



TESTING LABORATORY  
CERTIFICATE#4323.01



RSS-GEN ISSUE 5, MARCH 2019  
RSS-247, ISSUE 2, FEBRUARY 2017

## TEST REPORT

For

**Tomorrow systems s.r.o**

Karlstejska 323,Orech

**IC: 26861-DR900VX**

<b>Report Type:</b> Amended Report	<b>Product Type:</b> Dual Band 11AC Wireless Module
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<b>Report Number:</b> RKSA210401001-08A	
<b>Report Date:</b> 2021-04-06	
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**DOCUMENT REVISION HISTORY**

Revision Number	Report Number	Description of Revision	Date of Issue
1	RKSA210121001-08A	Original Report	2021-01-28
2	RKSA210401001-08A	Amended Report	2021-04-06

**Note:**

This is an amended report application based on RKSA210121001-08A, the details as below:

1. Change the manufacturer from “Wallys Communications Technologies Co.,Ltd” to “Tomorrow systems s.r.o”.
2. Change the address from “Room 2723,Le Jia building,Jia Rui Xiang No.8,Suzhoun Industrial Park,Suzhou, P.R” to “Karlstejska 323,Orech”.
3. Change the model name from “DR900VX,DR600VX” to “524WiFi 900VX, 524WiFi 600VX”.

The above changes will affect nothing, all test data and photos were referred to the original report RKSA210121001-08A that issued on 2021-01-28 by BACL (Kunshan).

## GENERAL INFORMATION

### Product Description for Equipment under Test

Applicant:	Tomorrow systems s.r.o
Tested Model:	524WiFi 900VX
Series Model:	524WiFi 600VX
Product Type:	Dual Band 11AC Wireless Module
Power Supply:	DC 3.3V
RF Function:	2.4G WiFi
Operating Band/Frequency:	2412-2462MHz(b,g,n-HT20),2422-2452MHz(n-HT40)
Channel Number:	11(b,g,n-HT20), 7(n-HT40)
Channel Separation:	5MHz
Modulation Type:	DSSS,OFDM
Antenna Type:	Omni antenna
*Maximum Antenna Gain:	2.0dBi
Maximum Conducted Power:	24.65dBm(802.11b), 23.04dBm(802.11g), 27.59dBm(802.11n-HT20), 24.26dBm(802.11n-HT40)

Note\*: The Maximum Antenna Gain was declared by applicant.

All measurement (except Occupied Bandwidth) and test data in this report was gathered from production sample serial number: 20191022001 (Assigned by the BACL. The EUT supplied by the applicant was received on 2019-10-22).

The test data of Occupied Bandwidth in this report was gathered from production sample serial number: RKSA210121001-1.(Assigned by the BACL. The EUT supplied by the applicant was received on 2021-01-21.)

### Objective

This type approval report is prepared on behalf of *Tomorrow systems s.r.o* in accordance with RSS-247 Issue 2, February 2017 and RSS-GEN Issue 5, March 2019 of the Innovation, Science and Economic Development Canada.

### Related Submittal(s)/Grant(s)

RSS-247 submissions with IC: 26861-DR900VX.

### Test Methodology

All tests and measurements indicated in this document were performed in accordance with RSS-247 Issue 2, February 2017 of the Innovation, Science and Economic Development Canada & RSS-GEN Issue 5, March 2019: General Requirements for Compliance of Radio Apparatus & ANSI C63.10-2013: American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

**Measurement Uncertainty**

Item		Uncertainty
AC Power Lines Conducted Emissions		3.19dB
RF conducted test with spectrum		0.9dB
RF Output Power with Power meter		0.5dB
Radiated emission	30MHz~1GHz	6.11dB
	1GHz~6GHz	4.45dB
	6GHz~18GHz	5.23dB
	18GHz~40GHz	5.65dB
Occupied Bandwidth		0.5kHz
Temperature		1.0°C
Humidity		6%

**Test Facility**

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu province, China.

Bay Area Compliance Laboratories Corp. (Kunshan) Lab is accredited to ISO/IEC 17025 by A2LA (Lab code: 4323.01) and the FCC designation No. CN1185 under the FCC KDB 974614 D01 and CAB identifier CN0004 under the ISED requirement. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier : CN0004.

## SYSTEM TEST CONFIGURATION

### Description of Test Configuration

Test channel list is as below:

For 802.11b, 802.11g and 802.11n-HT20 mode, EUT was tested with Channel 1, 6 and 11

For 802.11n-HT40 mode, EUT was tested with Channel 3, 6 and 9.

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	7	2442
2	2417	8	2447
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437	/	/

### EUT Exercise Software

RF test tool: Cart.exe

Pre-scan with all the data rates, and the worst case was performed as below:

Mode	Data Rate	Power Setting		
		ANT 1	ANT 2	ANT 3
802.11b	1 Mbps	20	20	20
802.11g	6 Mbps	15	15	15
802.11n-HT20	MCS0	15	15	15
802.11n-HT40	MCS0	10	10	10

### For Conducted Test:

802.11b & 802.11g&802.11n: each transmit chains were tested

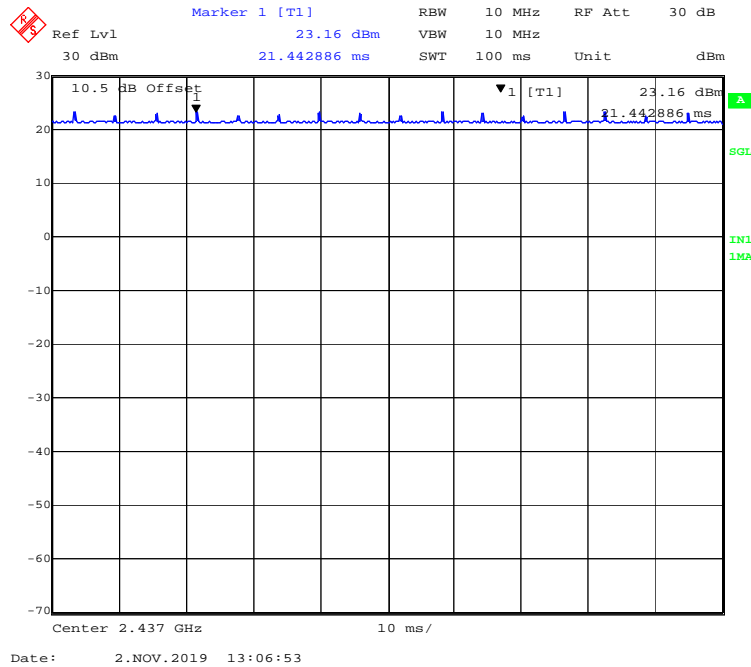
### For Radiated Test:

802.11b & 802.11g, SISO for each transmit chain  
802.11n: MIMO for three transmit chains

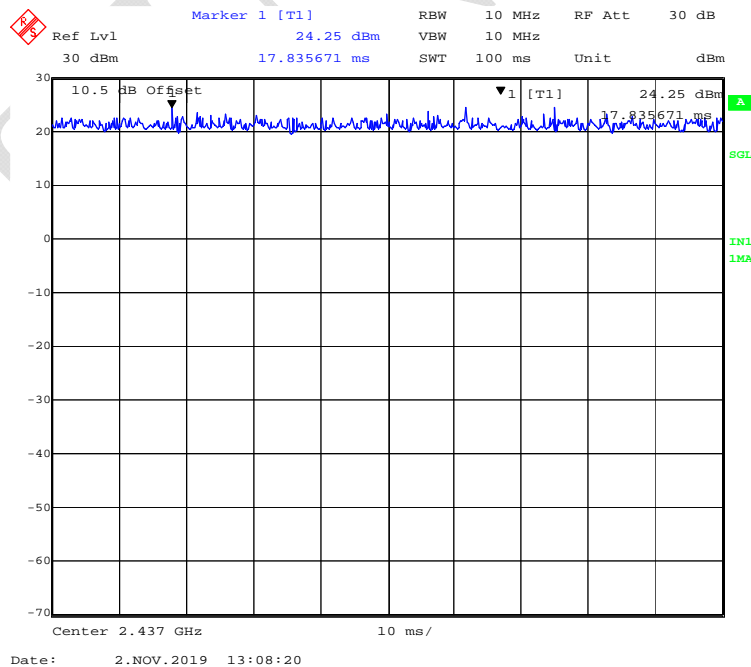
**Duty Cycle:**

**ANT 1:**

**802.11b Mode Middle Channel**

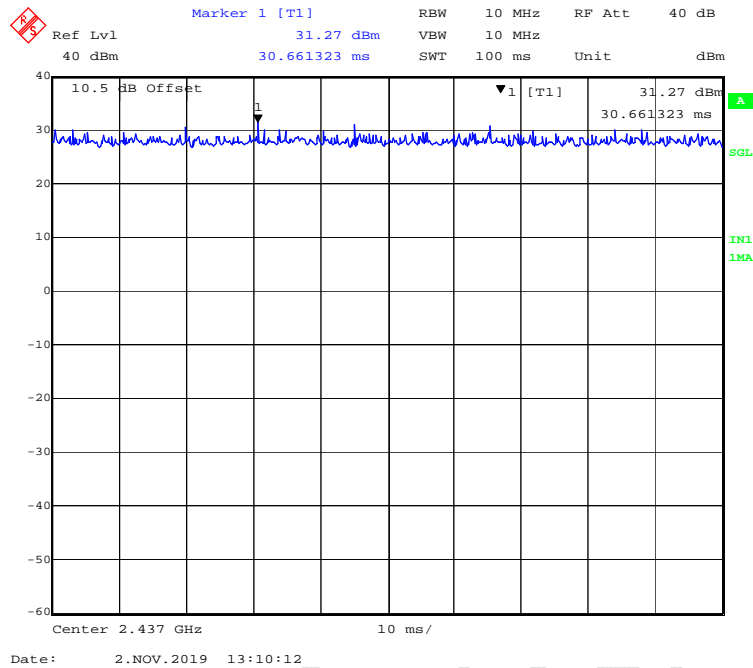


**802.11g Mode Middle Channel**

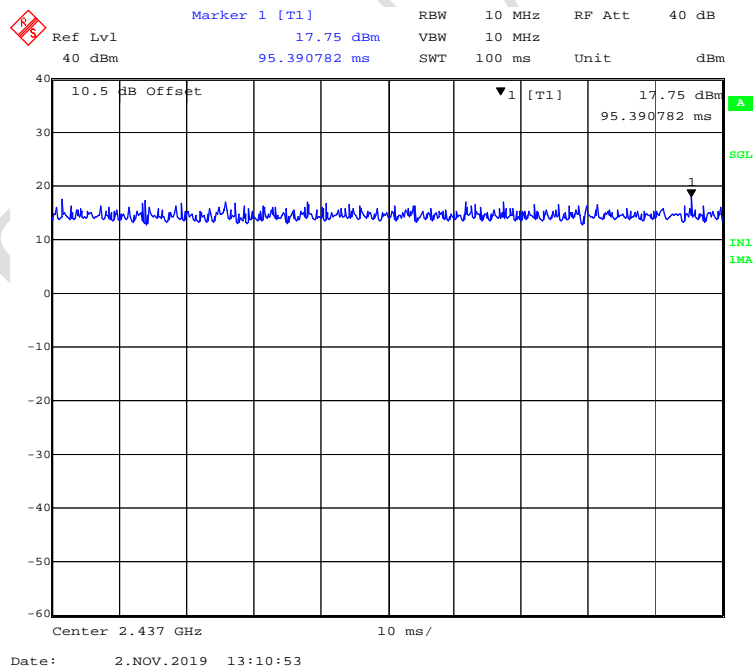




### 802.11n-HT20 Mode Middle Channel

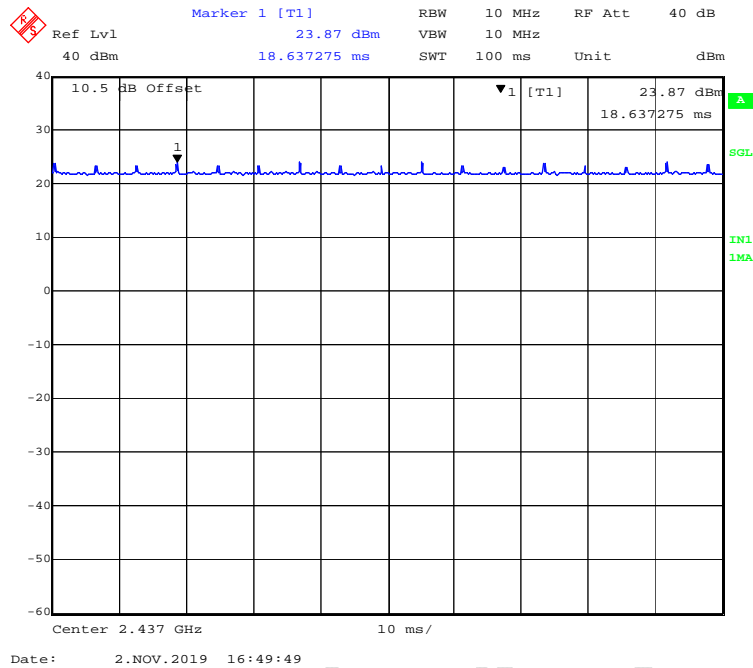


### 802.11n-HT40 Mode Middle Channel

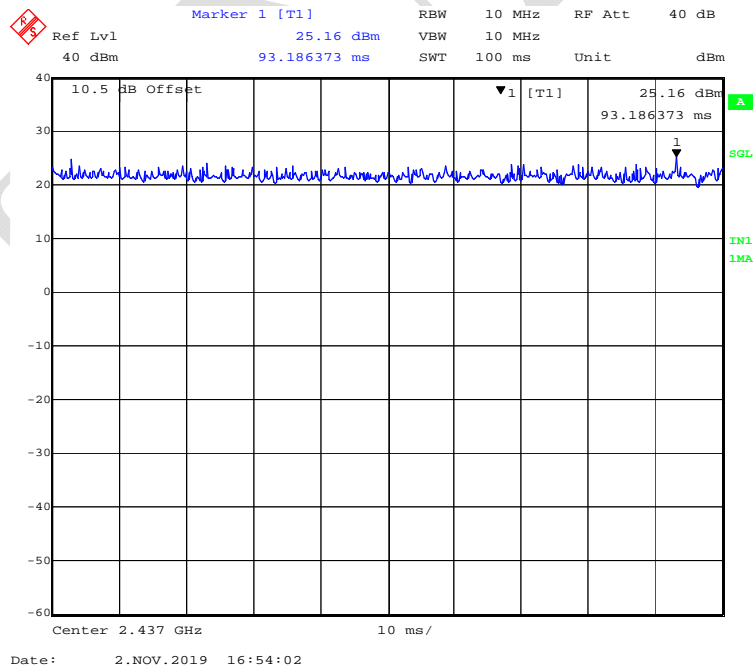


ANT 2:

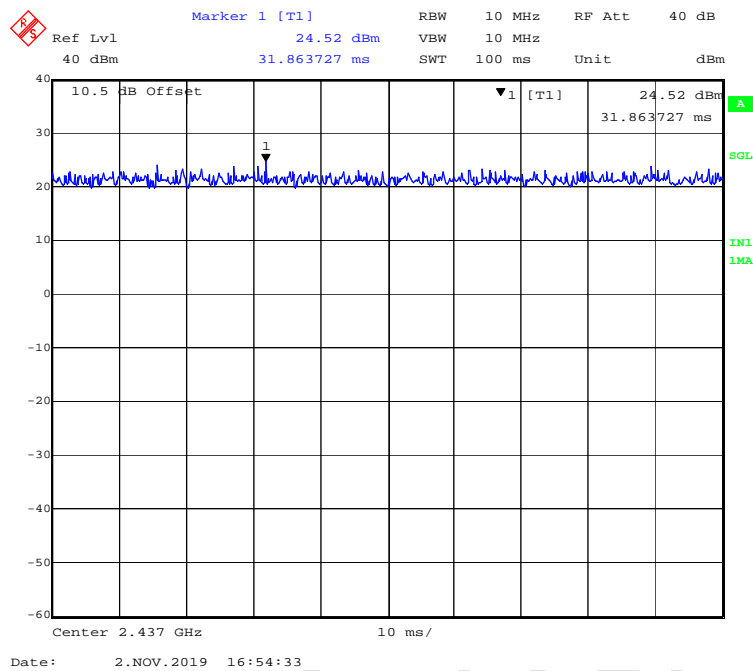
802.11b Mode Middle Channel



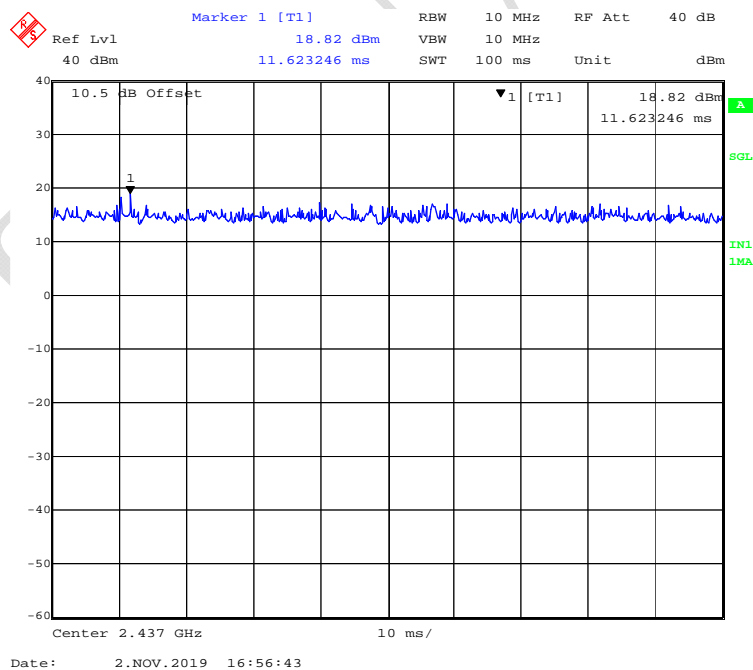
802.11g Mode Middle Channel



### 802.11n-HT20 Mode Middle Channel

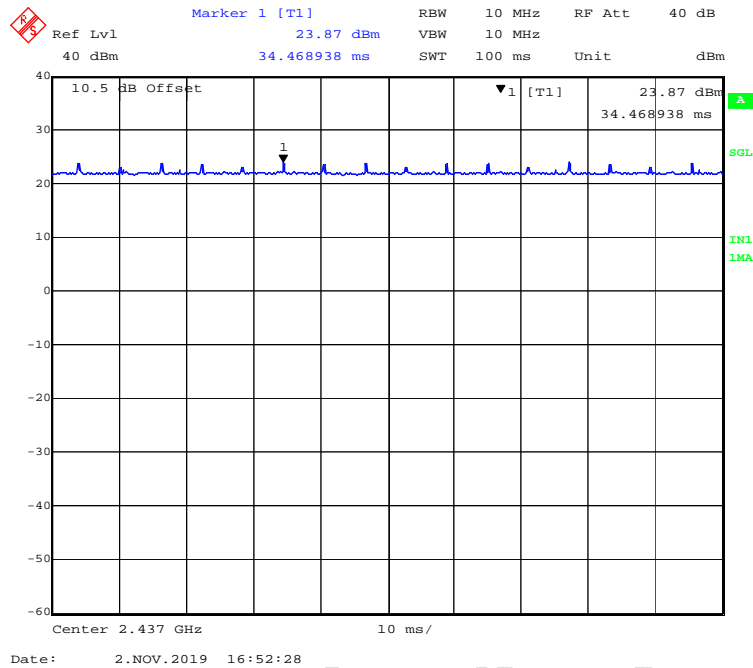


### 802.11n-HT40 Mode Middle Channel

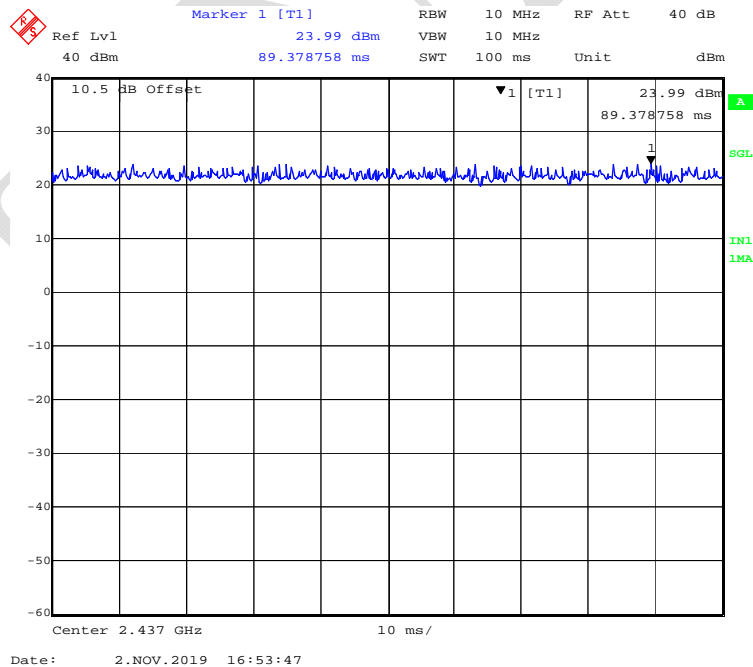


ANT 3:

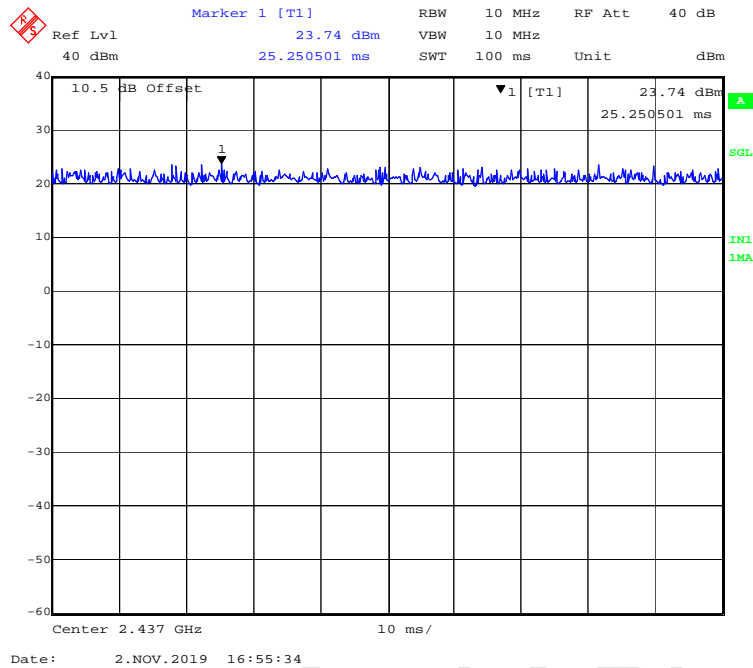
802.11b Mode Middle Channel



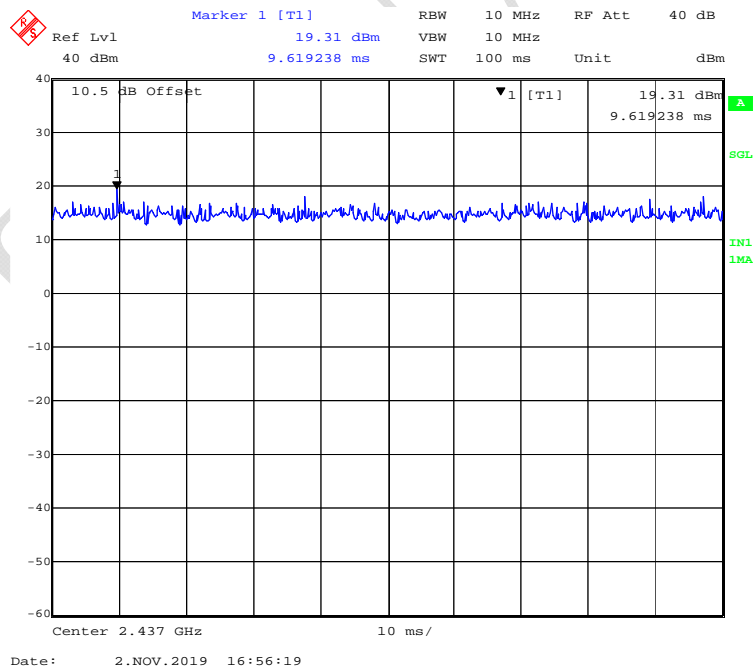
802.11g Mode Middle Channel



### 802.11n-HT20 Mode Middle Channel



### 802.11n-HT40 Mode Middle Channel



Mode	Duty Cycle (%)	T(ms)	1/T(kHz)	10log(1/x)
802.11b	100	/	/	0
802.11g	100	/	/	0
802.11n-HT20	100	/	/	0
802.11n-HT40	100	/	/	0

**Note:** “x” means the Duty Cycle.

### Support Equipment List and Details

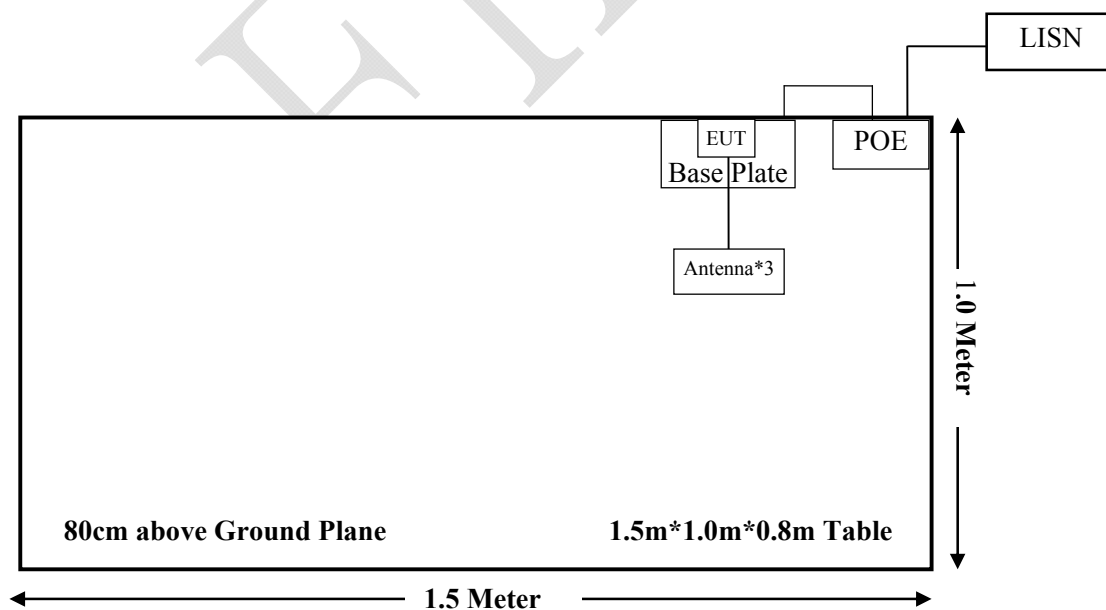
Manufacturer	Description	Model	Serial Number
Wallys	Base plate	DR344-NAS_Ver_MP3A	/
Wallys	POE	GRT-POE15-240100	/
Wallys	Antenna*3	/	/

### External I/O Cable

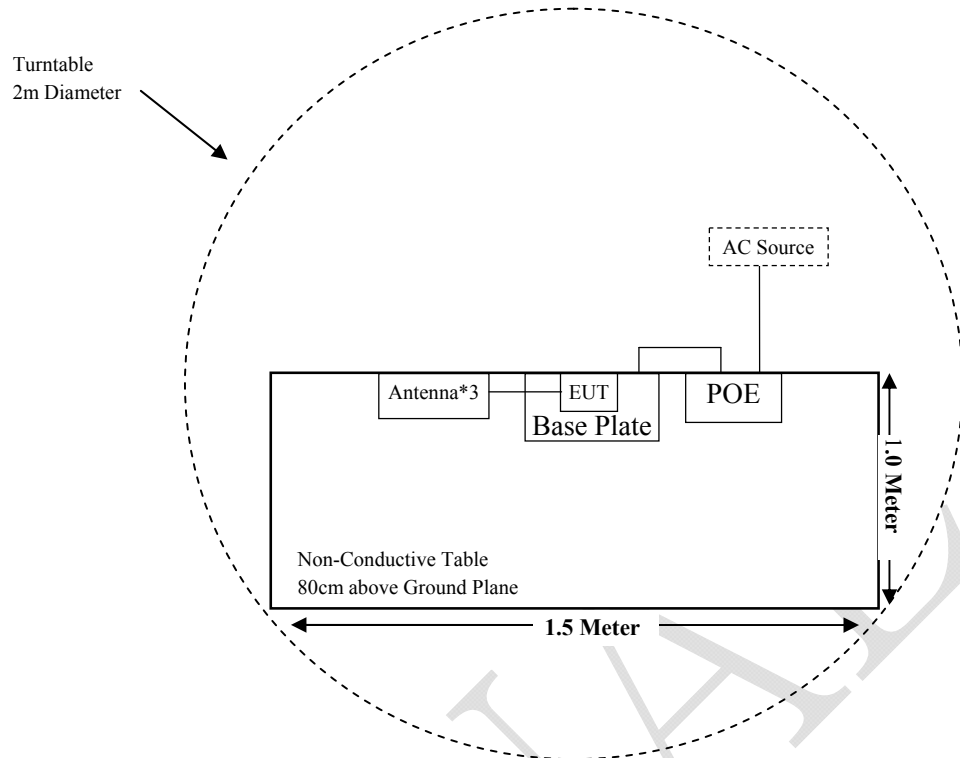
Cable Description	Length(m)	From Port	To
RJ45 Cable	1.0	Base plate	POE
Antenna Cable*3	0.3	EUT	Antenna

### Block Diagram of Test Setup

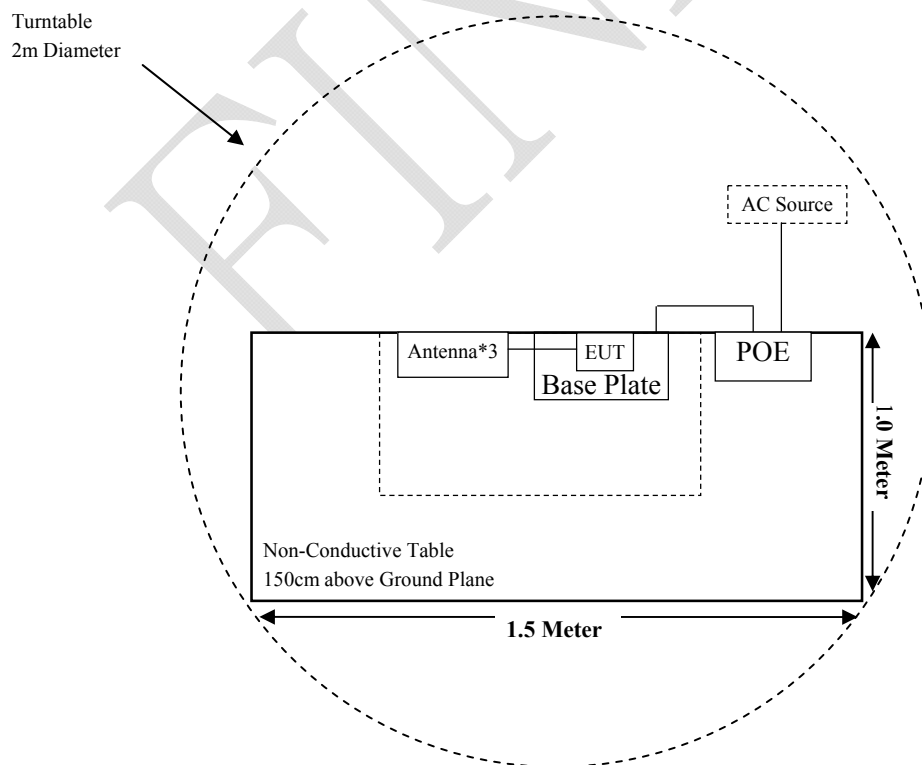
For Conducted Emissions:



For Radiated Emissions(Below 1GHz):



For Radiated Emissions(Above 1GHz):



**SUMMARY OF TEST RESULTS**

ISED RSS-247 & RSS-GEN Rules	Description of Test	Result
RSS-GEN Issue 5 Clause 6.8	Transmit Antenna	Compliant
RSS-102 Issue 5 Clause 2.5.2	Exemption From Routine Evaluation Limits - RF Exposure Evaluation	Compliant
RSS-GEN Issue 5 Clause 8.8	AC Power-line Conducted Emissions Limits	Compliant
RSS-247 Issue 2 Clause 5.5 RSS-GEN Issue 5 Clause 8.10	Unwanted Emissions & Restricted Frequency Bands	Compliant
RSS-247 Issue 2 Clause 5.2 a)	6 dB Emission Bandwidth	Compliant
RSS-GEN Issue 5 Clause 6.7	Occupied Bandwidth	Compliant
RSS-247 Issue 2 Clause 5.2 b)	Power Spectral Density	Compliant
RSS-247 Issue 2 Clause 5.4 d)	Transmitter Output Power Measurement	Compliant
RSS-247 Issue 2 Clause 5.5	Out of Band Emissions	Compliant



**TEST EQUIPMENT LIST**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
<b>Radiated Emission Test (Chamber 1#)</b>					
Rohde & Schwarz	EMI Test Receiver	ESR	1316.3003K03-101746-zn	2019-07-11	2020-07-10
Sunol Sciences	Broadband Antenna	JB3	A090413-1	2016-12-26	2019-12-25
Sonoma Instrument	Pre-amplifier	310N	171205	2019-08-14	2020-08-13
Audix	Test Software	e3	V9	N/A	N/A
MICRO-COAX	Coaxial Cable	Cable-8	008	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-9	009	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-10	010	2019-08-15	2020-08-14
<b>Radiated Emission Test (Chamber 2#)</b>					
Rohde & Schwarz	EMI Test Receiver	ESU40	100207	2019-08-27	2020-08-26
ETS-LINDGREN	Horn Antenna	3115	9207-3900	2017-07-15	2020-07-14
ETS-LINDGREN	Horn Antenna	3116	00084159	2016-12-12	2019-12-11
A.H.Systems, inc	Amplifier	2641-1	491	2019-02-20	2020-02-19
SELECTOR	Amplifier	EM18G40G	060726	2019-03-22	2020-03-21
MICRO-TRONICS	Band Reject Filter	BRM50702	G024	2019-08-05	2020-08-04
Narda	Attenuator	10dB	010	2019-08-15	2020-08-14
Rohde & Schwarz	Auto test Software	EMC32	100361	N/A	N/A
MICRO-COAX	Coaxial Cable	Cable-6	006	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-11	011	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-12	012	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-13	013	2019-08-15	2020-08-14
<b>RF Conducted Test</b>					
Rohde & Schwarz	EMI Test Receiver	ESIB26	100146	2018-11-30	2019-11-29
Rohde & Schwarz	EMI Test Receiver	ESIB26	100146	2020-11-27	2021-11-26
Agilent	Power Meter	N1912A	MY5000492	2018-11-18	2019-11-17
Agilent	Power Sensor	N1921A	MY54210024	2018-11-18	2019-11-17
Narda	Attenuator	10dB	010	2019-08-15	2020-08-14
Narda	Attenuator	10dB	010	2020-08-15	2021-08-14
Wallys	RF Cable	Wallys C01	C01	Each Time	N/A

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
<b>Conducted Emission Test</b>					
Rohde & Schwarz	EMI Test Receiver	ESR	1316.3003K03-101746-zn	2019-07-11	2020-07-10
Rohde & Schwarz	LISN	ENV216	3560655016	2018-11-30	2019-11-29
Audix	Test Software	e3	V9	N/A	N/A
Rohde & Schwarz	Pulse limiter	ESH3-Z2	357.8810.52	2019-08-10	2020-08-09
MICRO-COAX	Coaxial Cable	Cable-15	015	2019-08-15	2020-08-14

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

## **RSS-GEN ISSUE5 Clause 6.8 - TRANSMITTER ANTENNA**

### **Applicable Standard**

The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report (and in the notice to be included in the user manual, provided below).

When measurements at the antenna port are used to determine the RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna's manufacturer.

The test report shall state the RF power, output power setting and spurious emission measurements with each antenna type that is used with the transmitter being tested.

For licence-exempt equipment with detachable antennas, the user manual shall also contain the following notice in a conspicuous location:

This radio transmitter [enter the device's ISCED certification number] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types which can be used with the transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna type.

### **Antenna Connector Construction**

The EUT has been tested with three omni antennas for 2.4G Wi-Fi and each antenna gain is 2 dBi with IPEX connector which use a unique type of connector to attach to the EUT, fulfill the requirement of this section. Please refer to the EUT photos.

Antenna Type	Max. Antenna Gain	Input impedance
Omni antenna	2dBi	50Ω

**Result:** Compliant.

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## **RSS-102 ISSUE5 Clause 2.5.2 – EXEMPTION FROM ROUTINE EVALUATION LIMITS - RF EXPOSURE EVALUATION**

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### **Applicable Standard**

According to RSS-102 Issue 5:

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- Below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than  $22.48/f^{0.5}$  W (adjusted for tune-up tolerance), where  $f$  is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than  $1.31 * 10^{-2} f^{0.6834}$  W (adjusted for tune-up tolerance), where  $f$  is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

**Test Result**

RF exposure evaluation exemption:

Mode	Frequency Range (MHz)	Tune-up Conducted Power (dBm)	Antenna Gain (dBi)	Tune-up EIRP		Exemption Limit (mW)
				(dBm)	(mW)	
802.11b	2412~2462	25.00	2.0	27.00	501.19	2684.03
802.11g		23.50	2.0	25.50	354.81	2684.03
802.11n-HT20		28.00	2.0	30.00	1000.00	2684.03
802.11n-HT40	2422-2452	24.50	2.0	26.50	446.68	2691.63
802.11a	5150~5250	16.50	2.0	18.50	70.79	4525.27
	5725~5850	20.50	2.0	22.50	177.83	4857.02
802.11ac20	5150~5250	17.00	2.0	19.00	79.43	4525.27
	5725~5850	24.00	2.0	26.00	398.11	4857.02
802.11n20	5150~5250	17.00	2.0	19.00	79.43	4525.27
	5725~5850	24.00	2.0	26.00	398.11	4857.02
802.11ac40	5150~5250	17.50	2.0	19.50	89.13	4531.24
	5725~5850	23.00	2.0	25.00	316.23	4862.80
802.11n40	5150~5250	17.00	2.0	19.00	79.43	4531.24
	5725~5850	23.00	2.0	25.00	316.23	4862.80
802.11ac80	5210	15.50	2.0	17.50	56.23	4543.16
	5775	23.00	2.0	25.00	316.23	4874.34

**Note:** (1) For the above Tune-up Conducted Power were all declared by the manufacturer.  
(2) 2.4G Wi-Fi and 5G Wi-Fi cannot transmit simultaneously.

**Conclusion:** The device meets the exemption requirement.

## RSS-GEN ISSUE5 Clause 8.8 – AC POWER-LINE CONDUCTED EMISSIONS LIMITS

### Applicable Standard

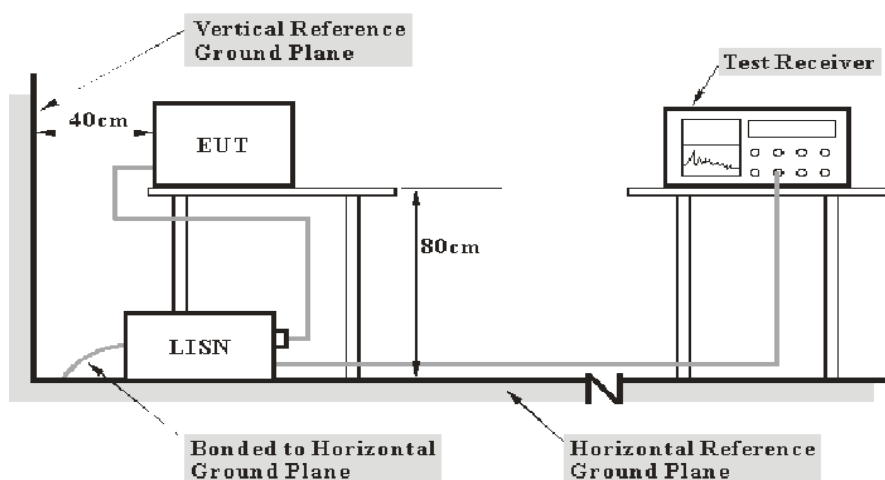
Unless stated otherwise in the applicable RSS, for radio apparatus that are designed to be connected to the public utility AC power network, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the range 150 kHz to 30 MHz shall not exceed the limits in table 4, as measured using a 50  $\mu$ H / 50  $\Omega$  line impedance stabilization network. This requirement applies for the radio frequency voltage measured between each power line and the ground terminal of each AC power-line mains cable of the EUT.

For an EUT that connects to the AC power lines indirectly, through another device, the requirement for compliance with the limits in table 4 shall apply at the terminals of the AC power-line mains cable of a representative support device, while it provides power to the EUT. The lower limit applies at the boundary between the frequency ranges. The device used to power the EUT shall be representative of typical applications.

Table 4 - AC Power Line Conducted Emissions Limits		
Frequency range (MHz)	Conducted limit (dB $\mu$ V)	
	Quasi-Peak	Average
0.15 – 0.5	66 to 56 <sup>1</sup>	56 to 46 <sup>1</sup>
0.5 – 5	56	46
5 – 30	60	50

**Note 1:** The level decreases linearly with the logarithm of the frequency.

### EUT Setup



- Note:**
1. Support units were connected to second LISN.
  2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with ANSI C63.10-2013.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

### EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

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

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

### Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

### Corrected Factor & Over Limit Calculation

The Corrected factor is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

$$\text{Factor (dB)} = \text{LISN VDF (dB)} + \text{Cable Loss (dB)} + \text{Transient Limiter Attenuation (dB)}$$

The “**Over Limit**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, an over Limit of 7dB means the emission is 7 dB above the limit. The equation for over Limit calculation is as follows:

$$\text{Over Limit (dB)} = \text{Read level (dB}\mu\text{V)} + \text{Factor (dB)} - \text{Limit (dB}\mu\text{V)}$$

### Test Results Summary

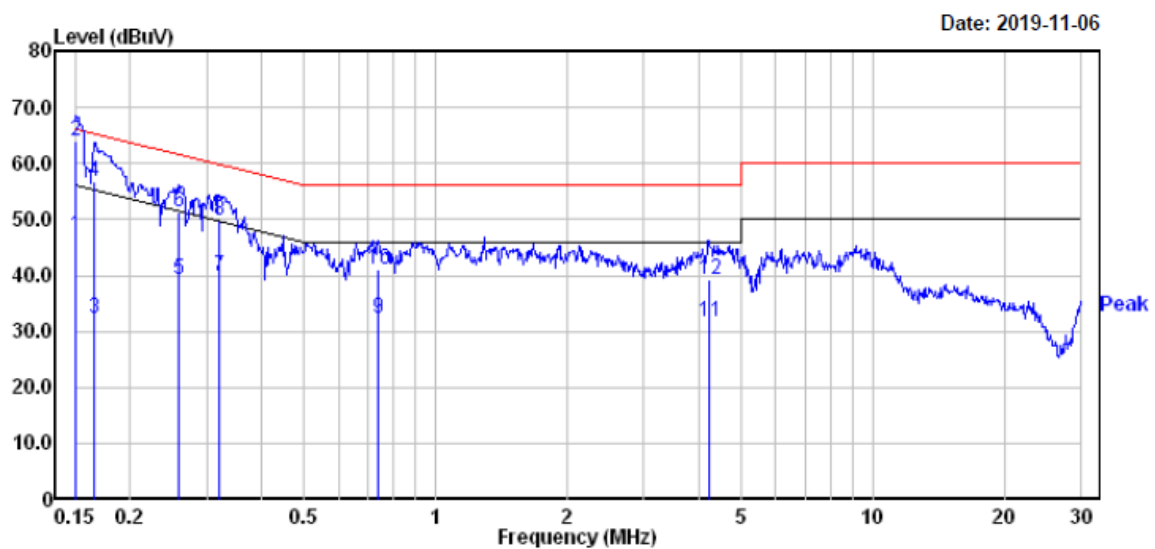
According to the recorded data in following table, the EUT complied with the RSS-GEN Issue 5.

**Test Data****Environmental Conditions**

<b>Temperature:</b>	24.2 °C
<b>Relative Humidity:</b>	50 %
<b>ATM Pressure:</b>	101.5 kPa

The testing was performed by Carry Cai on 2019-11-06.

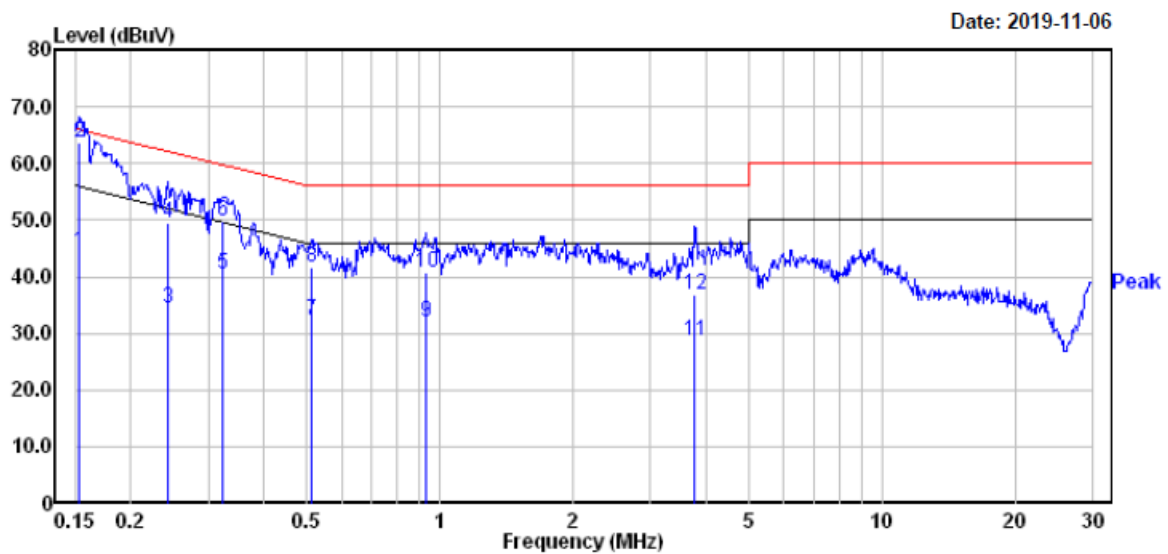
EUT operation mode: Transmitting in 802.11n-HT20 mode low channel (worst case)

**AC 120V/60 Hz, Line**

		Read			Limit	Over	
	Freq	Level	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.150	27.30	19.82	47.12	56.00	-8.88	Average
2	0.150	44.10	19.82	63.92	66.00	-2.08	QP
3	0.166	12.60	19.83	32.43	55.16	-22.73	Average
4	0.166	36.90	19.83	56.73	65.16	-8.43	QP
5	0.258	19.30	19.82	39.12	51.51	-12.39	Average
6	0.258	31.40	19.82	51.22	61.51	-10.29	QP
7	0.320	20.00	19.82	39.82	49.71	-9.89	Average
8	0.320	30.00	19.82	49.82	59.71	-9.89	QP
9	0.739	12.50	19.73	32.23	46.00	-13.77	Average
10	0.739	21.20	19.73	40.93	56.00	-15.07	QP
11	4.224	12.10	19.47	31.57	46.00	-14.43	Average
12	4.224	19.80	19.47	39.27	56.00	-16.73	QP



## AC 120V/60 Hz, Neutral



	Freq	Read		Limit	Over	
	MHz	Level	Factor	Line	Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB
1	0.153	24.50	19.82	44.32	55.82	-11.50 Average
2	0.153	44.00	19.82	63.82	65.82	-2.00 QP
3	0.243	14.60	19.82	34.42	52.00	-17.58 Average
4	0.243	29.80	19.82	49.62	62.00	-12.38 QP
5	0.322	20.50	19.82	40.32	49.66	-9.34 Average
6	0.322	29.90	19.82	49.72	59.66	-9.94 QP
7	0.513	12.40	19.76	32.16	46.00	-13.84 Average
8	0.513	21.80	19.76	41.56	56.00	-14.44 QP
9	0.928	12.19	19.76	31.95	46.00	-14.05 Average
10	0.928	20.99	19.76	40.75	56.00	-15.25 QP
11	3.779	9.10	19.47	28.57	46.00	-17.43 Average
12	3.779	17.50	19.47	36.97	56.00	-19.03 QP

## Note:

- 1) Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)  
 2) Over Limit (dB) = Read level (dBuV) + Factor (dB) - Limit (dBuV)

## **RSS-247 ISSUE2 Clause 5.5 & RSS-GEN ISSUE5 Clause 8.10 –UNWANTED EMISSIONS & RESTRICTED FREQUENCY BANDS**

### **Applicable Standard**

According to RSS-247 Issue2 Clause 5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-GEN is not required.

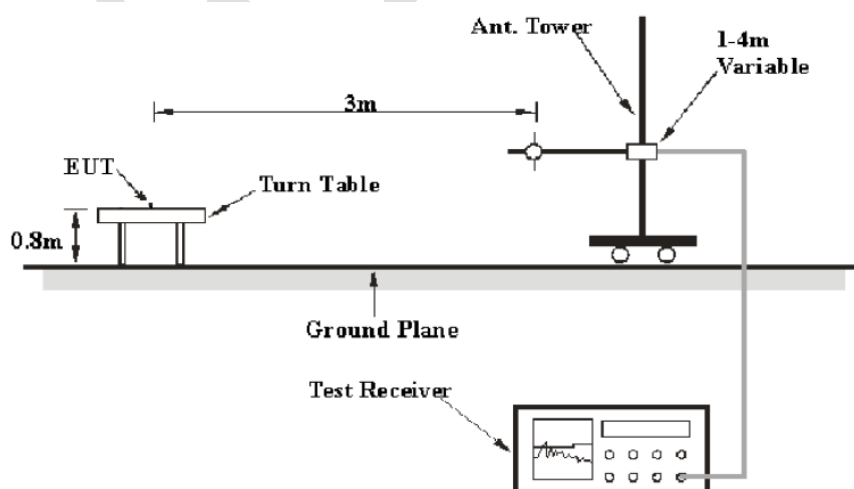
According to RSS-GEN Issue5 Clause 8.10

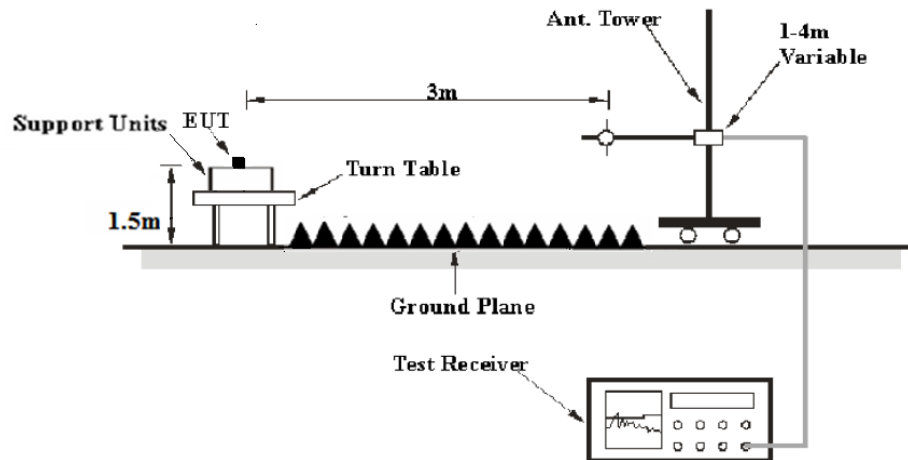
Restricted frequency bands, identified in table 7, are designated primarily for safety-of-life services (distress calling and certain aeronautical activities), certain satellite downlinks, radio astronomy and some government uses. Except where otherwise indicated, the following conditions related to the restricted frequency bands apply:

- (a) The transmit frequency, including fundamental components of modulation, of licence-exempt radio apparatus shall not fall within the restricted frequency bands listed in table 7 except for apparatus compliant with RSS-287;
- (b) Unwanted emissions that fall into restricted frequency bands listed in table 7 shall comply with the limits specified in table 5 and table 6.
- (c) Unwanted emissions that do not fall within the restricted frequency bands listed in table 7 shall comply either with the limits specified in the applicable RSS or with those specified in table 5 and table 6.

