

FCC REPORT

(WIFI)

Applicant: 8Devices

Address of Applicant: Gedimino 47, Kaunas, LT-44242, Lithuania

Equipment Under Test (EUT)

Product Name: Habanero

Model No.: Habanero

FCC ID: Z9W-HAB

Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247

Date of sample receipt: 21 Apr., 2020

Date of Test: 22 Apr., to 29 Jun., 2020

Date of report issued: 01 Jul., 2020

Test Result: PASS*

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Bruce Zhang
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the CCIS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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2 Version

Version No.	Date	Description
00	01 Jul., 2020	Original

Tested by:

Mike.ou

Test Engineer

Date:

01 Jul., 2020

Reviewed by:

Winner Zhang

Project Engineer

Date:

01 Jul., 2020

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4 Test Summary

Test Items	Section in CFR 47	Result
Antenna requirement	15.203 & 15.247 (b)	Pass
AC Power Line Conducted Emission	15.207	Pass
Conducted Peak Output Power	15.247 (b)(3)	Pass
6dB Emission Bandwidth 99% Occupied Bandwidth	15.247 (a)(2)	Pass
Power Spectral Density	15.247 (e)	Pass
Band Edge	15.247 (d)	Pass
Spurious Emission	15.205 & 15.209	Pass
Remark: 1. Pass: The EUT complies with the essential requirements in the standard. 2. N/A: Not Applicable. 3. The cable insertion loss used by "RF Output Power" and other conduction measurement items is 0.5dB (provided by the customer).		
Test Method:	ANSI C63.4-2014 ANSI C63.10-2013 KDB 558074 D01 15.247 Meas Guidance v05r02	

5 General Information

5.1 Client Information

Applicant:	8Devices
Address:	Gedimino 47, Kaunas, LT-44242, Lithuania
Manufacturer/ Factory:	8Devices
Address:	Gedimino 47, Kaunas, LT-44242, Lithuania

5.2 General Description of E.U.T.

Product Name:	Habanero
Model No.:	Habanero
HVIN:	HAB1003, HAB1004
Operation Frequency:	2412MHz~2462MHz (802.11b/802.11g/802.11n(HT20)) 2422MHz~2452MHz (802.11n(HT40))
Channel numbers:	11 for 802.11b/802.11g/802.11(HT20) 7 for 802.11n(HT40)
Channel separation:	5MHz
Modulation technology: (IEEE 802.11b)	Direct Sequence Spread Spectrum (DSSS)
Modulation technology: (IEEE 802.11g/802.11n)	Orthogonal Frequency Division Multiplexing(OFDM)
Data speed (IEEE 802.11b):	1Mbps, 2Mbps, 5.5Mbps, 11Mbps
Data speed (IEEE 802.11g):	6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps, 54Mbps
Data speed (IEEE 802.11n):	Up to 150Mbps
Antenna Type:	Ceramic Antenna Whip Antenne Planare WLAN Antenne
Antenna gain:	Ceramic Antenna: 2.09dBi Whip Antenne: 4.0dBi Planare WLAN Antenne: 1.0dBi
Power supply:	DC 3.3V
Remark:	Model No.: Habanero has two hardware version v03(HVIN:HAB1003) and v04(HVIN:HAB1004): v03 and v04 were identical inside, the electrical circuit design, layout, components used and internal wiring, with only difference being model version v03 and v04 and location of two capacitors C739, C740 which are on SFP interface datalines . v03 and v04 have Habanero -C, Habanero -I versions, with only difference being temperature grade of the components used, Habanero -C uses commercial temperature graded components and Habanero -I uses industrial temperature graded components(-I and -C, just different components which are graded for higher temperatures these are basically the same components but went with more robust testing and though industrial temperature grad) The hardware version v03(HVIN:HAB1003) was tested
Test Sample Condition:	The test samples were provided in good working order with no visible defects.

Operation Frequency each of channel for 802.11b/g/n(HT20)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz
3	2422MHz	6	2437MHz	9	2452MHz		

Note:

- For 802.11n-HT40 mode, the channel number is from 3 to 9;
- Channel 1, 6 & 11 selected for 802.11b/g/n-HT20 as Lowest, Middle and Highest channel. Channel 3, 6 & 9 selected for 802.11n-HT40 as Lowest, Middle and Highest Channel.

5.3 Test environment and test mode

Operating Environment:	
Temperature:	24.0 °C
Humidity:	54 % RH
Atmospheric Pressure:	1010 mbar
Test mode:	
Transmitting mode	Keep the EUT in continuous transmitting with modulation
Remark:	Conducted Emission and Radiated Emission below 1GHz pre-scan Ceramic Antenna and Planare WLAN Antenna and Whip Antenna, found Planare WLAN Antenna was worse case mode, the report only reflects the worst mode

Radiated Emission: The sample was placed 0.8m (below 1GHz)/1.5m (above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

Per-scan all kind of data rate, the follow list were the worst case.	
Mode	Data rate
802.11b	1Mbps
802.11g	6Mbps
802.11n(HT20)	6.5Mbps
802.11n(HT40)	13.5Mbps

5.4 Description of Support Units

Manufacturer	Description	Model	Serial Number	FCC ID/DoC
LENOVO	Laptop	SL510	2847A65	DoC
Vonhk	AC ADAPTOR	KSAFE0900270W2US	/	/

5.5 Measurement Uncertainty

Parameters	Expanded Uncertainty
Conducted Emission (9kHz ~ 30MHz)	±1.60 dB (k=2)
Radiated Emission (9kHz ~ 30MHz)	±3.12 dB (k=2)
Radiated Emission (30MHz ~ 1000MHz)	±4.32 dB (k=2)
Radiated Emission (1GHz ~ 18GHz)	±5.16 dB (k=2)
Radiated Emission (18GHz ~ 40GHz)	±3.20 dB (k=2)

5.6 Additions to, deviations, or exclusions from the method

No

5.7 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

● **FCC - Designation No.: CN1211**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Registration No. is 727551.

● **ISED – CAB identifier.: CN0021**

The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

● **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: <https://portal.a2la.org/scopepdf/4346-01.pdf>

5.8 Laboratory Location

Shenzhen Zhongjian Nanfang Testing Co., Ltd.

Address: No.110~116, Building B, Jinyuan Business Building, Xixiang Road, Bao'an District, Shenzhen, Guangdong, China

Tel: +86-755-23118282, Fax: +86-755-23116366

Email: info@ccis-cb.com, Website: <http://www.ccis-cb.com>

5.9 Test Instruments list

Radiated Emission:					
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
3m SAC	SAEMC	9m*6m*6m	966	07-22-2017	07-21-2020
Loop Antenna	SCHWARZBECK	FMZB1519B	044	03-07-2020	03-06-2021
BiConiLog Antenna	SCHWARZBECK	VULB9163	497	03-07-2020	03-06-2021
Horn Antenna	SCHWARZBECK	BBHA9120D	916	03-07-2020	03-06-2021
Horn Antenna	SCHWARZBECK	BBHA9120D	1805	06-22-2017	06-21-2020
				06-22-2020	06-21-2021
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170582	11-18-2019	11-17-2020
EMI Test Software	AUDIX	E3	Version: 6.110919b		
Pre-amplifier	HP	8447D	2944A09358	03-07-2020	03-06-2021
Pre-amplifier	CD	PAP-1G18	11804	03-07-2020	03-06-2021
Spectrum analyzer	Rohde & Schwarz	FSP30	101454	03-05-2020	03-04-2021
Spectrum analyzer	Rohde & Schwarz	FSP40	100363	11-18-2019	11-17-2020
EMI Test Receiver	Rohde & Schwarz	ESRP7	101070	03-05-2020	03-04-2021
Cable	ZDECL	Z108-NJ-NJ-81	1608458	03-07-2020	03-06-2021
Cable	MICRO-COAX	MFR64639	K10742-5	03-07-2020	03-06-2021
Cable	SUHNER	SUCOFLEX100	58193/4PE	03-07-2020	03-06-2021
RF Switch Unit	MWRFTTEST	MW200	N/A	N/A	N/A
Test Software	MWRFTTEST	MTS8200	Version: 2.0.0.0		

Conducted Emission:					
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
EMI Test Receiver	Rohde & Schwarz	ESCI	101189	03-05-2020	03-04-2021
Pulse Limiter	SCHWARZBECK	OSRAM 2306	9731	03-05-2020	03-04-2021
LISN	CHASE	MN2050D	1447	03-05-2020	03-04-2021
LISN	Rohde & Schwarz	ESH3-Z5	8438621/010	07-21-2017	07-20-2020
Cable	HP	10503A	N/A	03-05-2020	03-04-2021
EMI Test Software	AUDIX	E3	Version: 6.110919b		

6 Test results and Measurement Data

6.1 Antenna requirement

Standard requirement:	FCC Part 15 C Section 15.203 /247(b)								
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. 15.247(b) (4) requirement: (4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.									
E.U.T Antenna:									
The product is a professionally installed device which has three types of antennas for the application. The antennas information as below table: <table> <tr> <th>Antenna Type</th><th>Antenna Gain (dBi)</th></tr> <tr> <td>Ceramic Antenna</td><td>2.09</td></tr> <tr> <td>Whip Antenne</td><td>4.00</td></tr> <tr> <td>Planare WLAN Antenne</td><td>1.00</td></tr> </table>		Antenna Type	Antenna Gain (dBi)	Ceramic Antenna	2.09	Whip Antenne	4.00	Planare WLAN Antenne	1.00
Antenna Type	Antenna Gain (dBi)								
Ceramic Antenna	2.09								
Whip Antenne	4.00								
Planare WLAN Antenne	1.00								

Ceramic Antenna



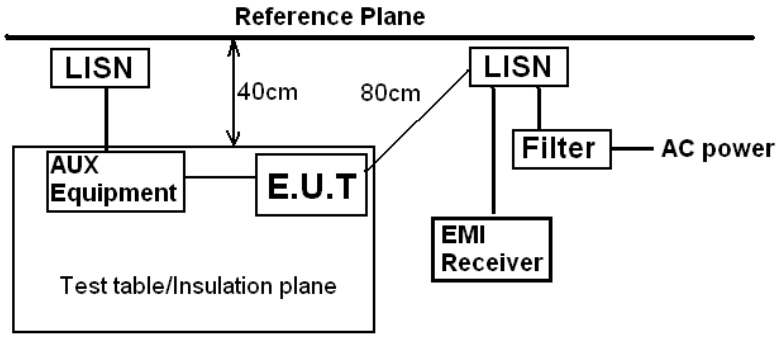
Planare WLAN Antenne



Whip Antenna

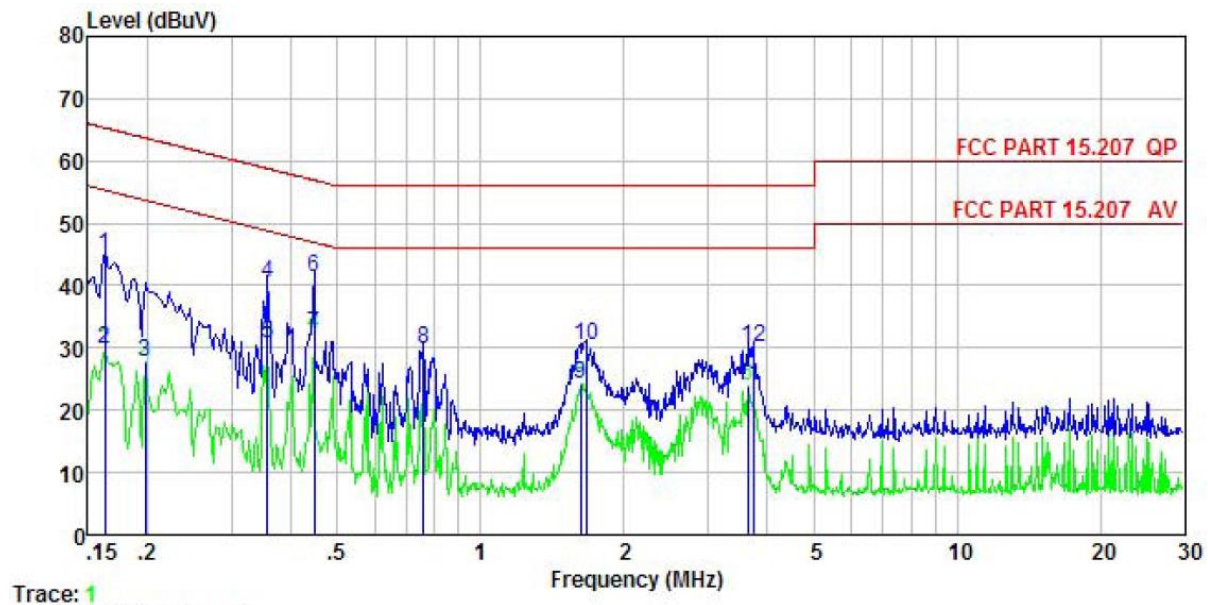


6.2 Conducted Emission

Test Requirement:	FCC Part 15 C Section 15.207		
Test Frequency Range:	150 kHz to 30 MHz		
Class / Severity:	Class B		
Receiver setup:	RBW=9 kHz, VBW=30 kHz		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
	* Decreases with the logarithm of the frequency.		
Test procedure	1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.), which provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. 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 C63.10(latest version) on conducted measurement.		
Test setup:	 Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m		
Test Instruments:	Refer to section 5.9 for details		
Test mode:	Refer to section 5.3 for details		
Test results:	Passed		

Measurement Data:

Product name:	Habanero	Product model:	Habanero
Test by:	Mike	Test mode:	Wi-Fi Tx mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Line
Test voltage:	AC 120 V/60 Hz	Environment:	Temp: 22.5°C Humi: 55%

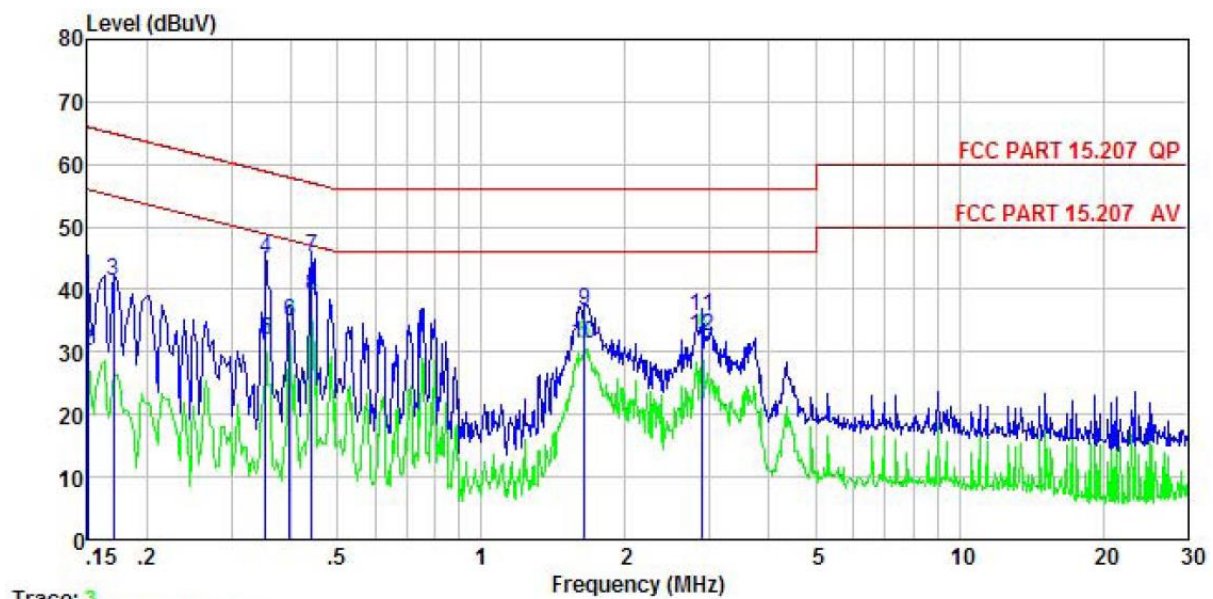


	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.162	34.65	-0.58	10.77	44.84	65.34	-20.50	QP
2	0.162	19.58	-0.58	10.77	29.77	55.34	-25.57	Average
3	0.198	17.45	-0.59	10.76	27.62	53.71	-26.09	Average
4	0.358	30.31	-0.51	10.73	40.53	58.78	-18.25	QP
5	0.358	20.49	-0.51	10.73	30.71	48.78	-18.07	Average
6	0.447	31.13	-0.46	10.74	41.41	56.93	-15.52	QP
7	0.447	21.96	-0.46	10.74	32.24	46.93	-14.69	Average
8	0.759	19.65	-0.55	10.80	29.90	56.00	-26.10	QP
9	1.619	13.87	-0.54	10.93	24.26	46.00	-21.74	Average
10	1.662	19.96	-0.54	10.94	30.36	56.00	-25.64	QP
11	3.642	13.37	-0.41	10.90	23.86	46.00	-22.14	Average
12	3.740	19.52	-0.41	10.90	30.01	56.00	-25.99	QP

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Aux Factor + Cable Loss.

Product name:	Habanero	Product model:	Habanero
Test by:	Mike	Test mode:	Wi-Fi Tx mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Neutral
Test voltage:	AC 120 V/60 Hz	Environment:	Temp: 22.5°C Humi: 55%

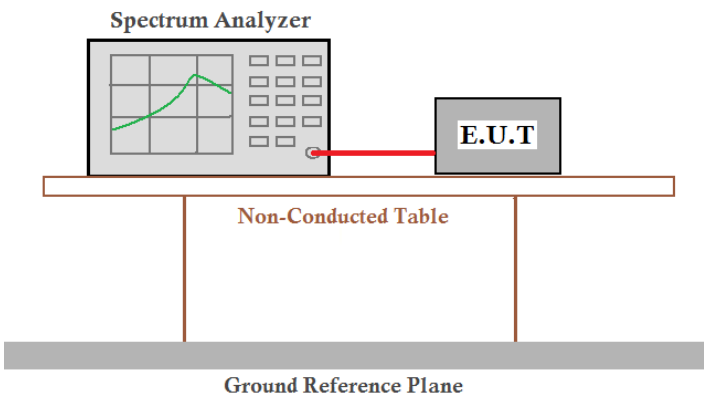


	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.150	31.84	-0.69	10.78	41.93	66.00	-24.07	QP
2	0.150	20.00	-0.69	10.78	30.09	56.00	-25.91	Average
3	0.170	31.14	-0.68	10.77	41.23	64.94	-23.71	QP
4	0.354	34.88	-0.65	10.73	44.96	58.87	-13.91	QP
5	0.354	21.68	-0.65	10.73	31.76	48.87	-17.11	Average
6	0.398	24.67	-0.63	10.72	34.76	47.90	-13.14	Average
7	0.442	34.98	-0.64	10.74	45.08	57.02	-11.94	QP
8	0.442	28.73	-0.64	10.74	38.83	47.02	-8.19	Average
9	1.645	26.43	-0.70	10.93	36.66	56.00	-19.34	QP
10	1.645	21.16	-0.70	10.93	31.39	46.00	-14.61	Average
11	2.900	25.50	-0.65	10.92	35.77	56.00	-20.23	QP
12	2.900	22.11	-0.65	10.92	32.38	46.00	-13.62	Average

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Aux Factor + Cable Loss.

6.3 Conducted Output Power

Test Requirement:	FCC Part 15 C Section 15.247 (b)(3)
Limit:	30dBm
Test setup:	 The diagram illustrates the test setup for conducted output power measurement. A Spectrum Analyzer is connected via a red cable to an E.U.T. (Equipment Under Test). Both are placed on a Non-Conducted Table, which is supported by a Ground Reference Plane.
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:

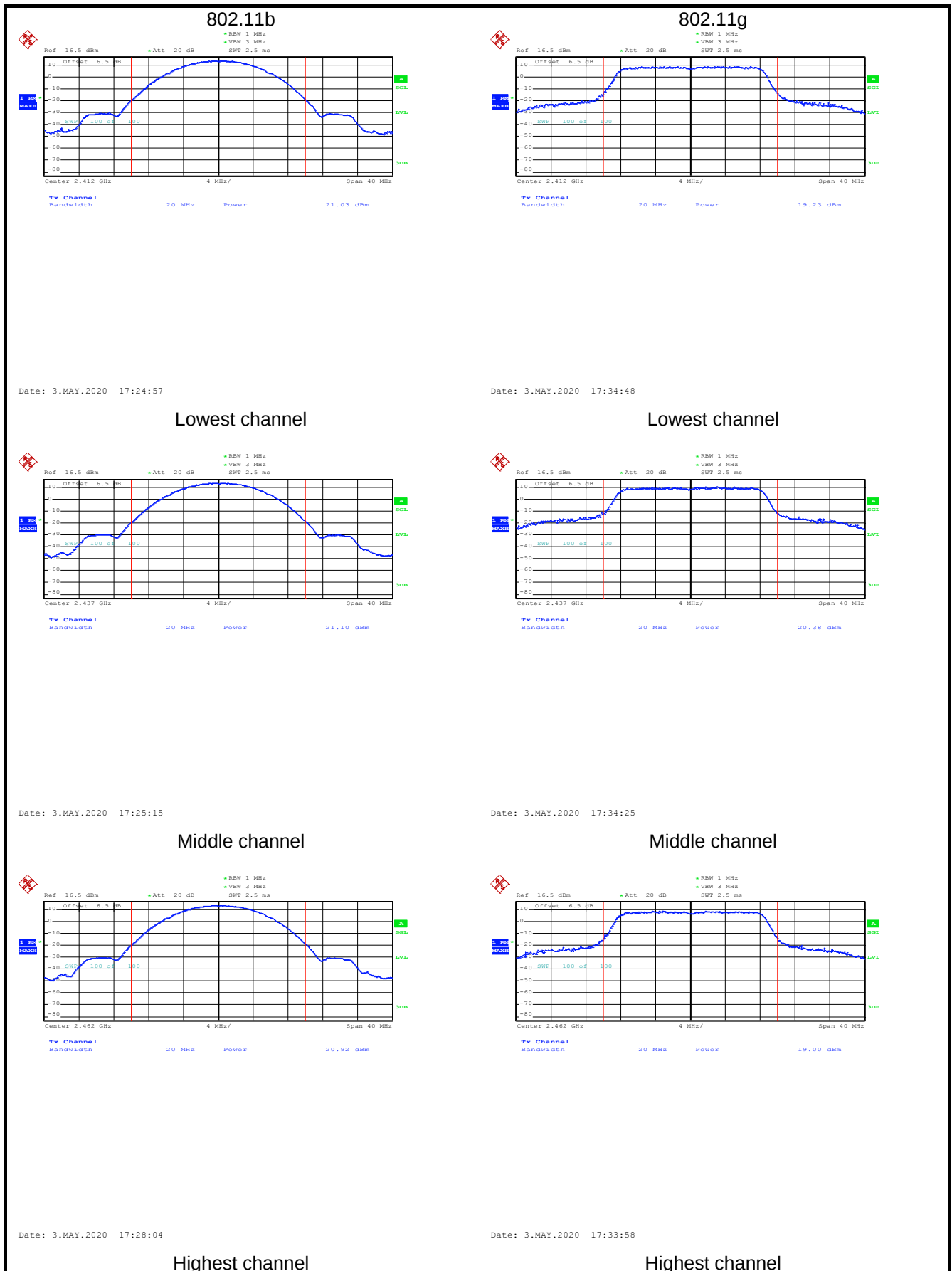
Mode	Test CH	Ant. Port	Conducted Output power(dBm)	Total power (dBm)	Limit (dBm)	Result
802.11b (SISO)	Lowest	ANT0	21.03	/	30.00	Pass
		ANT1	20.44			
	Middle	ANT0	21.10			
		ANT1	20.63			
	Highest	ANT0	20.92			
		ANT1	20.58			
802.11g (SISO)	Lowest	ANT0	19.23	/	30.00	Pass
		ANT1	19.52			
	Middle	ANT0	20.38			
		ANT1	20.66			
	Highest	ANT0	19.00			
		ANT1	19.64			
802.11n(HT20) (MIMO)	Lowest	ANT0	19.24	22.25	Ceramic Antenna:30 Planare WLAN Antenna:30.0 Whip Antenna:29.0	Pass
		ANT1	19.23			
	Middle	ANT0	20.41	23.45		
		ANT1	20.47			
	Highest	ANT0	19.05	22.27		
		ANT1	19.46			
802.11n(HT40) (MIMO)	Lowest	ANT0	19.08	22.13	Ceramic Antenna:30 Planare WLAN Antenna:30.0 Whip Antenna:29.0	Pass
		ANT1	19.16			
	Middle	ANT0	19.21	22.20		
		ANT1	19.16			
	Highest	ANT0	19.05	22.03		Pass
		ANT1	18.99			

Remark:

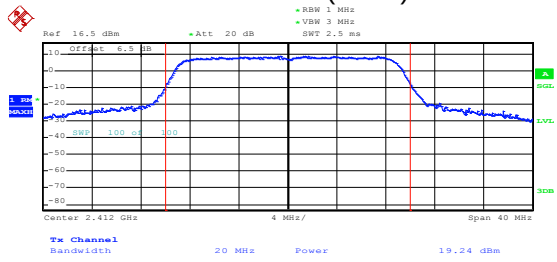
1. Because transmit signals are correlated, Directional gain = $G_{ANT} + 10 \log(N_{ANT})$ dBi.
2. So Ceramic Antenna: The Directional gain = $2.09 + 10 \log(2) = 5.09$ dBi, The directional Gain of antenna is not exceed 6 dBi, so the limit of power is 30 dBm(for 802.11n).
Planare WLAN Antenne: The Directional gain = $1.0 + 10 \log(2) = 4$ dBi, The directional Gain of antenna is greater than 6 dBi, so the limit of power is 30dBm(for 802.11n).
Whip Antenna: The Directional gain = $4 + 10 \log(2) = 7.0$ dBi, The directional Gain of antenna is greater than 6 dBi, so the limit of power is 29.0 dBm(for 802.11n).

