

FCC PART 15B
MEASUREMENT AND TEST REPORT
FOR

ENCORE ELECTRONICS INC.

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

FCC ID: YZ500000007

Report Concerns: Original Report	Equipment Type: Wireless N300 Router
Model:	<u>ENHWI-2AN42</u>
Report No.:	<u>STR11058057I-2</u>
Test Date:	<u>2011-05-12 to 2011-06-13</u>
Issue Date:	<u>2011-06-20</u>
Tested By:	<u>Susan Su / Engineer</u> <i>Susan Su</i>
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Approved & Authorized By:	<u>Jandy so / PSQ Manager</u> <i>Jandyso</i>
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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: 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 N300 Router
Trade Name:	ENCORE
Model No.:	ENHWI-2AN42
Add Models:	ENHWI-2AN45, WR8196C22, WR8196C55
Rated Voltage:	DC 12V adapter
Rated Current:	0.5A
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 others models listed in the report have different appearance only of ENHWI-2AN42 without circuit and electronic construction changed, declared by the manufacturer.

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 15.107, 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
ASUS	Notebook	X50R	74N0AS297138

1.7 EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
Power Cable	1.0	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 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 ± 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

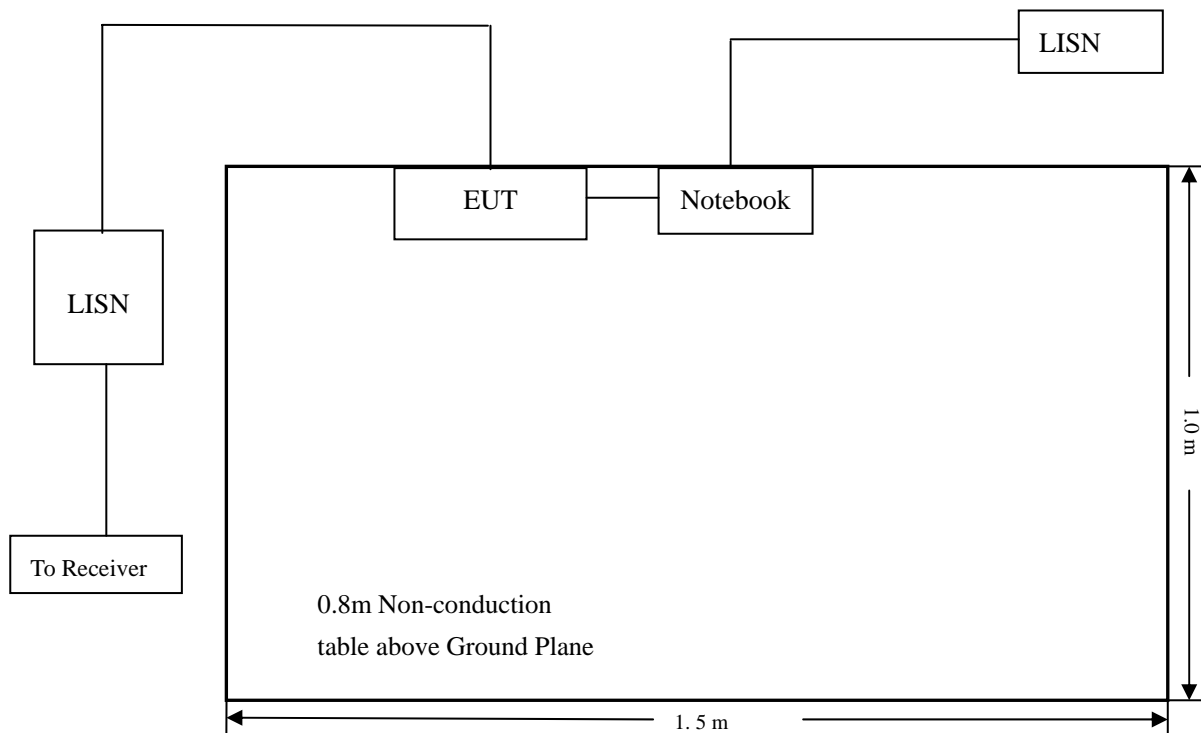
3.3 Test Procedure

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

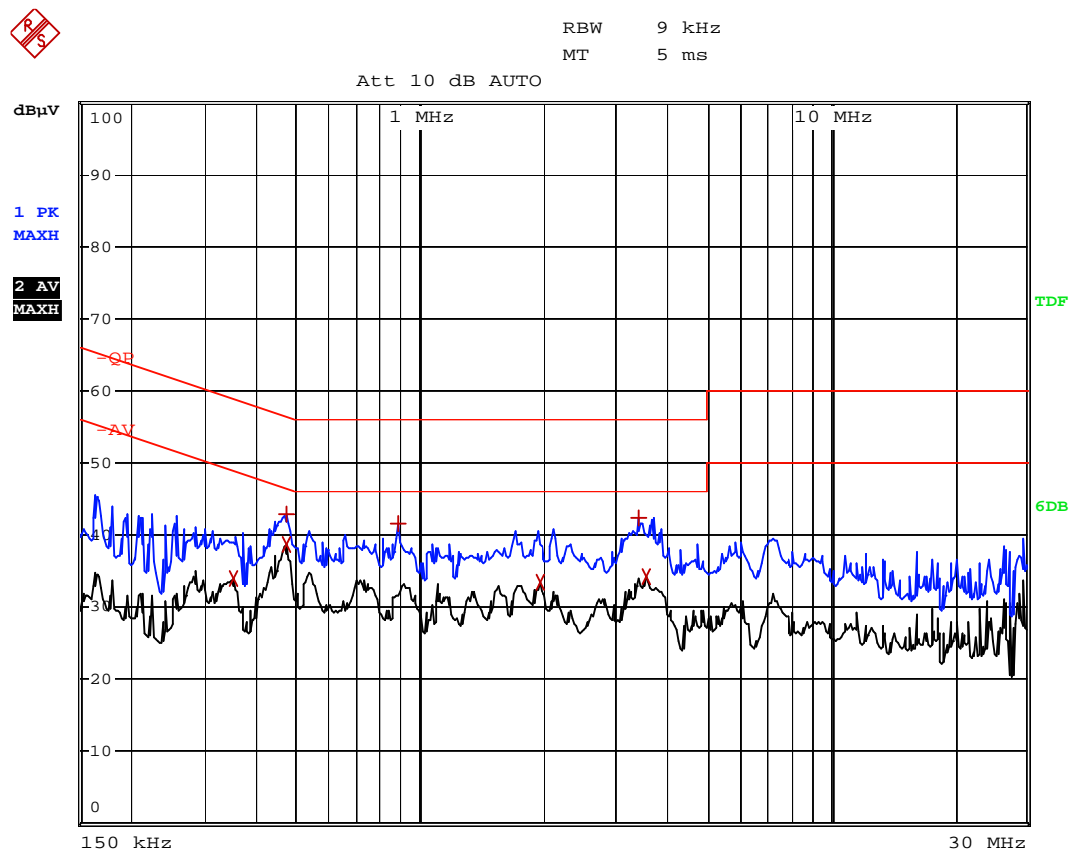
According to the data in section 3.8, the EUT complied with the FCC Part 15B Conducted margin for a Class B device, with the *worst* margin reading of:

-6.20 dBµV at 0.458 MHz in the **Line, Average** detector, 0.15-30MHz

3.8 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

Conducted Disturbance
EUT: Wireless N300 Router
M/N: ENHWI-2AN42
Operating Condition: Transmitting
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	350 kHz	34.05	-14.90
1 Max Peak	470 kHz	42.98	-13.52
2 Average	474 kHz	38.66	-7.77
1 Max Peak	886 kHz	41.61	-14.38
2 Average	1.958 MHz	33.42	-12.57
1 Max Peak	3.402 MHz	42.38	-13.61
2 Average	3.578 MHz	34.17	-11.82

