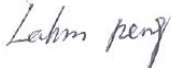

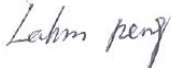

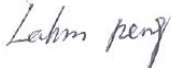



FCC Part 15.109
Measurement and Test Report
For
HANTECH CORPORATION

500 Cochrane Drive Unit 1, Markham, Ont. L3R 8E2, Canada

FCC ID: V5ZWG100R

Report Concerns: Original Report	Equipment Type: ENZO Wireless Network Router														
<table style="width: 100%;"><tr><td style="width: 40%;">Model:</td><td><u>WG-100R</u></td></tr><tr><td>Report No.:</td><td><u>STR08068114E-3</u></td></tr><tr><td>Test/Witness Engineer:</td><td><u>Lahm Peng</u> </td></tr><tr><td>Test Date:</td><td><u>2008-06-19 to 2008-06-27</u></td></tr><tr><td>Issued Date:</td><td><u>2008-06-28</u></td></tr><tr><td>Prepared By:</td><td><div style="text-align: center;">SEM.Test Compliance Service Co., Ltd 3/F, Jinbao Commerce Building, Xin'an Fanshen Road, Bao'an District, Shenzhen, P.R.C. (518101)</div></td></tr><tr><td>Approved & Authorized By:</td><td><div style="text-align: center;"> _____ Jandy So / PSQ Manager</div></td></tr></table>		Model:	<u>WG-100R</u>	Report No.:	<u>STR08068114E-3</u>	Test/Witness Engineer:	<u>Lahm Peng</u> 	Test Date:	<u>2008-06-19 to 2008-06-27</u>	Issued Date:	<u>2008-06-28</u>	Prepared By:	<div style="text-align: center;">SEM.Test Compliance Service Co., Ltd 3/F, Jinbao Commerce Building, Xin'an Fanshen Road, Bao'an District, Shenzhen, P.R.C. (518101)</div>	Approved & Authorized By:	<div style="text-align: center;"> _____ Jandy So / PSQ Manager</div>
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Approved & Authorized By:	<div style="text-align: center;"> _____ Jandy So / PSQ Manager</div>														

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: HANTECH CORPORATION
Address of applicant: 500 Cochrane Drive Unit 1, Markham, Ont. L3R 8E2, Canada

Manufacturer: ZIONCOM (SHENZHEN) TECHNOLOGY LTD
Address of manufacturer: Lantian Technology Park, Xinyu Road, Xinqiao henggang Block, Shajing Street, Baoan District, Shenzhen City, China

General Description of E.U.T

Items	Description
EUT Description:	ENZO Wireless Network Router
Trade Name:	/
Model No.:	WG-100R
Rated Voltage:	DC 9V Adapter
Max. Output Power	< 18dBm
Antenna gain:	2dBi
Frequency range:	2412-2462MHz
Number of channels:	11
Size:	5MHz
Channel Separation:	Unique Antenna
Type of Antenna:	17.0x10.7x3.0cm

Note: The test data gathered are from a production sample, it is provided by the manufacturer.

1.2 Test Standards

The following report is prepared on behalf of the HANTECH CORPORATION in accordance with FCC Part 15.107 and 15.109 of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15.107 and 15.109 of the Federal Communication Commissions rules.

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

1.3 Related Submittal(s)/Grant(s)

No Related Submittal(s).

1.4 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 emission level. The test modes were adapted in reference to the Operating Instructions.

1.5 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.: 5169.

Measurement required was performed at laboratory of SEM.Test Compliance Service Co., Ltd. at 3/F, Jinbao Commerce Building, Xin'an Fanshen Road, Bao'an District, Shenzhen, P.R.C. (518101).

Tel: +86 755 3366 3308 Fax: +86 755 3366 3309

1.6 EUT Exercise Software

The EUT exercise program used during the testing was designed to exercise the system components.

