

# FCC Part 15.109

## Measurement and Test Report

For

**SHENZHEN TENDA TECHNOLOGY CO., LTD.**

**3F, MOSO INDUSTRIAL BUILDING, NO. 1031, LIMING ROAD XILI TOWN,**

**NANSHAN DISTRICT, SHENZHEN, CHINA**

**FCC ID: V7TW322U**

<b>Report Concerns:</b> Original Report	<b>Equipment Type:</b> Wireless-N USB Adapter
<b>Model:</b>	<u>W322U</u>
<b>Report No.:</b>	<u>STR09088029E-3</u>
<b>Test/Witness Engineer:</b>	<u>Susan Su</u>
<b>Test Date:</b>	<u>2009-08-07 to 2009-08-13</u>
<b>Issue Date:</b>	<u>2009-08-19</u>
<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)
<b>Approved &amp; Authorized By:</b>	 _____ Jandy So / PSQ Manager

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: SHENZHEN TENDA TECHNOLOGY CO., LTD.  
Address of applicant: 3F, MOSO INDUSTRIAL BUILDING, NO. 1031, LIMING ROAD XILI TOWN, NANSHAN DISTRICT, SHENZHEN, CHINA

Manufacturer: SHENZHEN TENDA TECHNOLOGY CO., LTD.  
Address of manufacturer: 3F, MOSO INDUSTRIAL BUILDING, NO. 1031, LIMING ROAD XILI TOWN, NANSHAN DISTRICT, SHENZHEN, CHINA

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

Items	Description
EUT Description:	Wireless-N USB Adapter
Trade Name:	Tenda
Model No.:	W322U
Rated Voltage:	USB 5V
Rated Current:	/
Size:	6.4x1.9x0.1 cm

*The test data is gathered from a production sample, provided by the manufacturer.*

### 1.2 Test Standards

The following report is prepared on behalf of the SHENZHEN TENDA TECHNOLOGY CO., LTD. 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 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 susceptibility against the tested phenomena. The test modes were adapted 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.: 7673A.

### 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
/	/	/	/

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  $\pm 1.5$  dB.

#### 3.2 Test Equipment List and Details

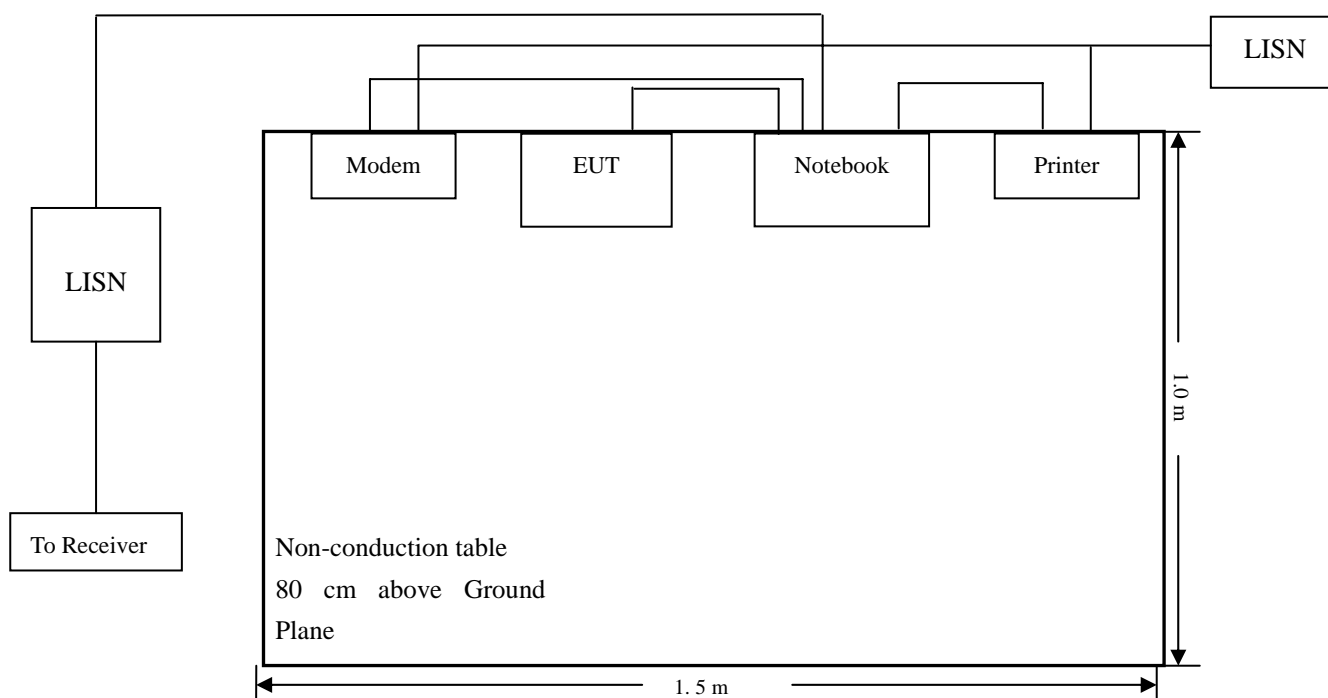
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2009-07-08	2010-07-07
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2009-07-08	2010-07-07
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2009-07-08	2010-07-07
AMN	Rohde & Schwarz	ESH3-Z5	828304/014	2009-07-08	2010-07-07

