

# FCC PART 15B

## MEASUREMENT AND TEST REPORT

### FOR

## FULL RIVER (HONGKONG) LIMITED

Room 0708, QiuRui Building, MinKang Rd., MinZhi DaDao, LongHua Town,  
BaoAn District, ShenZhen, China

**FCC ID: VTIS24PED**

<b>Report Concerns:</b> Original Report	<b>Equipment Type:</b> 24 Port Fast Ethernet PoE Switch
<b>Model:</b>	<u>SW1024P</u>
<b>Report No.:</b>	<u>STR10118120I</u>
<b>Test Date:</b>	<u>2010-11-11 to 2010-12-25</u>
<b>Issue Date:</b>	<u>2011-01-07</u>
<b>Tested By:</b>	<u>Breeze Jiang / Engineer</u> <i>Breeze Jiang</i>
<b>Reviewed By:</b>	<u>Lahm Peng / EMC Manager</u> <i>Lahm peng</i>
<b>Approved &amp; Authorized By:</b>	<u>Jandy so / PSQ Manager</u> <i>Jandyso</i>
<b>Prepared By:</b>	<b>SEM.Test Compliance Service Co., Ltd</b> 3/F, Jinbao Commerce Building, Xin'an Fanshen Road, Bao'an District, Shenzhen, P.R.C. (518101) Tel.: +86-755-33663308 Fax.: +86-755-33663309 Website: www.semtest.com.cn

Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by SEM.Test Compliance Service Co., Ltd.

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## 1. GENERAL INFORMATION

### 1.1 Product Description for Equipment Under Test (EUT)

#### Client Information

Applicant: FULL RIVER (HONGKONG) LIMITED  
Address of applicant: Room 0708, QiuRui Building, MinKang Rd., MinZhi DaDao, LongHua Town, BaoAn District, ShenZhen, China

Manufacturer: FULL RIVER (HONGKONG) LIMITED  
Address of manufacturer: FullRiver Industrial Ceramics Estate Garden Area LiLing City HuNan Province China

#### General Description of E.U.T

Items	Description
EUT Description:	24 Port Fast Ethernet PoE Switch
Trade Name:	FullRiver
Model No.:	SW1024P, POEFE24T
Rated Voltage:	AC 100-240V
Rated Current:	/
Packaging Size:	44.2X20.7X4.3 cm
For more information refer to the circuit diagram form and the user's manual.	

*The test data is gathered from a production sample, provided by the manufacturer. The other model listed in the report has different appearance only of SW1024P without circuit and electronic construction changed, declared by the manufacturer.*

### 1.2 Test Standards

The following report is prepared on behalf of the FULL RIVER (HONGKONG) LIMITED in accordance with Part 2, Subpart J, and Part 15, Subparts A and B of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15.107, and 15.109 rules.

**Maintenance of compliance** is the responsibility of the manufacturer. Any modification of the product, which results in lowering the emission/immunity, should be checked to ensure compliance has been maintained.

### 1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

The equipment under test (EUT) was configured to measure its highest possible susceptibility against the tested phenomena. The test modes were adapted accordingly in reference to the Operating Instructions.

## 1.4 Test Facility

- **FCC – Registration No.: 994117**

SEM.Test Compliance Services Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files and the Registration is 994117.

- **Industry Canada (IC) Registration No.: 7673A**

The 3m Semi-anechoic chamber of SEM.Test Compliance Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 7673A.

- **CNAS Registration No.: L4062**

Shenzhen SEM.Test Electronics Service Co., Ltd. is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L4062. All measurement facilities used to collect the measurement data are located at 3/F, Jinbao Commerce Building, Xin'an Fanshen Road, Bao'an District, Shenzhen, P.R.C (518101)

## 1.5 EUT Exercise Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the system components. The test software, provided by the customer, is started while the EUT is on to simulate the normal work. under the Windows XP terminal.