Plot of Conducted Emissions Test Data

Conducted Disturbance

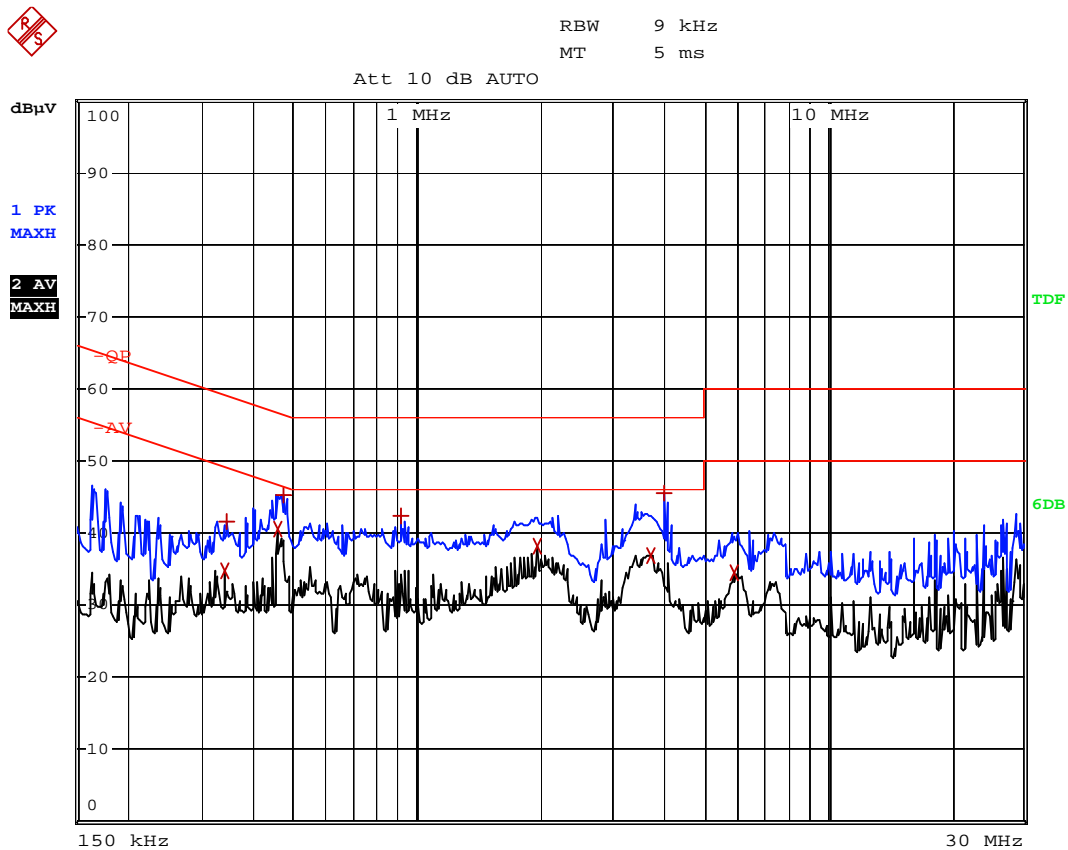
EUT: Wireless N300 Router

M/N: ENHWI-2AN42

Operating Condition: Transmitting

Test Specification: L

Comment: AC 120V/60Hz



EDIT PEAK LIST (Prescan Results)			
Trace1:	-QP		
Trace2:	-AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB
2 Average	338 kHz	34.71	-14.54
1 Max Peak	342 kHz	41.50	-17.65
2 Average	458 kHz	40.52	-6.20
1 Max Peak	470 kHz	45.25	-11.25
1 Max Peak	914 kHz	42.39	-13.60
2 Average	1.958 MHz	38.29	-7.70
2 Average	3.726 MHz	36.99	-9.00
1 Max Peak	4.002 MHz	45.63	-10.36
2 Average	5.954 MHz	34.46	-15.53

