TESTING LABORATORY
CERTIFICATE #4820.01

FCC PART 15.407

TEST REPORT

For

Beijing ULINK Technology Co., Ltd.

No.9-161, Fuqian street, Niulanshan town, Shunyi District,Beijing,China

FCC ID: 2AMIWUZ211

Report Type:	**Product Name:**
Original Report	Mobile WiFi

Report Number:	RBJ190927050-00C
Report Date:	2020-02-19
Reviewed By:	Ivan Cao Assistant manager
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:	Mobile WiFi
EUT Model:	UZ-211-1
Multiple Models:	UZ-200,UZ-201
Operation Frequency:	5150-5250 MHz 5725-5825 MHz
Maximum Output Power (Conducted):	13.17 dBm(5150-5250 MHz band) 13.61 dBm(5725-5850 MHz band)
Modulation Type:	OFDM
Rated Input Voltage:	DC 3.63V from Battery or DC 5V from USB port
Serial Number:	RBJ190927050-RF-S1
EUT Received Date:	2019/10/9
EUT Received Status:	Good

Notes: *Model UZ-211-1 was selected for fully testing, the detailed information about the difference among UZ-200,UZ-201and model UZ-211-1 can be referred to the declaration letter which was stated and guaranteed by the manufacturer.*

Objective

This type approval report is prepared on behalf of the Applicant 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.

Related Submittal(s)/Grant(s)

FCC Part 22H, 24E,27 PCB submissions with FCC ID: 2AMIWUZ211
FCC Part 15B JBP submissions with FCC ID: 2AMIWUZ211
FCC Part 15C DTS submissions with FCC ID: 2AMIWUZ211
FCC Part 15E DSS submissions with FCC ID: 2AMIWUZ211

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℃
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.69 Pulongcun, Puxinhu Industry Area, Tangxia, 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 EUT was configured for testing in an engineering mode which was provided by the manufacturer.

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

For 5150~5250 MHz band, 6 channels are provided:

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

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

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

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

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

Equipment Modifications

No modification was made to the EUT.

EUT Exercise Software

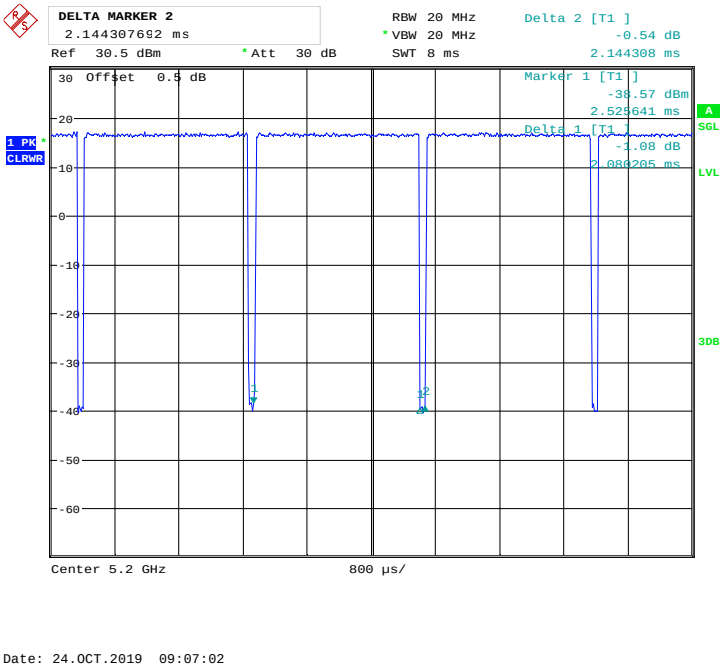
The software “QRCT” was used for testing, the QRCT command was provided by manufacturer. The worst-case data rates are determined to be as follows for each mode based upon investigations by measuring the average power and PSD across all data rates, bandwidths, and modulations. The maximum power was configured as below table, that provided by the manufacturer:

Band	Mode	Channel	Frequency (MHz)	Data rate	Power level setting
5.15 - 5.25 GHz	802.11a	Low	5180	6 Mbps	18
		Middle	5200	6 Mbps	18
		High	5240	6 Mbps	18
	802.11n ht20	Low	5180	MCS 0	18
		Middle	5200	MCS 0	18
		High	5240	MCS 0	18
	802.11n ht40	Low	5190	MCS 0	18
		High	5230	MCS 0	18
5.725 - 5.85 GHz	802.11a	Low	5745	6 Mbps	18
		Middle	5785	6 Mbps	18
		High	5825	6 Mbps	18
	802.11n ht20	Low	5745	MCS 0	18
		Middle	5785	MCS 0	18
		High	5825	MCS 0	18
	802.11n ht40	Low	5755	MCS 0	18
		High	5795	MCS 0	18