## 1.6 Accessories Equipment List and Details

Description	Manufacturer	Model	Serial Number
Notebook	ASUS	X50R	N/A

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
Network Cable	1	Unshielded	Without Core

## 1.7 EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
AC Cable	1.5	Unshielded	Without Core

## 2. SUMMARY OF TEST RESULTS

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Description of Test	Result
§15.107 (a) Conducted Emission	Compliant
§15.109 (a) Radiated Emission	Compliant

### 3. §15.107 (a)- CONDUCTED EMISSION

#### 3.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is  $\pm 2.88$  dB.

#### 3.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2010-08-12	2011-08-11
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2010-08-12	2011-08-11
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2010-08-12	2011-08-11

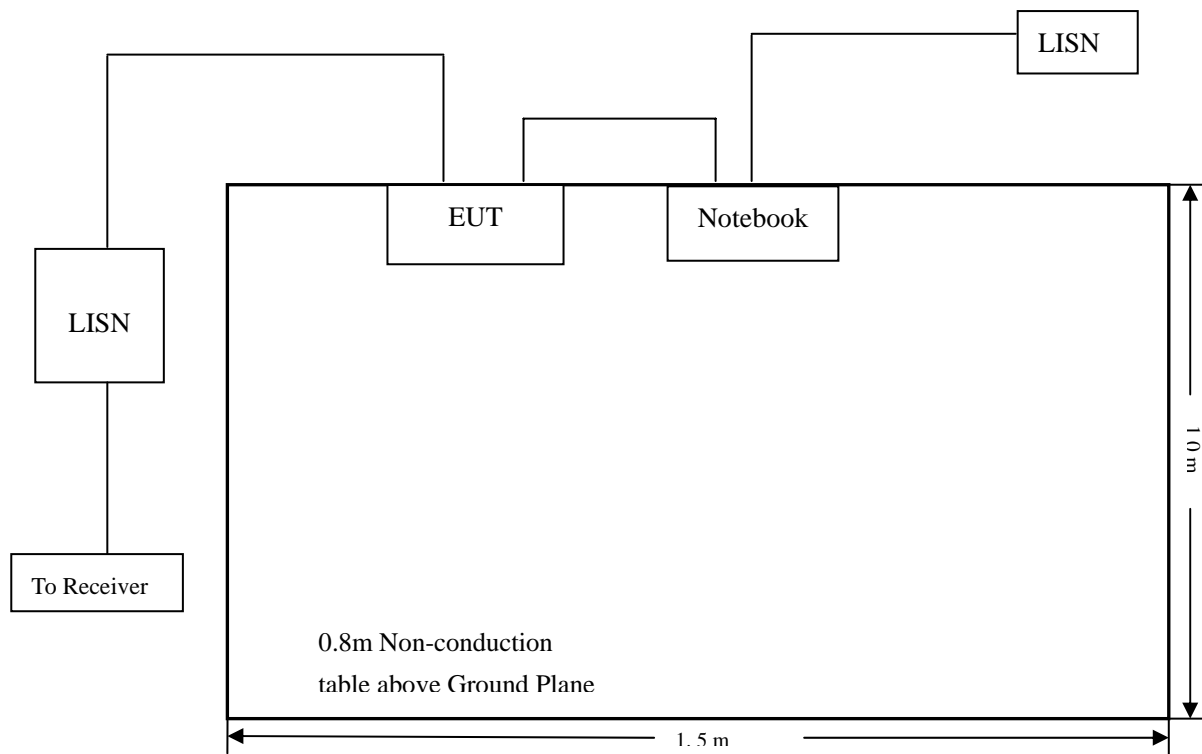
#### 3.3 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.107 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

#### 3.4 Basic Test Setup Block Diagram



3.5 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

3.6 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency ..... 150 kHz  
Stop Frequency..... 30 MHz  
Sweep Speed ..... Auto  
IF Bandwidth..... 10 kHz  
Quasi-Peak Adapter Bandwidth ..... 9 kHz  
Quasi-Peak Adapter Mode ..... Normal

