TESTING LABORATORY
CERTIFICATE #4820.01

FCC PART 15.247

RSS-GEN, ISSUE 5, AMENDMENT 1, MARCH 2019

RSS-247, ISSUE 2, FEBRUARY 2017

TEST REPORT

For

Proxim Wireless Corporation

2114 Ringwood Ave, San Jose, CA 95131, USA

FCC ID: HZB-NGPAP
IC: 1856A-NGPAP

Report Type:	**Product Name:**
Original Report	NGP LC 2.4 &5 GHz radios

Report Number:	RDG210319002-00A
Report Date:	2021-03-25
Reviewed By:	Ivan Cao Assistant Manager
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

TABLE OF CONTENTS

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:		NGP LC 2.4 &5 GHz radios
Test Model:		FCC: AP-9200R-US IC: AP-9200R-WD
Multiple Model:		AB-CCCCD-XXX-YYY-ZZ
Model Difference:		Refer to the DOS letter
Operation Frequency:		2412-2462 MHz(802.11b/g/n ht20) 2422-2452 MHz(802.11n ht40) 2402-2480MHz(BLE)
Maximum Peak Output Power (Conducted):		22.68 dBm(802.11b/g/n) -2.44 dBm(BLE)
Modulation Type:		DSSS, OFDM, GFSK
Rated Input Voltage:		DC 56.0V from PoE
PoE Adapter Information	**Model:**	RP025-5600536YG/Proxim 400-00021
	Input:	AC 100-240V 50/60Hz 0.7A Max
	Output:	DC 56.0V 0.536A 30.0W
Serial Number:		RDG200805002-RF-S2
EUT Received Date:		2020.08.07
EUT Received Status:		Good

Optional Antenna Kit Accessory Information For 2.4G Band▲:

Manufacturer	Model	Antenna Type	input impedance (Ohm)	Antenna Gain /Frequency Range
ARC Wireless	ARC-OA2413SD1	Omni	50	13.0dBi/2.4-2.5GHz
ARC Wireless	ARC-VS2418SD1	Variable Beamwidth Sector Antenna	50	18.0dBi/2.4-2.5GHz

Objective

This report is prepared on behalf of ***Proxim Wireless Corporation*** in accordance with Part 2, Subpart J, Part 15, Subparts A and C of the Federal Communications Commission's rules, RSS-247, Issue 2, February 2017, RSS-Gen Issue 5, Amendment 1, March 2019 of the Innovation, Science and Economic Development Canada.

The tests were performed in order to determine the compliance of the EUT with FCC Rules Part 15-Subpart C, section 15.203, 15.205, 15.207, 15.209 and 15.247 rules, RSS-247, Issue 2, February 2017, RSS-Gen Issue 5, Amendment 1, March 2019 of the Innovation, Science and Economic Development Canada.

The device is the upgraded version based on the certified device, FCC ID: HZB-NGPLC, IC: 1856A-NGPLC, the difference between the new and the old version is:

Add 2.4GHz WLAN hardware and enable 2.4GHz WLAN software.

The changes not affect the BLE radio part, the BLE part please refer to the original report: RDG200805002-00A.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices. And 558074 D01 15.247 Meas Guidance v05r02, RSS-247, Issue 2, February 2017, RSS-Gen Issue 5, Amendment 1, March 2019 of the Innovation, Science and Economic Development Canada.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Dongguan).

Measurement Uncertainty

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±0.61dB
Power Spectral Density, conducted	±0.61 dB
Unwanted Emissions, radiated	30M~200MHz: 4.55 dB,200M~1GHz: 5.92 dB,1G~6GHz: 4.98 dB, 6G~18GHz: 5.89 dB,18G~26.5G:5.47 dB,26.5G~40G:5.63 dB
Unwanted Emissions, conducted	±1.5 dB
Temperature	±1℃
Humidity	±5%
DC and low frequency voltages	±0.4%
Duty Cycle	1%
AC Power Lines Conducted Emission	3.12 dB (150 kHz to 30 MHz)

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 897218, the FCC Designation No. : CN1220.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0022.

Declarations

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 a triangle symbol "▲". Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

This report cannot be reproduced except in full, without prior written approval of the Company.

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.

This report may contain data that are not covered by the accreditation scope and shall be marked with an asterisk "★".

SUMMARY OF TEST RESULTS

Rules	Description of Test	Result
FCC §15.203, RSS-GEN Clause 6.8	Antenna Requirement	Compliance
FCC §15.207 (a); RSS-Gen Clause 8.8	AC Line Conducted Emissions	Compliance
FCC §15.205, §15.209, §15.247(d); RSS-247 Clause 5.5 RSS-Gen Clause 8.10	Spurious Emissions	Compliance
FCC §15.247 (a)(2); RSS-247 Clause 5.2 a) RSS-Gen Clause 6.7	6 dB Bandwidth and 99% Occupied Bandwidth	Compliance
FCC §15.247(b)(3); RSS-247 Clause 5.4 d)	Maximum Conducted Output Power	Compliance
FCC §15.247(d); RSS-247 Clause5.5	100 kHz Bandwidth of Frequency Band Edge	Compliance
FCC §15.247(e) RSS-247 Clause5.2 b)	Power Spectral Density	Compliance

Note:
The changes not affect the BLE radio part, the BLE part please refer to the original report: RDG200805002-00A.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in Engineering Mode, which was provided by the manufacturer.

For 802.11 2.4GHz band, total 11 channels are provided:

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	/	/

For 802.11b, 802.11g, and 802.11n ht20 modes were test with channel 1,6,11.
For 802.11n ht40 modes were test with channel 3, 6, 9.

The worst-case data rates are determined to be as follows for each mode based upon investigations by measuring the average power and PSD across all data rates, bandwidths, and modulations. The device supports SISO and maximum 3TX MIMO in 802.11n modes, per pretest, 3TX MIMO mode was the worst mode and reported.

EUT Exercise Software

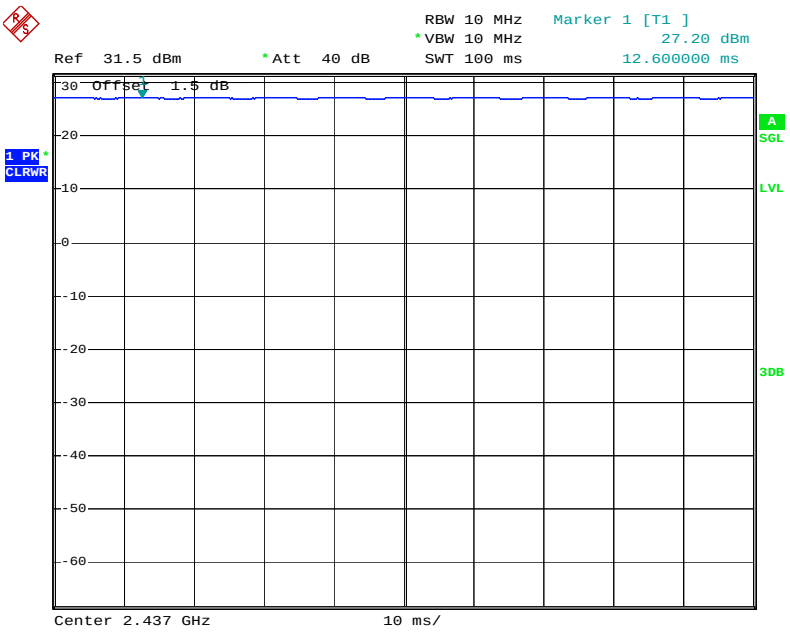
For 802.11 2.4GHz band, the software “artgui.exe” was used for testing, which was provided by manufacturer. The maximum power was configured as below table, that provided by the manufacturer▲:

Mode	Channel	Frequency (MHz)	Data Rate	Power level Setting		
				Chain 0	Chain 1	Chain 2
802.11 b	Low	2412	1Mbps	20	14	16
	Middle	2437	1Mbps	24	23	24
	High	2462	1Mbps	17	16	18
802.11 g	Low	2412	6Mbps	12	8.5	15
	Middle	2437	6Mbps	15.5	16	16.5
	High	2462	6Mbps	13	11	11
802.11n ht20	Low	2412	MCS16	8		
	Middle	2437	MCS16	10		
	High	2462	MCS16	9		
802.11n ht40	Low	2422	MCS16	4		
	Middle	2437	MCS16	10		
	High	2452	MCS16	4		

The maximum duty cycle as following table:

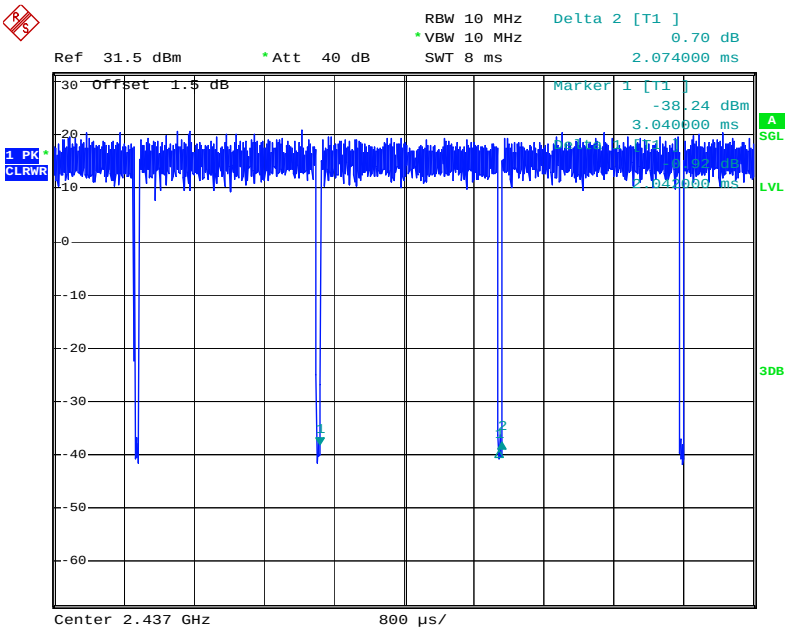
Test mode	T_{on} (ms)	T_{on+off} (ms)	Duty Cycle (%)
802.11b	100	100	100.00
802.11g	2.042	2.074	98.46
802.11n ht20	0.675	0.715	94.41
802.11n ht40	0.355	0.385	92.21

802.11b



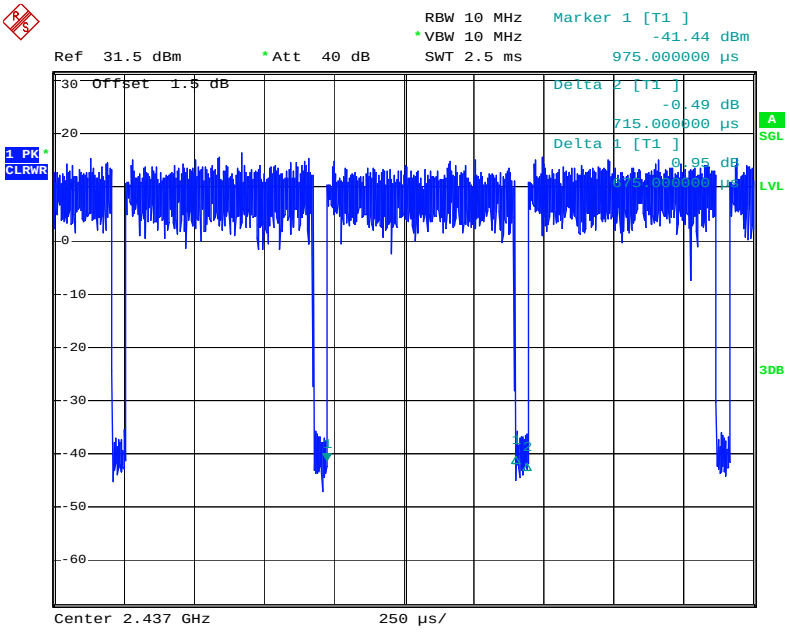
Date: 24.OCT.2020 17:18:23

802.11g



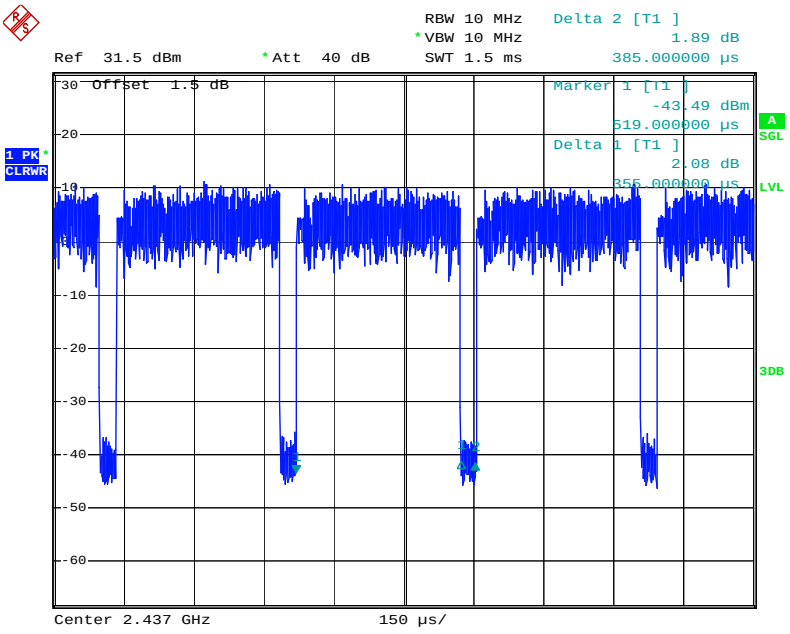
Date: 24.OCT.2020 17:19:42

802.11n ht20



Date: 24.OCT.2020 17:21:19

802.11n ht40



Date: 24.OCT.2020 17:22:14

Equipment Modifications

No modification was made to the EUT.

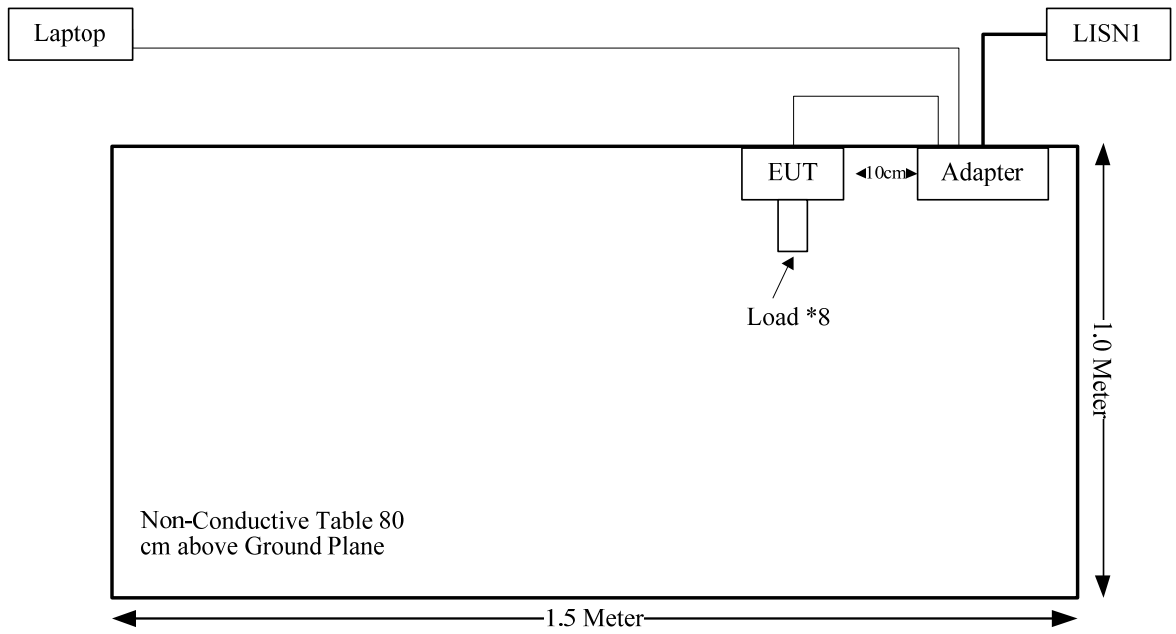
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
DELL	Laptop	PP11L	QDS-BRCM1017
Unknown	50Ohm SMA Load	Unknown	SMA Load-1
Unknown	50Ohm SMA Load	Unknown	SMA Load-2
Unknown	50Ohm SMA Load	Unknown	SMA Load-3
Unknown	50Ohm SMA Load	Unknown	SMA Load-4
Unknown	50Ohm SMA Load	Unknown	SMA Load-5
Unknown	50Ohm SMA Load	Unknown	SMA Load-6
Unknown	50Ohm SMA Load	Unknown	SMA Load-7
Unknown	50Ohm SMA Load	Unknown	SMA Load-8

Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
RJ45 Cable	Yes	No	1.0	PoE Adapter	EUT
RJ45 Cable	Yes	No	1.0	PoE Adapter	Laptop

Block Diagram of Test Setup



FCC §15.203, RSS-GEN CLAUSE 6.8 - ANTENNA REQUIREMENT

Applicable Standard

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

a. Antenna must be permanently attached to the unit.
b. Antenna must use a unique type of connector to attach to the EUT.
c. Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

According to RSS-Gen §6.8, 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 ISED 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

For Wi-Fi:

The Antenna use unique type of connector to attach to the EUT, and Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit. Please refer to the EUT photos.

Manufacturer	Model	Antenna Type	Minimum Cable Loss (dB)	input impedance (Ohm)	Antenna Gain /Frequency Range
ARC Wireless	ARC-OA2413SD1	Omni	0	50	13.0dBi/2.4-2.5GHz
ARC Wireless	ARC-VS2418SD1	Variable Beamwidth Sector Antenna	0	50	18.0dBi/2.4-2.5GHz

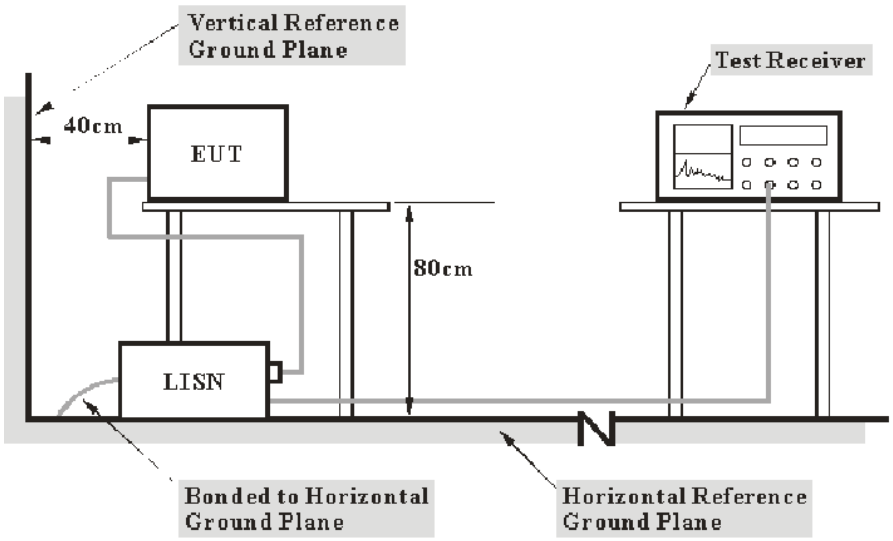
Result: Compliance.

FCC §15.207 (a), RSS-GEN CLAUSE 8.8 – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207(a), RSS-Gen CLAUSE 8.8.

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 per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 and the RSS-Gen limits.

The spacing between the peripherals was 10 cm.

The adapter was connected to the main lisn with a 120 V/60 Hz AC power source.

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 first LISN.

The frequency and amplitude of the six highest ac power-line conducted emissions relative to the limit, measured over all the current-carrying conductors of the EUT power cords, and the operating frequency or frequency to which the EUT is tuned (if appropriate), should be reported, unless such emissions are more than 20 dB below the limit. AC power-line conducted emissions measurements are to be separately carried out only on each of the phase ("hot") line(s) and (if used) on the neutral line(s), but not on the ground [protective earth] line(s). If less than six emission frequencies are within 20 dB of the limit, then the noise level of the measuring instrument at representative frequencies should be reported. The specific conductor of the power-line cord for each of the reported emissions should be identified. Measure the six highest emissions with respect to the limit on each current-carrying conductor of each power cord associated with the EUT (but not the power cords of associated or peripheral equipment that are part of the test configuration). Then, report the six highest emissions with respect to the limit from among all the measurements identifying the frequency and specific current-carrying conductor identified with the emission. The six highest emissions should be reported for each of the current-carrying conductors, or the six highest emissions may be reported over all the current-carrying conductors.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$V_C = V_R + A_C + VDF$
$C_f = A_C + VDF$

Herein,
V_C (cord. Reading): corrected voltage amplitude
V_R: reading voltage amplitude
A_c: attenuation caused by cable loss
VDF: voltage division factor of AMN
C_f: Correction Factor

The "**Margin**" column of the following data tables indicates the degree of compliance within 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:

Margin = Limit – Corrected Amplitude

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	LISN	ENV 216	101614	2019-09-12	2020-09-12
R&S	EMI Test Receiver	ESCI	101121	2020-05-09	2021-05-09
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-01	2019-09-05	2020-09-05
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A

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

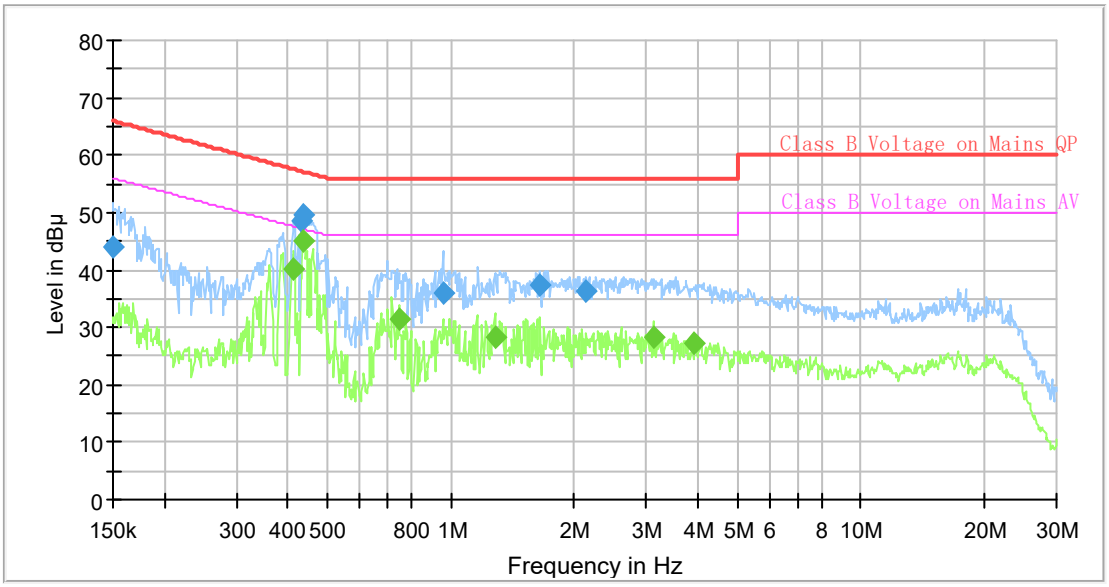
Test Data

Environmental Conditions

Temperature:	27.9℃
Relative Humidity:	62%
ATM Pressure:	99.8 kPa
Tester:	Barry Yang
Test Date:	2020-08-09

Test Mode: Transmitting (Wi-Fi mode 802.11b middle channel was the worst)

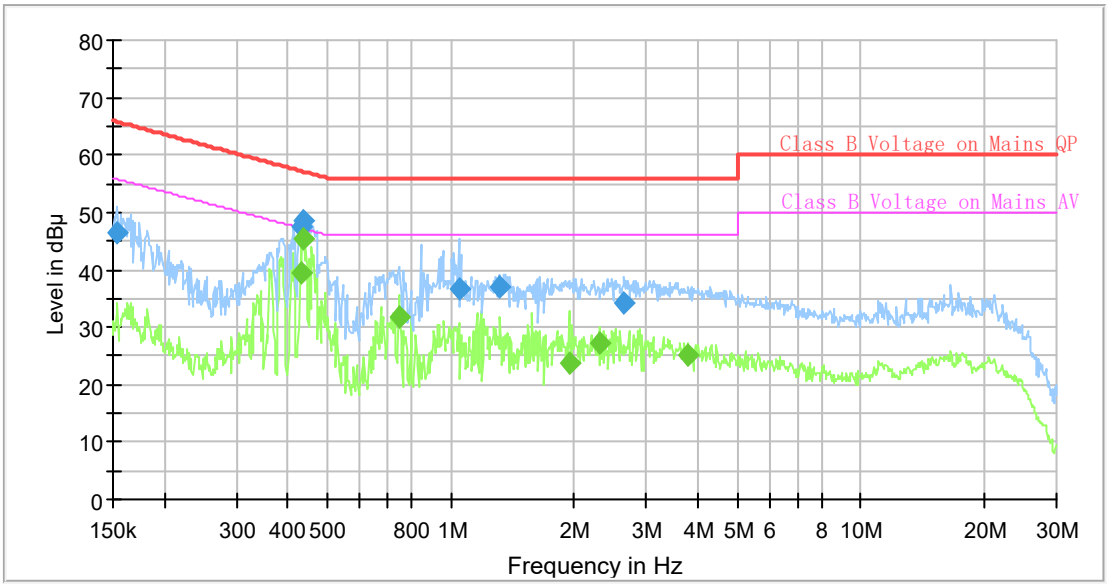
AC120 V, 60 Hz, Line:



Final_Result

Frequency (MHz)	QuasiPeak (dB µ V)	Average (dB µ V)	Limit (dB µ V)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.150000	44.01	---	66.00	21.99	9.000	L1	9.6
0.414923	---	40.30	47.55	7.25	9.000	L1	9.6
0.431814	48.72	---	57.22	8.50	9.000	L1	9.6
0.436143	---	44.91	47.13	2.22	9.000	L1	9.6
0.438323	49.75	---	57.09	7.34	9.000	L1	9.6
0.747417	---	31.58	46.00	14.42	9.000	L1	9.7
0.959105	36.00	---	56.00	20.00	9.000	L1	9.7
1.280849	---	28.36	46.00	17.64	9.000	L1	9.7
1.651836	37.30	---	56.00	18.70	9.000	L1	9.7
2.140929	36.28	---	56.00	19.72	9.000	L1	9.7
3.112123	---	28.36	46.00	17.64	9.000	L1	9.7
3.934248	---	27.31	46.00	18.69	9.000	L1	9.7

AC120 V, 60 Hz, Neutral:



Final_Result

Frequency (MHz)	QuasiPeak (dB µ V)	Average (dB µ V)	Limit (dB µ V)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.153788	46.61	---	65.79	19.18	9.000	N	9.6
0.429665	---	39.37	47.26	7.89	9.000	N	9.6
0.431814	47.49	---	57.22	9.73	9.000	N	9.6
0.438323	---	45.49	47.09	1.60	9.000	N	9.6
0.438323	48.41	---	57.09	8.68	9.000	N	9.6
0.747417	---	31.92	46.00	14.08	9.000	N	9.6
1.049193	36.76	---	56.00	19.24	9.000	N	9.6
1.313192	36.99	---	56.00	19.01	9.000	N	9.6
1.947363	---	23.78	46.00	22.22	9.000	N	9.6
2.318778	---	27.24	46.00	18.76	9.000	N	9.6
2.653034	34.39	---	56.00	21.61	9.000	N	9.6
3.799262	---	25.04	46.00	20.96	9.000	N	9.6

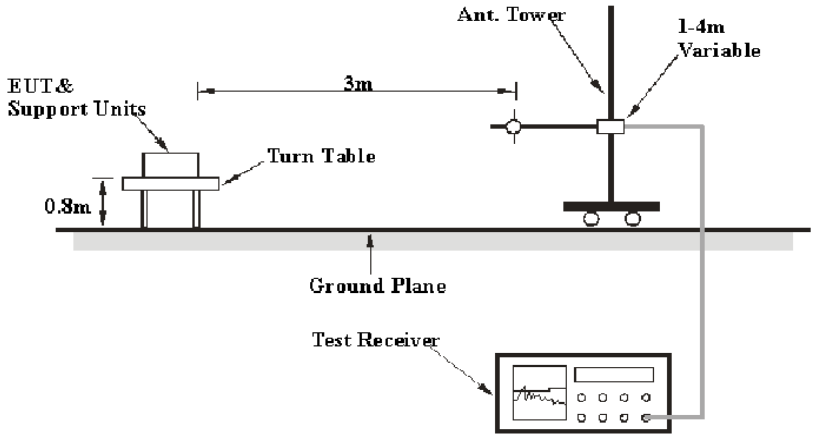
FCC §15.209, §15.205 & §15.247(d), RSS-247 CLAUSE 5.5, RSS-GEN CLAUSE 8.10 - SPURIOUS EMISSIONS

Applicable Standard

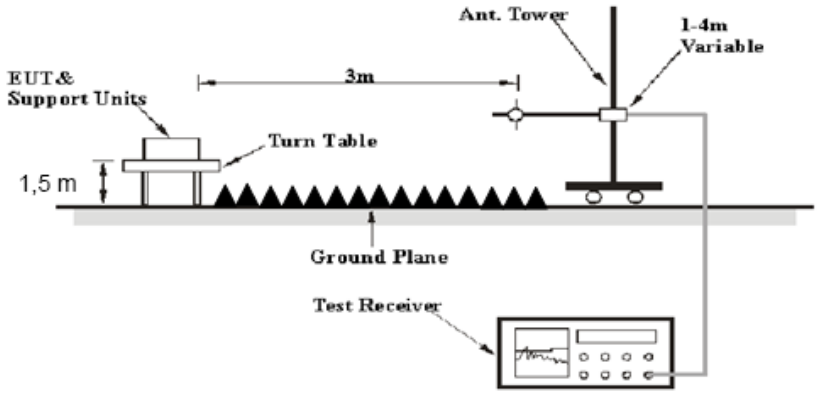
FCC §15.247 (d); §15.209; §15.205; RSS-247 §5.5, RSS-GEN §8.10.

EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission below 1GHz tests were performed in the 3 meters chamber test site A, above 1GHz tests were performed in the 3 meters chamber test site B, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.247 limits.

The spacing between the peripherals was 10 cm.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

30MHz-1000MHz:

Measurement	RBW	Video B/W	IF B/W
QP	120 kHz	300 kHz	120kHz

1GHz- 25GHz:

Measurement	Duty cycle	RBW	Video B/W
PK	Any	1MHz	3 MHz
AV	>98%	1MHz	10 Hz
	<98%	1MHz	1/T

Note: T is minimum transmission duration

If the maximized peak measured value complies with under the QP/Average limit more than 6dB, then it is unnecessary to perform an QP/Average measurement.

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.