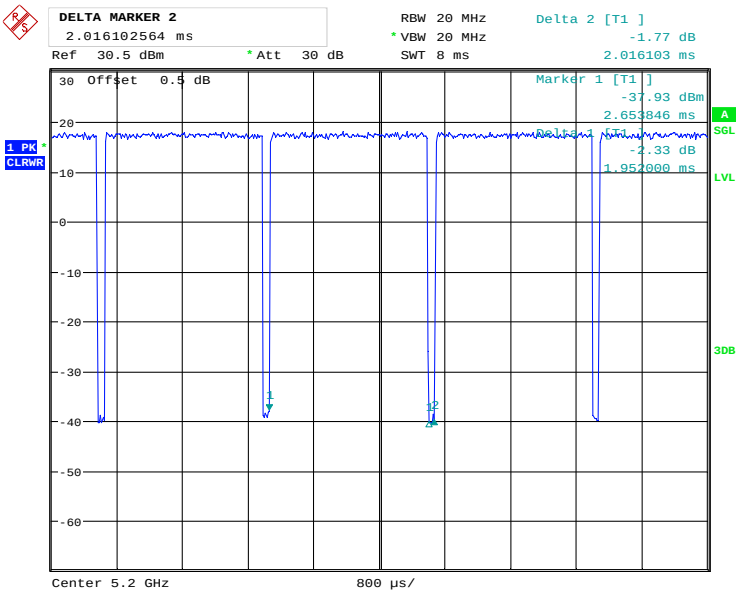
The duty cycle as below:

Mode	T_{on} (ms)	T_{on+off} (ms)	Duty Cycle(x) (%)
802.11 a	2.080	2.144	97.015
802.11n ht20	1.952	2.016	96.83
802.11n ht40	0.955	1.045	91.39

802.11a



802.11n ht20



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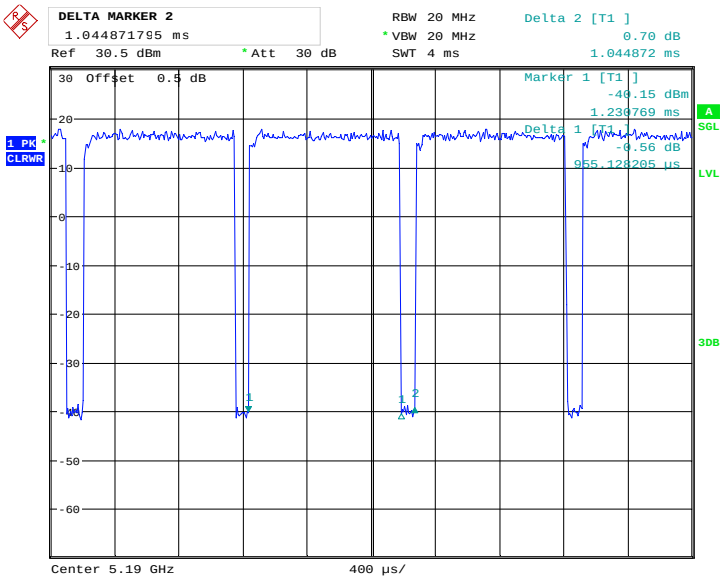
802.11 ht40