1.7 Accessories Equipment List and Details

Manufacturer	Description	Model	Serial Number
IBM	Notebook	T22	LV14893
TP-LINK	Modem	TM-EC5658V	KT99CTQC-508
Lenovo	Printer	3110	OD65133711480

1.8 EUT Cable List and Details

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

2. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§ 15.107	Conducted Emission	Compliant
§ 15.109	Radiated Emission	Compliant

3. CONDUCTED EMISSIONS

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 ± 0.5 dB.

3.2 Test Equipment List and Details

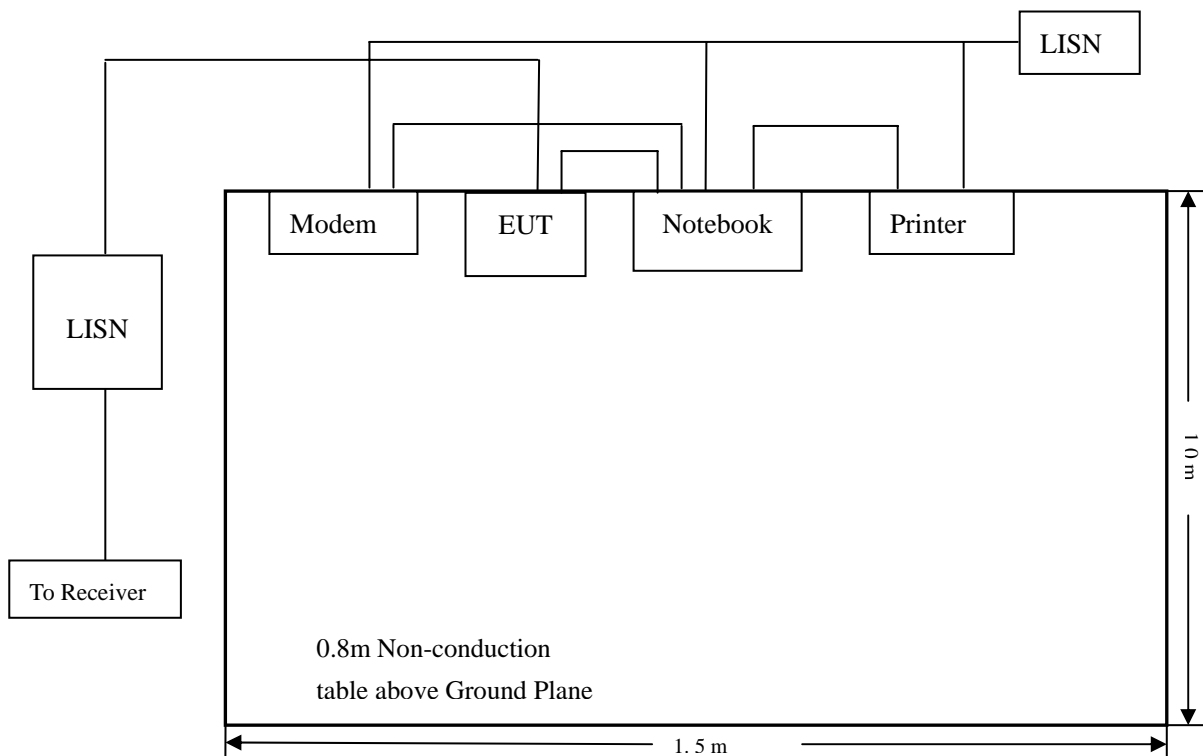
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2008-01-25	2009-01-24
Puls Limiter	Rohde & Schwarz	ESH3-Z2	100911	2008-01-25	2009-01-24
L.I.S.N.	SCHWARZBECK	NSLK812 6	8126-224	2008-01-25	2009-01-24
L.I.S.N.	EMCO	3825/2	11967C	2008-01-25	2009-01-24

Statement of Traceability: All calibrations have been performed per the NVLAP requirements traceable to the NIST.

3.3 Test Procedure

Test is conducting under the description of 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.

