

FCC Test Report

Product Name	VistaHub Wifi only
Model No	VISTAHUB-WIFI
FCC ID.	RZ5-VISTAHUB-WIFI

Applicant	Onyx Healthcare Inc.
Address	2F., No.135, LANE 235, PAO CHIAO RD., XINDIAN DIST., NEW TAIPEI CITY 231, TAIWAN (R.O.C.)

Date of Receipt	Aug. 08, 2017
Issue Date	Dec. 07, 2017
Report No.	1790230R-RFUSP26V00
Report Version	V1.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.

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Test Report

Issue Date: Dec. 07, 2017

Report No.: 1790230R-RFUSP26V00



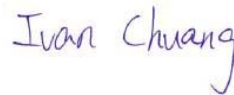
Product Name	VistaHub Wifi only
Applicant	Onyx Healthcare Inc.
Address	2F., No.135, LANE 235, PAO CHIAO RD., XINDIAN DIST., NEW TAIPEI CITY 231, TAIWAN (R.O.C.)
Manufacturer	VitalConnect, Inc.
Model No.	VISTAHUB-WIFI
FCC ID.	RZ5-VISTAHUB-WIFI
EUT Rated Voltage	AC 100-240V, 50/60Hz
EUT Test Voltage	AC 120V/60Hz
Trade Name	VitalConnect
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2016 ANSI C63.4: 2014, ANSI C63.10: 2013 KDB 558074 D01 DTS Meas Guidance v04
Test Result	Complied

Documented By :



(Senior Adm. Specialist / Genie Chang)

Tested By :



(Senior Engineer / Ivan Chuang)

Approved By :



(Director / Vincent Lin)

TABLE OF CONTENTS

Description	Page
1. GENERAL INFORMATION	5
1.1. EUT Description	5
1.2. Operational Description	7
1.3. Tested System Details	8
1.4. Configuration of Tested System	8
1.5. EUT Exercise Software	9
1.6. Test Facility	10
1.7. List of Test Item and Equipment	11
2. Conducted Emission	12
2.1. Test Setup	12
2.2. Limits	12
2.3. Test Procedure	12
2.4. Uncertainty	12
2.5. Test Result of Conducted Emission	13
3. Peak Power Output	17
3.1. Test Setup	17
3.2. Limits	17
3.3. Test Procedure	17
3.4. Uncertainty	17
3.5. Test Result of Peak Power Output	18
4. Radiated Emission	22
4.1. Test Setup	22
4.2. Limits	23
4.3. Test Procedure	24
4.4. Uncertainty	25
4.5. Test Result of Radiated Emission	26
5. RF antenna conducted test.....	46
5.1. Test Setup	46
5.2. Limits	46
5.3. Test Procedure	46
5.4. Uncertainty	46
5.5. Test Result of RF antenna conducted test	47
6. Band Edge	51
6.1. Test Setup	51
6.2. Limits	52
6.3. Test Procedure	52
6.4. Uncertainty	53
6.5. Test Result of Band Edge	54
7. 6dB Bandwidth	70
7.1. Test Setup	70
7.2. Limits	70

7.3.	Test Procedure	70
7.4.	Uncertainty	70
7.5.	Test Result of 6dB Bandwidth.....	71
8.	Power Density	79
8.1.	Test Setup	79
8.2.	Limits	79
8.3.	Test Procedure	79
8.4.	Uncertainty	79
8.5.	Test Result of Power Density	80
9.	Duty Cycle	88
9.1.	Test Setup	88
9.2.	Test Procedure	88
9.3.	Uncertainty	88
9.4.	Test Result of Duty Cycle.....	89
10.	EMI Reduction Method During Compliance Testing	90

Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	VistaHub Wifi only
Trade Name	VitalConnect
Model No.	VISTAHUB-WIFI
FCC ID.	RZ5-VISTAHUB-WIFI
Frequency Range	2412-2462MHz for 802.11b/g/n-20BW, 2422-2452MHz for 802.11n-40BW
Number of Channels	802.11b/g/n-20MHz: 11, n-40MHz: 7
Data Speed	802.11b: 1-11Mbps, 802.11g: 6-54Mbps, 802.11n: up to 150Mbps
Channel separation	802.11b/g/n: 5 MHz
Type of Modulation	802.11b:DSSS (DBPSK, DQPSK, CCK) 802.11g/n:OFDM (BPSK, QPSK, 16QAM, 64QAM)
Antenna Type	Dipole
Antenna Gain	Refer to the table “Antenna List”
Channel Control	Auto
Power Adapter (1)	M/N: ATM020-W050U Input: AC 100-240V~50-60Hz 0.45-0.27A Output: DC 5V, 3.5A Cable Out: Non-shielded, 1.8m
Power Adapter (2)	M/N: ATM036T-A050 Input: AC 100-240V~50-60Hz 1A-0.45 Output: DC 5V, 5A Cable IN: Non-shielded, 1.8m Cable Out: Non-shielded, 1.5m

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	ARISTOTLE	RFA-25-L14M3-B32	Dipole	2.5dBi for WLAN
2	ARISTOTLE	RFA-25-L14M3-B32	Dipole	2.5dBi for Bluetooth

Note: The antenna of EUT is conforming to FCC 15.203.

802.11b/g/n-20MHz Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 01:	2412 MHz	Channel 02:	2417 MHz	Channel 03:	2422 MHz	Channel 04:	2427 MHz
Channel 05:	2432 MHz	Channel 06:	2437 MHz	Channel 07:	2442 MHz	Channel 08:	2447 MHz
Channel 09:	2452 MHz	Channel 10:	2457 MHz	Channel 11:	2462 MHz		

802.11n-40MHz Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 03:	2422 MHz	Channel 04:	2427 MHz	Channel 05:	2432 MHz	Channel 06:	2437 MHz
Channel 07:	2442 MHz	Channel 08:	2447 MHz	Channel 09:	2452 MHz		

Note:

1. The EUT is a VistaHub Wifi only with a built-in 2.4GHz WLAN 、Bluetooth transceiver, this report for 2.4GHz WLAN.
2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
3. Lowest and highest data rates are tested in each mode. Only worst case is shown in the report. (802.11b is 1Mbps 、802.11g is 6Mbps 、802.11n(20M-BW) is 7.2Mbps and 802.11n(40M-BW) is 15Mbps)
4. These tests are conducted on a sample for the purpose of demonstrating compliance of 802.11b/g/n transmitter with Part 15 Subpart C Paragraph 15.247 of spread spectrum devices.
5. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

Test Mode:	Mode 1: Transmit (802.11b 1Mbps)
	Mode 2: Transmit (802.11g 6Mbps)
	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)
	Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW)

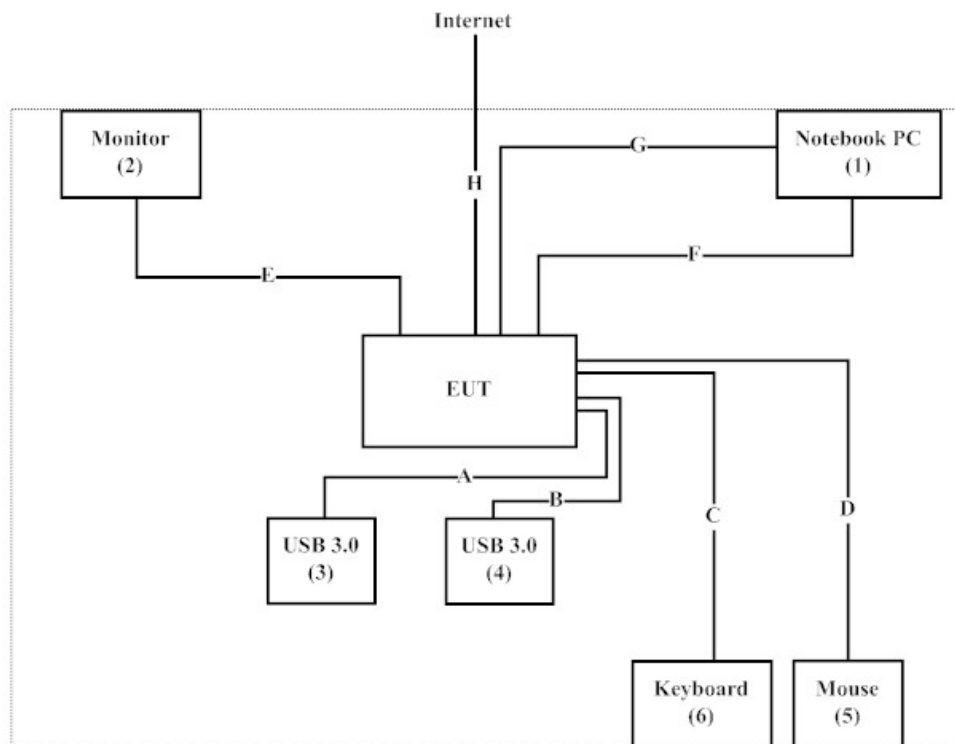
1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product	Manufacturer	Model No.	Serial No.	Power Cord
1 Notebook PC	DELL	P62G	229FJC2	N/A
2 Monitor	DELL	U2415	CN-01RMGX-74261-63H-09UL-A02	N/A
3 USB 3.0	WD	WDBUZG0010BBK-PESN	WX11A166S2Y3	N/A
4 USB 3.0	WD	WDBUZG0010BBK-PESN	WXR1AC5478U6	N/A
5 Mouse	Logitech	U0026	N/A	N/A
6 Keyboard	Logitech	K120	N/A	N/A

Signal Cable Type	Signal cable Description
A HDD USB 3.0 Cable	Shielded, 0.47m
B HDD USB 3.0 Cable	Shielded, 0.47m
C USB Keyboard Cable	Shielded, 1.8m
D USB Moue Cable	Shielded, 1.8m
E HDM Cable	Shielded, 2.0m
F USB Cable (Signal Cable)	Shielded, 0.78m
G USB Cable (Signal Cable)	Shielded, 0.78m
H LAB Cable	Non-shielded, 3.0m

1.4. Configuration of Tested System



1.5. EUT Exercise Software

1. Setup the EUT as shown in Section 1.4.
2. Execute software “RT5X7X (Ver 1.0.8.0)” on the EUT.
3. Configure the test mode, the test channel, and the data rate.
4. Press “OK” to start the continuous Transmit.
5. Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

The related certificate for our laboratories about the test site and management system can be downloaded from DEKRA Testing and Certification Co., Ltd. Web Site:

<http://www.dekra.com.tw/english/about/certificates.aspx?bval=5>

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E-Mail : info.tw@dekra.com

FCC Accreditation Number: TW3023

1.7. List of Test Item and Equipment

For Conduction measurements /ASR1

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	EMI Test Receiver	R&S	ESR7	161601	2017.01.06	2018.01.05
X	Two-Line V-Network	R&S	ENV216	101306	2017.02.16	2018.02.15
X	Two-Line V-Network	R&S	ENV216	101307	2017.03.17	2018.03.16
X	Coaxial Cable	Quietek	RG400_BNC	RF001	2017.05.24	2018.05.23

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version : QuieTek EMI 2.0 V2.1.113

For Conducted measurements /ASR4

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	Spectrum Analyzer	R&S	FSV30	103464	2017.01.09	2018.01.08
X	Power Meter	Anritsu	ML2496A	1548003	2016.12.15	2017.12.14
X	Power Sensor	Anritsu	MA2411B	1531024	2016.12.15	2017.12.14
X	Power Sensor	Anritsu	MA2411B	1531025	2016.12.15	2017.12.14
	Bluetooth Tester	R&S	CBT	101238	2017.01.03	2018.01.02

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version : QuieTek Conduction Test System V8.0.110

For Radiated measurements /ACB1

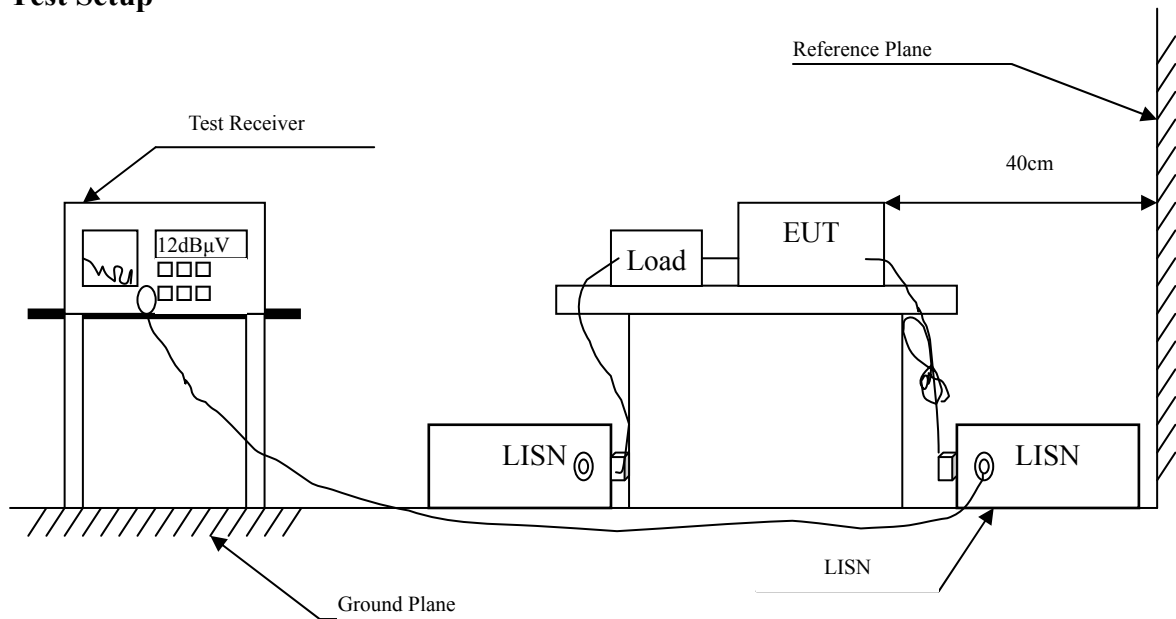
	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	Loop Antenna	TESEQ	HLA6121	37133	2017.10.13	2018.10.12
X	Bi-Log Antenna	SCHWARZBECK	VULB9168	9168-674	2017.02.09	2018.02.08
X	Horn Antenna	ETS-Lindgren	3117	00203761	2017.10.25	2018.10.24
X	Horn Antenna	Com-Power	AH-840	101087	2017.05.24	2018.05.23
X	Pre-Amplifier	EMCI	EMC001330	980316	2017.05.14	2018.05.13
X	Pre-Amplifier	EMCI	EMC051835SE	980311	2017.05.15	2018.05.14
X	Pre-Amplifier	EMCI	EMC05820SE	980310	2017.05.15	2018.05.14
X	Pre-Amplifier	EMCI	EMC184045SE	980314	2017.05.17	2018.05.16
X	Filter	MICRO TRONICS	BRM50702	G249	2017.08.11	2018.08.10
	Filter	MICRO TRONICS	BRM50716	G187	2017.08.16	2018.08.15
X	EMI Test Receiver	R&S	ESR7	101602	2016.12.15	2017.12.14
X	Spectrum Analyzer	R&S	FSV40	101148	2017.01.24	2018.01.23
X	Coaxial Cable	SUHNER	SUCOFLEX 106	RF002	2017.05.25	2018.05.24
X	Mircoflex Cable	HUBER SUHNER	SUCOFLEX 102	MY3381/2	2017.08.11	2018.08.10

Note:

1. Loop Antenna is calibrated every two year, the other equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version : QuieTek EMI 2.0 V2.1.113

2. Conducted Emission

2.1. Test Setup



2.2. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dB μ V) Limit		
Frequency MHz	Limits	
	QP	AVG
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

2.3. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

2.4. Uncertainty

± 2.35 dB

2.5. Test Result of Conducted Emission

Product : VistaHub Wifi only
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW) (2437MHz)
 _Adapter: ATM020-W050U
 Test Date : 2017/10/02

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level	dB	dBμV
	dB	dBμV	dBμV		
Line 1					
Quasi-Peak					
0.153	9.561	38.676	48.237	-17.677	65.914
0.190	9.560	33.082	42.642	-22.215	64.857
0.610	9.580	33.421	43.001	-12.999	56.000
2.337	9.583	33.057	42.640	-13.360	56.000
2.713	9.587	27.099	36.686	-19.314	56.000
4.827	9.608	17.098	26.706	-29.294	56.000
Average					
0.153	9.561	26.489	36.050	-19.864	55.914
0.190	9.560	21.782	31.342	-23.515	54.857
0.610	9.580	25.672	35.252	-10.748	46.000
2.337	9.583	25.313	34.896	-11.104	46.000
2.713	9.587	21.533	31.120	-14.880	46.000
4.827	9.608	8.434	18.042	-27.958	46.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : VistaHub Wifi only
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW) (2437MHz)
 Adapter: ATM020-W050U
 Test Date : 2017/10/02

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBμV	dBμV	dB	dBμV
Line 2					
Quasi-Peak					
0.153	9.552	39.219	48.770	-17.144	65.914
0.197	9.559	33.144	42.703	-21.954	64.657
0.607	9.575	34.040	43.615	-12.385	56.000
2.344	9.583	34.285	43.868	-12.132	56.000
2.700	9.587	29.113	38.700	-17.300	56.000
2.973	9.590	27.623	37.213	-18.787	56.000
Average					
0.153	9.552	26.316	35.868	-20.046	55.914
0.197	9.559	22.323	31.882	-22.775	54.657
0.607	9.575	25.696	35.271	-10.729	46.000
2.344	9.583	27.917	37.500	-8.500	46.000
2.700	9.587	23.205	32.792	-13.208	46.000
2.973	9.590	21.275	30.865	-15.135	46.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “ ” means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : VistaHub Wifi only
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW) (2437MHz)
 Adapter: ATM036T-A050
 Test Date : 2017/10/02

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBμV	dBμV	dB	dBμV
Line 1					
Quasi-Peak					
0.157	9.560	29.325	38.886	-26.914	65.800
0.392	9.573	32.038	41.611	-17.475	59.086
2.305	9.583	36.237	45.820	-10.180	56.000
2.700	9.587	31.102	40.689	-15.311	56.000
3.000	9.590	28.955	38.545	-17.455	56.000
3.400	9.594	22.416	32.010	-23.990	56.000
Average					
0.157	9.560	19.147	28.708	-27.092	55.800
0.392	9.573	24.331	33.903	-15.183	49.086
2.305	9.583	29.794	39.377	-6.623	46.000
2.700	9.587	24.449	34.036	-11.964	46.000
3.000	9.590	22.584	32.174	-13.826	46.000
3.400	9.594	15.178	24.772	-21.228	46.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : VistaHub Wifi only
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW) (2437MHz)
 _ Adapter: ATM036T-A050
 Test Date : 2017/10/02

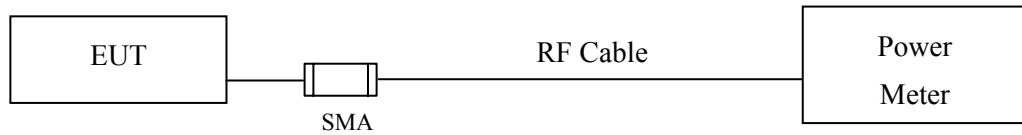
Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBμV	dBμV	dB	dBμV
Line 2					
Quasi-Peak					
0.159	9.552	30.480	40.032	-25.711	65.743
0.390	9.567	32.998	42.565	-16.578	59.143
2.321	9.583	38.450	48.033	-7.967	56.000
2.681	9.587	32.313	41.900	-14.100	56.000
2.962	9.590	30.252	39.842	-16.158	56.000
3.400	9.594	22.366	31.960	-24.040	56.000
Average					
0.159	9.552	20.159	29.711	-26.032	55.743
0.390	9.567	25.036	34.603	-14.540	49.143
2.321	9.583	30.402	39.985	-6.015	46.000
2.681	9.587	25.282	34.869	-11.131	46.000
2.962	9.590	23.557	33.146	-12.854	46.000
3.400	9.594	15.372	24.966	-21.034	46.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “” means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

3. Peak Power Output

3.1. Test Setup



3.2. Limits

The maximum peak power shall be less 1 Watt.

3.3. Test Procedure

Tested according to DTS test procedure of KDB 558074 for compliance to FCC 47CFR 15.247 requirements. The maximum peak conducted output power using KDB 558074 section 9.1.3 PKPM1 Peak power meter method.

3.4. Uncertainty

± 0.86 dB

3.5. Test Result of Peak Power Output

Product : VistaHub Wifi only
 Test Item : Peak Power Output Data
 Test Mode : Mode 1: Transmit (802.11b 1Mbps)
 Test Date : 2017/09/20

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)				Peak Power	Required Limit	Result
		1	2	5.5	11	1		
		Measurement Level (dBm)						
01	2412	13.86	--	--	--	16.37	<30dBm	Pass
06	2437	15.41	15.33	15.27	15.13	17.59	<30dBm	Pass
11	2462	15.04	--	--	--	17.21	<30dBm	Pass

Note: Peak Power Output Value = Reading value on power meter + cable loss

Product : VistaHub Wifi only
 Test Item : Peak Power Output Data
 Test Mode : Mode 2: Transmit (802.11g 6Mbps)
 Test Date : 2017/09/20

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power	Required Limit	Result
		6	9	12	18	24	36	48	54	6		
		Measurement Level (dBm)										
01	2412	13.03	--	--	--	--	--	--	--	23.42	<30dBm	Pass
06	2437	15.51	15.42	15.33	15.24	15.11	15.03	14.96	14.88	23.13	<30dBm	Pass
11	2462	15.28	--	--	--	--	--	--	--	23.02	<30dBm	Pass

Note: Peak Power Output Value = Reading value on power meter + cable loss

Product : VistaHub Wifi only
 Test Item : Peak Power Output Data
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)
 Test Date : 2017/09/20

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power	Required Limit	Result
		7.2	14.4	21.7	28.9	43.3	57.8	65	72.2			
		Measurement Level (dBm)										
01	2412	11.8	--	--	--	--	--	--	--	20.65	<30dBm	Pass
06	2437	15.03	14.89	14.73	14.62	14.54	14.41	14.35	14.22	22.93	<30dBm	Pass
11	2462	14.87	--	--	--	--	--	--	--	23.57	<30dBm	Pass

Note: Peak Power Output Value = Reading value on power meter + cable loss

Product : VistaHub Wifi only
 Test Item : Peak Power Output Data
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW)
 Test Date : 2017/09/20

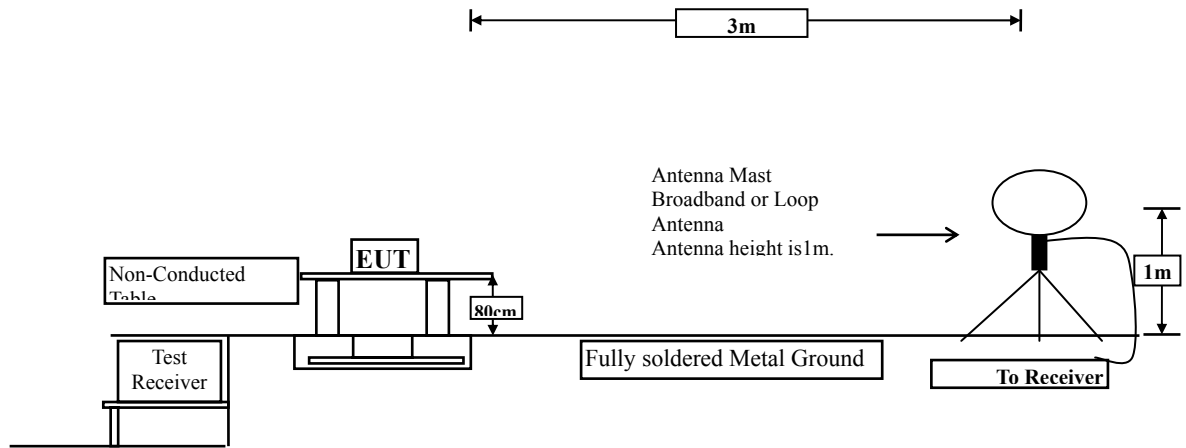
Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power	Required Limit	Result
		15	30	45	60	90	120	135	150			
		Measurement Level (dBm)										
03	2422	10.45	--	--	--	--	--	--	--	18.7	<30dBm	Pass
06	2437	14.67	14.59	14.45	14.37	14.22	14.13	14.02	13.97	23.06	<30dBm	Pass
09	2452	12.92	--	--	--	--	--	--	--	21.35	<30dBm	Pass

Note: Peak Power Output Value = Reading value on power meter + cable loss

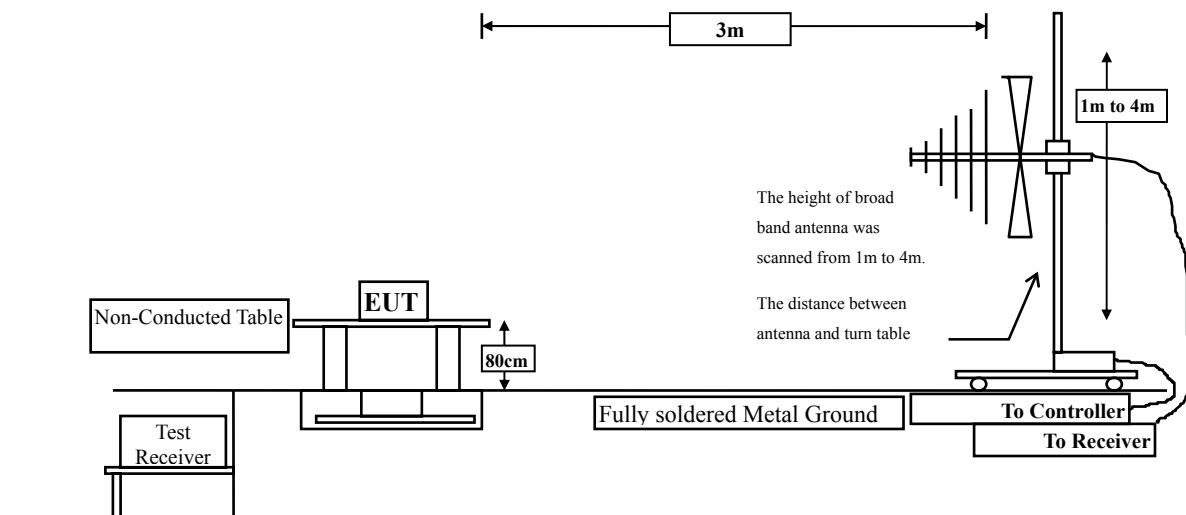
4. Radiated Emission

4.1. Test Setup

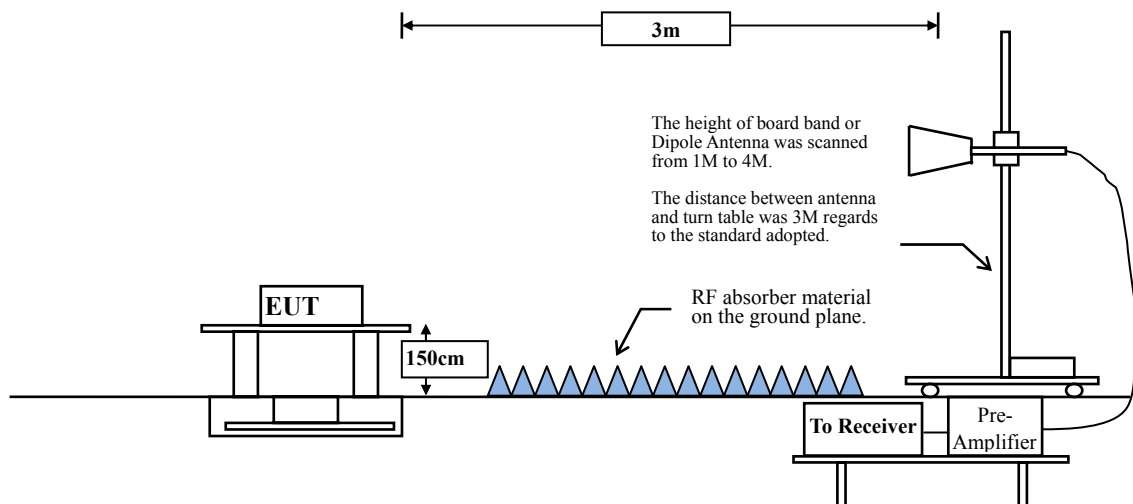
Radiated Emission Under 30MHz



Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



4.2. Limits

➤ General Radiated Emission Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	Field strength (microvolts/meter)	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

- Remarks:
1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
 2. In the Above Table, the tighter limit applies at the band edges.
 3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

4.3. Test Procedure

The EUT was setup according to ANSI C63.10: 2013 and tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Measuring the frequency range below 1GHz, the EUT is placed on a turn table which is 0.8 meter above ground, when measuring the frequency range above 1GHz, the EUT is placed on a turn table which is 1.5 meter above ground.