Test plot as follows:

ANT0

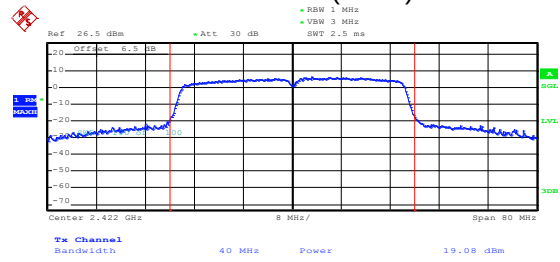


802.11n(HT20)



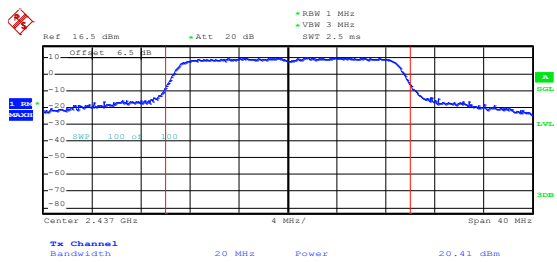
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802.11n(HT40)



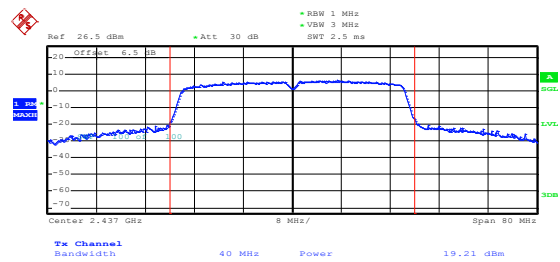
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Lowest channel



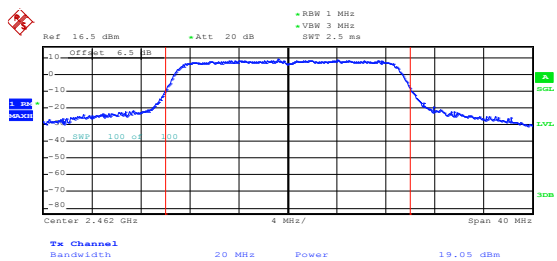
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Lowest channel



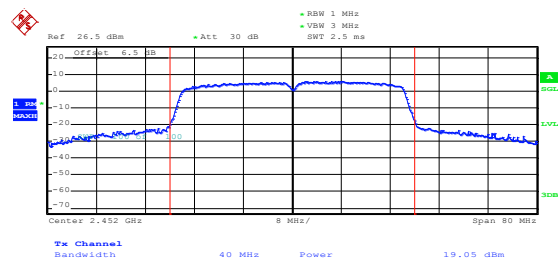
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Middle channel



Date: 3.MAY.2020 17:33:35

Middle channel



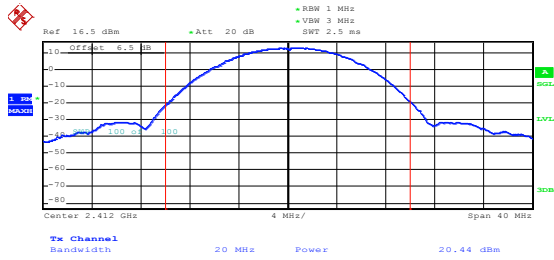
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Highest channel

Highest channel

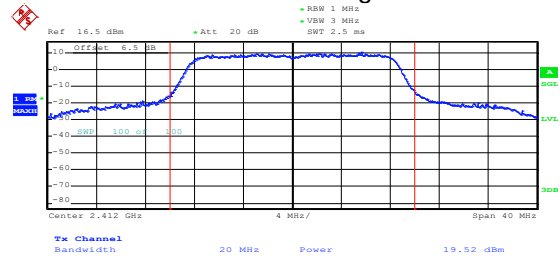
ANT1

802.11b



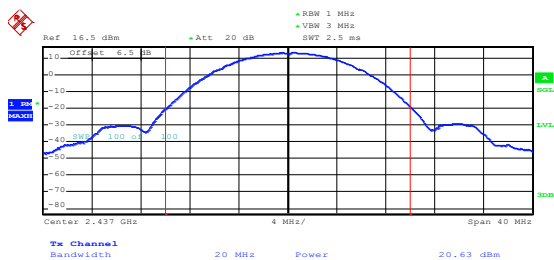
Date: 3.MAY.2020 17:53:35

802.11g



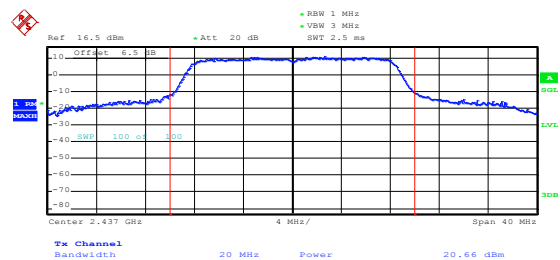
Date: 3.MAY.2020 18:02:18

Lowest channel



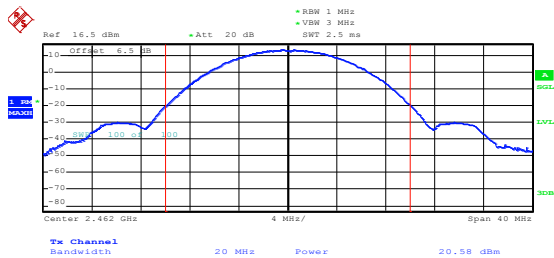
Date: 3.MAY.2020 17:54:03

Lowest channel



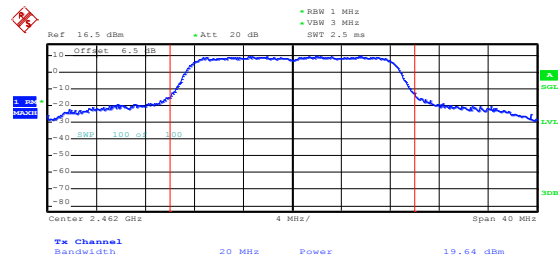
Date: 3.MAY.2020 18:02:37

Middle channel



Date: 3.MAY.2020 17:54:17

Middle channel

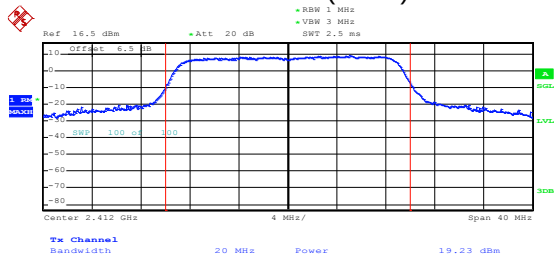


Date: 3.MAY.2020 18:02:08

Highest channel

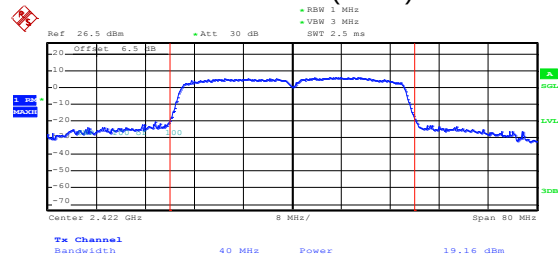
Highest channel

802.11n(HT20)



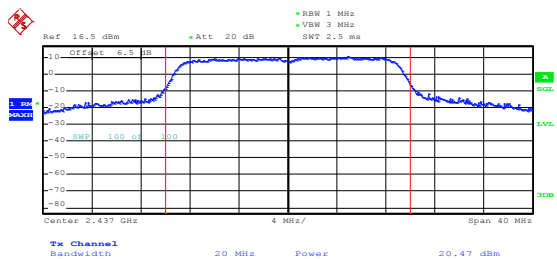
Date: 3.MAY.2020 18:01:43

802.11n(HT40)



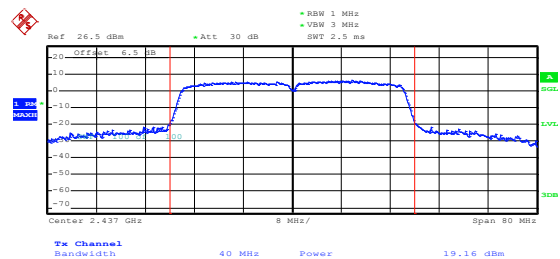
Date: 18.MAY.2020 14:06:47

Lowest channel



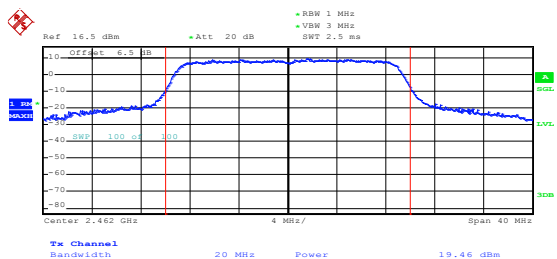
Date: 3.MAY.2020 18:01:24

Lowest channel



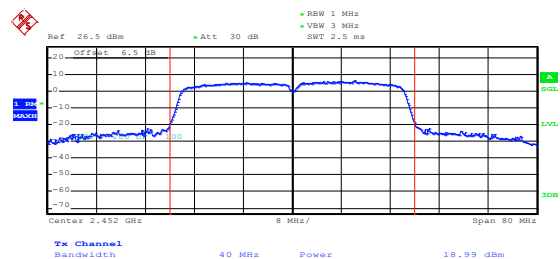
Date: 18.MAY.2020 14:07:20

Middle channel



Date: 3.MAY.2020 18:01:56

Middle channel

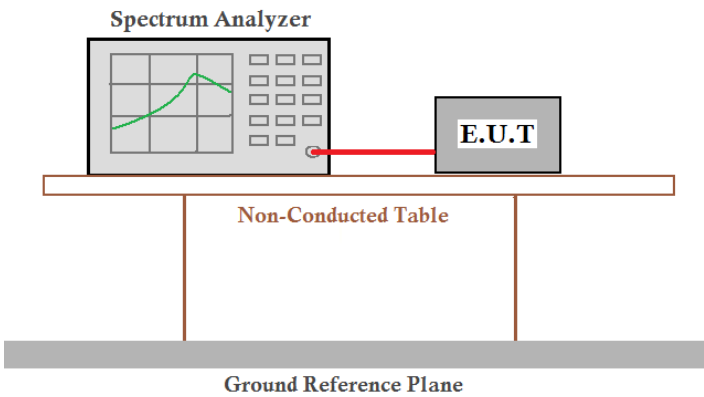


Date: 18.MAY.2020 14:07:54

Highest channel

Highest channel

6.4 Occupy Bandwidth

Test Requirement:	FCC Part 15 C Section 15.247 (a)(2)
Limit:	>500kHz
Test setup:	
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:

ANT0

Test CH	6dB Emission Bandwidth (MHz)				Limit(kHz)	Result
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)		
Lowest	8.24	16.56	17.76	35.84	>500	Pass
Middle	8.24	16.48	17.84	35.68		
Highest	8.24	16.56	17.76	35.68		
Test CH	99% Occupy Bandwidth (MHz)				Limit(kHz)	Result
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)		
Lowest	13.04	16.64	17.68	36.16	N/A	N/A
Middle	13.12	17.52	18.32	36.96		
Highest	13.20	16.64	17.76	36.16		

ANT1

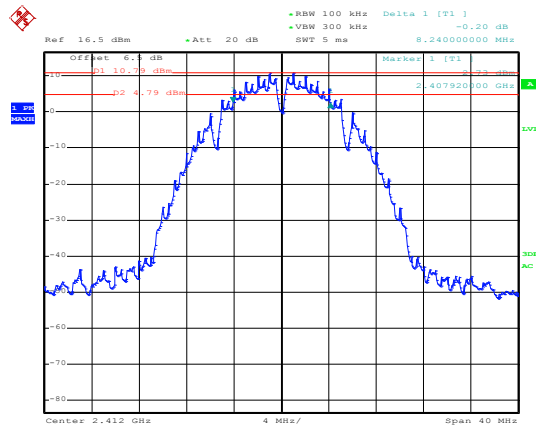
Test CH	6dB Emission Bandwidth (MHz)				Limit(kHz)	Result
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)		
Lowest	8.24	16.56	17.76	36.16	>500	Pass
Middle	8.24	16.48	17.76	35.52		
Highest	8.24	16.56	17.76	36.16		
Test CH	99% Occupy Bandwidth (MHz)				Limit(kHz)	Result
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)		
Lowest	13.20	16.56	17.76	36.32	N/A	N/A
Middle	13.12	18.40	19.12	36.80		
Highest	13.12	16.56	17.68	36.16		

Test plot as follows:

ANT0

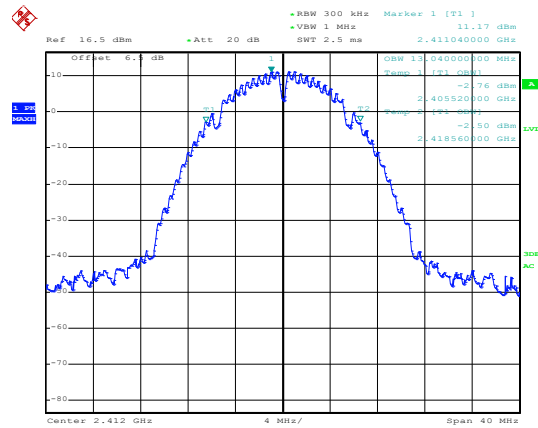
802.11b

6dB EBW



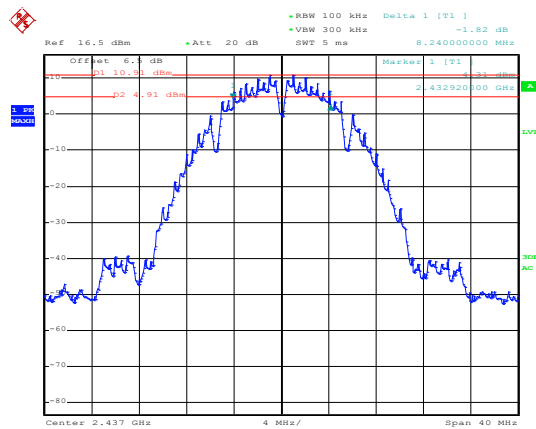
Date: 3.MAY.2020 14:09:38

99% OBW



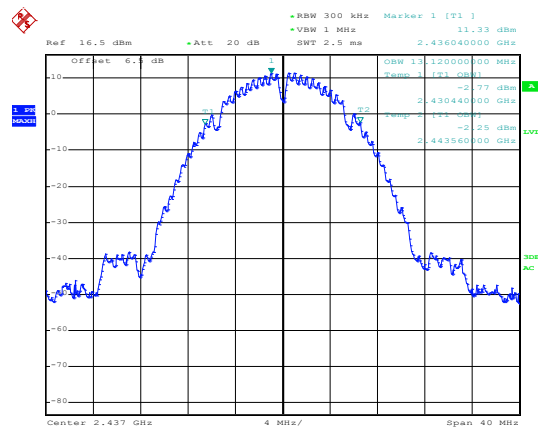
Date: 3.MAY.2020 14:05:13

Lowest channel



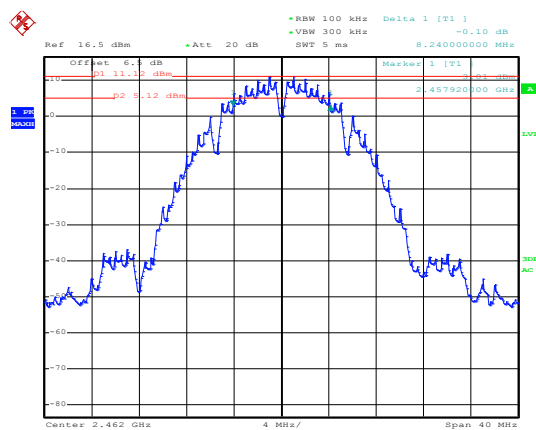
Date: 3.MAY.2020 14:07:27

Lowest channel



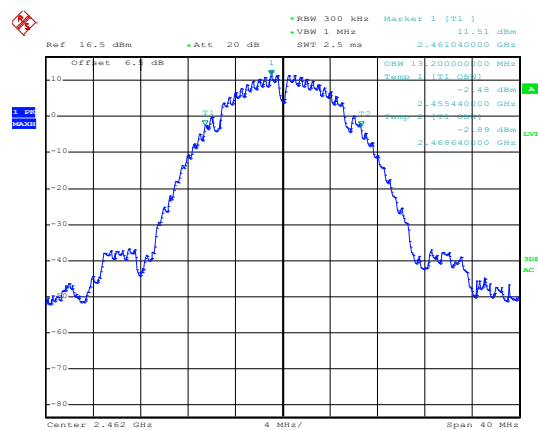
Date: 3.MAY.2020 14:05:26

Middle channel



Date: 3.MAY.2020 14:06:23

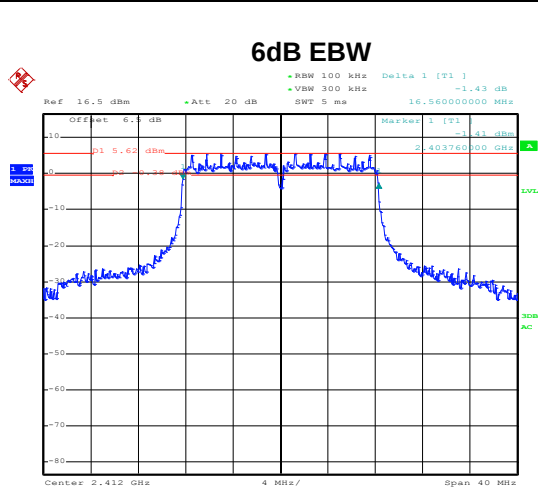
Middle channel



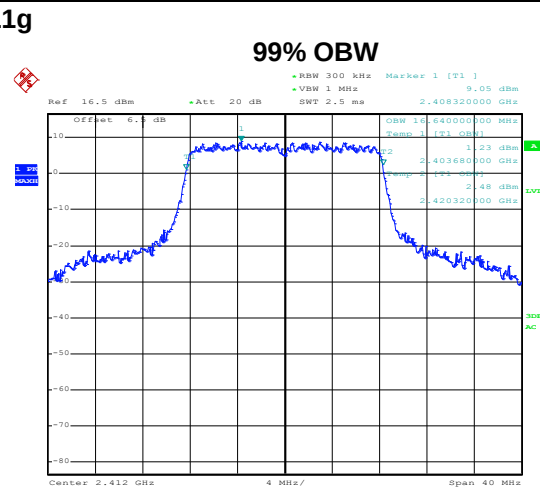
Date: 3.MAY.2020 14:05:40

Highest channel

Highest channel

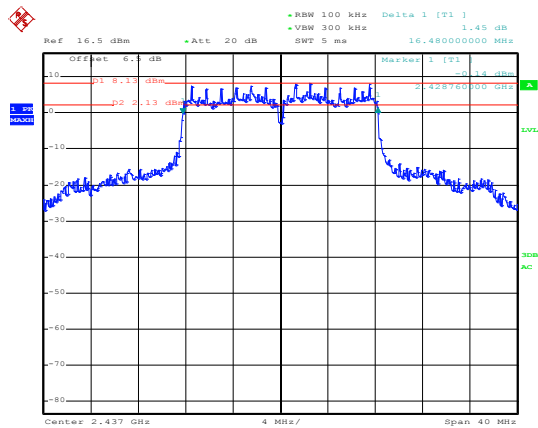


Date: 3.MAY.2020 14:12:32



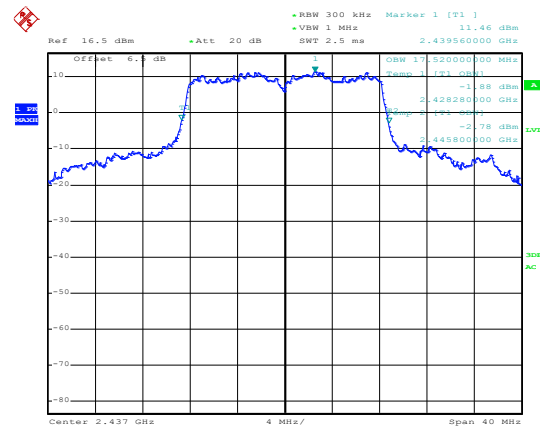
Date: 3.MAY.2020 14:04:59

Lowest channel



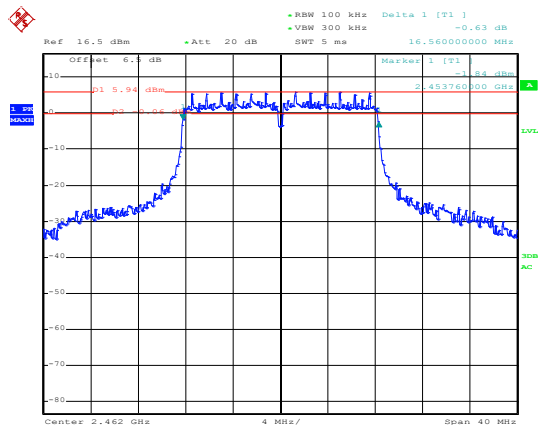
Date: 10.JUN.2020 17:54:07

Lowest channel



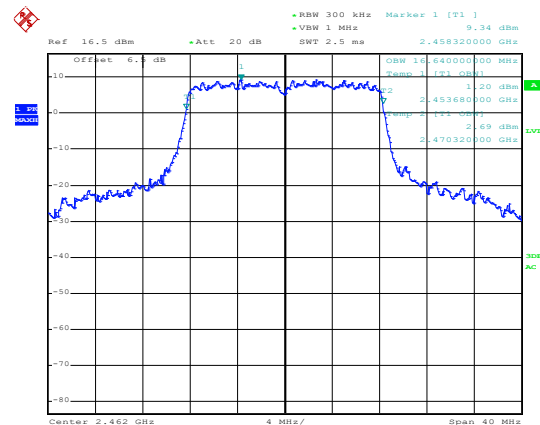
Date: 10.JUN.2020 17:53:10

Middle channel



Date: 3.MAY.2020 14:14:33

Middle channel



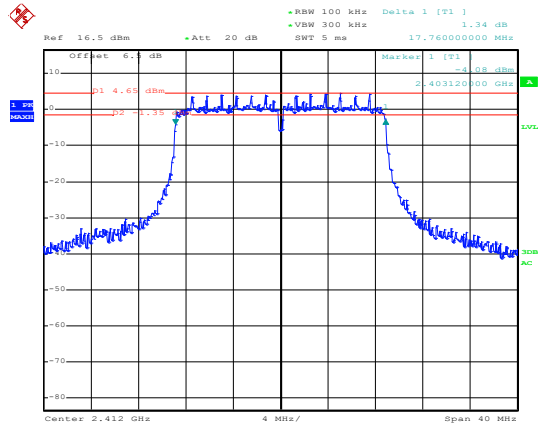
Date: 3.MAY.2020 14:04:36

Highest channel

Highest channel

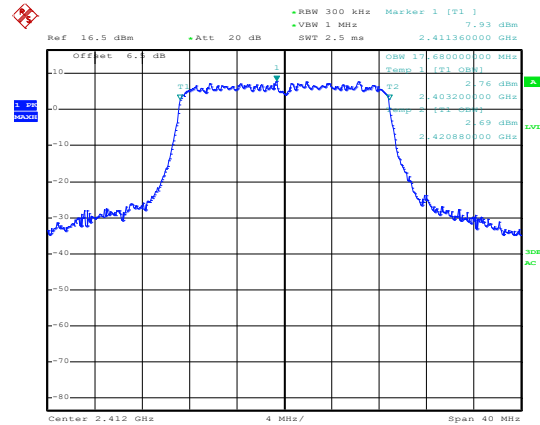
802.11n(HT20)

