

FSP Group Inc.
Switching Power Supply

Model : (1)FSP150-50SNV (2)FSP200-50SNV

Prepared for : FSP Group Inc.
No. 22, Jianguo E. Rd.,
Taoyuan City, Taiwan, R.O.C.

Prepared By : Taiwan Tokin EMC Eng. Corp.
No. 53-11, Tin-Fu Tsun, Lin-Kou,
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TABLE OF CONTENTS

Description	Page
Test Report For FCC Compliance Declaration	3
1. GENERAL INFORMATION.....	4
1.1. Description of Device (EUT)	4
1.2. Tested Supporting System Details.....	5
1.3. Test Facility	7
1.4. Measurement Uncertainty.....	7
2. POWERLINE CONDUCTED TEST	8
2.1. Test Equipment	8
2.2. Block Diagram of Test Setup.....	8
2.3. Powerline Conducted Emission Limit (CISPR 22 CLASS B).....	8
2.4. EUT's Configuration during Compliance Measurement.....	9
2.5. Operating Condition of EUT.....	9
2.6. Test Procedure.....	10
2.7. Line Conducted RF Voltage Measurement Results	10
3. RADIATED EMISSION TEST.....	13
3.1. Test Equipment	13
3.2. Block Diagram of Test Setup.....	13
3.3. Radiation Limit	14
3.4. EUT's Configuration during Compliance Measurement.....	14
3.5. Operating Condition of EUT.....	14
3.6. Test Procedure.....	14
3.7. Test Results.....	14
3.8. Radiated Emission Measurement Results.....	15
4. DEVIATION TO TEST SPECIFICATIONS.....	17
5. PHOTOGRAPHS	18
5.1. Photos of Powerline Conducted Measurement	18
5.2. Photos of Radiated Measurement at Open Field Test Site.....	19

APPENDIX I (Photos of EUT)

TEST REPORT FOR FCC COMPLIANCE DECLARATION

Applicant : FSP Group Inc.
 Manufacturer #1 : Shenzhen Huili Elec. Co., Ltd.
 Manufacturer #2 : Wellex Technology Co., Ltd.
 Manufacturer #3 : Fortron/Source (China) Corp.
 EUT Description : Switching Power Supply
 (A) MODEL NO. : (1)FSP150-50SNV (2)FSP200-50SNV
 (B) SERIAL NO. : N/A
 (C) POWER SUPPLY : 115/230V~, 60/50Hz

Measurement Procedure Used :

FCC RULES AND CISPR 22 (DOCKET NO. 92-152, SEP. 1993) AND
 FCC / ANSI C63.4-1992

The device described above was tested by TAIWAN TOKIN EMC ENG. CORP. to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the CISPR 22 Class B limits both radiated and conducted emissions. The measurement results are contained in this test report and TAIWAN TOKIN EMC ENG. CORP. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliance with the FCC official limits.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Taiwan Tokin EMC Eng. corp.

This report must not be used by the applicant to claim product endorsement by NVLAP or any agency of the U.S. Government.

Date of Test : Jul. 23. 2002

Prepared by : Julie Hsu Aug. 05. 2002
 (Julie Hsu/Assistant Officer)

Test Engineer : Allen Wang Aug. 05 2002
 (Allen Wang/Deputy Manager)

Approve & Authorized Signer : Jackie Deng 8/6/02
 (Jackie Deng/Assistant General Manager)

Name of the Representative of the Responsible Party : _____

Signature : _____

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description	:	Switching Power Supply
Model Number	:	(1)FSP150-50SNV (2)FSP200-50SNV Above models is the same appearance of style expect the watt & rating difference. The M/N FSP200-50SNV is representative selected in the test and included in this report.
Applicant	:	FSP Group Inc. No. 22, Jianguo E. Rd., Taoyuan City, Taiwan, R.O.C.
Manufacturer #1	:	Shenzhen Huili Elec., Co., Ltd. Blk. C, Bldg. 7, County 73, Baoan, Shenzhen, Guangdong, China.
Manufacturer #2	:	Wellex Technology Co., Ltd. Zhenlian Building, County 74, Baoan, Shenzhen, Guangdong, China.
Manufacturer #3	:	Fortron/Source (China) Corp. (1)Unit 25, Zone 37, Baoan County, Shenzhen, China. (2)The 2 nd Industrial Park Mabu Xi Xiang, Baoan District, Shenzhen, Guangdong, China.
M/N FSP150-50SNV		
AC Input	:	115/230V~, 6/3A, 60/50Hz
DC Output	:	150W +3.3V/12.0A, +5V/10.0A, +12V/4.0A +5Vsb/2.0A, -12V/0.3A, -5V/0.2A (Optional)
M/N FSP200-50SNV		
AC Input	:	115/230V~, 6/3A, 60/50Hz
DC Output	:	200W +3.3V/16.7A, +5V/16.0A, +12V/10.0A +5Vsb/2.0A, -12V/0.5A, -5V/0.3A (Optional) (+5V & +3.3V = 118W Max)
Date of Receipt of Sample	:	Jul. 23, 2002
Date of Test	:	Jul. 23, 2002

