FCC PART 15B

MEASUREMENT AND TEST REPORT

FOR

AsiaRF Ltd.

1F., No.2, Lane45, Shuiyuan Street., Yonghe City, Taipei County 234, Taiwan

FCC ID: TKZAWUHN2405

Report Concerns: Original Report	**Equipment Type:** WiFi USB Dongle
Model:	AWUHN2405
Report No.:	STR10128231I-2
Test Date:	2010-12-29 to 2011-01-11
Issue Date:	2011-01-13
Tested By:	Seven Song / Engineer
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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant:	AsiaRF Ltd.
Address of applicant:	1F., No.2, Lane45, Shuiyuan Street., Yonghe City, Taipei County 234, Taiwan
Manufacturer:	AsiaRF Ltd.
Address of manufacturer:	1F., No.2, Lane45, Shuiyuan Street., Yonghe City, Taipei County 234, Taiwan

General Description of E.U.T

Items	Description
EUT Description:	WiFi USB Dongle
Trade Name:	/
Model No.:	AWUHN2405
Rated Voltage:	DC 5V USB
Rated Current:	/
Size:	25.2X3.5X0.9cm
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.

1.2 Test Standards

The following report is prepared on behalf of the AsiaRF 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 15.107, 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
Notebook	ASUS	X50R	74NOAS297138
/	/	/	/

1.7 EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
USB Cable	4.0	Shielded	With 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.

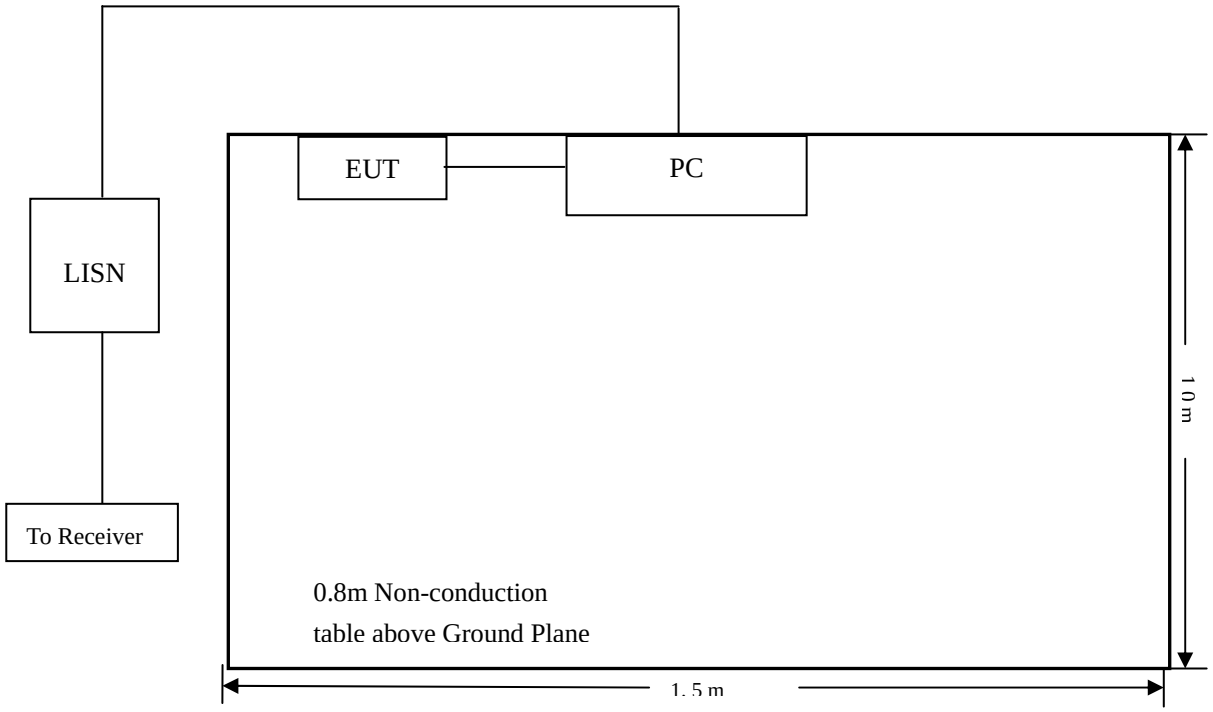
3.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2010-08-12	2011-08-11
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2010-08-12	2011-08-11
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2010-08-12	2011-08-11

