

FCC Part 15C

Measurement and Test Report

For

HANTECH CORPORATION

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

FCC ID: V5ZWG100U

Report Concerns: Original Report	Equipment Type: ENZO Wireless Network USB Adapter
Model:	<u>WG-100U</u>
Report No.:	<u>STR08068113E-3</u>
Test/Witness Engineer:	<u>Lahm Peng</u> <i>Lahm peng</i>
Test Date:	<u>2008-06-19 to 2008-06-27</u>
Issued Date:	<u>2008-06-28</u>
Prepared By:	<p>SEM.Test Compliance Service Co., Ltd 3/F, Jinbao Commerce Building, Xin'an Fanshen Road, Bao'an District, Shenzhen, P.R.C. (518101)</p>
Approved & Authorized By:	<div style="text-align: right; margin-bottom: 5px;"><i>Jandy So</i></div> <hr style="width: 80%; margin: 0 auto;"/> <p>Jandy So / PSQ Manager</p>

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 USB Adapter
Trade Name:	/
Model No.:	WG-100U
Rated Voltage:	DC 5V
Max. Output Power	< 18dBm
Frequency range:	2412-2462MHz
Number of channels:	11
Size:	5MHz
Channel Separation:	Fixed Antenna
Type of Antenna:	9.5x2.9x1.5cm

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, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 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 with Low Channel, Middle Channel and High Channel, accordingly 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).

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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
§ 15.209	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

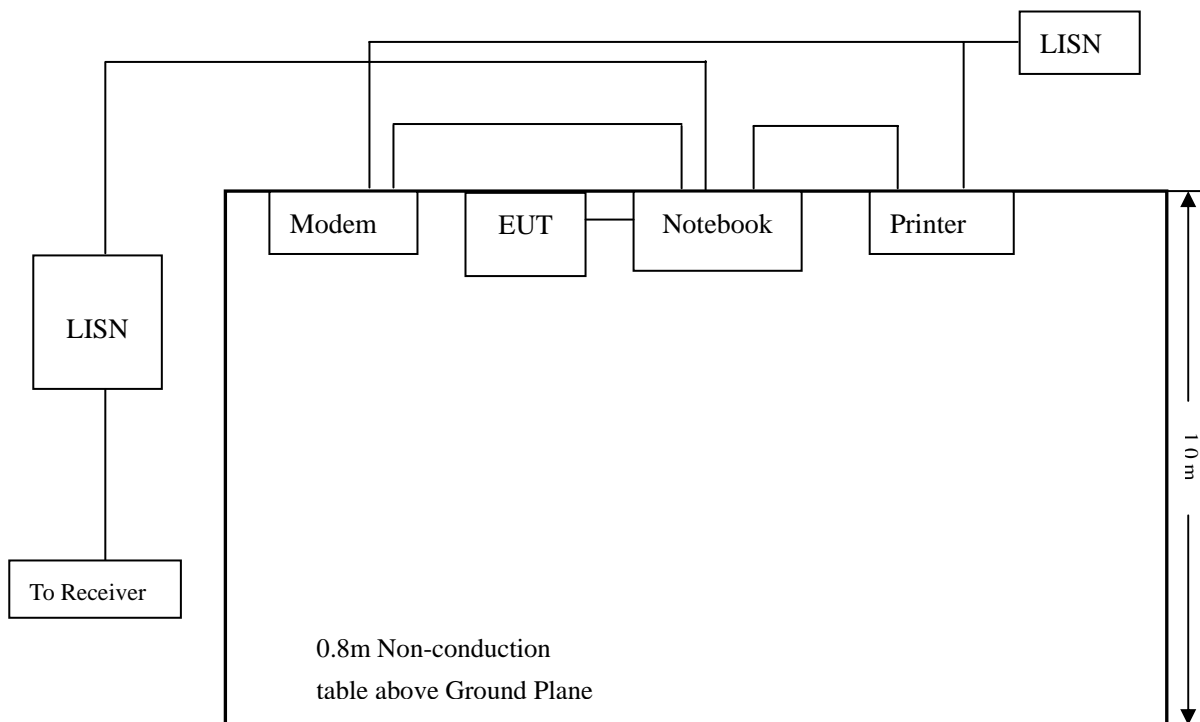
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2008-01-25	2009-01-24
Puls Limiter	Rohde & Schwarz	ESH3-Z2	100911	2008-01-25	2009-01-24
L.I.S.N.	SCHWARZBECK	NSLK812 6	8126-224	2008-01-25	2009-01-24
L.I.S.N.	EMCO	3825/2	11967C	2008-01-25	2009-01-24