The turn table is rotated 360 degrees to determine the position of the maximum emission level.

The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10: 2013 on radiated measurement.

The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and 30MHz~1GHz is 120kHz and above 1GHz is 1MHz.

Radiated emission measurements below 30MHz are made using Loop Antenna and 30MHz~1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The measurement frequency range from 9kHz - 10th Harmonic of fundamental was investigated.

RBW and VBW Parameter setting:

According to KDB 558074 section 12.2.4. Peak power measurement procedure

RBW = as specified in Table 1.

VBW $\geq 3 \times$ RBW.

Table 1 —RBW as a function of frequency

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

According to KDB 558074 section 12.2.5. Average power measurement procedure

RBW = 1MHz.

VBW = 10Hz, when duty cycle $\geq 98 \%$

VBW $\geq 1/T$, when duty cycle $< 98 \%$

(T refers to the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.)

2.4GHz band	Duty Cycle (%)	T (ms)	1/T (Hz)	VBW (Hz)
802.11b	100	--	--	10
802.11g	100	--	--	10
802.11n20	100	--	--	10
802.11n40	100	--	--	10

Note: Duty Cycle Refer to Section 9

4.4. Uncertainty

Horizontal :

30-300MHz: $\pm 4.08\text{dB}$; 300M-1GHz: $\pm 3.86\text{dB}$; 1-18GHz: $\pm 3.77\text{dB}$; 18-40GHz: $\pm 3.98\text{dB}$.

Vertical :

30-300MHz: $\pm 4.81\text{dB}$; 300M-1GHz: $\pm 3.87\text{dB}$; 1-18GHz: $\pm 3.83\text{dB}$; 18-40GHz: $\pm 3.98\text{dB}$.

4.5. Test Result of Radiated Emission

Product : VistaHub Wifi only
 Test Item : Harmonic Radiated Emission Data
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2412MHz)_ Adapter: ATM020-W050U
 Test Date : 2017/11/18

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector:					
4824.000	-6.117	61.690	55.573	-19.316	74.000
7236.000	-3.110	48.350	45.240	-28.859	74.000
9648.000	-0.709	46.460	45.751	-29.499	74.000
Average Detector:					
4824.000	-6.117	59.840	53.723	-0.277	54.000
Vertical					
Peak Detector:					
4824.000	-6.117	61.270	55.153	-18.536	74.000
7236.000	-3.110	48.090	44.980	-28.879	74.000
9648.000	-0.709	46.970	46.261	-28.529	74.000
Average Detector:					
4824.000	-6.117	59.310	53.193	-0.807	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : VistaHub Wifi only
 Test Item : Harmonic Radiated Emission Data
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2437 MHz)_ Adapter: ATM020-W050U
 Test Date : 2017/11/18

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector:					
4874.000	-6.080	61.690	55.610	-18.390	74.000
7311.000	-3.045	46.790	43.746	-30.254	74.000
9748.000	-0.536	46.750	46.213	-27.787	74.000
Average Detector:					
4874.000	-6.080	60.030	53.950	-0.050	54.000
Vertical					
Peak Detector:					
4874.000	-6.080	61.080	55.000	-19.000	74.000
7311.000	-3.045	47.260	44.216	-29.784	74.000
9748.000	-0.536	46.630	46.093	-27.907	74.000
Average Detector:					
4874.000	-6.080	59.120	53.040	-0.960	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : VistaHub Wifi only
 Test Item : Harmonic Radiated Emission Data
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2462 MHz)_ Adapter: ATM020-W050U
 Test Date : 2017/11/18

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
Peak Detector:					
4924.000	-6.060	61.500	55.440	-18.560	74.000
7386.000	-2.923	48.250	45.327	-28.673	74.000
9848.000	-0.441	46.280	45.840	-28.160	74.000
Average Detector:					
4924.000	-6.060	59.790	53.730	-0.270	54.000
Vertical					
Peak Detector:					
4924.000	-6.060	60.330	54.270	-19.730	74.000
7386.000	-2.923	47.130	44.207	-29.793	74.000
9848.000	-0.441	45.990	45.550	-28.450	74.000
Average Detector:					
4924.000	-6.060	58.430	52.370	-1.630	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : VistaHub Wifi only
 Test Item : Harmonic Radiated Emission Data
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2412MHz) _ Adapter: ATM020-W050U
 Test Date : 2017/11/18

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector:					
4824.000	-6.117	53.530	47.413	-26.587	74.000
7236.000	-3.110	46.180	43.070	-30.930	74.000
9648.000	-0.709	45.380	44.671	-29.329	74.000
Average Detector:					
--	--	--	--	--	54.000
Vertical					
Peak Detector:					
4824.000	-6.117	51.060	44.943	-29.057	74.000
7236.000	-3.110	46.400	43.290	-30.710	74.000
9648.000	-0.709	45.780	45.071	-28.929	74.000
Average Detector:					
--	--	--	--	--	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : VistaHub Wifi only
 Test Item : Harmonic Radiated Emission Data
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2437 MHz) _ Adapter: ATM020-W050U
 Test Date : 2017/11/18

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector:					
4874.000	-6.080	66.830	60.750	-13.250	74.000
7311.000	-3.045	46.740	43.696	-30.304	74.000
9748.000	-0.536	45.840	45.303	-28.697	74.000
Average Detector:					
4874.000	-6.080	53.180	47.100	-6.900	54.000
Vertical					
Peak Detector:					
4874.000	-6.080	64.410	58.330	-15.670	74.000
7311.000	-3.045	46.650	43.606	-30.394	74.000
9748.000	-0.536	46.230	45.693	-28.307	74.000
Average Detector:					
4874.000	-6.080	50.900	44.820	-9.180	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : VistaHub Wifi only
 Test Item : Harmonic Radiated Emission Data
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2462 MHz) _ Adapter: ATM020-W050U
 Test Date : 2017/11/18

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
Peak Detector:					
4924.000	-6.060	66.610	60.550	-13.450	74.000
7386.000	-2.923	46.560	43.637	-30.363	74.000
9848.000	-0.441	45.150	44.710	-29.290	74.000
Average Detector:					
4924.000	-6.060	52.620	46.560	-7.440	54.000
Vertical					
Peak Detector:					
4924.000	-6.060	63.240	57.180	-16.820	74.000
7386.000	-2.923	46.790	43.867	-30.133	74.000
9848.000	-0.441	45.820	45.380	-28.620	74.000
Average Detector:					
4924.000	-6.060	48.760	42.700	-11.300	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : VistaHub Wifi only
 Test Item : Harmonic Radiated Emission Data
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)(2412MHz)
 _Adapter: ATM020-W050U
 Test Date : 2017/11/18

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector:					
4824.000	-6.117	58.710	52.593	-21.407	74.000
7236.000	-3.110	46.850	43.740	-30.260	74.000
9648.000	-0.709	45.470	44.761	-29.239	74.000
Average Detector:					
--	--	--	--	--	54.000
Vertical					
Peak Detector:					
4824.000	-6.117	55.230	49.113	-24.887	74.000
7236.000	-3.110	46.850	43.740	-30.260	74.000
9648.000	-0.709	46.180	45.471	-28.529	74.000
Average Detector:					
--	--	--	--	--	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : VistaHub Wifi only
 Test Item : Harmonic Radiated Emission Data
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2437 MHz)
 _Adapter: ATM020-W050U
 Test Date : 2017/11/18

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector:					
4874.000	-6.080	67.830	61.750	-12.250	74.000
7311.000	-3.045	48.230	45.186	-28.814	74.000
9748.000	-0.536	46.220	45.683	-28.317	74.000
Average Detector:					
4874.000	-6.080	51.580	45.500	-8.500	54.000
Vertical					
Peak Detector:					
4874.000	-6.080	65.840	59.760	-14.240	74.000
7311.000	-3.045	47.120	44.076	-29.924	74.000
9748.000	-0.536	46.030	45.493	-28.507	74.000
Average Detector:					
4874.000	-6.080	49.900	43.820	-10.180	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : VistaHub Wifi only
 Test Item : Harmonic Radiated Emission Data
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2462 MHz)
 _ Adapter: ATM020-W050U
 Test Date : 2017/11/18

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector:					
4924.000	-6.060	60.590	54.530	-19.470	74.000
7386.000	-2.923	45.730	42.807	-31.193	74.000
9848.000	-0.441	45.290	44.850	-29.150	74.000
Average Detector:					
4924.000	-6.060	44.530	38.470	-15.530	54.000
Vertical					
Peak Detector:					
4924.000	-6.060	58.710	52.650	-21.350	74.000
7386.000	-2.923	46.540	43.617	-30.383	74.000
9848.000	-0.441	45.240	44.800	-29.200	74.000
Average Detector:					
--	--	--	--	--	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : VistaHub Wifi only
 Test Item : Harmonic Radiated Emission Data
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW)(2422MHz)
 _Adapter: ATM020-W050U
 Test Date : 2017/11/18

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector:					
4844.000	-6.104	52.250	46.146	-27.854	74.000
7266.000	-3.099	46.820	43.721	-30.279	74.000
9688.000	-0.649	46.600	45.951	-28.049	74.000
Average Detector:					
--	--	--	--	--	54.000
Vertical					
Peak Detector:					
4844.000	-6.104	49.360	43.256	-30.744	74.000
7266.000	-3.099	47.430	44.331	-29.669	74.000
9688.000	-0.649	45.500	44.851	-29.149	74.000
Average Detector:					
--	--	--	--	--	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : VistaHub Wifi only
 Test Item : Harmonic Radiated Emission Data
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW) (2437 MHz)
 _ Adapter: ATM020-W050U
 Test Date : 2017/11/18

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector:					
4874.000	-6.080	62.940	56.860	-17.140	74.000
7311.000	-3.045	46.820	43.776	-30.224	74.000
9748.000	-0.536	45.780	45.243	-28.757	74.000
Average Detector:					
4874.000	-6.080	50.290	44.210	-9.790	54.000
Vertical					
Peak Detector:					
4874.000	-6.080	60.110	54.030	-19.970	74.000
7311.000	-3.045	46.960	43.916	-30.084	74.000
9748.000	-0.536	46.020	45.483	-28.517	74.000
Average Detector:					
4874.000	-6.080	47.160	41.080	-12.920	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : VistaHub Wifi only
 Test Item : Harmonic Radiated Emission Data
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW)(2452 MHz)
 _Adapter: ATM020-W050U
 Test Date : 2017/11/18

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector:					
4904.000	-6.090	53.570	47.480	-26.520	74.000
7356.000	-2.975	46.190	43.216	-30.784	74.000
9808.000	-0.484	45.930	45.447	-28.553	74.000
Average Detector:					
--	--	--	--	--	54.000
Vertical					
Peak Detector:					
4904.000	-6.090	52.390	46.300	-27.700	74.000
7356.000	-2.975	46.280	43.306	-30.694	74.000
9808.000	-0.484	46.250	45.767	-28.233	74.000
Average Detector:					
--	--	--	--	--	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : VistaHub Wifi only
 Test Item : General Radiated Emission Data
 Test Mode : Mode 1: Transmit (802.11b 1Mbps)(2437 MHz) _ Adapter: ATM020-W050U
 Test Date : 2017/10/03

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
186.043	-12.887	54.110	41.223	-2.277	43.500
235.246	-12.163	54.509	42.347	-3.653	46.000
399.725	-7.349	51.324	43.975	-2.025	46.000
770.855	-0.656	42.686	42.029	-3.971	46.000
924.087	1.169	43.050	44.218	-1.782	46.000
1000.000	2.220	42.973	45.193	-8.807	54.000
Vertical					
39.841	-11.103	49.417	38.314	-1.686	40.000
184.638	-12.729	52.136	39.408	-4.092	43.500
399.725	-7.349	46.313	38.964	-7.036	46.000
616.217	-2.930	43.591	40.661	-5.339	46.000
924.087	1.169	42.882	44.051	-1.949	46.000
1000.000	2.220	43.261	45.481	-8.519	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product : VistaHub Wifi only
 Test Item : General Radiated Emission Data
 Test Mode : Mode 2: Transmit (802.11g 6Mbps)(2437 MHz) _ Adapter: ATM020-W050U
 Test Date : 2017/10/03

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
183.232	-12.567	52.250	39.683	-3.817	43.500
235.246	-12.163	54.039	41.877	-4.123	46.000
399.725	-7.349	49.266	41.917	-4.083	46.000
666.826	-2.298	38.817	36.520	-9.480	46.000
800.377	-0.321	44.707	44.386	-1.614	46.000
924.087	1.169	39.065	40.233	-5.767	46.000
Vertical					
38.435	-11.273	48.554	37.281	-2.719	40.000
183.232	-12.567	52.049	39.482	-4.018	43.500
399.725	-7.349	46.374	39.025	-6.975	46.000
533.275	-4.610	45.182	40.572	-5.428	46.000
770.855	-0.656	45.447	44.790	-1.210	46.000
924.087	1.169	43.738	44.906	-1.094	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product : VistaHub Wifi only
 Test Item : General Radiated Emission Data
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)(2437 MHz)
 _Adapter: ATM020-W050U
 Test Date : 2017/10/03

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
186.043	-12.887	54.119	41.232	-2.268	43.500
236.652	-12.074	53.576	41.502	-4.498	46.000
399.725	-7.349	51.225	43.876	-2.124	46.000
616.217	-2.930	41.184	38.254	-7.746	46.000
770.855	-0.656	43.241	42.584	-3.416	46.000
924.087	1.169	43.776	44.944	-1.056	46.000
Vertical					
58.116	-11.642	48.535	36.893	-3.107	40.000
186.043	-12.887	52.463	39.576	-3.924	43.500
461.580	-5.967	45.280	39.313	-6.687	46.000
600.754	-3.062	46.193	43.131	-2.869	46.000
770.855	-0.656	45.468	44.811	-1.189	46.000
924.087	1.169	41.496	42.664	-3.336	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product : VistaHub Wifi only
 Test Item : General Radiated Emission Data
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW)(2437 MHz)
 _Adapter: ATM020-W050U
 Test Date : 2017/10/03

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
187.449	-13.047	53.439	40.391	-3.109	43.500
235.246	-12.163	53.372	41.210	-4.790	46.000
399.725	-7.349	49.899	42.550	-3.450	46.000
610.594	-2.978	39.115	36.137	-9.863	46.000
770.855	-0.656	45.591	44.934	-1.066	46.000
924.087	1.169	43.548	44.716	-1.284	46.000
Vertical					
39.841	-11.103	48.393	37.290	-2.710	40.000
183.232	-12.567	52.289	39.722	-3.778	43.500
399.725	-7.349	46.905	39.556	-6.444	46.000
616.217	-2.930	44.351	41.421	-4.579	46.000
770.855	-0.656	45.624	44.967	-1.033	46.000
924.087	1.169	43.754	44.922	-1.078	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product : VistaHub Wifi only
 Test Item : General Radiated Emission Data
 Test Mode : Mode 1: Transmit (802.11b 1Mbps)(2437 MHz) _ Adapter: ATM036T-A050
 Test Date : 2017/11/24

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
79.470	-15.522	51.010	35.487	-4.513	40.000
258.920	-12.001	43.992	31.991	-14.009	46.000
399.570	-8.084	52.009	43.925	-2.075	46.000
600.360	-4.053	37.846	33.793	-12.207	46.000
800.180	-1.714	41.839	40.124	-5.876	46.000
960.230	0.354	40.722	41.076	-12.924	54.000
Vertical					
32.910	-12.011	50.768	38.758	-1.242	40.000
240.490	-12.249	51.660	39.411	-6.589	46.000
399.570	-8.084	44.876	36.792	-9.208	46.000
600.360	-4.053	35.075	31.022	-14.978	46.000
800.180	-1.714	37.489	35.774	-10.226	46.000
960.230	0.354	37.715	38.069	-15.931	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product : VistaHub Wifi only
 Test Item : General Radiated Emission Data
 Test Mode : Mode 2: Transmit (802.11g 6Mbps)(2437 MHz) _ Adapter: ATM036T-A050
 Test Date : 2017/11/24

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
143.490	-11.322	50.142	38.820	-4.680	43.500
262.800	-11.808	43.025	31.217	-14.783	46.000
399.570	-8.084	49.870	41.786	-4.214	46.000
600.360	-4.053	38.456	34.403	-11.597	46.000
800.180	-1.714	46.258	44.543	-1.457	46.000
960.230	0.354	41.027	41.381	-12.619	54.000
Vertical					
38.730	-11.306	50.156	38.850	-1.150	40.000
220.120	-13.317	51.876	38.559	-7.441	46.000
399.570	-8.084	43.637	35.553	-10.447	46.000
600.360	-4.053	34.282	30.229	-15.771	46.000
800.180	-1.714	38.414	36.699	-9.301	46.000
960.230	0.354	37.743	38.097	-15.903	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product : VistaHub Wifi only
 Test Item : General Radiated Emission Data
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)(2437 MHz)
 _Adapter: ATM036T-A050
 Test Date : 2017/11/24

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
143.490	-11.322	49.572	38.250	-5.250	43.500
260.860	-11.931	43.563	31.632	-14.368	46.000
399.570	-8.084	49.527	41.443	-4.557	46.000
600.360	-4.053	37.673	33.620	-12.380	46.000
800.180	-1.714	42.443	40.728	-5.272	46.000
960.230	0.354	41.095	41.449	-12.551	54.000
Vertical					
32.910	-12.011	50.838	38.828	-1.172	40.000
237.580	-12.433	51.900	39.467	-6.533	46.000
399.570	-8.084	42.271	34.187	-11.813	46.000
614.910	-3.966	35.048	31.082	-14.918	46.000
800.180	-1.714	40.320	38.605	-7.395	46.000
960.230	0.354	38.437	38.791	-15.209	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product : VistaHub Wifi only
 Test Item : General Radiated Emission Data
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW)(2437 MHz)
 _Adapter: ATM036T-A050
 Test Date : 2017/11/24

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
143.490	-11.322	49.916	38.594	-4.906	43.500
259.890	-11.988	43.071	31.083	-14.917	46.000
399.570	-8.084	50.841	42.757	-3.243	46.000
600.360	-4.053	37.648	33.595	-12.405	46.000
800.180	-1.714	43.496	41.781	-4.219	46.000
960.230	0.354	40.488	40.842	-13.158	54.000
Vertical					
32.910	-12.011	49.963	37.953	-2.047	40.000
224.000	-13.188	51.794	38.606	-7.394	46.000
399.570	-8.084	46.331	38.247	-7.753	46.000
600.360	-4.053	34.499	30.446	-15.554	46.000
800.180	-1.714	43.483	41.768	-4.232	46.000
960.230	0.354	37.640	37.994	-16.006	54.000

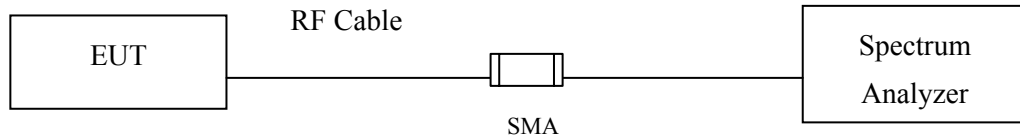
Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

5. RF antenna conducted test

5.1. Test Setup

RF antenna Conducted Measurement:



5.2. Limits

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

5.3. Test Procedure

The EUT was tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 100 kHz, Set VBW > RBW, scan up through 10th harmonic.

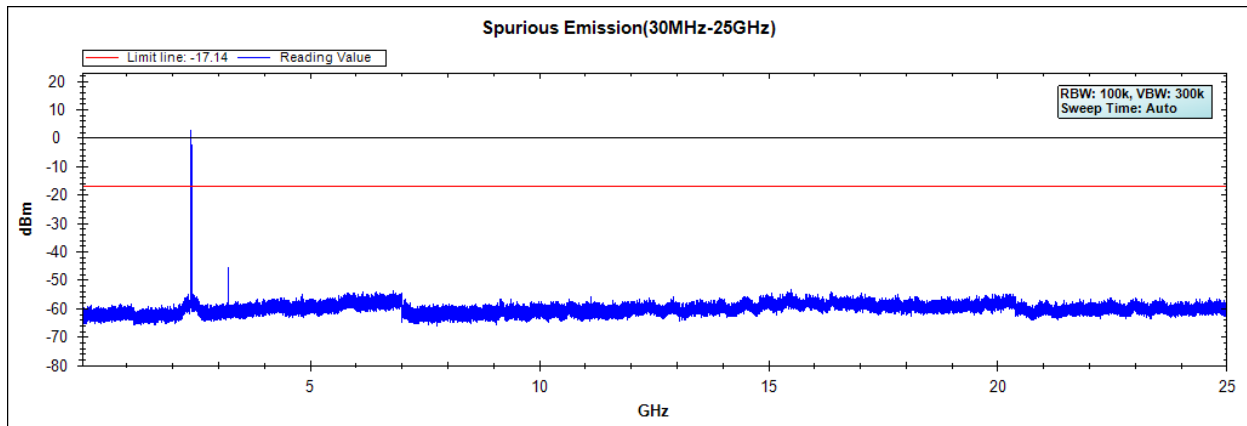
5.4. Uncertainty

$\pm 1.23\text{dB}$

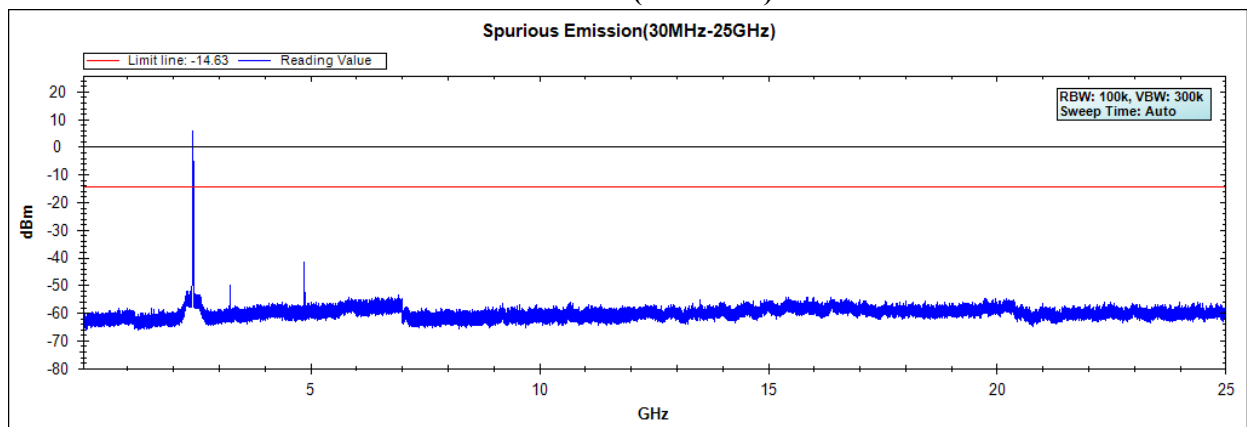
5.5. Test Result of RF antenna conducted test

Product : VistaHub Wifi only
Test Item : RF antenna conducted test
Test Mode : Mode 1: Transmit (802.11b 1Mbps)
Test Date : 2017/09/16