**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:

**-8.58 dB $\mu$ V at 0.154 MHz in the Neutral, Peak detector, 0.15-30MHz**

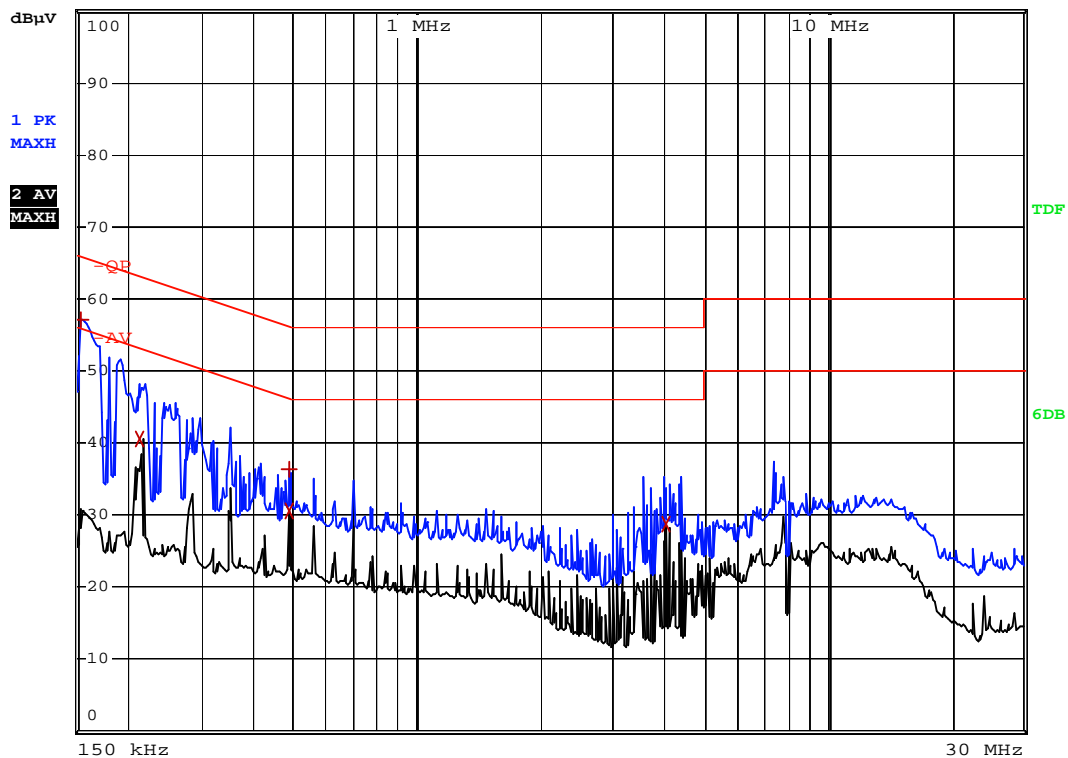
### 3.7 Conducted Emissions Test Data

LINE CONDUCTED EMISSIONS				FCC 15.107	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dB $\mu$ V	QP/Ave/Pk	Line/Neutral	dB $\mu$ V	dB
0.154	57.19	Pk	Neutral	65.77	-8.58
0.210	44.18	Ave	Line	53.20	-9.02
0.158	56.05	Pk	Line	65.55	-9.50
0.214	40.60	Ave	Neutral	53.04	-12.44
0.490	30.46	Ave	Neutral	46.16	-15.70
4.062	28.65	Ave	Neutral	45.99	-17.34
0.702	28.21	Ave	Line	45.99	-17.78
4.130	27.10	Ave	Line	45.99	-18.89
0.418	38.48	Pk	Line	57.48	-19.00