6dB EBW



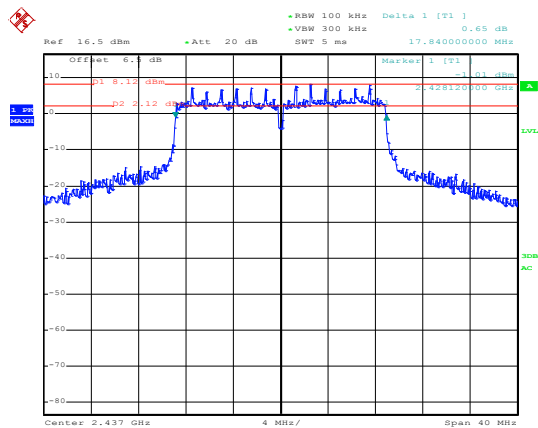
Date: 3.MAY.2020 14:17:36

99% OBW



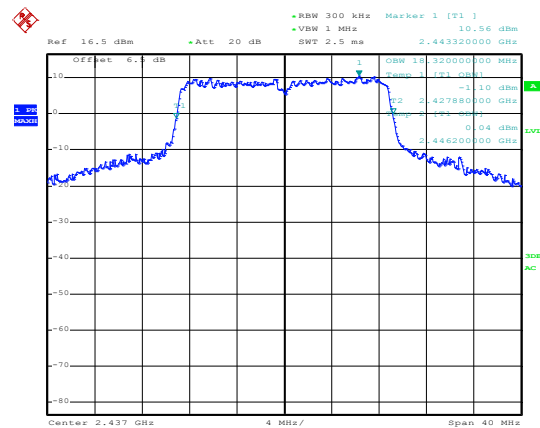
Date: 3.MAY.2020 14:03:56

Lowest channel



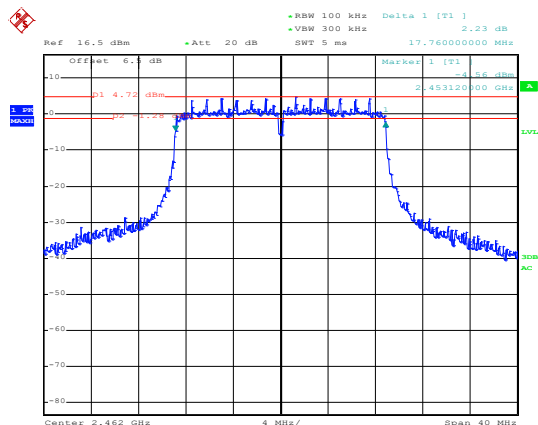
Date: 10.JUN.2020 17:56:05

Lowest channel



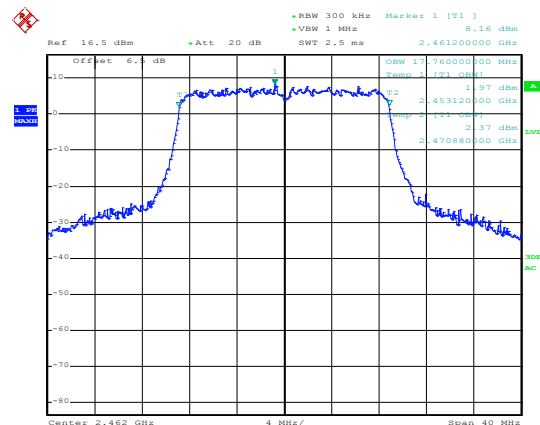
Date: 10.JUN.2020 17:56:31

Middle channel



Date: 3.MAY.2020 14:15:41

Middle channel



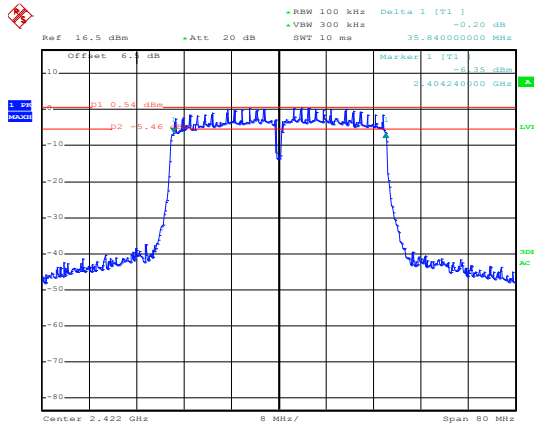
Date: 3.MAY.2020 14:04:17

Highest channel

Highest channel

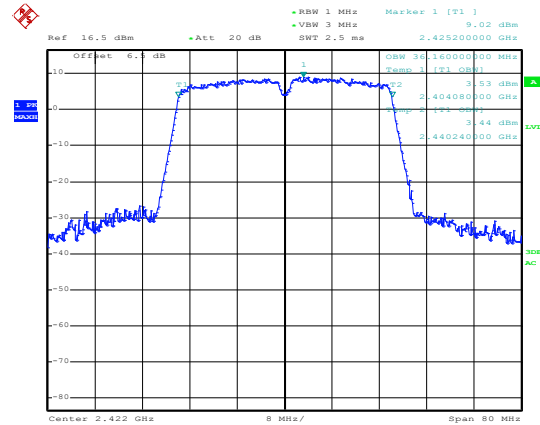
802.11n(HT40)

6dB EBW



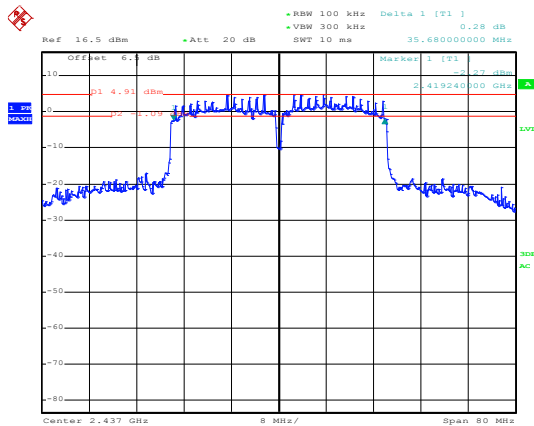
Date: 3.MAY.2020 14:18:37

99% OBW



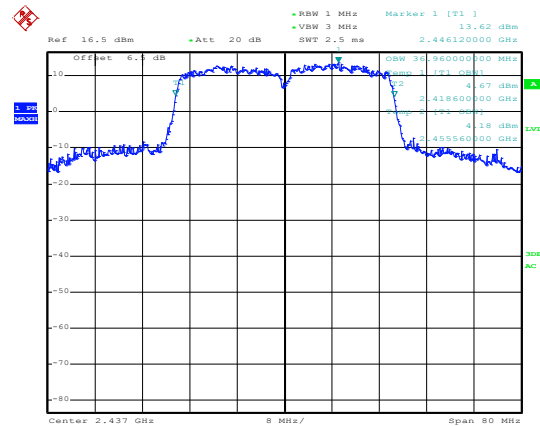
Date: 3.MAY.2020 14:03:24

Lowest channel



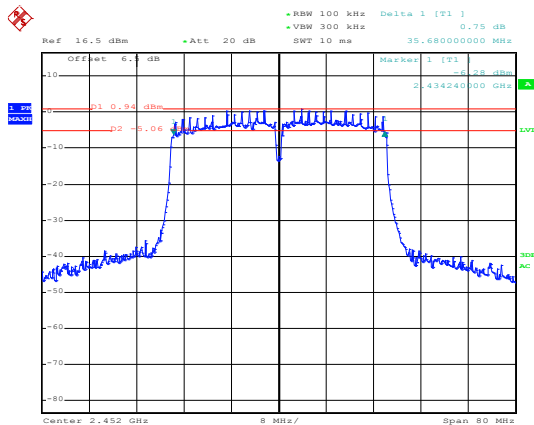
Date: 10.JUN.2020 17:59:41

Lowest channel



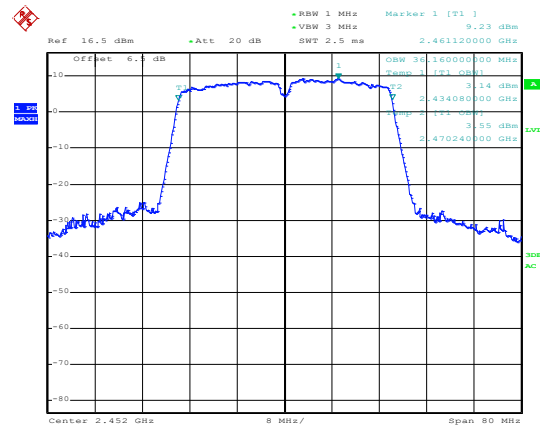
Date: 10.JUN.2020 17:58:40

Middle channel



Date: 3.MAY.2020 14:21:28

Middle channel



Date: 3.MAY.2020 14:02:59

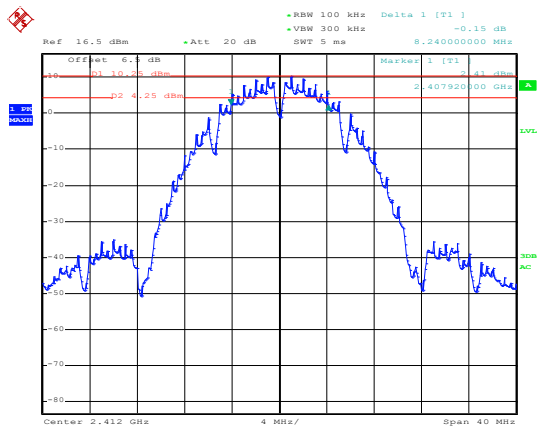
Highest channel

Highest channel

ANT1

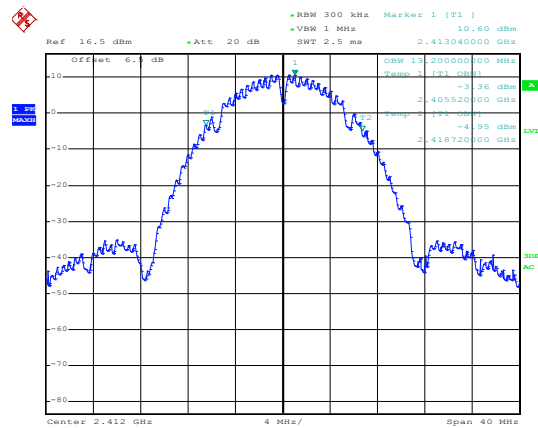
802.11b

6dB EBW



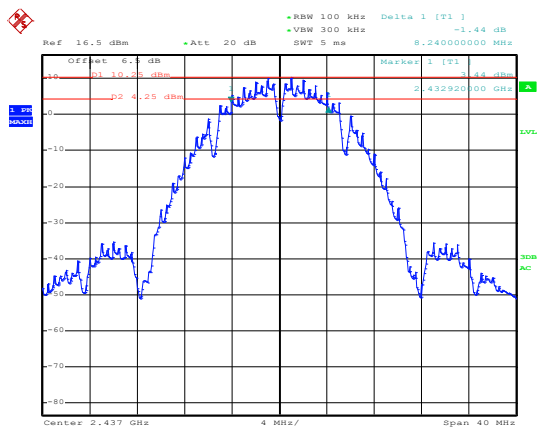
Date: 3.MAY.2020 14:44:50

99% OBW



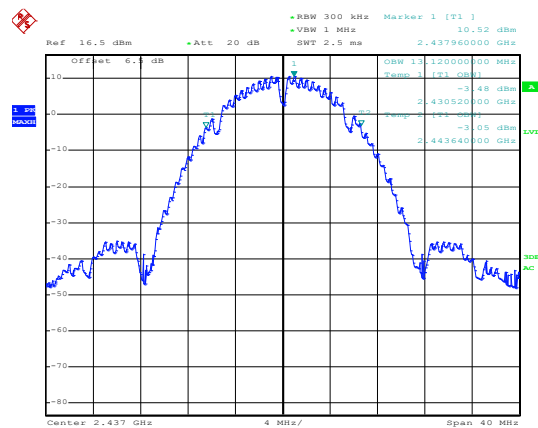
Date: 3.MAY.2020 14:34:48

Lowest channel



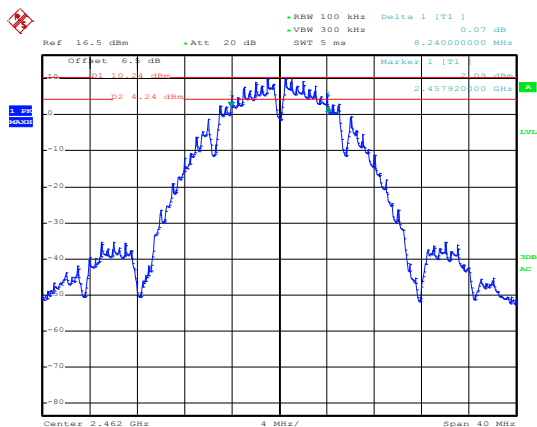
Date: 3.MAY.2020 14:43:49

Lowest channel



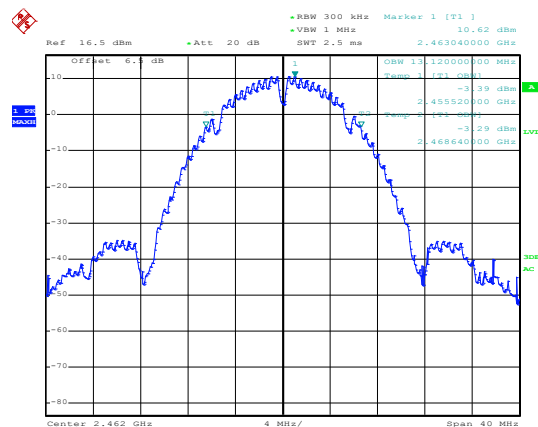
Date: 3.MAY.2020 14:34:28

Middle channel



Date: 3.MAY.2020 14:44:21

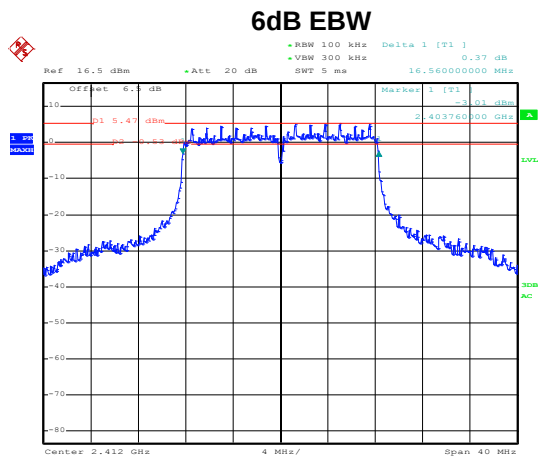
Middle channel



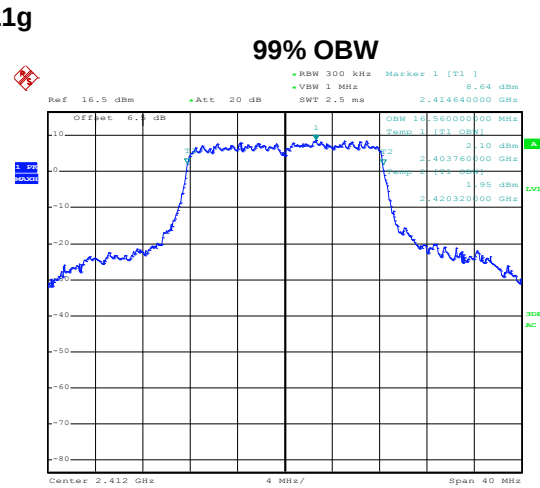
Date: 3.MAY.2020 14:34:38

Highest channel

Highest channel

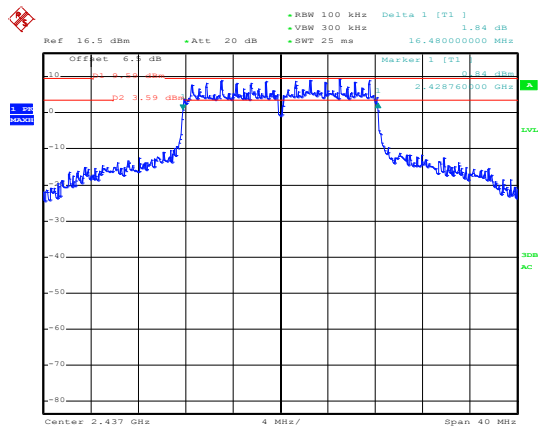


Date: 3.MAY.2020 14:45:56



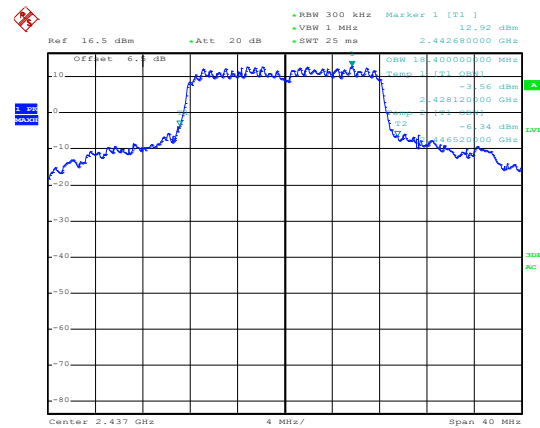
Date: 3.MAY.2020 14:35:07

Lowest channel



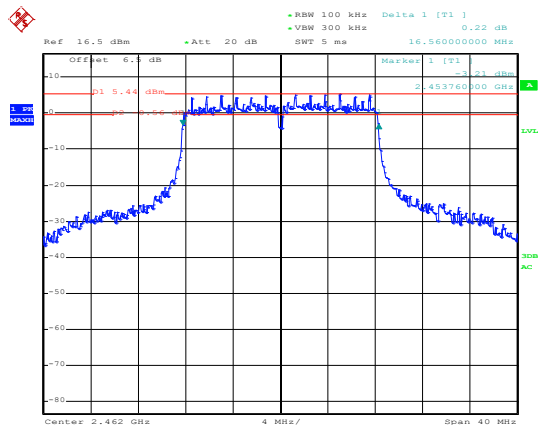
Date: 10.JUN.2020 18:04:39

Lowest channel



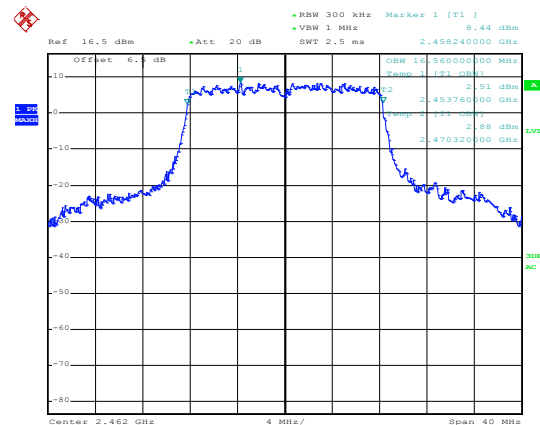
Date: 10.JUN.2020 18:04:58

Middle channel



Date: 3.MAY.2020 14:48:01

Middle channel



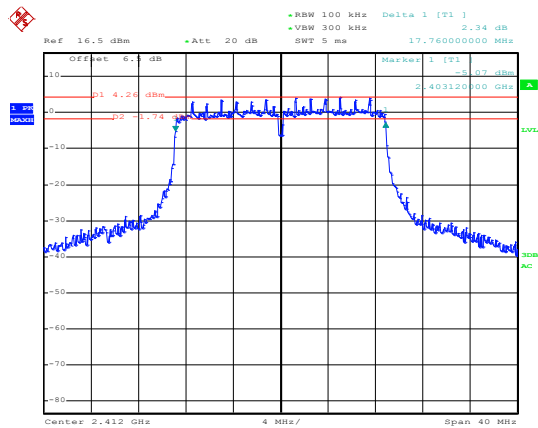
Date: 3.MAY.2020 14:35:29

Highest channel

Highest channel

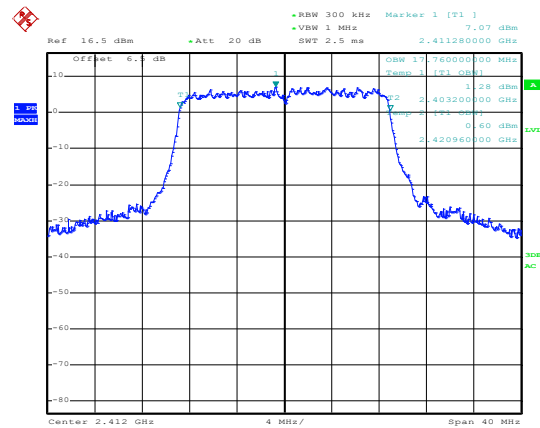
802.11n(HT20)

6dB EBW



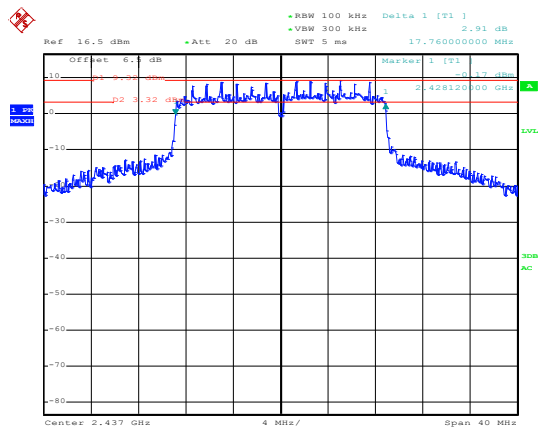
Date: 3.MAY.2020 14:51:33

99% OBW



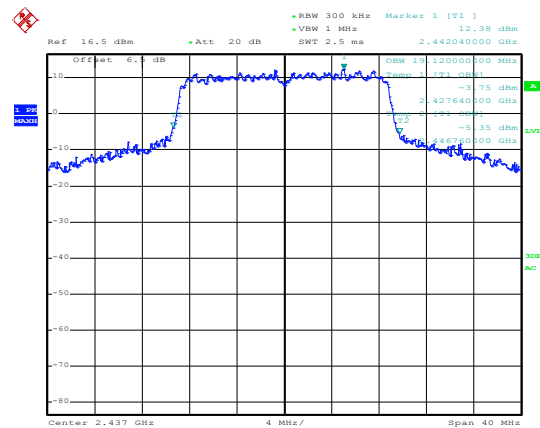
Date: 3.MAY.2020 14:36:08

Lowest channel



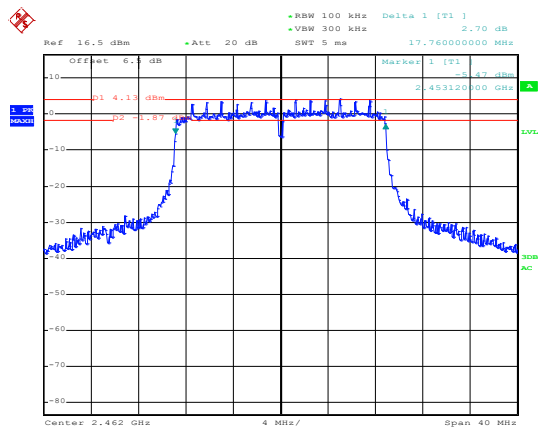
Date: 10.JUN.2020 18:03:13

Lowest channel



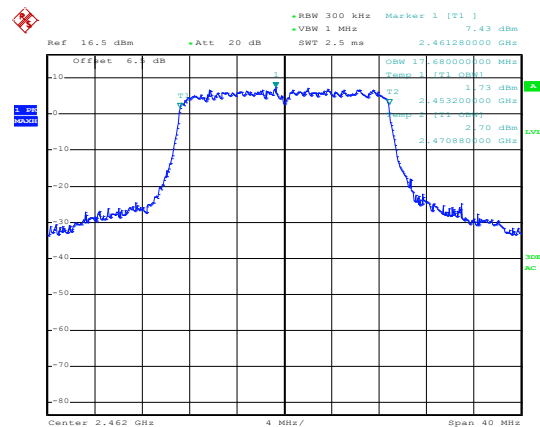
Date: 10.JUN.2020 18:02:34

Middle channel



Date: 3.MAY.2020 14:49:14

Middle channel



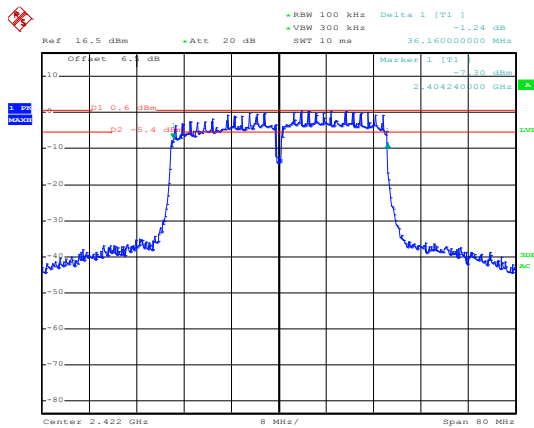
Date: 3.MAY.2020 14:35:46

Highest channel

Highest channel

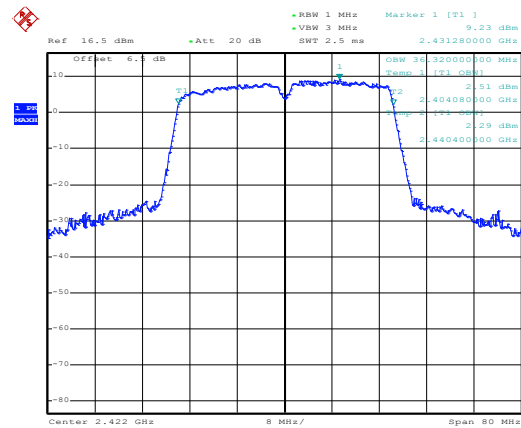
802.11n(HT40)