### **EUT Setup**

**Below 1 GHz:**



**Above 1GHz:**

The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the RSS-247 Issue2 Clause 5.5 limits.

**EMI Test Receiver Setup**

The system was investigated from 30 MHz to 25 GHz.

During the radiated emission test, the EMI test receiver setup was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1GHz	1MHz	3 MHz	/	PK
	1MHz	3 MHz	/	Ave.

**Test Procedure**

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1 GHz, peak and Average detection modes for frequencies above 1 GHz.

### Factor & Over Limit Calculation – for Below 1GHz

The Factor is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Factor (dB)} = \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} - \text{Amplifier Gain (dB)}$$

The “**Over Limit**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, an over limit of 7 dB means the emission is 7 dB above the limit. The equation for over limit calculation is as follows:

$$\text{Over Limit (dB)} = \text{Read level (dB}\mu\text{V)} + \text{Factor (dB)} - \text{Limit (dB}\mu\text{V)}$$

### Corrected Amplitude & Margin Calculation – for Above 1GHz

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude (dB}\mu\text{V/m)} = \text{Meter Reading (dB}\mu\text{V)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} - \text{Amplifier Gain (dB)}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin (dB)} = \text{Limit (dB}\mu\text{V/m)} - \text{Corrected Amplitude (dB}\mu\text{V/m)}$$

### Test Results Summary

According to the recorded data in following table, the EUT complied with the RSS-247 Issue2 Clause 5.5.

#### Test Data

##### Environmental Conditions

<b>Temperature:</b>	21.2-23.5 °C
<b>Relative Humidity:</b>	49-51 %
<b>ATM Pressure:</b>	101.3-102.1 kPa

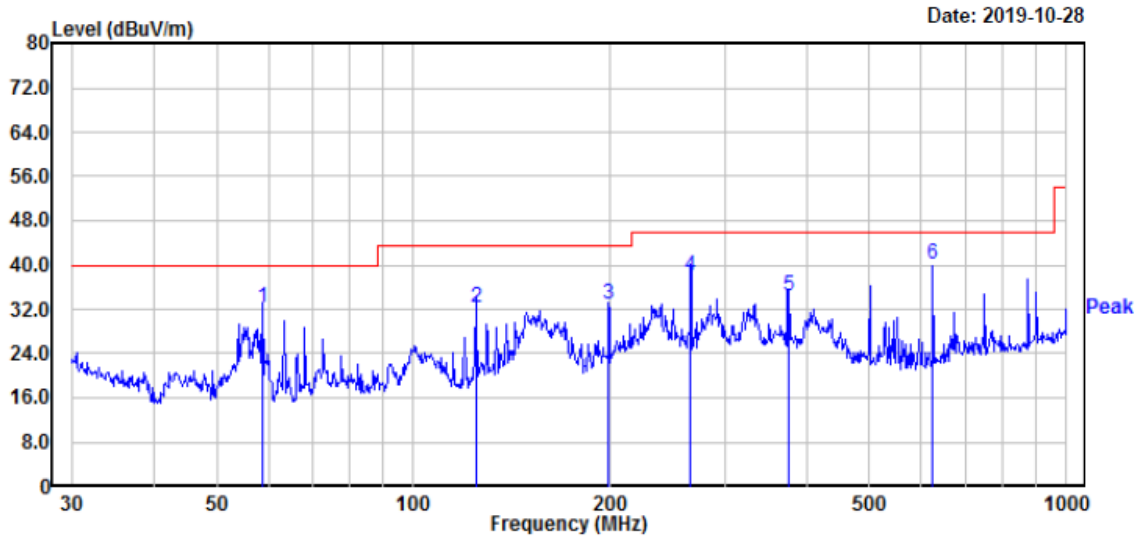
*The testing was performed by Carry Cai from 2019-10-28 to 2019-11-07.*

**Test Result:** Compliant.

*EUT operation mode: Transmitting*

**Spurious Emission Test:****30MHz-1GHz:****Horizontal:**

Pre-scan with 802.11b, 802.11g, 802.11n-HT20 and 802.11n-HT40 modes of operation in the X,Y and Z axes of orientation, the worst case **low channel of 802.11n-HT40 mode in Z-axis of orientation** was recorded

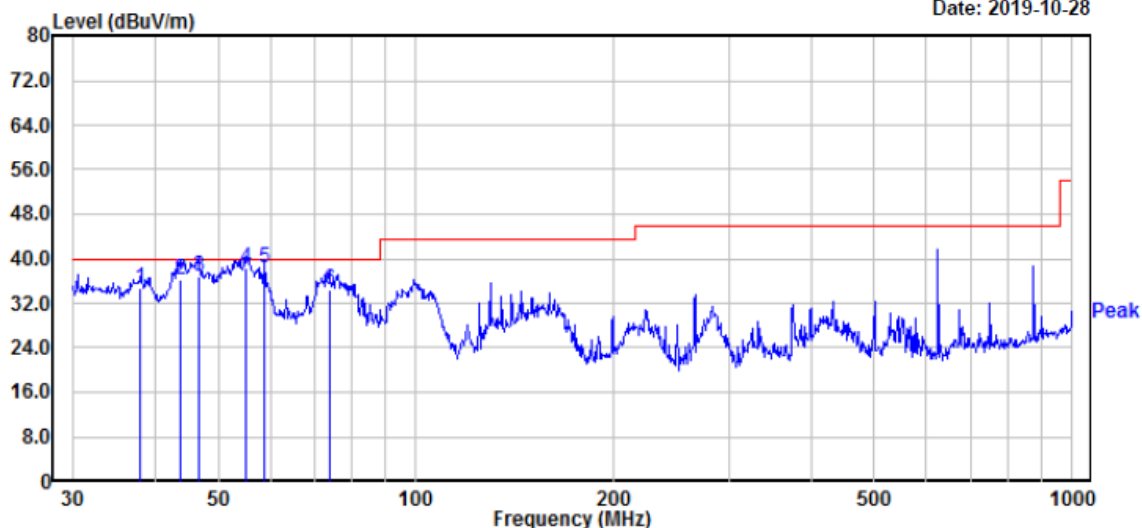


	Freq	Read Level	Level	Limit Line	Over Limit	APos	TPos	Remark	Factor
	MHz	dBuV	dBuV/m	dBuV/m	dB	cm	deg		dB/m
1	58.82	49.80	32.31	40.00	-7.69	200	191	QP	-17.49
2	124.57	43.19	32.28	43.50	-11.22	200	242	QP	-10.91
3	199.29	44.70	33.03	43.50	-10.47	100	261	QP	-11.67
4	265.68	49.39	38.07	46.00	-7.93	100	279	QP	-11.32
5	375.94	42.89	34.54	46.00	-11.46	100	144	QP	-8.35
6	625.08	43.69	40.17	46.00	-5.83	200	322	QP	-3.52

**Vertical:**

Pre-scan with 802.11b, 802.11g, 802.11n-HT20 and 802.11n-HT40 modes of operation in the X,Y and Z axes of orientation, the worst case **low channel of 802.11n-HT40 mode in Z-axis of orientation** was recorded

Date: 2019-10-28



	Freq	Read Level	Level	Limit Line	Over Limit	APos	TPos	Remark	Factor
	MHz	dBuV	dBuV/m	dBuV/m	dB	cm	deg		dB/m
1	38.08	44.49	34.65	40.00	-5.35	100	279	QP	-9.84
2	43.66	49.70	36.24	40.00	-3.76	100	297	QP	-13.46
3	46.67	52.00	36.89	40.00	-3.11	100	291	QP	-15.11
4	55.22	55.70	38.44	40.00	-1.56	100	270	QP	-17.26
5	58.82	55.90	38.41	40.00	-1.59	100	228	QP	-17.49
6	73.88	51.51	34.50	40.00	-5.50	100	103	QP	-17.01

**1GHz-18GHz****ANT 1:****802.11b Mode:**

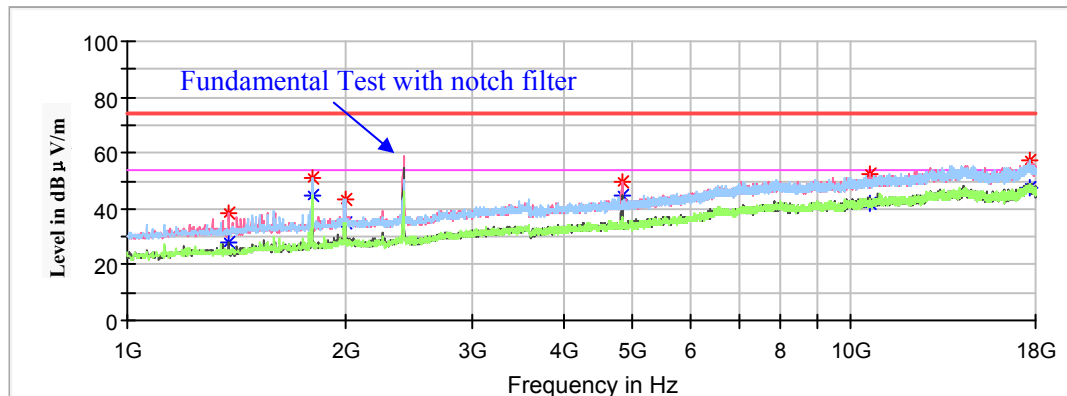
(Pre-scan in the X,Y and Z axes of orientation, the worst case **Z-axis of orientation** was recorded)

Note:

1. This test was performed with the 2.4-2.5GHz notch filter.
2. Corrected Factor (dB/m) = Antenna factor (RX) (dB/m) + Cable Loss (dB) – Amplifier Factor (dB)  
 Corrected Amplitude (dBμV/m) = Corrected Factor (dB/m) + Reading (dBμV)  
 Margin (dB) = Limit (dBμV/m) – Corrected Amplitude (dBμV/m)

**Low Channel: 2412MHz**

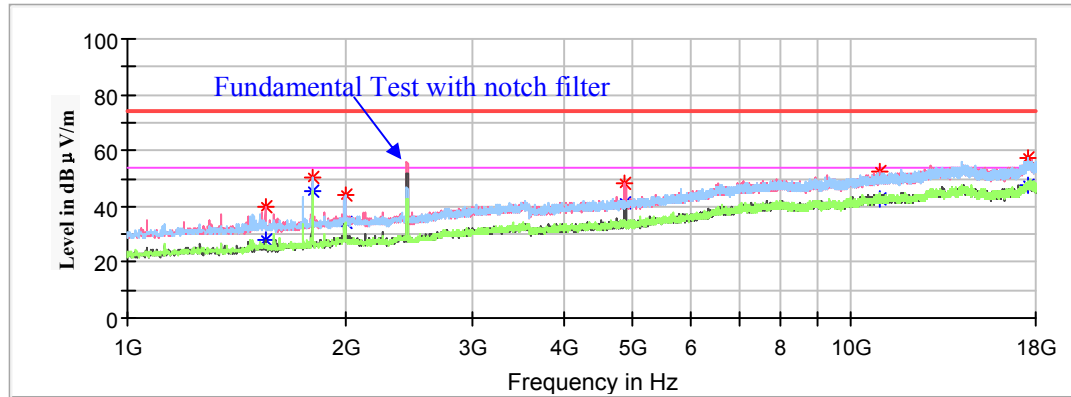
Full Spectrum



Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1382.50	---	27.78	100.0	V	93.0	-10.6	54.00	26.22
1382.50	38.43	---	100.0	V	93.0	-10.6	74.00	35.57
1799.00	---	45.06	150.0	H	33.0	-8.9	54.00	8.94
1799.00	50.82	---	150.0	H	33.0	-8.9	74.00	23.18
1997.90	---	34.98	200.0	V	9.0	-8.2	54.00	19.02
1997.90	43.46	---	200.0	V	9.0	-8.2	74.00	30.54
4824.00	---	44.44	150.0	V	171.0	-0.5	54.00	9.56
4824.00	49.37	---	150.0	V	171.0	-0.5	74.00	24.63
10601.60	---	41.73	100.0	V	358.0	9.1	54.00	12.27
10601.60	52.29	---	100.0	V	358.0	9.1	74.00	21.71
17692.30	---	47.88	200.0	H	50.0	14.0	54.00	6.12
17692.30	57.12	---	200.0	H	50.0	14.0	74.00	16.88

**Middle Channel: 2437MHz**

Full Spectrum

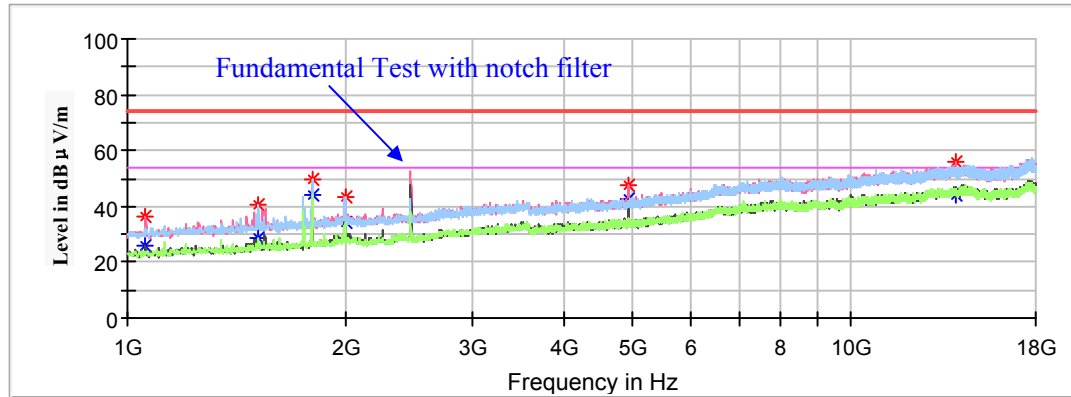


Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1549.10	---	27.78	100.0	V	52.0	-9.8	54.00	26.22
1549.10	40.17	---	100.0	V	52.0	-9.8	74.00	33.83
1799.00	---	45.12	100.0	H	45.0	-8.9	54.00	8.88
1799.00	50.36	---	100.0	H	45.0	-8.9	74.00	23.64
1997.90	---	34.39	100.0	H	59.0	-8.2	54.00	19.61
1997.90	44.30	---	100.0	H	59.0	-8.2	74.00	29.70
4874.00	---	41.14	200.0	V	284.0	-0.5	54.00	12.86
4874.00	47.92	---	200.0	V	284.0	-0.5	74.00	26.08
10928.00	---	42.65	200.0	V	327.0	9.6	54.00	11.35
10928.00	52.46	---	200.0	V	327.0	9.6	74.00	21.54
17598.80	---	47.46	200.0	H	234.0	14.1	54.00	6.54
17598.80	57.30	---	200.0	H	234.0	14.1	74.00	16.70



**High Channel: 2462MHz**

Full Spectrum



Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1059.50	---	25.89	150.0	V	250.0	-12.3	54.00	28.11
1059.50	36.36	---	150.0	V	250.0	-12.3	74.00	37.64
1518.50	---	28.71	200.0	H	341.0	-9.9	54.00	25.29
1518.50	40.57	---	200.0	H	341.0	-9.9	74.00	33.43
1799.00	---	44.08	200.0	H	24.0	-8.9	54.00	9.92
1799.00	49.85	---	200.0	H	24.0	-8.9	74.00	24.15
1997.90	---	34.59	150.0	H	32.0	-8.2	54.00	19.41
1997.90	43.23	---	150.0	H	32.0	-8.2	74.00	30.77
4924.00	---	42.31	100.0	V	19.0	-0.4	54.00	11.69
4924.00	47.59	---	100.0	V	19.0	-0.4	74.00	26.41
13935.30	---	44.38	100.0	V	300.0	12.4	54.00	9.62
13935.30	55.78	---	100.0	V	300.0	12.4	74.00	18.22

**802.11g Mode:**

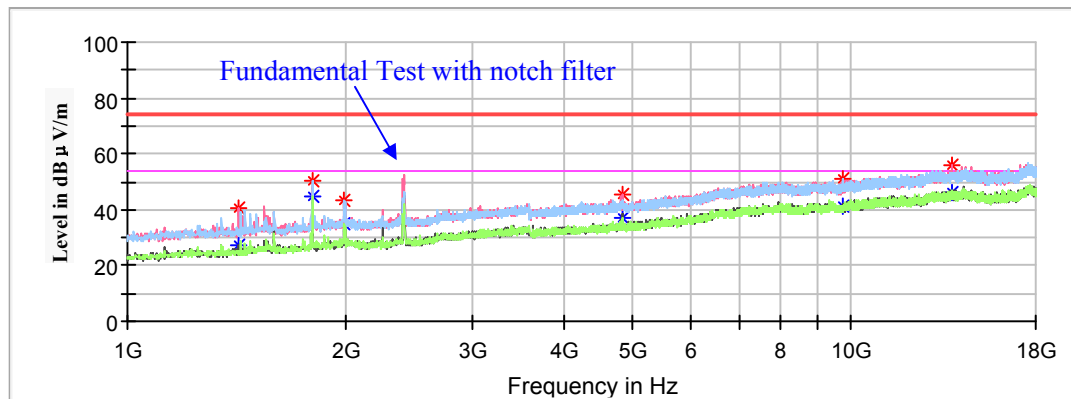
(Pre-scan in the X,Y and Z axes of orientation, the worst case **Z-axis of orientation** was recorded)

Note:

1. This test was performed with the 2.4-2.5GHz notch filter.
2. Corrected Factor (dB/m) = Antenna factor (RX) (dB/m) + Cable Loss (dB) – Amplifier Factor (dB)  
 Corrected Amplitude (dB $\mu$ V/m) = Corrected Factor (dB/m) + Reading (dB $\mu$ V)  
 Margin (dB) = Limit (dB $\mu$ V/m) – Corrected Amplitude (dB $\mu$ V/m)

**Low Channel: 2412MHz**

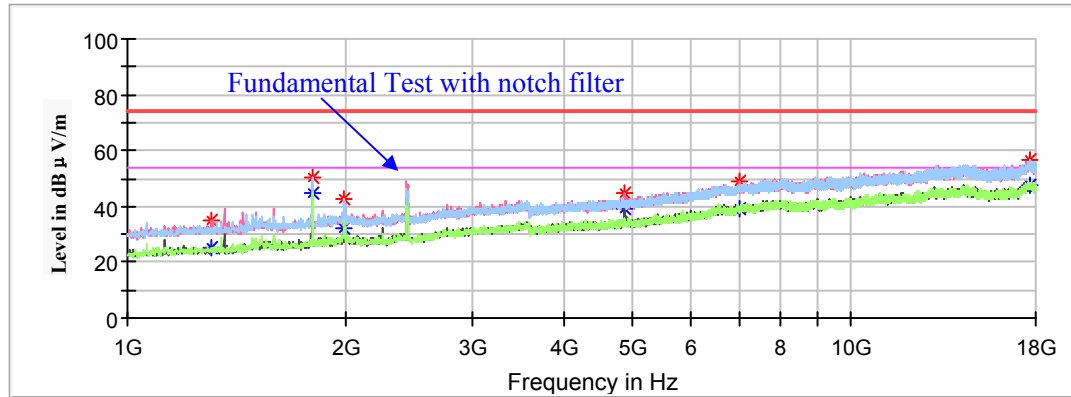
Full Spectrum



Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dB $\mu$ V/m)	Margin (dB)
	MaxPeak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)	Height (cm)	Polar (H/V)				
1425.00	---	27.37	150.0	V	0.0	-10.3	54.00	26.63
1425.00	40.88	---	150.0	V	0.0	-10.3	74.00	33.12
1799.00	---	44.44	200.0	H	32.0	-8.9	54.00	9.56
1799.00	50.59	---	200.0	H	32.0	-8.9	74.00	23.41
1996.20	---	35.17	200.0	H	300.0	-8.3	54.00	18.83
1996.20	43.60	---	200.0	H	300.0	-8.3	74.00	30.40
4824.00	---	36.95	200.0	V	0.0	-0.5	54.00	17.05
4824.00	45.75	---	200.0	V	0.0	-0.5	74.00	28.25
9739.70	---	41.49	200.0	H	79.0	7.9	54.00	12.51
9739.70	50.77	---	200.0	H	79.0	7.9	74.00	23.23
13756.80	---	46.28	150.0	V	124.0	12.2	54.00	7.72
13756.80	55.98	---	150.0	V	124.0	12.2	74.00	18.02

**Middle Channel: 2437MHz**

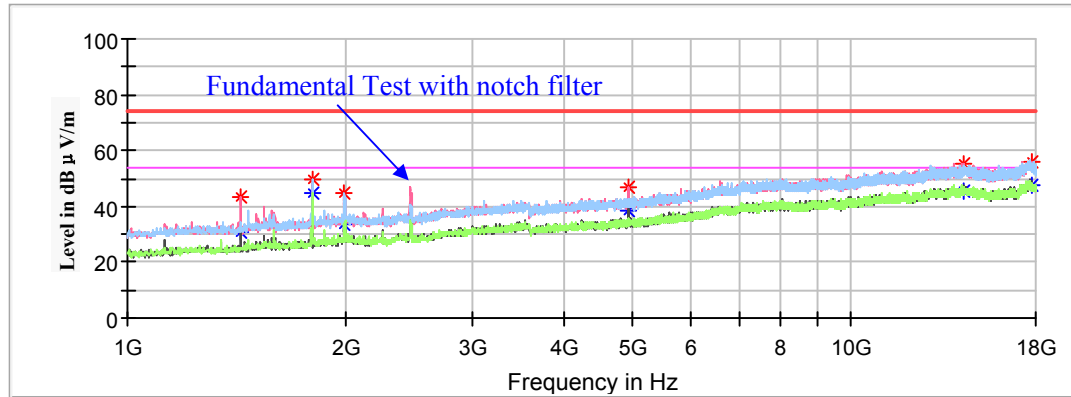
Full Spectrum



Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dB $\mu$ V/m)	Margin (dB)
	MaxPeak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)	Height (cm)	Polar (H/V)				
1304.30	---	25.28	200.0	V	58.0	-11.0	54.00	28.72
1304.30	35.08	---	200.0	V	58.0	-11.0	74.00	38.92
1799.00	---	44.95	200.0	H	32.0	-8.9	54.00	9.05
1799.00	50.14	---	200.0	H	32.0	-8.9	74.00	23.86
1996.20	---	31.90	200.0	V	328.0	-8.3	54.00	22.10
1996.20	42.82	---	200.0	V	328.0	-8.3	74.00	31.18
4874.00	---	39.39	200.0	V	281.0	-0.5	54.00	14.61
4874.00	44.67	---	200.0	V	281.0	-0.5	74.00	29.33
7311.00	---	39.06	150.0	V	309.0	5.8	54.00	14.94
7311.00	48.98	---	150.0	V	309.0	5.8	74.00	25.02
17629.40	---	47.45	200.0	H	0.0	14.1	54.00	6.55
17629.40	56.57	---	200.0	H	0.0	14.1	74.00	17.43

**High Channel: 2462MHz**

Full Spectrum



Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dB $\mu$ V/m)	Margin (dB)
	MaxPeak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)	Height (cm)	Polar (H/V)				
1433.50	---	30.44	200.0	V	42.0	-10.3	54.00	23.56
1433.50	43.29	---	200.0	V	42.0	-10.3	74.00	30.71
1799.00	---	44.84	200.0	H	32.0	-8.9	54.00	9.16
1799.00	49.79	---	200.0	H	32.0	-8.9	74.00	24.21
1996.20	---	33.50	200.0	H	307.0	-8.3	54.00	20.50
1996.20	44.42	---	200.0	H	307.0	-8.3	74.00	29.58
4924.00	---	38.53	150.0	V	331.0	-0.4	54.00	15.47
4924.00	46.98	---	150.0	V	331.0	-0.4	74.00	27.02
14282.10	---	45.30	200.0	V	86.0	12.6	54.00	8.70
14282.10	55.48	---	200.0	V	86.0	12.6	74.00	18.52
17830.00	---	47.40	200.0	V	115.0	13.8	54.00	6.60
17830.00	56.07	---	200.0	V	115.0	13.8	74.00	17.93

**ANT 2:****802.11b Mode:**

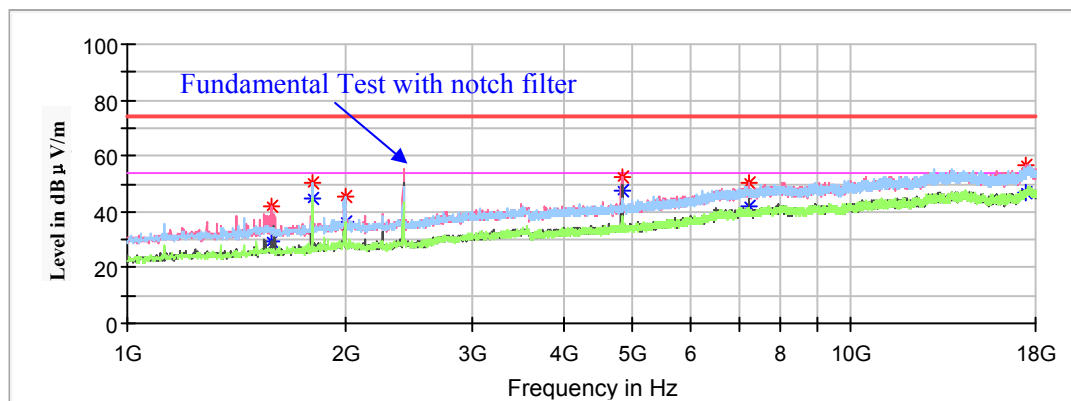
(Pre-scan in the X,Y and Z axes of orientation, the worst case **Z-axis of orientation** was recorded)

Note:

1. This test was performed with the 2.4-2.5GHz notch filter.
2. Corrected Factor (dB/m) = Antenna factor (RX) (dB/m) + Cable Loss (dB) – Amplifier Factor (dB)  
 Corrected Amplitude (dB $\mu$ V/m) = Corrected Factor (dB/m) + Reading (dB $\mu$ V)  
 Margin (dB) = Limit (dB $\mu$ V/m) – Corrected Amplitude (dB $\mu$ V/m)

**Low Channel: 2412MHz**

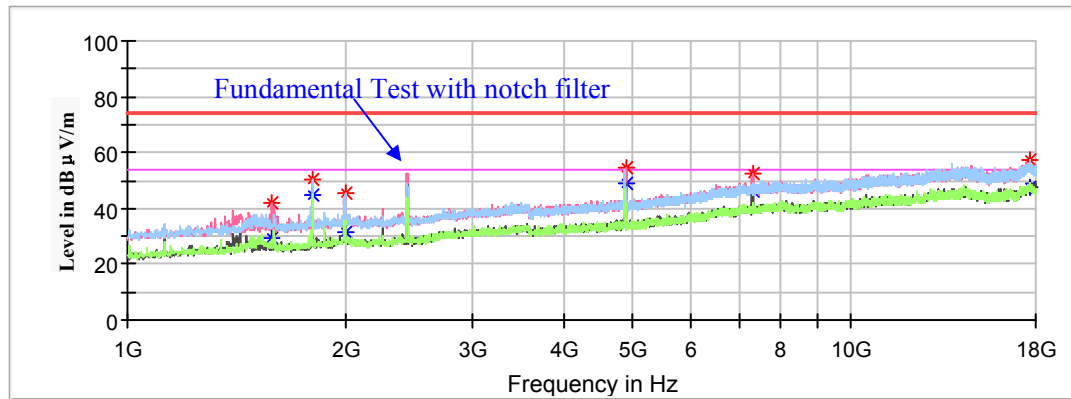
Full Spectrum



Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dB $\mu$ V/m)	Margin (dB)
	MaxPeak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)	Height (cm)	Polar (H/V)				
1579.70	---	29.33	200.0	V	219.0	-9.7	54.00	24.67
1579.70	41.86	---	200.0	V	219.0	-9.7	74.00	32.14
1799.00	---	44.58	200.0	H	175.0	-8.9	54.00	9.42
1799.00	50.50	---	200.0	H	175.0	-8.9	74.00	23.50
1997.90	---	36.10	150.0	H	159.0	-8.2	54.00	17.90
1997.90	45.31	---	150.0	H	159.0	-8.2	74.00	28.69
4824.00	---	47.49	150.0	V	172.0	-0.5	54.00	6.51
4824.00	52.74	---	150.0	V	172.0	-0.5	74.00	21.26
7240.70	---	42.25	200.0	V	347.0	5.7	54.00	11.75
7240.70	50.19	---	200.0	V	347.0	5.7	74.00	23.81
17488.30	---	47.00	200.0	V	0.0	14.2	54.00	7.00
17488.30	56.66	---	200.0	V	0.0	14.2	74.00	17.34

**Middle Channel: 2437MHz**

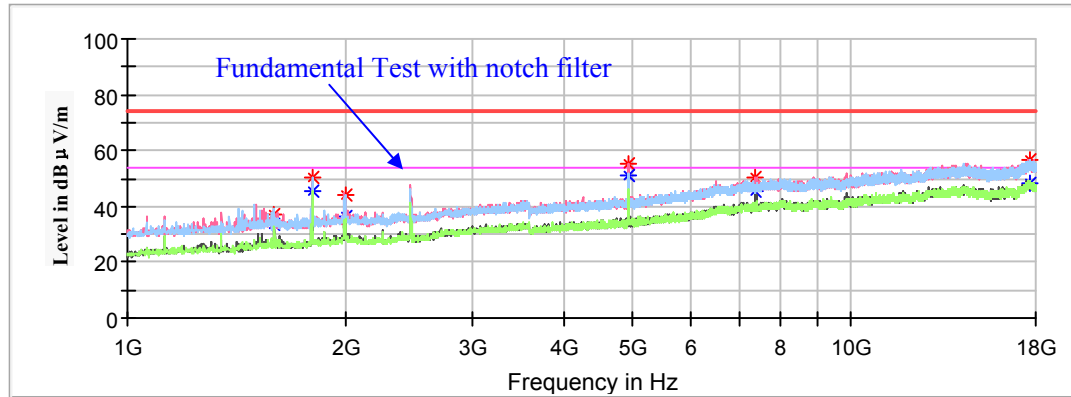
Full Spectrum



Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1581.40	---	29.05	200.0	V	52.0	-9.7	54.00	24.95
1581.40	41.83	---	200.0	V	52.0	-9.7	74.00	32.17
1799.00	---	44.95	200.0	H	359.0	-8.9	54.00	9.05
1799.00	50.69	---	200.0	H	359.0	-8.9	74.00	23.31
1999.60	---	31.25	200.0	H	300.0	-8.2	54.00	22.75
1999.60	45.41	---	200.0	H	300.0	-8.2	74.00	28.59
4874.00	---	48.81	200.0	V	67.0	-0.4	54.00	5.19
4874.00	54.58	---	200.0	V	67.0	-0.4	74.00	19.42
7311.00	---	45.98	200.0	V	351.0	5.8	54.00	8.02
7311.00	52.21	---	200.0	V	351.0	5.8	74.00	21.79
17636.20	---	47.83	150.0	H	199.0	14.1	54.00	6.17
17636.20	57.61	---	150.0	H	199.0	14.1	74.00	16.39

**High Channel: 2462MHz**

Full Spectrum



Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1596.70	---	33.73	200.0	V	74.0	-9.6	54.00	20.27
1596.70	37.27	---	200.0	V	74.0	-9.6	74.00	36.73
1799.00	50.56	---	150.0	H	43.0	-8.9	74.00	23.44
1799.00	---	45.23	150.0	H	43.0	-8.9	54.00	8.77
1997.90	44.22	---	200.0	V	12.0	-8.2	74.00	29.78
1997.90	---	36.33	200.0	V	12.0	-8.2	54.00	17.67
4924.00	---	50.74	200.0	V	0.0	-0.4	54.00	3.26
4924.00	55.16	---	200.0	V	0.0	-0.4	74.00	18.84
7386.00	50.38	---	200.0	V	358.0	5.9	74.00	23.62
7386.00	---	45.14	200.0	V	358.0	5.9	54.00	8.86
17649.80	---	48.29	200.0	V	266.0	14.0	54.00	5.71
17649.80	56.63	---	200.0	V	266.0	14.0	74.00	17.37

**802.11g Mode:**

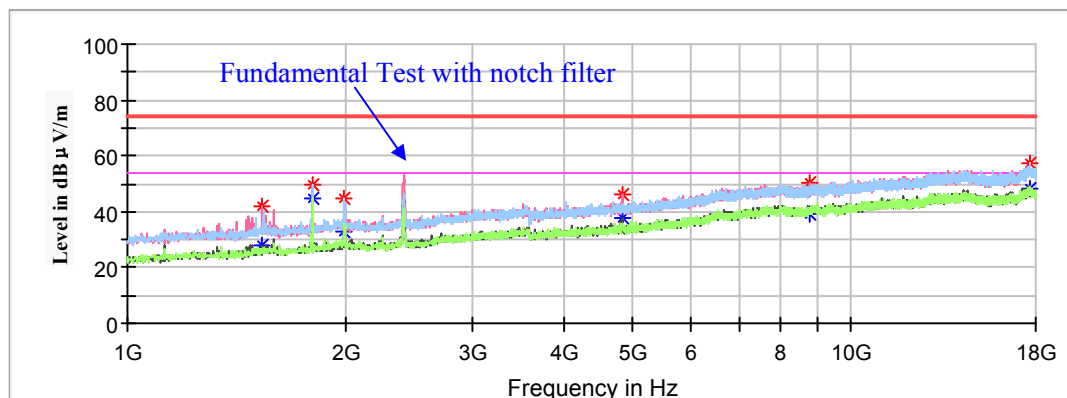
(Pre-scan in the X,Y and Z axes of orientation, the worst case **Z-axis of orientation** was recorded)

Note:

1. This test was performed with the 2.4-2.5GHz notch filter.
2. Corrected Factor (dB/m) = Antenna factor (RX) (dB/m) + Cable Loss (dB) – Amplifier Factor (dB)  
 Corrected Amplitude (dBμV/m) = Corrected Factor (dB/m) + Reading (dBμV)  
 Margin (dB) = Limit (dBμV/m) – Corrected Amplitude (dBμV/m)

**Low Channel: 2412MHz**

Full Spectrum

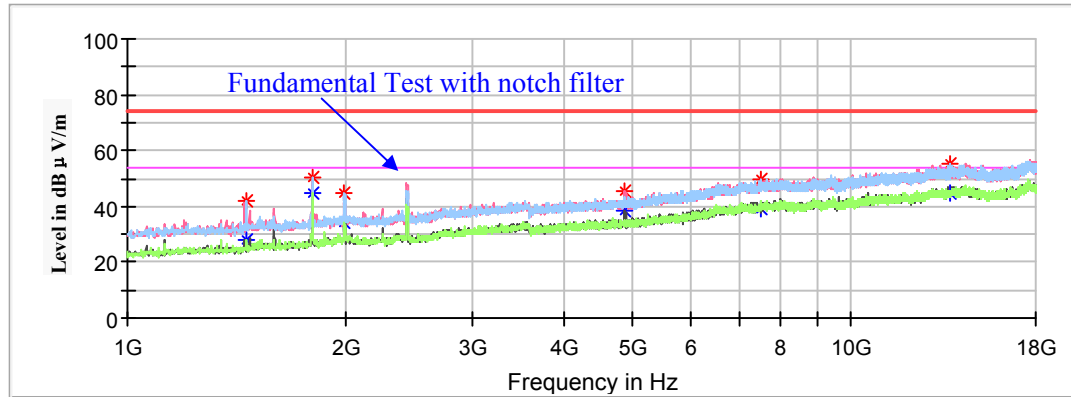


Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1532.10	---	28.22	150.0	V	356.0	-9.8	54.00	25.78
1532.10	41.89	---	150.0	V	356.0	-9.8	74.00	32.11
1799.00	---	44.50	200.0	H	32.0	-8.9	54.00	9.50
1799.00	49.62	---	200.0	H	32.0	-8.9	74.00	24.38
1994.50	---	32.70	150.0	H	323.0	-8.3	54.00	21.30
1994.50	44.64	---	150.0	H	323.0	-8.3	74.00	29.36
4824.00	---	37.76	200.0	V	0.0	-0.5	54.00	16.24
4824.00	46.20	---	200.0	V	0.0	-0.5	74.00	27.80
8755.40	---	39.39	200.0	V	274.0	7.0	54.00	14.61
8755.40	50.60	---	200.0	V	274.0	7.0	74.00	23.40
17629.40	---	48.37	150.0	H	39.0	14.1	54.00	5.63
17629.40	57.67	---	150.0	H	39.0	14.1	74.00	16.33



**Middle Channel: 2437MHz**

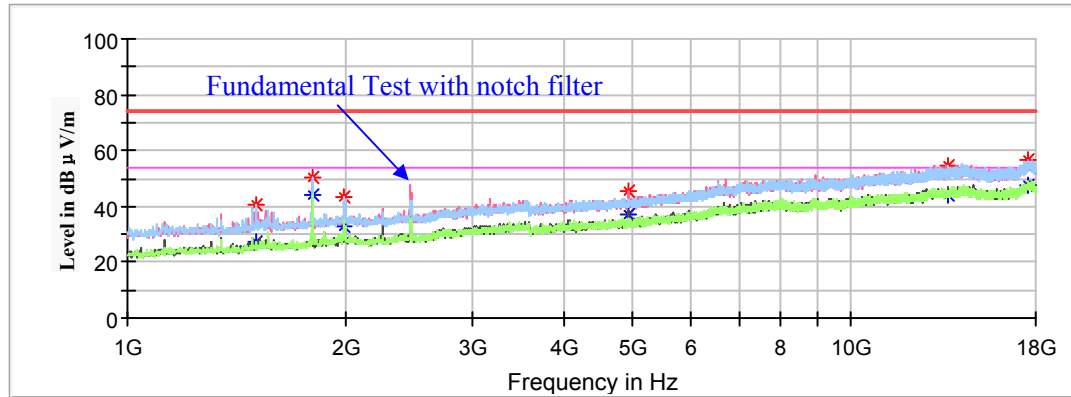
Full Spectrum



Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1462.40	---	28.28	200.0	H	344.0	-10.1	54.00	25.72
1462.40	42.07	---	200.0	H	344.0	-10.1	74.00	31.93
1799.00	---	44.82	200.0	H	32.0	-8.9	54.00	9.18
1799.00	50.08	---	200.0	H	32.0	-8.9	74.00	23.92
1996.20	---	34.41	150.0	H	312.0	-8.3	54.00	19.59
1996.20	44.71	---	150.0	H	312.0	-8.3	74.00	29.29
4874.00	---	38.15	200.0	V	250.0	-0.5	54.00	15.85
4874.00	45.29	---	200.0	V	250.0	-0.5	74.00	28.71
7485.50	---	39.14	200.0	H	354.0	6.1	54.00	14.86
7485.50	49.52	---	200.0	H	354.0	6.1	74.00	24.48
13682.00	---	44.49	150.0	H	53.0	12.1	54.00	9.51
13682.00	55.22	---	150.0	H	53.0	12.1	74.00	18.78

**High Channel: 2462MHz**

Full Spectrum



Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dB $\mu$ V/m)	Margin (dB)
	MaxPeak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)	Height (cm)	Polar (H/V)				
1503.20	---	27.34	150.0	H	358.0	-9.9	54.00	26.66
1503.20	40.73	---	150.0	H	358.0	-9.9	74.00	33.27
1799.00	---	44.19	200.0	H	32.0	-8.9	54.00	9.81
1799.00	50.26	---	200.0	H	32.0	-8.9	74.00	23.74
1994.50	---	32.70	150.0	H	312.0	-8.3	54.00	21.30
1994.50	43.57	---	150.0	H	312.0	-8.3	74.00	30.43
4924.00	---	37.07	200.0	V	221.0	-0.4	54.00	16.93
4924.00	45.52	---	200.0	V	221.0	-0.4	74.00	28.48
13580.00	---	44.00	150.0	H	312.0	12.0	54.00	10.00
13580.00	54.83	---	150.0	H	312.0	12.0	74.00	19.17
17573.30	---	47.88	200.0	V	133.0	14.2	54.00	6.12
17573.30	56.62	---	200.0	V	133.0	14.2	74.00	17.38

**ANT 3:****802.11b Mode:**

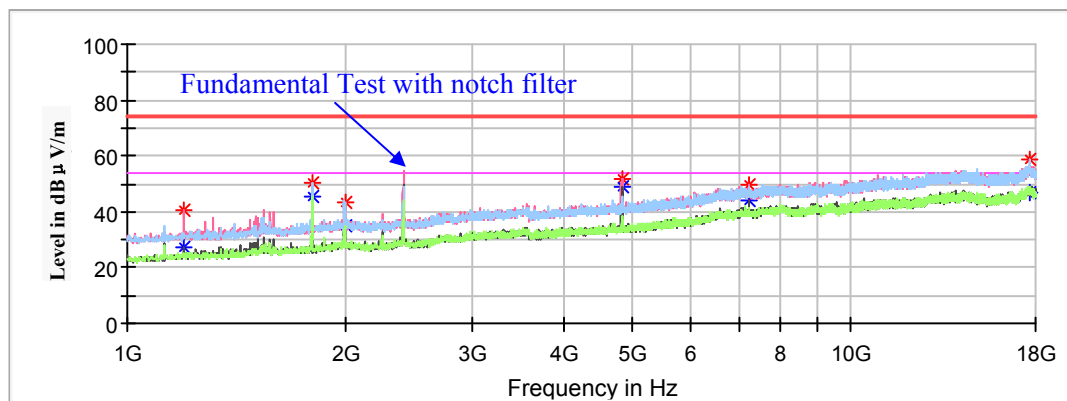
(Pre-scan in the X,Y and Z axes of orientation, the worst case **Z-axis of orientation** was recorded)

Note:

1. This test was performed with the 2.4-2.5GHz notch filter.
2. Corrected Factor (dB/m) = Antenna factor (RX) (dB/m) + Cable Loss (dB) – Amplifier Factor (dB)  
 Corrected Amplitude (dB $\mu$ V/m) = Corrected Factor (dB/m) + Reading (dB $\mu$ V)  
 Margin (dB) = Limit (dB $\mu$ V/m) – Corrected Amplitude (dB $\mu$ V/m)

**Low Channel: 2412MHz**

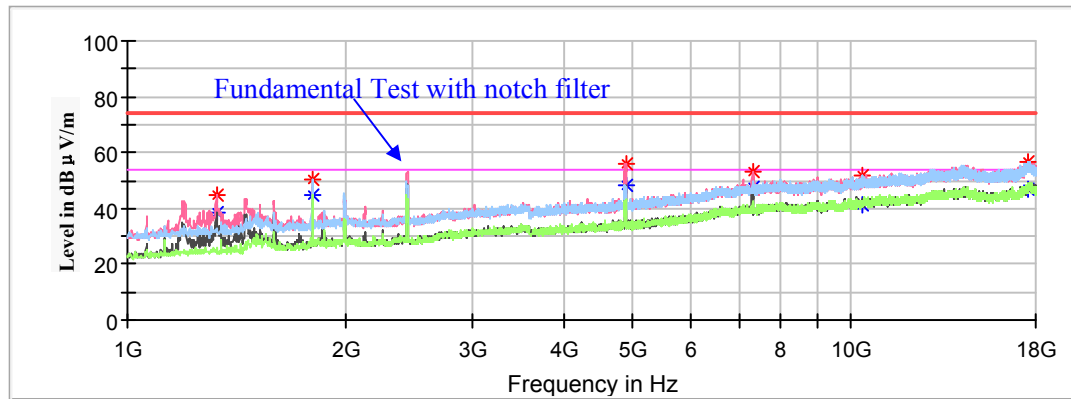
Full Spectrum



Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dB $\mu$ V/m)	Margin (dB)
	MaxPeak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)	Height (cm)	Polar (H/V)				
1197.20	---	27.43	150.0	V	77.0	-11.6	54.00	26.57
1197.20	40.69	---	150.0	V	77.0	-11.6	74.00	33.31
1799.00	---	45.15	200.0	H	175.0	-8.9	54.00	8.85
1799.00	50.47	---	200.0	H	175.0	-8.9	74.00	23.53
1997.90	---	35.21	150.0	H	160.0	-8.2	54.00	18.79
1997.90	43.34	---	150.0	H	160.0	-8.2	74.00	30.66
4824.00	---	48.69	200.0	V	0.0	-0.5	54.00	5.31
4824.00	51.83	---	200.0	V	0.0	-0.5	74.00	22.17
7236.00	---	43.94	200.0	V	334.0	5.7	54.00	10.06
7236.00	49.96	---	200.0	V	334.0	5.7	74.00	24.04
17654.90	---	47.20	200.0	H	265.0	14.0	54.00	6.80
17654.90	58.47	---	200.0	H	265.0	14.0	74.00	15.53

**Middle Channel: 2437MHz**

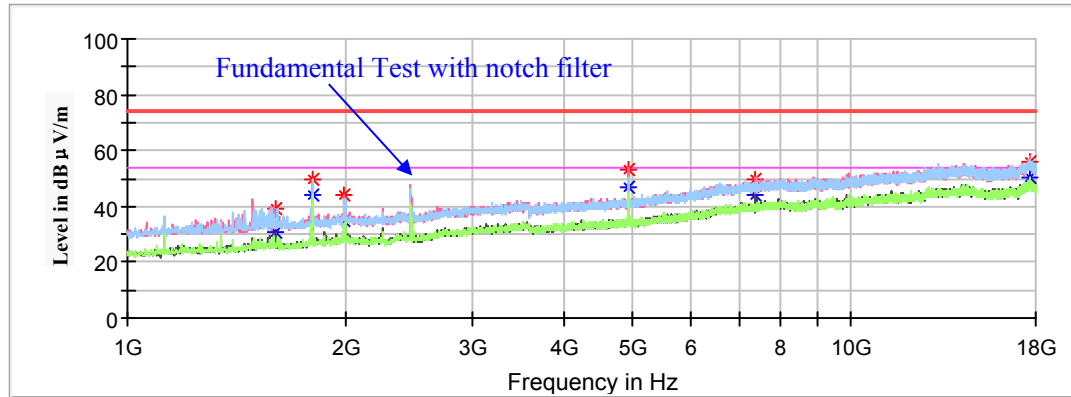
Full Spectrum



Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dB $\mu$ V/m)	Margin (dB)
	MaxPeak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)	Height (cm)	Polar (H/V)				
1328.10	---	38.19	200.0	V	73.0	-10.9	54.00	15.81
1328.10	44.58	---	200.0	V	73.0	-10.9	74.00	29.42
1799.00	---	45.02	150.0	H	358.0	-8.9	54.00	8.98
1799.00	50.38	---	150.0	H	358.0	-8.9	74.00	23.62
4874.00	---	48.57	200.0	V	58.0	-0.5	54.00	5.43
4874.00	56.19	---	200.0	V	58.0	-0.5	74.00	17.81
7311.00	---	47.82	200.0	V	351.0	5.8	54.00	6.18
7311.00	53.42	---	200.0	V	351.0	5.8	74.00	20.58
10367.00	---	40.93	150.0	H	31.0	8.8	54.00	13.07
10367.00	51.52	---	150.0	H	31.0	8.8	74.00	22.48
17595.40	---	46.76	200.0	V	161.0	14.1	54.00	7.24
17595.40	56.70	---	200.0	V	161.0	14.1	74.00	17.30

**High Channel: 2462MHz**

Full Spectrum



Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
	MaxPeak (dBµV/m)	Average (dBµV/m)	Height (cm)	Polar (H/V)				
1598.40	---	30.97	150.0	V	64.0	-9.6	54.00	23.03
1598.40	38.82	---	150.0	V	64.0	-9.6	74.00	35.18
1799.00	---	44.30	150.0	H	54.0	-8.9	54.00	9.70
1799.00	49.88	---	150.0	H	54.0	-8.9	74.00	24.12
1989.40	---	34.97	200.0	V	0.0	-8.3	54.00	19.03
1989.40	44.13	---	200.0	V	0.0	-8.3	74.00	29.87
4924.00	---	47.09	150.0	V	20.0	-0.4	54.00	6.91
4924.00	53.48	---	150.0	V	20.0	-0.4	74.00	20.52
7386.00	---	44.06	200.0	V	312.0	5.9	54.00	9.94
7386.00	49.86	---	200.0	V	312.0	5.9	74.00	24.14
17643.00	55.87	---	150.0	H	128.0	14.1	74.00	18.13
17643.00	---	50.06	150.0	H	128.0	14.1	54.00	3.94

**802.11g Mode:**

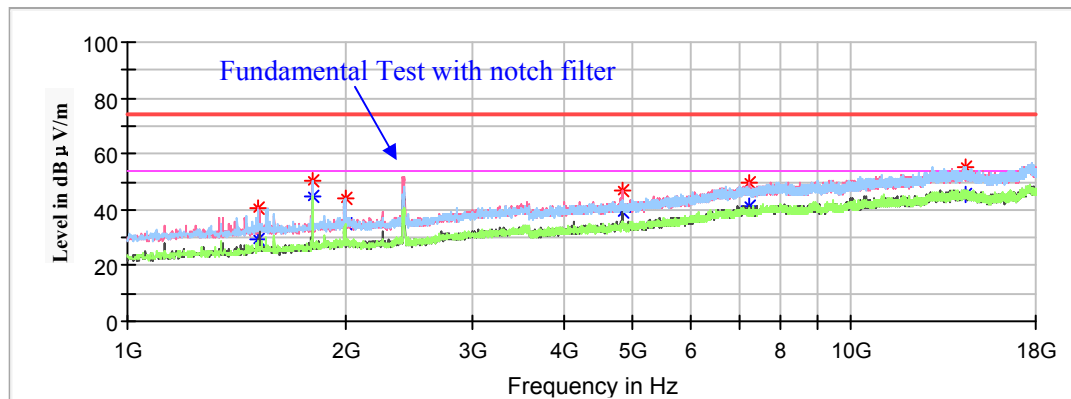
(Pre-scan in the X,Y and Z axes of orientation, the worst case **Z-axis of orientation** was recorded)

Note:

1. This test was performed with the 2.4-2.5GHz notch filter.
2. Corrected Factor (dB/m) = Antenna factor (RX) (dB/m) + Cable Loss (dB) – Amplifier Factor (dB)  
 Corrected Amplitude (dBμV/m) = Corrected Factor (dB/m) + Reading (dBμV)  
 Margin (dB) = Limit (dBμV/m) – Corrected Amplitude (dBμV/m)

**Low Channel: 2412MHz**

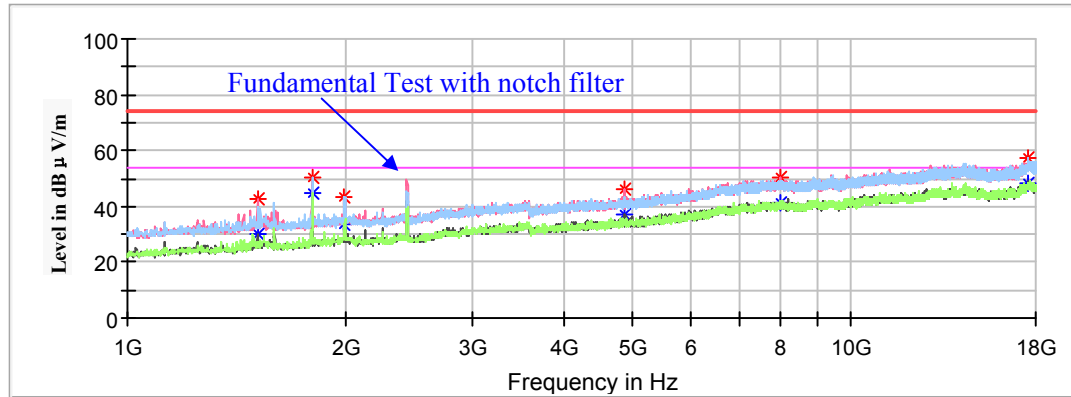
Full Spectrum



Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
1516.80	---	29.41	150.0	V	0.0	-9.9	54.00	24.59
1516.80	40.63	---	150.0	V	0.0	-9.9	74.00	33.37
1799.00	---	44.91	200.0	H	20.0	-8.9	54.00	9.09
1799.00	50.49	---	200.0	H	20.0	-8.9	74.00	23.51
1997.90	---	35.28	200.0	H	273.0	-8.2	54.00	18.72
1997.90	44.26	---	200.0	H	273.0	-8.2	74.00	29.74
4824.00	---	38.90	200.0	V	274.0	-0.5	54.00	15.10
4824.00	47.06	---	200.0	V	274.0	-0.5	74.00	26.94
7236.00	---	40.92	150.0	V	177.0	5.7	54.00	13.08
7236.00	49.57	---	150.0	V	177.0	5.7	74.00	24.43
14380.70	---	45.36	200.0	V	198.0	12.7	54.00	8.64
14380.70	55.57	---	200.0	V	198.0	12.7	74.00	18.43