3.4 Basic Test Setup Block Diagram



3.5 Environmental Conditions

Temperature:	20° C
Relative Humidity:	52%
ATM Pressure:	1011 mbar

3.6 Summary of Test Results/Plots

According to the data in section 3.7, the EUT complied with the FCC 15.107 Conducted margin for a Class B device, with the *worst* margin reading of:

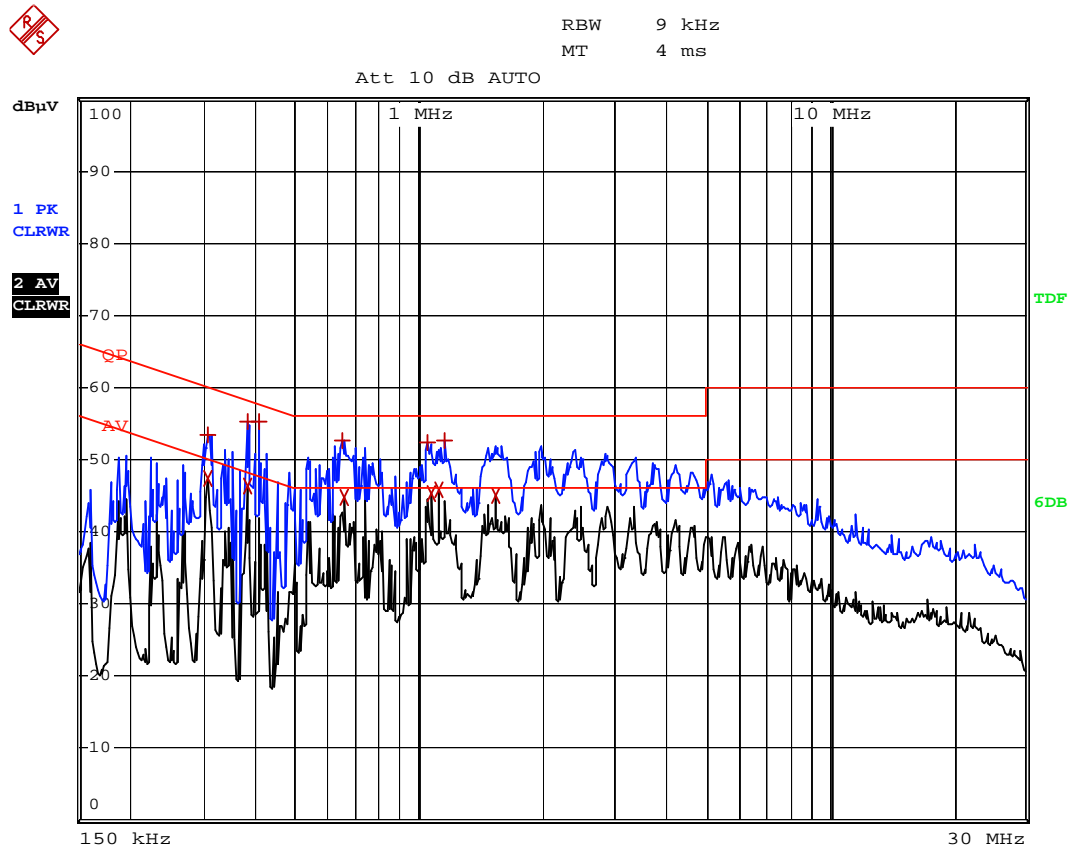
-0.3 dB μ V at 1.122 MHz in the Neutral, 0.15-30MHz

3.7 Conducted Emissions Test Data

LINE CONDUCTED EMISSIONS				FCC 15.107	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dB μ V	QP/Ave/Pk	Line/Neutral	dB μ V	dB
1.122	45.75	AV	Neutral	46	-0.3
1.078	45.29	AV	Neutral	46	-0.7
1.542	45.11	AV	Neutral	46	-0.9
0.658	44.70	AV	Neutral	46	-1.3
0.378	46.77	AV	Line	48.32	-1.6
0.382	46.25	AV	Neutral	48.24	-2.0
0.538	43.58	AV	Line	46	-2.4
1.126	43.58	AV	Line	46	-2.4
0.386	45.65	AV	Line	48.15	-2.5
0.406	55.18	PK	Neutral	57.73	-2.5
0.646	53.45	PK	Line	56	-2.6
1.118	43.26	AV	Line	46	-2.7
0.306	47.40	AV	Neutral	50.08	-2.7
0.382	55.26	PK	Neutral	58.24	-3.0
0.650	52.70	PK	Neutral	56	-3.3
1.158	52.64	PK	Neutral	56	-3.4
1.154	52.55	PK	Line	56	-3.5
0.306	46.44	AV	Line	50.08	-3.6
0.378	54.64	PK	Line	58.32	-3.7
1.050	52.27	PK	Neutral	56	-3.7
0.386	53.56	PK	Line	58.15	-4.6
0.334	53.78	PK	Line	59.35	-5.6
0.306	53.35	PK	Line	60.08	-6.7
0.310	53.31	PK	Neutral	59.97	-6.7

