FCC Part 15B

Measurement and Test Report

For

ENCORE ELECTRONICS INC.

16483 Old Valley Blvd., La Puente, CA 91744, USA

FCC ID: YZ500000006

Report Concerns: Original Report	**Equipment Type:** Wireless N150 Router
Model:	ENHWI-1AN42
Report No.:	STR11058055I-2
Test Date:	2011-05-10 to 2011-06-20
Issue Date:	2011-06-21
Tested By:	Jason Chen / Engineer
Reviewed By:	Lahm Peng / EMC Manager
Approved & Authorized By:	Jandy so/PSQ Manager

Prepared By:

SEM.Test Compliance Service Co., Ltd
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

TABLE OF CONTENTS

1. GENERAL INFORMATION 3
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) 3
1.2 TEST STANDARDS 3
1.3 TEST METHODOLOGY 3
1.4 TEST FACILITY 4
1.5 EUT EXERCISE SOFTWARE 4
1.6 ACCESSORIES EQUIPMENT LIST AND DETAILS 4
1.7 EUT CABLE LIST AND DETAILS 4
2. SUMMARY OF TEST RESULTS 5
3. §15.107 (A) CONDUCTED EMISSIONS 6
3.1 MEASUREMENT UNCERTAINTY 6
3.2 TEST EQUIPMENT LIST AND DETAILS 6
3.3 TEST PROCEDURE 6
3.4 BASIC TEST SETUP BLOCK DIAGRAM 6
3.5 ENVIRONMENTAL CONDITIONS 7
3.6 SUMMARY OF TEST RESULTS/PLOTS 7
3.7 CONDUCTED EMISSIONS TEST DATA 7
4. §15.109(A)- RADIATED EMISSION 10
4.1 MEASUREMENT UNCERTAINTY 10
4.2 TEST EQUIPMENT LIST AND DETAILS 10
4.3 TEST PROCEDURE 10
4.4 TEST RECEIVER SETUP 11
4.5 CORRECTED AMPLITUDE & MARGIN CALCULATION 11
4.6 ENVIRONMENTAL CONDITIONS 11
4.7 SUMMARY OF TEST RESULTS/PLOTS 11

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant:	ENCORE ELECTRONICS INC.
Address of applicant:	16483 Old Valley Blvd., La Puente, CA 91744, USA
Manufacturer:	Sun Rise Electronic Factory
Address of manufacturer:	LanYuan Road, ZengTian Industrial District, XinAn Community, ChangAn Town, DongGuan City, GuangDong Province, China

General Description of E.U.T

Items	Description
EUT Description:	Wireless N150 Router
Trade Name:	ENCORE
Model No.:	ENHWI-1AN42
Adding Model:	ENHWI-1AN45, WR8196C2, WR8196C5
Rated Voltage:	DC 12V
Rated Current:	400mA

The test data is gathered from a production sample, provided by the manufacturer. Test is carried out with ENHWI-1AN42 since the other models listed in this report are different appearance without circuit and electronic construction changed, declared by the manufacture.

1.2 Test Standards

The following report is prepared on behalf of the ENCORE ELECTRONICS INC. 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, Subpart B, and section 15.205, 15.107, and 15.109 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 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 the testing was designed to exercise the system components.

1.6 Accessories Equipment List and Details

Description	Manufacturer	Model	Serial Number
ASUS	Notebook	X50R	74N0AS297138
/	/	/	/

1.7 EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
Power Cable	1.2	Unshielded	Without Core
RJ45	1.5	Unshielded	Without Core

2. SUMMARY OF TEST RESULTS

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

3. §15.107 (a) 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 ± 2.88 dB.

