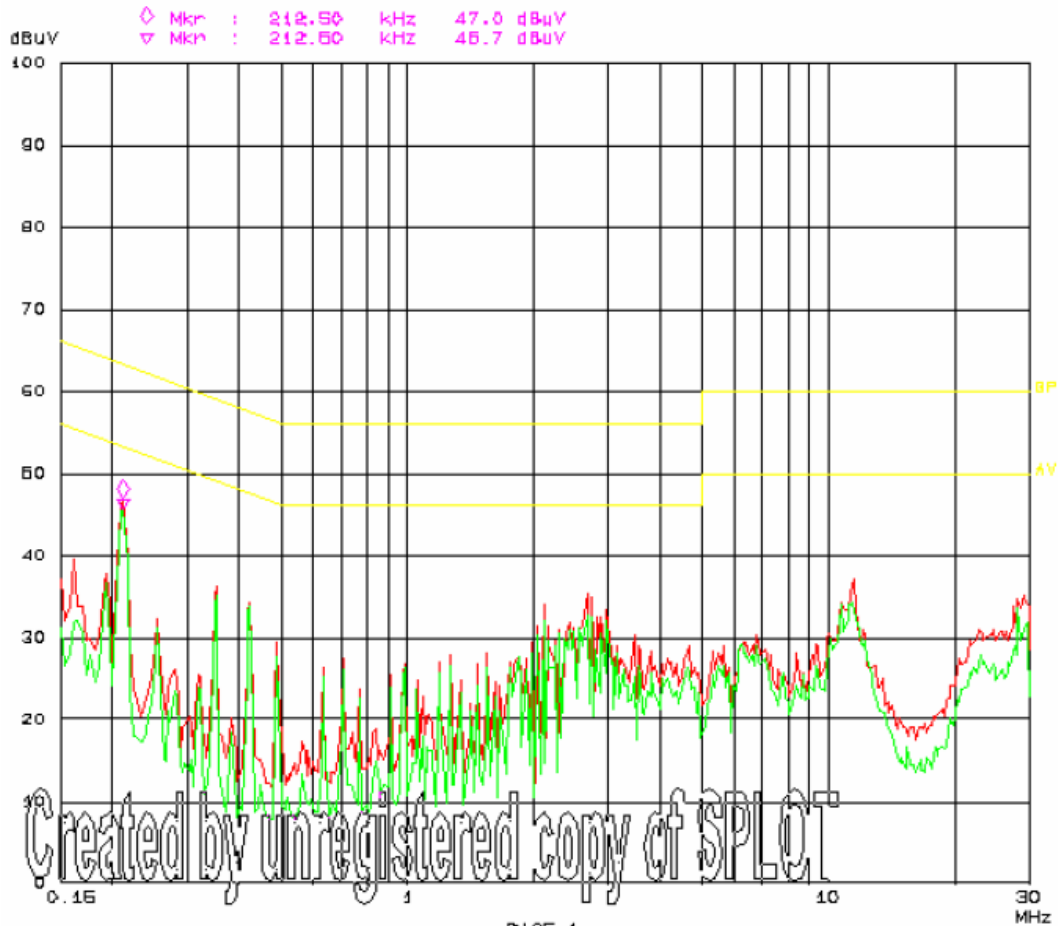
21. Sep 06 20:03

EUT: MS\_7276  
Manuf: MGI  
Op Cond: 230V 60Hz  
Operator: Bruce  
Test Spec: L1  
Comment: FSP POWER Mediaplayer

Overview Settings (1 Range)

Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	30M	3.9k	9k	PK+AV	0.09ms	10dB LN	OFF