Corrected Amplitude & Margin Calculation

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:

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

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:

Margin = Limit – Corrected Amplitude

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiation Below 1GHz					
Sunol Sciences	Antenna	JB3	A060611-3	2020-07-21	2023-07-21
R&S	EMI Test Receiver	ESCI	100224	2019-09-12	2020-09-12
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-02	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0530-01	2019-09-24	2020-09-24
Sonoma	Amplifier	310N	185914	2019-10-13	2020-10-13
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
Radiation Above 1GHz					
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
Ducommun Technolagies	Horn Antenna	ARH-4223-02	1007726-01 1304	2017-12-06	2020-12-05
Agilent	Spectrum Analyzer	E4440A	SG43360054	2020-07-07	2021-07-07
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-2.4J2.4J-50	C-0700-02	2020-06-27	2021-06-27
Mini-Circuit	Amplifier	ZVA-213-S+	54201245	2019-09-05	2020-09-05
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2020-06-27	2021-06-27
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
E-Microwave	Band-stop Filters	OBSF-2400-2483.5-S	OE01601525	2020-06-16	2021-06-16
Micro-tronics	High Pass Filter	HPM50111	S/N-G217	2020-06-16	2021-06-16

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

Test Data

Environmental Conditions

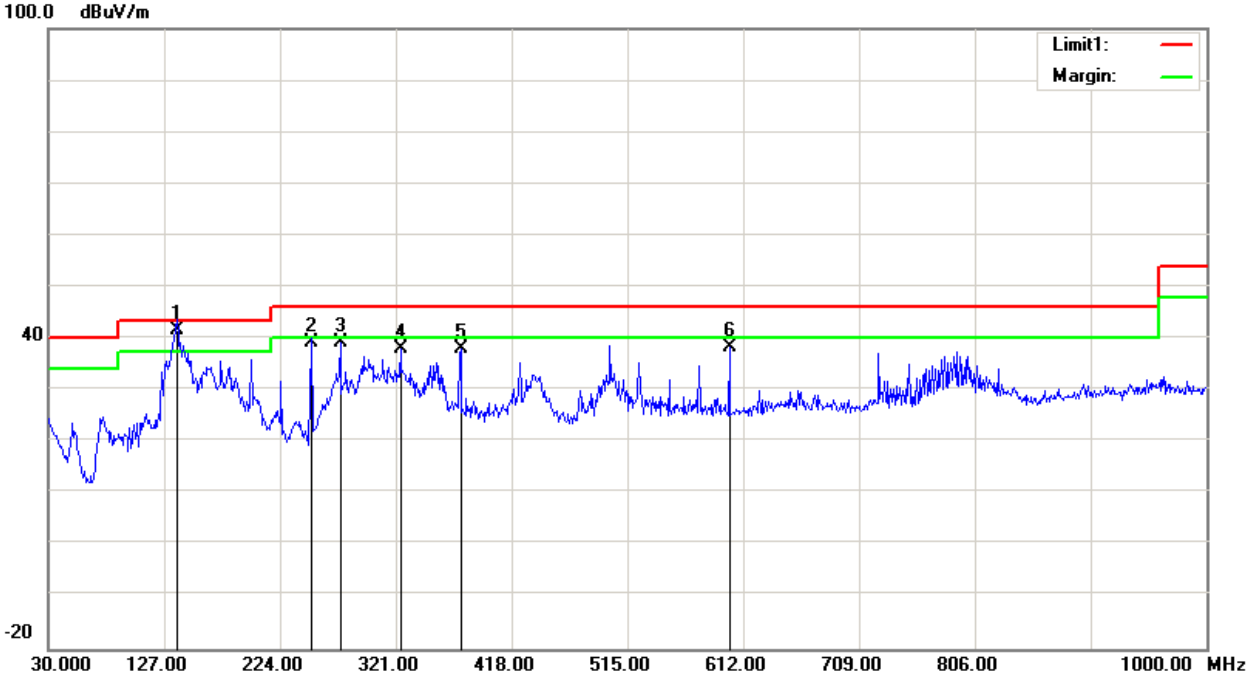
Test Items	Radiation Below 1GHz	Radiation Above 1GHz
Temperature:	28 °C	28~30 °C
Relative Humidity:	44%	32~60 %
ATM Pressure:	101 kPa	100~101.1 kPa
Tester:	Joker Chen	Carlos Jia, Felix Wang
Test Date:	2020-08-15	2020-08-13~2020-08-27

Test Result: Compliance, please Refer to the following data

Test Mode: Transmitting

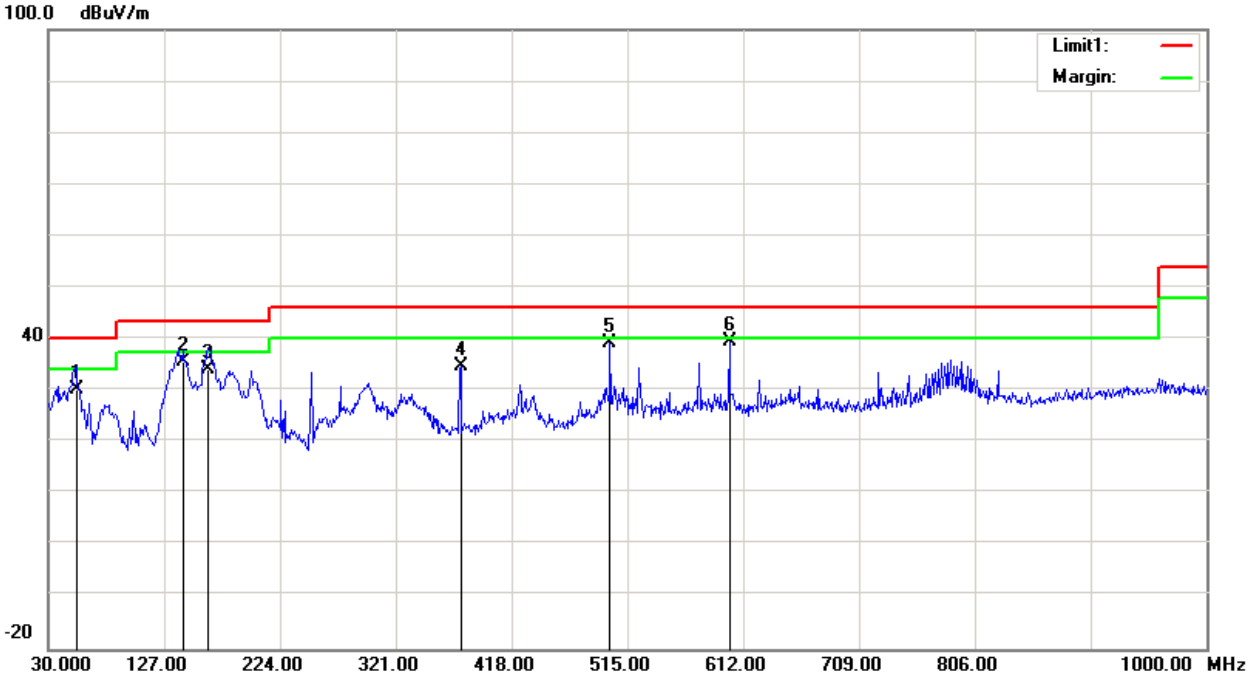
1) 30MHz-1GHz(13dBi antenna 802.11b mode low channel was the worst)

Horizontal:



Frequency (MHz)	Receiver Reading (dBuV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
137.6700	51.03	QP	-9.23	41.80	43.50	1.70
250.1900	49.03	QP	-9.73	39.30	46.00	6.70
274.4400	47.72	peak	-8.59	39.13	46.00	6.87
324.8800	44.95	peak	-7.03	37.92	46.00	8.08
375.3200	44.12	peak	-5.94	38.18	46.00	7.82
600.3600	39.77	peak	-1.39	38.38	46.00	7.62

Vertical:



Frequency (MHz)	Receiver Reading (dBuV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
53.2800	46.70	QP	-16.30	30.40	40.00	9.60
142.5200	44.91	QP	-9.11	35.80	43.50	7.70
163.8600	43.48	QP	-9.28	34.20	43.50	9.30
375.3200	40.82	peak	-5.94	34.88	46.00	11.12
500.4500	42.58	peak	-3.45	39.13	46.00	6.87
600.3600	41.02	peak	-1.39	39.63	46.00	6.37

2) 1-25GHz:

Antenna 13dBi(Model: ARC-OA2413SD1)
802.11b Mode, Chain 0:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector	Polar (H/V)	Factor (dB/m)					
Low Channel: 2412 MHz									
2390.00	36.12	PK	V	28.08	1.80	0.00	66.00	74.00	8.00
2390.00	21.31	AV	V	28.08	1.80	0.00	51.19	54.00	2.81
4824.00	36.09	PK	V	32.95	3.19	25.62	46.61	74.00	27.39
4824.00	24.02	AV	V	32.95	3.19	25.62	34.54	54.00	19.46
7236.00	36.26	PK	V	35.81	4.77	25.64	51.20	74.00	22.80
7236.00	24.15	AV	V	35.81	4.77	25.64	39.09	54.00	14.91
Middle Channel: 2437 MHz									
4874.00	35.65	PK	V	33.05	3.26	25.65	46.31	74.00	27.69
4874.00	23.51	AV	V	33.05	3.26	25.65	34.17	54.00	19.83
7311.00	35.48	PK	V	36.01	4.64	25.71	50.42	74.00	23.58
7311.00	23.35	AV	V	36.01	4.64	25.71	38.29	54.00	15.71
High Channel: 2462 MHz									
2483.50	28.58	PK	V	28.27	1.84	0.00	58.69	74.00	15.31
2483.50	16.07	AV	V	28.27	1.84	0.00	46.18	54.00	7.82
4924.00	36.27	PK	V	33.15	3.27	25.65	47.04	74.00	26.96
4924.00	24.11	AV	V	33.15	3.27	25.65	34.88	54.00	19.12
7386.00	35.55	PK	V	36.20	4.51	25.79	50.47	74.00	23.53
7386.00	23.35	AV	V	36.20	4.51	25.79	38.27	54.00	15.73

802.11b Mode, Chain 1:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector	Polar (H/V)	Factor (dB/m)					
Low Channel: 2412 MHz									
2390.00	32.15	PK	V	28.08	1.80	0.00	62.03	74.00	11.97
2390.00	20.56	AV	V	28.08	1.80	0.00	50.44	54.00	3.56
4824.00	35.71	PK	V	32.95	3.19	25.62	46.23	74.00	27.77
4824.00	23.63	AV	V	32.95	3.19	25.62	34.15	54.00	19.85
7236.00	35.55	PK	V	35.81	4.77	25.64	50.49	74.00	23.51
7236.00	23.49	AV	V	35.81	4.77	25.64	38.43	54.00	15.57
Middle Channel: 2437 MHz									
4874.00	35.27	PK	V	33.05	3.26	25.65	45.93	74.00	28.07
4874.00	23.16	AV	V	33.05	3.26	25.65	33.82	54.00	20.18
7311.00	35.69	PK	V	36.01	4.64	25.71	50.63	74.00	23.37
7311.00	23.54	AV	V	36.01	4.64	25.71	38.48	54.00	15.52
High Channel: 2462 MHz									
2483.50	29.71	PK	V	28.27	1.84	0.00	59.82	74.00	14.18
2483.50	17.70	AV	V	28.27	1.84	0.00	47.81	54.00	6.19
4924.00	35.78	PK	V	33.15	3.27	25.65	46.55	74.00	27.45
4924.00	23.67	AV	V	33.15	3.27	25.65	34.44	54.00	19.56
7386.00	35.18	PK	V	36.20	4.51	25.79	50.10	74.00	23.90
7386.00	23.06	AV	V	36.20	4.51	25.79	37.98	54.00	16.02

802.11b Mode, Chain 2:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector	Polar (H/V)	Factor (dB/m)					
Low Channel: 2412 MHz									
2390.00	32.15	PK	H	28.08	1.80	0.00	62.03	74.00	11.97
2390.00	20.23	AV	H	28.08	1.80	0.00	50.11	54.00	3.89
4824.00	35.67	PK	H	32.95	3.19	25.62	46.19	74.00	27.81
4824.00	23.55	AV	H	32.95	3.19	25.62	34.07	54.00	19.93
7236.00	35.98	PK	H	35.81	4.77	25.64	50.92	74.00	23.08
7236.00	23.87	AV	H	35.81	4.77	25.64	38.81	54.00	15.19
Middle Channel: 2437 MHz									
4874.00	36.25	PK	H	33.05	3.26	25.65	46.91	74.00	27.09
4874.00	24.12	AV	H	33.05	3.26	25.65	34.78	54.00	19.22
7311.00	36.05	PK	H	36.01	4.64	25.71	50.99	74.00	23.01
7311.00	24.02	AV	H	36.01	4.64	25.71	38.96	54.00	15.04
High Channel: 2462 MHz									
2483.50	30.45	PK	H	28.27	1.84	0.00	60.56	74.00	13.44
2483.50	18.20	AV	H	28.27	1.84	0.00	48.31	54.00	5.69
4924.00	35.68	PK	H	33.15	3.27	25.65	46.45	74.00	27.55
4924.00	23.51	AV	H	33.15	3.27	25.65	34.28	54.00	19.72
7386.00	35.39	PK	H	36.20	4.51	25.79	50.31	74.00	23.69
7386.00	23.23	AV	H	36.20	4.51	25.79	38.15	54.00	15.85

802.11g Mode, Chain 0:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector	Polar (H/V)	Factor (dB/m)					
Low Channel: 2412 MHz									
2390.00	39.91	PK	V	28.08	1.80	0.00	69.79	74.00	4.21
2390.00	22.06	AV	V	28.08	1.80	0.00	51.94	54.00	2.06
4824.00	36.16	PK	V	32.95	3.19	25.62	46.68	74.00	27.32
4824.00	24.12	AV	V	32.95	3.19	25.62	34.64	54.00	19.36
7236.00	35.56	PK	V	35.81	4.77	25.64	50.50	74.00	23.50
7236.00	23.39	AV	V	35.81	4.77	25.64	38.33	54.00	15.67
Middle Channel: 2437 MHz									
4874.00	35.62	PK	V	33.05	3.26	25.65	46.28	74.00	27.72
4874.00	23.58	AV	V	33.05	3.26	25.65	34.24	54.00	19.76
7311.00	35.33	PK	V	36.01	4.64	25.71	50.27	74.00	23.73
7311.00	23.22	AV	V	36.01	4.64	25.71	38.16	54.00	15.84
High Channel: 2462 MHz									
2483.50	30.12	PK	V	28.27	1.84	0.00	60.23	74.00	13.77
2483.50	16.50	AV	V	28.27	1.84	0.00	46.61	54.00	7.39
4924.00	35.80	PK	V	33.15	3.27	25.65	46.57	74.00	27.43
4924.00	23.72	AV	V	33.15	3.27	25.65	34.49	54.00	19.51
7386.00	35.90	PK	V	36.20	4.51	25.79	50.82	74.00	23.18
7386.00	25.83	AV	V	36.20	4.51	25.79	40.75	54.00	13.25

802.11g Mode, Chain 1:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector	Polar (H/V)	Factor (dB/m)					
Low Channel: 2412 MHz									
2390.00	37.15	PK	V	28.08	1.80	0.00	67.03	74.00	6.97
2390.00	20.65	AV	V	28.08	1.80	0.00	50.53	54.00	3.47
4824.00	35.79	PK	V	32.95	3.19	25.62	46.31	74.00	27.69
4824.00	23.64	AV	V	32.95	3.19	25.62	34.16	54.00	19.84
7236.00	35.44	PK	V	35.81	4.77	25.64	50.38	74.00	23.62
7236.00	23.31	AV	V	35.81	4.77	25.64	38.25	54.00	15.75
Middle Channel: 2437 MHz									
4874.00	35.72	PK	V	33.05	3.26	25.65	46.38	74.00	27.62
4874.00	23.65	AV	V	33.05	3.26	25.65	34.31	54.00	19.69
7311.00	35.18	PK	V	36.01	4.64	25.71	50.12	74.00	23.88
7311.00	23.09	AV	V	36.01	4.64	25.71	38.03	54.00	15.97
High Channel: 2462 MHz									
2483.50	32.80	PK	V	28.27	1.84	0.00	62.91	74.00	11.09
2483.50	18.02	AV	V	28.27	1.84	0.00	48.13	54.00	5.87
4924.00	35.57	PK	V	33.15	3.27	25.65	46.34	74.00	27.66
4924.00	23.49	AV	V	33.15	3.27	25.65	34.26	54.00	19.74
7386.00	35.26	PK	V	36.20	4.51	25.79	50.18	74.00	23.82
7386.00	23.17	AV	V	36.20	4.51	25.79	38.09	54.00	15.91

802.11g Mode, Chain 2:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector	Polar (H/V)	Factor (dB/m)					
Low Channel: 2412 MHz									
2390.00	37.63	PK	H	28.08	1.80	0.00	67.51	74.00	6.49
2390.00	20.26	AV	H	28.08	1.80	0.00	50.14	54.00	3.86
4824.00	35.68	PK	H	32.95	3.19	25.62	46.20	74.00	27.80
4824.00	23.52	AV	H	32.95	3.19	25.62	34.04	54.00	19.96
7236.00	35.29	PK	H	35.81	4.77	25.64	50.23	74.00	23.77
7236.00	23.15	AV	H	35.81	4.77	25.64	38.09	54.00	15.91
Middle Channel: 2437 MHz									
4874.00	36.25	PK	H	33.05	3.26	25.65	46.91	74.00	27.09
4874.00	24.12	AV	H	33.05	3.26	25.65	34.78	54.00	19.22
7311.00	35.41	PK	H	36.01	4.64	25.71	50.35	74.00	23.65
7311.00	23.36	AV	H	36.01	4.64	25.71	38.30	54.00	15.70
High Channel: 2462 MHz									
2483.50	37.58	PK	H	28.27	1.84	0.00	67.69	74.00	6.31
2483.50	21.68	AV	H	28.27	1.84	0.00	51.79	54.00	2.21
4924.00	35.62	PK	H	33.15	3.27	25.65	46.39	74.00	27.61
4924.00	23.49	AV	H	33.15	3.27	25.65	34.26	54.00	19.74
7386.00	35.07	PK	H	36.20	4.51	25.79	49.99	74.00	24.01
7386.00	23.05	AV	H	36.20	4.51	25.79	37.97	54.00	16.03

802.11n ht20 Mode(3TX was the worst):

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector	Polar (H/V)	Factor (dB/m)					
Low Channel: 2412 MHz									
2390.00	34.64	PK	V	28.08	1.80	0.00	64.52	74.00	9.48
2390.00	20.28	AV	V	28.08	1.80	0.00	50.16	54.00	3.84
4824.00	35.67	PK	V	32.95	3.19	25.62	46.19	74.00	27.81
4824.00	23.54	AV	V	32.95	3.19	25.62	34.06	54.00	19.94
7236.00	35.07	PK	V	35.81	4.77	25.64	50.01	74.00	23.99
7236.00	23.02	AV	V	35.81	4.77	25.64	37.96	54.00	16.04
Middle Channel: 2437 MHz									
4874.00	35.45	PK	V	33.05	3.26	25.65	46.11	74.00	27.89
4874.00	23.37	AV	V	33.05	3.26	25.65	34.03	54.00	19.97
7311.00	35.47	PK	V	36.01	4.64	25.71	50.41	74.00	23.59
7311.00	23.39	AV	V	36.01	4.64	25.71	38.33	54.00	15.67
High Channel: 2462 MHz									
2483.50	31.94	PK	V	28.27	1.84	0.00	62.05	74.00	11.95
2483.50	17.63	AV	V	28.27	1.84	0.00	47.74	54.00	6.26
4924.00	35.76	PK	V	33.15	3.27	25.65	46.53	74.00	27.47
4924.00	23.52	AV	V	33.15	3.27	25.65	34.29	54.00	19.71
7386.00	35.30	PK	V	36.20	4.51	25.79	50.22	74.00	23.78
7386.00	23.21	AV	V	36.20	4.51	25.79	38.13	54.00	15.87

802.11n ht40 Mode(3TX was the worst):

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector	Polar (H/V)	Factor (dB/m)					
Low Channel: 2422 MHz									
2390.00	35.52	PK	V	28.08	1.80	0.00	65.40	74.00	8.60
2390.00	21.21	AV	V	28.08	1.80	0.00	51.09	54.00	2.91
4844.00	35.29	PK	V	32.99	3.22	25.63	45.87	74.00	28.13
4844.00	23.15	AV	V	32.99	3.22	25.63	33.73	54.00	20.27
7266.00	35.17	PK	V	35.89	4.72	25.67	50.11	74.00	23.89
7266.00	23.08	AV	V	35.89	4.72	25.67	38.02	54.00	15.98
Middle Channel: 2437 MHz									
4874.00	35.46	PK	V	33.05	3.26	25.65	46.12	74.00	27.88
4874.00	23.32	AV	V	33.05	3.26	25.65	33.98	54.00	20.02
7311.00	35.11	PK	V	36.01	4.64	25.71	50.05	74.00	23.95
7311.00	23.07	AV	V	36.01	4.64	25.71	38.01	54.00	15.99
High Channel: 2452 MHz									
2483.50	36.68	PK	V	28.27	1.84	0.00	66.79	74.00	7.21
2483.50	20.44	AV	V	28.27	1.84	0.00	50.55	54.00	3.45
4904.00	36.61	PK	V	33.11	3.30	25.67	47.35	74.00	26.65
4904.00	24.46	AV	V	33.11	3.30	25.67	35.20	54.00	18.80
7356.00	35.40	PK	V	36.13	4.56	25.76	50.33	74.00	23.67
7356.00	23.31	AV	V	36.13	4.56	25.76	38.24	54.00	15.76

Antenna 18dBi(Model: ARC-VS2418SD1)
802.11b Mode, Chain 0:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector	Polar (H/V)	Factor (dB/m)					
Low Channel: 2412 MHz									
2390.00	30.82	PK	V	28.08	1.80	0.00	60.70	74.00	13.30
2390.00	21.03	AV	V	28.08	1.80	0.00	50.91	54.00	3.09
4824.00	40.81	PK	V	32.95	3.19	25.62	51.33	74.00	22.67
4824.00	36.31	AV	V	32.95	3.19	25.62	46.83	54.00	7.17
7236.00	36.44	PK	V	35.81	4.77	25.64	51.38	74.00	22.62
7236.00	24.25	AV	V	35.81	4.77	25.64	39.19	54.00	14.81
3660.00	41.06	PK	V	31.65	2.50	25.93	49.28	74.00	24.72
3660.00	38.87	AV	V	31.65	2.50	25.93	47.09	54.00	**6.91**
Middle Channel: 2437 MHz									
4874.00	40.26	PK	V	33.05	3.26	25.65	50.92	74.00	23.08
4874.00	35.29	AV	V	33.05	3.26	25.65	45.95	54.00	8.05
7311.00	36.30	PK	V	36.01	4.64	25.71	51.24	74.00	22.76
7311.00	24.12	AV	V	36.01	4.64	25.71	39.06	54.00	14.94
3660.00	41.15	PK	V	31.65	2.50	25.93	49.37	74.00	24.63
3660.00	37.23	AV	V	31.65	2.50	25.93	45.45	54.00	8.55
High Channel: 2462 MHz									
2483.50	37.56	PK	V	28.27	1.84	0.00	67.67	74.00	6.33
2483.50	19.30	AV	V	28.27	1.84	0.00	49.41	54.00	4.59
4924.00	38.03	PK	V	33.15	3.27	25.65	48.80	74.00	25.20
4924.00	31.65	AV	V	33.15	3.27	25.65	42.42	54.00	11.58
7386.00	36.08	PK	V	36.20	4.51	25.79	51.00	74.00	23.00
7386.00	23.69	AV	V	36.20	4.51	25.79	38.61	54.00	15.39
3660.00	41.01	PK	V	31.65	2.50	25.93	49.23	74.00	24.77
3660.00	37.32	AV	V	31.65	2.50	25.93	45.54	54.00	8.46

802.11b Mode, Chain 1:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector	Polar (H/V)	Factor (dB/m)					
Low Channel: 2412 MHz									
2390.00	31.47	PK	V	28.08	1.80	0.00	61.35	74.00	12.65
2390.00	21.19	AV	V	28.08	1.80	0.00	51.07	54.00	2.93
4824.00	38.02	PK	V	32.95	3.19	25.62	48.54	74.00	25.46
4824.00	31.37	AV	V	32.95	3.19	25.62	41.89	54.00	12.11
7236.00	37.15	PK	V	35.81	4.77	25.64	52.09	74.00	21.91
7236.00	25.03	AV	V	35.81	4.77	25.64	39.97	54.00	14.03
3660.00	41.22	PK	V	31.65	2.50	25.93	49.44	74.00	24.56
3660.00	37.54	AV	V	31.65	2.50	25.93	45.76	54.00	8.24
Middle Channel: 2437 MHz									
4874.00	36.85	PK	V	33.05	3.26	25.65	47.51	74.00	26.49
4874.00	27.08	AV	V	33.05	3.26	25.65	37.74	54.00	16.26
7311.00	36.34	PK	V	36.01	4.64	25.71	51.28	74.00	22.72
7311.00	24.16	AV	V	36.01	4.64	25.71	39.10	54.00	14.90
3660.00	40.86	PK	V	31.65	2.50	25.93	49.08	74.00	24.92
3660.00	36.58	AV	V	31.65	2.50	25.93	44.80	54.00	9.20
High Channel: 2462 MHz									
2483.50	29.81	PK	V	28.27	1.84	0.00	59.92	74.00	14.08
2483.50	19.26	AV	V	28.27	1.84	0.00	49.37	54.00	4.63
4924.00	38.54	PK	V	33.15	3.27	25.65	49.31	74.00	24.69
4924.00	30.76	AV	V	33.15	3.27	25.65	41.53	54.00	12.47
7386.00	36.84	PK	V	36.20	4.51	25.79	51.76	74.00	22.24
7386.00	24.73	AV	V	36.20	4.51	25.79	39.65	54.00	14.35
3660.00	41.39	PK	V	31.65	2.50	25.93	49.61	74.00	24.39
3660.00	37.52	AV	V	31.65	2.50	25.93	45.74	54.00	8.26

802.11b Mode, Chain 2:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector	Polar (H/V)	Factor (dB/m)					
Low Channel: 2412 MHz									
2390.00	31.75	PK	V	28.08	1.80	0.00	61.63	74.00	12.37
2390.00	21.10	AV	V	28.08	1.80	0.00	50.98	54.00	3.02
4824.00	40.40	PK	V	32.95	3.19	25.62	50.92	74.00	23.08
4824.00	33.65	AV	V	32.95	3.19	25.62	44.17	54.00	9.83
7236.00	36.82	PK	V	35.81	4.77	25.64	51.76	74.00	22.24
7236.00	23.61	AV	V	35.81	4.77	25.64	38.55	54.00	15.45
3660.00	40.52	PK	V	31.65	2.50	25.93	48.74	74.00	25.26
3660.00	36.57	AV	V	31.65	2.50	25.93	44.79	54.00	9.21
Middle Channel: 2437 MHz									
4874.00	38.81	PK	V	33.05	3.26	25.65	49.47	74.00	24.53
4874.00	32.56	AV	V	33.05	3.26	25.65	43.22	54.00	10.78
7311.00	36.02	PK	V	36.01	4.64	25.71	50.96	74.00	23.04
7311.00	23.16	AV	V	36.01	4.64	25.71	38.10	54.00	15.90
3660.00	40.63	PK	V	31.65	2.50	25.93	48.85	74.00	25.15
3660.00	36.87	AV	V	31.65	2.50	25.93	45.09	54.00	8.91
High Channel: 2462 MHz									
2483.50	32.42	PK	V	28.27	1.84	0.00	62.53	74.00	11.47
2483.50	21.54	AV	V	28.27	1.84	0.00	51.65	54.00	2.35
4924.00	38.63	PK	V	33.15	3.27	25.65	49.40	74.00	24.60
4924.00	32.22	AV	V	33.15	3.27	25.65	42.99	54.00	11.01
7386.00	36.24	PK	V	36.20	4.51	25.79	51.16	74.00	22.84
7386.00	23.43	AV	V	36.20	4.51	25.79	38.35	54.00	15.65
3660.00	41.26	PK	V	31.65	2.50	25.93	49.48	74.00	24.52
3660.00	37.65	AV	V	31.65	2.50	25.93	45.87	54.00	8.13

802.11g Mode, Chain 0:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector	Polar (H/V)	Factor (dB/m)					
Low Channel: 2412 MHz									
2390.00	40.11	PK	V	28.08	1.80	0.00	69.99	74.00	4.01
2390.00	21.65	AV	V	28.08	1.80	0.00	51.53	54.00	2.47
4824.00	36.40	PK	V	32.95	3.19	25.62	46.92	74.00	27.08
4824.00	24.32	AV	V	32.95	3.19	25.62	34.84	54.00	19.16
7236.00	36.08	PK	V	35.81	4.77	25.64	51.02	74.00	22.98
7236.00	23.86	AV	V	35.81	4.77	25.64	38.80	54.00	15.20
3660.00	40.79	PK	V	31.65	2.50	25.93	49.01	74.00	24.99
3660.00	36.76	AV	V	31.65	2.50	25.93	44.98	54.00	9.02
Middle Channel: 2437 MHz									
4874.00	36.44	PK	V	33.05	3.26	25.65	47.10	74.00	26.90
4874.00	24.13	AV	V	33.05	3.26	25.65	34.79	54.00	19.21
7311.00	36.31	PK	V	36.01	4.64	25.71	51.25	74.00	22.75
7311.00	24.08	AV	V	36.01	4.64	25.71	39.02	54.00	14.98
3660.00	41.07	PK	V	31.65	2.50	25.93	49.29	74.00	24.71
3660.00	36.87	AV	V	31.65	2.50	25.93	45.09	54.00	8.91
High Channel: 2462 MHz									
2483.50	35.84	PK	V	28.27	1.84	0.00	65.95	74.00	8.05
2483.50	21.45	AV	V	28.27	1.84	0.00	51.56	54.00	2.44
4924.00	35.89	PK	V	33.15	3.27	25.65	46.66	74.00	27.34
4924.00	23.67	AV	V	33.15	3.27	25.65	34.44	54.00	19.56
7386.00	35.24	PK	V	36.20	4.51	25.79	50.16	74.00	23.84
7386.00	23.16	AV	V	36.20	4.51	25.79	38.08	54.00	15.92
3660.00	41.53	PK	V	31.65	2.50	25.93	49.75	74.00	24.25
3660.00	37.93	AV	V	31.65	2.50	25.93	46.15	54.00	7.85

802.11g Mode, Chain 1:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector	Polar (H/V)	Factor (dB/m)					
Low Channel: 2412 MHz									
2390.00	34.37	PK	V	28.08	1.80	0.00	64.25	74.00	9.75
2390.00	21.19	AV	V	28.08	1.80	0.00	51.07	54.00	2.93
4824.00	36.22	PK	V	32.95	3.19	25.62	46.74	74.00	27.26
4824.00	23.89	AV	V	32.95	3.19	25.62	34.41	54.00	19.59
7236.00	36.39	PK	V	35.81	4.77	25.64	51.33	74.00	22.67
7236.00	24.11	AV	V	35.81	4.77	25.64	39.05	54.00	14.95
3660.00	40.44	PK	V	31.65	2.50	25.93	48.66	74.00	25.34
3660.00	36.25	AV	V	31.65	2.50	25.93	44.47	54.00	9.53
Middle Channel: 2437 MHz									
4874.00	35.55	PK	V	33.05	3.26	25.65	46.21	74.00	27.79
4874.00	23.46	AV	V	33.05	3.26	25.65	34.12	54.00	19.88
7311.00	36.25	PK	V	36.01	4.64	25.71	51.19	74.00	22.81
7311.00	23.93	AV	V	36.01	4.64	25.71	38.87	54.00	15.13
3660.00	41.13	PK	V	31.65	2.50	25.93	49.35	74.00	24.65
3660.00	37.22	AV	V	31.65	2.50	25.93	45.44	54.00	8.56
High Channel: 2462 MHz									
2483.50	35.37	PK	V	28.27	1.84	0.00	65.48	74.00	8.52
2483.50	21.09	AV	V	28.27	1.84	0.00	51.20	54.00	2.80
4924.00	36.01	PK	V	33.15	3.27	25.65	46.78	74.00	27.22
4924.00	23.75	AV	V	33.15	3.27	25.65	34.52	54.00	19.48
7386.00	36.66	PK	V	36.20	4.51	25.79	51.58	74.00	22.42
7386.00	24.35	AV	V	36.20	4.51	25.79	39.27	54.00	14.73
3660.00	40.78	PK	V	31.65	2.50	25.93	49.00	74.00	25.00
3660.00	36.38	AV	V	31.65	2.50	25.93	44.60	54.00	9.40