1.2.5. MODEM #1

Model Number : DM-1414
 Serial Number : 980034385
 FCC ID : IFAXDM1414
 Manufacturer : Accex
 Data Cable : Shielded, Detachable, 1.2m
 Power Adapter : Amigo, M/N AM-91000A
 Non-Shielded, Undetachable, 1.8m

1.2.6. MODEM #2

Model Number : DM-1414
 Serial Number : 980034383
 FCC ID : IFAXDM1414
 Manufacturer : Accex
 Data Cable : Shielded, Detachable, 1.2m
 Power Adapter : Amigo, M/N AM-91000A
 Non-Shielded, Undetachable, 1.8m

1.2.7. PS2 MOUSE

Model Number : M-S48a
 Serial Number : LZE20501538
 FCC ID : JNZ201213
 BSMI ID : 4882A001
 Manufacturer : Logitech (Brand: HP)
 Data Cable : Non-Shielded, Undetachable, 1.8m

1.2.8. USB MOUSE #1

Model Number : CREUBB
 Serial Number : N/A
 FCC ID : NHM-CREUBE
 Manufacturer : CRE Technology Co., Ltd.
 Data Cable : Shielded, Undetachable, 1.8m

1.2.9. USB MOUSE #2

Model Number : CREUBB
 Serial Number : N/A
 FCC ID : NHM-CREUBE
 Manufacturer : CRE Technology Co., Ltd.
 Data Cable : Shielded, Undetachable, 1.8m

1.2.10. MICROPHONE

Model Number : HD-303
 Serial Number : N/A
 Manufacturer : Multimedia Microphone System
 Data Cable : Non-Shielded, Undetachable, 2.2m

1.2.11.WALKMAN

Model Number : RQ-P35LT-K
 Serial Number : HA08473
 Manufacturer : Panasonic
 Data Cable : Non-Shielded, Detachable, 1.8m

1.2.12.EARPHONE #1

Model Number : N/A
 Manufacturer : Panasonic
 Earphone Cable : Non-Shielded, Undetachable, 1.1m

1.2.13.EARPHONE #2

Model Number : N/A
 Manufacturer : Panasonic
 Earphone Cable : Non-Shielded, Undetachable, 1.1m

1.2.14.10/100 Fast Ethernet Switch

Model Number : DES-1005D
 Serial Number : 0212G1A06038
 FCC ID : by DoC
 Manufacturer : D-Link
 Power Adapter : I/P:120Vac,60Hz O/P: DC 7.5V
 Power Cord : Non-Shielded, Undetachable, 1.8m

1.3. Test Facility

Site Description : Jan. 29, 2001 Re-File on
 (No. 5 Open Site) Federal Communication Commission
 Registration Number: 90992

Name of Firm : Taiwan Tokin EMC Eng. Corp.

Site Location : No. 53-11, Tin-Fu Tsun, Lin-Kou,
 Taipei Hsien, Taiwan, R.O.C.

NVLAP Lab Code : 200077-0

1.4. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty (dB)
Conduction Test	150KHz~30MHz	±2.66dB
Radiation Test (Distance: 10m)	30MHz~300MHz	+4.5dB / -4.5dB
	300MHz~1000MHz	+3.88dB / -3.84dB