3.2 Test Equipment List and Details

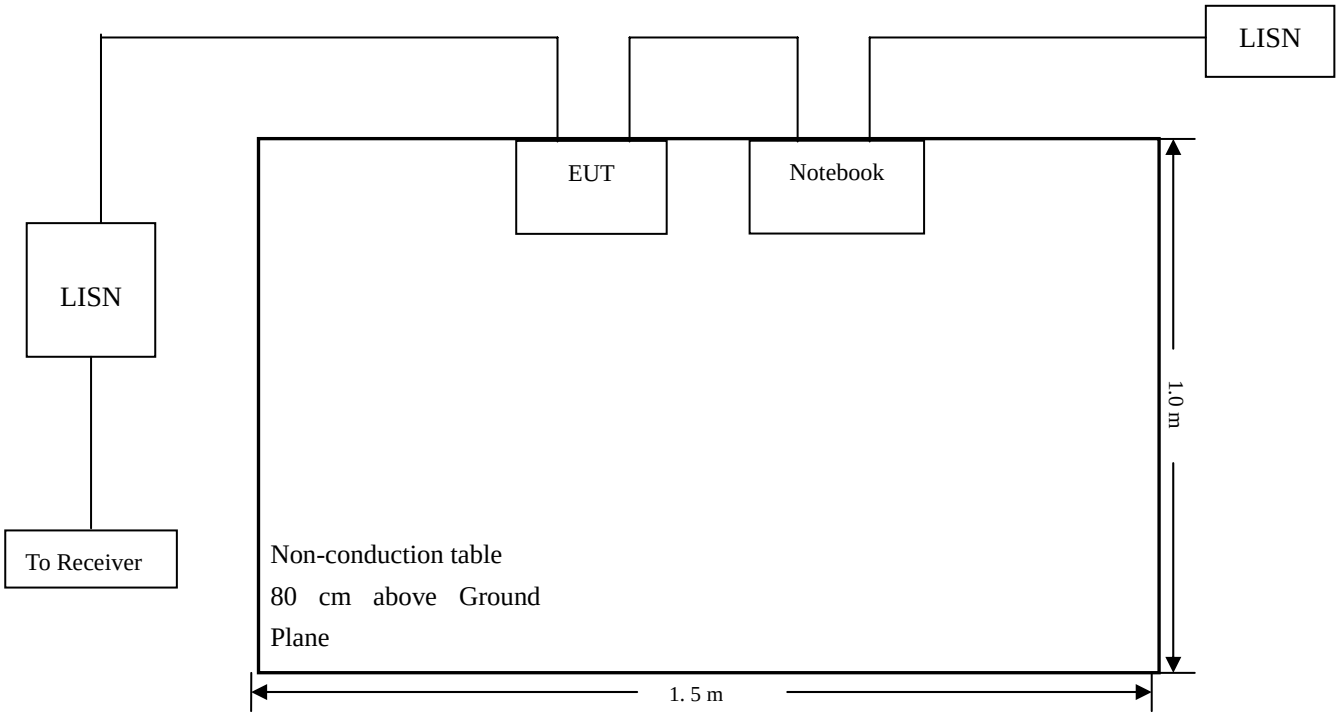
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2010-12-20	2011-12-19
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2010-12-20	2011-12-19
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2010-12-20	2011-12-19

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:	23 °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:

-5.98 dBμV at **0.502 MHz** in the **Line**, **Average** detector, 0.15-30MHz

3.7 Conducted Emissions Test Data

LINE CONDUCTED EMISSIONS				FCC 15.107	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dBμV	QP/Ave/Pk	Line/Neutral	dBμV	dB
0.502	40.01	AV	Line	46.00	-5.98
3.49	39.08	AV	Line	46.00	-6.91
4.642	46.78	Pk	Line	56.00	-9.21
0.506	46.19	Pk	Line	56.00	-9.80
0.502	43.68	Pk	Neutral	56.00	-12.31
2.102	43.66	Pk	Neutral	56.00	-12.33
0.498	33.45	AV	Neutral	46.02	-12.57
2.79	30.08	AV	Neutral	46.00	-15.91
23.982	33.18	AV	Line	50.00	-16.82
11.99	31.37	AV	Neutral	50.00	-18.62
7.066	40.03	Pk	Neutral	60.00	-19.96

Emission attenuated more than 20dB of the limit is not reported.