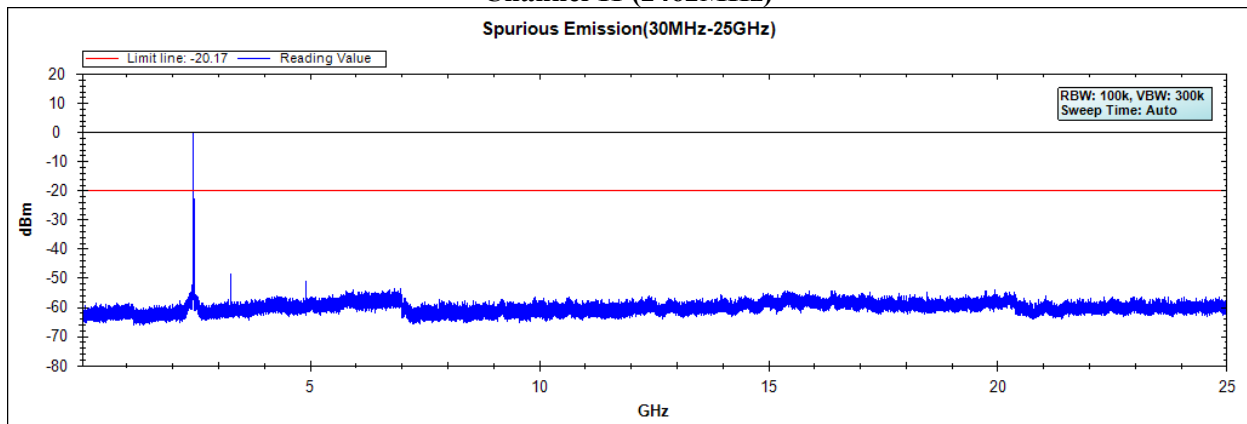
Channel 01 (2412MHz)



Channel 06 (2437MHz)



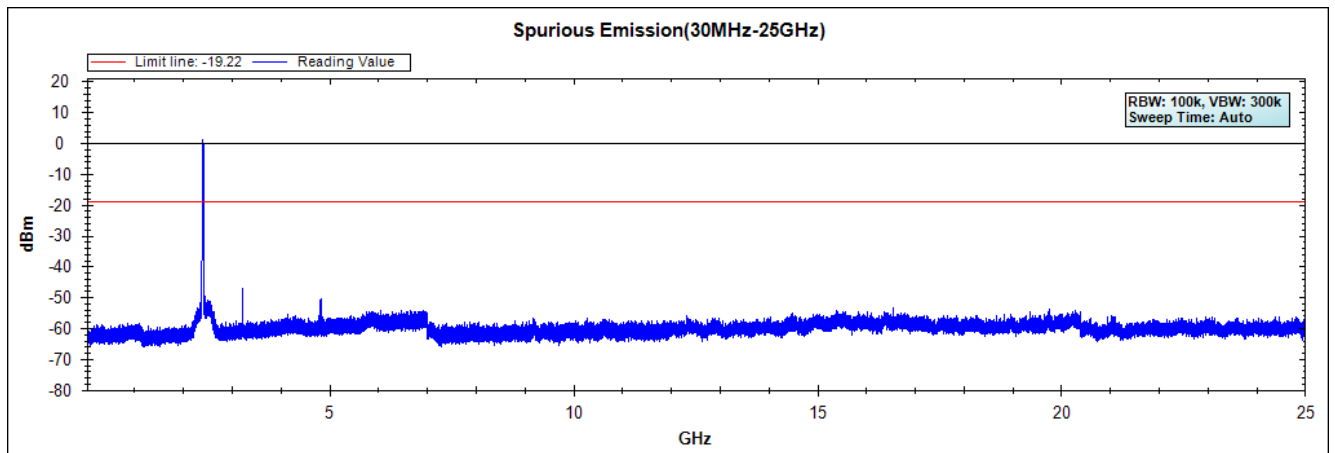
Channel 11 (2462MHz)



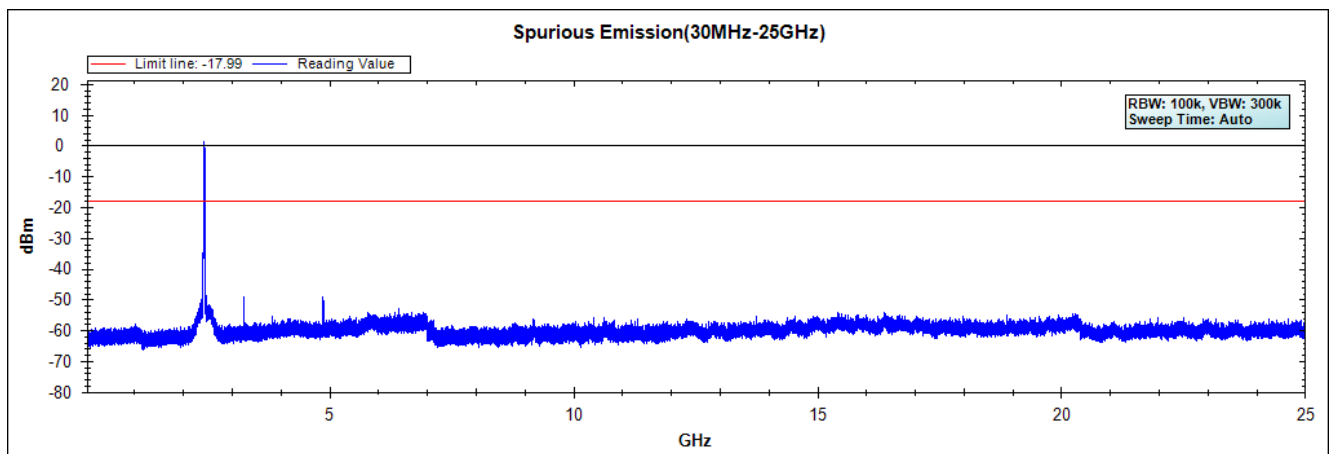
Note: The above test pattern is synthesized by multiple of the frequency range.

Product : VistaHub Wifi only
Test Item : RF Antenna Conducted Spurious
Test Mode : Mode 2: Transmit (802.11g 6Mbps)
Test Date : 2017/09/16

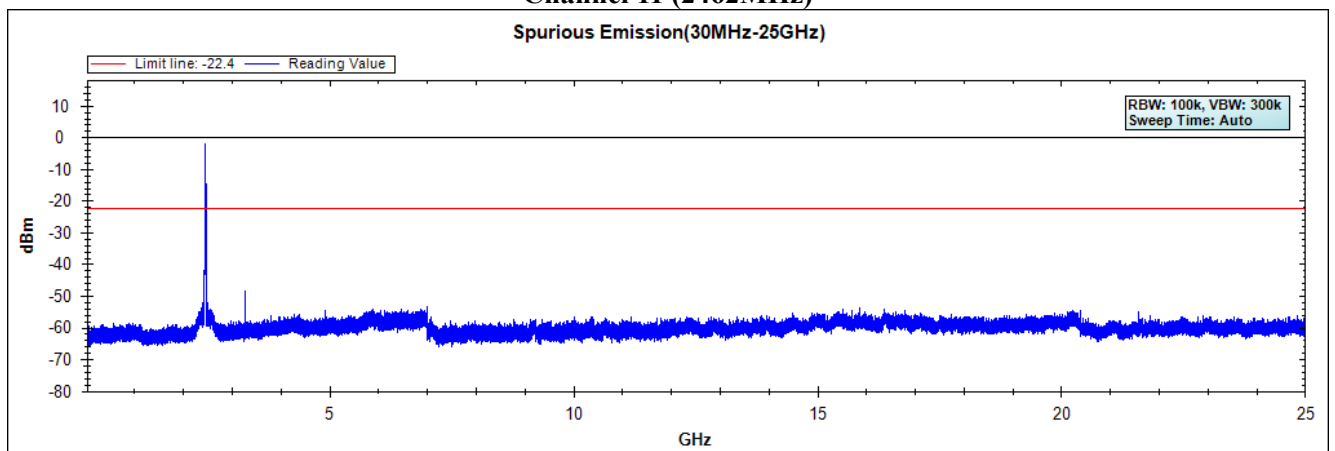
Channel 01 (2412MHz)



Channel 06 (2437MHz)



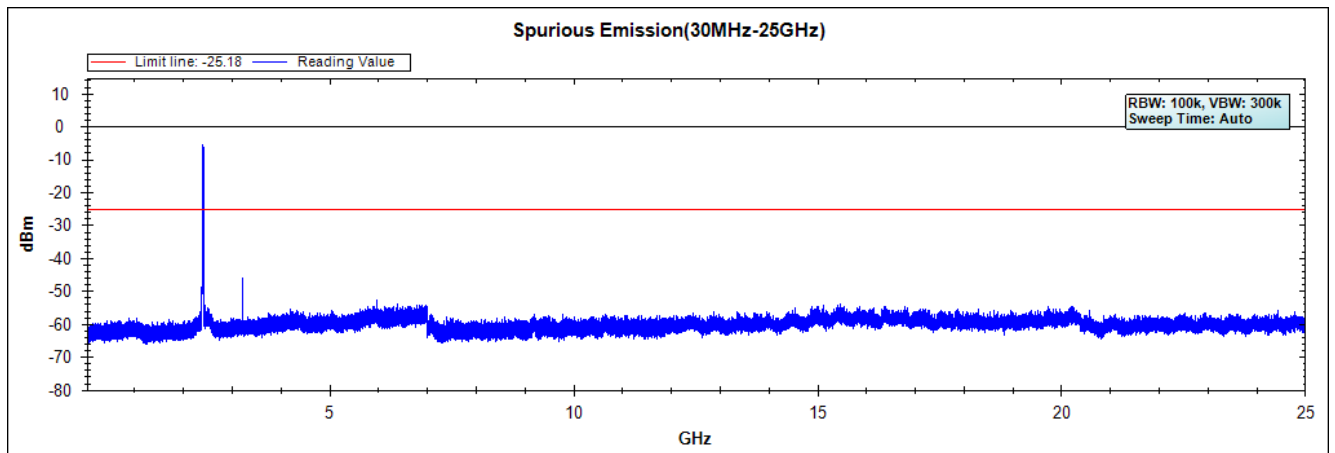
Channel 11 (2462MHz)



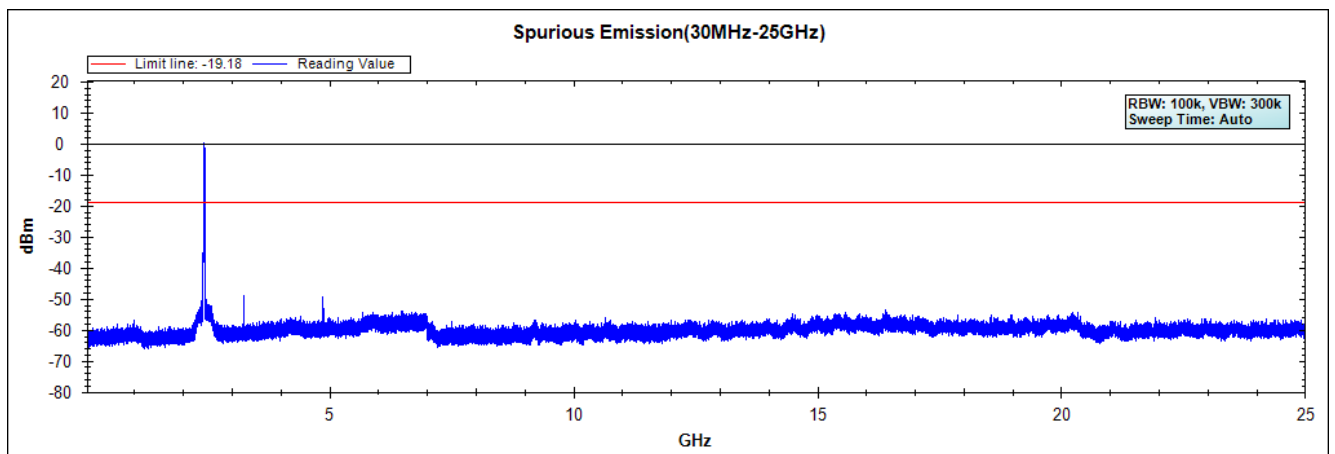
Note: The above test pattern is synthesized by multiple of the frequency range.

Product : VistaHub Wifi only
Test Item : RF Antenna Conducted Spurious
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)
Test Date : 2017/09/16

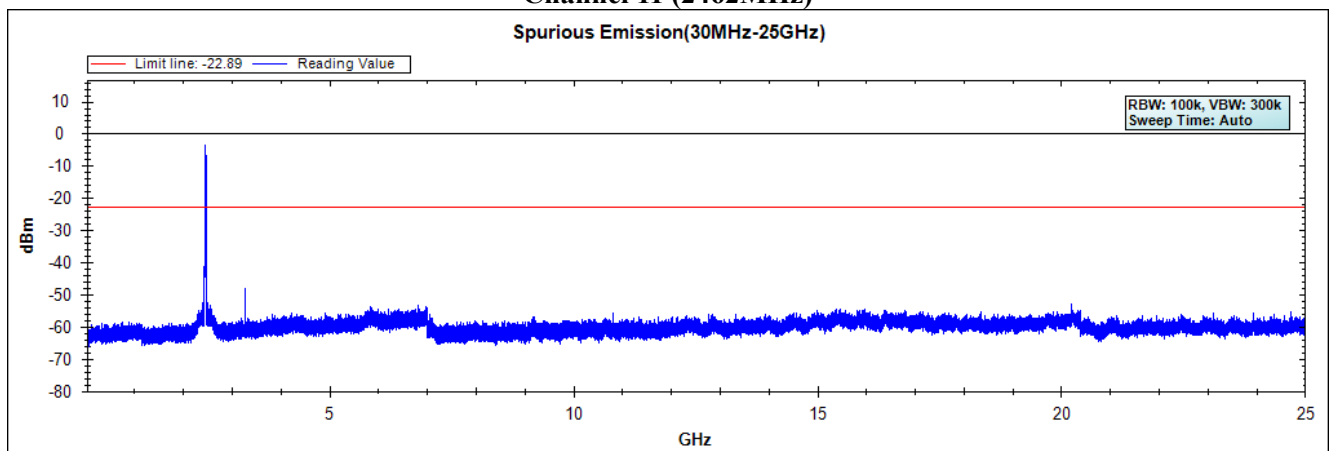
Channel 01 (2412MHz)



Channel 06 (2437MHz)



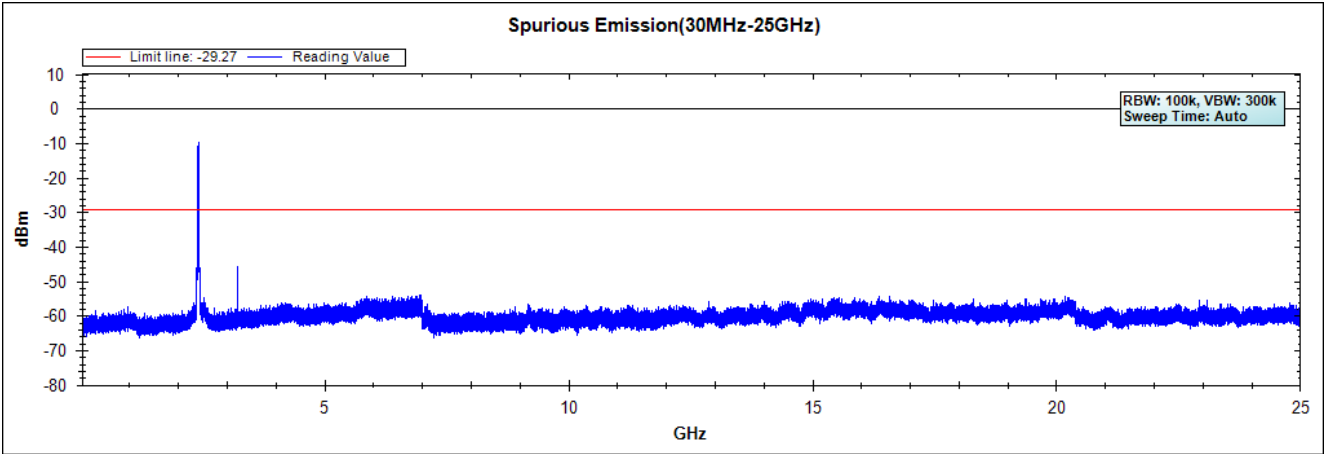
Channel 11 (2462MHz)



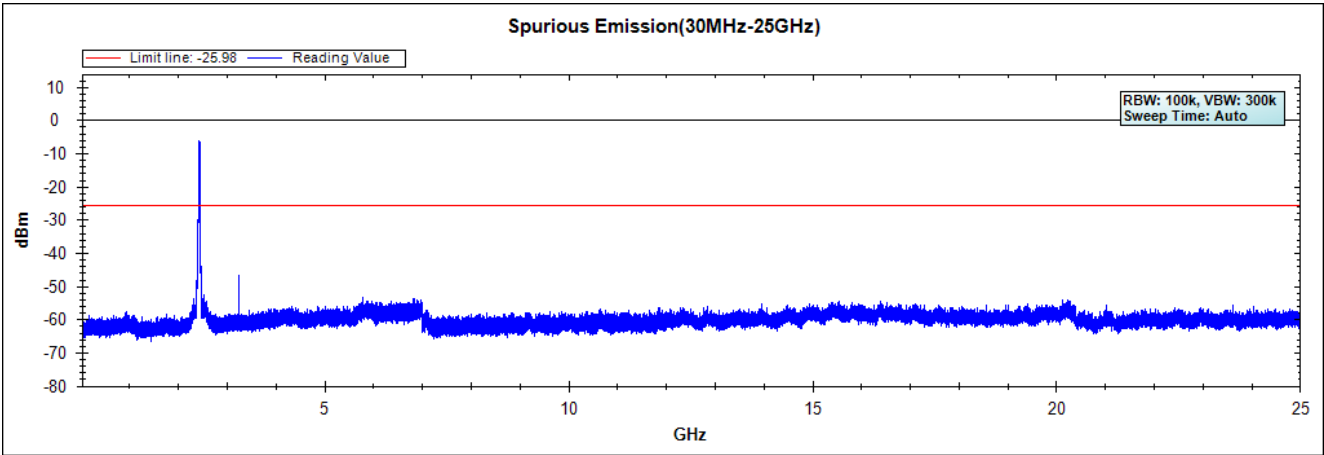
Note: The above test pattern is synthesized by multiple of the frequency range.

Product : VistaHub Wifi only
Test Item : RF Antenna Conducted Spurious
Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW)
Test Date : 2017/09/16

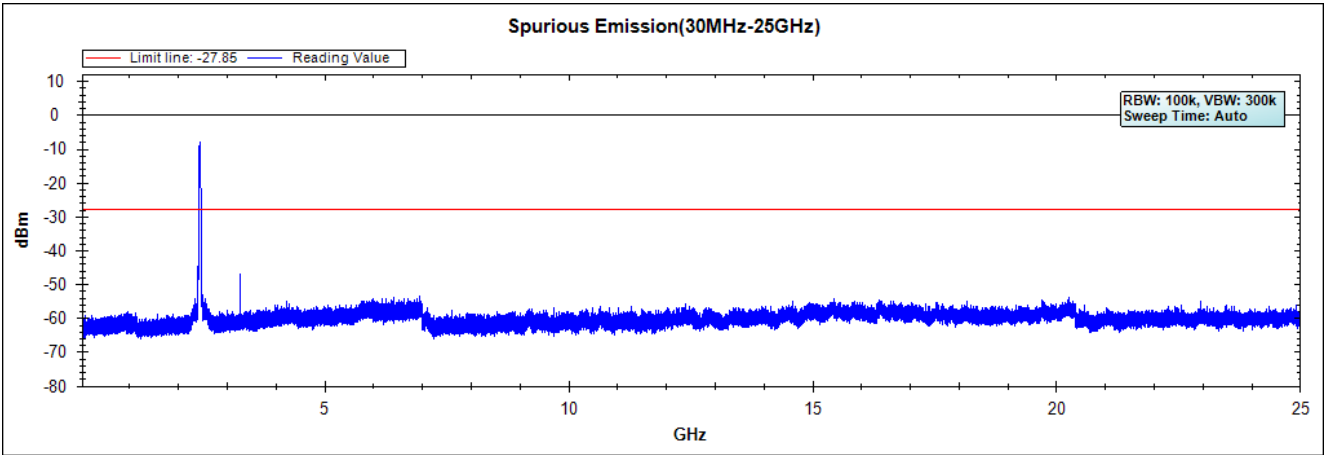
Channel 01 (2422MHz)



Channel 04 (2437MHz)



Channel 07 (2452MHz)

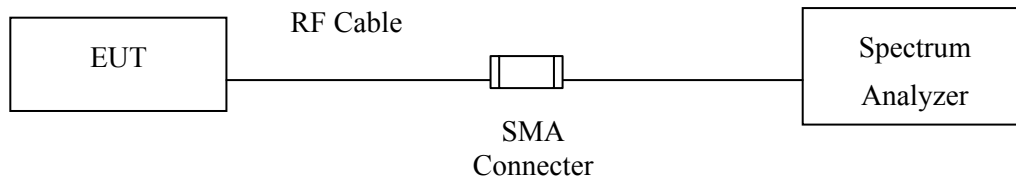


Note: The above test pattern is synthesized by multiple of the frequency range.

6. Band Edge

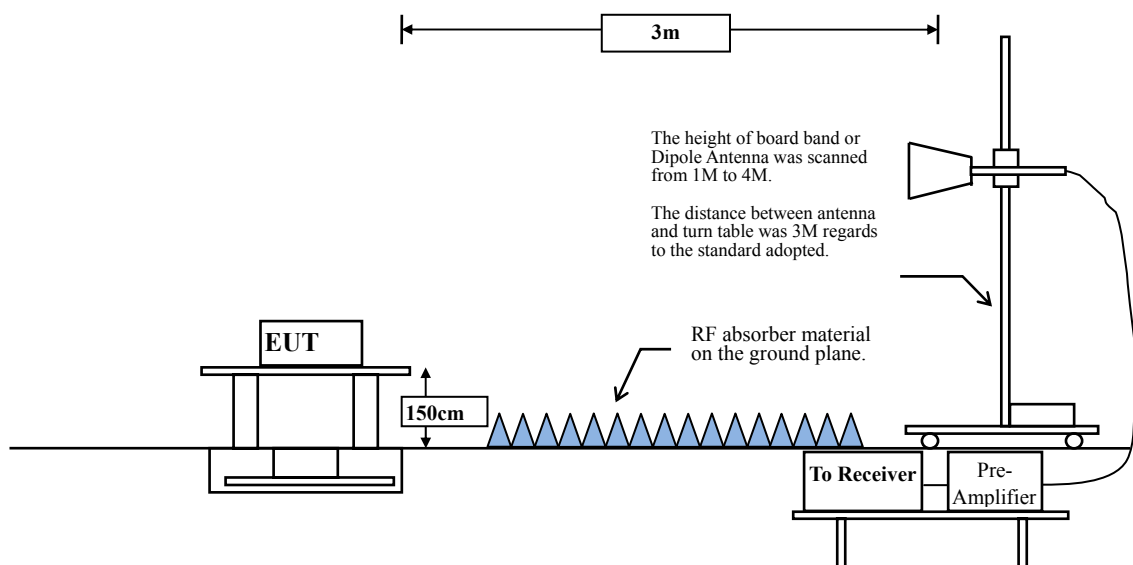
6.1. Test Setup

RF Conducted Measurement



RF Radiated Measurement:

Above 1GHz



6.2. Limits

According to FCC Section 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 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, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

6.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.

RBW and VBW Parameter setting:

According to KDB 558074 section 12.2.4. Peak power measurement procedure

RBW = as specified in Table 1.

$VBW \geq 3 \times RBW$.

Table 1 —RBW as a function of frequency

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

According to KDB 558074 section 12.2.5. Average power measurement procedure

RBW = 1MHz.

VBW = 10Hz, when duty cycle $\geq 98\%$

$VBW \geq 1/T$, when duty cycle $< 98\%$

(T refers to the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.)