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

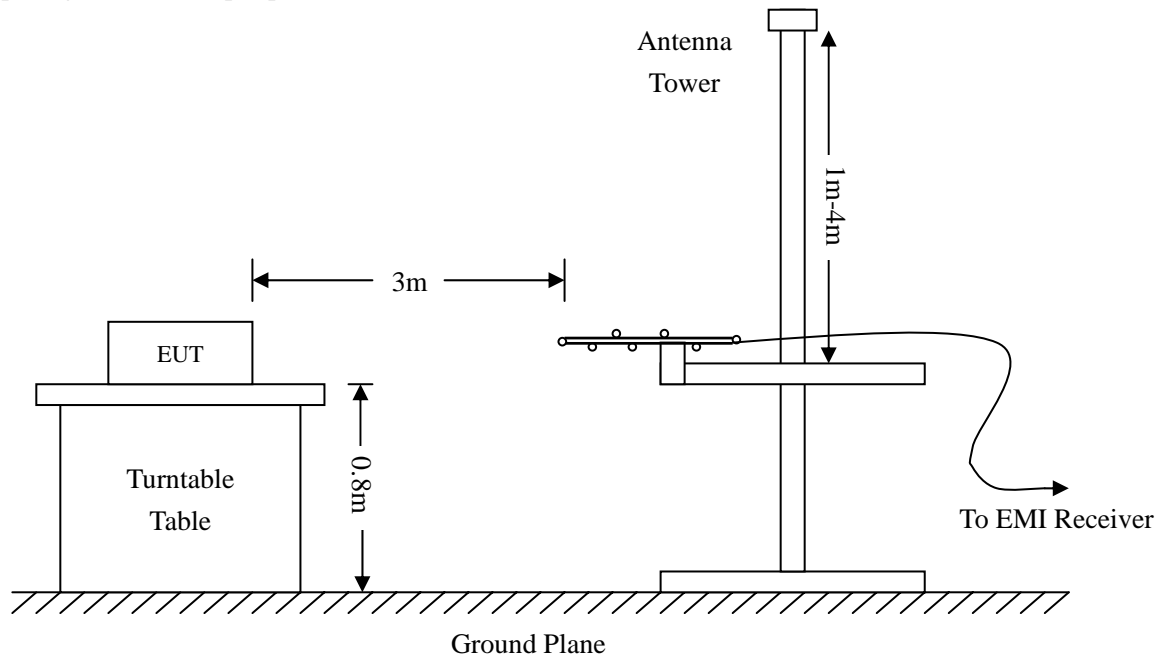
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2010-12-20	2011-12-19
EMI Test Receiver	R&S	ESVB	825471/005	2010-12-20	2011-12-19
Positioning Controller	C&C	CC-C-1F	N/A	2010-12-20	2011-12-19
RF Switch	EM	EMSW18	SW060023	2010-12-20	2011-12-19
Pre-amplifier	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 15.205 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 μ V means the emission is 6dB μ V below the maximum limit for Class B. The equation for margin calculation is as follows:

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

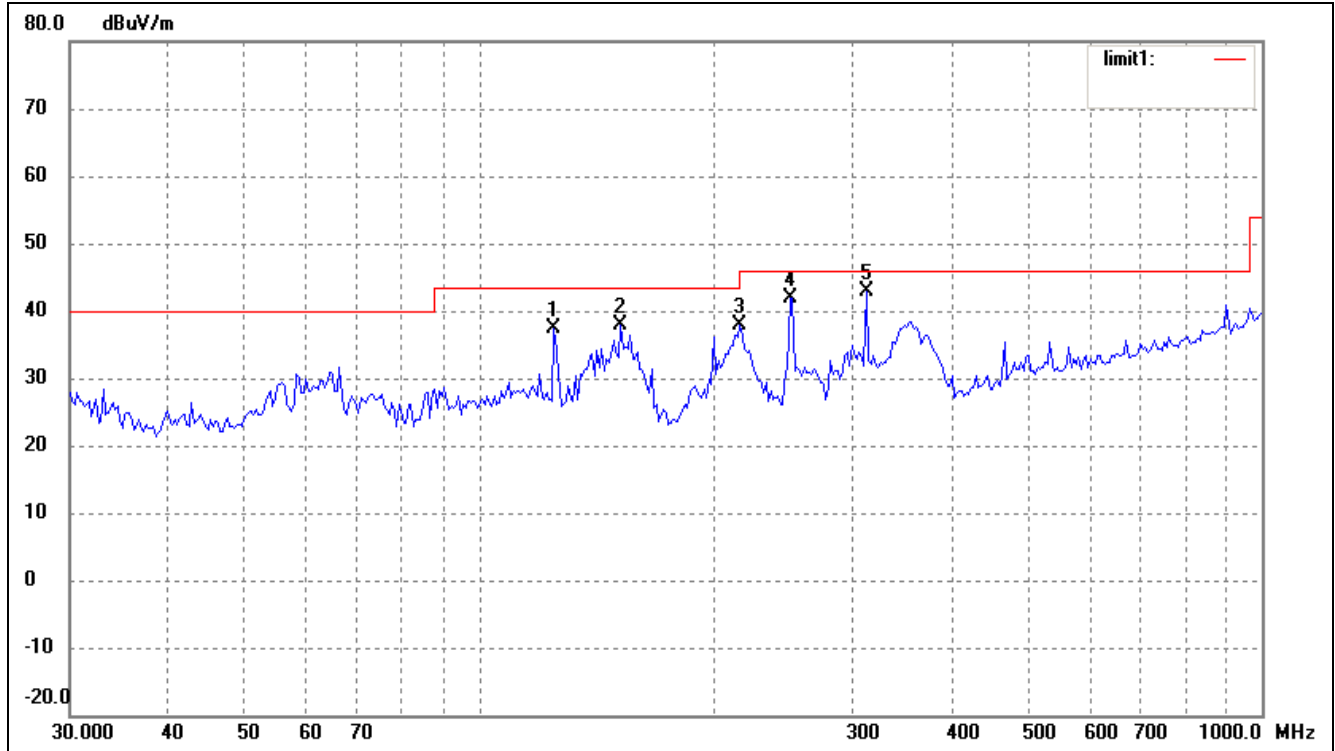
4.6 Environmental Conditions

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

4.7 Summary of Test Results/Plots

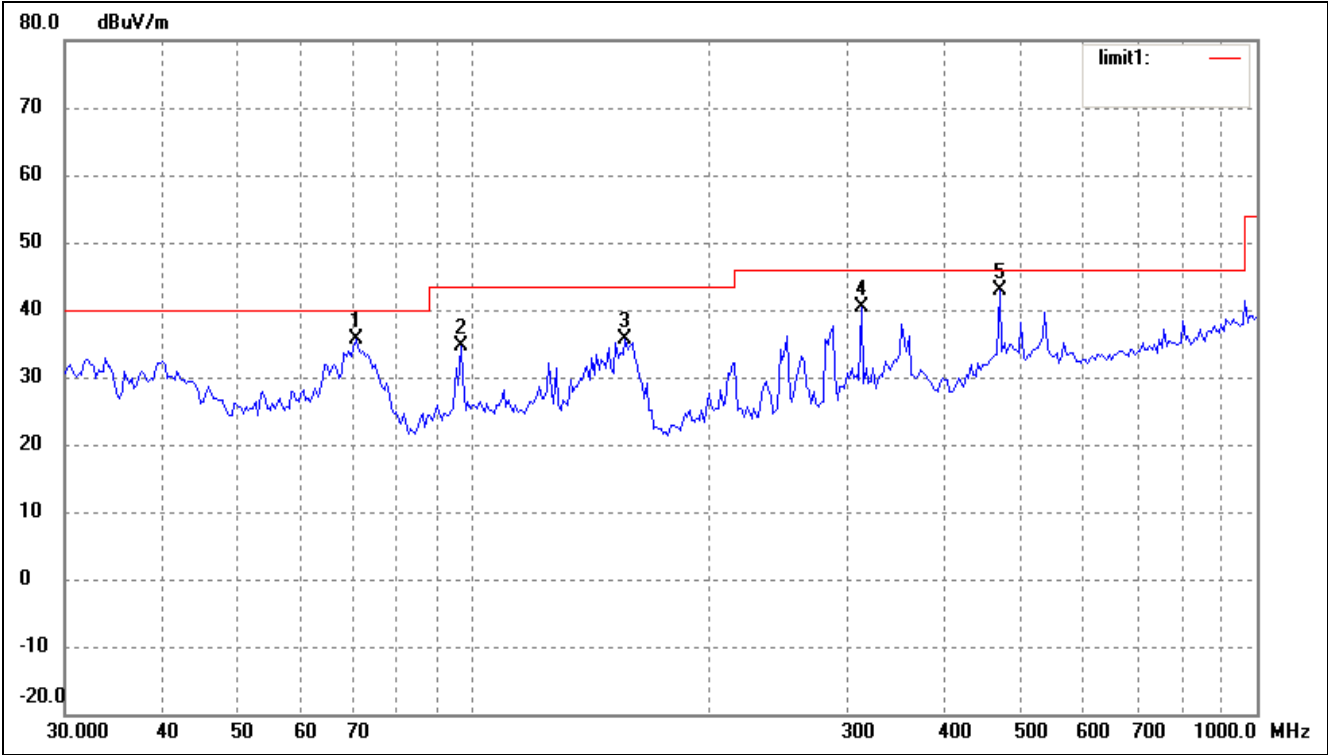
According to the data, the EUT complied with the FCC Part 15B Class B standards, and had the worst margin of:

-2.98 dB μ V at 30.4238MHz in the Vertical polarization, with 2dBi antenna, 30 MHz to 1 GHz, 3Meters

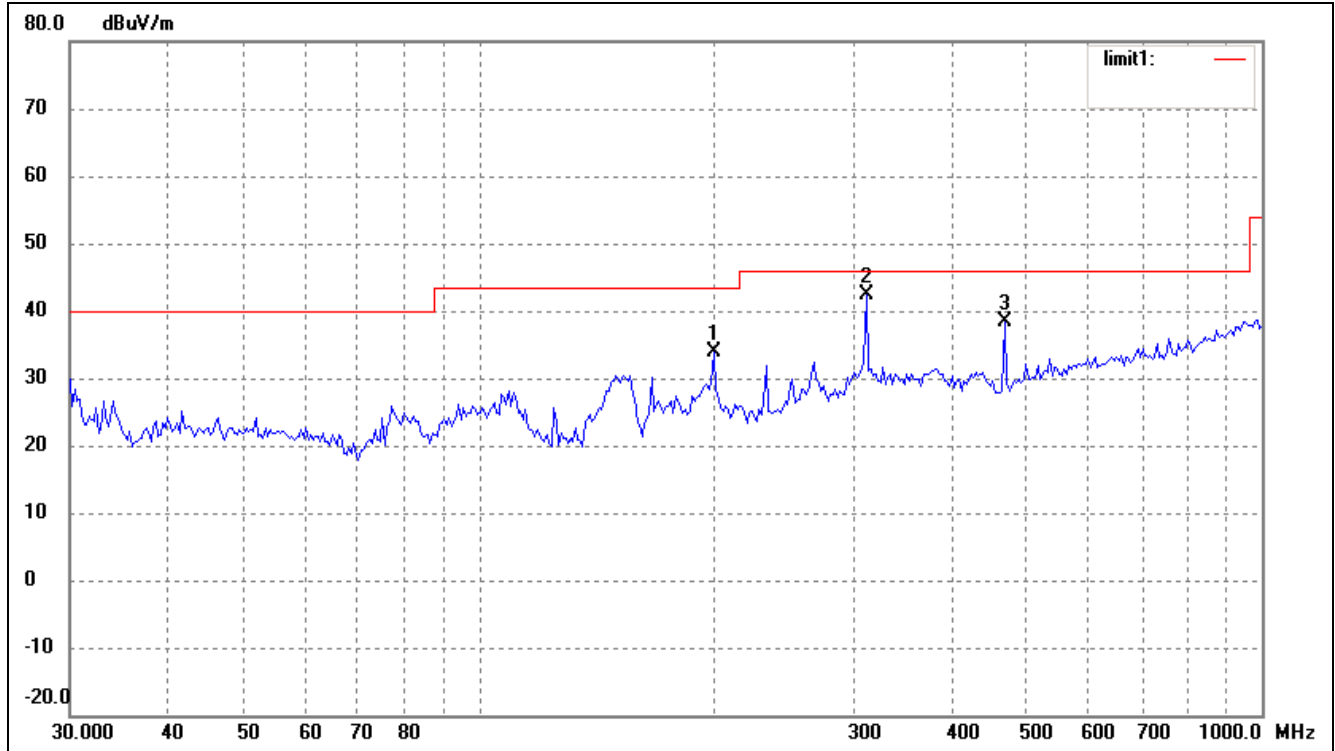
Plot of Radiation Emissions Test Data*Radiated Disturbance**EUT: Wireless N300 Router**M/N: ENHWI-2AN42**Operating Condition: Running with Program**Test Specification: Horizontal & Vertical**Comment: with 5dBi antenna***Horizontal**

No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	124.5690	32.05	5.32	37.37	43.50	-6.13	58	100	peak
2	151.5972	33.75	4.15	37.90	43.50	-5.60	74	100	peak
3	215.2678	30.81	7.12	37.93	43.50	-5.57	166	100	peak
4	249.4250	33.31	8.68	41.99	46.00	-4.01	44	100	peak
5	312.1794	32.92	9.90	42.82	46.00	-3.18	26	100	peak