Plot of Conducted Emissions Test Data

Conducted Disturbance

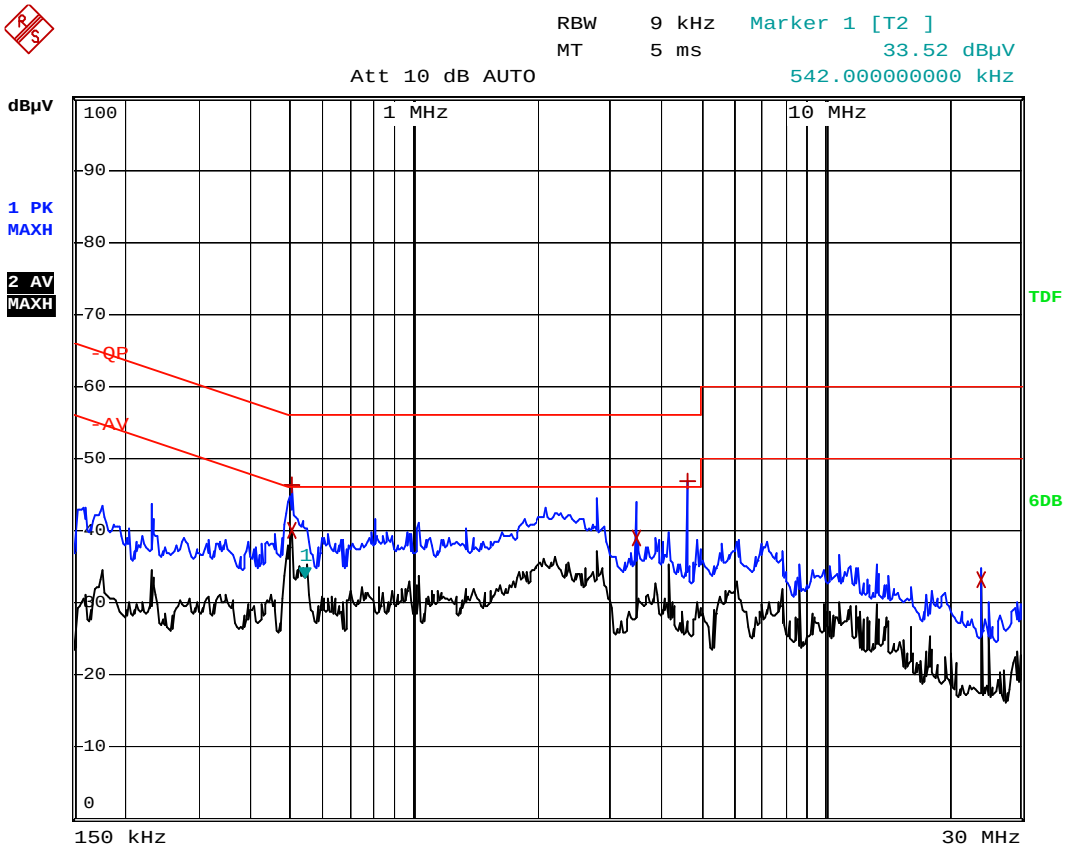
EUT: Wireless N150 Router

M/N: ENHWI-1AN42

Operating Condition: Transmitting

Test Specification: L

Comment: AC 120V/60Hz/Adapter 12V



Date: 7.JUN.2011 14:23:13

Plot of Conducted Emissions Test Data

Conducted Disturbance

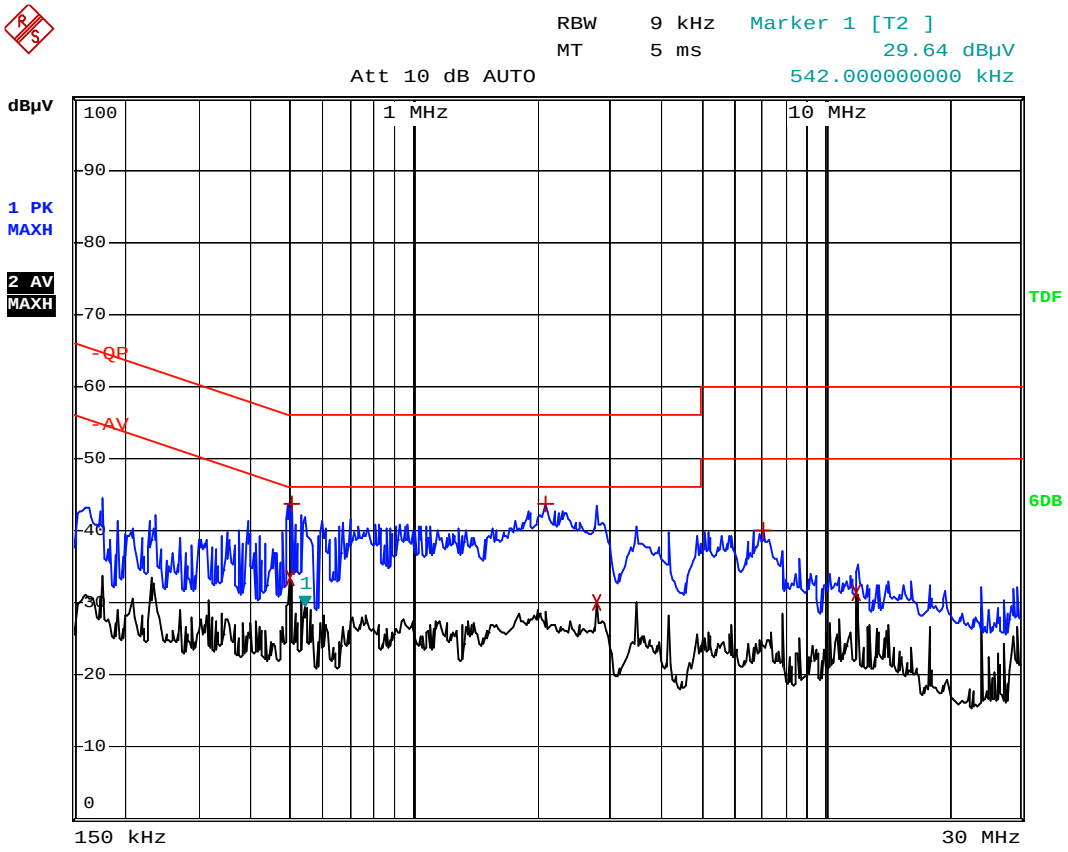
