

**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT
UNINTENTIONAL RADIATOR CERTIFICATION TO
FCC PART 15 SUBPART B REQUIREMENT**

for

Microcomputer

M/N: D400P

FCC ID: V3KHCD86895TSDL

Trade Name: HASEE

Report No.: SZEE080218119901

Issue Date: Feb. 21, 2008

Prepared for

**SHENZHEN HASEE COMPUTER CO., LTD
HASEE INDUSTRIAL BASE, BANTIAN,
LONGGANG, SHENZHEN, CHINA
TEL: 86-755-8471 0382
FAX: 86-755-8794 2345**

Prepared by

**CENTRE TESTING INTERNATIONAL CO., LTD.
1F., BUILDING C, HONGWEI INDUSTRIAL ZONE,
BAOAN 70 DISTRICT, SHENZHEN, CHINA
TEL: 86-755-3368 3365
FAX: 86-755-3368 3365**

**This report shall not be reproduced, except in full, without the written approval of
CENTRE TESTING INTERNATIONAL**

TABLE OF CONTENTS

1. General Information	3
2. Product Information	4
3. Test Methodology.....	5
4. Test Facility	5
5. Special Accessories.....	5
6. Equipment Modifications.....	5
7. Test Condition	5
7.1 Test Configuration.....	5
7.2 Test Procedure.....	5
7.3 EUT operation	6
7.4 Peripherals / Support Equipment Used	6
7.5 Limit	7
8. Summary of Test Results	8
9. Conducted Emissions Test	8
9.1 Measurement Procedure	8
9.2 Test Set-up (Block Diagram of Configuration)	8
9.3 Measurement Equipment Used	8
9.4 Measurement Results.....	9
10. Radiated Emission Test.....	11
10.1 Measurement Procedure	11
10.2 Test Set-up (Block Diagram of Configuration)	11
10.3 Measurement Equipment Used	12
10.4 Measurement Results.....	12
11. Measurement Uncertainty	15
APPENDIX 1 PHOTOGRAPHS OF TEST SETUP	16
APPENDIX 2 EXTERNAL PHOTOGRAPHS OF EUT.....	19
APPENDIX 3 INTERNAL PHOTOGRAPHS OF EUT.....	22



1. General Information

Applicant: SHENZHEN HASEE COMPUTER Co.,Ltd
Hasee industrial base, Bantian,
Longgang, Shenzhen, China

Manufacturer: SHENZHEN HASEE COMPUTER Co.,Ltd
Hasee industrial base, Bantian,
Longgang, Shenzhen, China

Trade Name: HASEE

Product Name : Microcomputer

M/N: D400P

Report No.: SZEE080218119901


Date of Test: Feb. 18, 2008 to Feb. 20, 2008

We hereby certify that:

The above equipment was tested by Centre Testing International (CTI), The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15B.

The test results of this report relate only to the tested sample identified in this report.


Prepared by :


Christy Chen

Inspected by :


Forrest Lei

Approved by:


Jacky Guo
General Manager

Date :

Feb. 21, 2008



2. Product Information

System Specification for D400P

- 1) CPU
 - Intel® Celeron 420,1.6GHz
- 2) System memory
 - 1GB DDR2
- 3) Hard Disk Drive
 - 80GB (Serial ATA type)
- 4) ODD
 - N/A
- 5) Serial connector
 - On-Board (9pin male, 1Pcs)
- 6) Parallel connector
 - N/A
- 7) Keyboard connector
 - On-Board (6pin PS/2 type, 1 Pcs)
- 8) Mouse connector
 - On-Board (6pin PS/2 type, 1 Pcs)
- 9) Sound connector
 - Line-In, Line-Out, Mic-In
- 10) Front-End connector
 - On-Sub Board in front panel (Mic jack, Earphone jack and USB connector 2 Pcs)
- 11) USB connector
 - On-Board (4 Pcs), Front-End (2 Pcs)
- 12) VGA Card
 - Integrated VGA, Intel GMA950
- 13) Expansion slot
 - PCI-16x slot 1 Pcs, PCI slot 1 Pcs
- 14) Case spec.
 - Dimension:175mm(W) x 366mm(H) x 394mm(D)
 - Weight: 10Kg(gross) with packing parts
- 15) Cooling Solution
 - 80mm*80mm*25mm for EC528LB, 2000rpm
 - 90mm*90mm*25mm for DK-T829, 2450rpm
- 16) Cable
 - Power cable: 1.5m
- 17) Power Supply Unit
 - 300W Maximum
 - AC Input Voltage: 100~127VAC,
 - AC Input Frequency: 47 ~ 63Hz
- 18) Environmental conditions
 - Operating Temperature: 5°C~40°C, Storage Temperature: -20°C~ 55°C
 - Operating Humidity: 30% ~ 80% (RH), Storage Humidity: 30% ~80%(RH)

3. Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003). Radiated testing was performed at an antenna to EUT distance 3 meters.

