

FCC Part 15C

Measurement and Test Report

For

AWOX

93 place Pierre Duhem Montpellier France

FCC ID: A7K-SCW

FCC Rule(s):	<u>FCC Part 15C</u>	
Product Description:	<u>Awox StriimCAST</u>	
Tested Model:	<u>SC-W</u>	
Report No.:	<u>STR14058054I</u>	
Tested Date:	<u>2014-05-06 to 2014-05-22</u>	
Issued Date:	<u>2014-05-22</u>	
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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 Shenzhen SEM.Test Technology Co., Ltd.

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: AWOX
 Address of applicant: 93 place Pierre Duhem Montpellier France
 Manufacturer: SHENZHEN GAEA ELECTRONICS CO., LTD
 Address of manufacturer: 2-3, Datian Xiaoqu, Tongfuyu Industrial Zone,
 Buyong, Shajing Street, Bao'an District, Shenzhen,
 Guangdong Province, China

General Description of EUT	
Product Name:	Awox StriimCAST
Trade Name:	Awox StriimCAST
Model No.:	SC-W
Adding Model(s):	/
Rated Voltage:	DC 5V
Power Adapter Model:	/
<i>Note: The test data is gathered from a production sample provided by the manufacturer.</i>	

Technical Characteristics of EUT	
Support Standards:	802.11b, 802.11g, 802.11n
Frequency Range:	2412-2472MHz
RF Output Power:	9.10dBm (Conducted)
Type of Modulation:	CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM
Data Rate:	1-11Mbps, 6-54Mbps, up to 150Mbps
Quantity of Channels:	13
Channel Separation:	5MHz
Type of Antenna:	PCB
Antenna Gain:	0dBi
Lowest Internal Frequency	24MHz

1.2 Test Standards

The following report is prepared on behalf of the AWOX 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 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 public notice KDB 558074 D01 V03 for digital transmission systems shall be performed also.

1.4 Test Facility

FCC – Registration No.: 934118

Shenzhen SEM.Test Technology 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 934118.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Shenzhen SEM.Test Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

CNAS Registration No.: L4062

Shenzhen SEM.Test Technology 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 1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road, Bao'an District, Shenzhen, P.R.C (518101).

1.5 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, and to measure its highest possible emissions level, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	802.11b	2412MHz, 2442MHz, 2472MHz
TM2	802.11g	2412MHz, 2442MHz, 2472MHz
TM3	802.11n-HT20	2412MHz, 2442MHz, 2472MHz

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
USB Cable	0.91	Unshielded	Without Ferrite
HDMI Cable	0.6	Shielded	Without Ferrite

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
Display	DELL	U2410f	50642P246601H(B) ZL

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§ 2.1093	RF Exposure	Compliant
§ 15.203; § 15.247(b)(4)(i)	Antenna Requirement	Compliant
§ 15.207(a)	Conducted Emission	Compliant
§ 15.247(e)	Power Spectral Density	Compliant
§ 15.247(a)(2)	6 dB Bandwidth	Compliant
§ 15.247(b)(3)	RF Output Power	Compliant
§ 15.209(a)	Radiated Emission	Compliant
§ 15.247(d)	Band Edge (Out of Band Emissions)	Compliant

N/A: not applicable

3. RF Exposure

3.1 Standard Applicable

According to § 1.1307 and § 2.1093, the portable transmitter must comply the RF exposure requirements.

3.2 Test Result

This product complied with the requirement of the RF exposure, please see the RF Exposure Report.

4. Antenna Requirement

4.1 Standard Applicable

According to FCC Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

4.2 Evaluation Information

This product has a integral antenna, fulfill the requirement of this section.

5. Power Spectral Density

5.1 Standard Applicable

According to 15.247(a)(1)(iii), For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

5.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	Agilent	E4402B	US41192821	2014-05-07	2015-05-06
Attenuator	ATTEN	ATS100-4-20	/	2014-05-07	2015-05-06

5.3 Test Procedure

According to the KDB 558074 D01 V03, the test method of power spectral density as below:

1. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set analyzer center frequency to DTS channel center frequency.
3. Set the span to 1.5 times the DTS channel bandwidth.
4. Set the RBW \geq 3 kHz.
5. Set the VBW \geq 3 x RBW.
6. Detector = peak.
7. Sweep time = auto couple.
8. Trace mode = max hold.
9. Allow trace to fully stabilize.
10. Use the peak marker function to determine the maximum amplitude level.
11. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

5.4 Environmental Conditions

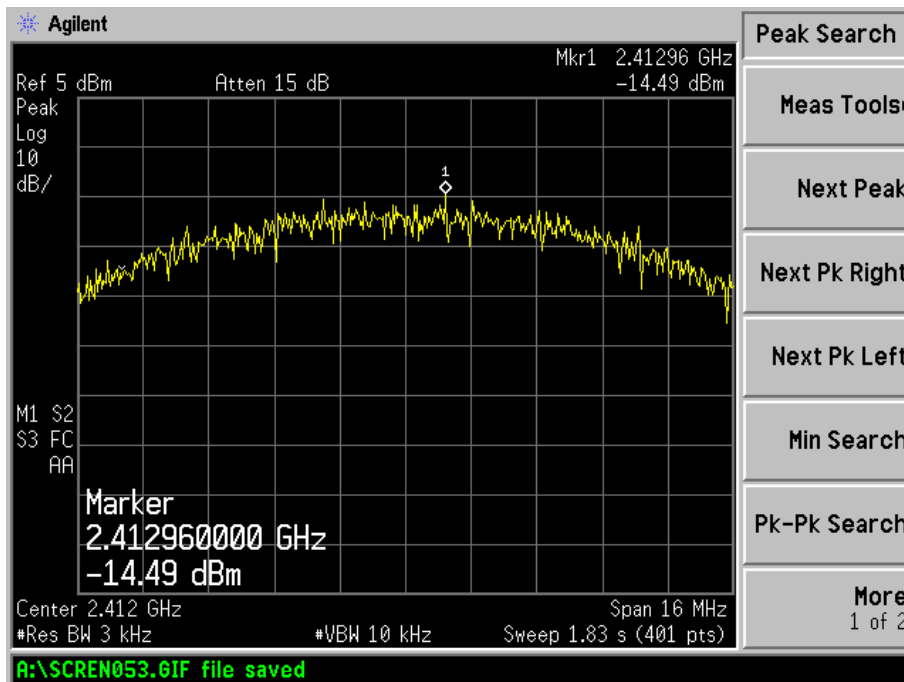
Temperature:	26° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

5.5 Summary of Test Results/Plots

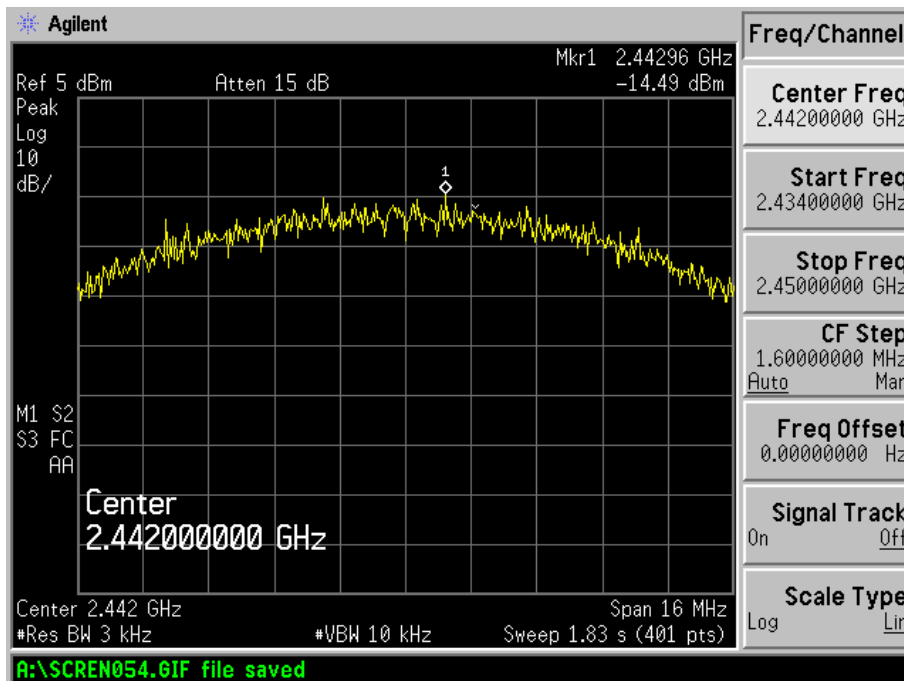
Test Mode	Test Channel MHz	Power Spectral Density dBm/3kHz	Limit dBm/3kHz
802.11b	2412	-14.49	8
	2442	-14.49	8
	2472	-15.65	8
802.11g	2412	-23.43	8
	2442	-23.34	8
	2472	-23.47	8
802.11n HT20	2412	-22.24	8
	2442	-22.91	8
	2472	-22.81	8

Please refer to the following test plots:

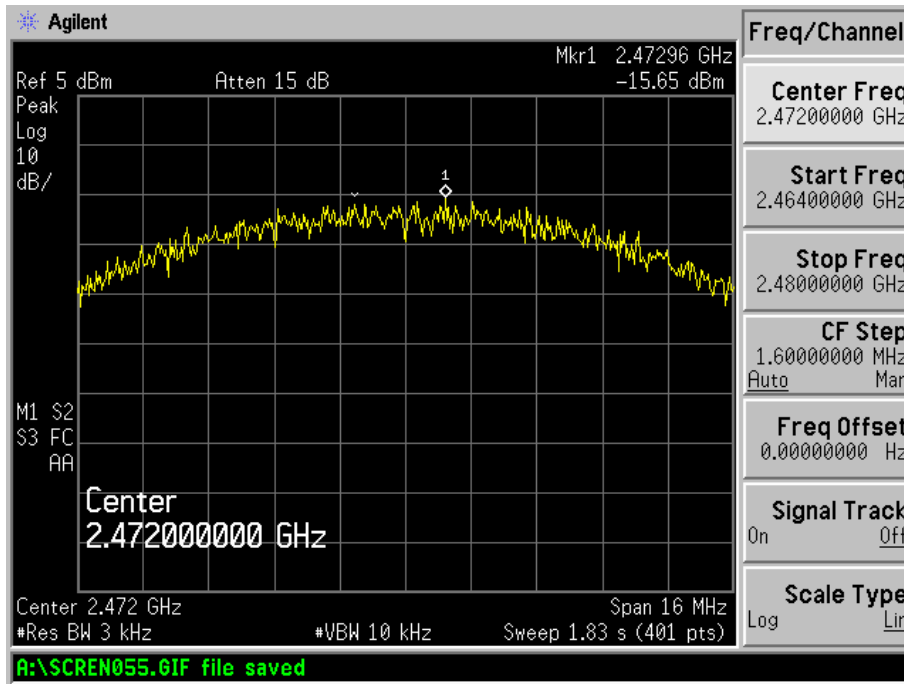
802.11b-Low Channel



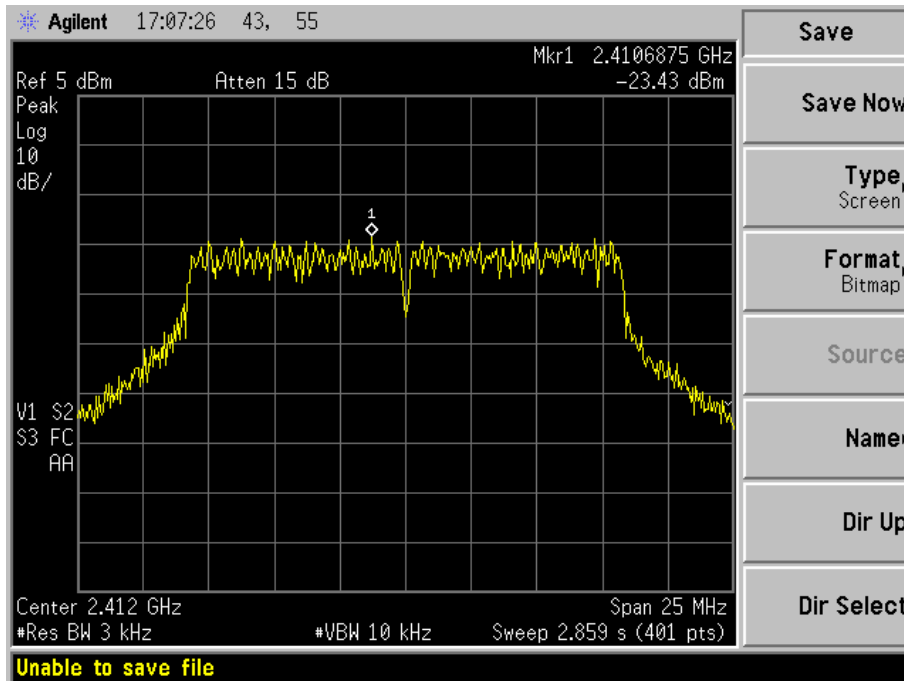
802.11b-Middle Channel



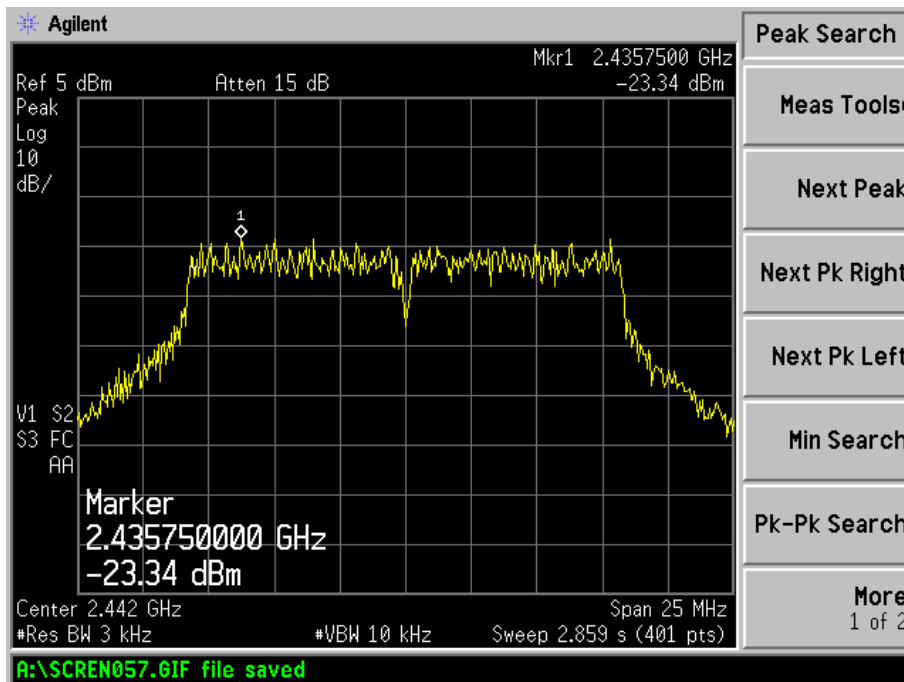
802.11b-High Channel



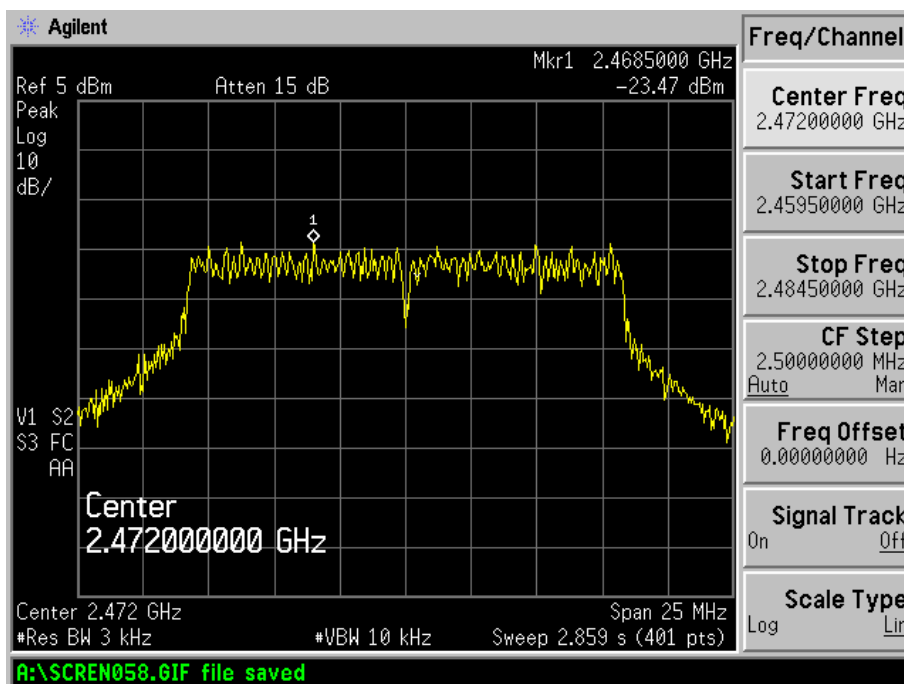
802.11g-Low Channel



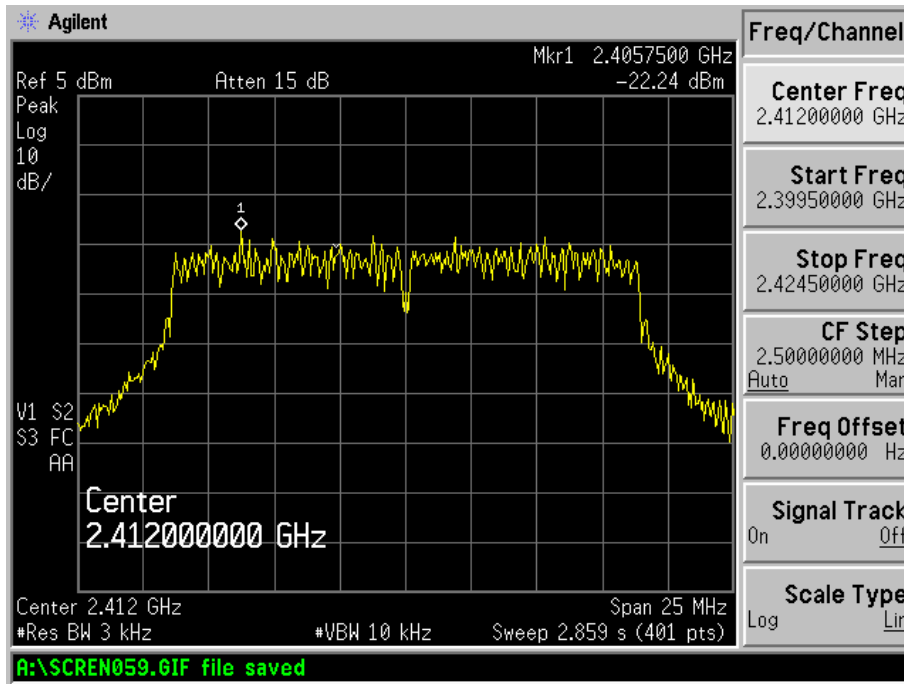
802.11g-Middle Channel



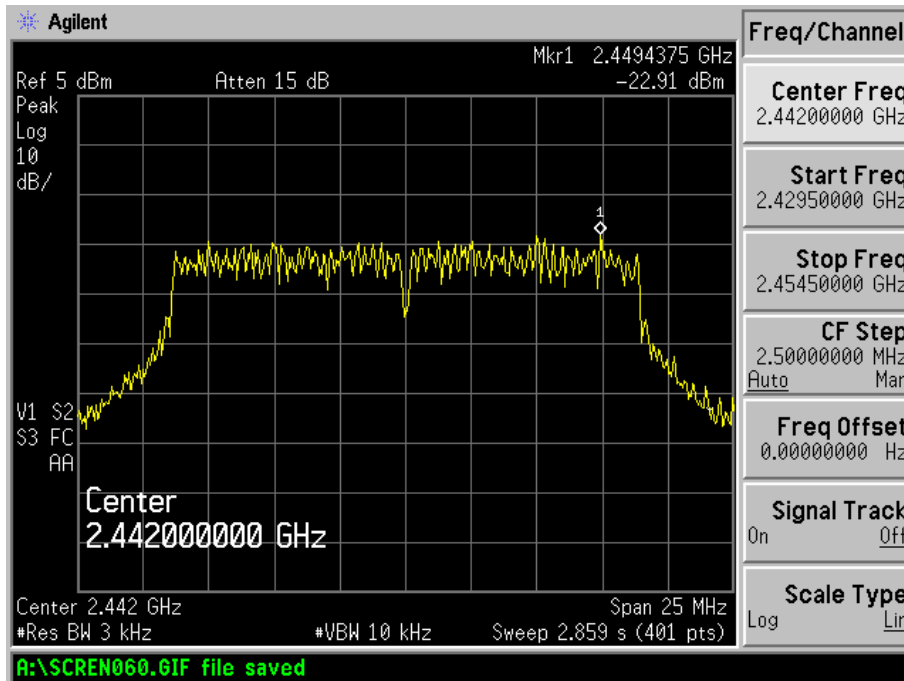
802.11g-High Channel



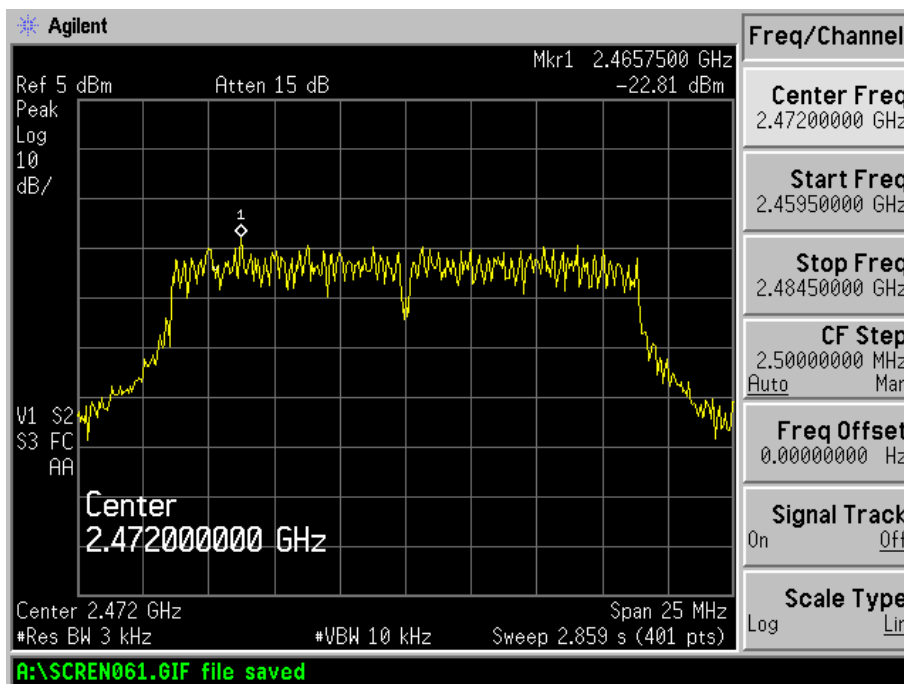
802.11n-HT20-Low Channel



802.11n-HT20-Middle Channel



802.11n-HT20-High Channel



6. 6dB Bandwidth

6.1 Standard Applicable

According to 15.247(a)(2). Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

6.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	Agilent	E4402B	US41192821	2014-05-07	2015-05-06
Attenuator	ATTEN	ATS100-4-20	/	2014-05-07	2015-05-06

6.3 Test Procedure

1. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set resolution bandwidth (RBW) = 1-5% or DTS BW, not to exceed 100 kHz.
3. Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Sweep = auto couple.
7. Allow the trace to stabilize.
8. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission..