EUT: Wireless N150 Router

M/N: ENHWI-1AN42

Operating Condition: Transmitting

Test Specification: N

Comment: AC 120V/60Hz/Adapter 12V



Date: 7.JUN.2011 14:24:22

4. §15.109(a)- RADIATED EMISSION

4.1 Measurement Uncertainty

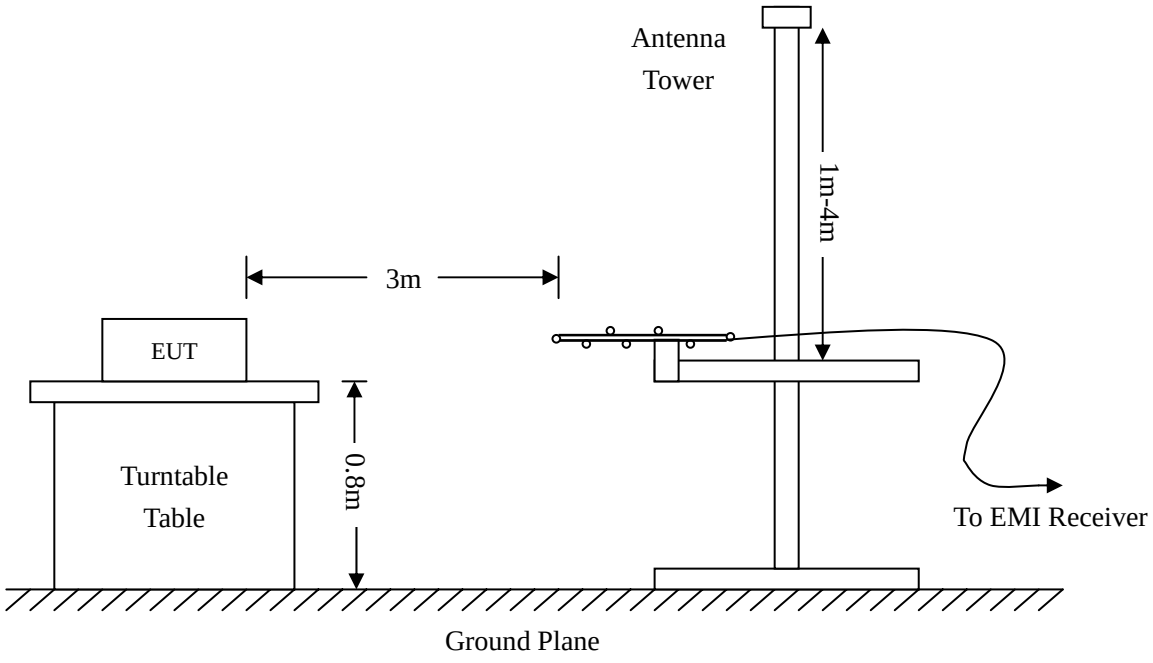
Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any radiation emissions measurement is ± 5.10 dB.

