



FCC PART 15.407

TEST REPORT

For

INGENICO

9 Avenue de la gare - Rovaltain TGV BP25156 26958 Valence Cedex 9, France

FCC ID: XKB-EXMBASEW1


Report Type: Original Report	Product Name: Smart POS Terminal BASE
Report Number:	XMDN210621-24581E-00B
Report Date:	2021-08-10
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TABLE OF CONTENTS

GENERAL INFORMATION.....	4
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	4
OBJECTIVE	4
TEST METHODOLOGY	4
MEASUREMENT UNCERTAINTY	5
TEST FACILITY	5
DECLARATIONS.....	5
SYSTEM TEST CONFIGURATION.....	6
DESCRIPTION OF TEST CONFIGURATION	6
EUT EXERCISE SOFTWARE	7
EQUIPMENT MODIFICATIONS	10
LOCAL SUPPORT EQUIPMENT LIST AND DETAILS	11
SUPPORT CABLE LIST AND DETAILS	11
BLOCK DIAGRAM OF TEST SETUP	12
SUMMARY OF TEST RESULTS.....	13
FCC §15.407 (f) & §1.1310 & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)	14
APPLICABLE STANDARD	14
FCC §15.203- ANTENNA REQUIREMENT.....	16
APPLICABLE STANDARD	16
ANTENNA CONNECTOR CONSTRUCTION	16
FCC §15.207(a)– CONDUCTED EMISSIONS.....	17
APPLICABLE STANDARD	17
EUT SETUP.....	17
EMI TEST RECEIVER SETUP.....	17
CORRECTED AMPLITUDE & MARGIN CALCULATION	18
TEST EQUIPMENT LIST AND DETAILS.....	18
TEST PROCEDURE	18
TEST DATA	19
FCC §15.209, §15.205 , §15.407(b) –UNWANTED EMISSION.....	21
APPLICABLE STANDARD	21
EUT SETUP.....	22
EMI TEST RECEIVER & SPECTRUM ANALYZER SETUP	23
TEST PROCEDURE	23
CORRECTED AMPLITUDE & MARGIN CALCULATION	24
TEST EQUIPMENT LIST AND DETAILS.....	25
TEST DATA	25
FCC §15.407(a)(e)–EMISSION BANDWIDTH AND OCCUPIED BANDWIDTH.....	50
APPLICABLE STANDARD	50
TEST EQUIPMENT LIST AND DETAILS.....	50
TEST PROCEDURE	50
TEST DATA	50
FCC §15.407(a) –MAXIMUM CONDUCTED OUTPUT POWER.....	95
APPLICABLE STANDARD	95
TEST EQUIPMENT LIST AND DETAILS.....	96

TEST PROCEDURE	96
TEST DATA	96
FCC §15.407(a) - POWER SPECTRAL DENSITY	99
APPLICABLE STANDARD	99
TEST PROCEDURE	100
TEST EQUIPMENT LIST AND DETAILS.....	100
TEST DATA	100

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:	Smart POS Terminal BASE
EUT Model:	AXIUM EX-MBASE-W1
Operation Frequency:	5180-5240 MHz (802.11a/n ht20/ac vht20) 5190-5230 MHz(802.11n ht40/ac vht40) 5210 MHz(802.11ac vht80) 5260-5320 MHz (802.11a/n ht20/ac vht20) 5270-5310 MHz(802.11n ht40/ac vht40) 5290 MHz(802.11ac vht80) 5500-5720 MHz (802.11a/n ht20/ac vht20) 5510-5710 MHz(802.11n ht40/ac vht40) 5530-5690 MHz(802.11ac vht80) 5745-5825 MHz (802.11a/n ht20/ac vht20) 5755-5795 MHz(802.11n ht40/ac vht40) 5775 MHz(802.11ac vht80)
Maximum Output Power (Conducted):	17.80 dBm/5.15-5.25GHz 17.55 dBm/5.25-5.35GHz 17.75 dBm /5.47-5.725GHz 17.81 dBm 5.725-5.85GHz
Antenna Gain ▲:	2.32 dBi/5.15-5.25GHz 3.58 dBi/5.25-5.35GHz 3.35 dBi/5.47-5.725GHz 2.63 dBi/5.725-5.85GHz
Modulation Type:	OFDM
Rated Input Voltage:	DC 12V from Adapter
Adapter Information	Model: PA-1041-81
	Input: 100-240Vac 50/60Hz 1.2A
	Output: 12Vdc 3.33A
Serial Number:	XMDN210621-24581E-RF-S1
EUT Received Date:	2021.06.21
EUT Received Status:	Good

Objective

This type approval report is prepared on behalf of **INGENICO** in accordance with Part 2-Subpart J, Part 15-Subparts A, and E of the Federal Communications Commission's rules.

The tests were performed in order to determine compliance with FCC Rules Part 15, Subpart E, section 15.203, 15.205, 15.207, 15.209 and 15.407 rules.

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 KDB 789033 D02 General U-NII Test Procedures New Rules v02r01.

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 °C
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.

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SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system support 802.11a/n ht20/n ht40/ac vht20/ac vht40/ac vht80, the vht20/vht40 were reduced since the identical parameters with 802.11n ht20 and ht40.

For 5150~5250 MHz band, 7 channels are provided:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220
38	5190	46	5230
40	5200	48	5240
42	5210	/	/

For 802.11a, 802.11n ht20, channel 36, 40 and 48 was tested, for 802.11n ht40, channel 38, 46 were tested, for 802.11ac vht80, channel 42 was tested.

For 5250~5350 MHz band, 7 channels are provided:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	5260	60	5300
54	5270	62	5310
56	5280	64	5320
58	5290	/	/

For 802.11a, 802.11n ht20, Channel 52, 56 and 64 were tested, for 802.11n ht40 Channel 54, 62 were tested, for 802.11ac vht80 channel 58 was tested.

For 5470~5725 MHz band, 21 channels are provided:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	116	5580	132	5660
102	5510	118	5590	134	5670
104	5520	120	5600	136	5680
106	5530	122	5610	138	5690
108	5540	124	5620	140	5700
110	5550	126	5630	142	5710
112	5560	128	5640	144	5720

For 802.11a, 802.11n ht20 Channel 100, 116 and 140 were tested, for 802.11n ht40 Channel 102, 110 and 134 were tested, for 802.11ac vht80 channel 106,122.

Channel 144 for 802.11a and n ht20, Channel 142 for 802.11n ht40, Channel 138 for 802.11ac vht80 crossed the band U-NII 2C to U-NII 3, were choose to test for compliance requirement.

For 5725~5850MHz band, 8 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	157	5785
151	5755	159	5795
153	5765	161	5805
155	5775	165	5825

For 802.11a, 802.11n ht20, channel 149, 157 and 165 was tested, for 802.11n ht40, channel 151, 159 were tested, for 802.11ac vht80, channel 155 was tested.

EUT Exercise Software

The software “RTL819X 3.6” was used for testing, which was provided by Manufacturer. 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 MIMO at 802.11n and ac mode, per pre-test, MIMO 2TX mode was the worst and reported. The maximum power was configured as below table, that provided by the Manufacturer▲:

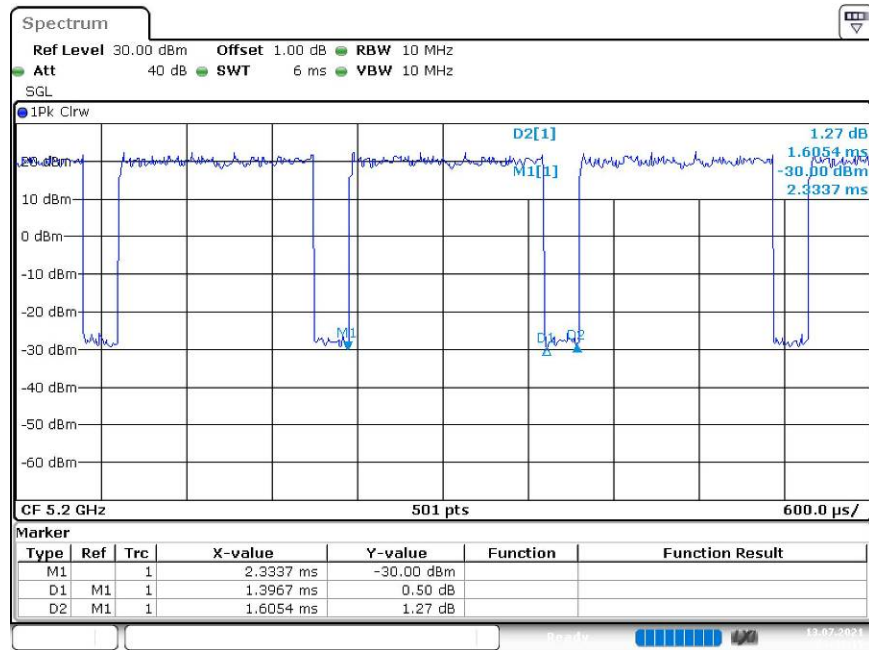
Band	Mode	Channel	Frequency (MHz)	Data rate	Power level Setting	
					Chain 0	Chain 1
5150 - 5250 MHz	802.11a	Low	5180	6Mbps	104	108
		Middle	5200	6Mbps	104	108
		High	5240	6Mbps	104	108
	802.11n ht20	Low	5180	MCS8	100	103
		Middle	5200	MCS8	100	103
		High	5240	MCS8	100	103
	802.11n ht40	Low	5190	MCS8	100	103
		High	5230	MCS8	100	103
	802.11ac vht80	Middle	5210	MCS8	104	108
5250-5350 MHz	802.11a	Low	5260	6Mbps	108	106
		Middle	5280	6Mbps	108	106
		High	5320	6Mbps	108	106
	802.11n ht20	Low	5260	MCS8	102	100
		Middle	5280	MCS8	102	100
		High	5320	MCS8	102	100
	802.11n ht40	Low	5270	MCS8	102	100
		High	5310	MCS8	102	100
	802.11ac vht80	Middle	5290	MCS8	102	100

Band	Mode	Channel	Frequency (MHz)	Data rate	Power level Setting	
					Chain 0	Chain 1
5470-5725	802.11a	Low	5500	6Mbps	98	98
		Middle	5580	6Mbps	98	98
		High	5700	6Mbps	94	94
		Additional	5720	6Mbps	94	94
	802.11n ht20	Low	5500	MCS8	100	100
		Middle	5580	MCS8	100	100
		High	5700	MCS8	100	100
		Additional	5720	MCS8	100	100
	802.11n ht40	Low	5510	MCS8	104	104
		Middle	5550	MCS8	104	104
		High	5670	MCS8	104	104
		Additional	5710	MCS8	104	104
802.11ac vht80	Low	5530	MCS8	100	100	
	Middle	5610	MCS8	100	100	
	Additional	5690	MCS8	100	100	
5725 - 5850 MHz	802.11a	Low	5745	6Mbps	107	108
		Middle	5785	6Mbps	107	108
		High	5825	6Mbps	107	108
	802.11n ht20	Low	5745	MCS8	101	101
		Middle	5785	MCS8	101	101
		High	5825	MCS8	101	98
	802.11n ht40	Low	5755	MCS8	101	101
		High	5795	MCS8	101	101
	802.11ac vht80	Middle	5775	MCS8	98	98

The duty cycle as below:

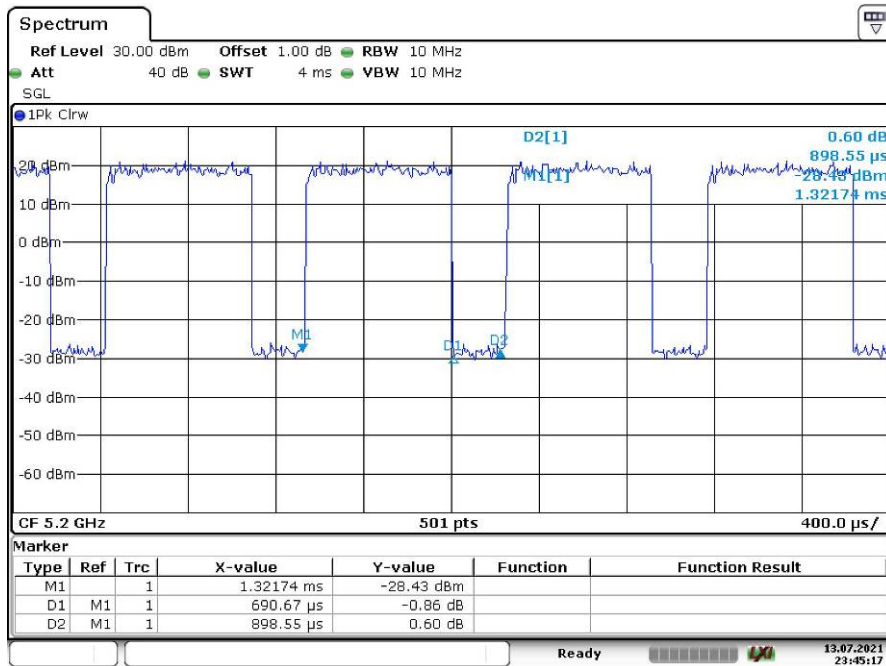
Mode	T _{on} (ms)	T _{on+off} (ms)	Duty Cycle (%)
802.11 a	1.397	1.605	87.04
802.11n ht20	0.691	0.899	76.86
802.11n ht40	0.36	0.602	59.80
802.11ac vht80	0.078	0.317	24.61

802.11a



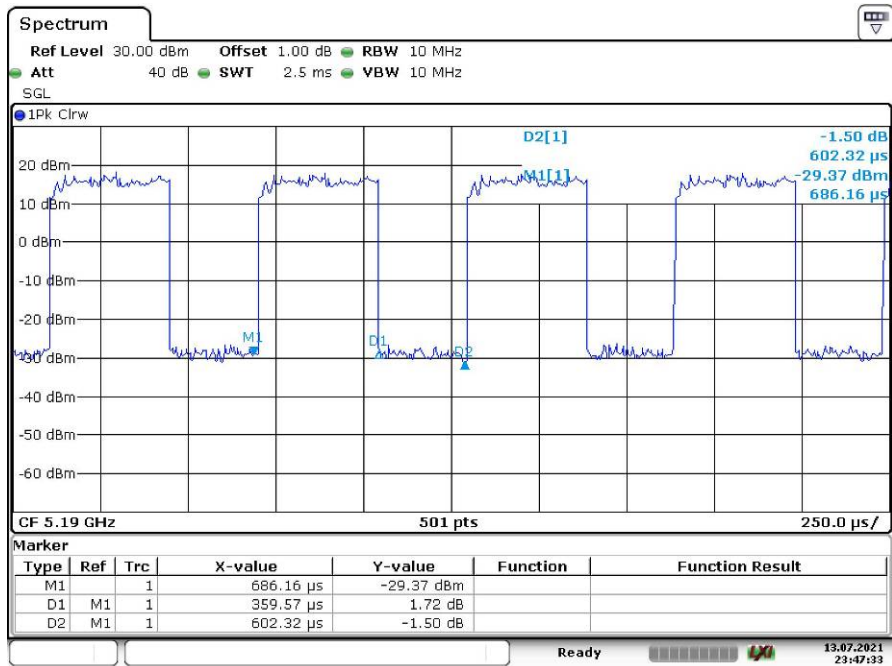
Date: 13.JUL.2021 23:43:15

802.11n ht20



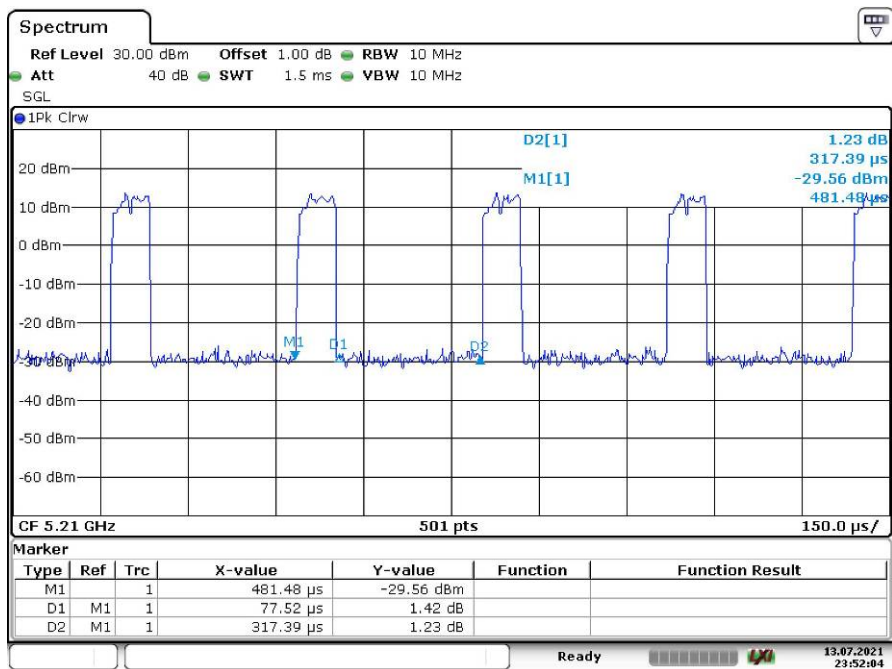
Date: 13.JUL.2021 23:45:17

802.11n ht40



Date: 13.JUL.2021 23:47:33

802.11ac vht80



Date: 13.JUL.2021 23:52:04

Equipment Modifications

No modification was made to the EUT.

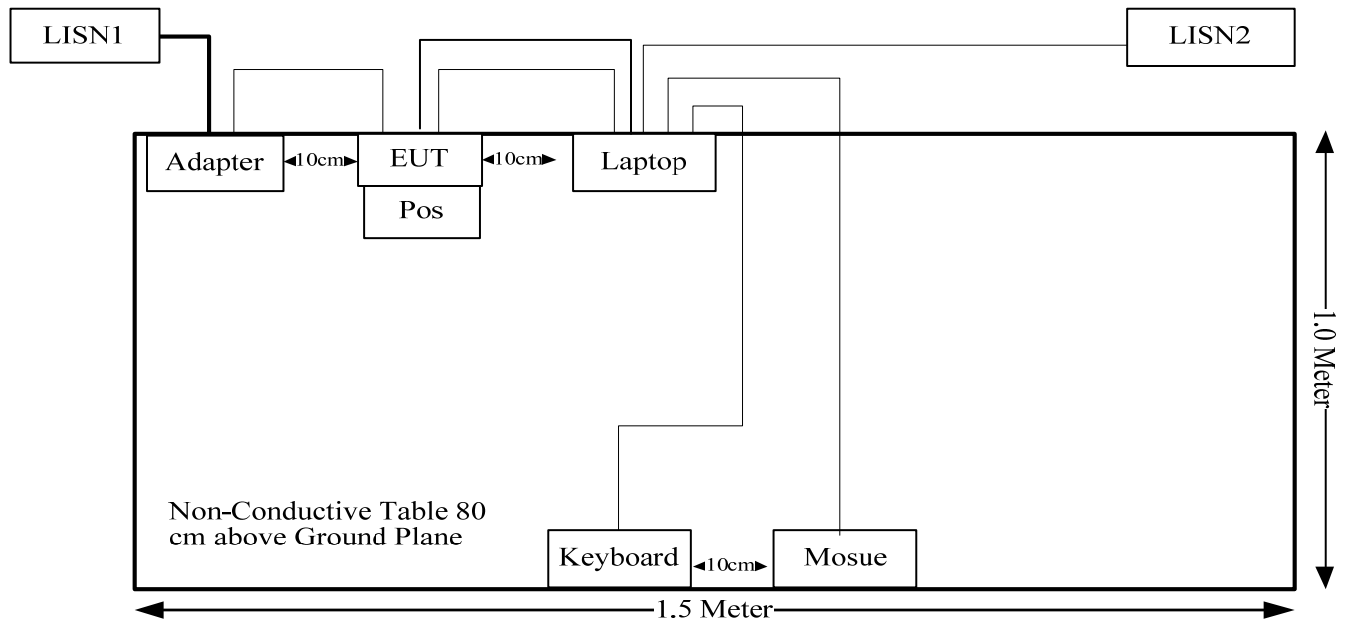
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
DELL	Laptop	PP11L	QDS-BRCM1017
ingenico	POS	EX8000	2142AU800360
ingenico	POS	EX8000	2142AU800361
ingenico	POS	EX8000	2142AU800365
ingenico	POS	EX8000	2142AU800363
ingenico	POS	EX8000	2142AU800364
DELL	Mouse	MO56UOA	F0Y02PTY
DELL	Keyboard	L100	CNORH656658907BL05DC
D-Link	Router	DGS-1100-08PD	S01Z1H000012

Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
RJ45 Cable	Yes	No	1.2	EUT	Laptop
USB Cable	Yes	No	1.5	EUT	Laptop
USB Cable	No	No	1.5	Laptop	Keyboard
USB Cable	No	No	1.5	Laptop	Mouse
DC Cable	No	Yes	1.5	Adapter	EUT

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

Rules	Description of Test	Result
FCC §15.407 (f) & §1.1310 & §2.1091	Maximum Permissible Exposure (MPE)	Compliance
FCC§15.203	Antenna Requirement	Compliance
FCC§15.407(b)(6)& §15.207(a)	Conducted Emissions	Compliance
FCC§15.205& §15.209 &§15.407(b)	Undesirable Emission& Restricted Bands	Compliance
FCC§15.407(b)	Out Of Band Emissions	Compliance
FCC§15.407(a) (e)	Emission Bandwidth	Compliance
FCC§15.407(a)	Conducted Transmitter Output Power	Compliance
FCC§15.407 (a)	Power Spectral Density	Compliance

FCC §15.407 (f) & §1.1310 & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.407(f) and subpart §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission’s guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm²)	Averaging Time (minutes)
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f ²)	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

f = frequency in MHz; * = Plane-wave equivalent power density;

According to §1.1310 and §2.1091 RF exposure is calculated.

Calculation formula:

Prediction of power density at the distance of the applicable MPE limit

S = PG/4πR² = power density (in appropriate units, e.g. mW/cm²);

P = power input to the antenna (in appropriate units, e.g., mW);

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain Factor, is normally numeric gain;

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

Calculated Data:

Mode	Frequency (MHz)	Antenna Gain		Conducted output power including Tune-up Tolerance		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
		(dBi)	(numeric)	(dBm)	(mW)			
WLAN	2412-2462	2.36	1.72	21	125.89	20.00	0.04	1.0
WLAN	5150-5850	3.58	2.28	18	63.10	20.00	0.03	1.0

The WLAN 2.4G and 5G can transmit simultaneously:

$$\sum_i \frac{S_i}{S_{Limit,i}}$$

$$=S_{2.4}/S_{limit-2.4} + S_5/S_{limit-5}$$

$$=0.04/1+0.03/1$$

$$=0.07$$

$$< 1.0$$

Result: The device meet FCC MPE at **20 cm** distance

FCC §15.203- ANTENNA REQUIREMENT

Applicable Standard

According to FCC§ 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.

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

Antenna Connector Construction

The EUT has 2 internal antennas for 2.4G WLAN and 2 internal antennas for 5G WLAN, which was permanently attached to the unit, fulfill the requirement of this section. Please refer to the EUT photos and below information:

Antenna	Antenna Type	input impedance (Ohm)	Antenna Gain /Frequency Range
2.4G Chain 0	FPC	50	2.36 dBi/2.4-2.5GHz
2.4G Chain 1	FPC	50	2.36 dBi/2.4-2.5GHz
5G Chain 0	FPC	50	2.32 dBi/5.15-5.25GHz 3.58 dBi/5.25-5.35GHz 3.35 dBi/5.47-5.725GHz 2.63 dBi/5.725-5.85GHz
5G Chain 1	FPC	50	2.32 dBi/5.15-5.25GHz 3.58 dBi/5.25-5.35GHz 3.35 dBi/5.47-5.725GHz 2.63 dBi/5.725-5.85GHz

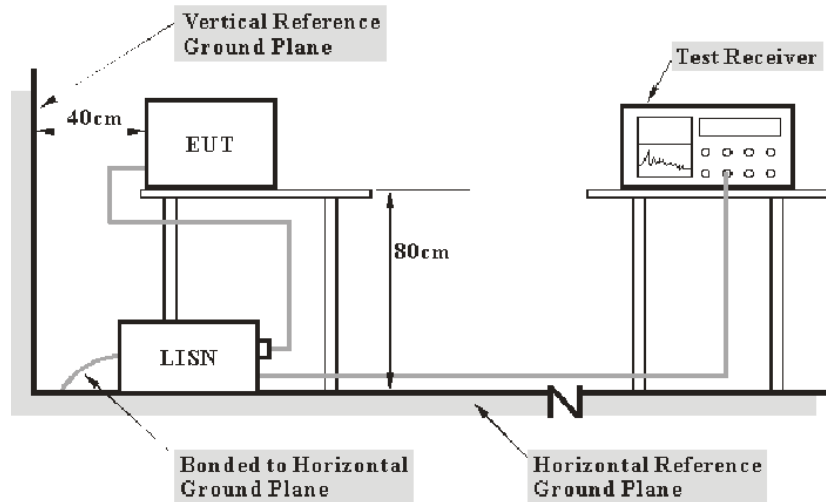
Result: Compliance.