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 15B Conducted margin for a Class B device, with the *worst* margin reading of:

-2.4 dBμV at 0.19 MHz in the **Line** mode**, Pk** detector, **0.15-30MHz**

3.8 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
0.190	61.67	Pk	Line	64.04	-2.4
0.190	49.66	Ave	Line	54.04	-4.4
11.330	44.03	Ave	Line	50.00	-6.0
0.190	47.15	Ave	Neutral	54.04	-6.9
4.526	48.24	Pk	Line	56.00	-7.8
0.178	56.30	Pk	Neutral	64.58	-8.3
12.734	41.59	Ave	Line	50.00	-8.4
11.146	50.49	Pk	Line	60.00	-9.5
0.410	47.17	Pk	Line	57.65	-10.5
14.006	49.42	Pk	Line	60.00	-10.6
4.862	35.10	Ave	Line	46.00	-10.9
0.382	36.86	Ave	Neutral	48.24	-11.4
8.602	48.37	Pk	Neutral	60.00	-11.6
1.006	44.41	Pk	Line	56.00	-11.6
8.360	37.65	Ave	Neutral	50.00	-12.4
13.706	37.64	Ave	Neutral	50.00	-12.4
14.066	47.15	Pk	Neutral	60.00	-12.9
0.378	44.66	Pk	Neutral	58.32	-13.7
0.930	31.88	Ave	Neutral	46.00	-14.1
4.714	39.69	Pk	Neutral	56.00	-16.3
0.926	39.51	Pk	Neutral	56.00	-16.5
2.526	28.95	Ave	Neutral	46.00	-17.1
0.398	24.11	Ave	Line	47.90	-23.8
1.898	21.21	Ave	Line	46.00	-24.8