Transducer No.	Start	Stop	Name
1	150K	30M	AC_POWER





MICRO\_STAR INT, L CO; LTD  
CISPR 22 CLASS B

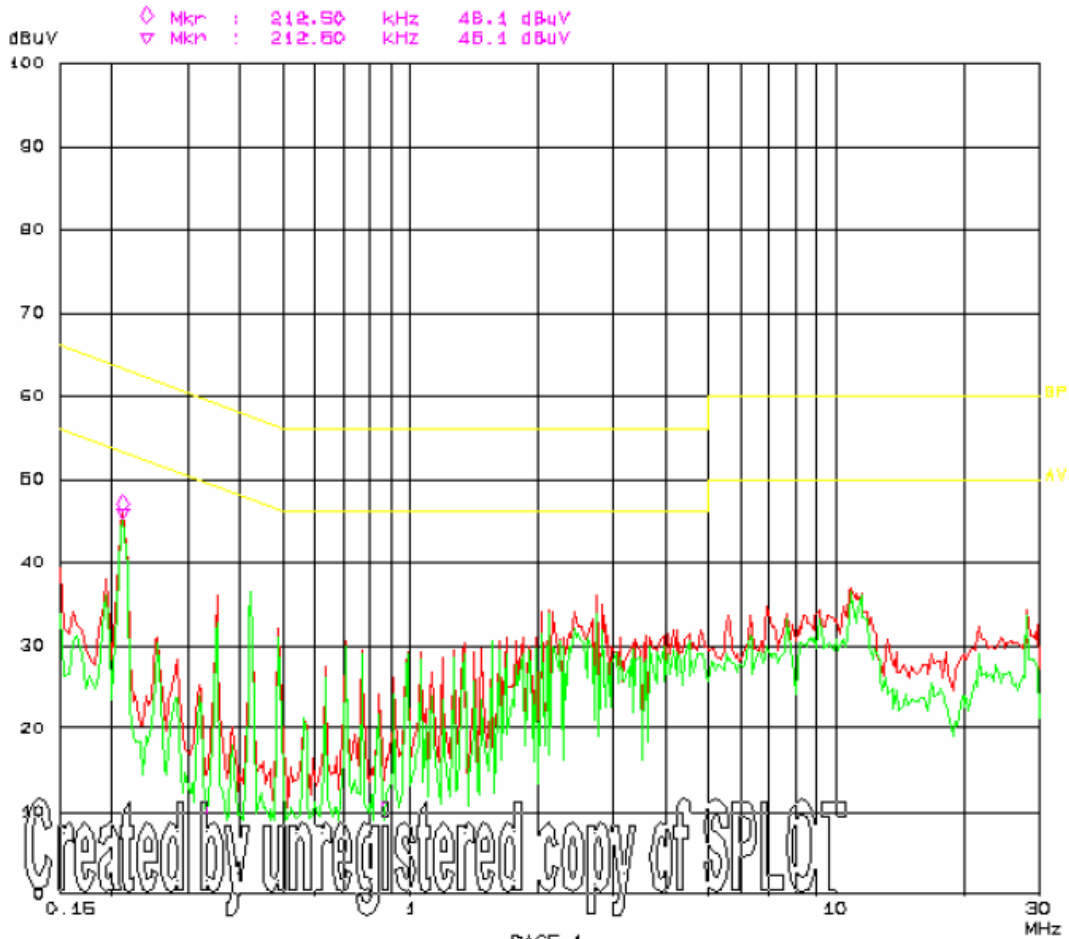
21. Sep 06 20:08

EUT: MS\_7276  
Manuf: M&I  
Op Cond: 230V 60Hz  
Operator: Bruce  
Test Spec: N  
Comment: FSP POWER  
Mediaplayer

Overview Scan Settings (1 Range)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	30M	3.9k	9k	PK+AV	0.08ms	10dB LN	OFF

Transducer No.	Start	Stop	Name
1	150K	30M	AC_POWER



PAGE 1

### Result

The measured values of conducted emission test are below the limit.

Test Engineer : Bruce Tsai

## 5. Test Of Radiated Emission

Radiated emissions from 30 MHz to 1000 MHz were measured with a bandwidth of 120KHZ according to the methods defines in European Standard EN 55022, Clause 10. The EUT was placed on a nonmetallic stand in the open-field site, 0.8 meter above the ground plane, as shown in section 5.1.2. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions.

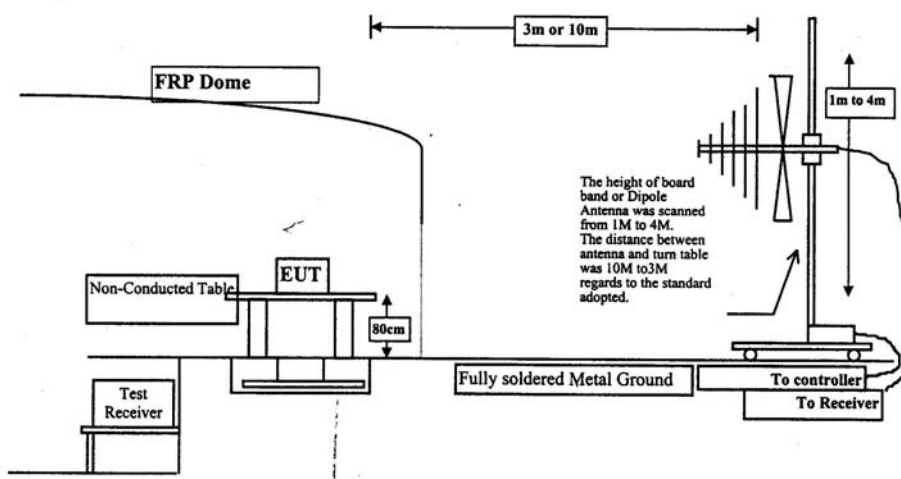
### 5-1. Test Construction

#### 5.1.1 Test Equipment List

The following test equipment are used during the conducted emission test:

Item	Instrument	Manufacturer	Type No./Serial No.	Cal.Date	Remark
1	Test Receiver	R & S	ESVS 10 / 834468/003	March., 2006	
2	Spectrum Analyzer	Advantest	R3162/ 00803480	Oct, 2005	
3	Pre -Amplifier	Advantest	BB525C/ 3307A01812	Jan, 2006	
4	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	Sept., 2005	

#### 5.1.2 Test Setup





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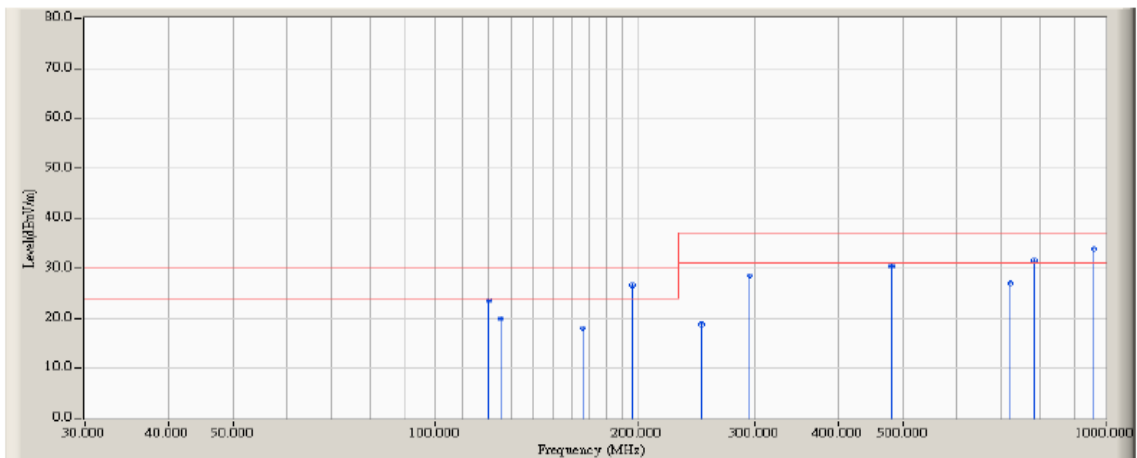
## 5-2 Test Procedures

- a. The EUT was placed on a rotatable table top 0.8 meter above ground.
- b. The EUT was set 10 meters from the interference-receiving antenna which was mounted on the top of a variable height antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiation.
- d. The antenna is a half wave dipole and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower ( from 1 M to 4 M ) and turn table ( from 0 degree to 360 degrees ) to find the maximum reading.
- f. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 6 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported , otherwise, the emissions which do not have 6 dB margin will be repeated one by one using the quasi-peak method and reported.