3.7 Summary of Test Results/Plots

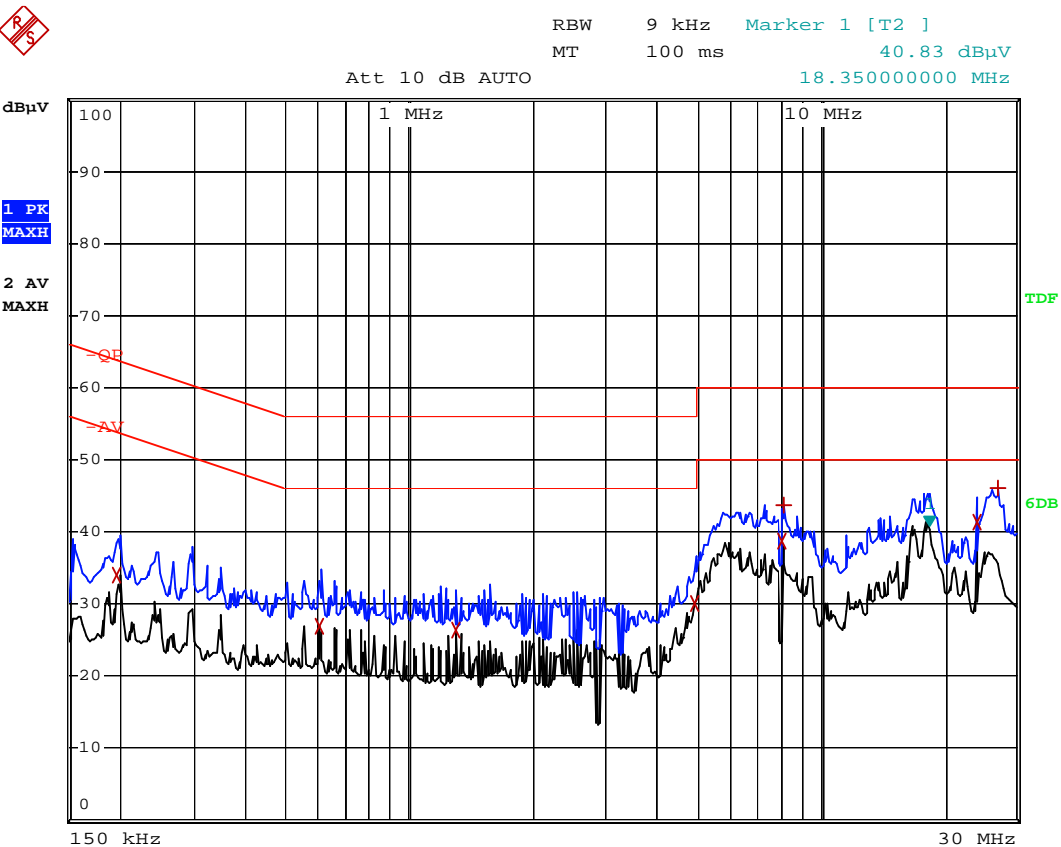
According to the data in section 3.8, the EUT complied with the FCC 15B Conducted margin for a Class B device, with the *worst* margin reading of:

**-2.32 dBµV at 18.534 MHz in the Neutral mode, Average detector, 0.15-30MHz**

3.8 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

Conducted Disturbance  
EUT: 24 Port Fast Ethernet PoE Switch  
M/N: SW1024P  
Operating Condition: Running  
Test Specification: N  
Comment: AC 120V/60Hz