Remark : Uncertainty = $K\mu c(y)$

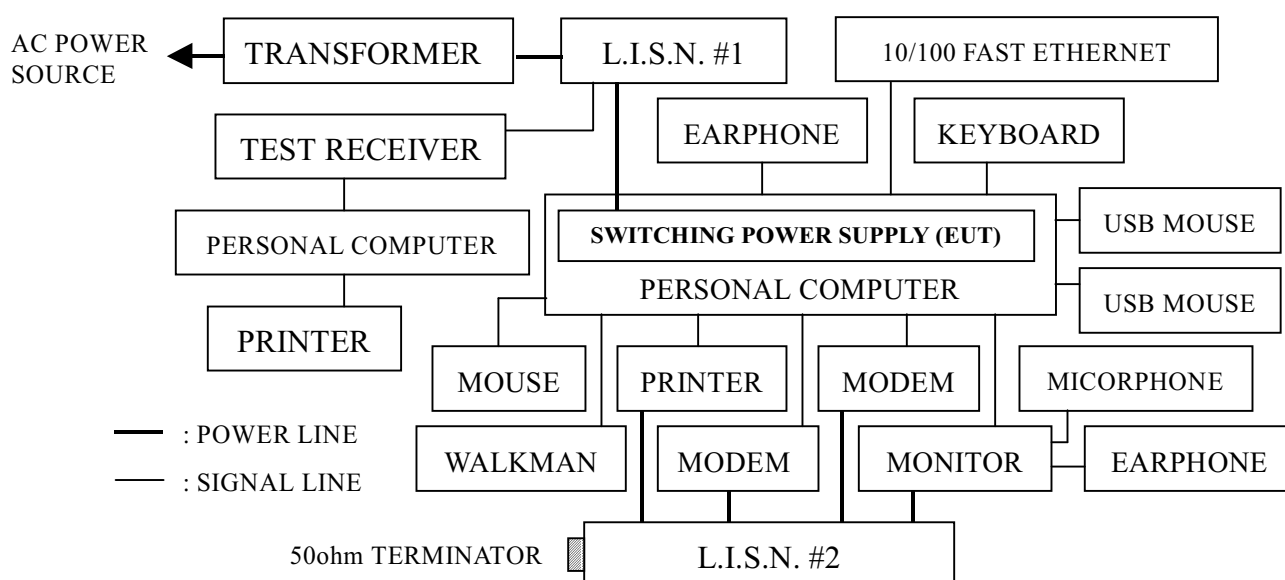
2. POWERLINE CONDUCTED TEST

2.1. Test Equipment

The following test equipments are used during the power line conducted tests :

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESHS10	844591/015	Feb.27, 02'	1 Year
2.	L.I.S.N. # 1	Kyoritsu	KNW-407	8-1430-5	Nov.12, 01'	1 Year
3.	L.I.S.N. # 2	Kyoritsu	KNW-407	8-1430-6	Nov.12, 01'	1 Year

2.2. Block Diagram of Test Setup



2.3. Powerline Conducted Emission Limit (CISPR 22 CLASS B)

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level	Average Level
150KHz ~ 500KHz	66 ~ 56 dB	56 ~ 46 dB
500KHz ~ 5MHz	56 dB	46 dB
5MHz ~ 30MHz	60 dB	50 dB

2.4. EUT's Configuration during Compliance Measurement

The following equipments were installed on RF LINE VOLTAGE measurement to meet the Commission requirement and operating in a manner which tended to maximize its emission characteristics in a normal application.

2.4.1. Switching Power Supply (EUT)

Model Number	:	FSP200-50SNV
Manufacturer #1	:	Shenzhen Huili Elec., Co., Ltd.
Manufacturer #2	:	Wellex Technology Co., Ltd.
Manufacturer #3	:	Fortron/Source (China) Corp.
AC Input	:	115/230V~, 6/3A, 60/50Hz
DC Output	:	200W +3.3V/16.7A, +5V/16.0A, +12V/10.0A +5Vsb/2.0A, -12V/0.5A, -5V/0.3A (Optional) (+5V & +3.3V = 118W Max)

2.4.2. Supporting System : As in Section 1.2

2.5. Operating Condition of EUT

2.5.1. Setup the EUT and simulator as shown on 2.2.

2.5.2. Turned on the power of all equipments.

2.5.3. Personal Computer (EUT inside) read data from disk.

2.5.4. Personal Computer running the self-test program "Hwin" by windows and sent "H" character to monitor, then the screen of monitor displayed and filled with "H" pattern.

2.5.5. Personal Computer read data from floppy disk and then wrote data into floppy disk.

2.5.6. The other peripheral devices were drove and operated in turn during all testing.

2.5.7. Repeat above procedures form 2.5.3. to 2.5.6.

2.6. Test Procedure

The EUT (within PC) was connected to the power mains through a line impedance stabilization network (L.I.S.N. #1). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N. #2). This provided a 50 ohm coupling impedance for the measuring equipment. (Please refer to the block diagram of the test setup and photographs.) Both sides of A.C. 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 FCC ANSI C63.4-1992 on conducted measurement.

The bandwidth of the R&S Test Receiver ESHS10 was set at 10KHz.

The frequency range from 150KHz to 30MHz was checked.

All the test results are listed in Section 2.7.

2.7. Line Conducted RF Voltage Measurement Results

PASSED. Please refer to the following pages.
(All emissions not reported below are too low against the prescribed limits.)

Test Date : Jul. 23, 2002 Temperature : 28°C Humidity : 74%

Test Model : FSP200-50SNV

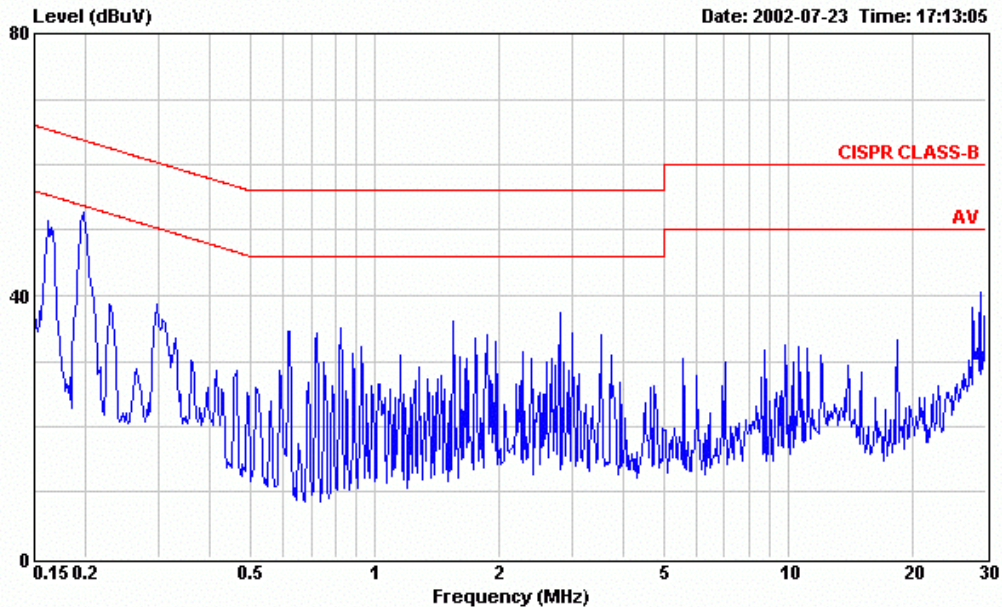
Reference Data # : 4 (5, 6) 1 (2, 3)