4.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2010-12-20	2011-12-19
EMI Test Receiver	R&S	ESVB	825471/005	2010-12-20	2011-12-19
Positioning Controller	C&C	CC-C-1F	N/A	2010-12-20	2011-12-19
RF Switch	EM	EMSW18	SW060023	2010-12-20	2011-12-19
Pre-amplifier	Agilent	8447F	3113A06717	2010-12-20	2011-12-19
Pre-amplifier	Compliance Direction	PAP-0118	24002	2010-12-20	2011-12-19
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2011-01-09	2012-01-08
Horn Antenna	ETS	3117	00086197	2011-01-09	2012-01-08

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 15.109 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 for above 1GHz, the test receiver was set with the following configurations:

For peak detector:
RBW = 1000kHz, VBW = 3000kHz, Sweep Time = Auto

For average detector:
RBW = 1000kHz, VBW = 10Hz, Sweep Time = Auto

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:

Corr. Ampl. = Indicated Reading – Corr. Factor

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:

Margin = Corr. Ampl. – FCC Part 15B Limit

4.6 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	55 %
ATM Pressure:	1011 mbar

4.7 Summary of Test Results/Plots

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

-2.87 dBμV at **468.8761 MHz** in the **Vertical** polarization, **2dBi Gain Antenna** mode, **30 MHz to 1 GHz, 3Meters**

-2.87 dBμV at **468.8761 MHz** in the **Vertical** polarization, **5dBi Gain Antenna** mode, **30 MHz to 1 GHz, 3Meters**