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 15.207 Conducted margin for a Class B device, with the *worst* margin reading of:

-13.4 dBμV at 0.494 MHz in the Line, 0.15-30MHz

3.7 Conducted Emissions Test Data

LINE CONDUCTED EMISSIONS				EN55022 CLASS B	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dBμV	QP/Ave/Pk	Line/Neutral	dBμV	dB
0.494	32.73	AV	Neutral	46.10	-13.4
0.154	51.78	Pk	Neutral	65.78	-14.0
0.150	51.37	Pk	Line	66.00	-14.6
0.166	49.76	Pk	Line	65.16	-15.4
0.354	32.50	AV	Neutral	48.87	-16.4
1.130	29.62	AV	Neutral	46.00	-16.4
0.214	46.10	Pk	Line	63.05	-16.9
0.186	47.19	Pk	Line	64.21	-17.0
0.158	48.06	Pk	Line	65.57	-17.5
0.494	38.45	Pk	Neutral	56.10	-17.7
3.886	28.26	AV	Neutral	46.00	-17.7
0.202	44.04	Pk	Line	63.53	-19.5
0.494	31.64	AV	Line	56.10	-24.5
4.594	30.70	AV	Line	56.00	-25.3
0.210	37.82	AV	Line	63.21	-25.4
0.282	35.25	AV	Line	60.76	-25.5
0.354	32.07	AV	Line	58.87	-26.8
0.174	37.77	AV	Line	64.77	-27.0