TAIWAN TOKIN EMC ENG. CORP.
 台灣東金科技股份有限公司

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 Tel:02-26092133 Fax:02-26099303
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Data#: 4 File#: D:\Fsp-G91699.EMI



Site : No.4 Shielded room
 Condition : CISPR CLASS-B KNW-407 NEUTRAL
 EUT : S.P.S. M/N:FSP200-50SNV
 POWER : 120Vac/60Hz (28°C/74%)
 MEMO : FULL SYSTEM

Data#: 5 File#: D:\Fsp-G91699.EMI

Date: 2002-07-23 Time: 17:14:58

Site : No.4 Shielded room
 Condition : CISPR CLASS-B KNW-407 NEUTRAL
 EUT : S.P.S. M/N:FSP200-50SNV
 POWER : 120Vac/60Hz (28°C/74%)
 MEMO : FULL SYSTEM

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.164	48.69	-16.55	65.24	48.22	0.27	0.20	QP
2	0.195	48.37	-15.45	63.82	47.96	0.21	0.20	QP
3	0.297	35.39	-24.92	60.31	35.05	0.14	0.20	QP
4	0.622	34.42	-21.58	56.00	34.12	0.10	0.20	QP
5	2.795	35.77	-20.23	56.00	35.27	0.10	0.40	QP
6	27.868	26.17	-33.83	60.00	25.01	0.46	0.70	QP

Data#: 6 File#: D:\Fsp-G91699.EMI

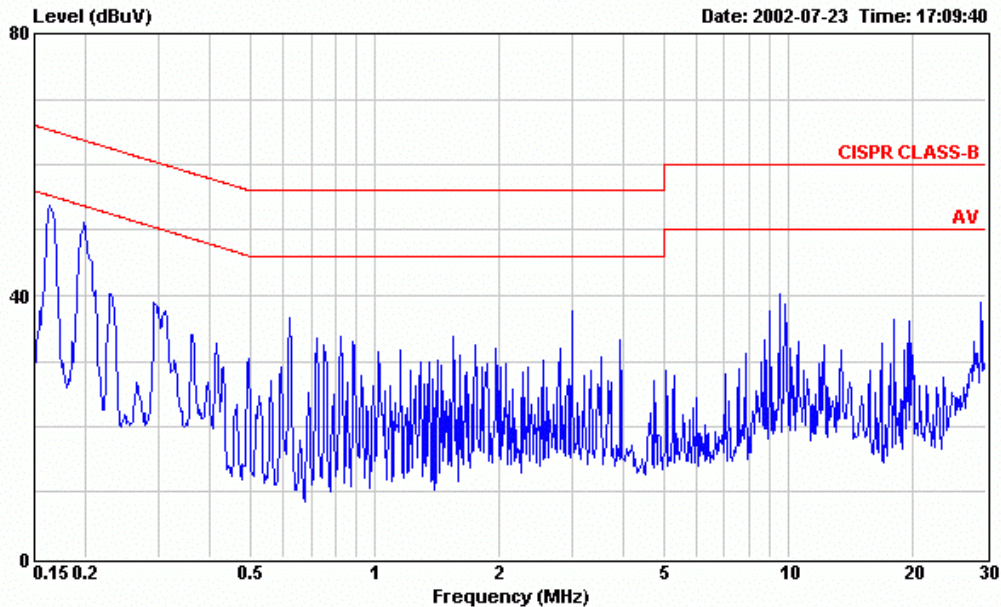
	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.164	41.28	-13.96	55.24	40.81	0.27	0.20	Average
2	0.195	34.31	-19.51	53.82	33.90	0.21	0.20	Average
3	0.297	27.92	-22.39	50.31	27.58	0.14	0.20	Average
4	0.622	32.27	-13.73	46.00	31.97	0.10	0.20	Average
5	2.795	30.08	-15.92	46.00	29.58	0.10	0.40	Average
6	27.868	20.78	-29.22	50.00	19.62	0.46	0.70	Average



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Data#: 1 File#: D:\Fsp-G91699.EMI