FCC §15.207(a)– CONDUCTED EMISSIONS

Applicable Standard

FCC §15.207(a), §15.407(b) (6).

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 limits.

The spacing between the peripherals was 10 cm.

The adapter was connected to the main lisen 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

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:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	LISN	ENV 216	101614	2020-09-12	2021-09-12
R&S	EMI Test Receiver	ESCI	101121	2020-07-07	2021-07-07
MICRO-COAX	Coaxial Cable	C-NJNJ-50	C-0200-01	2020-09-05	2021-09-05
R&S	Test Software	EMC32	Version 9.10.00	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 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.

Test Data

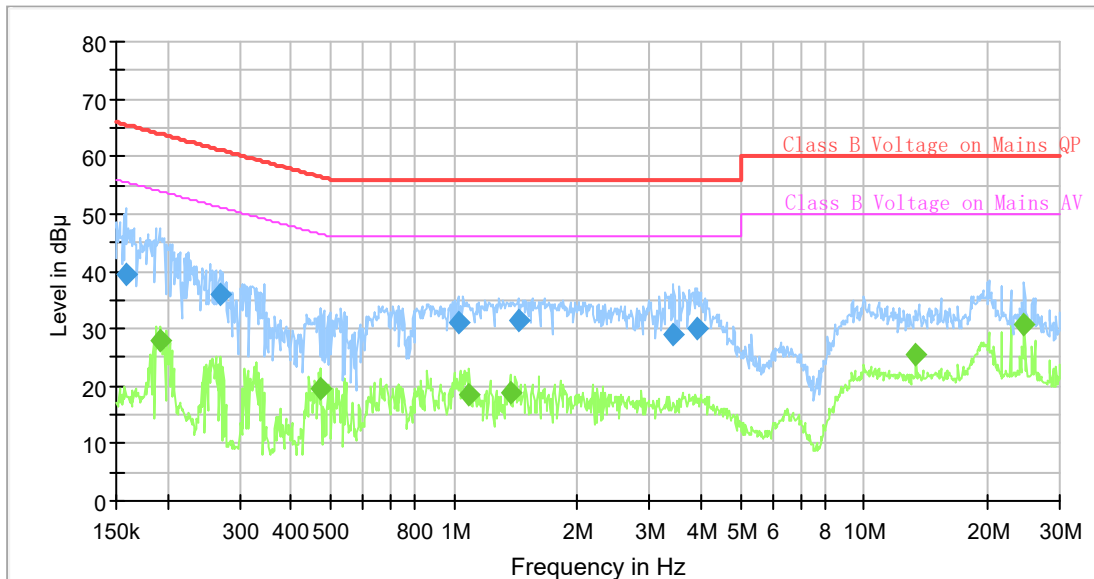
Environmental Conditions

Temperature:	25.8°C
Relative Humidity:	71%
ATM Pressure:	100.4kPa
Tester:	Walker Chen
Test Date:	2021-06-29

Test Result: Compliance.

Test Mode: Transmitting (802.11a 5200MHz chain 1 was the worst)

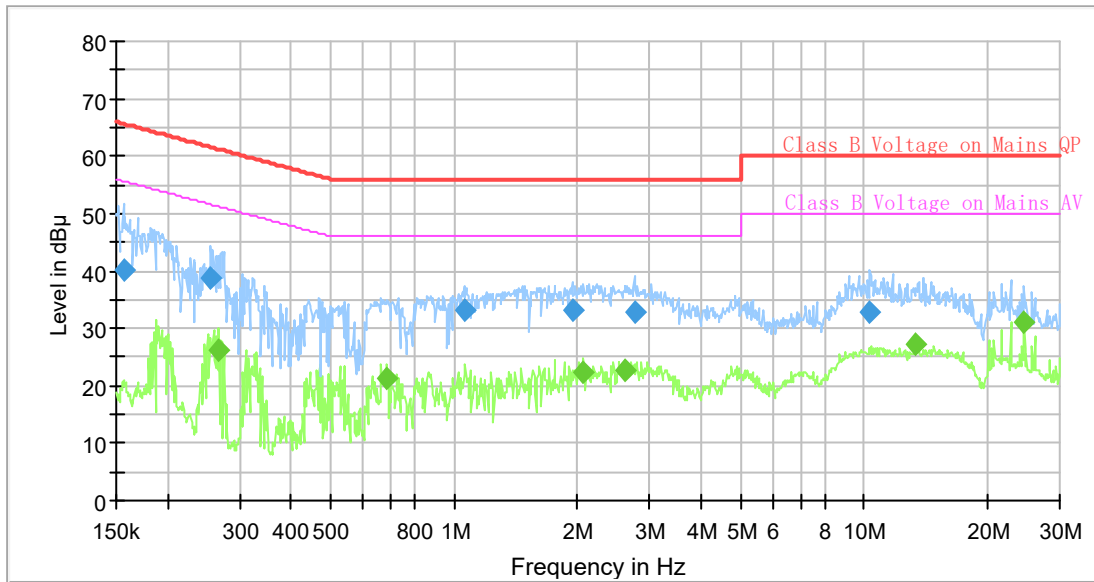
AC120 V, 60 Hz, Line:



Final Result

Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Limit (dB μ V)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.158459	39.39	---	65.54	26.15	9.000	L1	9.6
0.192484	---	27.90	53.93	26.03	9.000	L1	9.6
0.270201	36.06	---	61.11	25.05	9.000	L1	9.6
0.472373	---	19.69	46.47	26.78	9.000	L1	9.6
1.023352	31.26	---	56.00	24.74	9.000	L1	9.7
1.091902	---	18.42	46.00	27.58	9.000	L1	9.7
1.373481	---	18.95	46.00	27.05	9.000	L1	9.7
1.436538	31.40	---	56.00	24.60	9.000	L1	9.7
3.421464	29.11	---	56.00	26.89	9.000	L1	9.7
3.895198	30.16	---	56.00	25.84	9.000	L1	9.7
13.418776	---	25.59	50.00	24.41	9.000	L1	10.1
24.536148	---	30.73	50.00	19.27	9.000	L1	10.0

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)
0.156106	40.17	---	65.67	25.50	9.000	N	9.6
0.255776	38.63	---	61.57	22.94	9.000	N	9.6
0.267519	---	26.35	51.19	24.84	9.000	N	9.6
0.686657	---	21.31	46.00	24.69	9.000	N	9.6
1.059711	33.18	---	56.00	22.82	9.000	N	9.6
1.947363	33.15	---	56.00	22.85	9.000	N	9.6
2.067473	---	22.22	46.00	23.78	9.000	N	9.6
2.626701	---	22.54	46.00	23.46	9.000	N	9.6
2.761031	32.81	---	56.00	23.19	9.000	N	9.6
10.353274	32.70	---	60.00	27.30	9.000	N	9.7
13.418776	---	27.32	50.00	22.68	9.000	N	9.8
24.536148	---	30.93	50.00	19.07	9.000	N	9.9

FCC §15.209, §15.205 , §15.407(b) –UNWANTED EMISSION

Applicable Standard

FCC §15.407; §15.209; §15.205;

(b) Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(4) For transmitters operating in the 5.725-5.85 GHz band:

(i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

(ii) Devices certified before March 2, 2017 with antenna gain greater than 10 dBi may demonstrate compliance with the emission limits in §15.247(d), but manufac vhturing, marketing and importing of devices certified under this alternative must cease by March 2, 2018. Devices certified before March 2, 2018 with antenna gain of 10 dBi or less may demonstrate compliance with the emission limits in §15.247(d), but manufac vhturing, marketing and importing of devices certified under this alternative must cease before March 2, 2020.

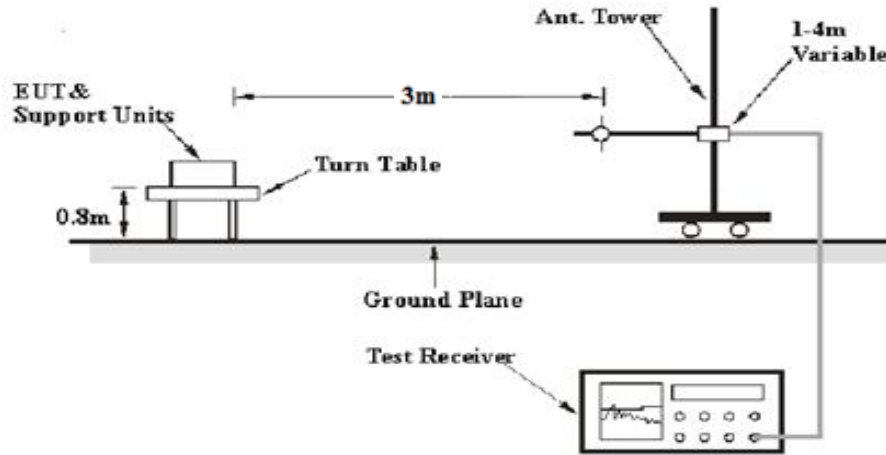
(5) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

(6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

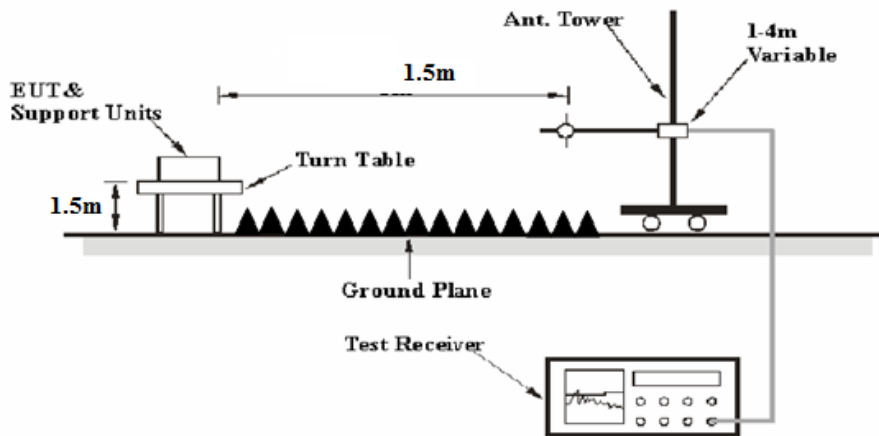
(7) The provisions of §15.205 apply to intentional radiators operating under this section.

EUT Setup

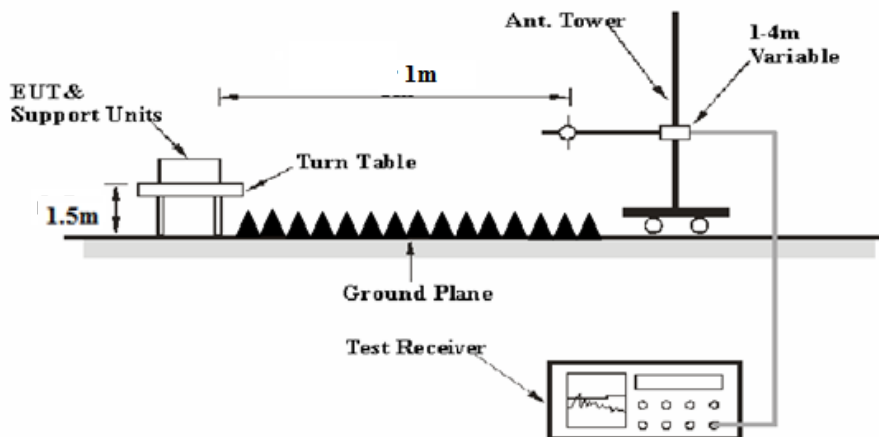
Below 1 GHz:



1-26.5 GHz:



26.5-40 GHz:



The radiated emission Below 1GHz tests were performed in the 10 meters chamber test site, above 1GHz tests were performed in the 3 meters chamber test site A, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.407 limits.

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

The spacing between the peripherals was 10 cm.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 40 GHz.

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

30-1000MHz:

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

1GHz- 40GHz:

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

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

During the radiated emission test, the adapter was connected to the first AC floor outlet.

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

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, emission shall be computed as: $E [dB\mu V/m] = EIRP[dBm] + 95.2$, for $d = 3$ meters.

According to C63.10, the above 1G test result shall be extrapolated to the specified distance using an extrapolation Factor of 20dB/decade from 3m to 1.5m or 1m

Distance extrapolation Factor = $20 \log (\text{specific distance } [3m]/\text{test distance } [1.5m])$ dB= 6.02 dB

or

Distance extrapolation Factor = $20 \log (\text{specific distance } [3m]/\text{test distance } [1m])$ dB= 9.54 dB

All emissions under the average limit and under the noise floor have not recorded in the report.

Corrected Amplitude & Margin Calculation

For the range 30MHz-1GHz, the Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

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:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

For the range 1GHz-40GHz, Test performed at 1.5m or 1m, the Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading and the Distance extrapolation Factor. The basic equation is as follows:

$$\begin{aligned} &\text{Corrected Amplitude} \\ &= \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} - \text{Distance extrapolation factor} \end{aligned}$$

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

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiation Below 1GHz Test					
Sunol Sciences	Antenna	JB3	A060611-2	2020-08-25	2023-08-25
R&S	EMI Test Receiver	ESCI	100224	2020-09-12	2021-09-12
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-02	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0530-01	2020-09-24	2021-09-24
Sonoma	Amplifier	310N	185914	2020-10-13	2021-10-13
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
Radiation Above 1GHz Test					
ETS-Lindgren	Horn Antenna	3115	9912-5985	2020-10-13	2023-10-12
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-01 1304	2020-12-05	2023-12-04
Ducommun Technologies	Horn Antenna	ARH-2823-02	1007726-01 1302	2020-12-05	2023-12-04
R&S	Spectrum Analyzer	FSP 38	100478	2020-07-07	2021-07-07
Agilent	Spectrum Analyzer	E4440A	MY44303352	2021-04-25	2022-04-24
HUBER+SUHNER	Coaxial Cable	SUCOFLEX 126EA	MY369/26/26E A	2020-09-25	2021-09-25
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2020-09-05	2021-09-05
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2021-06-27	2022-06-26
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
Sinoscite	Bandstop Filters	BSF5150-5850MN- 0899-003	0899003	2021-05-06	2022-05-06
Mini Circuits	High Pass Filter	VHF-6010+	31118	2021-06-16	2022-06-16

* **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

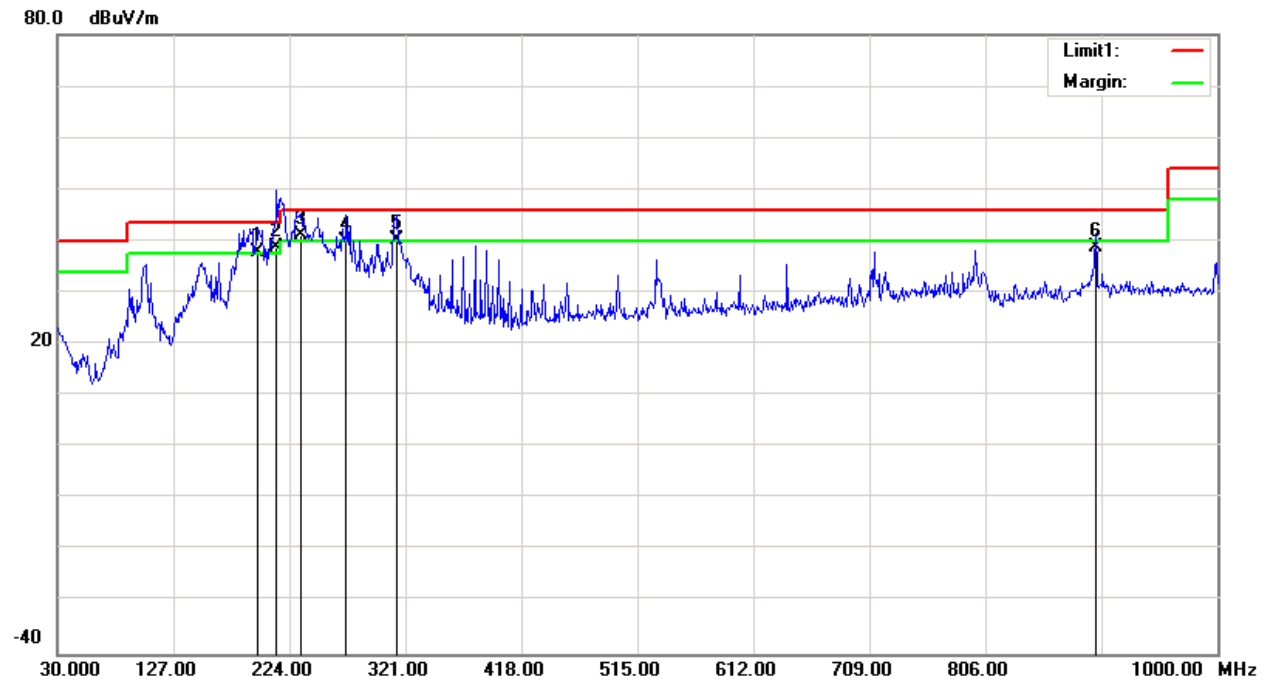
Test Items	Radiation Below 1GHz	Radiation Above 1GHz
Temperature:	26.2°C	26.1 °C
Relative Humidity:	56 %	43 %
ATM Pressure:	100.3kPa	100.1kPa
Tester:	Burt Hu	Alex Hu, Joker Chen
Test Date:	2021-07-13	2021-07-17

Test Mode: Transmitting

Note: 2.4GHz and 5 GHz radios can transmit simultaneously, per pretest, no additional emission was created when simultaneous transmitting.

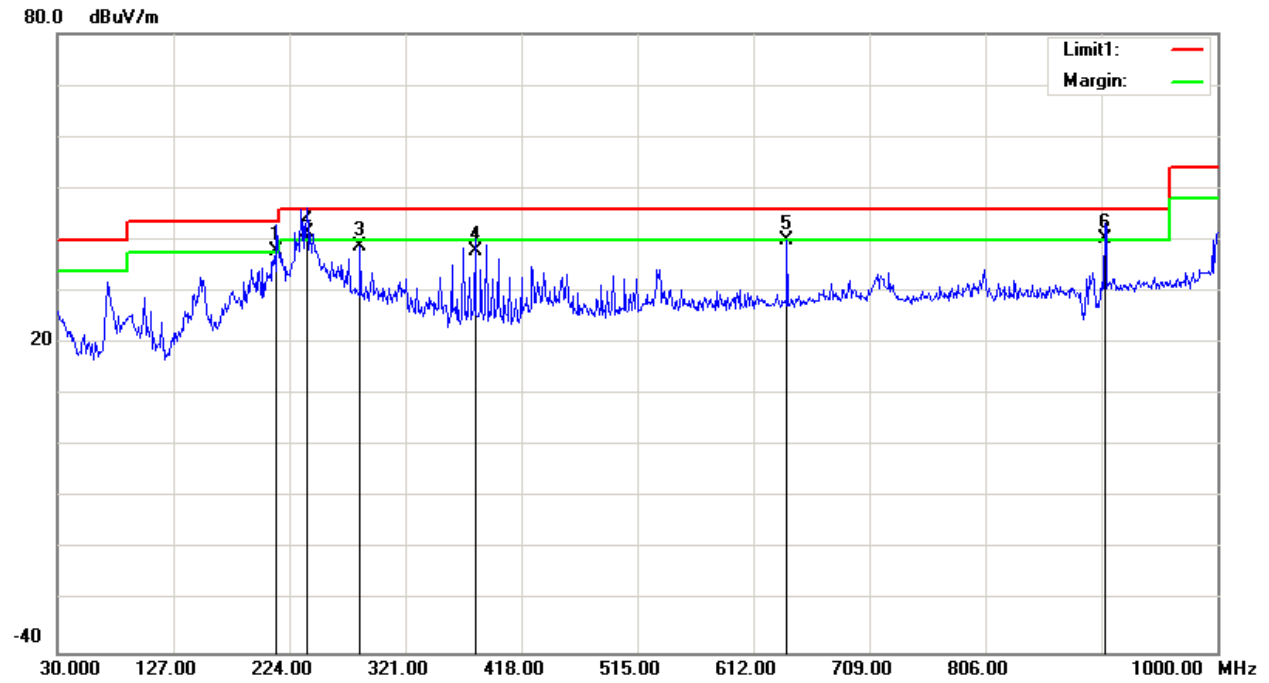
1) Below 1GHz(802.11a chain 0 5745 MHz was the worst):

Horizontal:



Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
197.8100	47.58	QP	-9.58	38.00	43.50	5.50
213.3300	49.94	QP	-11.14	38.80	43.50	4.70
233.7000	51.34	QP	-10.24	41.10	46.00	4.90
271.5300	48.60	QP	-8.60	40.00	46.00	6.00
314.2100	47.22	QP	-7.02	40.20	46.00	5.80
898.1500	35.50	QP	3.40	38.90	46.00	7.10

Vertical:



Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
213.3300	49.14	QP	-11.14	38.00	43.50	5.50
238.5500	51.56	QP	-10.06	41.50	46.00	4.50
283.1700	47.06	peak	-8.43	38.63	46.00	7.37
379.2000	43.87	QP	-5.87	38.00	46.00	8.00
640.1300	40.66	peak	-0.79	39.87	46.00	6.13
905.9100	36.67	QP	3.53	40.20	46.00	5.80

2) 1GHz-40GHz:
5150-5250MHz
802.11a, Chain 0

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dB μ V/m)	Extrapolation result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
	Reading (dB μ V)	Detector	Polar (H/V)	Factor (dB/m)						
Low Channel: 5180 MHz										
5180.00	70.35	PK	H	33.52	4.71	0.00	108.58	102.56	N/A	N/A
5180.00	60.80	AV	H	33.52	4.71	0.00	99.03	93.01	N/A	N/A
5180.00	75.24	PK	V	33.52	4.71	0.00	113.47	107.45	N/A	N/A
5180.00	65.45	AV	V	33.52	4.71	0.00	103.68	97.66	N/A	N/A
5150.00	29.19	PK	V	33.47	4.70	0.00	67.36	61.34	74.00	12.66
5150.00	17.08	AV	V	33.47	4.70	0.00	55.25	49.23	54.00	4.77
10360.00	37.19	PK	V	37.93	6.91	26.86	55.17	49.15	68.20	19.05
15540.00	36.46	PK	V	37.96	8.39	25.66	57.15	51.13	74.00	22.87
15540.00	23.24	AV	V	37.96	8.39	25.66	43.93	37.91	54.00	16.09
Middle Channel: 5200 MHz										
5200.00	69.72	PK	H	33.56	4.71	0.00	107.99	101.97	N/A	N/A
5200.00	59.89	AV	H	33.56	4.71	0.00	98.16	92.14	N/A	N/A
5200.00	74.24	PK	V	33.56	4.71	0.00	112.51	106.49	N/A	N/A
5200.00	64.77	AV	V	33.56	4.71	0.00	103.04	97.02	N/A	N/A
10400.00	37.68	PK	V	37.92	6.92	26.84	55.68	49.66	68.20	18.54
15600.00	36.79	PK	V	37.90	8.43	25.97	57.15	51.13	74.00	22.87
15600.00	23.37	AV	V	37.90	8.43	25.97	43.73	37.71	54.00	16.29
High Channel: 5240 MHz										
5240.00	68.68	PK	H	33.63	4.75	0.00	107.06	101.04	N/A	N/A
5240.00	58.95	AV	H	33.63	4.75	0.00	97.33	91.31	N/A	N/A
5240.00	73.25	PK	V	33.63	4.75	0.00	111.63	105.61	N/A	N/A
5240.00	63.23	AV	V	33.63	4.75	0.00	101.61	95.59	N/A	N/A
5350.00	27.49	PK	V	33.83	4.84	0.00	66.16	60.14	74.00	13.86
5350.00	16.64	AV	V	33.83	4.84	0.00	55.31	49.29	54.00	4.71
10480.00	37.99	PK	V	37.90	6.94	27.02	55.81	49.79	68.20	18.41
15720.00	36.81	PK	V	37.78	8.51	25.68	57.42	51.4	74.00	22.60
15720.00	23.39	AV	V	37.78	8.51	25.68	44.00	37.98	54.00	16.02