2.4GHz band	Duty Cycle (%)	T (ms)	1/T (Hz)	VBW (Hz)
802.11b	100	--	--	10
802.11g	100	--	--	10
802.11n20	100	--	--	10
802.11n40	100	--	--	10

Note: Duty Cycle Refer to Section 9

6.4. Uncertainty

Conducted: $\pm 1.23\text{dB}$

Radiated:

Horizontal polarization : 1-18GHz: $\pm 3.77\text{dB}$

Vertical polarization : 1-18GHz : $\pm 3.83\text{dB}$

6.5. Test Result of Band Edge

Product : VistaHub Wifi only
 Test Item : Band Edge Data
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2412MHz)
 Test Date : 2017/11/15

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
01 (Peak)	2389.420	12.147	44.994	57.140	74.00	54.00	Pass
01 (Peak)	2390.000	12.148	43.370	55.518	74.00	54.00	Pass
01 (Peak)	2397.101	12.168	66.629	78.797	--	--	--
01 (Peak)	2400.000	12.176	60.902	73.078	--	--	--
01 (Peak)	2410.580	12.200	97.008	109.208	--	--	--
01 (Average)	2389.130	12.146	34.427	46.573	74.00	54.00	Pass
01 (Average)	2390.000	12.148	32.133	44.281	74.00	54.00	Pass
01 (Average)	2409.275	12.198	93.831	106.028	--	--	--

Figure Channel 01: Horizontal (Peak)

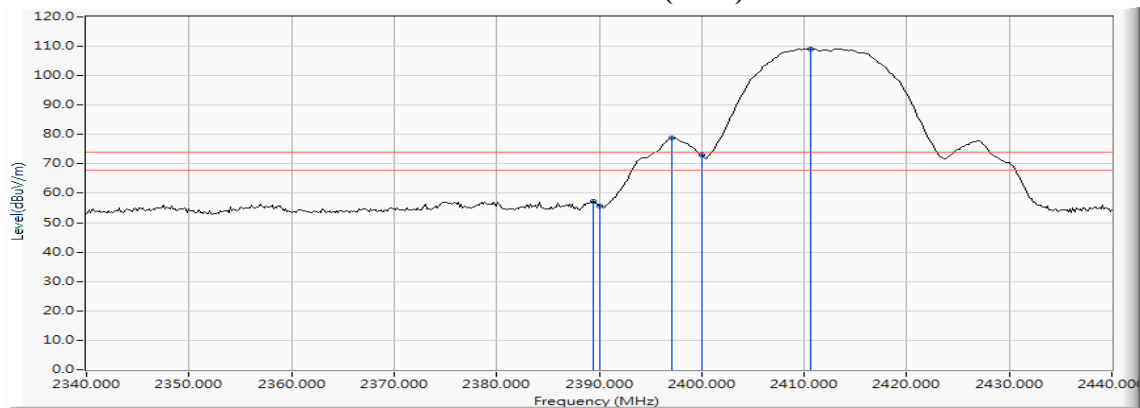
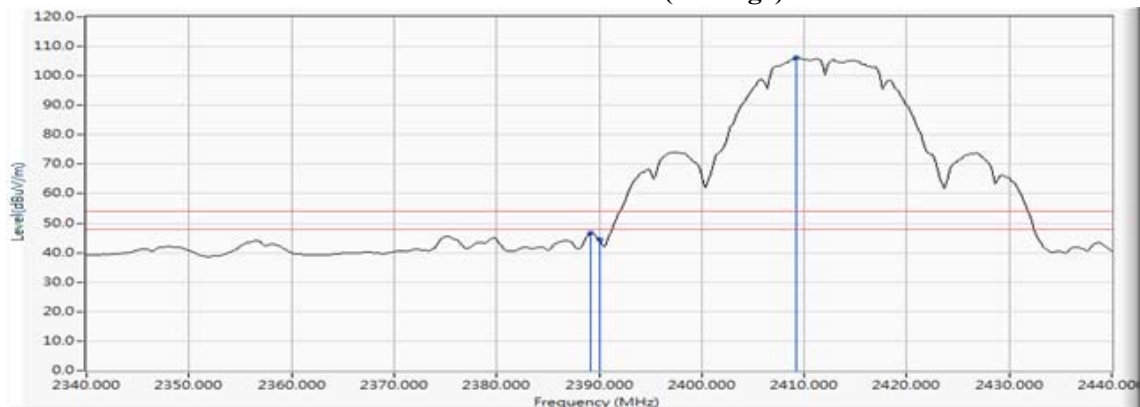


Figure Channel 01: Horizontal (Average)

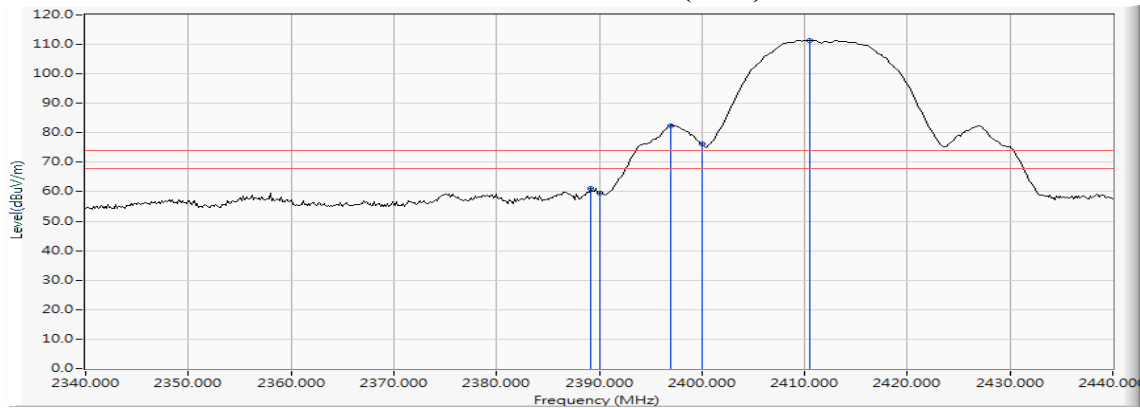
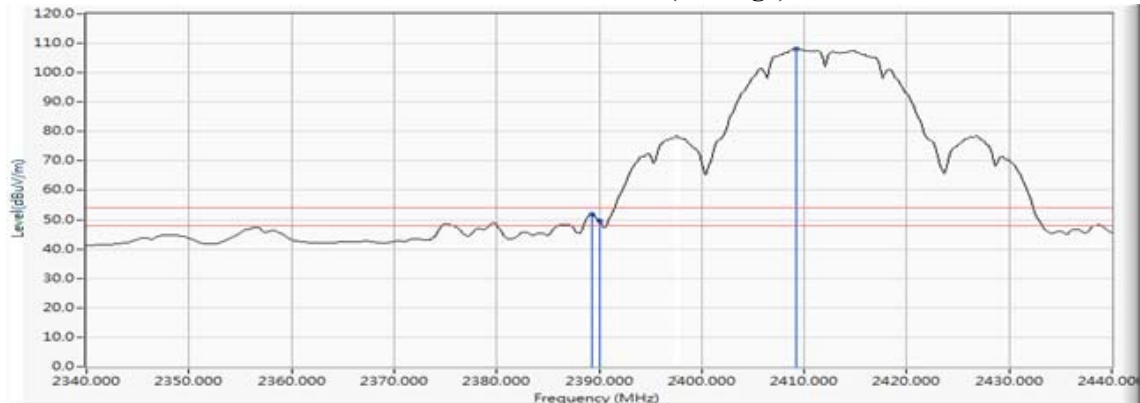


- Note: 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
 4. “ * ”, means this data is the worst emission level.
 5. Measurement Level = Reading Level + Correct Factor.
 6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : VistaHub Wifi only
 Test Item : Band Edge Data
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2412MHz)
 Test Date : 2017/11/15

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
01 (Peak)	2389.130	12.146	48.860	61.006	74.00	54.00	Pass
01 (Peak)	2390.000	12.148	47.315	59.463	74.00	54.00	Pass
01 (Peak)	2396.957	12.167	70.301	82.468	--	--	--
01 (Peak)	2400.000	12.176	64.028	76.204	--	--	--
01 (Peak)	2410.435	12.200	99.265	111.465	--	--	--
01 (Average)	2389.275	12.146	39.629	51.775	74.00	54.00	Pass
01 (Average)	2390.000	12.148	37.373	49.521	74.00	54.00	Pass
01 (Average)	2409.275	12.198	96.008	108.205	--	--	--

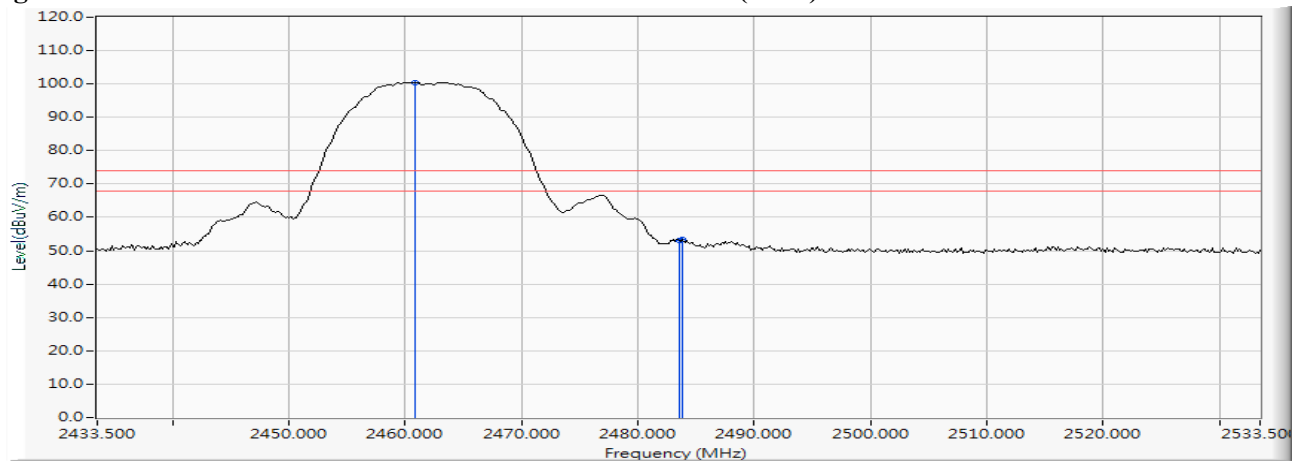
Figure Channel 01:
VERTICAL (Peak)

Figure Channel 01:
VERTICAL (Average)


- Note: 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
 4. “ * ”, means this data is the worst emission level.
 5. Measurement Level = Reading Level + Correct Factor.
 6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : VistaHub Wifi only
 Test Item : Band Edge Data
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2462MHz)
 Test Date : 2017/11/15

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
11 (Peak)	2460.891	12.337	88.157	100.495	--	--	--
11 (Peak)	2483.500	12.403	40.532	52.935	74.00	54.00	Pass
11 (Peak)	2483.790	12.403	40.906	53.309	74.00	54.00	Pass
11 (Average)	2461.181	12.339	85.261	97.600	--	--	--
11 (Average)	2483.500	12.403	29.696	42.099	74.00	54.00	Pass

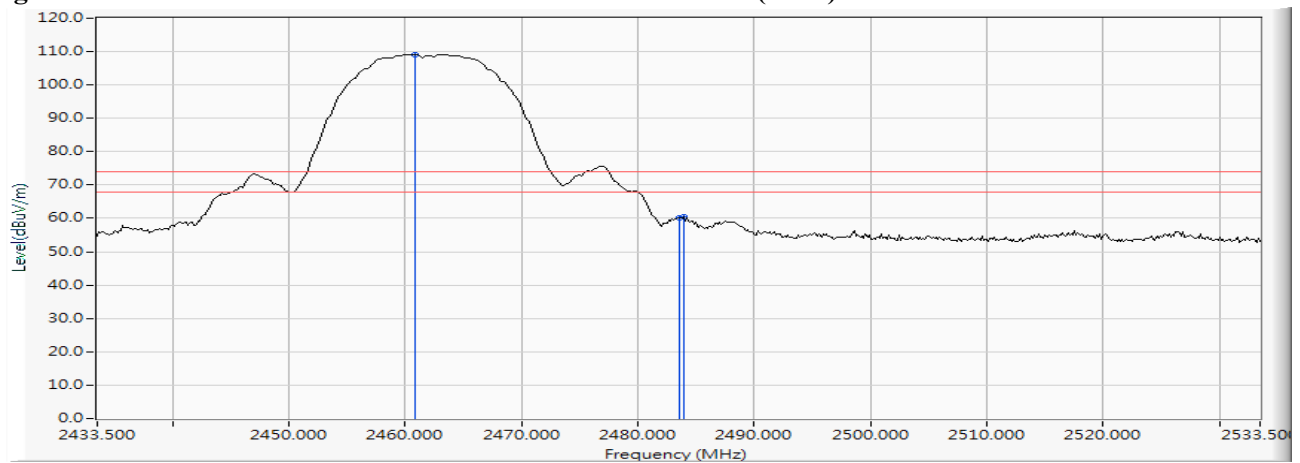
Figure Channel 11: Horizontal (Peak)

Figure Channel 11: Horizontal (Average)


- Note: 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
 4. “ * ”, means this data is the worst emission level.
 5. Measurement Level = Reading Level + Correct Factor.
 6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : VistaHub Wifi only
 Test Item : Band Edge Data
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2462MHz)
 Test Date : 2017/11/15

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
11 (Peak)	2460.891	12.337	96.769	109.107	--	--	--
11 (Peak)	2483.500	12.403	47.632	60.035	--	--	--
11 (Peak)	2483.935	12.404	48.136	60.540	74.00	54.00	Pass
11 (Average)	2461.181	12.339	93.845	106.184	--	--	--
11 (Average)	2483.500	12.403	39.743	52.146	74.00	54.00	Pass

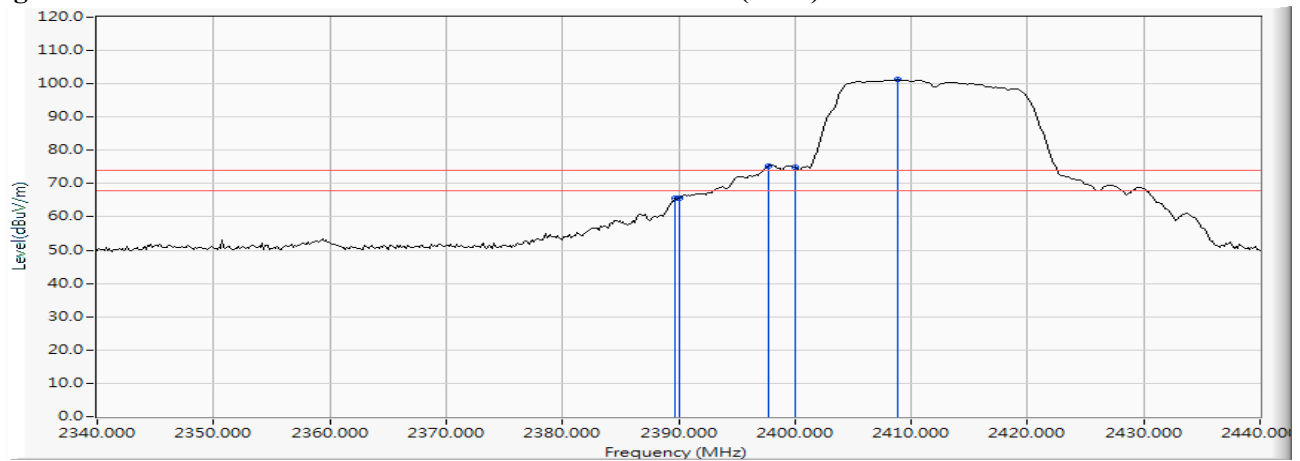
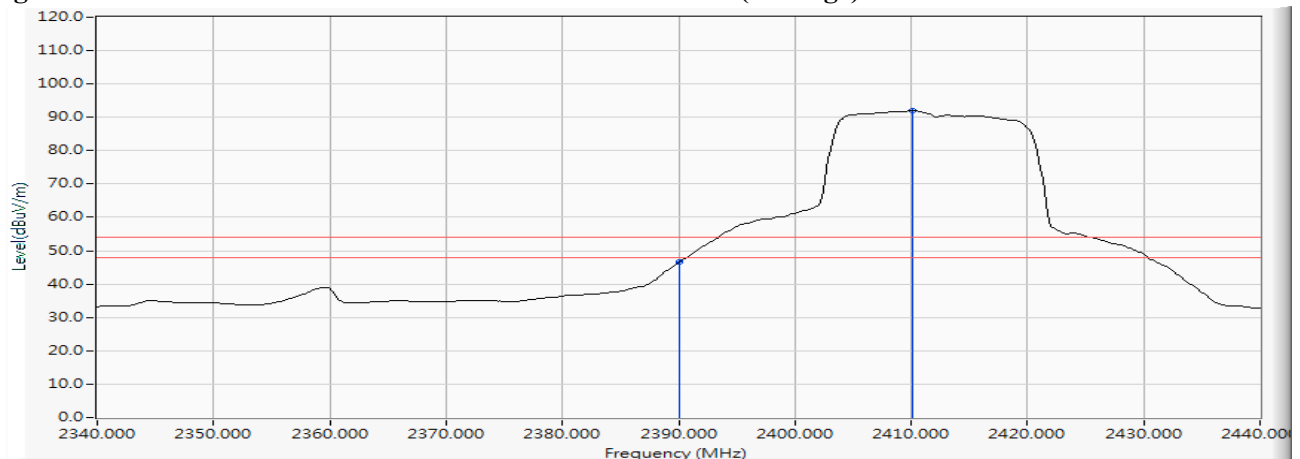
Figure Channel 11:
VERTICAL (Peak)

Figure Channel 11:
VERTICAL (Average)


- Note:1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : VistaHub Wifi only
 Test Item : Band Edge Data
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2412MHz)
 Test Date : 2017/11/15

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Peak Limit (dB μ V/m)	Average Limit (dB μ V/m)	Result
01 (Peak)	2389.710	12.147	53.553	65.700	74.00	54.00	Pass
01 (Peak)	2390.000	12.148	53.483	65.631	74.00	54.00	Pass
01 (Peak)	2397.681	12.169	63.252	75.421	--	--	--
01 (Peak)	2400.000	12.176	62.782	74.958	--	--	--
01 (Peak)	2408.841	12.197	88.992	101.188	--	--	--
01 (Average)	2390.000	12.148	34.358	46.506	74.00	54.00	Pass
01 (Average)	2410.145	12.200	79.834	92.033	--	--	--

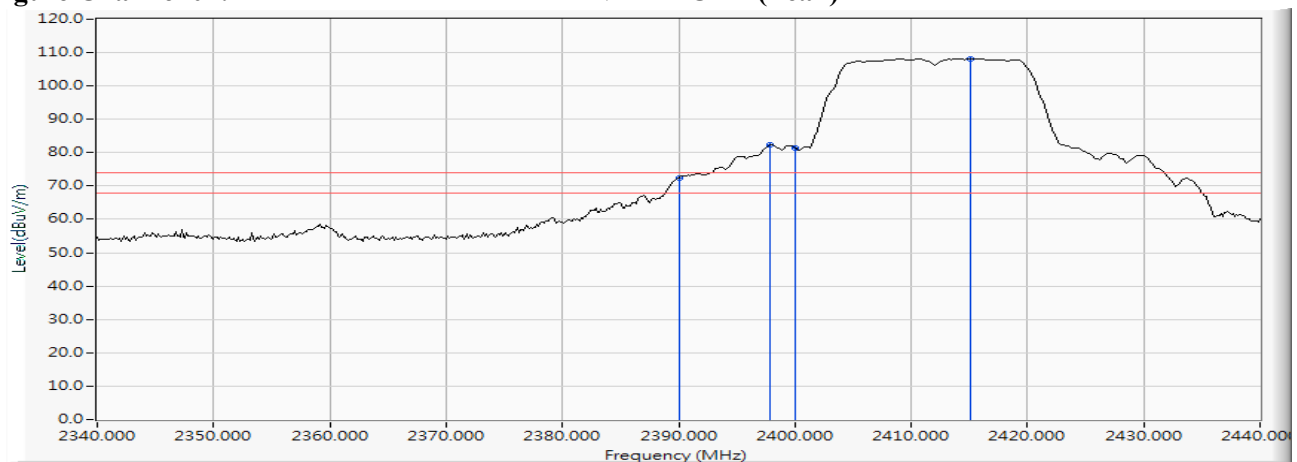
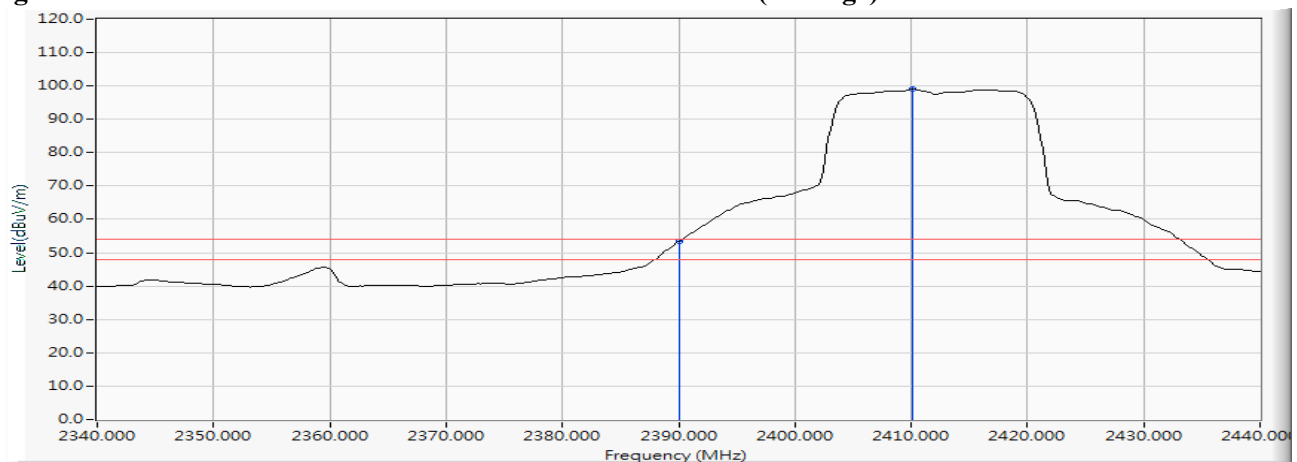
Figure Channel 01: Horizontal (Peak)**Figure Channel 01: Horizontal (Average)**

- Note: 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
 4. “ * ”, means this data is the worst emission level.
 5. Measurement Level = Reading Level + Correct Factor.
 6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : VistaHub Wifi only
 Test Item : Band Edge Data
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2412MHz)
 Test Date : 2017/11/15

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
01 (Peak)	2390.000	12.148	60.149	72.297	74.00	54.00	Pass
01 (Peak)	2397.826	12.169	70.089	82.259	--	--	--
01 (Peak)	2400.000	12.176	69.329	81.505	--	--	--
01 (Peak)	2415.072	12.210	95.978	108.188	--	--	--
01 (Average)	2390.000	12.148	41.144	53.292	74.00	54.00	Pass
01 (Average)	2410.145	12.200	86.792	98.991	--	--	--

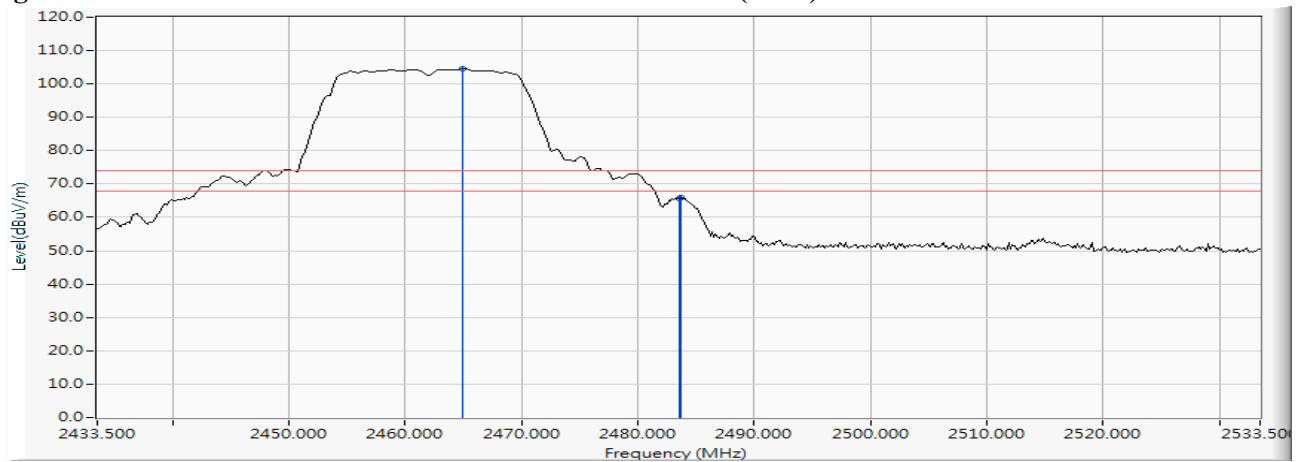
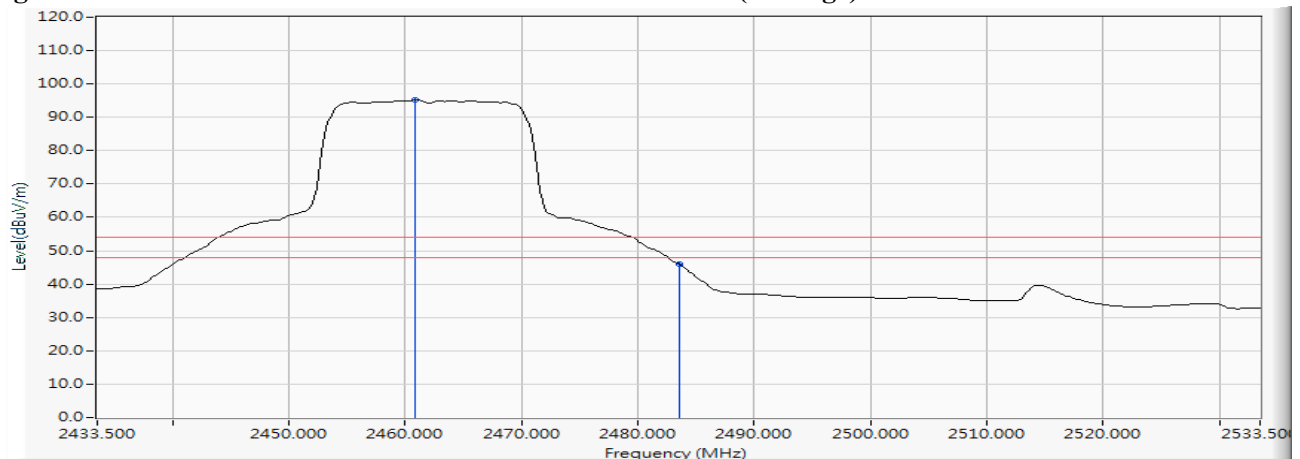
Figure Channel 01:
VERTICAL (Peak)

Figure Channel 01:
VERTICAL (Average)


- Note:1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
 4. “ * ”, means this data is the worst emission level.
 5. Measurement Level = Reading Level + Correct Factor.
 6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : VistaHub Wifi only
 Test Item : Band Edge Data
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2462MHz)
 Test Date : 2017/11/15

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Peak Limit (dB μ V/m)	Average Limit (dB μ V/m)	Result
11 (Peak)	2464.949	12.350	92.143	104.493	--	--	--
11 (Peak)	2483.500	12.403	53.235	65.638	74.00	54.00	Pass
11 (Peak)	2483.645	12.403	53.670	66.073	74.00	54.00	Pass
11 (Average)	2460.891	12.337	82.782	95.120	--	--	--
11 (Average)	2483.500	12.403	33.519	45.922	74.00	54.00	Pass