### 5-3 Test Results Of Radiated Emission Horizontal Open Site, 30MHz to 1000MHz TEST Mode: Intel P4 2.8GHz

Site : OATS-4	Time : 2006/09/19 - 14:00
Limit : CISPR_B_10M_QP	Margin : 6
EUT : MotherBoard	Probe : LKANT_S4_2006_01 - HORIZONTAL
Power : AC 120V/60Hz	Note : M/N:MS-7276,D-Sub : 2048*1536/60Hz



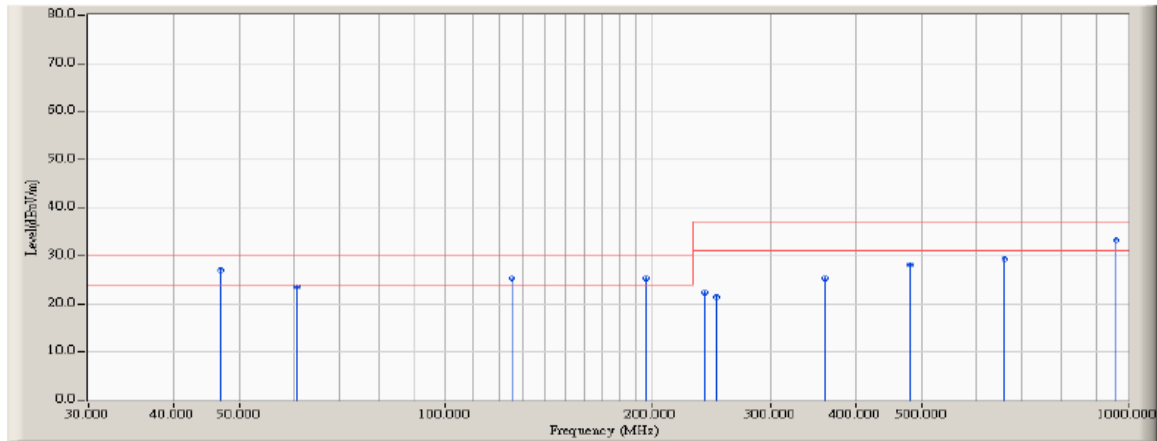
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	120.028	15.131	8.360	23.491	-6.509	30.000	QUASPEAK	0.000	0.000
2	125.010	14.972	5.030	20.002	-9.998	30.000	QUASPEAK	0.000	0.000
3	165.865	12.958	5.160	18.117	-11.883	30.000	QUASPEAK	0.000	0.000
4	196.683	12.498	14.020	26.518	-3.482	30.000	QUASPEAK	0.000	0.000
5	250.025	16.089	2.760	18.850	-18.150	37.000	QUASPEAK	0.000	0.000
6	295.022	17.326	11.200	28.527	-8.473	37.000	QUASPEAK	0.000	0.000
7	480.108	21.720	8.800	30.521	-6.479	37.000	QUASPEAK	0.000	0.000
8	720.178	25.420	1.700	27.120	-9.880	37.000	QUASPEAK	0.000	0.000
9	780.180	26.148	5.400	31.548	-5.452	37.000	QUASPEAK	0.000	0.000
10	* 960.215	29.050	4.900	33.950	-3.050	37.000	QUASPEAK	0.000	0.000



# Vertical Open Site, 30MHz to 1000MHz

TEST Mode: Intel P4 2.8GHz

Site : OATS-4	Time : 2006/09/19 - 14:30
Limit : CISPR_B_10M_QP	Margin : 6
EUT : MotherBoard	Probe : LKANT_S4_2006_01 - VERTICAL
Power : AC 120V/60Hz	Note : M/N:MS-7276,D-Sub : 2048*1536/60Hz



	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	* 46.910	12.700	14.300	26.999	-3.001	30.000	QUASPEAK	0.000	0.000
2	60.480	7.752	15.800	23.552	-6.448	30.000	QUASPEAK	0.000	0.000
3	125.010	14.972	10.400	25.372	-4.628	30.000	QUASPEAK	0.000	0.000
4	196.683	12.498	12.800	25.298	-4.702	30.000	QUASPEAK	0.000	0.000
5	240.053	15.388	6.820	22.208	-14.792	37.000	QUASPEAK	0.000	0.000
6	250.023	16.089	5.370	21.460	-15.540	37.000	QUASPEAK	0.000	0.000
7	360.055	19.138	6.070	25.208	-11.792	37.000	QUASPEAK	0.000	0.000
8	480.113	21.720	6.460	28.181	-8.819	37.000	QUASPEAK	0.000	0.000
9	660.000	24.680	4.800	29.480	-7.520	37.000	QUASPEAK	0.000	0.000
10	960.263	29.051	4.190	33.241	-3.759	37.000	QUASPEAK	0.000	0.000

## Result

The measured values of radiated emission test are below the limit.

Test Engineer : Bruce Tsai

## 5.4 Photographs Of Radiated Emission Test Configuration





## 6. Harmonics Test

6.1 Standard : EN 61000-3-2 :2000

### 6.2 Test Procedure

The measured values of the harmonics components of the input current, including line current and neutral current, shall be compared with the limits given in Clause 7 of EN 61000-3-2:2000.

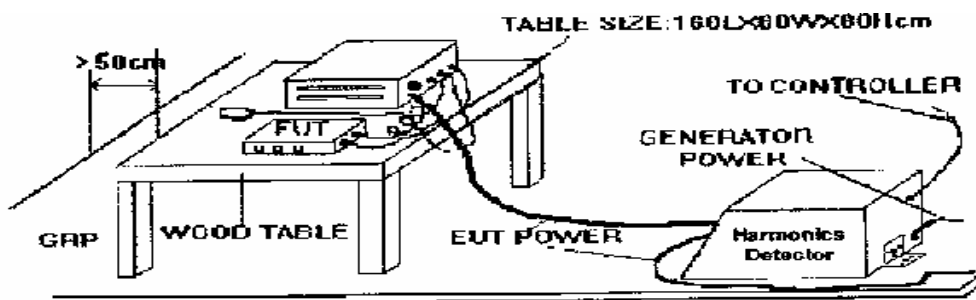
### 6.3 Test Equipment Settings

- Line Voltage : 230 V
- Line Frequency :50 Hz
- Device Class : D
- Current Measurement Range :High
- Measurement Delay : 10.0 seconds
- Test Duration :2.00 minutes
- Class determination Pre-test Duration : 10.00 seconds

#### 6.3.1 Test Equipment List

Item	Instrument	Manufacturer	Type No/Serial No.	Cal.Date
1	Power Harmonics Tester	SCHAFFNER	Proflin 2105-400 S/N: HK54148	July., 2006
2	Analyzer	SCHAFFNER	CCN 1000-1/X71887	July.,2006
3	No.2 Shielded Room			N/A