Chain 1

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Extrapolation result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector	Polar (H/V)	Factor (dB/m)						
Low Channel: 5180 MHz										
5180.00	69.32	PK	H	33.52	4.71	0.00	107.55	101.53	N/A	N/A
5180.00	59.57	AV	H	33.52	4.71	0.00	97.80	91.78	N/A	N/A
5180.00	75.87	PK	V	33.52	4.71	0.00	114.10	108.08	N/A	N/A
5180.00	66.32	AV	V	33.52	4.71	0.00	104.55	98.53	N/A	N/A
5150.00	29.97	PK	V	33.47	4.70	0.00	68.14	62.12	74.00	11.88
5150.00	17.29	AV	V	33.47	4.70	0.00	55.46	49.44	54.00	4.56
10360.00	36.79	PK	V	37.93	6.91	26.86	54.77	48.75	68.20	19.45
15540.00	36.72	PK	V	37.96	8.39	25.66	57.41	51.39	74.00	22.61
15540.00	23.32	AV	V	37.96	8.39	25.66	44.01	37.99	54.00	16.01
Middle Channel: 5200 MHz										
5200.00	68.83	PK	H	33.56	4.71	0.00	107.10	101.08	N/A	N/A
5200.00	59.28	AV	H	33.56	4.71	0.00	97.55	91.53	N/A	N/A
5200.00	75.47	PK	V	33.56	4.71	0.00	113.74	107.72	N/A	N/A
5200.00	65.77	AV	V	33.56	4.71	0.00	104.04	98.02	N/A	N/A
10400.00	37.64	PK	V	37.92	6.92	26.84	55.64	49.62	68.20	18.58
15600.00	36.82	PK	V	37.90	8.43	25.97	57.18	51.16	74.00	22.84
15600.00	23.41	AV	V	37.90	8.43	25.97	43.77	37.75	54.00	16.25
High Channel: 5240 MHz										
5240.00	70.29	PK	H	33.63	4.75	0.00	108.67	102.65	N/A	N/A
5240.00	60.67	AV	H	33.63	4.75	0.00	99.05	93.03	N/A	N/A
5240.00	76.71	PK	V	33.63	4.75	0.00	115.09	109.07	N/A	N/A
5240.00	66.94	AV	V	33.63	4.75	0.00	105.32	99.3	N/A	N/A
5350.00	28.40	PK	V	33.83	4.84	0.00	67.07	61.05	74.00	12.95
5350.00	16.86	AV	V	33.83	4.84	0.00	55.53	49.51	54.00	4.49
10480.00	37.89	PK	V	37.90	6.94	27.02	55.71	49.69	68.20	18.51
15720.00	36.89	PK	V	37.78	8.51	25.68	57.50	51.48	74.00	22.52
15720.00	23.45	AV	V	37.78	8.51	25.68	44.06	38.04	54.00	15.96

802.11n ht20(2Tx mode was the worst):

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Extrapolation result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector	Polar (H/V)	Factor (dB/m)						
Low Channel: 5180 MHz										
5180.00	68.12	PK	H	33.52	4.71	0.00	106.35	100.33	N/A	N/A
5180.00	56.80	AV	H	33.52	4.71	0.00	95.03	89.01	N/A	N/A
5180.00	75.67	PK	V	33.52	4.71	0.00	113.90	107.88	N/A	N/A
5180.00	64.32	AV	V	33.52	4.71	0.00	102.55	96.53	N/A	N/A
5150.00	28.72	PK	V	33.47	4.70	0.00	66.89	60.87	74.00	13.13
5150.00	16.86	AV	V	33.47	4.70	0.00	55.03	49.01	54.00	4.99
10360.00	37.54	PK	V	37.93	6.91	26.86	55.52	49.5	68.20	18.70
15540.00	36.64	PK	V	37.96	8.39	25.66	57.33	51.31	74.00	22.69
15540.00	23.37	AV	V	37.96	8.39	25.66	44.06	38.04	54.00	15.96
Middle Channel: 5200 MHz										
5200.00	66.71	PK	H	33.56	4.71	0.00	104.98	98.96	N/A	N/A
5200.00	55.12	AV	H	33.56	4.71	0.00	93.39	87.37	N/A	N/A
5200.00	74.49	PK	V	33.56	4.71	0.00	112.76	106.74	N/A	N/A
5200.00	63.30	AV	V	33.56	4.71	0.00	101.57	95.55	N/A	N/A
10400.00	37.49	PK	V	37.92	6.92	26.84	55.49	49.47	68.20	18.73
15600.00	36.71	PK	V	37.90	8.43	25.97	57.07	51.05	74.00	22.95
15600.00	23.39	AV	V	37.90	8.43	25.97	43.75	37.73	54.00	16.27
High Channel: 5240 MHz										
5240.00	68.60	PK	H	33.63	4.75	0.00	106.98	100.96	N/A	N/A
5240.00	57.18	AV	H	33.63	4.75	0.00	95.56	89.54	N/A	N/A
5240.00	76.05	PK	V	33.63	4.75	0.00	114.43	108.41	N/A	N/A
5240.00	64.77	AV	V	33.63	4.75	0.00	103.15	97.13	N/A	N/A
5350.00	28.88	PK	V	33.83	4.84	0.00	67.55	61.53	74.00	12.47
5350.00	16.68	AV	V	33.83	4.84	0.00	55.35	49.33	54.00	4.67
10480.00	37.62	PK	V	37.90	6.94	27.02	55.44	49.42	68.20	18.78
15720.00	36.67	PK	V	37.78	8.51	25.68	57.28	51.26	74.00	22.74
15720.00	23.46	AV	V	37.78	8.51	25.68	44.07	38.05	54.00	15.95

802.11n ht40(2Tx mode was the worst)::

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector	Polar (H/V)	Factor (dB/m)						
Low Channel: 5190 MHz										
5190.00	65.20	PK	H	33.54	4.71	0.00	103.45	97.43	N/A	N/A
5190.00	54.32	AV	H	33.54	4.71	0.00	92.57	86.55	N/A	N/A
5190.00	73.42	PK	V	33.54	4.71	0.00	111.67	105.65	N/A	N/A
5190.00	62.42	AV	V	33.54	4.71	0.00	100.67	94.65	N/A	N/A
5150.00	33.86	PK	V	33.47	4.70	0.00	72.03	66.01	74.00	7.99
5150.00	20.02	AV	V	33.47	4.70	0.00	58.19	52.17	54.00	1.83
10380.00	37.72	PK	V	37.92	6.92	26.85	55.71	49.69	68.20	18.51
15570.00	36.58	PK	V	37.93	8.41	25.82	57.10	51.08	74.00	22.92
15570.00	23.46	AV	V	37.93	8.41	25.82	43.98	37.96	54.00	16.04
High Channel: 5230 MHz										
5230.00	64.93	PK	H	33.61	4.74	0.00	103.28	97.26	N/A	N/A
5230.00	54.04	AV	H	33.61	4.74	0.00	92.39	86.37	N/A	N/A
5230.00	73.25	PK	V	33.61	4.74	0.00	111.60	105.58	N/A	N/A
5230.00	62.39	AV	V	33.61	4.74	0.00	100.74	94.72	N/A	N/A
5350.00	28.44	PK	V	33.83	4.84	0.00	67.11	61.09	74.00	12.91
5350.00	16.55	AV	V	33.83	4.84	0.00	55.22	49.2	54.00	4.80
10460.00	37.64	PK	V	37.91	6.93	26.98	55.50	49.48	68.20	18.72
15690.00	36.53	PK	V	37.81	8.49	25.71	57.12	51.1	74.00	22.90
15690.00	23.38	AV	V	37.81	8.49	25.71	43.97	37.95	54.00	16.05

802.11ac vht80(2Tx mode was the worst)::

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (Db)	Amplifier Gain (Db)	Corrected Amplitude (dBμV/m)	Extrapolation result (dBμV/m)	Limit (dBμV/m)	Margin (Db)
	Reading (dBμV)	Detector	Polar (H/V)	Factor (Db/m)						
Middle Channel: 5210 MHz										
5210.00	63.29	PK	H	33.58	4.72	0.00	101.59	95.57	N/A	N/A
5210.00	52.22	AV	H	33.58	4.72	0.00	90.52	84.5	N/A	N/A
5210.00	71.59	PK	V	33.58	4.72	0.00	109.89	103.87	N/A	N/A
5210.00	60.63	AV	V	33.58	4.72	0.00	98.93	92.91	N/A	N/A
5150.00	34.45	PK	V	33.47	4.70	0.00	72.62	66.6	74.00	7.40
5150.00	20.81	AV	V	33.47	4.70	0.00	58.98	52.96	54.00	1.04
5350.00	28.88	PK	V	33.83	4.84	0.00	67.55	61.53	74.00	12.47
5350.00	16.71	AV	V	33.83	4.84	0.00	55.38	49.36	54.00	4.64
10420.00	37.51	PK	V	37.92	6.93	26.89	55.47	49.45	68.20	18.75
15630.00	36.48	PK	V	37.87	8.45	25.88	56.92	50.9	74.00	23.10
15630.00	23.35	AV	V	37.87	8.45	25.88	43.79	37.77	54.00	16.23

**5250-5350MHz:
802.11a, Chain 0:**

Frequency MHz	Receiver		Rx Antenna		Cable loss dB	Amplifier Gain dB	Corrected Amplitude dBµV/m	Extrapolation result dBµV/m	Limit dBµV/m	Margin dB
	Reading dBµV	Detector PK/QP/AV	Polar H/V	Factor dB/m						
Low Channel: 5260 MHz										
5260.00	69.35	PK	H	33.67	4.76	0.00	107.78	101.76	N/A	N/A
5260.00	59.64	AV	H	33.67	4.76	0.00	98.07	92.05	N/A	N/A
5260.00	74.51	PK	V	33.67	4.76	0.00	112.94	106.92	N/A	N/A
5260.00	64.90	AV	V	33.67	4.76	0.00	103.33	97.31	N/A	N/A
5150.00	29.28	PK	V	33.47	4.70	0.00	67.45	61.43	74.00	12.57
5150.00	16.67	AV	V	33.47	4.70	0.00	54.84	48.82	54.00	5.18
10520.00	37.17	PK	V	37.92	6.94	27.04	54.99	48.97	68.20	19.23
15780.00	36.10	PK	V	37.72	8.55	25.69	56.68	50.66	74.00	23.34
15780.00	23.15	AV	V	37.72	8.55	25.69	43.73	37.71	54.00	16.29
Middle Channel: 5280 MHz										
5280.00	69.20	PK	H	33.70	4.78	0.00	107.68	101.66	N/A	N/A
5280.00	59.59	AV	H	33.70	4.78	0.00	98.07	92.05	N/A	N/A
5280.00	74.46	PK	V	33.70	4.78	0.00	112.94	106.92	N/A	N/A
5280.00	65.03	AV	V	33.70	4.78	0.00	103.51	97.49	N/A	N/A
10560.00	37.09	PK	V	37.95	6.94	26.97	55.01	48.99	68.20	19.21
15840.00	36.15	PK	V	37.66	8.59	25.67	56.73	50.71	74.00	23.29
15840.00	23.17	AV	V	37.66	8.59	25.67	43.75	37.73	54.00	16.27
High Channel: 5320 MHz										
5320.00	67.79	PK	H	33.78	4.81	0.00	106.38	100.36	N/A	N/A
5320.00	57.99	AV	H	33.78	4.81	0.00	96.58	90.56	N/A	N/A
5320.00	73.23	PK	V	33.78	4.81	0.00	111.82	105.8	N/A	N/A
5320.00	63.68	AV	V	33.78	4.81	0.00	102.27	96.25	N/A	N/A
5350.00	29.32	PK	V	33.83	4.84	0.00	67.99	61.97	74.00	12.03
5350.00	17.00	AV	V	33.83	4.84	0.00	55.67	49.65	54.00	4.35
10640.00	37.34	PK	V	38.01	6.94	26.95	55.34	49.32	74.00	24.68
10640.00	25.41	AV	V	38.01	6.94	26.95	43.41	37.39	54.00	16.61
15960.00	36.55	PK	V	37.54	8.67	25.71	57.05	51.03	74.00	22.97
15960.00	23.41	AV	V	37.54	8.67	25.71	43.91	37.89	54.00	16.11

Chain 1:

Frequency MHz	Receiver		Rx Antenna		Cable loss dB	Amplifier Gain dB	Corrected Amplitude dBµV/m	Extrapolation result dBµV/m	Limit dBµV/m	Margin dB
	Reading dBµV	Detector PK/QP/AV	Polar H/V	Factor dB/m						
Low Channel: 5260 MHz										
5260.00	70.97	PK	H	33.67	4.76	0.00	109.40	103.38	N/A	N/A
5260.00	61.53	AV	H	33.67	4.76	0.00	99.96	93.94	N/A	N/A
5260.00	77.07	PK	V	33.67	4.76	0.00	115.50	109.48	N/A	N/A
5260.00	67.51	AV	V	33.67	4.76	0.00	105.94	99.92	N/A	N/A
5150.00	28.88	PK	V	33.47	4.70	0.00	67.05	61.03	74.00	12.97
5150.00	16.47	AV	V	33.47	4.70	0.00	54.64	48.62	54.00	5.38
10520.00	37.27	PK	V	37.92	6.94	27.04	55.09	49.07	68.20	19.13
15780.00	36.40	PK	V	37.72	8.55	25.69	56.98	50.96	74.00	23.04
15780.00	23.35	AV	V	37.72	8.55	25.69	43.93	37.91	54.00	16.09
Middle Channel: 5280 MHz										
5280.00	71.82	PK	H	33.70	4.78	0.00	110.30	104.28	N/A	N/A
5280.00	62.28	AV	H	33.70	4.78	0.00	100.76	94.74	N/A	N/A
5280.00	78.06	PK	V	33.70	4.78	0.00	116.54	110.52	N/A	N/A
5280.00	68.17	AV	V	33.70	4.78	0.00	106.65	100.63	N/A	N/A
10560.00	37.23	PK	V	37.95	6.94	26.97	55.15	49.13	68.20	19.07
15840.00	37.12	PK	V	37.66	8.59	25.67	57.70	51.68	74.00	22.32
15840.00	23.66	AV	V	37.66	8.59	25.67	44.24	38.22	54.00	15.78
High Channel: 5320 MHz										
5320.00	72.73	PK	H	33.78	4.81	0.00	111.32	105.3	N/A	N/A
5320.00	63.21	AV	H	33.78	4.81	0.00	101.80	95.78	N/A	N/A
5320.00	79.27	PK	V	33.78	4.81	0.00	117.86	111.84	N/A	N/A
5320.00	69.75	AV	V	33.78	4.81	0.00	108.34	102.32	N/A	N/A
5350.00	32.21	PK	V	33.83	4.84	0.00	70.88	64.86	74.00	9.14
5350.00	18.19	AV	V	33.83	4.84	0.00	56.86	50.84	54.00	3.16
10640.00	37.36	PK	V	38.01	6.94	26.95	55.36	49.34	74.00	24.66
10640.00	25.19	AV	V	38.01	6.94	26.95	43.19	37.17	54.00	16.83
15960.00	37.08	PK	V	37.54	8.67	25.71	57.58	51.56	74.00	22.44
15960.00	23.54	AV	V	37.54	8.67	25.71	44.04	38.02	54.00	15.98

802.11n ht20(2Tx mode was the worst):

Frequency MHz	Receiver		Rx Antenna		Cable loss dB	Amplifier Gain dB	Corrected Amplitude dBµV/m	Extrapolation result dBµV/m	Limit dBµV/m	Margin dB
	Reading dBµV	Detector PK/QP/AV	Polar H/V	Factor dB/m						
Low Channel: 5260 MHz										
5260.00	70.35	PK	H	33.67	4.76	0.00	108.78	102.76	N/A	N/A
5260.00	59.61	AV	H	33.67	4.76	0.00	98.04	92.02	N/A	N/A
5260.00	77.71	PK	V	33.67	4.76	0.00	116.14	110.12	N/A	N/A
5260.00	66.76	AV	V	33.67	4.76	0.00	105.19	99.17	N/A	N/A
5150.00	28.69	PK	V	33.47	4.70	0.00	66.86	60.84	74.00	13.16
5150.00	16.66	AV	V	33.47	4.70	0.00	54.83	48.81	54.00	5.19
10520.00	37.41	PK	V	37.92	6.94	27.04	55.23	49.21	68.20	18.99
15780.00	36.87	PK	V	37.72	8.55	25.69	57.45	51.43	74.00	22.57
15780.00	23.45	AV	V	37.72	8.55	25.69	44.03	38.01	54.00	15.99
Middle Channel: 5280 MHz										
5280.00	70.56	PK	H	33.70	4.78	0.00	109.04	103.02	N/A	N/A
5280.00	59.75	AV	H	33.70	4.78	0.00	98.23	92.21	N/A	N/A
5280.00	78.05	PK	V	33.70	4.78	0.00	116.53	110.51	N/A	N/A
5280.00	67.05	AV	V	33.70	4.78	0.00	105.53	99.51	N/A	N/A
10560.00	37.38	PK	V	37.95	6.94	26.97	55.30	49.28	68.20	18.92
15840.00	36.76	PK	V	37.66	8.59	25.67	57.34	51.32	74.00	22.68
15840.00	23.42	AV	V	37.66	8.59	25.67	44.00	37.98	54.00	16.02
High Channel: 5320 MHz										
5320.00	70.66	PK	H	33.78	4.81	0.00	109.25	103.23	N/A	N/A
5320.00	59.83	AV	H	33.78	4.81	0.00	98.42	92.4	N/A	N/A
5320.00	77.89	PK	V	33.78	4.81	0.00	116.48	110.46	N/A	N/A
5320.00	67.48	AV	V	33.78	4.81	0.00	106.07	100.05	N/A	N/A
5350.00	29.53	PK	V	33.83	4.84	0.00	68.20	62.18	74.00	11.82
5350.00	17.38	AV	V	33.83	4.84	0.00	56.05	50.03	54.00	3.97
10640.00	37.43	PK	V	38.01	6.94	26.95	55.43	49.41	74.00	24.59
10640.00	25.23	AV	V	38.01	6.94	26.95	43.23	37.21	54.00	16.79
15960.00	36.82	PK	V	37.54	8.67	25.71	57.32	51.3	74.00	22.70
15960.00	23.43	AV	V	37.54	8.67	25.71	43.93	37.91	54.00	16.09

802.11n ht40(2Tx mode was the worst):

Frequency MHz	Receiver		Rx Antenna		Cable loss dB	Amplifier Gain dB	Corrected Amplitude dBµV/m	Extrapolation result dBµV/m	Limit dBµV/m	Margin dB
	Reading dBµV	Detector PK/QP/AV	Polar H/V	Factor dB/m						
Low Channel: 5270 MHz										
5270.00	67.27	PK	H	33.69	4.77	0.00	105.73	99.71	N/A	N/A
5270.00	56.01	AV	H	33.69	4.77	0.00	94.47	88.45	N/A	N/A
5270.00	75.33	PK	V	33.69	4.77	0.00	113.79	107.77	N/A	N/A
5270.00	63.89	AV	V	33.69	4.77	0.00	102.35	96.33	N/A	N/A
5150.00	28.85	PK	V	33.47	4.70	0.00	67.02	61	74.00	13.00
5150.00	16.64	AV	V	33.47	4.70	0.00	54.81	48.79	54.00	5.21
10540.00	37.51	PK	V	37.93	6.94	27.01	55.37	49.35	68.20	18.85
15810.00	36.65	PK	V	37.69	8.57	25.69	57.22	51.2	74.00	22.80
15810.00	23.34	AV	V	37.69	8.57	25.69	43.91	37.89	54.00	16.11
High Channel: 5310 MHz										
5310.00	66.81	PK	H	33.76	4.81	0.00	105.38	99.36	N/A	N/A
5310.00	55.37	AV	H	33.76	4.81	0.00	93.94	87.92	N/A	N/A
5310.00	74.85	PK	V	33.76	4.81	0.00	113.42	107.4	N/A	N/A
5310.00	64.07	AV	V	33.76	4.81	0.00	102.64	96.62	N/A	N/A
5350.00	31.35	PK	V	33.83	4.84	0.00	70.02	64	74.00	10.00
5350.00	19.46	AV	V	33.83	4.84	0.00	58.13	52.11	54.00	1.89
10620.00	37.47	PK	V	38.00	6.94	26.93	55.48	49.46	74.00	24.54
10620.00	25.28	AV	V	38.00	6.94	26.93	43.29	37.27	54.00	16.73
15930.00	36.56	PK	V	37.57	8.65	25.68	57.10	51.08	74.00	22.92
15930.00	23.36	AV	V	37.57	8.65	25.68	43.90	37.88	54.00	16.12

802.11ac vht80(2Tx mode was the worst):

Frequency MHz	Receiver		Rx Antenna		Cable loss dB	Amplifier Gain dB	Corrected Amplitude dBμV/m	Extrapolation result dBμV/m	Limit dBμV/m	Margin dB
	Reading dBμV	Detector PK/QP/AV	Polar H/V	Factor dB/m						
Low Channel: 5290 MHz										
5290.00	62.94	PK	H	33.72	4.79	0.00	101.45	95.43	N/A	N/A
5290.00	52.25	AV	H	33.72	4.79	0.00	90.76	84.74	N/A	N/A
5290.00	71.30	PK	V	33.72	4.79	0.00	109.81	103.79	N/A	N/A
5290.00	60.87	AV	V	33.72	4.79	0.00	99.38	93.36	N/A	N/A
5150.00	28.80	PK	V	33.47	4.70	0.00	66.97	60.95	74.00	13.05
5150.00	16.65	AV	V	33.47	4.70	0.00	54.82	48.8	54.00	5.20
5350.00	31.12	PK	V	33.83	4.84	0.00	69.79	63.77	74.00	10.23
5350.00	19.03	AV	V	33.83	4.84	0.00	57.70	51.68	54.00	2.32
10580.00	37.68	PK	V	37.96	6.94	26.94	55.64	49.62	68.20	18.58
15870.00	36.71	PK	V	37.63	8.61	25.66	57.29	51.27	74.00	22.73
15870.00	23.47	AV	V	37.63	8.61	25.66	44.05	38.03	54.00	15.97

**5470-5725MHz:
802.11a, Chain 0:**

Frequency MHz	Receiver		Rx Antenna		Cable loss dB	Amplifier Gain dB	Corrected Amplitude dBµV/m	Extrapolation result dBµV/m	Limit dBµV/m	Margin dB
	Reading dBµV	Detector PK/QP/AV	Polar H/V	Factor dB/m						
Low Channel: 5500 MHz										
5500.00	75.24	PK	H	34.10	4.91	0.00	114.25	108.23	N/A	N/A
5500.00	65.73	AV	H	34.10	4.91	0.00	104.74	98.72	N/A	N/A
5500.00	79.26	PK	V	34.10	4.91	0.00	118.27	112.25	N/A	N/A
5500.00	69.81	AV	V	34.10	4.91	0.00	108.82	102.8	N/A	N/A
5470.00	33.40	PK	V	34.05	4.90	0.00	72.35	66.33	68.20	1.87
11000.00	37.64	PK	V	38.30	6.95	26.61	56.28	50.26	74.00	23.74
11000.00	25.04	AV	V	38.30	6.95	26.61	43.68	37.66	54.00	16.34
16500.00	36.05	PK	V	38.20	8.89	25.17	57.97	51.95	68.20	16.25
Middle Channel: 5580 MHz										
5580.00	74.31	PK	H	34.13	4.93	0.00	113.37	107.35	N/A	N/A
5580.00	64.79	AV	H	34.13	4.93	0.00	103.85	97.83	N/A	N/A
5580.00	79.28	PK	V	34.13	4.93	0.00	118.34	112.32	N/A	N/A
5580.00	69.76	AV	V	34.13	4.93	0.00	108.82	102.8	N/A	N/A
11160.00	38.29	PK	V	38.49	6.96	26.86	56.88	50.86	74.00	23.14
11160.00	25.35	AV	V	38.49	6.96	26.86	43.94	37.92	54.00	16.08
16740.00	36.68	PK	V	39.11	8.92	25.36	59.35	53.33	68.20	14.87
High Channel: 5700 MHz										
5700.00	70.76	PK	H	34.18	4.97	0.00	109.91	103.89	N/A	N/A
5700.00	60.69	AV	H	34.18	4.97	0.00	99.84	93.82	N/A	N/A
5700.00	74.71	PK	V	34.18	4.97	0.00	113.86	107.84	N/A	N/A
5700.00	64.61	AV	V	34.18	4.97	0.00	103.76	97.74	N/A	N/A
5725.00	34.05	PK	V	34.19	4.96	0.00	73.20	67.18	68.20	1.02
11400.00	37.57	PK	V	38.78	6.97	27.09	56.23	50.21	74.00	23.79
11400.00	25.06	AV	V	38.78	6.97	27.09	43.72	37.7	54.00	16.30
17100.00	36.14	PK	V	40.72	8.98	24.46	61.38	55.36	68.20	12.84

Chain 1:

Frequency MHz	Receiver		Rx Antenna		Cable loss dB	Amplifier Gain dB	Corrected Amplitude dBµV/m	Extrapolation result dBµV/m	Limit dBµV/m	Margin dB
	Reading dBµV	Detector PK/QP/AV	Polar H/V	Factor dB/m						
Low Channel: 5500 MHz										
5500.00	74.00	PK	H	34.10	4.91	0.00	113.01	106.99	N/A	N/A
5500.00	64.45	AV	H	34.10	4.91	0.00	103.46	97.44	N/A	N/A
5500.00	79.13	PK	V	34.10	4.91	0.00	118.14	112.12	N/A	N/A
5500.00	69.63	AV	V	34.10	4.91	0.00	108.64	102.62	N/A	N/A
5470.00	33.97	PK	V	34.05	4.90	0.00	72.92	66.9	68.20	1.30
11000.00	37.32	PK	V	38.30	6.95	26.61	55.96	49.94	74.00	24.06
11000.00	25.15	AV	V	38.30	6.95	26.61	43.79	37.77	54.00	16.23
16500.00	36.21	PK	V	38.20	8.89	25.17	58.13	52.11	68.20	16.09
Middle Channel: 5580 MHz										
5580.00	72.38	PK	H	34.13	4.93	0.00	111.44	105.42	N/A	N/A
5580.00	6276.00	AV	H	34.13	4.93	0.00	6315.06	6309.04	N/A	N/A
5580.00	77.57	PK	V	34.13	4.93	0.00	116.63	110.61	N/A	N/A
5580.00	68.08	AV	V	34.13	4.93	0.00	107.14	101.12	N/A	N/A
11160.00	37.52	PK	V	38.49	6.96	26.86	56.11	50.09	74.00	23.91
11160.00	25.21	AV	V	38.49	6.96	26.86	43.80	37.78	54.00	16.22
16740.00	36.26	PK	V	39.11	8.92	25.36	58.93	52.91	68.20	15.29
High Channel: 5700 MHz										
5700.00	70.08	PK	H	34.18	4.97	0.00	109.23	103.21	N/A	N/A
5700.00	60.32	AV	H	34.18	4.97	0.00	99.47	93.45	N/A	N/A
5700.00	73.84	PK	V	34.18	4.97	0.00	112.99	106.97	N/A	N/A
5700.00	64.33	AV	V	34.18	4.97	0.00	103.48	97.46	N/A	N/A
5725.00	34.09	PK	V	34.19	4.96	0.00	73.24	67.22	68.20	0.98
11400.00	37.23	PK	V	38.78	6.97	27.09	55.89	49.87	74.00	24.13
11400.00	25.11	AV	V	38.78	6.97	27.09	43.77	37.75	54.00	16.25
17100.00	36.16	PK	V	40.72	8.98	24.46	61.40	55.38	68.20	12.82

802.11n ht20(2TX was the worst):

Frequency MHz	Receiver		Rx Antenna		Cable loss dB	Amplifier Gain dB	Corrected Amplitude dBµV/m	Extrapolation result dBµV/m	Limit dBµV/m	Margin dB
	Reading dBµV	Detector PK/QP/AV	Polar H/V	Factor dB/m						
Low Channel: 5500 MHz										
5500.00	75.65	PK	H	34.10	4.91	0.00	114.66	108.64	N/A	N/A
5500.00	64.77	AV	H	34.10	4.91	0.00	103.78	97.76	N/A	N/A
5500.00	80.79	PK	V	34.10	4.91	0.00	119.80	113.78	N/A	N/A
5500.00	70.12	AV	V	34.10	4.91	0.00	109.13	103.11	N/A	N/A
5470.00	33.77	PK	V	34.05	4.90	0.00	72.72	66.7	68.20	1.50
11000.00	37.36	PK	V	38.30	6.95	26.61	56.00	49.98	74.00	24.02
11000.00	25.18	AV	V	38.30	6.95	26.61	43.82	37.8	54.00	16.20
16500.00	36.27	PK	V	38.20	8.89	25.17	58.19	52.17	68.20	16.03
Middle Channel: 5580 MHz										
5580.00	75.57	PK	H	34.13	4.93	0.00	114.63	108.61	N/A	N/A
5580.00	65.22	AV	H	34.13	4.93	0.00	104.28	98.26	N/A	N/A
5580.00	79.45	PK	V	34.13	4.93	0.00	118.51	112.49	N/A	N/A
5580.00	69.21	AV	V	34.13	4.93	0.00	108.27	102.25	N/A	N/A
11160.00	37.33	PK	V	38.49	6.96	26.86	55.92	49.9	74.00	24.10
11160.00	25.26	AV	V	38.49	6.96	26.86	43.85	37.83	54.00	16.17
16740.00	36.28	PK	V	39.11	8.92	25.36	58.95	52.93	68.20	15.27
High Channel: 5700 MHz										
5700.00	72.23	PK	H	34.18	4.97	0.00	111.38	105.36	N/A	N/A
5700.00	61.79	AV	H	34.18	4.97	0.00	100.94	94.92	N/A	N/A
5700.00	76.24	PK	V	34.18	4.97	0.00	115.39	109.37	N/A	N/A
5700.00	65.62	AV	V	34.18	4.97	0.00	104.77	98.75	N/A	N/A
5725.00	34.29	PK	V	34.19	4.96	0.00	73.44	67.42	68.20	0.78
11400.00	37.37	PK	V	38.78	6.97	27.09	56.03	50.01	74.00	23.99
11400.00	25.21	AV	V	38.78	6.97	27.09	43.87	37.85	54.00	16.15
17100.00	36.35	PK	V	40.72	8.98	24.46	61.59	55.57	68.20	12.63

802.11n ht40(2TX was the worst):

Frequency MHz	Receiver		Rx Antenna		Cable loss dB	Amplifier Gain dB	Corrected Amplitude dBµV/m	Extrapolation result dBµV/m	Limit dBµV/m	Margin dB
	Reading dBµV	Detector PK/QP/AV	Polar H/V	Factor dB/m						
Low Channel: 5510 MHz										
5510.00	73.35	PK	H	34.10	4.91	0.00	112.36	106.34	N/A	N/A
5510.00	63.26	AV	H	34.10	4.91	0.00	102.27	96.25	N/A	N/A
5510.00	77.28	PK	V	34.10	4.91	0.00	116.29	110.27	N/A	N/A
5510.00	66.05	AV	V	34.10	4.91	0.00	105.06	99.04	N/A	N/A
5470.00	33.51	PK	V	34.05	4.90	0.00	72.46	66.44	68.20	1.76
11020.00	37.45	PK	V	38.32	6.95	26.64	56.08	50.06	74.00	23.94
11020.00	25.34	AV	V	38.32	6.95	26.64	43.97	37.95	54.00	16.05
16530.00	36.47	PK	V	38.31	8.89	25.32	58.35	52.33	68.20	15.87
Middle Channel: 5550 MHz										
5550.00	73.37	PK	H	34.12	4.92	0.00	112.41	106.39	N/A	N/A
5550.00	62.48	AV	H	34.12	4.92	0.00	101.52	95.5	N/A	N/A
5550.00	77.47	PK	V	34.12	4.92	0.00	116.51	110.49	N/A	N/A
5550.00	66.38	AV	V	34.12	4.92	0.00	105.42	99.4	N/A	N/A
11100.00	37.45	PK	V	38.42	6.96	26.75	56.08	50.06	74.00	23.94
11100.00	25.36	AV	V	38.42	6.96	26.75	43.99	37.97	54.00	16.03
16650.00	36.37	PK	V	38.77	8.91	25.36	58.69	52.67	68.20	15.53
High Channel: 5670 MHz										
5670.00	71.35	PK	H	34.17	4.96	0.00	110.48	104.46	N/A	N/A
5670.00	61.34	AV	H	34.17	4.96	0.00	100.47	94.45	N/A	N/A
5670.00	75.24	PK	V	34.17	4.96	0.00	114.37	108.35	N/A	N/A
5670.00	64.29	AV	V	34.17	4.96	0.00	103.42	97.4	N/A	N/A
5725.00	34.07	PK	V	34.19	4.96	0.00	73.22	67.2	68.20	1.00
11340.00	37.37	PK	V	38.71	6.97	26.87	56.18	50.16	74.00	23.84
11340.00	25.29	AV	V	38.71	6.97	26.87	44.10	38.08	54.00	15.92
17010.00	36.32	PK	V	40.16	8.96	25.47	59.97	53.95	68.20	14.25

802.11ac vht80(2TX was the worst):

Frequency MHz	Receiver		Rx Antenna		Cable loss dB	Amplifier Gain dB	Corrected Amplitude dBµV/m	Extrapolation result dBµV/m	Limit dBµV/m	Margin dB
	Reading dBµV	Detector PK/QP/AV	Polar H/V	Factor dB/m						
Low Channel: 5530 MHz										
5530.00	69.57	PK	H	34.11	4.92	0.00	108.60	102.58	N/A	N/A
5530.00	59.48	AV	H	34.11	4.92	0.00	98.51	92.49	N/A	N/A
5530.00	72.46	PK	V	34.11	4.92	0.00	111.49	105.47	N/A	N/A
5530.00	62.37	AV	V	34.11	4.92	0.00	101.40	95.38	N/A	N/A
5470.00	33.56	PK	V	34.05	4.90	0.00	72.51	66.49	68.20	1.71
11060.00	37.42	PK	V	38.37	6.95	26.69	56.05	50.03	74.00	23.97
11060.00	25.33	AV	V	38.37	6.95	26.69	43.96	37.94	54.00	16.06
16590.00	36.35	PK	V	38.54	8.90	25.62	58.17	52.15	68.20	16.05
High Channel: 5610 MHz										
5610.00	70.65	PK	H	34.14	4.93	0.00	109.72	103.7	N/A	N/A
5610.00	60.13	AV	H	34.14	4.93	0.00	99.20	93.18	N/A	N/A
5610.00	73.58	PK	V	34.14	4.93	0.00	112.65	106.63	N/A	N/A
5610.00	63.81	AV	V	34.14	4.93	0.00	102.88	96.86	N/A	N/A
5725.00	31.77	PK	V	34.19	4.96	0.00	70.92	64.9	68.20	3.30
11220.00	37.47	PK	V	38.56	6.96	26.89	56.10	50.08	74.00	23.92
11220.00	25.35	AV	V	38.56	6.96	26.89	43.98	37.96	54.00	16.04
16830.00	36.60	PK	V	39.45	8.94	25.58	59.41	53.39	68.20	14.81

5725-5850MHz
802.11a, Chain 0

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dB μ V/m)	Extrapolation result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
	Reading (dB μ V)	Detector	Polar (H/V)	Factor (dB/m)						
Low Channel: 5745 MHz										
5745.00	72.13	PK	H	34.20	4.96	0.00	111.29	105.27	N/A	N/A
5745.00	62.66	AV	H	34.20	4.96	0.00	101.82	95.8	N/A	N/A
5745.00	76.39	PK	V	34.20	4.96	0.00	115.55	109.53	N/A	N/A
5745.00	66.95	AV	V	34.20	4.96	0.00	106.11	100.09	N/A	N/A
5725.00	44.80	PK	V	34.19	4.96	0.00	83.95	77.93	122.20	44.27
5720.00	43.01	PK	V	34.19	4.96	0.00	82.16	76.14	110.80	34.66
5700.00	35.26	PK	V	34.18	4.97	0.00	74.41	68.39	105.20	36.81
5650.00	26.43	PK	V	34.16	4.95	0.00	65.54	59.52	68.20	8.68
11490.00	37.63	PK	V	38.89	6.98	26.57	56.93	50.91	74.00	23.09
11490.00	24.73	AV	V	38.89	6.98	26.57	44.03	38.01	54.00	15.99
17235.00	37.26	PK	V	41.56	9.01	25.11	62.72	56.7	68.20	11.50
Middle Channel: 5785 MHz										
5785.00	70.67	PK	H	34.21	4.94	0.00	109.82	103.8	N/A	N/A
5785.00	61.42	AV	H	34.21	4.94	0.00	100.57	94.55	N/A	N/A
5785.00	78.12	PK	V	34.21	4.94	0.00	117.27	111.25	N/A	N/A
5785.00	68.93	AV	V	34.21	4.94	0.00	108.08	102.06	N/A	N/A
11570.00	37.48	PK	V	38.94	6.98	26.97	56.43	50.41	74.00	23.59
11570.00	24.56	AV	V	38.94	6.98	26.97	43.51	37.49	54.00	16.51
17355.00	37.11	PK	V	42.30	9.04	25.16	63.29	57.27	68.20	10.93
High Channel: 5825 MHz										
5825.00	70.04	PK	H	34.23	4.94	0.00	109.21	103.19	N/A	N/A
5825.00	60.89	AV	H	34.23	4.94	0.00	100.06	94.04	N/A	N/A
5825.00	77.59	PK	V	34.23	4.94	0.00	116.76	110.74	N/A	N/A
5825.00	68.37	AV	V	34.23	4.94	0.00	107.54	101.52	N/A	N/A
5850.00	44.42	PK	V	34.24	4.95	0.00	83.61	77.59	122.20	44.61
5855.00	41.47	PK	V	34.24	4.95	0.00	80.66	74.64	110.80	36.16
5875.00	33.07	PK	V	34.25	4.95	0.00	72.27	66.25	105.20	38.95
5925.00	27.77	PK	V	34.27	4.95	0.00	66.99	60.97	68.20	7.23
11650.00	37.37	PK	V	38.99	6.99	26.84	56.51	50.49	74.00	23.51
11650.00	24.42	AV	V	38.99	6.99	26.84	43.56	37.54	54.00	16.46
17475.00	37.05	PK	V	43.05	9.06	24.55	64.61	58.59	68.20	9.61

Chain 1

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Extrapolation result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector	Polar (H/V)	Factor (dB/m)						
Low Channel: 5745 MHz										
5745.00	72.72	PK	H	34.20	4.96	0.00	111.88	105.86	N/A	N/A
5745.00	63.95	AV	H	34.20	4.96	0.00	103.11	97.09	N/A	N/A
5745.00	77.30	PK	V	34.20	4.96	0.00	116.46	110.44	N/A	N/A
5745.00	67.91	AV	V	34.20	4.96	0.00	107.07	101.05	N/A	N/A
5725.00	49.04	PK	V	34.19	4.96	0.00	88.19	82.17	122.20	40.03
5720.00	45.15	PK	V	34.19	4.96	0.00	84.30	78.28	110.80	32.52
5700.00	38.05	PK	V	34.18	4.97	0.00	77.20	71.18	105.20	34.02
5650.00	27.60	PK	V	34.16	4.95	0.00	66.71	60.69	68.20	7.51
11490.00	37.36	PK	V	38.89	6.98	26.57	56.66	50.64	74.00	23.36
11490.00	24.39	AV	V	38.89	6.98	26.57	43.69	37.67	54.00	16.33
17235.00	37.13	PK	V	41.56	9.01	25.11	62.59	56.57	68.20	11.63
Middle Channel: 5785 MHz										
5785.00	72.96	PK	H	34.21	4.94	0.00	112.11	106.09	N/A	N/A
5785.00	63.98	AV	H	34.21	4.94	0.00	103.13	97.11	N/A	N/A
5785.00	77.07	PK	V	34.21	4.94	0.00	116.22	110.2	N/A	N/A
5785.00	68.02	AV	V	34.21	4.94	0.00	107.17	101.15	N/A	N/A
11570.00	37.21	PK	V	38.94	6.98	26.97	56.16	50.14	74.00	23.86
11570.00	24.27	AV	V	38.94	6.98	26.97	43.22	37.2	54.00	16.80
17355.00	37.13	PK	V	42.30	9.04	25.16	63.31	57.29	68.20	10.91
High Channel: 5825 MHz										
5825.00	72.19	PK	H	34.23	4.94	0.00	111.36	105.34	N/A	N/A
5825.00	63.53	AV	H	34.23	4.94	0.00	102.70	96.68	N/A	N/A
5825.00	78.50	PK	V	34.23	4.94	0.00	117.67	111.65	N/A	N/A
5825.00	69.41	AV	V	34.23	4.94	0.00	108.58	102.56	N/A	N/A
5850.00	47.36	PK	V	34.24	4.95	0.00	86.55	80.53	122.20	41.67
5855.00	47.00	PK	V	34.24	4.95	0.00	86.19	80.17	110.80	30.63
5875.00	37.07	PK	V	34.25	4.95	0.00	76.27	70.25	105.20	34.95
5925.00	28.58	PK	V	34.27	4.95	0.00	67.80	61.78	68.20	6.42
11650.00	37.16	PK	V	38.99	6.99	26.84	56.30	50.28	74.00	23.72
11650.00	24.17	AV	V	38.99	6.99	26.84	43.31	37.29	54.00	16.71
17475.00	37.15	PK	V	43.05	9.06	24.55	64.71	58.69	68.20	9.51

802.11n ht20(2Tx mode was the worst):

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Extrapolation result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector	Polar (H/V)	Factor (dB/m)						
Low Channel: 5745 MHz										
5745.00	72.89	PK	H	34.20	4.96	0.00	112.05	106.03	N/A	N/A
5745.00	62.65	AV	H	34.20	4.96	0.00	101.81	95.79	N/A	N/A
5745.00	75.67	PK	V	34.20	4.96	0.00	114.83	108.81	N/A	N/A
5745.00	65.92	AV	V	34.20	4.96	0.00	105.08	99.06	N/A	N/A
5725.00	42.57	PK	V	34.19	4.96	0.00	81.72	75.7	122.20	46.50
5720.00	39.63	PK	V	34.19	4.96	0.00	78.78	72.76	110.80	38.04
5700.00	33.64	PK	V	34.18	4.97	0.00	72.79	66.77	105.20	38.43
5650.00	27.61	PK	V	34.16	4.95	0.00	66.72	60.7	68.20	7.50
11490.00	37.32	PK	V	38.89	6.98	26.57	56.62	50.6	74.00	23.40
11490.00	24.15	AV	V	38.89	6.98	26.57	43.45	37.43	54.00	16.57
17235.00	37.23	PK	V	41.56	9.01	25.11	62.69	56.67	68.20	11.53
Middle Channel: 5785 MHz										
5785.00	73.56	PK	H	34.21	4.94	0.00	112.71	106.69	N/A	N/A
5785.00	62.73	AV	H	34.21	4.94	0.00	101.88	95.86	N/A	N/A
5785.00	77.52	PK	V	34.21	4.94	0.00	116.67	110.65	N/A	N/A
5785.00	67.12	AV	V	34.21	4.94	0.00	106.27	100.25	N/A	N/A
11570.00	37.26	PK	V	38.94	6.98	26.97	56.21	50.19	74.00	23.81
11570.00	24.09	AV	V	38.94	6.98	26.97	43.04	37.02	54.00	16.98
17355.00	37.28	PK	V	42.30	9.04	25.16	63.46	57.44	68.20	10.76
High Channel: 5825 MHz										
5825.00	61.69	AV	H	34.23	4.94	0.00	100.86	94.84	N/A	N/A
5825.00	77.56	PK	V	34.23	4.94	0.00	116.73	110.71	N/A	N/A
5825.00	66.44	AV	V	34.23	4.94	0.00	105.61	99.59	N/A	N/A
5850.00	41.32	PK	V	34.24	4.95	0.00	80.51	74.49	122.20	47.71
5855.00	38.42	PK	V	34.24	4.95	0.00	77.61	71.59	110.80	39.21
5875.00	30.99	PK	V	34.25	4.95	0.00	70.19	64.17	105.20	41.03
5925.00	28.78	PK	V	34.27	4.95	0.00	68.00	61.98	68.20	6.22
11650.00	37.28	PK	V	38.99	6.99	26.84	56.42	50.4	74.00	23.60
11650.00	24.35	AV	V	38.99	6.99	26.84	43.49	37.47	54.00	16.53
17475.00	37.27	PK	V	43.05	9.06	24.55	64.83	58.81	68.20	9.39

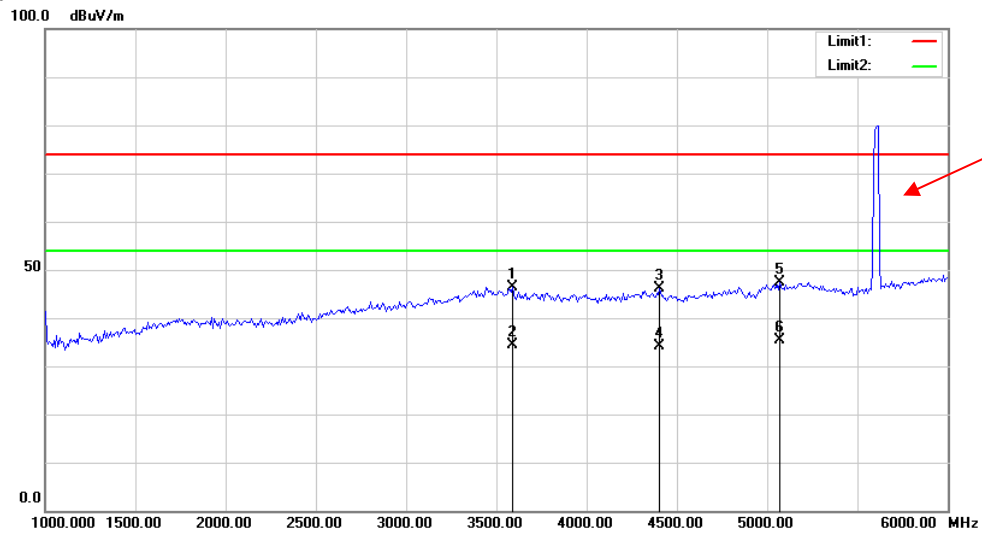
802.11n ht40(2Tx mode was the worst):

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dB μ V/m)	Extrapolation result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
	Reading (dB μ V)	Detector	Polar (H/V)	Factor (dB/m)						
Low Channel: 5755 MHz										
5755.00	90.97	PK	H	34.20	4.95	0.00	130.12	124.1	N/A	N/A
5755.00	60.49	AV	H	34.20	4.95	0.00	99.64	93.62	N/A	N/A
5755.00	75.47	PK	V	34.20	4.95	0.00	114.62	108.6	N/A	N/A
5755.00	64.64	AV	V	34.20	4.95	0.00	103.79	97.77	N/A	N/A
5725.00	46.33	PK	H	34.19	4.96	0.00	85.48	79.46	122.20	42.74
5720.00	44.09	PK	H	34.19	4.96	0.00	83.24	77.22	110.80	33.58
5700.00	36.09	PK	H	34.18	4.97	0.00	75.24	69.22	105.20	35.98
5650.00	27.17	PK	H	34.16	4.95	0.00	66.28	60.26	68.20	7.94
11510.00	37.24	PK	H	38.91	6.98	26.58	56.55	50.53	74.00	23.47
11510.00	24.32	AV	H	38.91	6.98	26.58	43.63	37.61	54.00	16.39
17265.00	37.26	PK	H	41.74	9.02	24.84	63.18	57.16	68.20	11.04
High Channel: 5795 MHz										
5795.00	70.21	PK	H	34.22	4.94	0.00	109.37	103.35	N/A	N/A
5795.00	60.23	AV	H	34.22	4.94	0.00	99.39	93.37	N/A	N/A
5795.00	75.59	PK	V	34.22	4.94	0.00	114.75	108.73	N/A	N/A
5795.00	64.31	AV	V	34.22	4.94	0.00	103.47	97.45	N/A	N/A
5850.00	37.25	PK	V	34.24	4.95	0.00	76.44	70.42	122.20	51.78
5855.00	36.70	PK	V	34.24	4.95	0.00	75.89	69.87	110.80	40.93
5875.00	31.80	PK	V	34.25	4.95	0.00	71.00	64.98	105.20	40.22
5925.00	28.77	PK	V	34.27	4.95	0.00	67.99	61.97	68.20	6.23
11590.00	37.18	PK	V	38.95	6.99	27.10	56.02	50	74.00	24.00
11590.00	24.24	AV	V	38.95	6.99	27.10	43.08	37.06	54.00	16.94
17385.00	37.16	PK	V	42.49	9.04	25.51	63.18	57.16	68.20	11.04

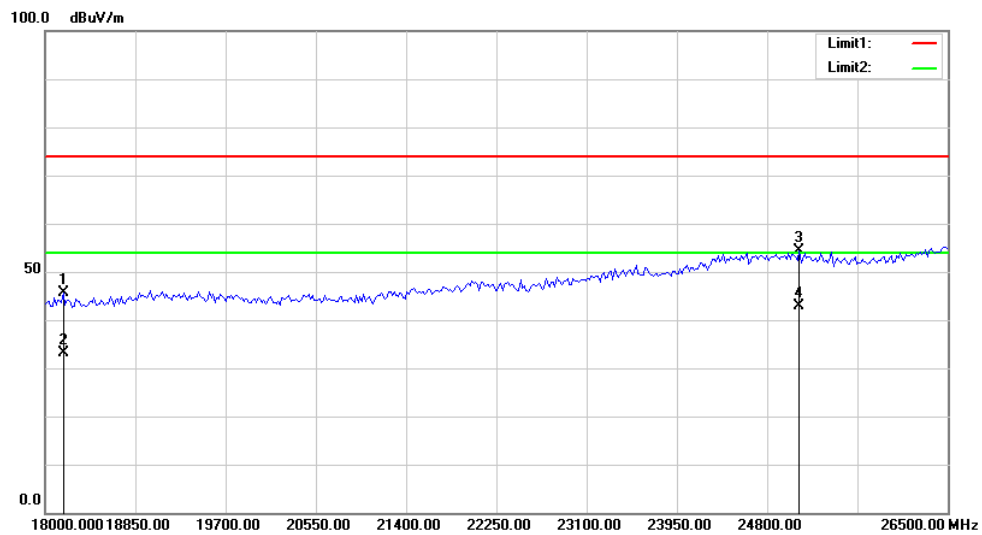
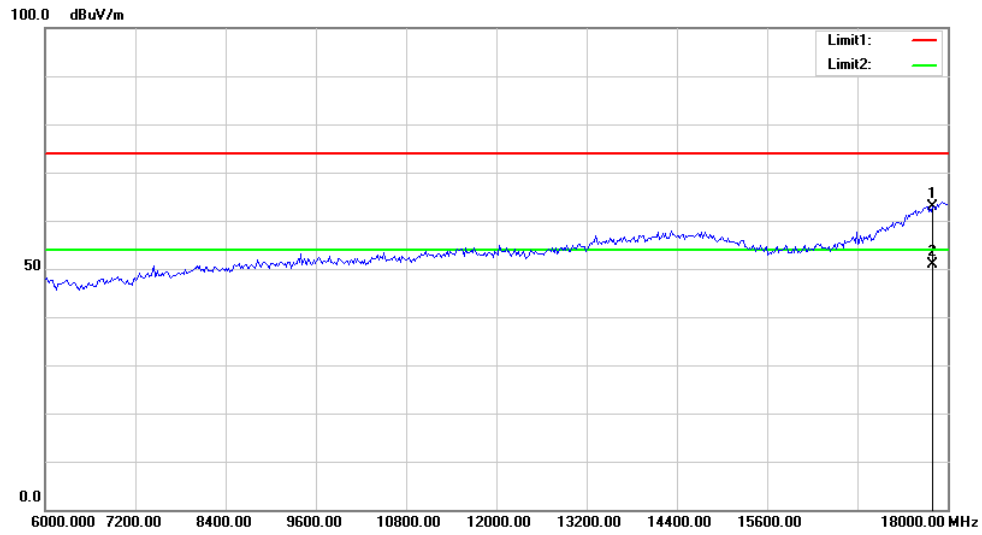
802.11ac vht80(2Tx mode was the worst):