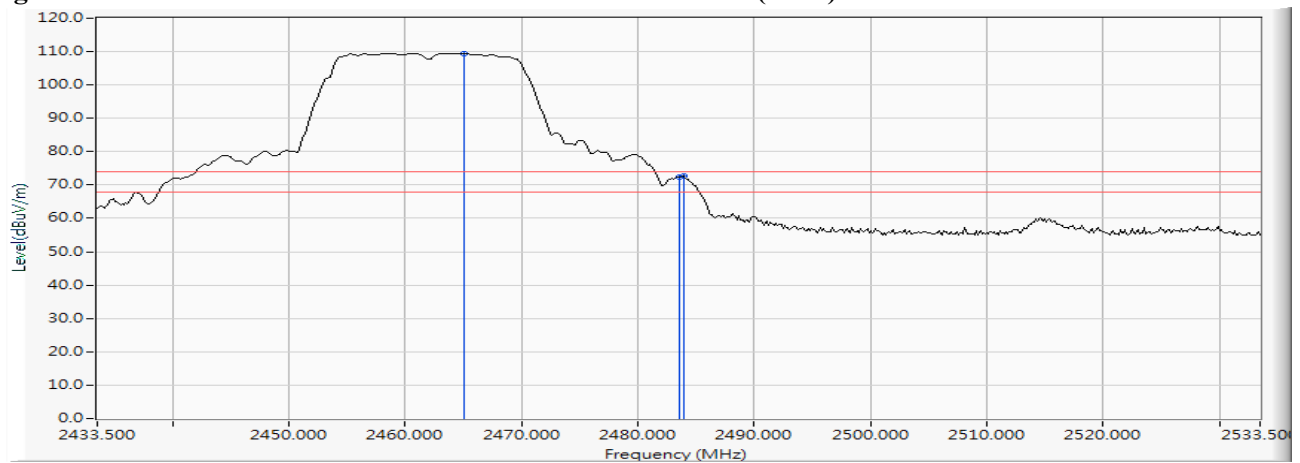
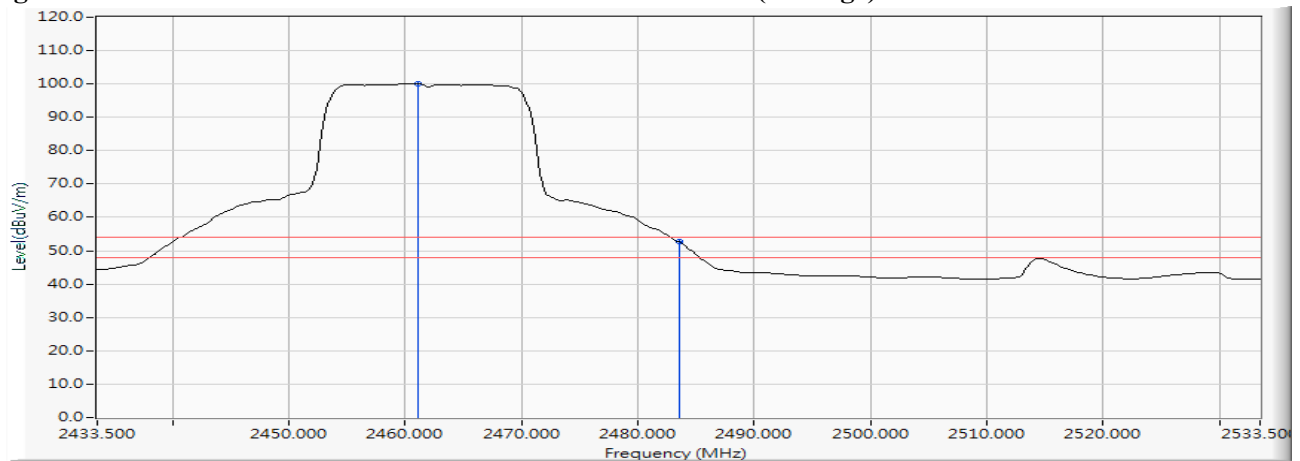
Figure Channel 11: Horizontal (Peak)

Figure Channel 11: Horizontal (Average)


- Note: 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
 4. “ * ”, means this data is the worst emission level.
 5. Measurement Level = Reading Level + Correct Factor.
 6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : VistaHub Wifi only
 Test Item : Band Edge Data
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2462MHz)
 Test Date : 2017/11/15

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Peak Limit (dB μ V/m)	Average Limit (dB μ V/m)	Result
11 (Peak)	2465.094	12.350	97.192	109.542	--	--	--
11 (Peak)	2483.500	12.403	59.958	72.361	--	--	--
11 (Peak)	2483.935	12.404	60.149	72.553	74.00	54.00	Pass
11 (Average)	2461.036	12.339	87.803	100.142	--	--	--
11 (Average)	2483.500	12.403	40.210	52.613	74.00	54.00	Pass

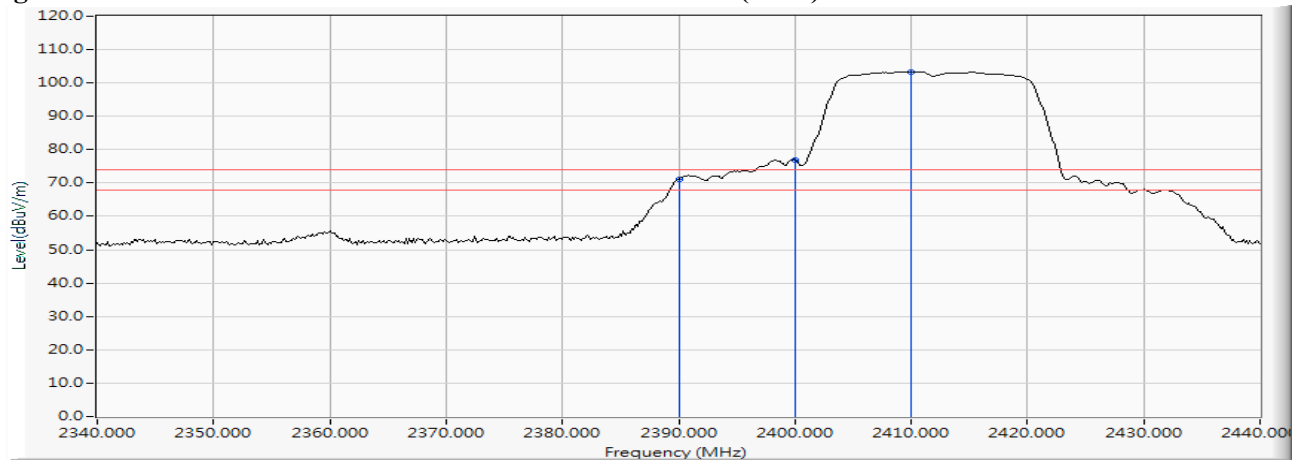
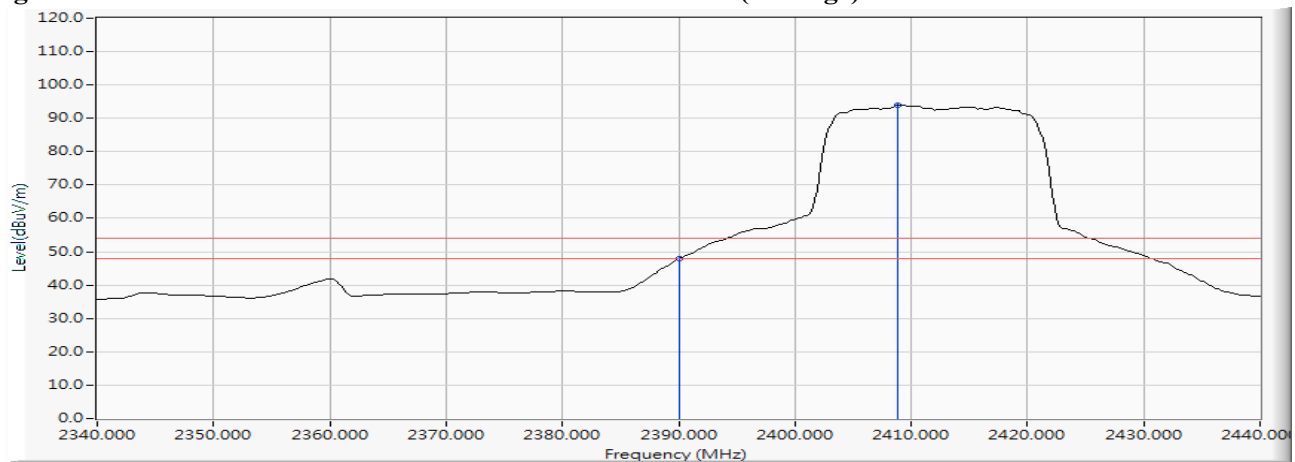
Figure Channel 11: VERTICAL (Peak)

Figure Channel 11: VERTICAL (Average)


- Note: 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
 4. “ * ”, means this data is the worst emission level.
 5. Measurement Level = Reading Level + Correct Factor.
 6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : VistaHub Wifi only
 Test Item : Band Edge Data
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2412MHz)
 Test Date : 2017/11/15

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Peak Limit (dB μ V/m)	Average Limit (dB μ V/m)	Result
01 (Peak)	2390.000	12.148	59.042	71.190	74.00	54.00	Pass
01 (Peak)	2400.000	12.176	64.835	77.011	74.00	54.00	Pass
01 (Peak)	2410.000	12.199	91.137	103.336	--	--	--
01 (Average)	2390.000	12.148	35.685	47.833	74.00	54.00	Pass
01 (Average)	2408.841	12.197	81.720	93.916	--	--	--

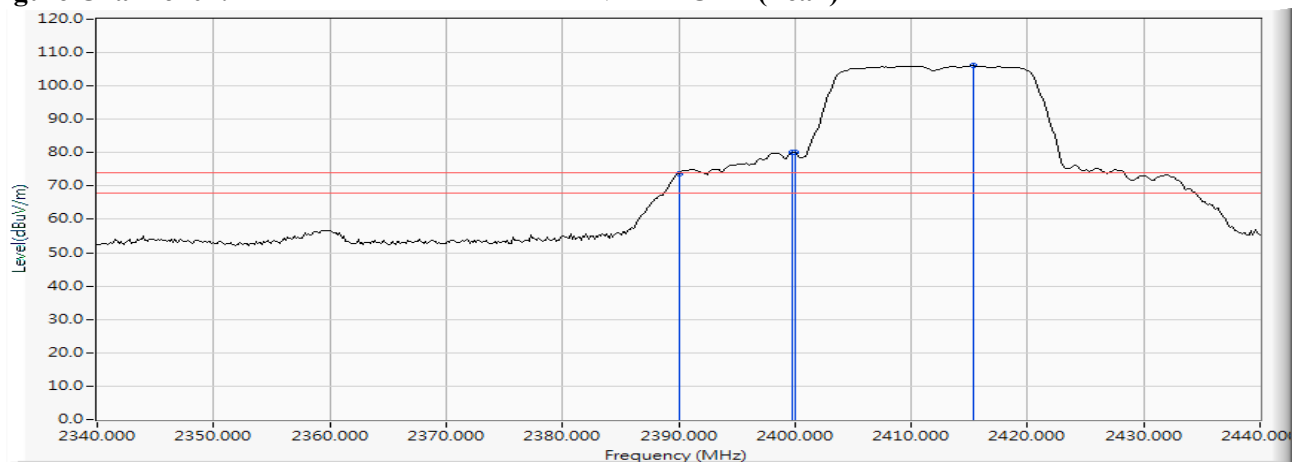
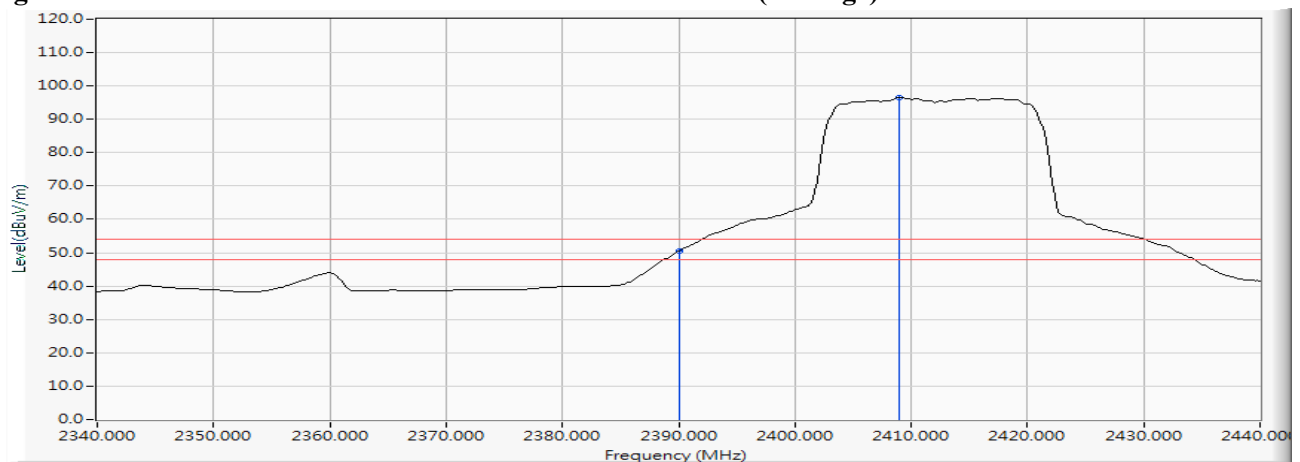
Figure Channel 01:
Horizontal (Peak)

Figure Channel 01:
Horizontal (Average)


- Note: 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
 4. “ * ”, means this data is the worst emission level.
 5. Measurement Level = Reading Level + Correct Factor.
 6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : VistaHub Wifi only
 Test Item : Band Edge Data
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2412MHz)
 Test Date : 2017/11/15

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
01 (Peak)	2390.000	12.148	61.627	73.775	74.00	54.00	Pass
01 (Peak)	2399.710	12.175	67.887	80.062	--	--	--
01 (Peak)	2400.000	12.176	67.882	80.058	--	--	--
01 (Peak)	2415.362	12.211	93.862	106.073	--	--	--
01 (Average)	2390.000	12.148	38.447	50.595	74.00	54.00	Pass
01 (Average)	2408.986	12.197	84.234	96.431	--	--	--

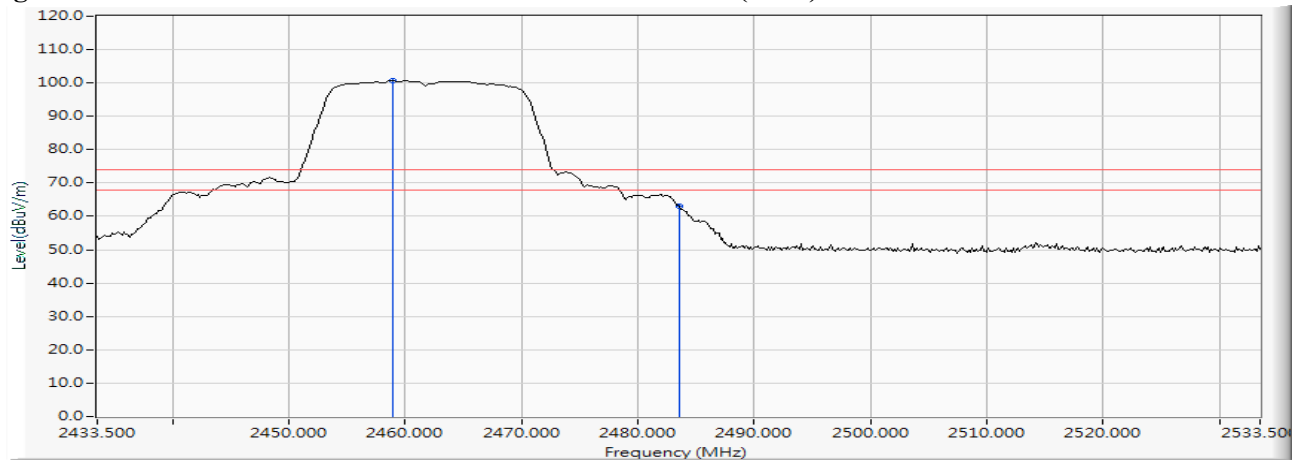
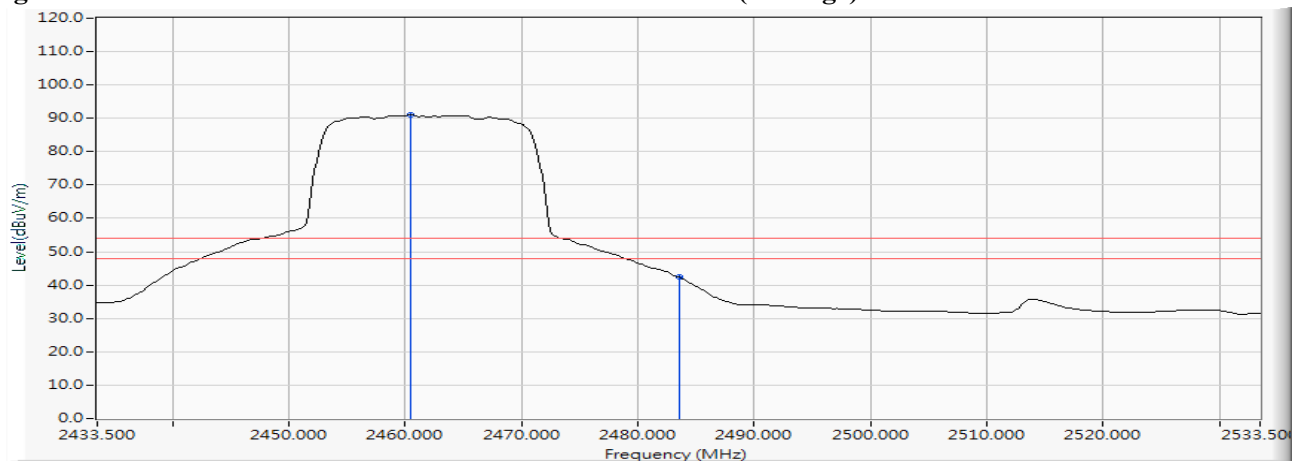
Figure Channel 01:
VERTICAL (Peak)

Figure Channel 01:
VERTICAL (Average)


- Note:1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
 4. “ * ”, means this data is the worst emission level.
 5. Measurement Level = Reading Level + Correct Factor.
 6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : VistaHub Wifi only
 Test Item : Band Edge Data
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2462MHz)
 Test Date : 2017/11/15

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Peak Limit (dB μ V/m)	Average Limit (dB μ V/m)	Result
11 (Peak)	2458.862	12.333	88.438	100.771	--	--	--
11 (Peak)	2483.500	12.403	50.782	63.185	74.00	54.00	Pass
11 (Average)	2460.457	12.337	78.683	91.020	--	--	--
11 (Average)	2483.500	12.403	29.952	42.355	74.00	54.00	Pass

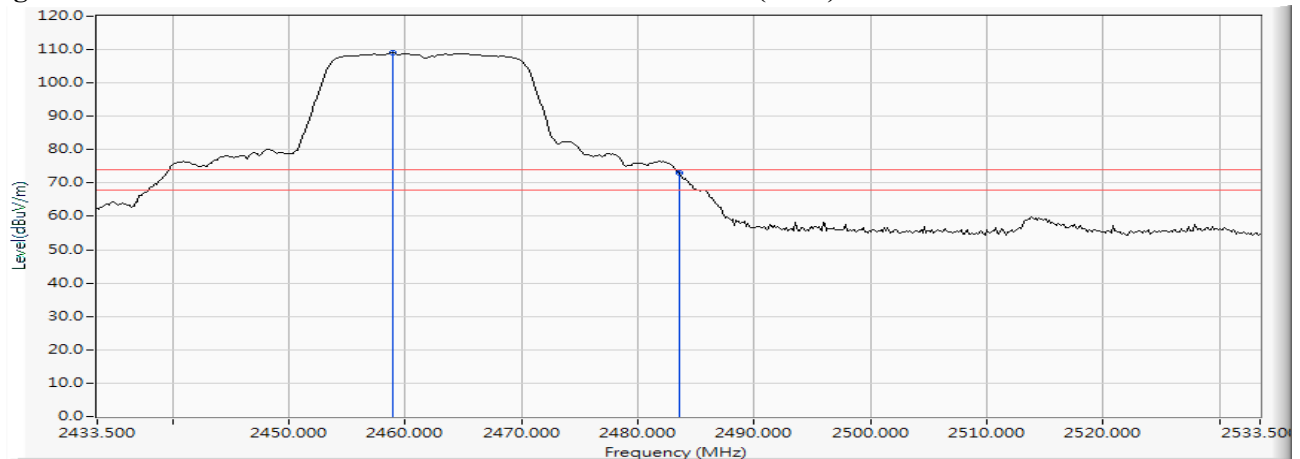
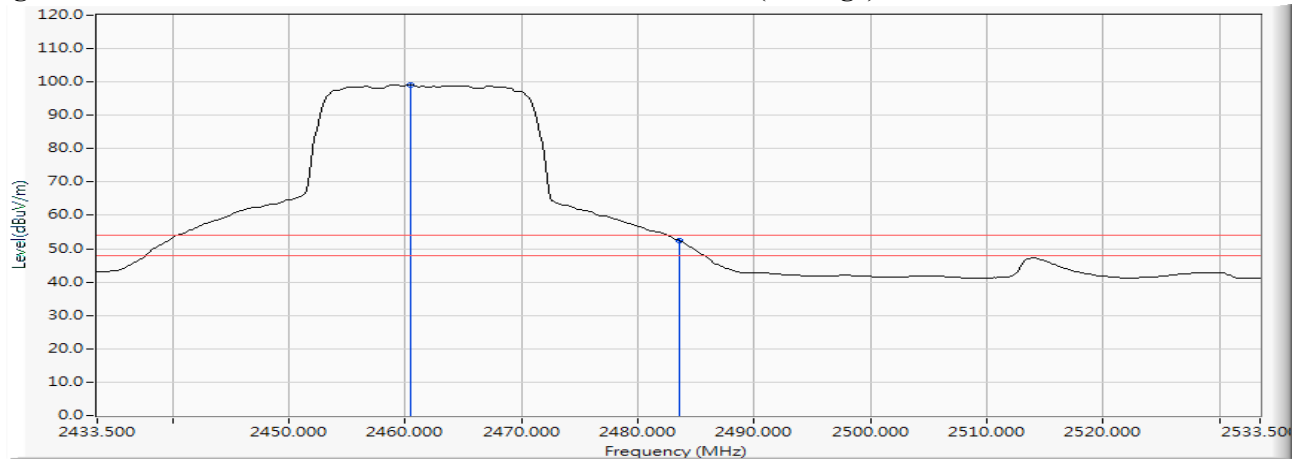
Figure Channel 11: Horizontal (Peak)

Figure Channel 11: Horizontal (Average)


- Note: 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
 4. “ * ”, means this data is the worst emission level.
 5. Measurement Level = Reading Level + Correct Factor.
 6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : VistaHub Wifi only
 Test Item : Band Edge Data
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2462MHz)
 Test Date : 2017/11/15

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Peak Limit (dB μ V/m)	Average Limit (dB μ V/m)	Result
11 (Peak)	2458.862	12.333	96.681	109.014	--	--	--
11 (Peak)	2483.500	12.403	60.610	73.013	74.00	54.00	Pass
11 (Average)	2460.457	12.337	86.752	99.089	--	--	--
11 (Average)	2483.500	12.403	40.031	52.434	74.00	54.00	Pass

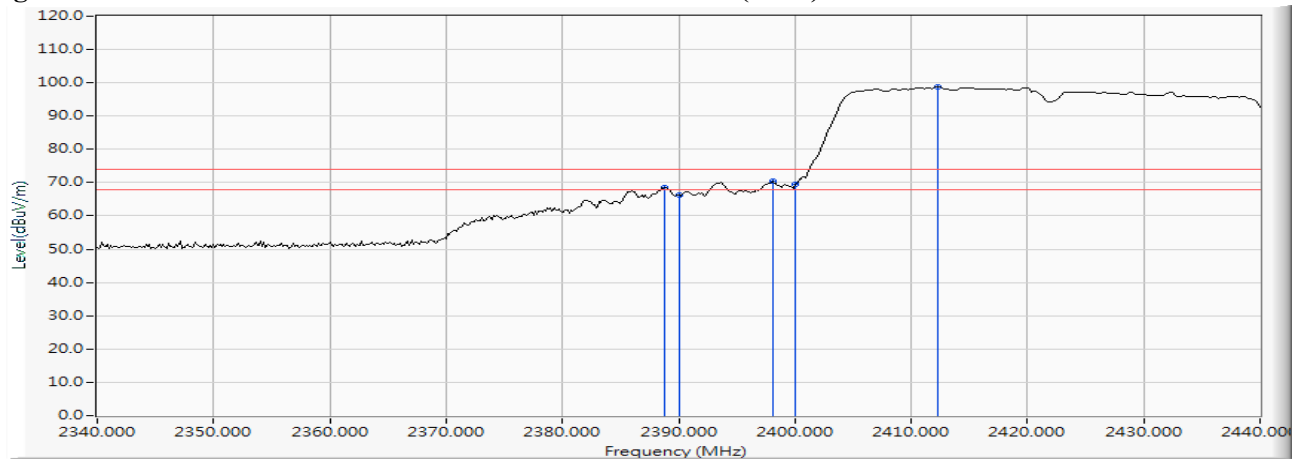
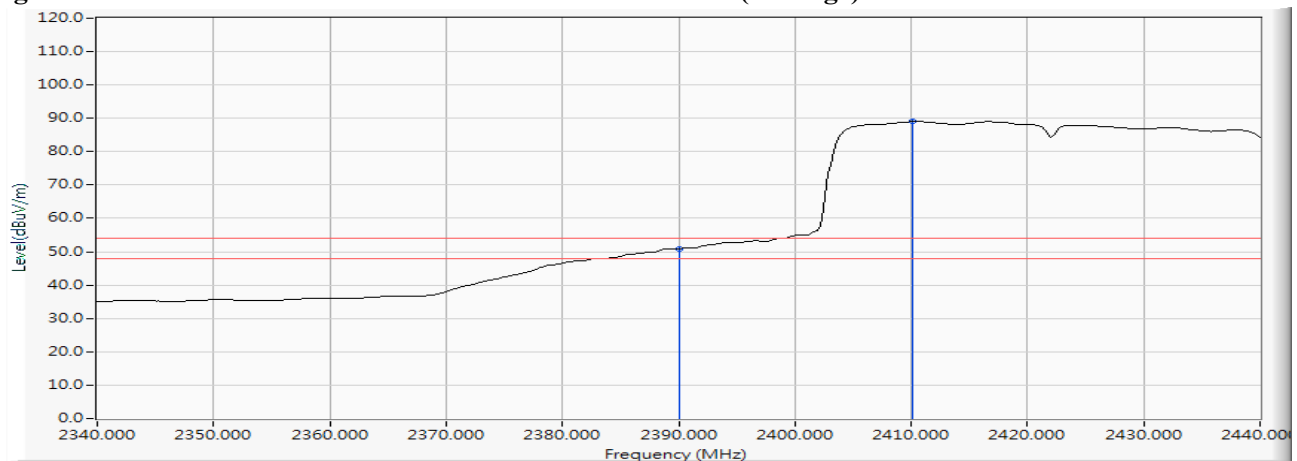
Figure Channel 11: VERTICAL (Peak)