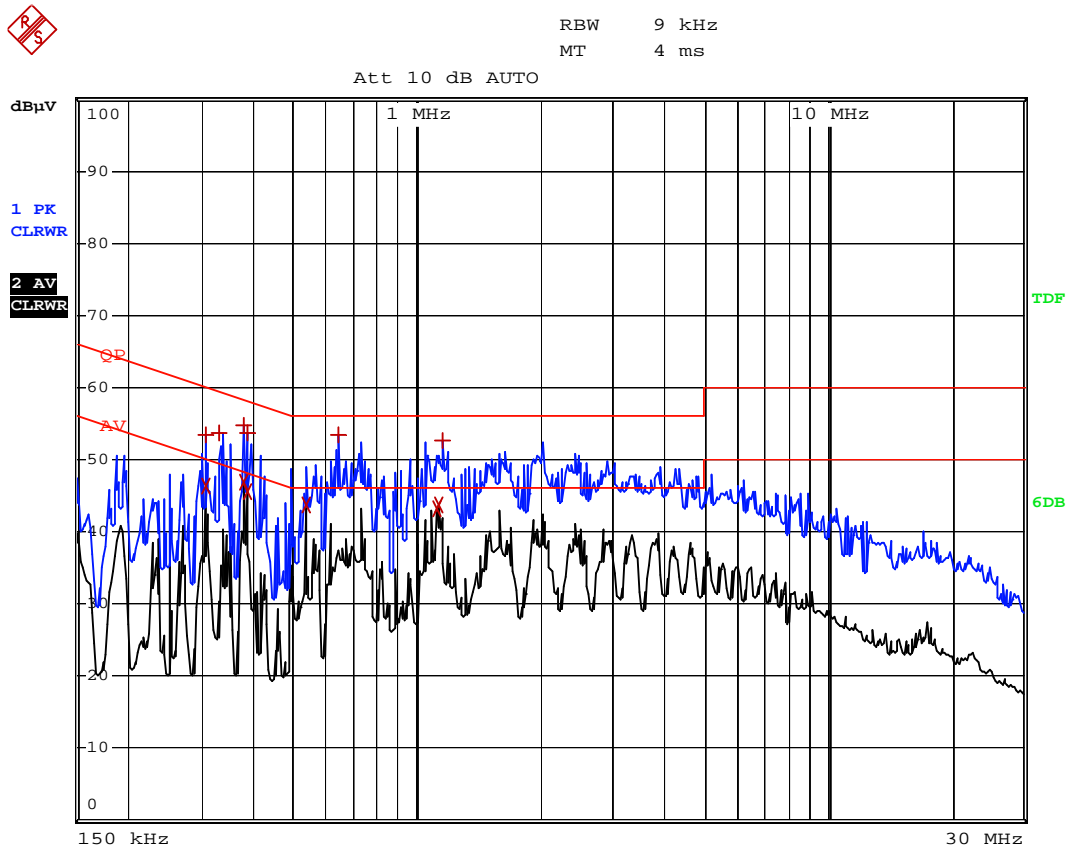
Plot of Conducted Emissions Test Data

Conducted Disturbance
EUT: ENZO Wireless Network Router
M/N: WG-100R
Operating Condition: Running
Test Specification: N
Comment: AC120V/60Hz USB 5V



Plot of Conducted Emissions Test Data

Conducted Disturbance
EUT: ENZO Wireless Network Router
M/N: WG-100R
Operating Condition: Running
Test Specification: L
Comment: AC120V/60Hz USB 5V



4. FIELD STRENGTH OF SPURIOUS EMISSIONS

4.1 Measurement Uncertainty

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement is ± 3.0 dB.