Plot of Conducted Emissions Test Data

Conducted Disturbance

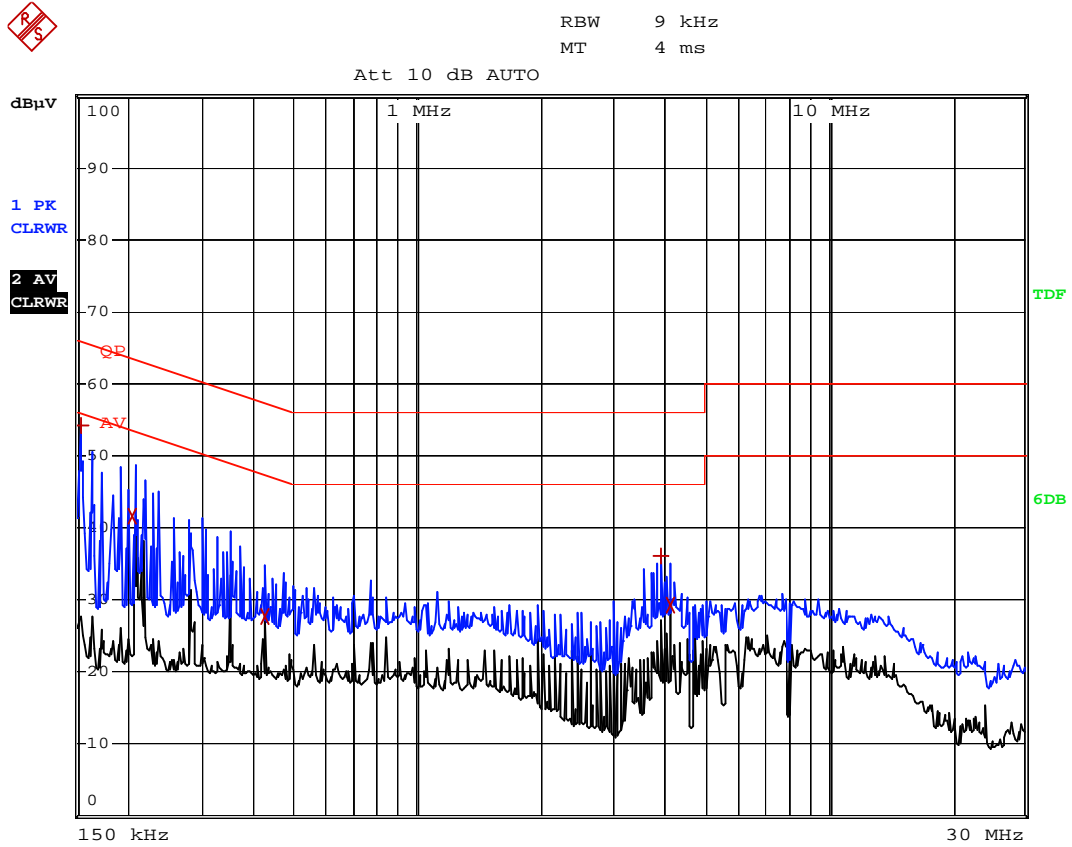
EUT: ENZO Wireless Network USB Adapter

M/N: WG-100U

Operating Condition: Running

Test Specification: N

Comment: AC120V/60Hz USB 5V



Conducted Disturbance

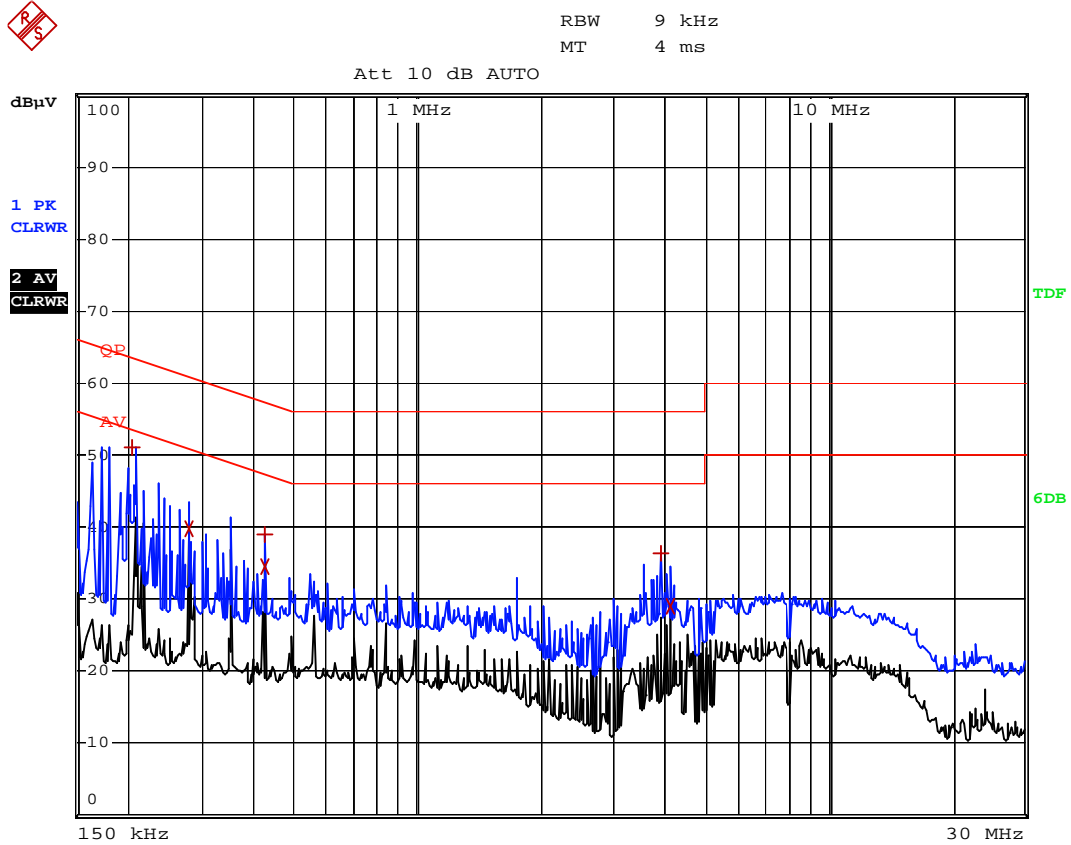
EUT: ENZO Wireless Network USB Adapter

M/N: WG-100U

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 §15.247(c), 15.205 15.209(b) & 15.35 (b), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Section 15.209:

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

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