Plot of Radiation Emissions Test

Radiated Disturbance

EUT: Wireless N150 Router

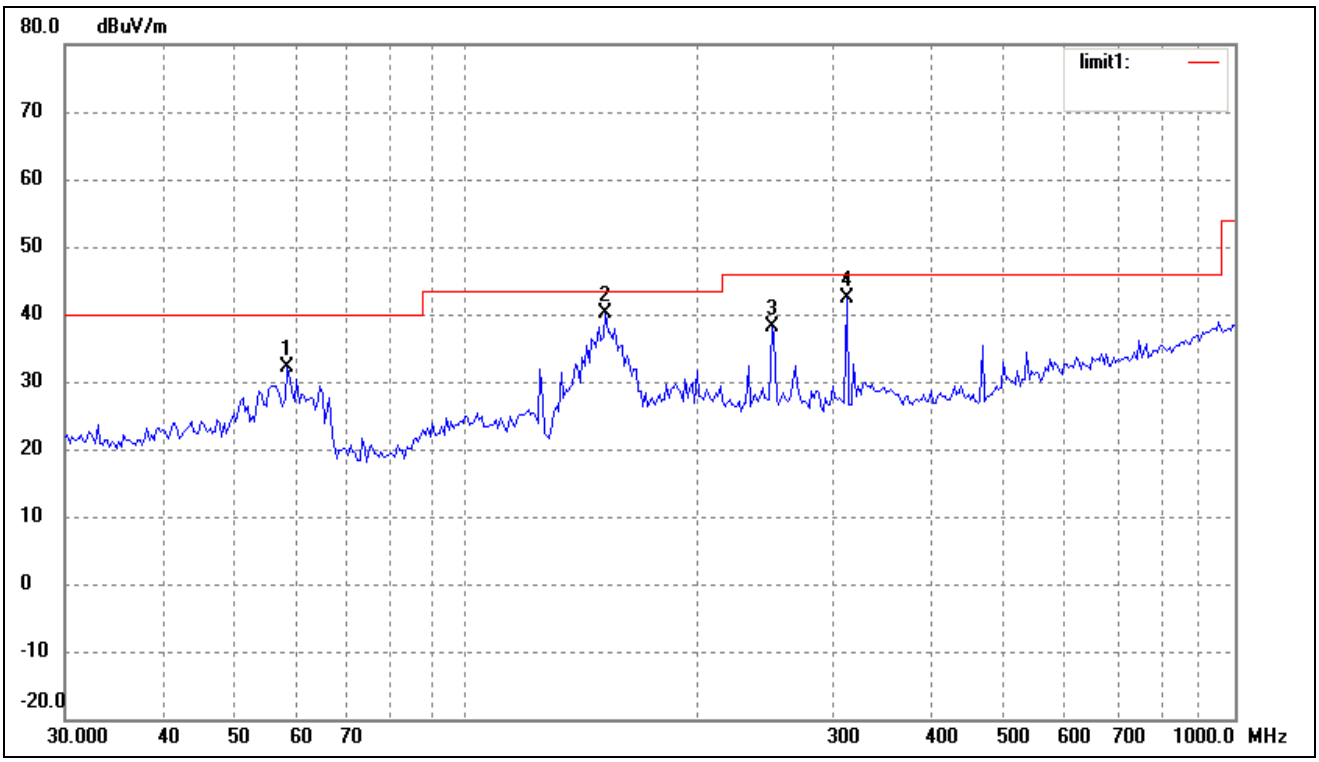
M/N: ENHWI-1AN42

Operating Condition: Connect to PC Communication

Test Specification: Horizontal & Vertical

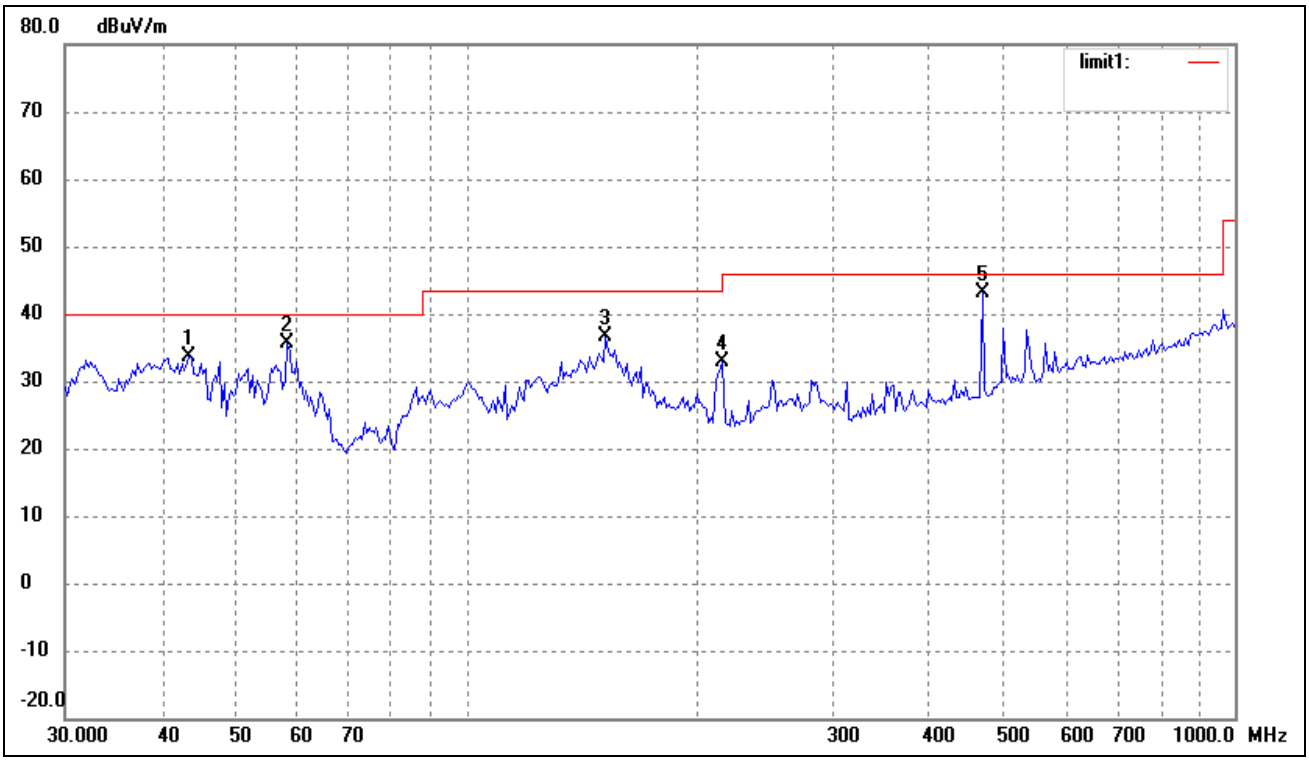
Comment: DC 12V/ Antenna (Gain 2dBi)