Site : No.4 Shielded room
 Condition : CISPR CLASS-B KMW-407 LINE
 EUT : S.P.S. M/N:FSP200-50SNV
 POWER : 120Vac/60Hz (28°C/74%)
 MEMO : FULL SYSTEM

Data#: 2 File#: D:\Fsp-G91699.EMI

Date: 2002-07-23 Time: 17:12:30

Site : No.4 Shielded room
 Condition : CISPR CLASS-B KMW-407 LINE
 EUT : S.P.S. M/N:FSP200-50SNV
 POWER : 120Vac/60Hz (28°C/74%)
 MEMO : FULL SYSTEM

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.164	52.04	-13.23	65.27	51.57	0.27	0.20	QP
2	0.195	47.32	-16.49	63.81	46.91	0.21	0.20	QP
3	0.296	37.25	-23.11	60.36	36.91	0.14	0.20	QP
4	0.496	28.36	-27.70	56.06	28.06	0.10	0.20	QP
5	3.000	35.29	-20.71	56.00	34.79	0.10	0.40	QP
6	9.525	30.05	-29.95	60.00	29.35	0.10	0.60	QP

Data#: 3 File#: D:\Fsp-G91699.EMI

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.164	44.46	-10.81	55.27	43.99	0.27	0.20	Average
2	0.195	26.40	-27.41	53.81	25.99	0.21	0.20	Average
3	0.296	32.14	-18.22	50.36	31.80	0.14	0.20	Average
4	0.496	27.10	-18.96	46.06	26.80	0.10	0.20	Average
5	3.000	30.48	-15.52	46.00	29.98	0.10	0.40	Average
6	9.525	16.66	-33.34	50.00	15.96	0.10	0.60	Average

3. RADIATED EMISSION TEST

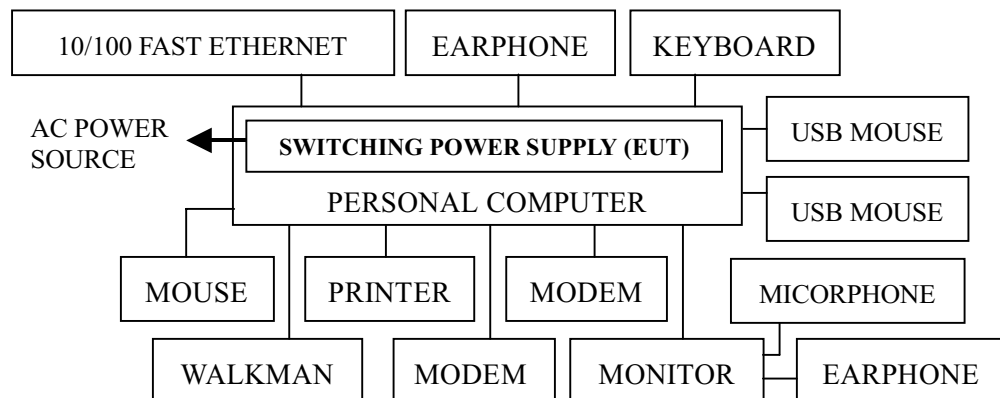
3.1. Test Equipment

The following test equipments are used during the radiated emission tests :

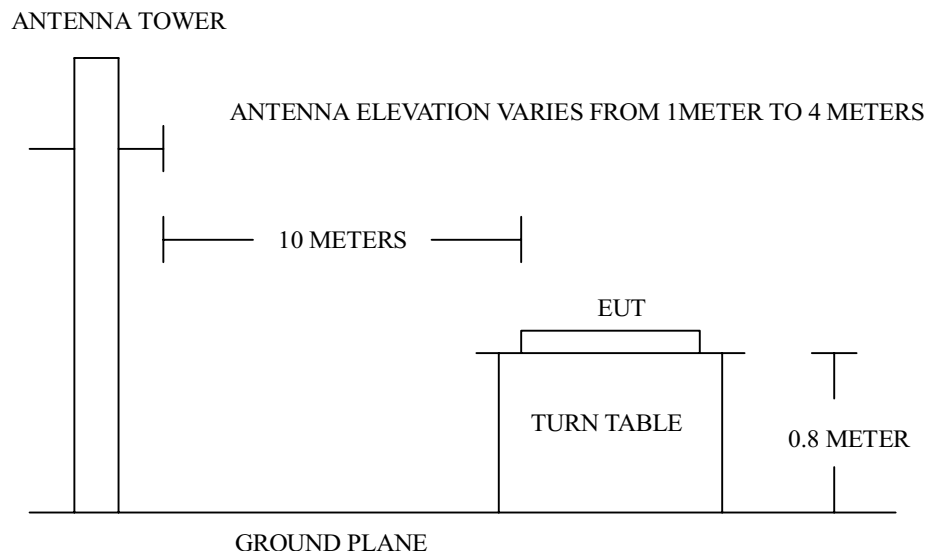
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	HP	8595E	3829A03778	Aug.17, 01'	1 Year
2.	Test Receiver	Rohde & Schwarz	ESVS10	849231/017	Dec.20, 01'	1 Year
3.	Amplifier	HP	8447D	2944A07185	N/A	N/A
4.	Broadband Antenna	Chase	VBA6106A	1227	Nov.27, 01'	1 Year
5.	Log Periodic Antenna	Chase	UPA6109	1061	Nov.27, 01'	1 Year

3.2. Block Diagram of Test Setup

3.2.1. Block Diagram of connection between EUT and simulators



3.2.2. Open Field Test Site Setup Diagram



3.3. Radiation Limit

All emanations from a 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 (dBuV/m)
30 ~ 230	10	30
230 ~ 1000	10	37

- Note :
- (1) The tighter limit shall apply at the edge between two frequency bands.
 - (2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the E.U.T..