6.4 Environmental Conditions

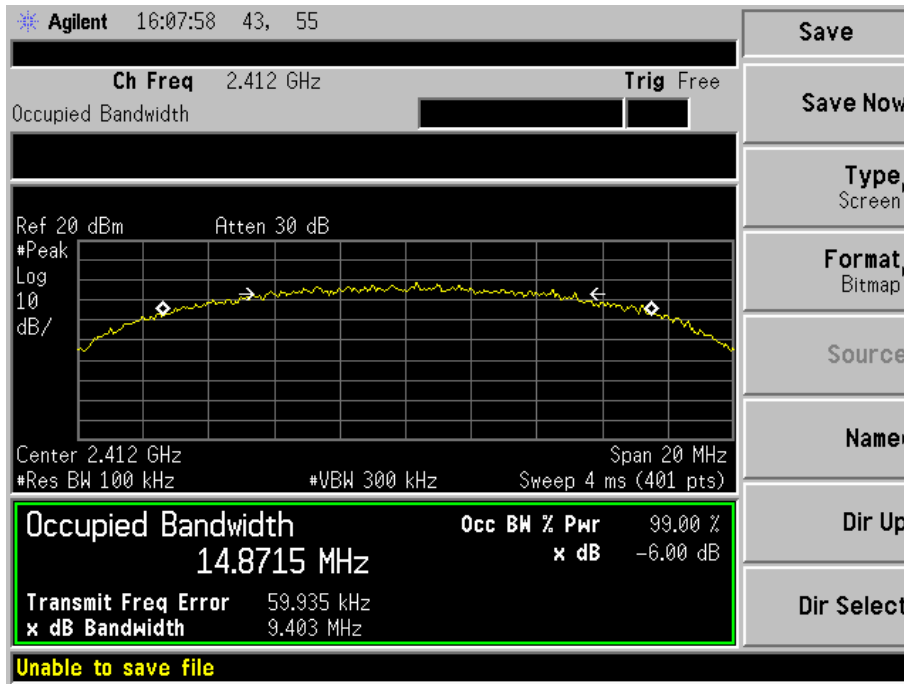
Temperature:	25° C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

6.5 Summary of Test Results/Plots

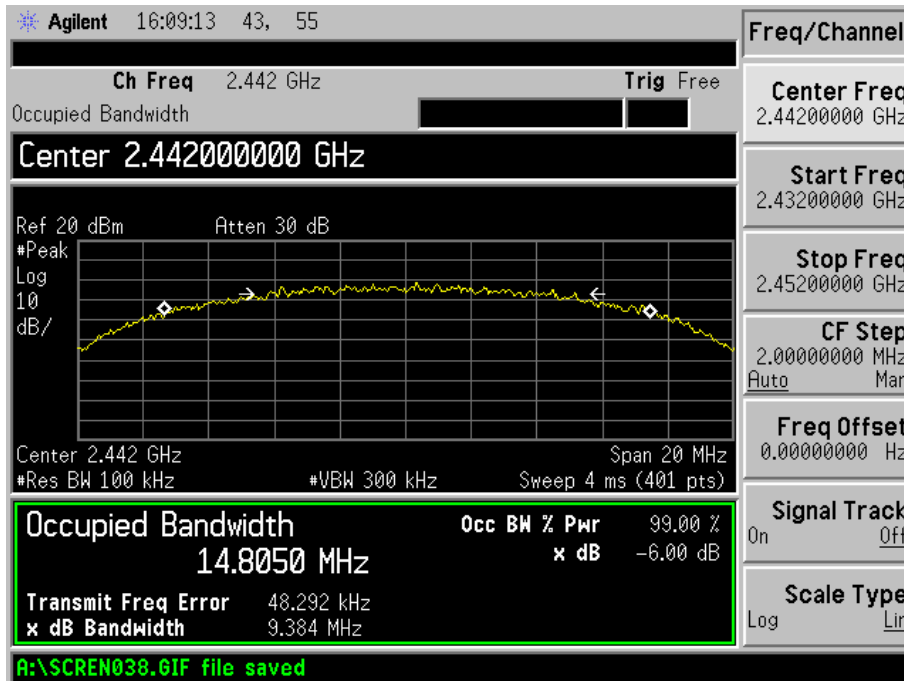
Test Mode	Test Channel MHz	6 dB Bandwidth kHz	99% Bandwidth kHz	Limit kHz
802.11b	2412	9403	14871.5	500
	2442	9384	14805.0	500
	2472	8784	14941.6	500
802.11g	2412	16464	16486.5	500
	2442	16399	16480.7	500
	2472	16394	16469.9	500
802.11n-HT20	2412	17656	17629.1	500
	2442	17657	17663.9	500
	2472	17594	17662.4	500

Please refer to the following test plots:

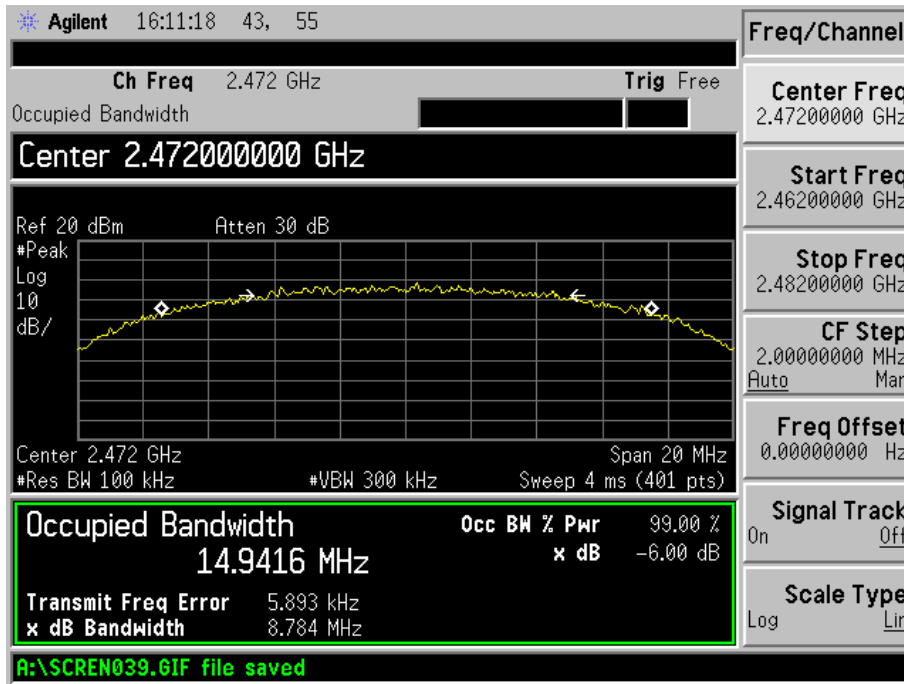
802.11b-Low Channel



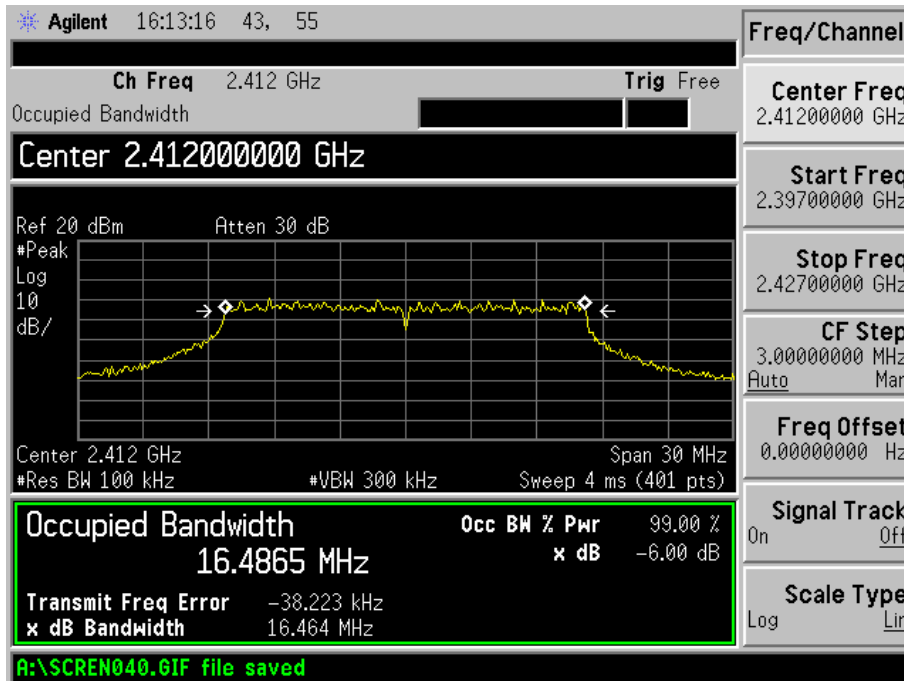
802.11b-Middle Channel



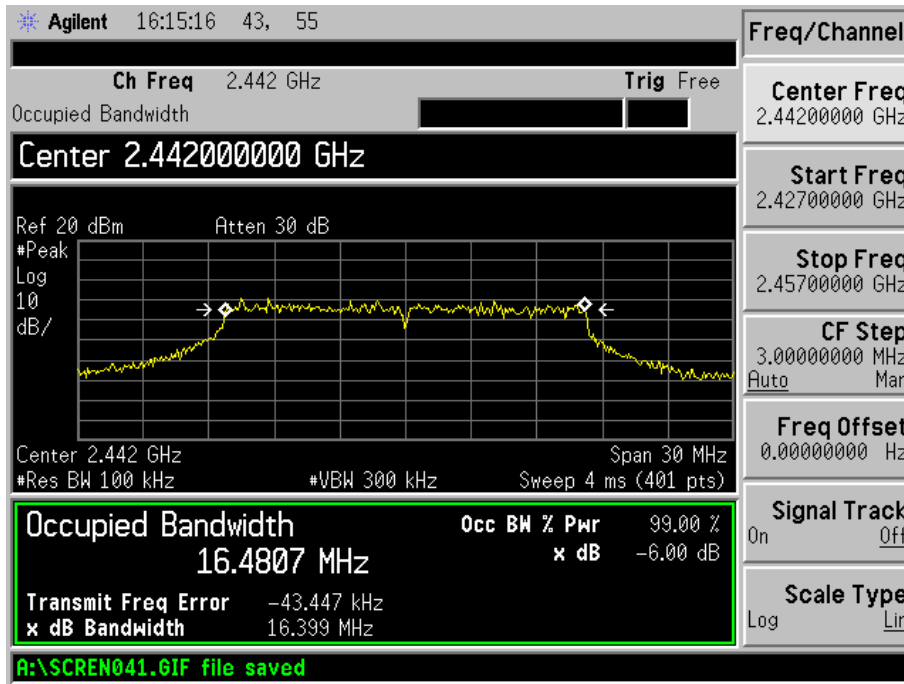
802.11b-High Channel



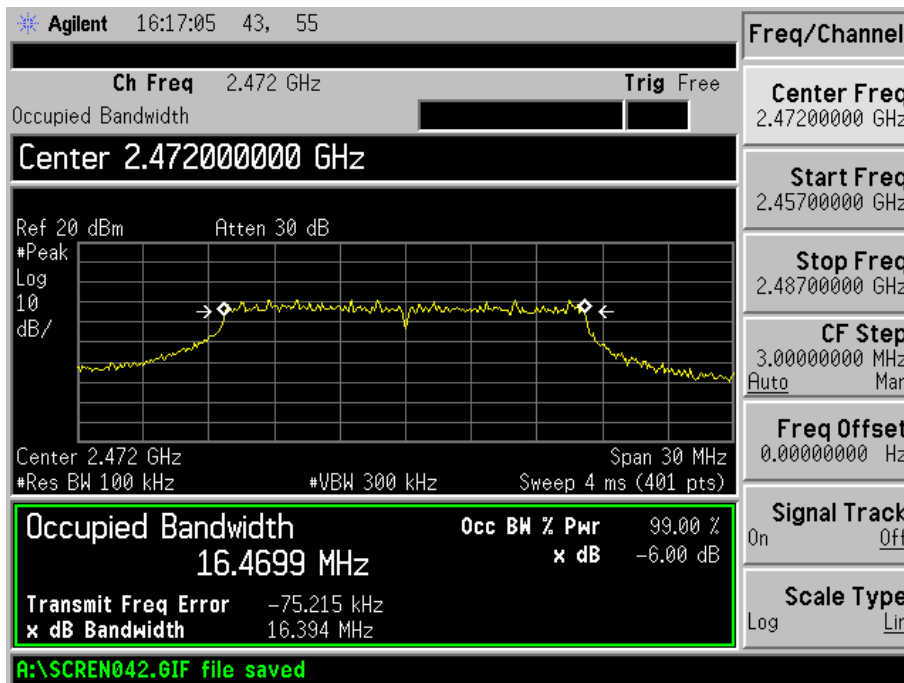
802.11g-Low Channel



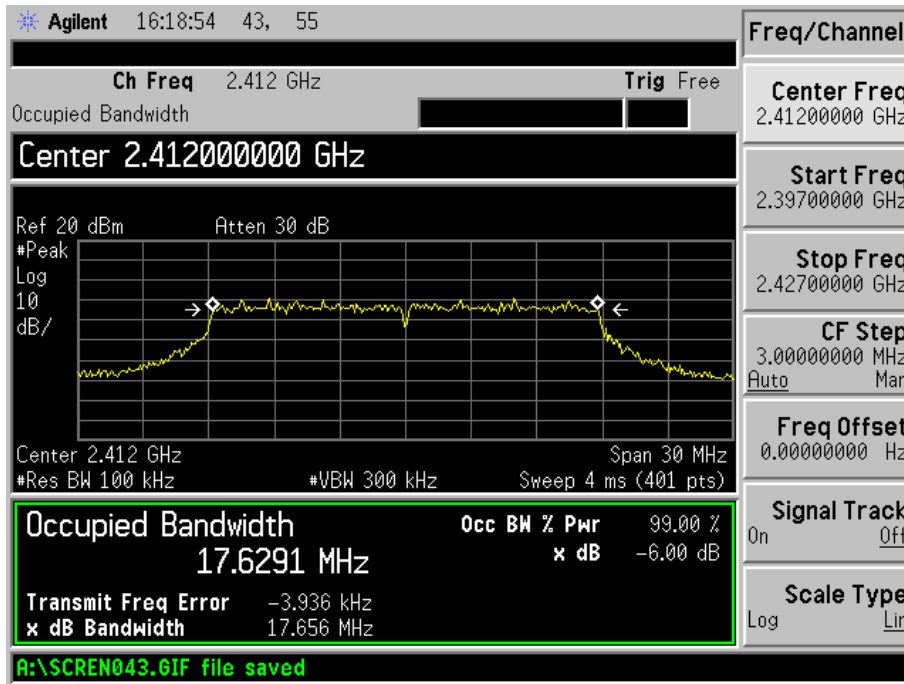
802.11g-Middle Channel



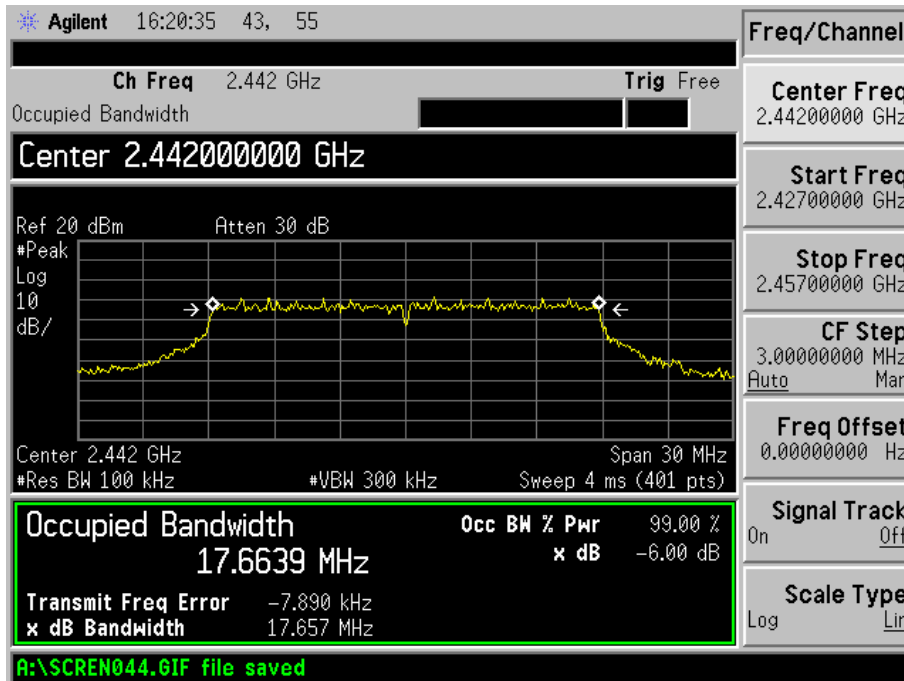
802.11g-High Channel



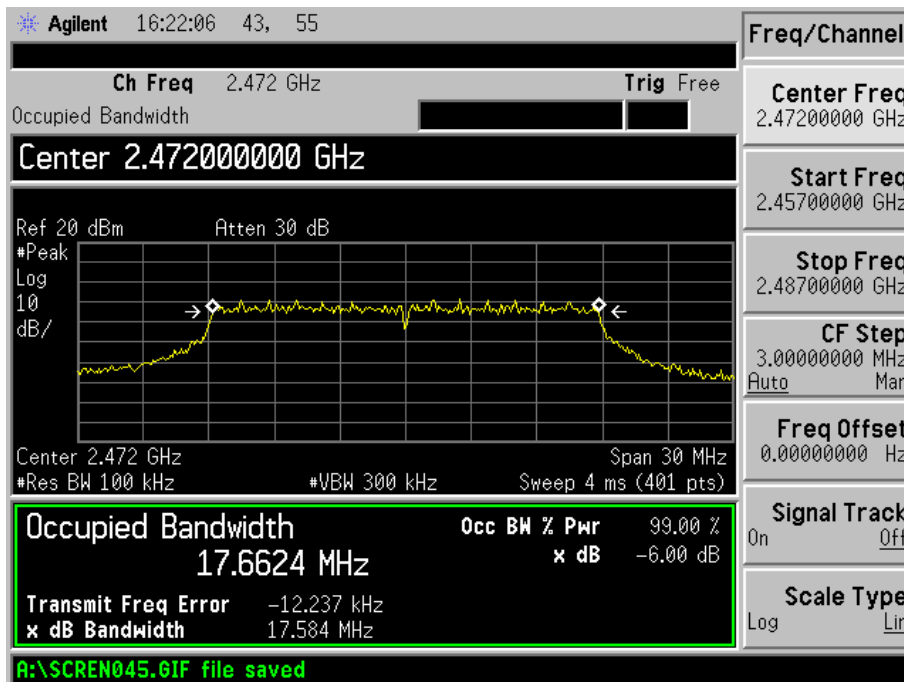
802.11n-HT20-Low Channel



802.11n-HT20-Middle Channel



802.11n-HT20-High Channel



7. RF Output Power

7.1 Standard Applicable

According to 15.247(b)(3). For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.