4.2 Standard Applicable

According to §15.109, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

30 - 88 MHz 40 dBuV/m @3M

88 -216 MHz 43.5 dBuV/m @3M

216 -960 MHz 46 dBuV/m @3M

Above 960 MHz 54dBuV/m @3M

4.3 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	ROHDE&SCHWARZ	FSEM30	DE20133	2008-01-25	2009-01-24
Spectrum Analyzer	ROHDE&SCHWARZ	FSEA20	DE25181	2008-01-25	2009-01-24
Test Receiver	ROHDE&SCHWARZ	ESVB	825471/005	2008-01-25	2009-01-24
Amplifier	Agilent	8447F	3113A06717	2008-01-25	2009-01-24
RF Switch	EM	EMSW18	SW060023	2008-01-25	2009-01-24
Positioning Controller	C&C	CC-C-1F	N/A	2008-01-25	2009-01-24
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2008-01-25	2009-01-24
Horn Antenna	SCHWARZBECK	BBHX 9120	9120	2008-01-25	2009-01-24

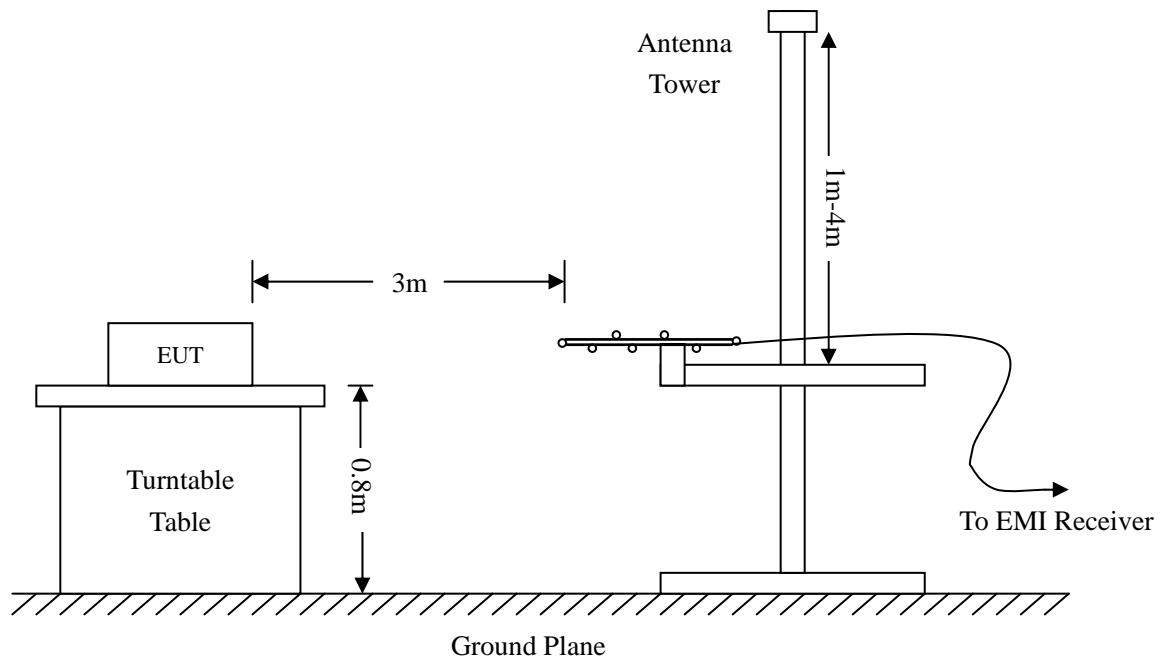
Statement of Traceability: All calibrations have been performed per the NVLAP requirements traceable to the NIST.