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	58.4074	24.63	7.60	32.23	40.00	-7.77	360	200	peak
2	151.5971	35.87	4.15	40.02	43.50	-3.48	223	125	QP
3	249.4250	29.35	8.68	38.03	46.00	-7.97	0	100	peak
4	312.1793	32.45	9.90	42.35	46.00	-3.65	210	200	QP

Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	43.5056	25.34	8.20	33.54	40.00	-6.46	360	200	peak
2	58.4074	28.13	7.60	35.73	40.00	-4.27	223	112	QP
3	151.5971	32.59	4.15	36.74	43.50	-6.76	0	100	peak
4	215.2677	25.71	7.12	32.83	43.50	-10.67	0	100	peak
5	468.8761	31.07	12.06	43.13	46.00	-2.87	125	208	QP

Plot of Radiation Emissions Test

Radiated Disturbance

EUT: Wireless N150 Router

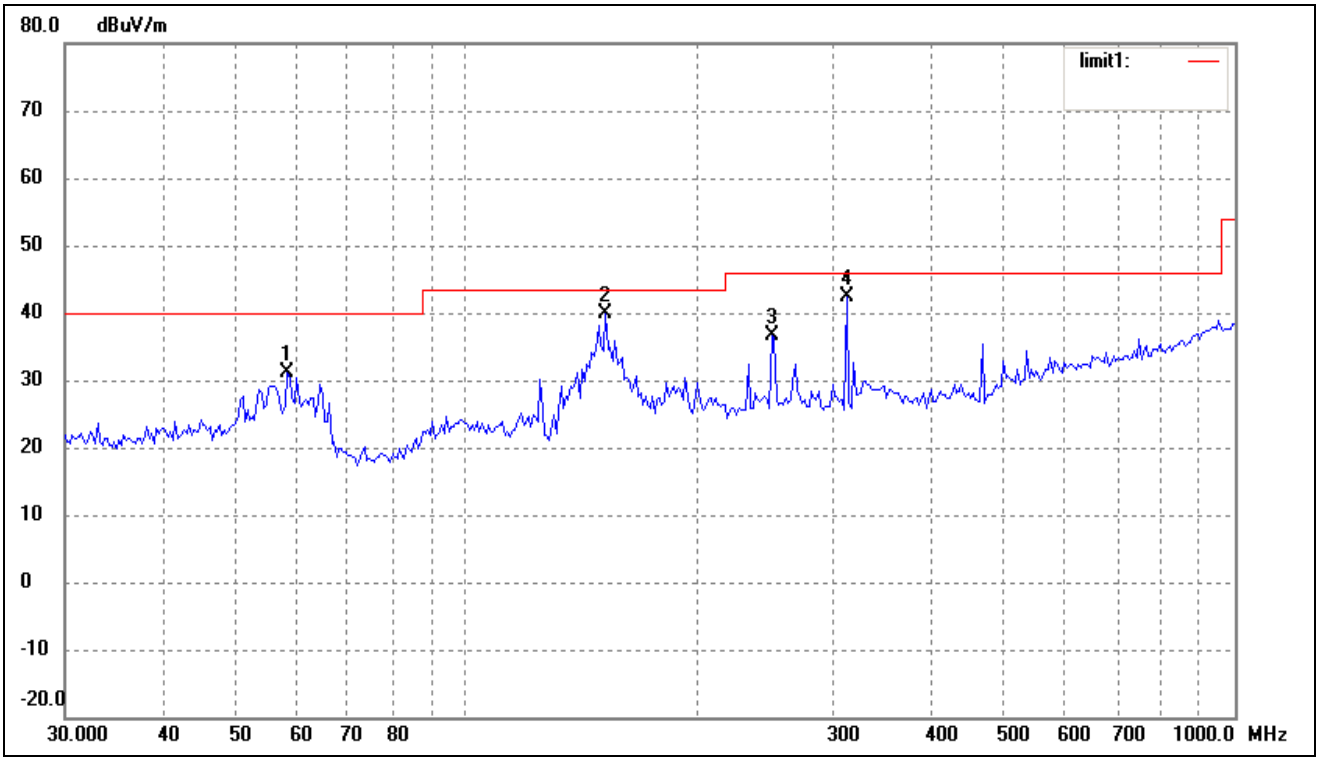
M/N: ENHWI-1AN42