3.4. EUT's Configuration during Compliance Measurement

The configuration of EUT and its simulators were the same as those used in conducted measurement. Please refer to 2.4.

3.5. Operating Condition of EUT

Same as conducted measurement which was listed in 2.5. except the test set up replaced by section 3.2.

3.6. Test Procedure

The EUT (within PC) and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 10 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated biconical and log periodical antenna) and dipole antenna are used as receiving antenna. Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4-1992 on radiated measurement.

The bandwidth of the R&S Test Receiver ESVS10 was set at 120KHz.

The frequency range from 30MHz to 1000MHz is checked.

All the test results are listed in section 3.8.

3.7. Test Results

PASSED. Please refer to the following pages.

3.8. Radiated Emission Measurement Results

All emissions not reported below are too low against the prescribed limits.

Date of Test : Jul. 23, 2002 Temperature : 26°C
 EUT : Switching Power Supply Humidity : 55%
 Test Model : FSP200-50SNV

Frequency MHz	Antenna		Cable		Meter Reading	Emission Level	
	Factor dB/m	Loss dB	Loss dB	Horizontal dBuV	Horizontal dBuV/m	Limits dBuV/m	Margin dB
51.452	14.57	1.45		2.60	18.62	30.00	11.38
110.601	18.58	2.24		- 0.53	20.29	30.00	9.71
139.212	20.11	2.54		- 1.70	20.95	30.00	9.05
167.873	20.97	2.80		- 2.30	21.47	30.00	8.53
196.496	21.70	3.05		- 2.38	22.37	30.00	7.63
* 225.158	22.02	3.28		- 2.56	22.74	30.00	7.26
253.806	22.65	3.47		- 0.61	25.51	37.00	11.49
325.387	15.02	4.02		3.95	22.99	37.00	14.01
397.002	16.79	4.54		0.67	22.00	37.00	15.00
468.554	18.33	4.94		- 0.80	22.47	37.00	14.53
540.195	19.35	5.32		- 0.88	23.79	37.00	13.21
611.747	20.53	5.68		- 1.02	25.19	37.00	11.81
683.363	22.09	6.08		- 1.40	26.77	37.00	10.23

- Remark :
1. All reading are Quasi-Peak values.
 2. The worst emission is detected at 225.158MHz with corrected signal level of 22.74dBuV/m (limit is 30dBuV/m) when the antenna is at horizontal polarization and is at 4m high and the turn table is at 225° .
 3. 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

Date of Test : Jul. 23, 2002 Temperature : 26°C

EUT : Switching Power Supply Humidity : 55%

Test Model : FSP200-50SNV

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading		Emission Level		Margin dB
			Vertical dBuV	Vertical dBuV/m	Limits dBuV/m		
51.361	15.94	1.45	4.78	22.17	30.00	7.83	
64.612	13.32	1.66	2.99	17.97	30.00	12.03	
* 110.550	16.74	2.24	3.39	22.37	30.00	7.63	
139.224	20.44	2.54	- 1.07	21.91	30.00	8.09	
167.835	21.90	2.80	- 2.33	22.37	30.00	7.63	
196.496	21.19	3.05	- 2.38	21.86	30.00	8.14	
225.158	21.11	3.28	- 2.48	21.91	30.00	8.09	
253.832	23.15	3.47	- 0.61	26.01	37.00	10.99	
325.362	15.43	4.02	3.72	23.17	37.00	13.83	
396.977	17.51	4.54	0.74	22.79	37.00	14.21	
468.592	19.05	4.94	- 0.78	23.21	37.00	13.79	
540.157	19.06	5.32	- 1.00	23.38	37.00	13.62	
611.773	20.58	5.68	- 1.13	25.13	37.00	11.87	
683.337	22.56	6.08	- 1.29	27.35	37.00	9.65	

- Remark :
1. All reading are Quasi-Peak values.
 2. The worst emission is detected at 110.550MHz with corrected signal level of 22.37dBuV/m (limit is 30dBuV/m) when the antenna is at vertical polarization and is at 1m high and the turn table is at 105° .
 3. 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