### 6.4 TEST SETUP





## 6.5 Current Harmonics Test

### 6.5.1 Test Data Of Current Harmonics

- Final Test Result : **Pass**
- Fundamental Current : 0.249A
- Real Power : 83W
- Power Factor : 0.762
- Percent in Envelope : 100.0%
- Temperature : 24°C
- Relative Humidity : 49% RH
- Test Date : 09/19/2006
- Environmental Conditions : 25deg. C, 55% RH, 1005hPa

#### Current Test Result Summary (Run time)

EUT: MOTHER BOARD  
Test category: Class D Steady State (European limits)

Tested by: MILLER  
Test Margin: 100

Comment: M/N:  
Customer: MSI

Test Result: Pass

Source qualification: Normal

Highest parameter values during test:

V<sub>RMS</sub> (Volts): 229.71  
I<sub>Peak</sub> (Amps): 2.443  
I<sub>Fund</sub> (Amps): 0.389  
Power (Watts): 83  
I<sub>RMS</sub> (Amps): 0.472  
Crest Factor: 5.228  
Power Factor: 0.762

Harm#	Harmonics	Limit	% of Limit	Status
2	0.006			
3	0.275	0.280	97.99	Pass
4	0.006			
5	0.129	0.155	83.24	Pass
6	0.008			
7	0.040	0.081	49.83	Pass
8	0.006			
9	0.029	0.041	71.21	Pass
10	0.007			
11	0.010	0.028	33.62	Pass
12	0.007			
13	0.013	0.028	50.37	Pass
14	0.007			
15	0.009	0.022	38.11	Pass
16	0.006			
17	0.006	0.020	32.34	Pass
18	0.006			
19	0.010	0.017	60.01	Pass
20	0.007			
21	0.005	0.016	0.00	Pass
22	0.006			
23	0.010	0.014	71.87	Pass
24	0.006			
25	0.005	0.013	0.00	Pass
26	0.007			
27	0.009	0.012	70.63	Pass
28	0.006			
29	0.006	0.011	57.29	Pass
30	0.007			
31	0.007	0.010	66.47	Pass
32	0.007			
33	0.008	0.010	76.87	Pass
34	0.007			
35	0.006	0.009	64.38	Pass
36	0.006			
37	0.008	0.009	90.14	Pass
38	0.007			
39	0.006	0.008	73.82	Pass
40	0.007			

Test Engineer : Bruce Tsai

## 7. Voltage Fluctuations Test

7.1 Standard : EN 61000-3-3 :1995 +A1 :2001

### 7.2 Test Procedure

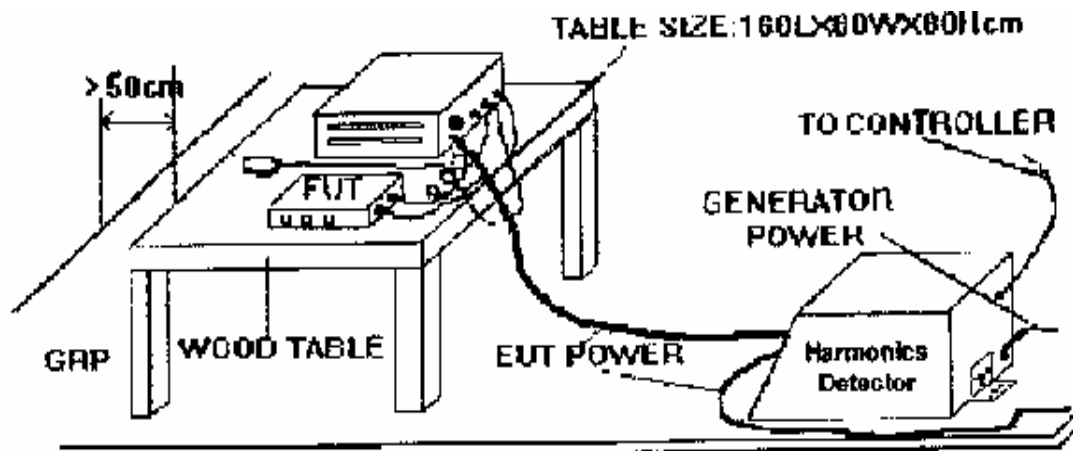
The equipment shall be tested under the conditions of Clause 5.

The total impedance of the test circuit, excluding the appliance under test, but including the internal impedance of the supply source, shall be equal to the reference impedance. The stability and tolerance of the reference impedance shall be adequate to ensure that the overall accuracy of  $\pm 8\%$  is achieved during the whole assessment procedure.

#### 7.2.1 Test Equipment List

Item	Instrument	Manufacturer	Type No/Serial No.	Cal. Date
1	Power Harmonics Tester	SCHAFFNER	Proflin 2105-400 S/N: HK54148	July., 2006
2	Analyzer	SCHAFFNER	CCN 1000-1/X71887	July.,2006
3	No.2 Shielded Room			N/A

### 7.3 TEST SETUP





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**7.4 TEST RESULT OF VOLTAGE FLUCTUATION AND FLICKER TEST****7.4.1 TEST DATA OF VOLTAGE AND FLICKER**

- Final test Result : **Pass**
- Temperature : 24°C
- Relative Humidity : 49% RH
- Test Date : 09/19/2006
- Environmental Conditions : 25deg. C, 55% RH, 1005hPa

Urms = 228.9V                      Freq = 49.987                      Range :5A  
Irms =0.671A                      Ipk = 2.864A                      Cf =4.265  
P =68.60W                      Pap =153.7VA                      pf =0.446  
Test- Time :      1x 10min = 10min (100%)

LIN (Line Impedance Network) : Soft LIN 0.24Ohm +j 0.15Ohm N:0.16 Ohm + j 0.10Ohm

Limits :              Plt : 0.65              Pst : 1.00  
                         dmax : 4.00%      dc :3.30%  
                         dtLim :3.30%      dt>Lim : 500ms