Operating Condition: Connect to PC Communication

Test Specification: Horizontal & Vertical

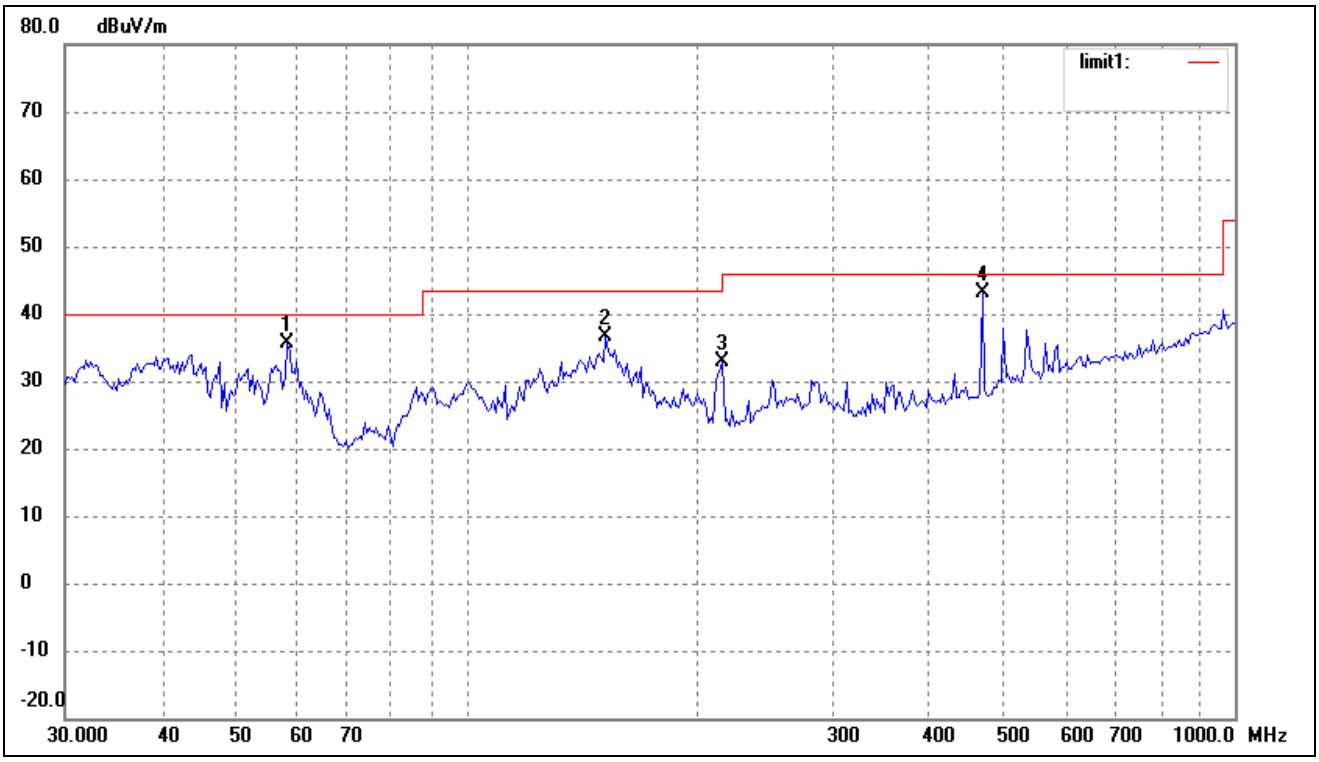
Comment: DC 12V/ Antenna (Gain 5dBi)

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	58.4074	23.42	7.60	31.02	40.00	-8.98	360	100	peak
2	151.5971	35.69	4.15	39.84	43.50	-3.66	223	114	QP
3	249.4250	27.90	8.68	36.58	46.00	-9.42	0	200	peak
4	312.1793	32.45	9.90	42.35	46.00	-3.65	109	118	QP

Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	58.4074	28.13	7.60	35.73	40.00	-4.27	223	114	QP
2	151.5971	32.59	4.15	36.74	43.50	-6.76	360	100	peak
3	215.2677	25.71	7.12	32.83	43.50	-10.67	0	200	peak
4	468.8761	31.07	12.06	43.13	46.00	-2.87	112	108	QP

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