4. DEVIATION TO TEST SPECIFICATIONS

【NONE】

5. PHOTOGRAPHS

5.1. Photos of Powerline Conducted Measurement



FRONT VIEW OF CONDUCTED TEST



BACK VIEW OF CONDUCTED TEST

5.2. Photos of Radiated Measurement at Open Field Test Site



FRONT VIEW OF RADIATED TEST



BACK VIEW OF RADIATED TEST



SETUP WITH MAXIMUM DETECTED EMISSION AT HORIZONTAL POLARIZATION



SETUP WITH MAXIMUM DETECTED EMISSION AT VERTICAL POLARIZATION

APPENDIX I (Photos of EUT)

Total Page : 6

Figure 1
General Appearance (Front View)



Figure 2
General Appearance (Rear View)



Figure 3
General Appearance (Label)



Figure 4
Open the Top Cover (Internal View)

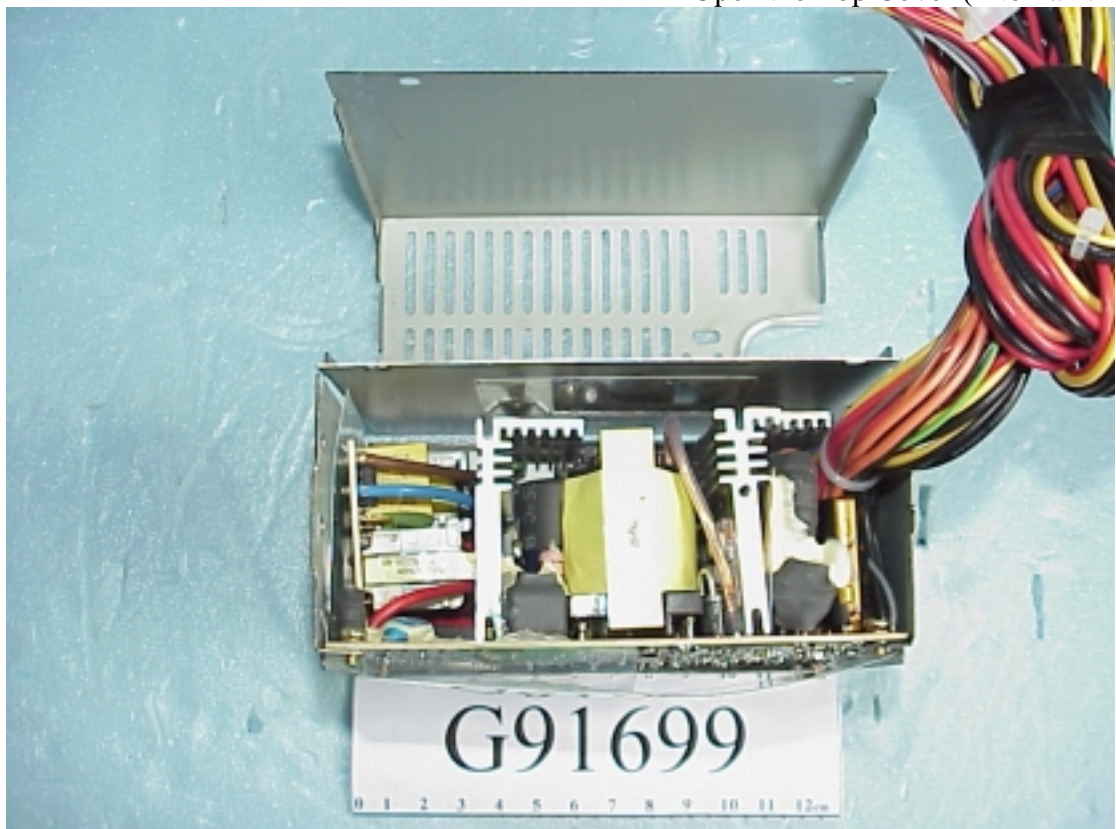


Figure 5
Internal View (Main Board I/Component Side)



Figure 6
Internal View (Main Board I/Foil Side)



Figure 7
Internal View (Main Board II/Component Side)



Figure 8
Internal View (Main Board II/Foil Side)