6dB EBW



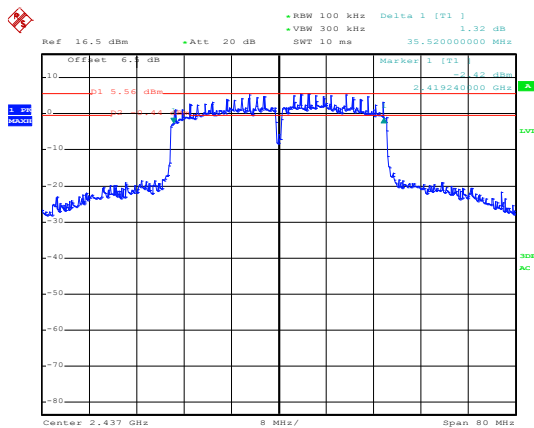
Date: 3.MAY.2020 14:52:29

99% OBW



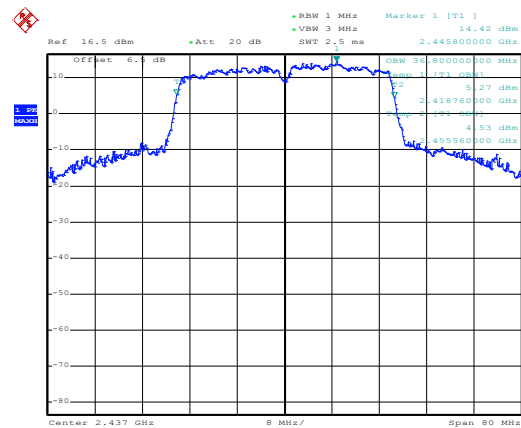
Date: 3.MAY.2020 14:37:23

Lowest channel



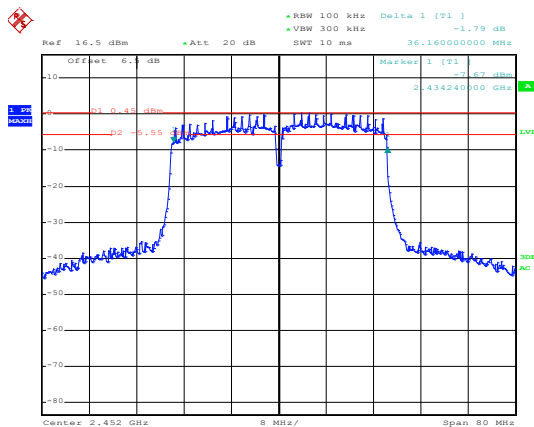
Date: 10.JUN.2020 18:01:43

Lowest channel



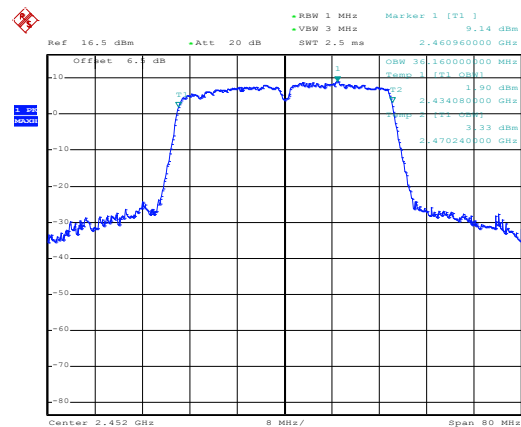
Date: 10.JUN.2020 18:02:09

Middle channel



Date: 3.MAY.2020 14:54:46

Middle channel

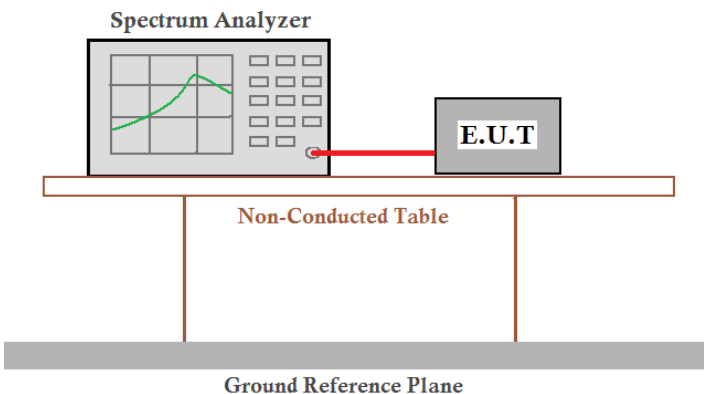


Date: 3.MAY.2020 14:37:10

Highest channel

Highest channel

6.5 Power Spectral Density

Test Requirement:	FCC Part 15 C Section 15.247 (e)
Limit:	8dBm/3kHz
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer, shown with a grid and a green curve, is connected to an E.U.T. (Equipment Under Test) box by a red cable. Both the Spectrum Analyzer and the E.U.T. are positioned on a table labeled 'Non-Conducted Table'. This table is supported by two vertical legs, which are in turn supported by a thick grey bar at the bottom labeled 'Ground Reference Plane'.
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:

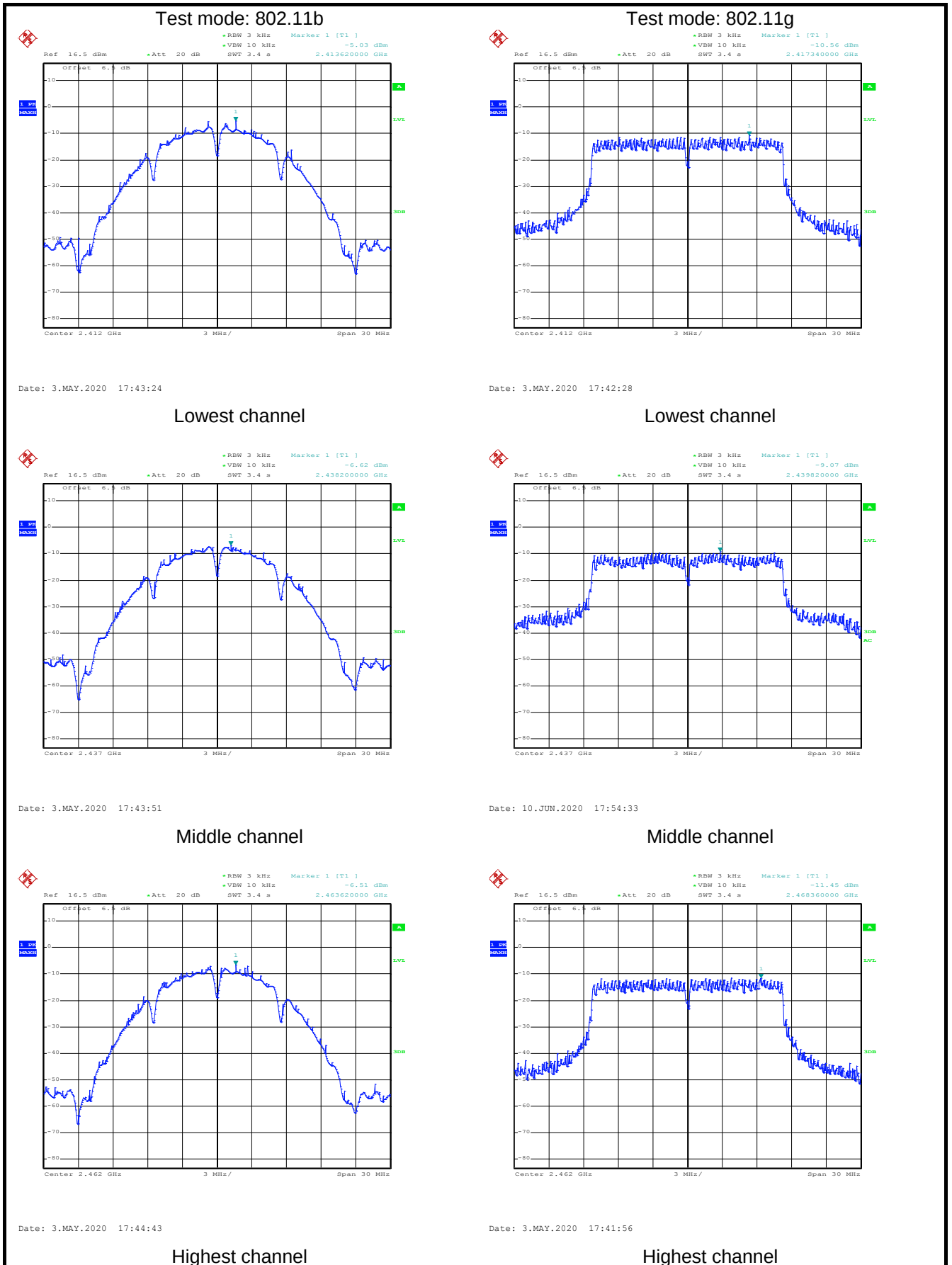
Mode	Test CH	Ant. Port	Conducted P.S.D(dBm/3KHz)	Total P.S.D (dBm/3KHz)	Limit (dBm/3KHz)	Result
802.11b (SISO)	Lowest	ANT0	-5.30	/	8.0	Pass
		ANT1	-5.90			
	Middle	ANT0	-6.62			
		ANT1	-6.13			
	Highest	ANT0	-6.51			
		ANT1	-6.26			
802.11g (SISO)	Lowest	ANT0	-10.56	/	8.0	Pass
		ANT1	-10.93			
	Middle	ANT0	-9.07			
		ANT1	-8.01			
	Highest	ANT0	-11.45			
		ANT1	-10.18			
802.11n(HT20) (MIMO)	Lowest	ANT0	-10.60	-7.62	Ceramic Antenna:8.0 Planare WLAN Antenna:8.0 Whip Antenna:7.0	Pass
		ANT1	-10.66			
	Middle	ANT0	-8.43	-4.97		
		ANT1	-7.25			
	Highest	ANT0	-10.97	-7.52		
		ANT1	-10.14			
802.11n(HT40) (MIMO)	Lowest	ANT0	-11.25	-7.94	Ceramic Antenna:30 Planare WLAN Antenna:8.0 Whip Antenna:7.0	Pass
		ANT1	-10.67			
	Middle	ANT0	-11.12	-7.63		
		ANT1	-10.20			
	Highest	ANT0	-11.69	-7.99		Pass
		ANT1	-10.41			

Remark:

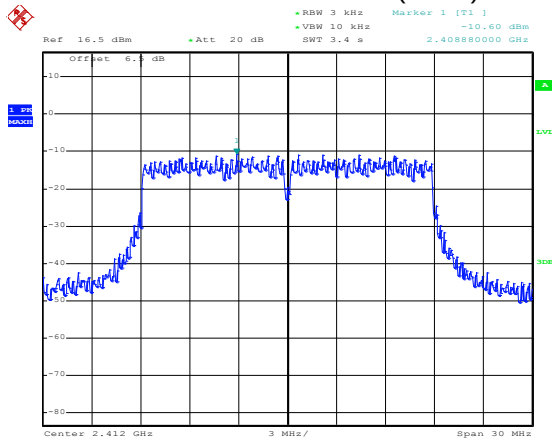
1. Because transmit signals are correlated, Directional gain = $G_{ANT} + 10 \log(N_{ANT})$ dBi.
2. So Ceramic Antenna: The Directional gain= $2.09 + 10 \log(2)=5.09$ dBi, The directional Gain of antenna is not exceed 6 dBi, so the limit of P.S.D is 8 dBm/3KHz (for 802.11n).
Planare WLAN Antenna: The Directional gain= $1.0 + 10 \log(2)=4.0$ dBi, The directional Gain of antenna is greater than 6 dBi, so the limit of P.S.D is 8.0dBm/3KHz (for 802.11n).
Whip Antenna: The Directional gain= $4 + 10 \log(2)=7.0$ dBi, The directional Gain of antenna is greater than 6 dBi, so the limit of P.S.D is 7dBm/3KHz (for 802.11n).

Test plot as follows:

ANT0

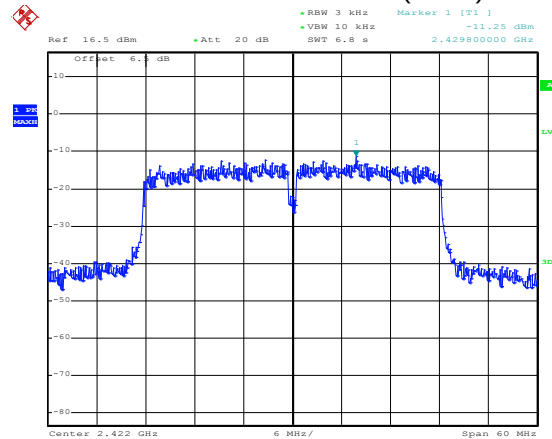


Test mode: 802.11n(HT20)



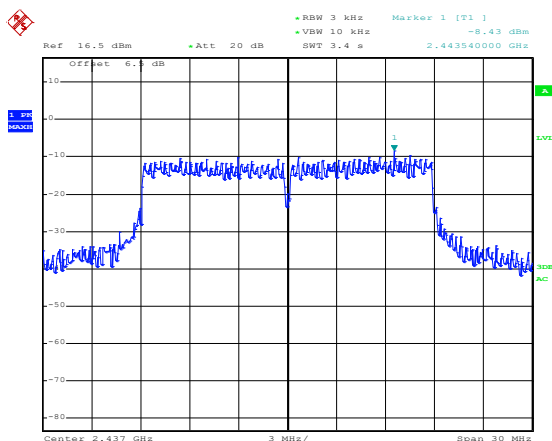
Date: 3.MAY.2020 17:41:09

Test mode: 802.11n(HT40)



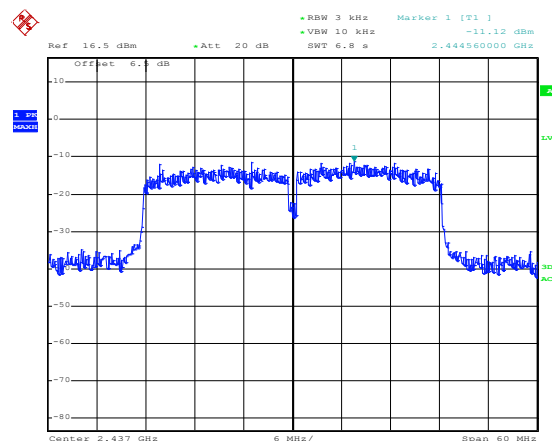
Date: 3.MAY.2020 17:40:25

Lowest channel



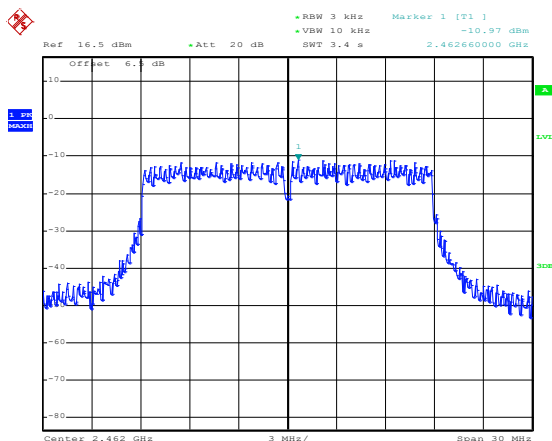
Date: 10.JUN.2020 17:55:07

Lowest channel



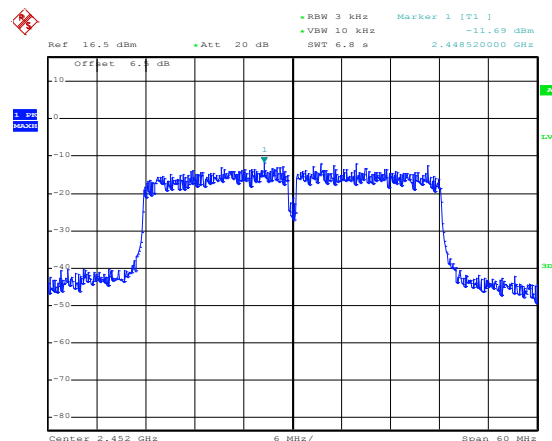
Date: 10.JUN.2020 18:00:19

Middle channel



Date: 3.MAY.2020 17:41:40

Middle channel



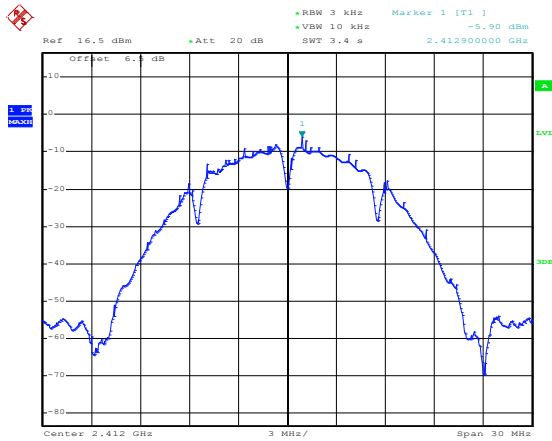
Date: 3.MAY.2020 17:40:42

Highest channel

Highest channel

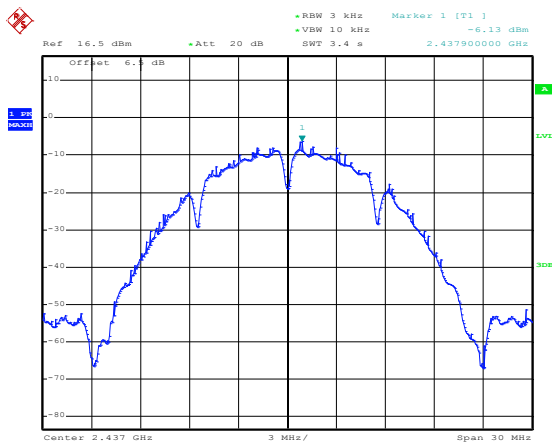
ANT1

Test mode: 802.11b



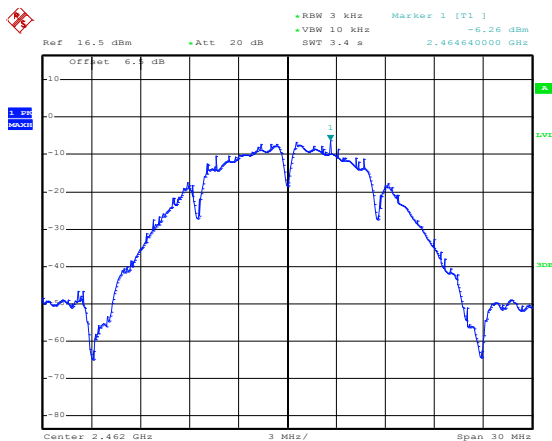
Date: 3.MAY.2020 17:46:50

Lowest channel



Date: 3.MAY.2020 17:46:13

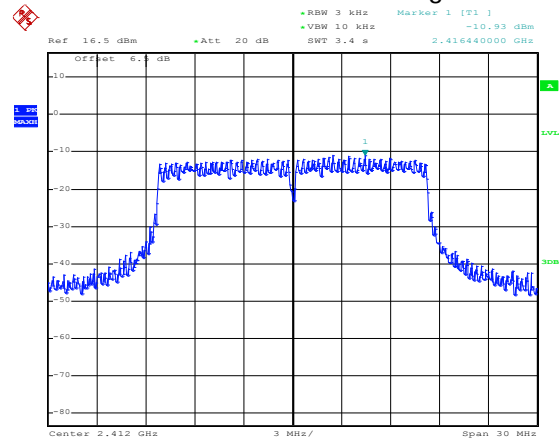
Middle channel



Date: 3.MAY.2020 17:45:27

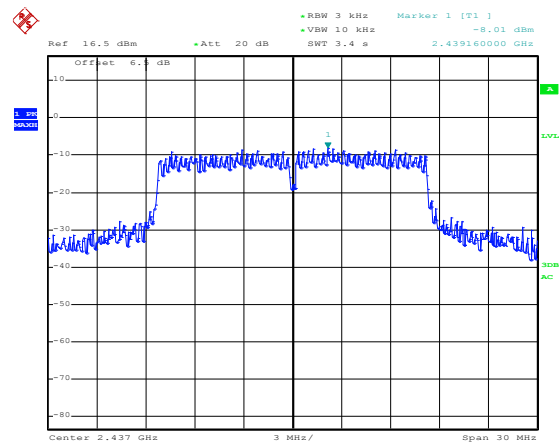
Highest channel

Test mode: 802.11g



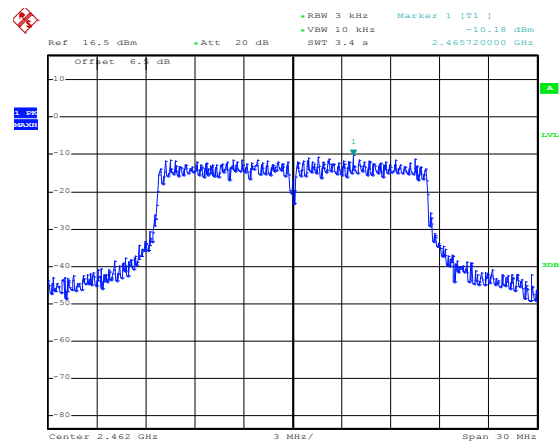
Date: 3.MAY.2020 17:47:12

Lowest channel



Date: 10.JUN.2020 18:03:55

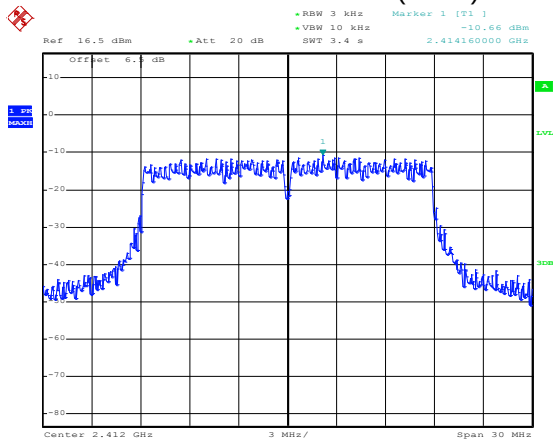
Middle channel



Date: 3.MAY.2020 17:47:40

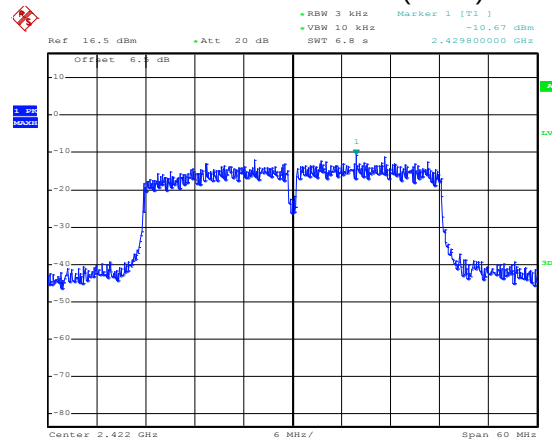
Highest channel

Test mode: 802.11n(HT20)



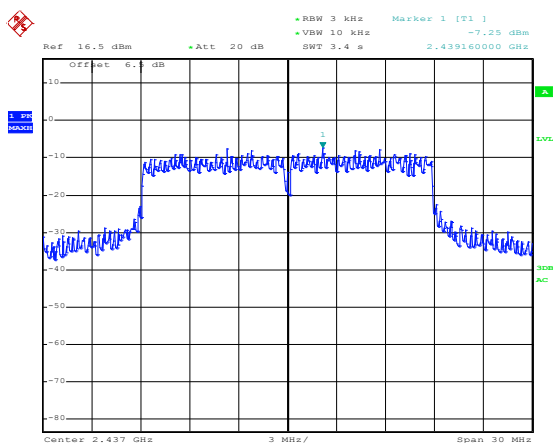
Date: 3.MAY.2020 17:48:25

Test mode: 802.11n(HT40)



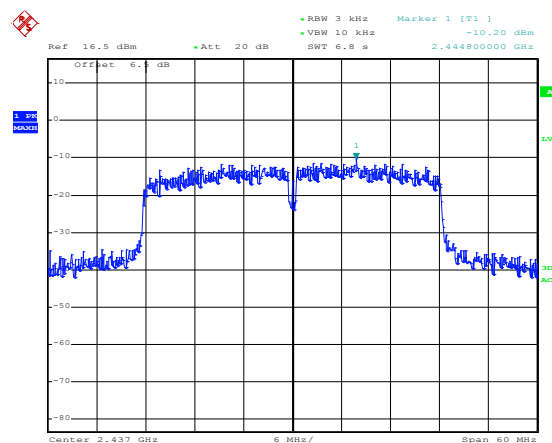
Date: 3.MAY.2020 17:48:50

Lowest channel



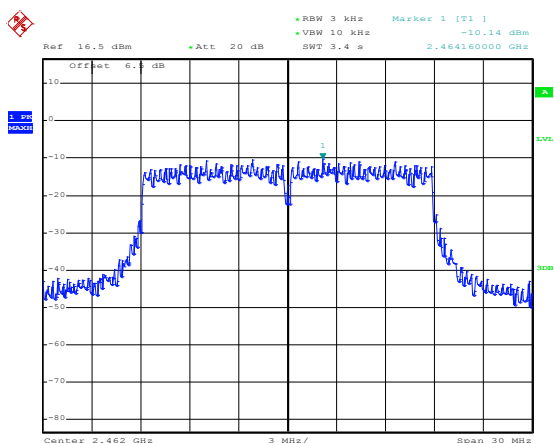
Date: 10.JUN.2020 18:03:35

Lowest channel



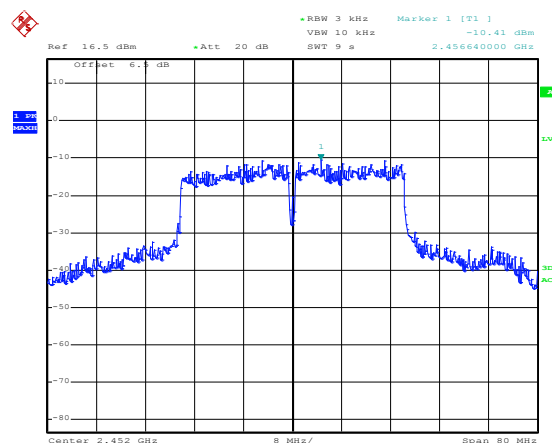
Date: 10.JUN.2020 18:00:49

Middle channel



Date: 3.MAY.2020 17:47:57

Middle channel



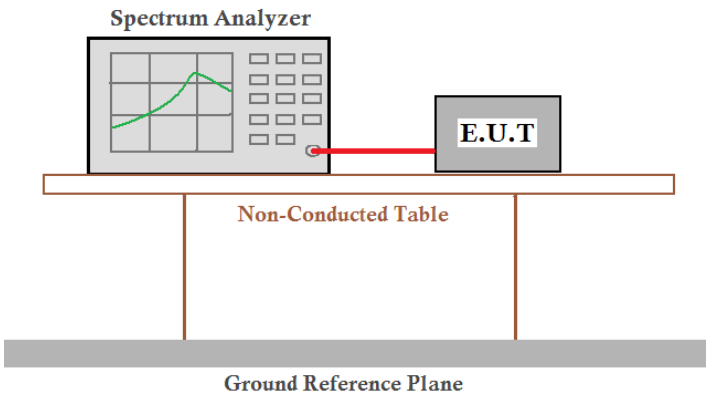
Date: 10.JUN.2020 10:30:27

Highest channel

Highest channel

6.6 Band Edge

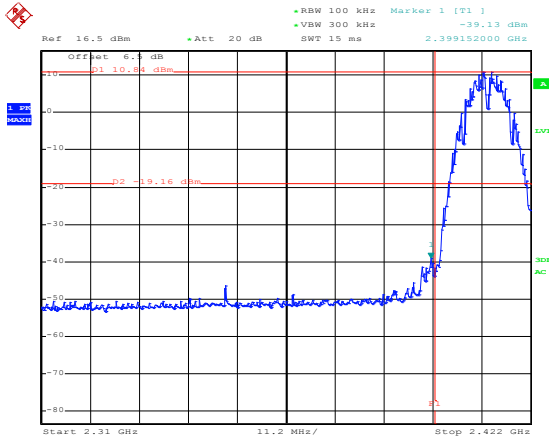
6.6.1 Conducted Emission Method

Test Requirement:	FCC Part 15 C Section 15.247 (d)
Limit:	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. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph(b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T are placed on a Non-Conducted Table. The table is supported by two vertical legs and sits on a Ground Reference Plane.
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Test plot as follows:

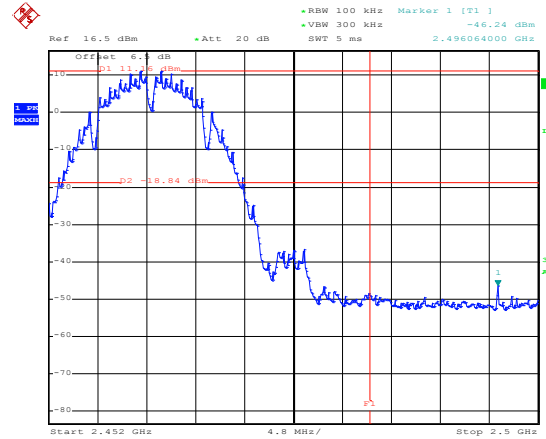
ANT0

802.11b



Date: 3.MAY.2020 13:50:26

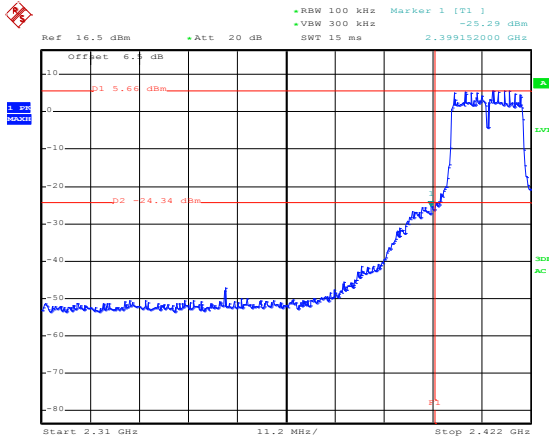
Lowest channel



Date: 3.MAY.2020 13:51:15

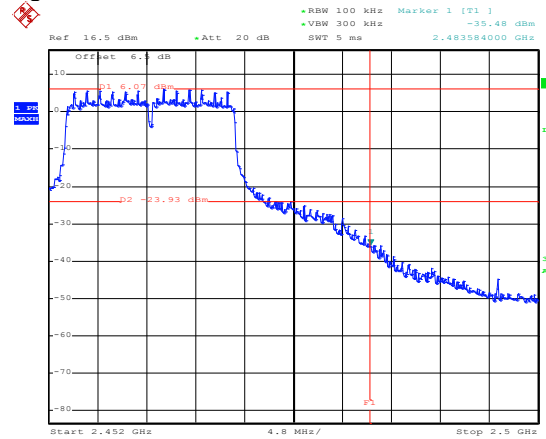
Highest channel

802.11g



Date: 3.MAY.2020 13:48:56

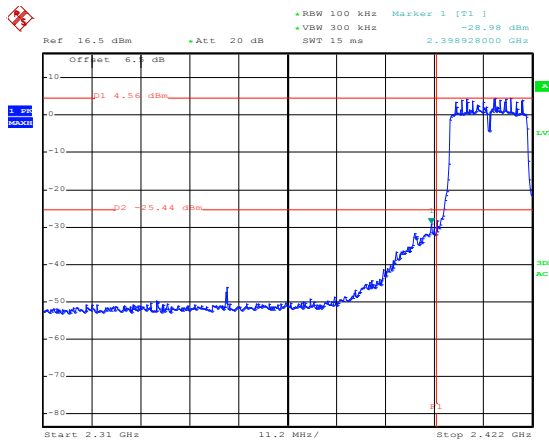
Lowest channel



Date: 3.MAY.2020 13:48:01

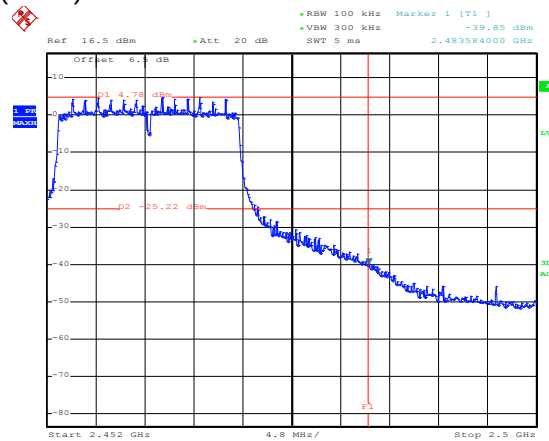
Highest channel

802.11n(HT20)



Date: 3.MAY.2020 13:46:08

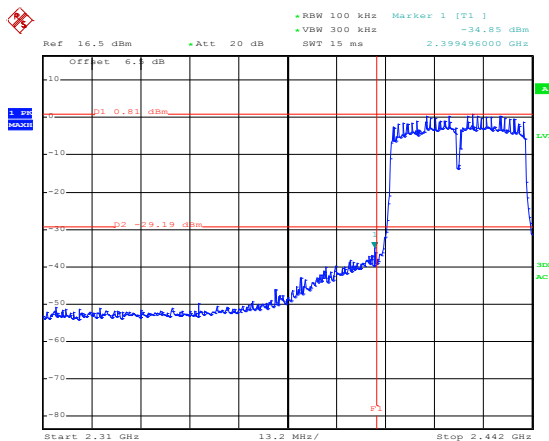
Lowest channel



Date: 3.MAY.2020 13:46:58

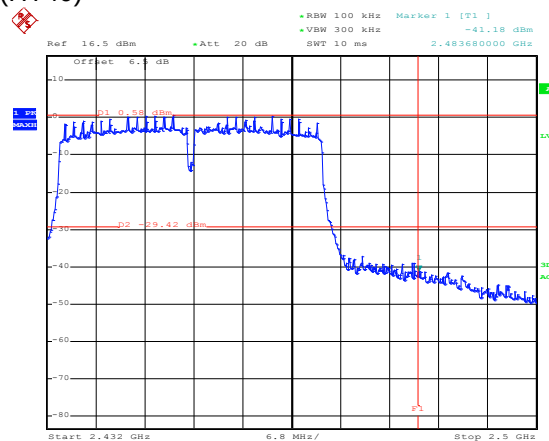
Highest channel

802.11n(HT40)



Date: 3.MAY.2020 13:44:58

Lowest channel

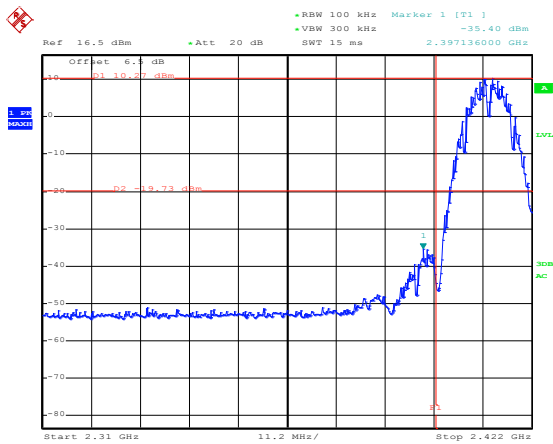


Date: 3.MAY.2020 13:43:47

Highest channel

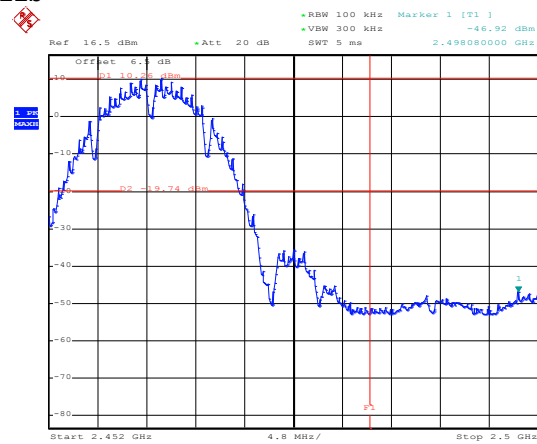
ANT1

802.11b



Date: 3.MAY.2020 15:02:56

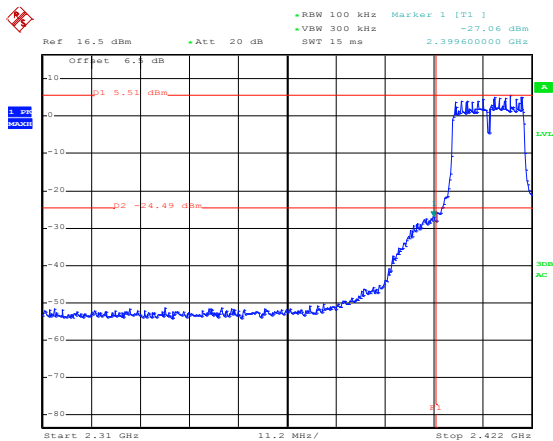
Lowest channel



Date: 3.MAY.2020 15:03:44

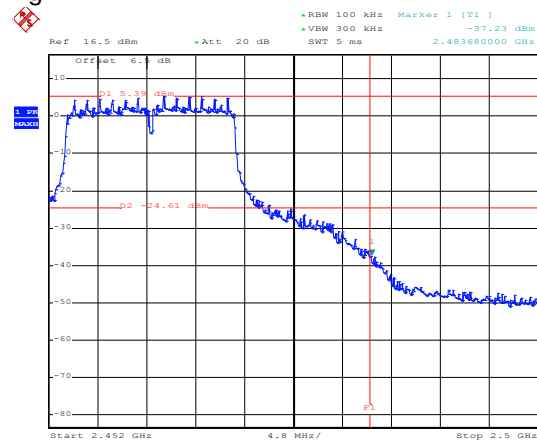
Highest channel

802.11g



Date: 3.MAY.2020 15:01:53

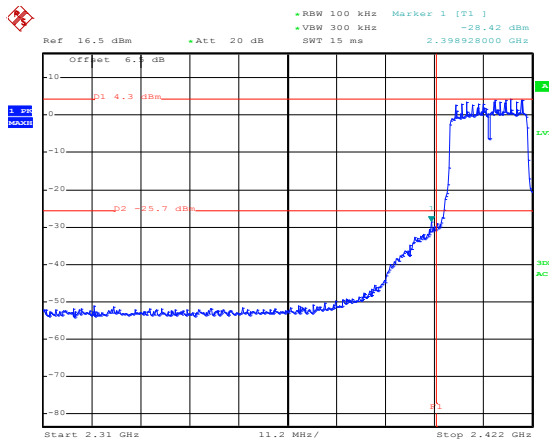
Lowest channel



Date: 3.MAY.2020 15:00:20

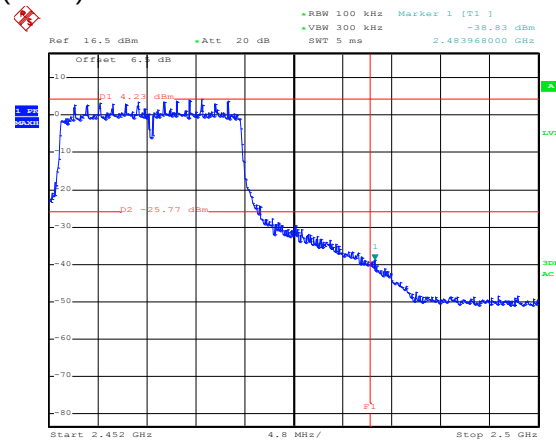
Highest channel

802.11n(HT20)



Date: 3.MAY.2020 14:57:46

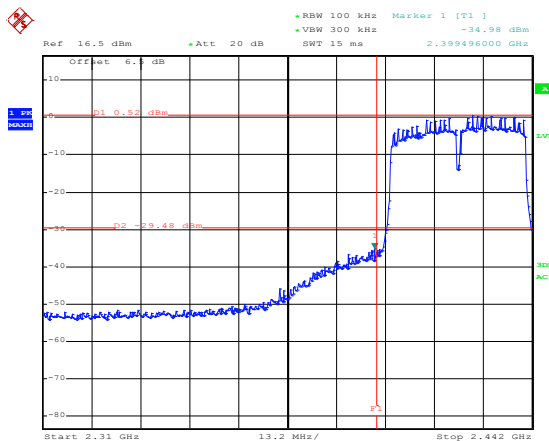
Lowest channel



Date: 3.MAY.2020 14:59:12

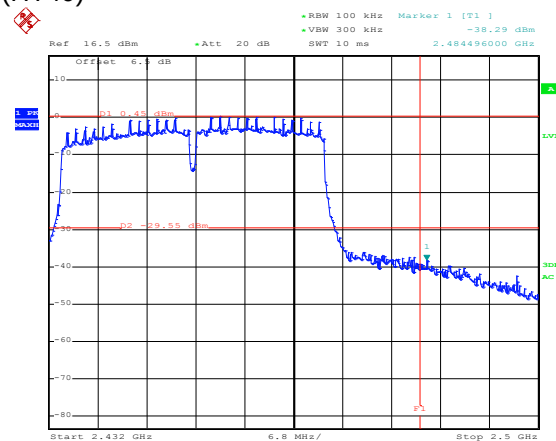
Highest channel

802.11n(HT40)



Date: 3.MAY.2020 14:56:44

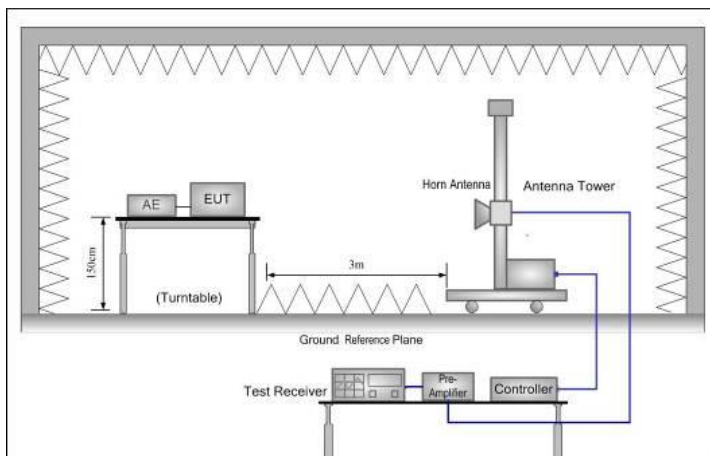
Lowest channel



Date: 3.MAY.2020 14:56:00

Highest channel

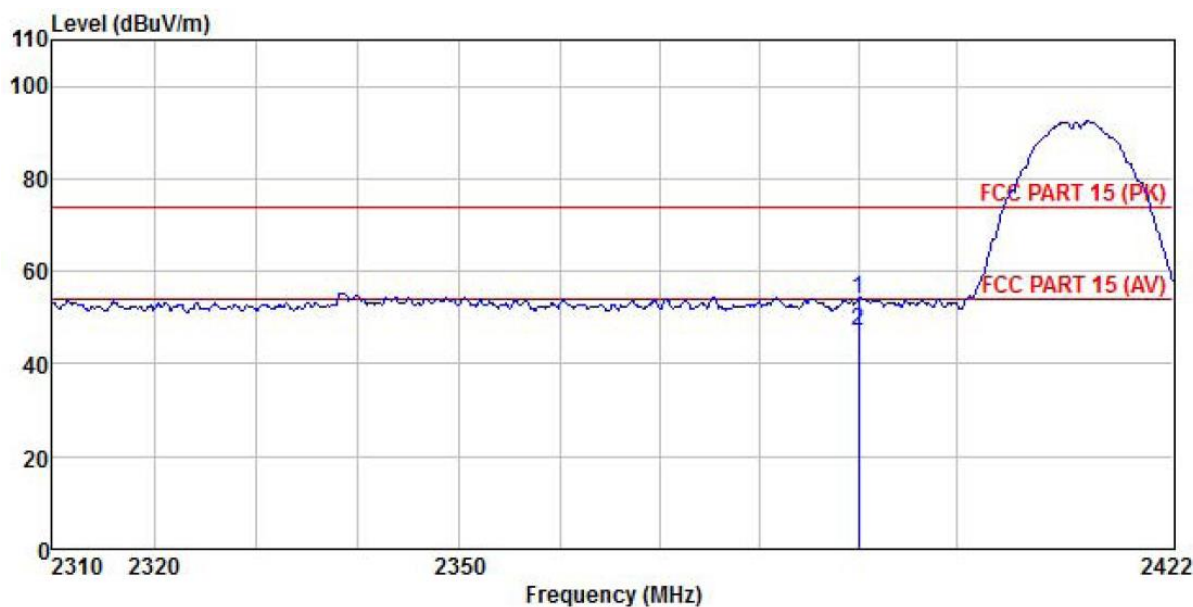
6.6.2 Radiated Emission Method

Test Requirement:	FCC Part 15 C Section 15.209 and 15.205				
Test Frequency Range:	2310 MHz to 2390 MHz and 2483.5 MHz to 2500 MHz				
Test Distance:	3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		RMS	1MHz	3MHz	Average Value
Limit:	Frequency	Limit (dBuV/m @3m)		Remark	
	Above 1GHz	54.00		Average Value	
		74.00		Peak Value	
Test Procedure:	1. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.				
Test setup:					
Test Instruments:	Refer to section 5.9 for details				
Test mode:	Refer to section 5.3 for details				
Test results:	Passed				

Ceramic Antenna
ANT0

802.11b mode:

Product Name:	Habanero	Product Model:	Habanero
Test By:	Mike	Test mode:	802.11b Tx mode
Test Channel:	Lowest channel	Polarization:	Vertical
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24°C Humi: 57%

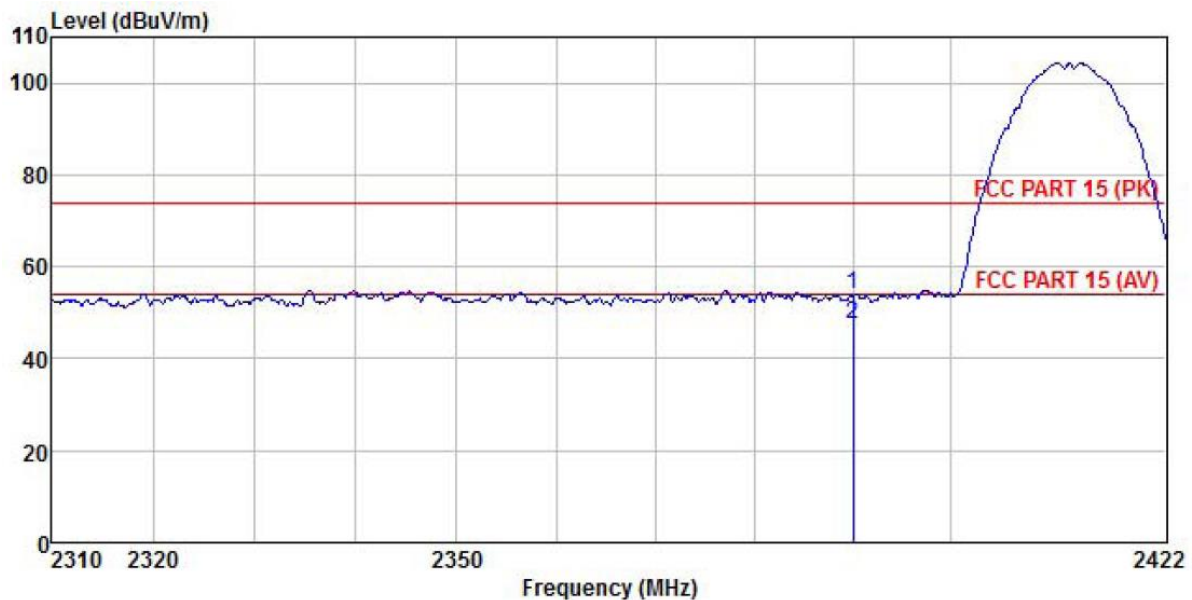


	Freq	ReadAntenna	Cable	Aux	Preamp	Level	Limit	Over	
	MHz	Level	Factor	Loss	Factor	Factor	Line	Limit	Remark
		dBuV	dB/m	dB	dB	dB	dBuV/m	dB	
1	2390.000	20.97	27.03	4.28	1.68	0.00	53.96	74.00	-20.04 Peak
2	2390.000	14.27	27.03	4.28	1.68	0.00	47.26	54.00	-6.74 Average

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.
2. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

Product Name:	Habanero	Product Model:	Habanero
Test By:	Mike	Test mode:	802.11b Tx mode
Test Channel:	Lowest channel	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24℃ Humi: 57%

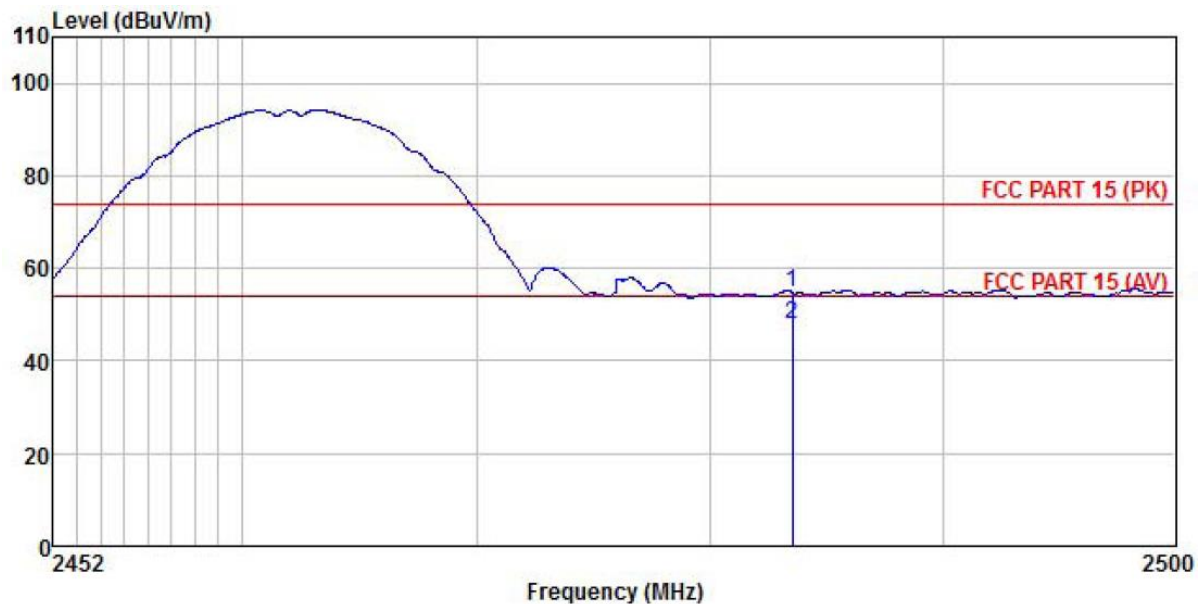


	Freq	Read Level	Antenna Factor	Cable Loss	Aux Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	2390.000	20.84	27.03	4.28	1.68	0.00	53.83	74.00	-20.17	Peak
2	2390.000	14.37	27.03	4.28	1.68	0.00	47.36	54.00	-6.64	Average

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.
2. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

Product Name:	Habanero	Product Model:	Habanero
Test By:	Mike	Test mode:	802.11b Tx mode
Test Channel:	Highest channel	Polarization:	Vertical
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24℃ Humi: 57%

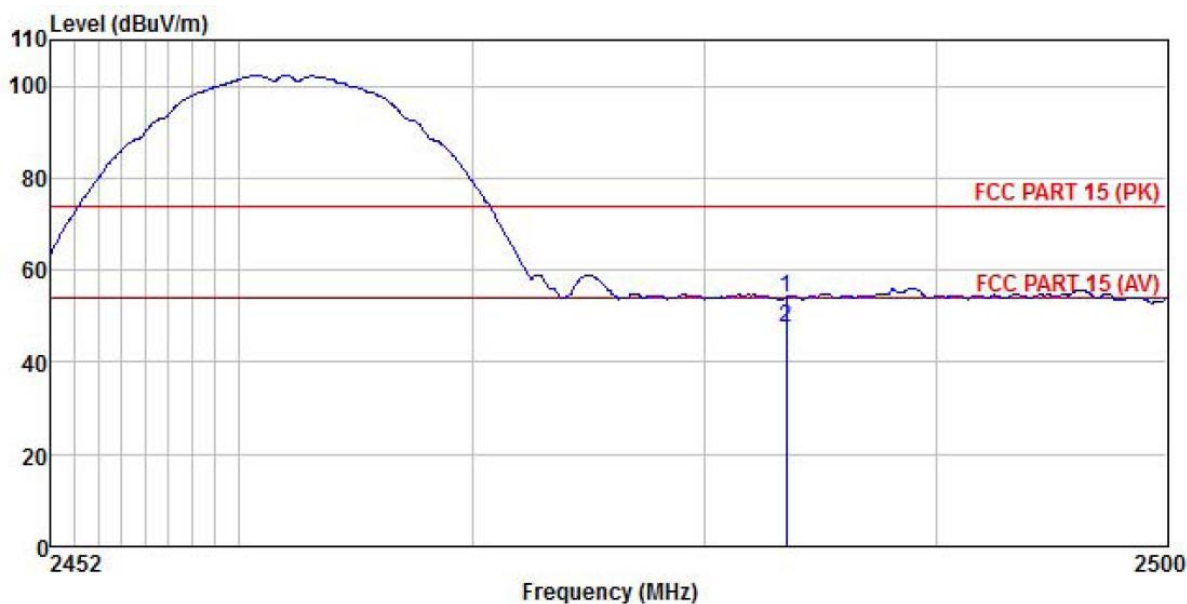


	Freq	Read Level	Antenna Factor	Cable Loss	Aux Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	2483.500	21.46	27.27	4.38	1.70	0.00	54.81	74.00	-19.19	Peak
2	2483.500	14.57	27.27	4.38	1.70	0.00	47.92	54.00	-6.08	Average