**Middle Channel: 2437MHz**

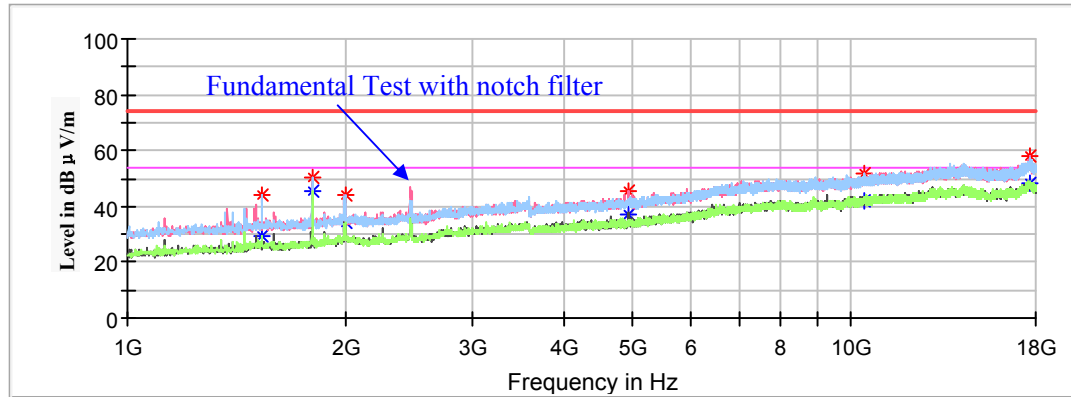
Full Spectrum



Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dB $\mu$ V/m)	Margin (dB)
	MaxPeak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)	Height (cm)	Polar (H/V)				
1511.70	---	30.32	200.0	V	52.0	-9.9	54.00	23.68
1511.70	42.55	---	200.0	V	52.0	-9.9	74.00	31.45
1799.00	---	44.44	200.0	H	33.0	-8.9	54.00	9.56
1799.00	50.52	---	200.0	H	33.0	-8.9	74.00	23.48
1989.40	---	33.84	200.0	H	302.0	-8.3	54.00	20.16
1989.40	43.62	---	200.0	H	302.0	-8.3	74.00	30.38
4874.00	---	37.04	150.0	V	274.0	-0.5	54.00	16.96
4874.00	46.48	---	150.0	V	274.0	-0.5	74.00	27.52
7998.90	---	40.93	150.0	V	66.0	7.1	54.00	13.07
7998.90	50.21	---	150.0	V	66.0	7.1	74.00	23.79
17595.40	---	48.32	150.0	V	245.0	14.1	54.00	5.68
17595.40	57.68	---	150.0	V	245.0	14.1	74.00	16.32

**High Channel: 2462MHz**

Full Spectrum



Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dB $\mu$ V/m)	Margin (dB)
	MaxPeak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)	Height (cm)	Polar (H/V)				
1535.50	---	29.71	200.0	H	354.0	-9.8	54.00	24.29
1535.50	44.11	---	200.0	H	354.0	-9.8	74.00	29.89
1799.00	---	45.21	200.0	H	19.0	-8.9	54.00	8.79
1799.00	50.11	---	200.0	H	19.0	-8.9	74.00	23.89
1997.90	---	34.01	200.0	H	302.0	-8.2	54.00	19.99
1997.90	43.99	---	200.0	H	302.0	-8.2	74.00	30.01
4924.00	---	37.35	200.0	V	216.0	-0.4	54.00	16.65
4924.00	45.47	---	200.0	V	216.0	-0.4	74.00	28.53
10448.60	---	41.92	200.0	H	198.0	8.9	54.00	12.08
10448.60	52.05	---	200.0	H	198.0	8.9	74.00	21.95
17668.50	---	48.50	200.0	V	5.0	14.0	54.00	5.50
17668.50	57.83	---	200.0	V	5.0	14.0	74.00	16.17



**802.11n-HT20 Mode(ANT 1&ANT 2&ANT 3 transmitting simultaneously):**

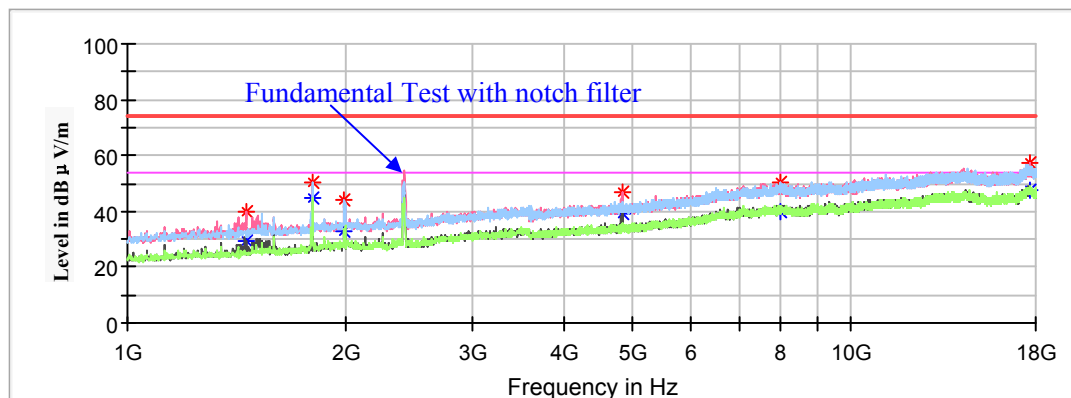
(Pre-scan in the X,Y and Z axes of orientation, the worst case **Z-axis of orientation** was recorded)

Note:

1. This test was performed with the 2.4-2.5GHz notch filter.
2. Corrected Factor (dB/m) = Antenna factor (RX) (dB/m) + Cable Loss (dB) – Amplifier Factor (dB)  
 Corrected Amplitude (dBμV/m) = Corrected Factor (dB/m) + Reading (dBμV)  
 Margin (dB) = Limit (dBμV/m) – Corrected Amplitude (dBμV/m)

**Low Channel : 2412MHz**

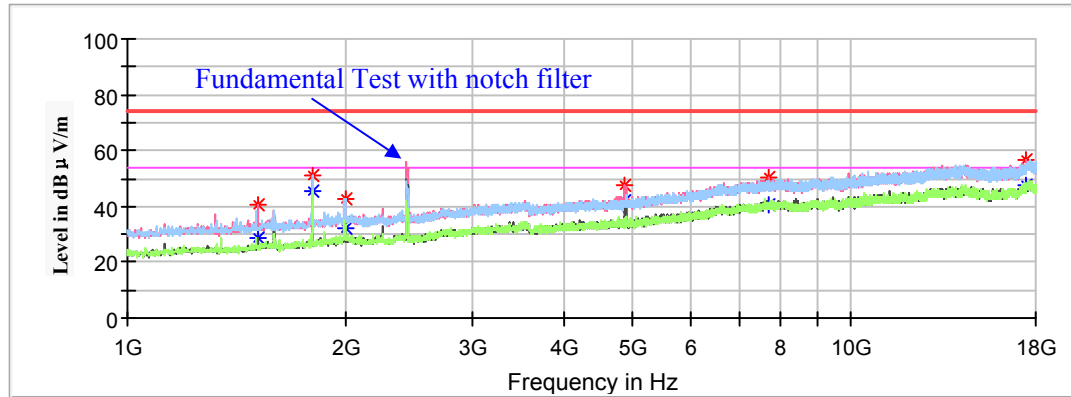
Full Spectrum



Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV /m)	Average (dBμV /m)	Height (cm)	Polar (H/V)				
1457.30	---	29.65	200.0	V	72.0	-10.2	54.00	24.35
1457.30	39.67	---	200.0	V	72.0	-10.2	74.00	34.33
1799.00	---	44.80	200.0	H	33.0	-8.9	54.00	9.20
1799.00	50.51	---	200.0	H	33.0	-8.9	74.00	23.49
1996.20	---	32.64	200.0	H	295.0	-8.3	54.00	21.36
1996.20	43.92	---	200.0	H	295.0	-8.3	74.00	30.08
4824.00	---	39.06	200.0	V	23.0	-0.5	54.00	14.94
4824.00	47.13	---	200.0	V	23.0	-0.5	74.00	26.87
8005.70	---	40.17	150.0	V	331.0	7.1	54.00	13.83
8005.70	50.50	---	150.0	V	331.0	7.1	74.00	23.50
17649.80	---	47.32	150.0	V	344.0	14.0	54.00	6.68
17649.80	57.54	---	150.0	V	344.0	14.0	74.00	16.46

**Middle Channel: 2437MHz**

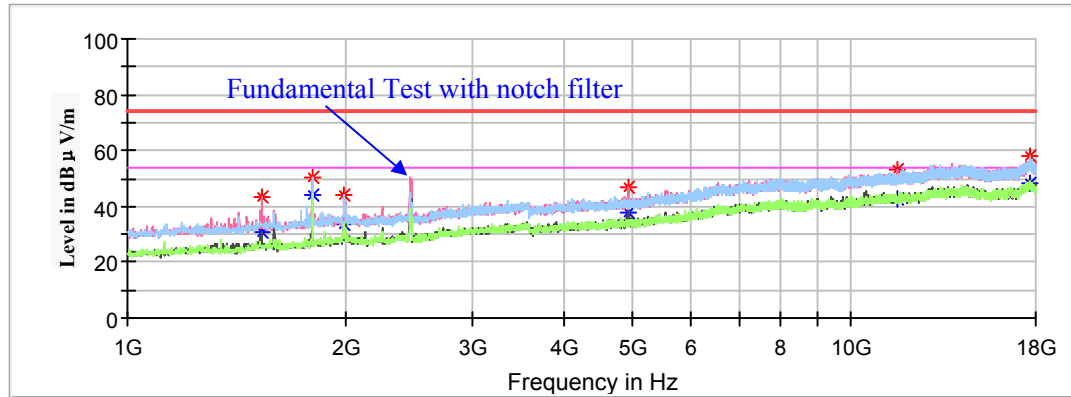
Full Spectrum



Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV /m)	Average (dBμV /m)	Height (cm)	Polar (H/V)				
1515.10	---	28.65	200.0	V	37.0	-9.9	54.00	25.35
1515.10	40.85	---	200.0	V	37.0	-9.9	74.00	33.15
1799.00	---	45.15	200.0	H	33.0	-8.9	54.00	8.85
1799.00	50.81	---	200.0	H	33.0	-8.9	74.00	23.19
1999.60	---	32.17	200.0	H	280.0	-8.2	54.00	21.83
1999.60	42.92	---	200.0	H	280.0	-8.2	74.00	31.08
4874.00	---	41.63	200.0	V	340.0	-0.5	54.00	12.37
4874.00	47.72	---	200.0	V	340.0	-0.5	74.00	26.28
7692.90	---	40.74	150.0	V	199.0	6.5	54.00	13.26
7692.90	50.38	---	150.0	V	199.0	6.5	74.00	23.62
17500.20	---	47.71	200.0	V	358.0	14.3	54.00	6.29
17500.20	56.40	---	200.0	V	358.0	14.3	74.00	17.60

**High Channel : 2462MHz**

Full Spectrum



Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dB $\mu$ V/m)	Margin (dB)
	MaxPeak (dB $\mu$ V /m)	Average (dB $\mu$ V /m)	Height (cm)	Polar (H/V)				
1532.10	---	31.01	150.0	V	38.0	-9.8	54.00	22.99
1532.10	43.42	---	150.0	V	38.0	-9.8	74.00	30.58
1799.00	---	44.21	200.0	H	33.0	-8.9	54.00	9.79
1799.00	50.63	---	200.0	H	33.0	-8.9	74.00	23.37
1994.50	---	33.39	200.0	H	311.0	-8.3	54.00	20.61
1994.50	43.97	---	200.0	H	311.0	-8.3	74.00	30.03
4924.00	---	37.54	200.0	V	340.0	-0.4	54.00	16.46
4924.00	46.69	---	200.0	V	340.0	-0.4	74.00	27.31
11575.70	---	42.98	200.0	V	0.0	9.8	54.00	11.02
11575.70	53.16	---	200.0	V	0.0	9.8	74.00	20.84
17687.20	---	47.98	150.0	V	148.0	14.0	54.00	6.02
17687.20	57.91	---	150.0	V	148.0	14.0	74.00	16.09

**802.11n-HT40 Mode(ANT 1&ANT 2&ANT 3 transmitting simultaneously):**

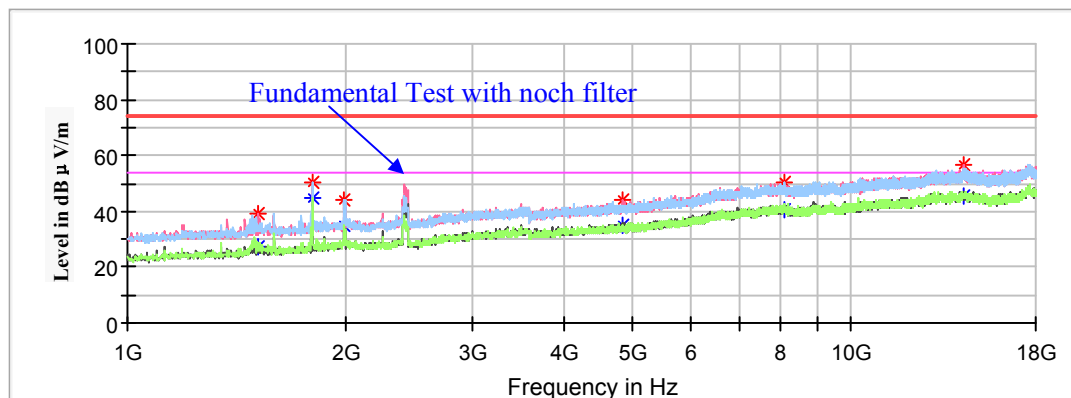
(Pre-scan in the X,Y and Z axes of orientation, the worst case **Z-axis of orientation** was recorded)

Note:

1. This test was performed with the 2.4-2.5GHz notch filter.
2. Corrected Factor (dB/m) = Antenna factor (RX) (dB/m) + Cable Loss (dB) – Amplifier Factor (dB)  
Corrected Amplitude (dB $\mu$ V/m) = Corrected Factor (dB/m) + Reading (dB $\mu$ V)  
Margin (dB) = Limit (dB $\mu$ V/m) – Corrected Amplitude (dB $\mu$ V/m)

**Low Channel : 2422MHz**

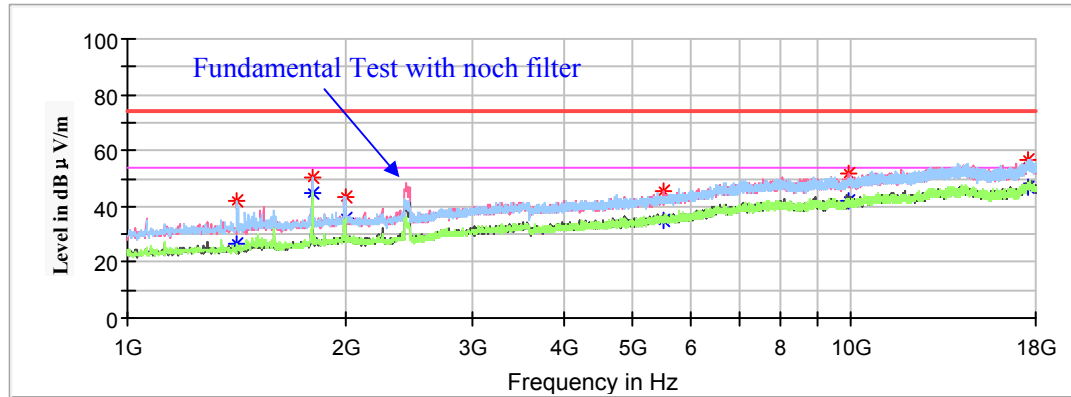
Full Spectrum



Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dB $\mu$ V/m)	Margin (dB)
	MaxPeak (dB $\mu$ V /m)	Average (dB $\mu$ V /m)	Height (cm)	Polar (H/V)				
1518.50	---	27.21	150.0	V	33.0	-9.9	54.00	26.79
1518.50	39.31	---	150.0	V	33.0	-9.9	74.00	34.69
1799.00	---	44.85	200.0	H	33.0	-8.9	54.00	9.15
1799.00	50.64	---	200.0	H	33.0	-8.9	74.00	23.36
1989.40	---	35.31	150.0	H	312.0	-8.3	54.00	18.69
1989.40	44.27	---	150.0	H	312.0	-8.3	74.00	29.73
4844.00	---	35.14	150.0	V	173.0	-0.5	54.00	18.86
4844.00	44.03	---	150.0	V	173.0	-0.5	74.00	29.97
8085.60	---	40.77	150.0	H	351.0	6.9	54.00	13.23
8085.60	50.10	---	150.0	H	351.0	6.9	74.00	23.90
14294.00	---	45.35	200.0	V	122.0	12.6	54.00	8.65
14294.00	56.65	---	200.0	V	122.0	12.6	74.00	17.35

**Middle Channel: 2437MHz**

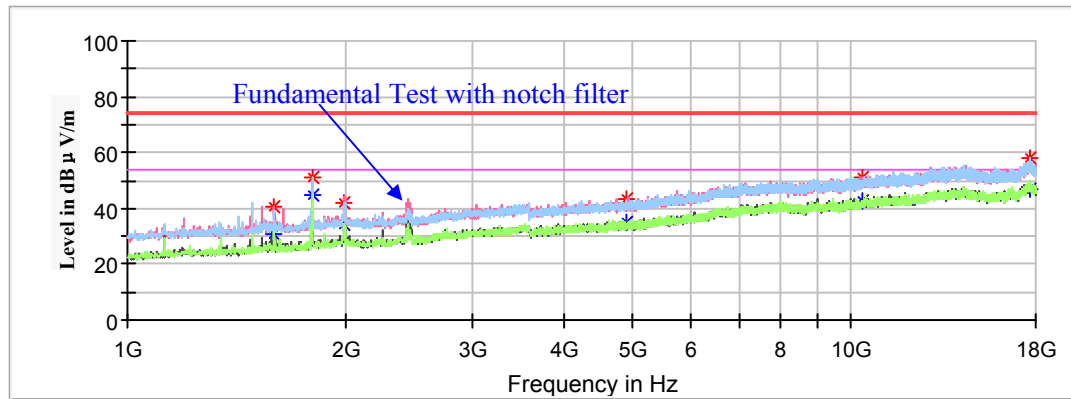
Full Spectrum



Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV /m)	Average (dBμV /m)	Height (cm)	Polar (H/V)				
1418.20	---	26.63	200.0	H	0.0	-10.4	54.00	27.37
1418.20	41.81	---	200.0	H	0.0	-10.4	74.00	32.19
1799.00	---	44.91	200.0	H	33.0	-8.9	54.00	9.09
1799.00	50.40	---	200.0	H	33.0	-8.9	74.00	23.60
1997.90	---	35.74	150.0	H	311.0	-8.2	54.00	18.26
1997.90	43.68	---	150.0	H	311.0	-8.2	74.00	30.32
5513.50	---	35.12	200.0	V	196.0	1.4	54.00	18.88
5513.50	45.21	---	200.0	V	196.0	1.4	74.00	28.79
9940.30	---	42.20	150.0	V	157.0	8.2	54.00	11.80
9940.30	51.43	---	150.0	V	157.0	8.2	74.00	22.57
17554.60	---	46.85	200.0	H	0.0	14.2	54.00	7.15
17554.60	56.94	---	200.0	H	0.0	14.2	74.00	17.06

**High Channel : 2452MHz**

Full Spectrum

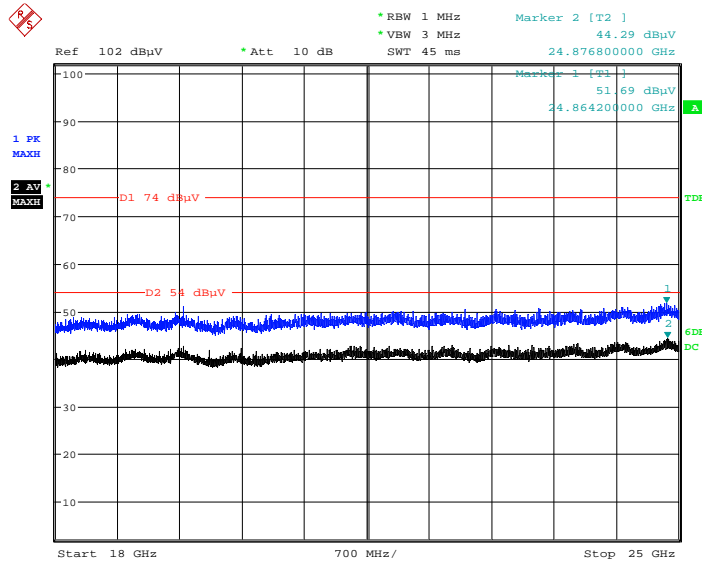


Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dB $\mu$ V/m)	Margin (dB)
	MaxPeak (dB $\mu$ V /m)	Average (dB $\mu$ V /m)	Height (cm)	Polar (H/V)				
1596.70	---	31.11	200.0	V	53.0	-9.6	54.00	22.89
1596.70	40.35	---	200.0	V	53.0	-9.6	74.00	33.65
1799.00	---	44.88	150.0	H	37.0	-8.9	54.00	9.12
1799.00	50.74	---	150.0	H	37.0	-8.9	74.00	23.26
1996.20	---	34.55	150.0	H	294.0	-8.3	54.00	19.45
1996.20	42.21	---	150.0	H	294.0	-8.3	74.00	31.79
4904.00	---	35.18	150.0	V	1.0	-0.4	54.00	18.82
4904.00	43.51	---	150.0	V	1.0	-0.4	74.00	30.49
10336.40	---	42.32	200.0	V	282.0	8.7	54.00	11.68
10336.40	51.09	---	200.0	V	282.0	8.7	74.00	22.91
17671.90	---	47.20	150.0	H	322.0	14.0	54.00	6.80
17671.90	57.83	---	150.0	H	322.0	14.0	74.00	16.17

# 18GHz-25GHz:

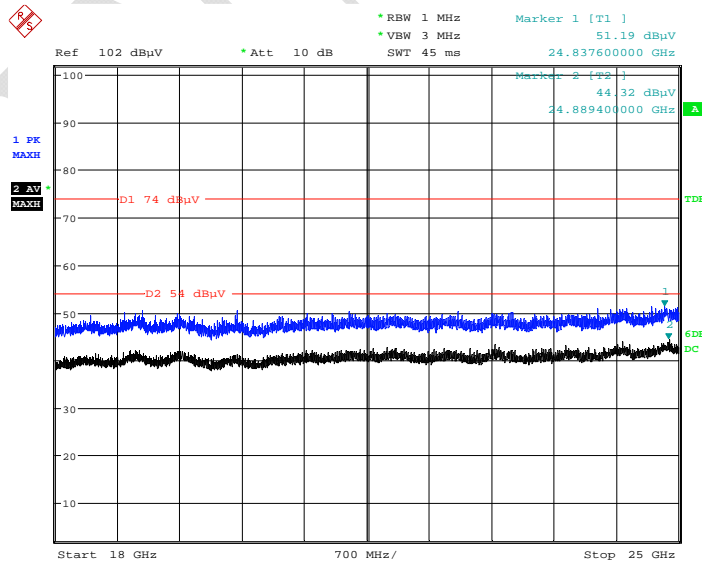
Pre-scan with 802.11b, 802.11g, 802.11n-HT20 and 802.11n-HT40 modes of operation in the X,Y and Z axes of orientation, the worst case **low channel of 802.11n-HT20 mode in Z-axis of orientation** was recorded

## Vertical



Date: 7.NOV.2019 11:53:31

## Horizontal



Date: 7.NOV.2019 12:21:24

**Restricted Bands Emissions Test**

Note:

1. Corrected Factor (dB/m) = Antenna factor (RX) (dB/m) + Cable Loss (dB) – Amplifier Factor (dB)

Corrected Amplitude (dB $\mu$ V/m) = Corrected Factor (dB/m) + Reading (dB $\mu$ V)Margin (dB) = Limit (dB $\mu$ V/m) – Corrected Amplitude (dB $\mu$ V/m)**802.11b Mode (ANT 1):** (Pre-scan in the X, Y and Z axes of orientation, the worst case Z-axis of orientation was recorded)

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
Low Channel: 2412MHz								
2390.00	54.22	---	150	V	322	2.8	74.00	19.78
2390.00	---	46.83	150	V	322	2.8	54.00	7.17
2390.00	51.21	---	150	H	161	2.8	74.00	22.79
2390.00	---	43.71	150	H	161	2.8	54.00	10.29
High Channel: 2462MHz								
2483.50	53.78	---	150	V	255	3.0	74.00	20.22
2483.50	---	46.73	150	V	255	3.0	54.00	7.27
2483.50	50.54	---	100	H	65	3.0	74.00	23.46
2483.50	---	43.52	100	H	65	3.0	54.00	10.48

**802.11g Mode (ANT 1):** (Pre-scan in the X,Y and Z axes of orientation, the worst case Z-axis of orientation was recorded)

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
Low Channel: 2412MHz								
2390.00	59.52	---	200	V	209	2.8	74.00	14.48
2390.00	---	48.4	200	V	209	2.8	54.00	5.60
2390.00	56.61	---	200	H	204	2.8	74.00	17.39
2390.00	---	45.33	200	H	204	2.8	54.00	8.67
High Channel: 2462MHz								
2483.50	59.94	---	150	V	154	3.0	74.00	14.06
2483.50	---	48.67	150	V	154	3.0	54.00	5.33
2483.50	56.87	---	150	H	131	3.0	74.00	17.13
2483.50	---	45.58	150	H	131	3.0	54.00	8.42



**802.11b Mode (ANT 2):** (Pre-scan in the X, Y and Z axes of orientation, the worst case Z-axis of orientation was recorded)

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
Low Channel: 2412MHz								
2390.00	54.13	---	150	V	135	2.8	74.00	19.87
2390.00	---	46.65	150	V	135	2.8	54.00	7.35
2390.00	51.24	---	200	H	29	2.8	74.00	22.76
2390.00	---	43.75	200	H	29	2.8	54.00	10.25
High Channel: 2462MHz								
2483.50	53.69	---	150	V	328	3.0	74.00	20.31
2483.50	---	46.71	150	V	328	3.0	54.00	7.29
2483.50	50.45	---	200	H	264	3.0	74.00	23.55
2483.50	---	43.47	200	H	264	3.0	54.00	10.53

**802.11g Mode (ANT 2):** (Pre-scan in the X,Y and Z axes of orientation, the worst case Z-axis of orientation was recorded)

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
Low Channel: 2412MHz								
2390.00	59.45	---	200	V	56	2.8	74.00	14.55
2390.00	---	48.37	200	V	56	2.8	54.00	5.63
2390.00	56.66	---	200	H	30	2.8	74.00	17.34
2390.00	---	45.41	200	H	30	2.8	54.00	8.59
High Channel: 2462MHz								
2483.50	59.81	---	150	V	287	3.0	74.00	14.19
2483.50	---	48.61	150	V	287	3.0	54.00	5.39
2483.50	56.73	---	100	H	328	3.0	74.00	17.27
2483.50	---	45.42	100	H	328	3.0	54.00	8.58

**802.11b Mode (ANT 3):** (Pre-scan in the X, Y and Z axes of orientation, the worst case Z-axis of orientation was recorded)

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
Low Channel: 2412MHz								
2390.00	54.31	---	150	V	338	2.8	74.00	19.69
2390.00	---	46.74	150	V	338	2.8	54.00	7.26
2390.00	51.29	---	200	H	225	2.8	74.00	22.71
2390.00	---	43.68	200	H	225	2.8	54.00	10.32
High Channel: 2462MHz								
2483.50	53.74	---	150	V	186	3.0	74.00	20.26
2483.50	---	46.64	150	V	186	3.0	54.00	7.36
2483.50	50.66	---	100	H	270	3.0	74.00	23.34
2483.50	---	43.58	100	H	270	3.0	54.00	10.42

**802.11g Mode (ANT 3):** (Pre-scan in the X,Y and Z axes of orientation, the worst case Z-axis of orientation was recorded)

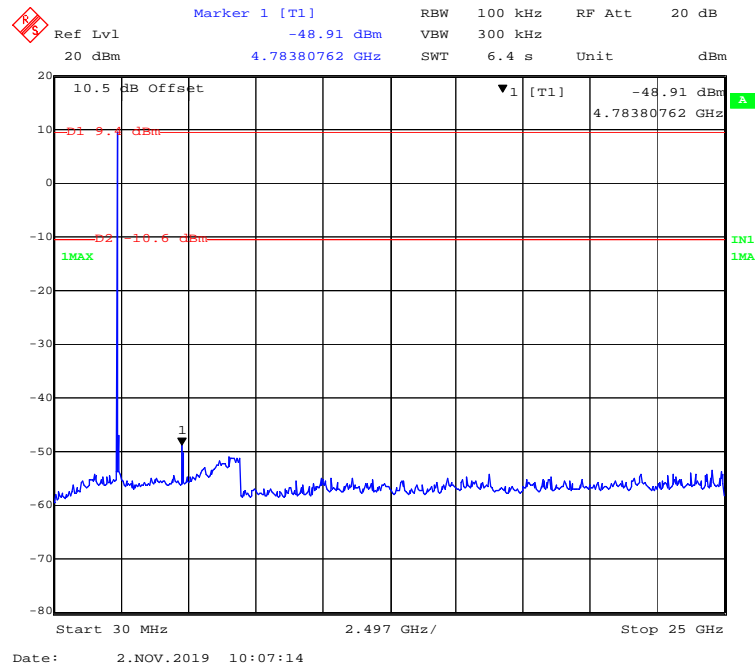
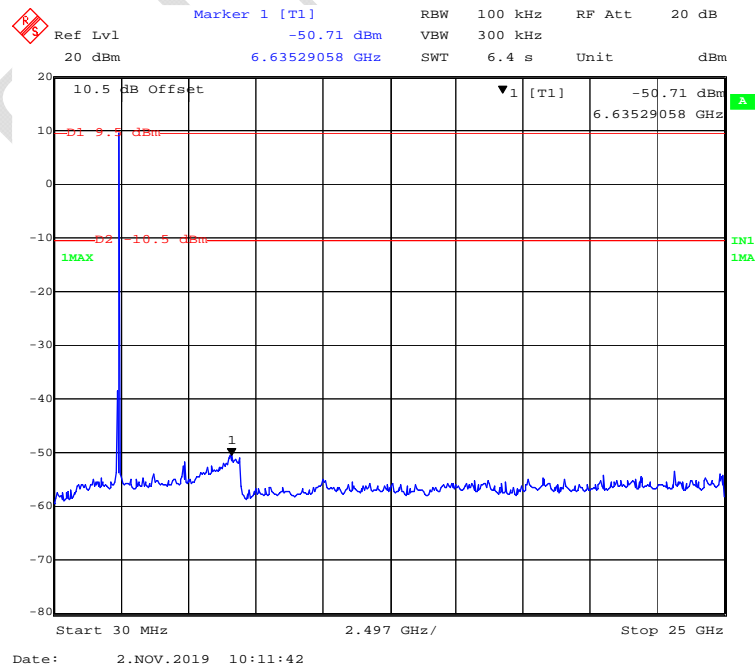
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
Low Channel: 2412MHz								
2390.00	59.39	---	200	V	243	2.8	74.00	14.61
2390.00	---	48.28	200	V	243	2.8	54.00	5.72
2390.00	56.42	---	150	H	277	2.8	74.00	17.58
2390.00	---	45.25	150	H	277	2.8	54.00	8.75
High Channel: 2462MHz								
2483.50	59.76	---	150	V	80	3.0	74.00	14.24
2483.50	---	48.46	150	V	80	3.0	54.00	5.54
2483.50	56.65	---	150	H	322	3.0	74.00	17.35
2483.50	---	45.35	150	H	322	3.0	54.00	8.65

**802.11n-HT20 Mode (ANT 1&ANT 2&ANT 3 transmitting simultaneously):** (Pre-scan in the X,Y and Z axes of orientation, the worst case Z-axis of orientation was recorded)

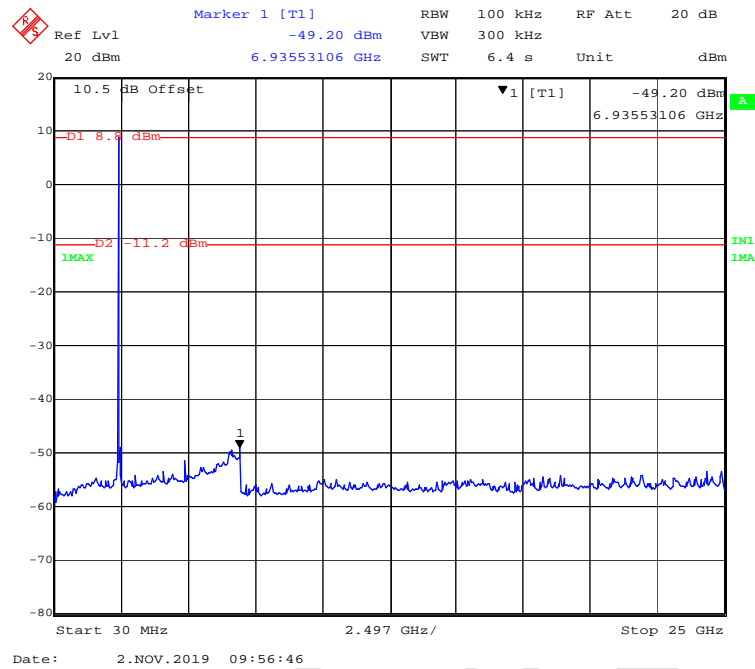
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
Low Channel: 2412MHz								
2390.00	59.78	---	200	V	322	2.8	74.00	14.22
2390.00	---	50.71	200	V	322	2.8	54.00	3.29
2390.00	56.67	---	200	H	102	2.8	74.00	17.33
2390.00	---	47.65	200	H	102	2.8	54.00	6.35
High Channel: 2462MHz								
2483.50	58.84	---	150	V	255	3.0	74.00	15.16
2483.50	---	49.72	150	V	255	3.0	54.00	4.28
2483.50	55.71	---	150	H	81	3.0	74.00	18.29
2483.50	---	46.62	150	H	81	3.0	54.00	7.38

**802.11n-HT40 Mode (ANT 1&ANT 2&ANT 3 transmitting simultaneously):** (Pre-scan in the X,Y and Z axes of orientation, the worst case Z-axis of orientation was recorded)

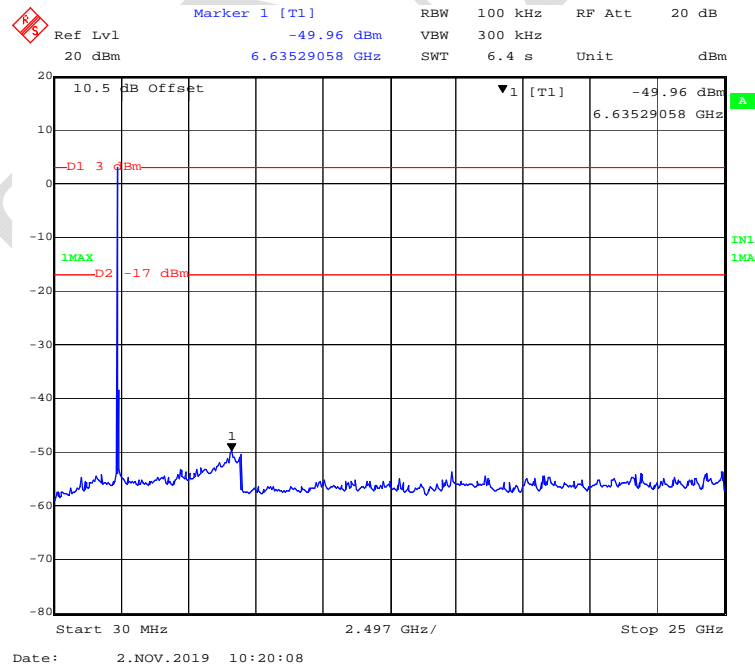
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Corrected Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV/m)	Average (dBμV/m)	Height (cm)	Polar (H/V)				
Low Channel: 2422MHz								
2390.00	57.76	---	200	V	125	2.8	74.00	16.24
2390.00	---	51.2	200	V	125	2.8	54.00	2.80
2390.00	54.65	---	250	H	206	2.8	74.00	19.35
2390.00	---	48.18	250	H	206	2.8	54.00	5.82
High Channel: 2452MHz								
2483.50	58.77	---	150	V	298	3.0	74.00	15.23
2483.50	---	51.65	150	V	298	3.0	54.00	2.35
2483.50	55.71	---	200	H	57	3.0	74.00	18.29
2483.50	---	48.73	200	H	57	3.0	54.00	5.27

**Conducted Spurious Emissions at Antenna Port****ANT 1:****802.11b Mode Low Channel****802.11b Mode Middle Channel**

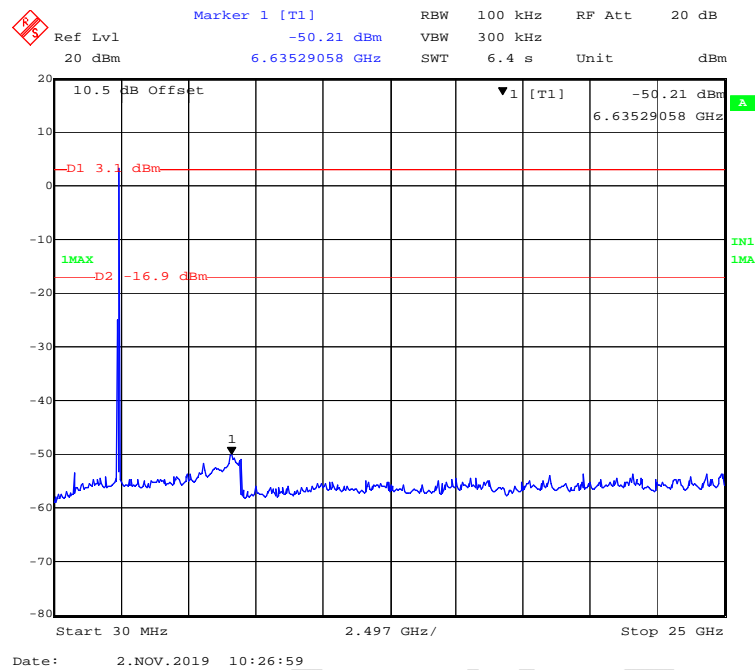
### 802.11b Mode High Channel



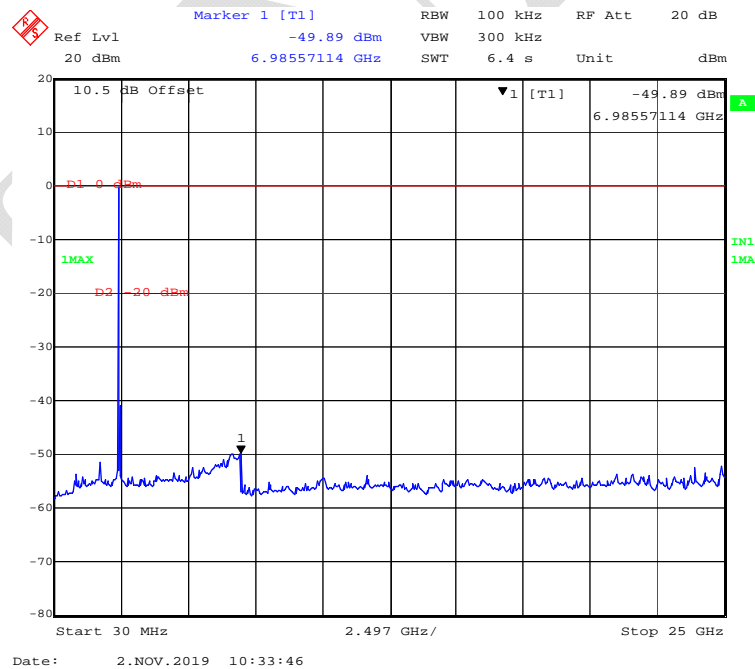
### 802.11g Mode Low Channel



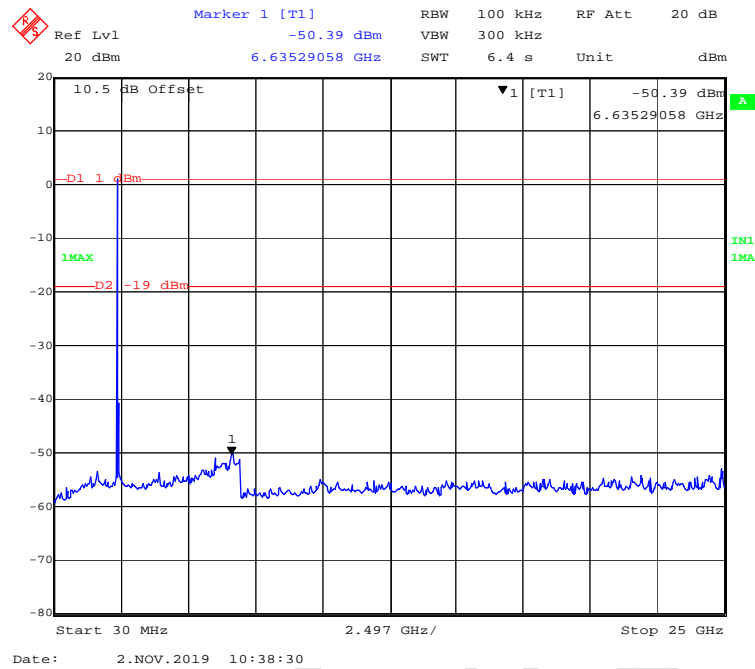
### 802.11g Mode Middle Channel



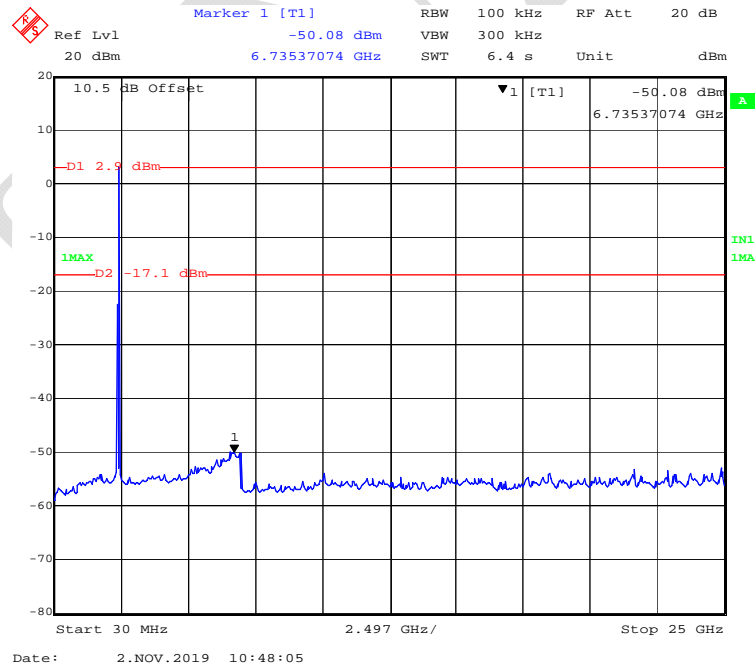
### 802.11g Mode High Channel



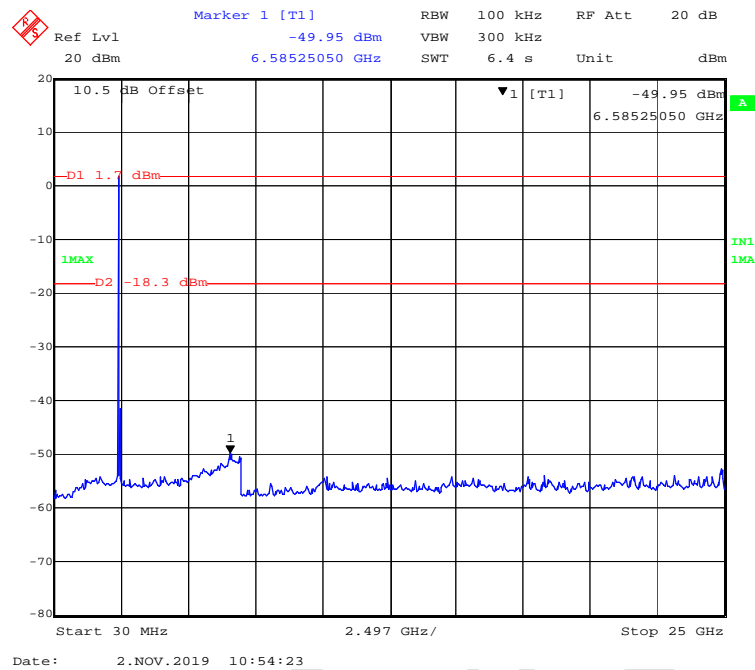
### 802.11n-HT20 Mode Low Channel



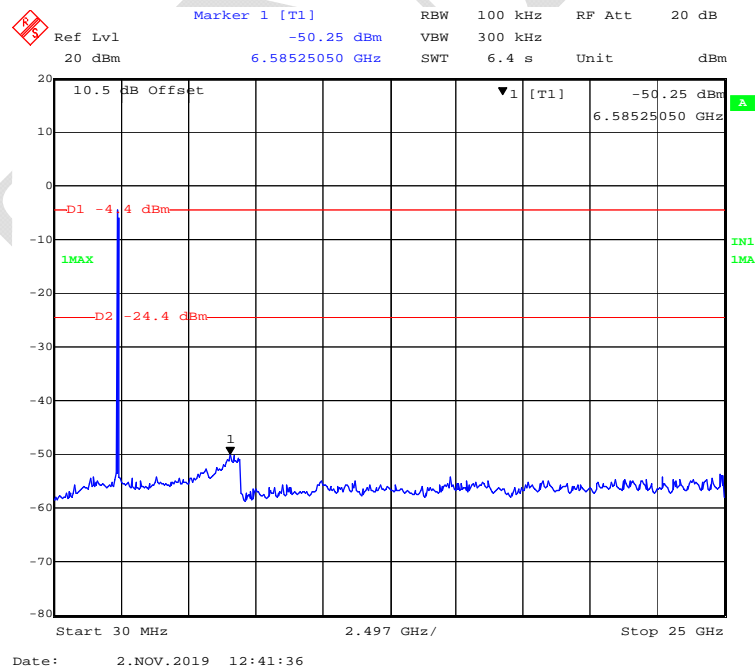
### 802.11n-HT20 Mode Middle Channel



### 802.11n-HT20 Mode High Channel

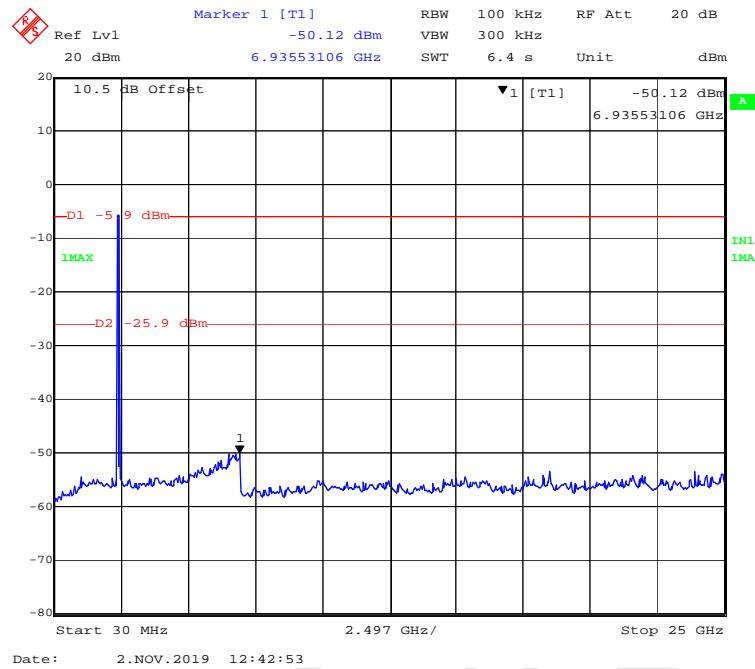


### 802.11n-HT40 Mode Low Channel

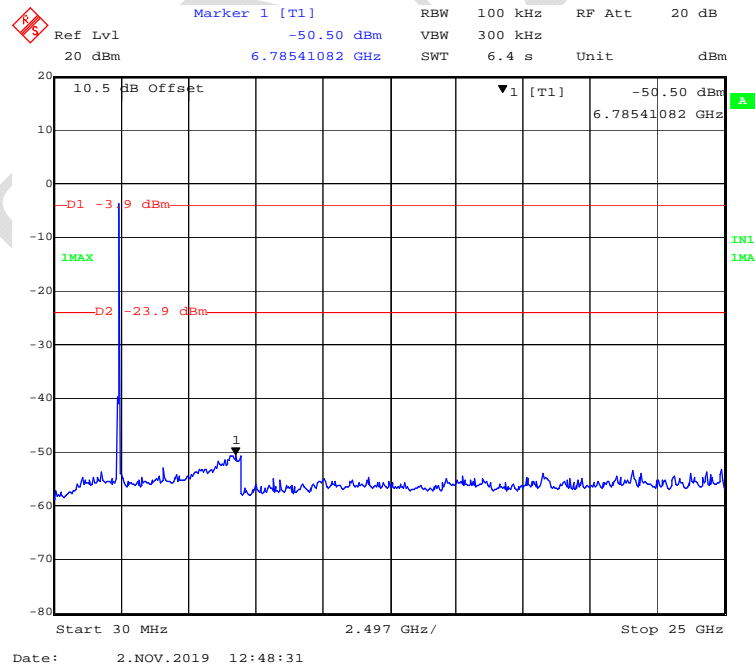




### 802.11n-HT40 Mode Middle Channel

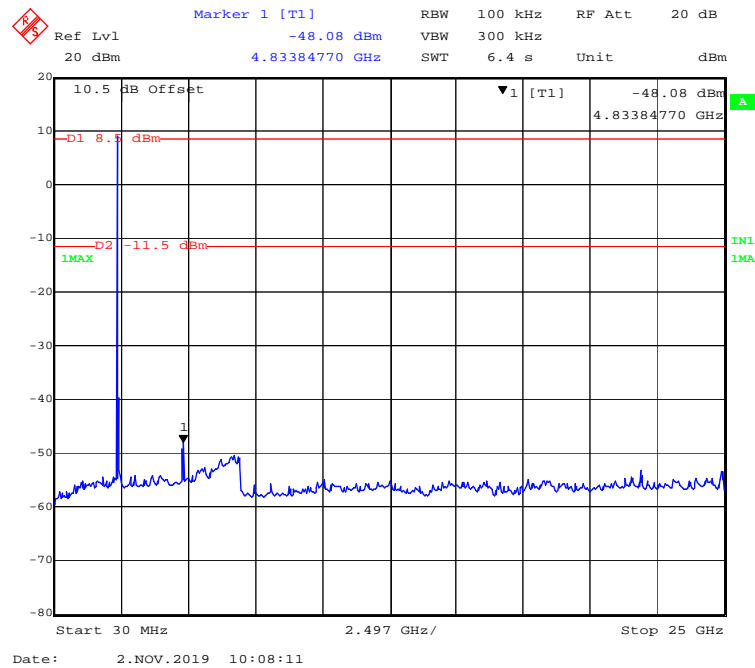


### 802.11n-HT40 Mode High Channel

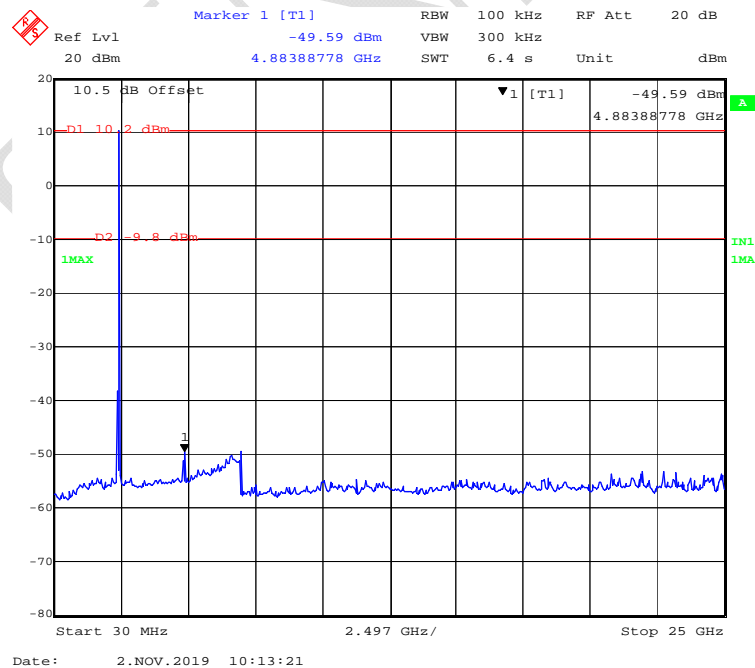


ANT 2:

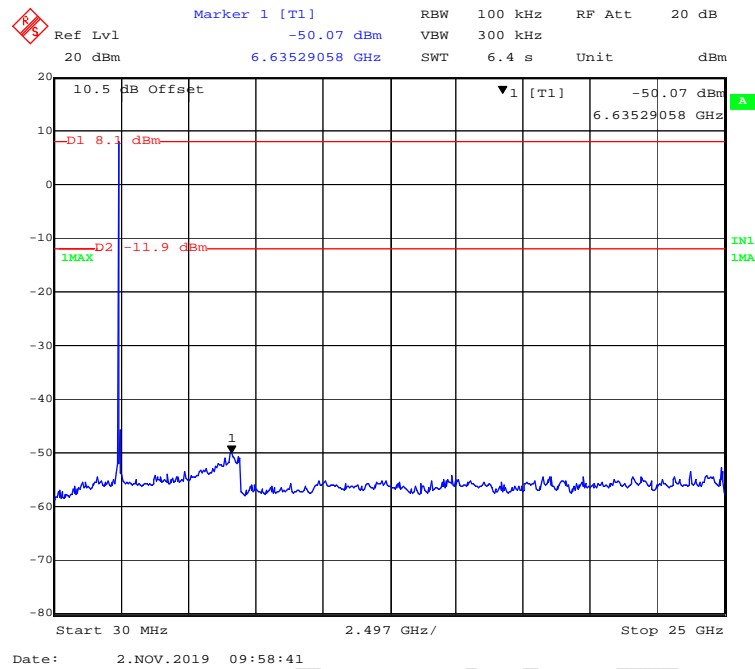
802.11b Mode Low Channel



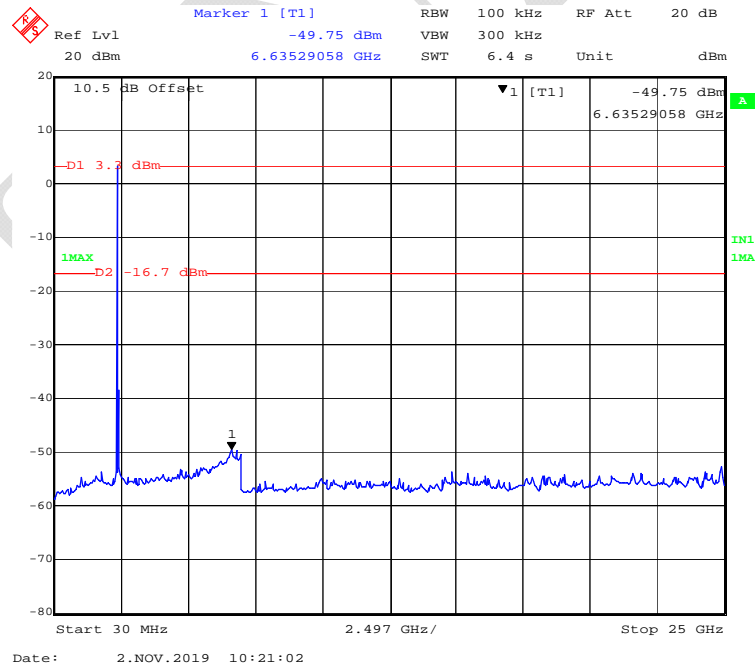
802.11b Mode Middle Channel



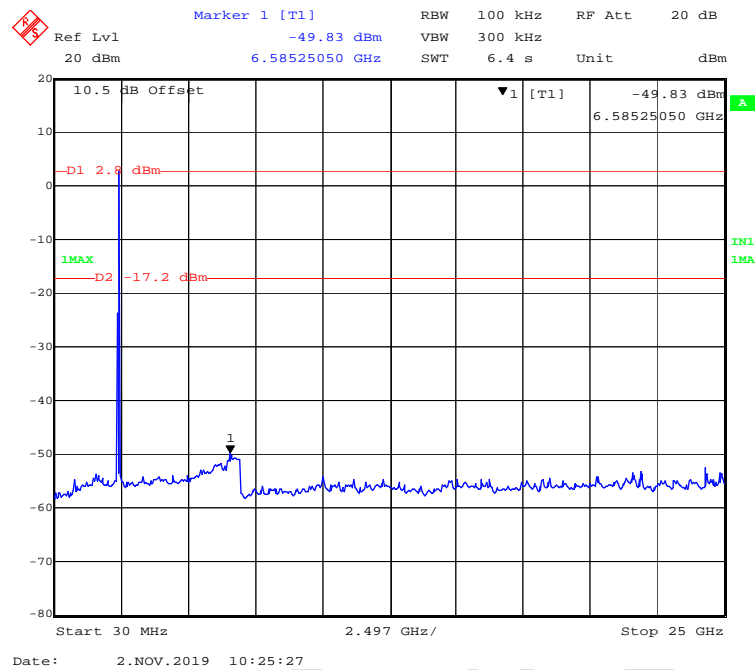
### 802.11b Mode High Channel



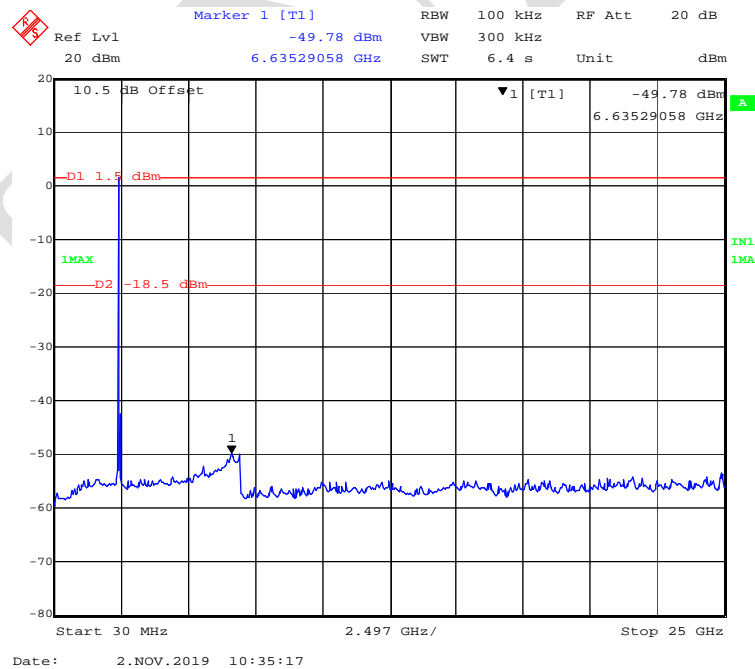
### 802.11g Mode Low Channel



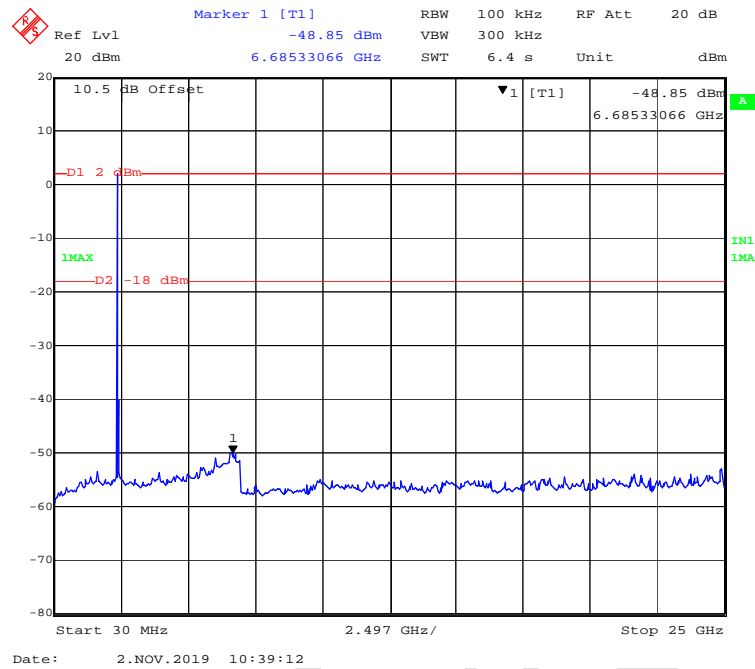
### 802.11g Mode Middle Channel



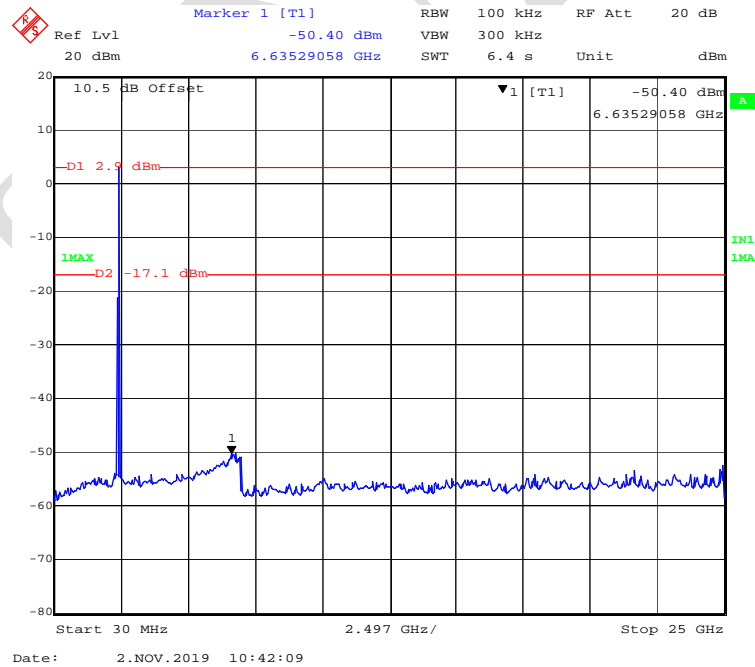
### 802.11g Mode High Channel



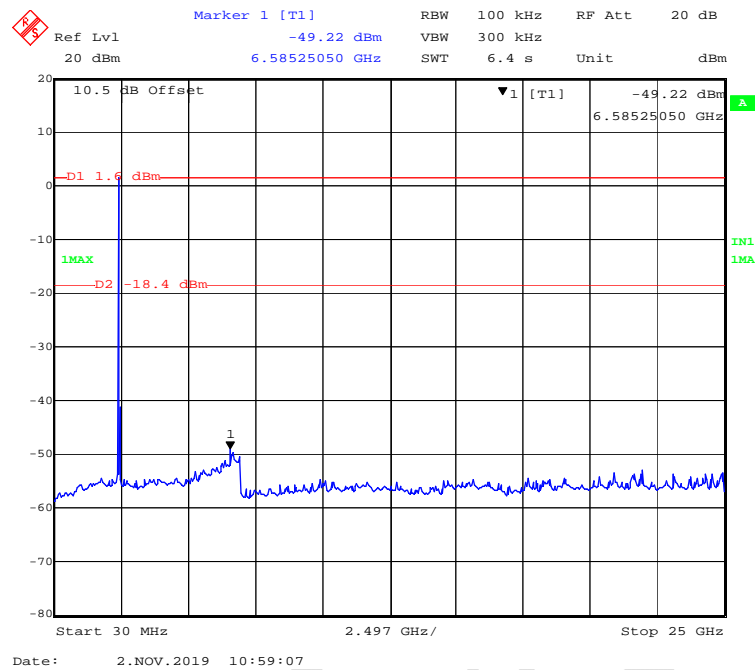
### 802.11n-HT20 Mode Low Channel



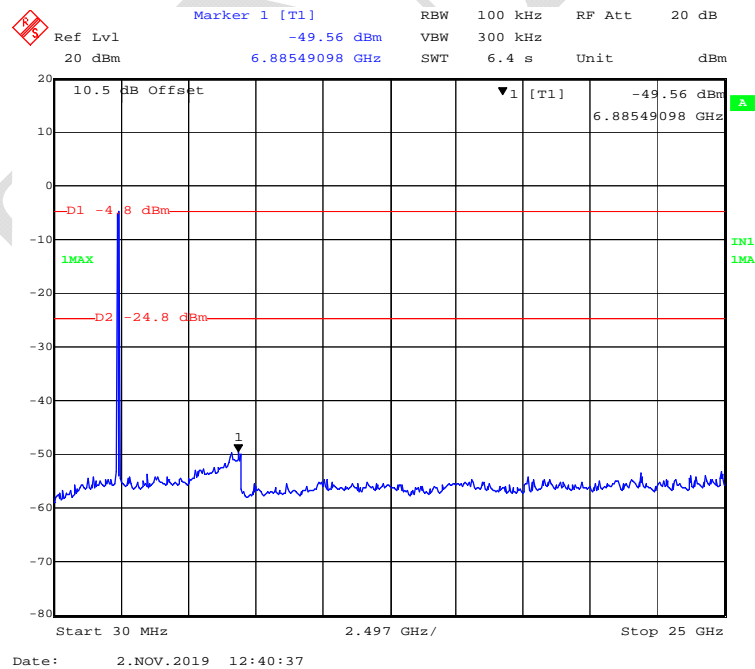
### 802.11n-HT20 Mode Middle Channel

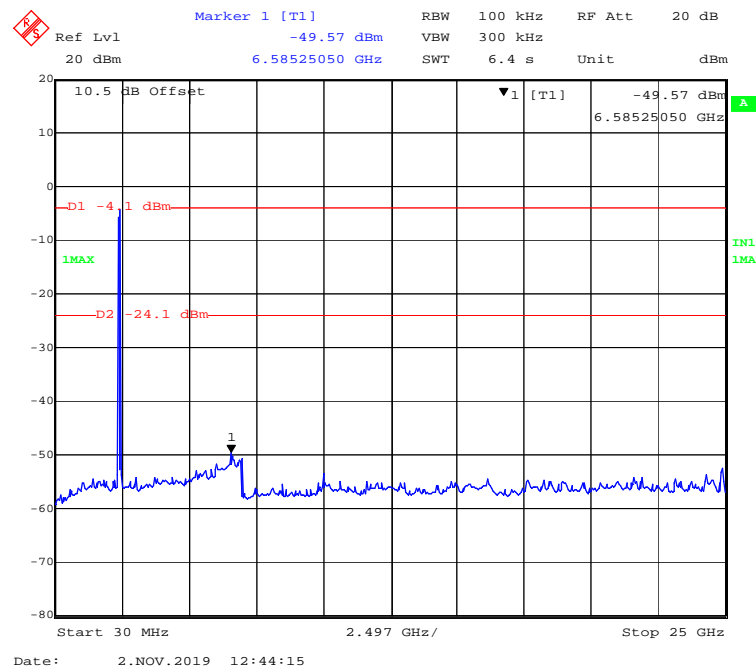
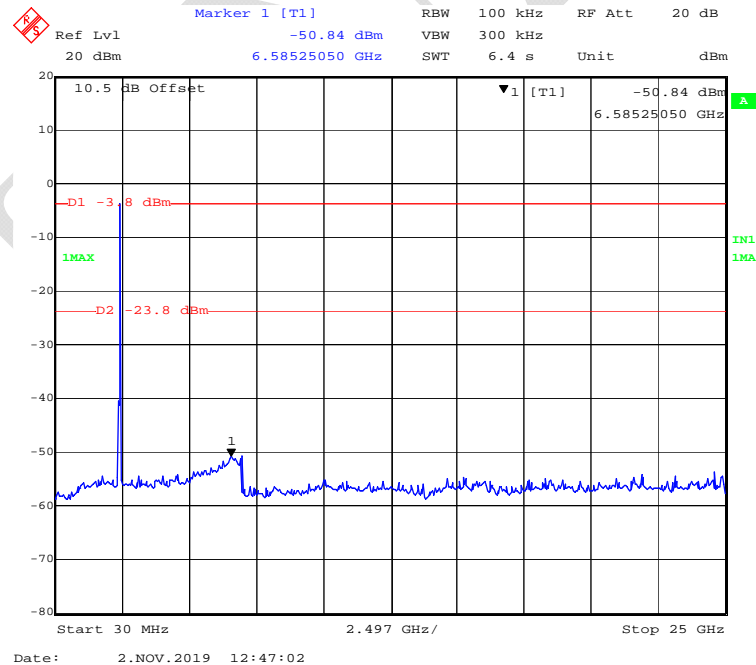


### 802.11n-HT20 Mode High Channel



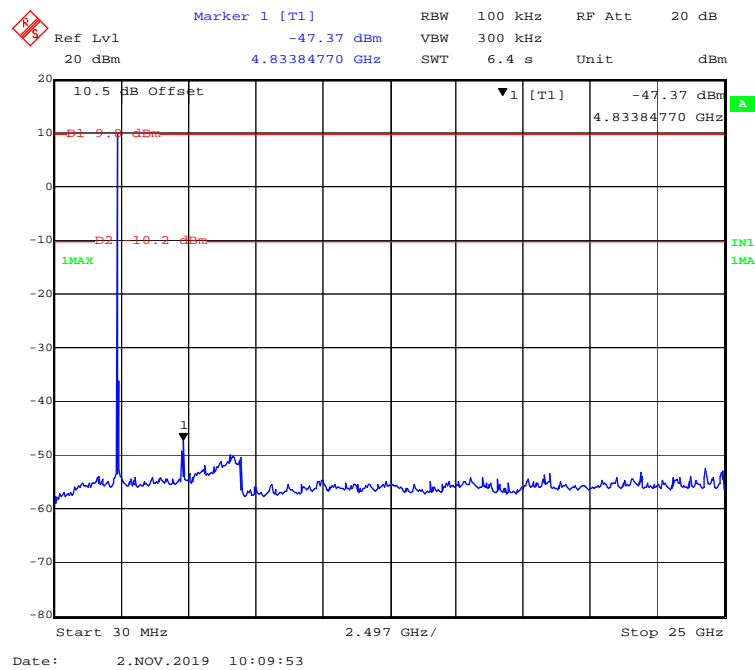
### 802.11n-HT40 Mode Low Channel



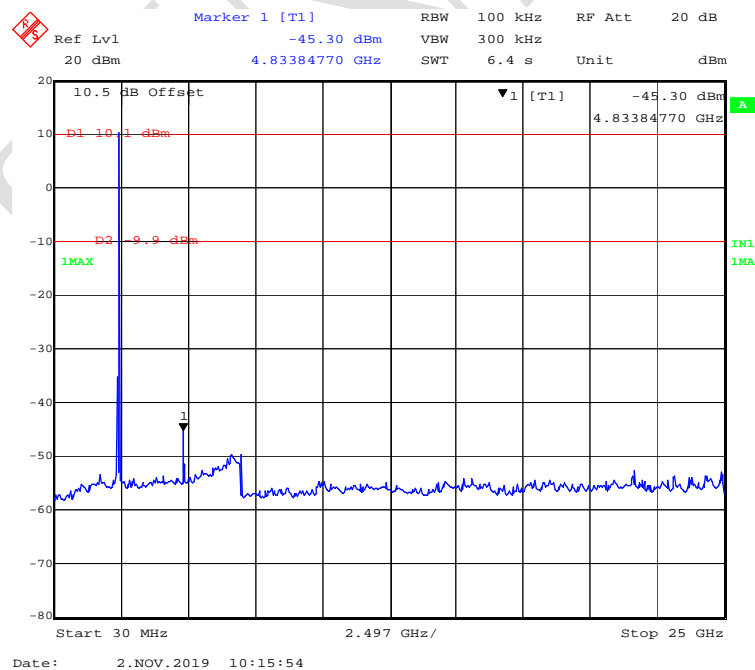
**802.11n-HT40 Mode Middle Channel****802.11n-HT40 Mode High Channel**

ANT 3:

802.11b Mode Low Channel

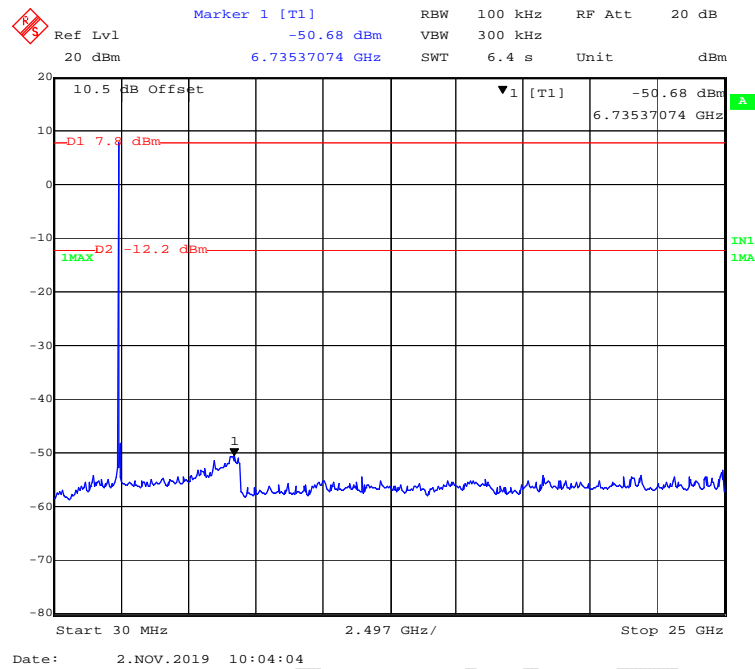


802.11b Mode Middle Channel

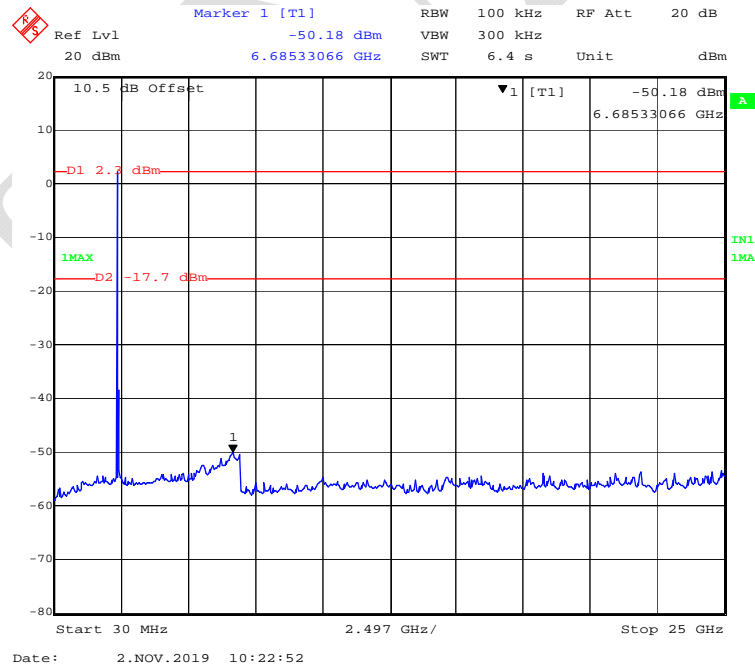




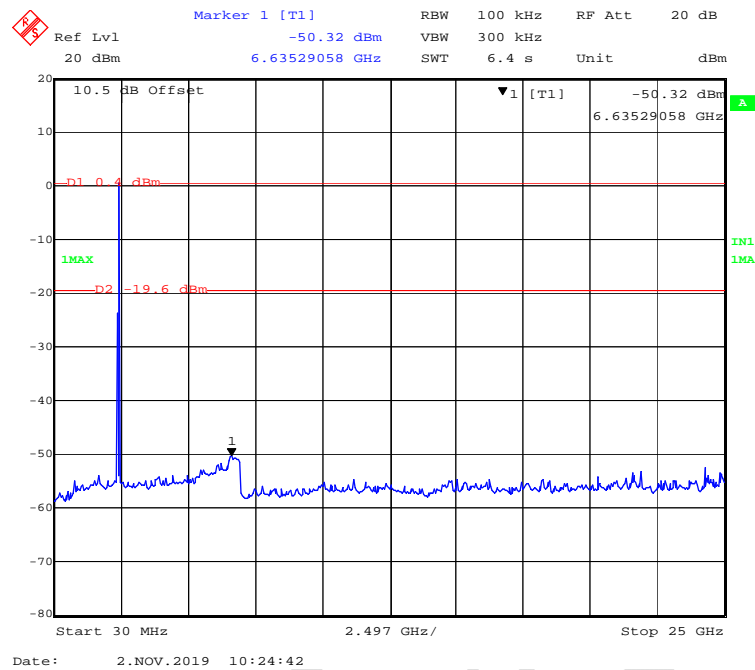
### 802.11b Mode High Channel



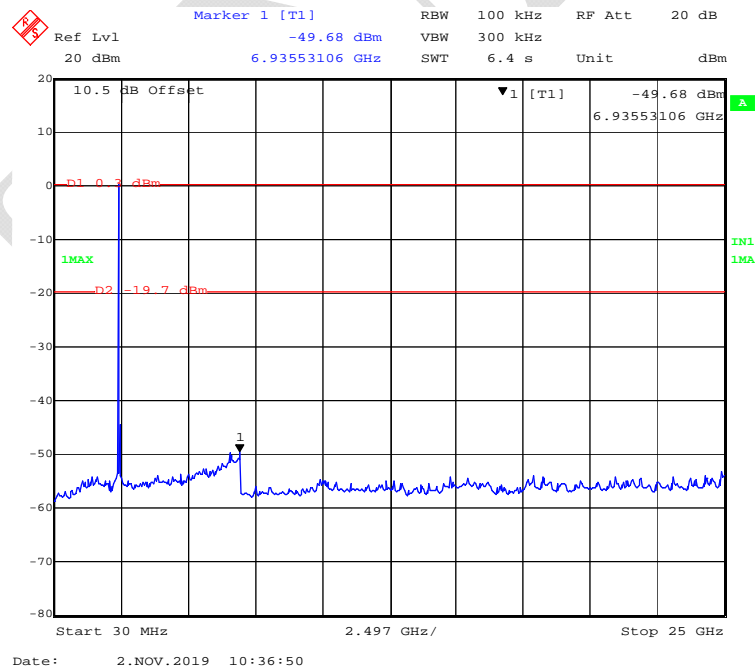
### 802.11g Mode Low Channel



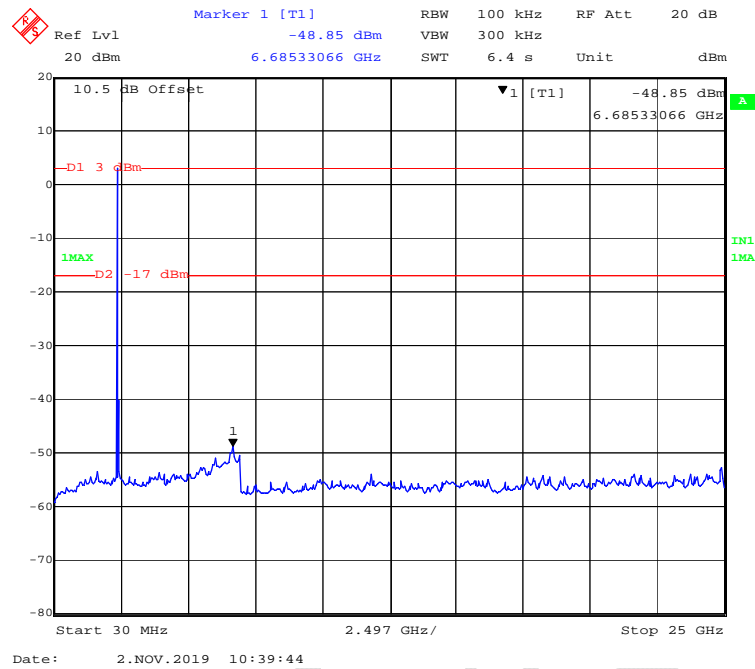
### 802.11g Mode Middle Channel



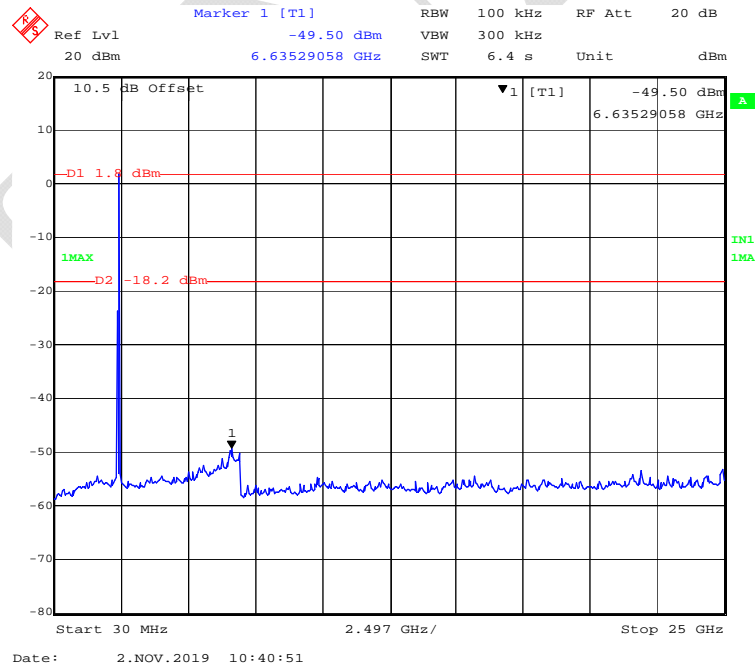
### 802.11g Mode High Channel



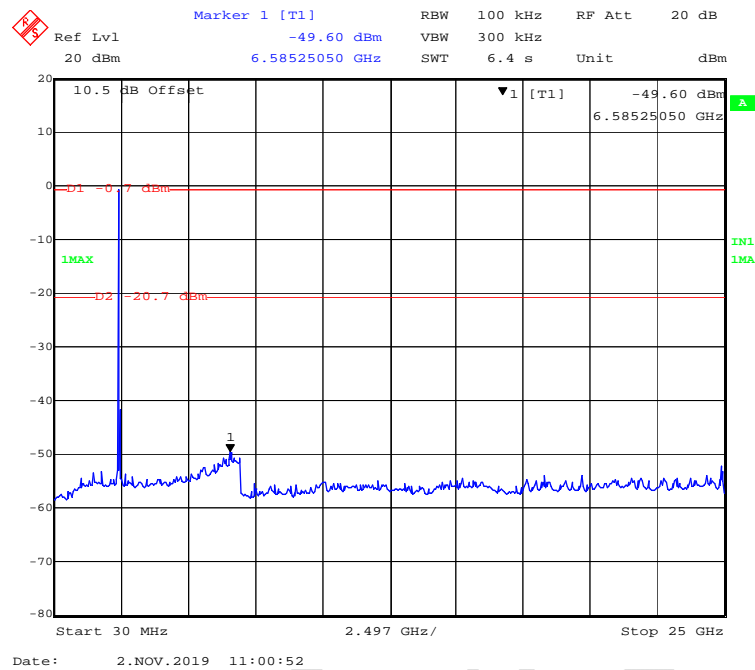
### 802.11n-HT20 Mode Low Channel



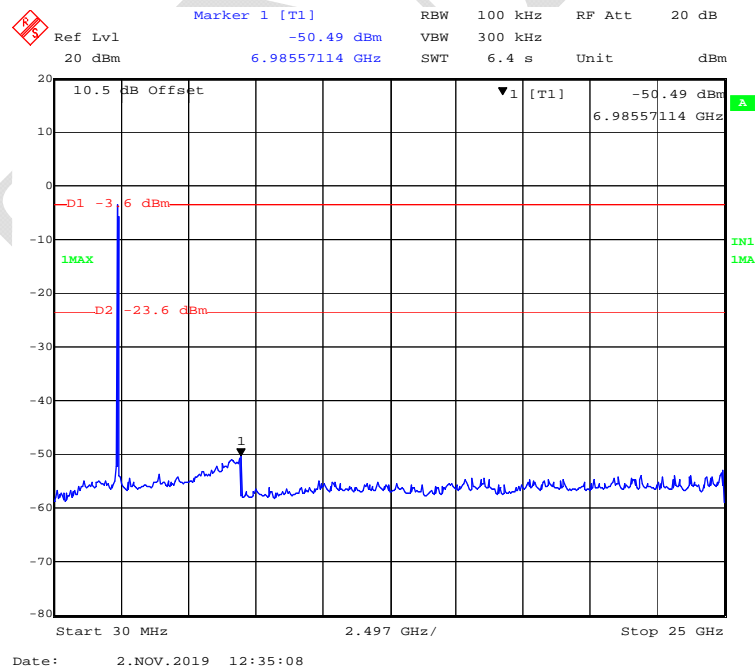
### 802.11n-HT20 Mode Middle Channel



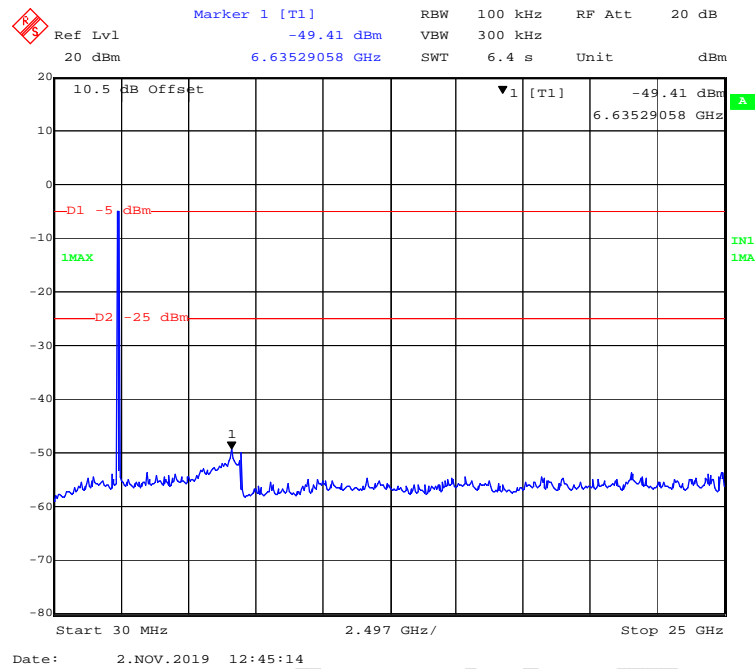
### 802.11n-HT20 Mode High Channel



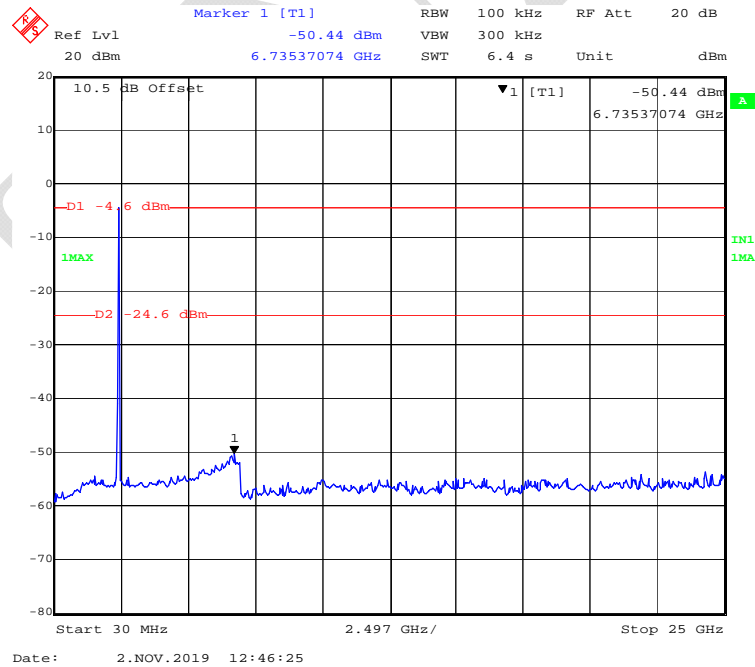
### 802.11n-HT40 Mode Low Channel



### 802.11n-HT40 Mode Middle Channel



### 802.11n-HT40 Mode High Channel



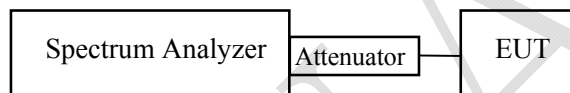
**RSS-247 ISSUE2 Clause 5.2 a) – 6 dB EMISSION BANDWIDTH****Applicable Standard**

According to RSS-247 Clause 5.2 a)

The minimum 6 dB bandwidth shall be 500 kHz.

**Test Procedure**

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW)  $\geq 3 \times$  RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

**Test Data****Environmental Conditions**

Temperature:	24.0~24.2 °C
Relative Humidity:	51~53 %
ATM Pressure:	101.3~101.6 kPa

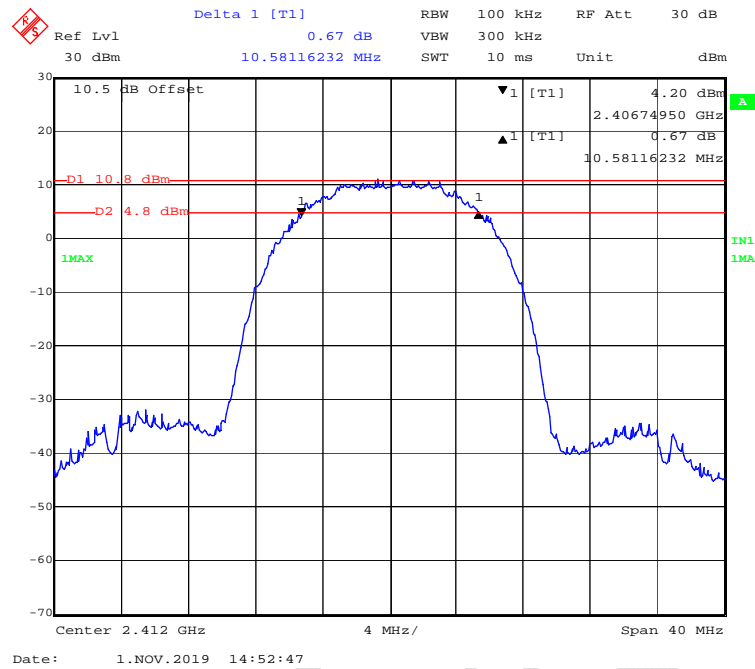
The testing was performed by Carry Cai from 2019-11-01 to 2019-11-02.

**Test Result:** Compliant.

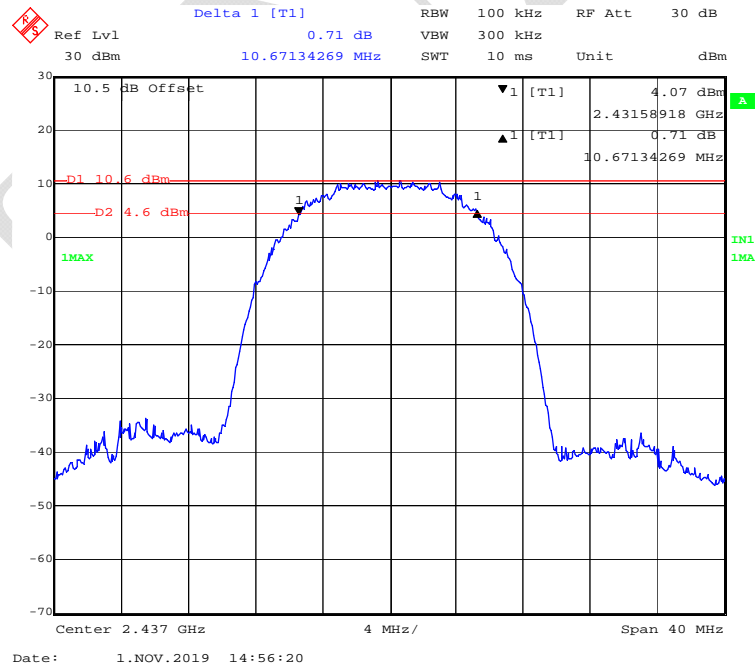
*EUT operation mode: Transmitting*

Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	Limit (MHz)
ANT 1 802.11b Mode			
Low	2412	10.581	$\geq 0.5$
Middle	2437	10.671	$\geq 0.5$
High	2462	10.661	$\geq 0.5$
ANT 1 802.11g Mode			
Low	2412	16.433	$\geq 0.5$
Middle	2437	16.513	$\geq 0.5$
High	2462	16.353	$\geq 0.5$
ANT 1 802.11n-HT20 Mode			
Low	2412	17.555	$\geq 0.5$
Middle	2437	17.645	$\geq 0.5$
High	2462	17.655	$\geq 0.5$
ANT 1 802.11n-HT40 Mode			
Low	2422	35.952	$\geq 0.5$
Middle	2437	36.343	$\geq 0.5$
High	2452	36.413	$\geq 0.5$

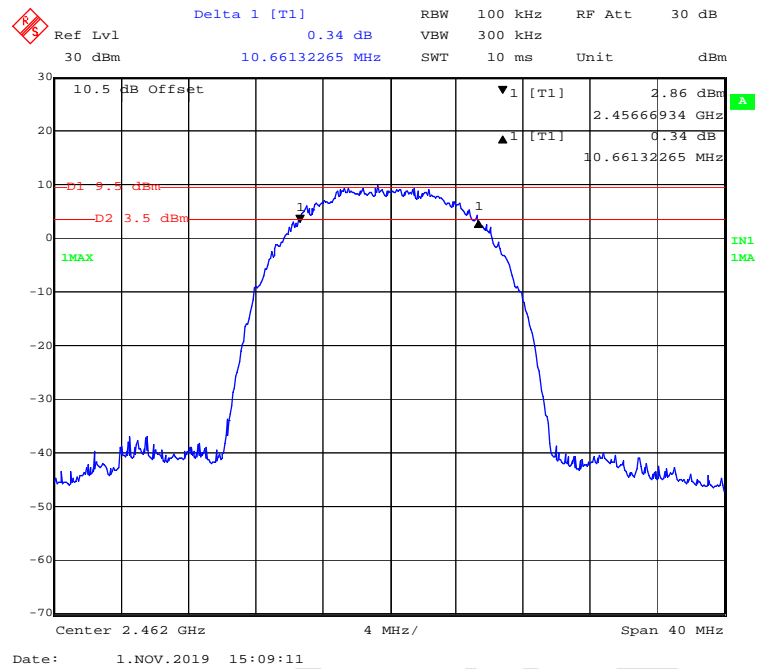
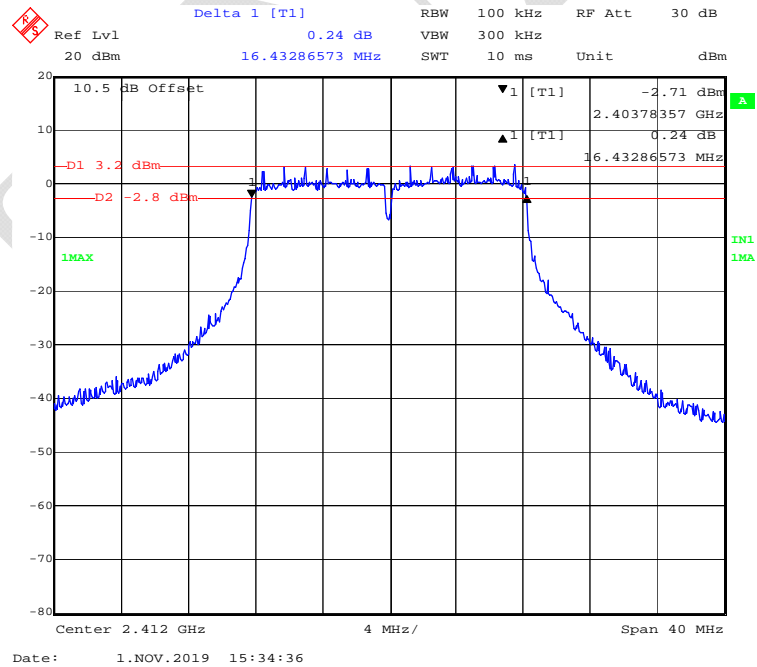
### 802.11b Mode Low Channel



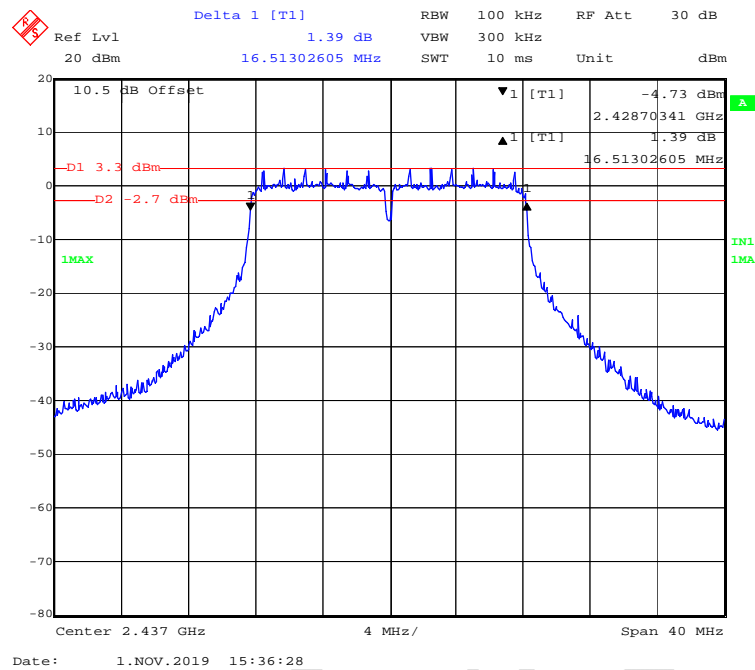
### 802.11b Mode Middle Channel



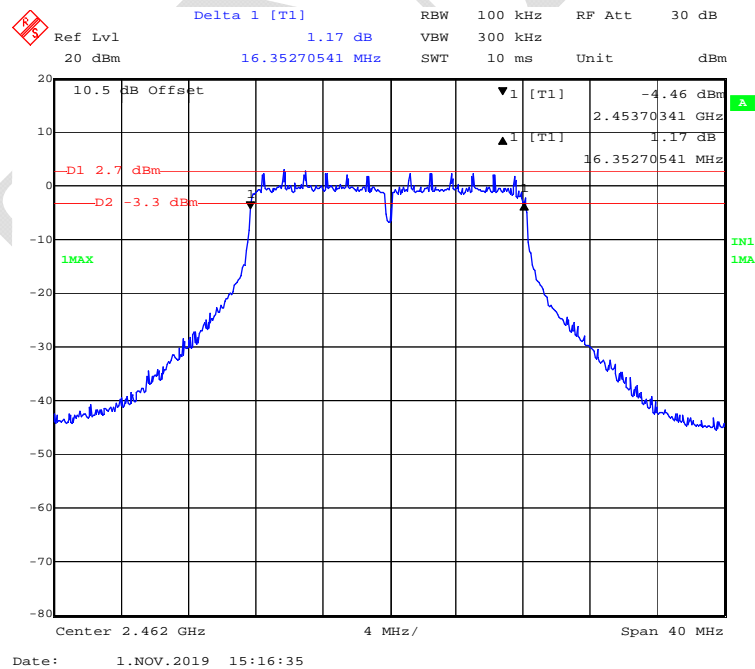


**802.11b Mode High Channel****802.11g Mode Low Channel**

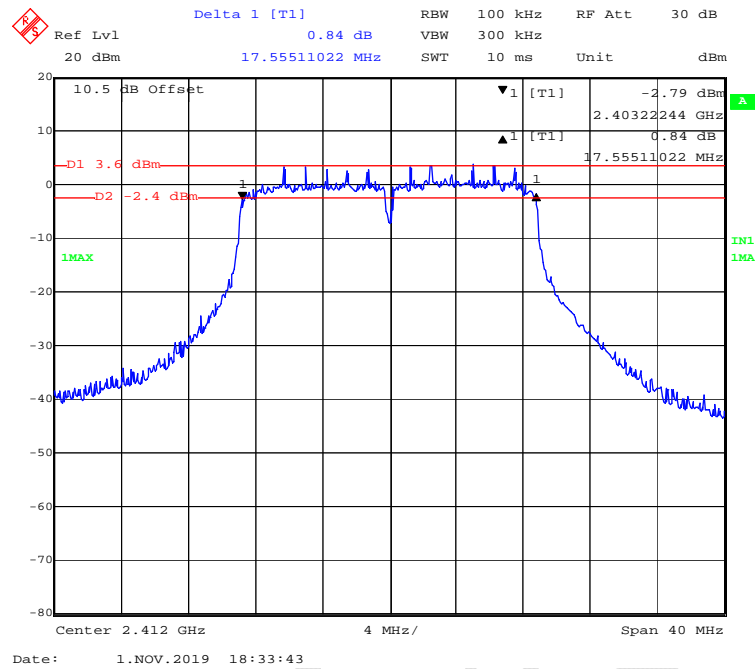
### 802.11g Mode Middle Channel



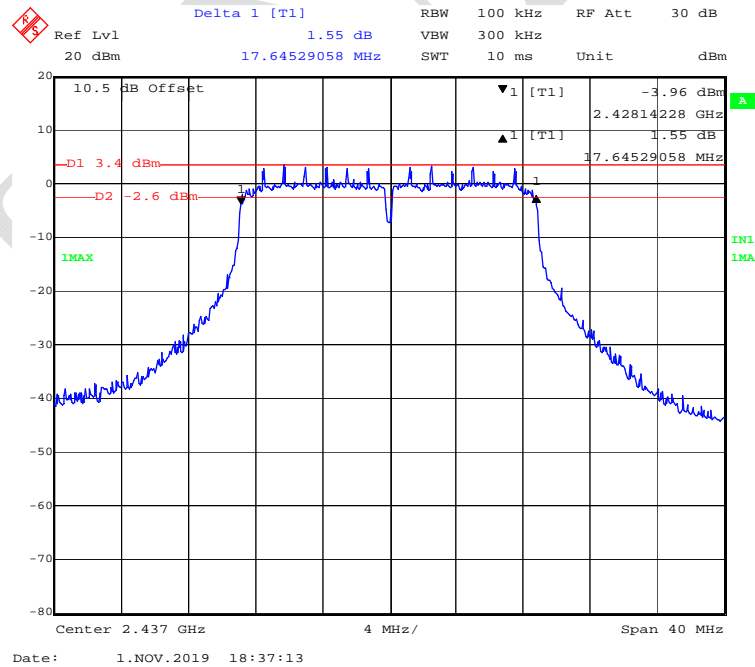
### 802.11g Mode High Channel

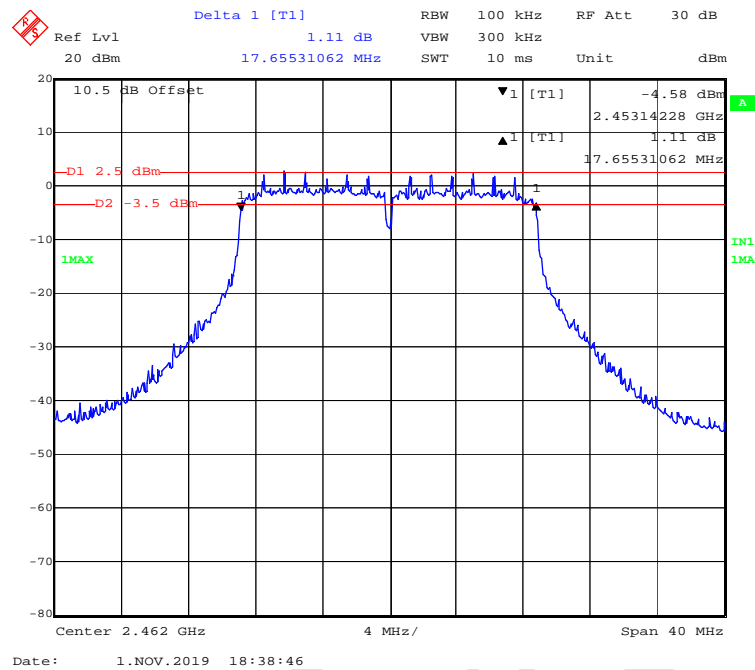
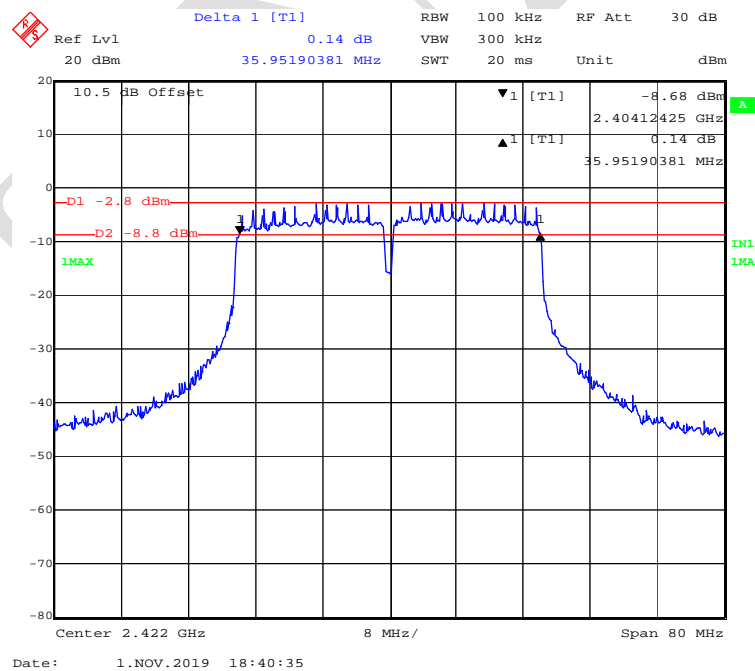