7.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	Agilent	E4402B	US41192821	2014-05-07	2015-05-06
Attenuator	ATTEN	ATS100-4-20	/	2014-05-07	2015-05-06

7.3 Test Procedure

According to section 15.247(b)-power output of the KDB-558074 D01 V03 (2013), 8.1.2 Option 2 (channel integration method) this procedure should only be used when the maximum available RBW of the spectrum/signal analyzer is less than the DTS bandwidth.

1. Set the RBW = maximum available (at least 1 MHz).
2. Set the VBW = 3 x RBW or maximum available setting (must be \geq RBW).
3. Set the span to fully encompass the DTS bandwidth.
4. Detector = peak.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the spectrum analyzer's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges (for some analyzers, this may require a manual override to ensure use of peak detector).

7.4 Environmental Conditions

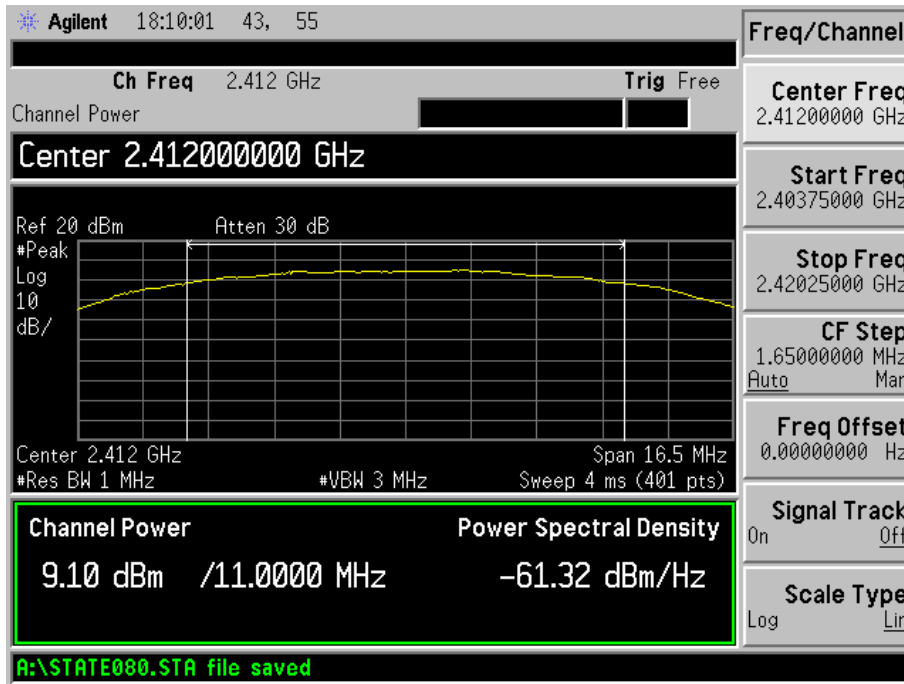
Temperature:	26° C
Relative Humidity:	57%
ATM Pressure:	1011 mbar

7.5 Summary of Test Results/Plots

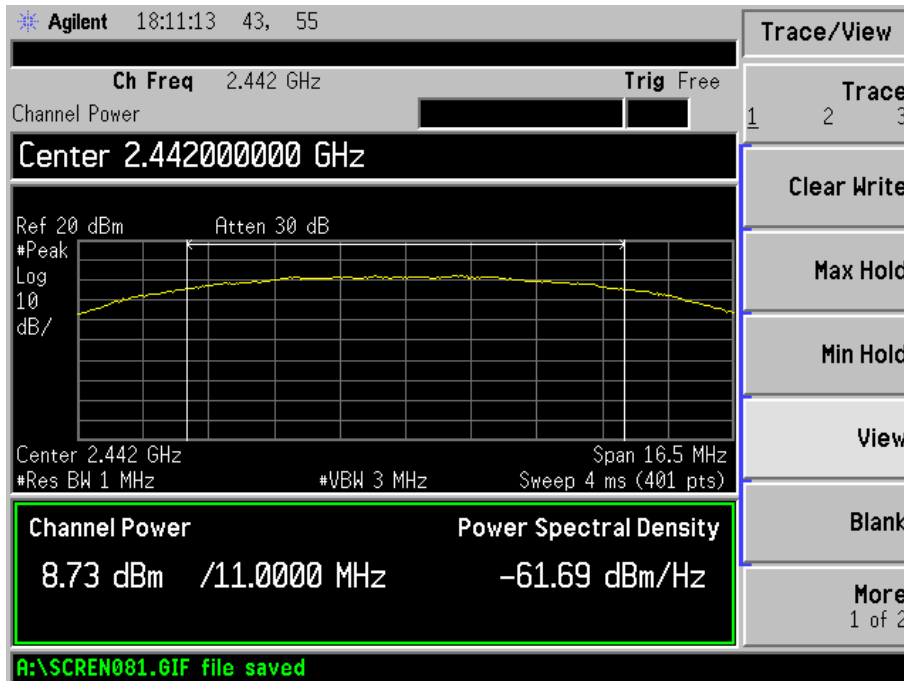
Test Mode	Frequency MHz	Reading dBm	Output Power mW	Limit mW
802.11b	2412	9.10	8.1283	1000
	2442	8.73	7.4645	1000
	2472	8.75	7.4989	1000
802.11g_	2412	8.67	7.3621	1000
	2442	7.82	6.0534	1000
	2472	7.71	5.9020	1000
802.11n HT20	2412	8.98	7.9068	1000
	2442	8.27	6.7143	1000
	2472	7.49	5.6105	1000

Please refer to the following test plots:

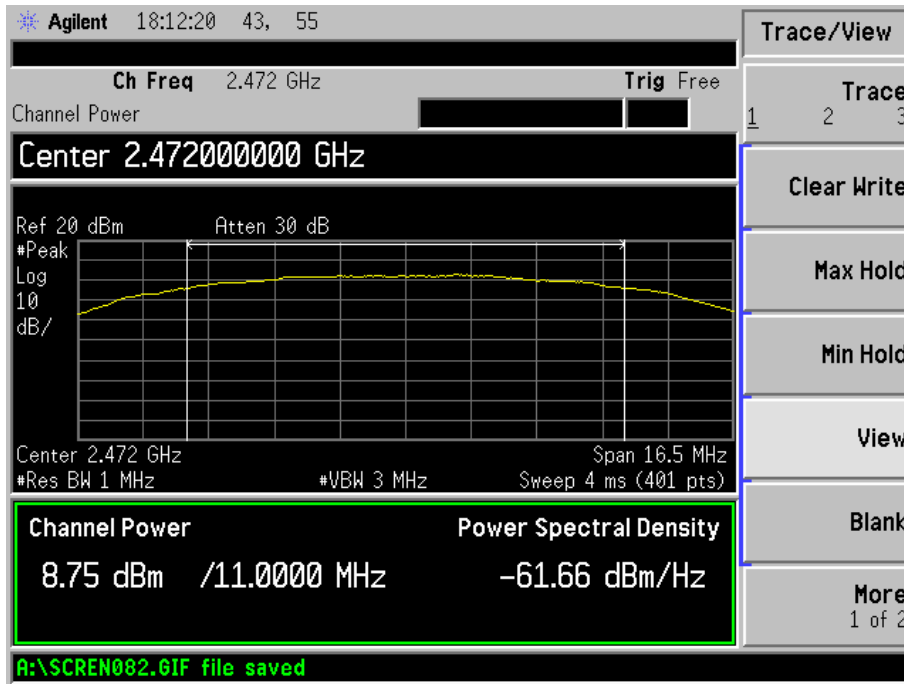
802.11b-Low Channel



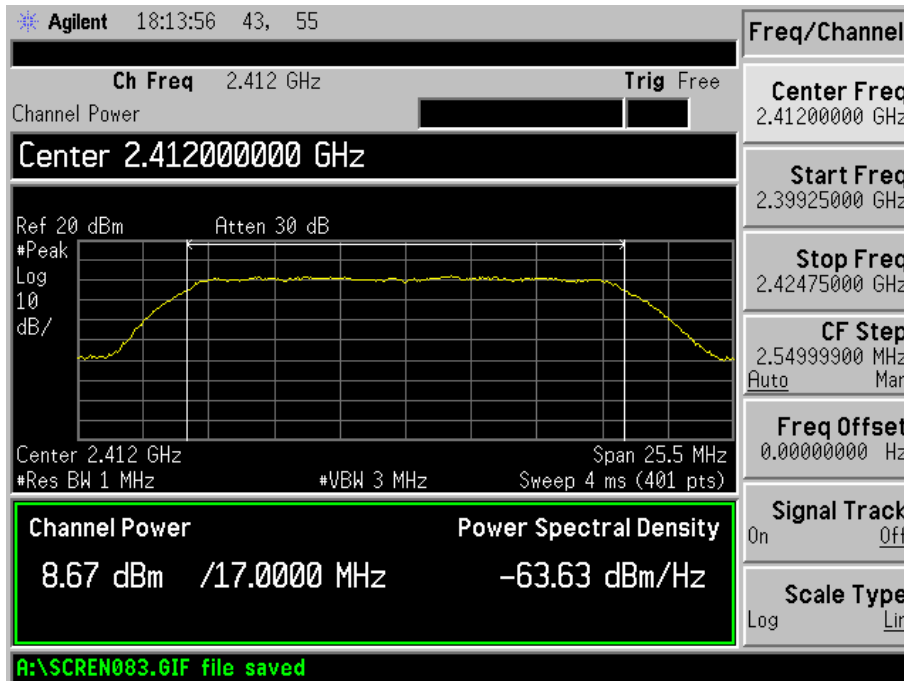
802.11b -Middle Channel



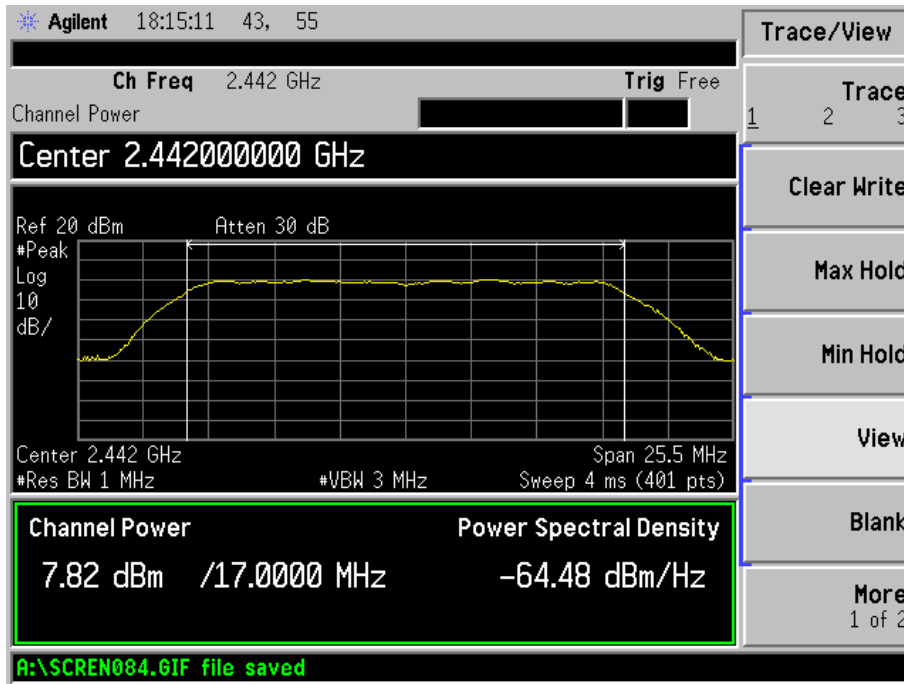
802.11b -High Channel



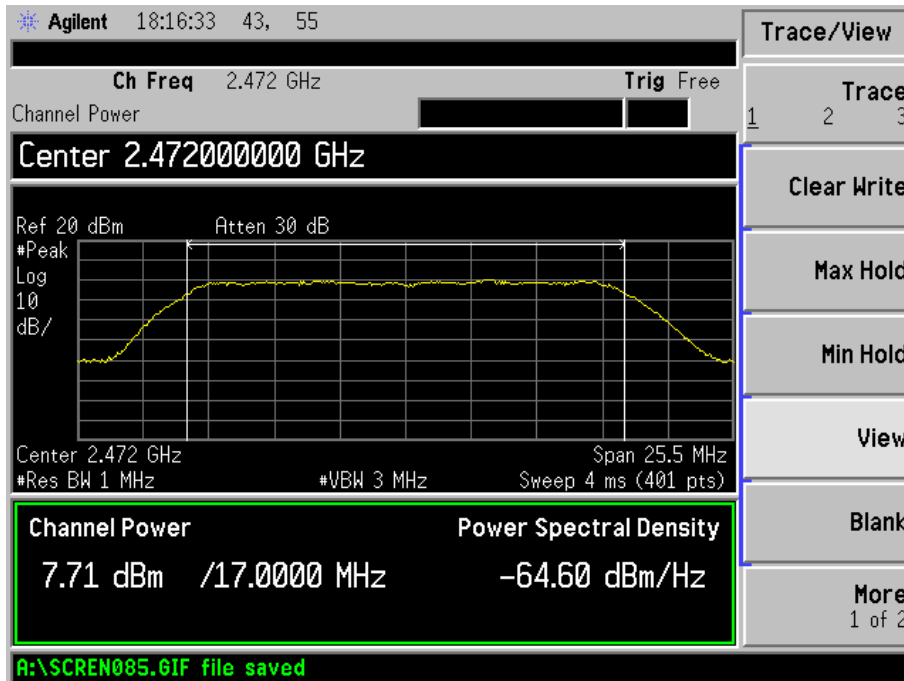
802.11g-Low Channel



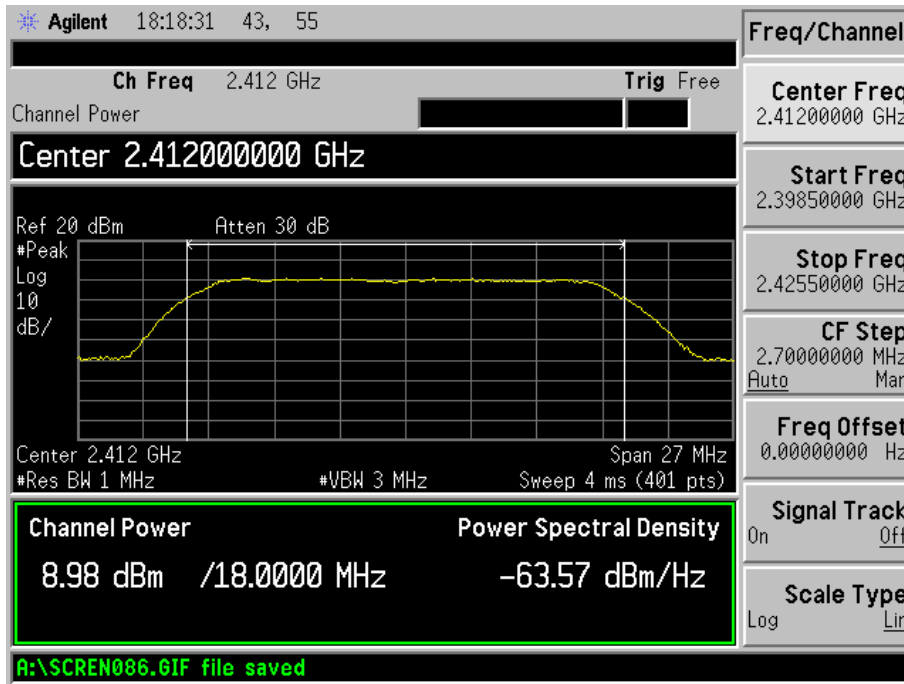
802.11g-Middle Channel



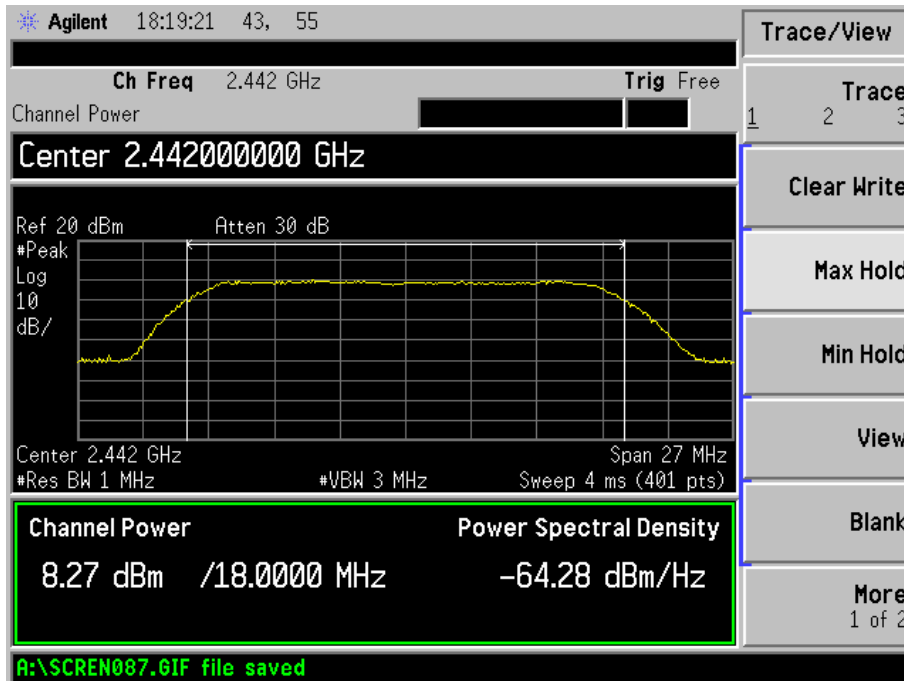
802.11g-High Channel



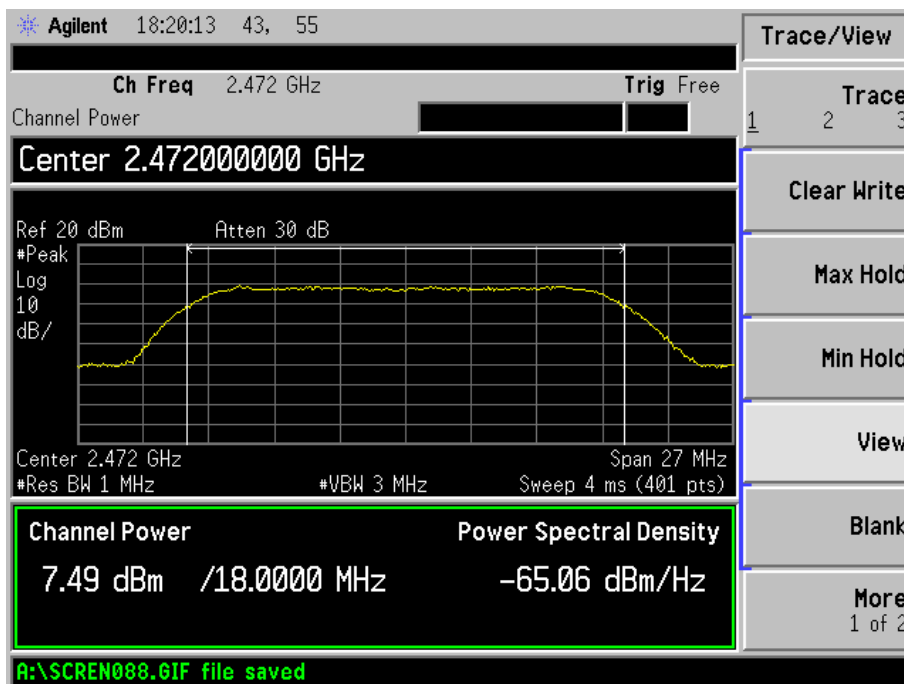
802.11n-HT20-Low Channel



802.11n-HT20-Middle Channel



802.11n-HT20-High Channel



8. Field Strength of Spurious Emissions

8.1 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 ± 5.10 dB.