4. Test Facility

The 3m Semi-Anechoic chamber test site and conducted measurement facility used to collect the radiated data is located on the address:

1F., Building C, Hongwei Industrial Zone 70 District., Baoan, Shenzhen, Guangdong, China.

The Test Sites and the Line Conducted labs are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003 requirements. The test site

Registration Number: 614926

5. Special Accessories

Not available for this EUT intended for grant.

6. Equipment Modifications

Not available for this EUT intended for grant.

7. Test Condition

7.1 Test Configuration

The device was configured for testing in a typical fashion (as a customer would normally use it). During the tests, the EUT and the supported equipments were installed to meet FCC requirement and operated in a manner which tends to maximize its emission level in a typical application.

7.2 Test Procedure

Conducted Emissions:

The EUT is placed on a turn table which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4-2003. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode.

Radiated Emissions:

The EUT is placed on a turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.4-2003.

7.3 EUT operation

EUT was tested according to the following operation modes provided by the specifications given by the manufacturer, and reported the worst emissions.

7.4 Peripherals / Support Equipment Used

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

Type of Peripheral Equipment Used:

Description	Model Name	Serial No.	Manufacturer	FCC ID
Monitor	LT1563	TS1536K02034100040	IBM	DoC
Keyboard	KB-9963	B28AC0NGANB1WH	Lenovo	DoC
Mouse	Wheel Mouse 3.0 PS/2	B28A0532589PU	Lenovo	DoC
Headset	N/A	N/A	N/A	N/A
Printer	HP laser jet 1020	HP0589714521JK	HP	DoC
Modem	TM-EC5658V	06327401556	TP-LINK	DoC

Type of Cables Used:

Device from	Device to	Type of Cable	Length(m)	Type of shield
EUT	Keyboard	PS/2	2.1	Unshielded
EUT	Mouse	PS/2	2.1	Unshielded
EUT	Headset	Din	2.5	Unshielded
EUT	Power	INLET	1.8	Unshielded
EUT	Monitor	Video	1.8	Shielded
EUT	Printer	Dsub	1.5	Unshielded
EUT	Modem	USB	1.8	Shielded
EUT	Modem	INTERNET	1.8	Shielded

7.5 Limit

Conducted Emission:

According to section 15.107(a) Conducted Emission Limits is as following:

Frequency range (MHz)	Limits (dBuV)	
	Quasi-peak	Average
0.15 to 0.5	66 to 56 *	56 to 46 *
0.5 to 5	56	46
5 to 30	60	50

Note:

* Decreases with the logarithm of the frequency.

Radiated Emission:

According to section 15.109(g) Radiated Emission Limits is as following:

Frequency (MHz)	Field strength ($\mu\text{V/m}$)	Distance (m)	Field strength at 3m (dB $\mu\text{V/m}$)
30-88	100	3	40
88-216	150	3	43.5
216-960	200	3	46
Above 960	500	3	54

Remark:

1. Emission level in dBuV/m=20 log ($\mu\text{V/m}$)
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.

8. Summary of Test Results

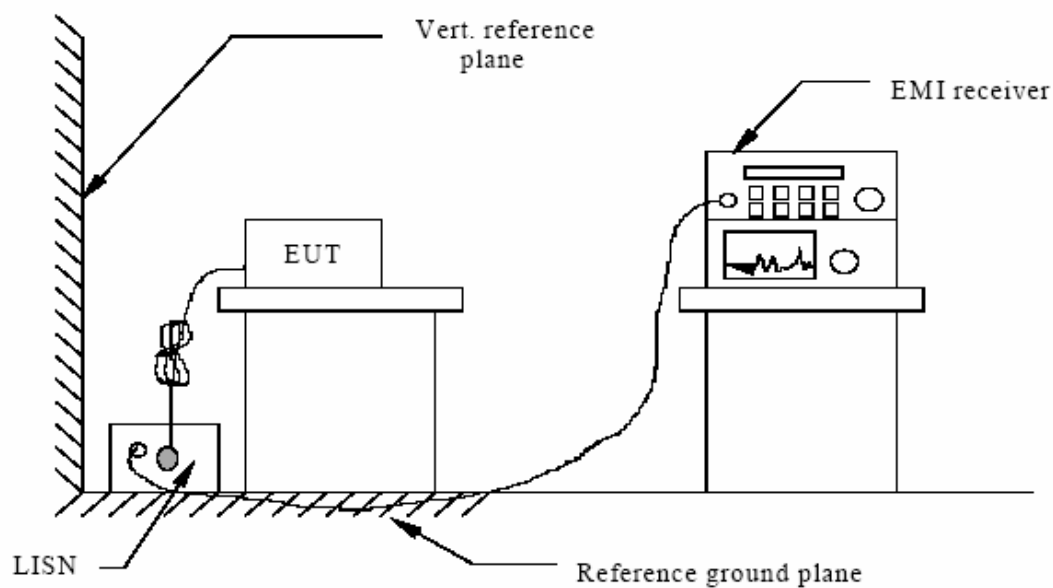
FCC Rules	Description Of Test	Result
§15.107(a)	Conducted Emission	Compliant
§15.109(g)	Radiated Emission	Compliant