Date: 24.OCT.2019 09:08:17

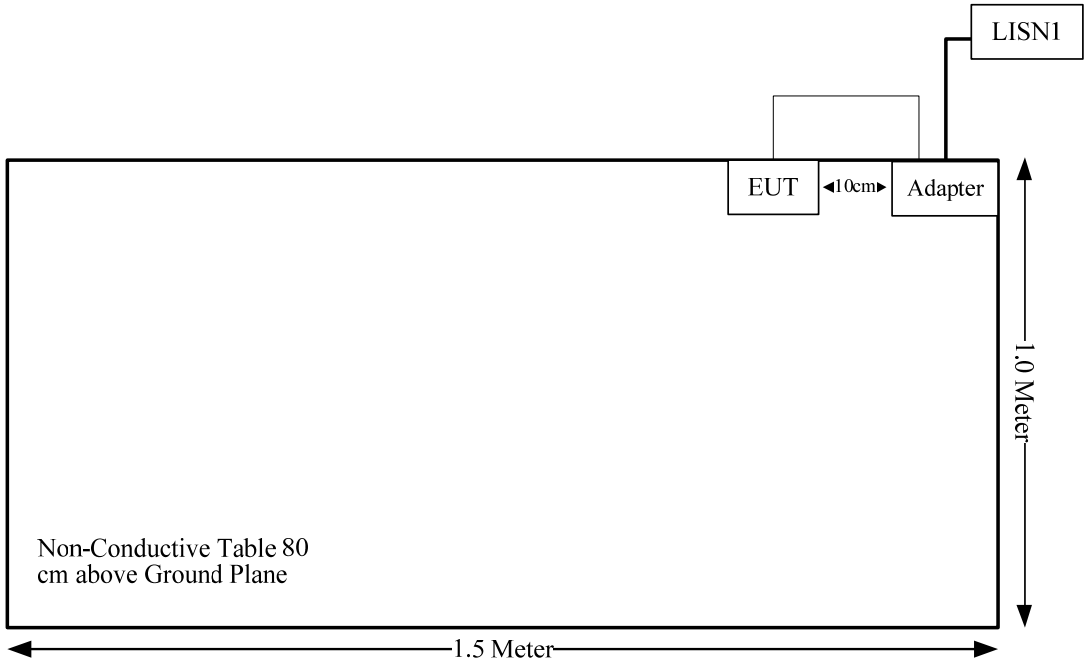
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
HUAWEI	Adapter	HW-050200C01	P78518G9V49032

Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
USB-C Cable	Yes	No	1	EUT	Adapter

Configuration of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
FCC§15.407 (f) & §1.1310 & §2.1093	RF Exposure	Compliance
§15.203	Antenna Requirement	Compliance
§15.407(b)(6)& §15.207(a)	Conducted Emissions	Compliance
§15.205& §15.209 &§15.407(b)	Undesirable Emission& Restricted Bands	Compliance
§15.407(a)(e)	Emission Bandwidth	Compliance
§15.407(a)	Conducted Transmitter Output Power	Compliance
§15.407 (a)	Power Spectral Density	Compliance

FCC §15.407(f) & §1.1310 & §2.1093- RF EXPOSURE

Applicable Standard

According to§15.247(i) and §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

Measurement Result

Compliance, please refer to the SAR report: RBJ190927050-SAR.

FCC §15.203 – 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 use of a standard antenna jack or electrical connector is prohibited.

Antenna Connector Construction

The EUT has one internal antenna arrangement, fulfill the requirement of this section. Please refer to below information and the EUT photos:

Antenna Type	input impedance (Ohm)	Antenna Gain /Frequency Range
FPC	50	0 dBi/5150~5850MHz

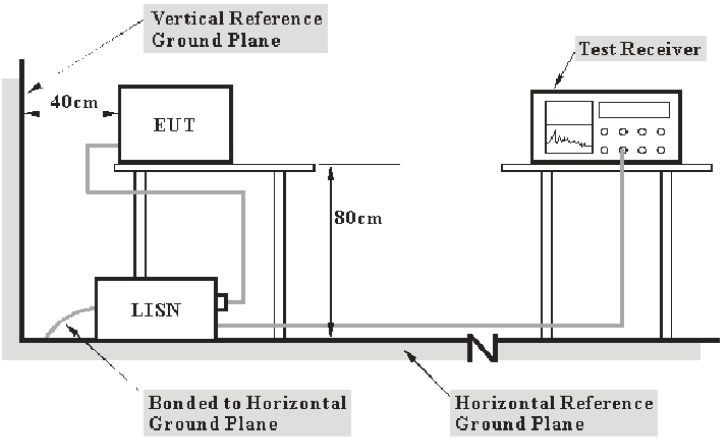
Result: Compliance.

FCC §15.407 (b) (6) §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 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

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
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
R&S	Two-line V-network	ENV 216	101614	2018-12-10	2019-12-10
R&S	EMI Test Receiver	ESPI	100120	2019-05-09	2020-05-09
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-01	2019-09-05	2020-09-05