802.11g Mode, Chain 2:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector	Polar (H/V)	Factor (dB/m)					
Low Channel: 2412 MHz									
2390.00	30.06	PK	V	28.08	1.80	0.00	59.94	74.00	14.06
2390.00	20.08	AV	V	28.08	1.80	0.00	49.96	54.00	4.04
4824.00	36.06	PK	V	32.95	3.19	25.62	46.58	74.00	27.42
4824.00	23.88	AV	V	32.95	3.19	25.62	34.40	54.00	19.60
7236.00	36.74	PK	V	35.81	4.77	25.64	51.68	74.00	22.32
7236.00	24.51	AV	V	35.81	4.77	25.64	39.45	54.00	14.55
3660.00	40.76	PK	V	31.65	2.50	25.93	48.98	74.00	25.02
3660.00	36.54	AV	V	31.65	2.50	25.93	44.76	54.00	9.24
Middle Channel: 2437 MHz									
4874.00	35.22	PK	V	33.05	3.26	25.65	45.88	74.00	28.12
4874.00	23.15	AV	V	33.05	3.26	25.65	33.81	54.00	20.19
7311.00	36.42	PK	V	36.01	4.64	25.71	51.36	74.00	22.64
7311.00	24.26	AV	V	36.01	4.64	25.71	39.20	54.00	14.80
3660.00	40.75	PK	V	31.65	2.50	25.93	48.97	74.00	25.03
3660.00	36.35	AV	V	31.65	2.50	25.93	44.57	54.00	9.43
High Channel: 2462 MHz									
2483.50	38.68	PK	V	28.27	1.84	0.00	68.79	74.00	5.21
2483.50	21.75	AV	V	28.27	1.84	0.00	51.86	54.00	2.14
4924.00	35.62	PK	V	33.15	3.27	25.65	46.39	74.00	27.61
4924.00	23.46	AV	V	33.15	3.27	25.65	34.23	54.00	19.77
7386.00	36.02	PK	V	36.20	4.51	25.79	50.94	74.00	23.06
7386.00	23.83	AV	V	36.20	4.51	25.79	38.75	54.00	15.25
3660.00	41.89	PK	V	31.65	2.50	25.93	50.11	74.00	23.89
3660.00	37.55	AV	V	31.65	2.50	25.93	45.77	54.00	8.23

802.11n ht20 Mode(3TX was the worst):

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector	Polar (H/V)	Factor (dB/m)					
Low Channel: 2412 MHz									
2390.00	39.46	PK	V	28.08	1.80	0.00	69.34	74.00	4.66
2390.00	22.01	AV	V	28.08	1.80	0.00	51.89	54.00	2.11
4824.00	35.65	PK	V	32.95	3.19	25.62	46.17	74.00	27.83
4824.00	23.47	AV	V	32.95	3.19	25.62	33.99	54.00	20.01
7236.00	36.42	PK	V	35.81	4.77	25.64	51.36	74.00	22.64
7236.00	24.29	AV	V	35.81	4.77	25.64	39.23	54.00	14.77
3660.00	41.84	PK	V	31.65	2.50	25.93	50.06	74.00	23.94
3660.00	37.37	AV	V	31.65	2.50	25.93	45.59	54.00	8.41
Middle Channel: 2437 MHz									
4874.00	36.04	PK	V	33.05	3.26	25.65	46.70	74.00	27.30
4874.00	23.89	AV	V	33.05	3.26	25.65	34.55	54.00	19.45
7311.00	36.07	PK	V	36.01	4.64	25.71	51.01	74.00	22.99
7311.00	23.94	AV	V	36.01	4.64	25.71	38.88	54.00	15.12
3660.00	40.93	PK	V	31.65	2.50	25.93	49.15	74.00	24.85
3660.00	36.78	AV	V	31.65	2.50	25.93	45.00	54.00	9.00
High Channel: 2462 MHz									
2483.50	39.14	PK	V	28.27	1.84	0.00	69.25	74.00	4.75
2483.50	21.58	AV	V	28.27	1.84	0.00	51.69	54.00	2.31
4924.00	35.60	PK	V	33.15	3.27	25.65	46.37	74.00	27.63
4924.00	23.55	AV	V	33.15	3.27	25.65	34.32	54.00	19.68
7386.00	36.06	PK	V	36.20	4.51	25.79	50.98	74.00	23.02
7386.00	24.02	AV	V	36.20	4.51	25.79	38.94	54.00	15.06
3660.00	40.77	PK	V	31.65	2.50	25.93	48.99	74.00	25.01
3660.00	36.54	AV	V	31.65	2.50	25.93	44.76	54.00	9.24

802.11n ht40 Mode(3TX was the worst):

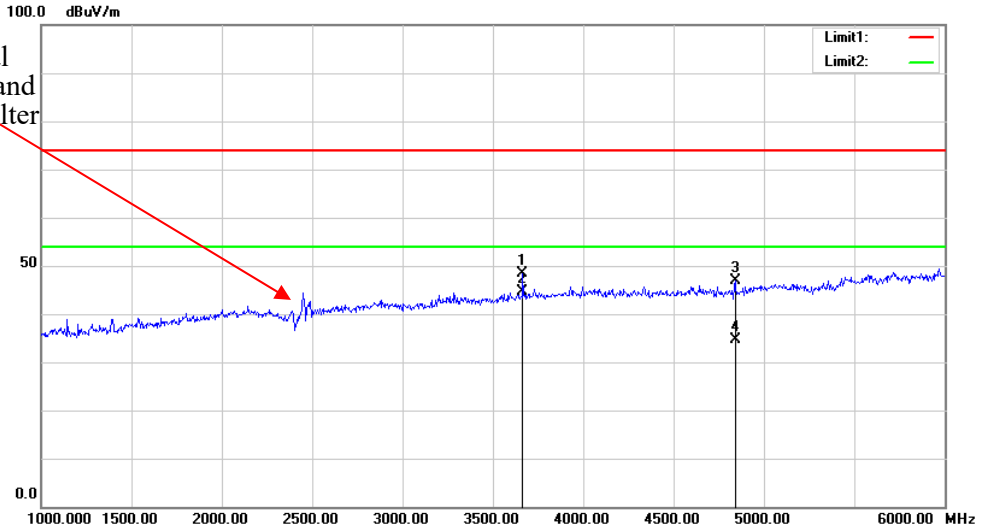
Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector	Polar (H/V)	Factor (dB/m)					
Low Channel: 2422 MHz									
2390.00	37.85	PK	V	28.08	1.80	0.00	67.73	74.00	6.27
2390.00	23.60	AV	V	28.08	1.80	0.00	53.48	54.00	0.52
4844.00	36.32	PK	V	32.99	3.22	25.63	46.90	74.00	27.10
4844.00	24.16	AV	V	32.99	3.22	25.63	34.74	54.00	19.26
7266.00	36.67	PK	V	35.89	4.72	25.67	51.61	74.00	22.39
7266.00	24.46	AV	V	35.89	4.72	25.67	39.40	54.00	14.60
3660.00	40.44	PK	V	31.65	2.50	25.93	48.66	74.00	25.34
3660.00	36.38	AV	V	31.65	2.50	25.93	44.60	54.00	9.40
Middle Channel: 2437 MHz									
4874.00	36.00	PK	V	33.05	3.26	25.65	46.66	74.00	27.34
4874.00	23.86	AV	V	33.05	3.26	25.65	34.52	54.00	19.48
7311.00	36.78	PK	V	36.01	4.64	25.71	51.72	74.00	22.28
7311.00	24.59	AV	V	36.01	4.64	25.71	39.53	54.00	14.47
3660.00	40.81	PK	V	31.65	2.50	25.93	49.03	74.00	24.97
3660.00	36.87	AV	V	31.65	2.50	25.93	45.09	54.00	8.91
High Channel: 2452 MHz									
2483.50	39.48	PK	V	28.27	1.84	0.00	69.59	74.00	4.41
2483.50	22.66	AV	V	28.27	1.84	0.00	52.77	54.00	1.23
4904.00	37.87	PK	V	33.11	3.30	25.67	48.61	74.00	25.39
4904.00	25.64	AV	V	33.11	3.30	25.67	36.38	54.00	17.62
7356.00	36.06	PK	V	36.13	4.56	25.76	50.99	74.00	23.01
7356.00	24.05	AV	V	36.13	4.56	25.76	38.98	54.00	15.02
3660.00	40.88	PK	V	31.65	2.50	25.93	49.10	74.00	24.90
3660.00	36.75	AV	V	31.65	2.50	25.93	44.97	54.00	9.03

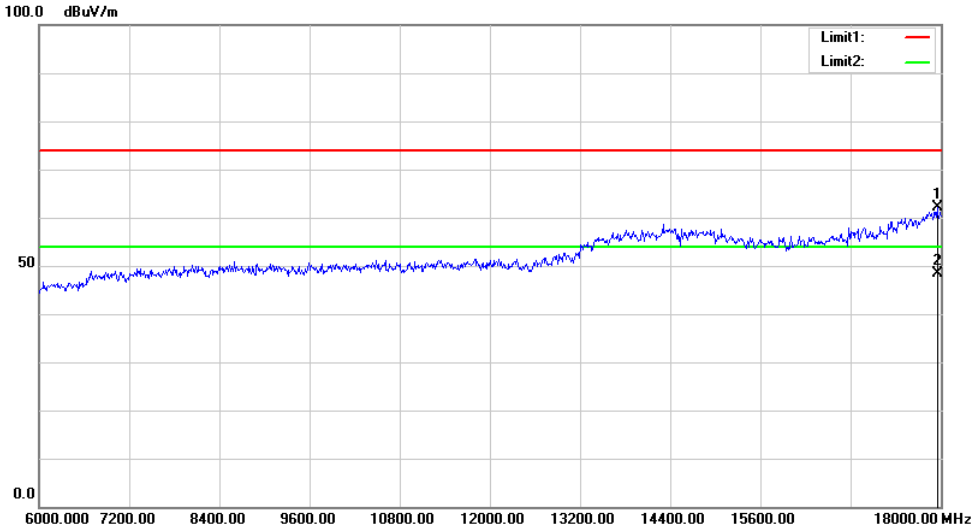
Simultaneously(Worst Mode):

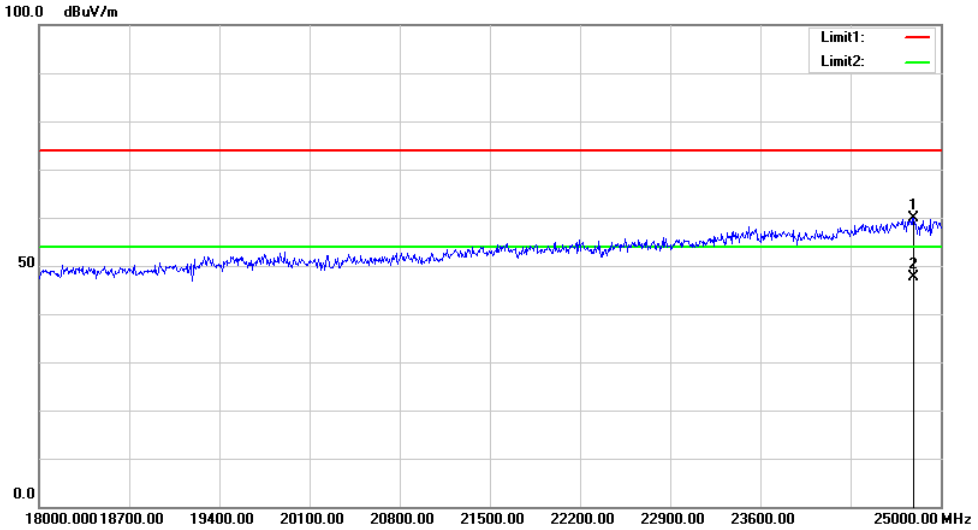
Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector	Polar (H/V)	Factor (dB/m)					
2.4G b mode, chain 0 low channel + BLE Low Channel+5G 5825MHz n ht20 mode MIMO									
4824.00	39.87	PK	V	32.95	3.19	25.62	50.39	74.00	23.61
4824.00	36.22	AV	V	32.95	3.19	25.62	46.74	54.00	7.26
7236.00	36.41	PK	V	35.81	4.77	25.64	51.35	74.00	22.65
7236.00	23.99	AV	V	35.81	4.77	25.64	38.93	54.00	15.07
3660.00	40.98	PK	V	31.65	2.50	25.93	49.20	74.00	24.80
3660.00	36.42	AV	V	31.65	2.50	25.93	44.64	54.00	9.36
3880.00	40.25	PK	V	32.14	2.56	25.77	49.18	74.00	27.82
3880.00	36.87	AV	V	32.14	2.56	25.77	45.80	54.00	8.20

Test plots(18dBi antenna, 802.11b chain 0, Low channel was the worst)
Horizontal:

Fundamental Test with Band Rejection Filter

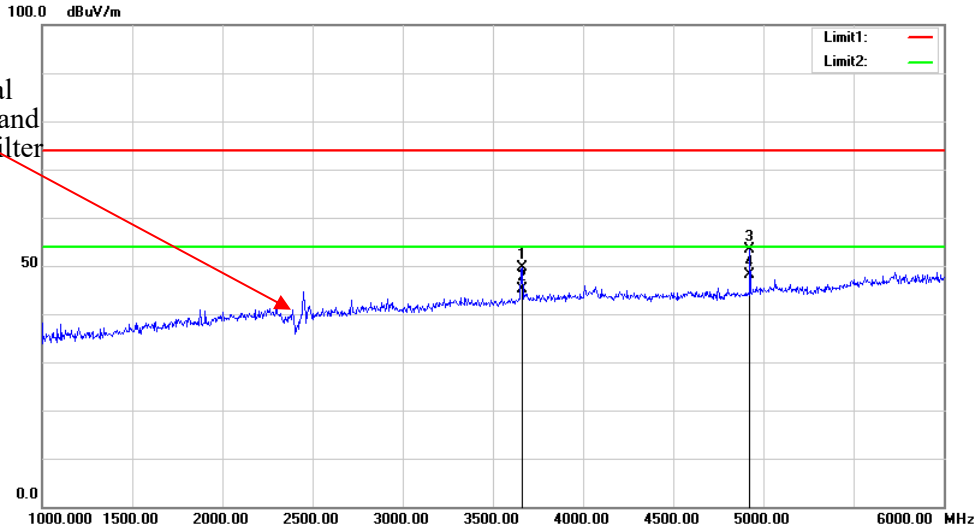


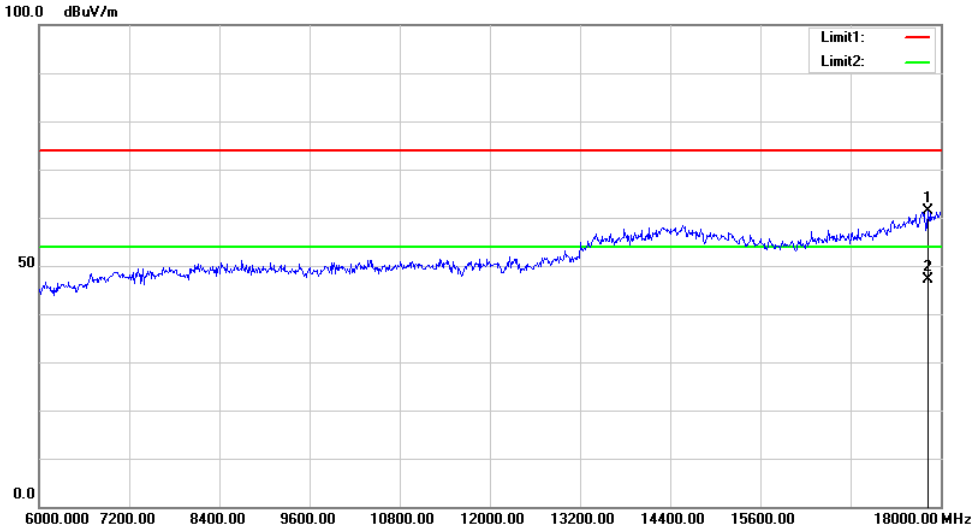


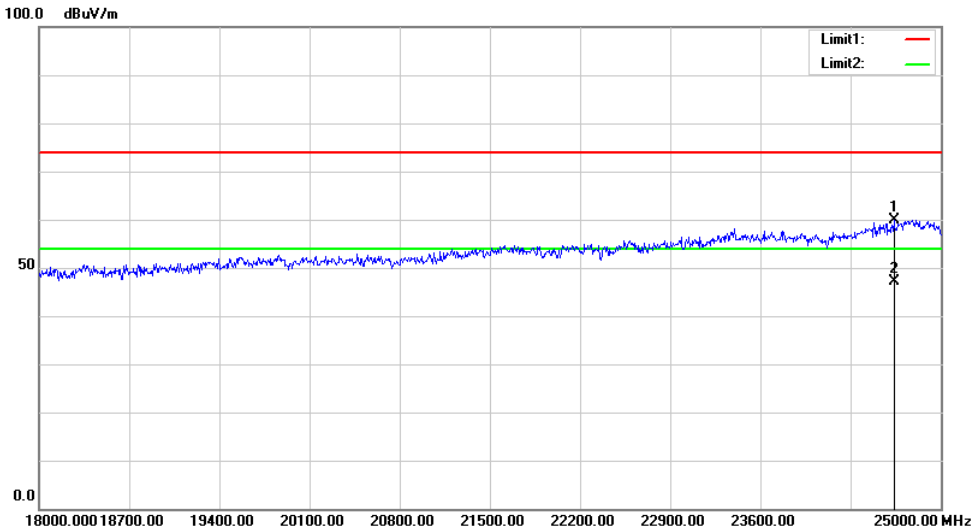


Vertical:

Fundamental Test with Band Rejection Filter







FCC §15.247(a) (2), RSS-247 CLAUSE 5.2 a) &RSS-GEN CLAUSE 6.7– 6 dB EMISSION BANDWIDTH AND 99% OCCUPIED BANDWIDTH

Applicable Standard

According to FCC §15.247(a) (2)

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

According to RSS-247 §5.2 a)

The minimum 6 dB bandwidth shall be 500 kHz.

According to RSS-Gen §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.

In some cases, the "x dB bandwidth" is required, which is defined as the frequency range between two points, one at the lowest frequency below and one at the highest frequency above the carrier frequency, at which the maximum power level of the transmitted emission is attenuated x dB below the maximum in-band power level of the modulated signal, where the two points are on the outskirts of the in-band emission.

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

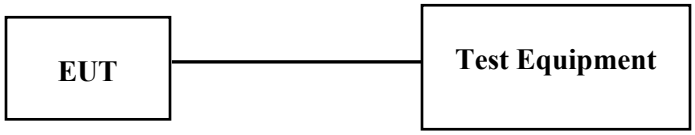
- The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
- The span of the spectrum analyzer shall be set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency, but small enough to avoid having other emissions (e.g. on adjacent channels) within the span.
- 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 / x dB bandwidth if the device is not transmitting continuously.
- The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied / x dB 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 Procedure

a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3×RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) 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.
h) Test 99% Occupied bandwidth use the function 99% OBW of the test equipment.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSU 26	200256	2020-07-07	2021-07-07
R&S	Spectrum Analyzer	FSV40	101474	2020-07-07	2021-07-07
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41010013	Each time	N/A
Unknown	Coaxial Cable	C-SJ00-0010	C0010/03	Each time	N/A

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

Test Data

Environmental Conditions

Temperature:	22.1~28.7 °C
Relative Humidity:	30 ~ 53 %
ATM Pressure:	100.6~102.5 kPa
Tester:	Billy Li, Chris Mo
Test Date:	2020-10-19~2020-12-14

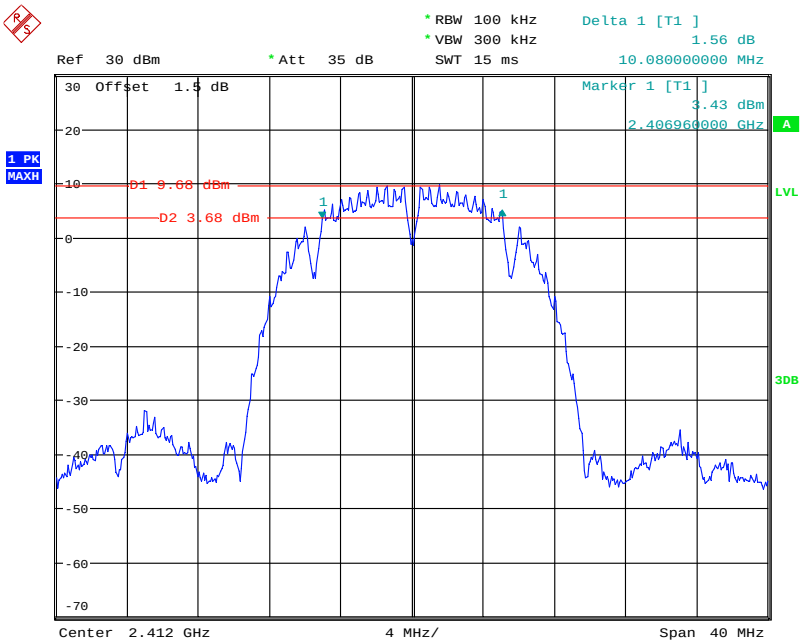
Test Mode: Transmitting

Test Result: Compliant. For 802.11b/g/n modes, test only performed at chain 0. Please refer to the following table and plots.

Test mode	Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)
802.11b	Low	2412	10.080	13.840	≥0.5
	Middle	2437	10.080	14.000	≥0.5
	High	2462	10.000	13.840	≥0.5
802.11g	Low	2412	16.480	17.280	≥0.5
	Middle	2437	16.480	17.360	≥0.5
	High	2462	16.480	17.280	≥0.5
802.11n ht20	Low	2412	16.000	18.080	≥0.5
	Middle	2437	17.600	18.080	≥0.5
	High	2462	16.480	18.080	≥0.5
802.11n ht40	Low	2422	36.160	36.640	≥0.5
	Middle	2437	36.000	36.800	≥0.5
	High	2452	35.840	36.800	≥0.5

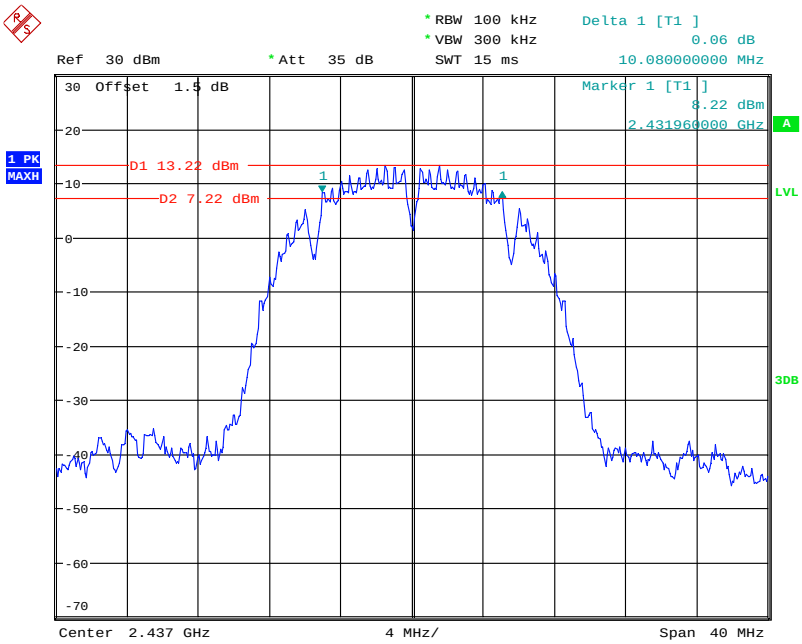
6 dB Bandwidth:

802.11b Low Channel



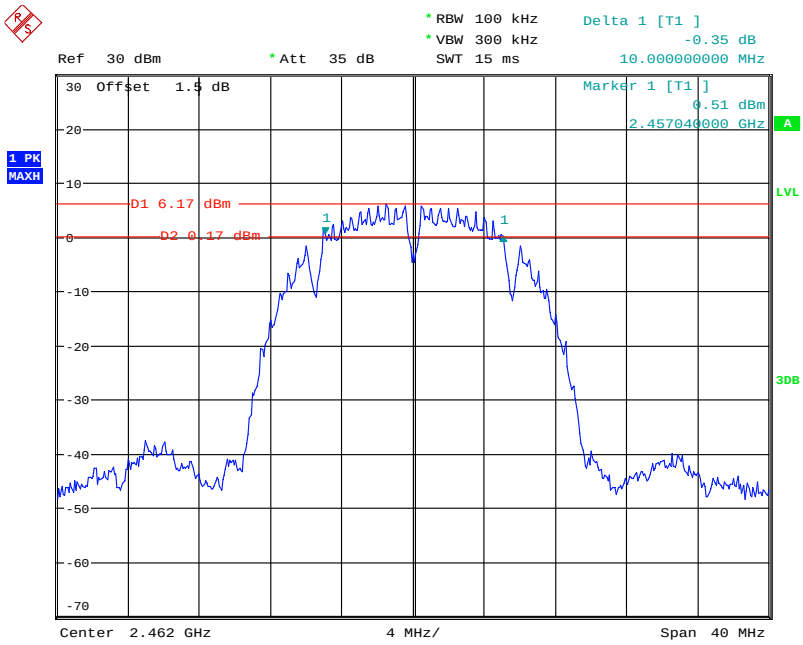
Date: 19.OCT.2020 14:16:06

802.11b Middle Channel



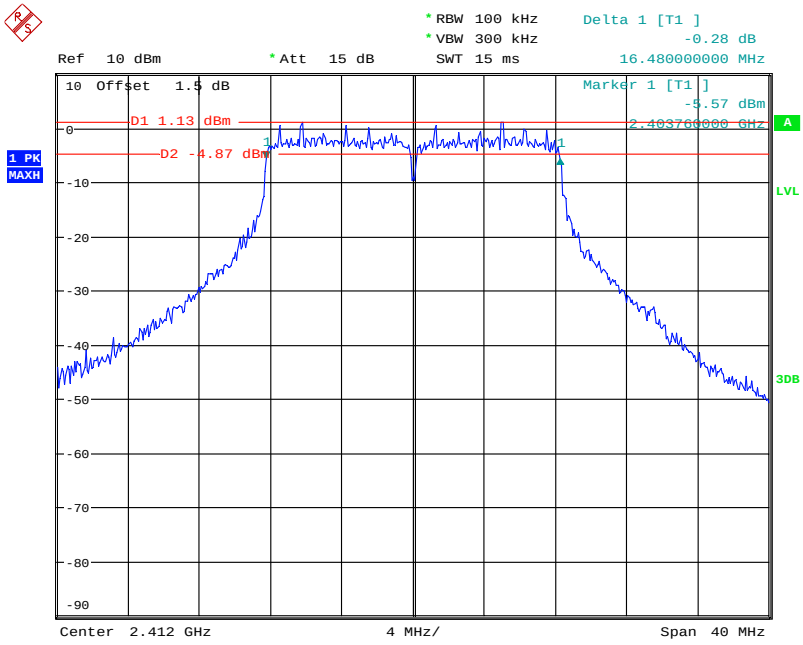
Date: 19.OCT.2020 13:53:15

802.11b High Channel



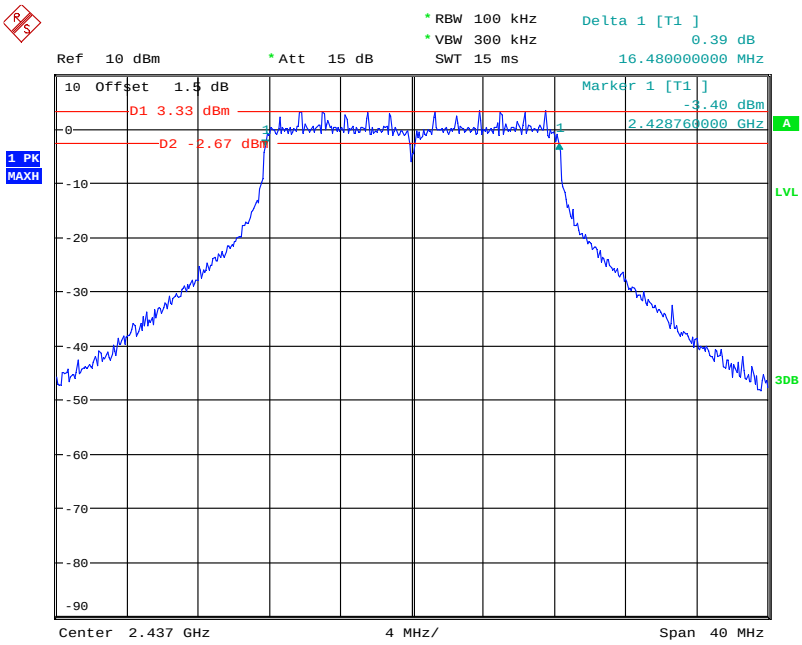
Date: 19.OCT.2020 13:54:15

802.11g Low Channel



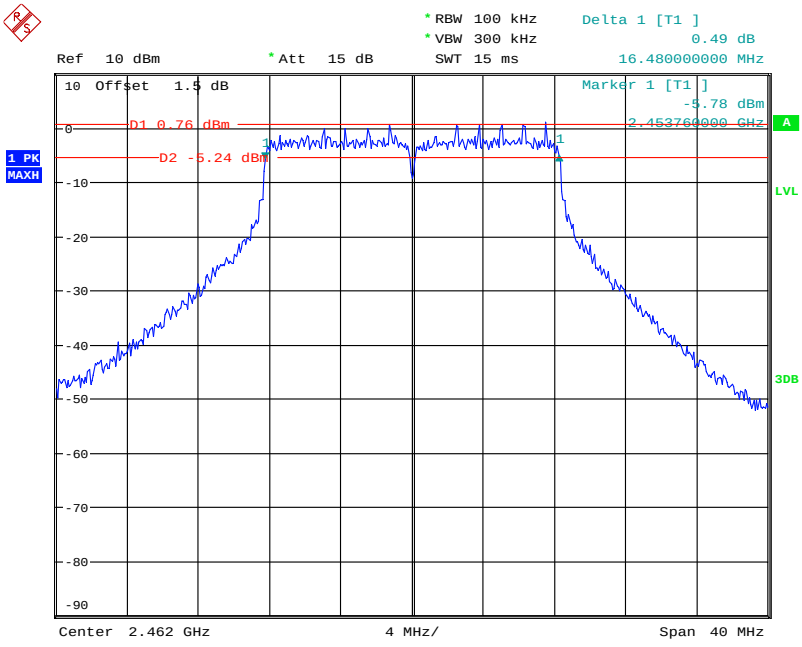
Date: 19.OCT.2020 14:44:51

802.11g Middle Channel



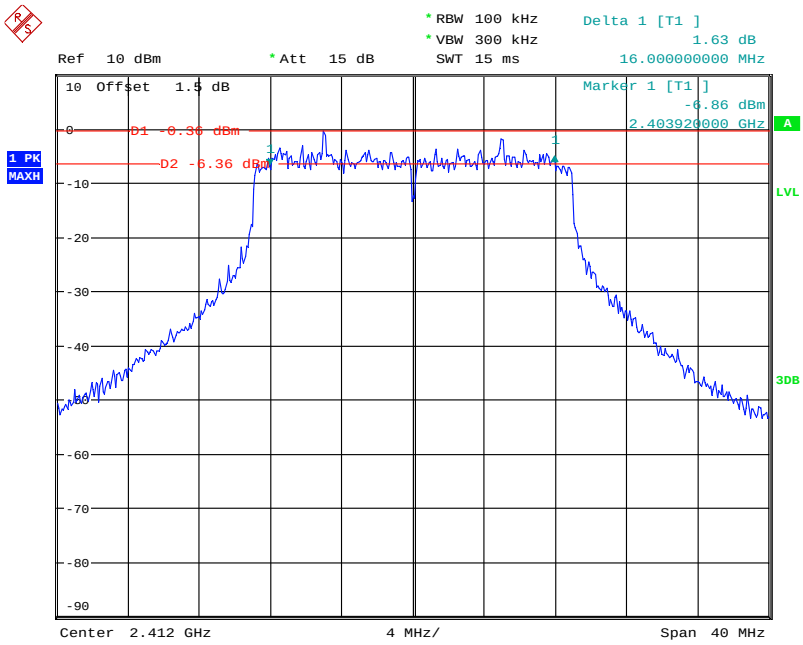
Date: 19.OCT.2020 14:46:41

802.11g High Channel



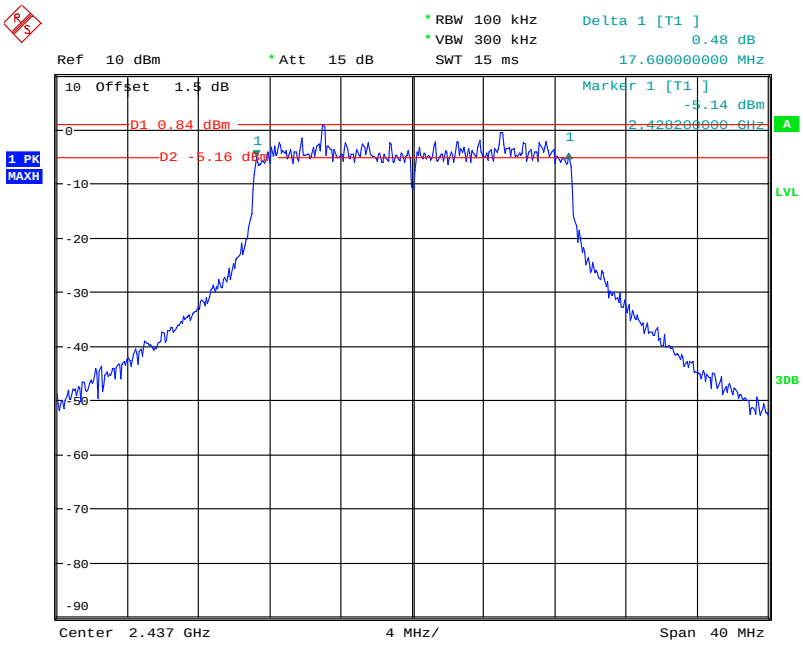
Date: 19.OCT.2020 14:48:50

802.11n ht20 Low Channel



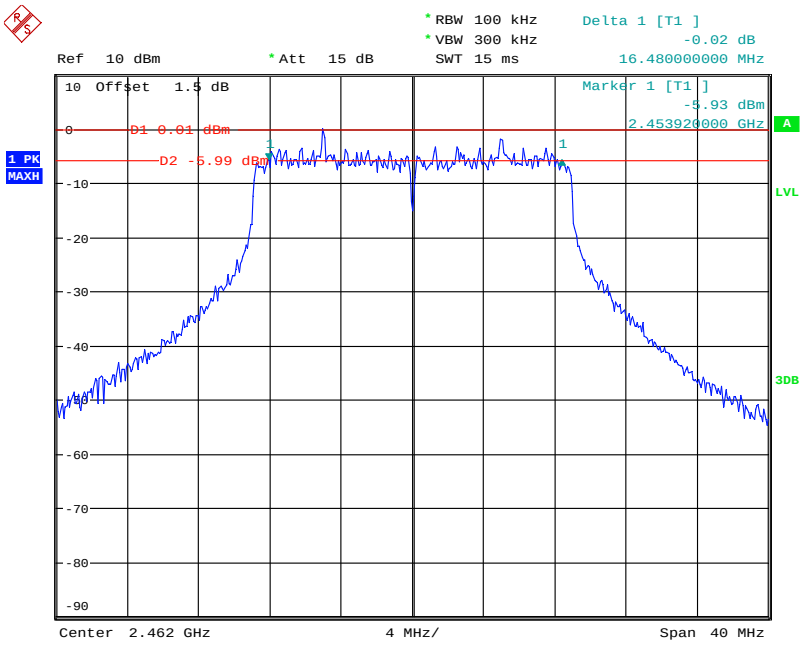
Date: 19.OCT.2020 14:50:59

802.11n ht20 Middle Channel



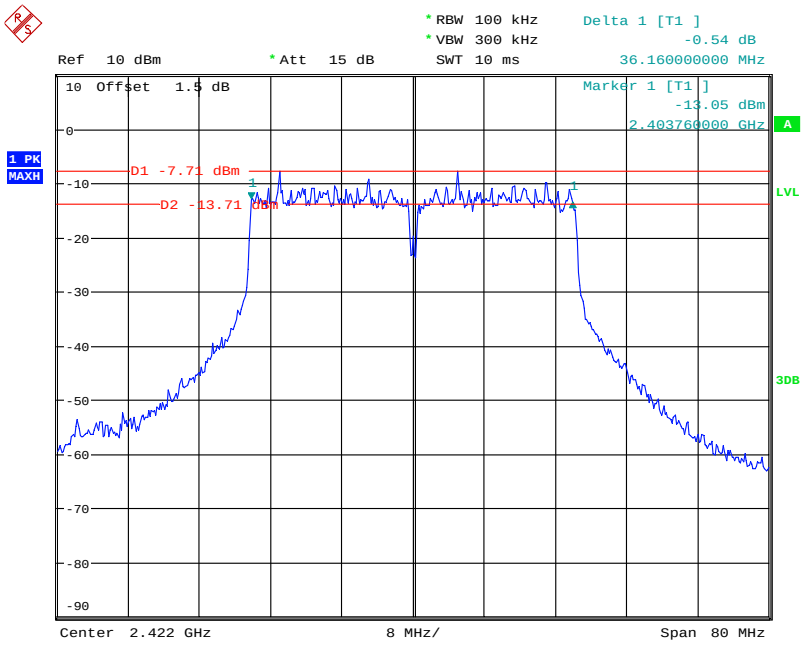
Date: 19.OCT.2020 14:52:35

802.11n ht20 High Channel



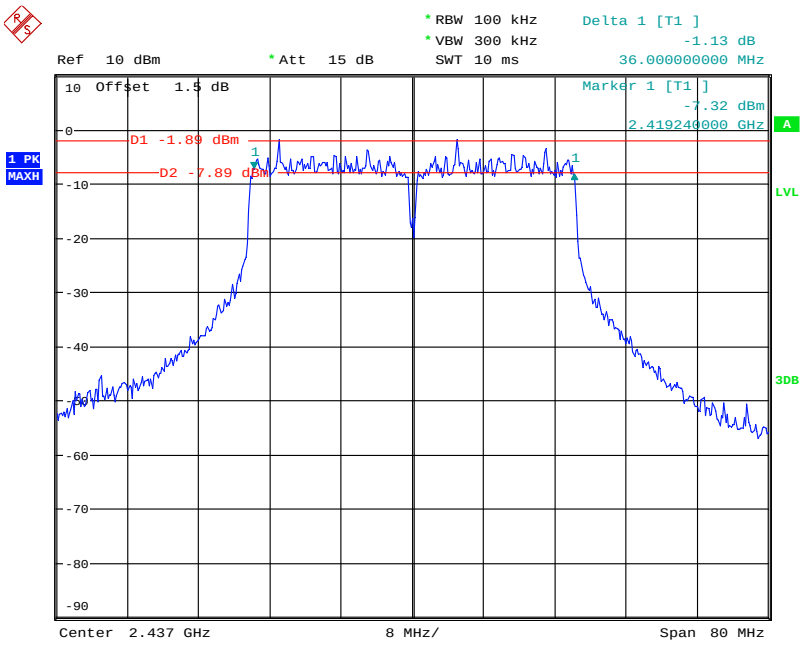
Date: 19.OCT.2020 14:54:40

802.11n ht40 Low Channel



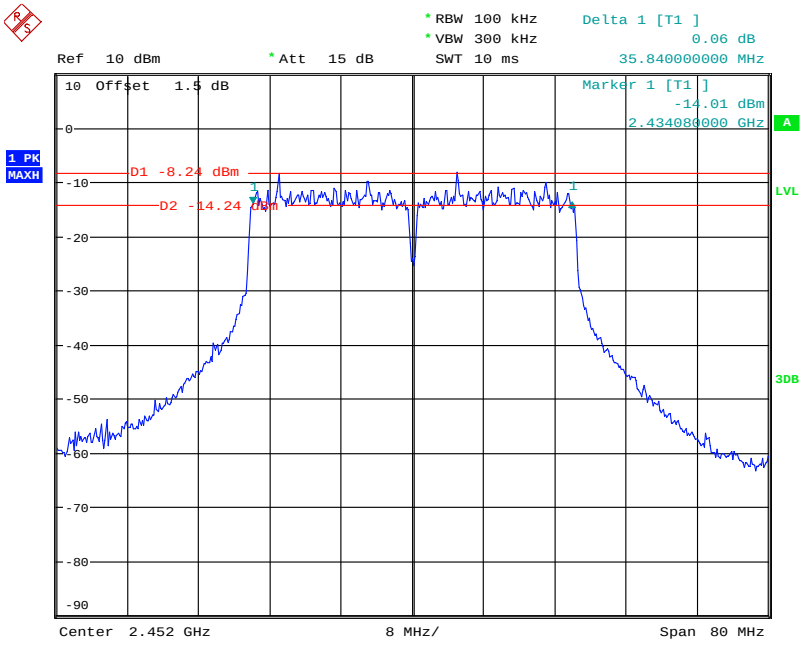
Date: 19.OCT.2020 14:37:31

802.11n ht40 Middle Channel



Date: 19.OCT.2020 14:40:16

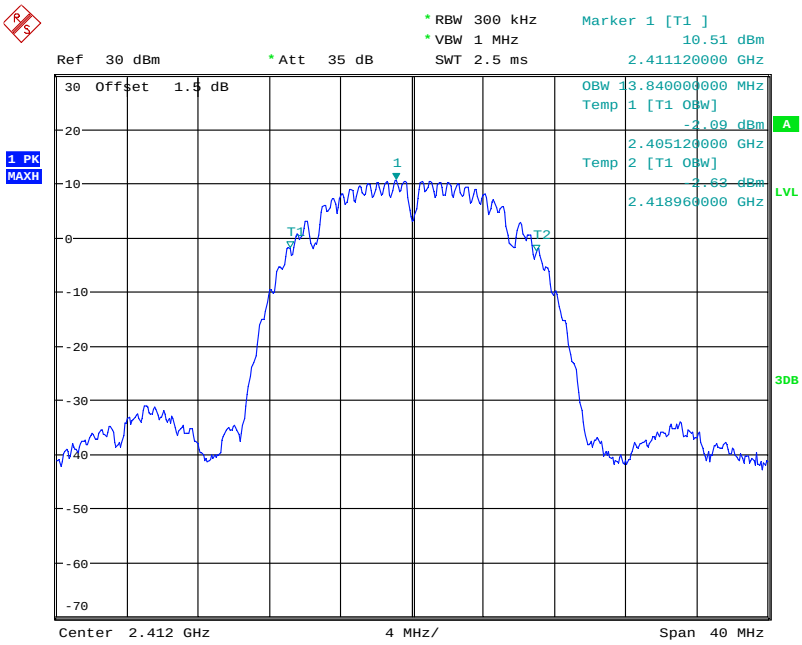
802.11n ht40 High Channel



Date: 19.OCT.2020 14:42:22

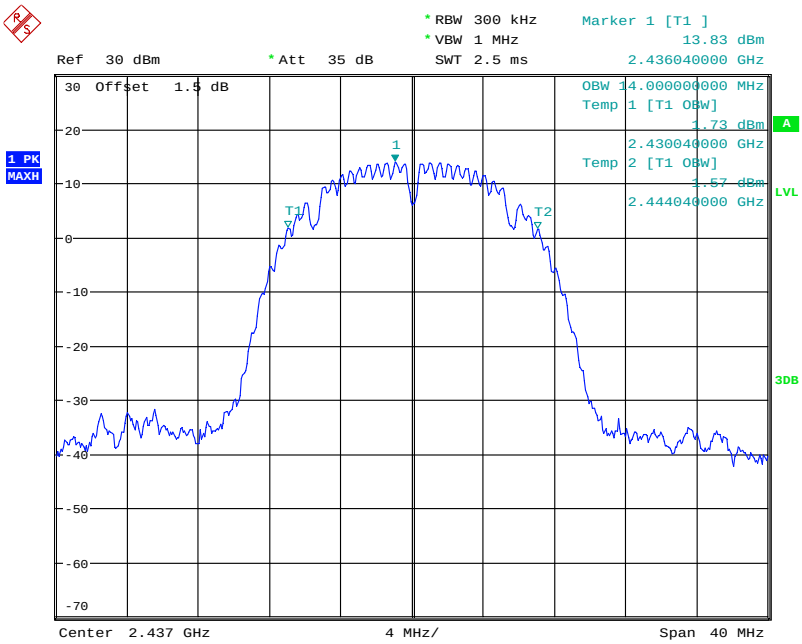
99% occupied Bandwidth

802.11b Low Channel



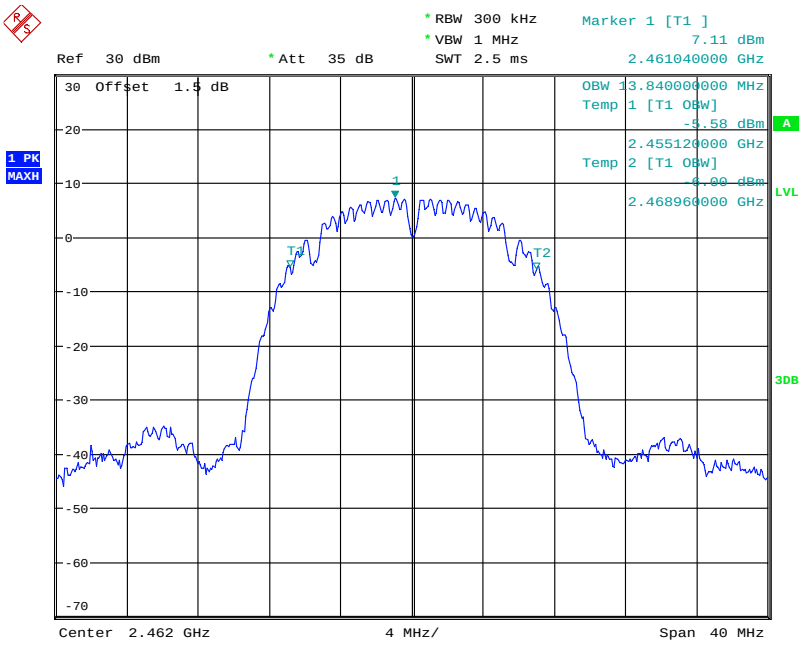
Date: 19.OCT.2020 14:16:18

802.11b Middle Channel



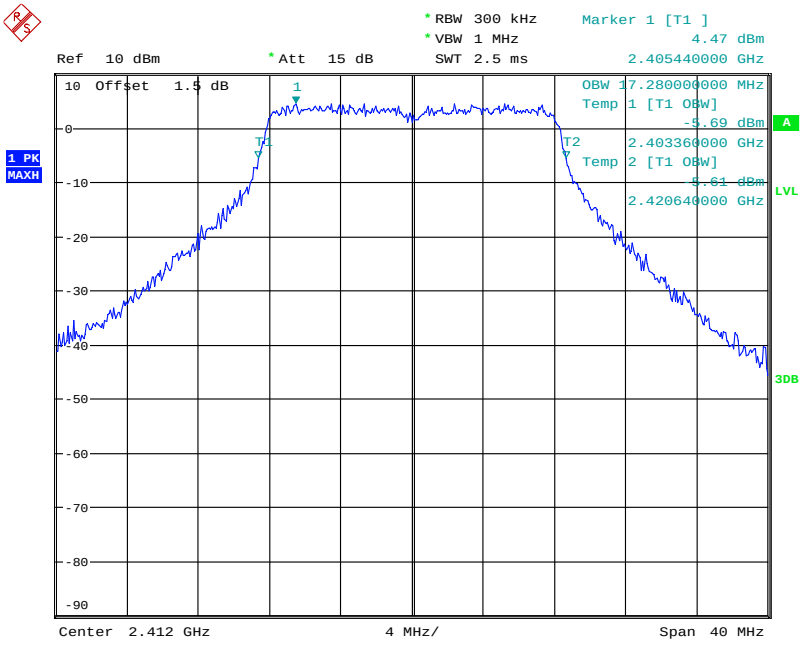
Date: 19.OCT.2020 13:56:07

802.11b High Channel



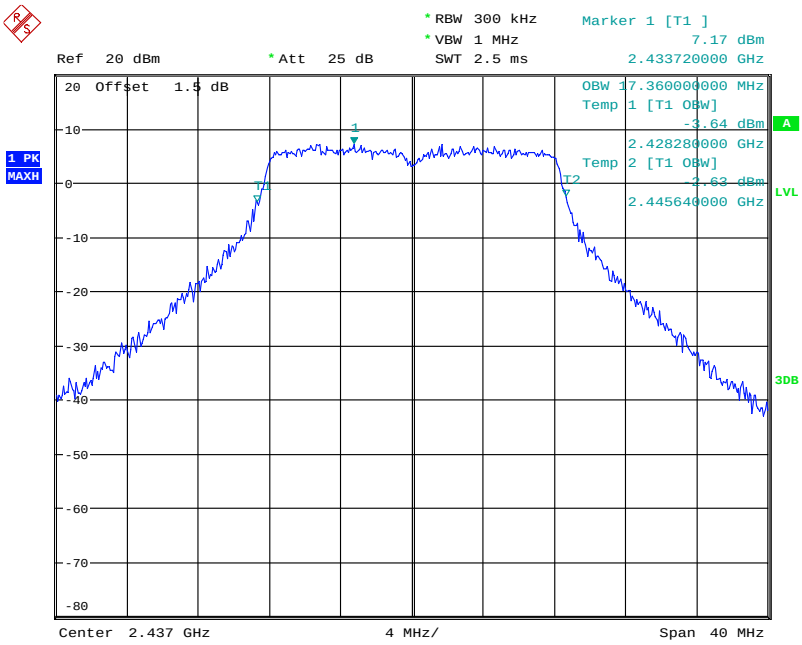
Date: 19.OCT.2020 13:54:27

802.11g Low Channel



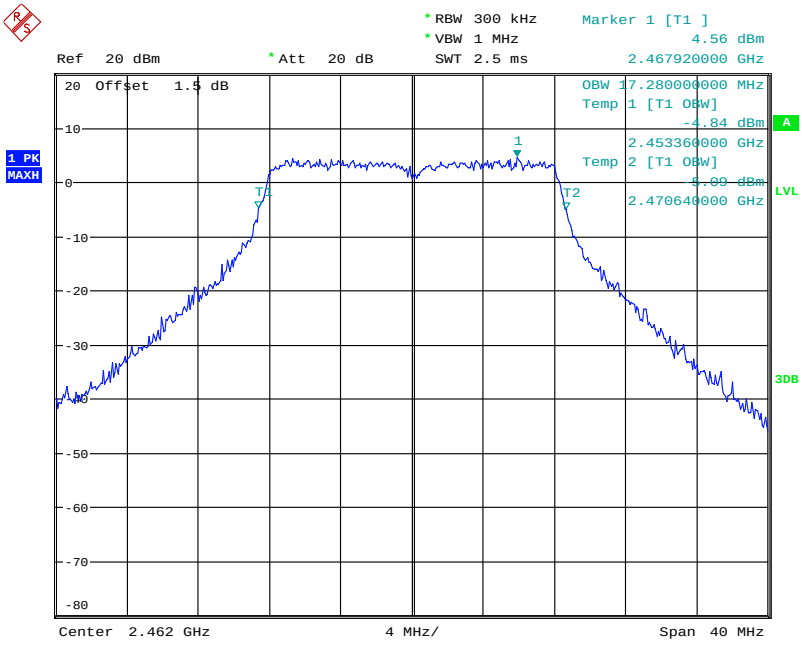
Date: 19.OCT.2020 14:45:07

802.11g Middle Channel



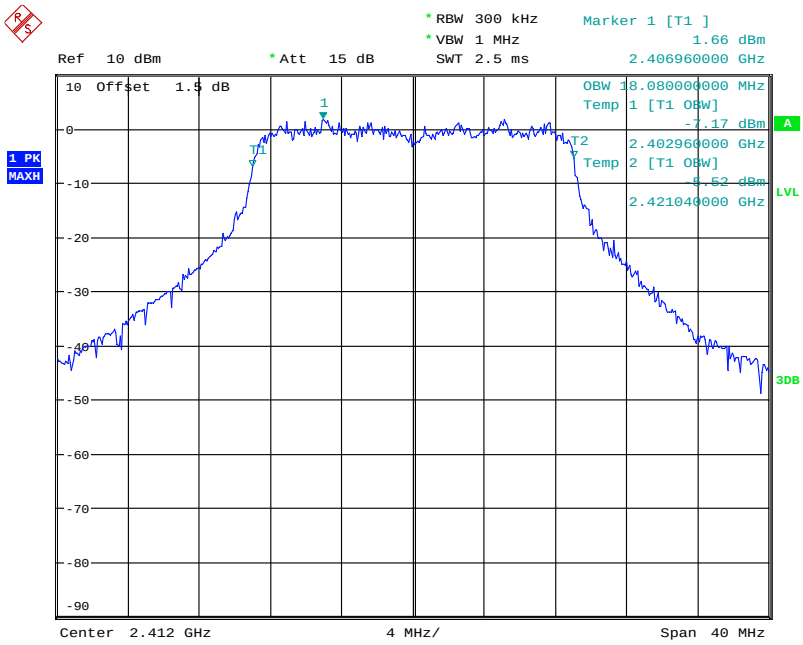
Date: 19.OCT.2020 14:47:13

802.11g High Channel



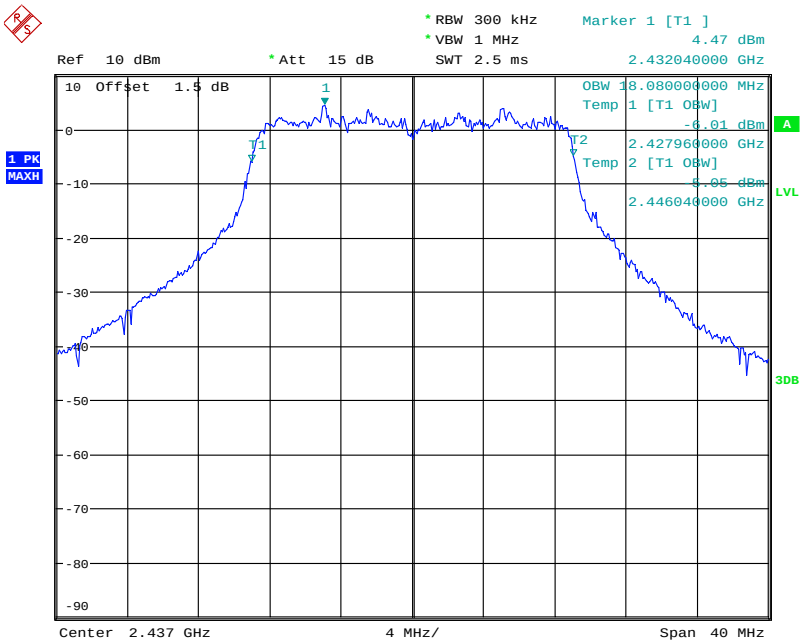
Date: 19.OCT.2020 14:49:18

802.11n ht20 Low Channel



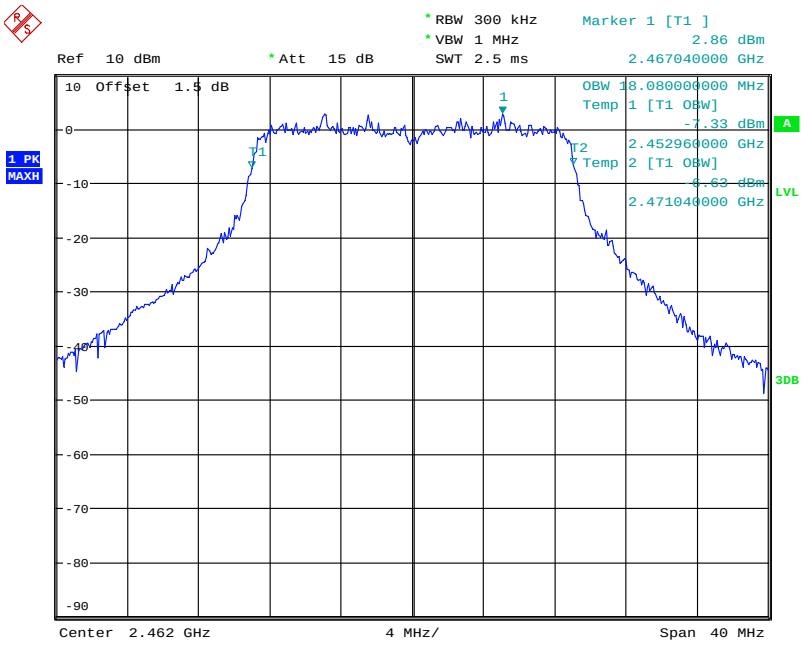
Date: 19.OCT.2020 14:51:12

802.11n ht20 Middle Channel



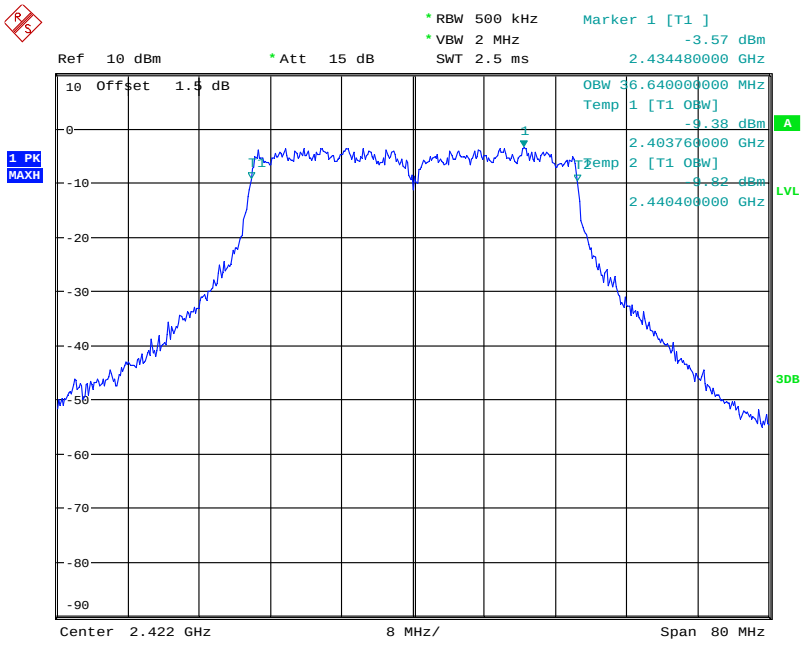
Date: 19.OCT.2020 14:52:51

802.11n ht20 High Channel



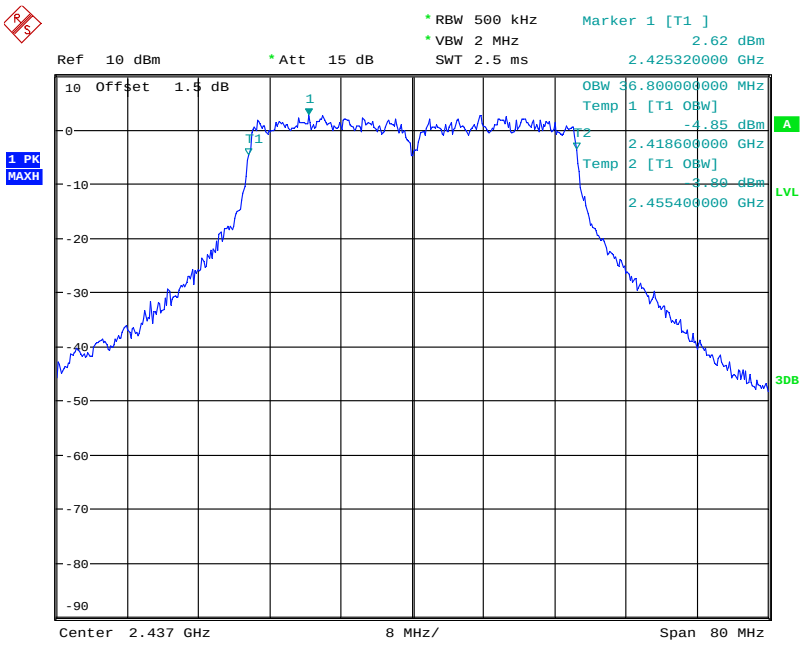
Date: 19.OCT.2020 14:54:56

802.11n ht40 Low Channel



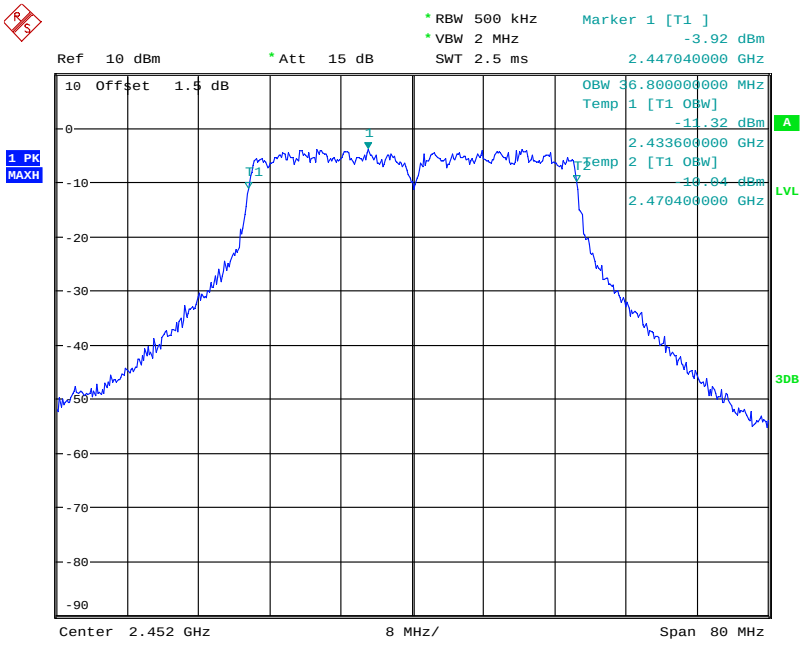
Date: 19.OCT.2020 14:37:43

802.11n ht40 Middle Channel



Date: 19.OCT.2020 14:40:31

802.11n ht40 High Channel



Date: 19.OCT.2020 14:42:37

FCC §15.247(b) , RSS-247 CLAUSE 5.4 - MAXIMUM PEAK CONDUCTED OUTPUT POWER

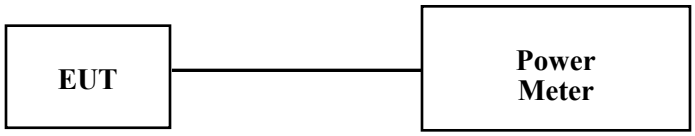
Applicable Standard

According to FCC §15.247(b) and (c)

According to RSS-247§5.4

Test Procedure

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 test equipment.
3. Add a correction factor to the display.
4. Set the power Meter to test Peak output power, record the result as peak power.
5. Set the power meter to test average output power, record the result as average power.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	USB Wideband Power Sensor	U2021XA	MY5425009	2020-09-12	2021-09-12
E-Microwave	Coaxial Attenuators	EMCA10-5RN-6	OE01203239	Each time	N/A
E-Microwave	Blocking Control	EMDCB-00036	0E01201048	Each time	N/A
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41010013	Each time	N/A
Unknown	Coaxial Cable	C-SJ00-0010	C0010/03	Each time	N/A

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

Test Data

Environmental Conditions

Temperature:	26.1 °C
Relative Humidity:	41 %
ATM Pressure:	101.5 kPa
Tester:	Billy Li, Chris Mo
Test Date:	2020-11-13

Test Mode: Transmitting

Test Result: Compliant. Please refer to the following table.