9. Conducted Emissions Test

9.1 Measurement Procedure

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

9.2 Test Set-up (Block Diagram of Configuration)



9.3 Measurement Equipment Used

Equipment Type	Manufacturer	Model Number	Serial Number	Last Calibration	Calibration Due
Receiver	R&S	ESCI	100435	01/29/2008	01/28/2009
LISN	ETS	3816	00060336	06/07/2007	06/06/2008

9.4 Measurement Results

Limit : FCC Class B Conduction
EUT : Microcomputer
M/N : D400P
Mode : Full load

Power : AC 120V
Temperature : 24
Humidity : 53%
Tested by : Christy Chen

(The chart below shows the highest readings taken from the final data)

Conducted Emission Test Result													
Frequency	Reading Level (dBuV)			Correct Factor	Measurement (dBuV)			Limits		Margin		Result	Remarks
(MHz)	Peak	Q.P.	Avg.	dB	Peak	Q.P.	Avg.	Q.P.	Avg.	Q.P.	Avg.	(P/F)	(L1/L2)
0.1499	23.04	20.23	11.63	21.51	44.55	41.74	33.14	66.00	56.00	-14.26	-22.86	P	L
0.2180	22.09	19.61	18.74	22.13	44.22	41.74	40.87	62.89	52.89	-11.15	-12.02	P	L
0.3420	23.98	20.03	19.08	21.71	45.69	41.74	40.79	59.15	49.15	-7.41	-8.36	P	L
0.4100	19.11	18.20	17.93	21.66	40.77	39.86	39.59	57.65	47.65	-7.79	-8.06	P	L
0.5900	17.23	14.66	13.75	21.53	38.76	36.19	35.28	56.00	46.00	-9.81	-10.72	P	L
1.3020	18.21	15.90	14.38	21.36	39.57	37.26	35.74	56.00	46.00	-8.74	-10.26	P	L
0.1820	28.58	26.66	24.25	21.96	50.54	48.62	46.21	64.39	54.39	-15.77	-8.18	P	N
0.3620	24.81	20.16	16.91	21.70	46.51	41.86	38.61	58.68	48.68	-16.82	-10.07	P	N
0.4820	23.56	20.83	16.62	21.60	45.16	42.43	38.22	56.30	46.30	-13.87	-8.08	P	N
0.5300	25.60	24.05	20.19	21.56	47.16	45.61	41.75	56.00	46.00	-10.39	-4.25	P	N
0.6220	25.49	21.11	15.68	21.53	47.02	42.64	37.21	56.00	46.00	-13.36	-8.79	P	N
1.1460	26.12	18.84	11.68	21.45	47.57	40.29	33.13	56.00	46.00	-15.71	-12.87	P	N

Freq.