8.2 Standard Applicable

According to §15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

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. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

8.3 Test Equipment List and Details

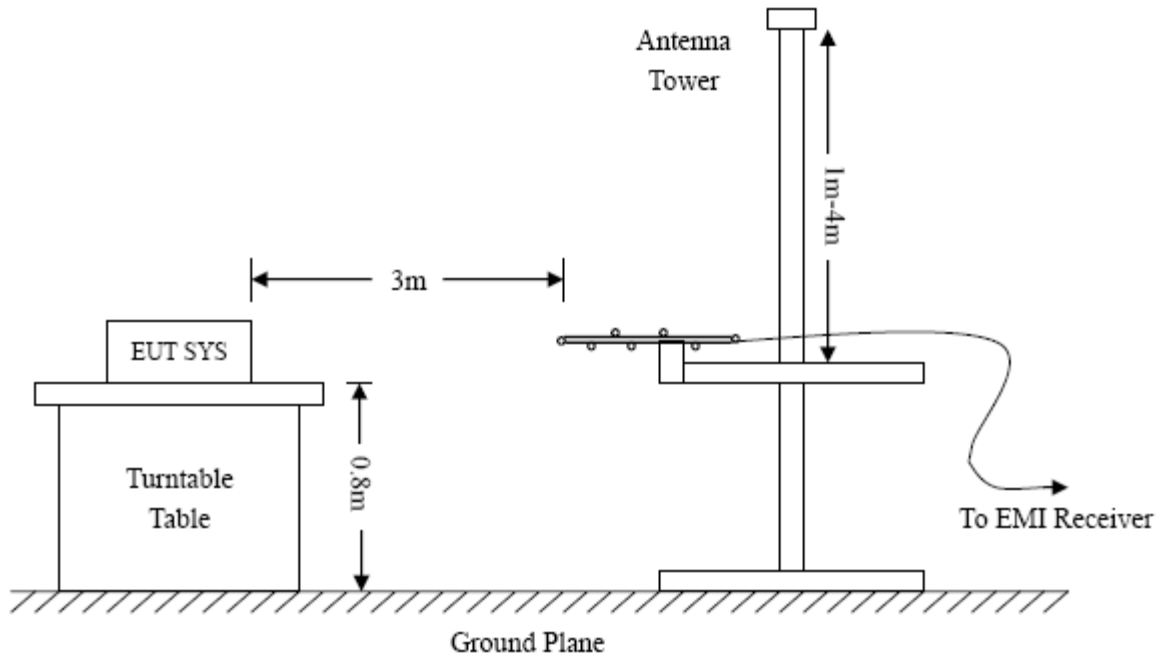
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2014-05-07	2015-05-06
EMI Test Receiver	R&S	ESVB	825471/005	2014-05-07	2015-05-06
Pre-amplifier	Agilent	8447F	3113A06717	2014-05-07	2015-05-06
Pre-amplifier	Compliance Direction	PAP-0118	24002	2014-05-07	2015-05-06
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2014-05-07	2015-05-06
Horn Antenna	ETS	3117	00086197	2014-05-07	2015-05-06
Horn Antenna	ETS	3116B	00088203	2014-05-07	2015-05-06
Loop Antenna	SCHWARZECK	HFRA 5165	9365	2014-05-07	2015-05-06

8.4 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.



Frequency :9kHz-30MHz
 RBW=10KHz,
 VBW =30KHz
 Sweep time= Auto
 Trace = max hold
 Detector function = peak

Frequency :30MHz-1GHz
 RBW=120KHz,
 VBW=300KHz
 Sweep time= Auto
 Trace = max hold
 Detector function = peak, QP

Frequency :Above 1GHz
 RBW=1MHz,
 VBW=3MHz(Peak), 10Hz(AV)
 Sweep time= Auto
 Trace = max hold
 Detector function = peak, AV

8.5 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:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Ant. Factor} + \text{Cable Loss} - \text{Ampl. Gain}$$

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:

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

8.6 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

8.7 Summary of Test Results/Plots

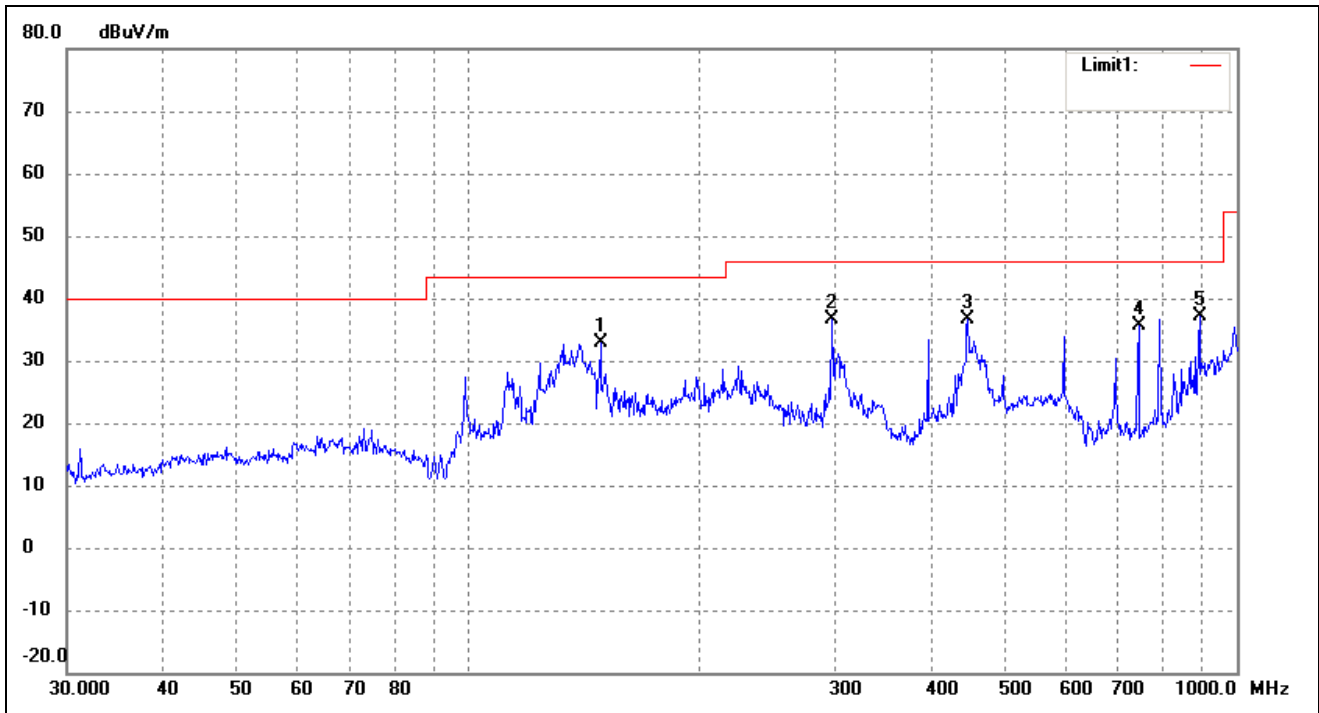
According to the data below, the FCC Part 15.205, 15.209 and 15.247 standards, and had the worst cases:

Note: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

Plot of Radiated Emissions Test Data (30MHz to 1GHz)

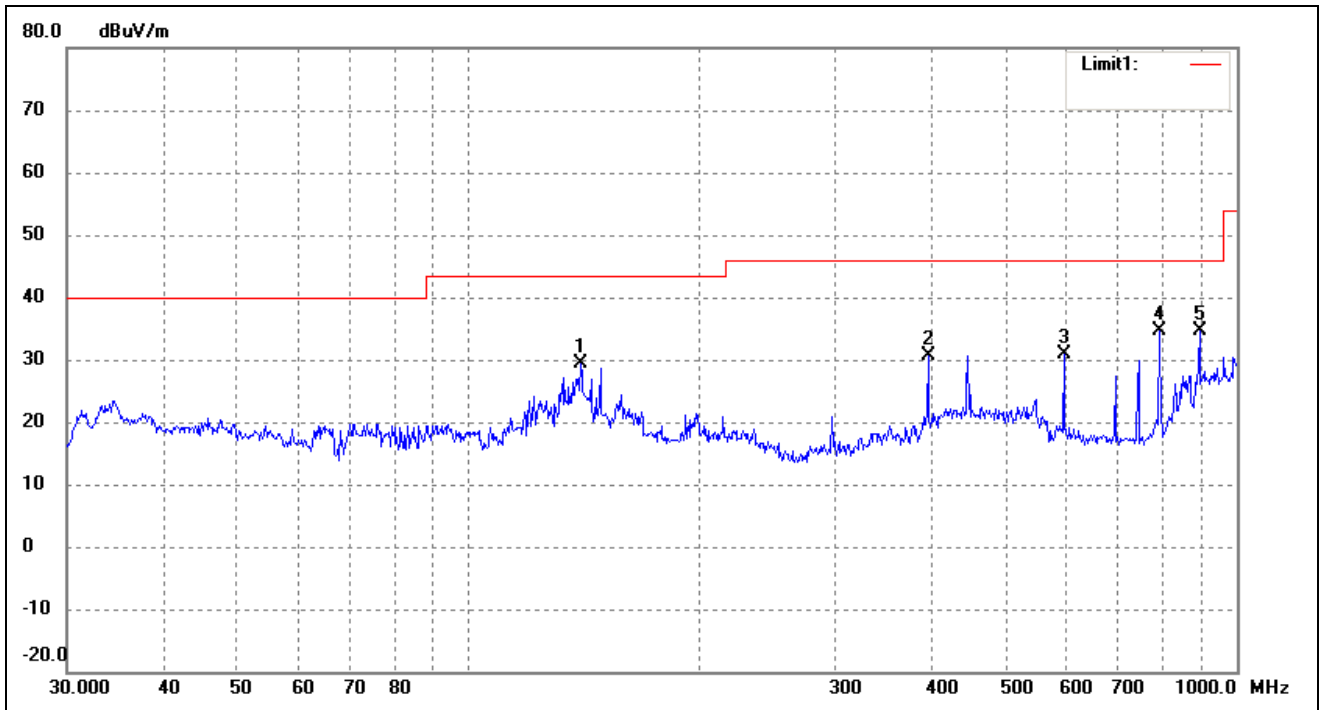
EUT: *Awox StrimCAST*
 Tested Model: *SC-W*
 Operating Condition: *802.11b Transmitting Low Channel-2412MHz*
 Comment: *USB DC 5V*

Test Specification: *Horizontal*



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	148.4410	45.79	-12.98	32.81	43.50	-10.69	254	100	peak
2	297.2241	42.89	-6.24	36.65	46.00	-9.35	113	100	peak
3	446.4141	38.75	-2.21	36.54	46.00	-9.46	284	100	peak
4	744.8659	34.84	0.83	35.67	46.00	-10.33	360	100	peak
5	893.8567	32.00	5.20	37.20	46.00	-8.80	100	100	peak

Test Specification: Vertical

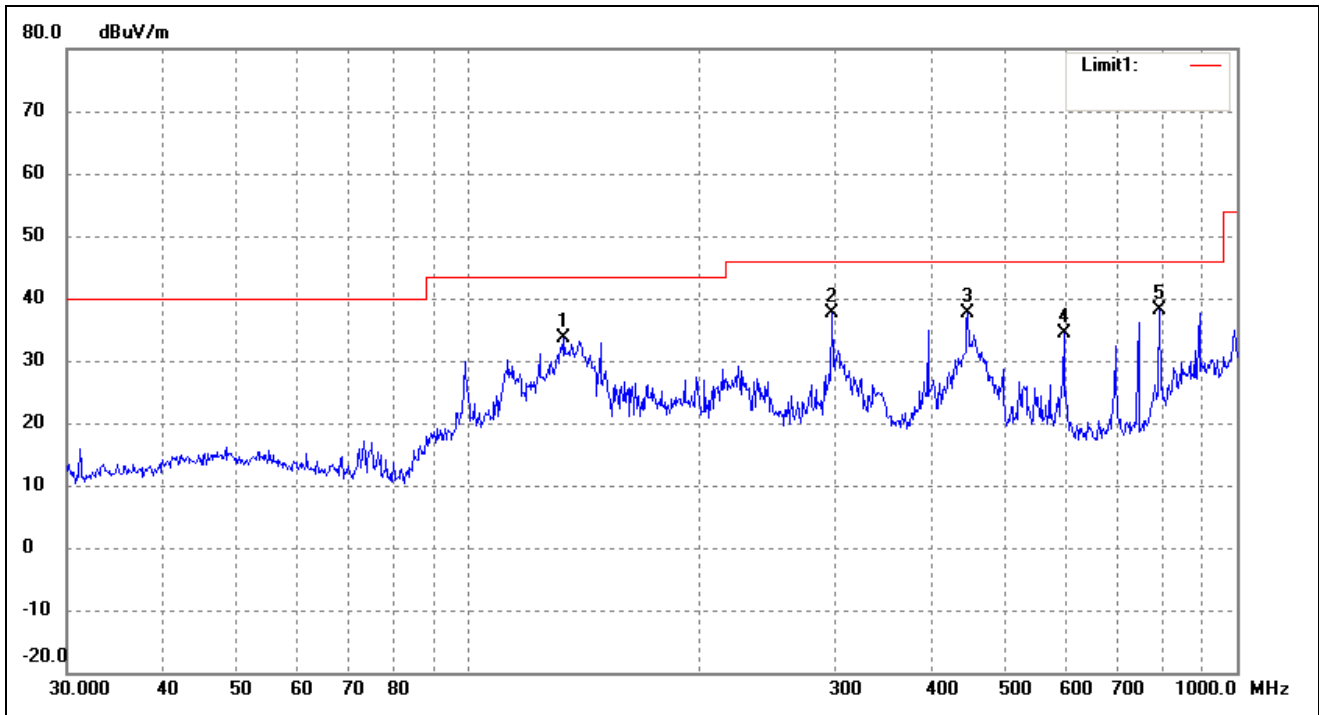


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Detector
1	139.8505	42.47	-13.15	29.32	43.50	-14.18	132	100	peak
2	396.2413	33.63	-3.06	30.57	46.00	-15.43	102	100	peak
3	595.1326	29.89	1.04	30.93	46.00	-15.07	55	100	peak
4	793.3958	31.07	3.63	34.70	46.00	-11.30	124	100	peak
5	893.8567	29.30	5.26	34.56	46.00	-11.44	77	200	peak

Operating Condition: 802.11b Transmitting Middle Channel-2442MHz

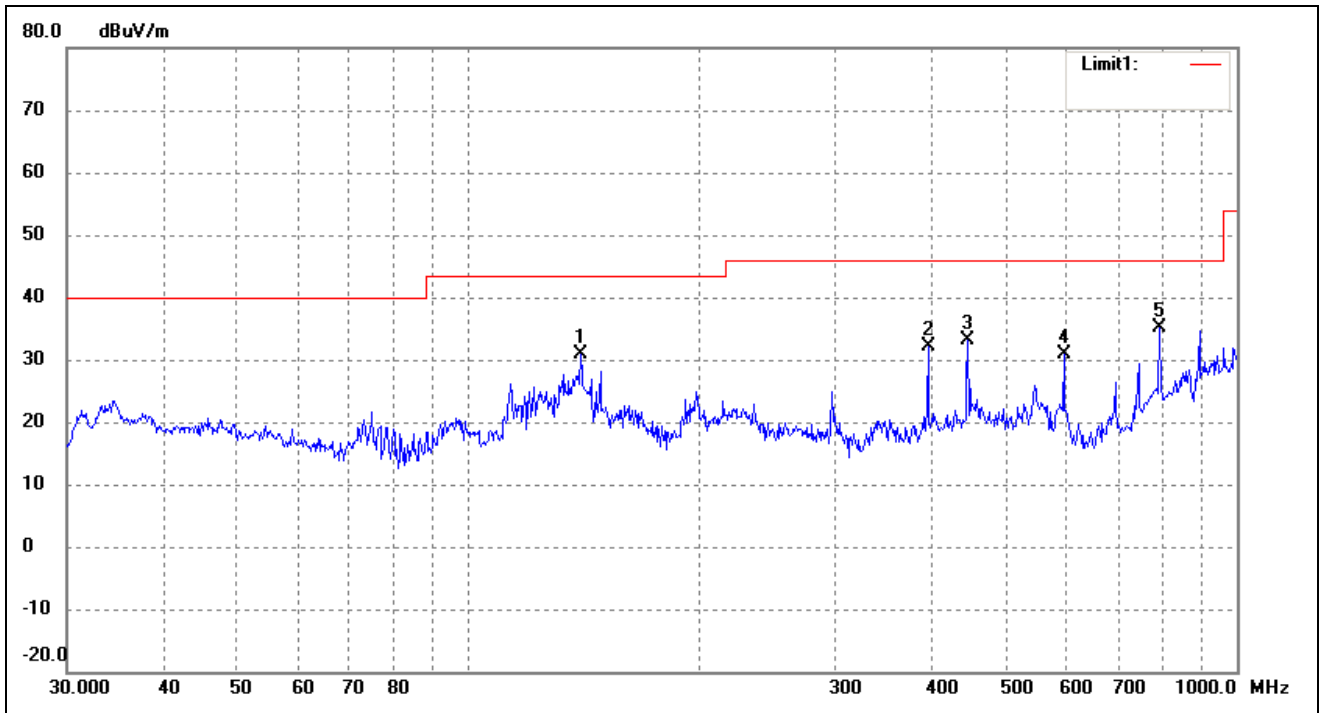
Comment: USB DC 5V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Detector
1	133.1511	46.58	-12.87	33.71	43.50	-9.79	35	100	peak
2	297.2241	43.89	-6.24	37.65	46.00	-8.35	188	100	peak
3	446.4141	39.75	-2.21	37.54	46.00	-8.46	202	200	peak
4	595.1327	36.11	-1.81	34.30	46.00	-11.70	108	200	peak
5	793.3958	35.74	2.49	38.23	46.00	-7.77	325	100	peak

Test Specification: Vertical

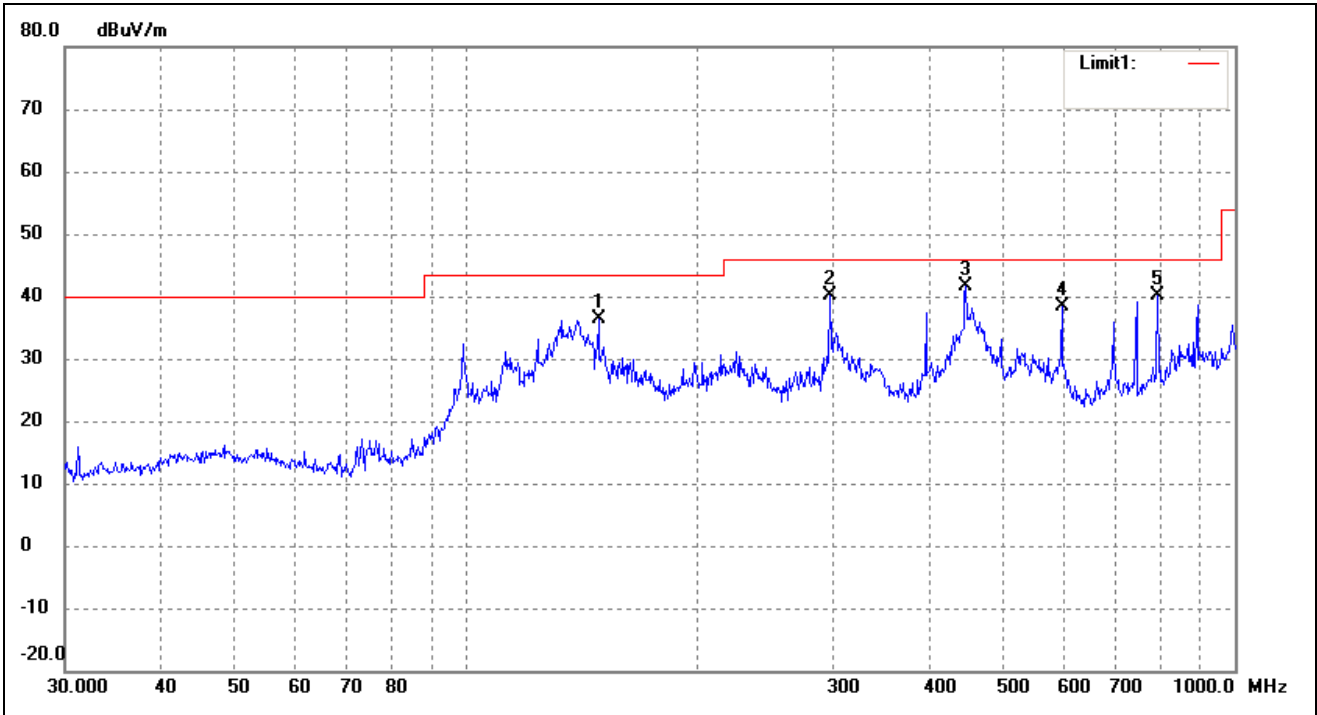


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Detector
1	139.8505	43.97	-13.15	30.82	43.50	-12.68	97	100	peak
2	396.2413	35.13	-3.06	32.07	46.00	-13.93	105	100	peak
3	446.4141	35.35	-2.21	33.14	46.00	-12.86	285	200	peak
4	595.1326	29.89	1.04	30.93	46.00	-15.07	108	200	peak
5	793.3958	31.57	3.63	35.20	46.00	-10.80	32	100	peak