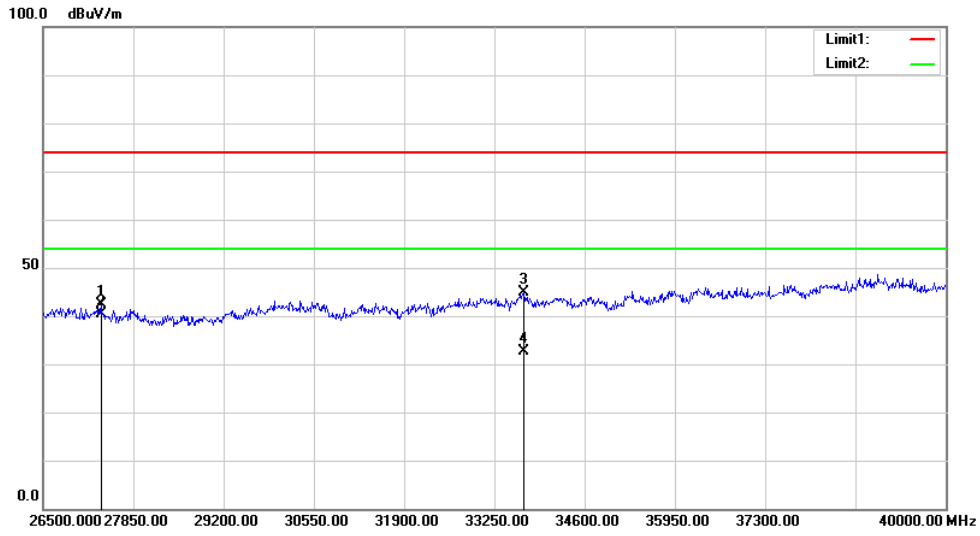
Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dB μ V/m)	Extrapolation result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
	Reading (dB μ V)	Detector	Polar (H/V)	Factor (dB/m)						
Middle Channel: 5775 MHz										
5775.00	67.23	PK	H	34.21	4.95	0.00	106.39	100.37	N/A	N/A
5775.00	56.85	AV	H	34.21	4.95	0.00	96.01	89.99	N/A	N/A
5775.00	71.77	PK	V	34.21	4.95	0.00	110.93	104.91	N/A	N/A
5775.00	61.39	AV	V	34.21	4.95	0.00	100.55	94.53	N/A	N/A
5725.00	43.77	PK	V	34.19	4.96	0.00	82.92	76.9	122.20	45.30
5720.00	44.23	PK	V	34.19	4.96	0.00	83.38	77.36	110.80	33.44
5700.00	42.95	PK	V	34.18	4.97	0.00	82.10	76.08	105.20	29.12
5650.00	33.52	PK	V	34.16	4.95	0.00	72.63	66.61	68.20	1.59
5850.00	44.51	PK	V	34.24	4.95	0.00	83.70	77.68	122.20	44.52
5855.00	45.67	PK	V	34.24	4.95	0.00	84.86	78.84	110.80	31.96
5875.00	37.29	PK	V	34.25	4.95	0.00	76.49	70.47	105.20	34.73
5925.00	30.44	PK	V	34.27	4.95	0.00	69.66	63.64	68.20	4.56
11550.00	37.26	PK	V	38.93	6.98	26.84	56.33	50.31	74.00	23.69
11550.00	24.21	AV	V	38.93	6.98	26.84	43.28	37.26	54.00	16.74
17325.00	37.07	PK	V	42.12	9.03	24.81	63.41	57.39	68.20	10.81

Test Plots(802.11n ht20 mode 2TX 5825MHz was the worst)
Horizontal

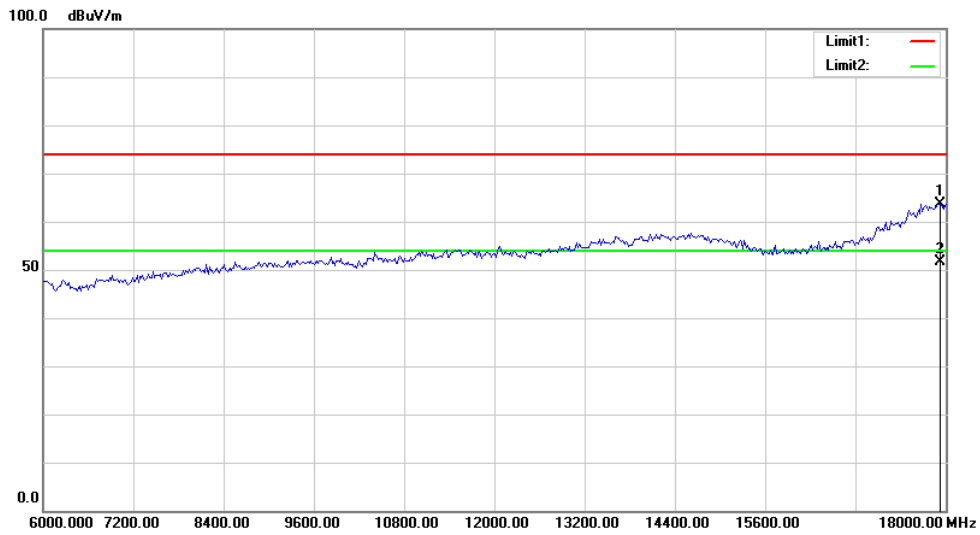
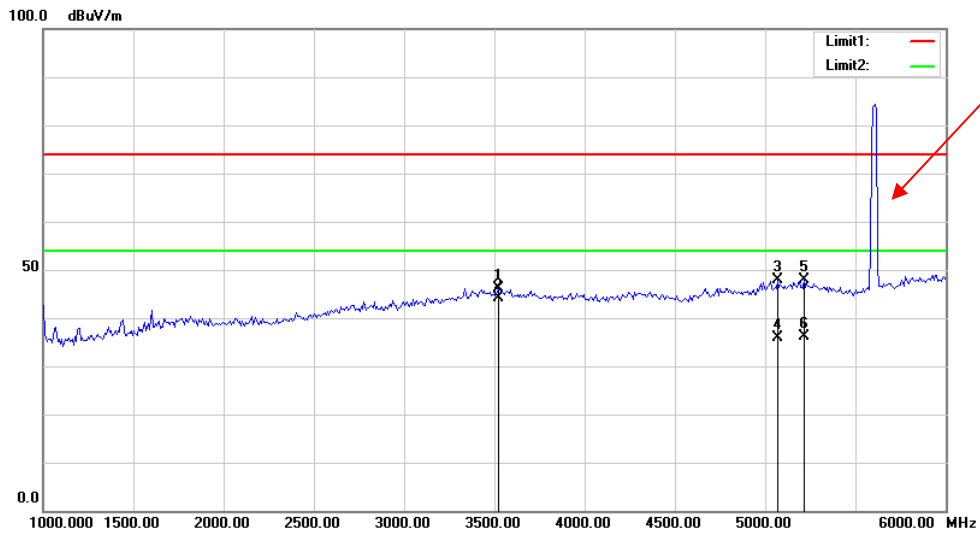


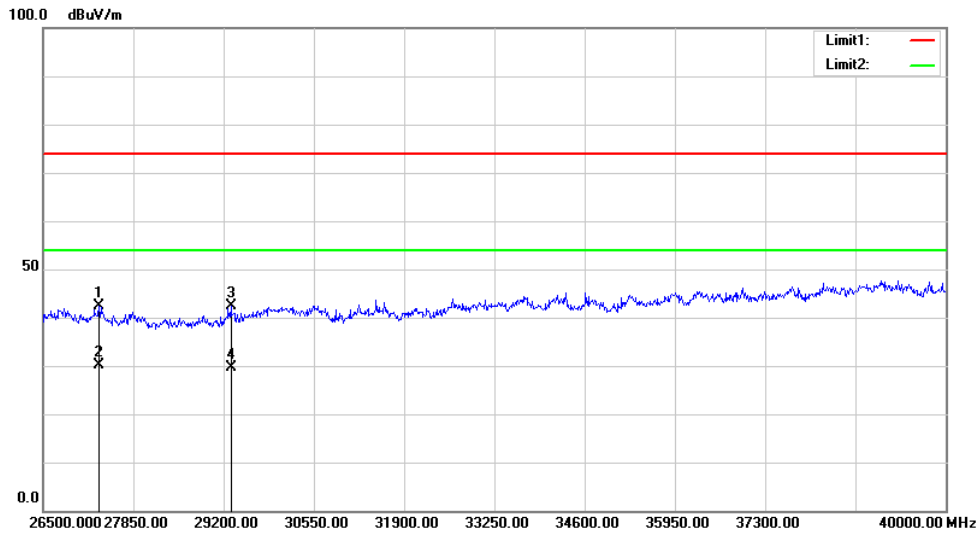
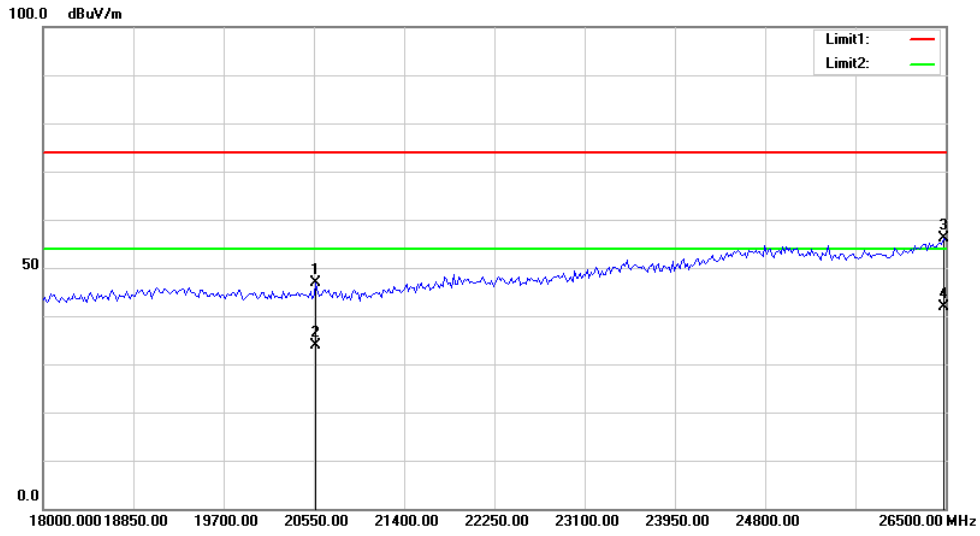
Fundamental
Test with Band
Rejection Filter





Vertical





FCC §15.407(a)(e)–EMISSION BANDWIDTH AND OCCUPIED BANDWIDTH

Applicable Standard

15.407(a) (e).

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101474	2021-07-07	2022-07-07
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005011	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 Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01

Test Data

Environmental Conditions

Temperature:	28.4~29.6°C
Relative Humidity:	46~47 %
ATM Pressure:	100.3~100.5 kPa
Test by:	Joe Qiao
Test Date:	2021-07-12~2021-08-10

Test Result: Pass.

Please refer to the following tables and plots.

Test mode: Transmitting (test was only performed at chain 0)

5150-5250MHz:

Mode	Frequency (MHz)	26 dB Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11 a	5180	18.880	16.367
	5200	18.880	16.447
	5240	18.960	16.367
802.11n ht20	5180	19.760	17.645
	5200	19.760	17.645
	5240	19.760	17.645
802.11n ht40	5190	40.800	36.407
	5230	40.800	36.567
802.11ac vht80	5210	94.188	75.688

5250-5350MHz:

Mode	Frequency (MHz)	26 dB Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11 a	5260	18.880	16.447
	5280	18.880	16.447
	5320	18.880	16.527
802.11n ht20	5260	19.760	17.645
	5280	19.760	17.645
	5320	19.760	17.645
802.11n ht40	5270	40.800	36.567
	5310	40.800	36.567
802.11ac vht80	5290	102.720	76.008

5470-5725 MHz:

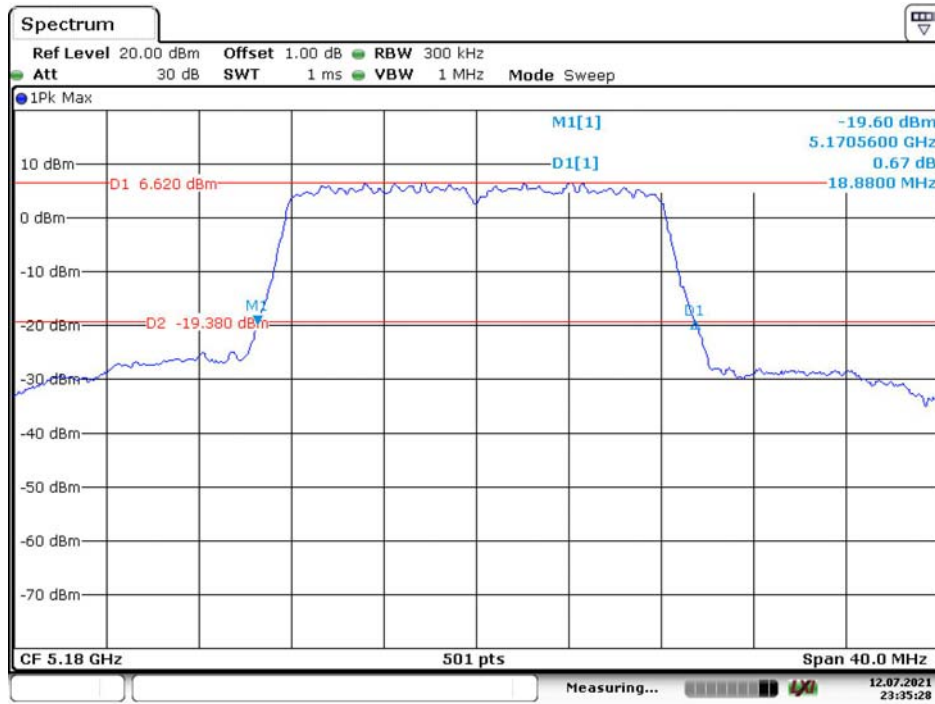
Mode	Frequency (MHz)	26 dB Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11 a	5500	19.520	16.527
	5580	28.880	16.687
	5700	19.759	16.926
802.11n ht20	5500	19.760	17.645
	5580	19.760	17.645
	5700	24.960	17.725
802.11n ht40	5510	40.800	36.727
	5550	40.800	36.727
	5670	40.874	37.046
802.11ac vht80	5530	105.600	76.008
	5610	112.890	76.327
	5690	112.471	78.244

5725-5850MHz:

Mode	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	6 dB Emission Bandwidth Limits (MHz)	99% Occupied Bandwidth (MHz)
802.11 a	5745	16.160	≥0.5	17.006
	5785	16.320	≥0.5	18.603
	5825	16.320	≥0.5	22.435
802.11n ht20	5745	17.440	≥0.5	17.725
	5785	17.440	≥0.5	17.804
	5825	17.600	≥0.5	17.964
802.11n ht40	5755	35.520	≥0.5	37.844
	5795	35.520	≥0.5	40.240
802.11ac vht80	5775	74.560	≥0.5	91.657

5150-5250MHz:
26dB Emission Bandwidth:

802.11a Low Channel



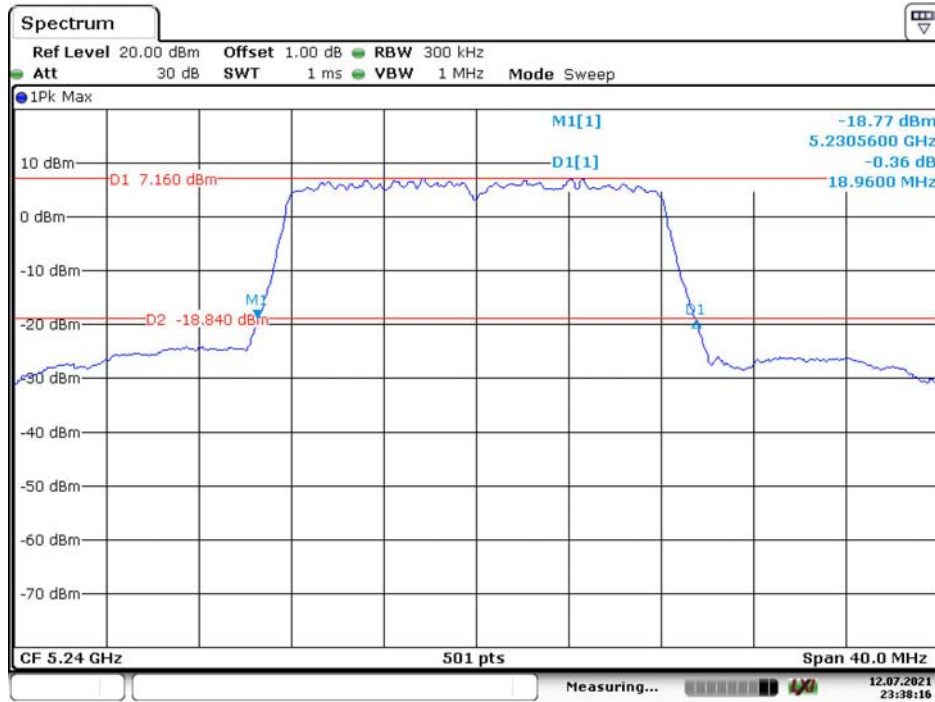
Date: 12.JUL.2021 23:35:28

802.11a Middle Channel

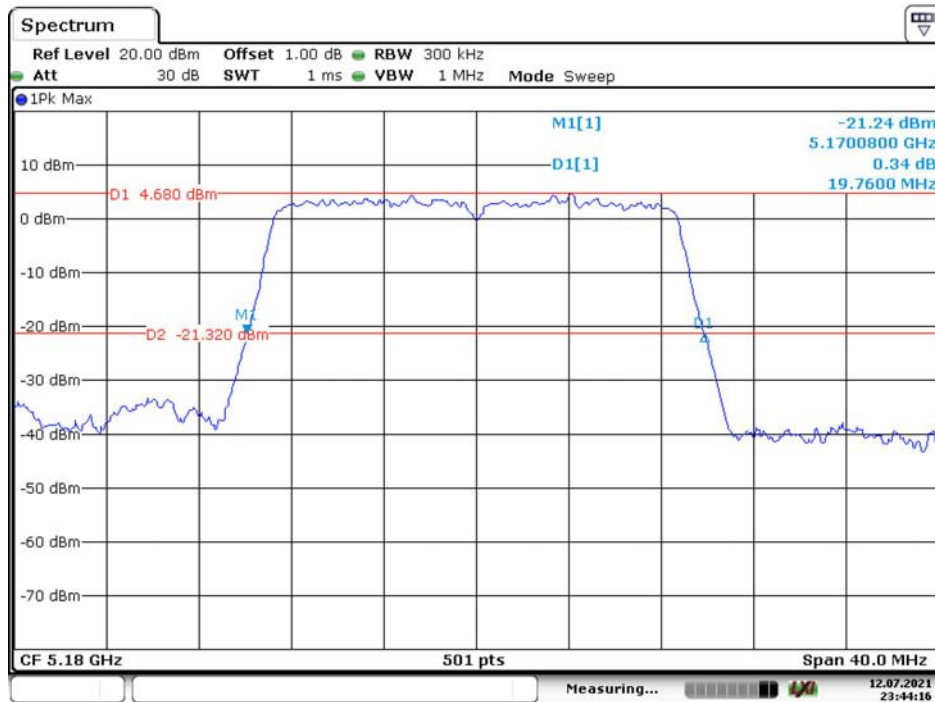


Date: 12.JUL.2021 23:37:11

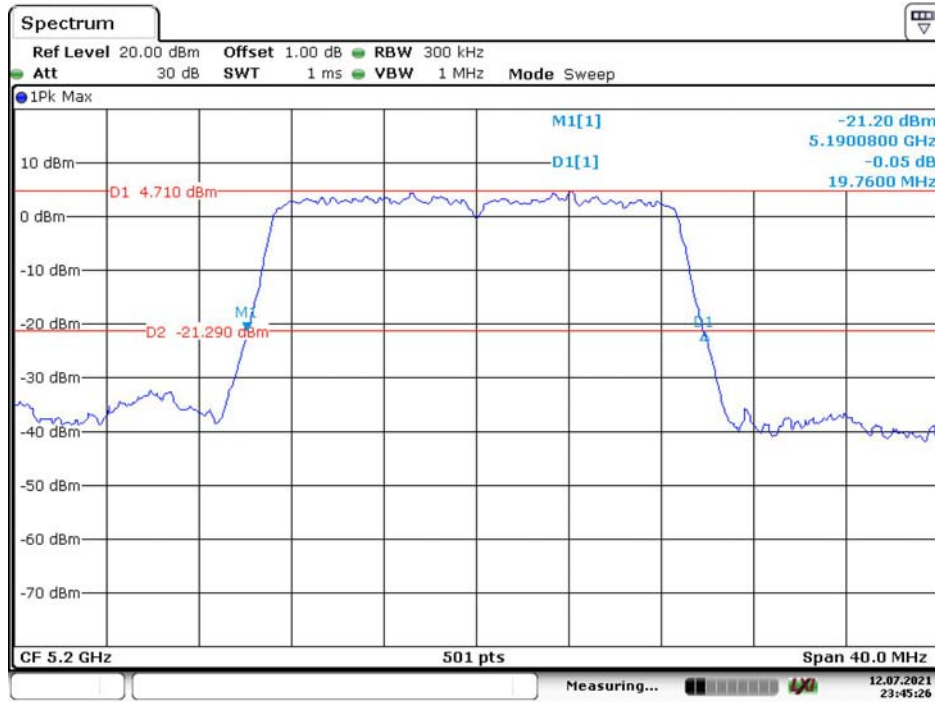
802.11a High Channel



802.11n ht20 Low Channel

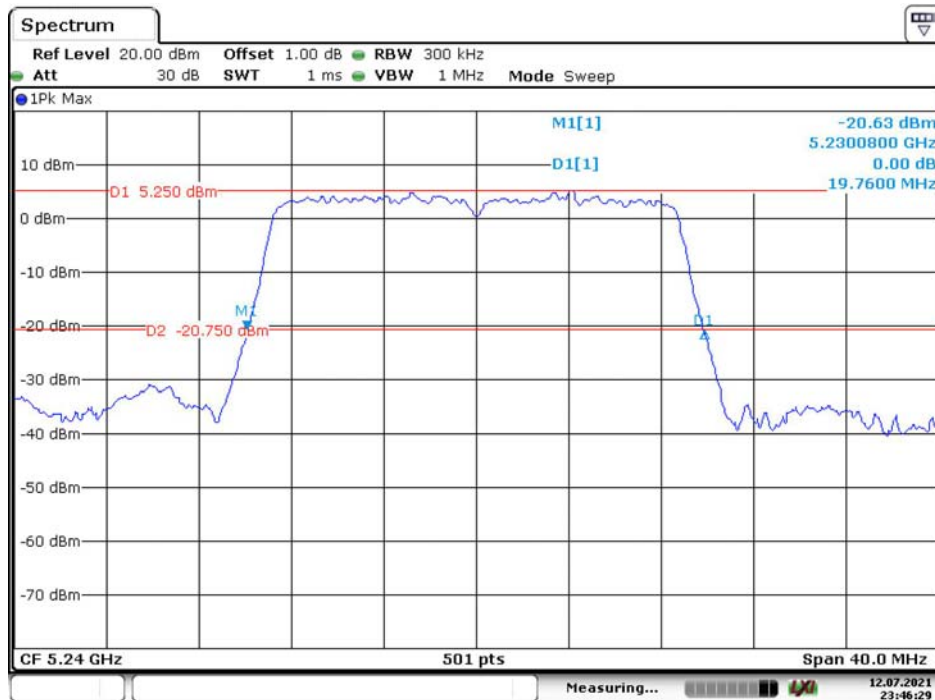


802.11n ht20 Middle Channel



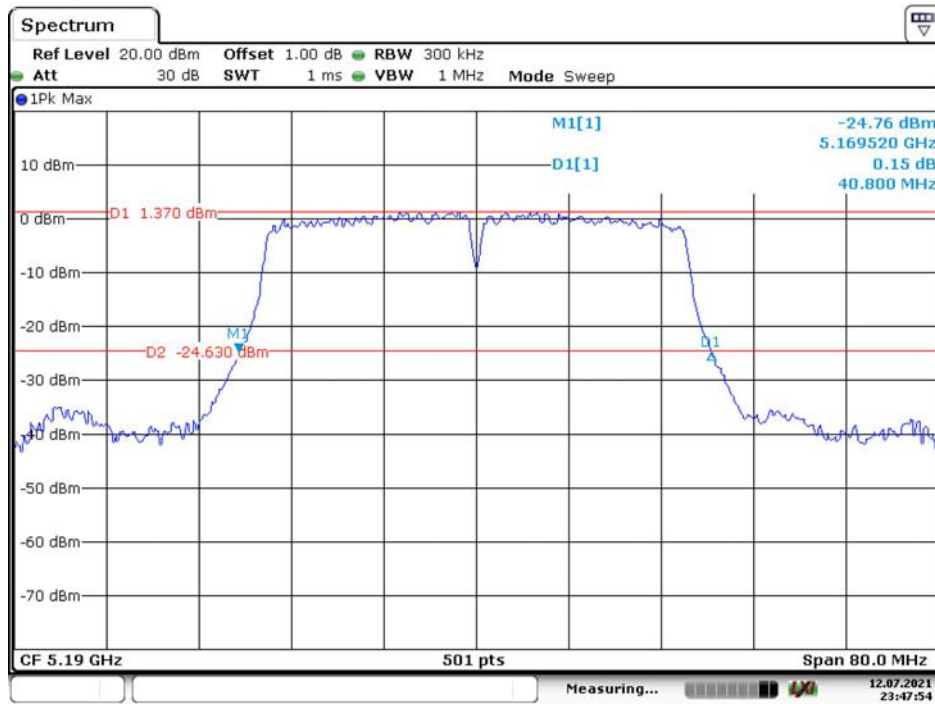
Date: 12.JUL.2021 23:45:26

802.11n ht20 High Channel

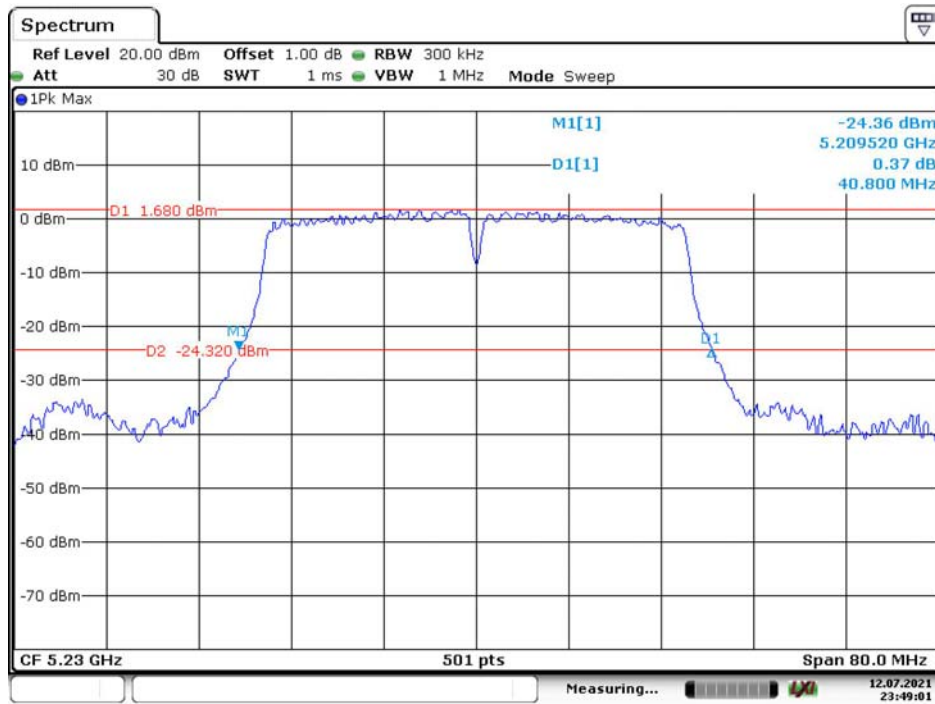


Date: 12.JUL.2021 23:46:30

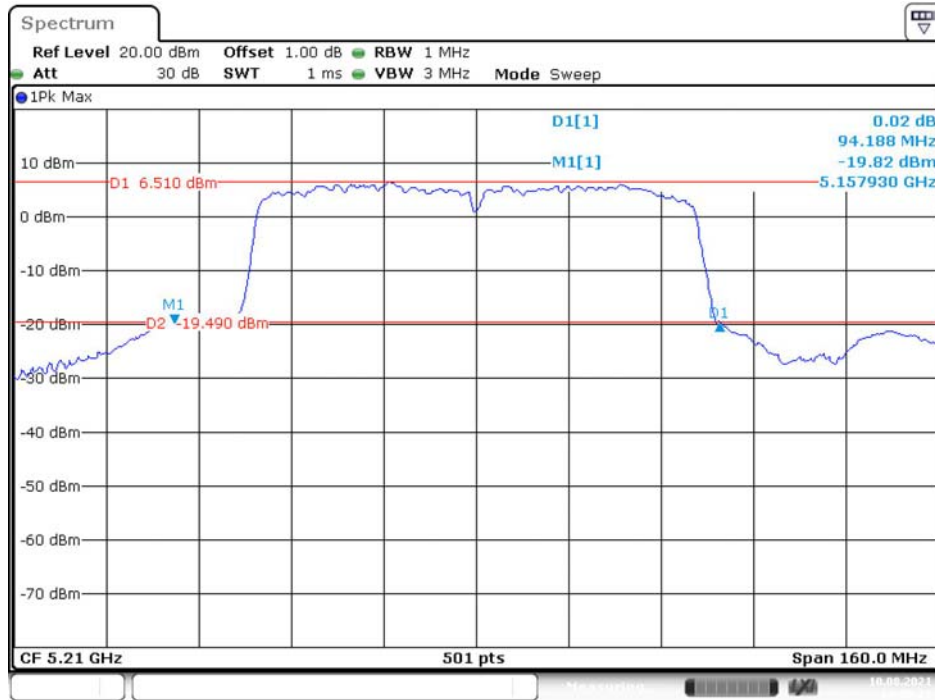
802.11n ht40 Low Channel



802.11n ht40 High Channel



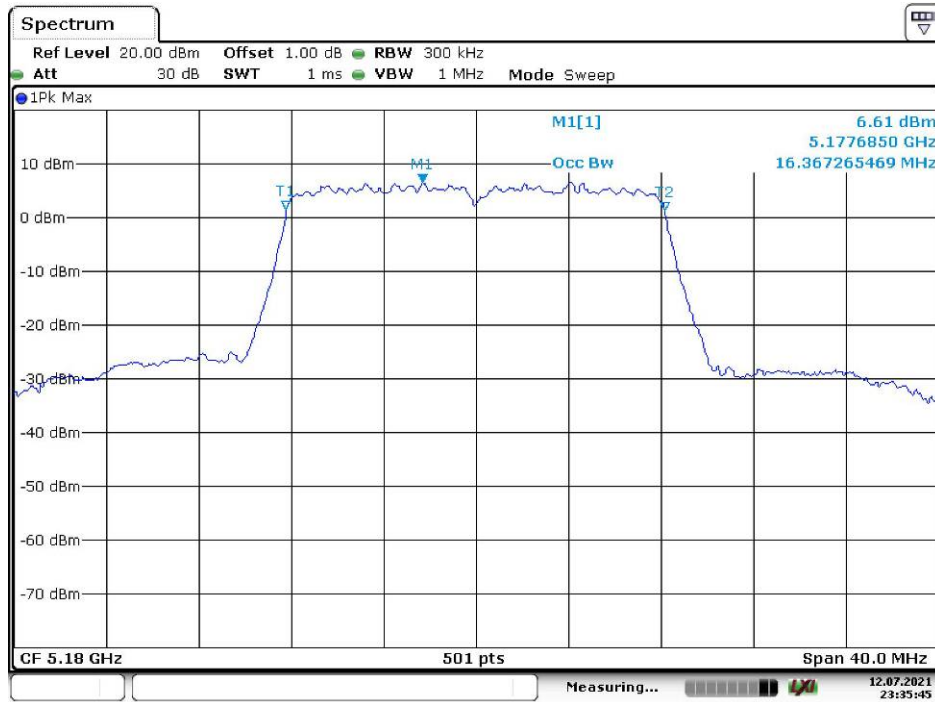
802.11ac vht80 Middle Channel



Date: 10.AUG.2021 14:00:22

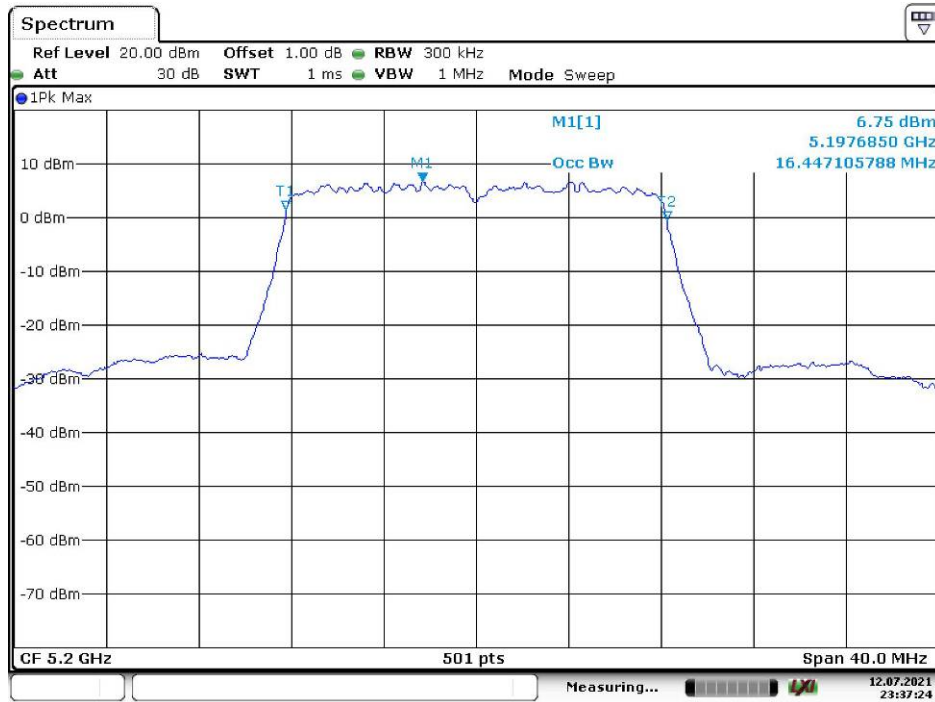
99% Occupied Bandwidth:

802.11a Low Channel



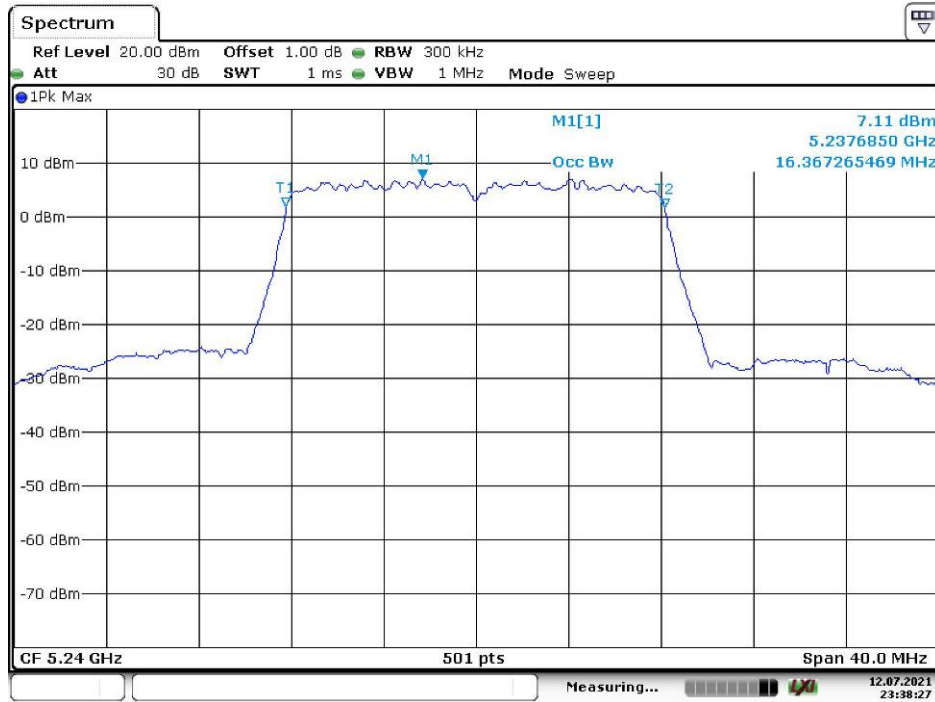
Date: 12.JUL.2021 23:35:45

802.11a Middle Channel

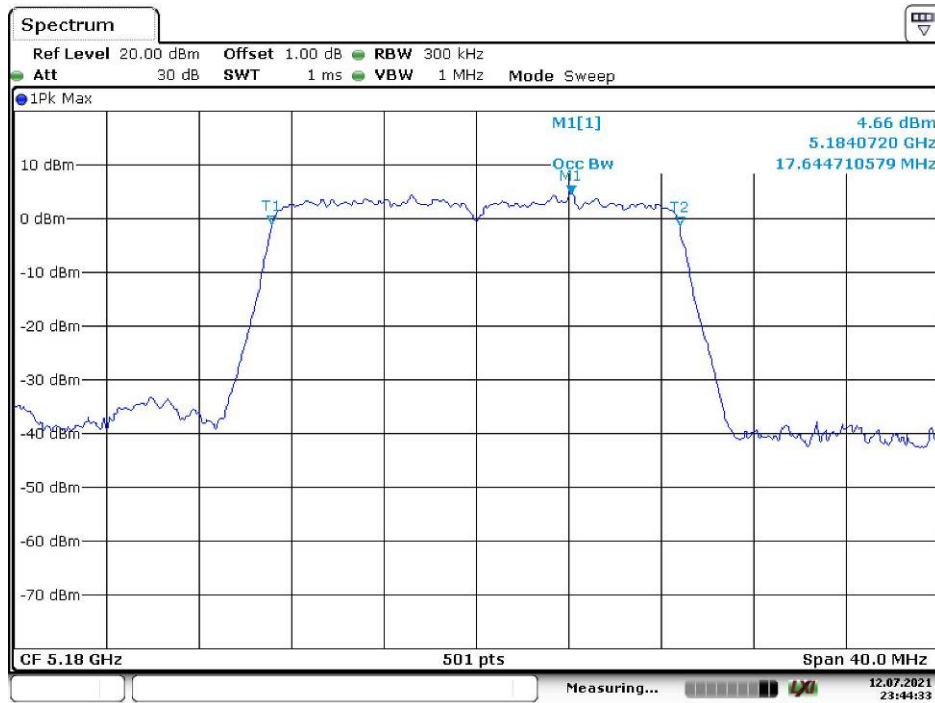


Date: 12.JUL.2021 23:37:25

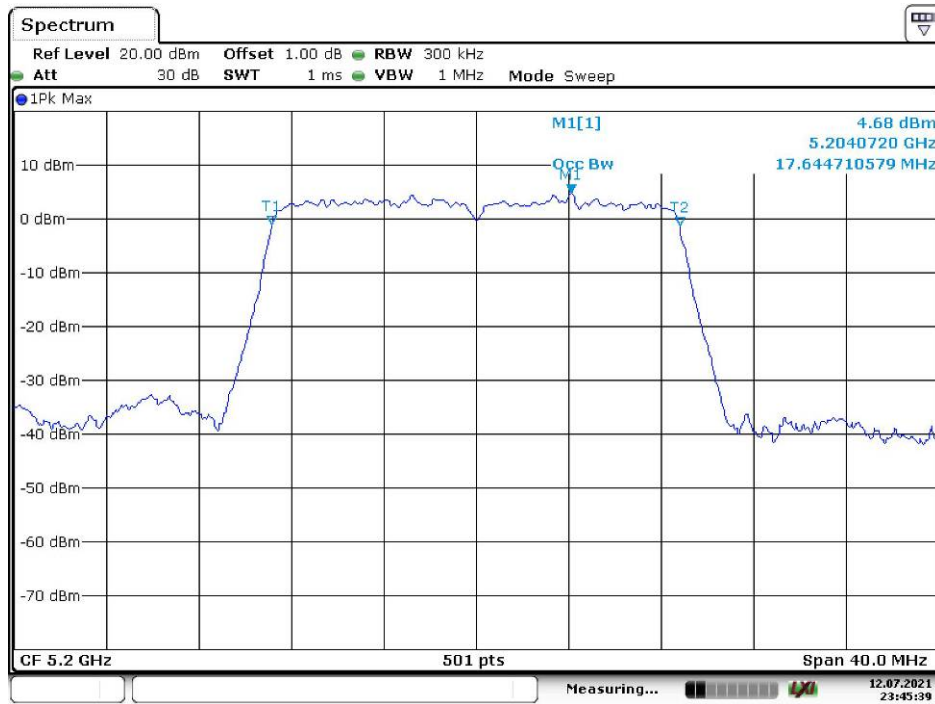
802.11a High Channel



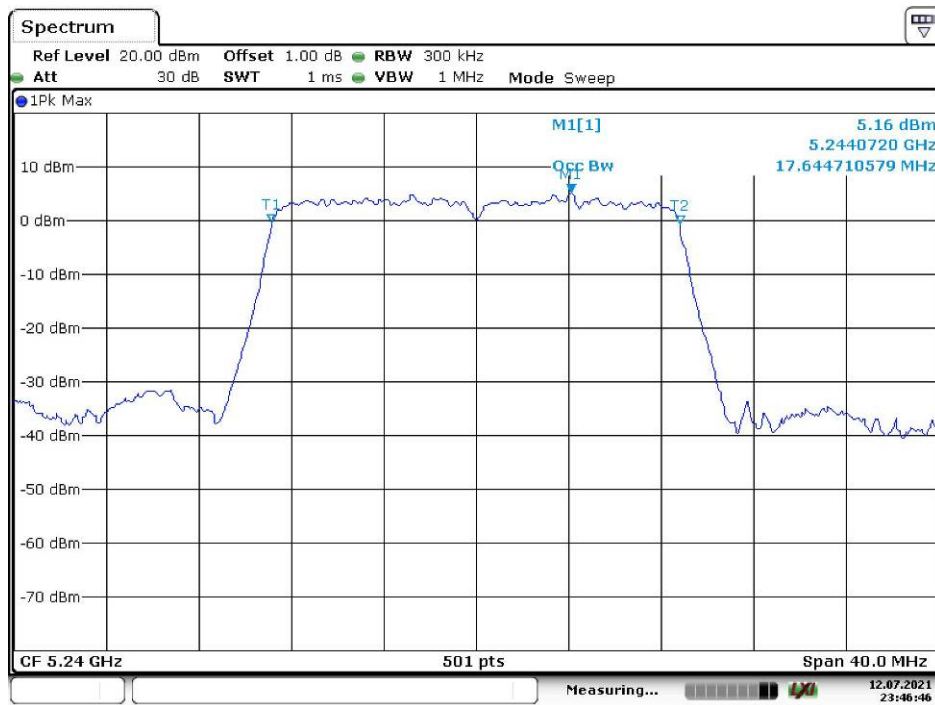
802.11n ht20 Low Channel



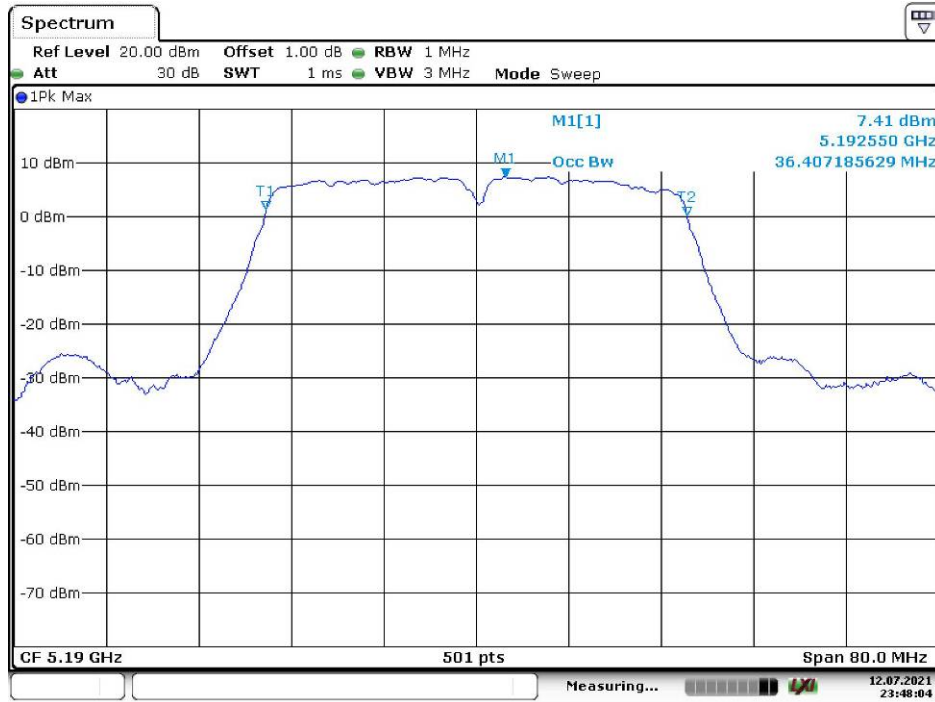
802.11n ht20 Middle Channel



802.11n ht20 High Channel

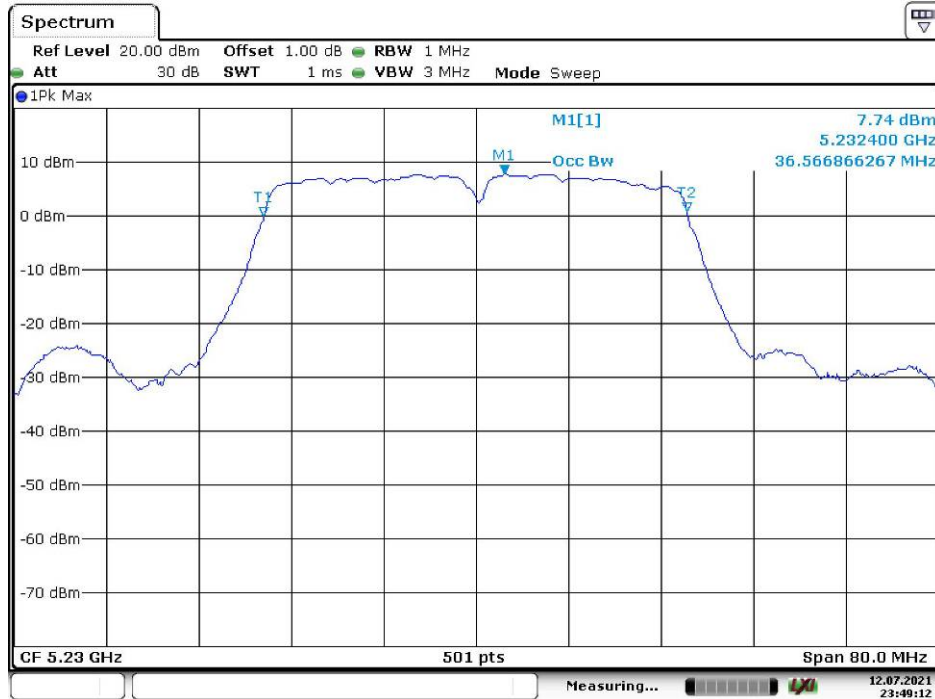


802.11n ht40 Low Channel



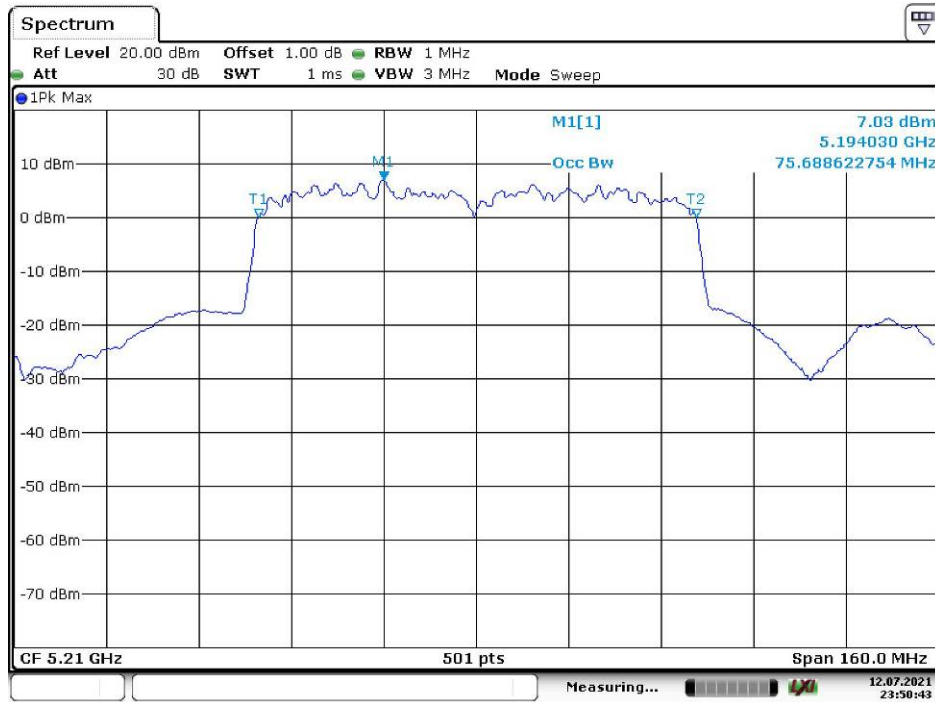
Date: 12.JUL.2021 23:48:05

802.11n ht40 High Channel



Date: 12.JUL.2021 23:49:13

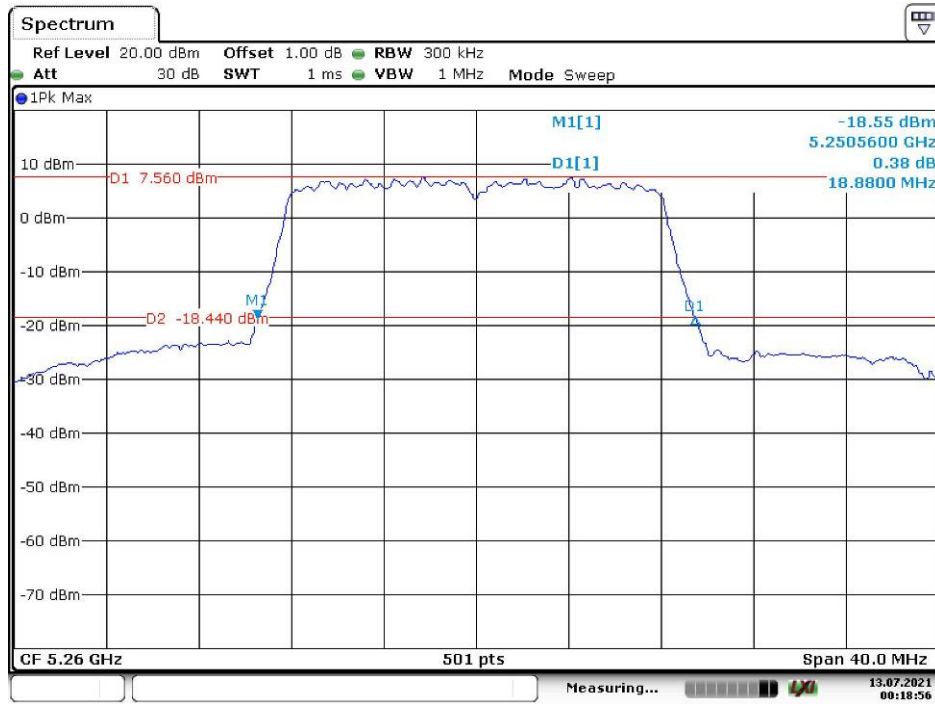
802.11ac vht80 Middle Channel



Date: 12.JUL.2021 23:50:44

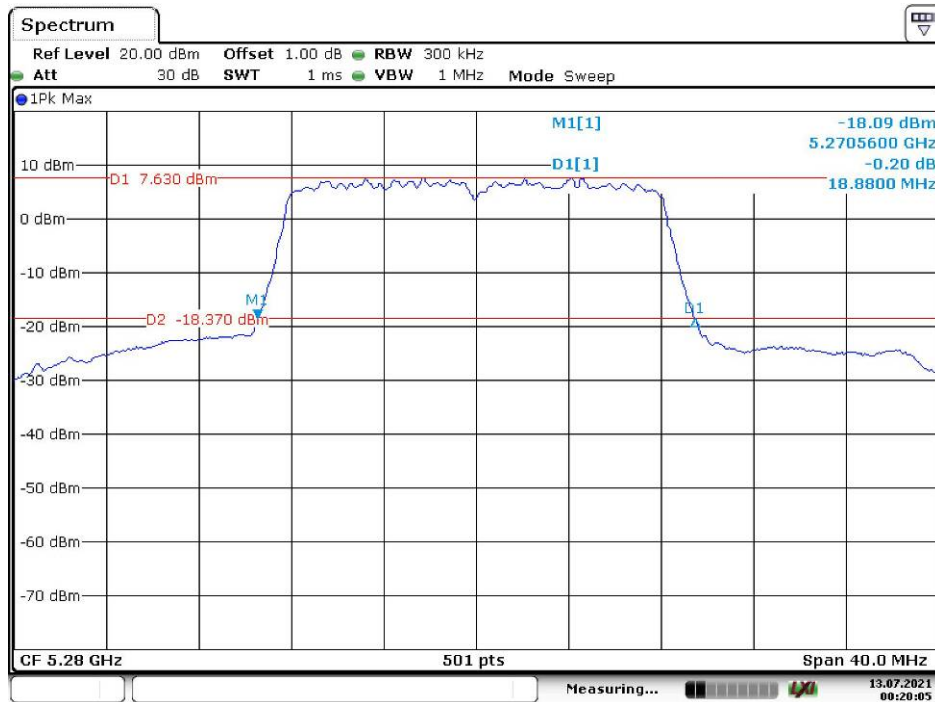
5250-5350MHz:
26dB Emission Bandwidth:

802.11a Low Channel



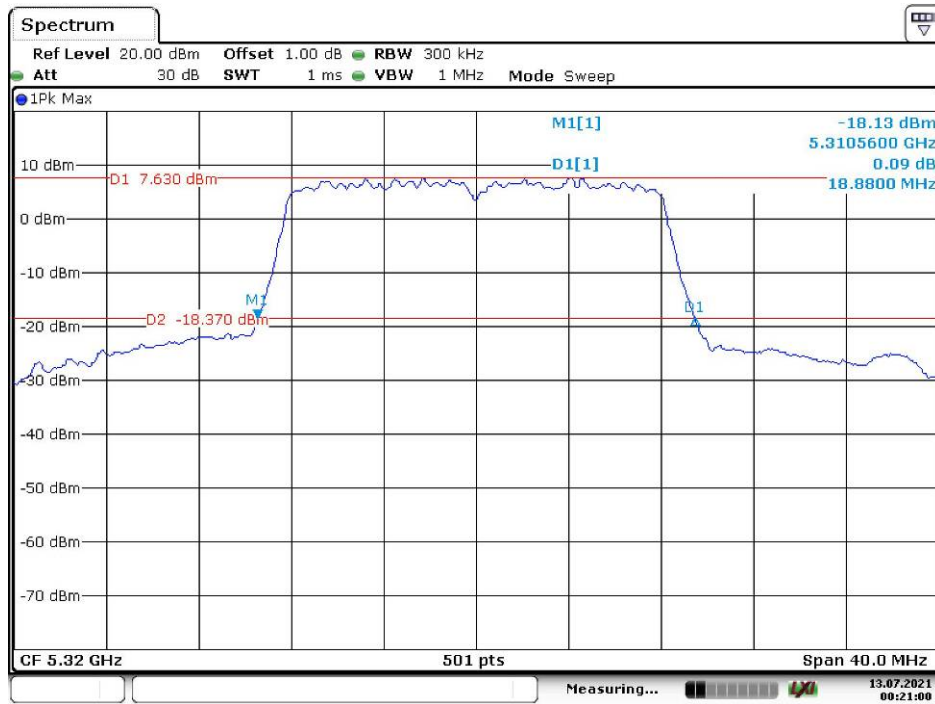
Date: 13.JUL.2021 00:18:56

802.11a Middle Channel



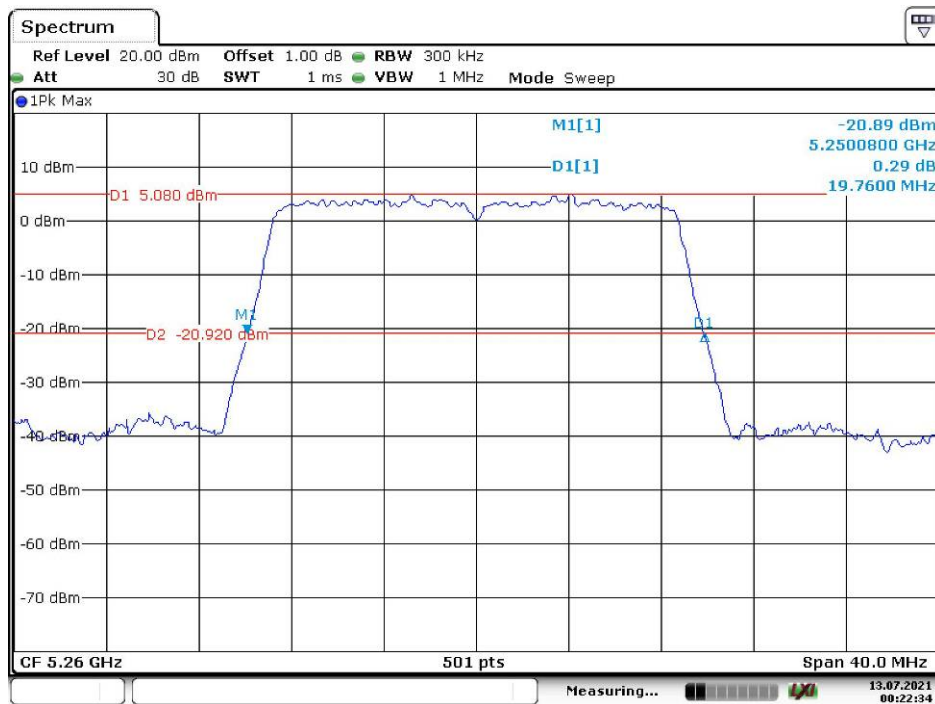
Date: 13.JUL.2021 00:20:06

802.11a High Channel



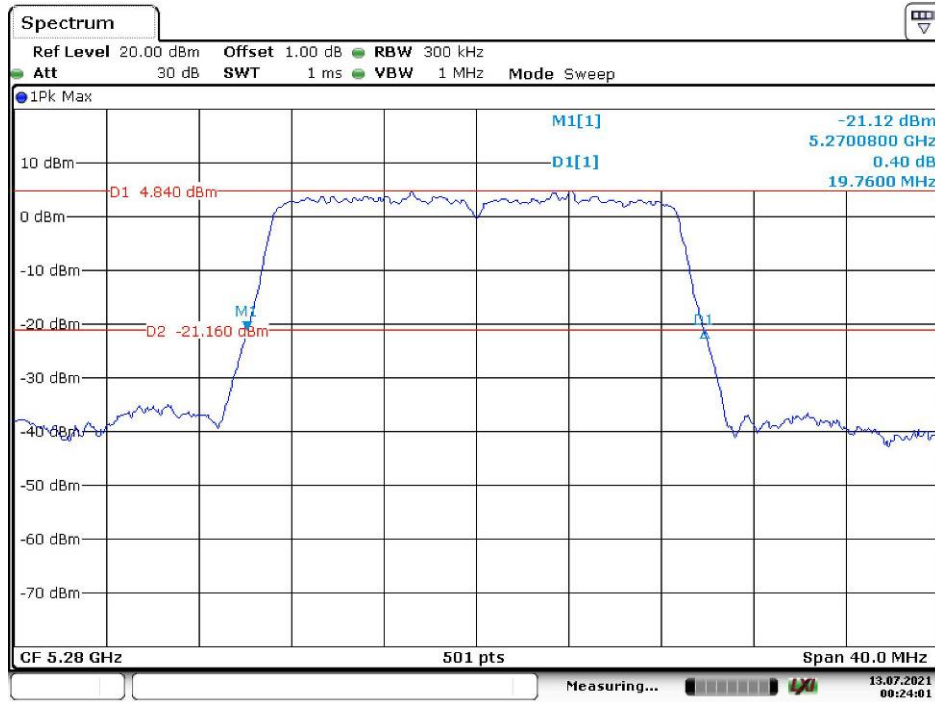
Date: 13.JUL.2021 00:21:01

802.11n ht20 Low Channel

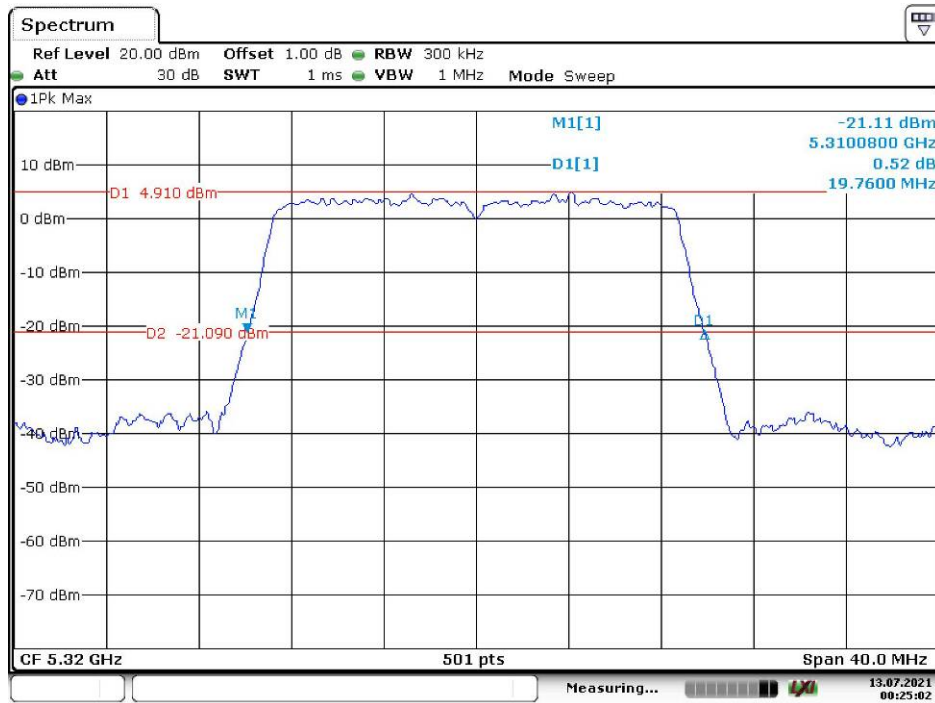


Date: 13.JUL.2021 00:22:35

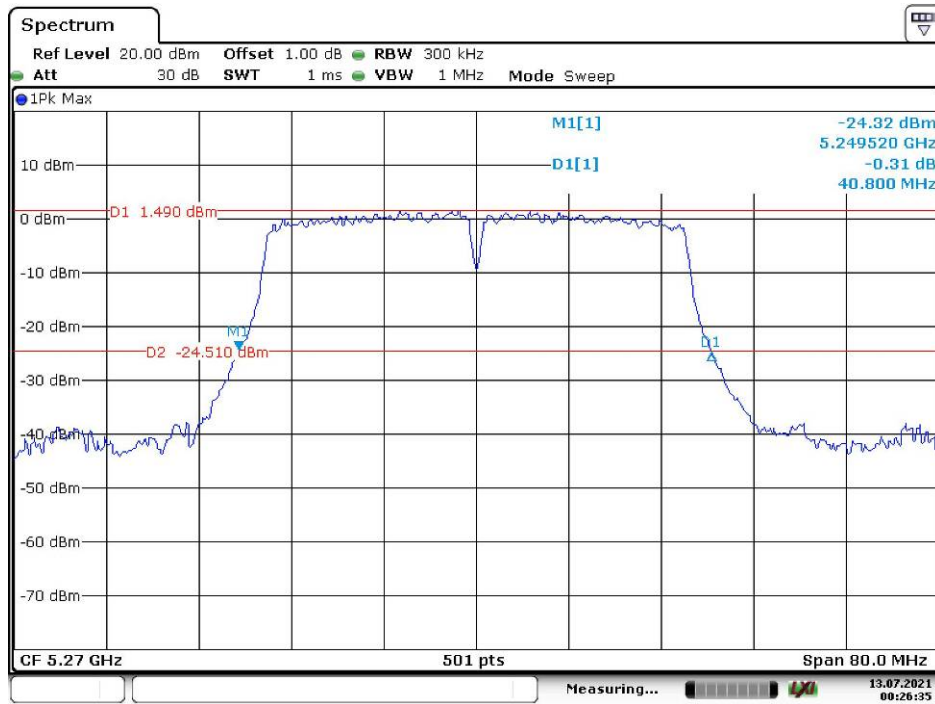
802.11n ht20 Middle Channel



802.11n ht20 High Channel

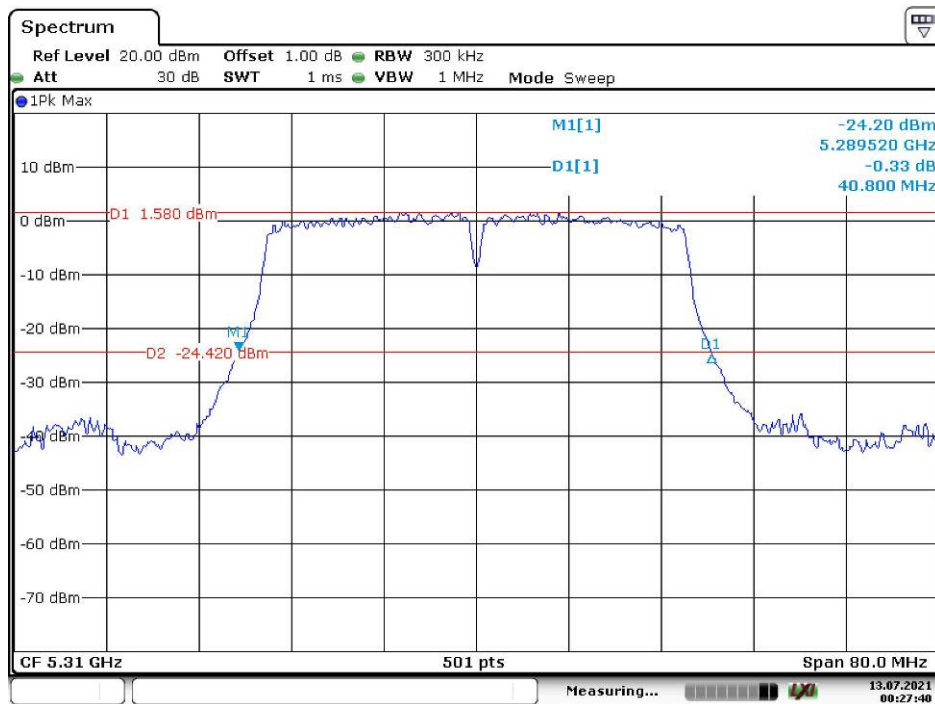


802.11n ht40 Low Channel



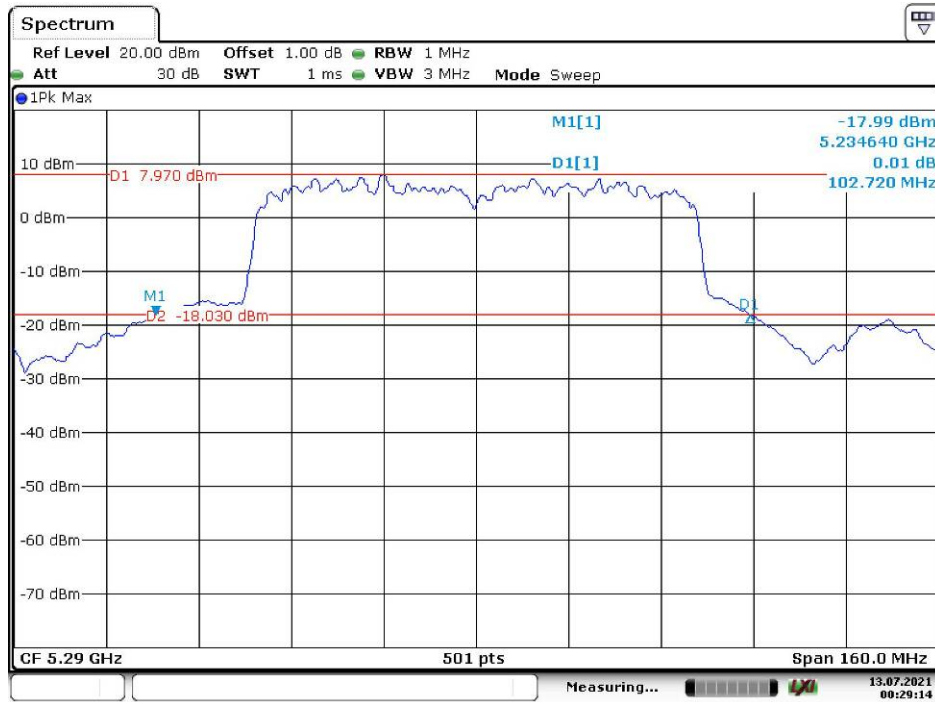
Date: 13.JUL.2021 00:26:36

802.11n ht40 High Channel



Date: 13.JUL.2021 00:27:41

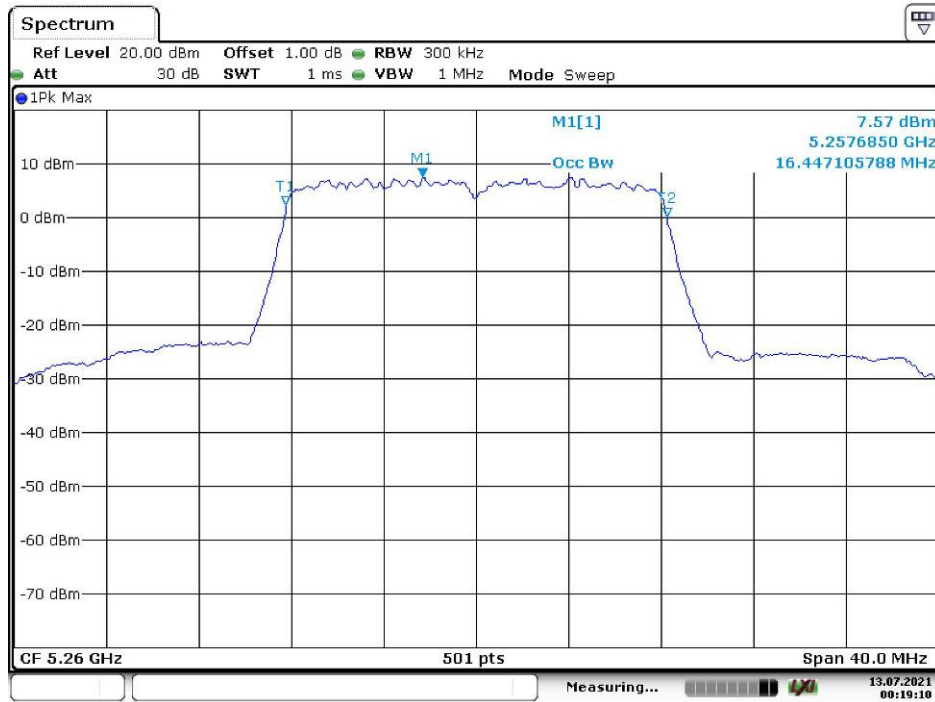
802.11ac vht80 Middle Channel



Date: 13.JUL.2021 00:29:14

99% Occupied Bandwidth:

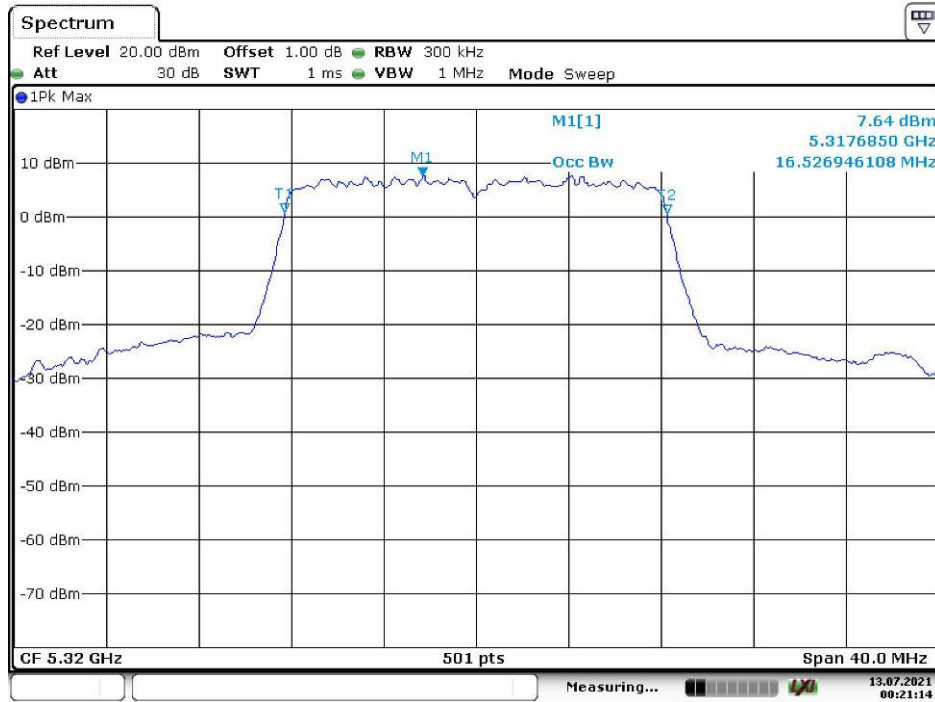
802.11a Low Channel



802.11a Middle Channel

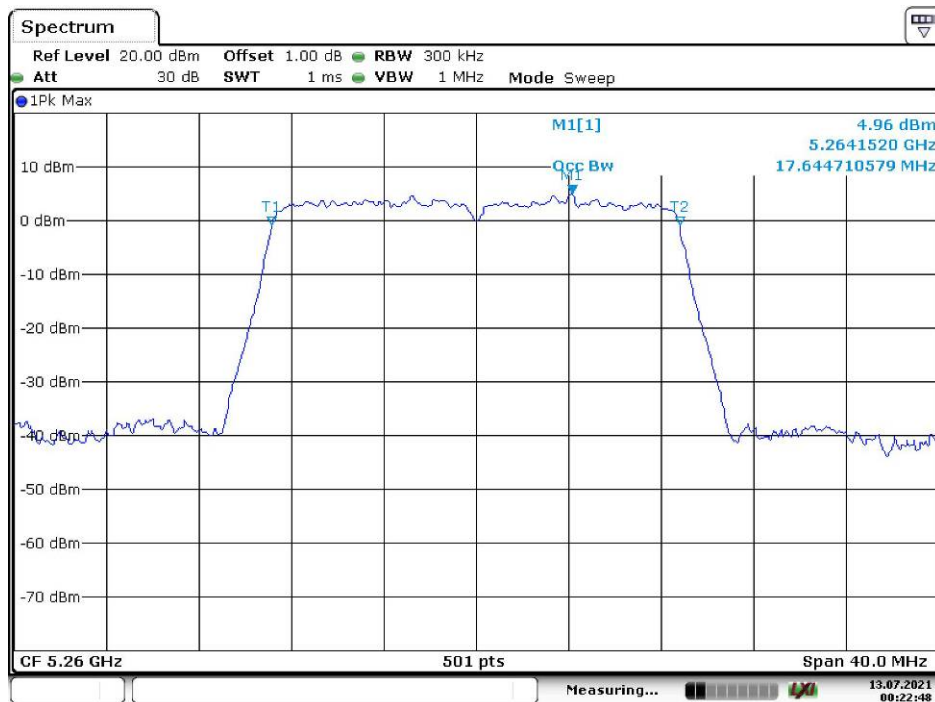


802.11a High Channel



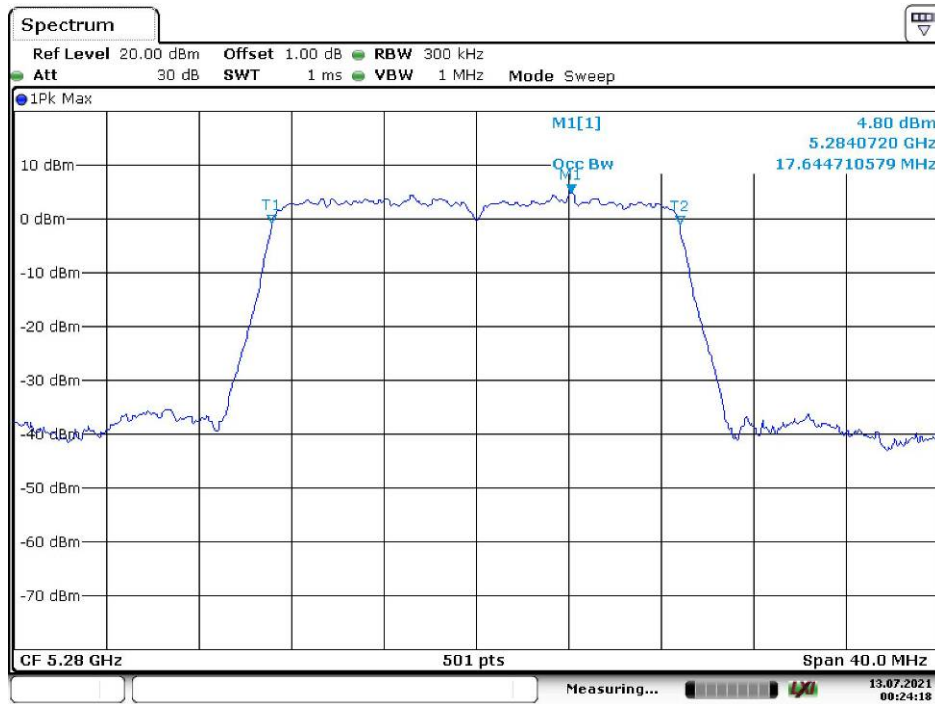
Date: 13.JUL.2021 00:21:15

802.11n ht20 Low Channel

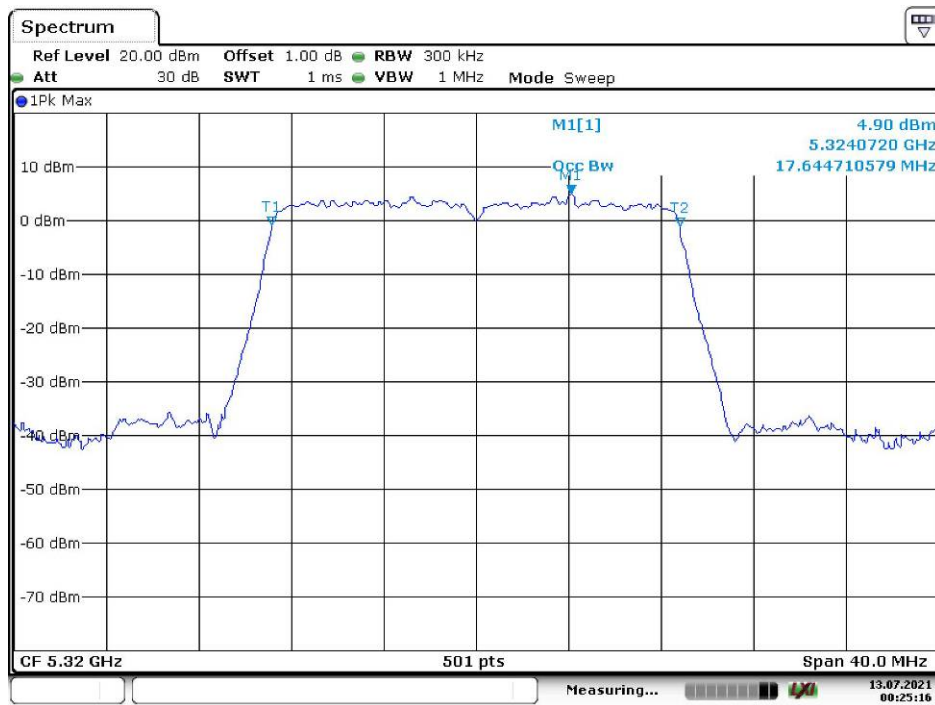


Date: 13.JUL.2021 00:22:49

802.11n ht20 Middle Channel



802.11n ht20 High Channel



802.11n ht40 Low Channel



802.11n ht40 High Channel



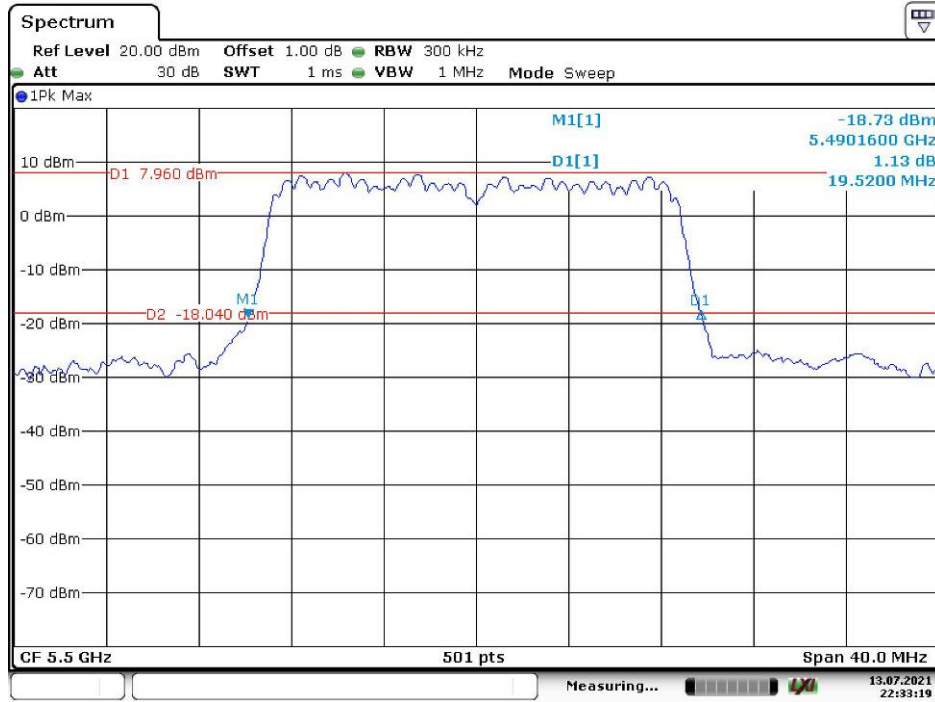
802.11ac vht80 Middle Channel



Date: 13.JUL.2021 00:29:25

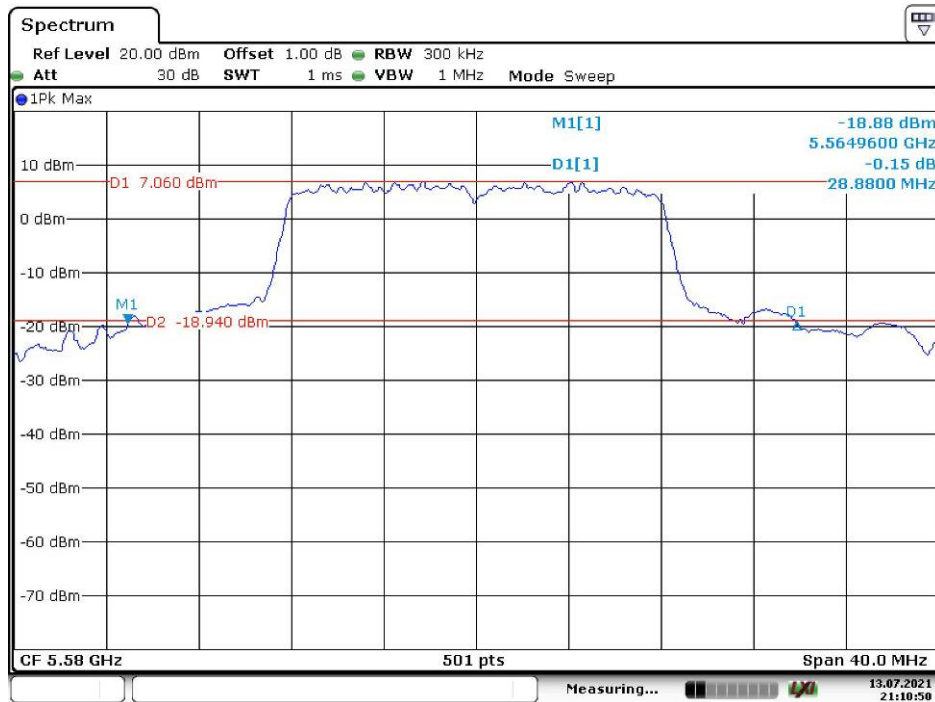
5470-5725MHz:
26dB Emission Bandwidth:

802.11a Low Channel



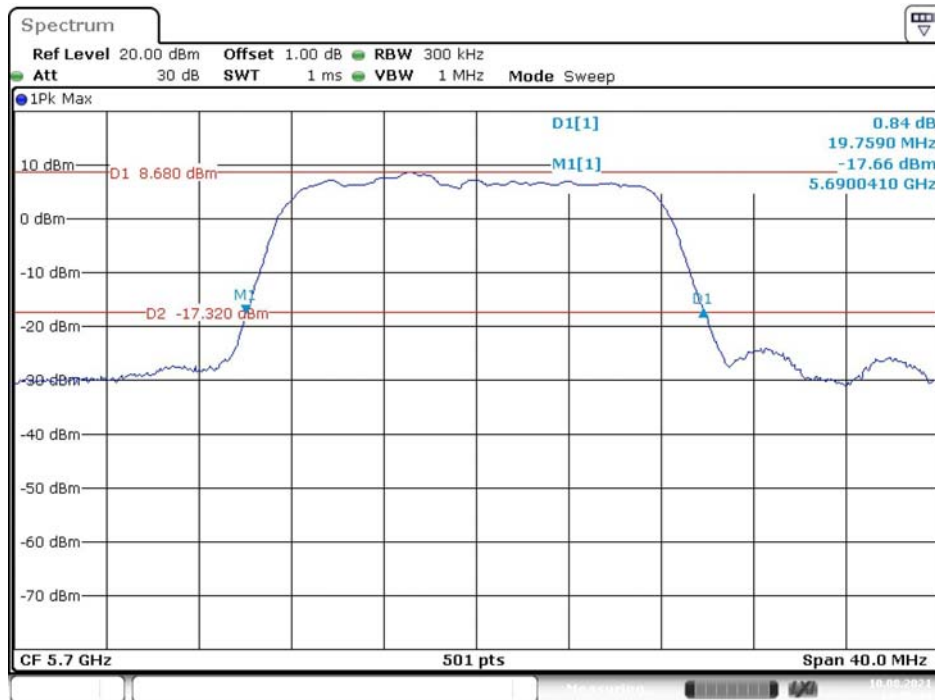
Date: 13.JUL.2021 22:33:20

802.11a Middle Channel

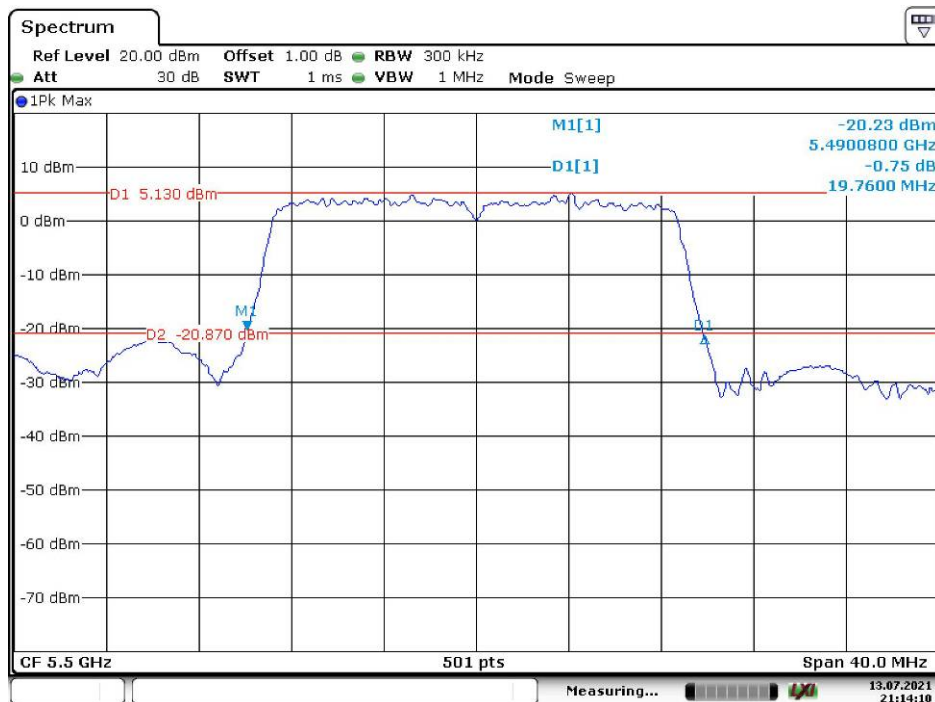


Date: 13.JUL.2021 21:10:50

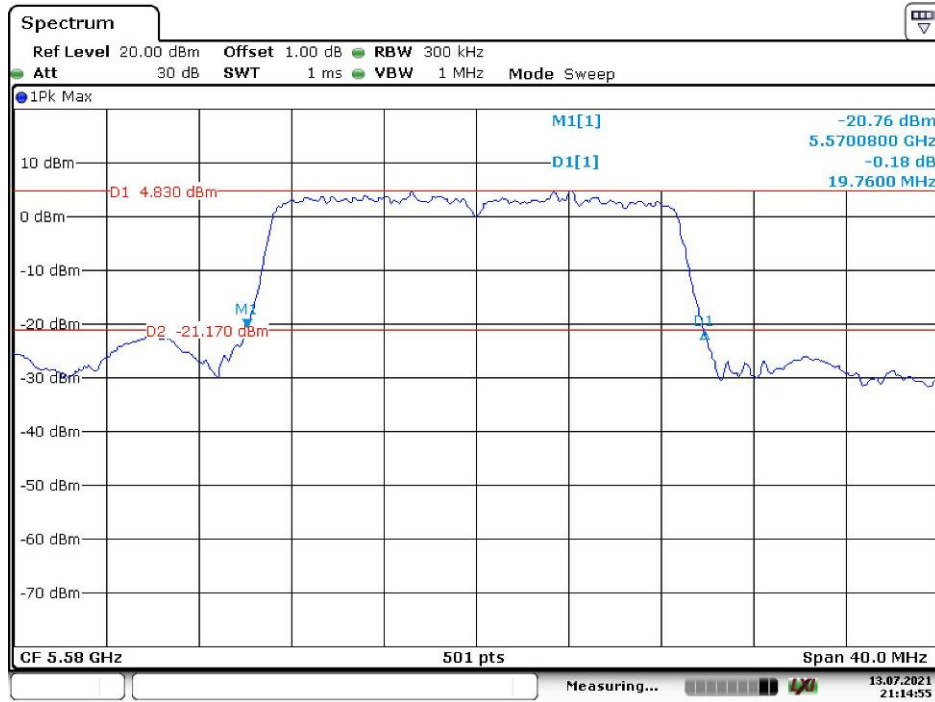
802.11a High Channel



802.11n ht20 Low Channel

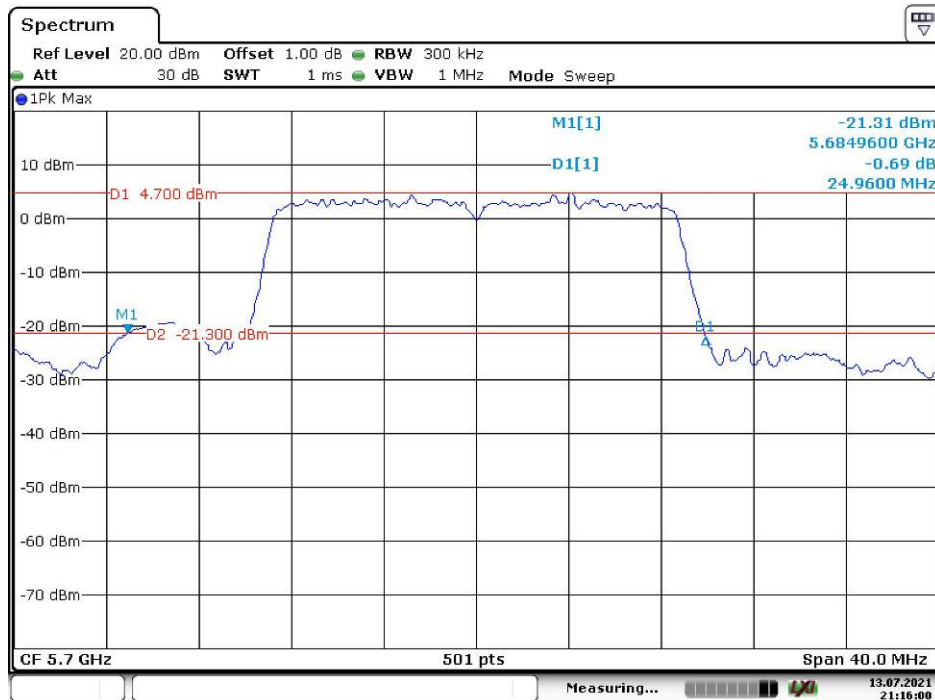


802.11n ht20 Middle Channel



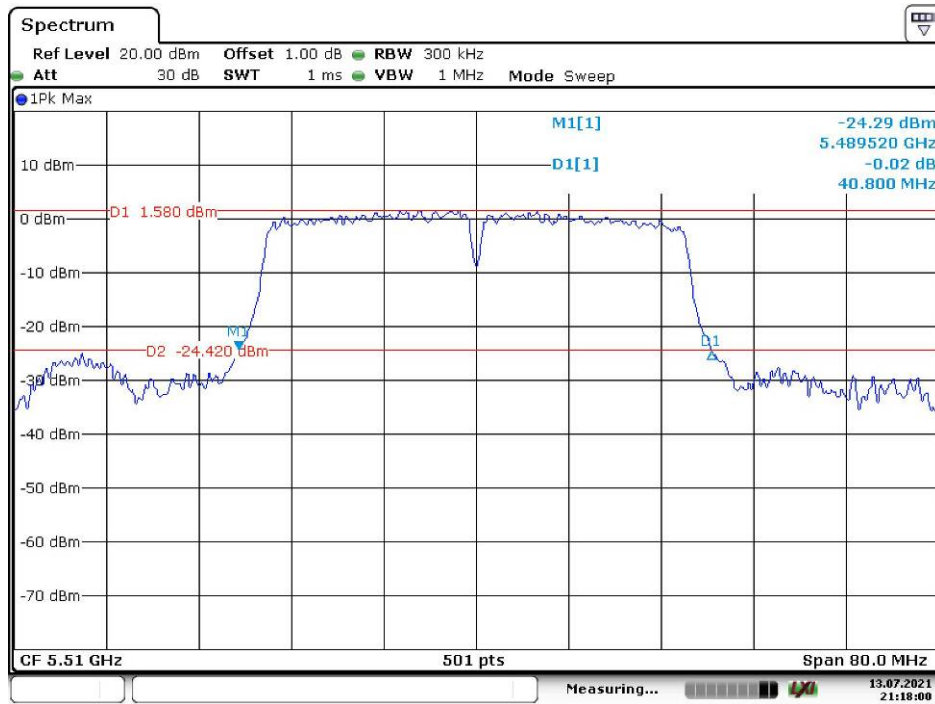
Date: 13.JUL.2021 21:14:56

802.11n ht20 High Channel



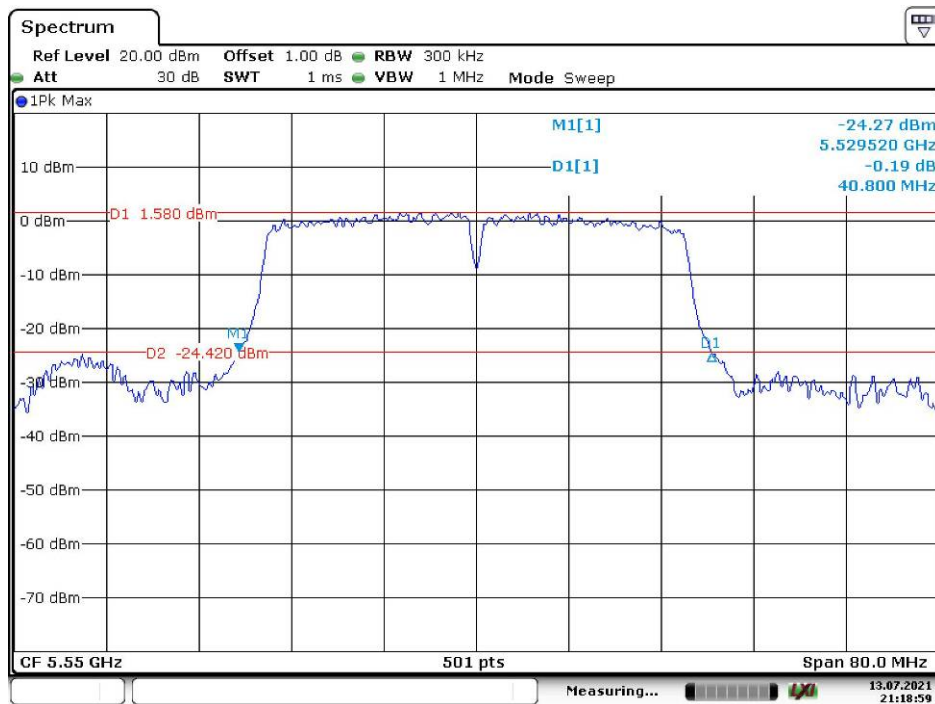
Date: 13.JUL.2021 21:16:00

802.11n ht40 Low Channel



Date: 13.JUL.2021 21:18:01

802.11n ht40 Middle Channel



Date: 13.JUL.2021 21:18:59