Plot of Conducted Emissions Test Data

Conducted Disturbance

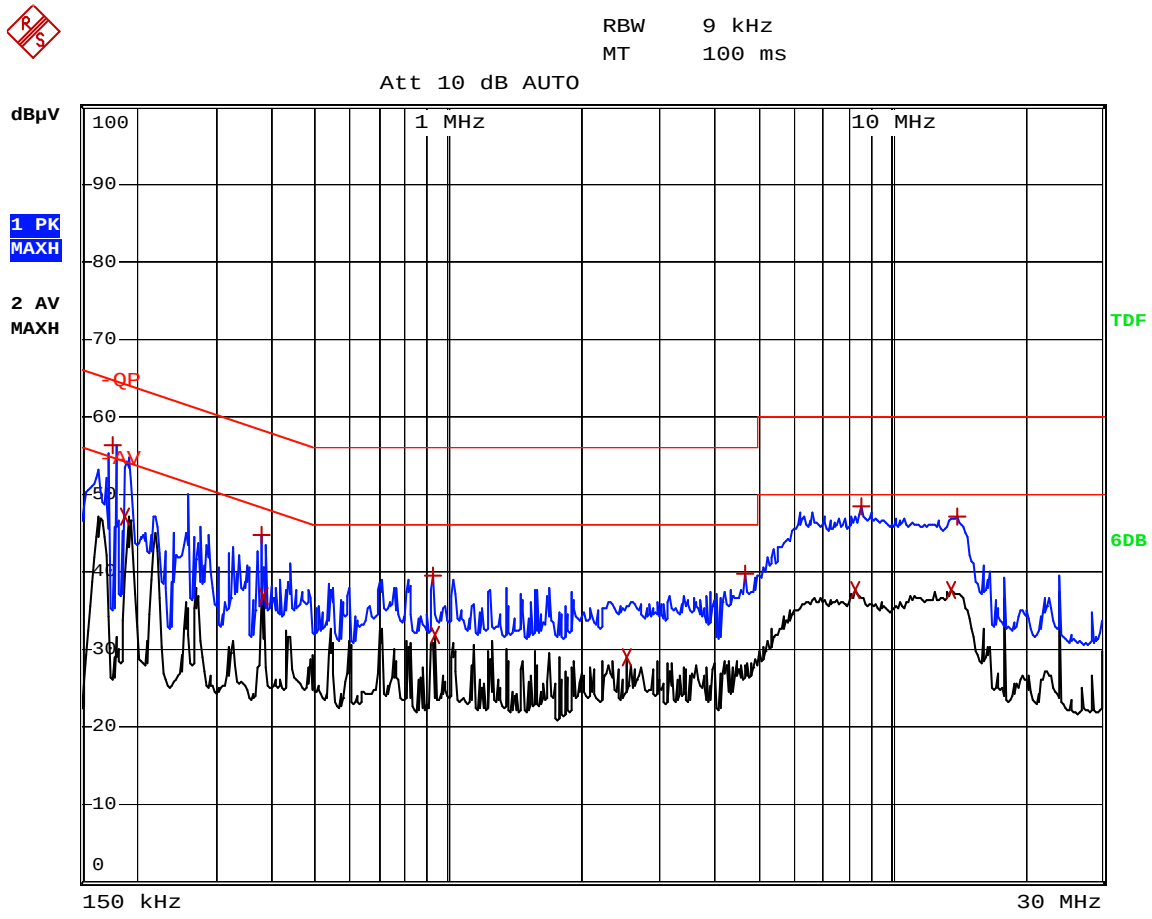
EUT: WiFi USB Dongle

M/N: AWUHN2405

Operating Condition: Transmitting

Test Specification: N

Comment: AC 120V/60Hz Notebook, USB 5V



Plot of Conducted Emissions Test Data

Conducted Disturbance

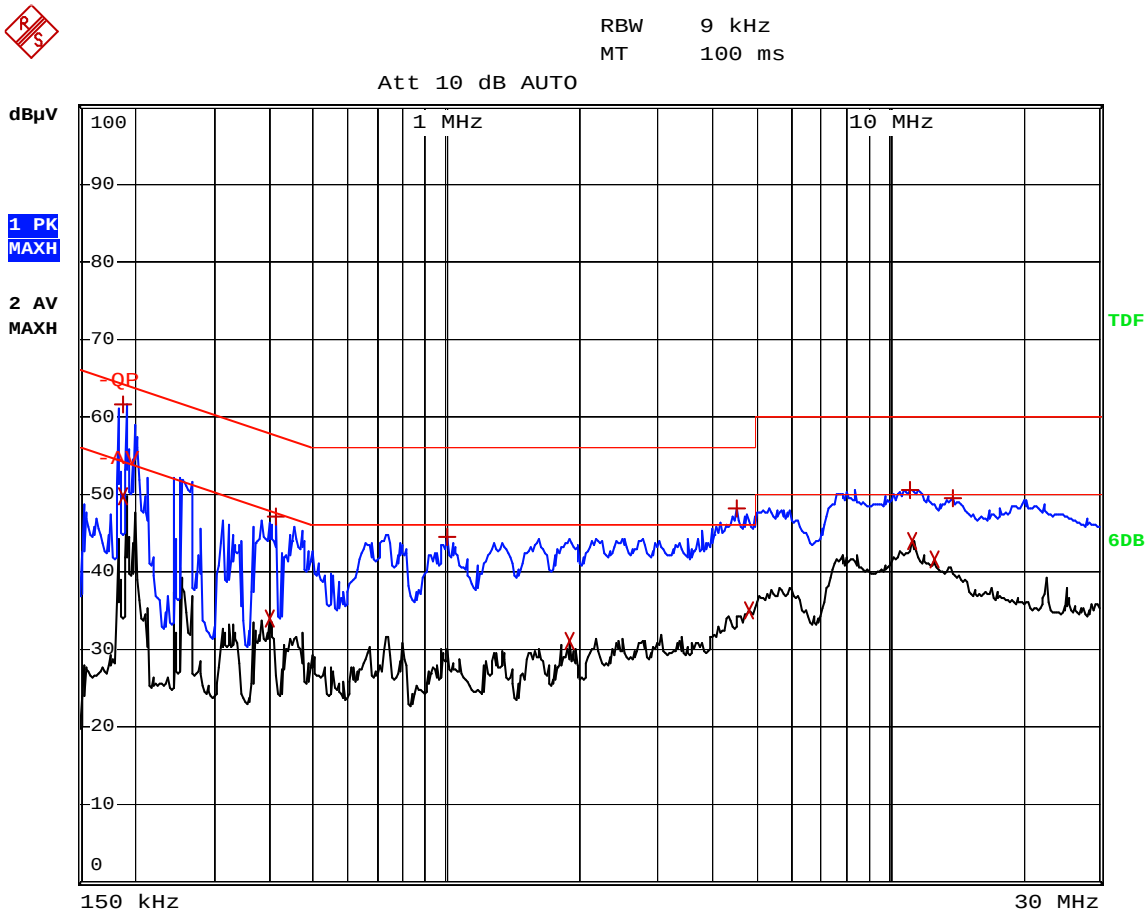