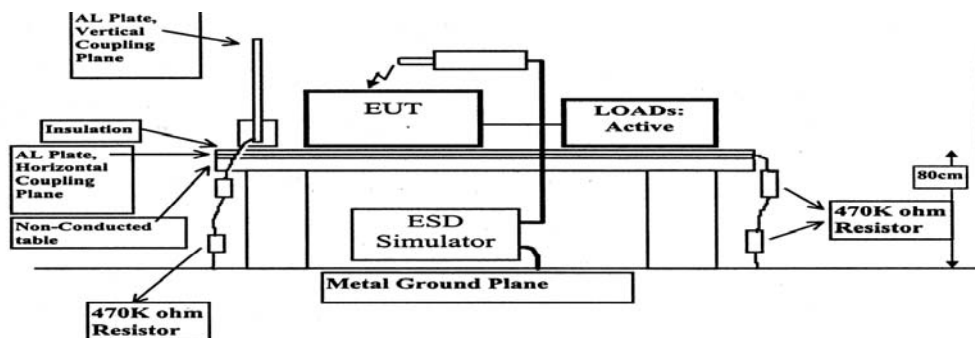
Test completed, Result :PASSED

Test Engineer : Bruce Tsai

## 8. Immunity Tests Against Electrostatic Discharge (ESD)

- FINAL TEST RESULT : PASS
- Passed Performance Criteria : B
- Basic Standard : EN 61000-4-2 :2001
- Generic Standard : EN 55024:1998+A1:2001+A2:2003
- Level : 2
- Frequency Range : 80-1000 MHz
- Field Strength : 3 V/m (Modulated 80%, AM)
- Temperature : 23°C
- Relative Humidity : 49 %
- Test Date : 09/19/2006
- Environmental Conditions : 25deg. C, 55% RH, 1005hPa

### 8.1.1 TEST SETUP



The test setup consists of the test generator, EUT and auxiliary instrumentation necessary to perform DIRECT and INDIRECT application of discharges to the EUT as applicable, in the follow manner:

- CONTACT DISCHARGE to the conductive surfaces and to coupling plane.
- AIR DISCHARGE at insulating surfaces.

The preferred test method is that of type tests performed in laboratories and the only accepted method of demonstrating conformance with this standard. The EUT was arranged as closely as possible to arrangement in final installed conditions.



8.1.2 Test Equipment List

Item	Instrument	Manufacturer	Type No/Serial No.	Cal. Date
1	ESD Simulator System	Noiseken	ESS-2000 S/N: 3010C03842	August., 2005
2	Horizontal Coupling Plane(HCP)	QuieTek	HCP AL50	N/A
3	Horizontal Coupling Plane(HCP)	QuieTek	VCP AL50	N/A
4	No.2 Shielded Room			N/A

8-2 Test Levels

8-2-1 Contact Discharge

Level	Test Voltage (KV) of Contact Voltage
1	±2
2	±4
3	±6
4	±8

8-2-2 Air Discharge

Level	Test Voltage (KV) of Air Voltage
1	±2
2	±4
3	±8
4	±15

**8-3 Test Result Of Air Discharge**

TEST POINT	VOLTAGE	TESTED NO	OBSERVATION	RESULT
CASE	±2/ ±4/ ±8KV	BY 10	NORMAL	<b>PASS</b>
SCREW	±2/ ±4/ ±8KV	BY 10	NORMAL	<b>PASS</b>
BRACKET	±2/ ±4/ ±8KV	BY 10	NORMAL	<b>PASS</b>
FAN	±2/ ±4/ ±8KV	BY 10	NORMAL	<b>PASS</b>
PRINTER PORT	±2/ ±4/ ±8KV	BY 10	NORMAL	<b>PASS</b>
COM 1 PORT	±2/ ±4/ ±8KV	BY 10	NORMAL	<b>PASS</b>
COM 2 PORT	±2/ ±4/ ±8KV	BY 10	NORMAL	<b>PASS</b>
LED	±2/ ±4/ ±8KV	BY 10	NORMAL	<b>PASS</b>
AC SOCKET	±2/ ±4/ ±8KV	BY 10	NORMAL	<b>PASS</b>
POWER SWITCH	±2/ ±4/ ±8KV	BY 10	NORMAL	<b>PASS</b>
RESET SWITCH	±2/ ±4/ ±8KV	BY 10	NORMAL	<b>PASS</b>
PS/2 KEYBOARD PORT	±2/ ±4/ ±8KV	BY 10	NORMAL	<b>PASS</b>
PS/2 MOUSE PORT	±2/ ±4/ ±8KV	BY 10	NORMAL	<b>PASS</b>
USB POT	±2/ ±4/ ±8KV	BY 10	NORMAL	<b>PASS</b>
F.D.D.	±2/ ±4/ ±8KV	BY 10	NORMAL	<b>PASS</b>
115/230 SWITCH	±2/ ±4/ ±8KV	BY 10	NORMAL	<b>PASS</b>