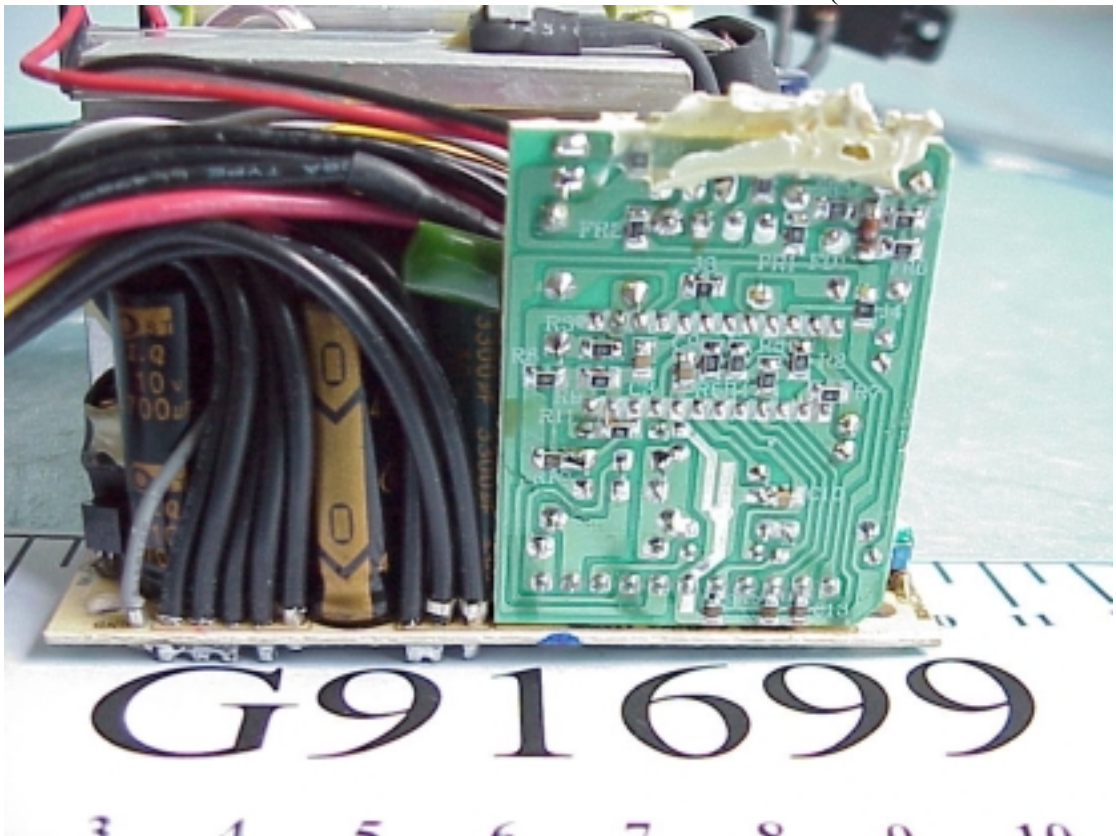


Figure 9
Internal View (Filter Board/Component Side)

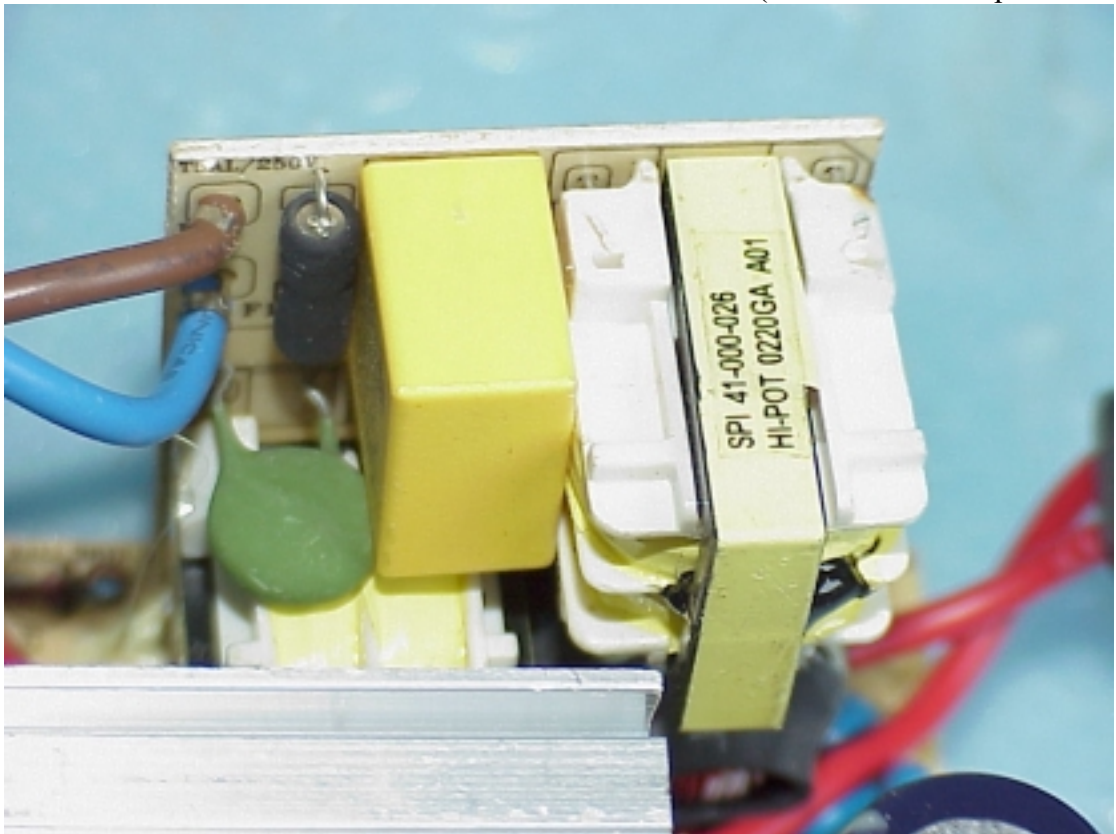


Figure 10
Internal View (Filter Board/Foil Side)