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.
2. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

Product Name:	Habanero	Product Model:	Habanero
Test By:	Mike	Test mode:	802.11b Tx mode
Test Channel:	Highest channel	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24°C Humi: 57%



	Freq	Read Level	Antenna Factor	Cable Loss	Aux Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	2483.500	20.81	27.27	4.38	1.70	0.00	54.16	74.00	-19.84	Peak
2	2483.500	14.22	27.27	4.38	1.70	0.00	47.57	54.00	-6.43	Average

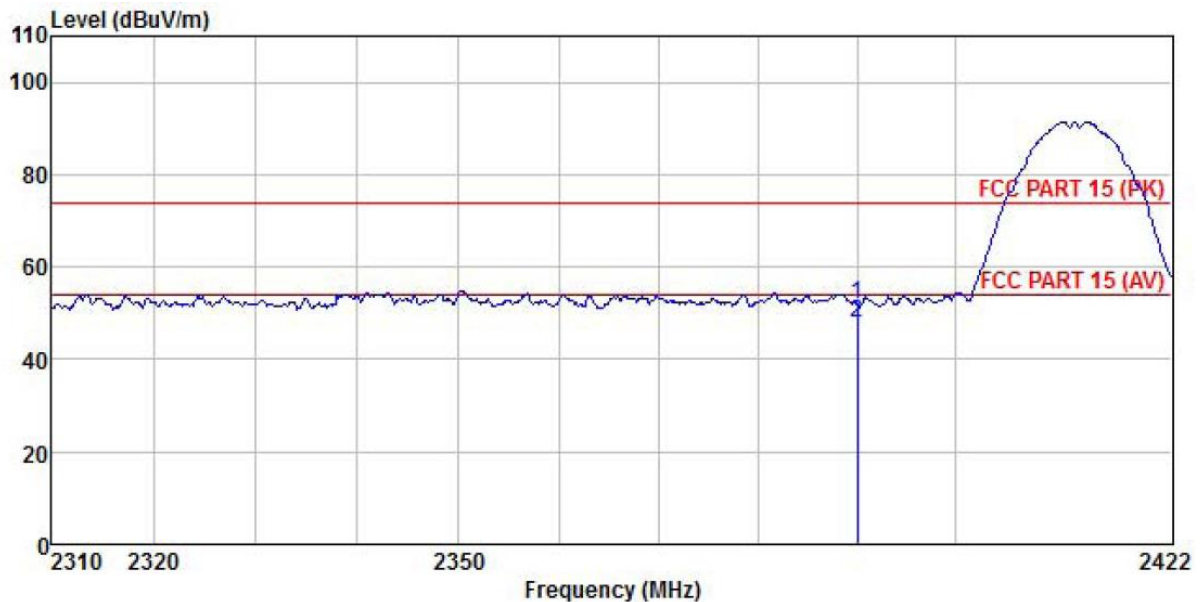
Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.
2. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

ANT1

802.11b mode:

Product Name:	Habanero	Product Model:	Habanero
Test By:	Mike	Test mode:	802.11b Tx mode
Test Channel:	Lowest channel	Polarization:	Vertical
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24°C Humi: 57%

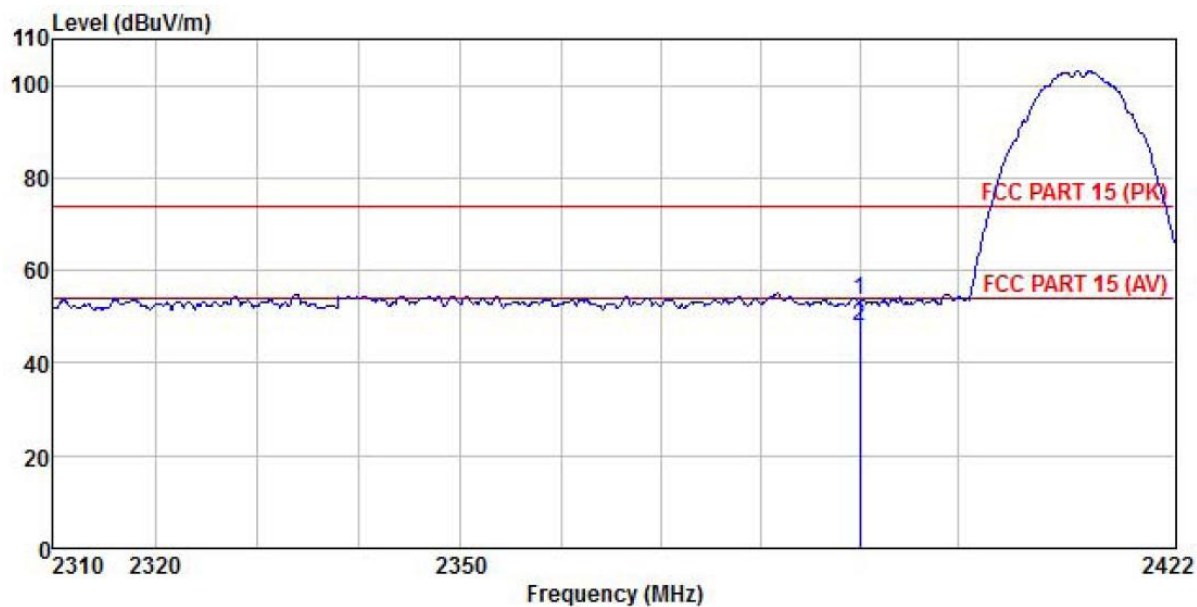


	Freq	Read Level	Antenna Factor	Cable Loss	Aux Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	2390.000	18.82	27.03	4.28	1.68	0.00	51.81	74.00	-22.19	Peak
2	2390.000	14.99	27.03	4.28	1.68	0.00	47.98	54.00	-6.02	Average

Remark:

- Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.
- The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

Product Name:	Habanero	Product Model:	Habanero
Test By:	Mike	Test mode:	802.11b Tx mode
Test Channel:	Lowest channel	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24°C Humi: 57%

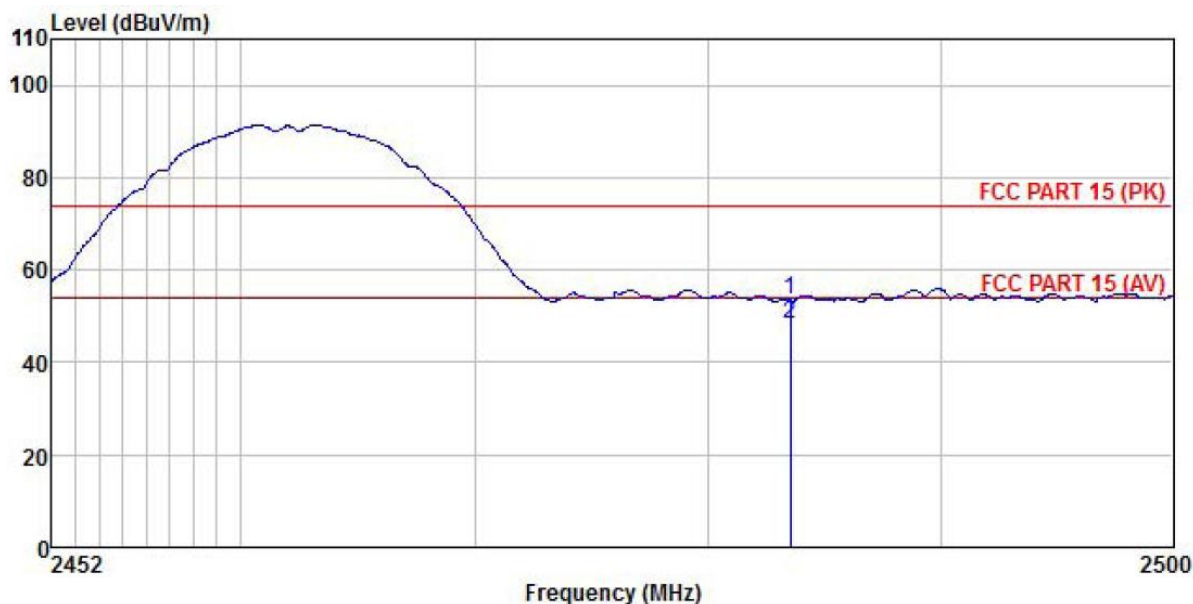


	Freq	Read Level	Antenna Factor	Cable Loss	Aux Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	2390.000	20.39	27.03	4.28	1.68	0.00	53.38	74.00	-20.62	Peak
2	2390.000	14.81	27.03	4.28	1.68	0.00	47.80	54.00	-6.20	Average

Remark:

- Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.
- The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

Product Name:	Habanero	Product Model:	Habanero
Test By:	Mike	Test mode:	802.11b Tx mode
Test Channel:	Highest channel	Polarization:	Vertical
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24°C Humi: 57%

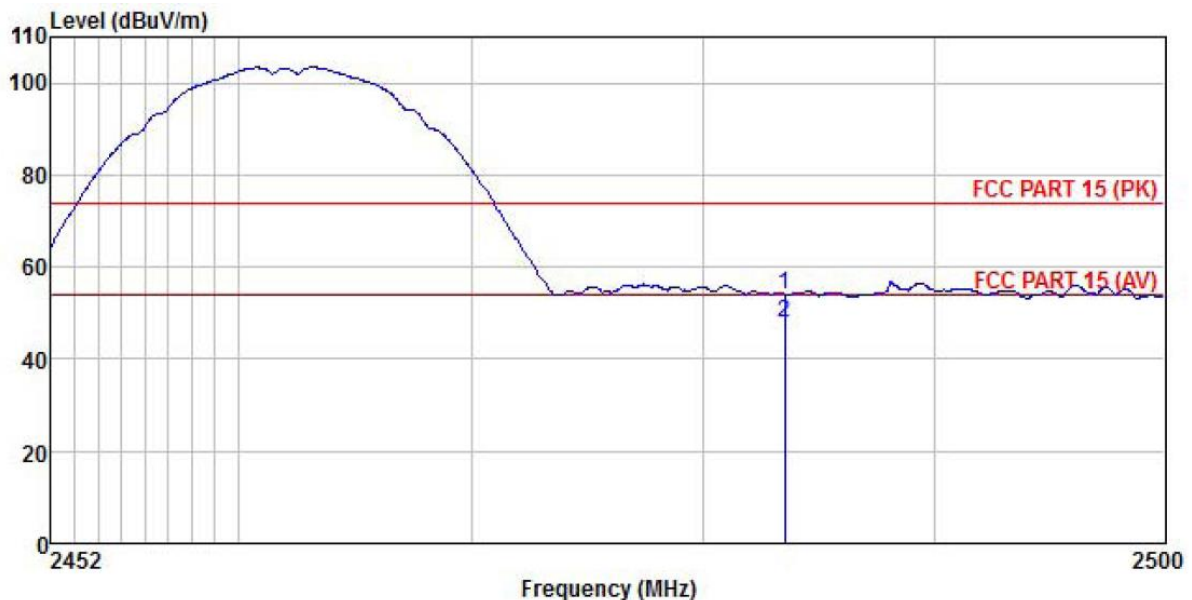


	Freq	Read Level	Antenna Factor	Cable Loss	Aux Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	2483.500	20.08	27.27	4.38	1.70	0.00	53.43	74.00	-20.57	Peak
2	2483.500	14.80	27.27	4.38	1.70	0.00	48.15	54.00	-5.85	Average

Remark:

- Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.
- The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

Product Name:	Habanero	Product Model:	Habanero
Test By:	Mike	Test mode:	802.11b Tx mode
Test Channel:	Highest channel	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24℃ Humi: 57%



	Freq	Read Level	Antenna Factor	Cable Loss	Aux Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	2483.500	20.80	27.27	4.38	1.70	0.00	54.15	74.00	-19.85	Peak
2	2483.500	14.56	27.27	4.38	1.70	0.00	47.91	54.00	-6.09	Average

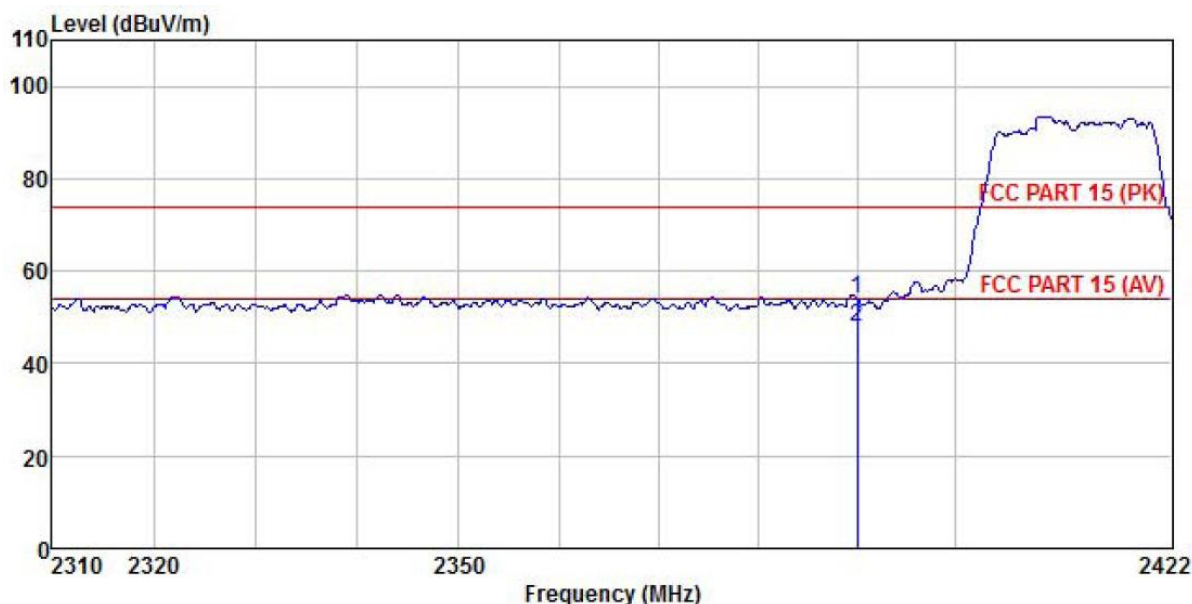
Remark:

- Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.
- The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

ANT0

802.11g mode:

Product Name:	Habanero	Product Model:	Habanero
Test By:	Mike	Test mode:	802.11g Tx mode
Test Channel:	Lowest channel	Polarization:	Vertical
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24℃ Humi: 57%

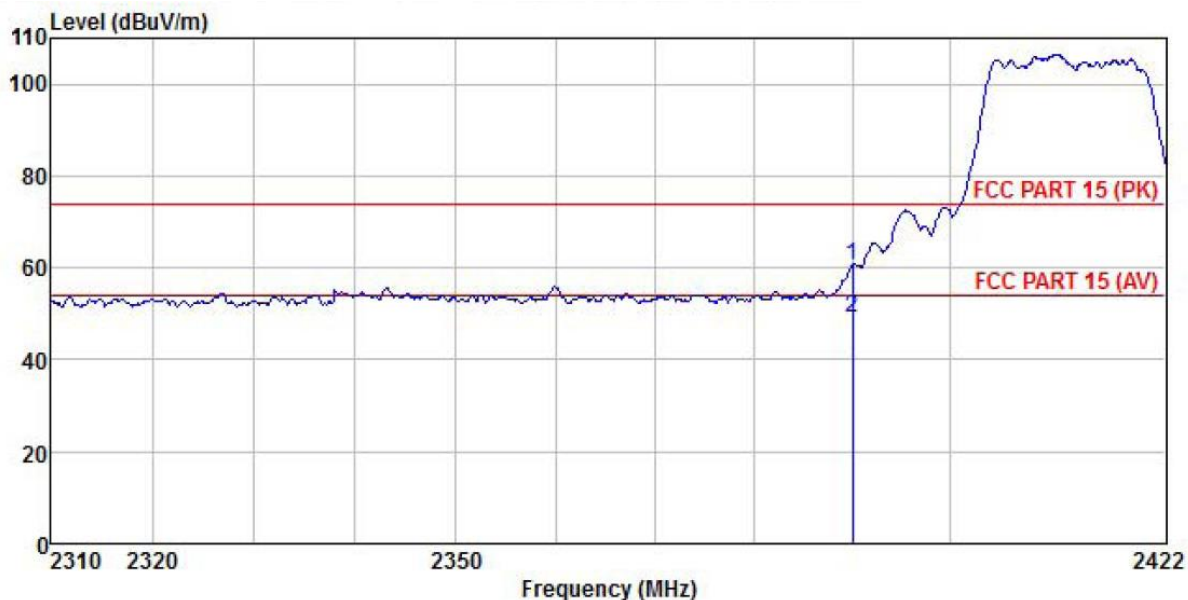


	Freq	Read Level	Antenna Factor	Cable Loss	Aux Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	2390.000	20.83	27.03	4.28	1.68	0.00	53.82	74.00	-20.18	Peak
2	2390.000	14.75	27.03	4.28	1.68	0.00	47.74	54.00	-6.26	Average

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.
2. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

Product Name:	Habanero	Product Model:	Habanero
Test By:	Mike	Test mode:	802.11g Tx mode
Test Channel:	Lowest channel	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24°C Humi: 57%

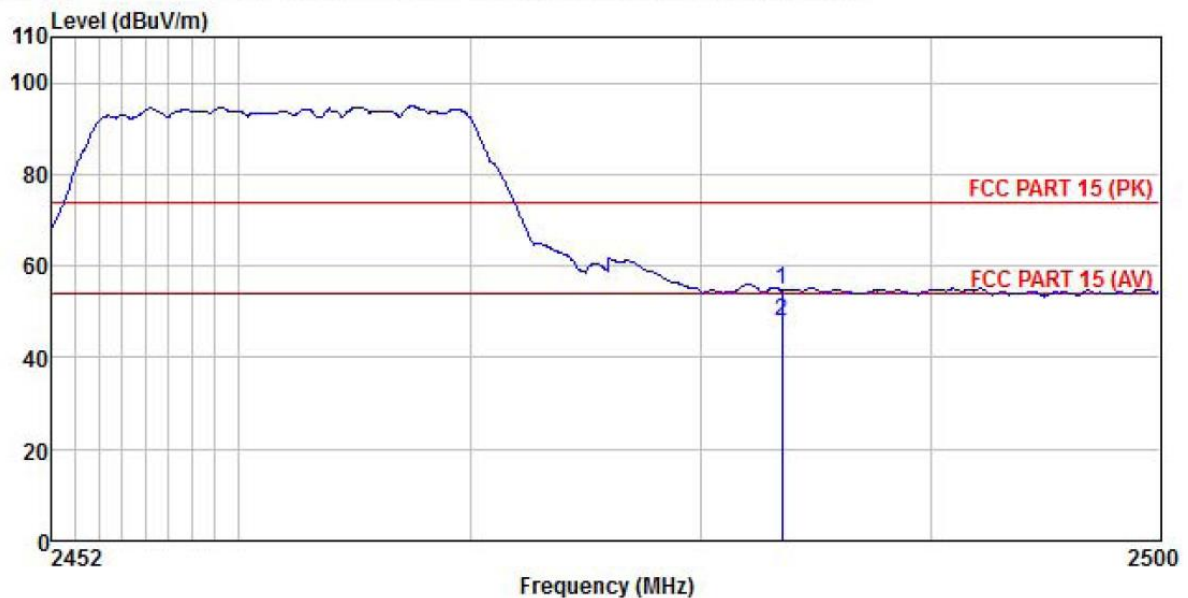


	Freq	Read Level	Antenna Factor	Cable Loss	Aux Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	2390.000	27.33	27.03	4.28	1.68	0.00	60.32	74.00	-13.68	Peak
2	2390.000	16.05	27.03	4.28	1.68	0.00	49.04	54.00	-4.96	Average

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.
2. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

Product Name:	Habanero	Product Model:	Habanero
Test By:	Mike	Test mode:	802.11g Tx mode
Test Channel:	Highest channel	Polarization:	Vertical
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24°C Humi: 57%

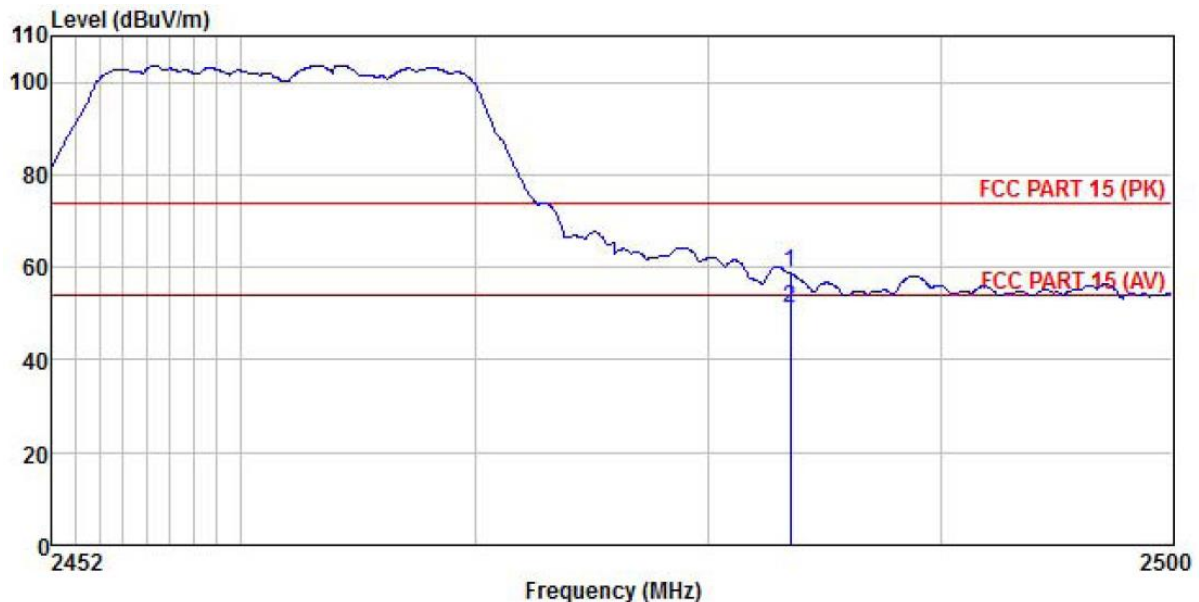


	Freq	Read Level	Antenna Factor	Cable Loss	Aux Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	2483.500	21.27	27.27	4.38	1.70	0.00	54.62	74.00	-19.38	Peak
2	2483.500	14.70	27.27	4.38	1.70	0.00	48.05	54.00	-5.95	Average

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.
2. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

Product Name:	Habanero	Product Model:	Habanero
Test By:	Mike	Test mode:	802.11g Tx mode
Test Channel:	Highest channel	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24°C Humi: 57%



	Freq	ReadAntenna	Cable	Aux	Preamp	Level	Limit	Over	
	MHz	Level	Factor	Loss	Factor	Factor	Line	Limit	Remark
		dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB
1	2483.500	25.39	27.27	4.38	1.70	0.00	58.74	74.00	-15.26 Peak
2	2483.500	17.97	27.27	4.38	1.70	0.00	51.32	54.00	-2.68 Average

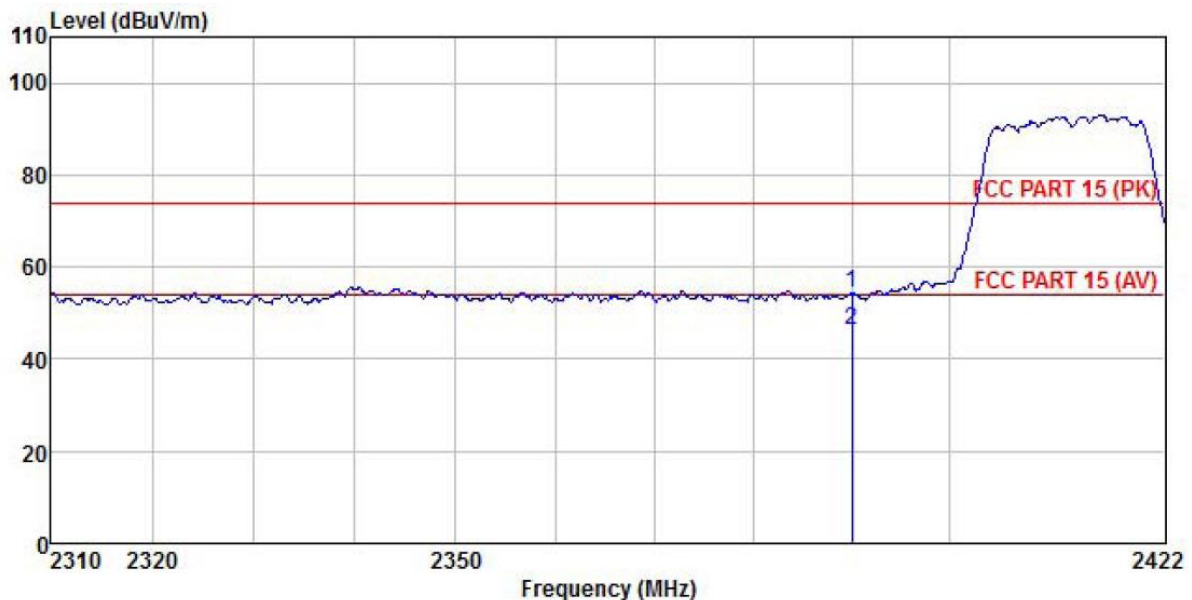
Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.
2. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