Test Engineer : Bruce Tsai

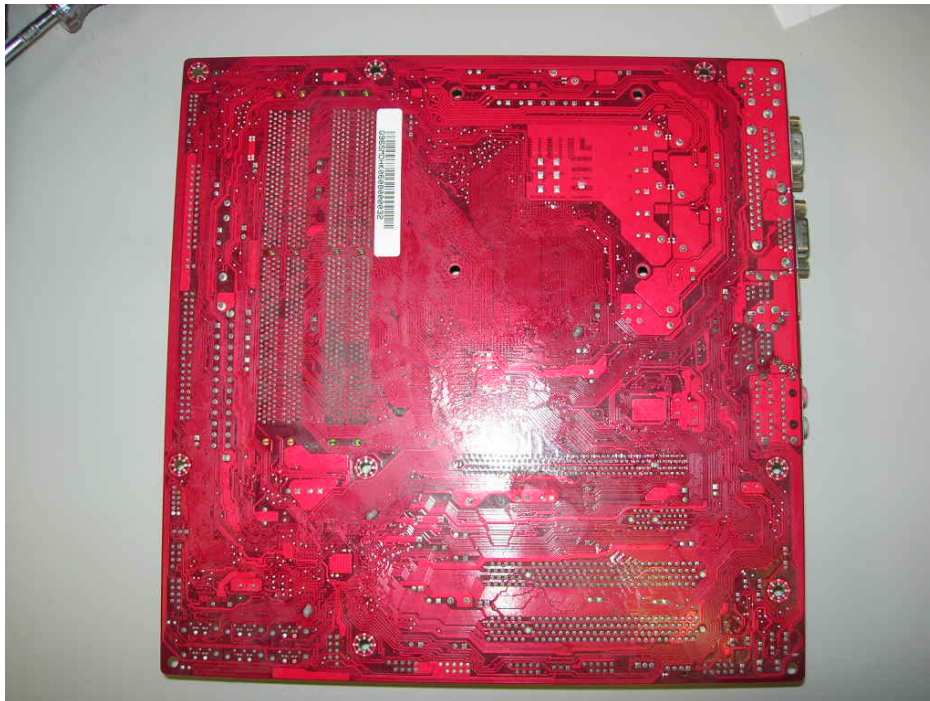
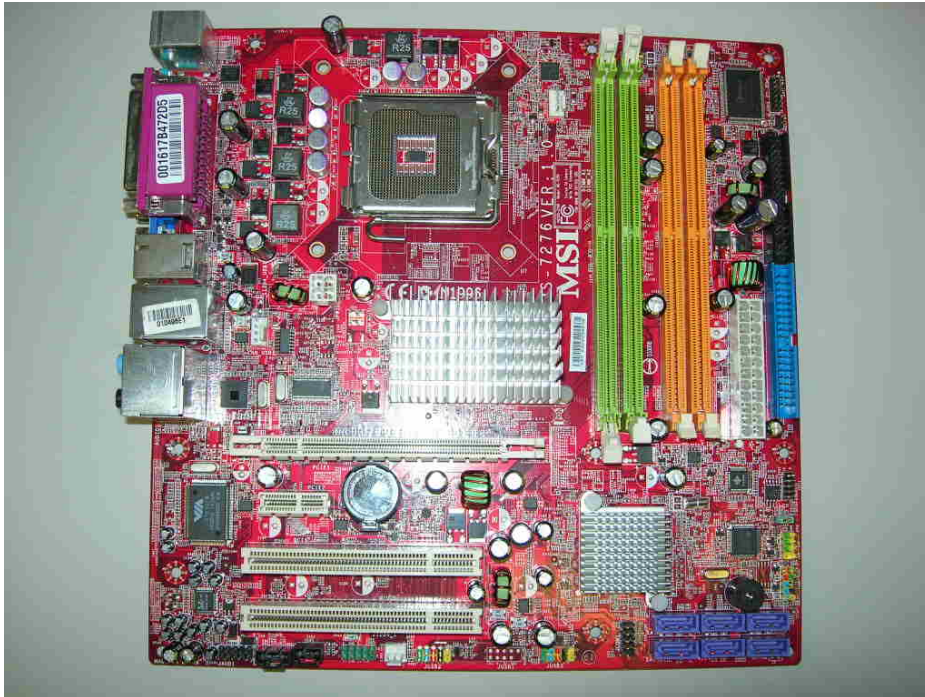
**8-4 Test Result Of Contact Discharge**

POLARITY	VOLTAGE	TESTED NO	OBSERVATION	RESULT
HORIZONTAL(FRONT)	±2/ ±4KV	BY 10	NORMAL	<b>PASS</b>
HORIZONTAL(REAR)	±2/ ±4KV	BY 10	NORMAL	<b>PASS</b>
HORIZONTAL(RIGHT)	±2/ ±4KV	BY 10	NORMAL	<b>PASS</b>
HORIZONTAL(LEFT)	±2/ ±4KV	BY 10	NORMAL	<b>PASS</b>
VERTICAL(FRONT)	±2/ ±4KV	BY 10	NORMAL	<b>PASS</b>
VERTICAL(REAR)	±2/ ±4KV	BY 10	NORMAL	<b>PASS</b>
VERTICAL(RIGHT)	±2/ ±4KV	BY 10	NORMAL	<b>PASS</b>
VERTICAL(LEFT)	±2/ ±4KV	BY 10	NORMAL	<b>PASS</b>
CASE	±2/ ±4KV	BY 10	NORMAL	<b>PASS</b>
SCREW	±2/ ±4KV	BY 10	NORMAL	<b>PASS</b>
BRACKET	±2/ ±4KV	BY 10	NORMAL	<b>PASS</b>
PRINTER PORT	±2/ ±4KV	BY 10	NORMAL	<b>PASS</b>
COM 1 PORT	±2/ ±4KV	BY 10	NORMAL	<b>PASS</b>
COM 2 PORT	±2/ ±4KV	BY 10	NORMAL	<b>PASS</b>
PS/2 KEYBOARD PORT	±2/ ±4KV	BY 10	NORMAL	<b>PASS</b>
PS/2 MOUSE PORT	±2/ ±4KV	BY 10	NORMAL	<b>PASS</b>
USB PORT	±2/ ±4KV	BY 10	NORMAL	<b>PASS</b>

Test Engineer : Bruce Tsai



9. Attachment A. Photograph Of EUT



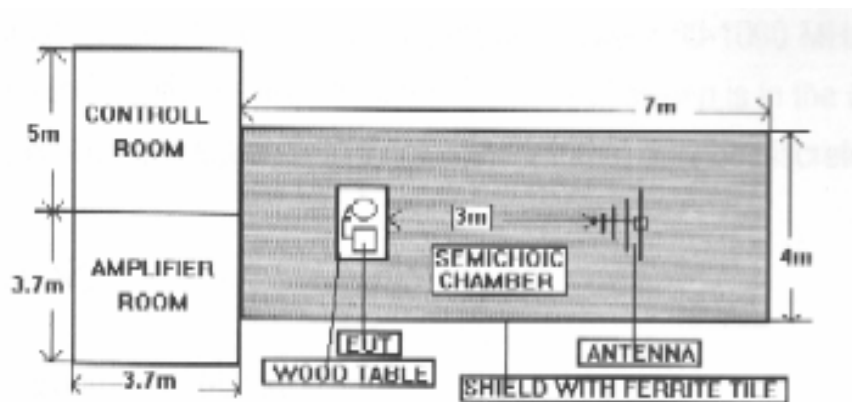
## 10. Radio Frequency Electromagnetic Field Immunity Test (RS)

- FINAL TEST RESULT : PASS
- Passed Performance Criteria : A
- Basic Standard : EN 61000-4-3 :2002:+A1:2002
- Generic Standard : EN 55024:1998 +A1:2001+A2:2003
- Level : 2
- Frequency Range : 80-1000 MHz
- Field Strength : 3 V/m (Modulated 80%, AM)
- Temperature : 23°C
- Relative Humidity : 49 %
- Test Date : 09/19/2006
- Environmental Conditions : 25deg. C, 55% RH, 1005hPa