EUT: WiFi USB Dongle

M/N: AWUHN2405

Operating Condition: Transmitting

Test Specification: L

Comment: AC 120V/60Hz Notebook, USB 5V



4. §15.109(a)- RADIATED EMISSION

4.1 Measurement Uncertainty

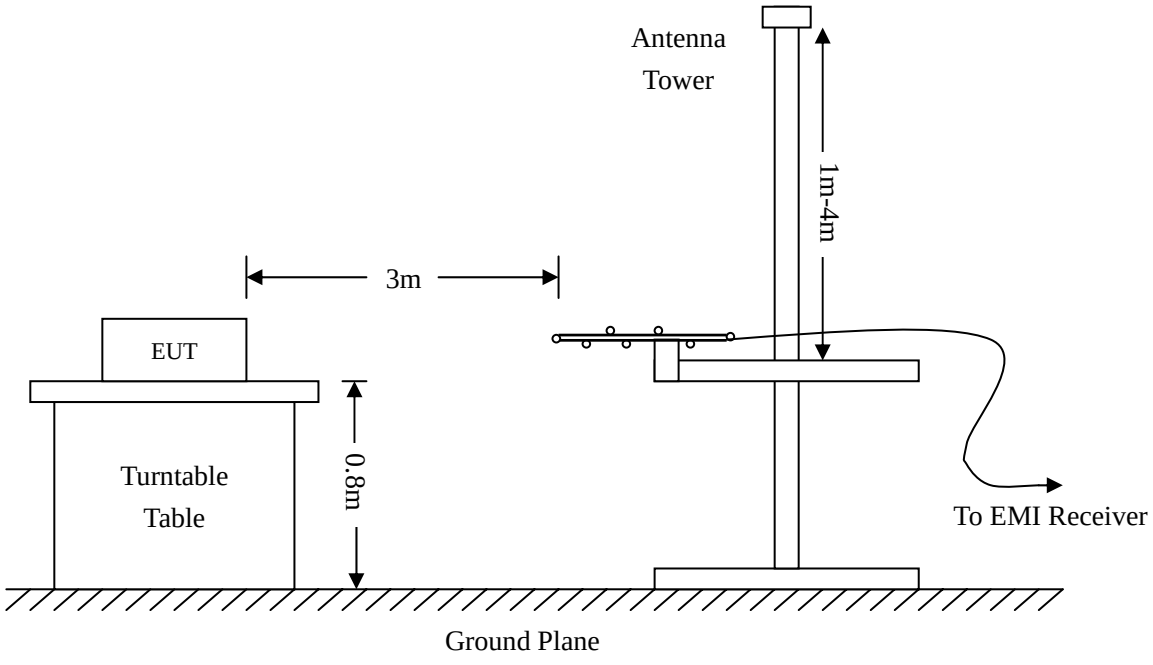
Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any radiation emissions measurement is ± 5.10 dB.