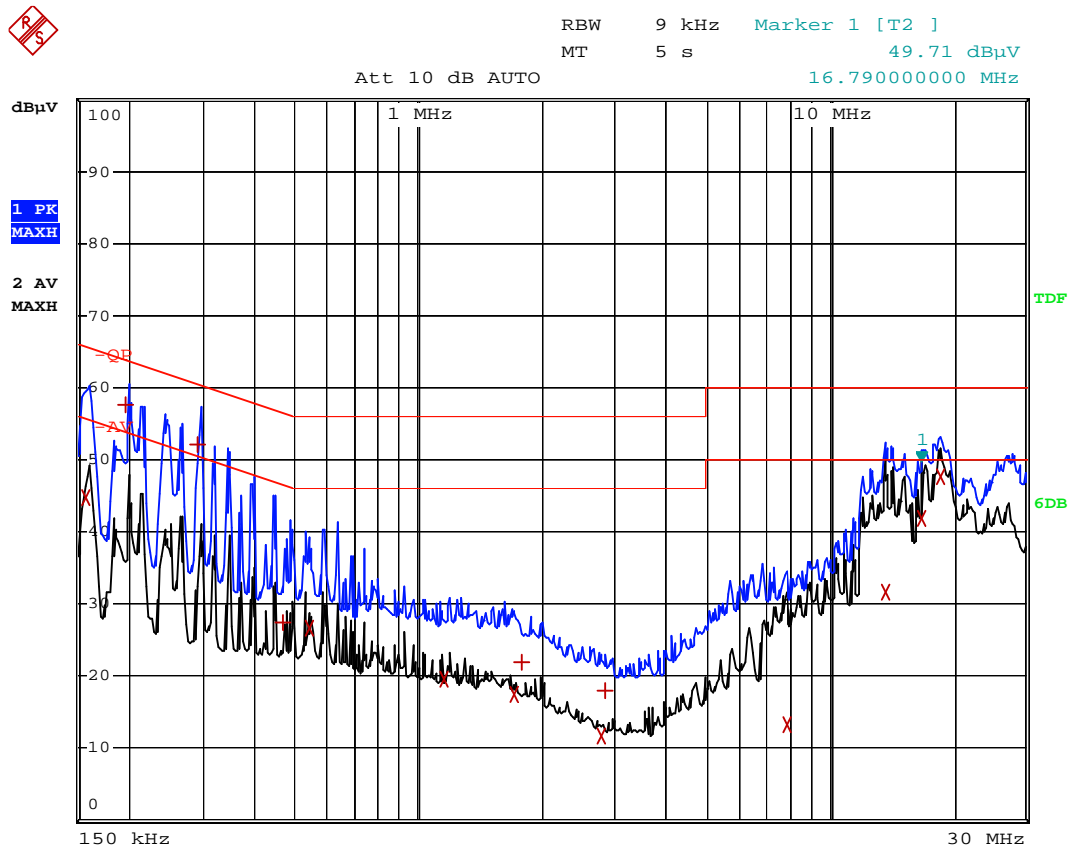


EDIT PEAK LIST (Prescan Results)			
Trace1:	-QP		
Trace2:	-AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2 Average	198 kHz	33.90	-19.79
2 Average	606 kHz	26.98	-19.01
2 Average	1.294 MHz	26.30	-19.69
2 Average	4.926 MHz	30.03	-15.96
2 Average	8.078 MHz	38.59	-11.40
1 Max Peak	8.13 MHz	43.71	-16.28
2 Average	24.094 MHz	41.36	-8.63
1 Max Peak	26.87 MHz	46.12	-13.87



Plot of Conducted Emissions Test Data

Conducted Disturbance  
EUT: 24 Port Fast Ethernet PoE Switch  
M/N: SW1024P  
Operating Condition: Running  
Test Specification: L  
Comment: AC 120V/60Hz



EDIT PEAK LIST (Final Measurement Results)				
Trace1:	-QP			
Trace2:	-AV			
Trace3:	---			
TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB	
2 Average	158 kHz	44.68	-10.88	
1 Quasi Peak	198 kHz	57.64	-6.04	
1 Quasi Peak	294 kHz	52.10	-8.30	
1 Quasi Peak	466 kHz	27.52	-29.05	
2 Average	542 kHz	26.71	-19.28	
2 Average	1.162 MHz	19.66	-26.33	
2 Average	1.706 MHz	17.44	-28.55	
1 Quasi Peak	1.782 MHz	21.93	-34.06	
2 Average	2.79 MHz	11.63	-34.36	
1 Quasi Peak	2.85 MHz	18.05	-37.94	
2 Average	7.854 MHz	13.16	-36.83	
2 Average	13.75 MHz	31.71	-18.29	
2 Average	16.79 MHz	41.81	-8.18	
2 Average	18.534 MHz	47.67	-2.32	