0.490	36.37	Pk	Neutral	56.15	-19.78
4.130	36.05	Pk	Line	55.99	-19.94
7.786	30.05	Ave	Line	49.99	-19.95

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

**Plot of Conducted Emissions Test Data***Conducted Disturbance**EUT: Wireless-N USB Adapter**M/N: W322U**Operating Condition: Ruuning with Program**Test Specification: N**Comment: 120V/60Hz; USB 5V*RBW 9 kHz  
MT 5 ms

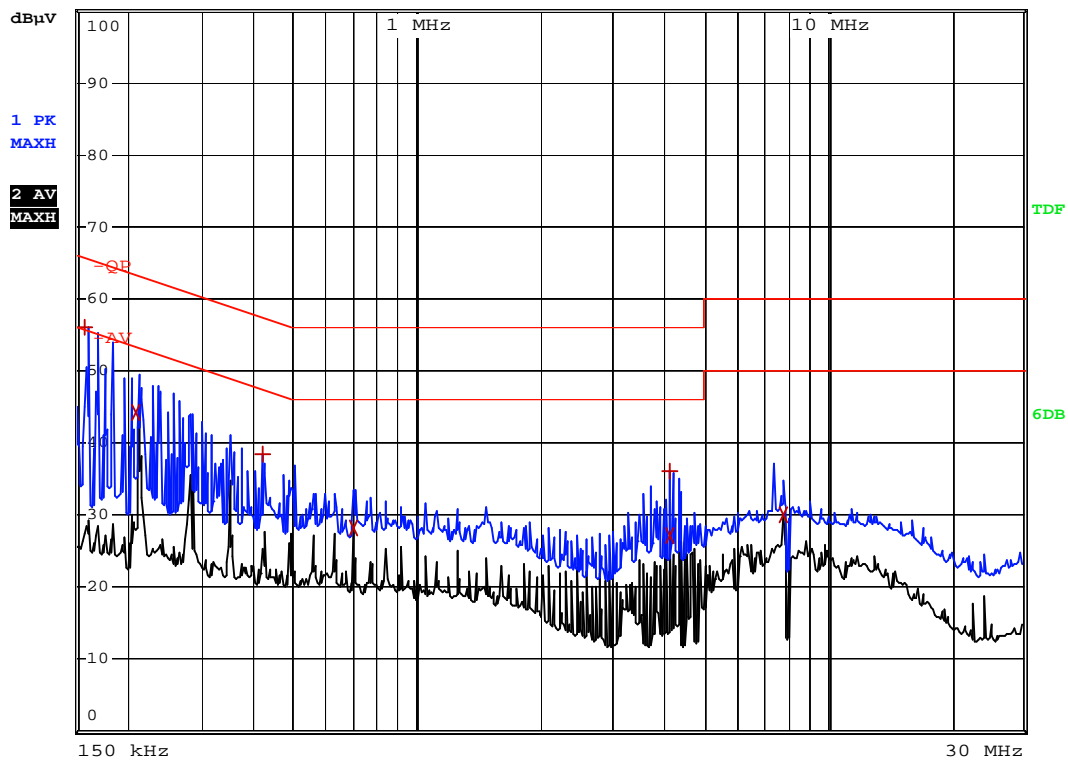
Att 10 dB AUTO





**Plot of Conducted Emissions Test Data***Conducted Disturbance**EUT: Wireless-N USB Adapter**M/N: W322U**Operating Condition: Ruuning with Program**Test Specification: L**Comment: 120V/60Hz; USB 5V*RBW 9 kHz  
MT 5 ms