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802.11g mode:

Product Name:	Habanero	Product Model:	Habanero
Test By:	Mike	Test mode:	802.11g Tx mode
Test Channel:	Lowest channel	Polarization:	Vertical
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24°C Humi: 57%

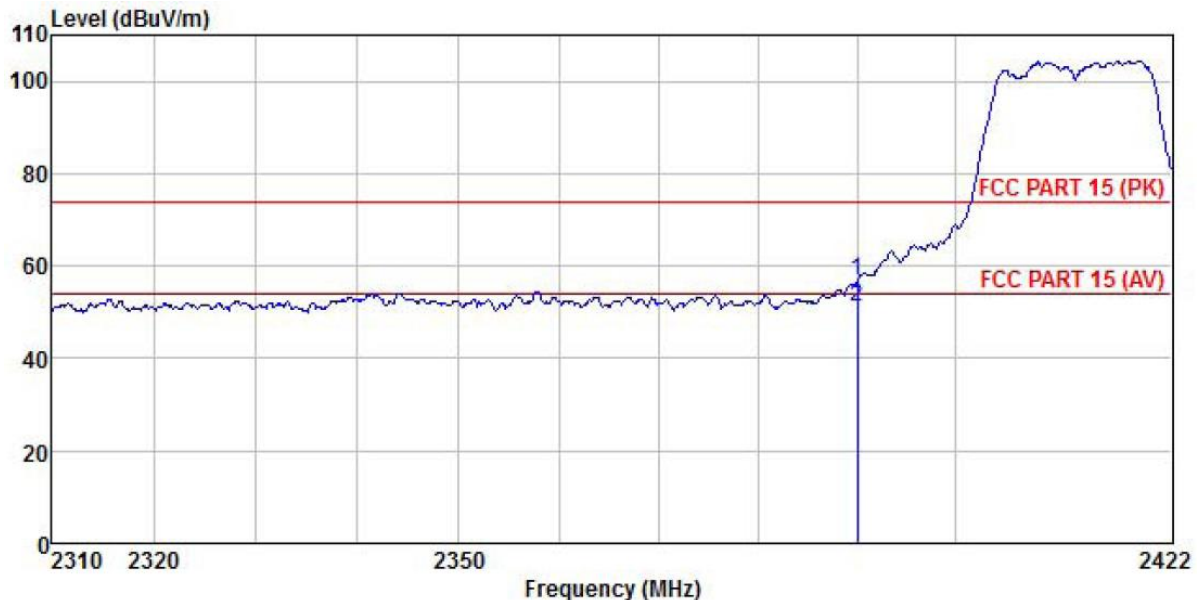


	Freq	Read Level	Antenna Factor	Cable Loss	Aux Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	2390.000	21.51	27.03	4.28	1.68	0.00	54.50	74.00	-19.50	Peak
2	2390.000	13.33	27.03	4.28	1.68	0.00	46.32	54.00	-7.68	Average

Remark:

- Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.
- The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

Product Name:	Habanero	Product Model:	Habanero
Test By:	Mike	Test mode:	802.11g Tx mode
Test Channel:	Lowest channel	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24°C Humi: 57%

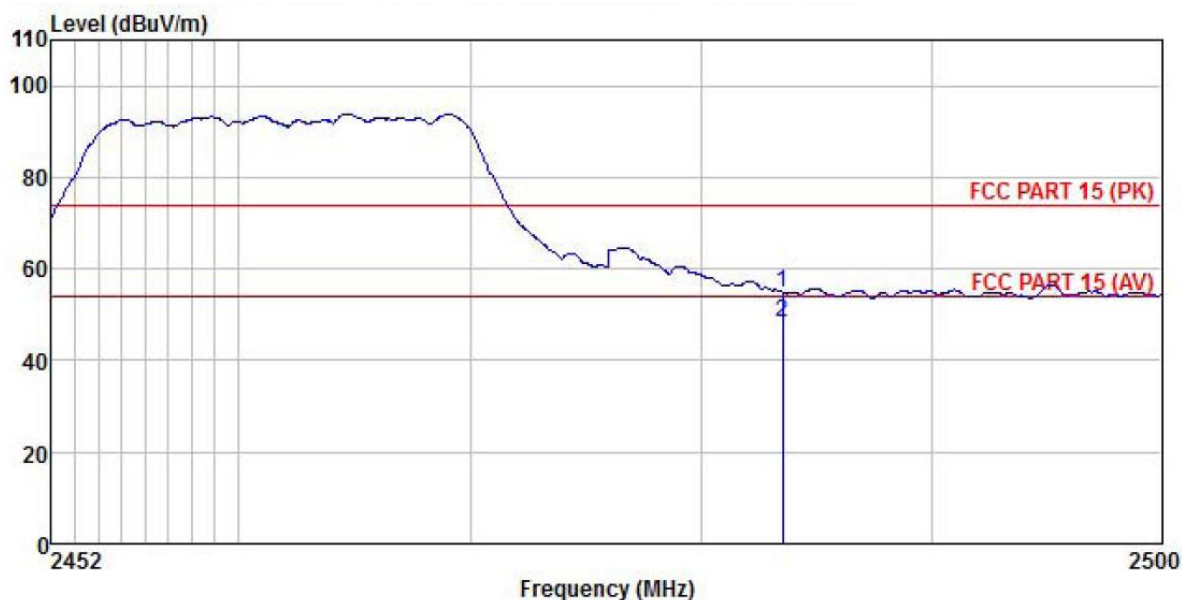


	Freq	Read	Antenna	Cable	Aux	Preamp	Level	Limit	Over	
	MHz	Level	Factor	Loss	Factor	Factor	dBuV/m	dBuV/m	Limit	Remark
		dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	2390.000	23.82	27.03	4.28	1.68	0.00	56.81	74.00	-17.19	Peak
2	2390.000	17.97	27.03	4.28	1.68	0.00	50.96	54.00	-3.04	Average

Remark:

- Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.
- The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

Product Name:	Habanero	Product Model:	Habanero
Test By:	Mike	Test mode:	802.11g Tx mode
Test Channel:	Highest channel	Polarization:	Vertical
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24°C Humi: 57%

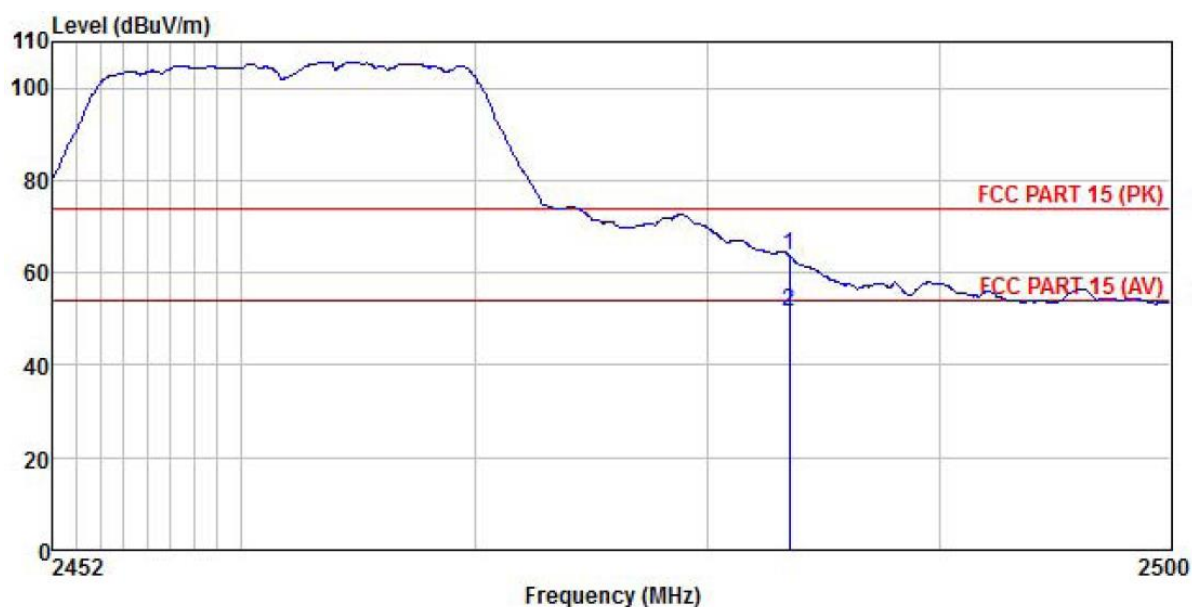


	Freq	Read Level	Antenna Factor	Cable Loss	Aux Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	2483.500	21.64	27.27	4.38	1.70	0.00	54.99	74.00	-19.01	Peak
2	2483.500	14.89	27.27	4.38	1.70	0.00	48.24	54.00	-5.76	Average

Remark:

- Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.
- The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

Product Name:	Habanero	Product Model:	Habanero
Test By:	Mike	Test mode:	802.11g Tx mode
Test Channel:	Highest channel	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24°C Humi: 57%



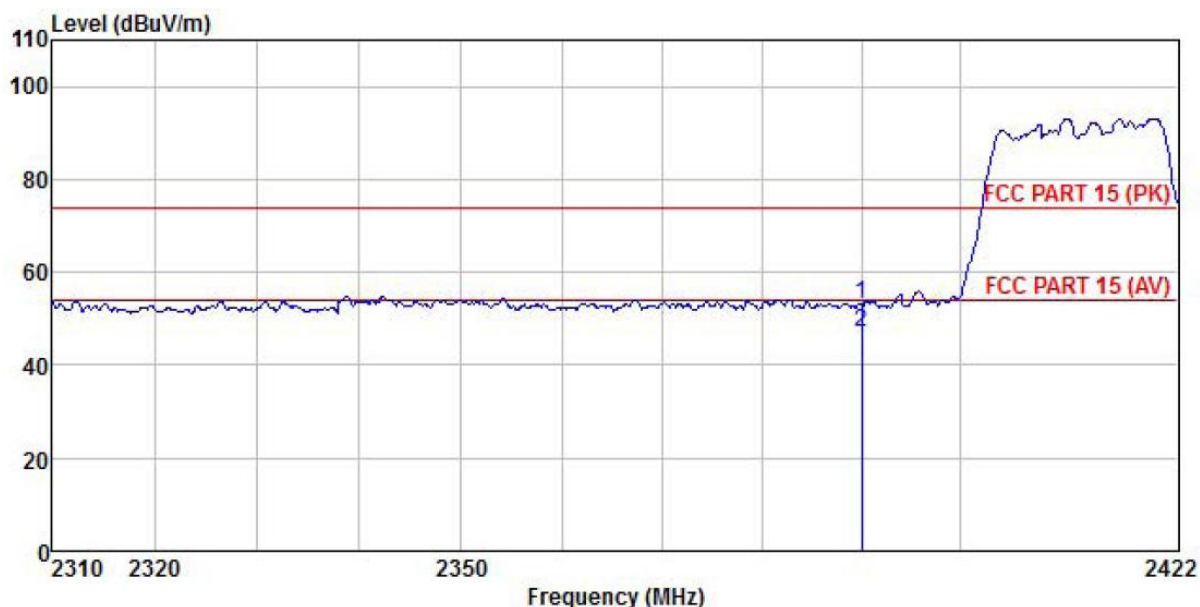
	Freq	Read Level	Antenna Factor	Cable Loss	Aux Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	2483.500	30.36	27.27	4.38	1.70	0.00	63.71	74.00	-10.29	Peak
2	2483.500	18.28	27.27	4.38	1.70	0.00	51.63	54.00	-2.37	Average

Remark:

3. Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.
4. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

802.11n-HT20 (MIMO)::

Product Name:	Habanero	Product Model:	Habanero
Test By:	Mike	Test mode:	802.11n(HT20) Tx mode
Test Channel:	Lowest channel	Polarization:	Vertical
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24℃ Humi: 57%

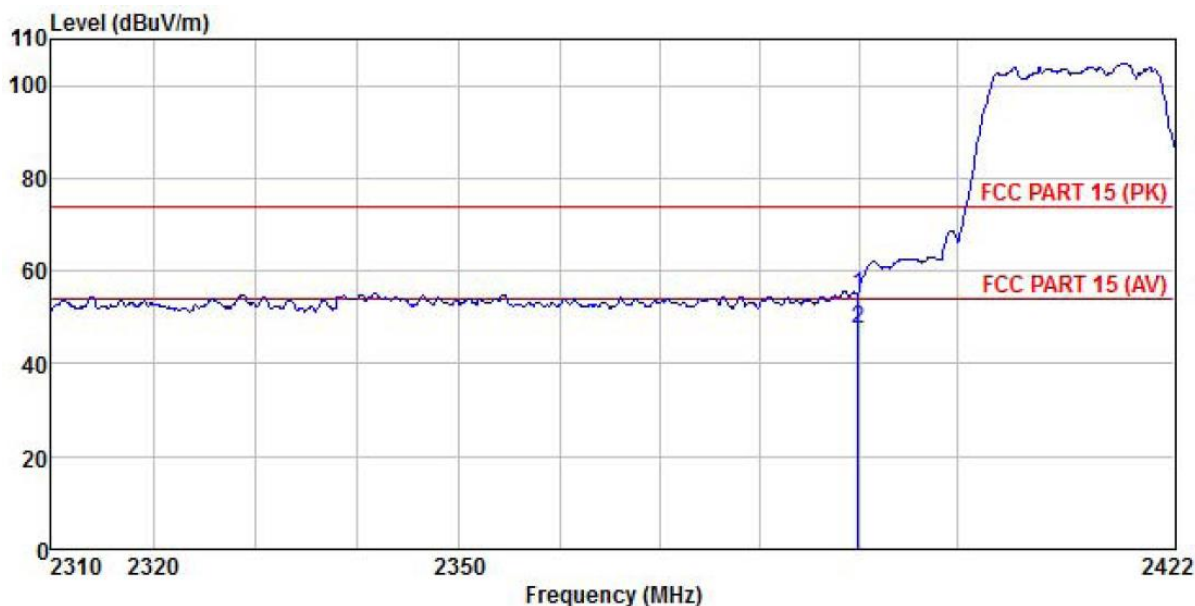


	Freq	Read Level	Antenna Factor	Cable Loss	Aux Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	2390.000	20.29	27.03	4.28	1.68	0.00	53.28	74.00	-20.72	Peak
2	2390.000	14.16	27.03	4.28	1.68	0.00	47.15	54.00	-6.85	Average

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.
2. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

Product Name:	Habanero	Product Model:	Habanero
Test By:	Mike	Test mode:	802.11n(HT20) Tx mode
Test Channel:	Lowest channel	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24°C Humi: 57%

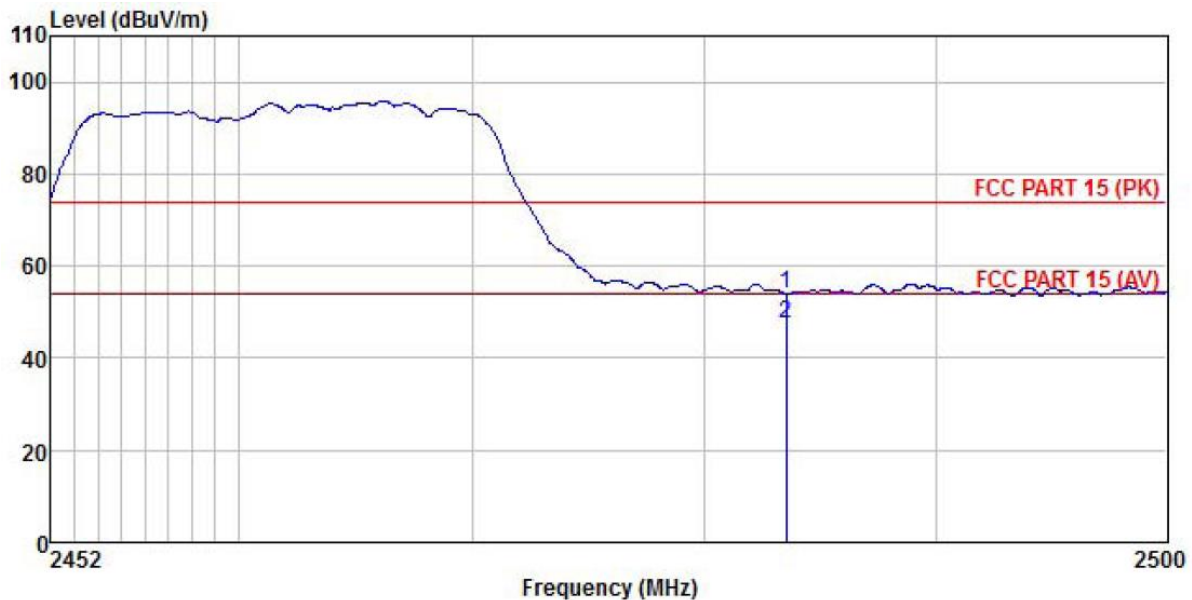


	Freq	Read	Antenna	Cable	Aux	Preamp	Level	Limit	Over	
	MHz	Level	Factor	Loss	Factor	Factor	dBuV/m	dBuV/m	Limit	Remark
		dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	2389.877	22.00	27.03	4.28	1.68	0.00	54.99	74.00	-19.01	Peak
2	2389.877	14.65	27.03	4.28	1.68	0.00	47.64	54.00	-6.36	Average

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.
2. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

Product Name:	Habanero	Product Model:	Habanero
Test By:	Mike	Test mode:	802.11n(HT20) Tx mode
Test Channel:	Highest channel	Polarization:	Vertical
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24℃ Humi: 57%

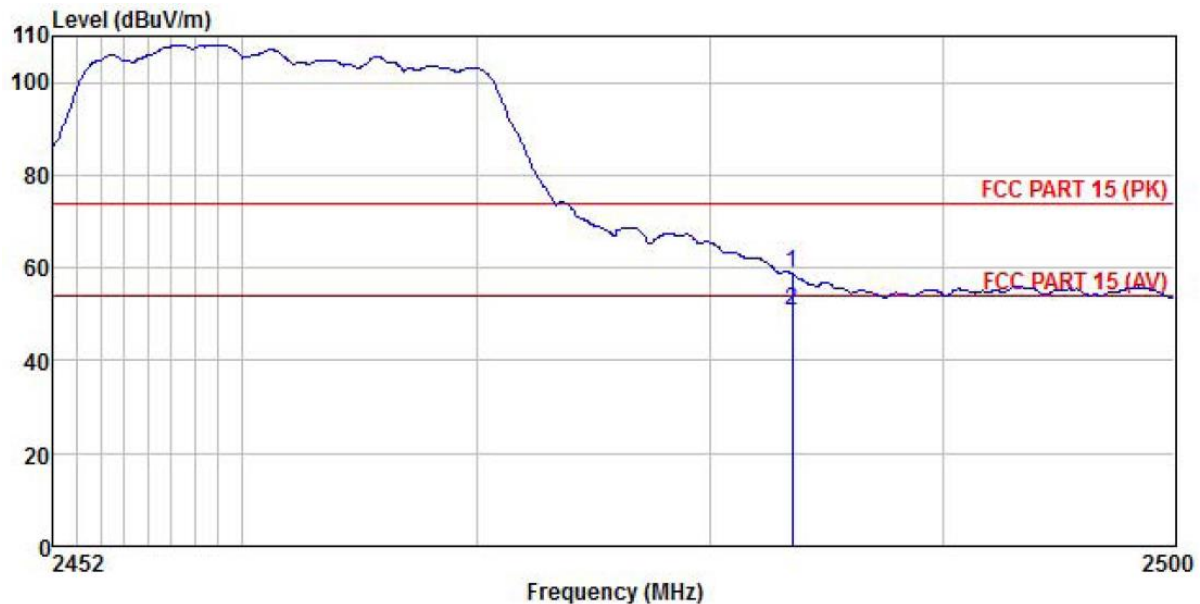


	Freq	ReadAntenna	Cable	Aux	Preamp	Level	Limit	Over	
	MHz	Level	Factor	Loss	Factor	Factor	Line	Limit	Remark
		dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB
1	2483.500	20.62	27.27	4.38	1.70	0.00	53.97	74.00	-20.03 Peak
2	2483.500	14.31	27.27	4.38	1.70	0.00	47.66	54.00	-6.34 Average

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.
2. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

Product Name:	Habanero	Product Model:	Habanero
Test By:	Mike	Test mode:	802.11n(HT20) Tx mode
Test Channel:	Highest channel	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24°C Humi: 57%



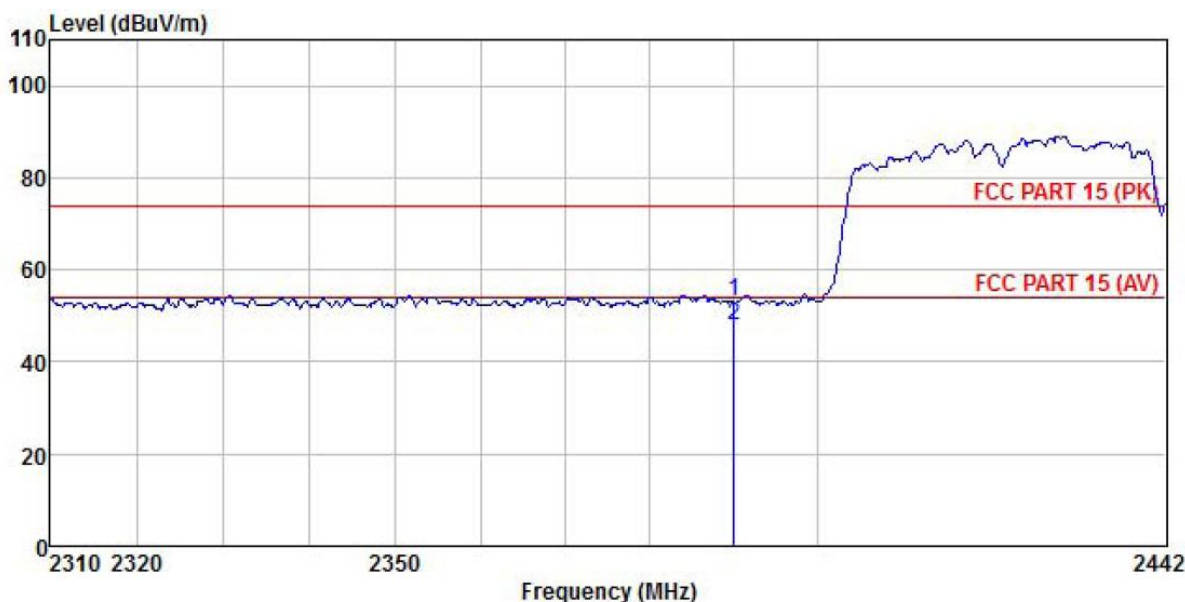
	Freq	Read Level	Antenna Factor	Cable Loss	Aux Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	2483.500	25.34	27.27	4.38	1.70	0.00	58.69	74.00	-15.31	Peak
2	2483.500	17.48	27.27	4.38	1.70	0.00	50.83	54.00	-3.17	Average

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.
2. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

802.11n-HT40 (MIMO):

Product Name:	Habanero	Product Model:	Habanero
Test By:	Mike	Test mode:	802.11n(HT40) Tx mode
Test Channel:	Lowest channel	Polarization:	Vertical
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24°C Humi: 57%

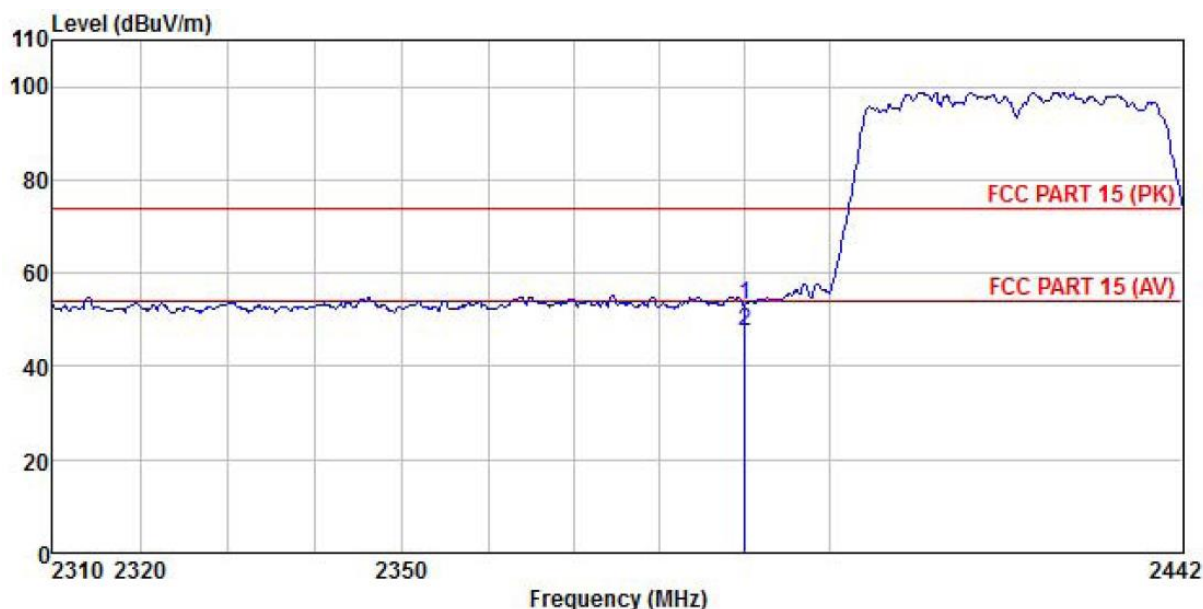


	Freq	Read Level	Antenna Factor	Cable Loss	Aux Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	2390.000	20.07	27.03	4.28	1.68	0.00	53.06	74.00	-20.94	Peak
2	2390.000	14.77	27.03	4.28	1.68	0.00	47.76	54.00	-6.24	Average

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.
2. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