802.11b/g/n:

Mode	Channel	Frequency (MHz)	Maximum Conducted Peak Output Power (dBm)				Limit (dBm)
			Chain 0	Chain 1	Chain 2	Total	
802.11 b	Low	2412	17.94	19.38	17.97	/	23
	Middle	2437	17.68	19.34	17.78	/	23
	High	2462	17.71	19.09	17.59	/	23
802.11 g	Low	2412	21.31	21.33	21.08	/	23
	Middle	2437	21.41	21.48	22.16	/	23
	High	2462	20.88	22.05	22.68	/	23
802.11n ht20	Low	2412	18.25	17.38	16.81	22.29	23
	Middle	2437	17.97	17.01	16.47	21.97	23
	High	2462	17.61	16.88	16.44	21.77	23
802.11n ht40	Low	2422	18.21	17.58	16.76	22.33	23
	Middle	2437	18.44	17.71	16.88	22.49	23
	High	2452	18.25	17.66	16.77	22.37	23

Note:
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 $N_{ANT} \leq 4$;

So:

Directional gain = 13 dBi for Antenna model:ARC-OA2413SD1
The power limit should reduced by: 13-6=7dB

Directional gain = 18 dBi for Antenna model: ARC-VS2418SD1
Antenna model: ARC-VS2418SD1 is Point-to-Point use, the power limit should reduced by: (18-6)/3=4dB

FCC §15.247(d), RSS-247 CLAUSE 5.5 – 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE

Applicable Standard

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

According to RSS-247 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(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 to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz 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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSU 26	200256	2020-07-07	2021-07-07
R&S	Spectrum Analyzer	FSV40	101474	2020-07-07	2021-07-07
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41010013	Each time	N/A
Unknown	Coaxial Cable	C-SJ00-0010	C0010/03	Each time	N/A

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

Test Data

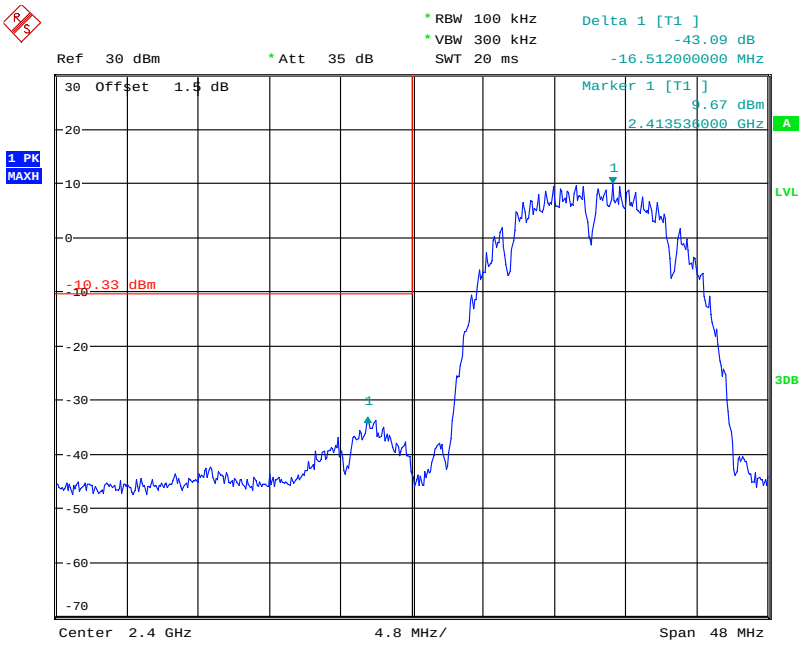
Environmental Conditions

Temperature:	22.1~28.7 °C
Relative Humidity:	30 ~ 53 %
ATM Pressure:	100.6~102.5 kPa
Tester:	Billy Li, Chris Mo
Test Date:	2020-10-19~2020-12-14

Test mode: Transmitting

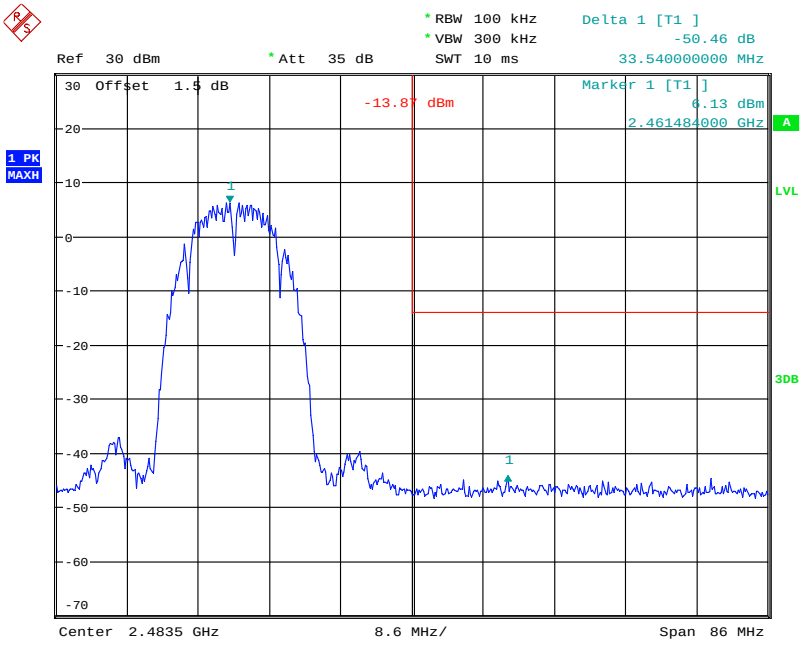
Test Result: Compliant. Please refer to following plots.