Reading level

Factor

Emission level

Limit

Margin

= Emission frequency in MHz

= Uncorrected Analyzer/Receiver reading

= Cable loss + insertion loss

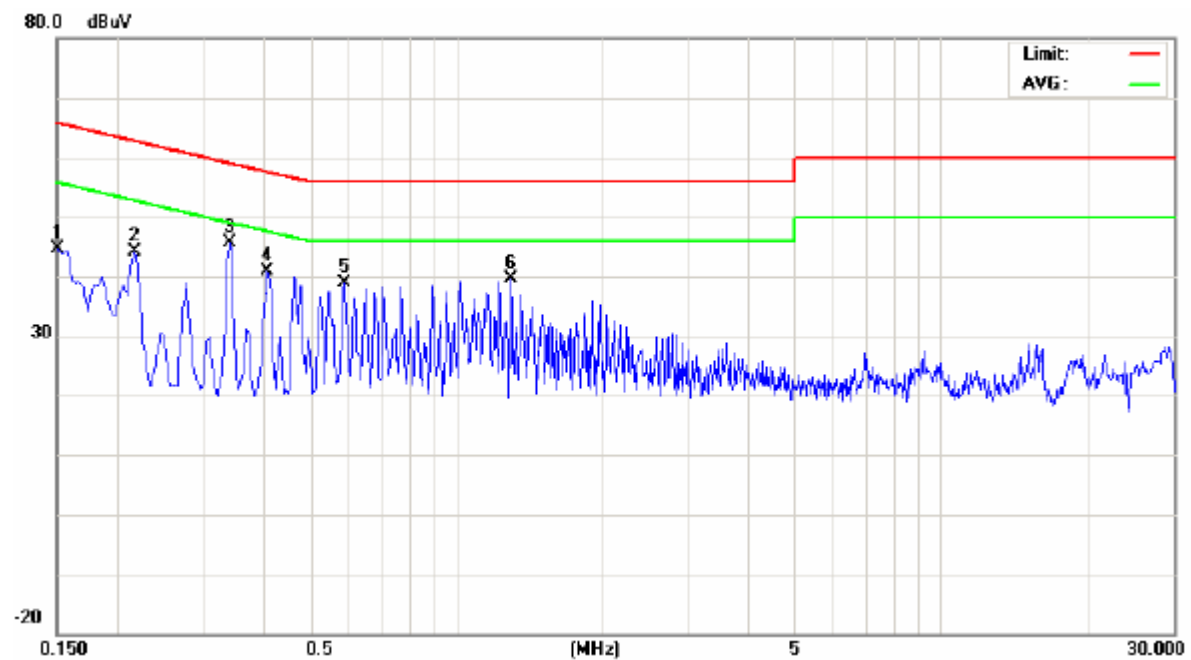
= Reading level + Factor

= Limit stated in standard

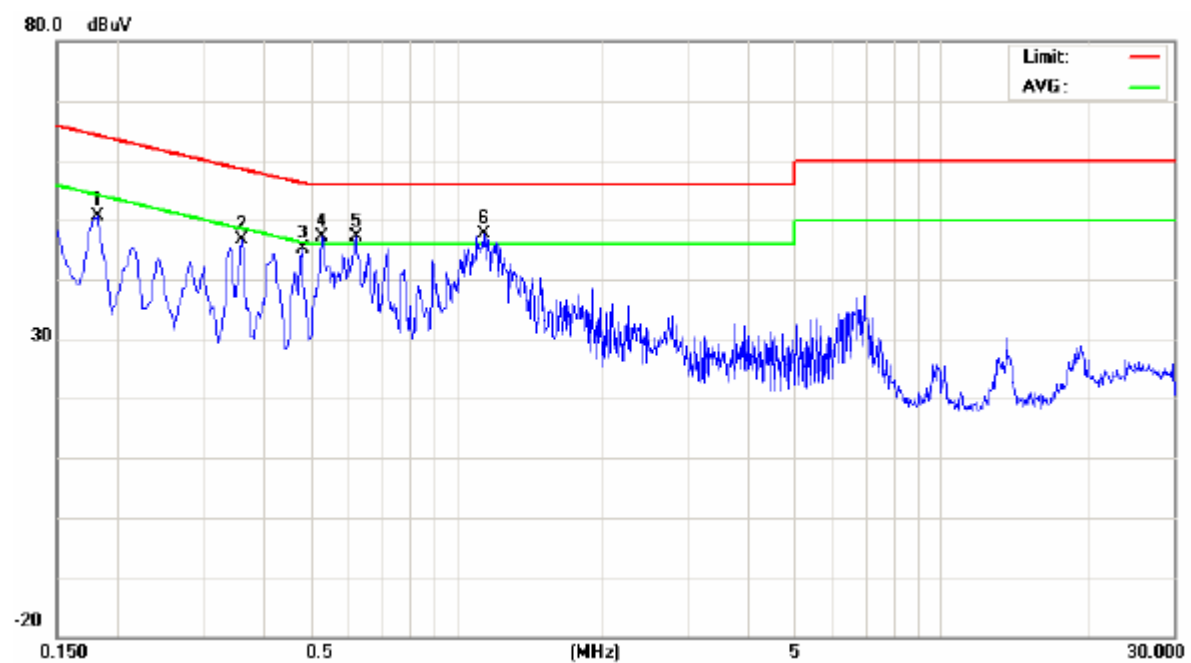
= Reading in reference to limit

Graph of Conducted Emissions:

L:



N:



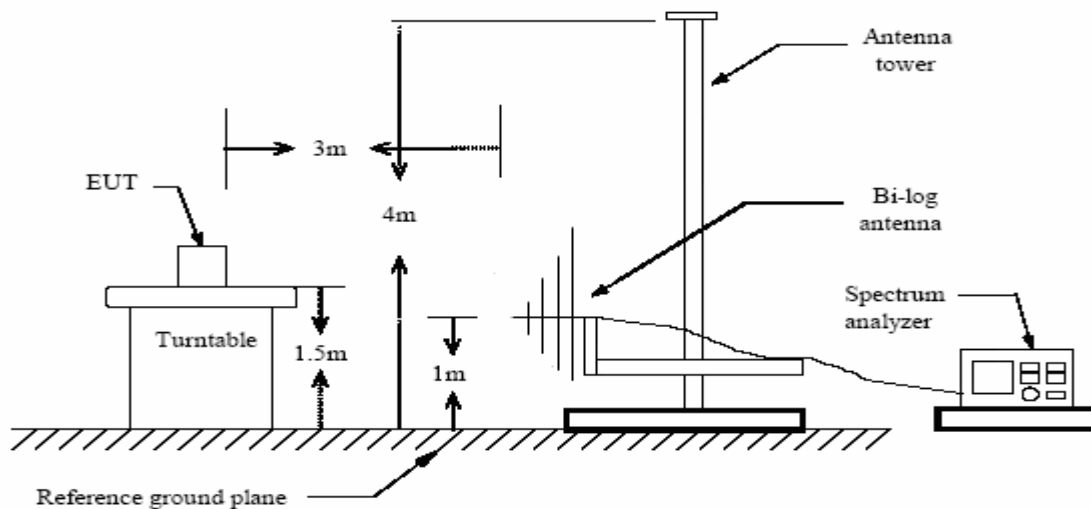
10. Radiated Emission Test

10.1 Measurement Procedure

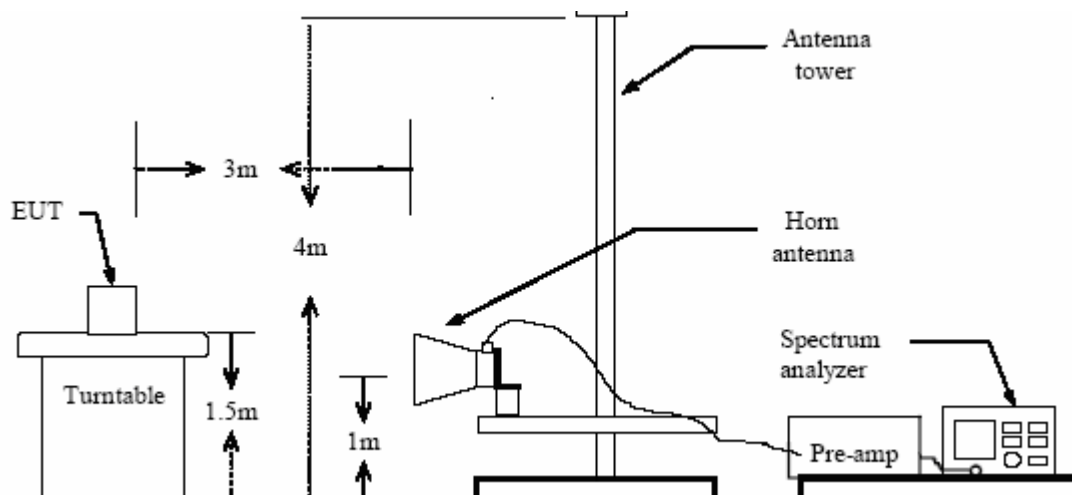
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on the twelve highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured were complete.

10.2 Test Set-up (Block Diagram of Configuration)

A. Radiated Emission Test Set-Up, Frequency below 1000MHz



B. Radiated Emission Test Set-Up, Frequency above 1000MHz



10.3 Measurement Equipment Used

Equipment Type	Manufacturer	Model Number	Serial Number	Last Calibration	Calibration Due
Spectrum Analyzer	Agilent	E4443A	MY46185649	06/29/2007	06/28/2008
Biconilog Antenna	ETS	3142C	920250	05/30/2007	05/29/2008
ETS Horn Antenna	ETS	3117	57410	05/30/2007	05/29/2008
Multi device Controller	ETS	2090	00057230	06/07/2007	06/06/2008

10.4 Measurement Results

Limit : FCC Class B Radiation
EUT : Microcomputer
M/N : D400P
Mode : Full load

Power : AC 120V
Temperature : 26
Humidity : 60%
Tested by : Christy Chen

(The chart below shows the highest readings taken from the final data)