Product Name:	Habanero	Product Model:	Habanero
Test By:	Mike	Test mode:	802.11n(HT40) Tx mode
Test Channel:	Lowest channel	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24℃ Humi: 57%

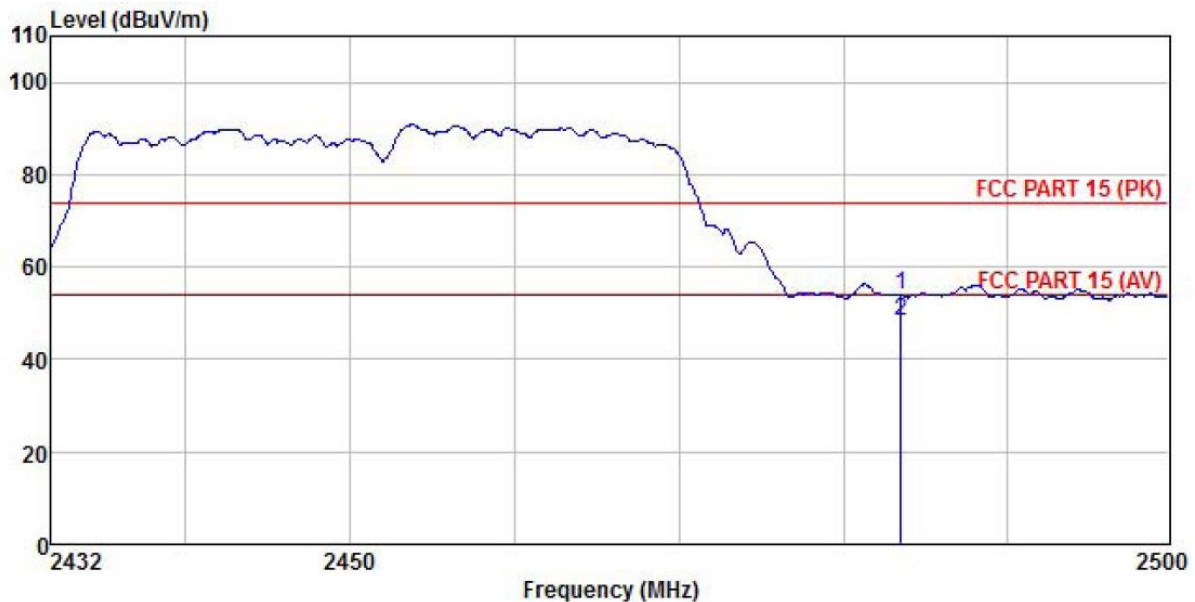


	Freq	Read Level	Antenna Factor	Cable Loss	Aux Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	2390.000	20.38	27.03	4.28	1.68	0.00	53.37	74.00	-20.63	Peak
2	2390.000	14.58	27.03	4.28	1.68	0.00	47.57	54.00	-6.43	Average

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.
2. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

Product Name:	Habanero	Product Model:	Habanero
Test By:	Mike	Test mode:	802.11n(HT40) Tx mode
Test Channel:	Highest channel	Polarization:	Vertical
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24°C Humi: 57%

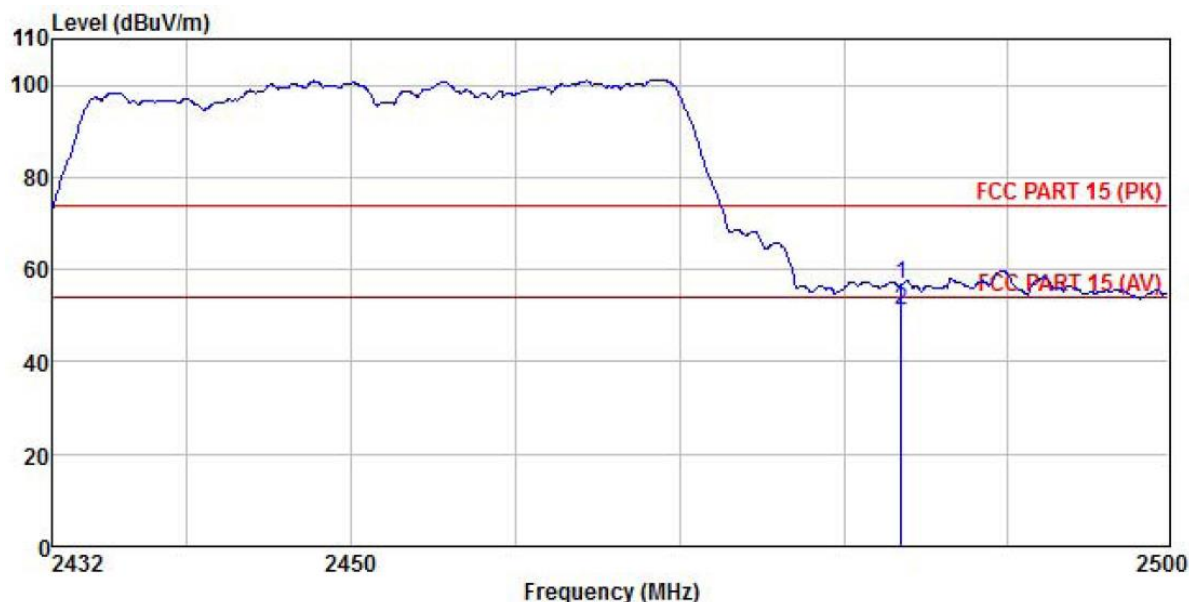


	Freq	Read Level	Antenna Factor	Cable Loss	Aux Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	2483.500	20.52	27.27	4.38	1.70	0.00	53.87	74.00	-20.13	Peak
2	2483.500	14.86	27.27	4.38	1.70	0.00	48.21	54.00	-5.79	Average

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.
2. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

Product Name:	Habanero	Product Model:	Habanero
Test By:	Mike	Test mode:	802.11n(HT40) Tx mode
Test Channel:	Highest channel	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24°C Humi: 57%



	Freq	Read Level	Antenna Factor	Cable Loss	Aux Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	2483.500	23.45	27.27	4.38	1.70	0.00	56.80	74.00	-17.20	Peak
2	2483.500	17.60	27.27	4.38	1.70	0.00	50.95	54.00	-3.05	Average

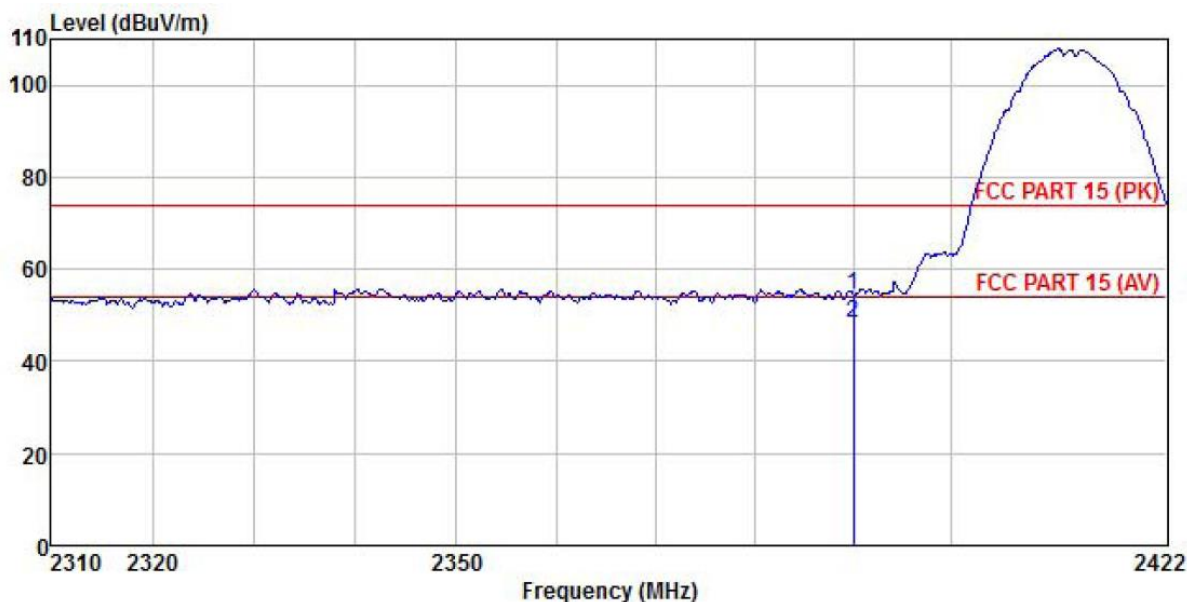
Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.
2. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

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802.11b mode:

Product Name:	Habanero	Product Model:	Habanero
Test By:	Mike	Test mode:	802.11b Tx mode
Test Channel:	Lowest channel	Polarization:	Vertical
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24°C Humi: 57%

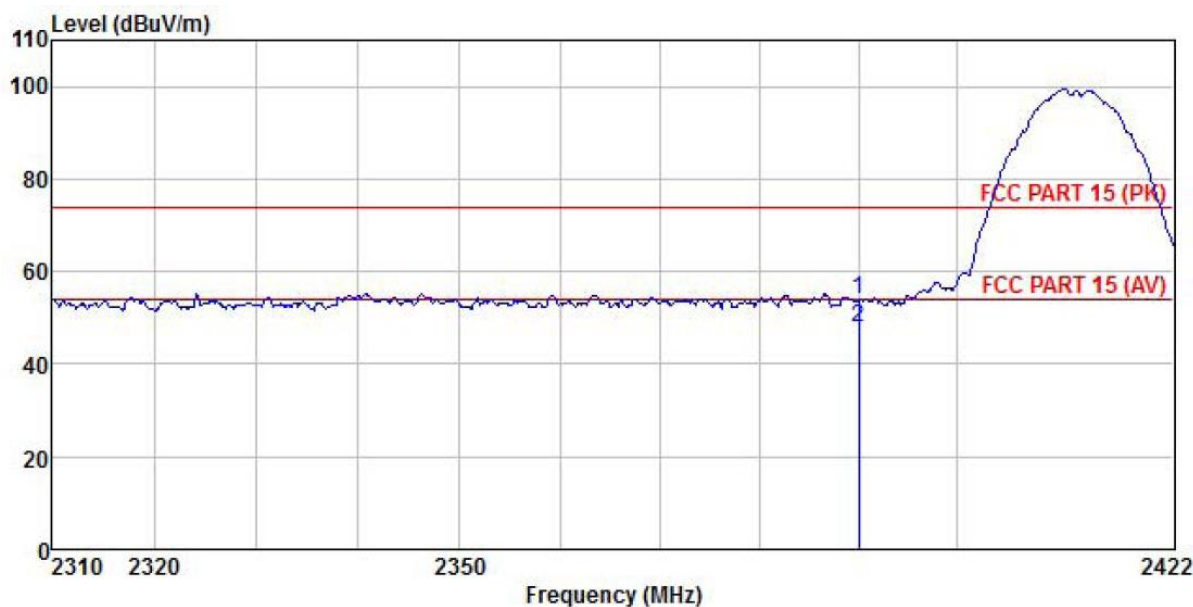


	Freq	Read Level	Antenna Factor	Cable Loss	Aux Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	2390.000	21.47	27.03	4.28	1.68	0.00	54.46	74.00	-19.54	Peak
2	2390.000	15.22	27.03	4.28	1.68	0.00	48.21	54.00	-5.79	Average

Remark:

5. Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.
6. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

Product Name:	Habanero	Product Model:	Habanero
Test By:	Mike	Test mode:	802.11b Tx mode
Test Channel:	Lowest channel	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24°C Humi: 57%

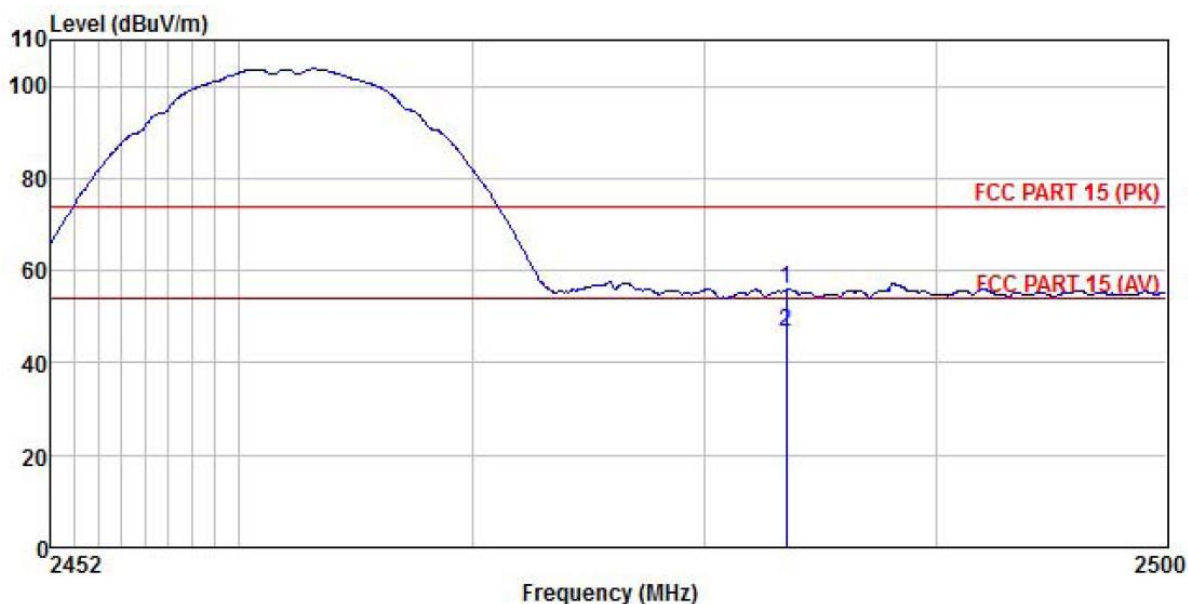


	Freq	Read Level	Antenna Factor	Cable Loss	Aux Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	2390.000	20.82	27.03	4.28	1.68	0.00	53.81	74.00	-20.19	Peak
2	2390.000	14.99	27.03	4.28	1.68	0.00	47.98	54.00	-6.02	Average

Remark:

5. Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.
6. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

Product Name:	Habanero	Product Model:	Habanero
Test By:	Mike	Test mode:	802.11b Tx mode
Test Channel:	Highest channel	Polarization:	Vertical
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24℃ Humi: 57%

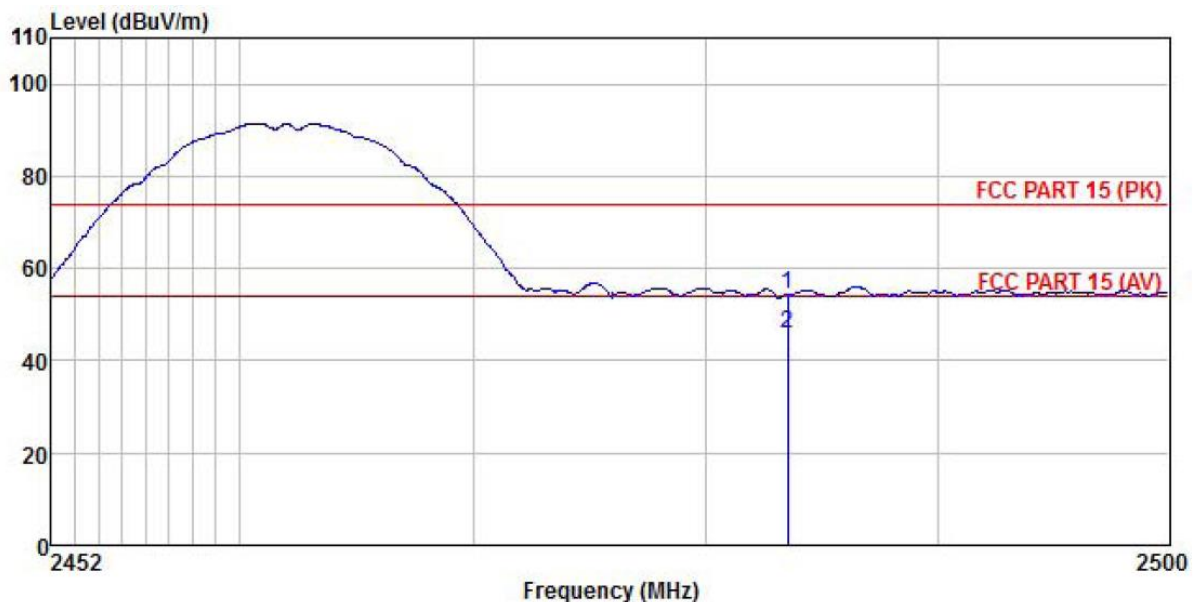


	Freq	Read Level	Antenna Factor	Cable Loss	Aux Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	2483.500	22.50	27.27	4.38	1.70	0.00	55.85	74.00	-18.15	Peak
2	2483.500	13.14	27.27	4.38	1.70	0.00	46.49	54.00	-7.51	Average

Remark:

5. Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.
6. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

Product Name:	Habanero	Product Model:	Habanero
Test By:	Mike	Test mode:	802.11b Tx mode
Test Channel:	Highest channel	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24℃ Humi: 57%



	Freq	Read Level	Antenna Factor	Cable Loss	Aux Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	2483.500	21.06	27.27	4.38	1.70	0.00	54.41	74.00	-19.59	Peak
2	2483.500	12.64	27.27	4.38	1.70	0.00	45.99	54.00	-8.01	Average

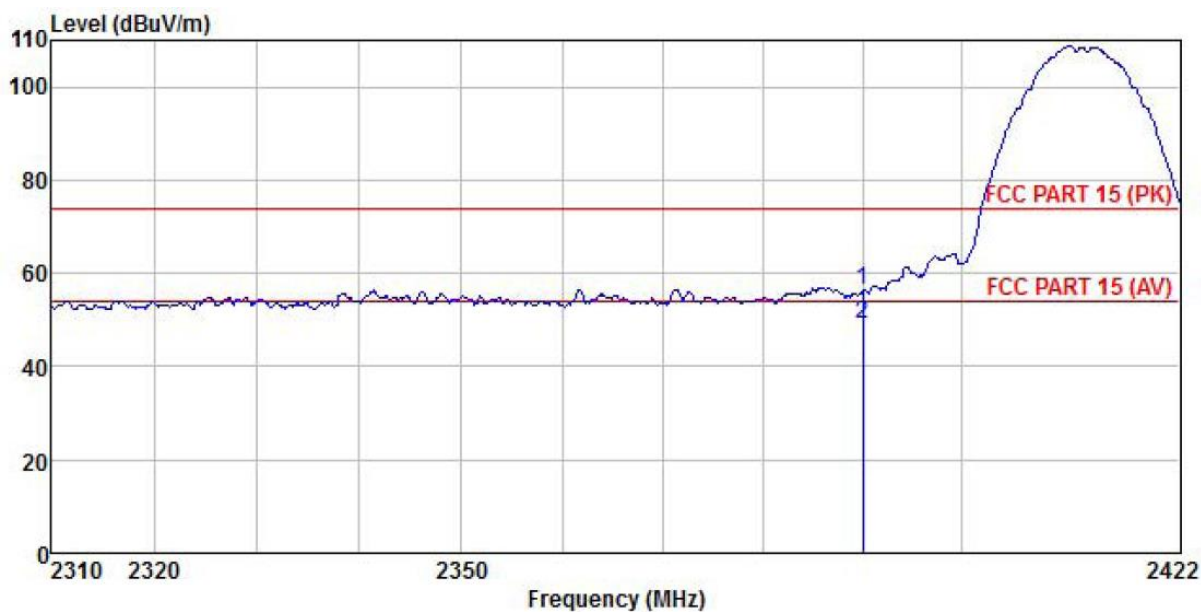
Remark:

5. Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.
6. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

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802.11b mode:

Product Name:	Habanero	Product Model:	Habanero
Test By:	Mike	Test mode:	802.11b Tx mode
Test Channel:	Lowest channel	Polarization:	Vertical
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24°C Humi: 57%

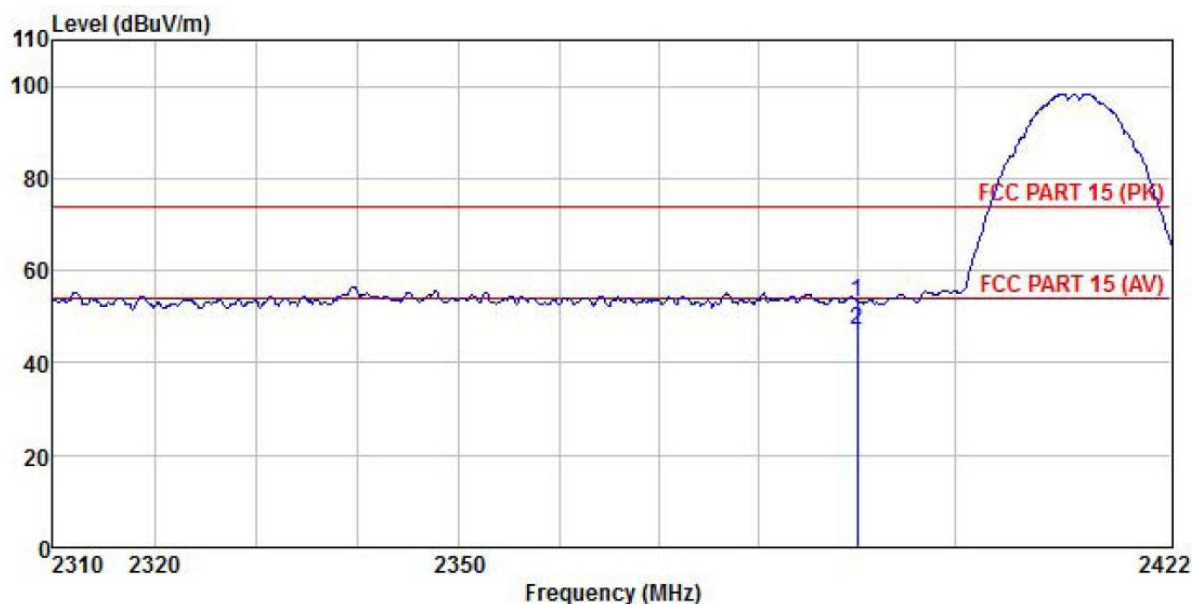


	Freq	Read Level	Antenna Factor	Cable Loss	Aux Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	2390.000	23.28	27.03	4.28	1.68	0.00	56.27	74.00	-17.73	Peak
2	2390.000	16.02	27.03	4.28	1.68	0.00	49.01	54.00	-4.99	Average

Remark:

7. Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.
8. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

Product Name:	Habanero	Product Model:	Habanero
Test By:	Mike	Test mode:	802.11b Tx mode
Test Channel:	Lowest channel	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24℃ Humi: 57%

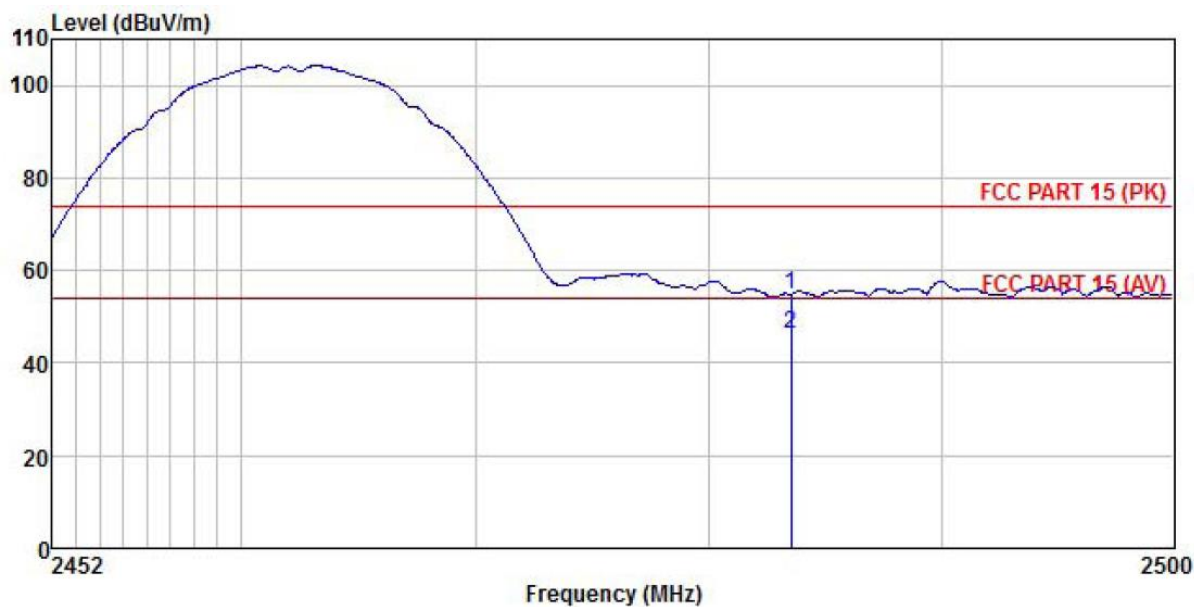


	Freq	Read Level	Antenna Factor	Cable Loss	Aux Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	2390.000	20.30	27.03	4.28	1.68	0.00	53.29	74.00	-20.71	Peak
2	2390.000	14.15	27.03	4.28	1.68	0.00	47.14	54.00	-6.86	Average

Remark:

7. Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.
 8. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

Product Name:	Habanero	Product Model:	Habanero
Test By:	Mike	Test mode:	802.11b Tx mode
Test Channel:	Highest channel	Polarization:	Vertical
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24°C Humi: 57%



	Freq	Read Level	Antenna Factor	Cable Loss	Aux Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	2483.500	21.48	27.27	4.38	1.70	0.00	54.83	74.00	-19.17	Peak
2	2483.500	12.93	27.27	4.38	1.70	0.00	46.28	54.00	-7.72	Average

Remark:

7. Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Preamplifier Factor.
8. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.