Chain 0, 802.11b: Band Edge, Left Side



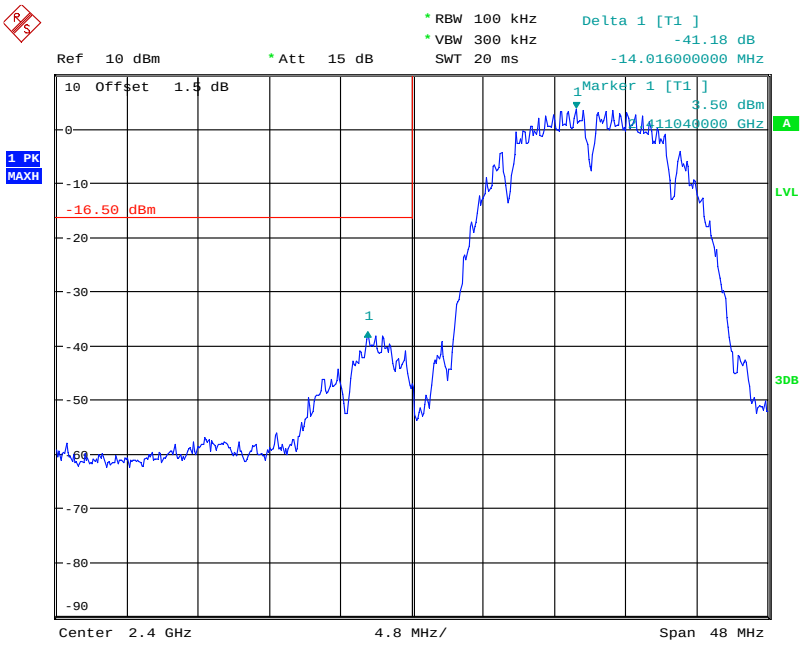
Date: 19.OCT.2020 14:16:53

Chain 0,802.11b: Band Edge, Right Side



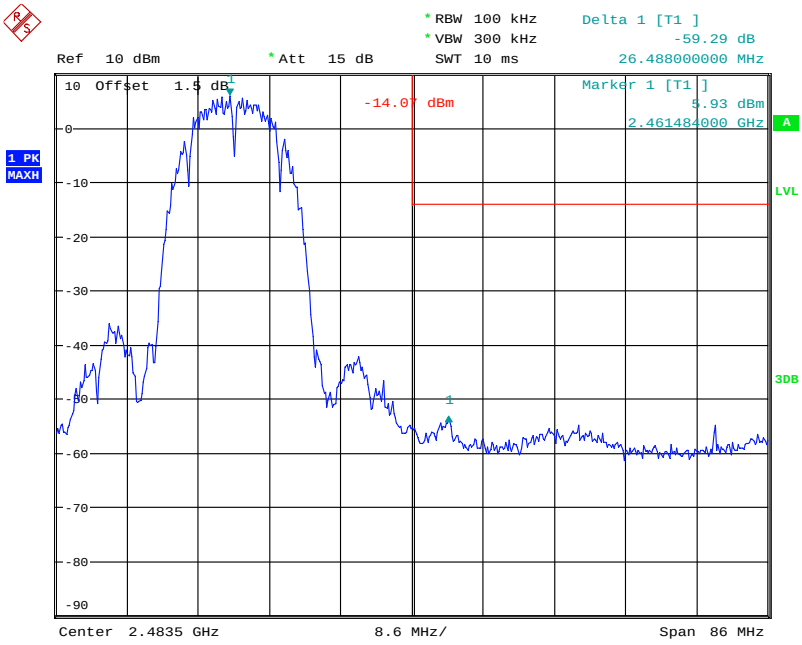
Date: 19.OCT.2020 13:55:08

Chain 1, 802.11b: Band Edge, Left Side



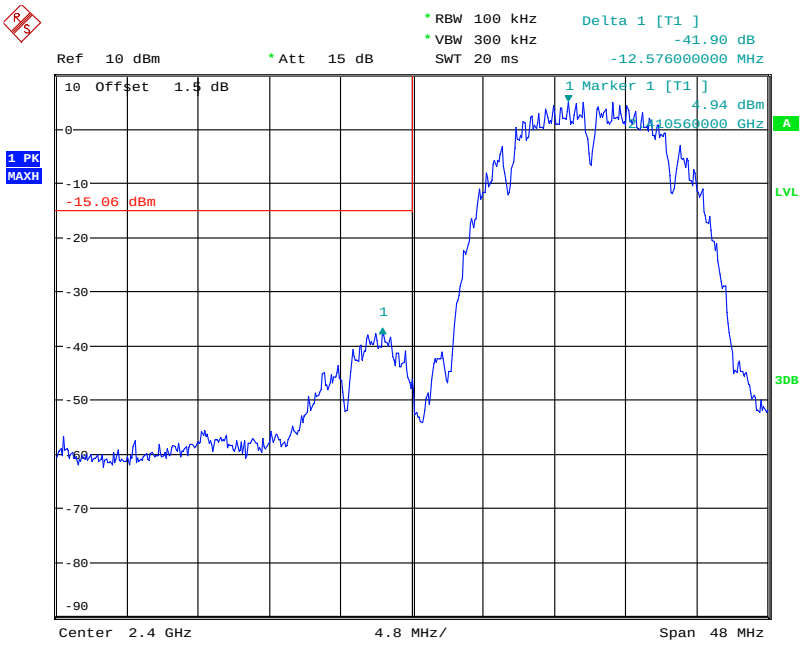
Date: 19.OCT.2020 15:18:32

Chain 1,802.11b: Band Edge, Right Side



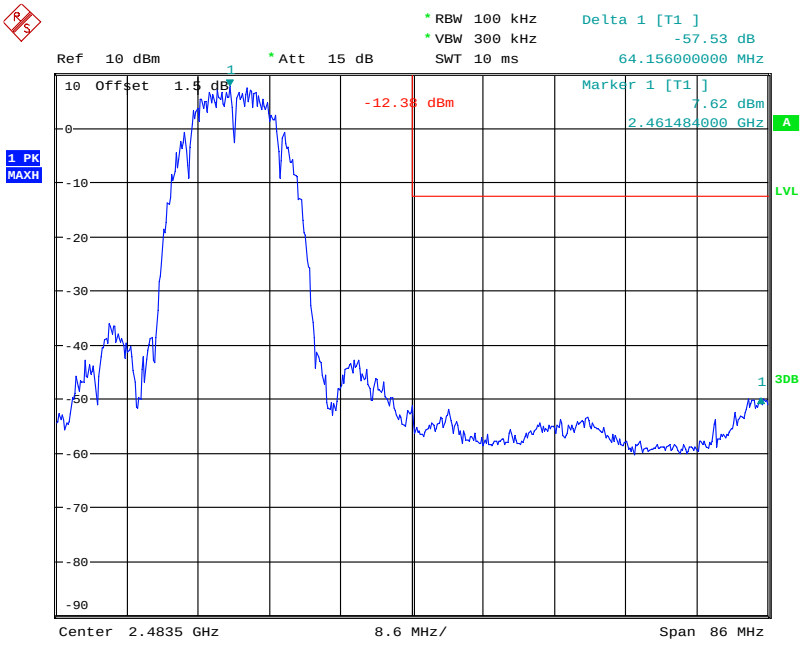
Date: 19.OCT.2020 15:21:04

Chain 2, 802.11b: Band Edge, Left Side



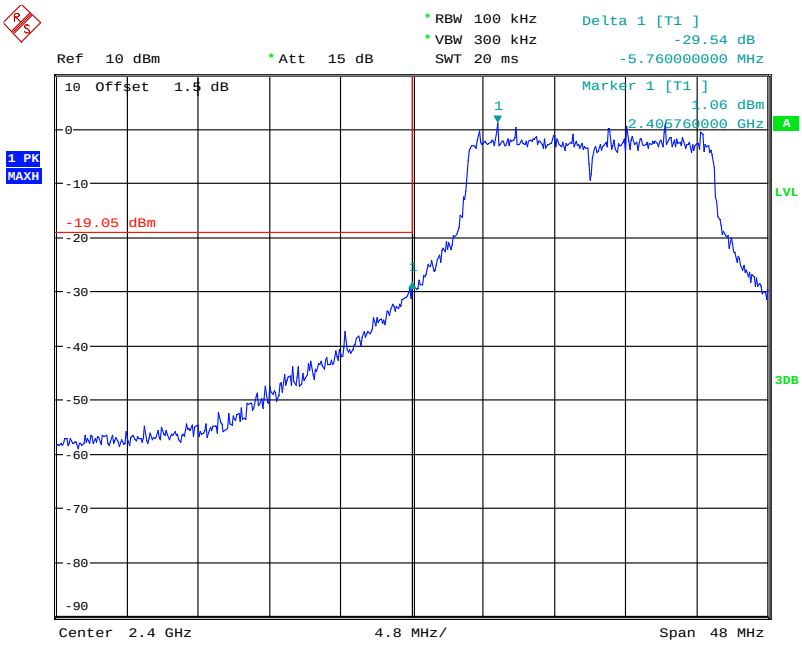
Date: 19.OCT.2020 15:22:35

Chain 2,802.11b: Band Edge, Right Side



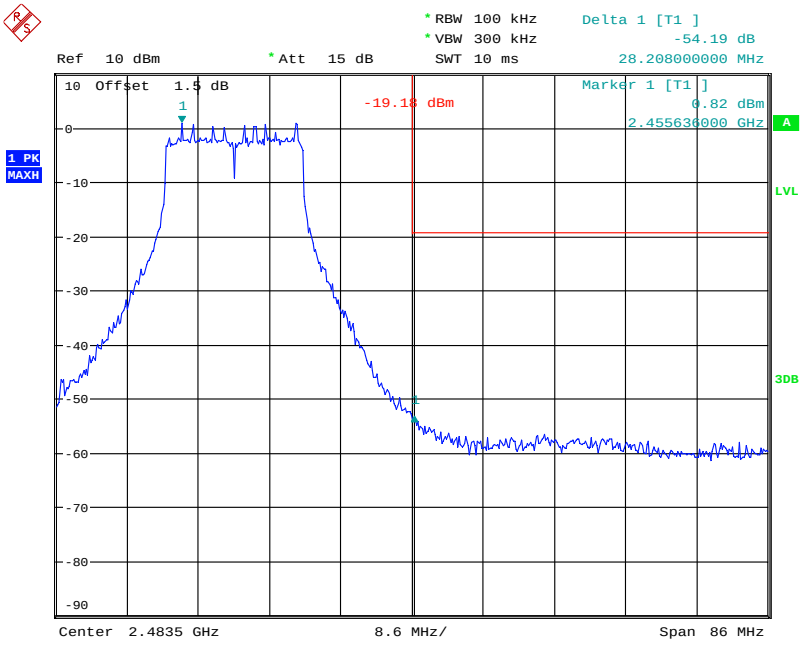
Date: 19.OCT.2020 15:24:48

Chain 0,802.11g: Band Edge, Left Side



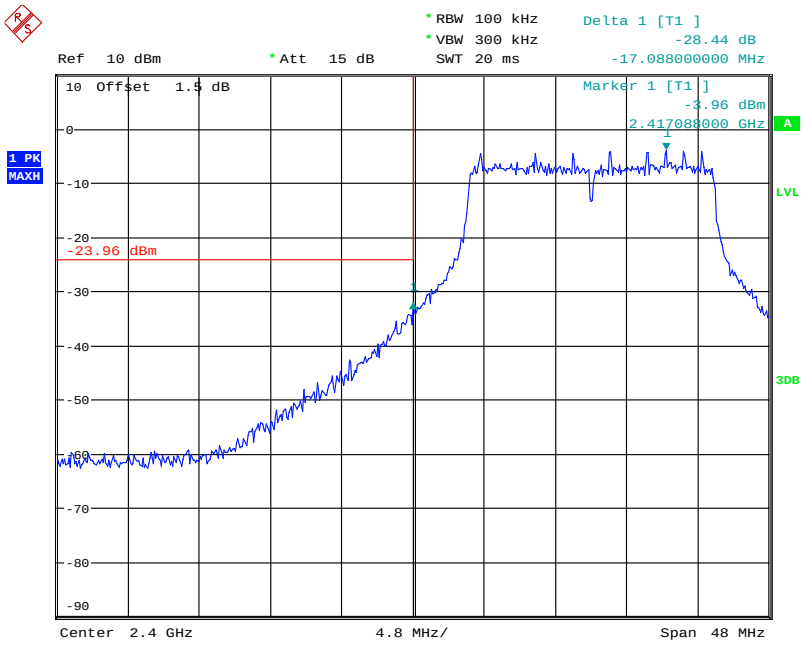
Date: 19.OCT.2020 14:45:52

Chain 0,802.11g: Band Edge, Right Side



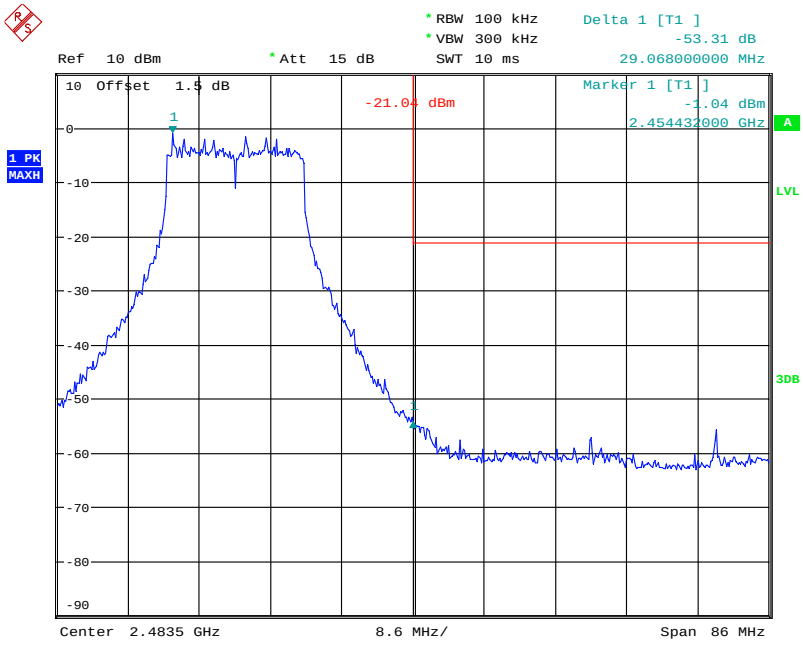
Date: 19.OCT.2020 14:50:04

Chain 1,802.11g: Band Edge, Left Side



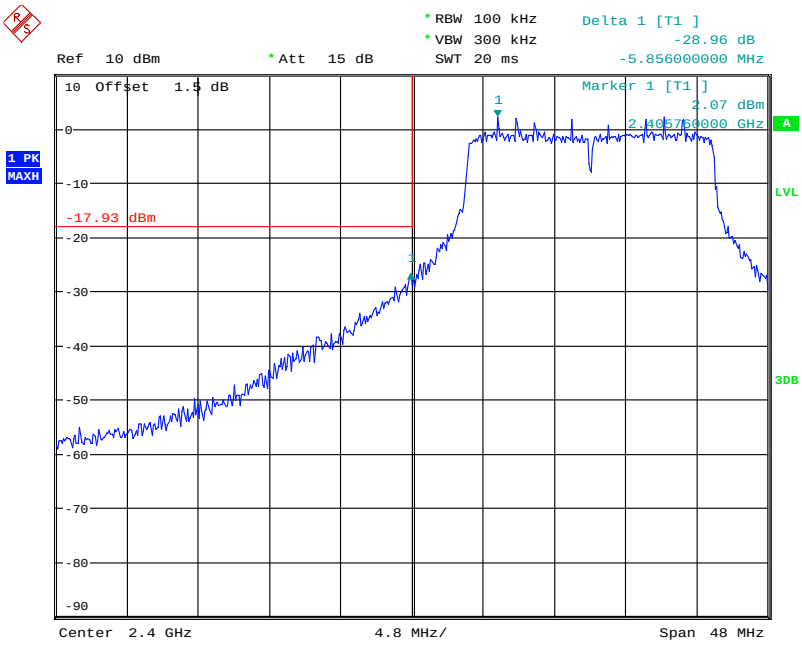
Date: 19.OCT.2020 15:15:05

Chain 1,802.11g: Band Edge, Right Side



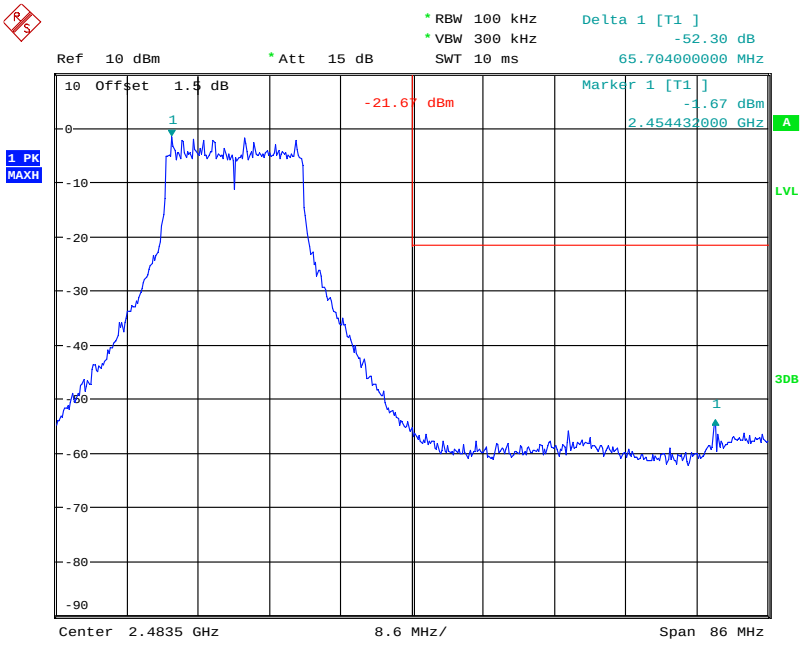
Date: 19.OCT.2020 15:17:25

Chain 2,802.11g: Band Edge, Left Side



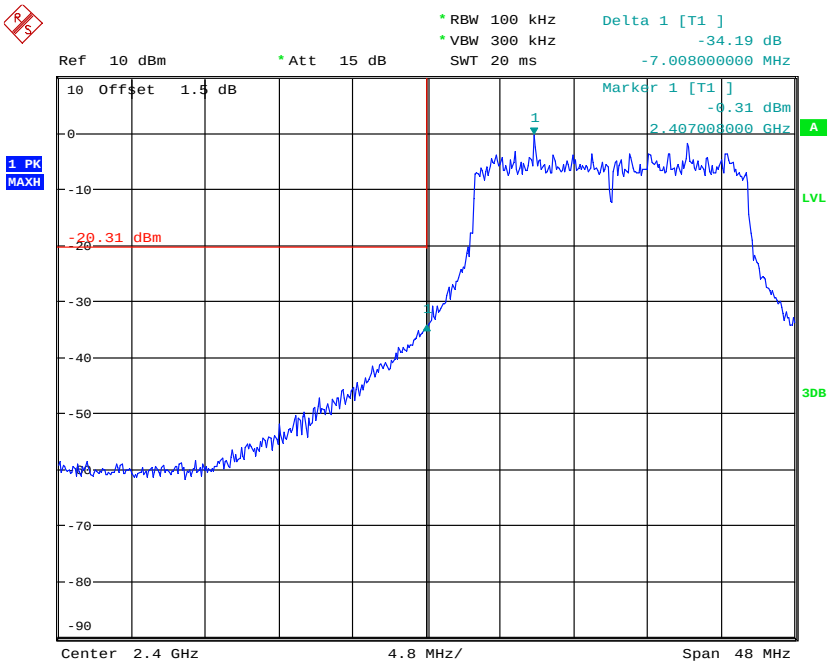
Date: 19.OCT.2020 15:26:02

Chain 2,802.11g: Band Edge, Right Side



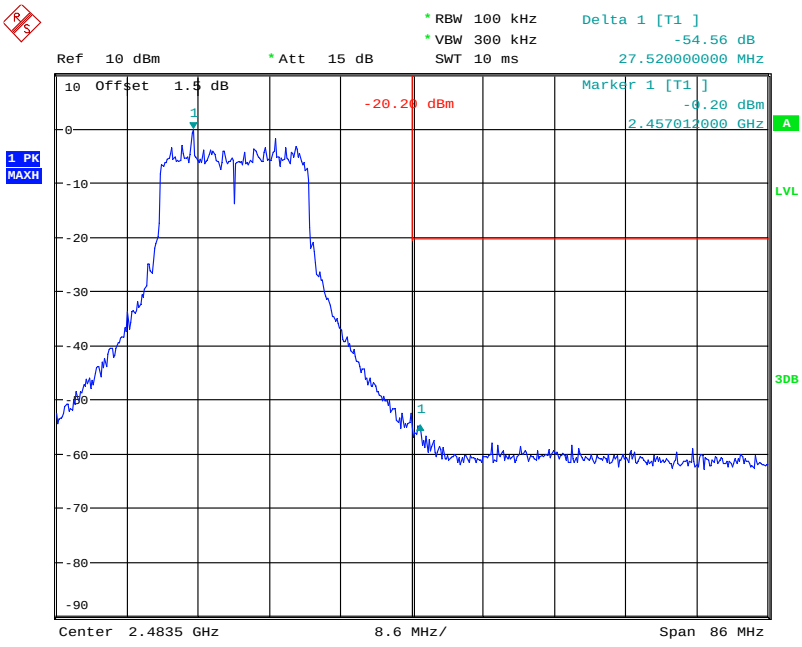
Date: 19.OCT.2020 15:28:30

Chain 0,802.11n ht20 Band Edge, Left Side



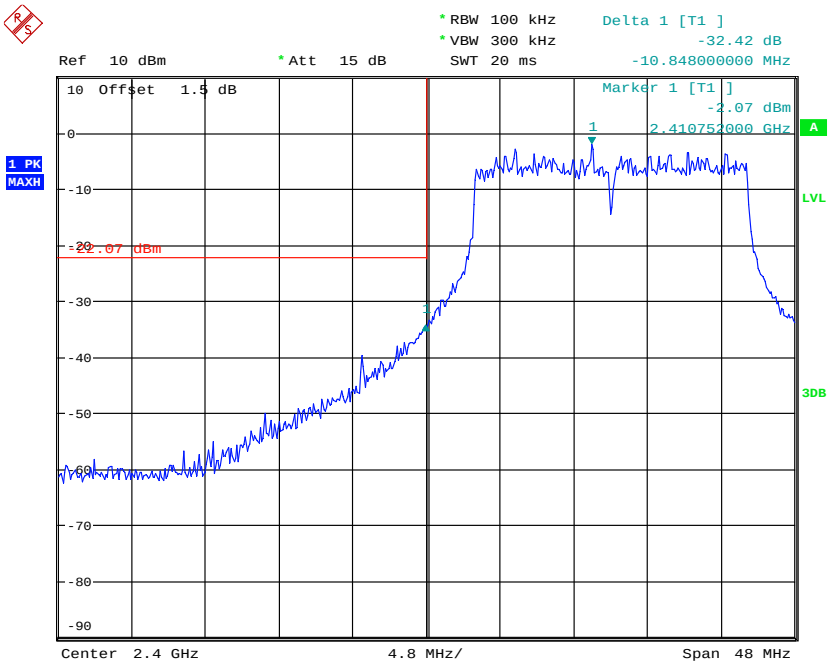
Date: 19.OCT.2020 14:51:57

Chain 0,802.11n ht20 Band Edge, Right Side



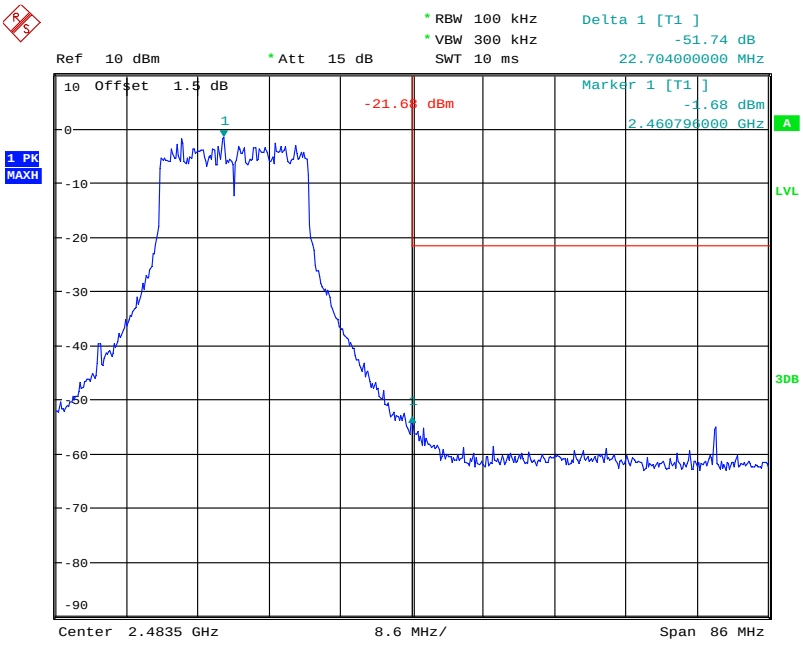
Date: 19.OCT.2020 14:55:42

Chain 1,802.11n ht20 Band Edge, Left Side



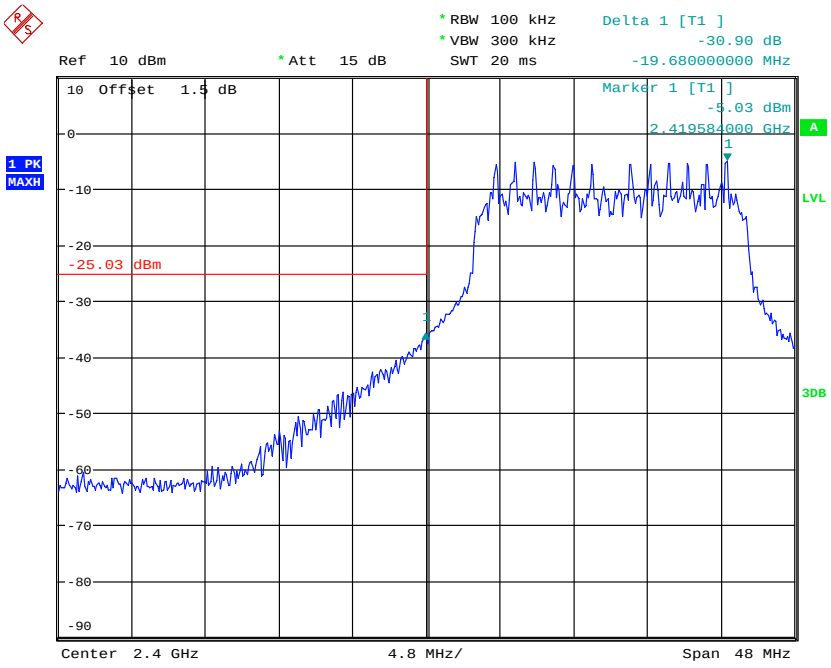
Date: 19.OCT.2020 15:06:55

Chain 1,802.11n ht20 Band Edge, Right Side



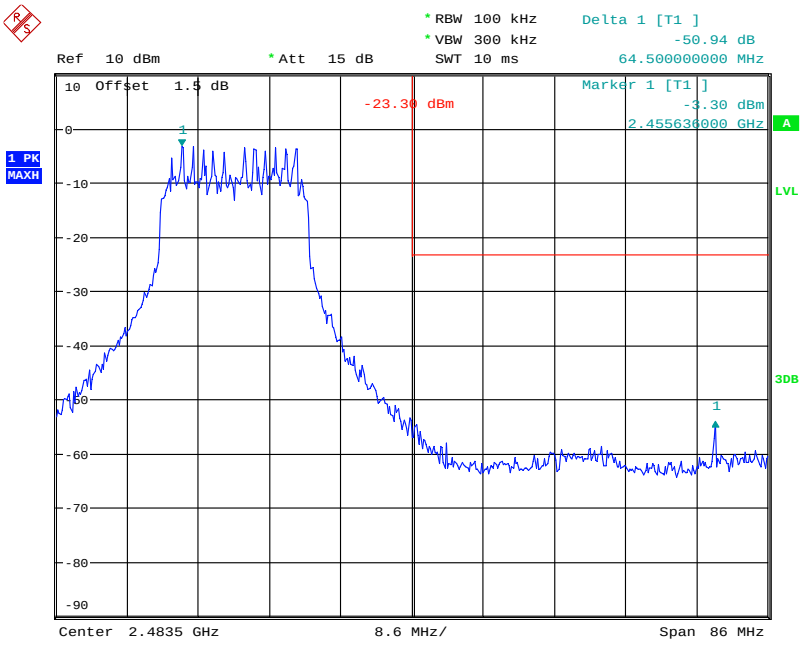
Date: 19.OCT.2020 15:10:06

Chain 2,802.11n ht20 Band Edge, Left Side



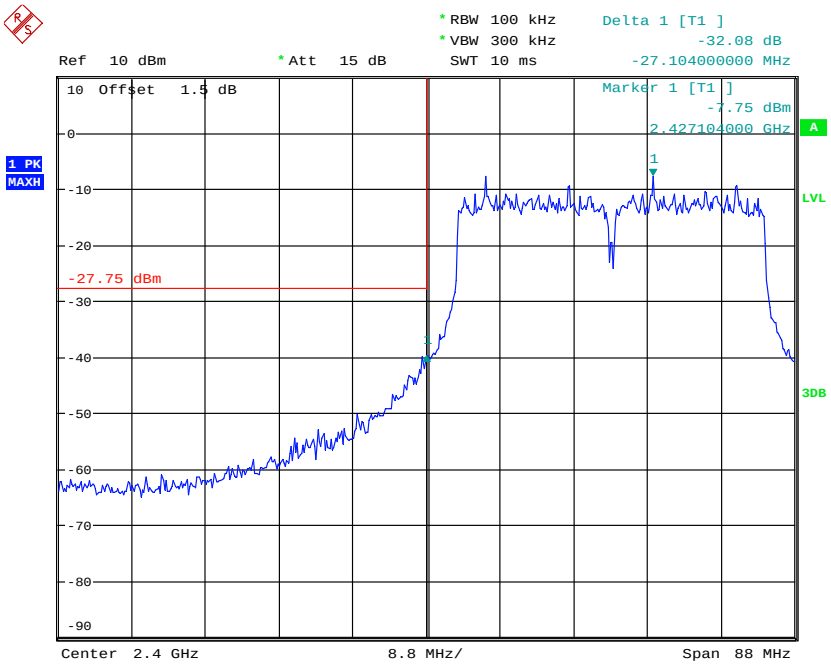
Date: 19.OCT.2020 15:29:54

Chain 2,802.11n ht20 Band Edge, Right Side



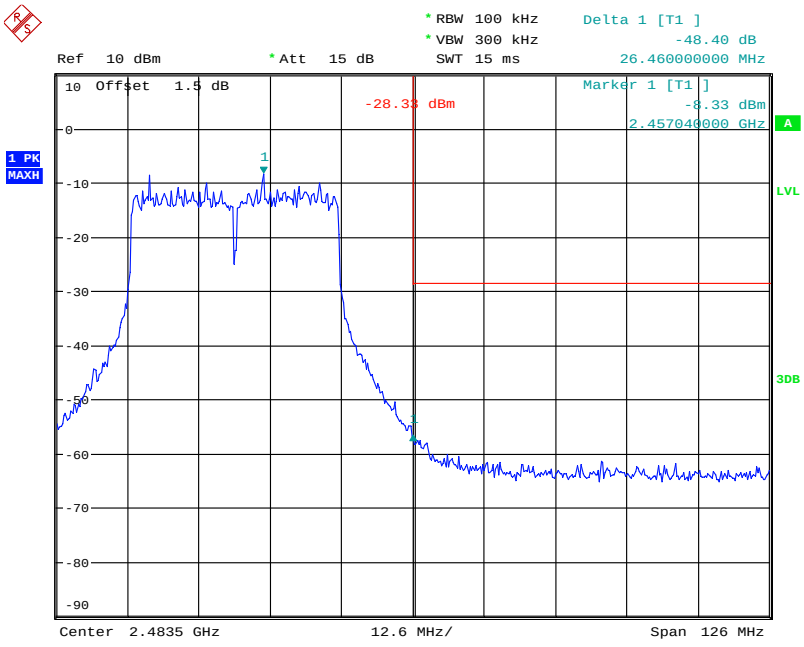
Date: 19.OCT.2020 15:32:40

Chain 0,802.11n ht40 Band Edge, Left Side



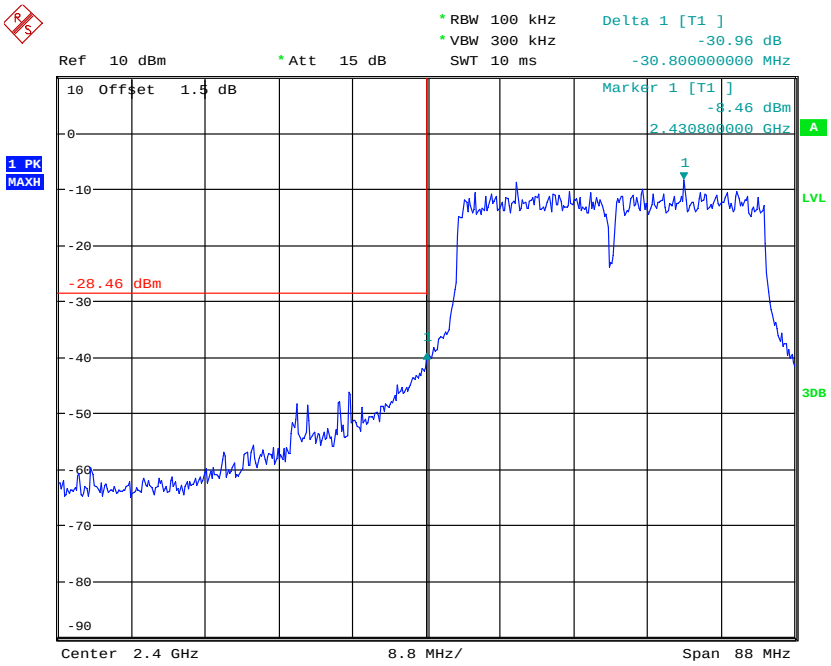
Date: 19.OCT.2020 14:39:03

Chain 0,802.11n ht40 Band Edge, Right Side



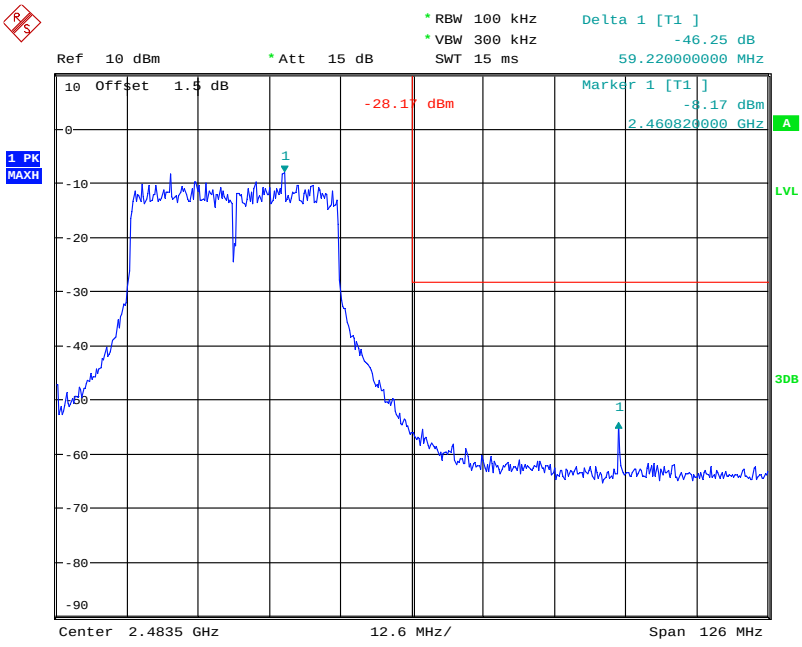
Date: 19.OCT.2020 14:43:55

Chain 1,802.11n ht40 Band Edge, Left Side



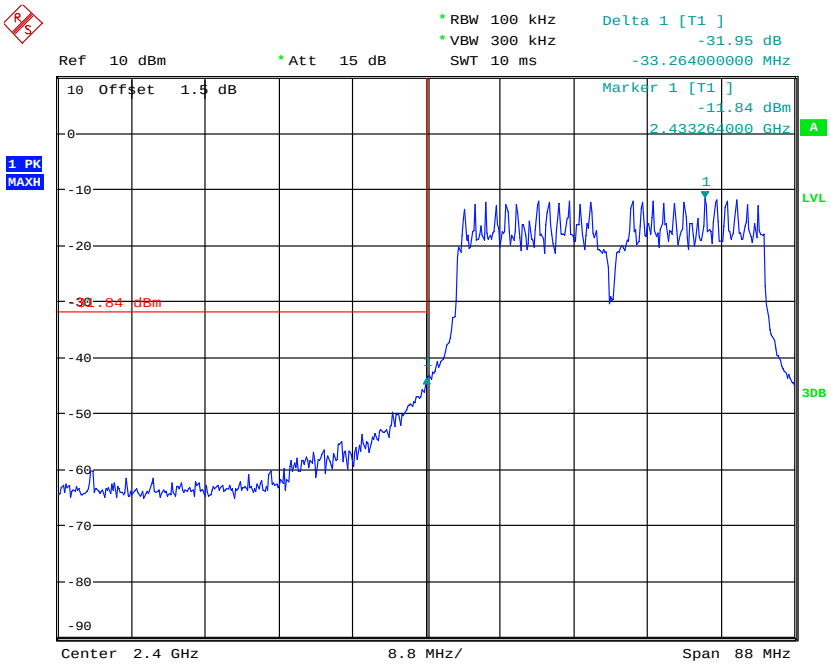
Date: 19.OCT.2020 15:05:28

Chain 1,802.11n ht40 Band Edge, Right Side



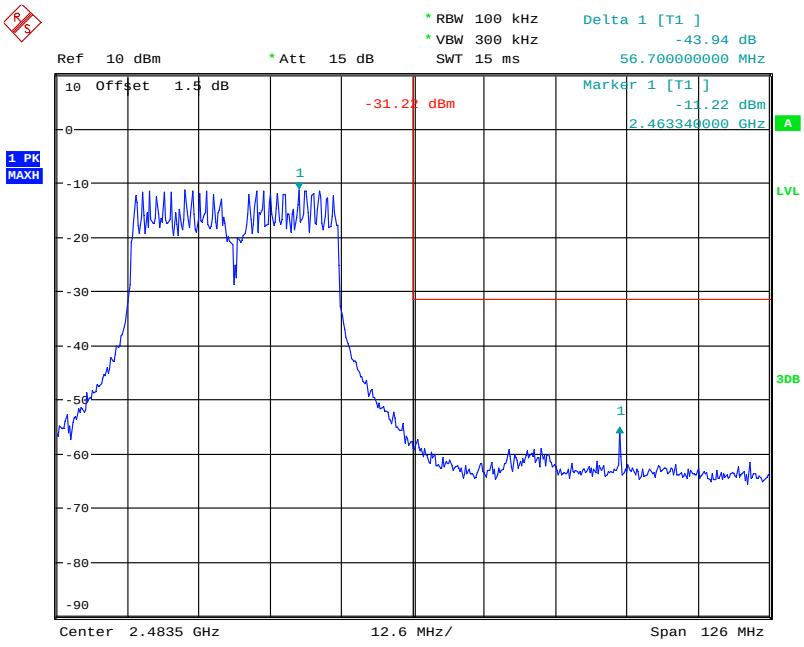
Date: 19.OCT.2020 15:01:16

Chain 2,802.11n ht40 Band Edge, Left Side



Date: 19.OCT.2020 15:39:55

Chain 2,802.11n ht40 Band Edge, Right Side



Date: 19.OCT.2020 15:43:55

FCC §15.247(e), RSS-247 CLAUSE 5.2 B - POWER SPECTRAL DENSITY

Applicable Standard

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

According to RSS-247 §5.2 b):

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. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT was set 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 the RBW = 3 kHz, VBW = 10 kHz, Set the span to 1.5 times the DTS bandwidth.
4. Use the peak marker function to determine the maximum amplitude level.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSU 26	200256	2020-07-07	2021-07-07
R&S	Spectrum Analyzer	FSV40	101474	2020-07-07	2021-07-07
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41010013	Each time	N/A
E-Microwave	Blocking Control	EMDCB-00036	0E01201048	Each time	N/A

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

Test Data

Environmental Conditions

Temperature:	22.1~28.7°C
Relative Humidity:	30 ~ 53 %
ATM Pressure:	100.6~102.5 kPa
Tester:	Billy Li, Chris Mo
Test Date:	2020-10-19~2020-12-14

Test Mode: Transmitting

Test Result: Compliance. Please refer to the following table and plots

For 802.11b/g/n:

Mode	Channel	Frequency (MHz)	Power Spectral Density (dBm/3kHz)				Limit (dBm/3kHz)
			Chain 0	Chain 1	Chain 2	Total	
802.11 b	Low	2412	-8.27	-6.94	-8.80	/	1.00
	Middle	2437	-8.84	-7.11	-9.26	/	1.00
	High	2462	-9.87	-7.66	-9.00	/	1.00
802.11 g	Low	2412	-15.05	-14.68	-14.88	/	1.00
	Middle	2437	-14.91	-14.44	-13.97	/	1.00
	High	2462	-16.08	-14.14	-14.36	/	1.00
802.11 n20	Low	2412	-18.31	-16.35	-19.56	-13.10	-3.77
	Middle	2437	-19.51	-18.50	-20.00	-14.52	-3.77
	High	2462	-19.24	-19.81	-19.89	-14.87	-3.77
802.11 n40	Low	2422	-21.00	-22.36	-23.45	-17.38	-3.77
	Middle	2437	-22.02	-22.85	-23.27	-17.91	-3.77
	High	2452	-22.07	-22.44	-24.29	-18.06	-3.77

Note:
For Antenna model:ARC-OA2413SD1
The maximum antenna gain is 13dBi. The device employed Cyclic Delay Diversity (CDD) for 802.11 MIMO transmitting, per KDB 662911 D01 Multiple Transmitter Output v02r01, for power spectral density (PSD) measurements on the devices:

Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

So:

Directional gain = G_{ANT} + Array Gain = 13dBi+10*log(3/1)=17.77 dBi for MIMO 3TX mode.
The PSD limit should be reduced by: 17.77-6 =11.77dB

Directional gain = 13 dBi for SISO Mode.
The PSD limit should be reduced by: 13-6 =7dB

For Antenna model: ARC-VS2418SD1
The maximum antenna gain is 18dBi. Two sets of identical Sector Antenna should be installed. Each Sector Antenna has two Cross-polarized antennas, per KDB 662911 D01 Multiple Transmitter Output v02r01, Clause F) 2):

b) *Sectorized antenna systems*. In sectorized antenna systems in which each antenna is used to transmit different data in a different direction from the other antennas, directional gain is equal to the gain of an individual sector antenna.

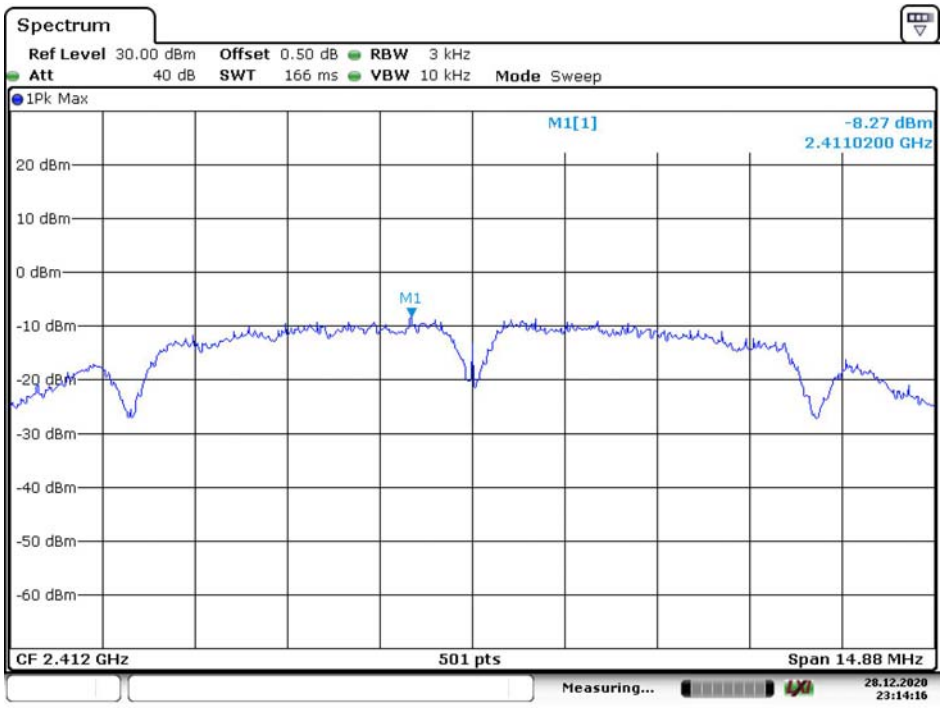
c) *Cross-polarized antennas*. For a system in which the antennas have fixed orientations relative to one another that ensure that the antennas are cross-polarized regardless of any user actions, the directional gain is computed as follows.

(i) *Cross-polarized antennas with N_{ANT} = 2*. In the case of a transmitter with only two outputs driving a pair of antennas that are cross-polarized (*e.g.*, vertical and horizontal or left-circular and right-circular), directional gain is the gain of an individual antenna. If the two antennas have different gains, the larger gain applies.

So:

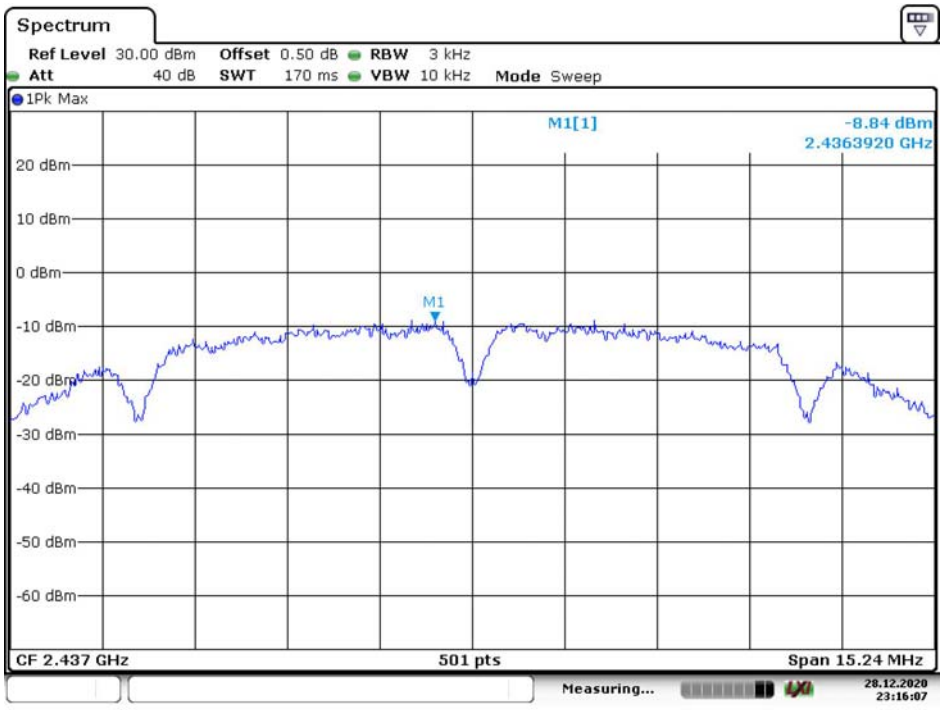
Directional gain = G_{ANT} = 18dBi for both MIMO and SISO modes.
The PSD limit should be reduced by: (18-6)/3=4dB