## 4. §15.109(a)- RADIATED EMISSION

### 4.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any radiation emissions measurement is  $\pm 5.10$  dB.

### 4.2 Test Equipment List and Details

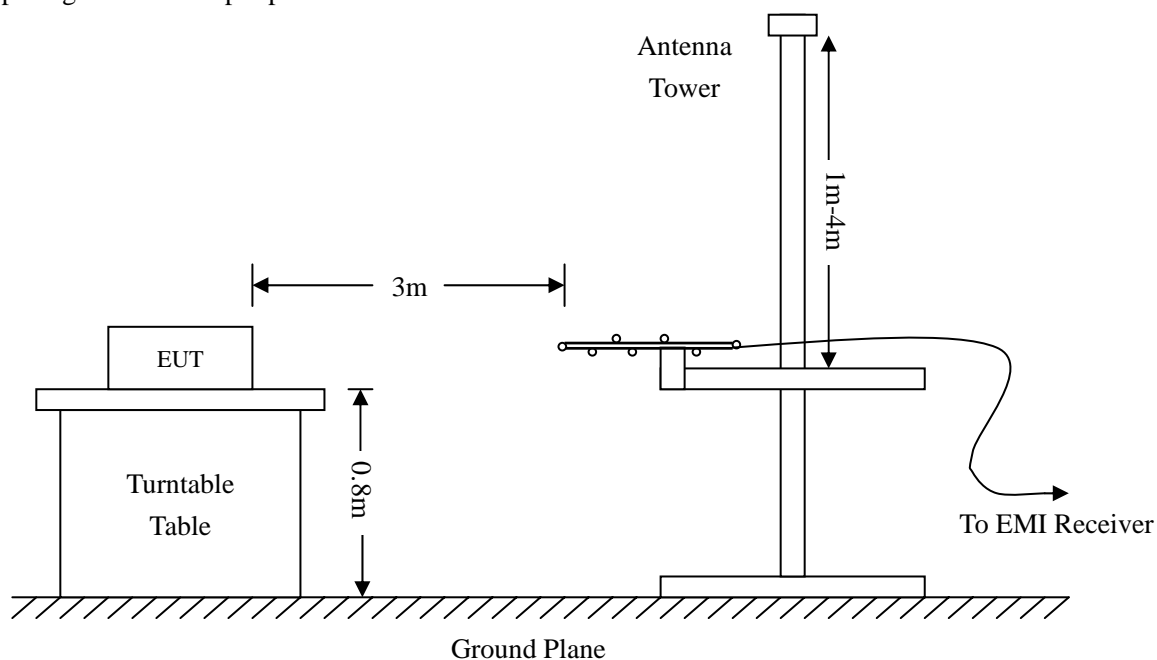
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2010-04-16	2011-04-15
EMI Test Receiver	R&S	ESVB	825471/005	2010-08-12	2011-08-11
Positioning Controller	C&C	CC-C-1F	N/A	2010-08-12	2011-08-11
RF Switch	EM	EMSW18	SW060023	2010-08-12	2011-08-11
Pre-amplifier	Agilent	8447F	3113A06717	2010-08-12	2011-08-11
Pre-amplifier	Compliance Direction	PAP-0118	24002	2010-08-12	2011-08-11
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2010-07-21	2011-07-20
Horn Antenna	ETS	3117	00086197	2010-07-21	2011-07-20

### 4.3 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.205 and FCC Part 15.109 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.