Operating Condition: 802.11b Transmitting High Channel-2472MHz

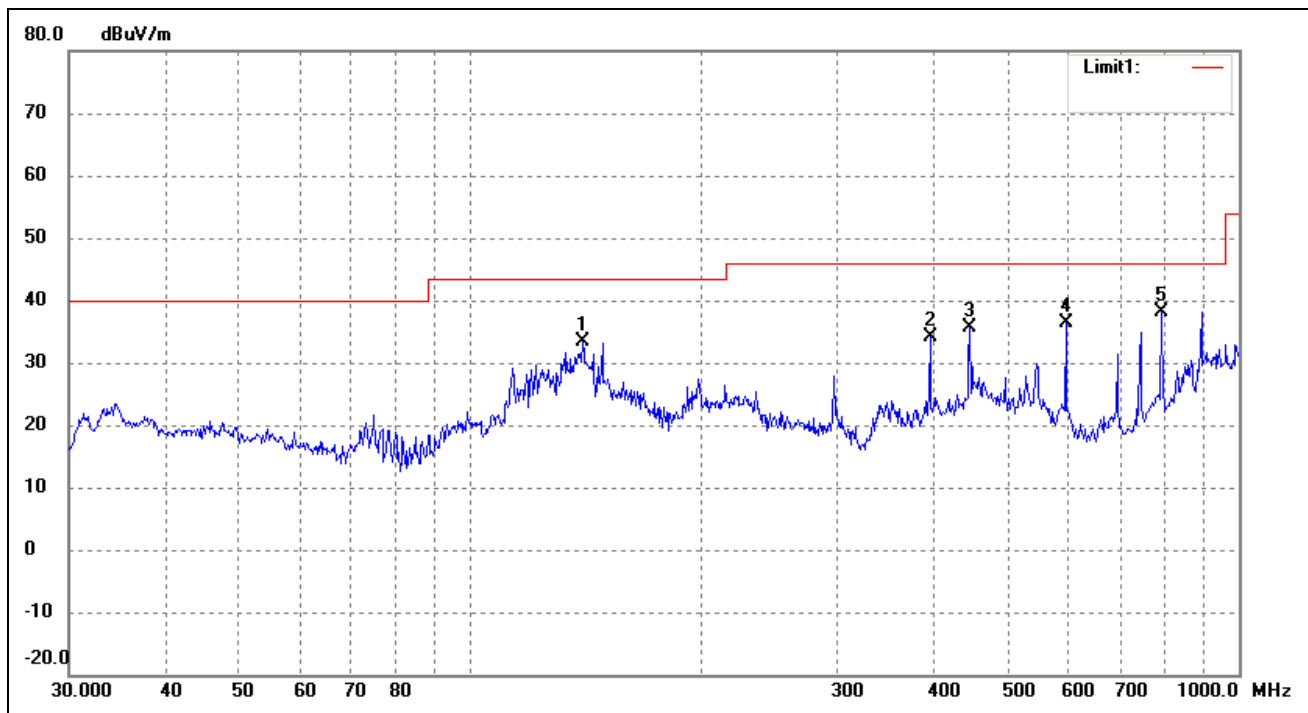
Comment: USB DC 5V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Detector
1	148.4410	49.29	-12.98	36.31	43.50	-7.19	91	100	peak
2	297.2241	46.39	-6.24	40.15	46.00	-5.85	102	100	peak
3	446.4141	43.75	-2.21	41.54	46.00	-4.46	321	200	peak
4	595.1327	40.11	-1.81	38.30	46.00	-7.70	12	200	peak
5	793.3958	37.74	2.49	40.23	46.00	-5.77	76	100	peak

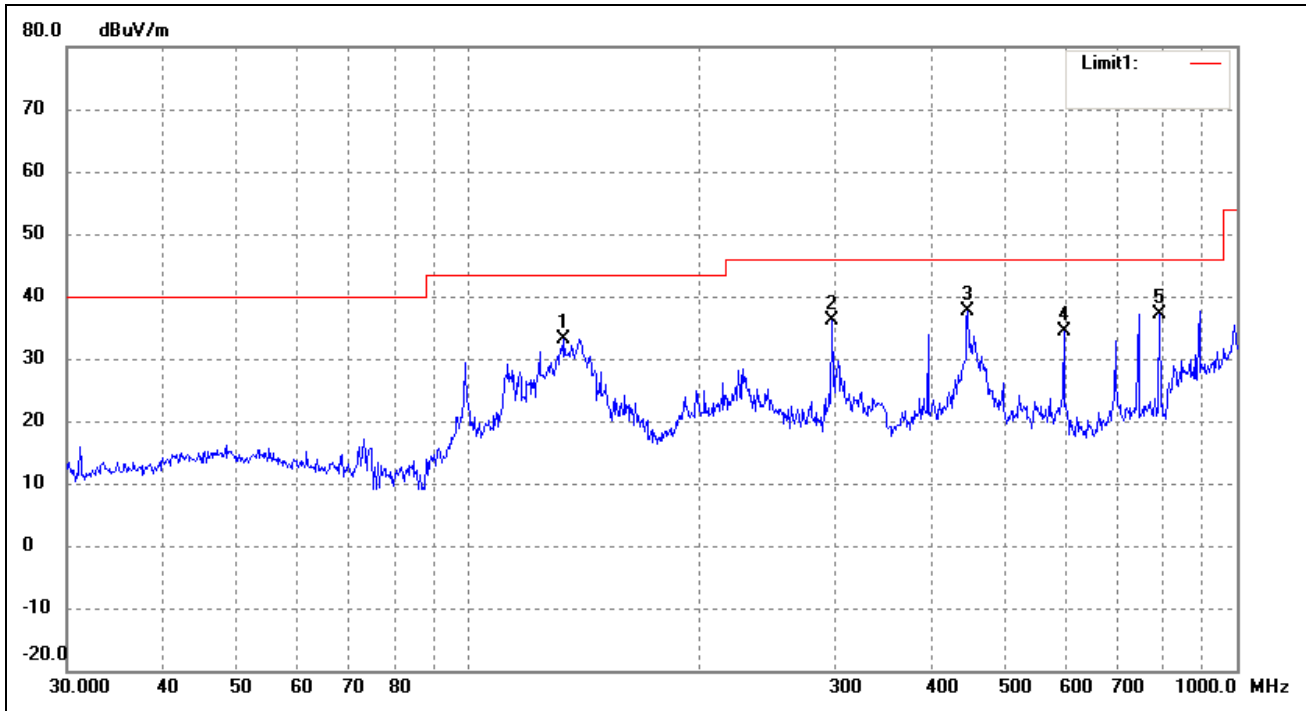
Test Specification: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Detector
1	139.8505	46.47	-13.15	33.32	43.50	-10.18	125	100	peak
2	396.2413	37.13	-3.06	34.07	46.00	-11.93	88	100	peak
3	446.4141	37.85	-2.21	35.64	46.00	-10.36	102	200	peak
4	595.1326	35.39	1.04	36.43	46.00	-9.57	232	200	peak
5	793.3958	34.57	3.63	38.20	46.00	-7.80	102	100	peak

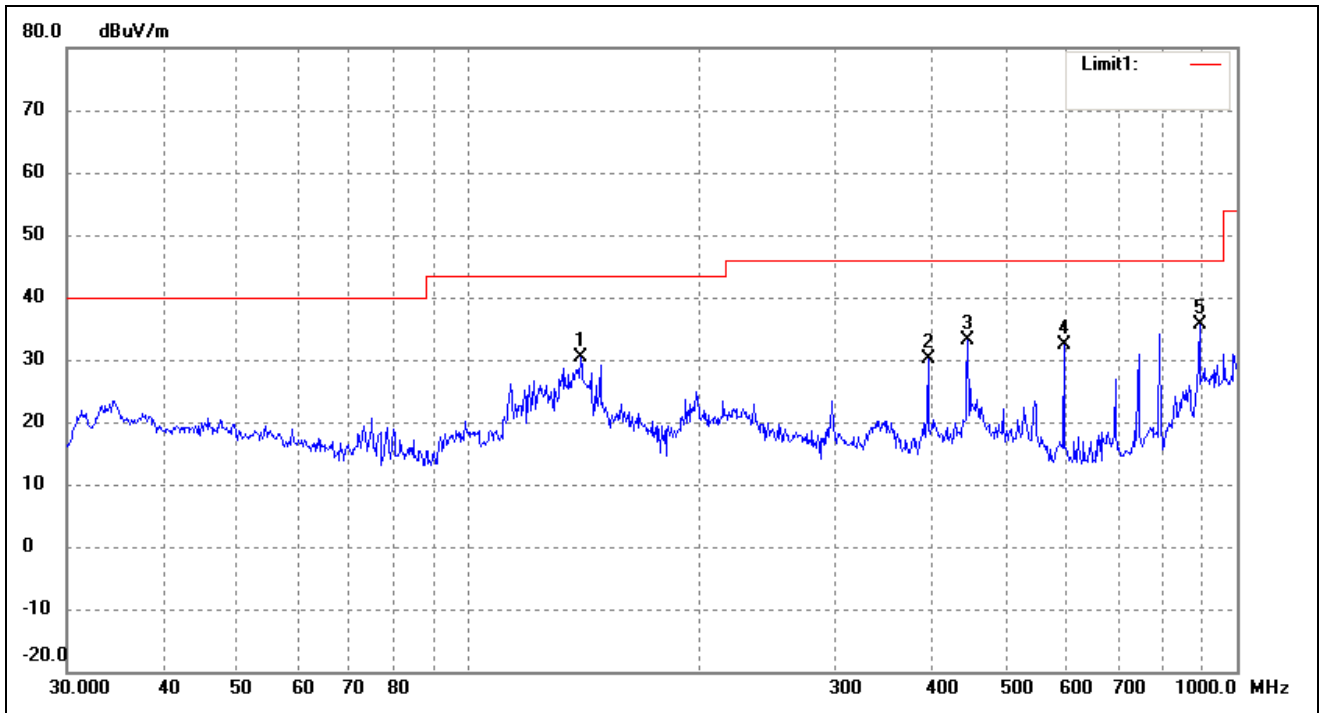
Plot of Radiated Emissions Test Data (30MHz to 1GHz)

EUT: *Awox StriimCAST*
 Tested Model: *SC-W*
 Operating Condition: *802.11g Transmitting Low Channel-2412MHz*
 Comment: *USB DC 5V*
 Test Specification: *Horizontal*



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Detector
1	133.1511	46.08	-12.87	33.21	43.50	-10.29	32	100	peak
2	297.2241	42.39	-6.24	36.15	46.00	-9.85	198	100	peak
3	446.4141	39.75	-2.21	37.54	46.00	-8.46	305	200	peak
4	595.1327	36.11	-1.81	34.30	46.00	-11.70	108	100	peak
5	793.3958	34.74	2.49	37.23	46.00	-8.77	125	200	peak

Test Specification: Vertical

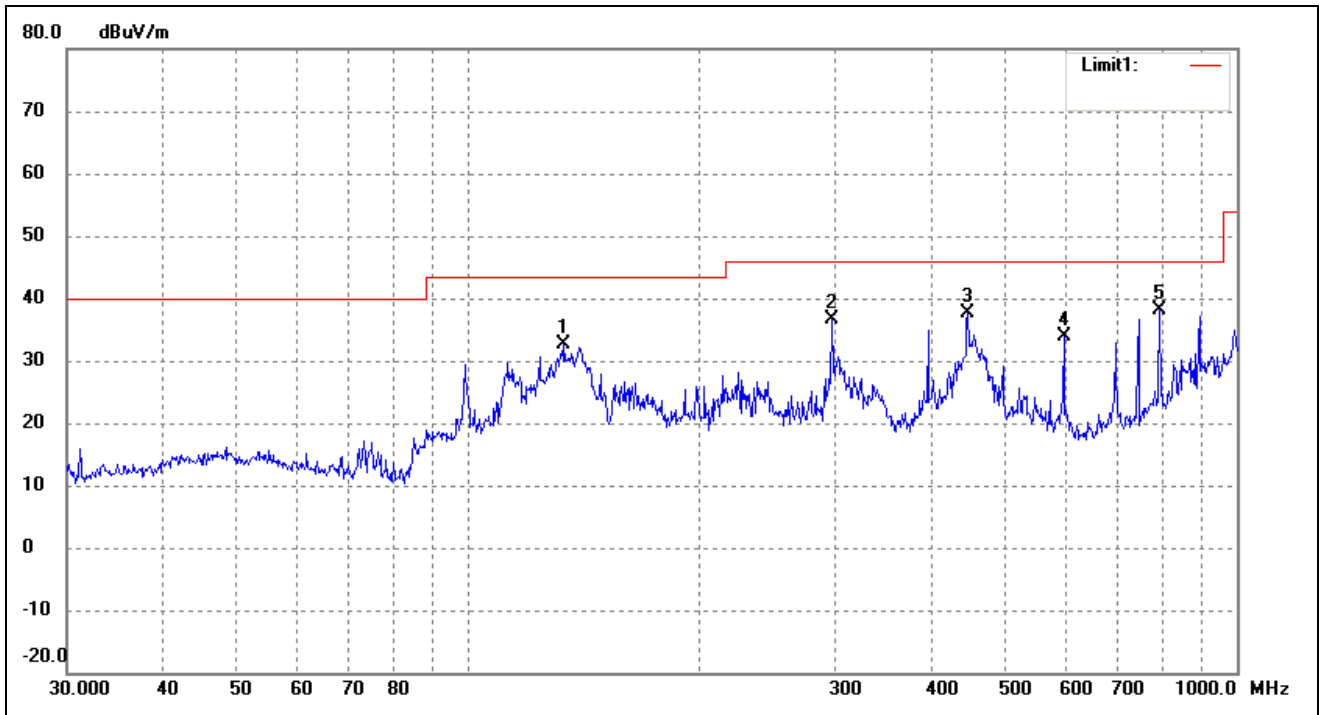


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Detector
1	139.8505	43.47	-13.15	30.32	43.50	-13.18	352	100	peak
2	396.2413	33.13	-3.06	30.07	46.00	-15.93	122	100	peak
3	446.4141	35.35	-2.21	33.14	46.00	-12.86	312	200	peak
4	595.1326	31.39	1.04	32.43	46.00	-13.57	78	200	peak
5	893.8567	30.30	5.26	35.56	46.00	-10.44	94	100	peak

Operating Condition: 802.11g Transmitting Middle Channel-2442MHz

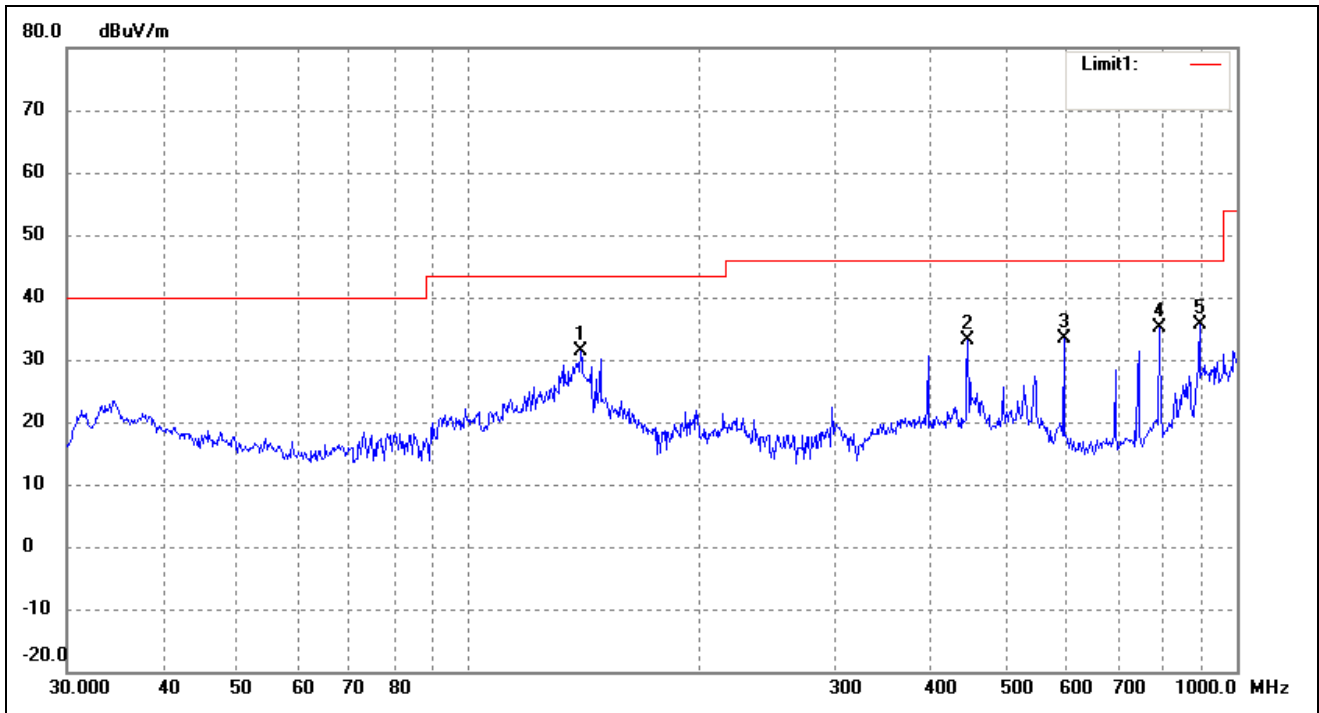
Comment: USB DC 5V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	133.1511	45.58	-12.87	32.71	43.50	-10.79	270	100	peak
2	297.2241	42.89	-6.24	36.65	46.00	-9.35	164	100	peak
3	446.4141	39.75	-2.21	37.54	46.00	-8.46	228	200	peak
4	595.1327	35.61	-1.81	33.80	46.00	-12.20	130	200	peak
5	793.3958	35.74	2.49	38.23	46.00	-7.77	360	100	peak

Test Specification: Vertical

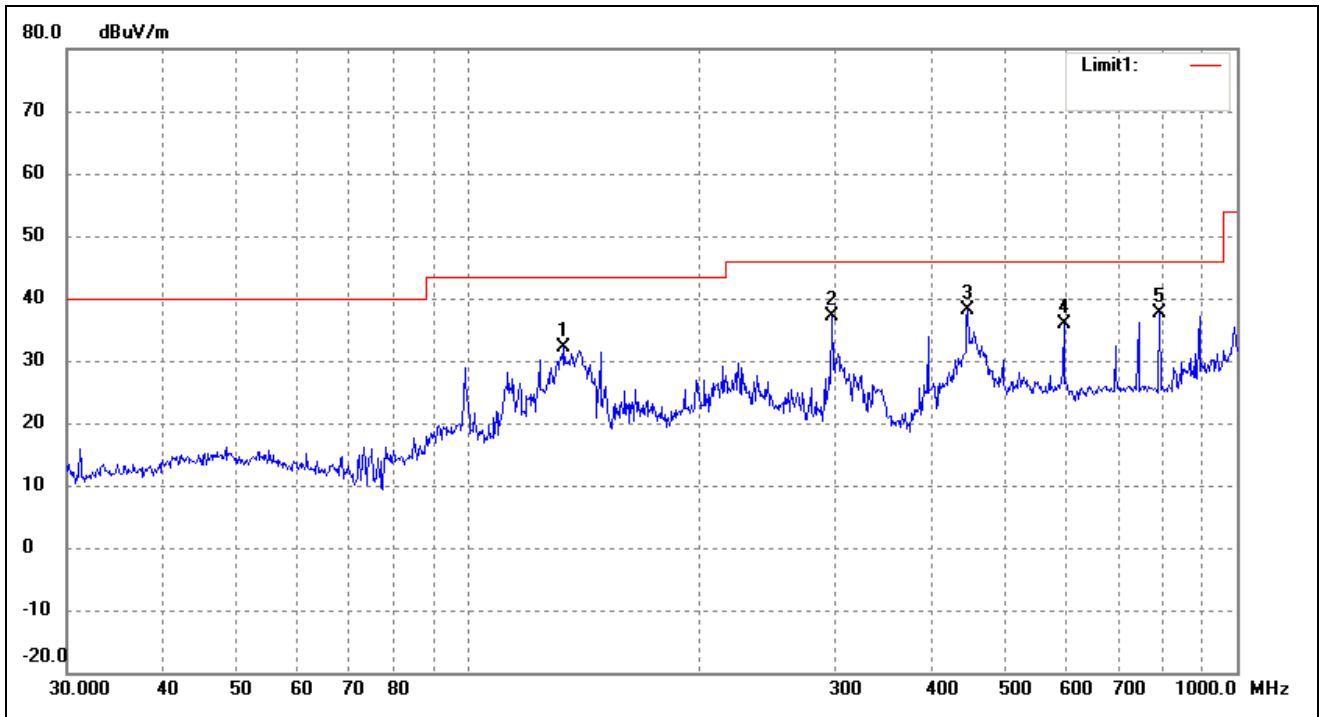


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Detector
1	139.8505	44.47	-13.15	31.32	43.50	-12.18	351	100	peak
2	446.4141	35.35	-2.21	33.14	46.00	-12.86	155	100	peak
3	595.1326	32.39	1.04	33.43	46.00	-12.57	211	200	peak
4	793.3958	31.57	3.63	35.20	46.00	-10.80	234	100	peak
5	893.8567	30.30	5.26	35.56	46.00	-10.44	321	200	peak