### 802.11n-HT20 Mode Low Channel

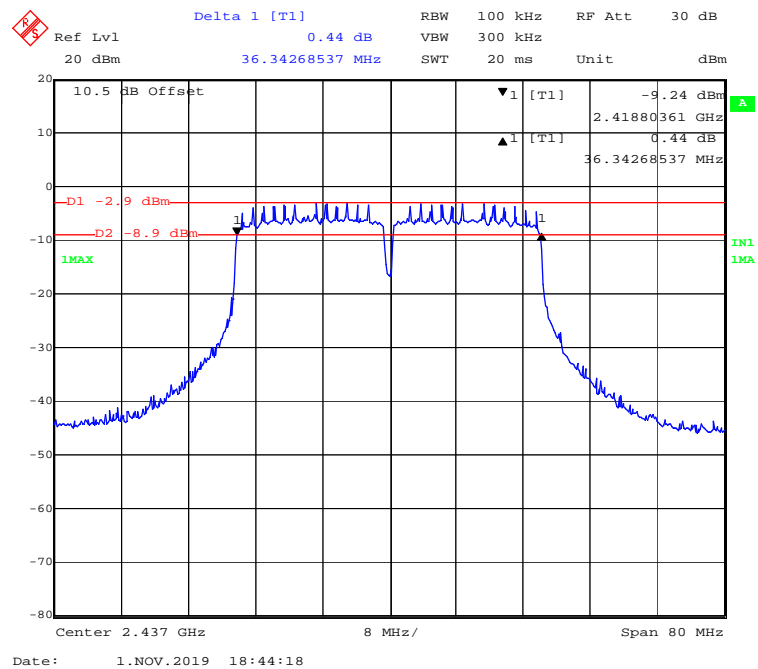


### 802.11n-HT20 Mode Middle Channel

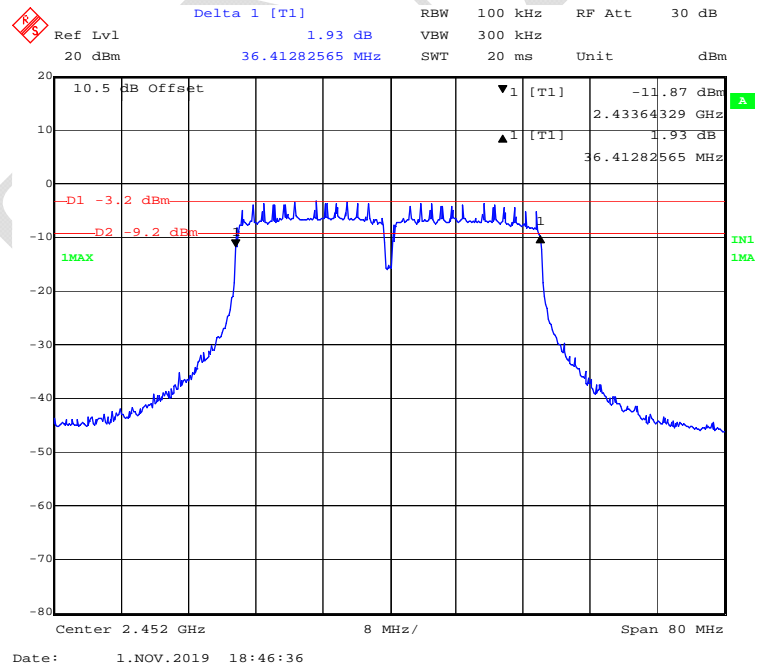


**802.11n-HT20 Mode High Channel****802.11n-HT40 Mode Low Channel**

## 802.11n-HT40 Mode Middle Channel

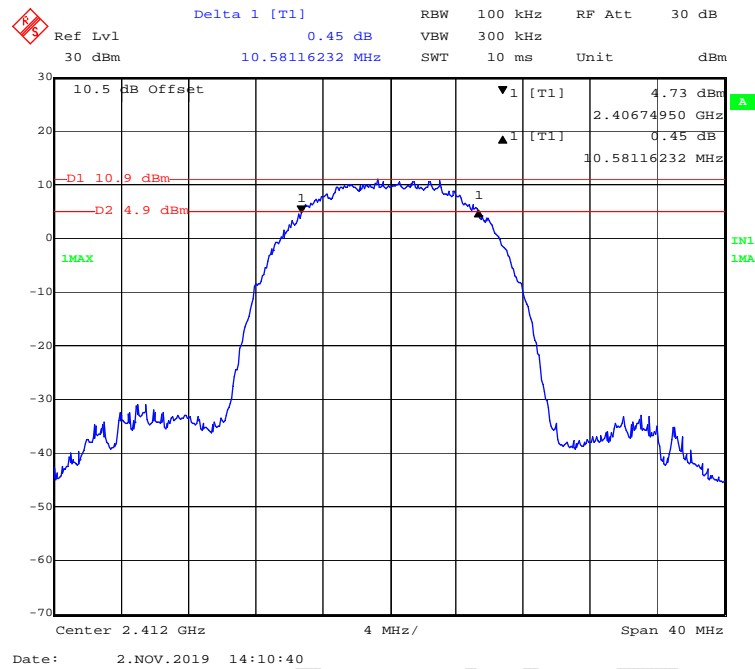


## 802.11n-HT40 Mode High Channel

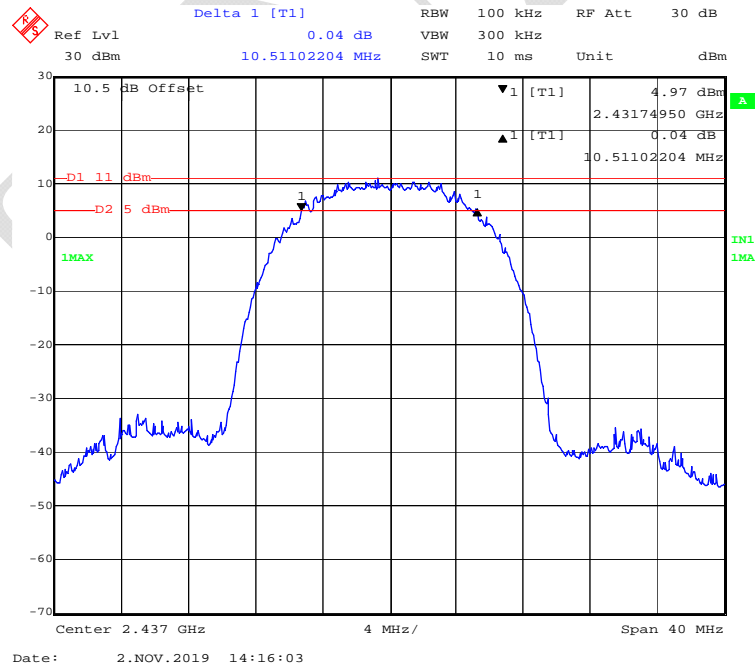


Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	Limit (MHz)
ANT 2 802.11b Mode			
Low	2412	10.581	$\geq 0.5$
Middle	2437	10.511	$\geq 0.5$
High	2462	10.681	$\geq 0.5$
ANT 2 802.11g Mode			
Low	2412	16.433	$\geq 0.5$
Middle	2437	16.523	$\geq 0.5$
High	2462	16.533	$\geq 0.5$
ANT 2 802.11n-HT20 Mode			
Low	2412	17.555	$\geq 0.5$
Middle	2437	17.635	$\geq 0.5$
High	2462	17.565	$\geq 0.5$
ANT 2 802.11n-HT40 Mode			
Low	2422	36.072	$\geq 0.5$
Middle	2437	36.393	$\geq 0.5$
High	2452	36.032	$\geq 0.5$

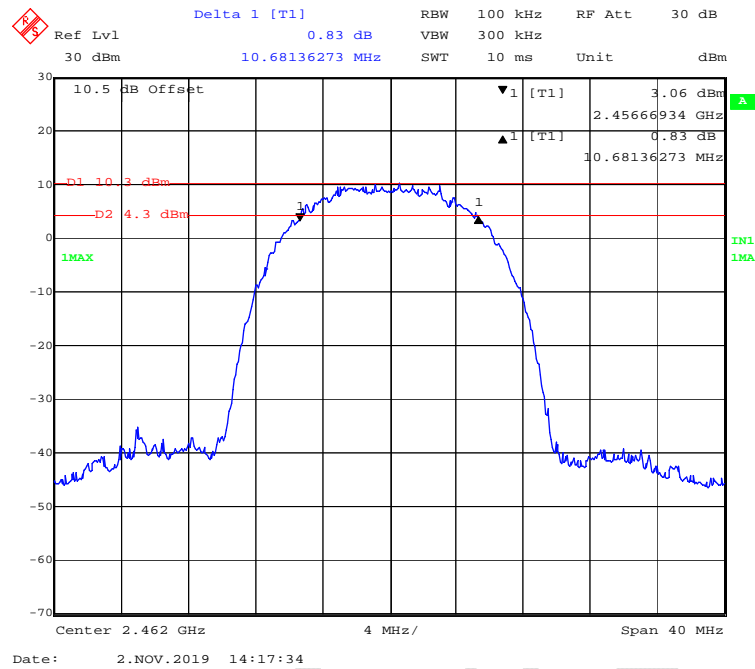
### 802.11b Mode Low Channel



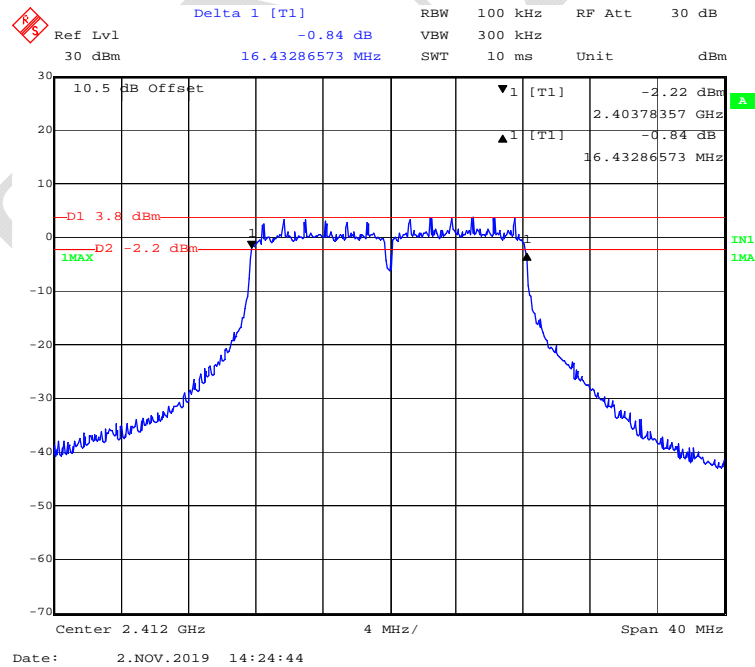
### 802.11b Mode Middle Channel



### 802.11b Mode High Channel

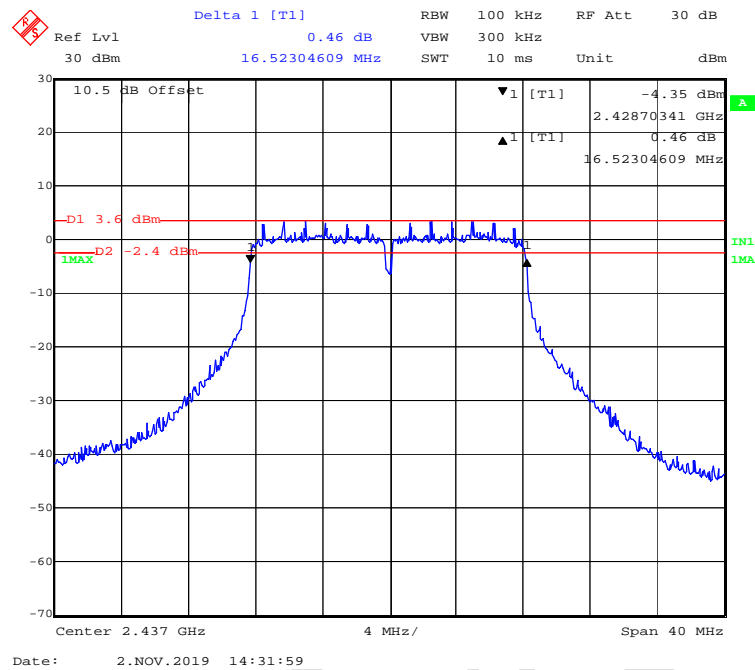


### 802.11g Mode Low Channel

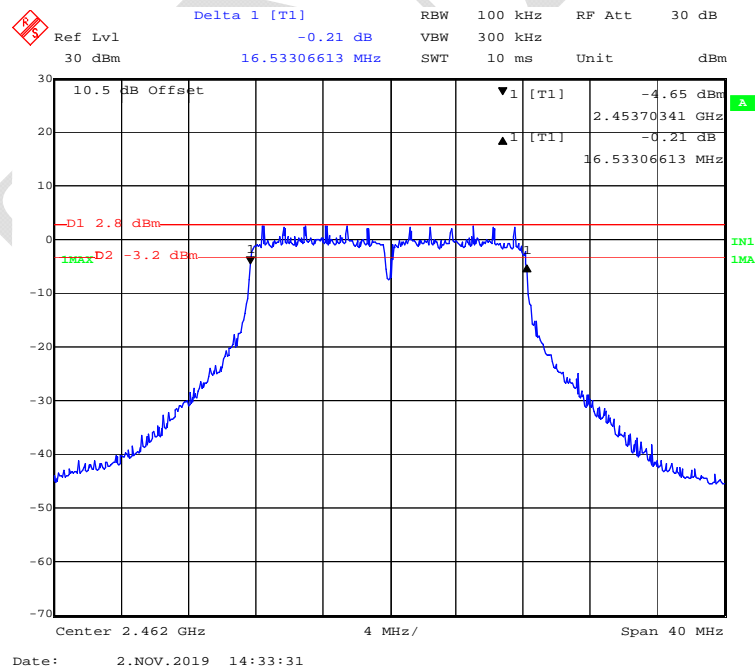




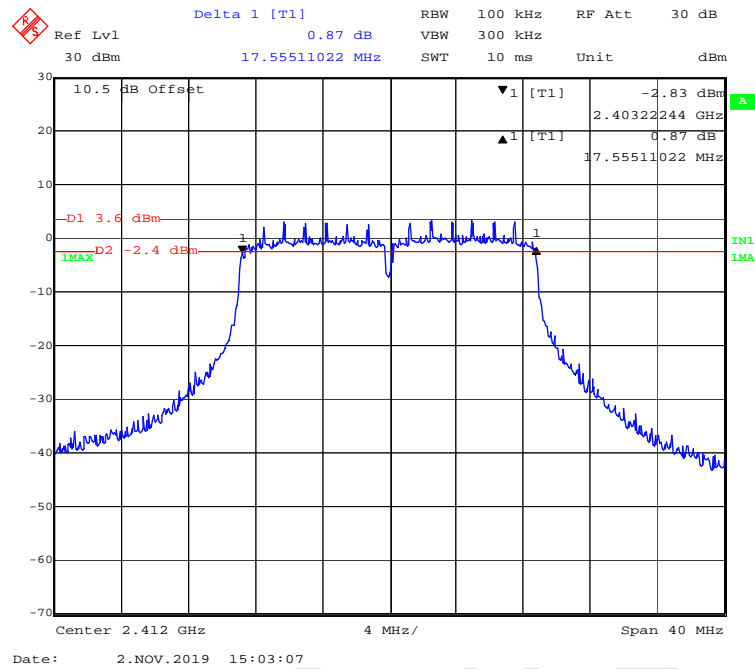
### 802.11g Mode Middle Channel



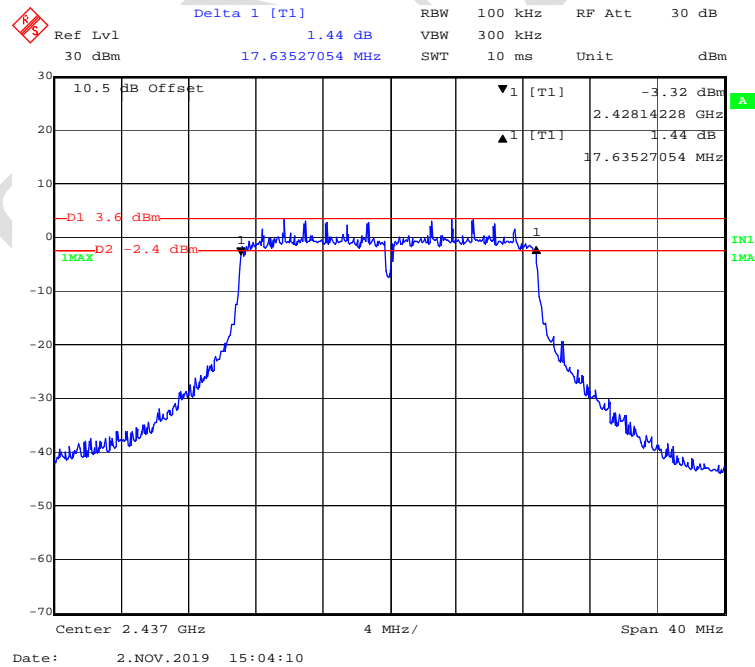
### 802.11g Mode High Channel



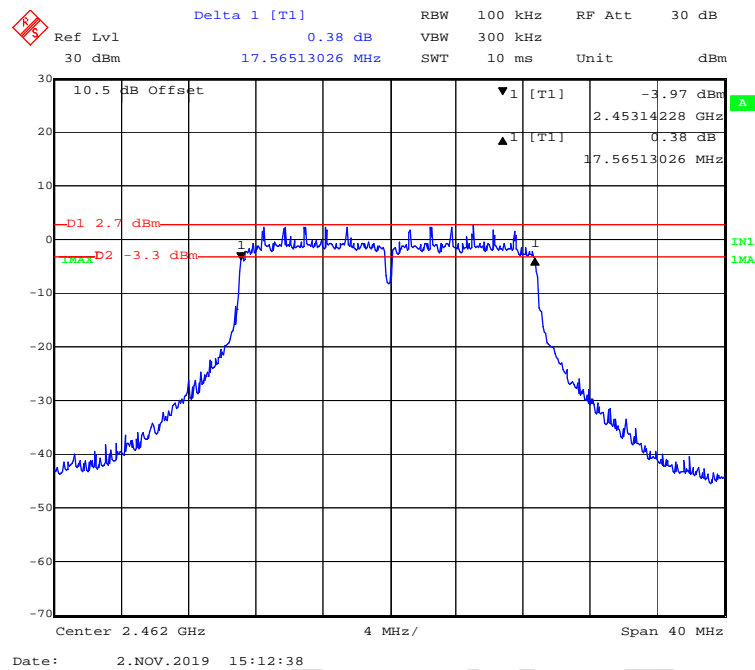
### 802.11n-HT20 Mode Low Channel



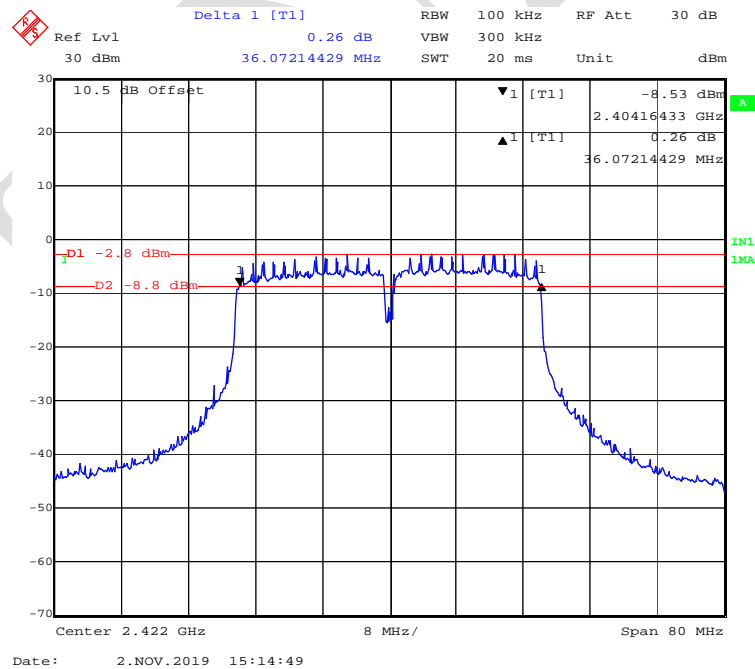
### 802.11n-HT20 Mode Middle Channel



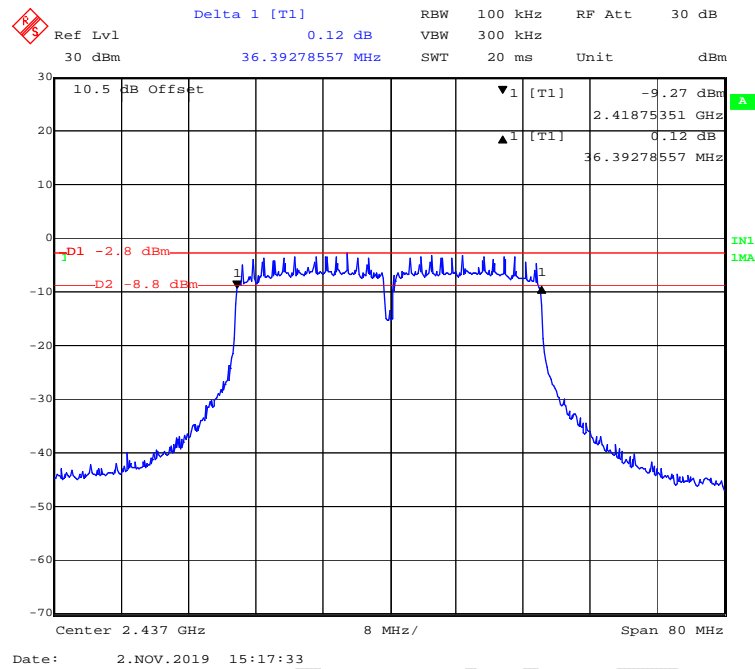
### 802.11n-HT20 Mode High Channel



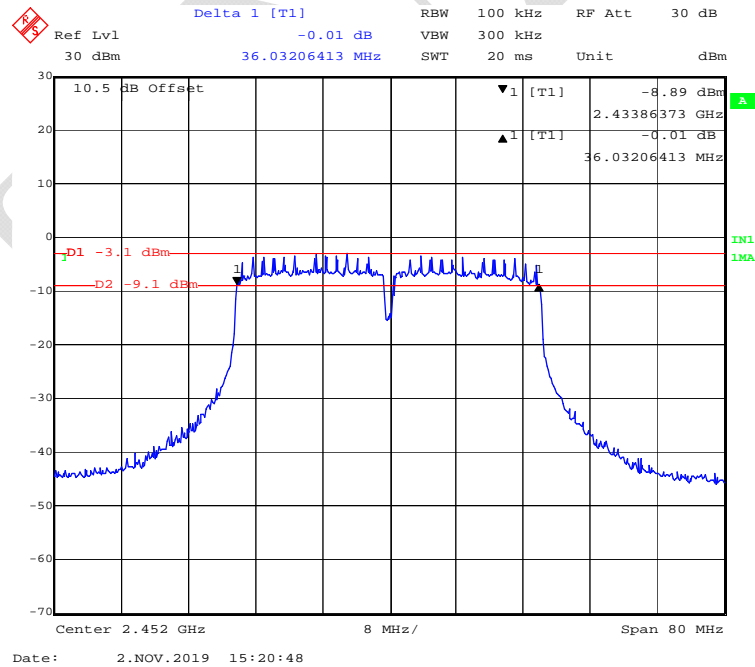
### 802.11n-HT40 Mode Low Channel



### 802.11n-HT40 Mode Middle Channel

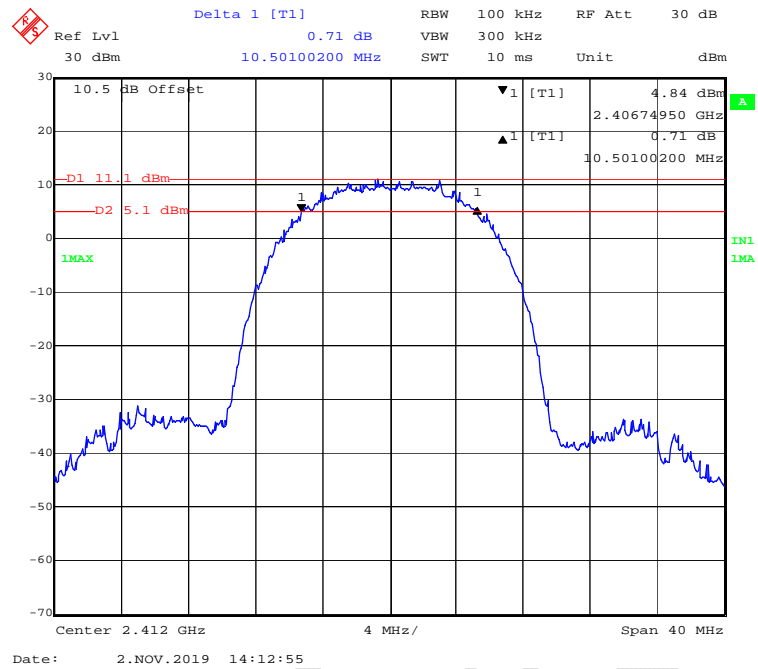


### 802.11n-HT40 Mode High Channel

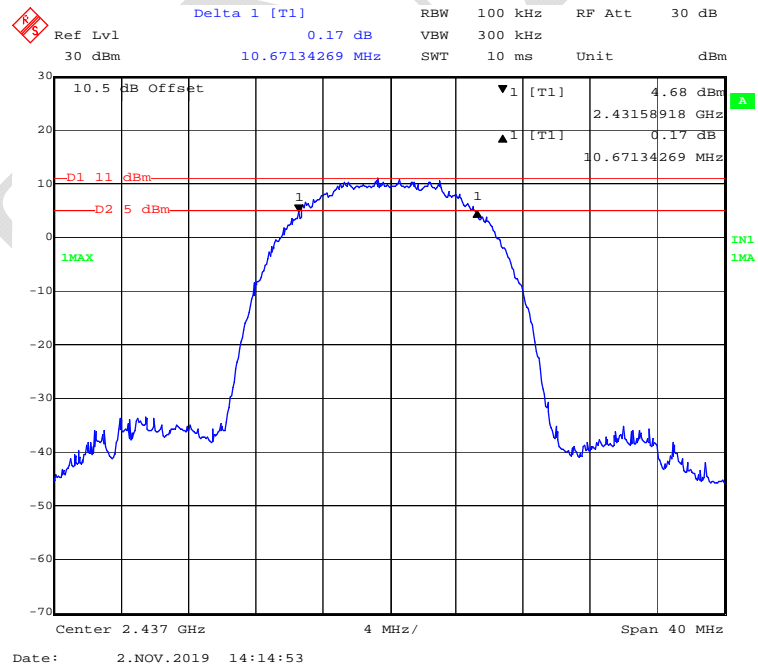


Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	Limit (MHz)
ANT 3 802.11b Mode			
Low	2412	10.501	$\geq 0.5$
Middle	2437	10.671	$\geq 0.5$
High	2462	10.521	$\geq 0.5$
ANT 3 802.11g Mode			
Low	2412	16.433	$\geq 0.5$
Middle	2437	16.523	$\geq 0.5$
High	2462	16.533	$\geq 0.5$
ANT 3 802.11n-HT20 Mode			
Low	2412	17.555	$\geq 0.5$
Middle	2437	17.555	$\geq 0.5$
High	2462	17.565	$\geq 0.5$
ANT 3 802.11n-HT40 Mode			
Low	2422	36.393	$\geq 0.5$
Middle	2437	36.553	$\geq 0.5$
High	2452	36.353	$\geq 0.5$

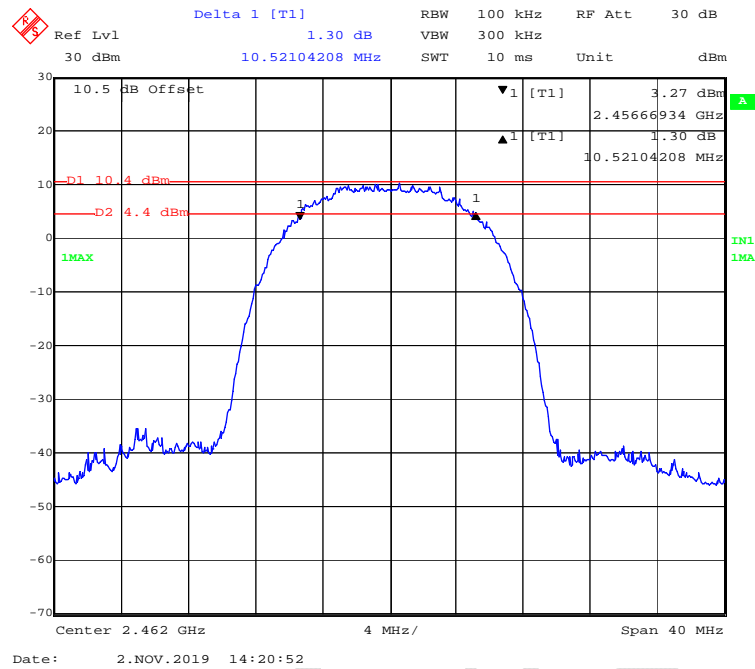
### 802.11b Mode Low Channel



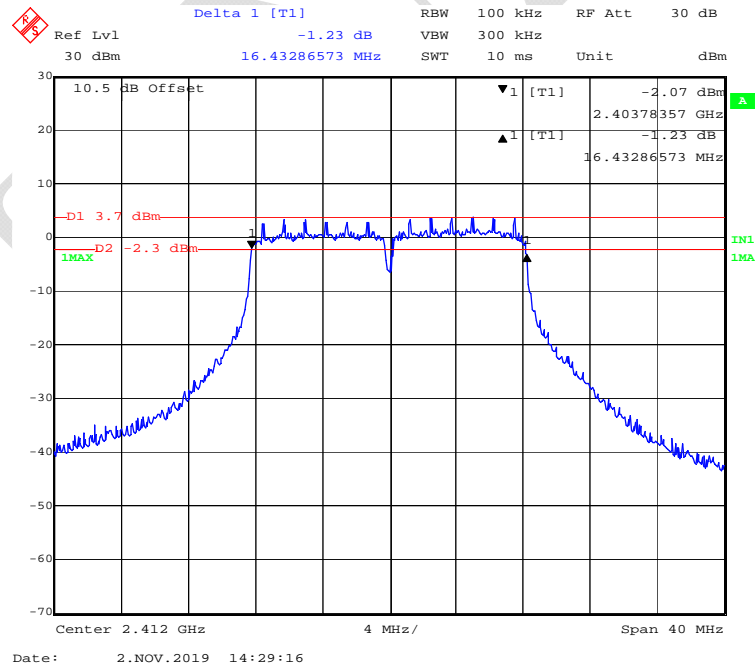
### 802.11b Mode Middle Channel



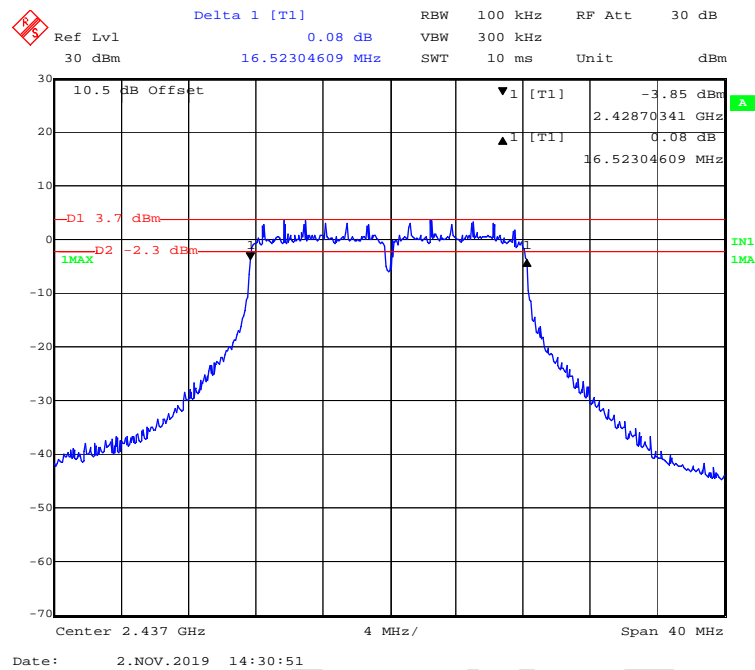
### 802.11b Mode High Channel



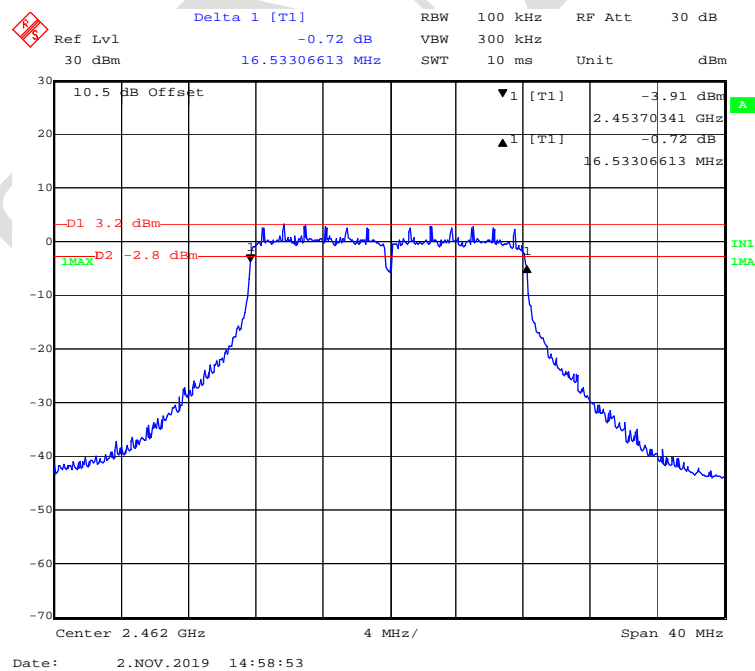
### 802.11g Mode Low Channel



### 802.11g Mode Middle Channel

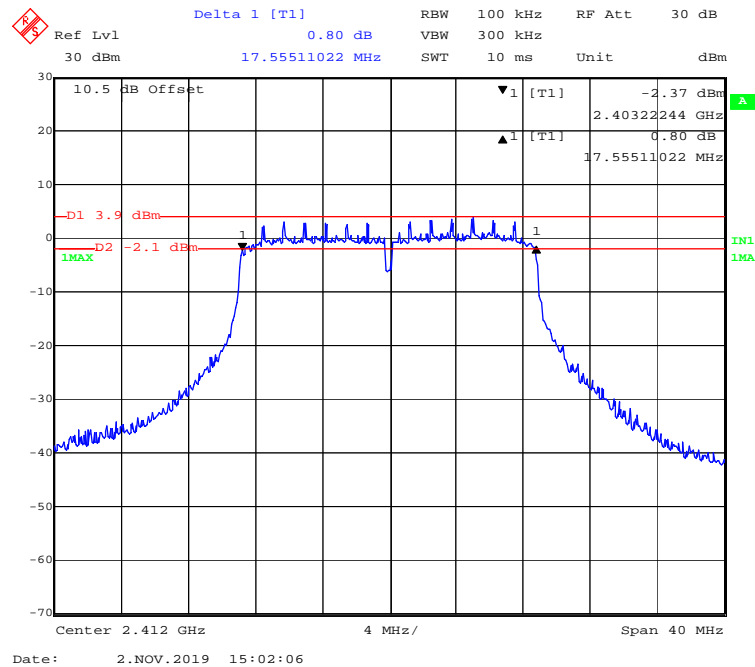


### 802.11g Mode High Channel

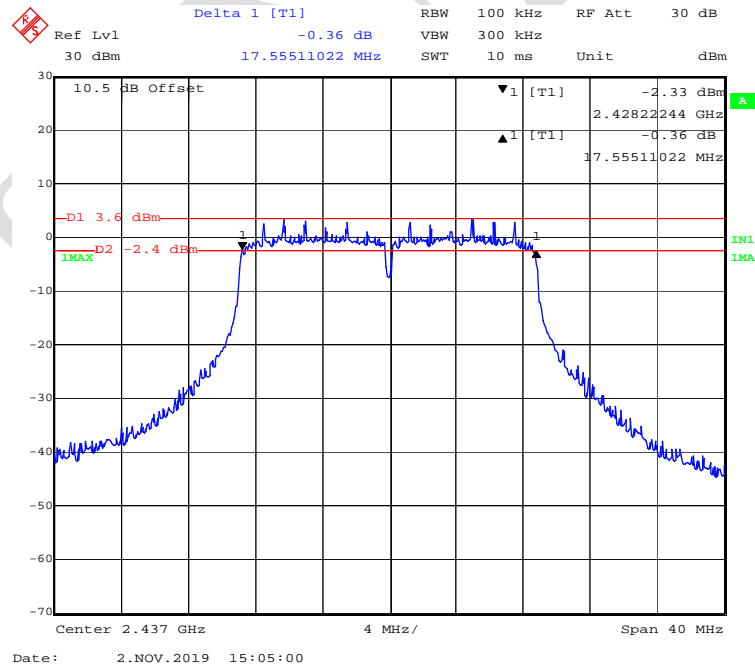




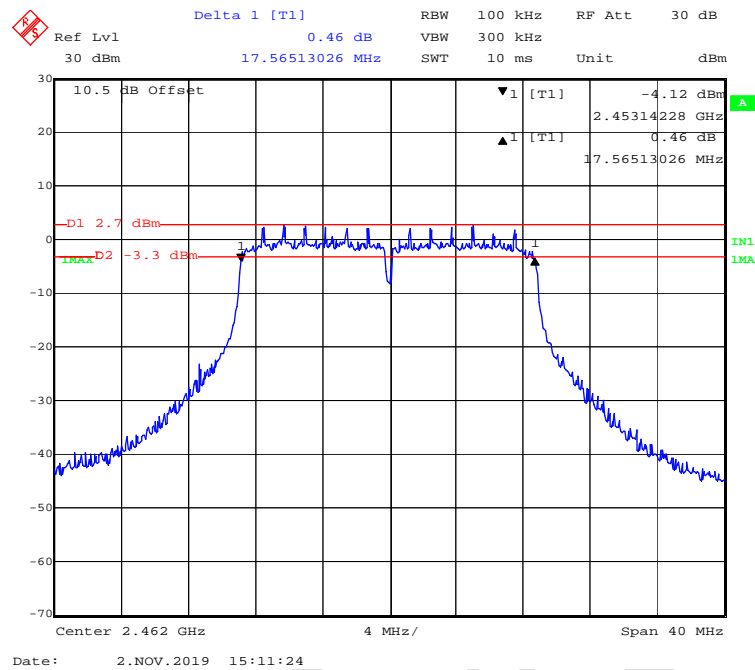
### 802.11n-HT20 Mode Low Channel



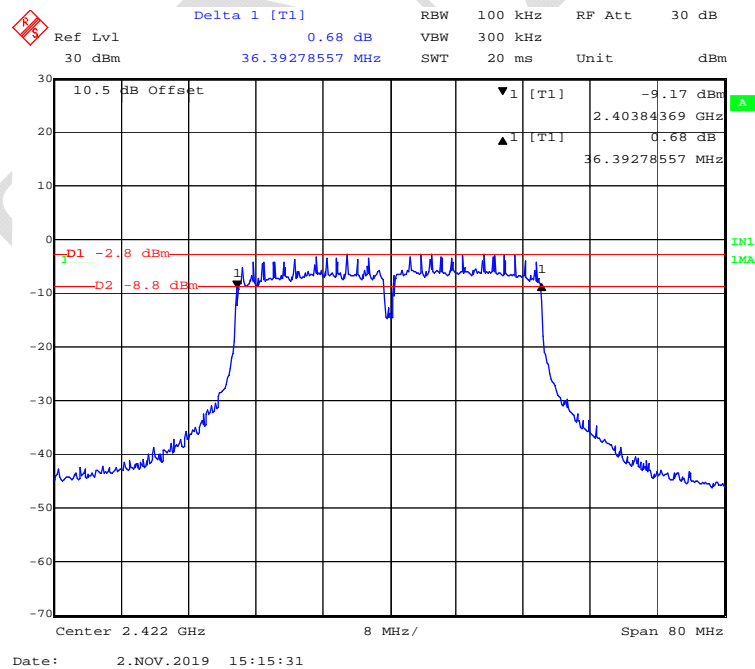
### 802.11n-HT20 Mode Middle Channel



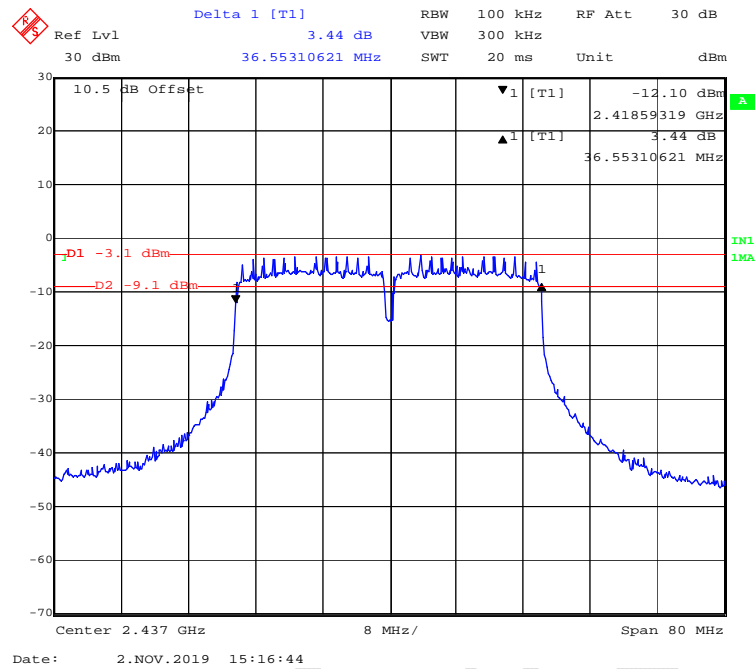
## 802.11n-HT20 Mode High Channel



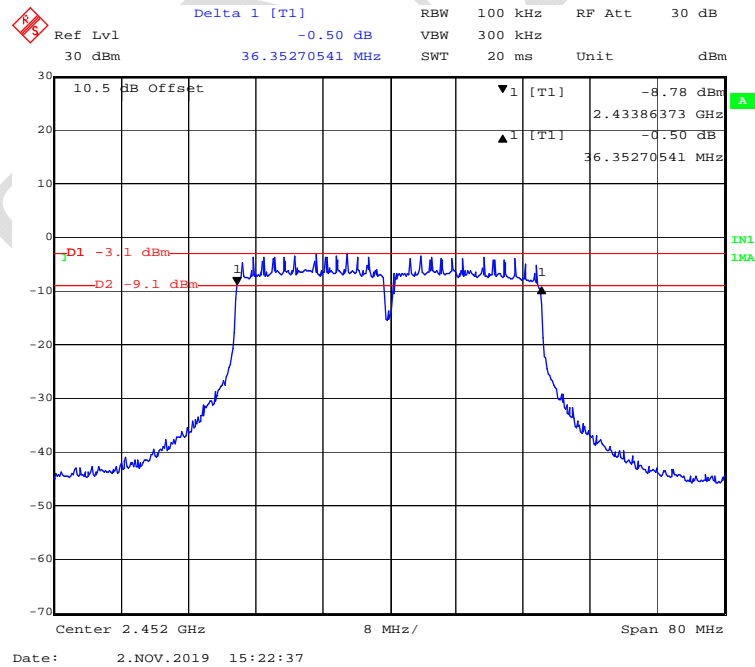
## 802.11n-HT40 Mode Low Channel



### 802.11n-HT40 Mode Middle Channel



### 802.11n-HT40 Mode High Channel



## **RSS-GEN ISSUE 5 Clause 6.7 – OCCUPIED BANDWIDTH**

### **Applicable Standard**

According to RSS-GEN Issue 5 Clause 6.7

The occupied bandwidth or the “99% emission bandwidth” is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.

### **Test Procedure**

The following conditions shall be observed for measuring the occupied bandwidth:

1. The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
2. The span of the spectrum analyzer shall be set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency, but small enough to avoid having other emissions (e.g. on adjacent channels) within the span.
3. The detector of the spectrum analyzer shall be set to “Sample”. However, a peak, or peak hold, may be used in place of the sampling detector since this usually produces a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold (or “Max Hold”) may be necessary to determine the occupied if the device is not transmitting continuously.
4. The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value. Video averaging is not permitted.

Note: It may be necessary to repeat the measurement a few times until the RBW and VBW are in compliance with the above requirement.

For the 99% emission bandwidth, the trace data points are recovered and directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached, and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded. The difference between the two recorded frequencies is the occupied bandwidth (or the 99% emission bandwidth).