4.4 Test Procedure

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



4.5 Corrected Amplitude & Margin Calculation

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

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Ant. Factor} + \text{Cable Loss} - \text{Ampl. Gain}$$

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

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

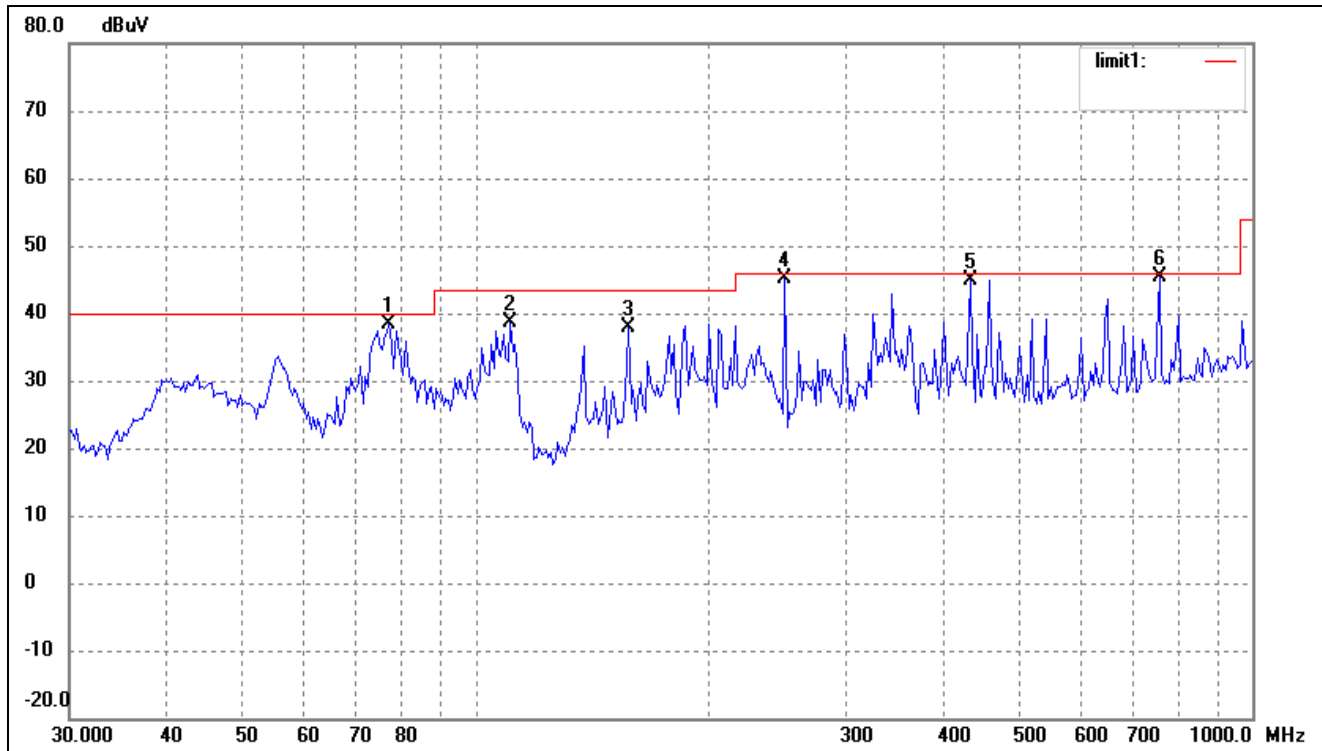
4.6 Environmental Conditions

Temperature:	22° C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

4.7 Summary of Test Results/Plots

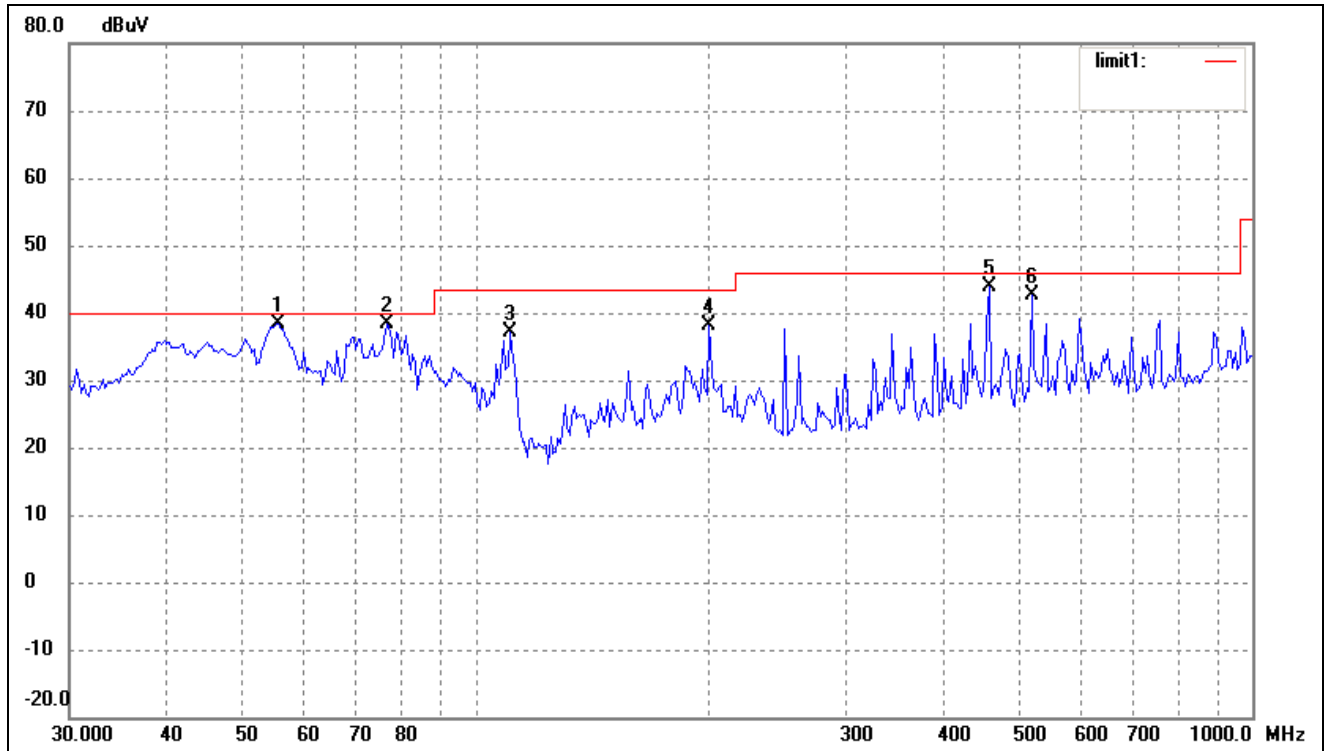
Spurious Emission From 30 MHz to 1 GHz

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV)	Factor(dB)	(dBuV)	(dBuV)	(dB)	(°)	(cm)	
1	77.4680	35.13	3.23	38.36	40.00	-1.64	25	100	QP
2	110.8581	31.29	7.45	38.74	43.50	-4.76	0	100	QP
3	157.5290	33.53	4.42	37.95	43.50	-5.55	124	100	QP
4	250.4859	36.53	8.70	45.23	46.00	-0.77	78	200	QP
5	433.3397	32.99	11.91	44.90	46.00	-1.10	360	100	QP
6	760.2867	30.27	15.11	45.38	46.00	-0.62	270	200	QP

Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV)	Factor(dB)	(dBuV)	(dBuV)	(dB)	(°)	(cm)	
1	55.6782	30.60	7.74	38.34	40.00	-1.66	0	100	QP
2	76.9256	35.13	3.14	38.27	40.00	-1.73	124	100	QP
3	110.8581	29.78	7.45	37.23	43.50	-6.27	78	200	QP
4	200.0432	31.62	6.58	38.20	43.50	-5.30	360	100	QP
5	458.3987	32.73	11.24	43.97	46.00	-2.03	270	200	QP
6	520.2079	29.95	12.76	42.71	46.00	-3.29	25	100	QP