### 10.1.1 Test Equipment List

Item	Instrument	Manufacturer	Type No/Serial No.	Cal. Date
1	Signal Generator	IFR	2023B / 202302/581	Oct.,2005
2	Power Amplifier	A & R	500A100AM3 /29369	N/A
3	Power Amplifier	SCHAFFNER	CBA9413B / 0006	N/A
4	Field Strength Sensor	SCHAFFNER	EMC 20 / Y-0028/ Z-0003	Feb.,2006
5	Power Antenna	SCHWARZBECK	VULB 9166 / 1073	Jan.,2006
6	Power Meter	BOONTON	4232A / 42201	Jan.,2006
7	No.2 EMC Fully Chamber			N/A

### 10.1.2 TEST SETUP





10.2 Test Severity Levels

Frequency Band :80-1000MHz

Level	Voltage field strength (V/m)	Result
1	1	N/A
2	3	Pass
3	10	N/A
X	Specified	N/A

Remark : "X" is an open class.

Test Engineer : Bence Tsai

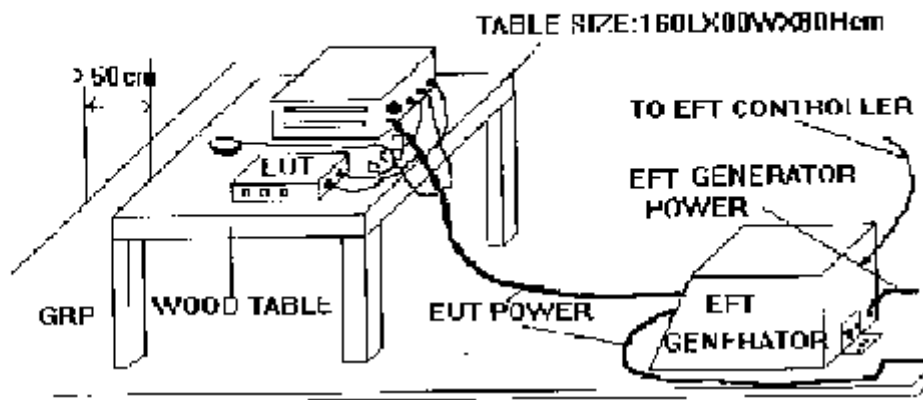
## 11. Immunity Tests Against Electrostatic Fast Transient (EFT)

- FINAL TEST RESULT : PASS
- Pass Performance Criteria : B
- Basic Standard : EN 61000-4-4:2004
- Generic Standard : EN 55024:1998+A1:2001+A2:2003
- Level : on Power Supply --2
- Tested voltage : on Power Supply --  $\pm 0.5/1.0$  KV
- Temperature : 24°C
- Relative Humidity : 49 %
- Test Date : 09/19/2006
- Environmental Conditions : 25deg. C, 55% RH, 1005hPa

### 11.1.1 Test Equipment List

Item	Instrument	Manufacturer	Type No/Serial No.	Cal. Date
1	Fast Transient/Burst Generator	Noiseken	FNS-AXIIA16 / 2010B01754	Dec., 2005
2	No.2 EMC Fully Chamber			N/A

### 11.1.2 Test setup





## 11.2 Test Severity Levels

The following test severity levels are recommended for the fast transient/burst test:

Open circuit output test voltage $\pm 10\%$			
Level	On Power Supply	On I/O signal, data and control line	RESULT
1	$\pm 0.5KV$	$\pm 0.25 KV$	<b>N/A</b>
2	$\pm 1.0KV$	$\pm 0.50 KV$	<b>PASS</b>
3	$\pm 2.0KV$	$\pm 1.00 KV$	<b>N/A</b>
4	$\pm 4.0 KV$	$\pm 2.00 KV$	<b>N/A</b>
X	Specified	Specified	<b>N/A</b>

Remark : "X" is an open level. The level is subject to negotiation between the user and the manufacturer or is specified by the manufacturer.

Test Engineer : Bruce Tsai

**12. Surge Immunity Test**

- FINAL TEST RESULT : PASS
- Pass Performance Criteria : B
- Basic Standard : EN 61000-4-5:2001
- Generic Standard : EN 55024:1998+A1:2001+A2:2003
- Input Voltage, Frequency : 230Vac, 50Hz
- Level : 3
- Tested voltage :  $\pm 1.0 / \pm 2KV$
- Temperature : 24°C
- Relative Humidity : 54 %
- Test Date : 09/19/2006
- Environmental Conditions : 25deg. C, 55% RH, 1005hPa

**12.1.1 Test Equipment List**

Item	Instrument	Manufacturer	Type No/Serial No.	Cal., Date
1	Surge Generator	SCHAFFNER	NSG 2050 S/N: 200124-031AR	Dec., 2005
2	No.2 EMC Fully Chamber			N/A

**12.1.2 Test Record**

Voltage (KV)	Test Location	Polarity	Phase Angle				Test Result
			0°	90°	180°	270°	
1KV	L-N	+	A	A	A	A	PASS
		-	A	A	A	A	PASS
2KV	L-PE	+	A	A	A	A	PASS
		-	A	A	A	A	PASS
	N-PE	+	A	A	A	A	PASS
		-	A	A	A	A	PASS

Remark : PE = DC Output GND



**12.2 Test Level**

Level	Open-circuit test voltage, $\pm$ 10%, KV
1	0.5
2	1.0
3	2.0
4	4.0
X	Specified

NOTE – X is an open class.  
This level can be specified in the product specification.