### **Test Data**

#### **Environmental Conditions**

<b>Temperature:</b>	23.2 °C
<b>Relative Humidity:</b>	55 %
<b>ATM Pressure:</b>	101.4 kPa

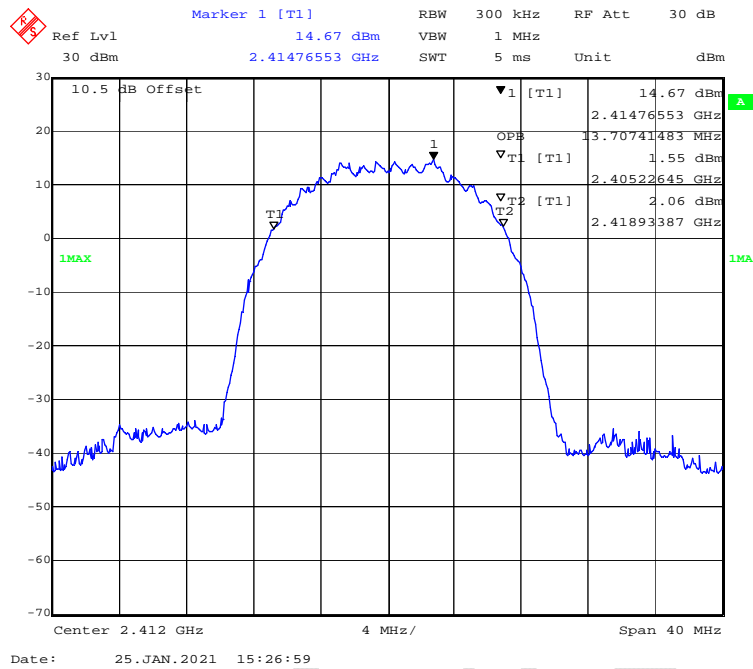
*The testing was performed by Stone Zhang on 2021-01-25.*

*Test Mode: Transmitting*

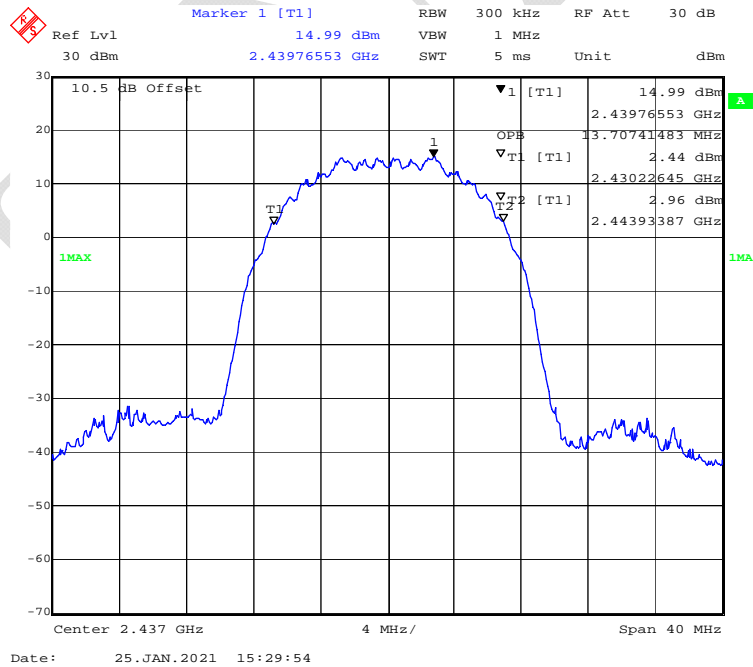
**Test Result:** Pass

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
ANT1: 802.11b Mode		
Low	2412	13.707
Middle	2437	13.707
High	2462	13.788
ANT1: 802.11g Mode		
Low	2412	16.834
Middle	2437	16.754
High	2462	16.834
ANT1: 802.11n-HT20 Mode		
Low	2412	17.956
Middle	2437	17.876
High	2462	17.956
ANT1: 802.11n-HT40 Mode		
Low	2422	36.713
Middle	2437	36.713
High	2452	36.713

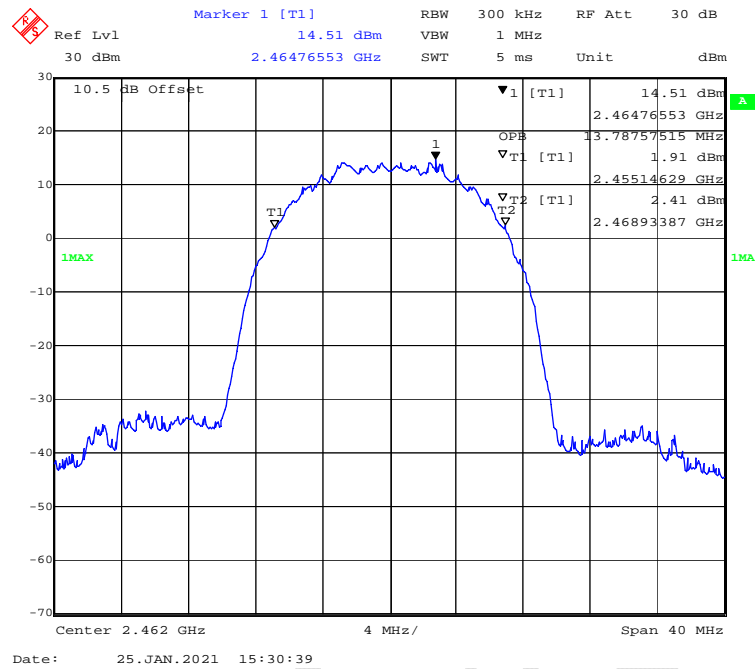
### 802.11b Mode Low Channel



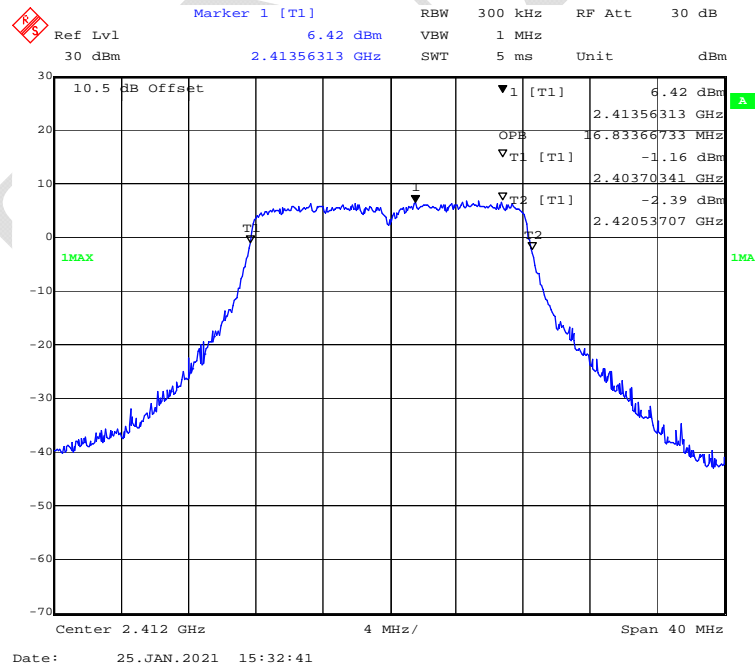
### 802.11b Mode Middle Channel



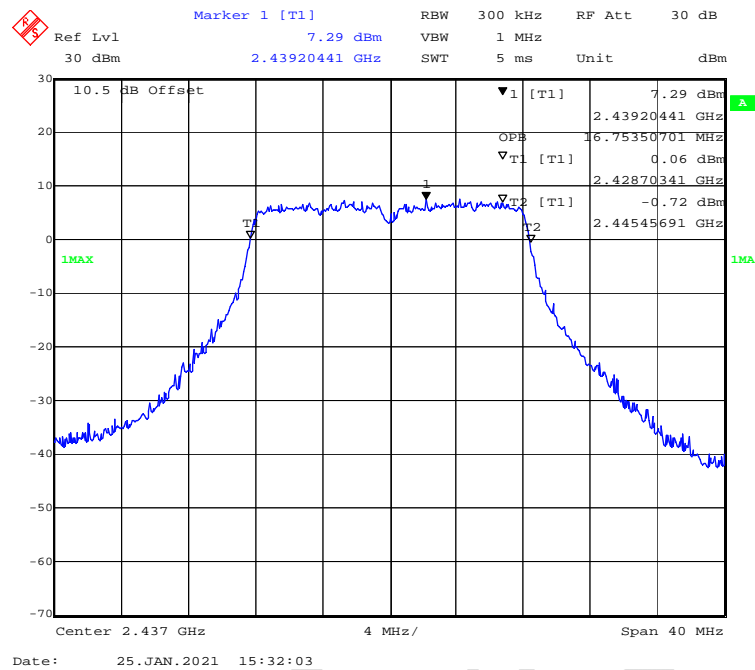
### 802.11b Mode High Channel



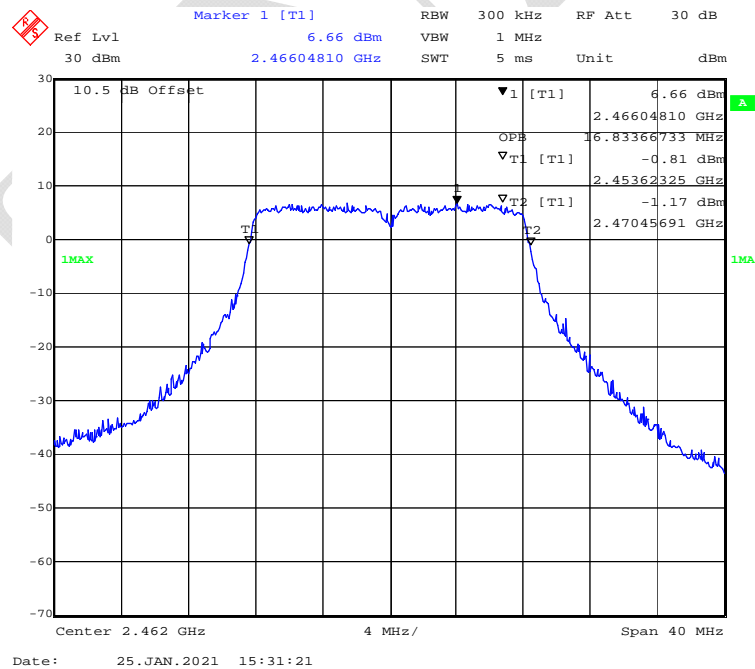
### 802.11g Mode Low Channel



### 802.11g Mode Middle Channel

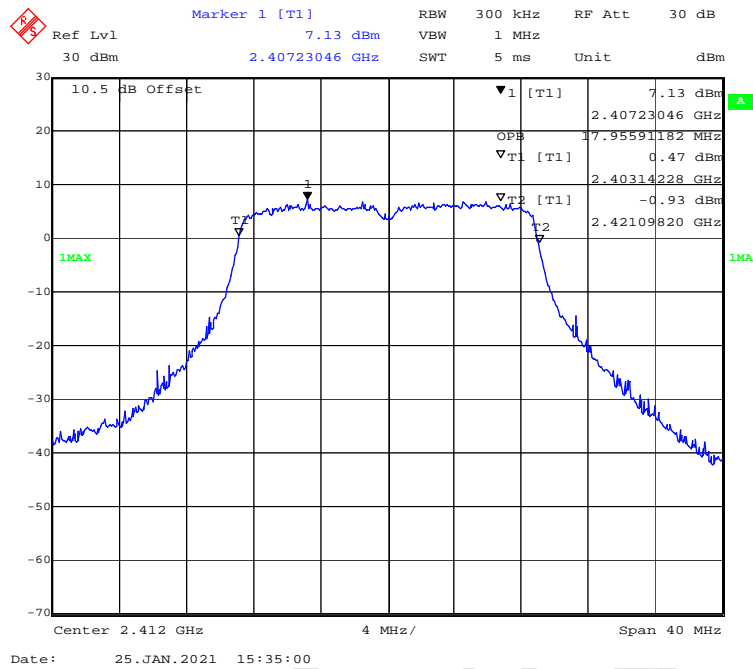


### 802.11g Mode High Channel

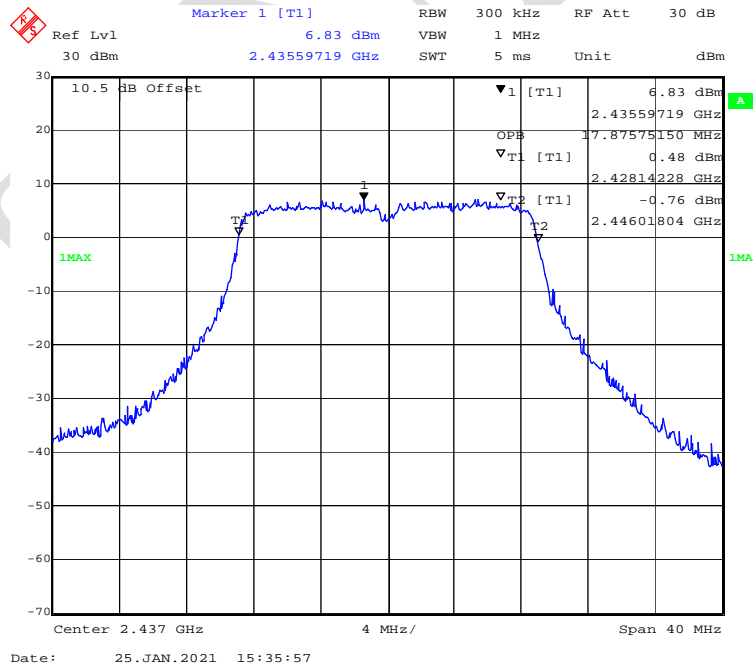




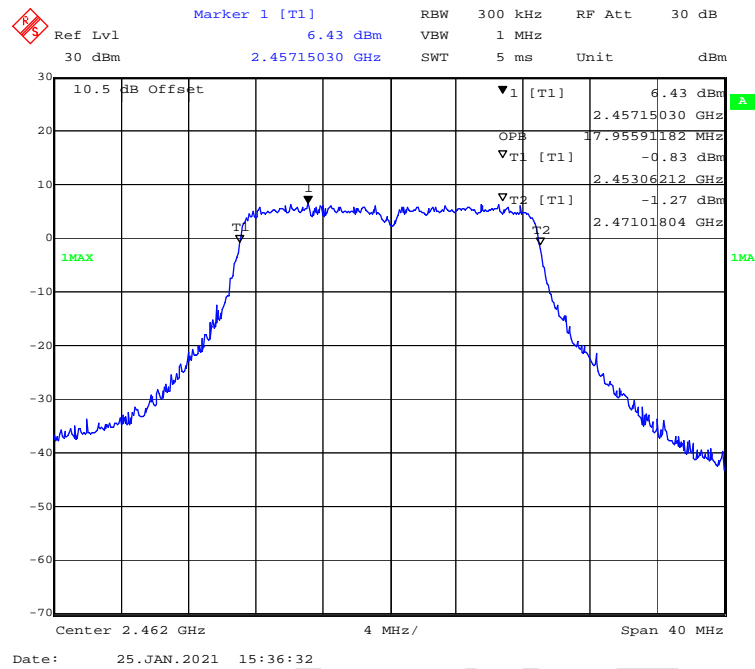
### 802.11n-HT20 Mode Low Channel



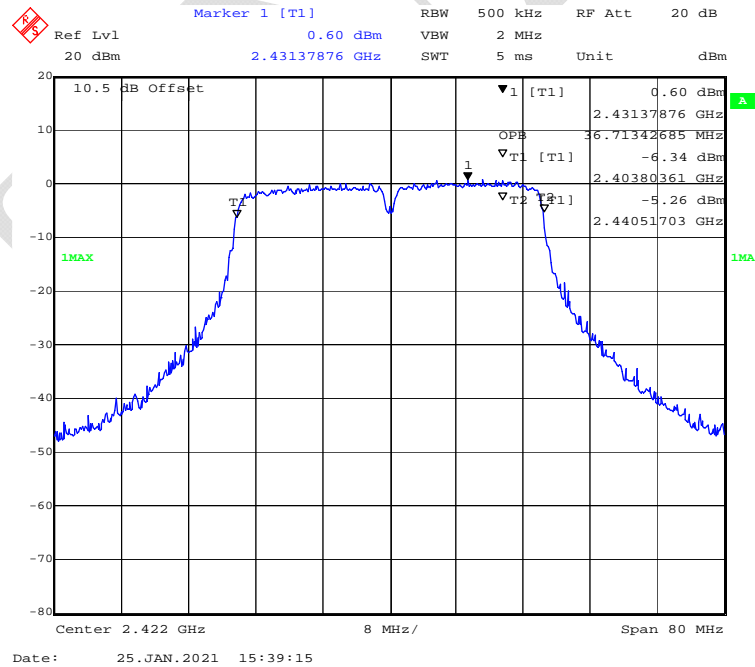
### 802.11n-HT20 Mode Middle Channel



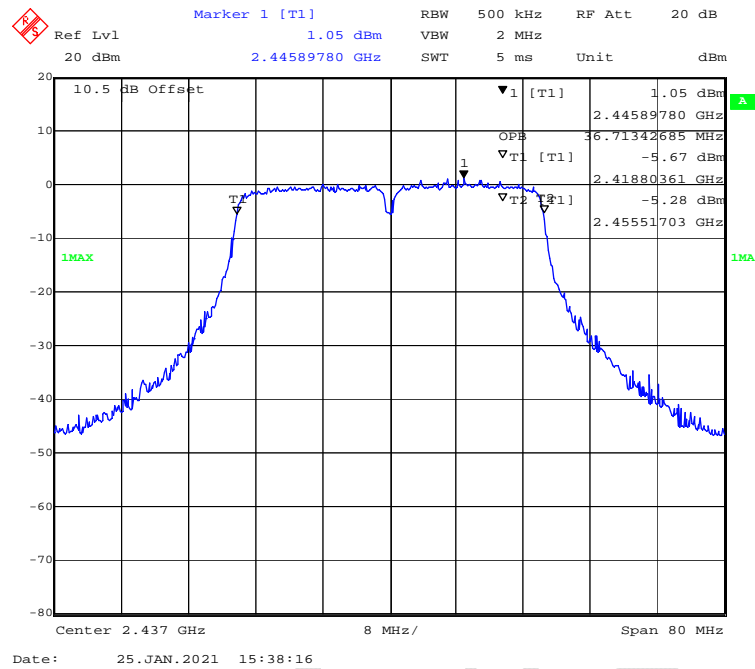
## 802.11n-HT20 Mode High Channel



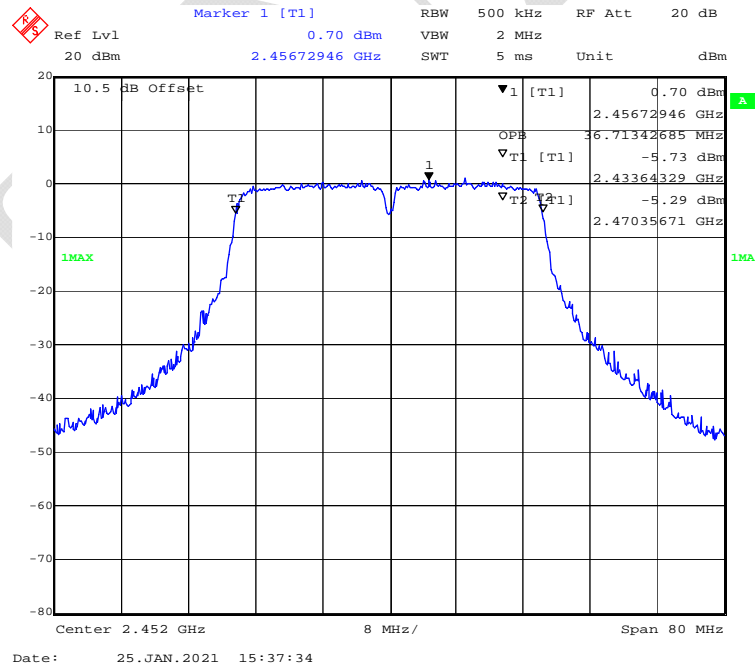
## 802.11n-HT40 Mode Low Channel



### 802.11n-HT40 Mode Middle Channel

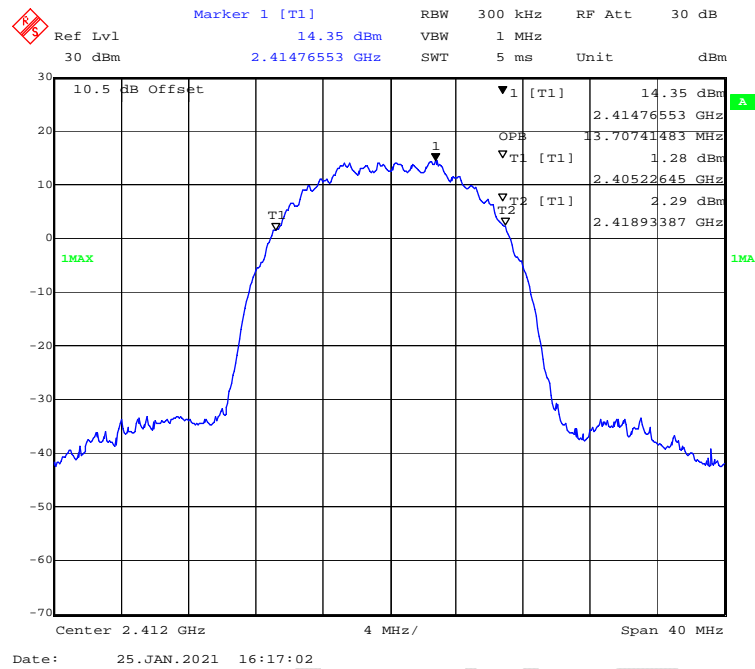


### 802.11n-HT40 Mode High Channel

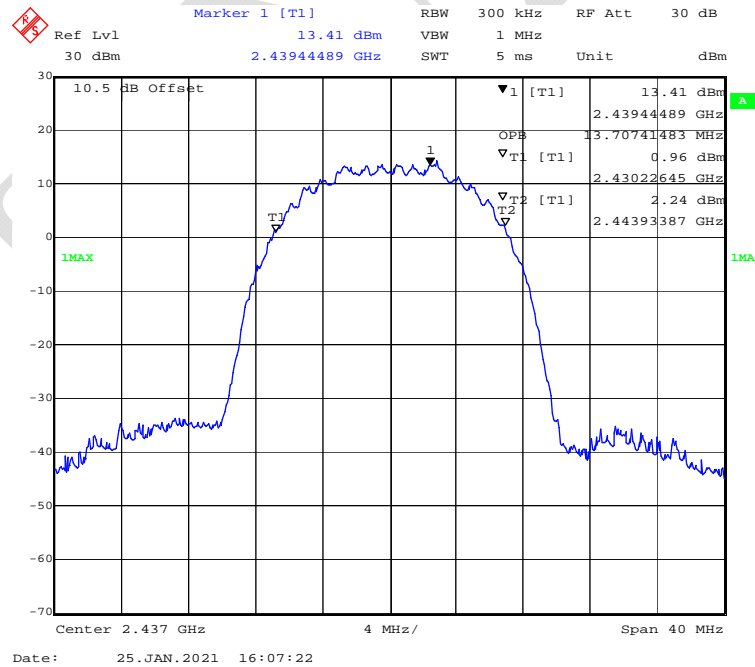


Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
ANT2: 802.11b Mode		
Low	2412	13.707
Middle	2437	13.707
High	2462	13.707
ANT2: 802.11g Mode		
Low	2412	16.754
Middle	2437	16.834
High	2462	16.914
ANT2: 802.11n-HT20 Mode		
Low	2412	17.876
Middle	2437	17.876
High	2462	17.876
ANT2: 802.11n-HT40 Mode		
Low	2422	36.553
Middle	2437	36.713
High	2452	36.713

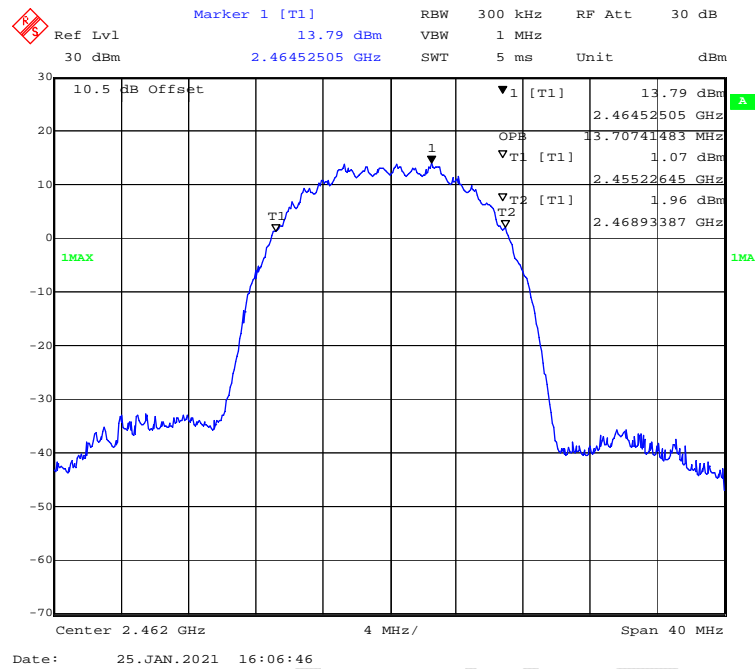
### 802.11b Mode Low Channel



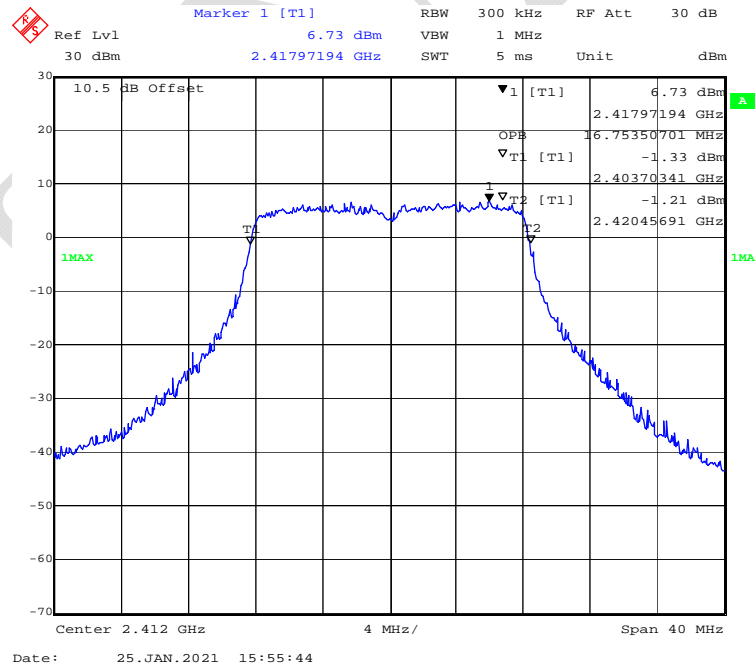
### 802.11b Mode Middle Channel



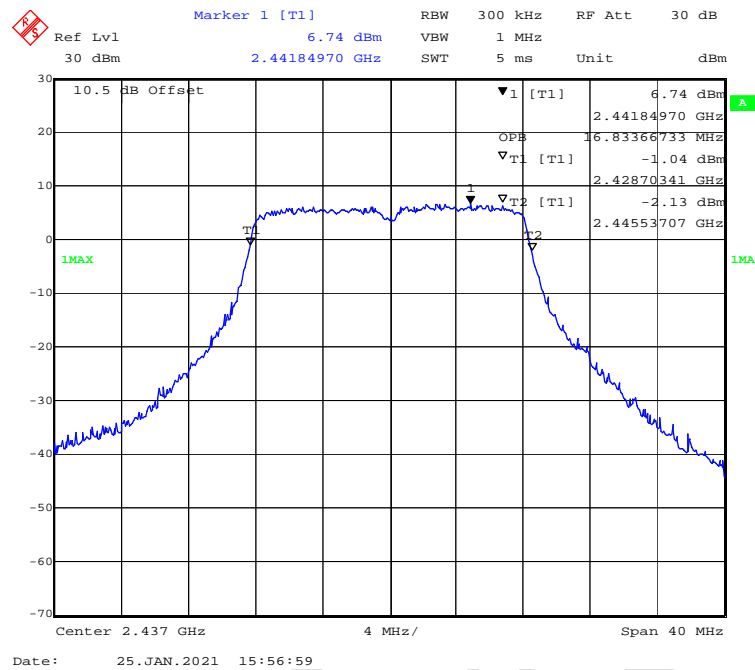
### 802.11b Mode High Channel



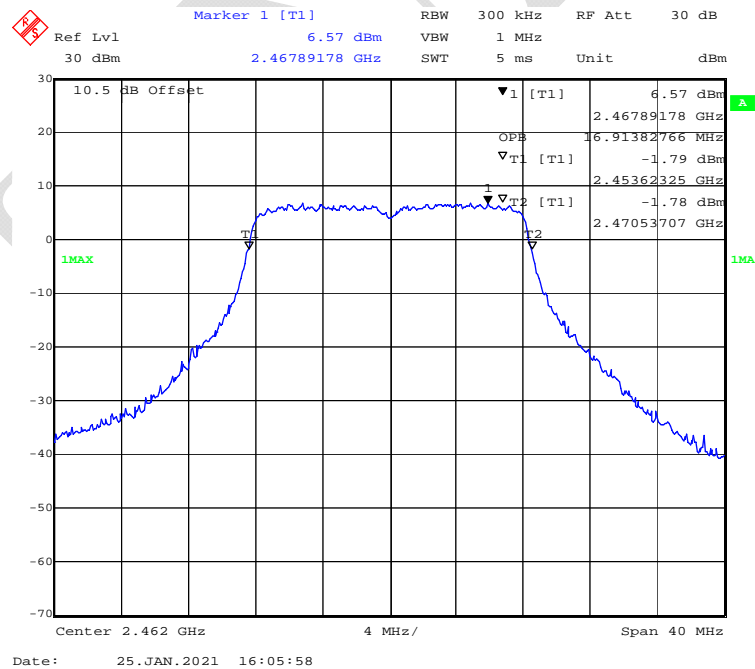
### 802.11g Mode Low Channel



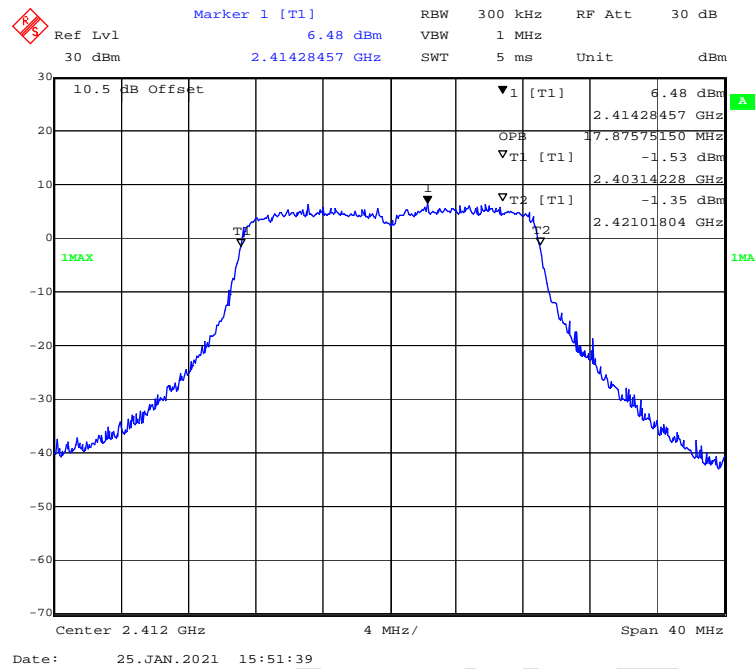
### 802.11g Mode Middle Channel



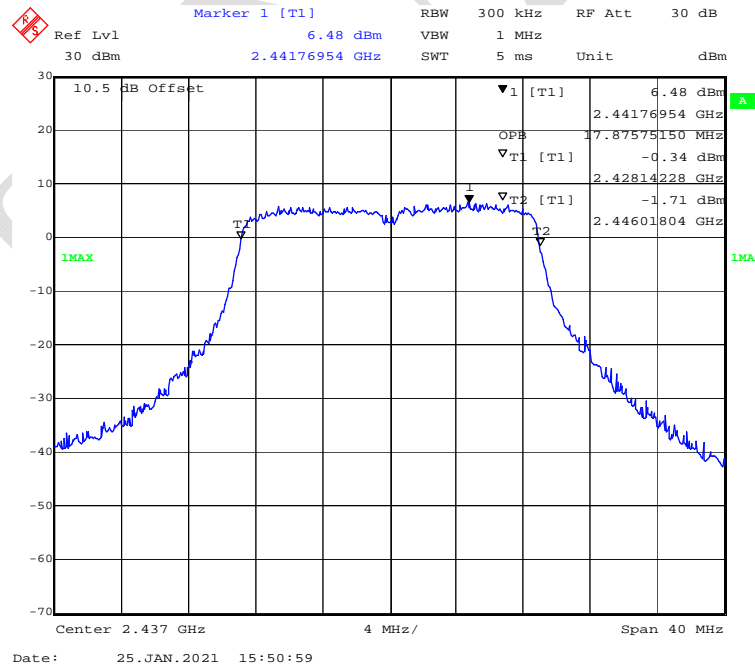
### 802.11g Mode High Channel



### 802.11n-HT20 Mode Low Channel

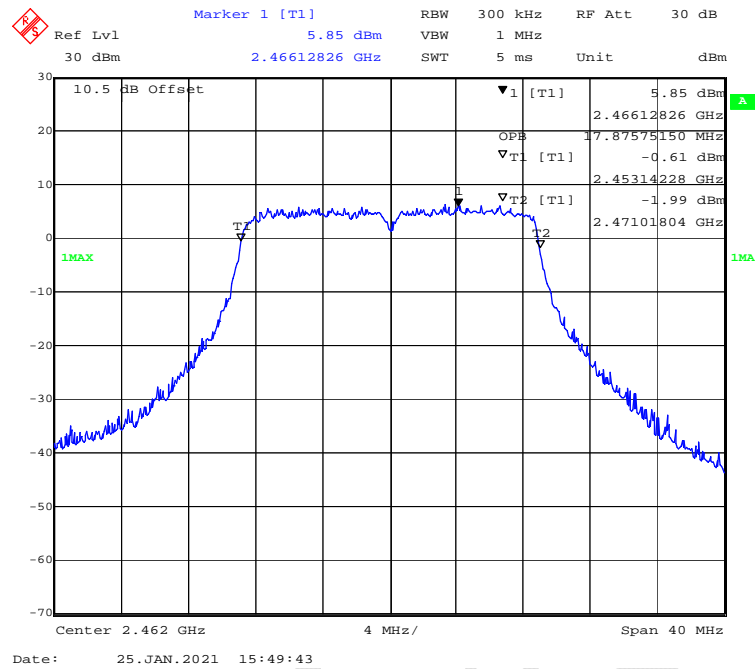


### 802.11n-HT20 Mode Middle Channel

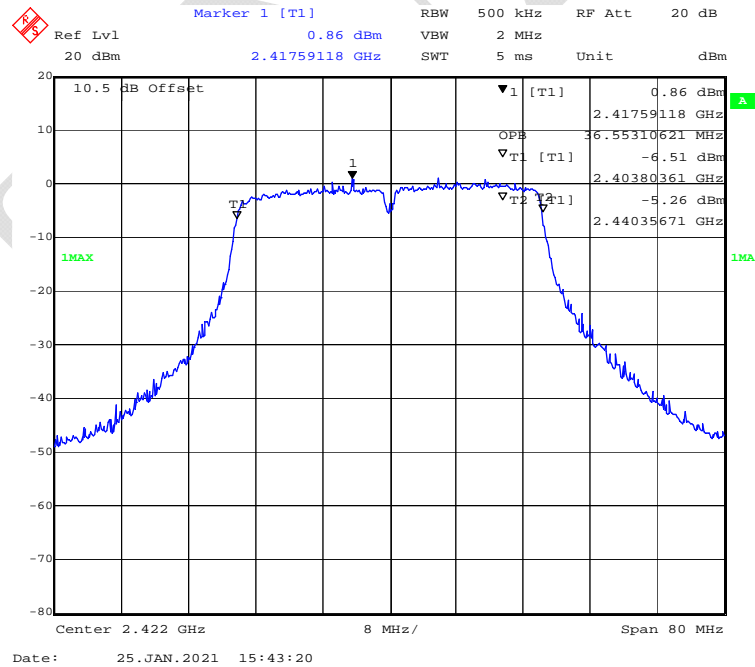




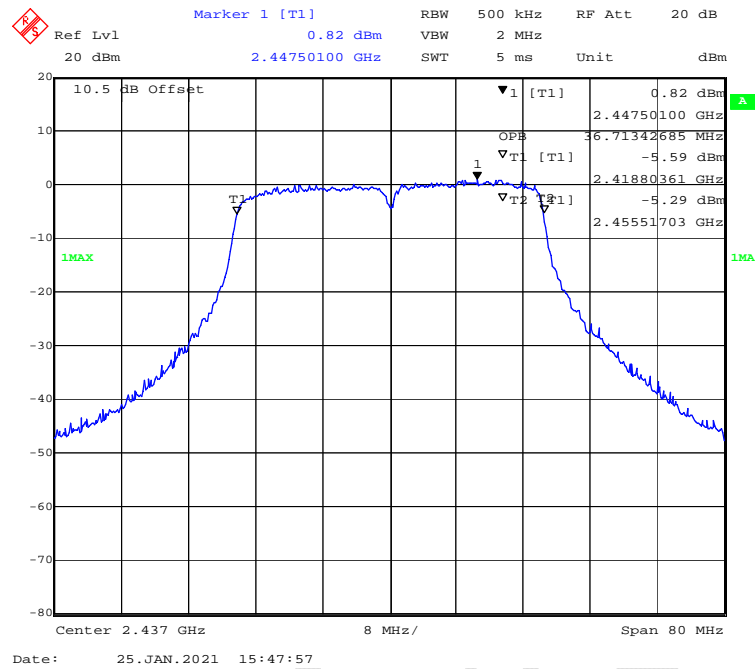
### 802.11n-HT20 Mode High Channel



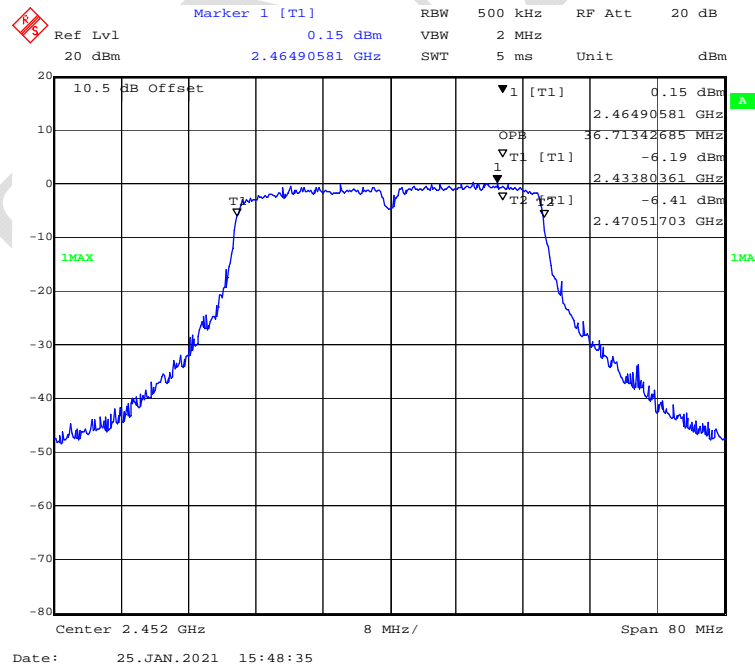
### 802.11n-HT40 Mode Low Channel



### 802.11n-HT40 Mode Middle Channel

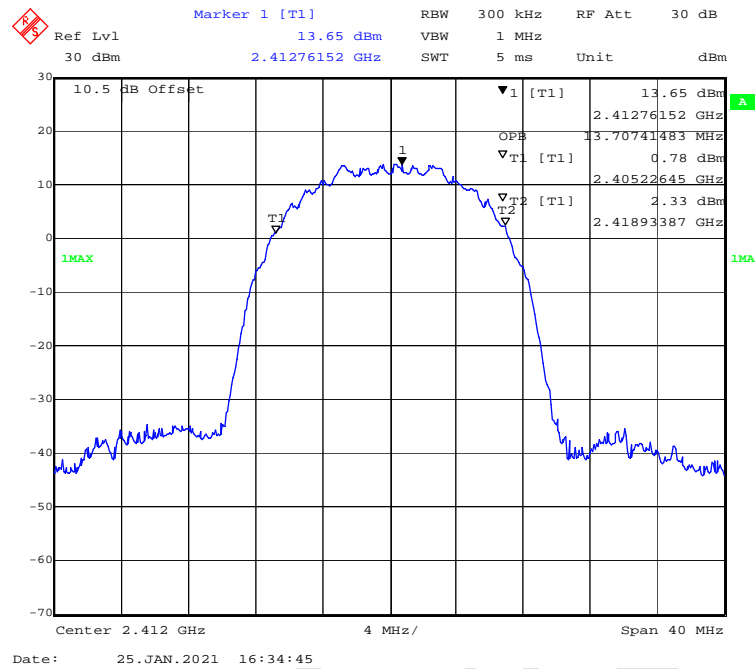


### 802.11n-HT40 Mode High Channel

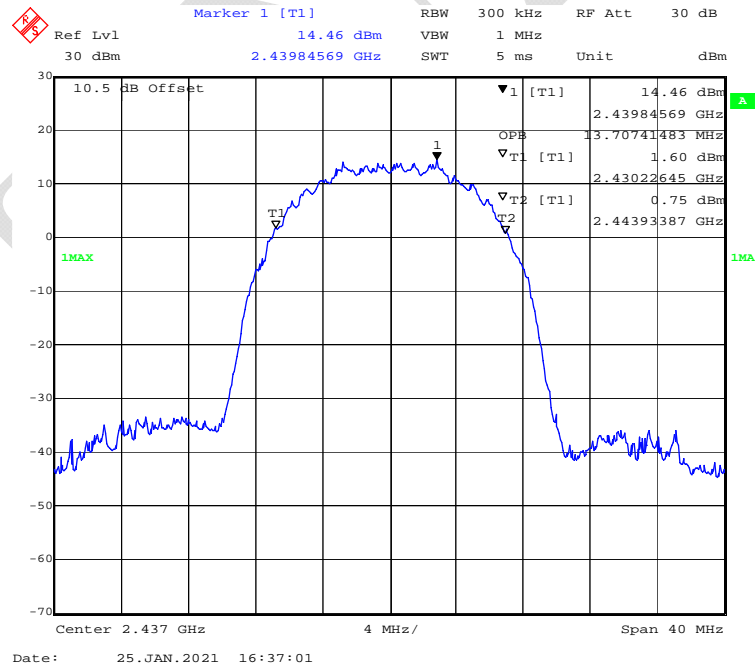


Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
ANT3: 802.11b Mode		
Low	2412	13.707
Middle	2437	13.707
High	2462	13.707
ANT3: 802.11g Mode		
Low	2412	16.834
Middle	2437	16.754
High	2462	16.834
ANT3: 802.11n-HT20 Mode		
Low	2412	17.876
Middle	2437	17.876
High	2462	17.876
ANT3: 802.11n-HT40 Mode		
Low	2422	36.553
Middle	2437	36.713
High	2452	36.713

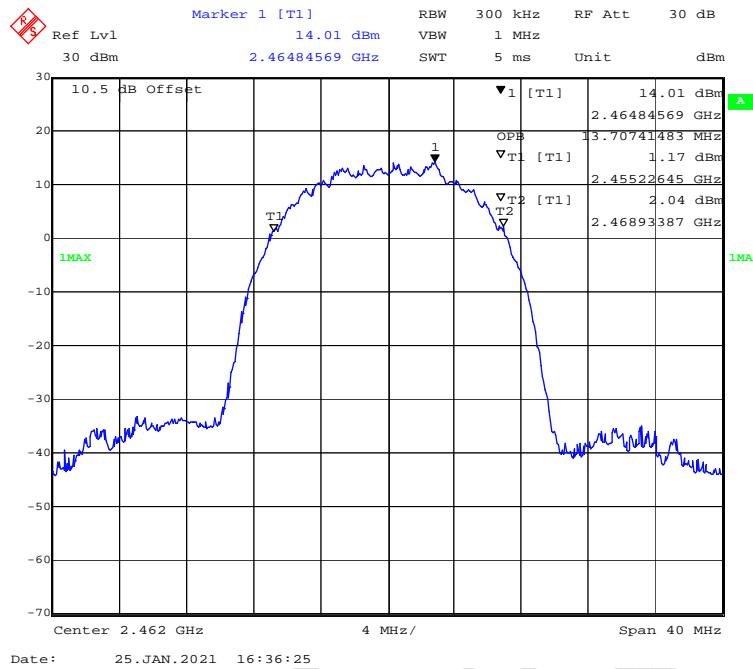
## 802.11b Mode Low Channel



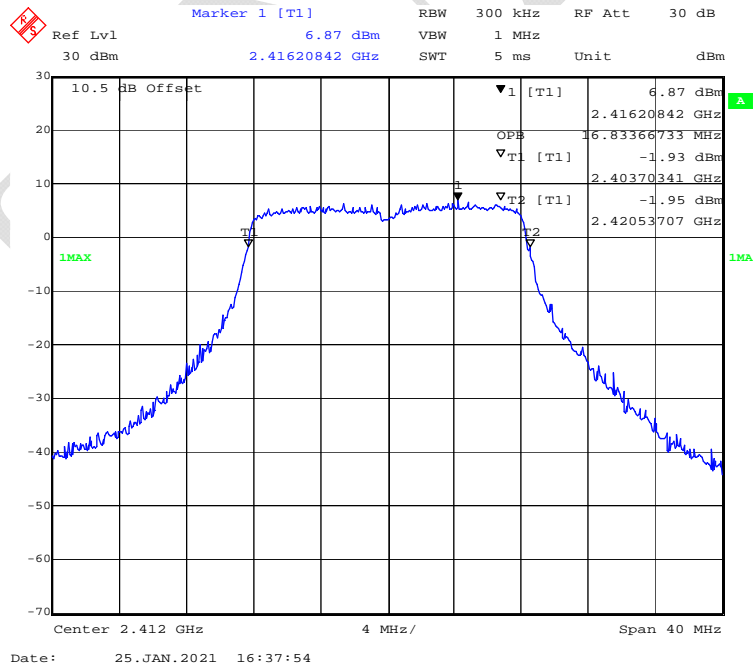
## 802.11b Mode Middle Channel



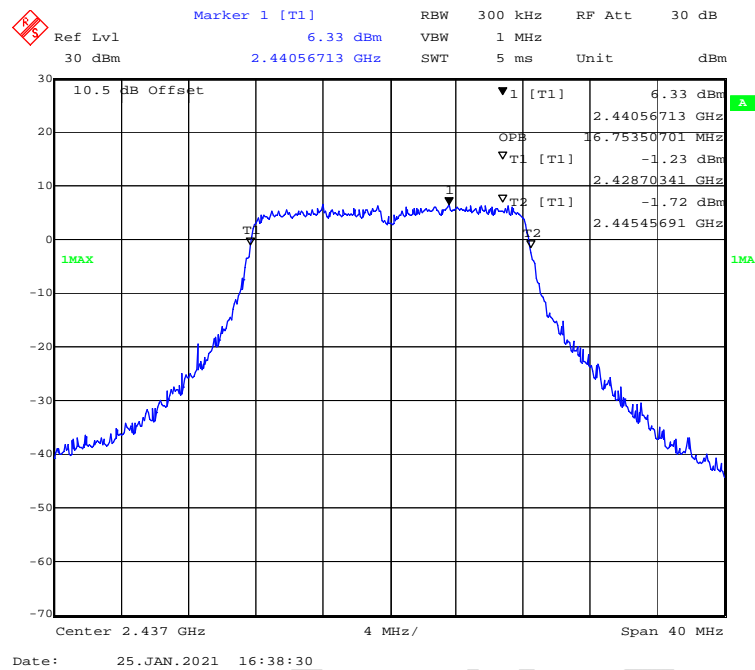
### 802.11b Mode High Channel



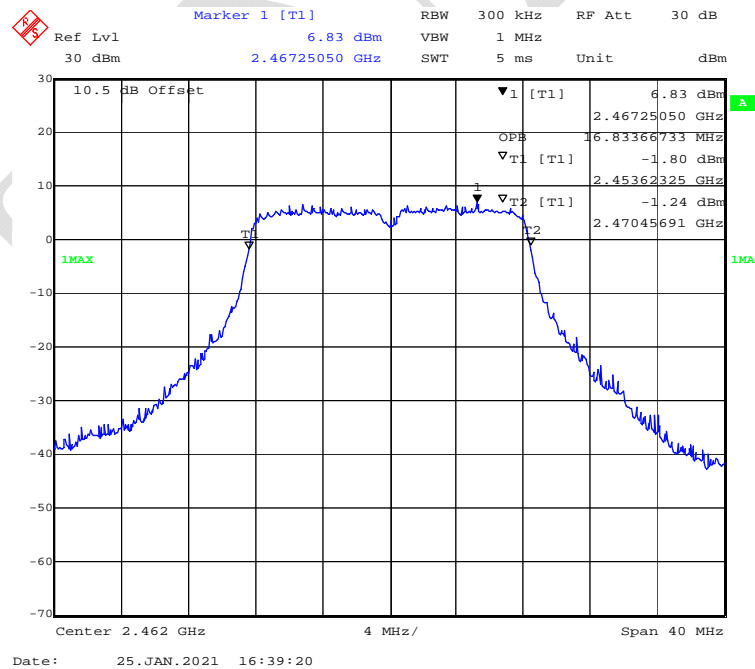
### 802.11g Mode Low Channel



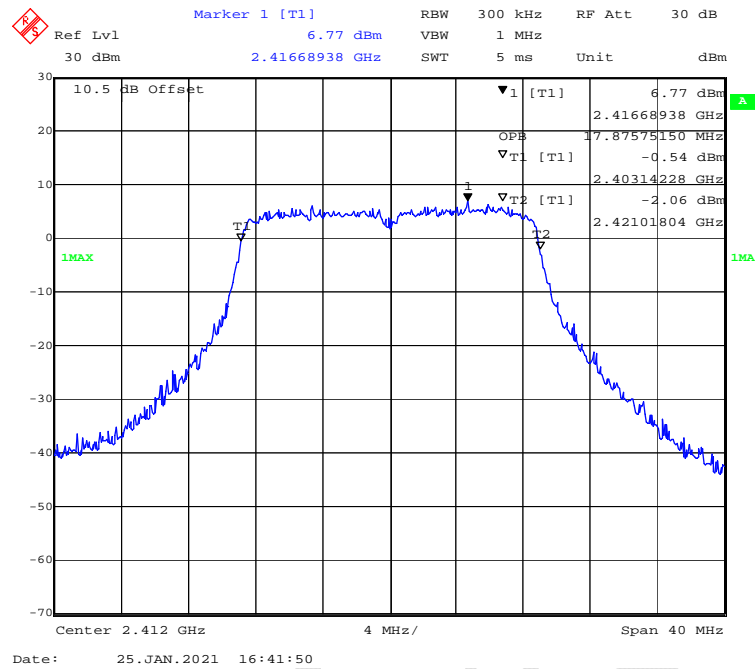
### 802.11g Mode Middle Channel



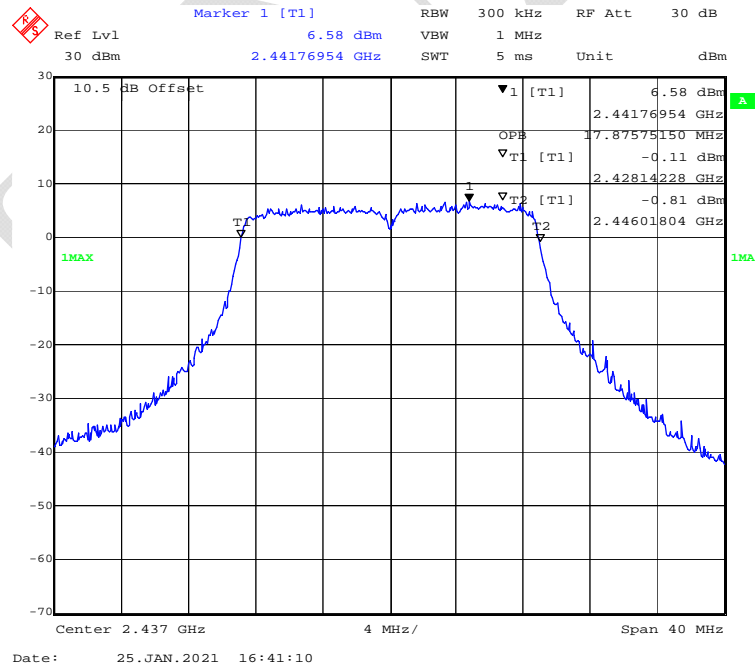
### 802.11g Mode High Channel

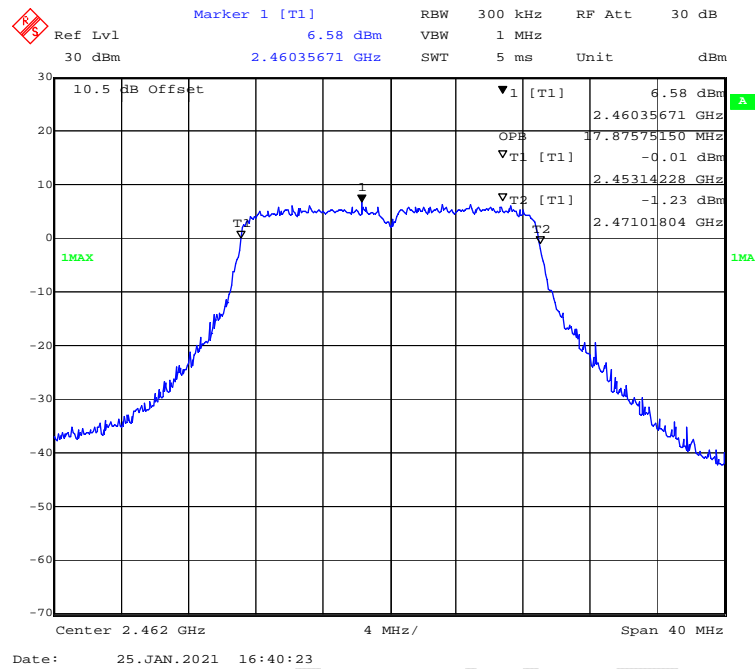
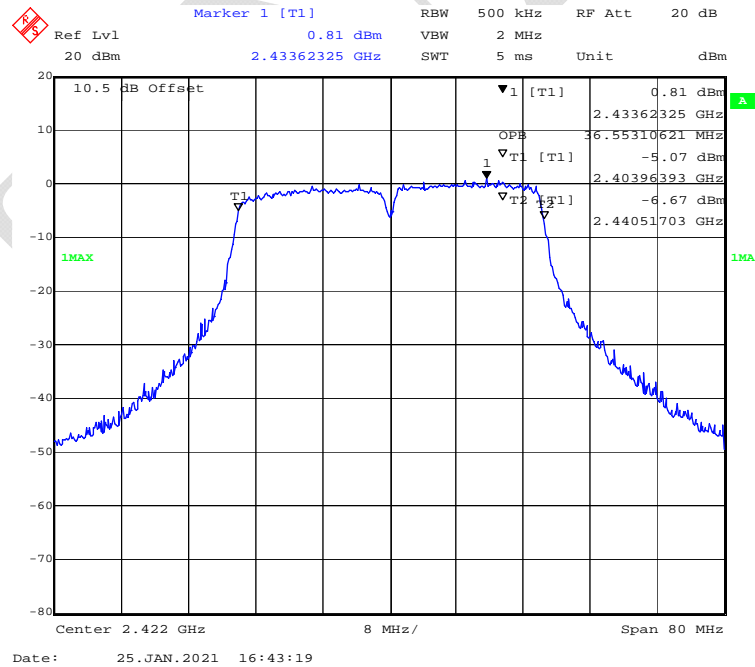


### 802.11n-HT20 Mode Low Channel



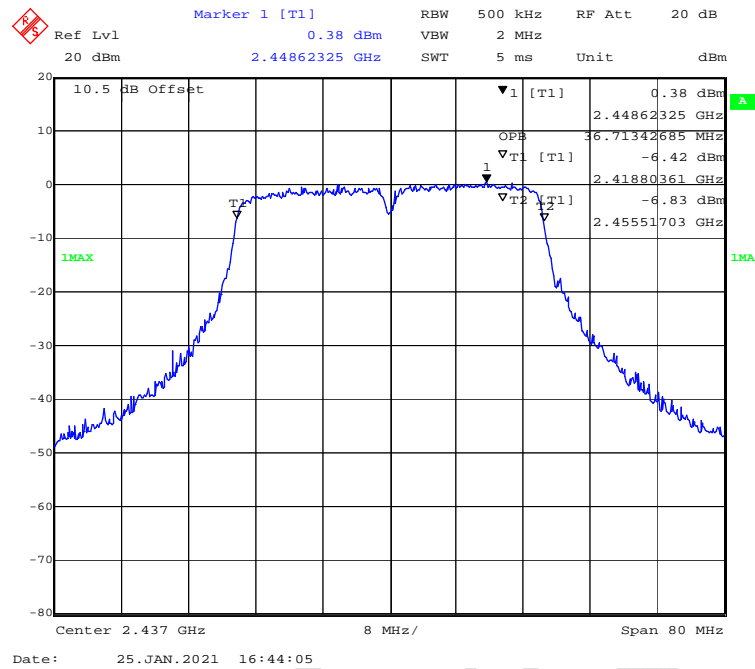
### 802.11n-HT20 Mode Middle Channel



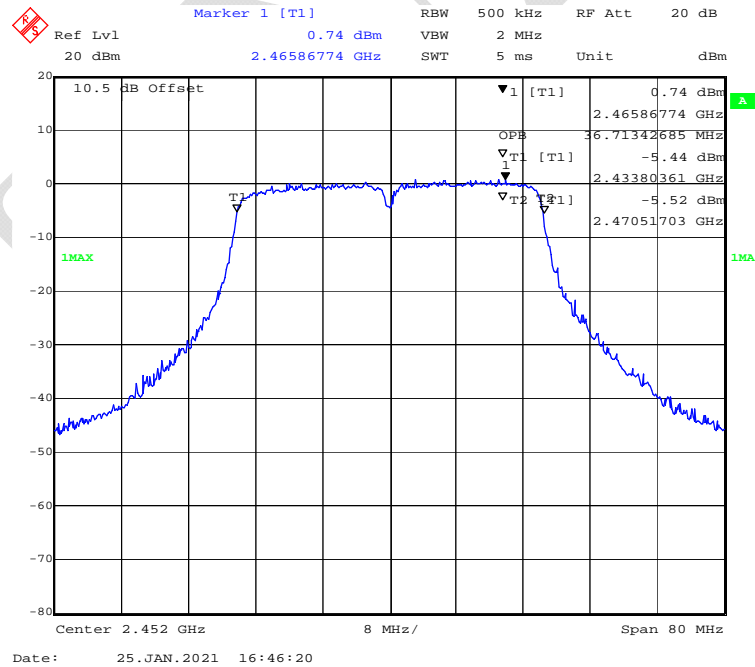
**802.11n-HT20 Mode High Channel****802.11n-HT40 Mode Low Channel**



### 802.11n-HT40 Mode Middle Channel



### 802.11n-HT40 Mode High Channel



**RSS-247 ISSUE2 Clause5.2 b) – POWER SPECTRAL DENSITY****Applicable Standard**

According to RSS-247 Issue2 Clause5.2 b)

The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of section 5.4(d), (i.e. the power spectral density shall be determined using the same method as is used to determine the conducted output power).