Emissions that fall in the restricted bands (15.205) must be less than 54dBuV/m otherwise the spurious and harmonics must be attenuated by at least 20dB.

4.3 Test Equipment List and Details

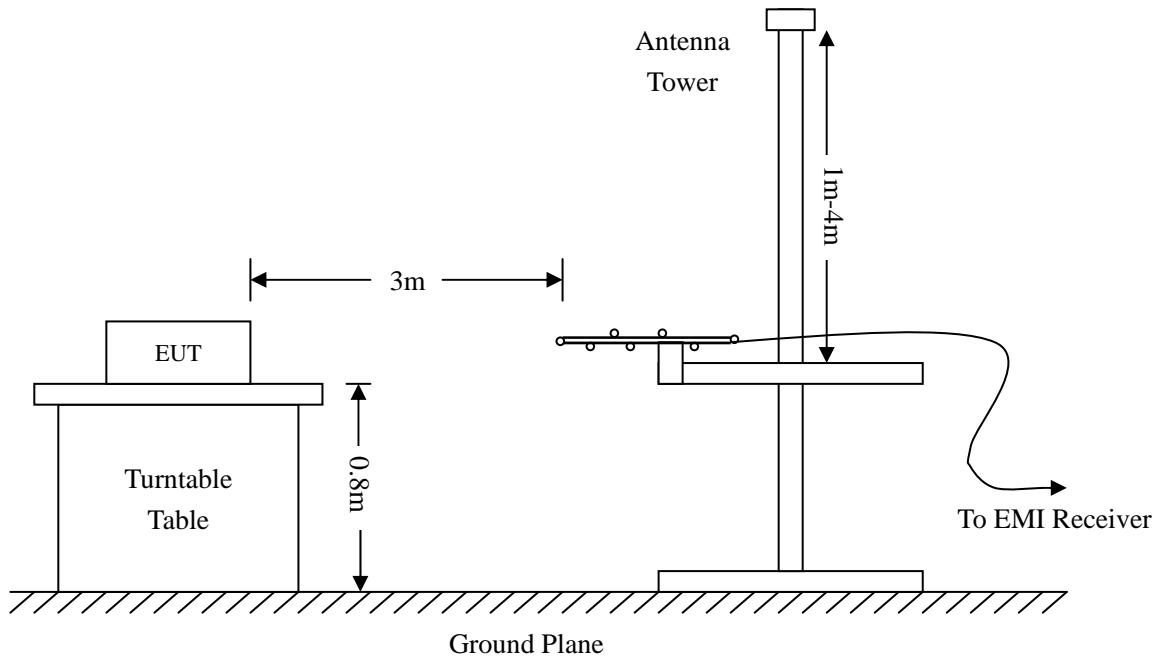
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	ROHDE&SCHWARZ	FSEM30	DE20133	2008-01-25	2009-01-24
Spectrum Analyzer	ROHDE&SCHWARZ	FSEA20	DE25181	2008-01-25	2009-01-24
Test Receiver	ROHDE&SCHWARZ	ESVB	825471/005	2008-01-25	2009-01-24
Amplifier	Agilent	8447F	3113A06717	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 15.205 15.247(a) and FCC Part 15.209 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

According to the data below, the FCC Part 15.205, 15.209 and 15.247 standards, and had the worst margin of:

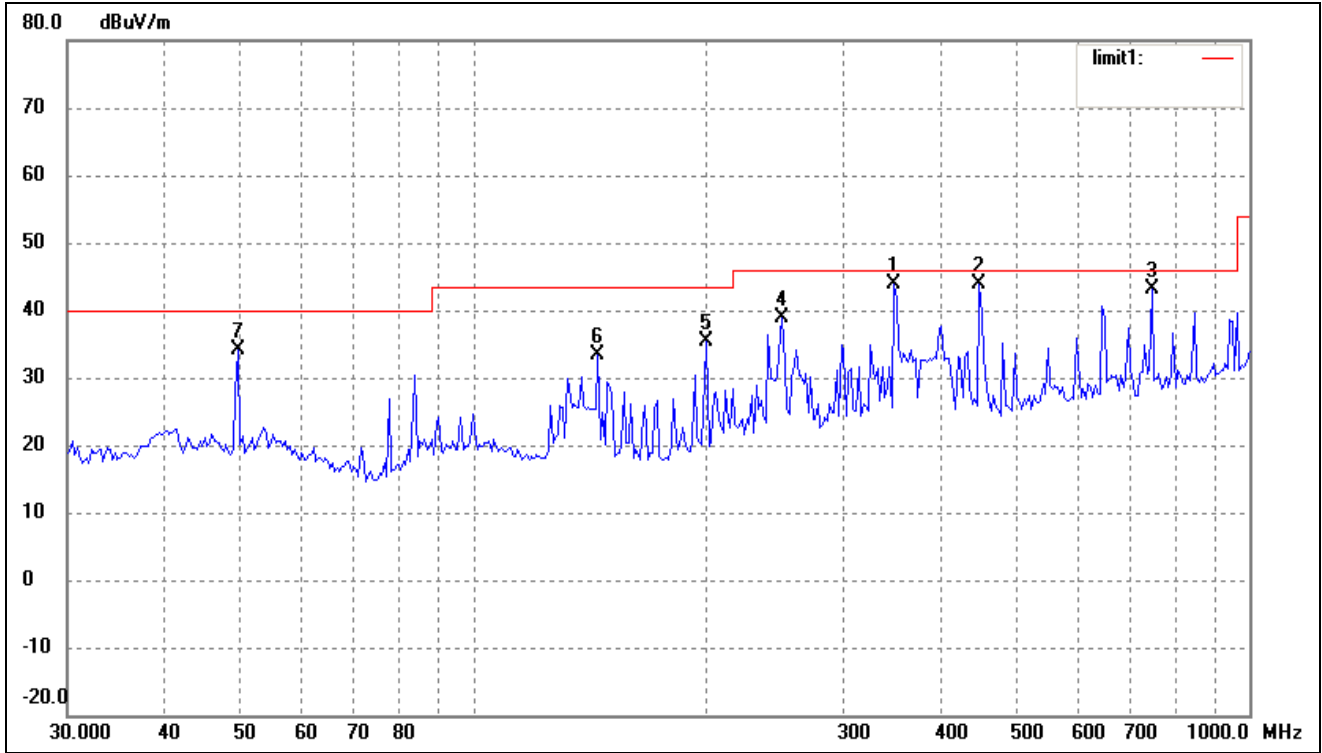
-1.3 dBµV at 4874 MHz in the Horizontal polarization, 30 MHz to 25 GHz, 3Meters

Test Result/Plots:

Spurious Emission From 30 MHz to 1 GHz

Test mode: Transmitting

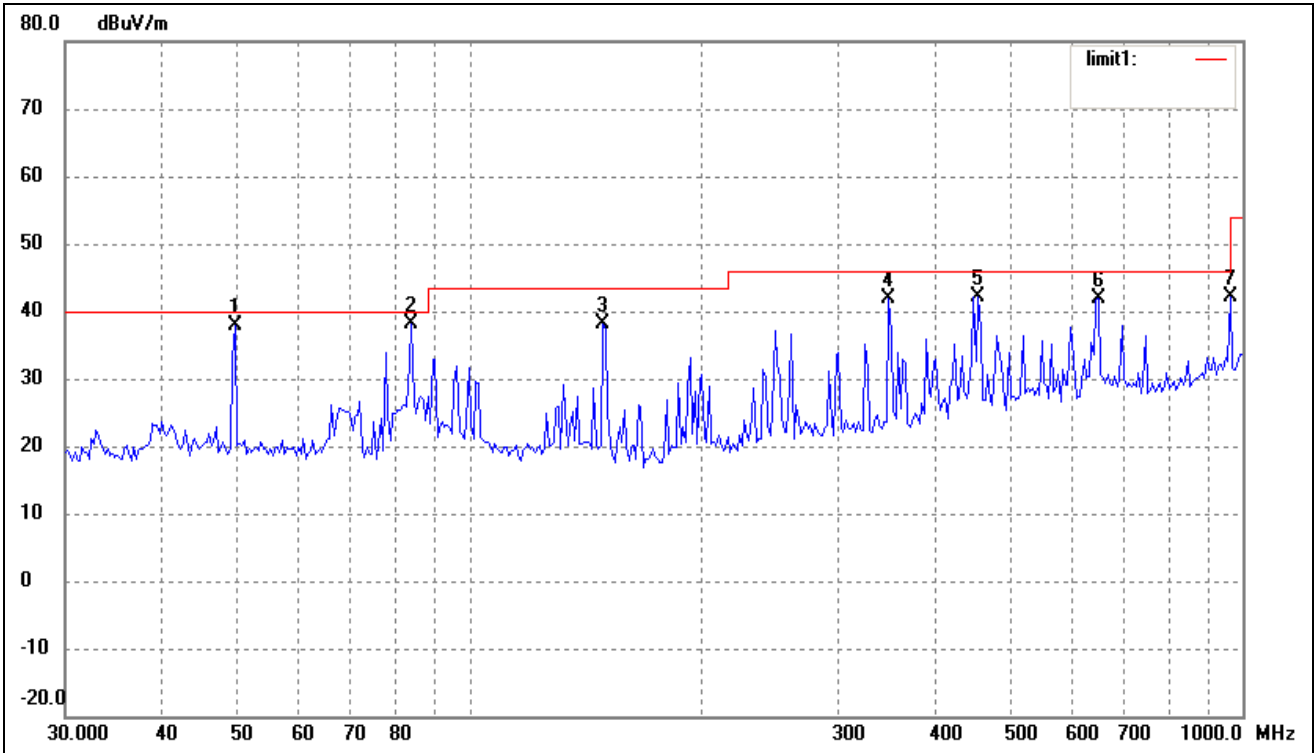
Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	348.5145	33.31	10.63	43.94	46.00	-2.06	45	100	QP
2	448.8361	32.27	11.72	43.99	46.00	-2.01	122	100	QP
3	749.6761	28.15	15.00	43.15	46.00	-2.85	10	200	QP
4	250.4859	30.15	8.70	38.85	46.00	-7.15	355	200	peak
5	200.0432	28.87	6.58	35.45	43.50	-8.05	0	100	peak
6	144.7899	29.25	4.01	33.26	43.50	-10.24	115	100	peak
7	49.7571	26.08	7.98	34.06	40.00	-5.94	0	100	QP

Test mode: Transmitting

Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	49.7571	29.80	7.98	37.78	40.00	-2.22	10	100	QP
2	84.2839	33.03	5.20	38.23	40.00	-1.77	180	100	QP
3	148.9175	34.09	4.07	38.16	43.50	-5.34	360	200	QP
4	348.5145	31.30	10.63	41.93	46.00	-4.07	0	200	QP
5	455.1888	30.77	11.39	42.16	46.00	-3.84	0	100	QP
6	651.3831	27.55	14.35	41.90	46.00	-4.10	33	200	QP
7	965.4742	24.32	17.78	42.10	54.00	-11.90	150	100	peak