Figure Channel 11: VERTICAL (Average)


- Note: 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
 4. “ * ”, means this data is the worst emission level.
 5. Measurement Level = Reading Level + Correct Factor.
 6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : VistaHub Wifi only
 Test Item : Band Edge Data
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW) (2422MHz)
 Test Date : 2017/11/15

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Peak Limit (dB μ V/m)	Average Limit (dB μ V/m)	Result
03 (Peak)	2388.841	12.145	56.421	68.566	74.00	54.00	Pass
03 (Peak)	2390.000	12.148	53.980	66.128	74.00	54.00	Pass
03 (Peak)	2398.116	12.171	58.211	70.382	--	--	--
03 (Peak)	2400.000	12.176	57.157	69.333	--	--	--
03 (Peak)	2412.319	12.205	86.665	98.869	--	--	--
03 (Average)	2390.000	12.148	38.783	50.931	74.00	54.00	Pass
03 (Average)	2410.145	12.200	76.798	88.997	--	--	--

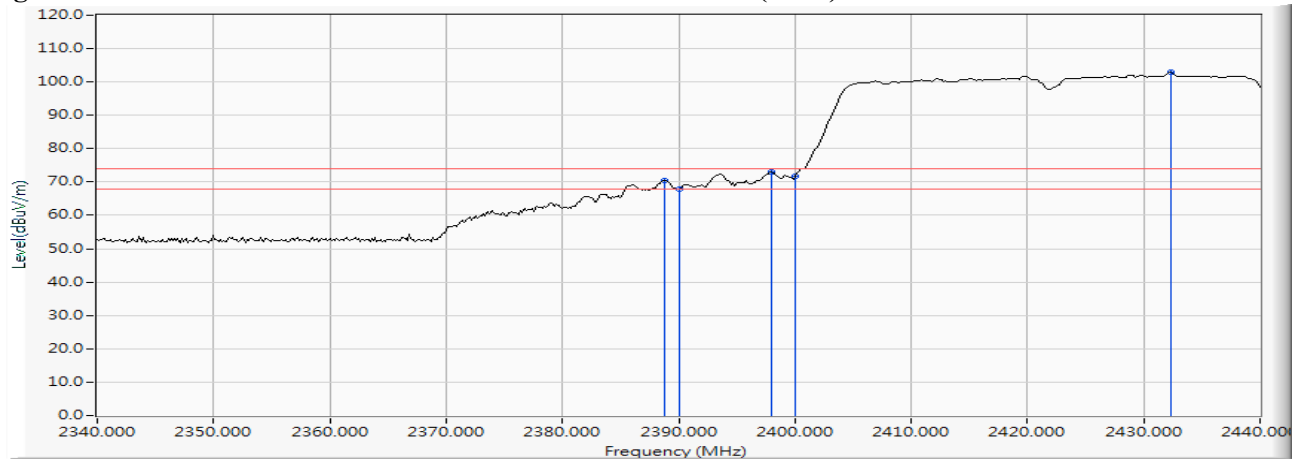
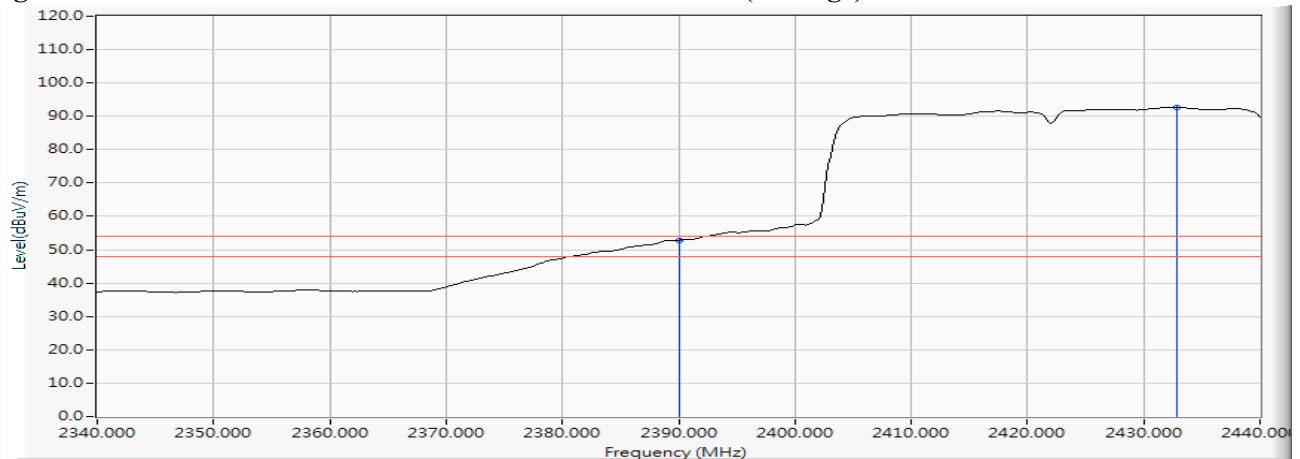
Figure Channel 03:
Horizontal (Peak)

Figure Channel 03:
Horizontal (Average)


- Note: 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
 4. “ * ”, means this data is the worst emission level.
 5. Measurement Level = Reading Level + Correct Factor.
 6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : VistaHub Wifi only
 Test Item : Band Edge Data
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW) (2422MHz)
 Test Date : 2017/11/15

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Peak Limit (dB μ V/m)	Average Limit (dB μ V/m)	Result
03 (Peak)	2388.841	12.145	58.375	70.520	74.00	54.00	Pass
03 (Peak)	2390.000	12.148	55.886	68.034	74.00	54.00	Pass
03 (Peak)	2397.971	12.169	60.778	72.948	--	--	--
03 (Peak)	2400.000	12.176	59.585	71.761	--	--	--
03 (Peak)	2432.319	12.257	90.587	102.844	--	--	--
03 (Average)	2390.000	12.148	40.716	52.864	74.00	54.00	Pass
03 (Average)	2432.899	12.258	80.407	92.666	--	--	--

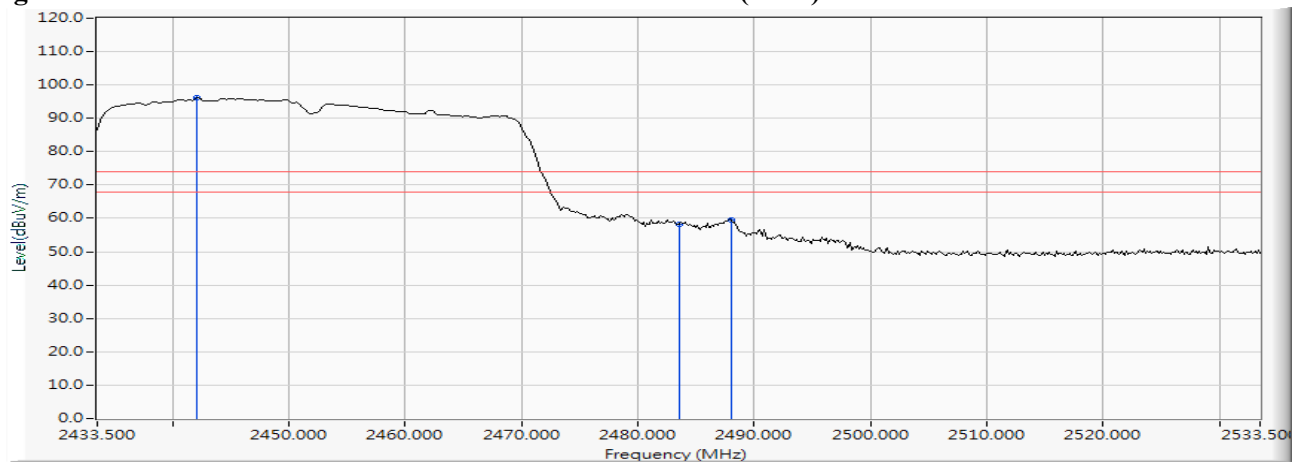
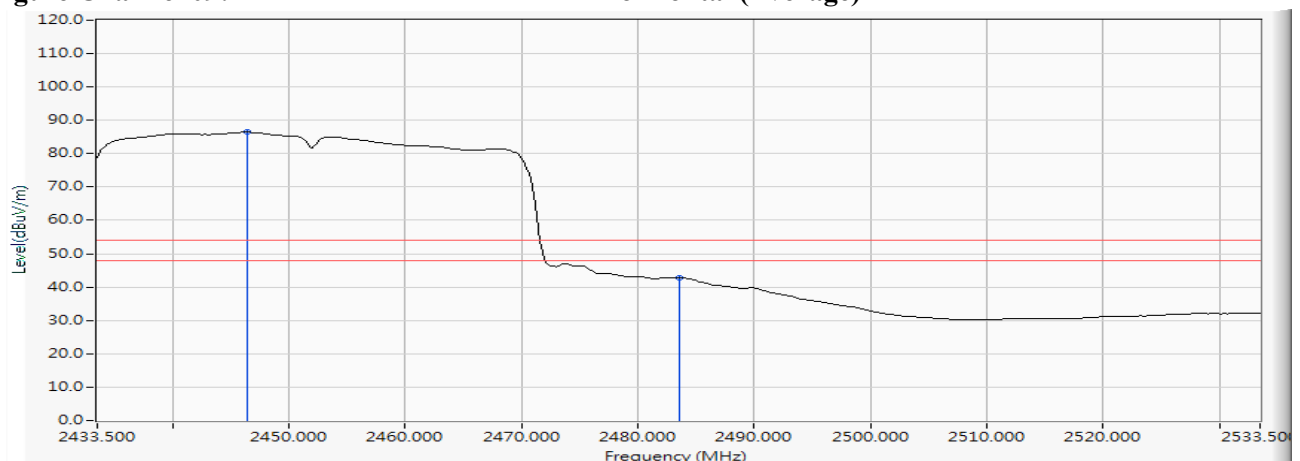
Figure Channel 03: VERTICAL (Peak)**Figure Channel 03: VERTICAL (Average)**

- Note:1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
 4. “ * ”, means this data is the worst emission level.
 5. Measurement Level = Reading Level + Correct Factor.
 6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : VistaHub Wifi only
 Test Item : Band Edge Data
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW) (2452MHz)
 Test Date : 2017/11/15

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Peak Limit (dB μ V/m)	Average Limit (dB μ V/m)	Result
09 (Peak)	2442.051	12.285	83.780	96.064	--	--	--
09 (Peak)	2483.500	12.403	45.988	58.391	74.00	54.00	Pass
09 (Peak)	2487.993	12.415	47.203	59.618	74.00	54.00	Pass
09 (Average)	2446.399	12.297	74.143	86.440	--	--	--
09 (Average)	2483.500	12.403	30.398	42.801	74.00	54.00	Pass

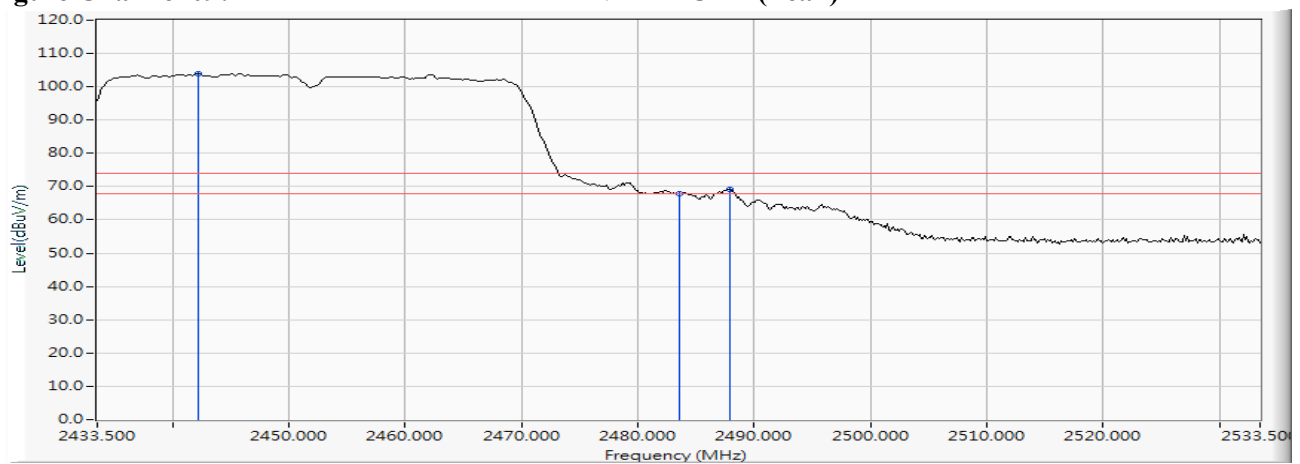
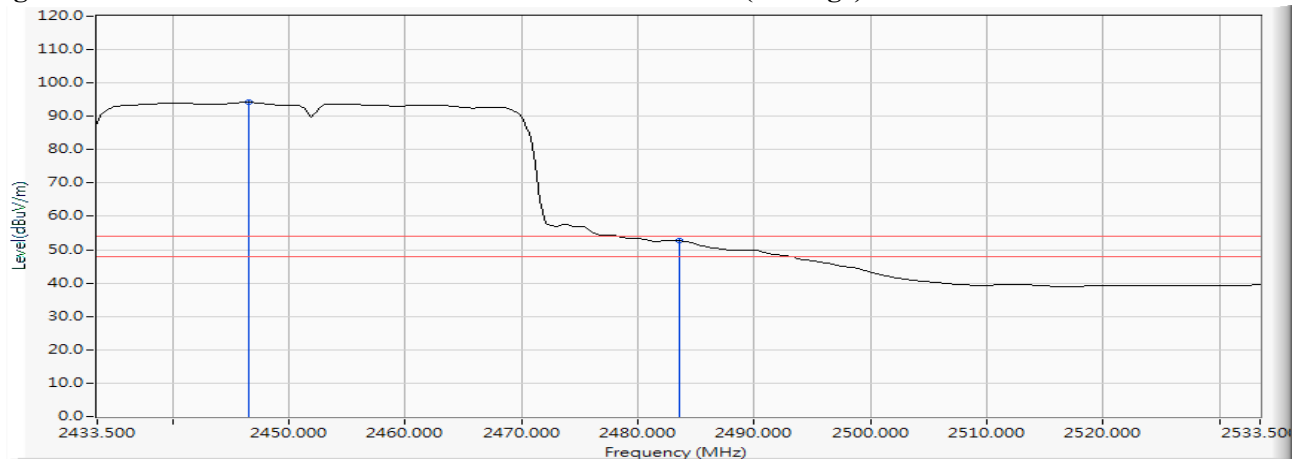
Figure Channel 09: Horizontal (Peak)

Figure Channel 09: Horizontal (Average)


- Note: 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
 4. “ * ”, means this data is the worst emission level.
 5. Measurement Level = Reading Level + Correct Factor.
 6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : VistaHub Wifi only
 Test Item : Band Edge Data
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW) (2452MHz)
 Test Date : 2017/11/15

RF Radiated Measurement (VERTICAL):

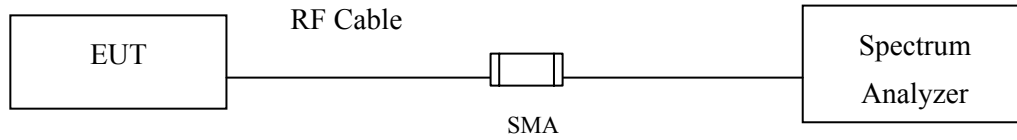
Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Peak Limit (dB μ V/m)	Average Limit (dB μ V/m)	Result
09 (Peak)	2442.196	12.285	91.727	104.012	--	--	--
09 (Peak)	2483.500	12.403	55.421	67.824	74.00	54.00	Pass
09 (Peak)	2487.848	12.415	56.872	69.287	74.00	54.00	Pass
09 (Average)	2446.543	12.298	81.892	94.190	--	--	--
09 (Average)	2483.500	12.403	40.289	52.692	74.00	54.00	Pass

Figure Channel 09: VERTICAL (Peak)

Figure Channel 09: VERTICAL (Average)


- Note: 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
 4. “ * ”, means this data is the worst emission level.
 5. Measurement Level = Reading Level + Correct Factor.
 6. The average measurement was not performed when the peak measured data under the limit of average detection.

7. 6dB Bandwidth

7.1. Test Setup



7.2. Limits

The minimum bandwidth shall be at least 500 kHz.

7.3. Test Procedure

The EUT was setup according to ANSI C63.4: 2014; tested according to DTS test procedure of Jan KDB558074 for compliance to FCC 47CFR 15.247 requirements.

7.4. Uncertainty

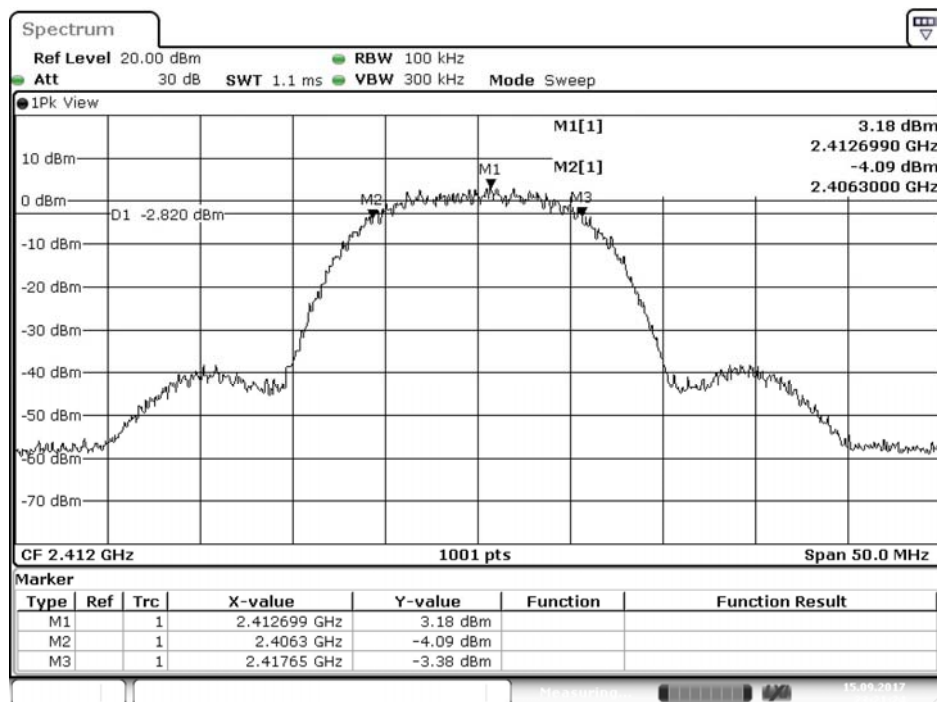
$\pm 279.2\text{Hz}$

7.5. Test Result of 6dB Bandwidth

Product : VistaHub Wifi only
 Test Item : 6dB Bandwidth Data
 Test Mode : Mode 1: Transmit (802.11b 1Mbps)

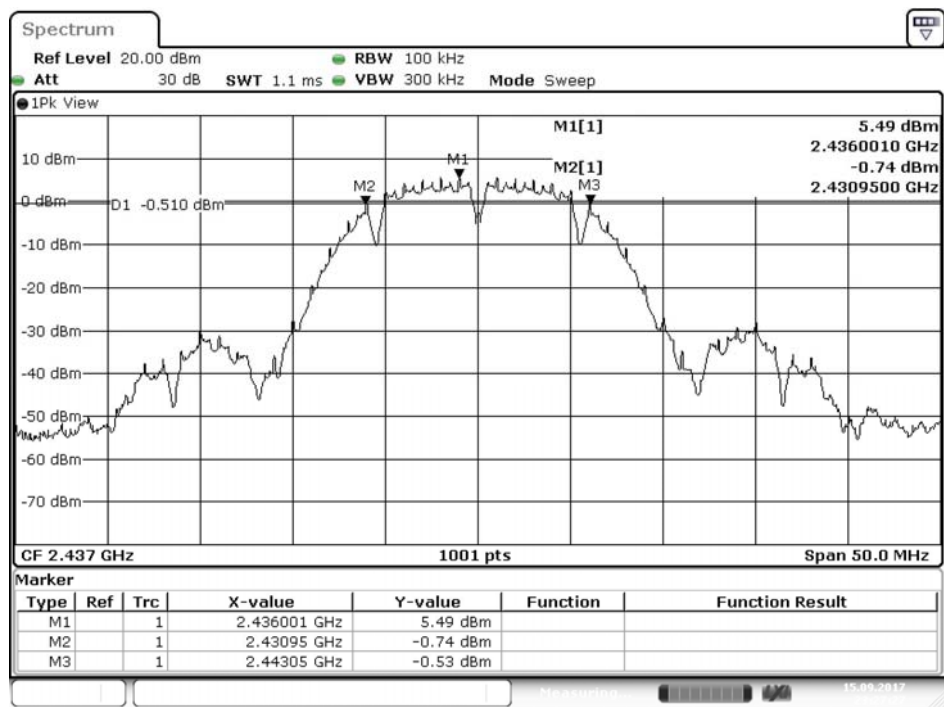
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
01	2412	11350	>500	Pass
06	2437	12100	>500	Pass
11	2462	12150	>500	Pass

Figure Channel 01:



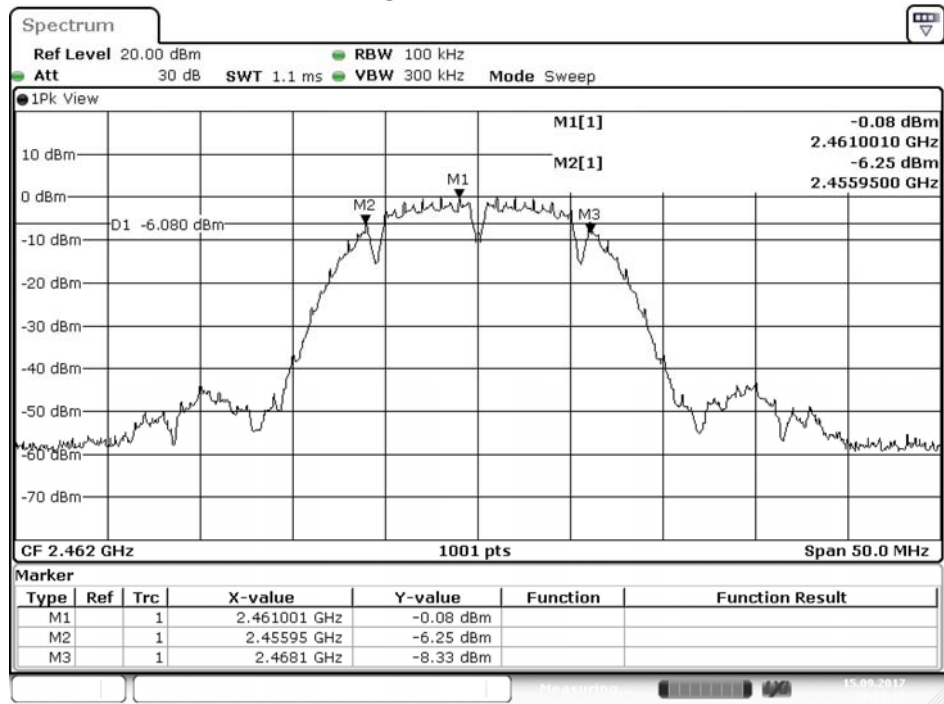
Date: 15.SEP.2017 23:21:24

Figure Channel 06:



Date: 15.SEP.2017 23:27:27

Figure Channel 11:

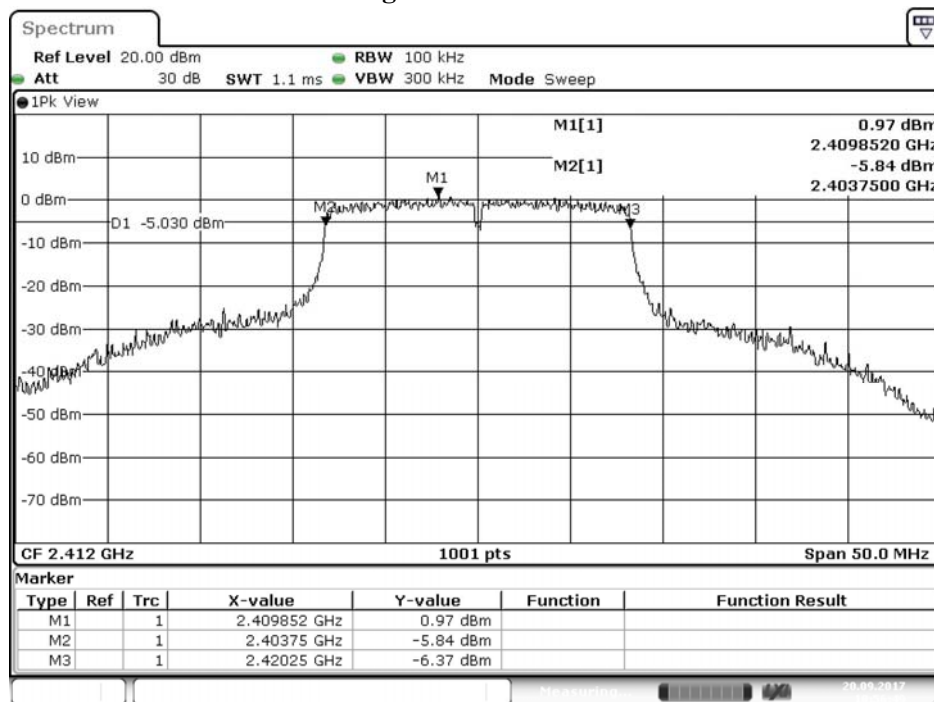


Date: 15.SEP.2017 23:33:20

Product : VistaHub Wifi only
 Test Item : 6dB Bandwidth Data
 Test Mode : Mode 2: Transmit (802.11g 6Mbps)