**Test Procedure**

1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
2. Set the RBW to:  $3\text{kHz} \leq \text{RBW} \leq 100\text{ kHz}$ .
3. Set the VBW  $\geq 3 \times \text{RBW}$ .
4. Set the span to 1.5 times the DTS bandwidth.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

**Test Data****Environmental Conditions**

<b>Temperature:</b>	24.3 °C
<b>Relative Humidity:</b>	52 %
<b>ATM Pressure:</b>	101.5 kPa

*The testing was performed by Carry Cai on 2019-11-02.*

**Test Result:** Pass.

*EUT operation mode: Transmitting*

Channel	Frequency (MHz)	PSD (dBm/3kHz)				Limit (dBm/3kHz)
		ANT 1	ANT 2	ANT 3	Total	
802.11b Mode						
Low	2412	-4.46	-3.22	-3.92	/	≤ 8
Middle	2437	-3.92	-3.05	-4.18	/	≤ 8
High	2462	-4.76	-4.03	-2.78	/	≤ 8
802.11g Mode						
Low	2412	-11.57	-11.44	-9.66	/	≤ 8
Middle	2437	-11.11	-10.94	-10.27	/	≤ 8
High	2462	-10.87	-11.87	-11.99	/	≤ 8
802.11n-HT20 mode						
Low	2412	-11.78	-11.11	-10.99	-6.51	≤ 7.23
Middle	2437	-11.27	-11.88	-11.24	-6.68	≤ 7.23
High	2462	-12.04	-12.25	-13.04	-7.65	≤ 7.23
802.11n-HT40 Mode						
Low	2422	-17.05	-18.01	-16.68	-12.44	≤ 7.23
Middle	2437	-18.27	-17.05	-17.98	-12.96	≤ 7.23
High	2452	-18.45	-17.81	-17.21	-13.02	≤ 7.23

Note:

The total PSD =  $10 \cdot \log(10^{\text{ANT 1}/10} + 10^{\text{ANT 2}/10} + 10^{\text{ANT 3}/10})$

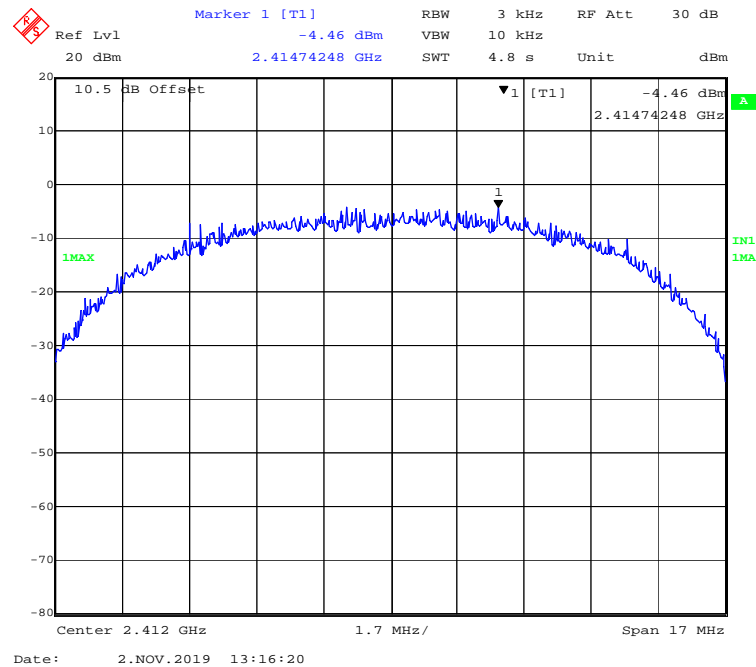
The maximum antenna gain is 2dBi. The device employed Cyclic Delay Diversity (CDD) for 802.11MIMO transmitting, per KDB 662911 D01 Multiple Transmitter Output v02r01, for power spectral density (PSD) measurements on the devices:

Array Gain =  $10 \cdot \log(N_{\text{ANT}}/N_{\text{SS}})$  dB.

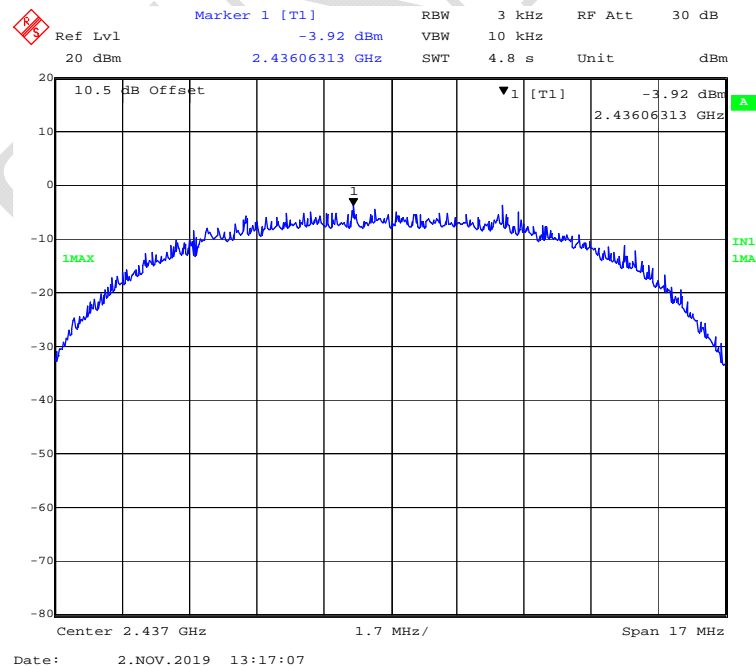
So: Directional gain = GANT + Array Gain = 2 +  $10 \cdot \log(3/1)$  = 6.77dBi, The power spectral density limit was reduced 6.77-6=0.77dB