Operating Condition: 802.11g Transmitting High Channel-2472MHz

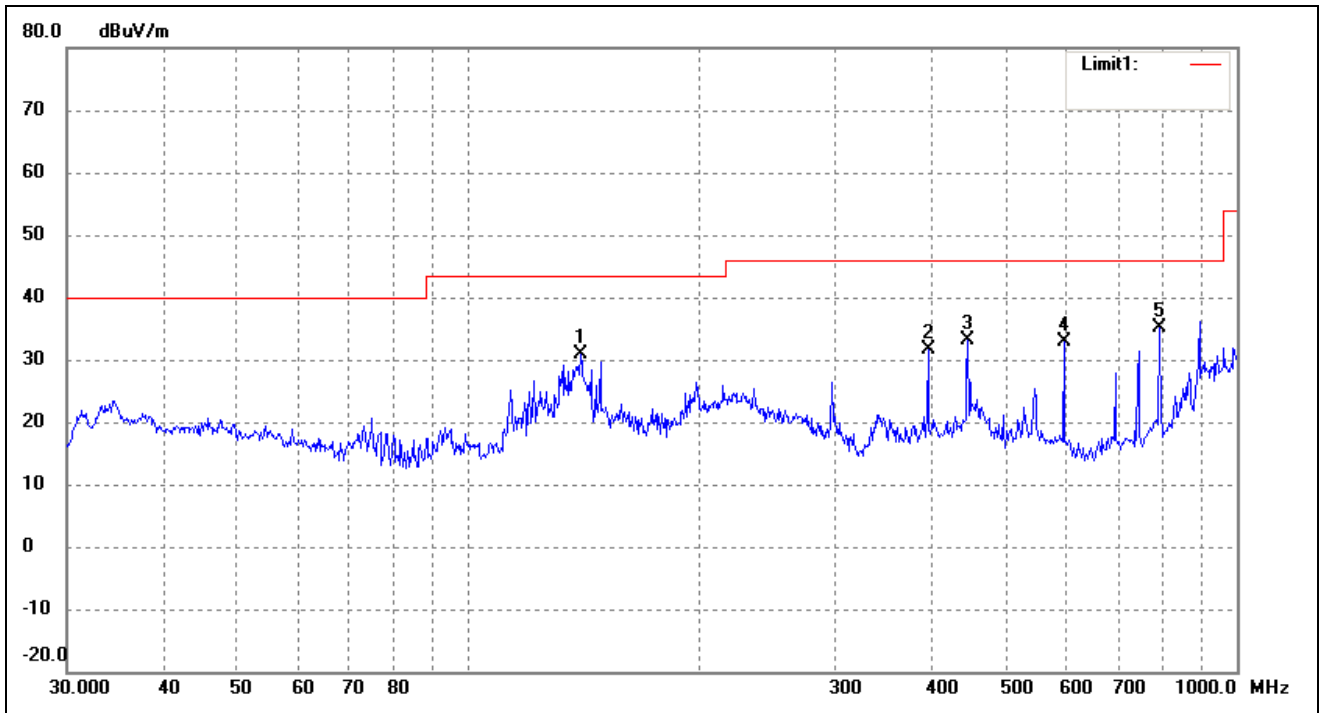
Comment: USB DC 5V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Detector
1	133.1511	45.08	-12.87	32.21	43.50	-11.29	41	100	peak
2	297.2241	43.39	-6.24	37.15	46.00	-8.85	139	100	peak
3	446.4141	40.25	-2.21	38.04	46.00	-7.96	255	200	peak
4	595.1327	37.61	-1.81	35.80	46.00	-10.20	102	200	peak
5	793.3958	35.24	2.49	37.73	46.00	-8.27	68	100	peak

Test Specification: Vertical

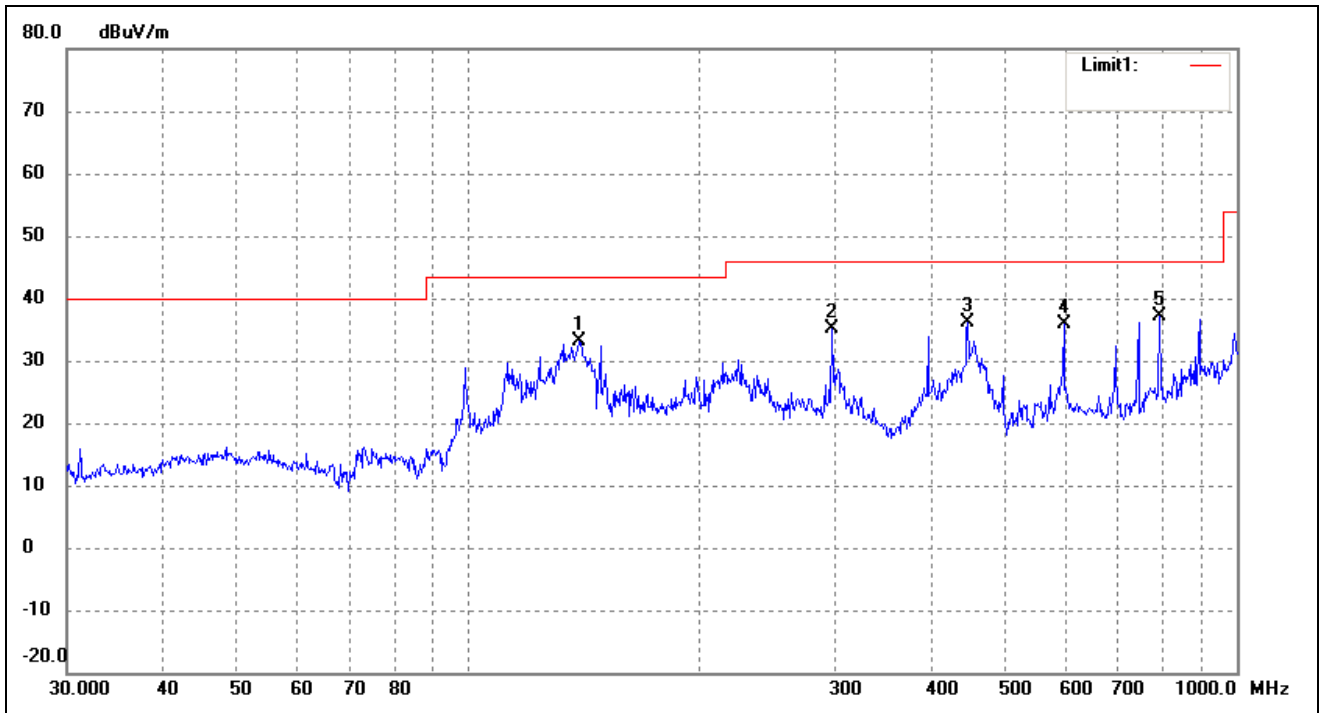


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Detector
1	139.8505	43.97	-13.15	30.82	43.50	-12.68	78	100	peak
2	396.2413	34.63	-3.06	31.57	46.00	-14.43	309	100	peak
3	446.4141	35.35	-2.21	33.14	46.00	-12.86	325	200	peak
4	595.1326	31.89	1.04	32.93	46.00	-13.07	100	200	peak
5	793.3958	31.57	3.63	35.20	46.00	-10.80	108	100	peak

Plot of Radiated Emissions Test Data (30MHz to 1GHz)

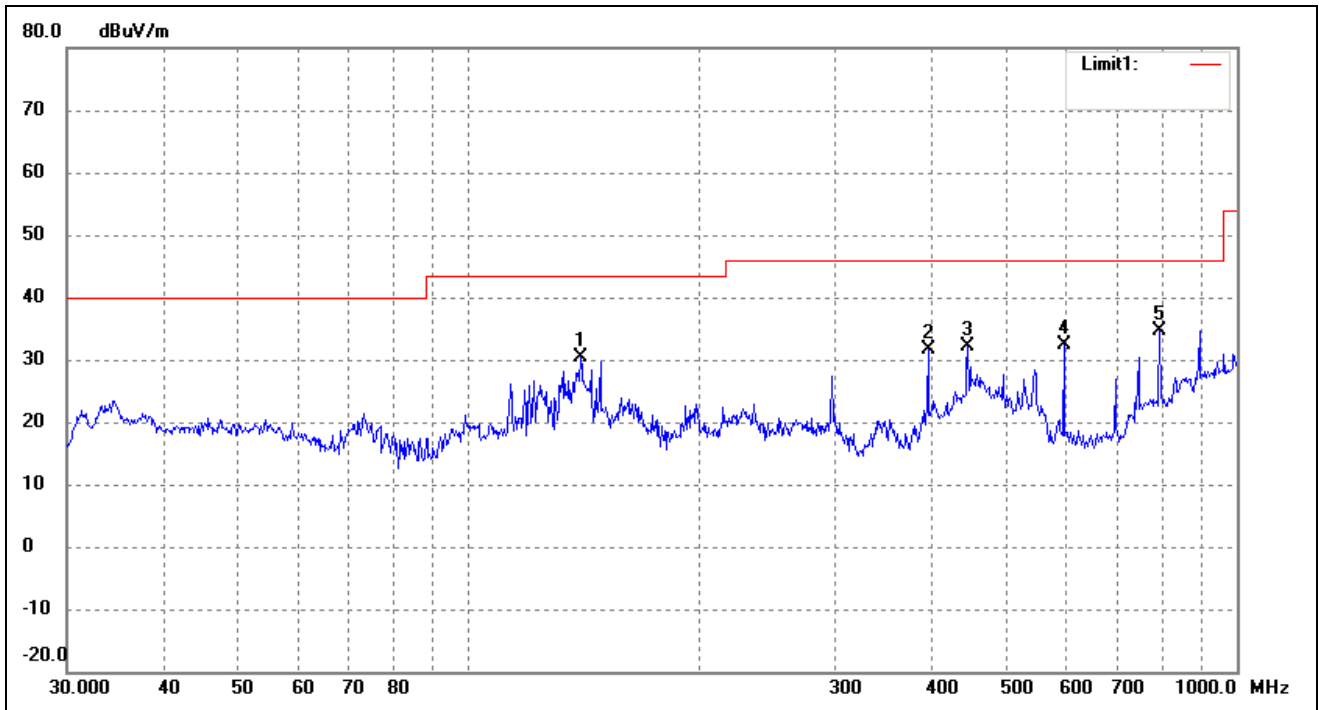
EUT: *Awox StrimCAST*
 Tested Model: *SC-W*
 Operating Condition: *802.11n-HT20 Transmitting Low Channel-2412MHz*
 Comment: *USB DC 5V*

Test Specification: *Horizontal*



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Detector
1	139.3611	46.22	-13.13	33.09	43.50	-10.41	341	100	peak
2	297.2241	41.39	-6.24	35.15	46.00	-10.85	100	200	peak
3	446.4141	38.25	-2.21	36.04	46.00	-9.96	201	100	peak
4	595.1327	37.61	-1.81	35.80	46.00	-10.20	100	200	peak
5	793.3958	34.74	2.49	37.23	46.00	-8.77	212	100	peak

Test Specification: Vertical

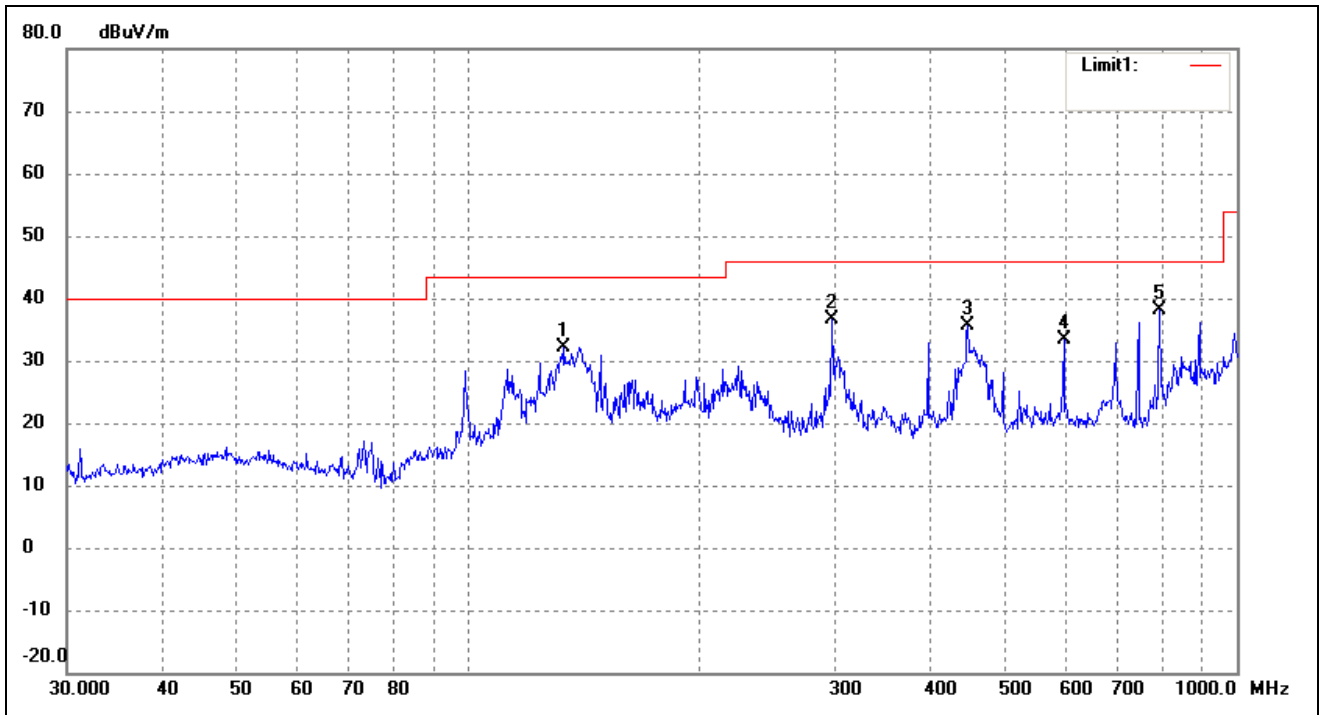


No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	139.8505	43.47	-13.15	30.32	43.50	-13.18	155	100	peak
2	396.2413	34.63	-3.06	31.57	46.00	-14.43	197	100	peak
3	446.4141	34.35	-2.21	32.14	46.00	-13.86	310	100	peak
4	595.1326	31.39	1.04	32.43	46.00	-13.57	229	100	peak
5	793.3958	31.07	3.63	34.70	46.00	-11.30	130	100	peak

Operating Condition: 802.11n-HT20 Transmitting Middle Channel-2442MHz

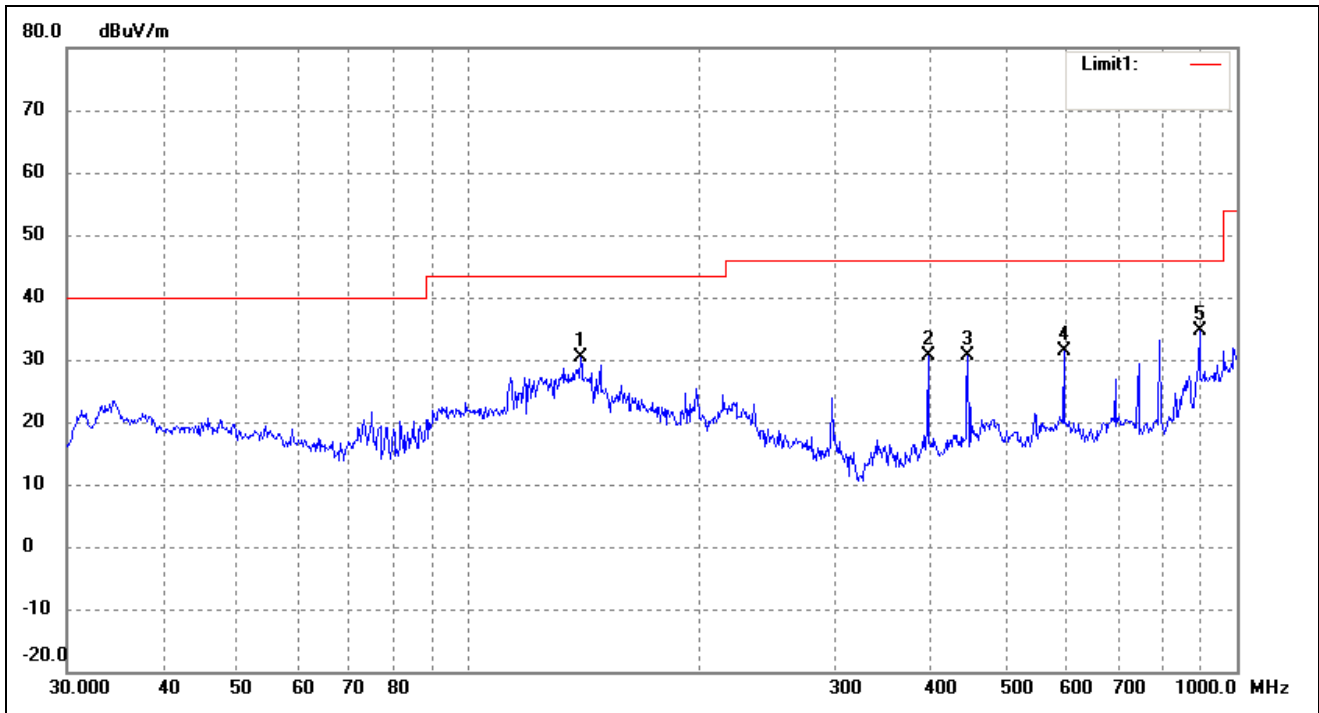
Comment: USB DC 5V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Detector
1	133.1511	45.08	-12.87	32.21	43.50	-11.29	78	100	peak
2	297.2241	42.89	-6.24	36.65	46.00	-9.35	55	100	peak
3	446.4141	37.75	-2.21	35.54	46.00	-10.46	145	200	peak
4	595.1327	35.11	-1.81	33.30	46.00	-12.70	325	200	peak
5	793.3958	35.74	2.49	38.23	46.00	-7.77	125	100	peak

Test Specification: Vertical

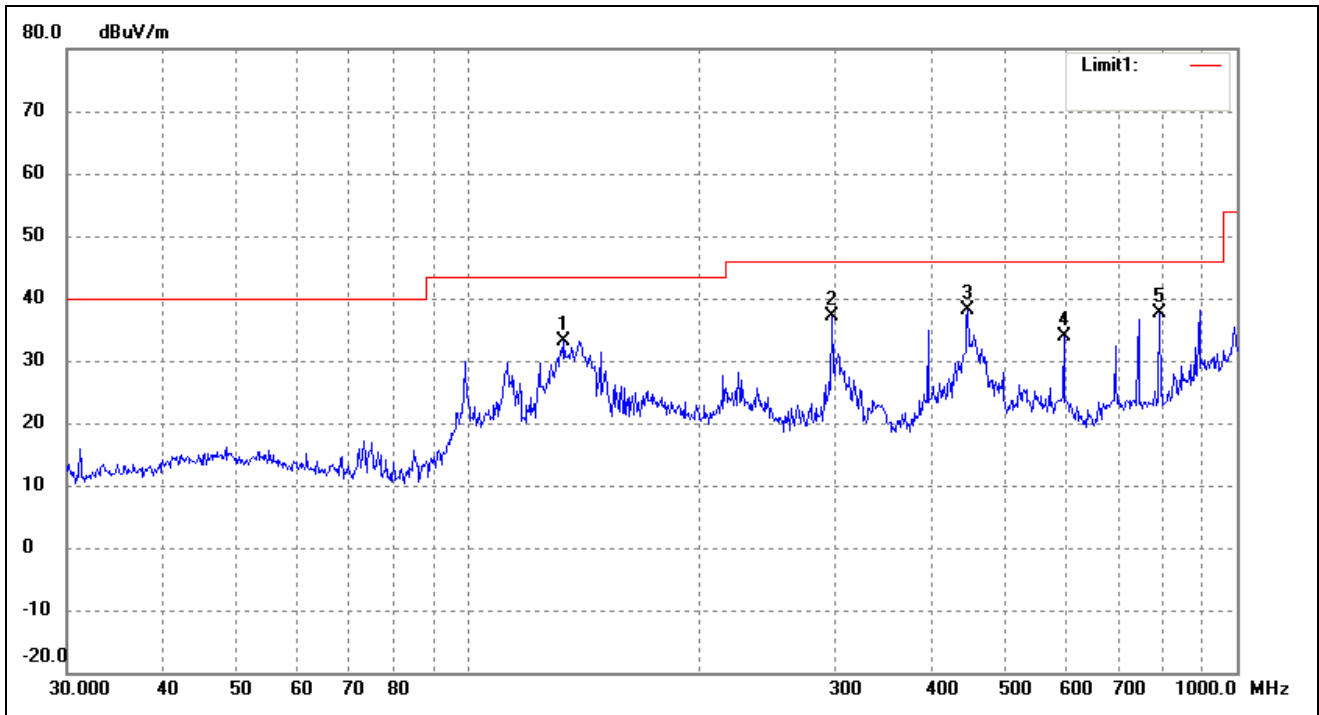


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Detector
1	139.8505	43.47	-13.15	30.32	43.50	-13.18	321	100	peak
2	396.2413	33.63	-3.06	30.57	46.00	-15.43	102	100	peak
3	446.4141	32.85	-2.21	30.64	46.00	-15.36	321	200	peak
4	595.1326	30.39	1.04	31.43	46.00	-14.57	102	100	peak
5	893.8567	29.30	5.26	34.56	46.00	-11.44	88	200	peak