Att 10 dB AUTO



## 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  $\pm 3.0$  dB.

### 4.2 Test Equipment List and Details

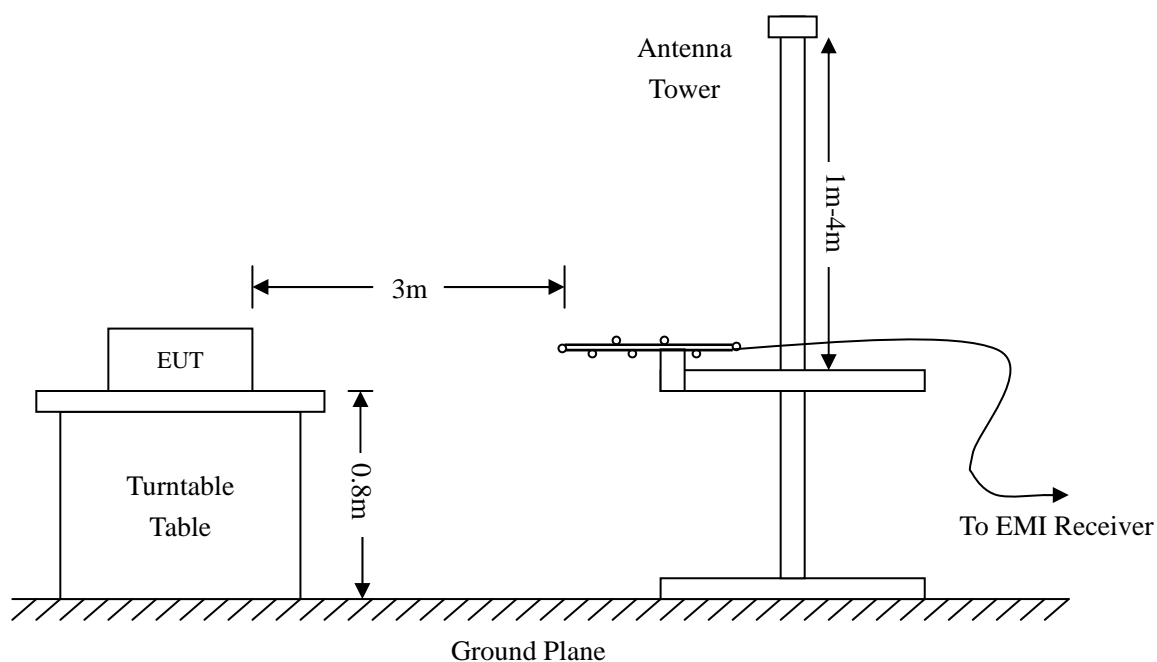
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	ROHDE&SCHWARZ	FSEA20	DE25181	2009-07-08	2010-07-07
Positioning Controller	C&C	CC-C-1F	N/A	2009-07-08	2010-07-07
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2009-07-08	2010-07-07
Horn Antenna	SCHWARZBECK	BBHX 9120	9120-426	2009-07-08	2010-07-07
RF Switch	EM	EMSW18	SW060023	2009-07-08	2010-07-07
Amplifier	Agilent	8447F	3113A06717	2009-07-08	2010-07-07
Coaxial Cable	SCHWARZBECK	AK9513	9513-10	2009-07-08	2010-07-07
EMI Test Receiver	ROHDE&SCHWARZ	ESPI	25498514	2009-07-08	2010-07-07

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

Start Frequency ..... 30 MHz  
 Stop Frequency..... 1000 MHz  
 Sweep Speed ..... Auto  
 IF Bandwidth..... 10 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:

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

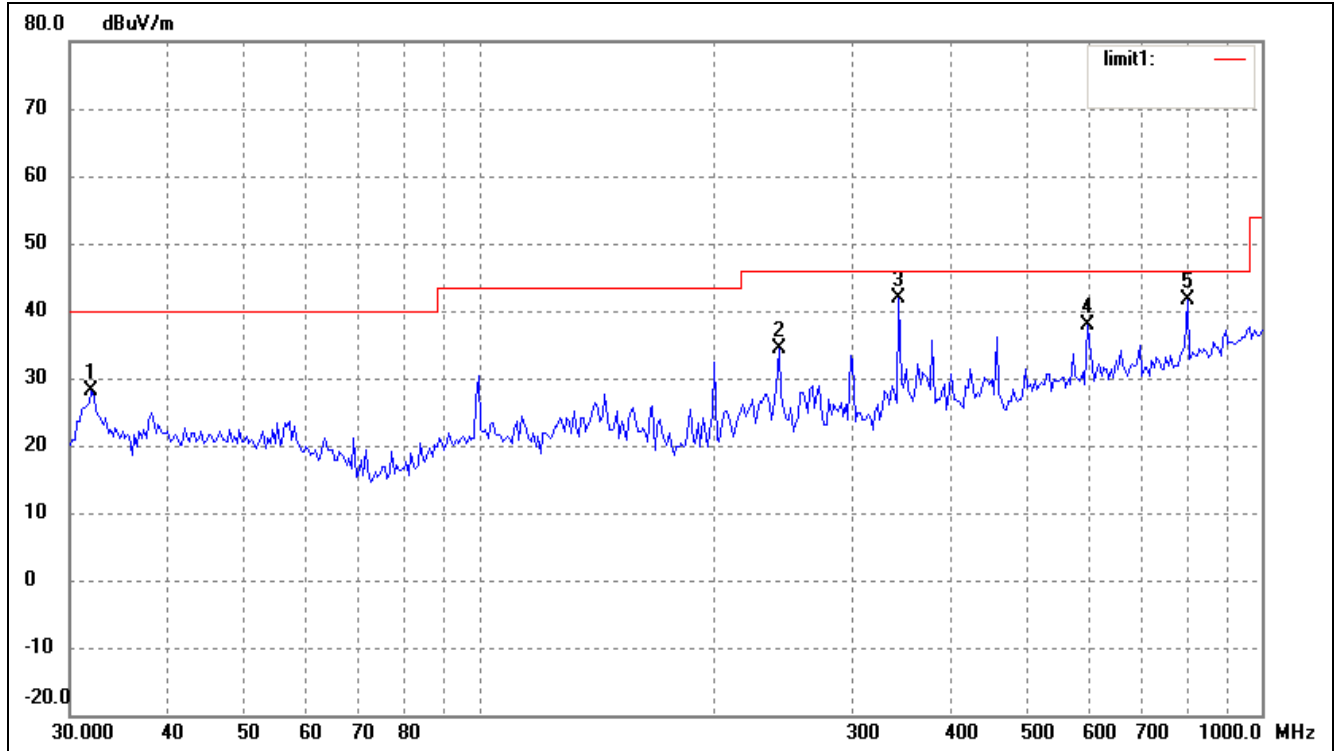
#### 4.6 Environmental Conditions

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

#### 4.7 Summary of Test Results/Plots

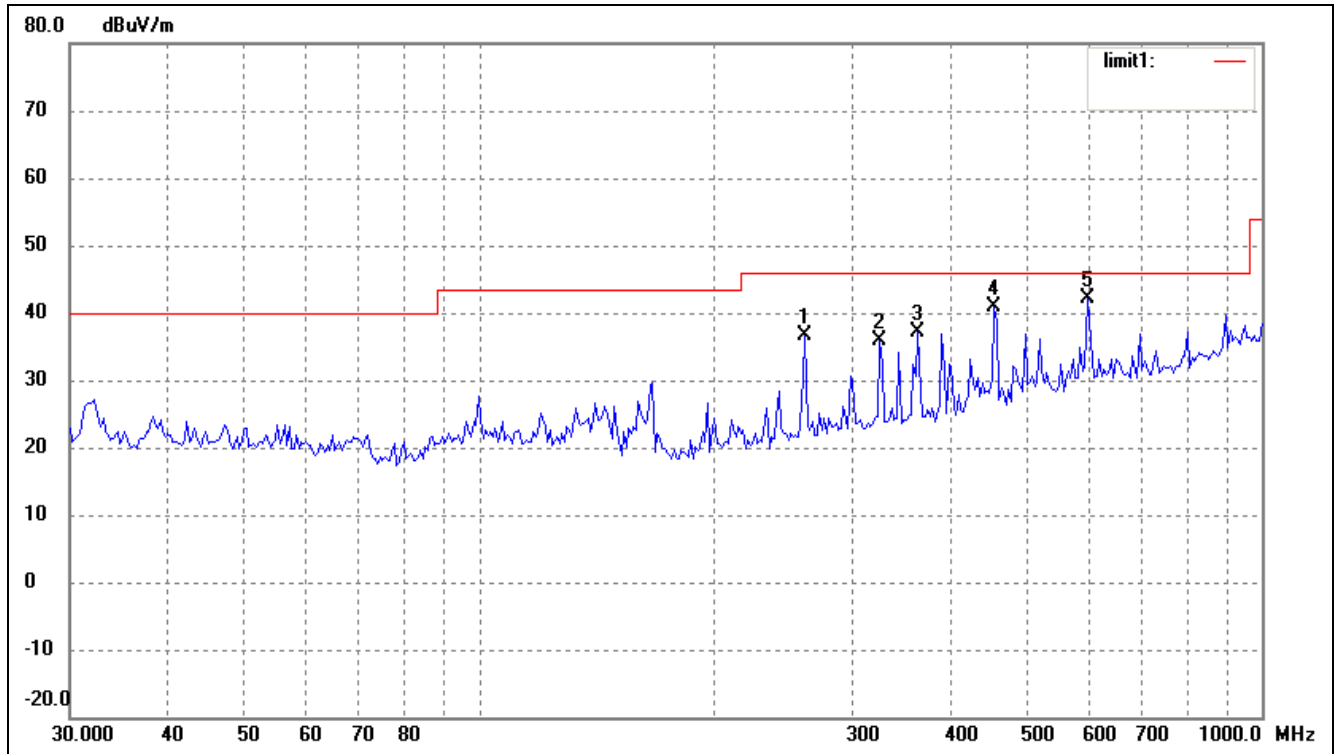
According to the data, the EUT complied with the FCC 15B Class B standards, and had the worst margin of:

**-3.97 dB $\mu$ V at 598.7067 MHz in the Vertical polarization, 30 MHz to 1 GHz, 3Meters**

**Plot of Radiation Emissions Test***Radiated Disturbance**EUT: Wireless-N USB Adapter**M/N: W322U**Operating Condition: Running with Program**Test Specification: Horizontal & Vertical**Comment: 120V/60Hz; USB 5V**Horizontal*

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( ° )	Height (cm)	Remark
1	31.9586	21.57	6.62	28.19	40.00	-11.81	11	100	peak
2	241.8377	26.97	7.49	34.46	46.00	-11.54	156	100	peak
3	343.6506	32.55	9.31	41.86	46.00	-4.14	307	100	QP
4	598.7067	22.88	14.99	37.87	46.00	-8.13	41	100	peak
5	804.2523	24.60	17.13	41.73	46.00	-4.27	51	100	QP

Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( ° )	Height (cm)	Remark
1	261.2730	28.73	7.95	36.68	46.00	-9.32	55	100	peak
2	324.8645	27.04	8.92	35.96	46.00	-10.04	125	100	peak
3	363.5231	27.47	9.70	37.17	46.00	-8.83	135	100	peak
4	455.1888	30.47	10.45	40.92	46.00	-5.08	41	100	QP
5	598.7067	27.04	14.99	42.03	46.00	-3.97	201	100	QP

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