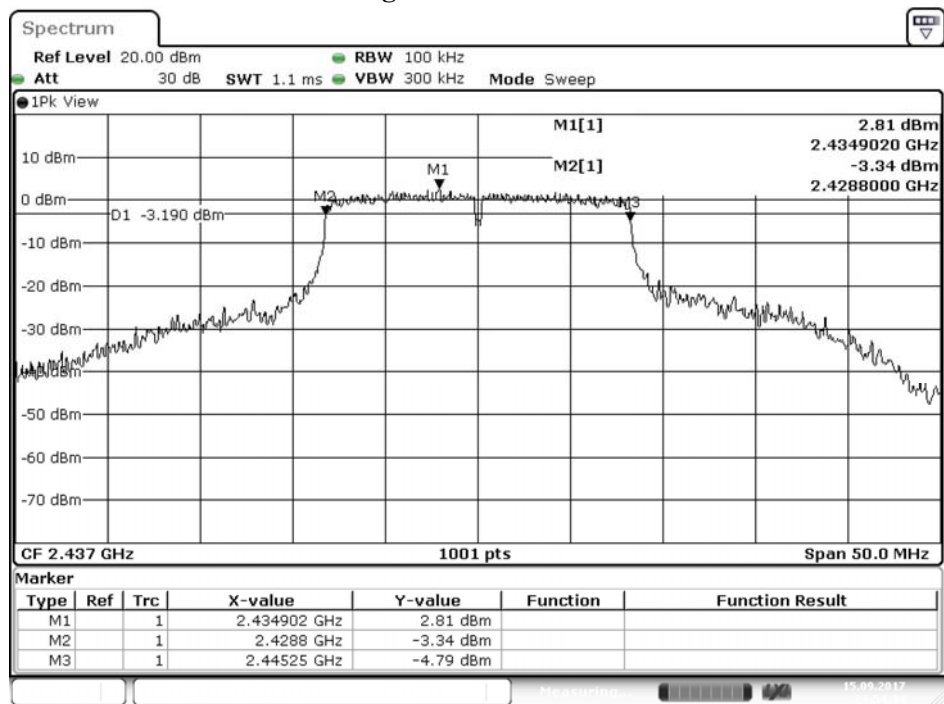
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
01	2412	16500	>500	Pass
06	2437	16450	>500	Pass
11	2462	16450	>500	Pass

Figure Channel 01:



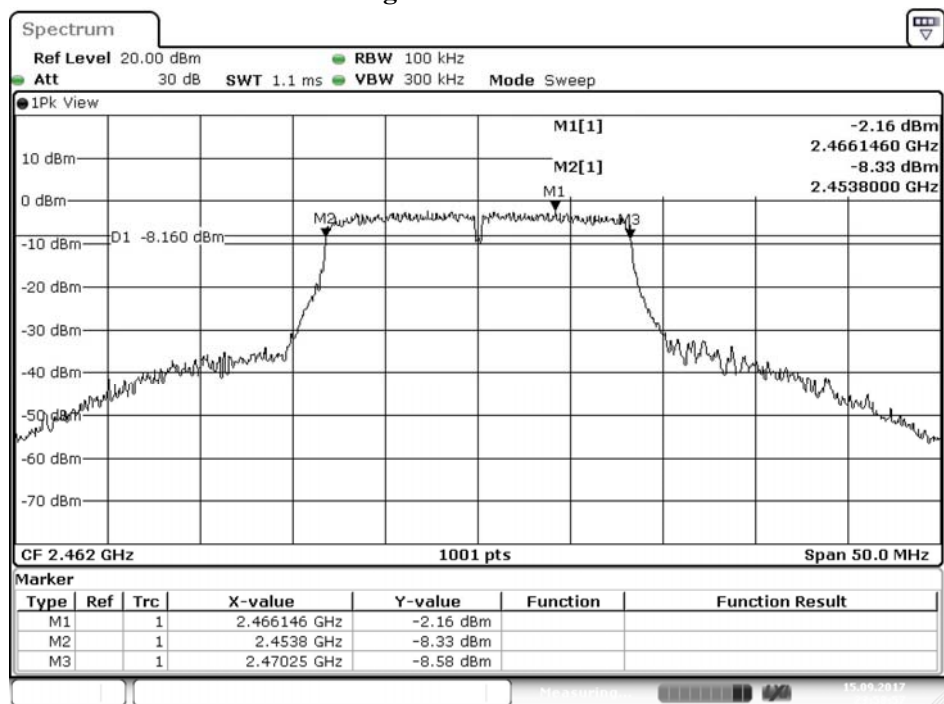
Date: 20.SEP.2017 10:56:50

Figure Channel 06:



Date: 15.SEP.2017 23:54:34

Figure Channel 11:

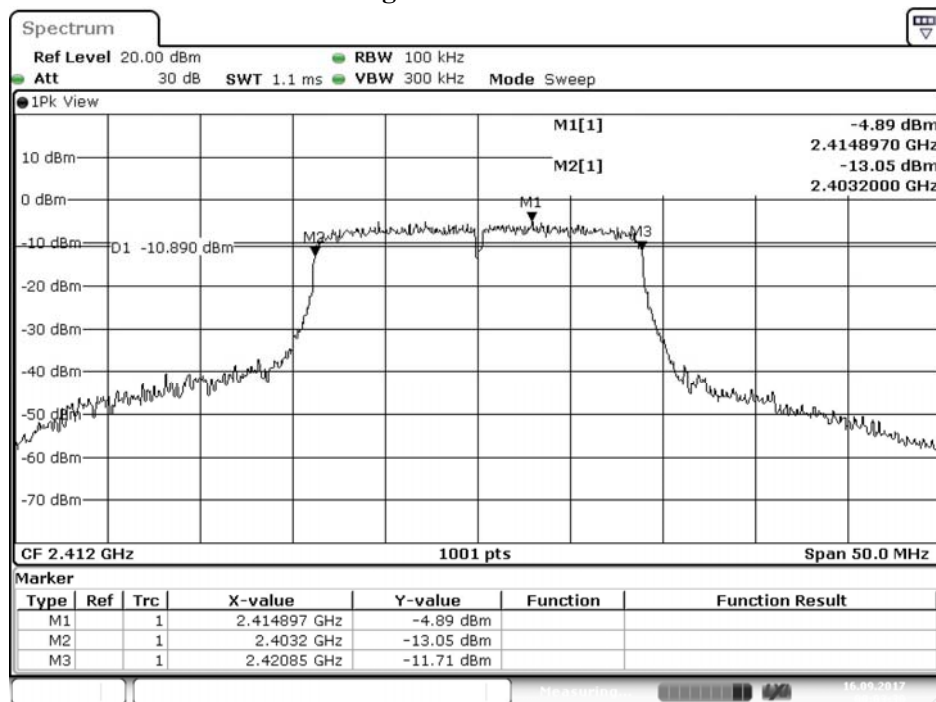


Date: 15.SEP.2017 23:58:57

Product : VistaHub Wifi only
 Test Item : 6dB Bandwidth Data
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)

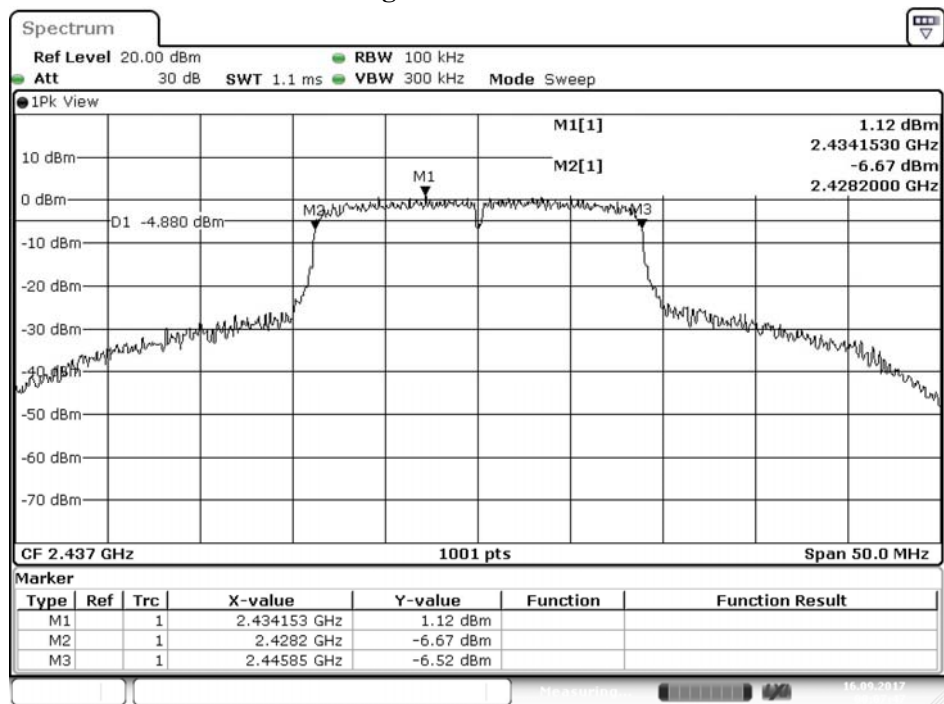
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
01	2412	17650	>500	Pass
06	2437	17650	>500	Pass
11	2462	17650	>500	Pass

Figure Channel 01:



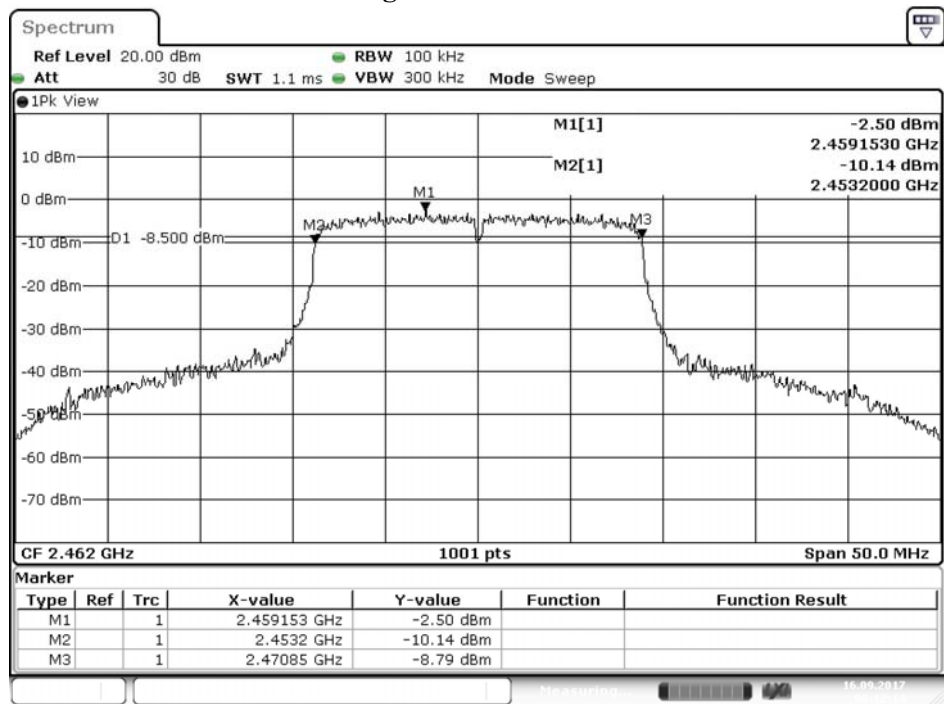
Date: 16.SEP.2017 00:03:31

Figure Channel 06:



Date: 16.SEP.2017 00:07:47

Figure Channel 11:

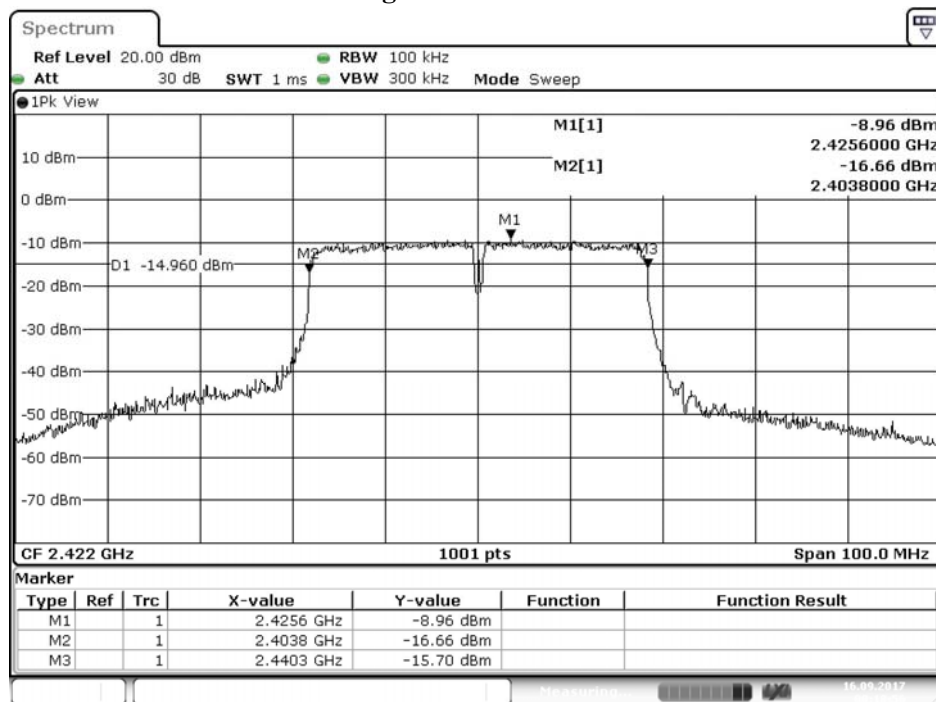


Date: 16.SEP.2017 00:12:14

Product : VistaHub Wifi only
 Test Item : 6dB Bandwidth Data
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW)

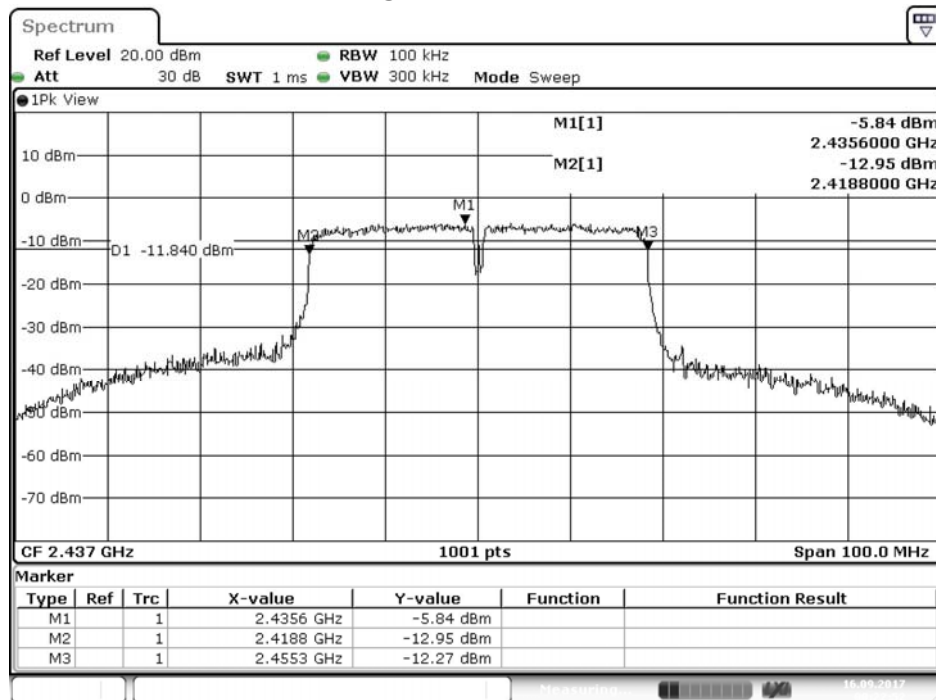
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
03	2422	36500	>500	Pass
06	2437	36500	>500	Pass
09	2452	36500	>500	Pass

Figure Channel 03:



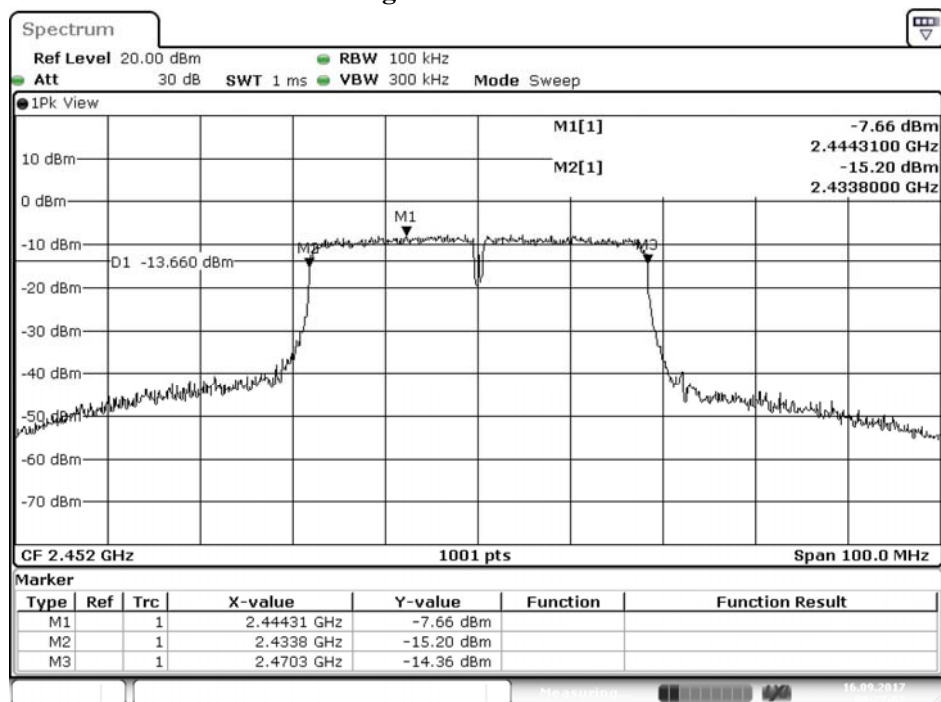
Date: 16.SEP.2017 00:18:56

Figure Channel 06:



Date: 16.SEP.2017 00:22:53

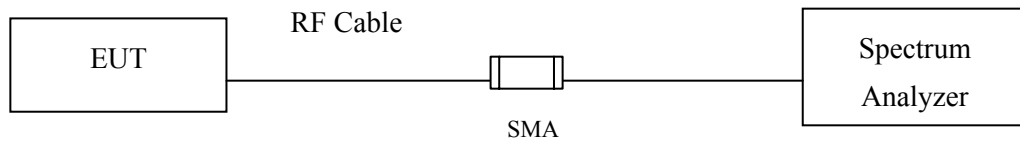
Figure Channel 09:



Date: 16.SEP.2017 00:27:07

8. Power Density

8.1. Test Setup



8.2. Limits

The transmitted power density averaged over any 1 second interval shall not be greater +8dBm in any 3kHz bandwidth.

8.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013; tested according to DTS test procedure of KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

The maximum power spectral density using KDB 558074 section 10.2 PKPSD (peak PSD) method.

8.4. Uncertainty

± 1.23 dB

8.5. Test Result of Power Density

Product : VistaHub Wifi only
 Test Item : Power Density Data
 Test Mode : Mode 1: Transmit (802.11b 1Mbps)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
01	2412	2.860	≤ 8 dBm	Pass
06	2437	5.370	≤ 8 dBm	Pass
11	2462	-0.170	≤ 8 dBm	Pass

Figure Channel 01:

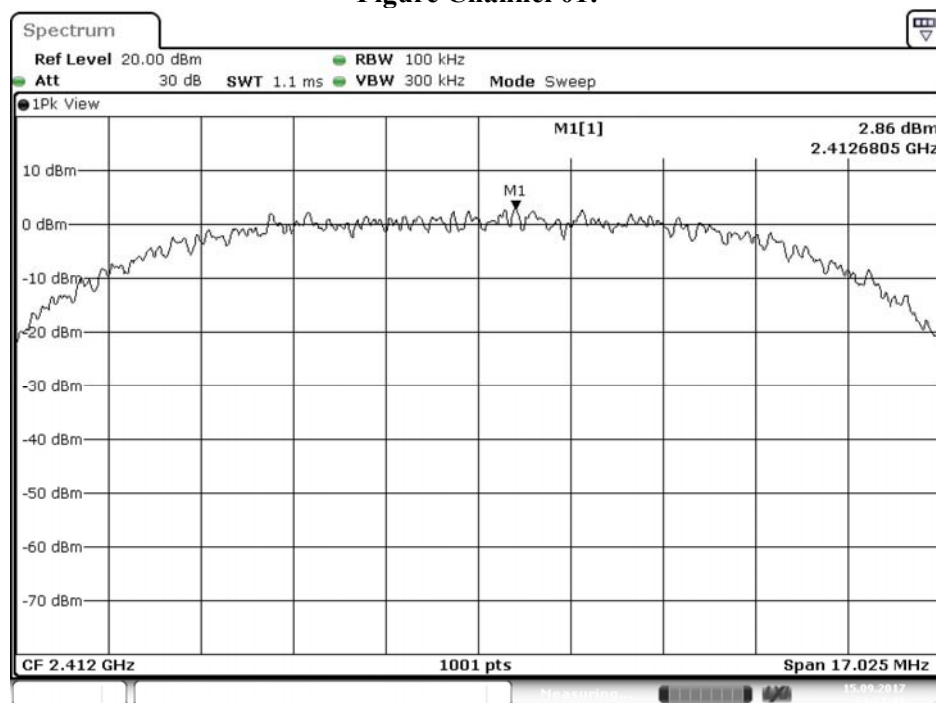
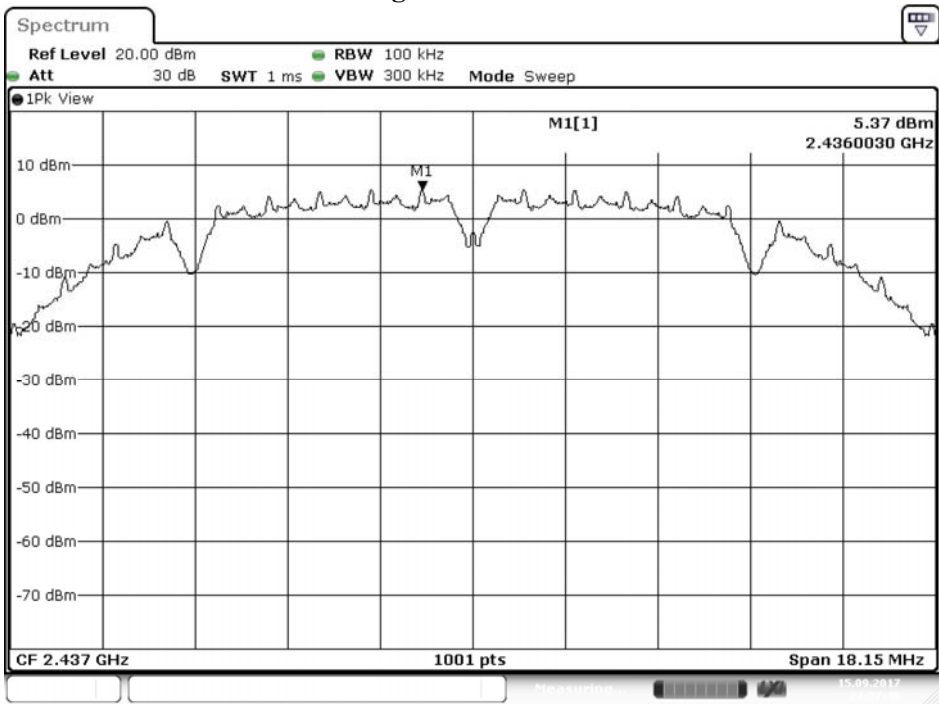
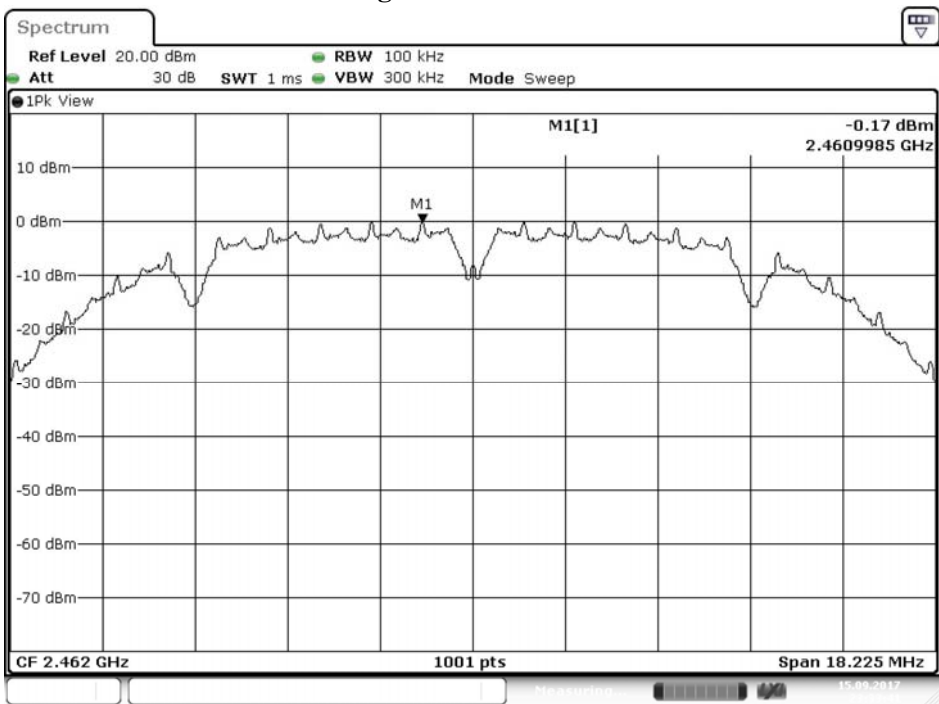


Figure Channel 06:



Date: 15.SEP.2017 23:27:48

Figure Channel 11:



Date: 15.SEP.2017 23:33:41

Product : VistaHub Wifi only
 Test Item : Power Density Data
 Test Mode : Mode 2: Transmit (802.11g 6Mbps)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
01	2412	0.780	$\leq 8\text{dBm}$	Pass
06	2437	2.010	$\leq 8\text{dBm}$	Pass
11	2462	-2.400	$\leq 8\text{dBm}$	Pass

Figure Channel 01:

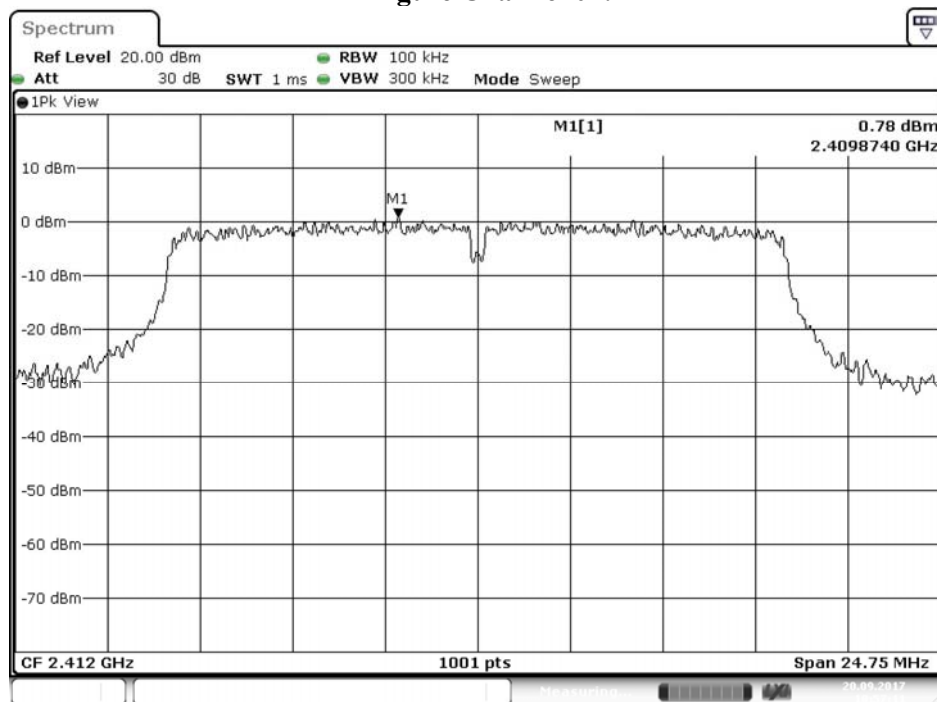
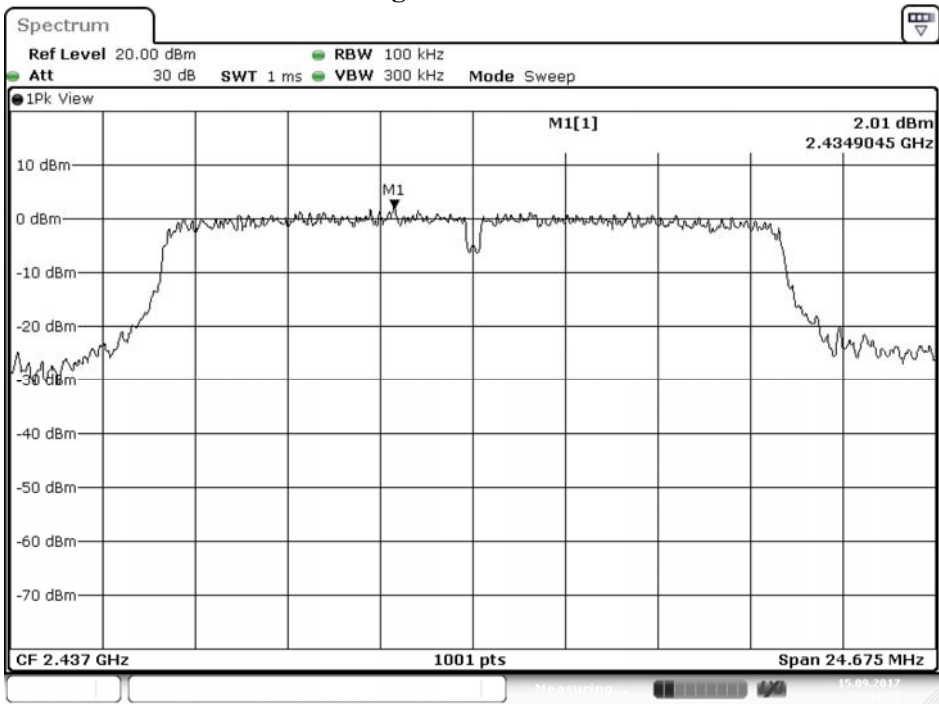
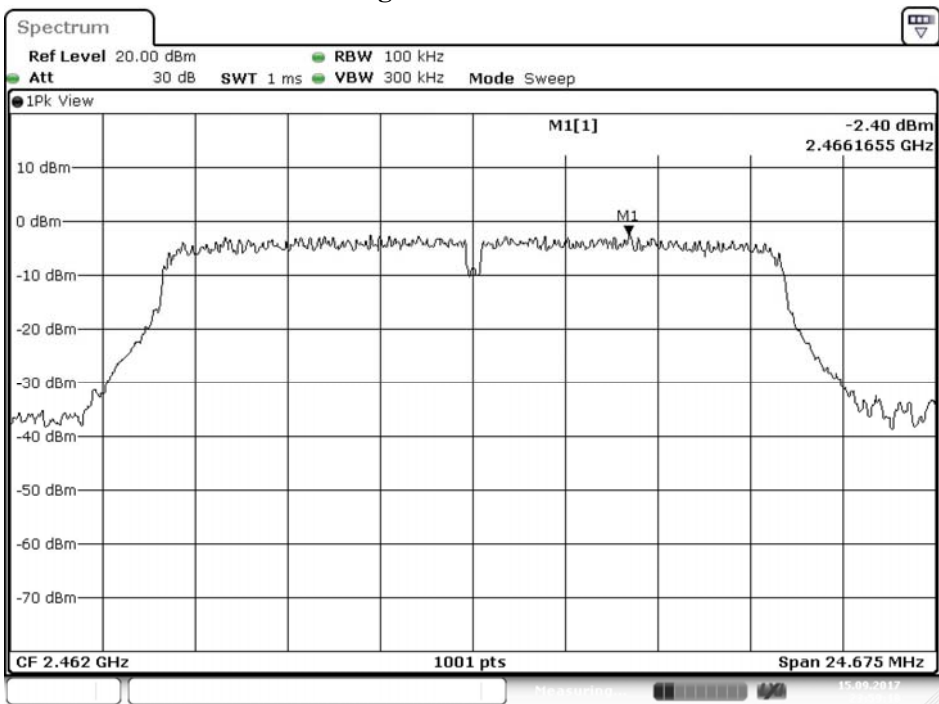


Figure Channel 06:



Date: 15.SEP.2017 23:54:55

Figure Channel 11:

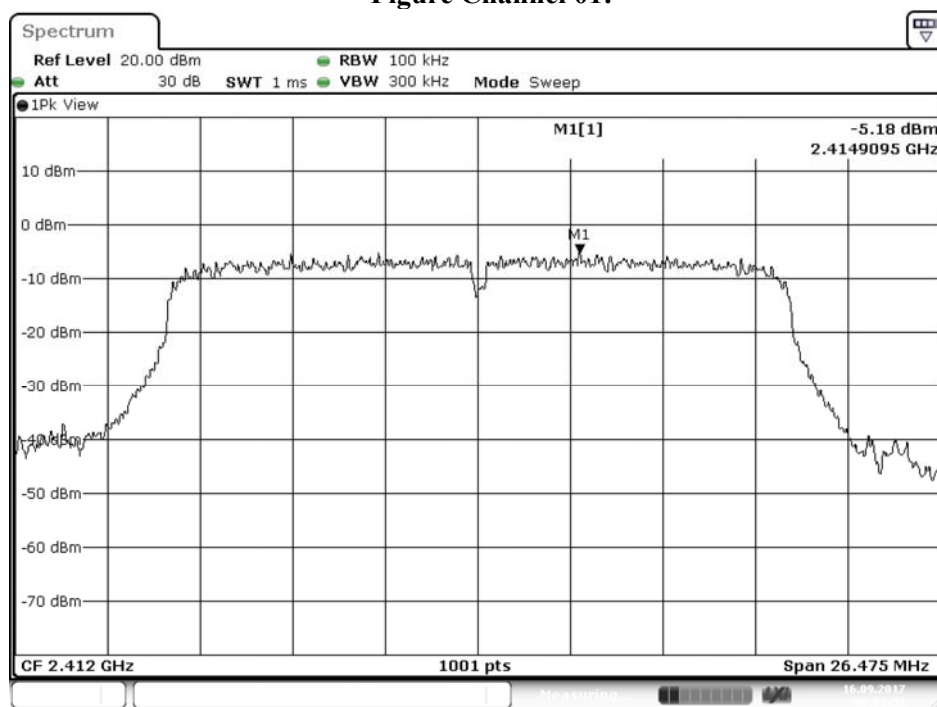


Date: 15.SEP.2017 23:59:19

Product : VistaHub Wifi only
 Test Item : Power Density Data
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
01	2412	-5.180	$\leq 8\text{dBm}$	Pass
06	2437	0.820	$\leq 8\text{dBm}$	Pass
11	2462	-2.890	$\leq 8\text{dBm}$	Pass

Figure Channel 01:



Date: 16.SEP.2017 00:03:52

Figure Channel 06:

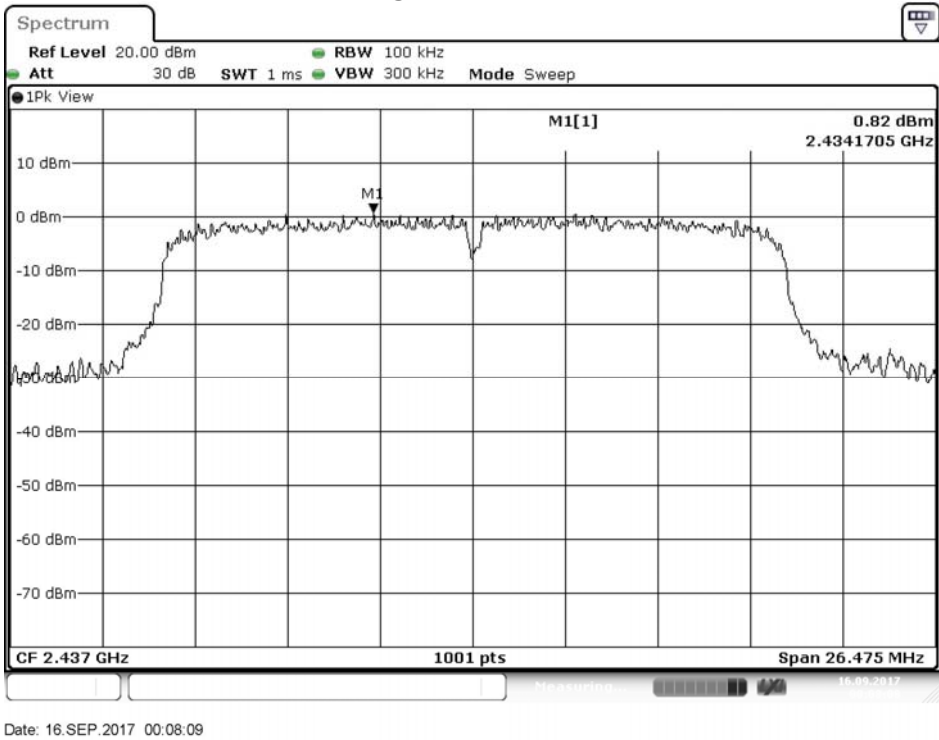
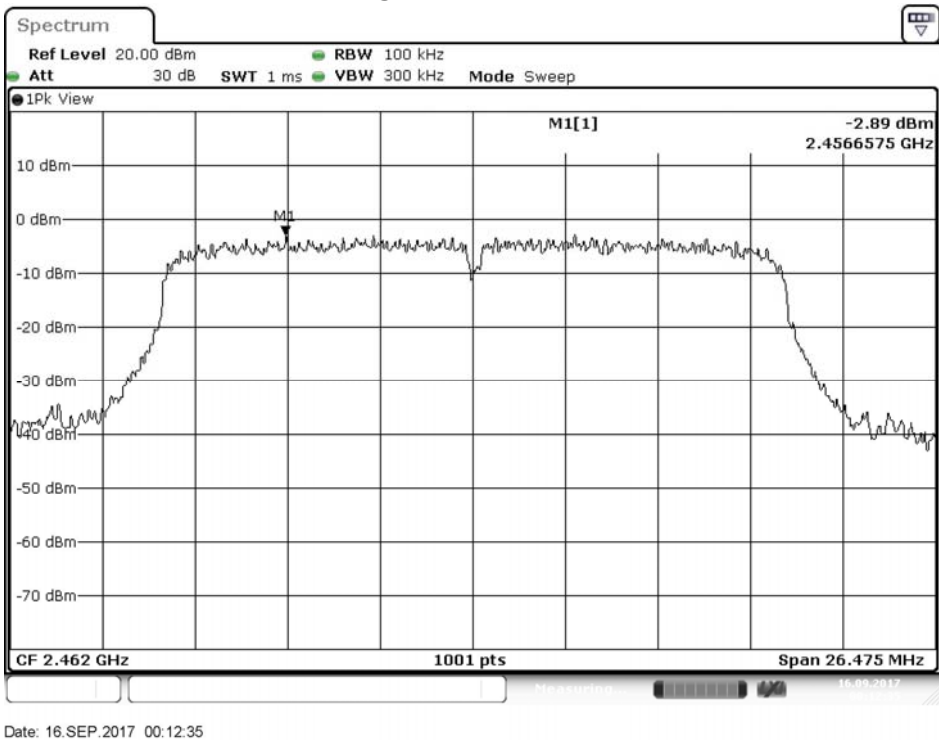


Figure Channel 11:



Product : VistaHub Wifi only
 Test Item : Power Density Data
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
03	2422	-9.270	$\leq 8\text{dBm}$	Pass
06	2437	-5.980	$\leq 8\text{dBm}$	Pass
09	2452	-7.850	$\leq 8\text{dBm}$	Pass

Figure Channel 03:

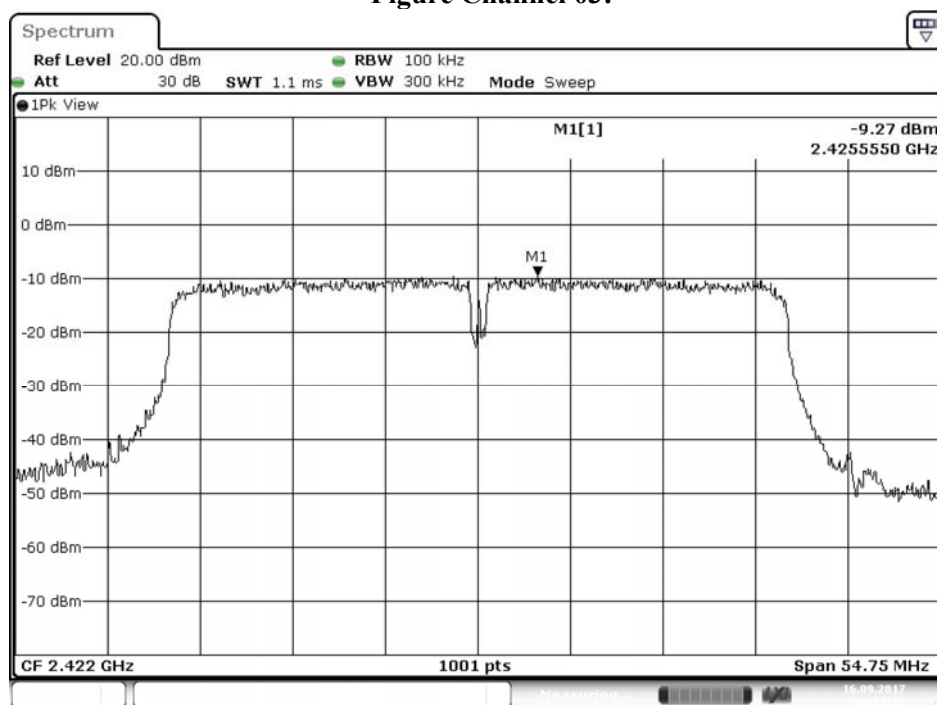
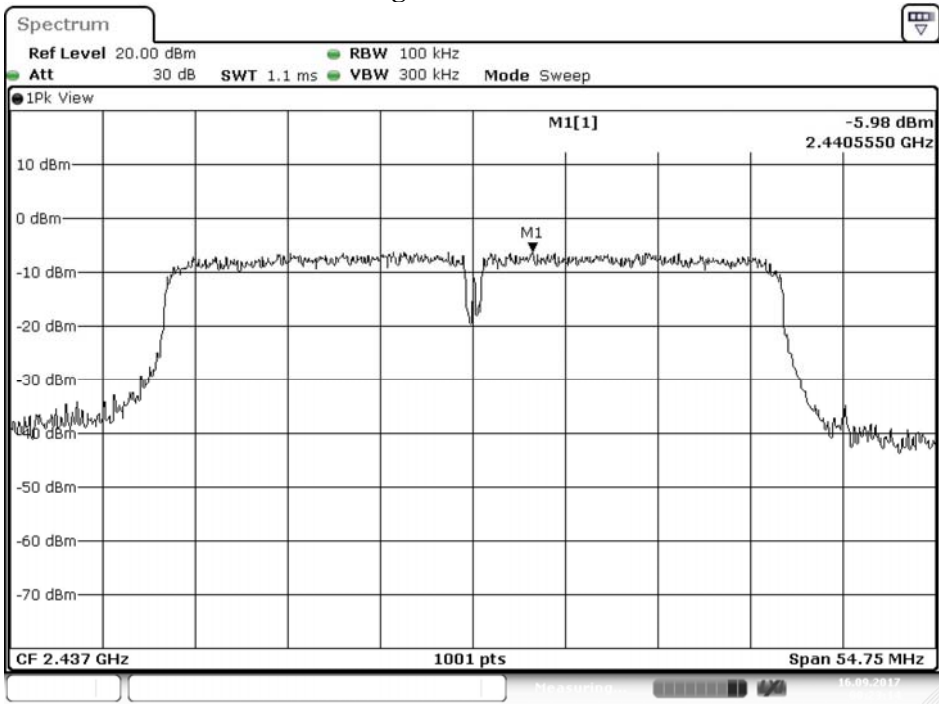
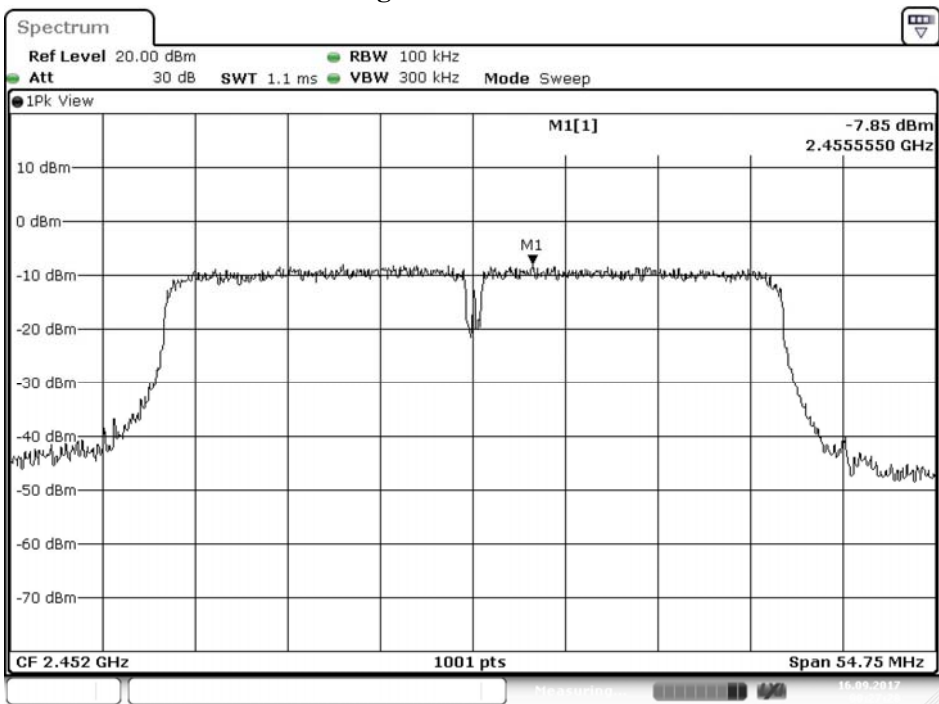


Figure Channel 06:



Date: 16.SEP.2017 00:23:14

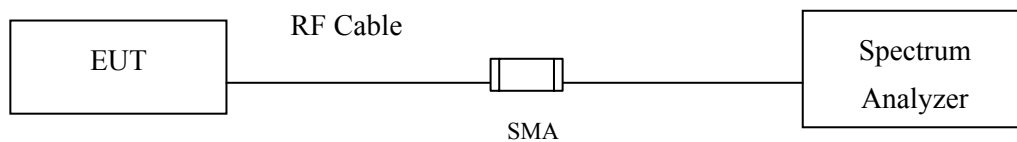
Figure Channel 09:



Date: 16.SEP.2017 00:27:28

9. Duty Cycle

9.1. Test Setup



9.2. Test Procedure

The EUT was setup according to ANSI C63.10 2013; tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

9.3. Uncertainty

$\pm 2.31\text{msec}$

9.4. Test Result of Duty Cycle

Product : VistaHub Wifi only
 Test Item : Duty Cycle
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)

Duty Cycle Formula:

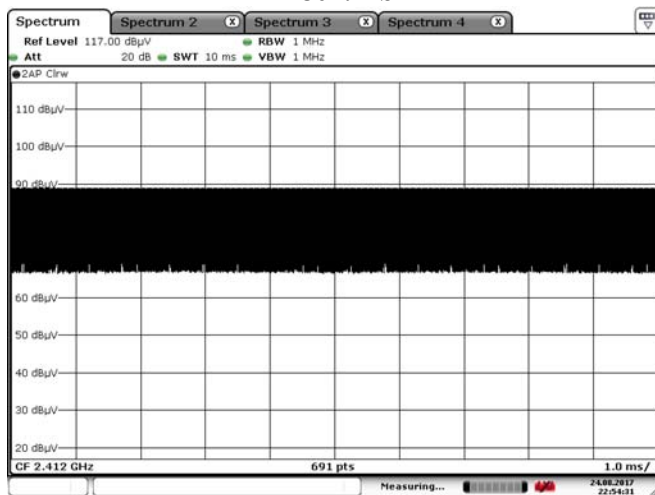
Duty Cycle = Ton / (Ton + Toff)

Duty Factor = 10 Log (1/Duty Cycle)

Results:

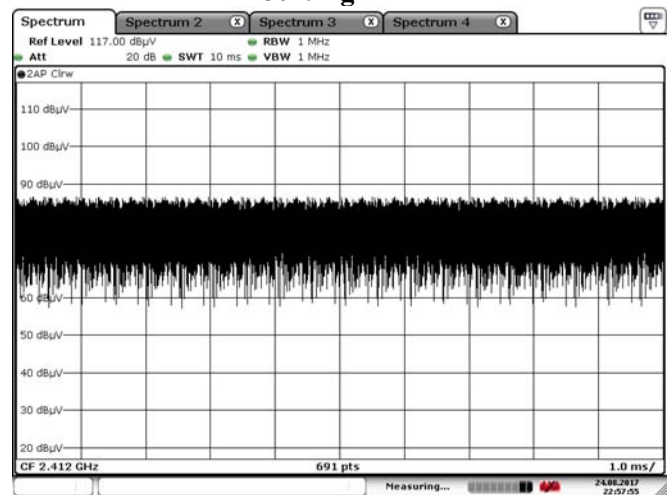
Mode	Ton (ms)	Ton + Toff (ms)	Duty Cycle (%)	Duty Factor (dB)
802.11 b	10	10	100	0
802.11 g	10	10	100	0
802.11 n20	10	10	100	0
802.11 n40	10	10	100	0

802.11b



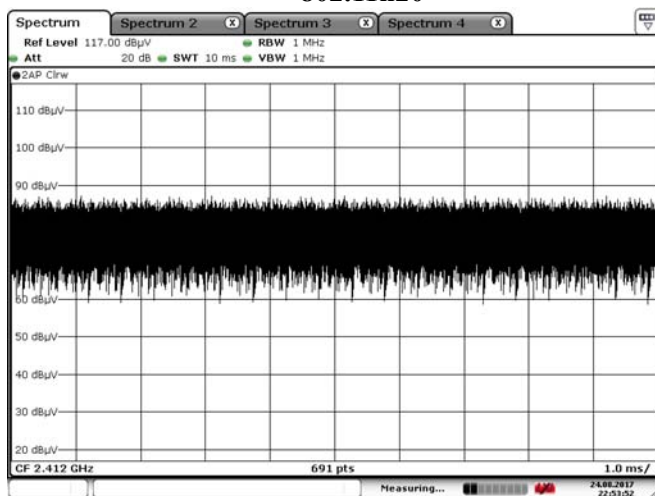
Date: 24 AUG 2017 22:54:32

802.11g



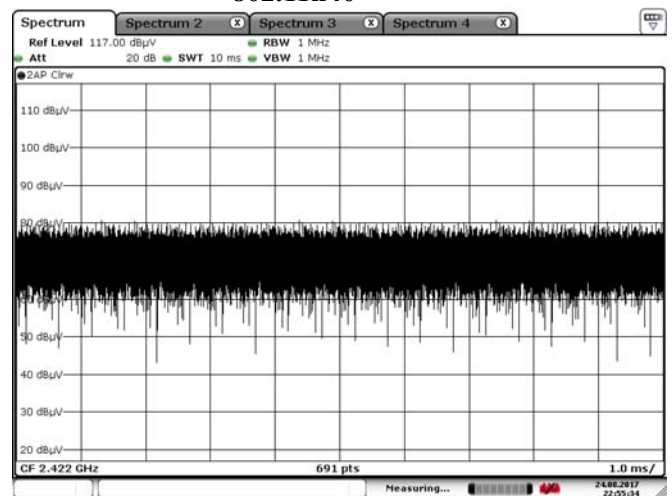
Date: 24 AUG 2017 22:57:55

802.11n20



Date: 24 AUG 2017 22:53:52

802.11n40



Date: 24 AUG 2017 22:55:34

10. EMI Reduction Method During Compliance Testing

No modification was made during testing.