Operating Condition: 802.11n-HT20 Transmitting High Channel-2472MHz

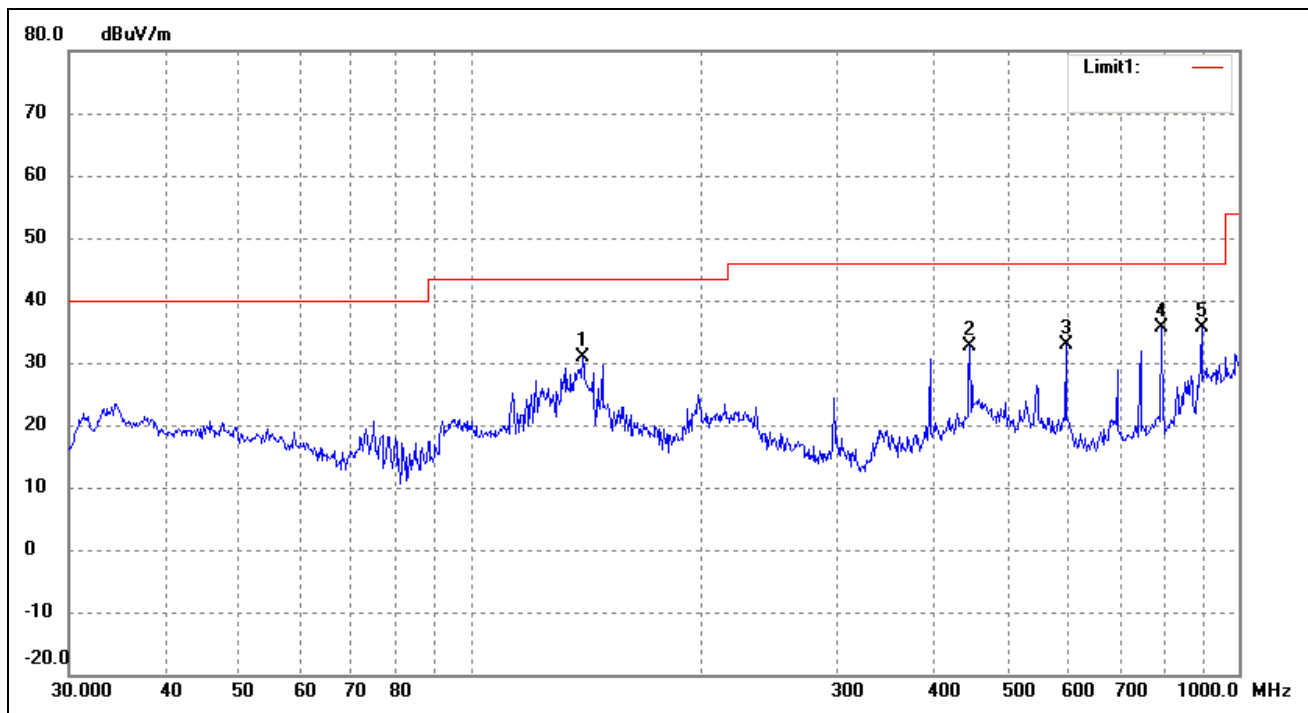
Comment: USB DC 5V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Detector
1	133.1511	46.08	-12.87	33.21	43.50	-10.29	32	100	peak
2	297.2241	43.39	-6.24	37.15	46.00	-8.85	102	100	peak
3	446.4141	40.25	-2.21	38.04	46.00	-7.96	188	200	peak
4	595.1327	35.61	-1.81	33.80	46.00	-12.20	38	200	peak
5	793.3958	35.24	2.49	37.73	46.00	-8.27	238	200	peak

Test Specification: Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	139.8505	43.97	-13.15	30.82	43.50	-12.68	267	100	peak
2	446.4141	34.85	-2.21	32.64	46.00	-13.36	116	100	peak
3	595.1326	31.89	1.04	32.93	46.00	-13.07	360	200	peak
4	793.3958	32.07	3.63	35.70	46.00	-10.30	228	100	peak
5	893.8567	30.30	5.26	35.56	46.00	-10.44	270	100	peak

*Spurious Emissions Above 1GHz**Test Mode: 802.11b*

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2412MHz							
4824.000	51.08	0.57	51.65	74.00	-22.35	H	PK
4824.000	38.84	0.57	39.41	54.00	-14.59	H	AV
7236.000	41.33	3.69	45.02	74.00	-28.98	H	PK
7236.000	30.08	3.69	33.77	54.00	-20.23	H	AV
4824.000	60.42	0.57	60.99	74.00	-13.01	V	PK
4824.000	48.77	0.57	49.34	54.00	-4.66	V	AV
7236.000	41.72	3.69	45.41	74.00	-28.59	V	PK
7236.000	31.06	3.69	34.75	54.00	-19.25	V	AV
Middle Channel-2442MHz							
4884.000	49.10	0.66	49.76	74.00	-24.24	H	PK
4884.000	37.47	0.66	38.13	54.00	-15.87	H	AV
7326.000	42.72	3.76	46.48	74.00	-27.52	H	PK
7326.000	31.54	3.76	35.30	54.00	-18.70	H	AV
4884.000	49.10	0.66	49.76	74.00	-24.24	V	PK
4884.000	37.47	0.66	38.13	54.00	-15.87	V	AV
7326.000	42.72	3.76	46.48	74.00	-27.52	V	PK
7326.000	31.54	3.76	35.30	54.00	-18.70	V	AV
High Channel-2472MHz							
4944.000	51.68	0.75	52.43	74.00	-21.57	H	PK
4944.000	40.54	0.75	41.29	54.00	-12.71	H	AV
7416.000	42.42	3.83	46.25	74.00	-27.75	H	PK
7416.000	31.27	3.83	35.10	54.00	-18.90	H	AV
4944.000	65.34	0.75	66.09	74.00	-7.91	V	PK
4944.000	51.77	0.75	52.52	54.00	-1.48	V	AV
7416.000	42.34	3.83	46.17	74.00	-27.83	V	PK
7416.000	30.68	3.83	34.51	54.00	-19.49	V	AV

Test Mode: 802.11g

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2412MHz							
4824.000	44.01	-0.05	43.96	74.00	-30.04	H	PK
4824.000	32.71	-0.05	32.66	54.00	-21.34	H	AV
7236.000	41.40	3.69	45.09	74.00	-28.91	H	PK
7236.000	29.48	3.69	33.17	54.00	-20.83	H	AV
4824.000	47.10	0.57	47.67	74.00	-26.33	V	PK
4824.000	35.43	0.58	36.01	54.00	-17.99	V	AV
7236.000	41.34	3.69	45.03	74.00	-28.97	V	PK
7236.000	29.94	3.69	33.63	54.00	-20.37	V	AV
Middle Channel-2442MHz							
4884.000	43.83	0.66	44.49	74.00	-29.51	H	PK
4884.000	32.83	0.66	33.49	54.00	-20.51	H	AV
7326.000	44.51	3.82	48.33	74.00	-25.67	H	PK
7326.000	34.82	3.82	38.64	54.00	-15.36	H	AV
4884.000	57.76	0.64	58.40	74.00	-15.60	V	PK
4884.000	41.54	0.66	42.20	54.00	-11.80	V	AV
7326.000	42.31	3.76	46.07	74.00	-27.93	V	PK
7326.000	30.49	3.76	34.25	54.00	-19.75	V	AV
High Channel-2472MHz							
4944.000	45.02	0.75	45.77	74.00	-28.23	H	PK
4944.000	33.52	0.75	34.27	54.00	-19.73	H	AV
7416.000	42.40	3.83	46.23	74.00	-27.77	H	PK
7416.000	31.25	3.83	35.08	54.00	-18.92	H	AV
4944.000	48.76	0.75	49.51	74.00	-24.49	V	PK
4944.000	37.40	0.75	38.15	54.00	-15.85	V	AV
7416.000	42.11	3.83	45.94	74.00	-28.06	V	PK
7416.000	31.19	3.83	35.02	54.00	-18.98	V	AV

Test Mode: 802.11n-HT20

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2412MHz							
4824.000	58.12	0.66	58.78	74.00	-15.22	H	PK
4824.000	39.09	0.66	39.75	54.00	-14.25	H	AV
7236.000	40.61	3.69	44.30	74.00	-29.70	H	PK
7236.000	29.59	3.69	33.28	54.00	-20.72	H	AV
4824.000	43.96	0.57	44.53	74.00	-29.47	V	PK
4824.000	32.79	0.57	33.36	54.00	-20.64	V	AV
7236.000	40.89	3.69	44.58	74.00	-29.42	V	PK
7236.000	29.53	3.69	33.22	54.00	-20.78	V	AV
Middle Channel-2442MHz							
4884.000	44.54	0.66	45.20	74.00	-28.80	H	PK
4884.000	32.94	0.66	33.60	54.00	-20.40	H	AV
7326.000	41.79	3.76	45.55	74.00	-28.45	H	PK
7326.000	30.95	3.76	34.71	54.00	-19.29	H	AV
4884.000	51.56	0.66	52.22	74.00	-21.78	V	PK
4884.000	38.26	0.66	38.92	54.00	-15.08	V	AV
7326.000	42.54	3.76	46.30	74.00	-27.70	V	PK
7326.000	30.94	3.76	34.70	54.00	-19.30	V	AV
High Channel-2472MHz							
4944.000	45.21	0.75	45.96	74.00	-28.04	H	PK
4944.000	33.15	0.75	33.90	54.00	-20.10	H	AV
7416.000	42.31	3.83	46.14	74.00	-27.86	H	PK
7416.000	30.60	3.83	34.43	54.00	-19.57	H	AV
4944.000	51.96	0.73	52.69	74.00	-21.31	V	PK
4944.000	38.22	0.75	38.97	54.00	-15.03	V	AV
7416.000	30.99	3.83	34.82	54.00	-19.18	V	PK
7416.000	41.82	3.83	45.65	74.00	-28.35	V	AV

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, which above 3th Harmonics are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured. The measurements greater than 20dB below the limit from 9kHz to 30MHz.

9. Out of Band Emissions

9.1 Standard Applicable

According to §15.247 (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

9.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2014-05-07	2015-05-06
EMI Test Receiver	R&S	ESVB	825471/005	2014-05-07	2015-05-06
Pre-amplifier	Agilent	8447F	3113A06717	2014-05-07	2015-05-06
Pre-amplifier	Compliance Direction	PAP-0118	24002	2014-05-07	2015-05-06
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2014-05-07	2015-05-06
Horn Antenna	ETS	3117	00086197	2014-05-07	2015-05-06

9.3 Test Procedure

According to the KDB 558074, the band-edge radiated test method as follows:

Set span = wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation (2310MHz to 2420MHz for low bandedge, 2460MHz to 2500MHz for the high bandedge)

RBW = 1MHz, VBW = 1MHz for peak value measured

RBW = 1MHz, VBW = 10Hz for average value measured

Sweep = auto; Detector function = peak/average; Trace = max hold

All the trace to stabilize, set the marker on the emission at the bandedge, or on the highest modulation product outside of the band, if this level is greater than that at the bandedge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. Those emission must comply with the 15.209 limit for fall in the restricted bands listed in section 15.205. Note that the method of measurement KDB publication number: 913591 may be used for the radiated bandedge measurements.

According to the KDB 558074 D01 V03, the conducted spurious emissions test method as follows:

1. Set start frequency to DTS channel edge frequency.
2. Set stop frequency so as to encompass the spectrum to be examined.
3. Set RBW = 100 kHz.
4. Set VBW \geq 300 kHz.
5. Detector = peak.
6. Trace Mode = max hold.
7. Sweep = auto couple.
8. Allow the trace to stabilize (this may take some time, depending on the extent of the span).
9. Use peak marker function to determine maximum amplitude of all unwanted emissions within any 100 kHz bandwidth.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements specified in section 8.1. Report the three highest emissions relative to the limit.

9.4 Environmental Conditions

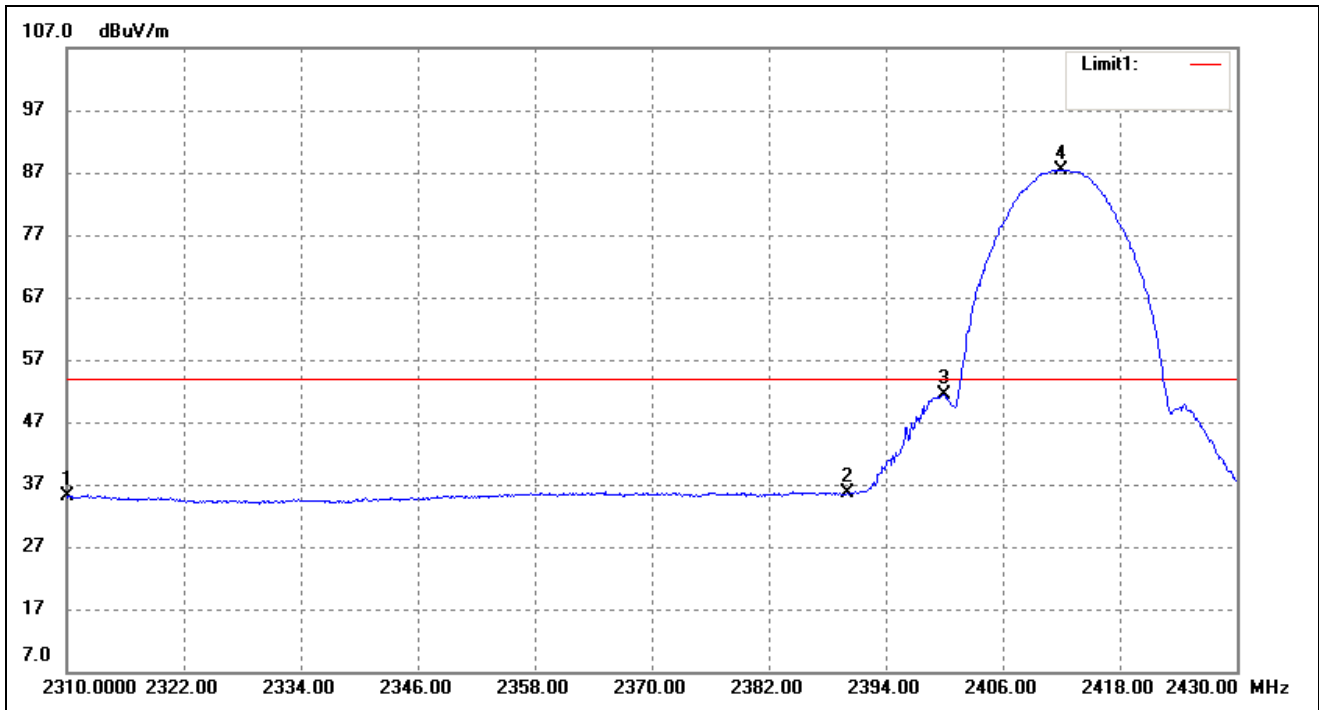
Temperature:	23°C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

9.5 Summary of Test Results/Plots

Please refer to the test plots as below.

802.11b-Lowest Bandedge

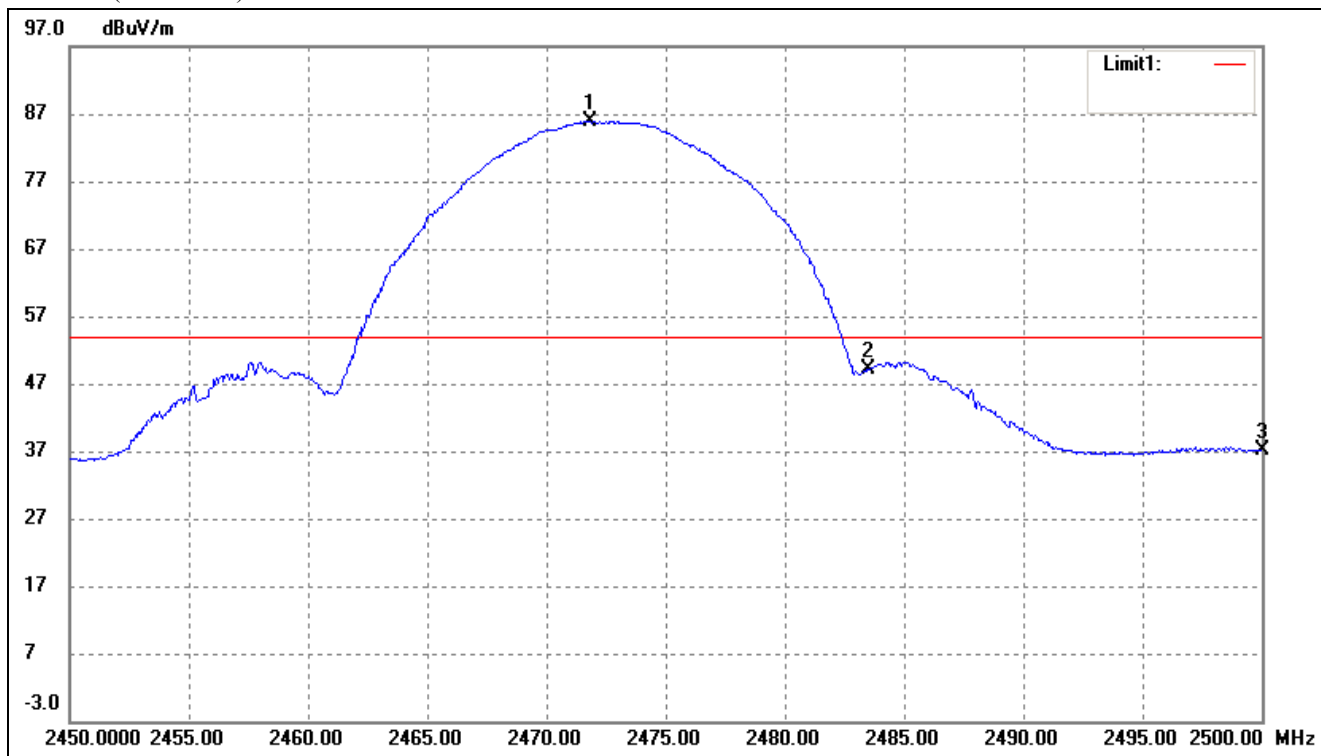
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	18.75	16.34	35.09	54.00	-18.91	Average Detector
	2310.000	30.58	16.34	46.92	74.00	-27.08	Peak Detector
2	2390.000	18.69	17.03	35.72	54.00	-18.28	Average Detector
	2390.000	30.28	17.03	47.31	74.00	-26.69	Peak Detector
3	2400.000	34.21	17.11	51.32	Delta=36.14dBc		Average Detector
	2412.000	70.26	17.20	87.46			Peak Detector

802.11b-Highest Bandedge

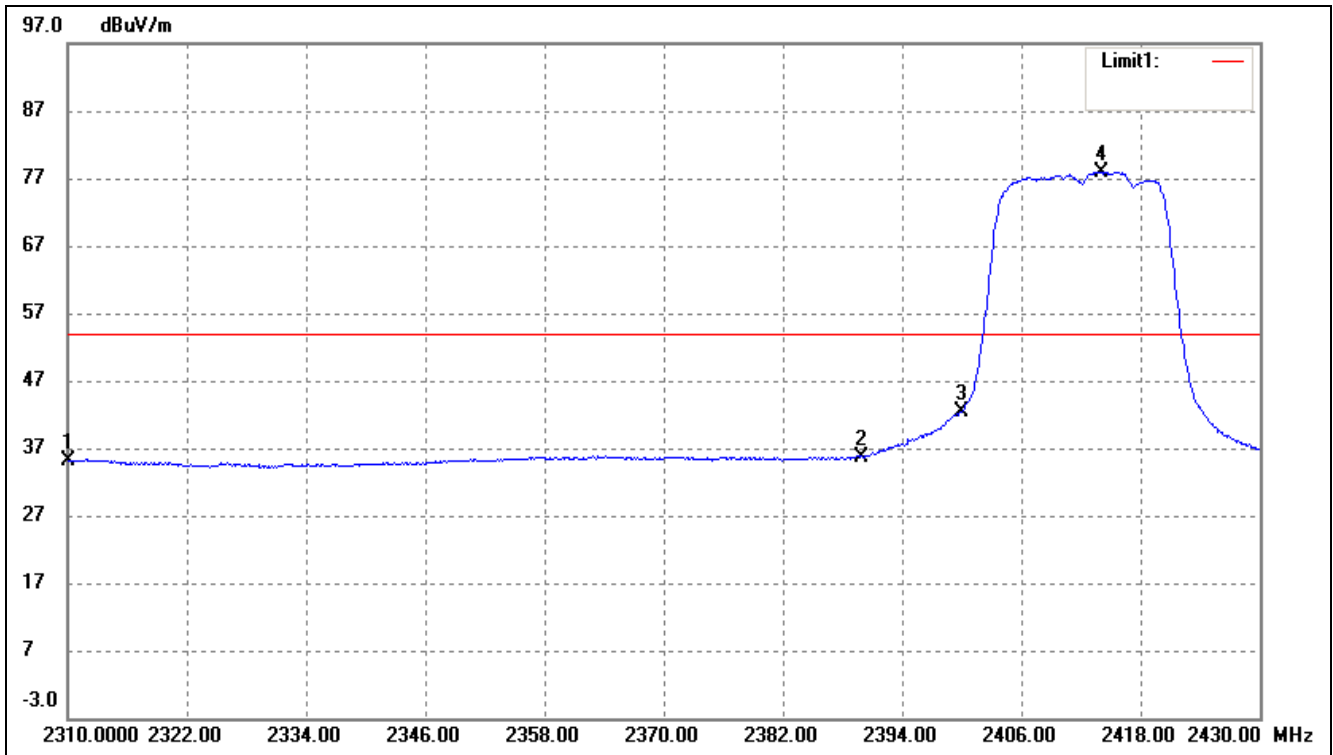
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2471.850	68.32	17.65	85.97	/	/	Average Detector
	2473.300	76.62	17.66	94.28	/	/	Peak Detector
2	2483.500	Delta =39.18dBc		46.79	54.00	-7.21	Average Detector
	2483.500			55.10	74.00	-18.90	Peak Detector
3	2500.000	19.24	17.85	37.09	54.00	-16.91	Average Detector
	2500.000	30.87	17.86	48.73	74.00	-25.27	Peak Detector