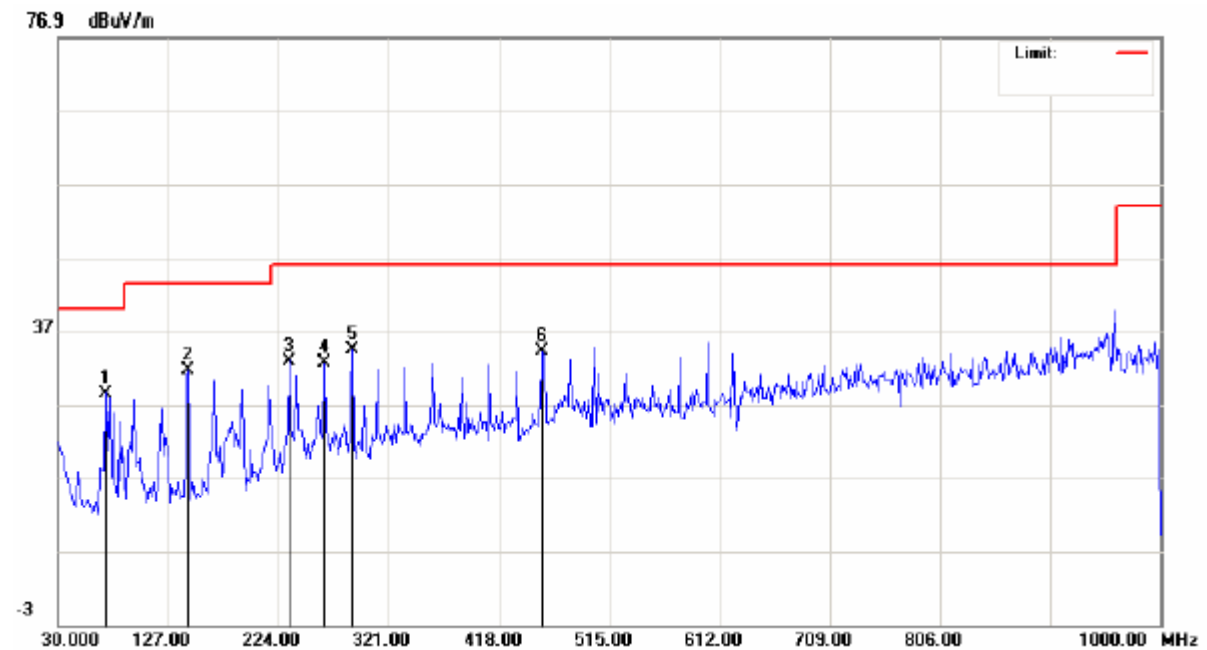
Radiated Emission Test Result													Remarks
Frequency	Reading Level (dBuV)			Correct Factor	Measurement (dBuV/m)			Limit (dBuV/m)		Margin (dB)		Result	
(MHz)	Peak	Q.P.	Avg.	dB	Peak	Q.P.	Avg.	Q.P.	Avg.	Q.P.	Avg.	(P/F)	(L/N)
72.0333	20.32			8.18	28.50			40.00		<-10		P	H
144.7833	21.49			10.09	31.58			43.50		<-10		P	H
233.7000	19.35			13.55	32.90			46.00		<-10		P	H
264.4167	18.16			14.52	32.68			46.00		<-10		P	H
288.6667	19.03			15.36	34.39			46.00		<-10		P	H
455.1833	14.89			19.28	34.17			46.00		<-10		P	H
30.0000	11.95			17.63	29.58			40.00		<-10		P	V
78.5000	21.08			8.80	29.88			40.00		<-10		P	V
120.5333	22.40			9.19	31.59			43.50		<-10		P	V
144.7833	20.77			10.09	30.86			43.50		<-10		P	V
215.9167	17.54			12.72	30.26			43.50		<-10		P	V
359.8000	15.14			17.78	32.92			46.00		<-10		P	V

Freq. = Emission frequency in MHz
 Raw Data (dBuV/m) = Uncorrected Analyzer / Receiver reading
 Corr. Factor (dB) = Correction factors of antenna factor and cable loss
 Emiss. Leve = Raw reading converted to dBuV/m and CF added
 Limit dBuV/m = Limit stated in standard
 Margin dB = Reading in reference to limit
 PK = Peak Reading
 QP = Quasi-peak