#### 4.4 Test Receiver Setup

During the radiated emission test, the test receiver was set with the following configurations:

Start Frequency ..... 30 MHz  
 Stop Frequency..... 1000 MHz  
 Sweep Speed ..... Auto  
 IF Bandwidth..... 100 kHz  
 Quasi-Peak Adapter Bandwidth ..... 120 kHz  
 Quasi-Peak Adapter Mode ..... Normal

#### 4.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} - \text{Corr. Factor}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB $\mu$ V means the emission is 6dB $\mu$ V below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15B Limit}$$

#### 4.6 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

#### 4.7 Summary of Test Results/Plots

According to the data, the EUT complied with the FCC 15B Class B standards, and had the worst margin of:

**-2.99 dB $\mu$ V at 81.2117MHz in the Vertical polarization, 30 MHz to 1 GHz, 3Meters**

Plot of Radiation Emissions Test Data

Radiated Disturbance

EUT: 24 Port Fast Ethernet PoE Switch

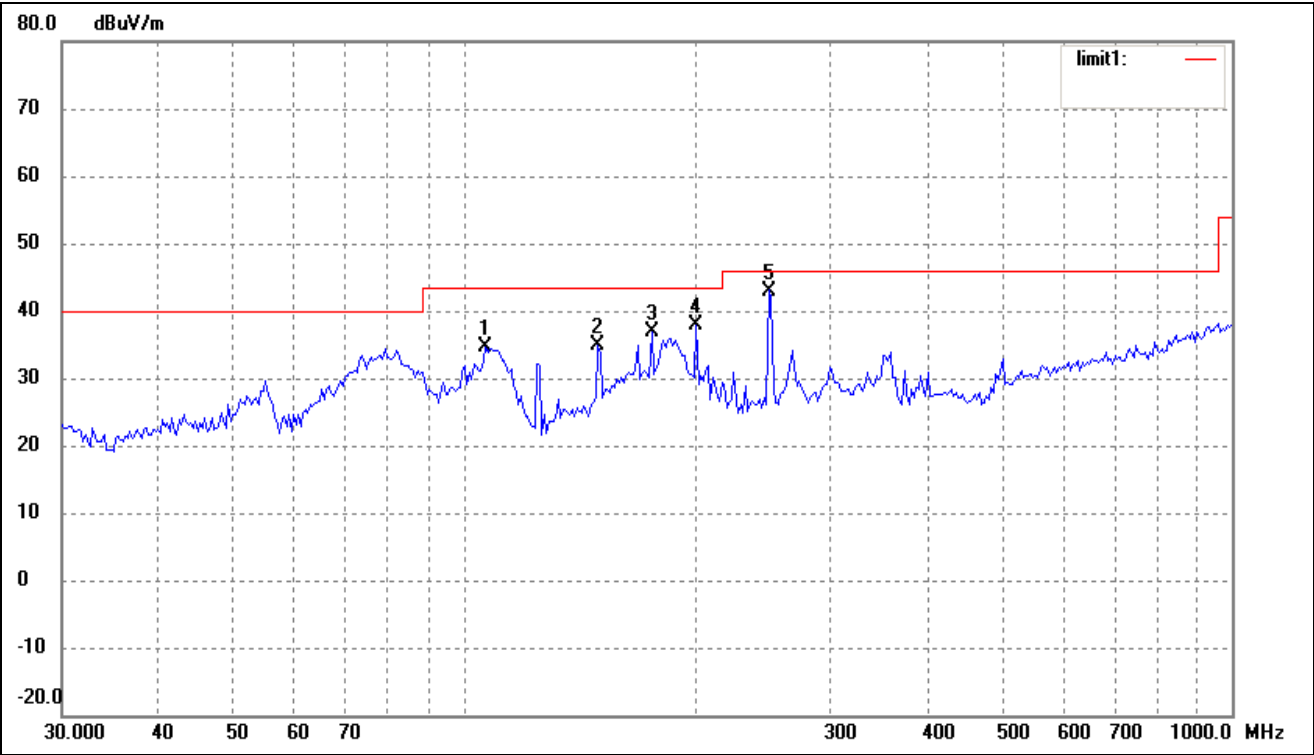
M/N: SW1024P

Operating Condition: Running

Test Specification: Horizontal & Vertical

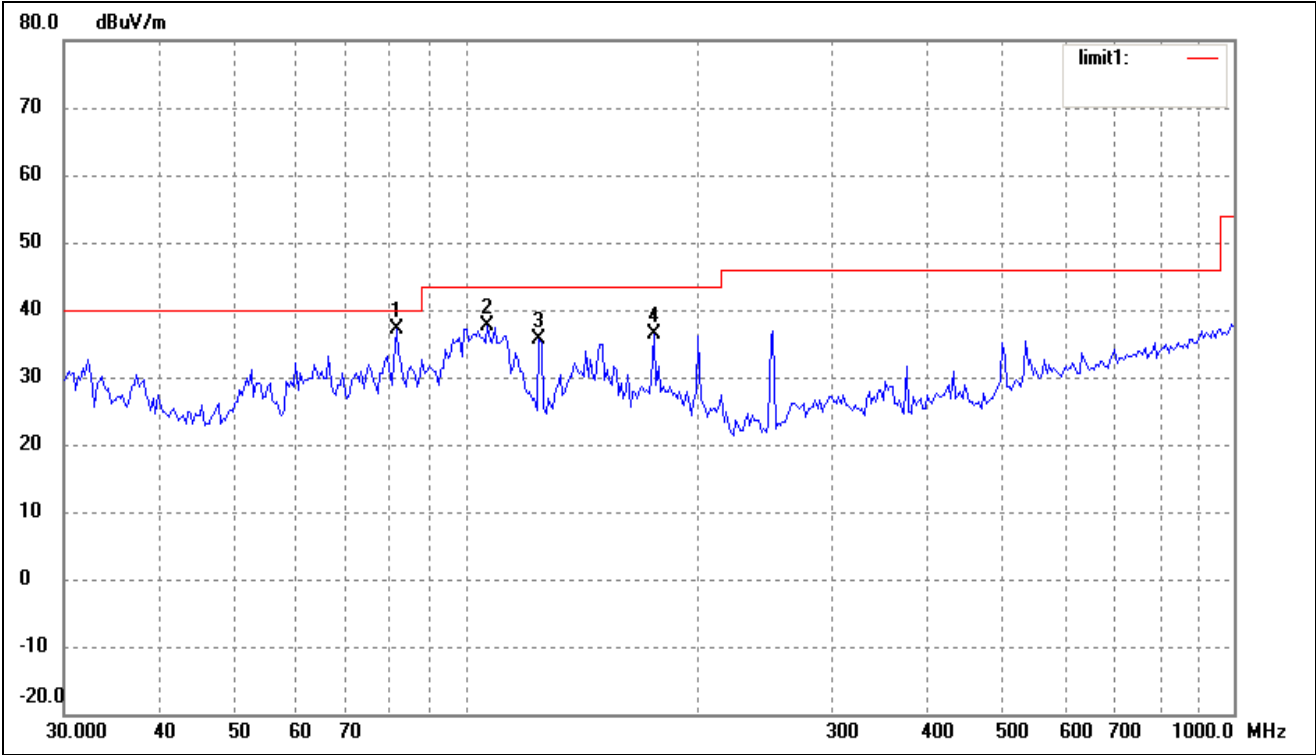
Comment: AC 120V/60Hz

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	106.7587	26.73	7.86	34.59	43.50	-8.91	360	100	peak
2	149.4857	30.68	4.08	34.76	43.50	-8.74	360	100	peak
3	175.6516	31.44	5.32	36.76	43.50	-6.74	360	100	peak
4	200.6881	31.29	6.60	37.89	43.50	-5.61	360	100	peak
5	249.4250	34.32	8.68	43.00	46.00	-3.00	360	100	peak

Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	81.2117	32.94	4.07	37.01	40.00	-2.99	360	100	peak
2	106.7587	29.73	7.86	37.59	43.50	-5.91	360	100	peak
3	124.5690	30.20	5.32	35.52	43.50	-7.98	360	100	peak
4	175.6516	31.14	5.32	36.46	43.50	-7.04	360	100	peak

\*\*\*\*\* END OF REPORT \*\*\*\*\*