802.11g-Lowest Bandedge

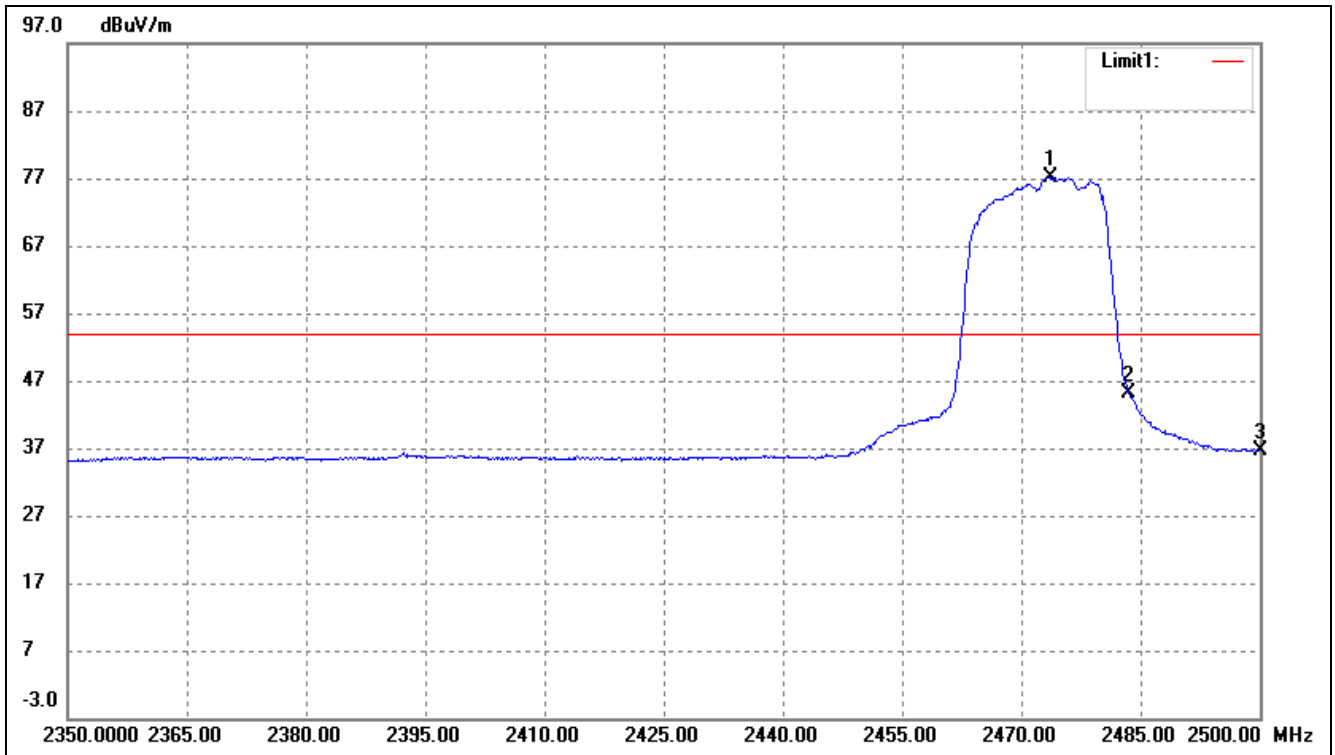
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	18.81	16.34	35.15	54.00	-18.85	Average Detector
		31.33	16.34	47.67	74.00	-26.33	Peak Detector
2	2390.000	30.96	17.03	47.99	74.00	-26.01	Average Detector
		18.65	17.03	35.68	54.00	-18.32	Peak Detector
3	2400.000	25.30	17.11	42.41	Delta=23.15dBc		Average Detector
		48.45	17.11	65.56			Peak Detector

802.11g-Highest Bandedge

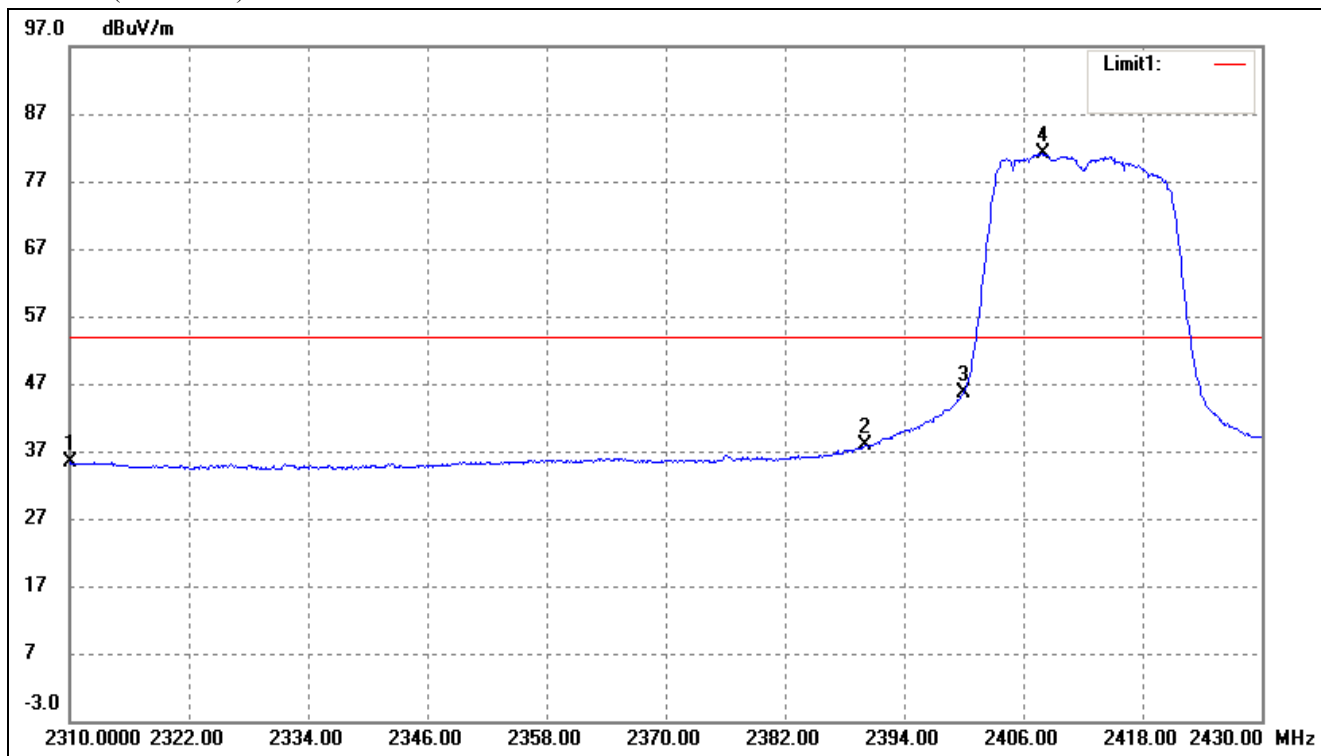
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2473.600	59.54	17.66	77.20	/	/	Average Detector
	2473.500	71.80	17.69	89.49	/	/	Peak Detector
2	2483.500	Delta = 32.72dBc		44.48	54.00	-9.52	Average Detector
	2483.500			56.77	74.00	-17.23	Peak Detector
3	2500.000	18.73	17.86	36.59	54.00	-17.41	Average Detector
	2500.000	30.72	17.86	48.58	74.00	-25.42	Peak Detector

802.11n-HT20-Lowest Bandedge

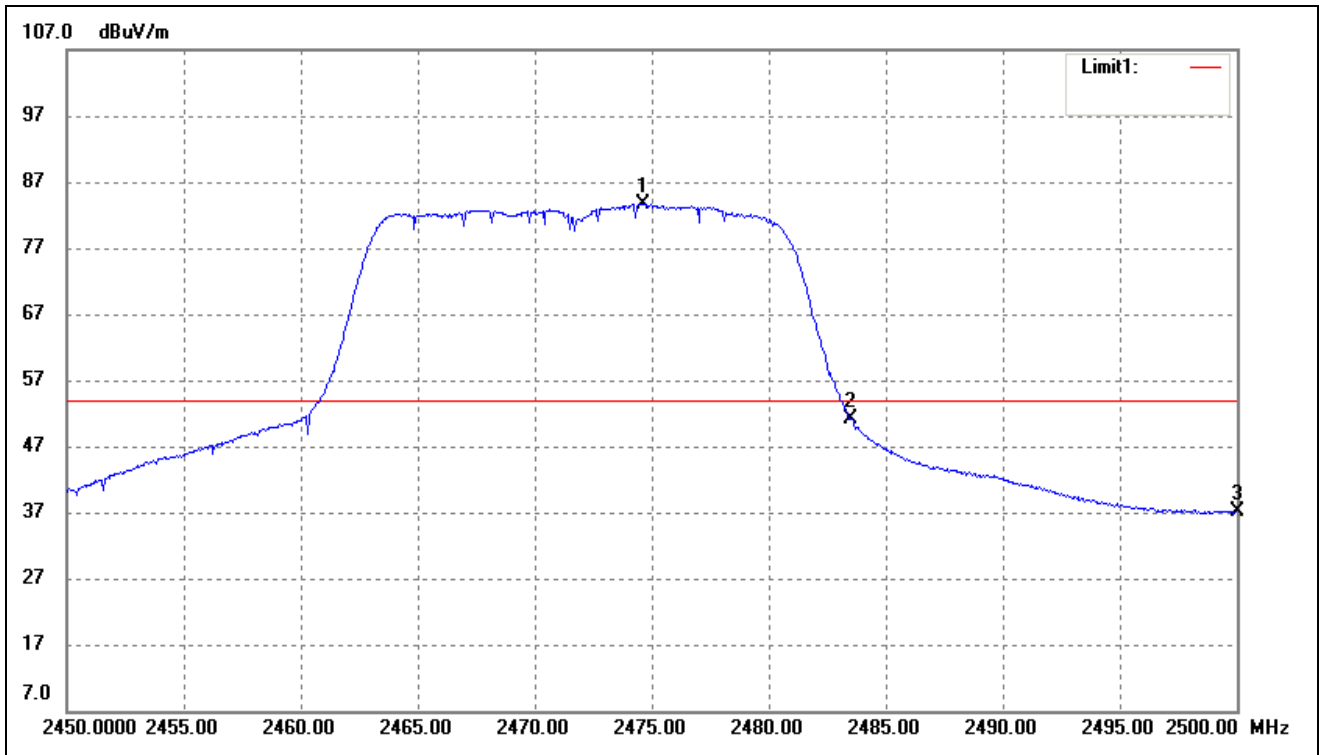
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	19.07	16.34	35.41	54.00	-18.59	Average Detector
		30.69	16.34	47.03	74.00	-26.97	Peak Detector
2	2390.000	20.77	17.03	37.80	54.00	-16.20	Average Detector
		42.99	17.03	60.02	74.00	-13.98	Peak Detector
3	2400.000	28.62	17.11	45.73	Delta=23.22dBc		Average Detector
		51.84	17.11	68.95			Peak Detector

802.11n-HT20-Highest Bandedge

Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2474.650	66.07	17.67	83.74	/	/	Average Detector
	2473.250	77.99	17.66	95.65	/	/	Peak Detector
2	2483.500	Delta = 36.01dBc		47.73	54.00	-6.27	Average Detector
	2483.500			59.64	74.00	-14.36	Peak Detector
3	2500.000	19.15	17.86	37.01	54.00	-16.99	Average Detector
	2500.000	31.40	17.85	49.25	74.00	-24.75	Peak Detector

10. Conducted Emissions

10.1 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.

10.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2014-05-07	2015-05-06
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2014-05-07	2015-05-06
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2014-05-07	2015-05-06

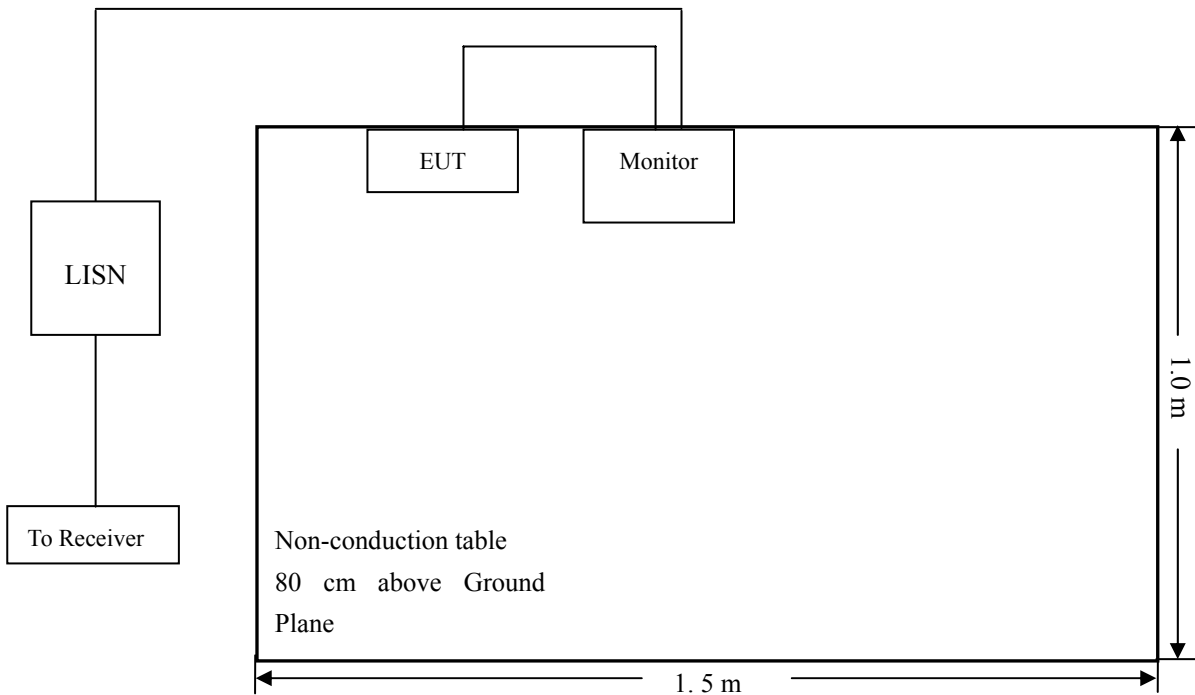
10.3 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.207 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.

10.4 Basic Test Setup Block Diagram



10.5 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

10.6 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

10.7 Summary of Test Results/Plots

According to the data in section 9.8, the EUT complied with the FCC Part 15.207 Conducted margin for a Class B device, with the *worst* margin reading of:

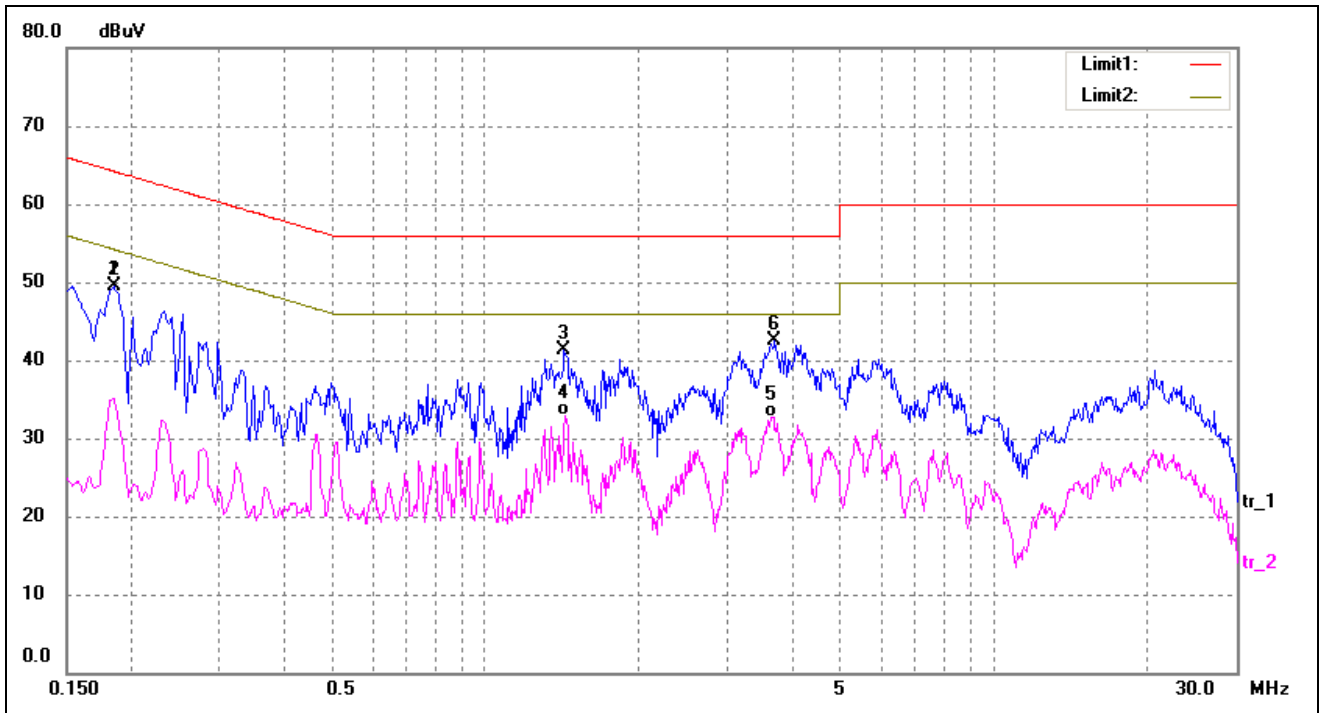
-11.27 dB at 0.1620 MHz in the Line mode, Peak detector, 0.15-30MHz

10.8 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

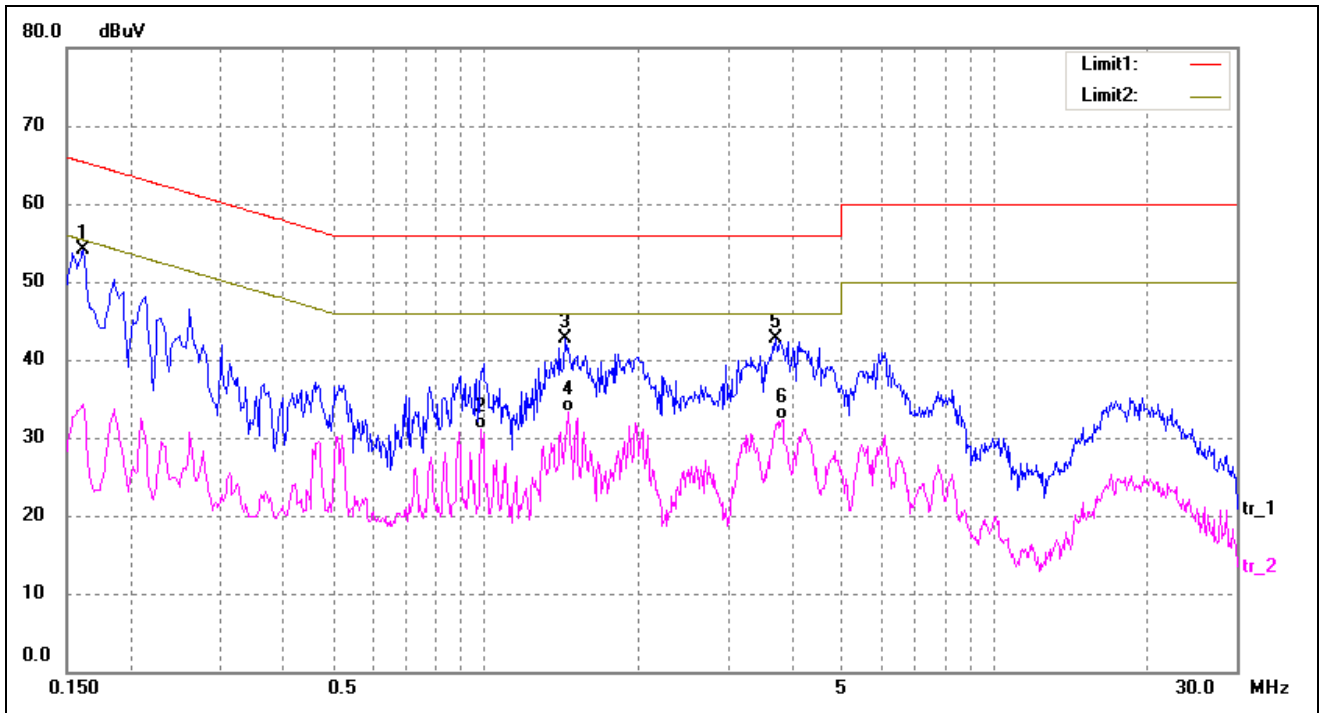
EUT: *Awox StrimCAST*
 Tested Model: *SC-W*
 Operating Condition: *Transmitting(Wi-Fi)*
 Comment: *USB DC 5V*

Test Specification: *Neutral*



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1860	39.92	9.50	49.42	64.21	-14.79	peak
2	0.1860	39.92	9.50	49.42	64.21	-14.79	peak
3	1.4299	31.24	10.00	41.24	56.00	-14.76	peak
4	1.4380	22.94	10.00	32.94	46.00	-13.06	AVG
5	3.6740	22.80	10.00	32.80	46.00	-13.20	AVG
6	3.7020	32.52	10.00	42.52	56.00	-13.48	peak

Test Specification: Live



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1620	44.59	9.50	54.09	65.36	-11.27	peak
2	0.9820	21.08	9.98	31.06	46.00	-14.94	AVG
3	1.4340	32.63	10.00	42.63	56.00	-13.37	peak
4	1.4580	23.32	10.00	33.32	46.00	-12.68	AVG
5	3.7300	32.73	10.00	42.73	56.00	-13.27	peak
6	3.8420	22.39	10.00	32.39	46.00	-13.61	AVG

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