Chain 0, Power Spectral Density, 802.11b Low Channel



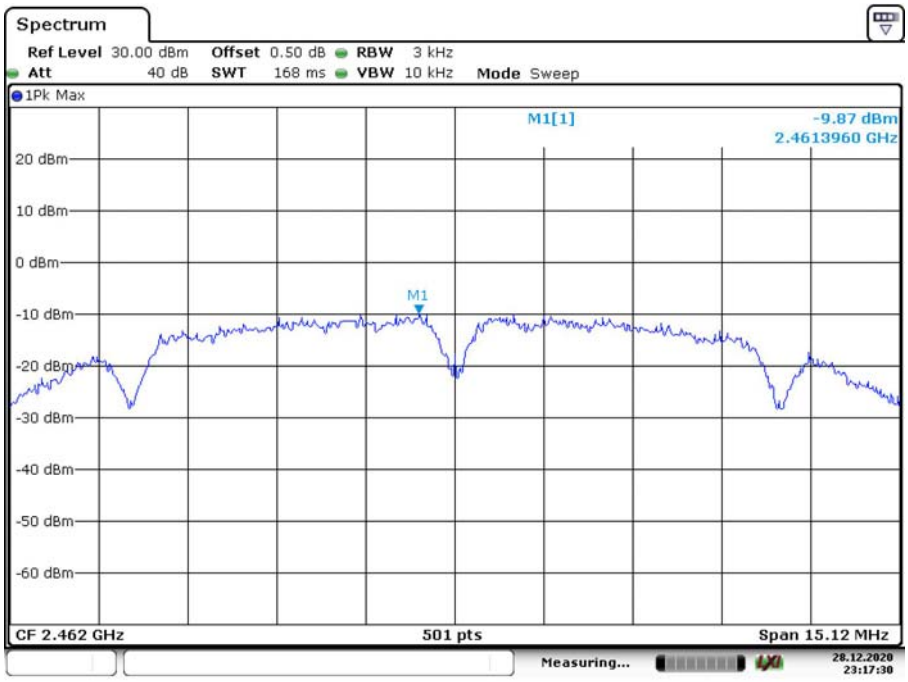
Date: 28.DEC.2020 23:14:17

Chain 0,Power Spectral Density, 802.11b Middle Channel



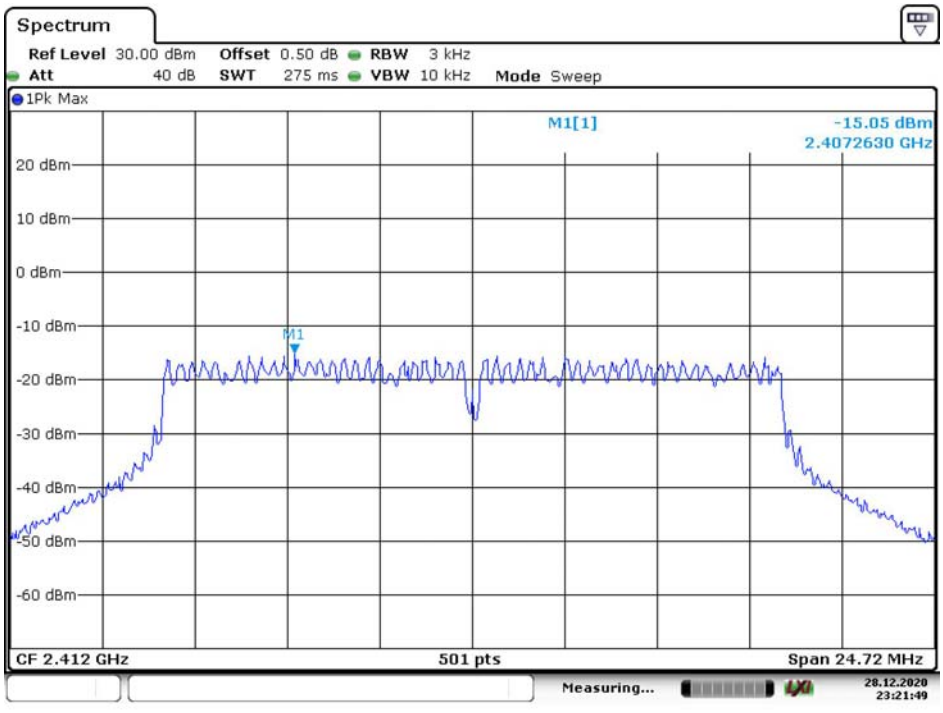
Date: 28.DEC.2020 23:16:07

Chain 0,Power Spectral Density, 802.11b High Channel



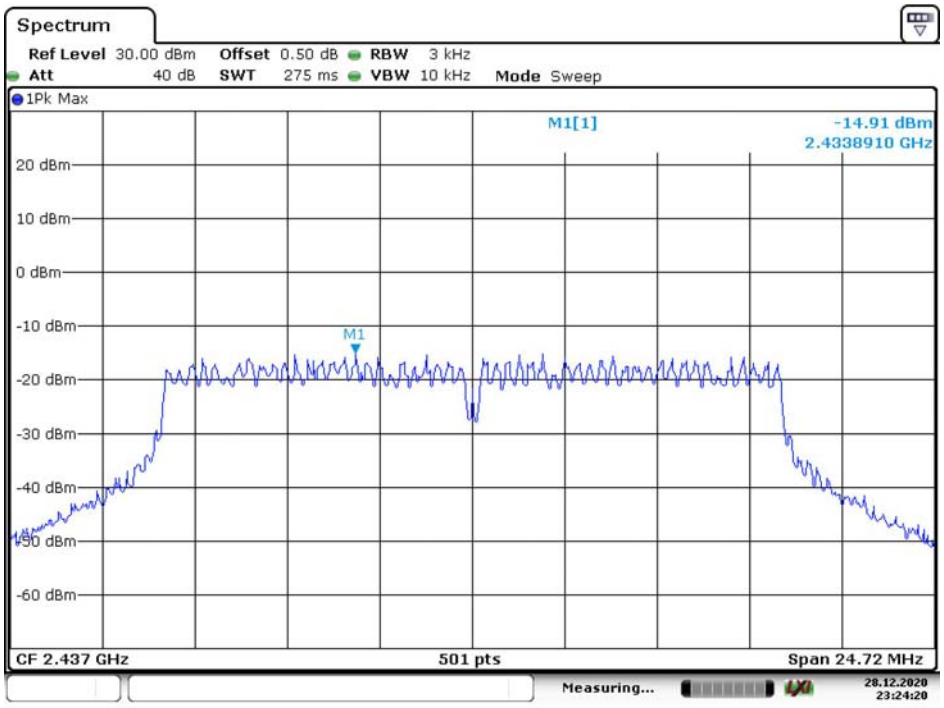
Date: 28.DEC.2020 23:17:31

Chain 0,Power Spectral Density, 802.11g Low Channel



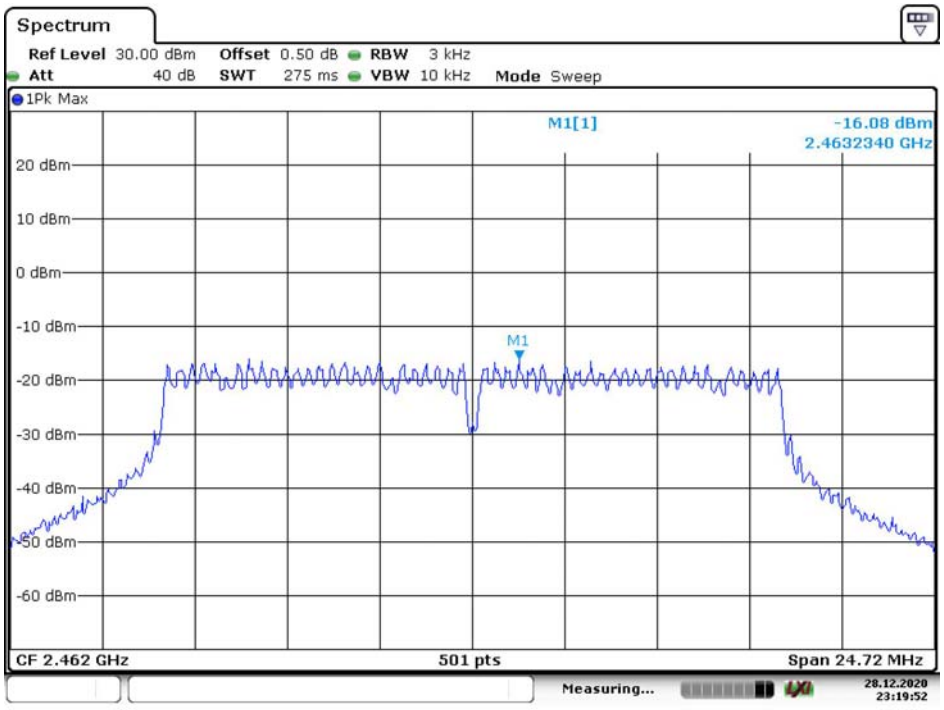
Date: 28.DEC.2020 23:21:50

Chain 0,Power Spectral Density, 802.11g Middle Channel



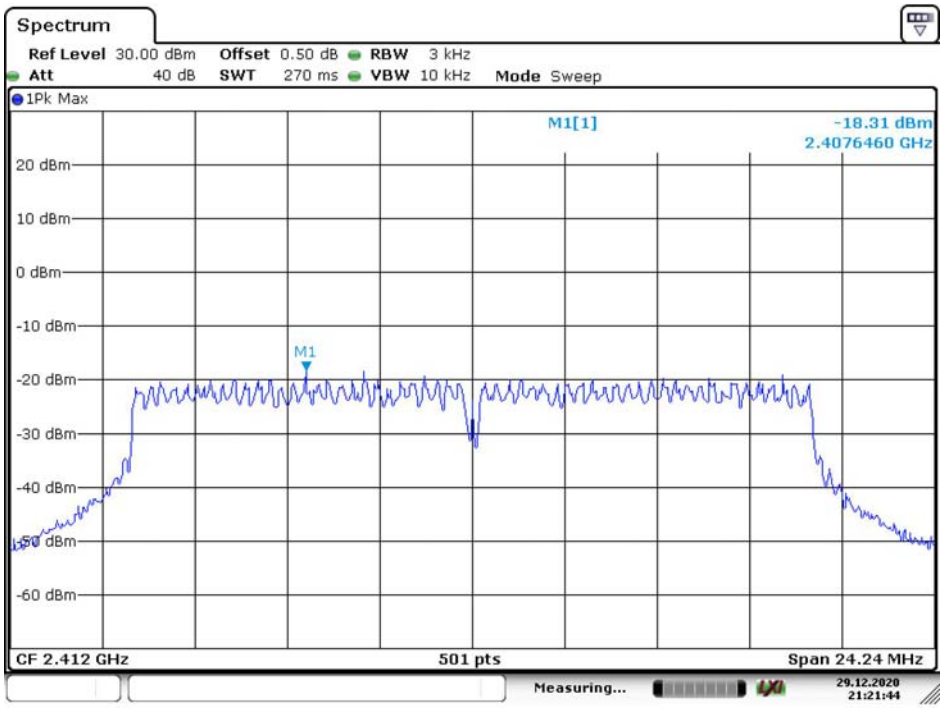
Date: 28.DEC.2020 23:24:20

Chain 0,Power Spectral Density, 802.11g High Channel



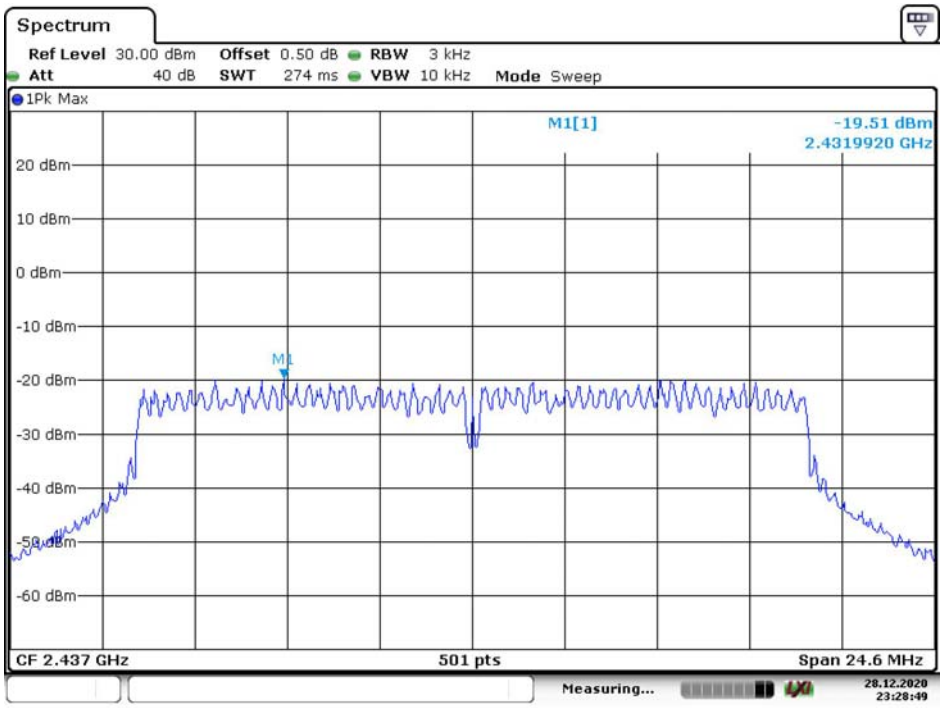
Date: 28.DEC.2020 23:19:52

Chain 0,Power Spectral Density, 802.11n ht20 Low Channel



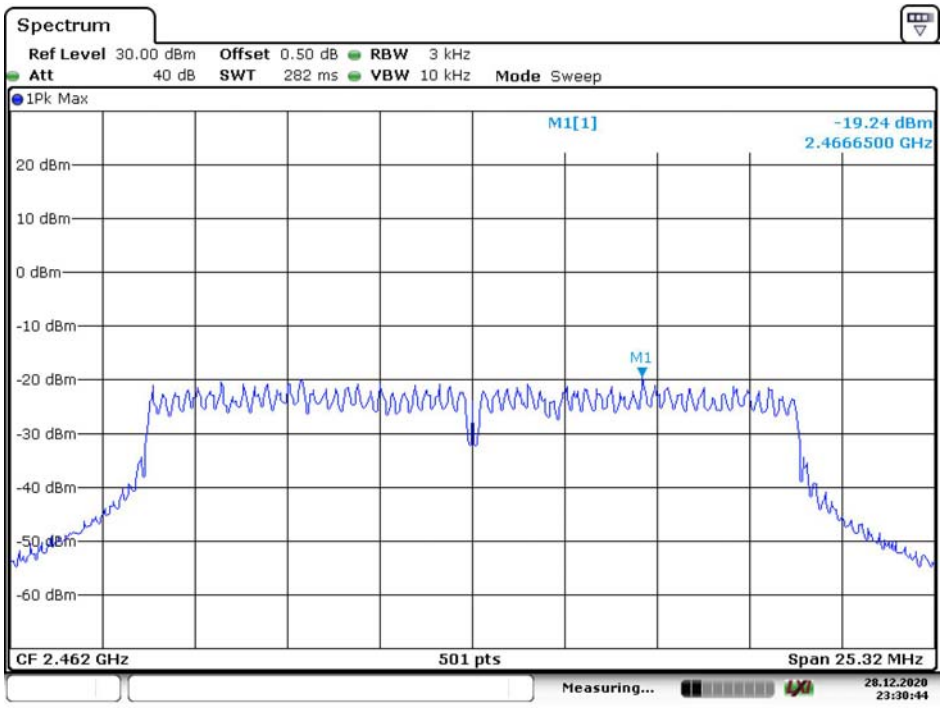
Date: 29.DEC.2020 21:21:45

Chain 0,Power Spectral Density, 802.11n ht20 Middle Channel



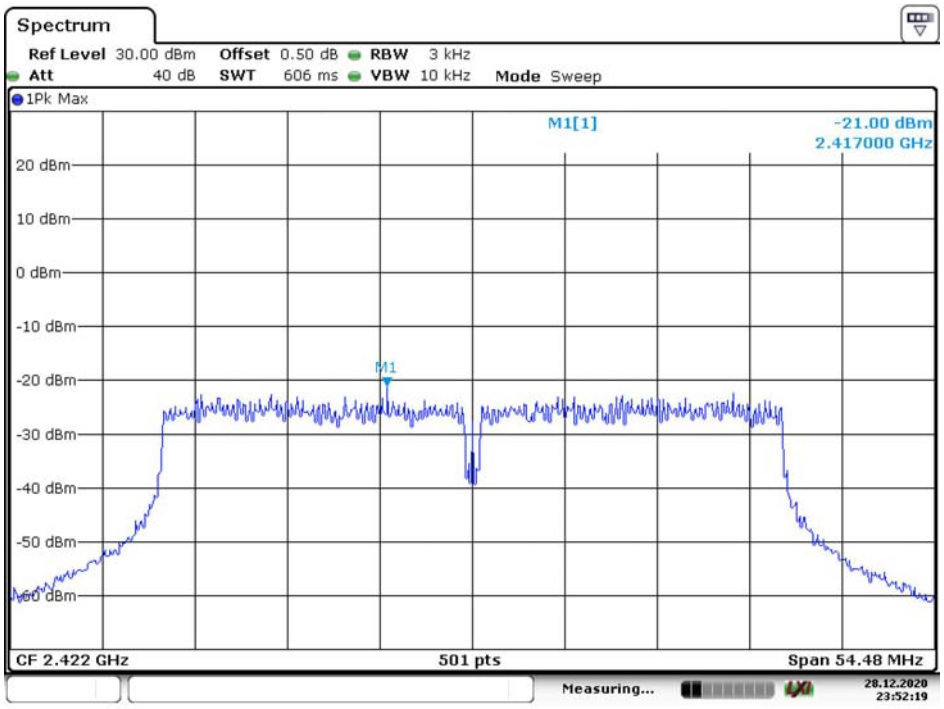
Date: 28.DEC.2020 23:28:50

Chain 0,Power Spectral Density, 802.11n ht20 High Channel



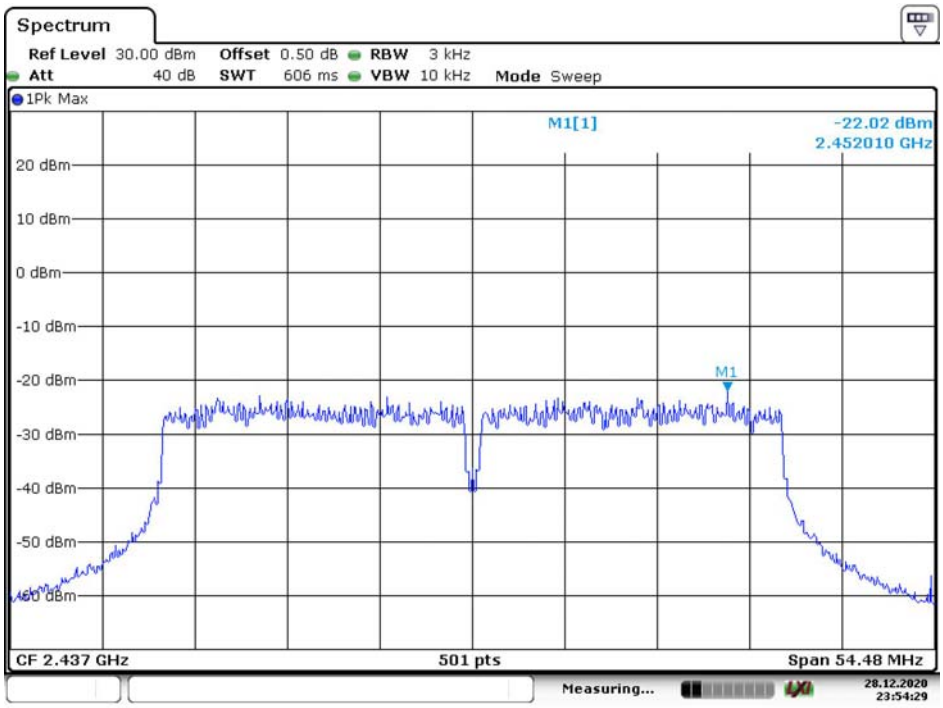
Date: 28.DEC.2020 23:30:44

Chain 0,Power Spectral Density, 802.11n ht40 Low Channel



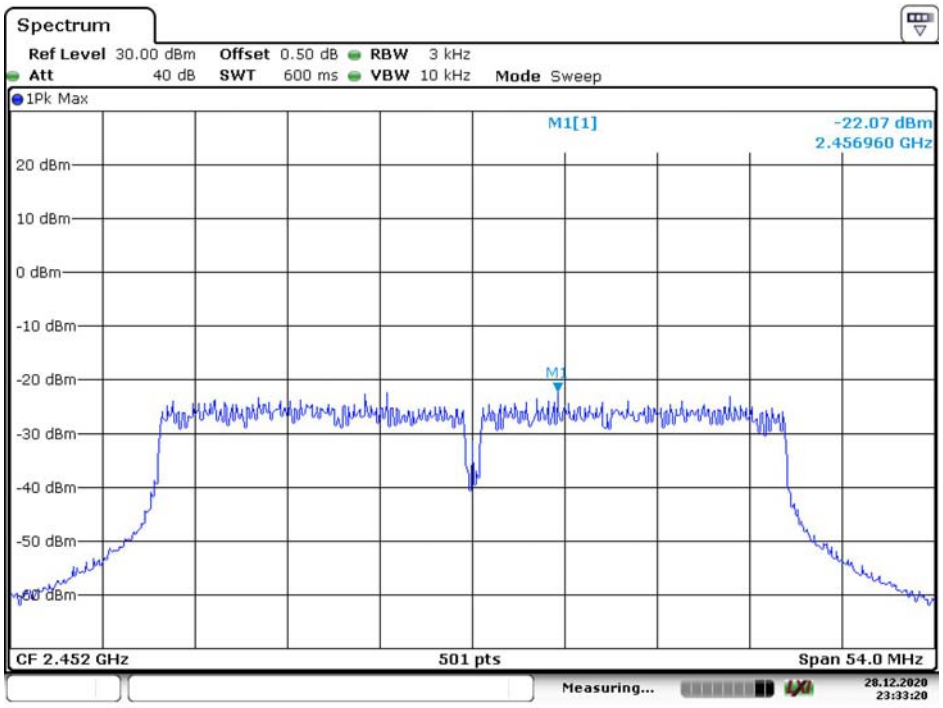
Date: 28.DEC.2020 23:52:20

Chain 0,Power Spectral Density, 802.11n ht40 Middle Channel



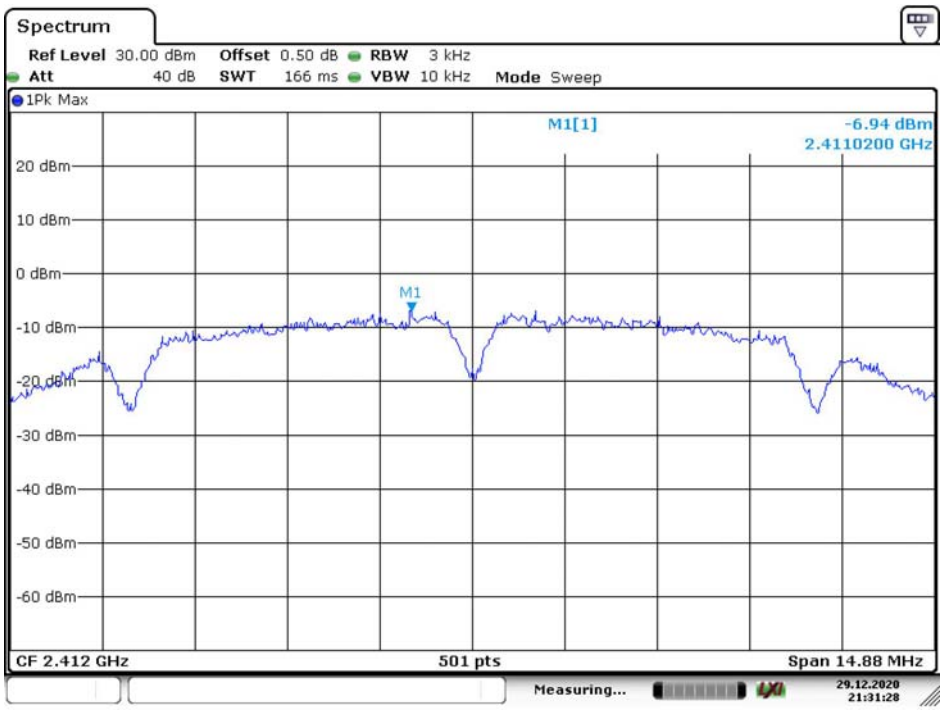
Date: 28.DEC.2020 23:54:29

Chain 0,Power Spectral Density, 802.11n ht40 High Channel



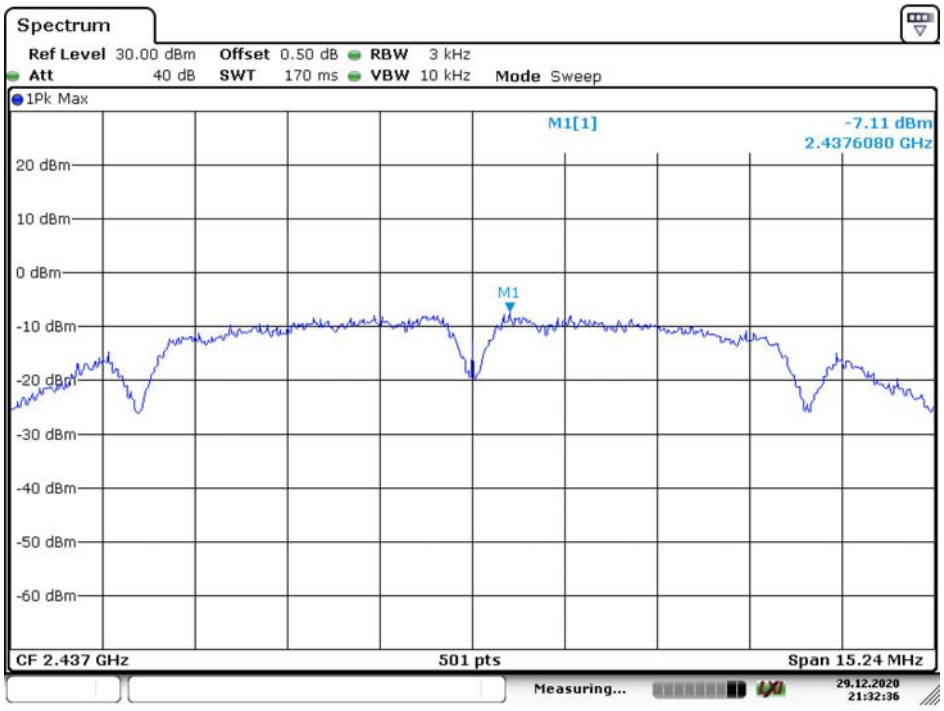
Date: 28.DEC.2020 23:33:20

Chain 1,Power Spectral Density, 802.11b Low Channel



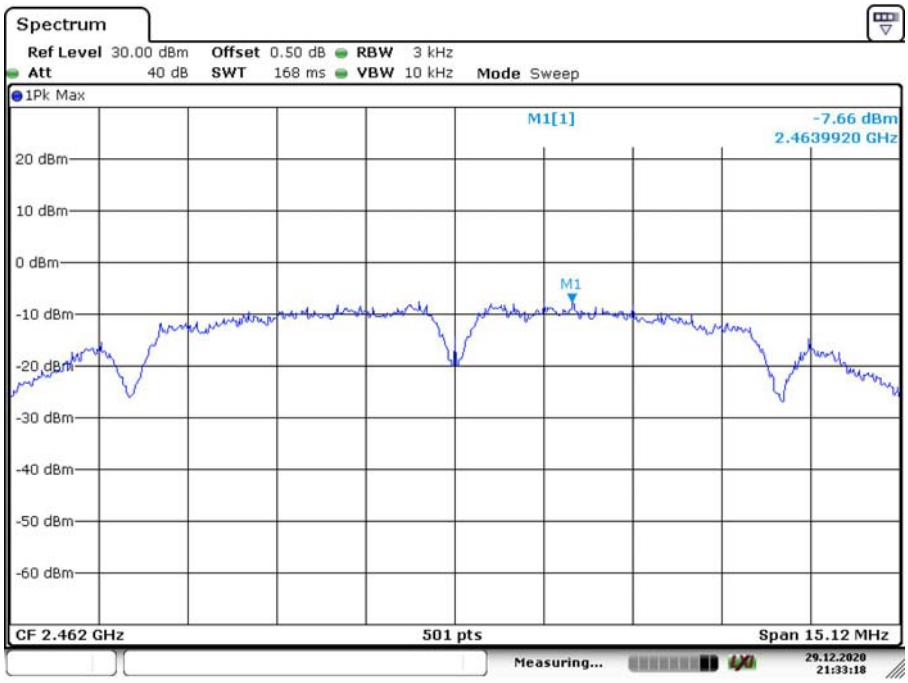
Date: 29.DEC.2020 21:31:29

Chain 1,Power Spectral Density, 802.11b Middle Channel



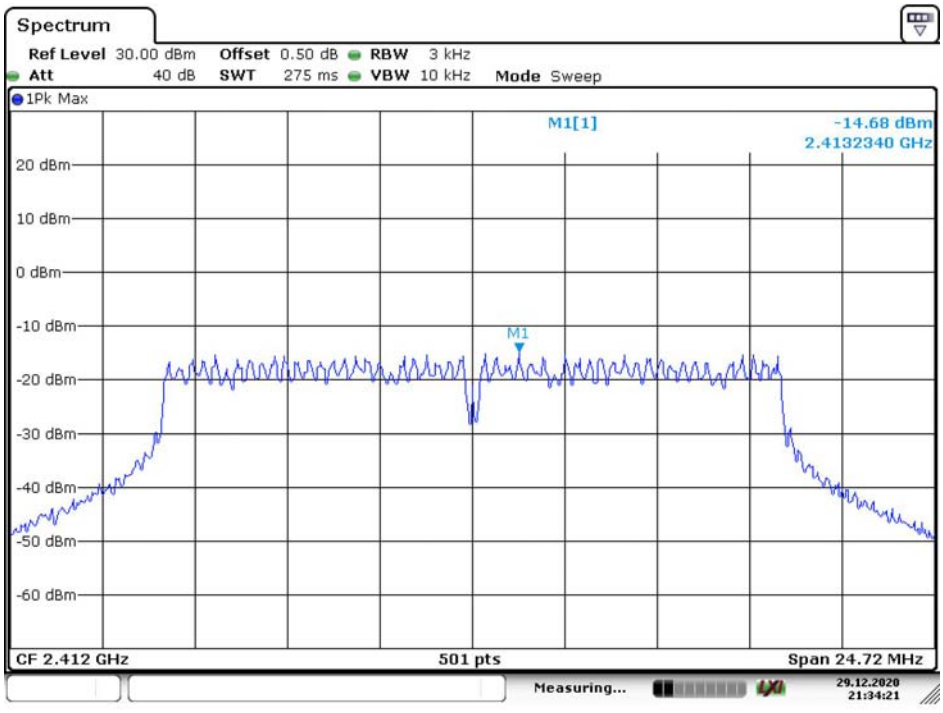
Date: 29.DEC.2020 21:32:36

Chain 1,Power Spectral Density, 802.11b High Channel



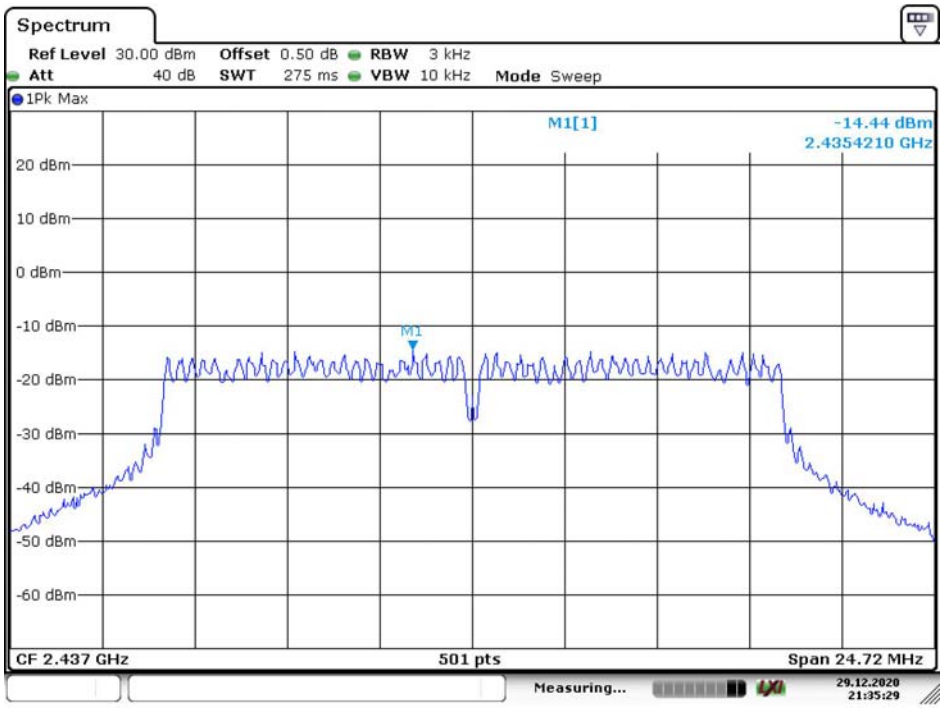
Date: 29.DEC.2020 21:33:19

Chain1,Power Spectral Density, 802.11g Low Channel



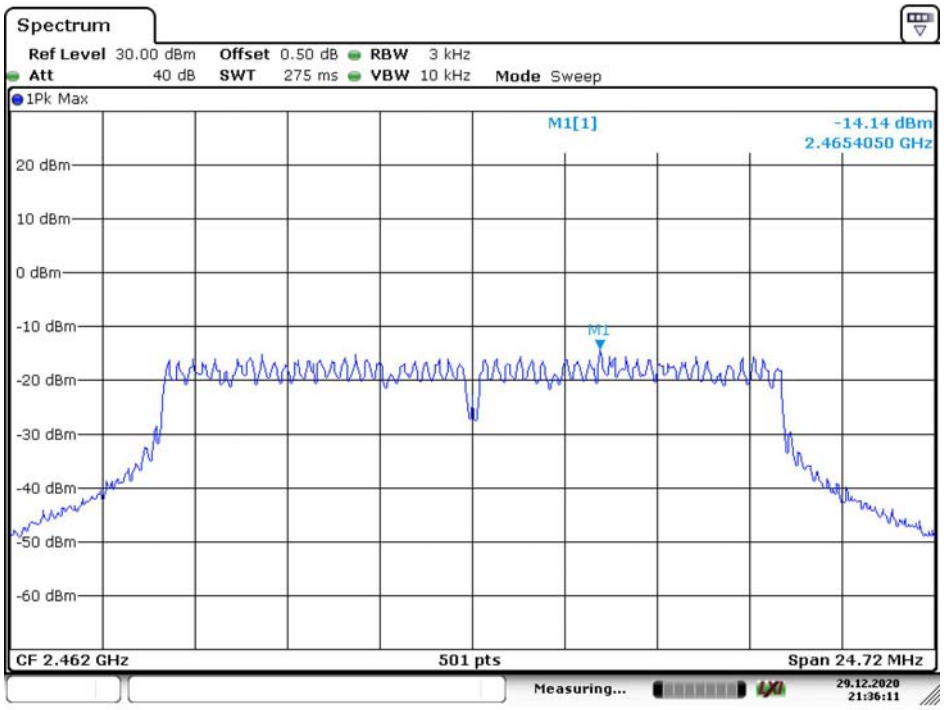
Date: 29.DEC.2020 21:34:21

Chain 1,Power Spectral Density, 802.11g Middle Channel



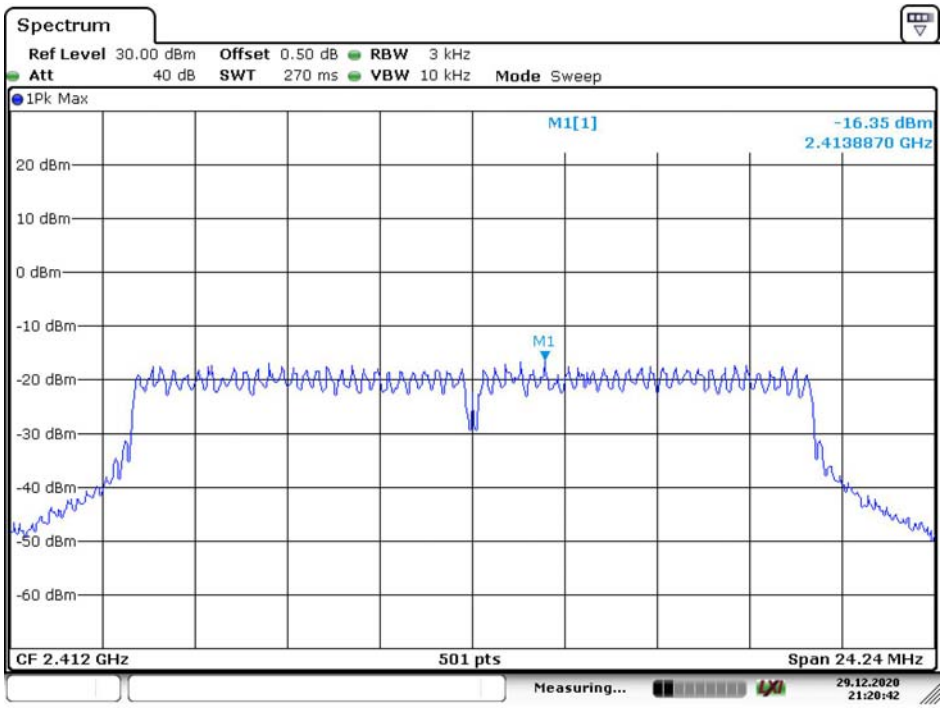
Date: 29.DEC.2020 21:35:29

Chain1,Power Spectral Density, 802.11g High Channel



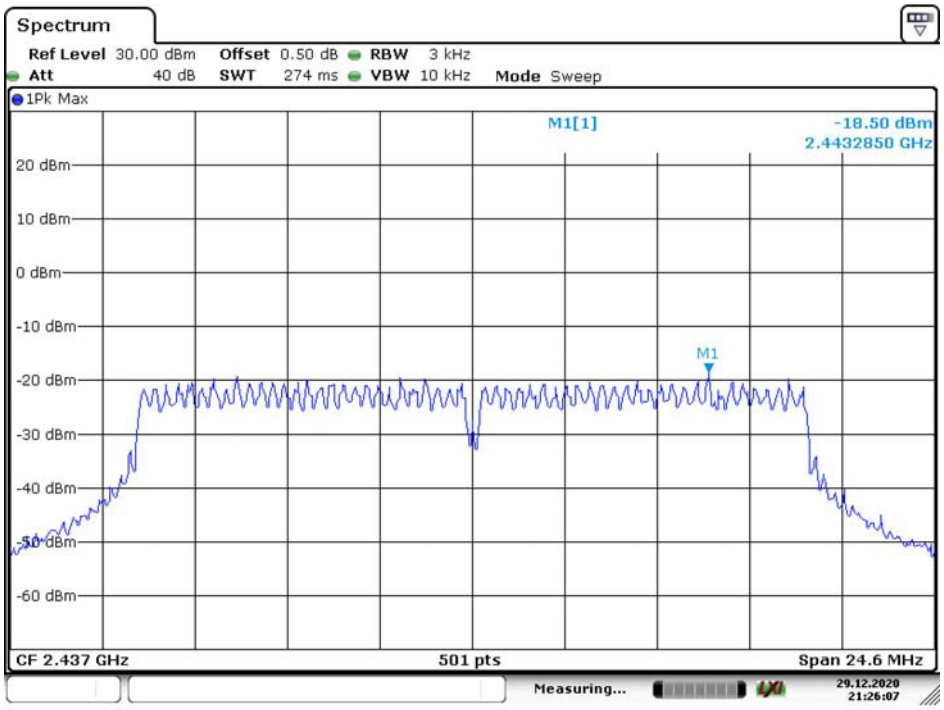
Date: 29.DEC.2020 21:36:11