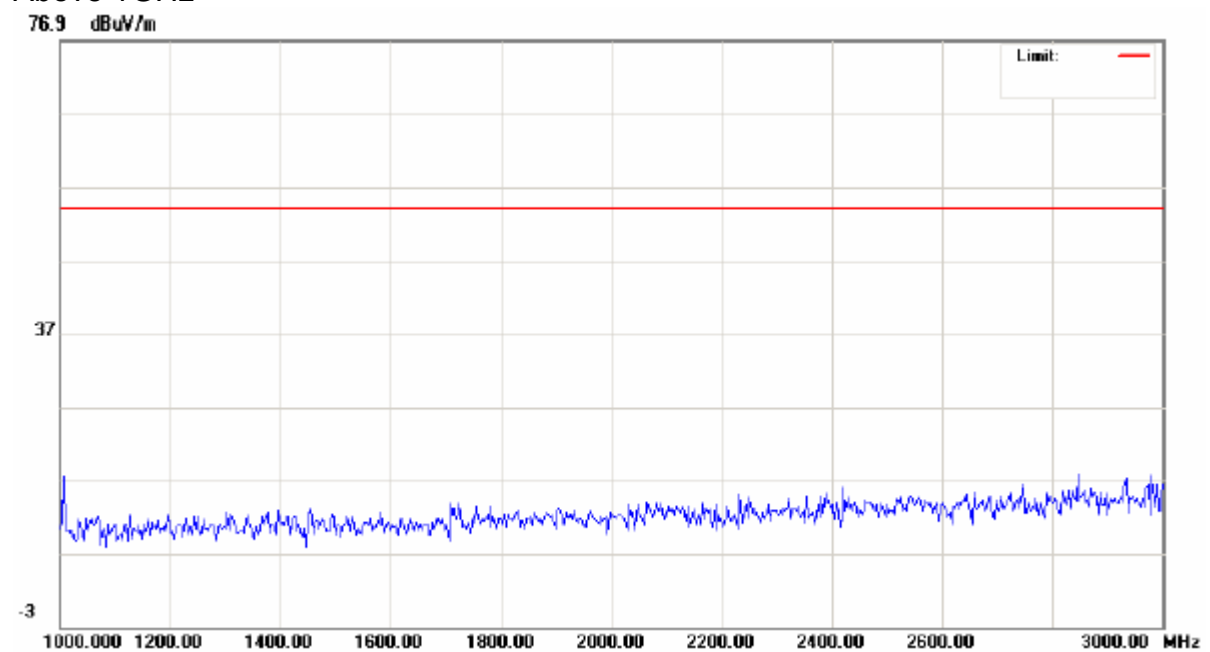
Graph of Radiated Emissions:

H:

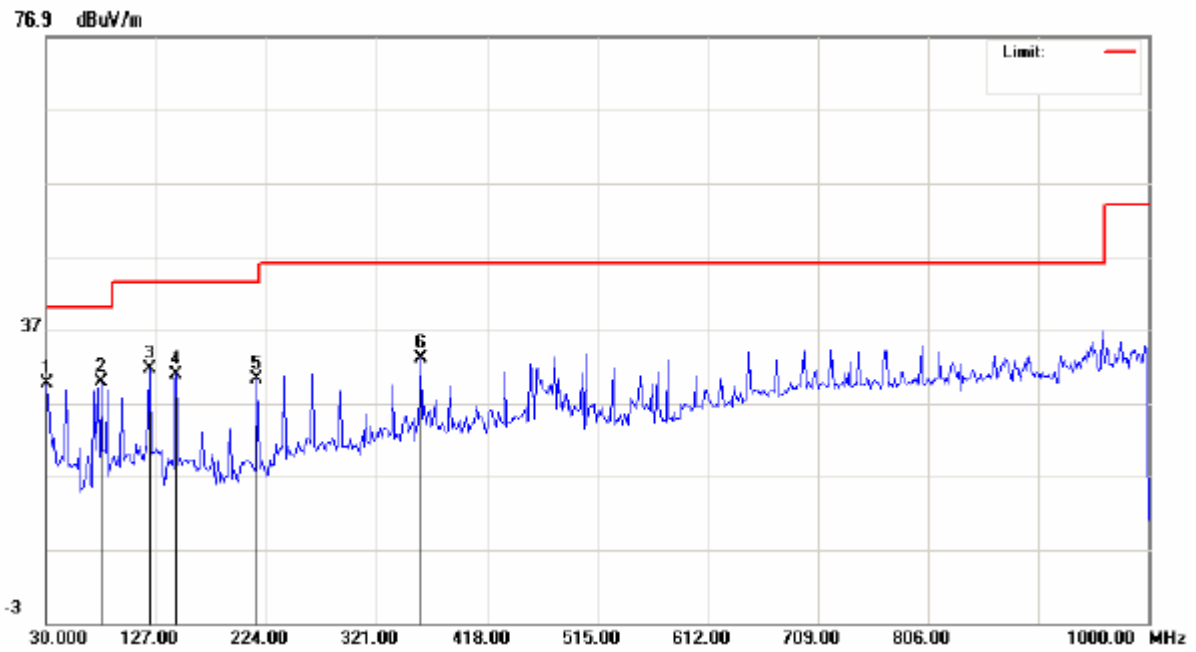
Below 1GHz



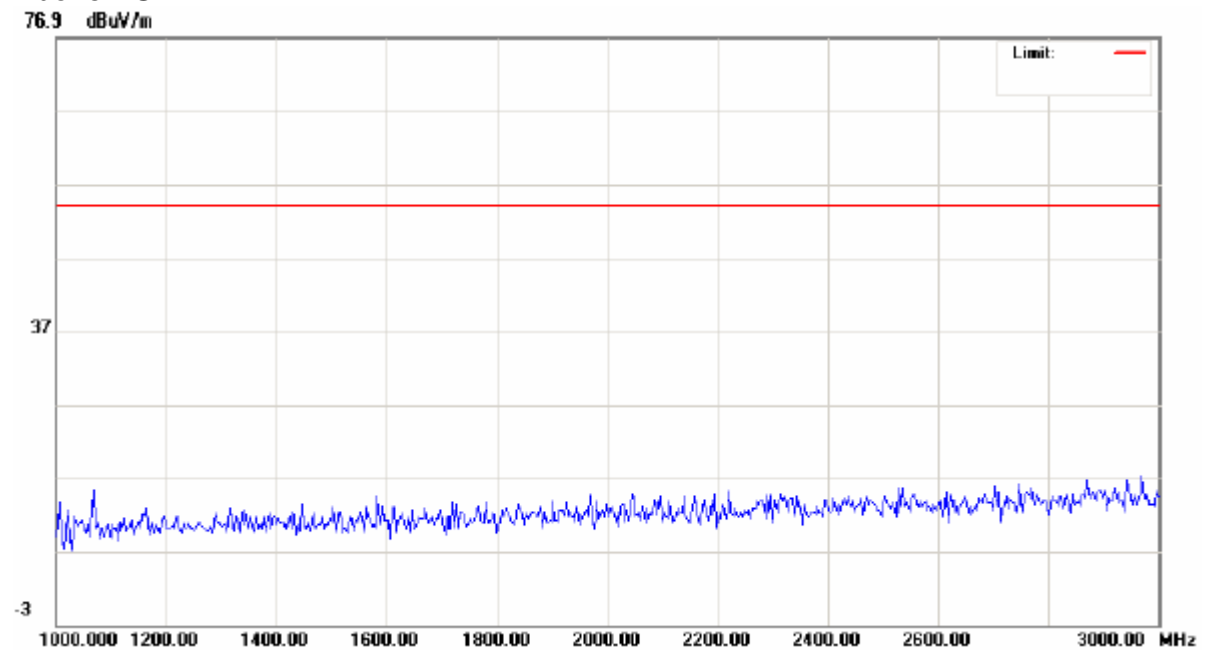
Above 1GHz



V:
Below 1GHz



Above 1GHz



11. Measurement Uncertainty

Conduction Uncertainty : $\pm 2.72\text{dB}$

Radiation Uncertainty : $\pm 3.84\text{dB}$

APPENDIX 1 PHOTOGRAPHS OF TEST SETUP

CONDUCTED EMISSION TEST



RADIATED EMISSION TEST



APPENDIX 2 EXTERNAL PHOTOGRAPHS OF EUT



View of EUT-1



View of EUT-2



View of EUT-3



View of EUT-4

APPENDIX 3 INTERNAL PHOTOGRAPHS OF EUT



View of inside



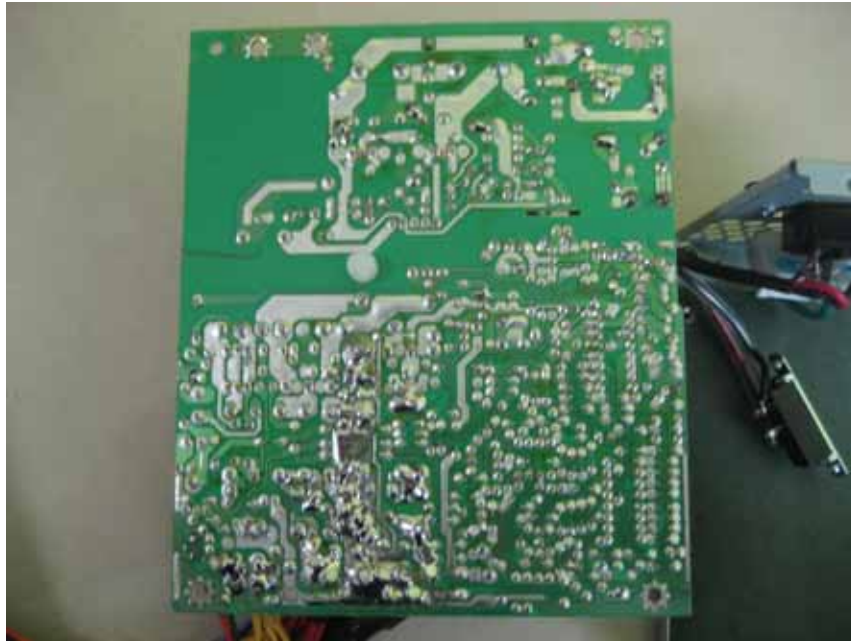
Top side view of mainboard



Bottom side view of main board



Top side view of power supply board



Bottom side view of power supply board



Top side view of main board fan



Bottom side view of main board fan



Top side view of hard disk



Bottom side view of hard disk

----End of the report----