**12.3 Operating Condition**

Full system

**12.4 Final Testing Result : Pass**

Test Engineer : Bruce Tsai



### 13. Conducted Disturbances Induced By Radio-Frequency Field Immunity Test (CS)

- FINAL TEST RESULT : PASS
- Pass Performance Criteria : A
- Basic Standard : EN 61000-4-6 :2003+A1:2004
- Generic Standard : EN 55024:1998+A1:2001+A2:2003
- Input Voltage, Frequency : AC 230V, 50Hz
- Level : 2
- Tested voltage : 3 V/rms (Modulated, 1KHz, 80%, AM)
- Frequency Range : 0.15MHz to 80MHz
- Temperature : 24°C
- Relative Humidity : 49 %
- Test Date : 09/19/2006
- Environmental Conditions : 25deg. C, 55% RH, 1005hPa

#### 13.1 Test Equipment

Item	Instrument	Manufacturer	Type No/Serial No.	Cal. Date
1	Signal Generator	FRANKONIA	CIT-10175/102C3D12	April, 2006
2	CDN 1	Schwarzbeck	CDNM3/A3003017	April, 2006
3	CDN 2	Schwarzbeck	RJ45/S / A3018002	April, 2006
4	50 ohm Terminator	RES-NET	RCX6BM	April, 2006
5	6dB Attenuator	BIRD	RFA250NFF10	April, 2006
6	EM Clamp	Schwarzbeck	KEMZ 801 / 15928	April, 2006
7	Power Amplifier	A & R	150A220 / 23076	N/A
8	Power Meter	HP	EPM-4418A / GB37482040	April, 2006
9	Power Sensor	Agilent	8482A / MY41091031	April, 2006
10	Directional Coupler	A & R	DC2600 / 23325	April, 2006
11	Fixed Pad	TRILITHIC	HFP-525-3/6-NF/NF/ N/A	N/A
12	No.2 Shielded room		N/A	





13.1.1 Test Level

Level	Voltage Level (EMF)
1	1 V
2	3 V
3	10 V
X	Specified

NOTE – X is an open class.  
This level can be specified in the product specification.

13.2 Operating Condition

Full system

13.4 Final Testing Result : Pass

Test Engineer : Bruce Tsai

## 14. Power Frequency Magnetic Field Immunity Tests

- FINAL TEST RESULT : PASS
- Pass Performance Criteria : A
- Basic Standard : EN 61000-4-8 :1993+A1:2000
- Generic Standard : EN 55024:1998+A1:2001+A2:2003
- Input Voltage, Frequency : AC 230V, 50Hz
- Temperature : 24°C
- Relative Humidity : 54 %
- Test Date : 09/19/2006
- Environmental Conditions : 25deg. C, 55% RH, 1005hPa

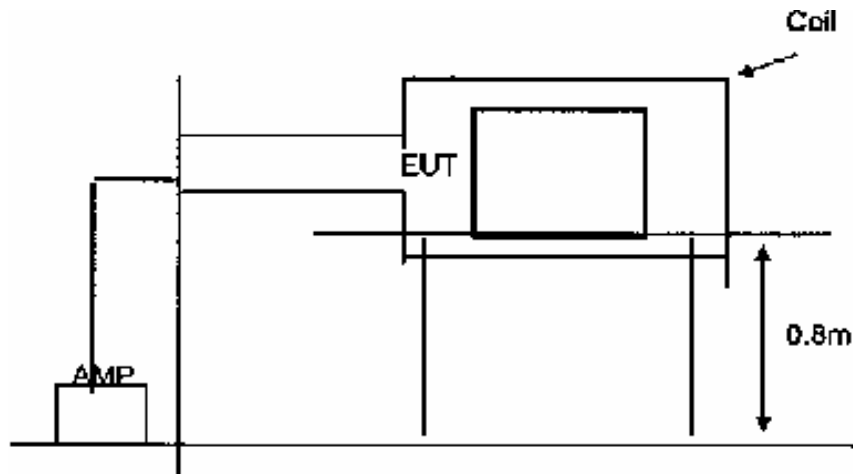
### 14.1 Test Record

Power Frequency Magnetic Field	Testing duration	Coil Orientation	Results	Remark
50Hz, 1A/m	1.0 Min	X-axis	Pass	Normal
50Hz, 1A/m	1.0 Min	Y-axis	Pass	Normal
50Hz, 1A/m	1.0 Min	Z-axis	Pass	Normal

#### 14.1.1 Test Equipment List

Item	Instrument	Manufacturer	Type No/Serial No.	Cal. Date
1	Power Line Magnetics	SCHAFFNER	PLINE1610 /080938-05	May, 2006
2	Gauss Meter	F.W.BELL	4090	May, 2006
3	Magnetic Field Coil	SCHAFFNER	INA702 /199749-020 IN	May, 2006
4	No.2 EMC Fully Chamber			N/A

## 14.2 Test Setup



## 14.3 Operating Condition

Full system

## 14.4 Final Testing Result : Pass

Test Engineer : Bruce Tsai



## 15. Voltage Dips And Voltage Interruptions Immunity Tests

- FINAL TEST RESULT : PASS
- Passed Performance Criteria : C for Voltage Interruption on >95% at 0.5 period, B for voltage Dip on >95% at 0.5 period & C for >30% at 25 period
- Basic Standard : EN 61000-4-11 :2004
- Generic Standard : EN 55024:1998+1:2001+A2:2003
- Input Voltage, Frequency : AC 230V, 50Hz
- Temperature : 24°C
- Relative Humidity : 54 %
- Test Date : 09/19/2006
- Environmental Conditions : 25deg. C, 55% RH, 1005hPa

### 15.1 Test Record Of Voltage Interruption

Voltage (V)	Phase Angle								% Reduction	Periods
	0°	45°	90°	135°	180°	225°	270°	315°		
230	C	C	C	C	C	C	C	C	>95%	250

#### 15.1.1 Test Equipment List

Item	Instrument	Manufacturer	Type No/Serial No.	Cal.Date
1	Voltage Dips Generator	SCHAFFNER	NSG 2050 200124-031AR	Dec., 2005
2	No.2 EMC Fully Chamber			N/A

### 15.2 Test Record Of Voltage Dips

Voltage (V)	Phase Angle								% Reduction	Periods(s)
	0°	45°	90°	135°	180°	225°	270°	315°		
230	A	A	A	A	A	A	A	A	30	25
230	A	A	A	A	A	A	A	A	>95%	0.5



15.3 Test conditions

- 1. Source voltage and frequency :230V / 50Mz , Single phase.
- 2. Test of interval : 10 sec.
- 3. Level and duration : Sequency of 3 dips / interrupts.
- 4. Voltage rise (and fall) time : 1~ 5  $\mu$ s.
- 5. Test severity :

Voltage dip and Interrupt reduction (%)	Test Duration (ms)
30	500
60	100
100	10
100	80
100	5000

15.4 OPERATING CONDITION

Full system

15.4 Final Testing Result : Pass

Test Engineer : Bruce Tsai