4.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2010-04-16	2011-04-15
EMI Test Receiver	R&S	ESVB	825471/005	2010-08-12	2011-08-11
Positioning Controller	C&C	CC-C-1F	N/A	2010-08-12	2011-08-11
RF Switch	EM	EMSW18	SW060023	2010-08-12	2011-08-11
Pre-amplifier	Agilent	8447F	3113A06717	2010-08-12	2011-08-11
Pre-amplifier	Compliance Direction	PAP-0118	24002	2010-08-12	2011-08-11
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2010-07-21	2011-07-20
Horn Antenna	ETS	3117	00086197	2010-07-21	2011-07-20

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:

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:	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 15B Class B standards, and had the worst margin of:

-3.48 dBμV at **839.1818MHz** in the **Horizontal** polarization, **30 MHz to 1 GHz, 3Meters**

Plot of Radiation Emissions Test Data

Radiated Disturbance

EUT: WiFi USB Dongel

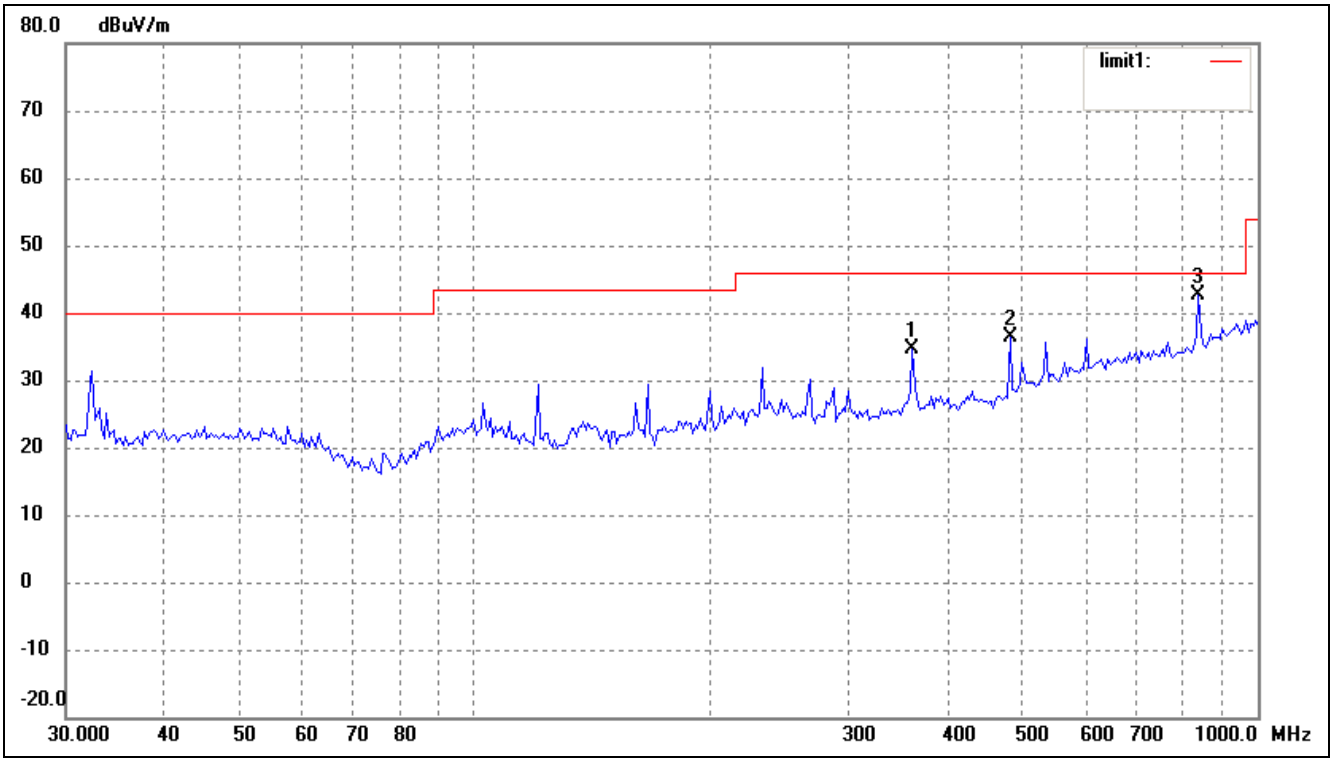
M/N: AWUHN2405

Operating Condition: Transmitting

Test Specification: Horizontal & Vertical

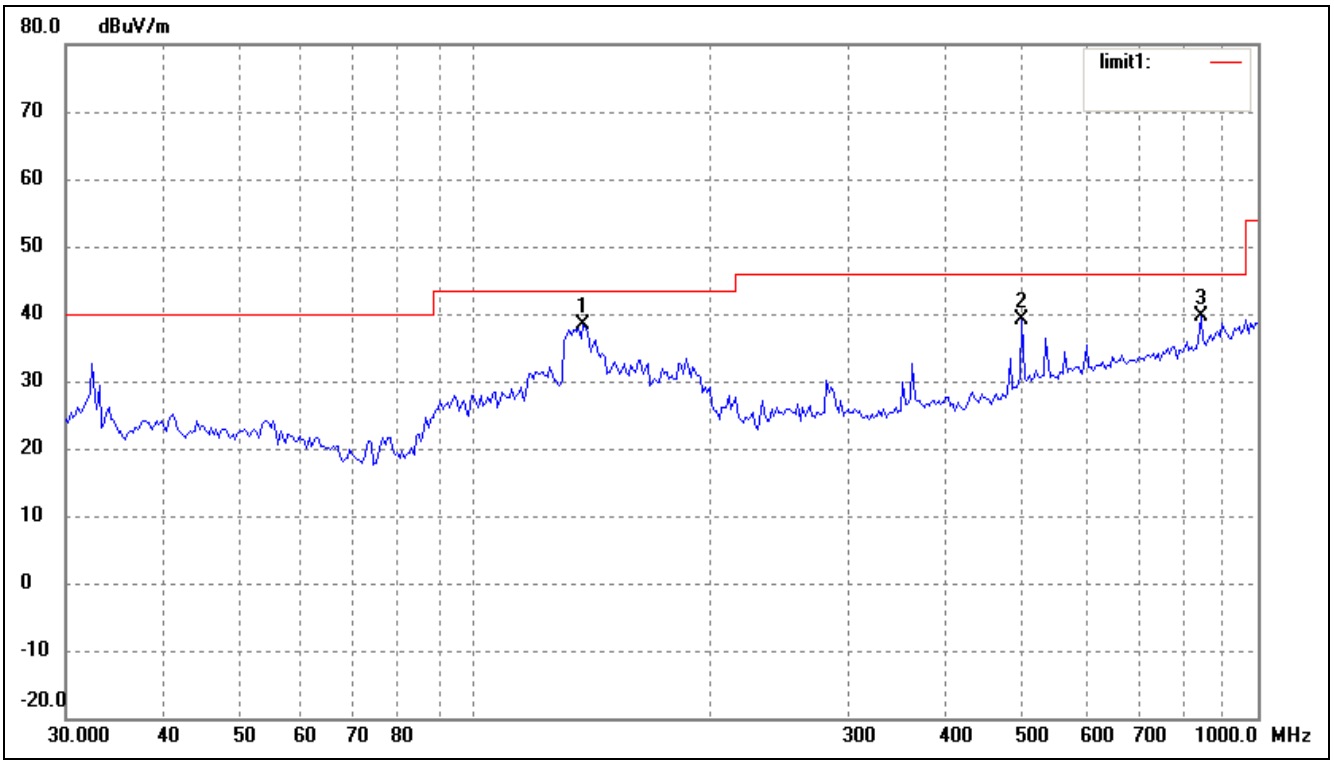
Comment: AC 120V/60Hz connect to PC, USB 5V

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	361.7139	23.60	10.91	34.51	46.00	-11.49	60	100	peak
2	482.2156	23.60	12.67	36.27	46.00	-9.73	360	100	peak
3	839.1818	22.77	19.75	42.52	46.00	-3.48	186	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	137.4202	34.34	4.11	38.45	43.50	-5.05	136	210	QP
2	499.4247	24.86	14.36	39.22	46.00	-6.78	250	132	peak
3	845.0878	19.85	19.86	39.71	46.00	-6.29	100	160	peak

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