ANT 1

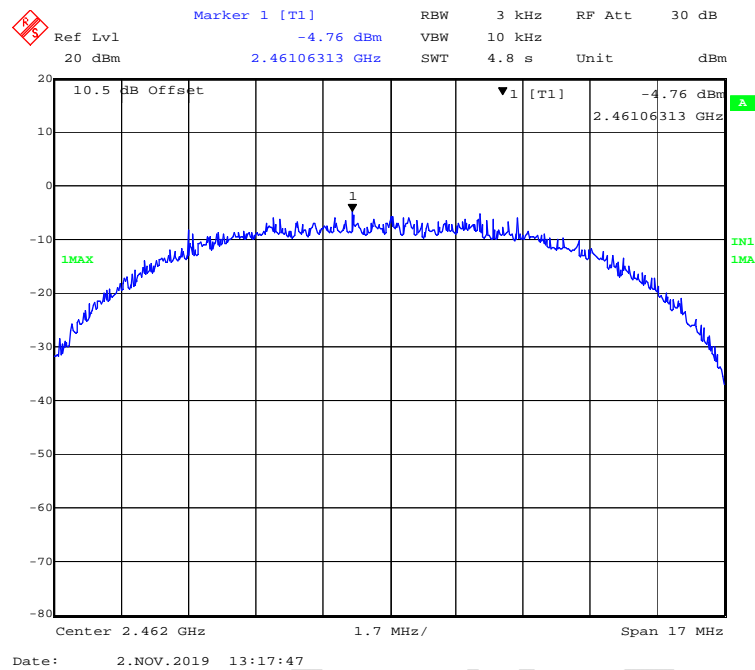
802.11b Mode Low Channel



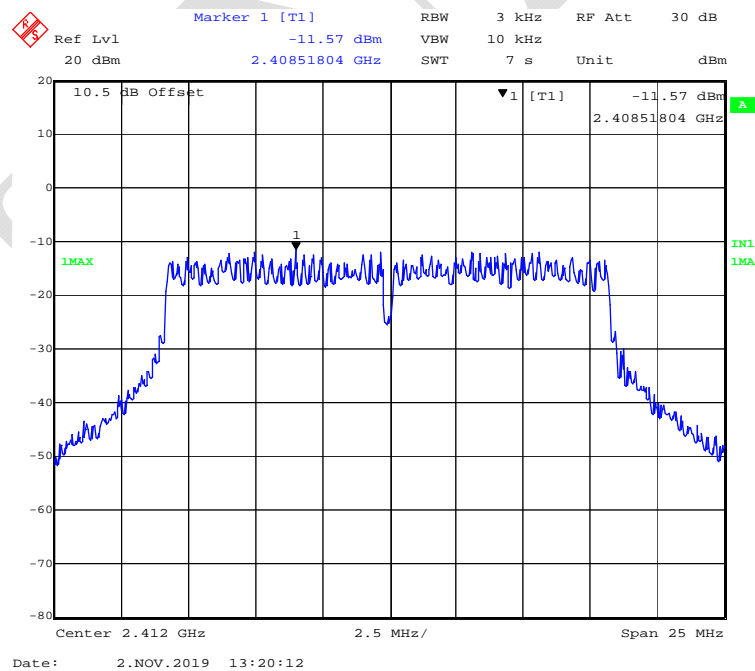
802.11b Mode Middle Channel



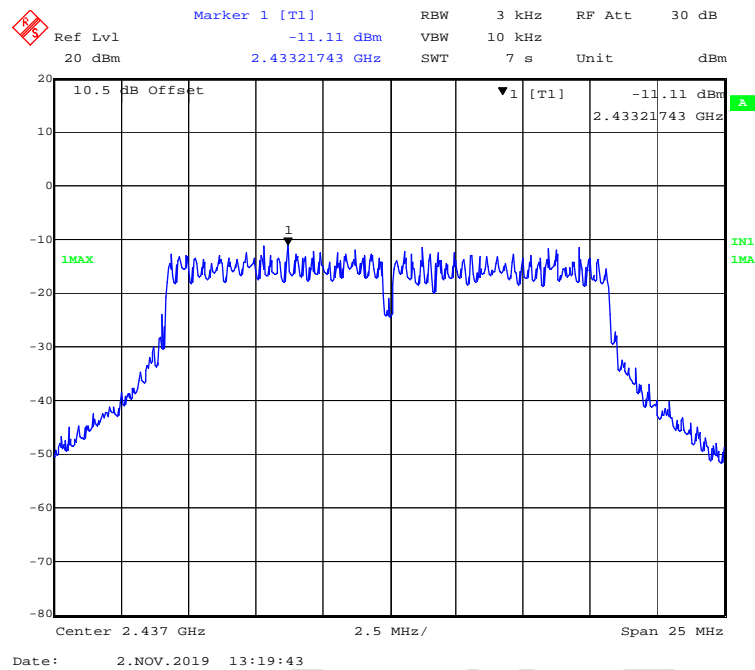
### 802.11b Mode High Channel



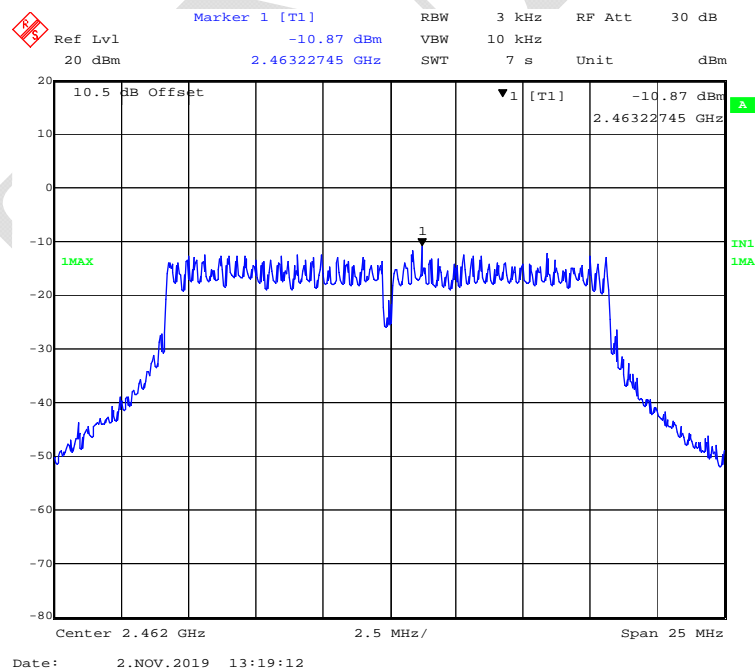
### 802.11g Mode Low Channel



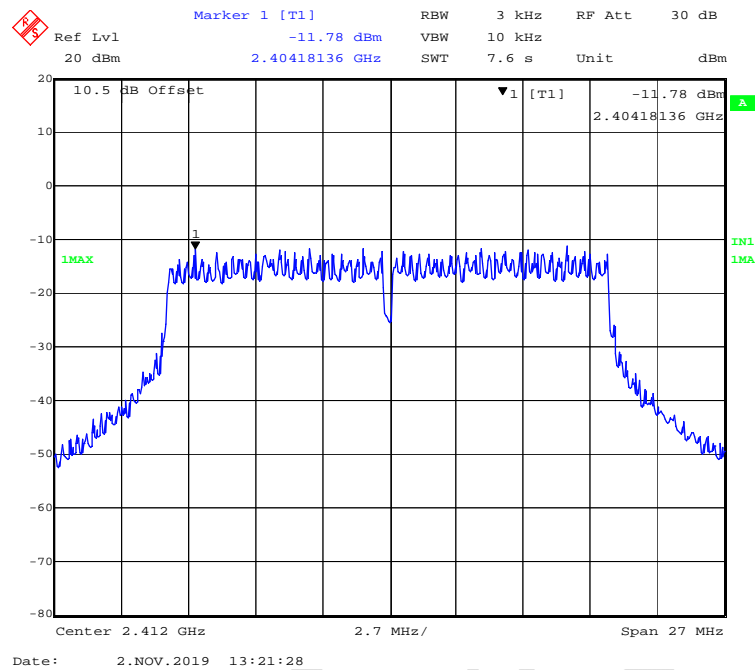
### 802.11g Mode Middle Channel



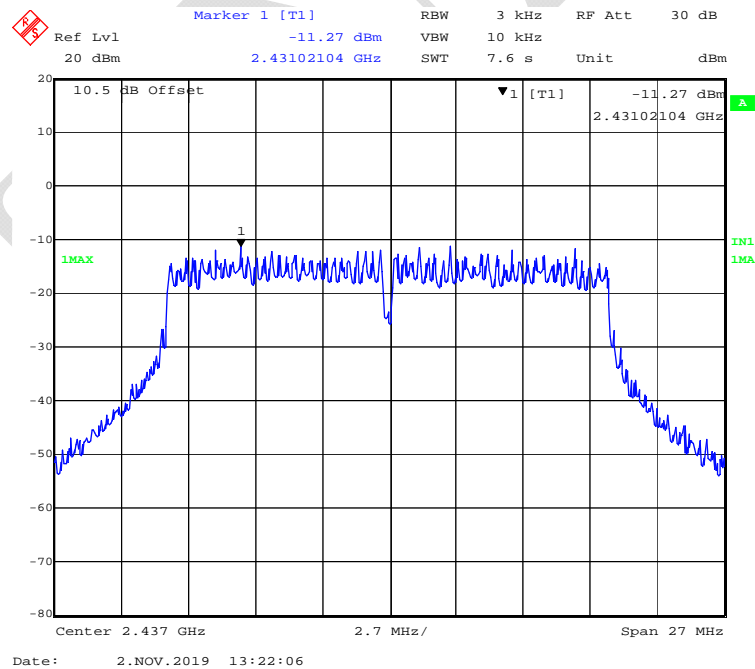
### 802.11g Mode High Channel



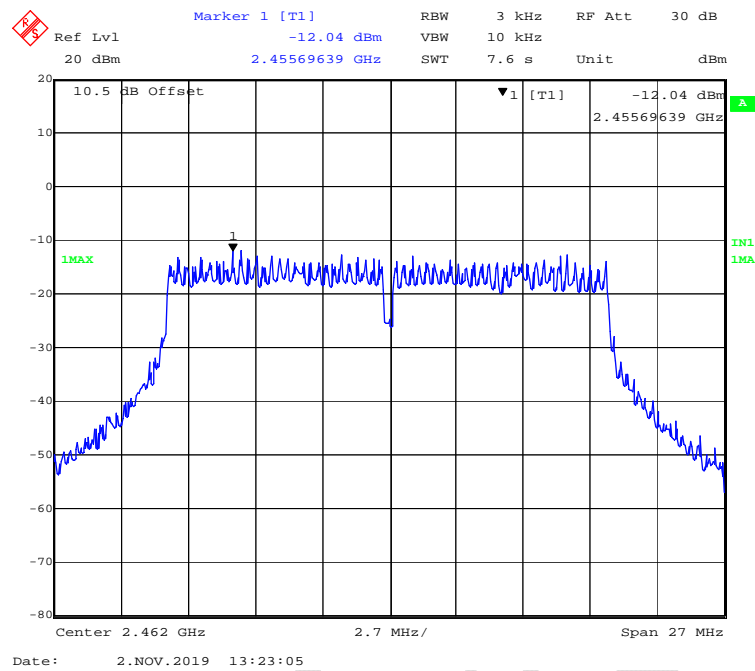
### 802.11n-HT20 Mode Low Channel



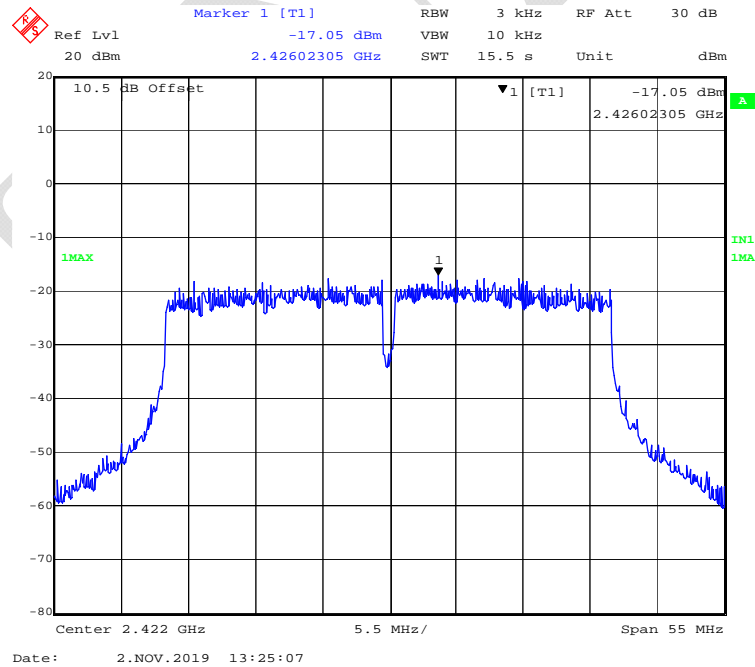
### 802.11n-HT20 Mode Middle Channel



### 802.11n-HT20 Mode High Channel

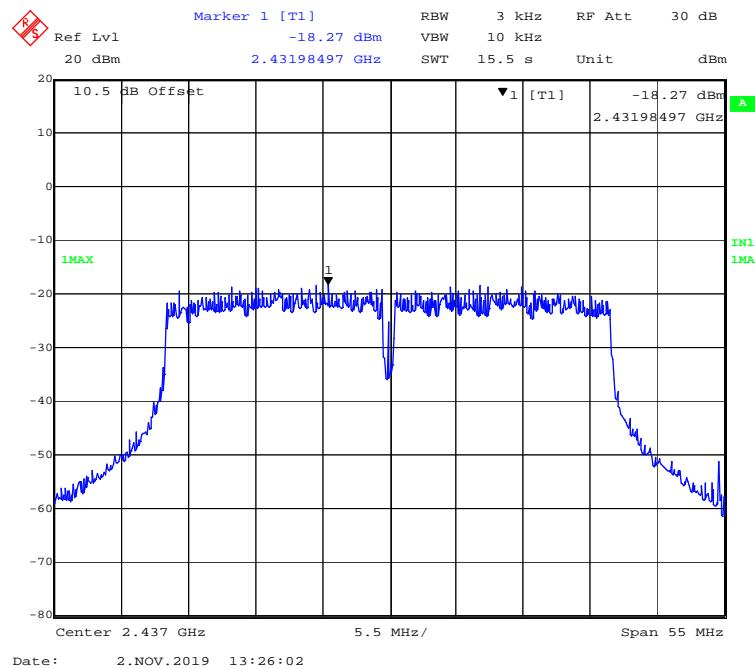


### 802.11n-HT40 Mode Low Channel

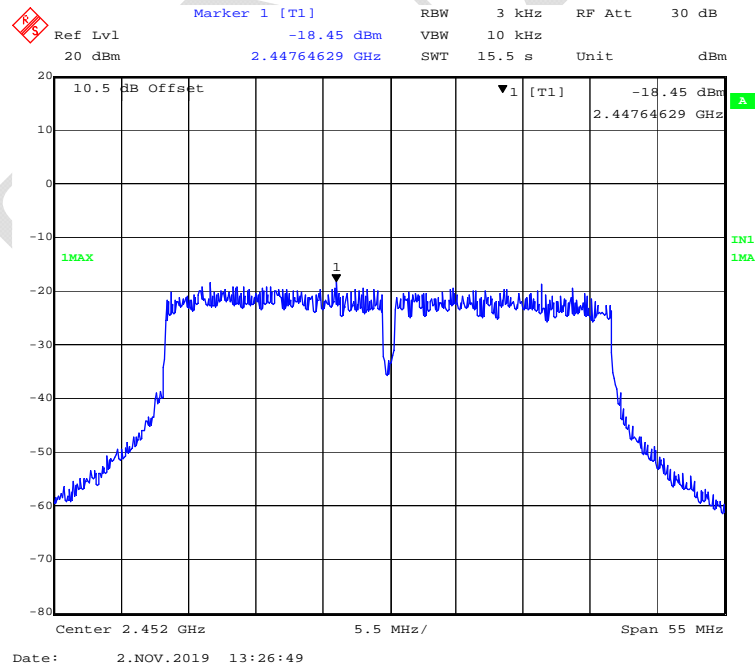




### 802.11n-HT40 Mode Middle Channel

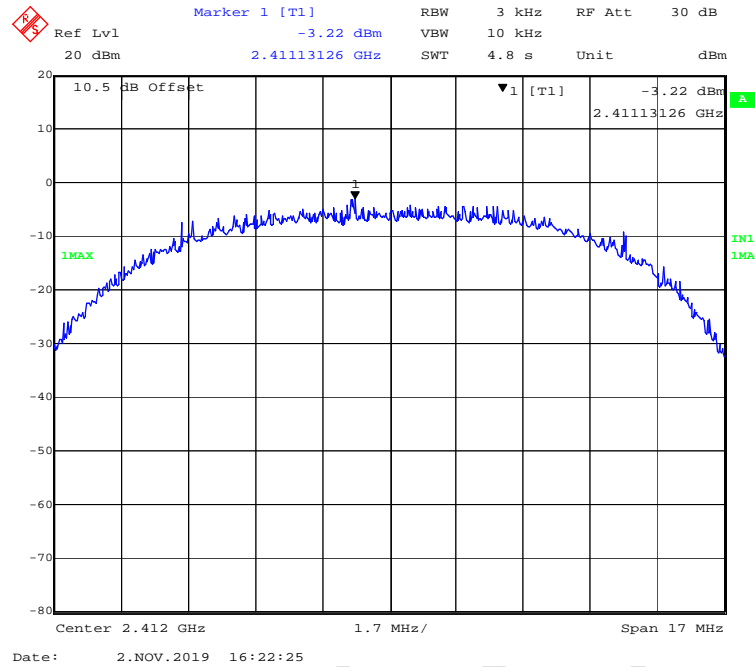


### 802.11n-HT40 Mode High Channel

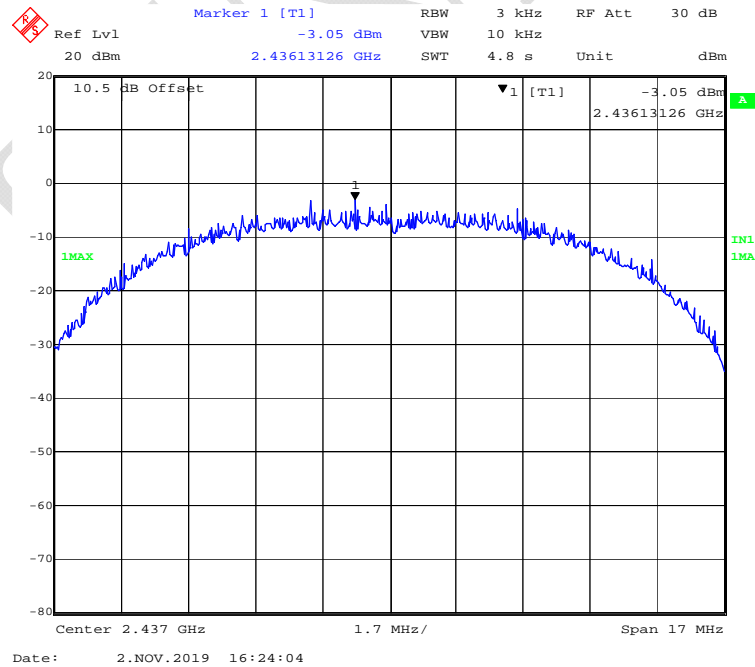


ANT 2

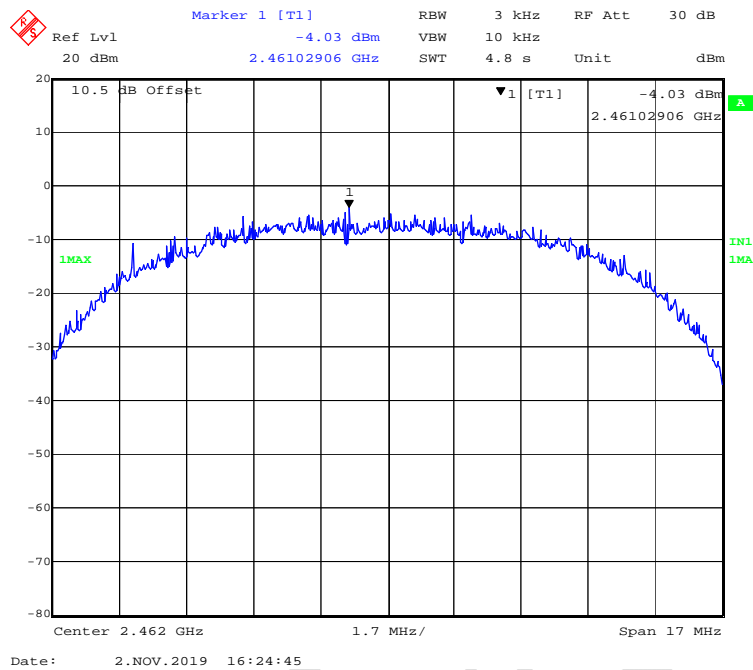
802.11b Mode Low Channel



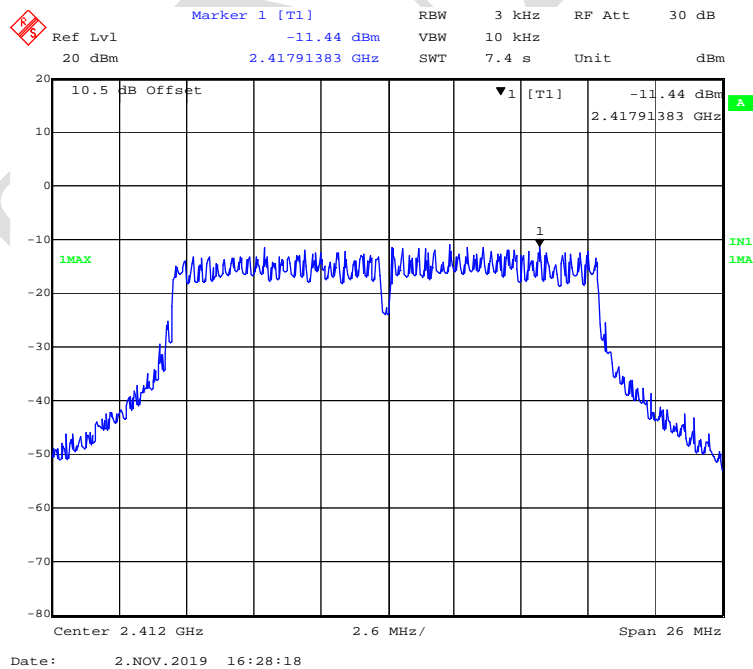
802.11b Mode Middle Channel



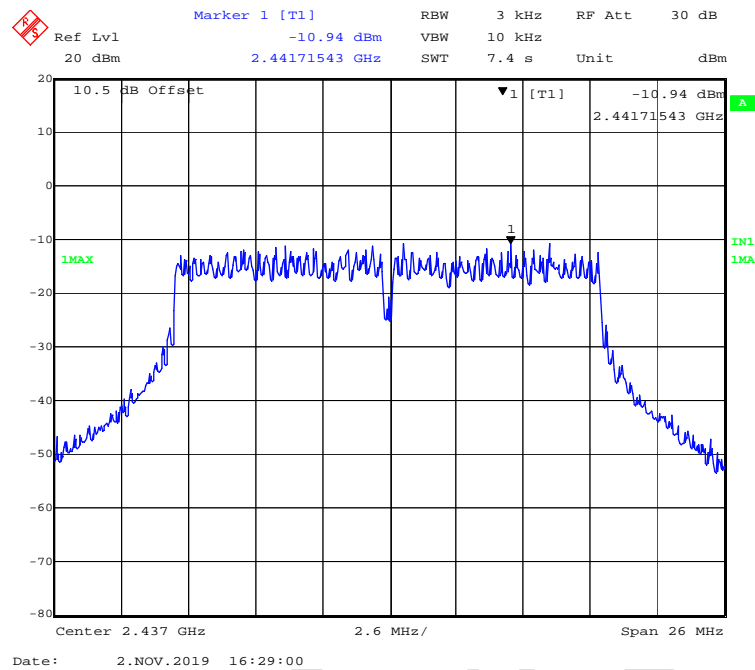
### 802.11b Mode High Channel



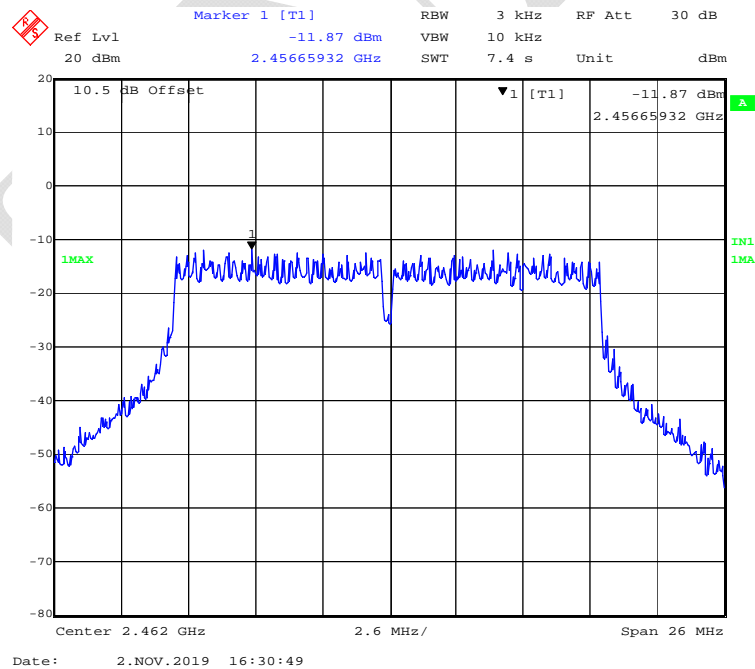
### 802.11g Mode Low Channel



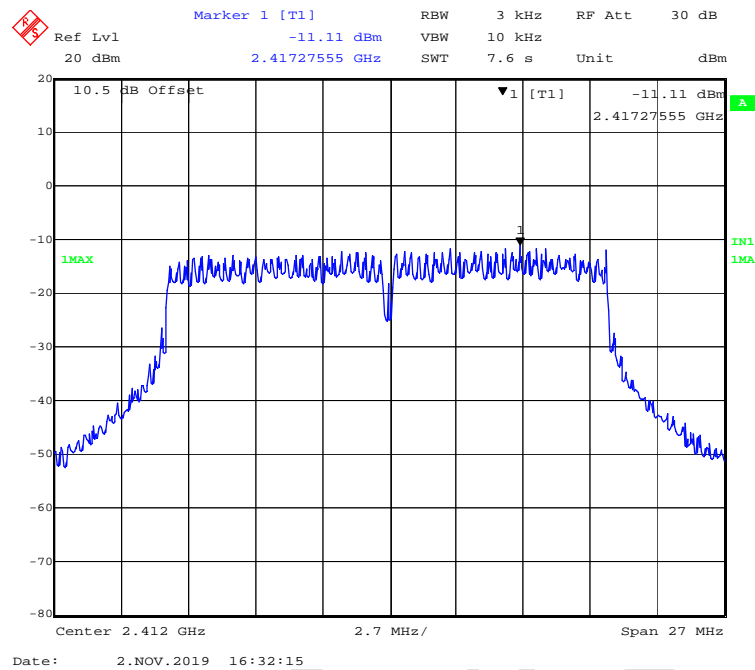
### 802.11g Mode Middle Channel



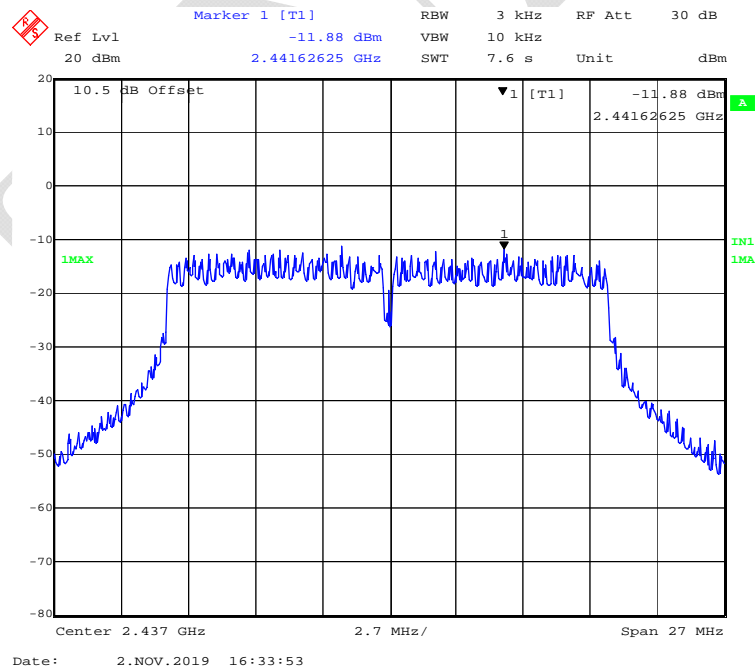
### 802.11g Mode High Channel



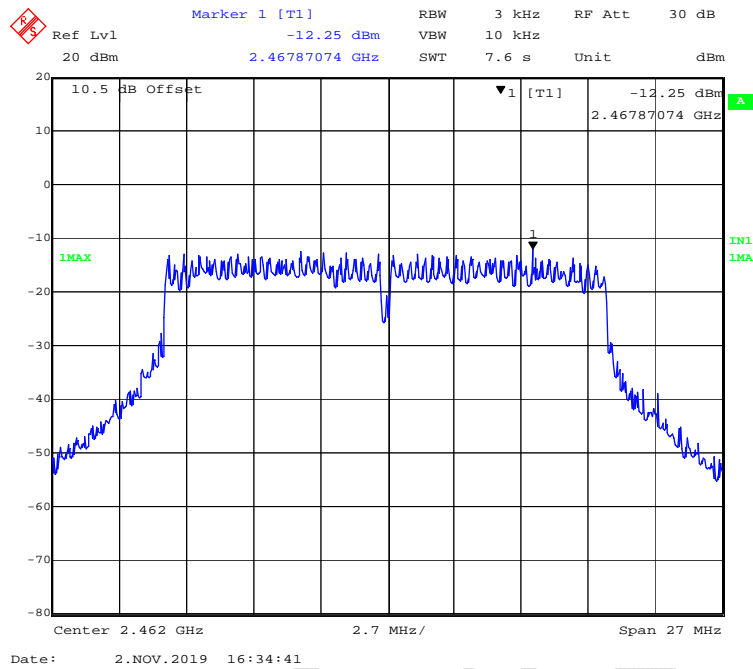
### 802.11n-HT20 Mode Low Channel



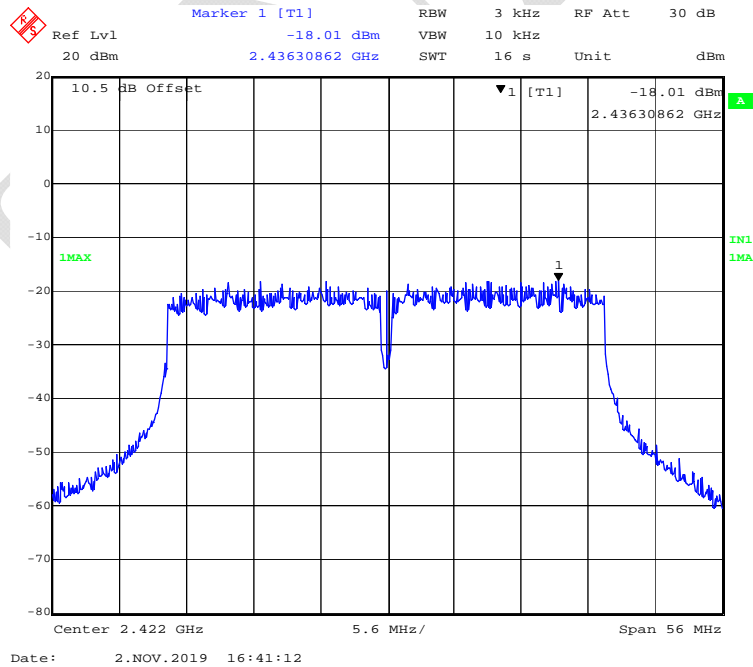
### 802.11n-HT20 Mode Middle Channel



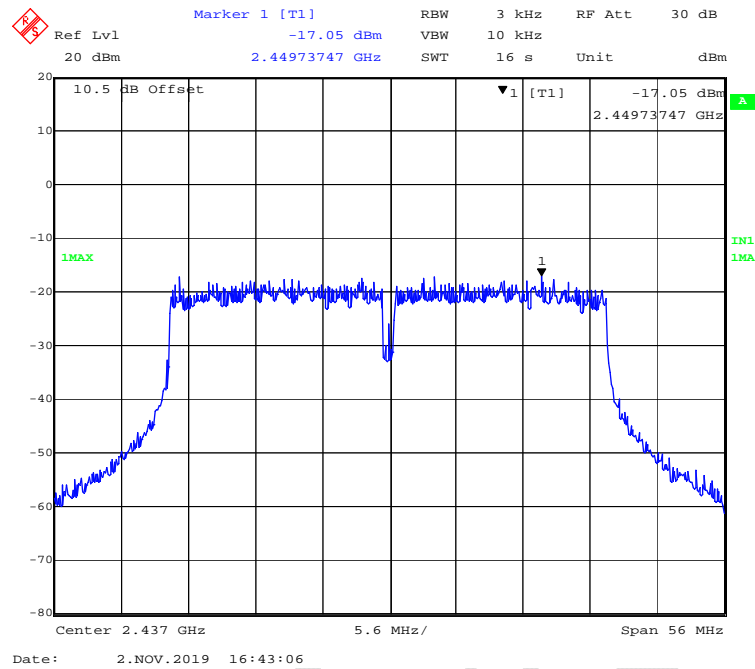
### 802.11n-HT20 Mode High Channel



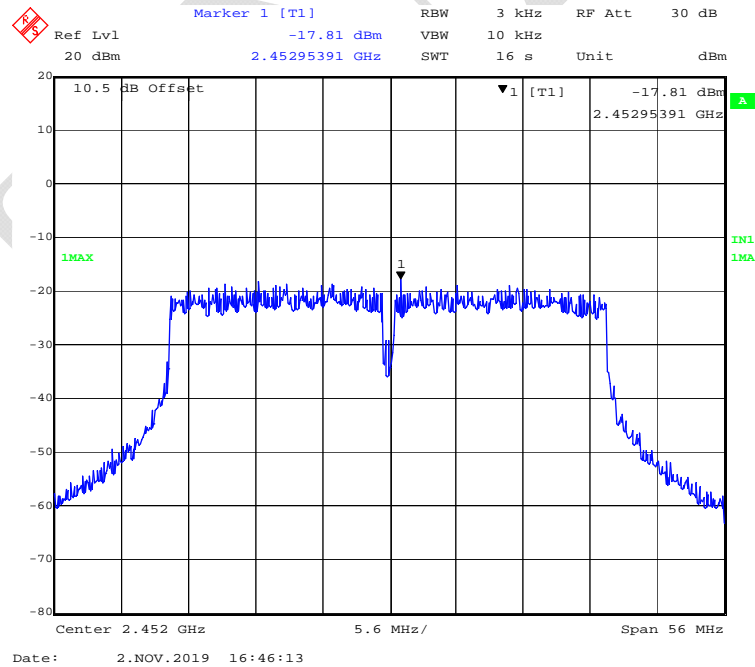
### 802.11n-HT40 Mode Low Channel



### 802.11n-HT40 Mode Middle Channel

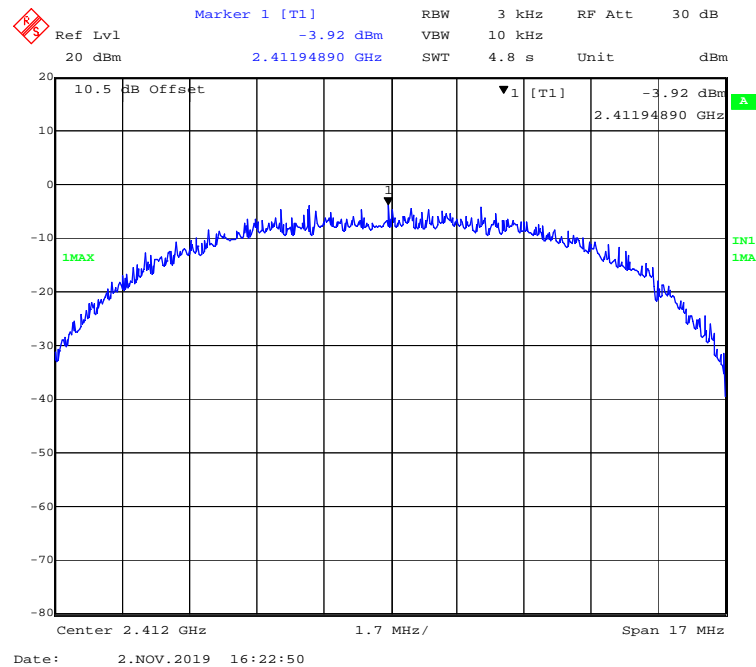


### 802.11n-HT40 Mode High Channel

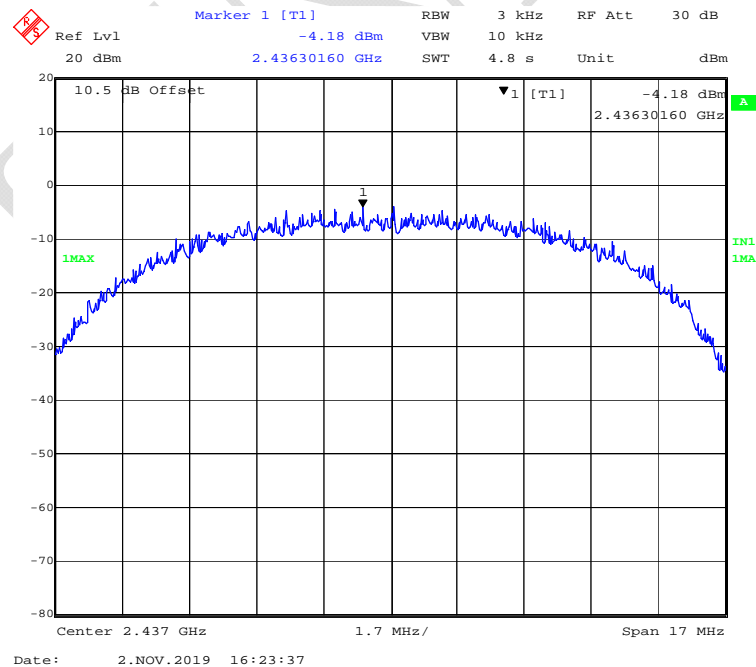


ANT 3

802.11b Mode Low Channel

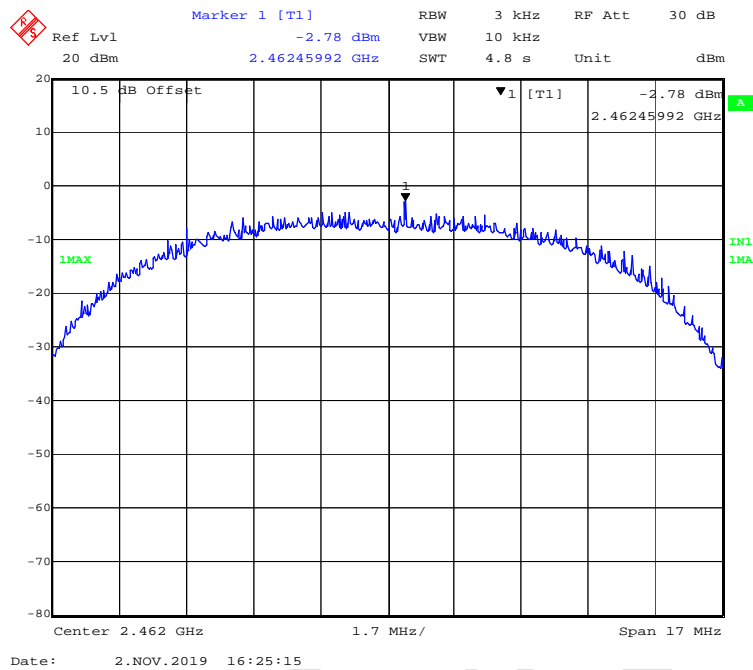


802.11b Mode Middle Channel

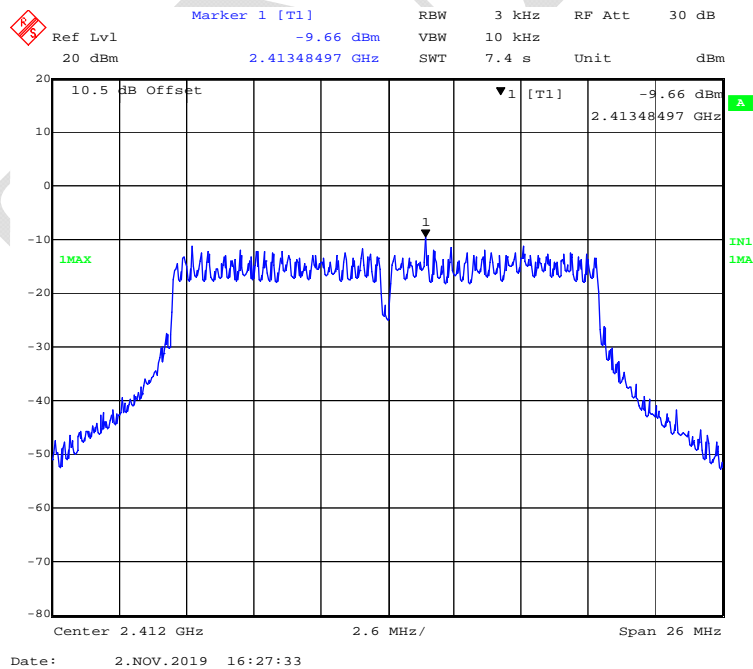




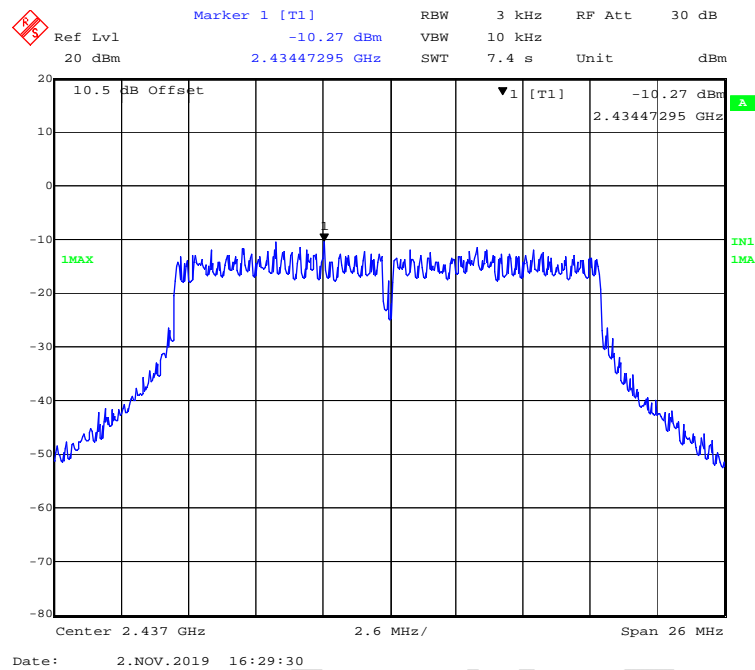
### 802.11b Mode High Channel



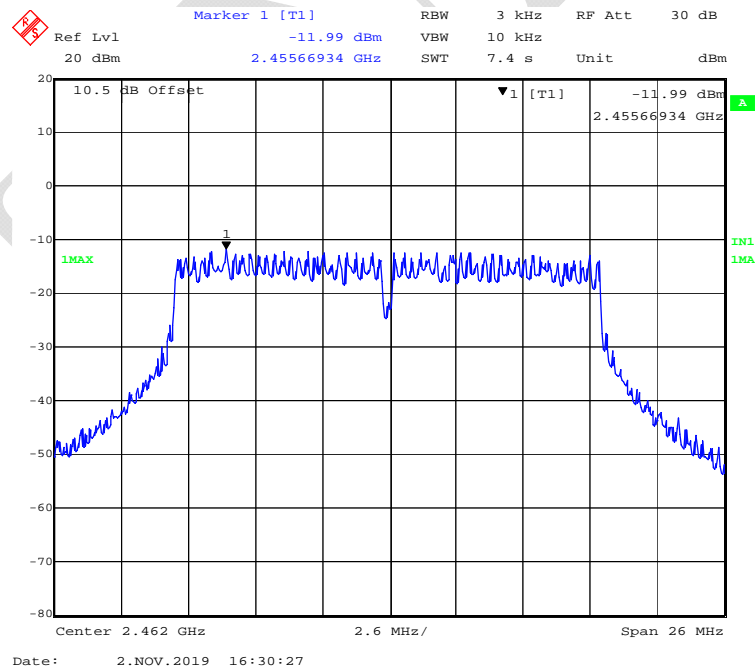
### 802.11g Mode Low Channel



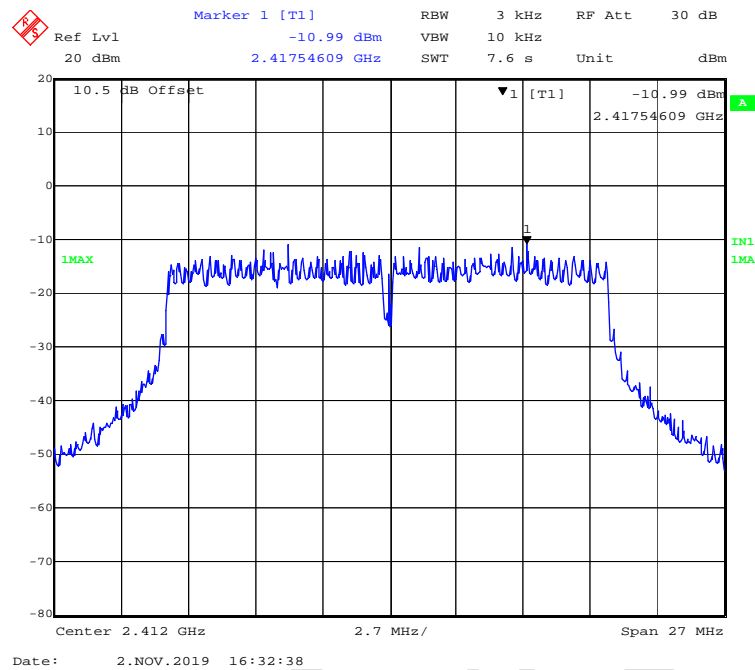
### 802.11g Mode Middle Channel



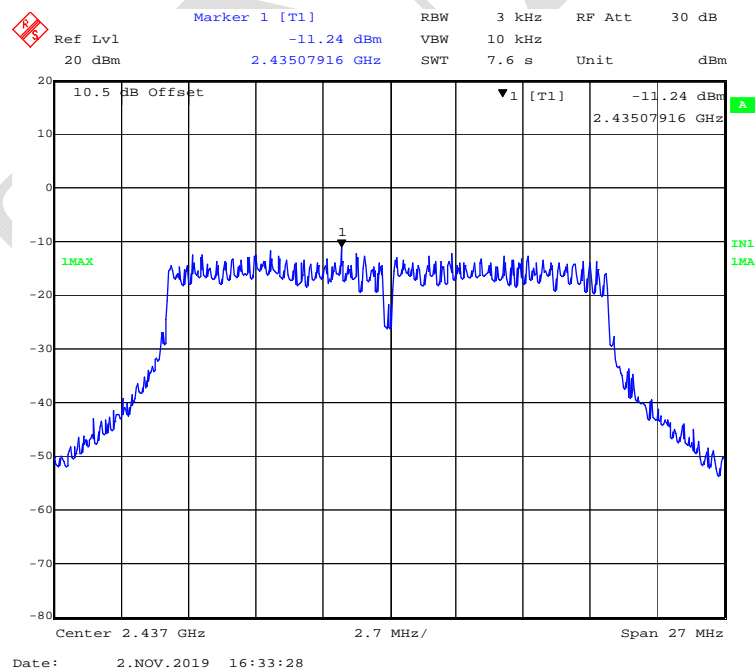
### 802.11g Mode High Channel



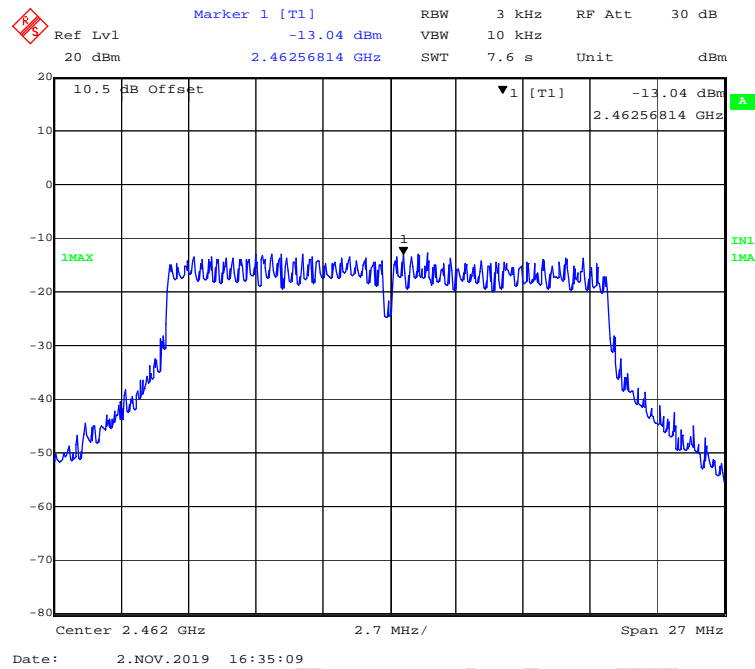
### 802.11n-HT20 Mode Low Channel



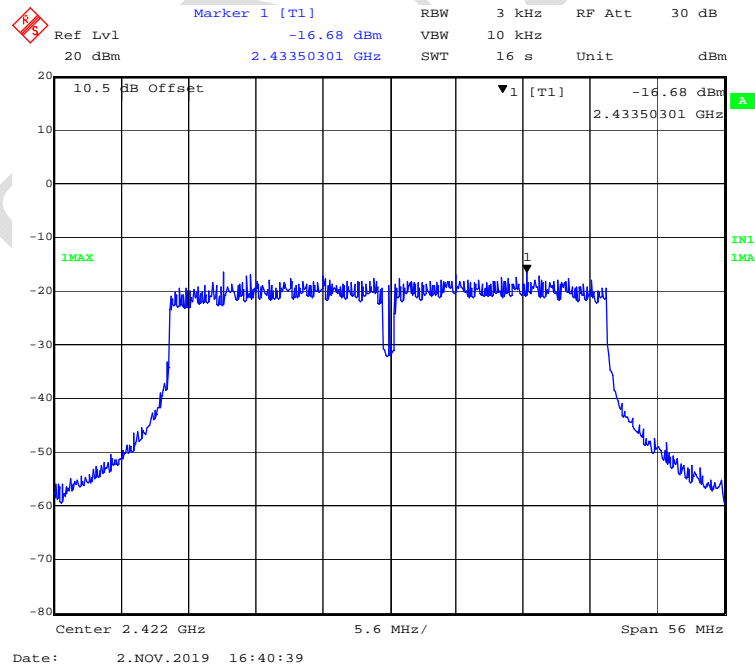
### 802.11n-HT20 Mode Middle Channel



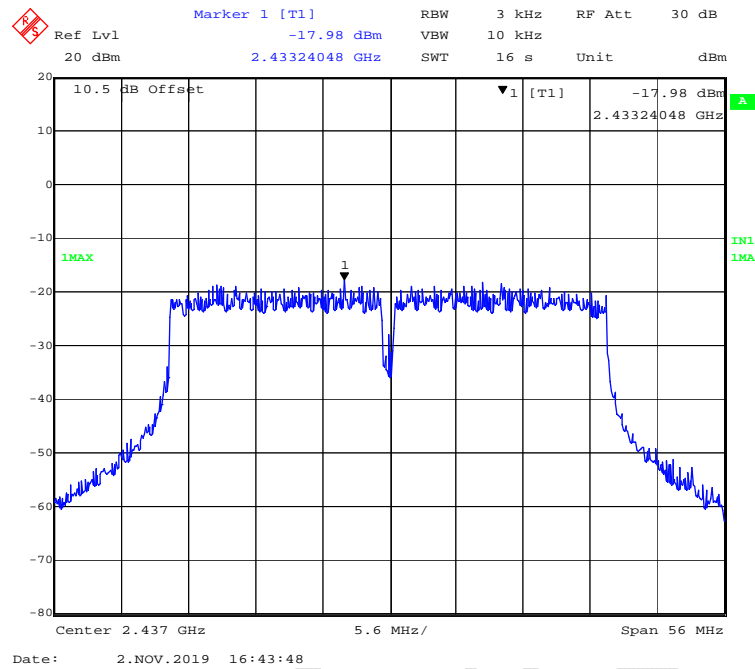
### 802.11n-HT20 Mode High Channel



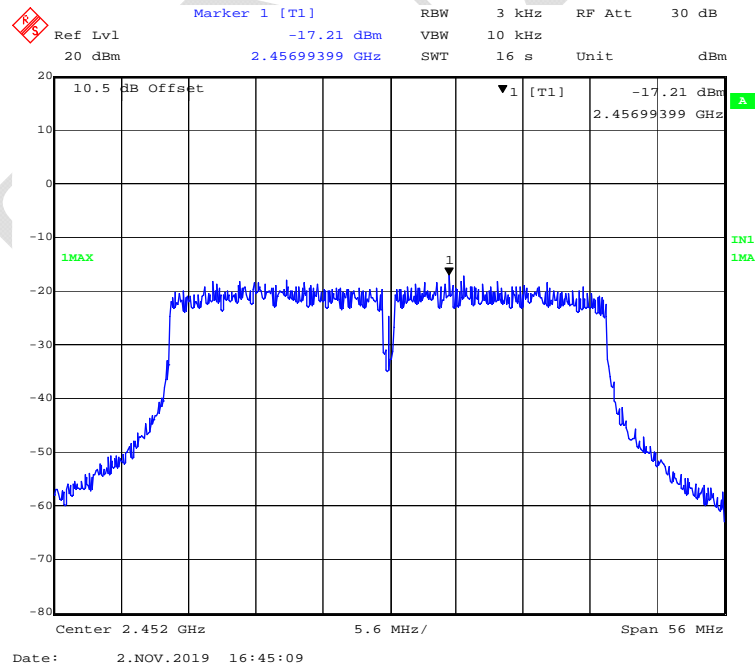
### 802.11n-HT40 Mode Low Channel



### 802.11n-HT40 Mode Middle Channel



### 802.11n-HT40 Mode High Channel



## RSS-247 ISSUE2 Clause 5.4 d)- TRANSMITTER OUTPUT POWER MEASUREMENT

### Applicable Standard

According to RSS-247 Issue2 Clause5.4 d)

For DTSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1 W. The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e).

As an alternative to a peak power measurement, compliance can be based on a measurement of the maximum conducted output power. The maximum conducted output power is the total transmit power delivered to all antennas and antenna elements, averaged across all symbols in the signalling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or transmitting at a reduced power level. If multiple modes of operation are implemented, the maximum conducted output power is the highest total transmit power occurring in any mode.

### Test Procedure

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall use a fast-responding diode detector.

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to one test equipment.
3. Add a correction factor to the display.



### Test Data

#### Environmental Conditions

Temperature:	23.8 °C
Relative Humidity:	54 %
ATM Pressure:	101.2 kPa

The testing was performed by Carry Cai on 2019-11-01.

EUT operation mode: Transmitting

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)				Limit (dBm)	Antenna Gain (dBi)	e.i.r.p. (dBm)				e.i.r.p. Limit (dBm)
		ANT 1	ANT 2	ANT 3	Total			ANT 1	ANT 2	ANT 3	Total	
802.11b Mode												
Low	2412	24.60	24.57	24.60	/	30	2.0	26.6	26.57	26.6	/	36
Middle	2437	24.25	24.54	24.65	/	30	2.0	26.25	26.54	26.65	/	36
High	2462	23.47	23.82	23.92	/	30	2.0	25.47	25.82	25.92	/	36
802.11g Mode												
Low	2412	22.70	22.63	23.04	/	30	2.0	24.7	24.63	25.04	/	36
Middle	2437	22.60	22.64	22.94	/	30	2.0	24.6	24.64	24.94	/	36
High	2462	21.75	21.99	22.15	/	30	2.0	23.75	23.99	24.15	/	36
802.11n-HT20 Mode												
Low	2412	22.82	23.04	22.57	27.59	30	2.0	24.82	25.04	24.57	29.59	36
Middle	2437	22.43	22.35	22.53	27.21	30	2.0	24.43	24.35	24.53	29.21	36
High	2462	21.48	21.60	21.45	26.28	30	2.0	23.48	23.6	23.45	28.28	36
802.11n-HT40 Mode												
Low	2422	19.55	19.33	19.57	24.26	30	2.0	21.55	21.33	21.57	26.26	36
Middle	2437	19.28	19.36	19.23	24.06	30	2.0	21.28	21.36	21.23	26.06	36
High	2452	18.82	19.01	19.03	23.73	30	2.0	20.82	21.01	21.03	25.73	36

Note 1: The total output power= $10 \cdot \log(10^{\text{ANT 1}/10} + 10^{\text{ANT 2}/10} + 10^{\text{ANT 3}/10})$

Note 2: The maximum antenna gain is 2.0 dBi, the device employed Cyclic Delay Diversity (CDD) for 802.11 MIMO transmitting, per KDB 662911 D01 Multiple Transmitter Output v02r01, for power measurements on IEEE 802.11 devices:

Array Gain = 0 dB (i.e., no array gain) for  $N_{\text{ANT}} \leq 4$ ;

So: Directional gain =  $G_{\text{ANT}} + \text{Array Gain} = 2\text{dBi} < 6\text{dBi}$ , no RF out power limit was reduced.

## **RSS-247 ISSUE2 Clause 5.5 - OUT OF BAND EMISSIONS**

### **Applicable Standard**

According to RSS-247 Issue2 Clause5.5.

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

### **Test Procedure**

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW and VBW of spectrum analyzer to 100 kHz and 300kHz with a convenient frequency span including 100kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

### **Test Data**

#### **Environmental Conditions**

<b>Temperature:</b>	22.8-24.3 °C
<b>Relative Humidity:</b>	49-50 %
<b>ATM Pressure:</b>	100.8-101.3 kPa

*The testing was performed by Carry Cai from 2019-11-01 to 2019-11-16.*

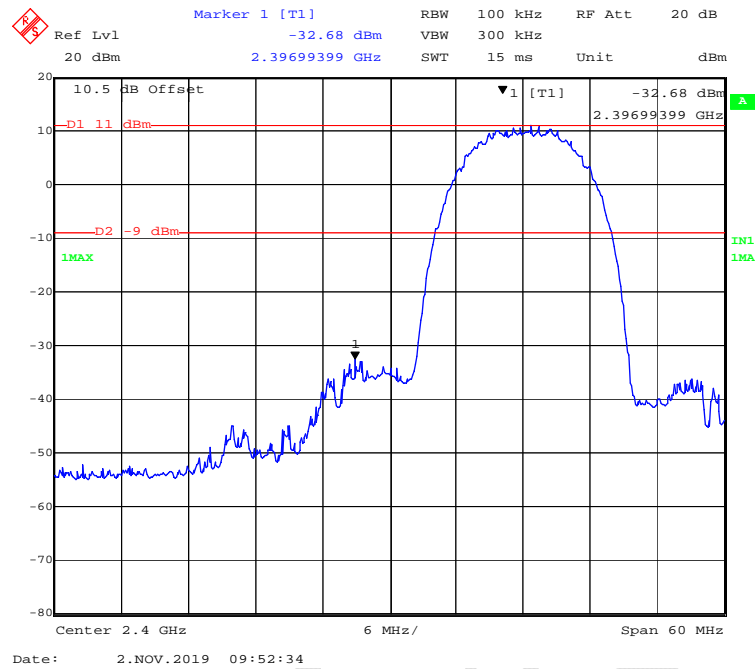
**Test Result:** Pass.

*EUT operation mode: Transmitting*

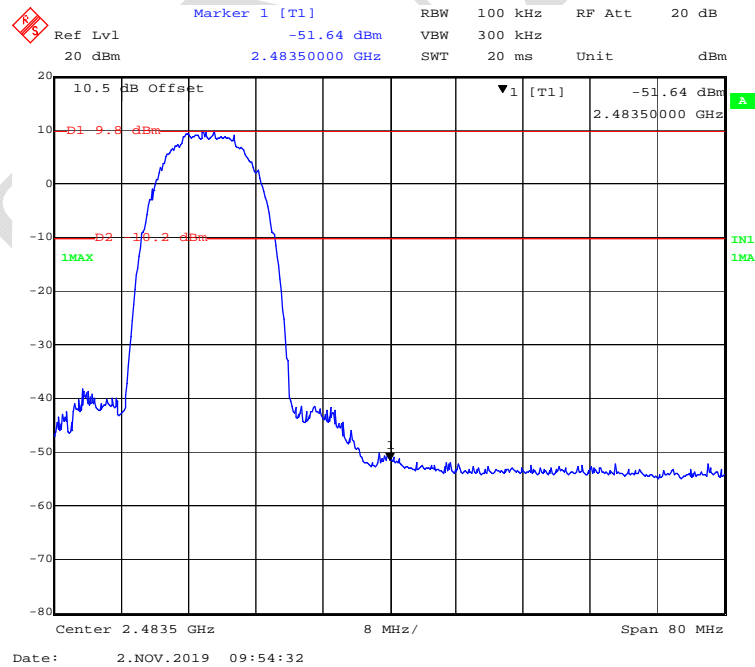
Note: For SISO mode, the margin is more than 4.77dB, so 3\*3 MIMO modes are compliant.



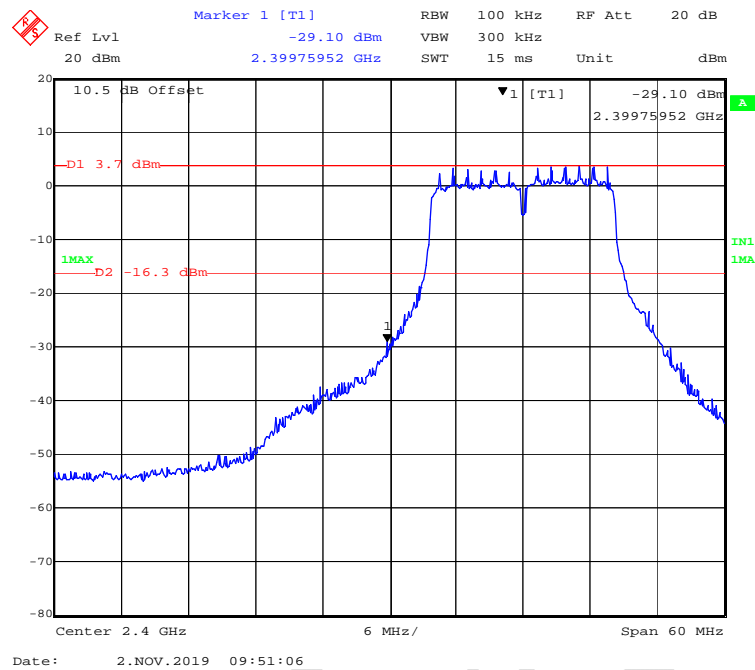
### ANT 1 802.11b Mode Left Side



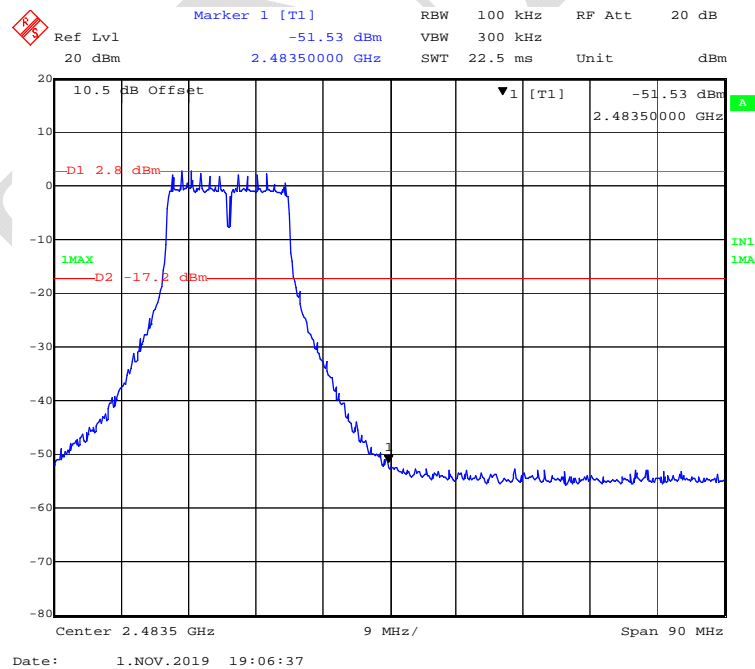
### ANT 1 802.11b Mode Right Side



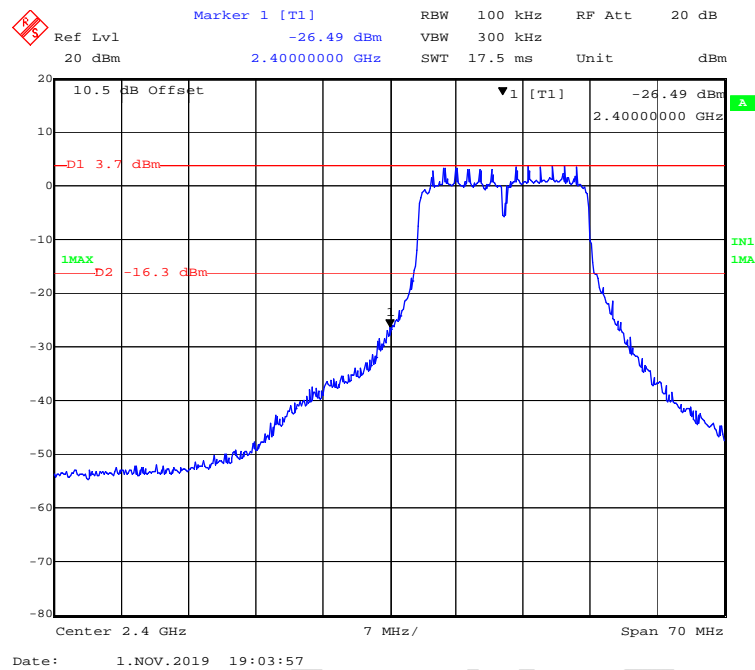
### ANT 1 802.11g Mode Left Side



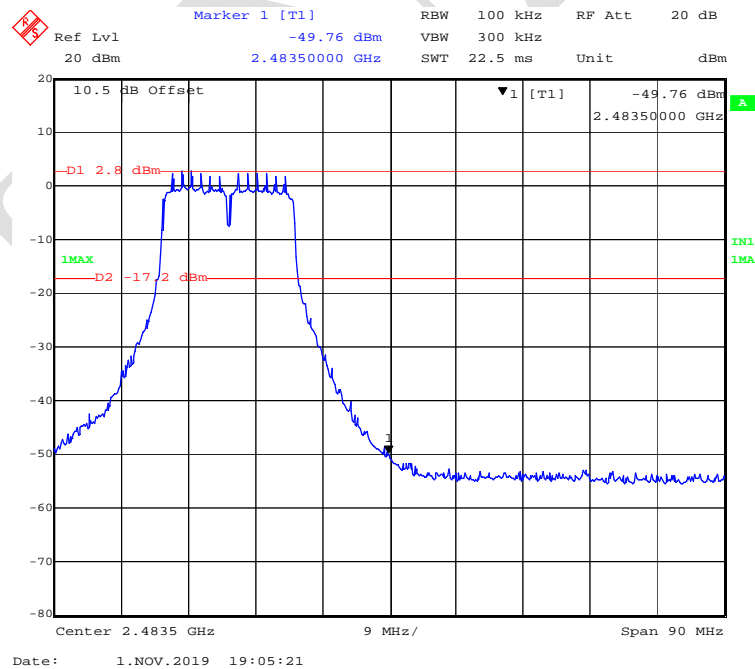
### ANT 1 802.11g Mode Right Side



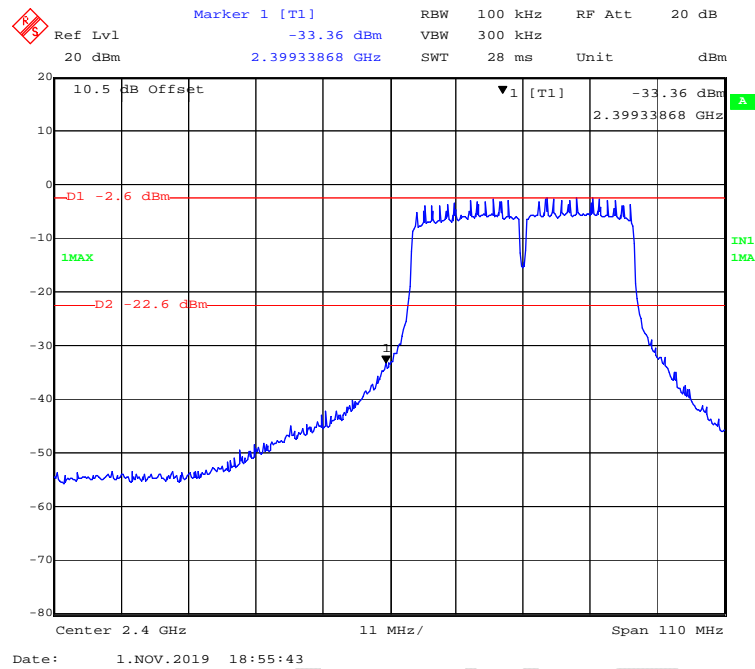
### ANT 1 802.11n-HT20 Mode Left Side



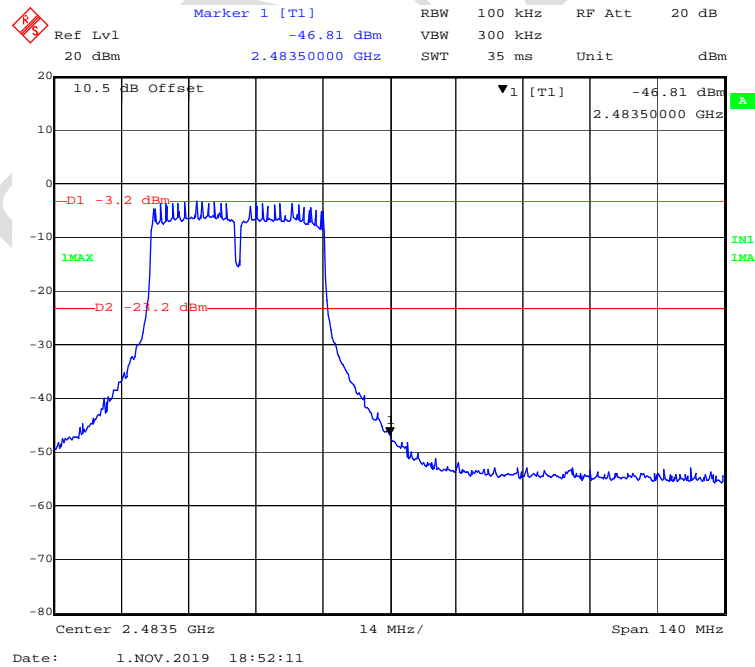
### ANT 1 802.11n-HT20 Mode Right Side



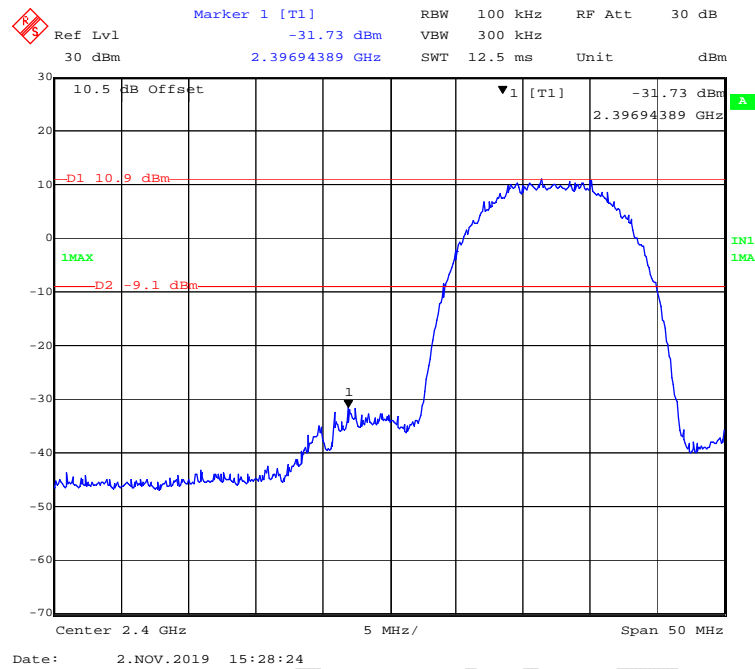
### ANT 1 802.11n-HT40 Mode Left Side



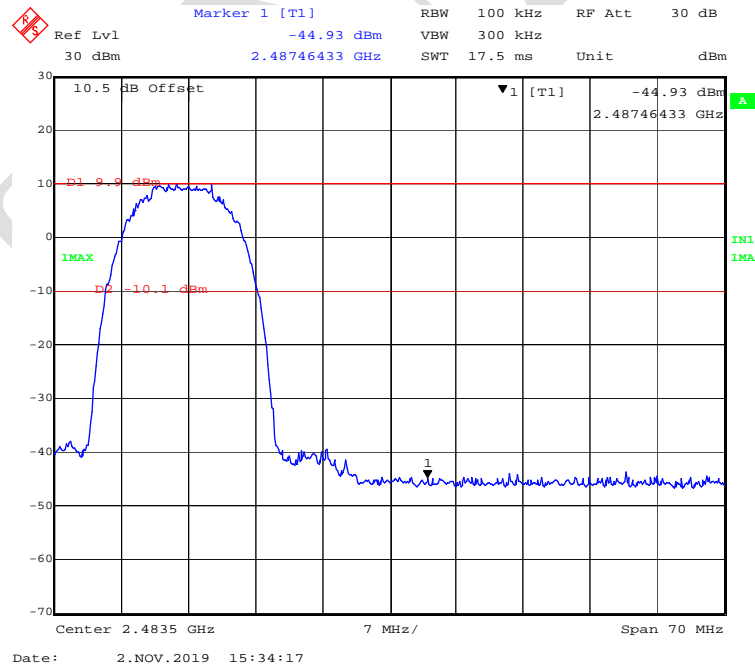
### ANT 1 802.11n-HT40 Mode Right Side



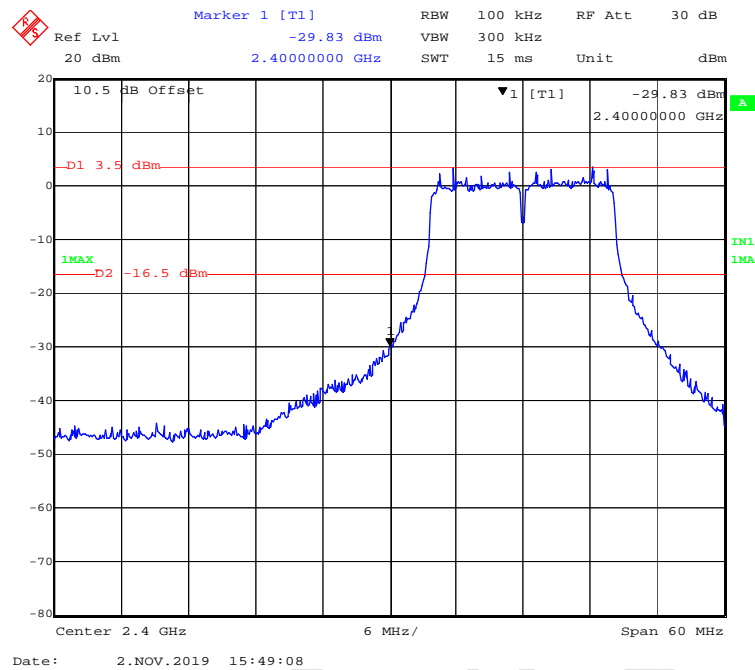
### ANT 2 802.11b Mode Left Side



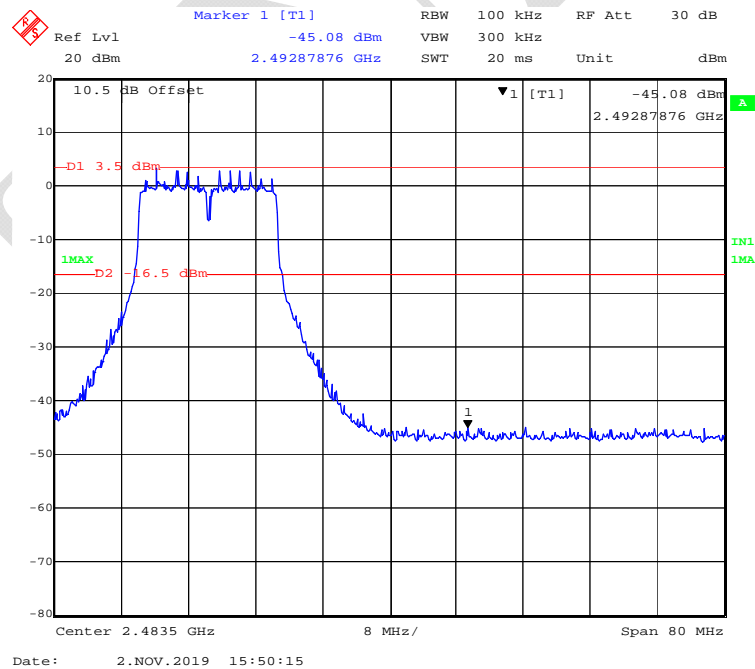
### ANT 2 802.11b Mode Right Side



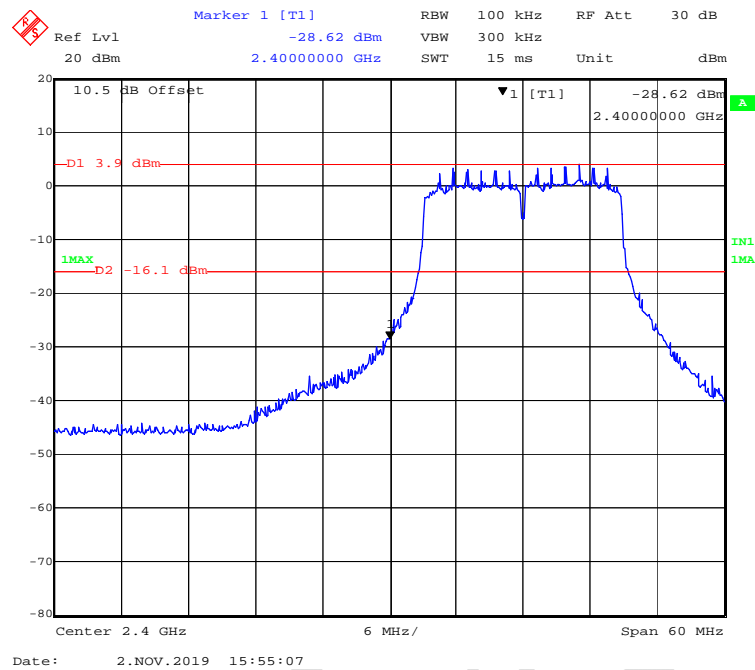
### ANT 2 802.11g Mode Left Side



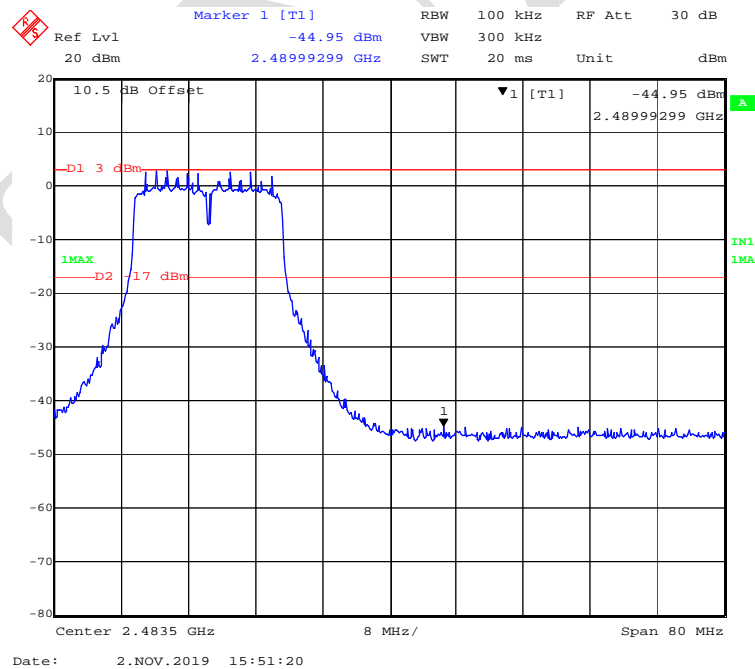
### ANT 2 802.11g Mode Right Side



### ANT 2 802.11n-HT20 Mode Left Side



### ANT 2 802.11n-HT20 Mode Right Side

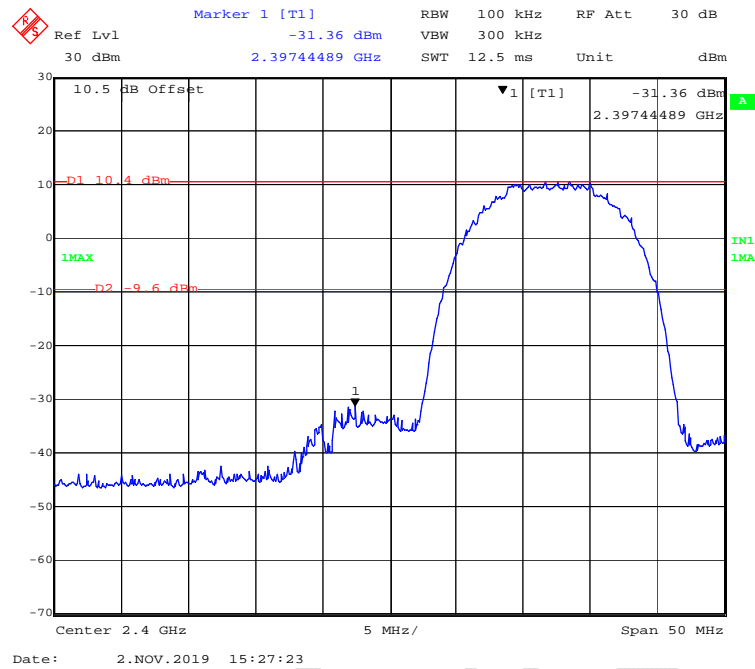


Ref Lvl 20 dBm  
 2.40000000 GHz  
 RBW 100 kHz  
 VBW 300 kHz  
 SWT 28 ms  
 Unit dBm  
 Marker 1 [T1] -32.66 dBm  
 11 dB Offset  
 11 MHz  
 -22.6 dBm  
 -32.66 dBm  
 2.40000000 GHz  
 11 MHz/  
 Span 110 MHz  
 Date: 16.NOV.2019 16:57:20

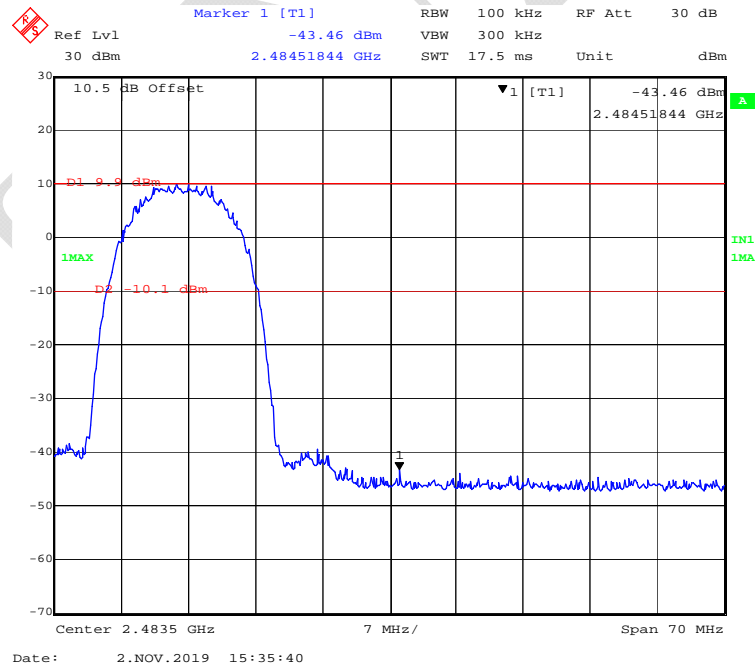
Ref Lvl 20 dBm  
 Center 2.4835 GHz  
 Span 130 MHz  
 RBW 100 kHz  
 VBW 300 kHz  
 SWT 33 ms  
 Unit dBm  
 Marker 1 [T1] -43.70 dBm  
 2.49157615 GHz  
 10.5 dB Offset  
 D1 -3.1 dBm  
 D2 -23.1 dBm  
 1MAX  
 1MIN



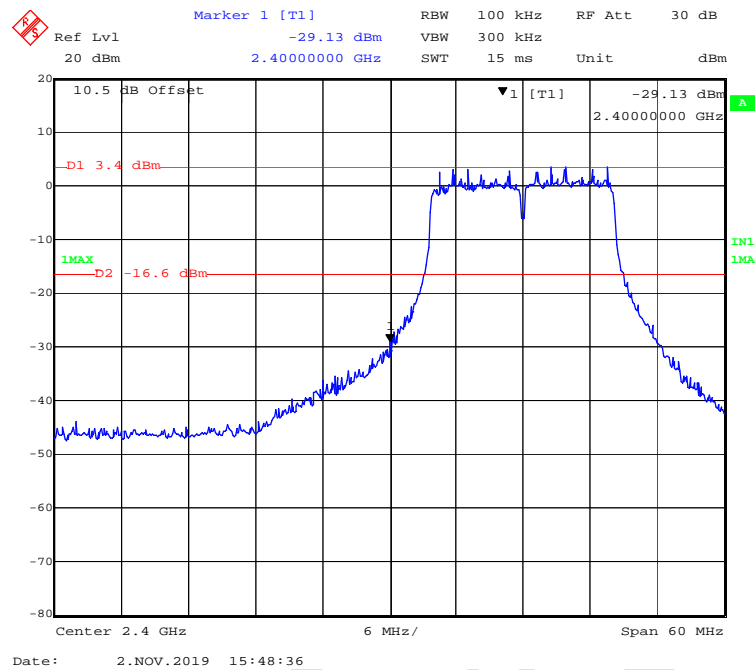
### ANT 3 802.11b Mode Left Side



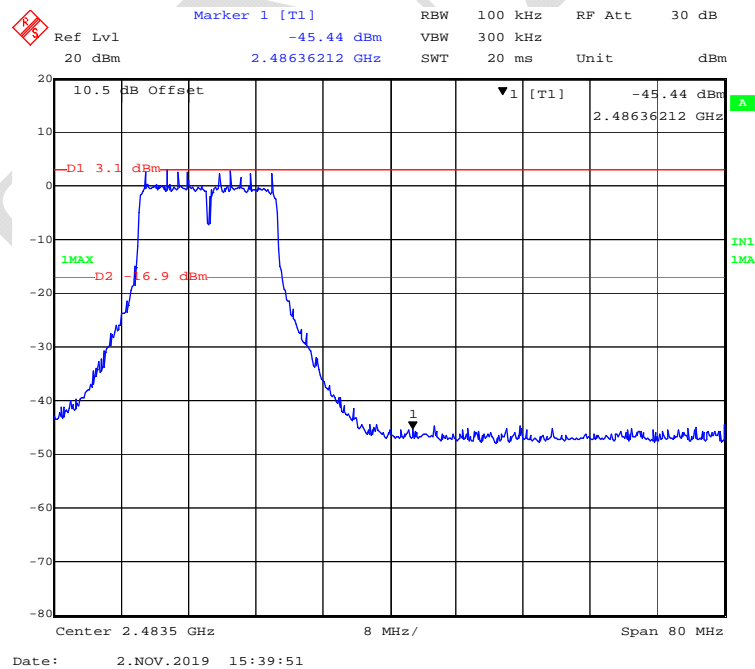
### ANT 3 802.11b Mode Right Side



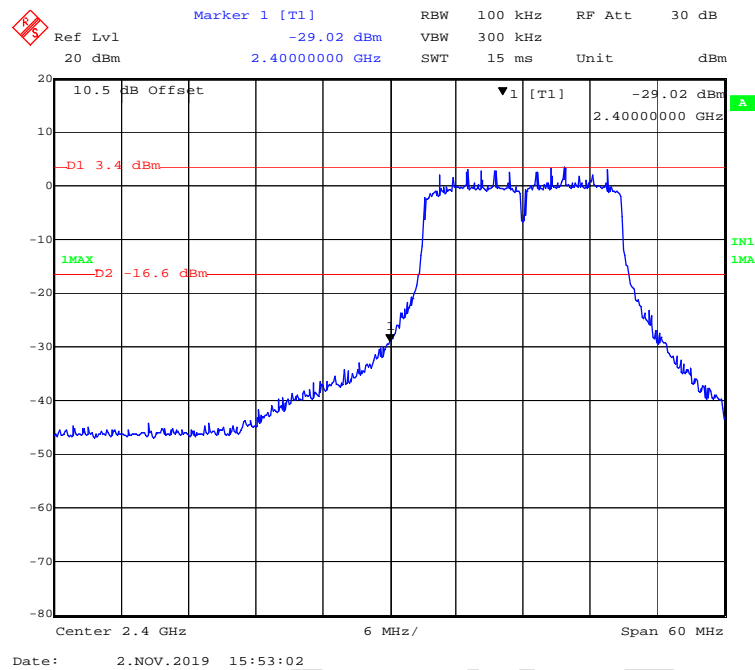
### ANT 3 802.11g Mode Left Side



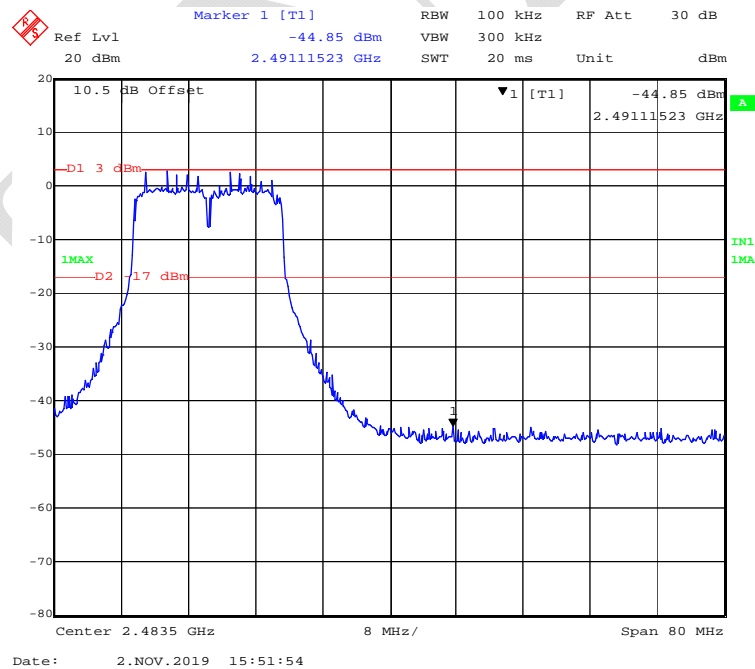
### ANT 3 802.11g Mode Right Side



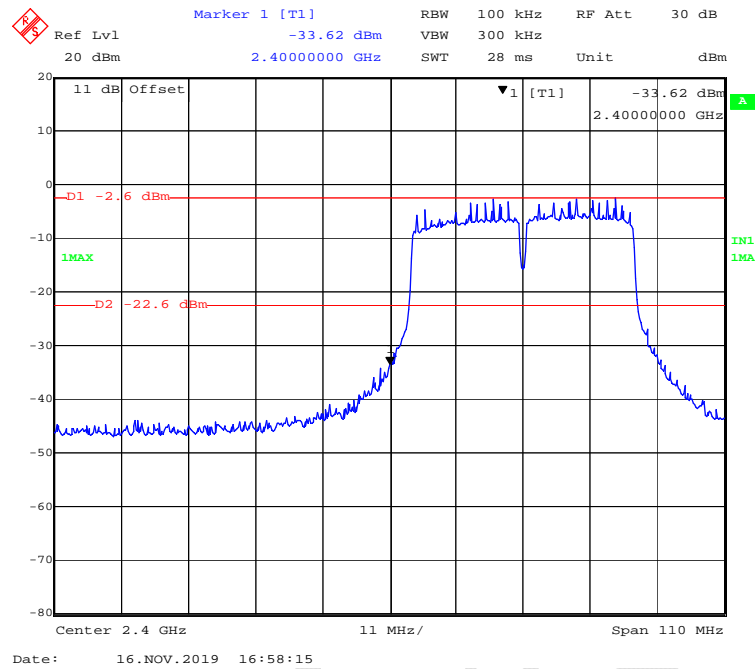
### ANT 3 802.11n-HT20 Mode Left Side



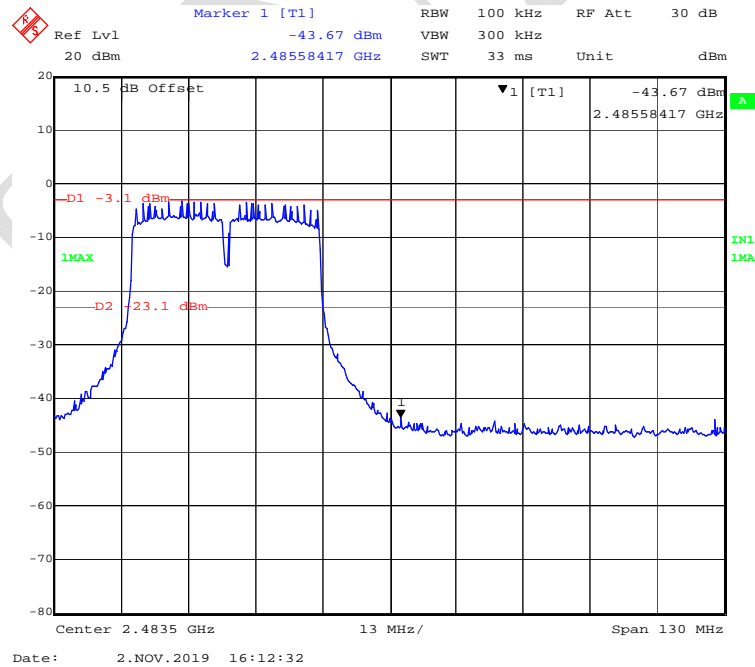
### ANT 3 802.11n-HT20 Mode Right Side



### ANT 3 802.11n-HT40 Mode Left Side



### ANT 3 802.11n-HT40 Mode Right Side



## Declarations

- 1: BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with an asterisk '\*'. Customer model name, addresses, names, trademarks etc. are not considered data.
- 2: Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.
- 3: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.
- 4: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.
- 5: This report cannot be reproduced except in full, without prior written approval of the Company.
- 6: This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

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