Chain1,Power Spectral Density, 802.11n ht20 Low Channel



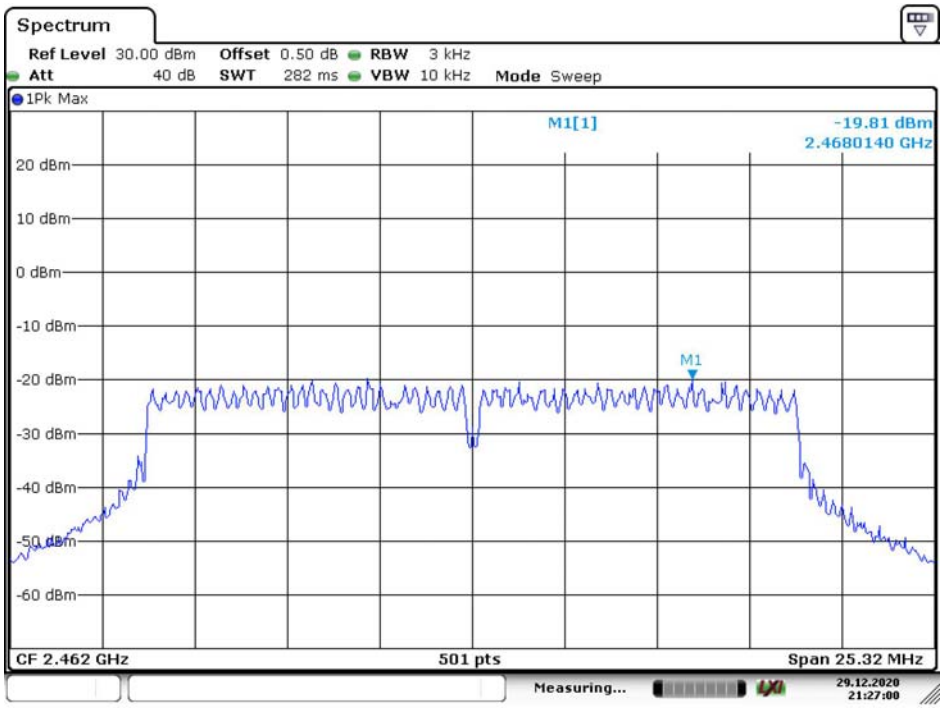
Date: 29.DEC.2020 21:20:42

Chain 1,Power Spectral Density, 802.11n ht20 Middle Channel



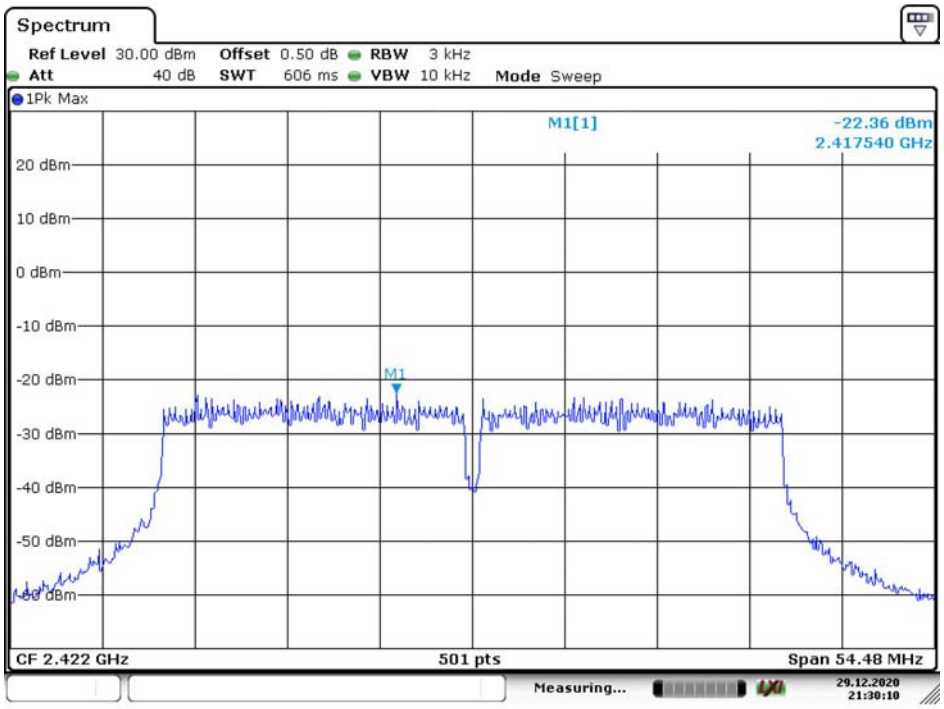
Date: 29.DEC.2020 21:26:07

Chain 1,Power Spectral Density, 802.11n ht20 High Channel



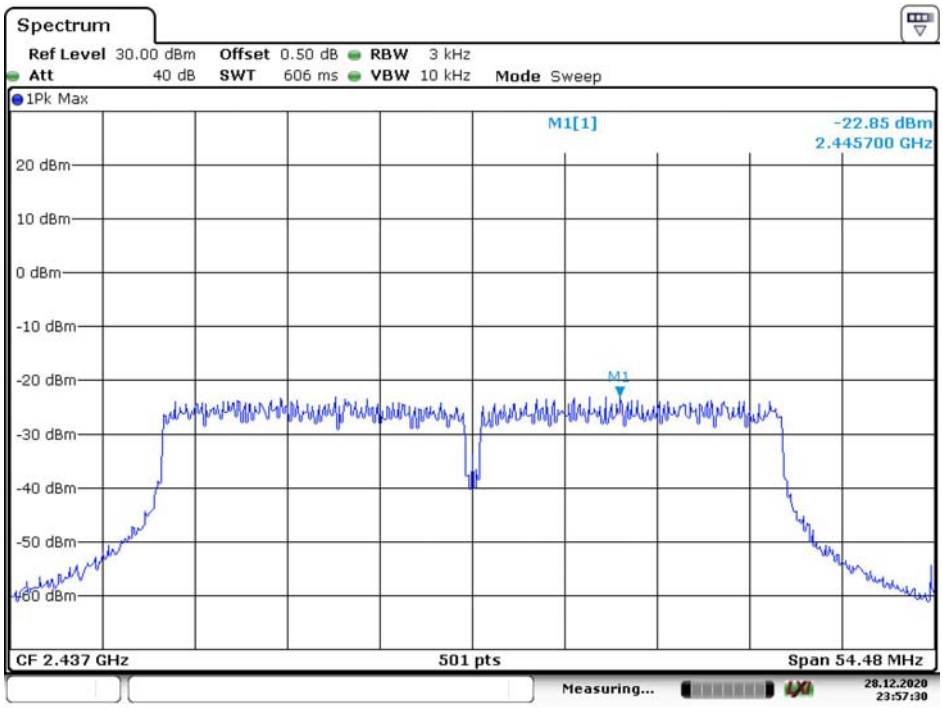
Date: 29.DEC.2020 21:27:01

Chain 1,Power Spectral Density, 802.11n ht40 Low Channel



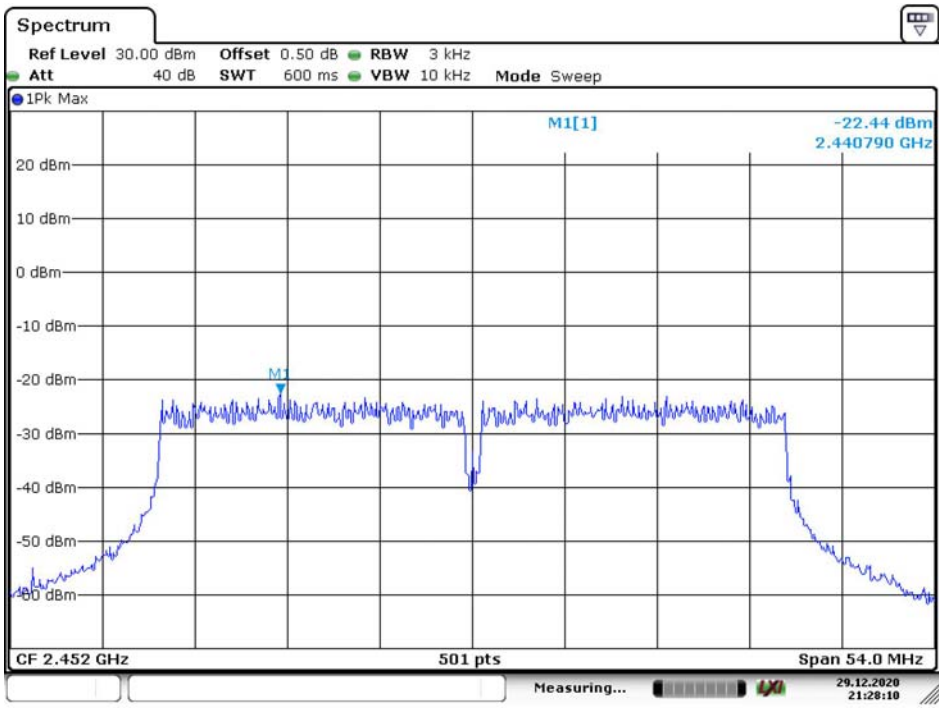
Date: 29.DEC.2020 21:30:11

Chain 1,Power Spectral Density, 802.11n ht40 Middle Channel



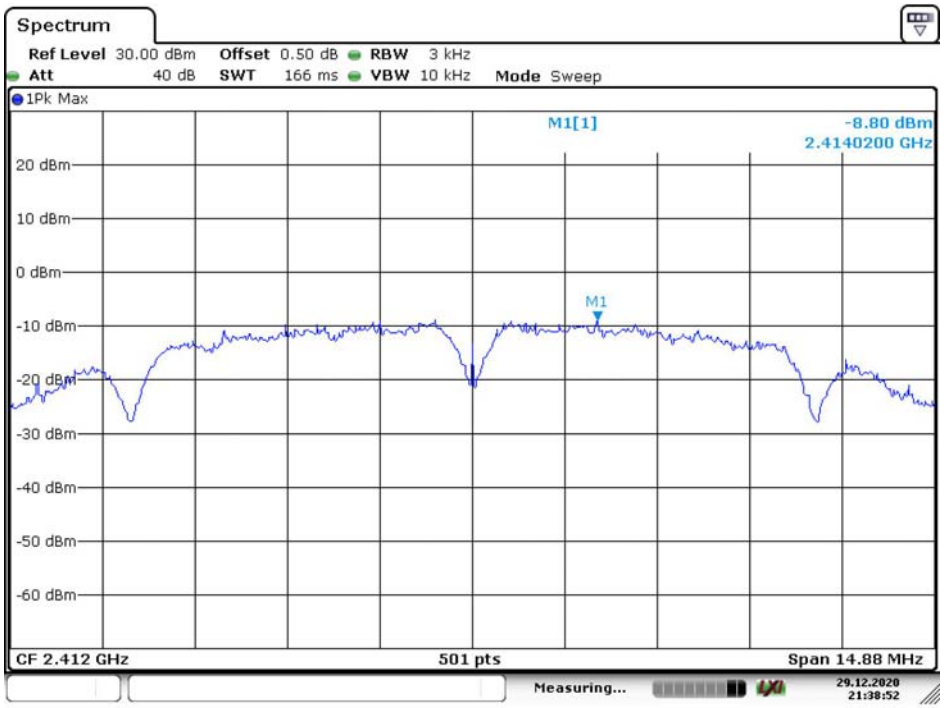
Date: 28.DEC.2020 23:57:30

Chain 1,Power Spectral Density, 802.11n ht40 High Channel



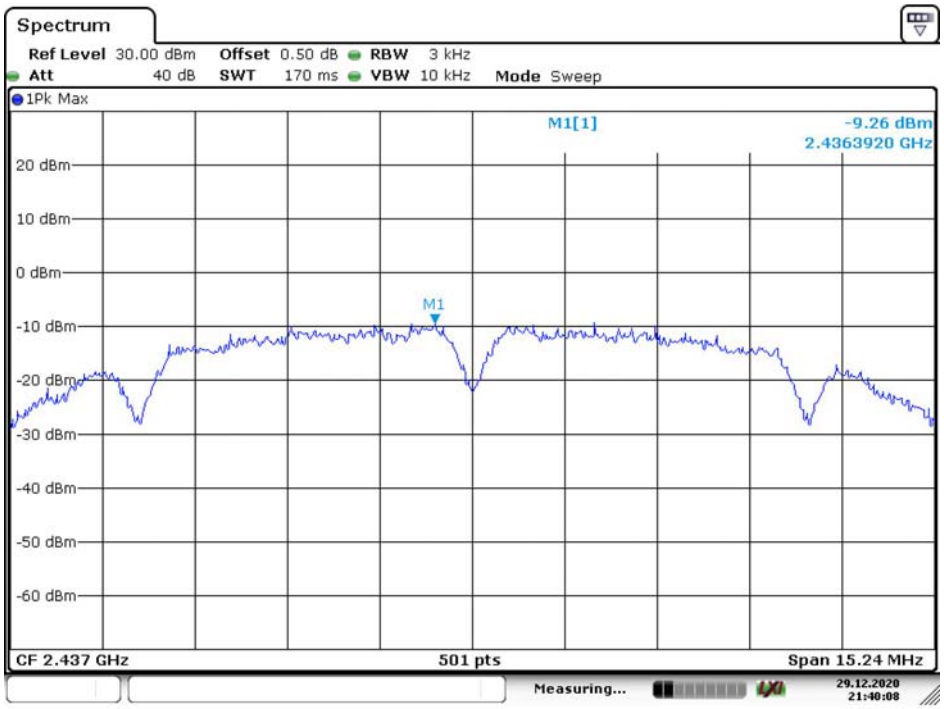
Date: 29.DEC.2020 21:28:10

Chain 2, Power Spectral Density, 802.11b Low Channel



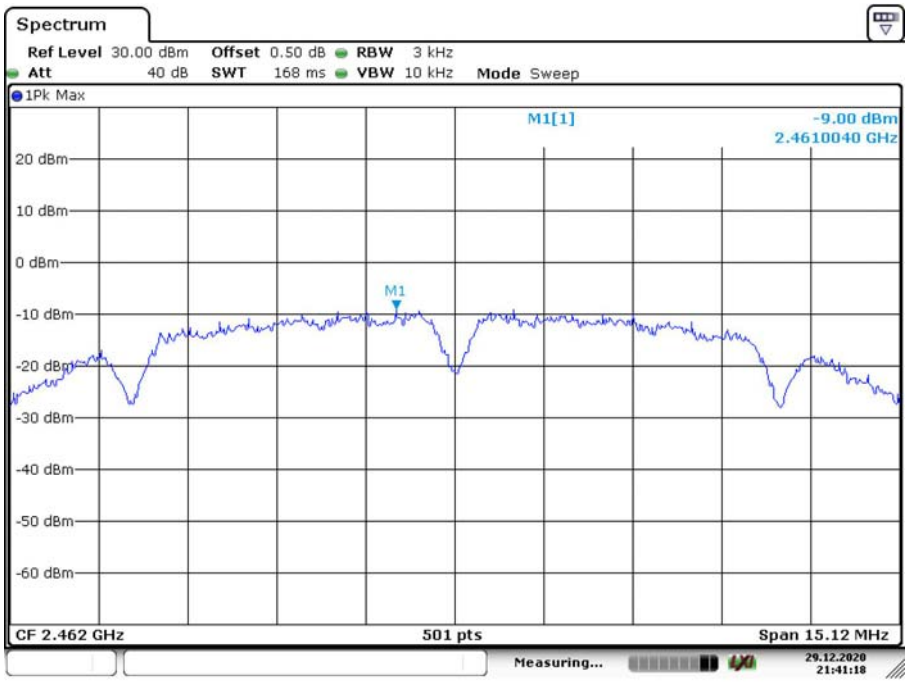
Date: 29.DEC.2020 21:38:53

Chain 2,Power Spectral Density, 802.11b Middle Channel



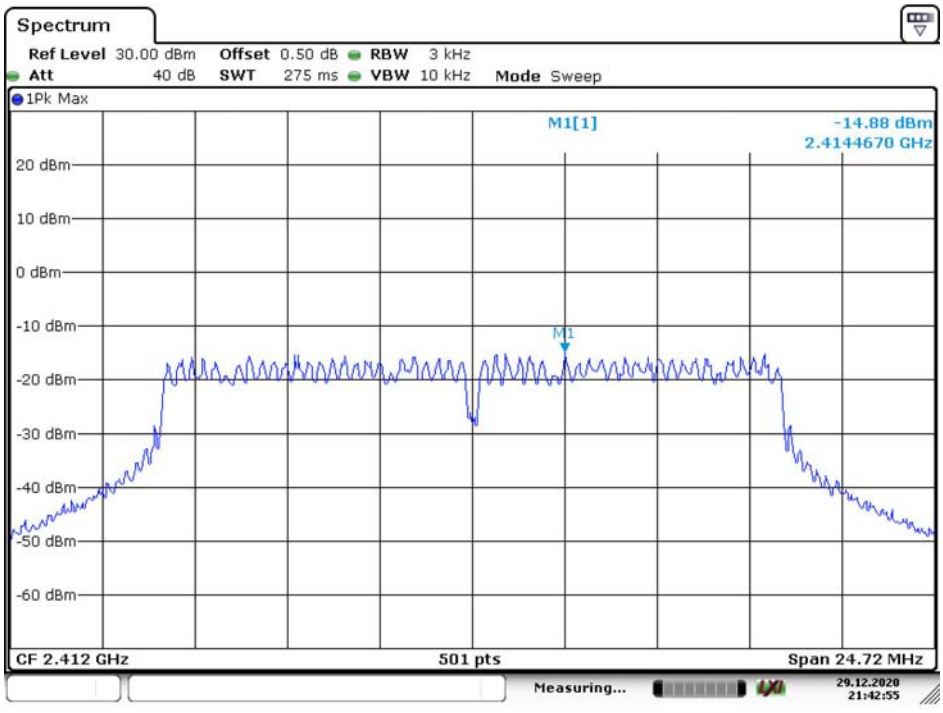
Date: 29.DEC.2020 21:40:08

Chain 2,Power Spectral Density, 802.11b High Channel



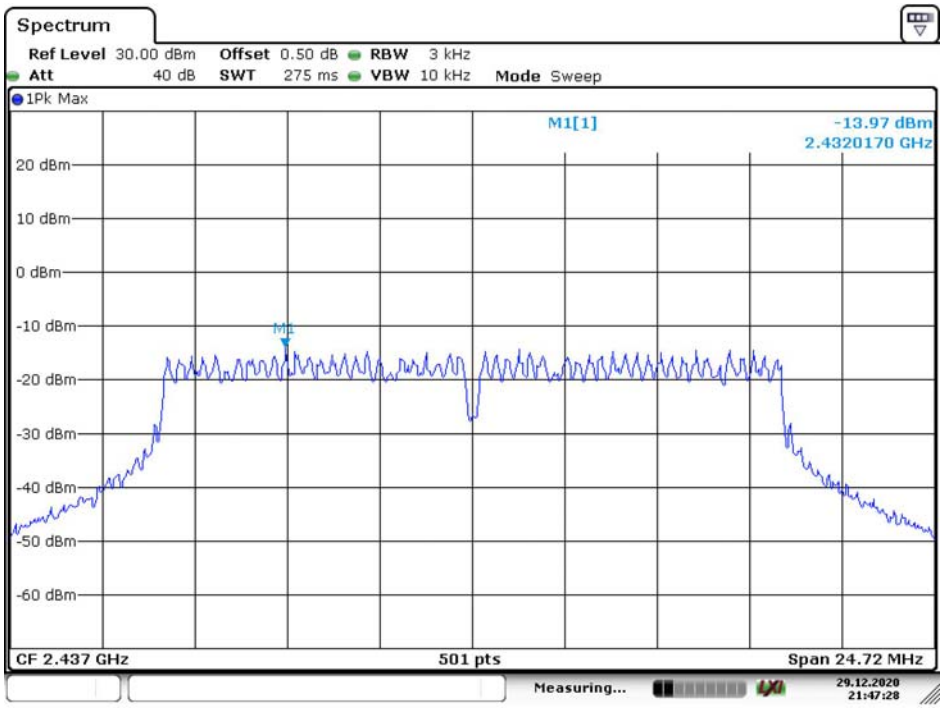
Date: 29.DEC.2020 21:41:18

Chain 2,Power Spectral Density, 802.11g Low Channel



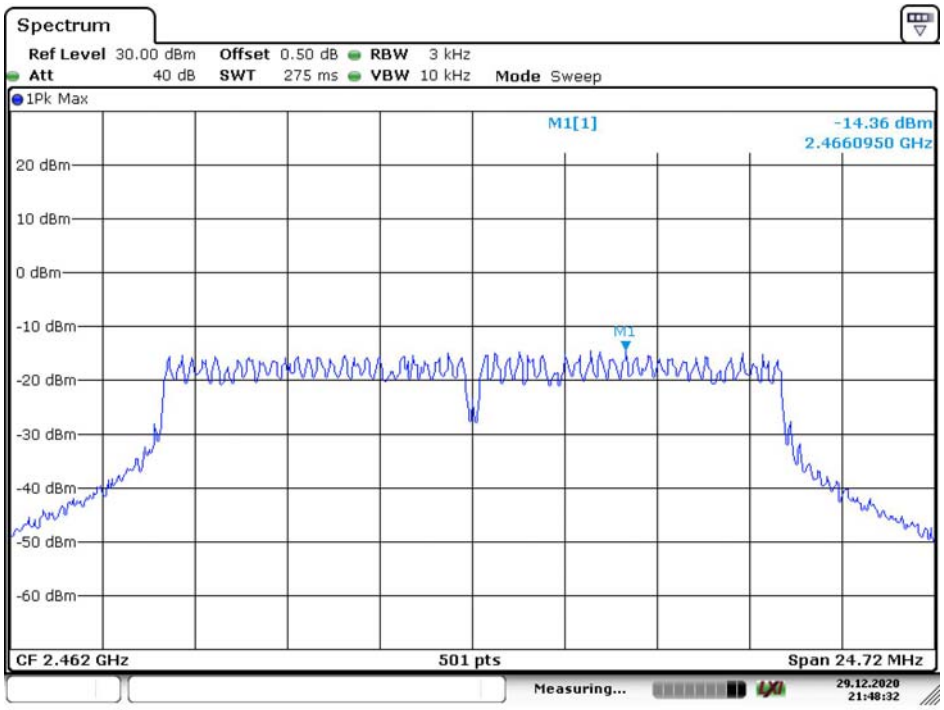
Date: 29.DEC.2020 21:42:56

Chain 2,Power Spectral Density, 802.11g Middle Channel



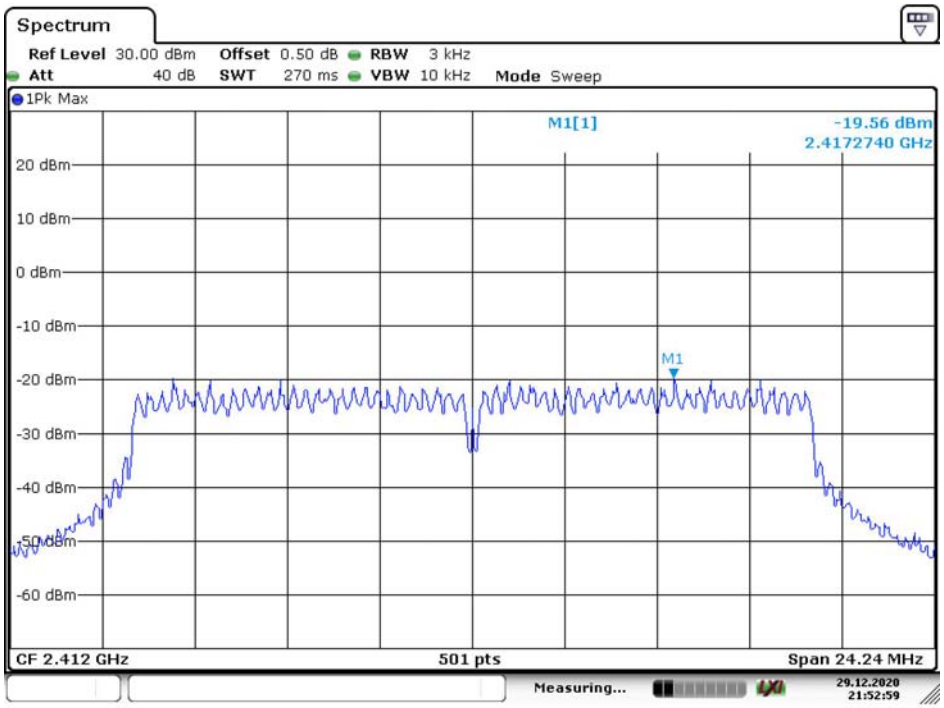
Date: 29.DEC.2020 21:47:28

Chain 2,Power Spectral Density, 802.11g High Channel



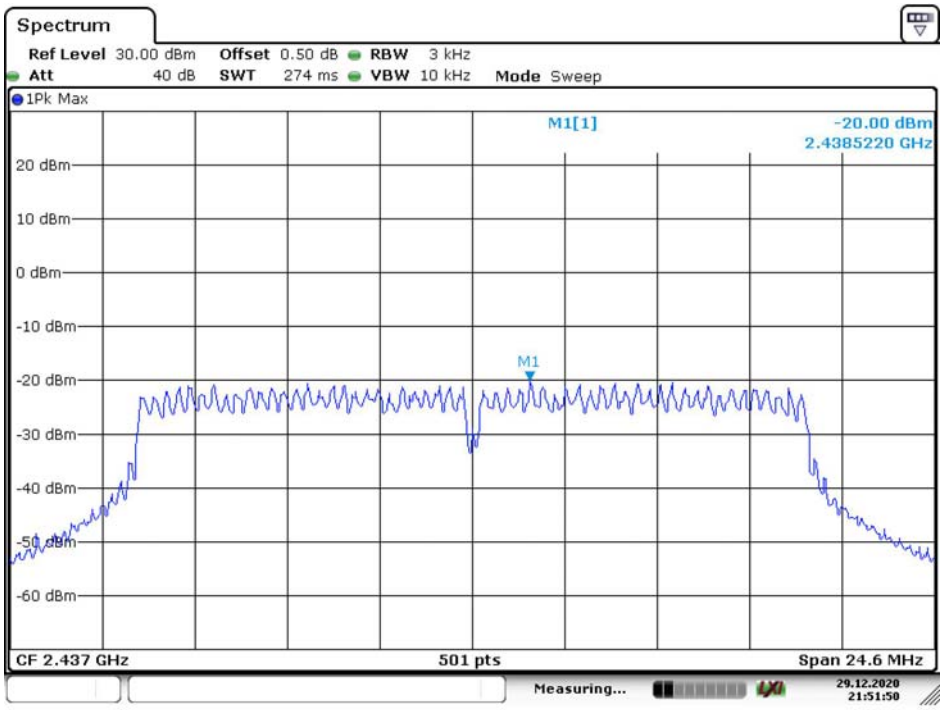
Date: 29.DEC.2020 21:48:33

Chain 2,Power Spectral Density, 802.11n ht20 Low Channel



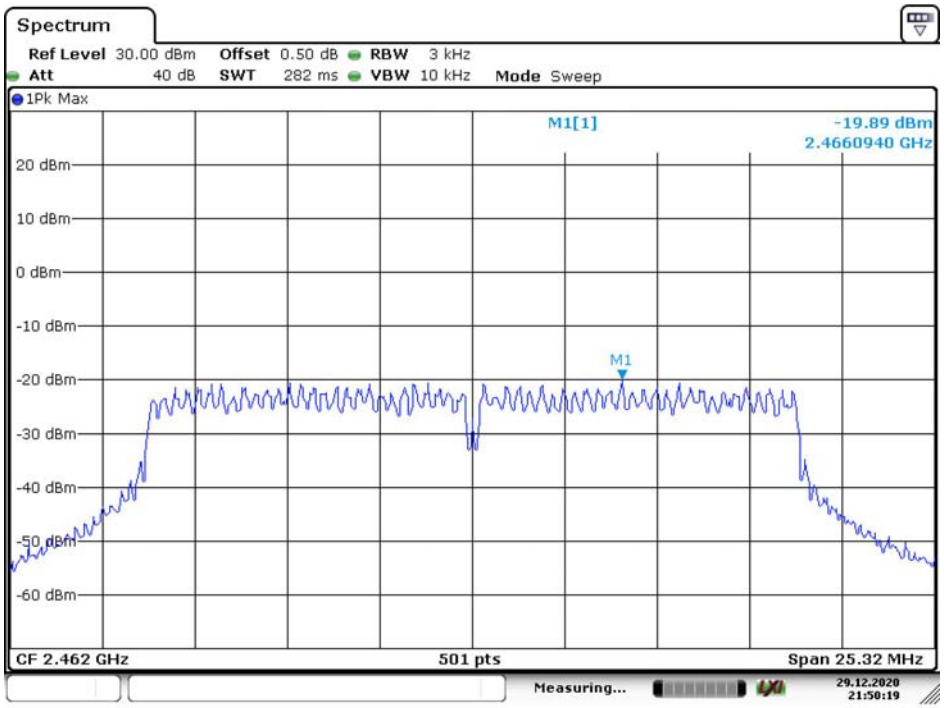
Date: 29.DEC.2020 21:53:00

Chain 2,Power Spectral Density, 802.11n ht20 Middle Channel



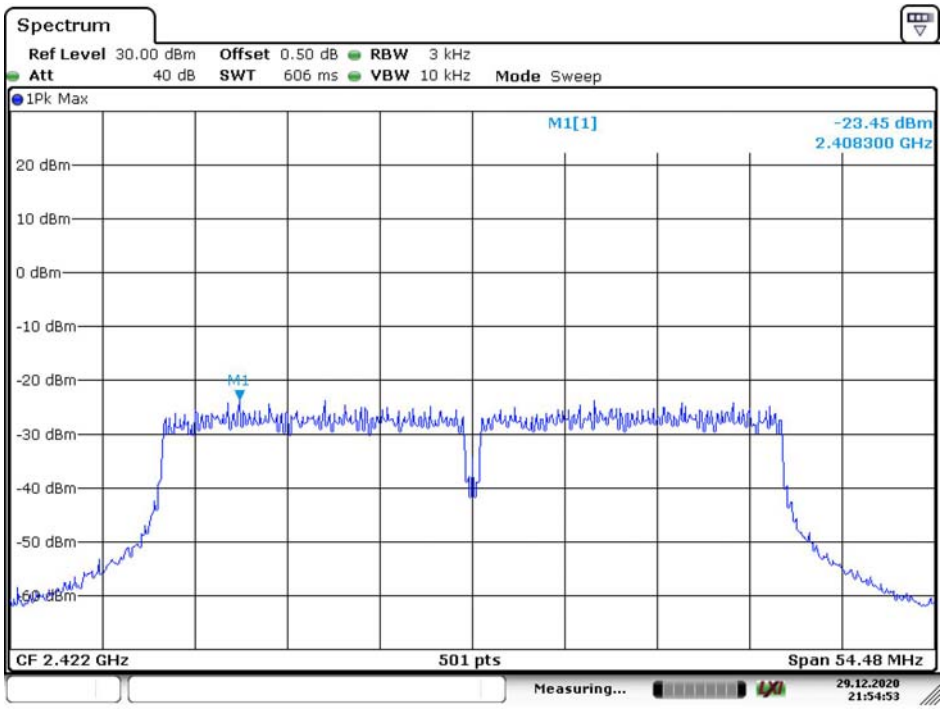
Date: 29.DEC.2020 21:51:50

Chain 2,Power Spectral Density, 802.11n ht20 High Channel



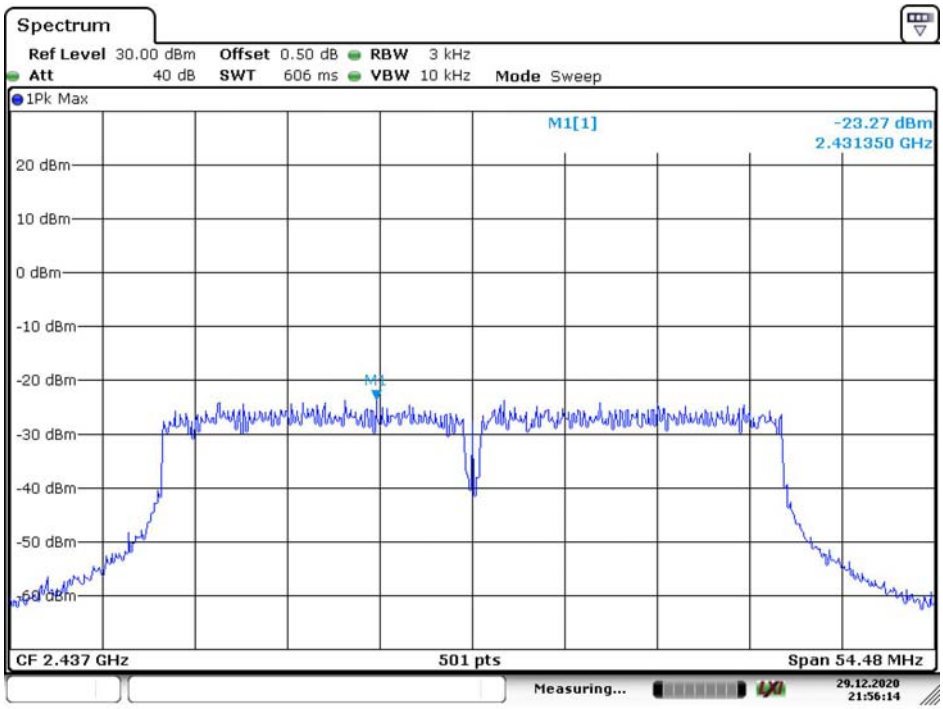
Date: 29.DEC.2020 21:50:20

Chain 2,Power Spectral Density, 802.11n ht40 Low Channel



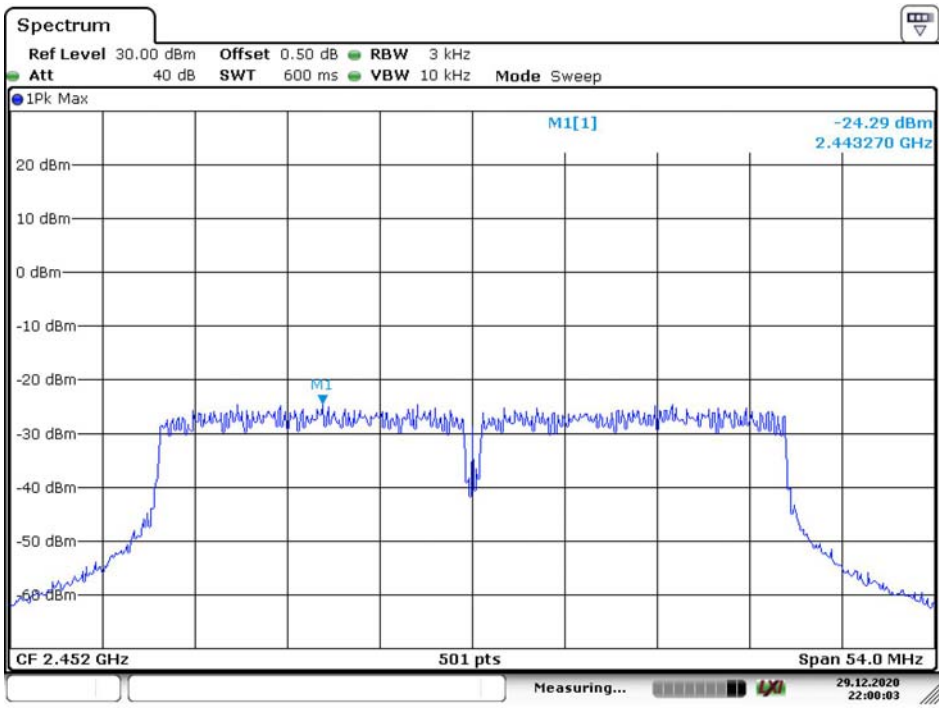
Date: 29.DEC.2020 21:54:53

Chain 2,Power Spectral Density, 802.11n ht40 Middle Channel



Date: 29.DEC.2020 21:56:14

Chain 2,Power Spectral Density, 802.11n ht40 High Channel



Date: 29.DEC.2020 22:00:04

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