Vertical

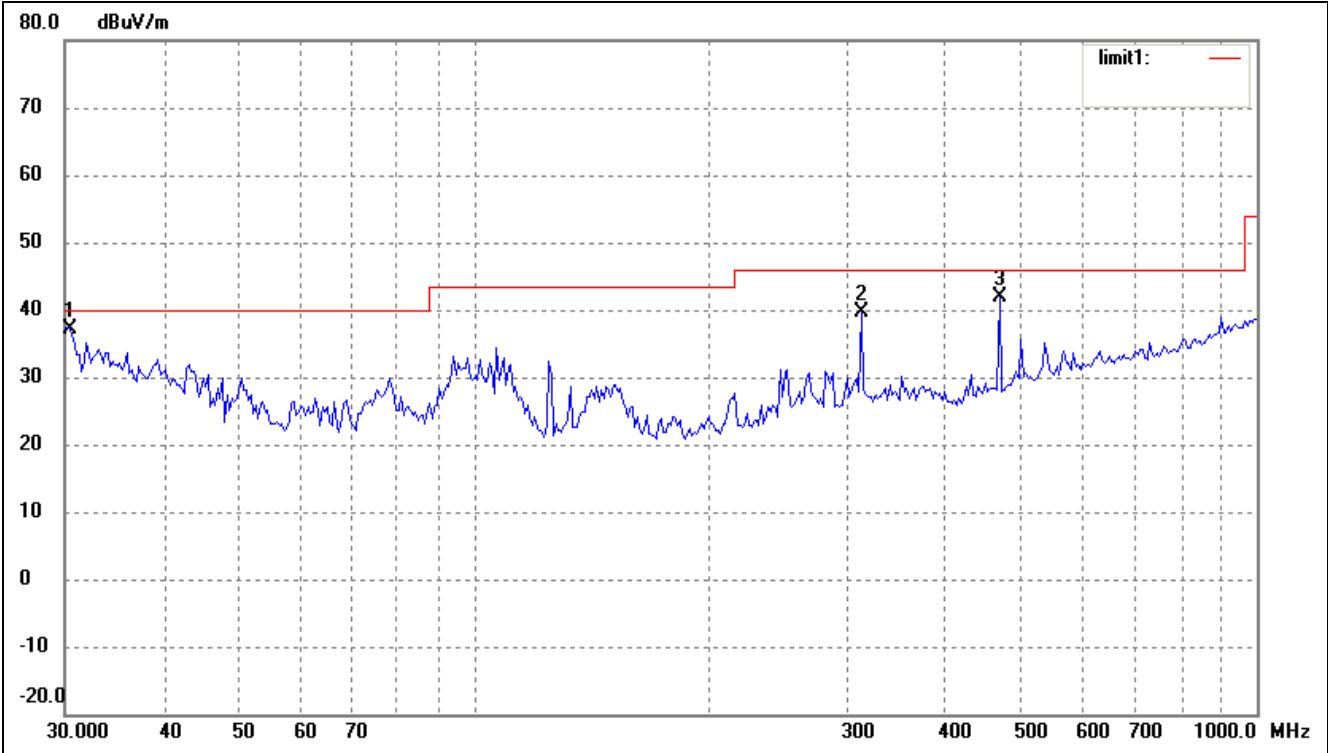


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	70.5836	32.12	3.52	35.64	40.00	-4.36	306	100	peak
2	96.0986	26.39	8.14	34.53	43.50	-8.97	44	100	peak
3	155.9101	31.26	4.35	35.61	43.50	-7.89	57	100	peak
4	312.1794	30.39	9.90	40.29	46.00	-5.71	11	100	peak
5	468.8762	30.78	12.06	42.84	46.00	-3.16	61	100	peak

Plot of Radiation Emissions Test Data*Radiated Disturbance**EUT: Wireless N300 Router**M/N: ENHWI-2AN42**Operating Condition: Running with Program**Test Specification: Horizontal & Vertical**Comment: with 2dBi antenna**Horizontal*

No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	199.2855	27.29	6.58	33.87	43.50	-9.63	25	100	peak
2	312.1794	32.58	9.90	42.48	46.00	-3.52	68	100	peak
3	468.8762	26.20	12.06	38.26	46.00	-7.74	77	100	peak

Vertical



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