*** 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.

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

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

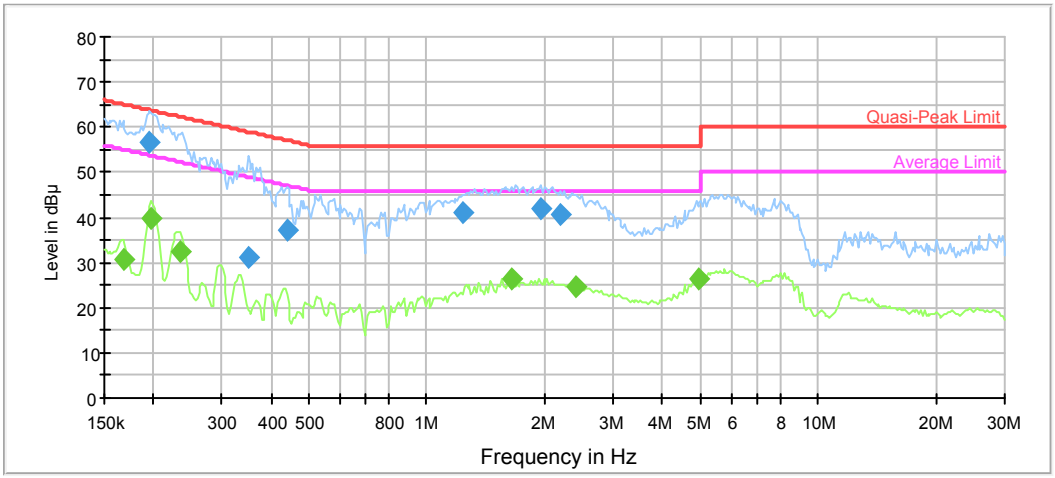
Test Data

Environmental Conditions

Temperature:	27.1℃
Relative Humidity:	61%
ATM Pressure:	101.0kPa
Test by:	Sern Xiang
Test Date:	2019-10-14

Test Mode: Transmitting (802.11a 5825MHz was the worst)

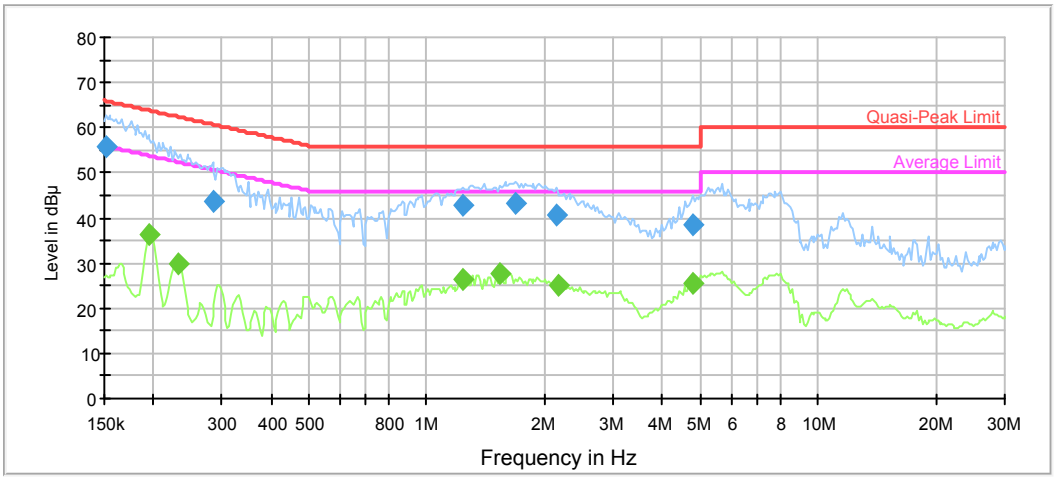
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.196231	56.7	9.000	L1	10.6	7.1	63.8
0.349469	31.2	9.000	L1	10.0	27.8	59.0
0.439339	37.4	9.000	L1	9.9	19.7	57.1
1.236582	41.0	9.000	L1	9.8	15.0	56.0
1.954366	41.9	9.000	L1	9.7	14.1	56.0
2.202229	40.5	9.000	L1	9.7	15.5	56.0

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.167350	30.8	9.000	L1	10.9	24.3	55.1
0.198194	39.7	9.000	L1	10.6	14.0	53.7
0.234722	32.5	9.000	L1	10.4	19.8	52.3
1.650223	26.6	9.000	L1	9.7	19.4	46.0
2.408545	24.8	9.000	L1	9.8	21.2	46.0
4.930532	26.2	9.000	L1	9.8	19.8	46.0

AC120 V, 60 Hz, Neutral:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.151500	55.8	9.000	N	11.1	10.1	65.9
0.283569	43.7	9.000	N	10.2	17.0	60.7
1.236582	42.7	9.000	N	9.8	13.3	56.0
1.683392	43.2	9.000	N	9.8	12.8	56.0
2.137462	40.6	9.000	N	9.8	15.4	56.0
4.785525	38.5	9.000	N	9.8	17.5	56.0

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.196231	36.1	9.000	N	10.6	17.7	53.8
0.232398	30.0	9.000	N	10.4	22.4	52.4
1.236582	26.2	9.000	N	9.8	19.8	46.0
1.539193	27.7	9.000	N	9.8	18.3	46.0
2.158836	25.2	9.000	N	9.8	20.8	46.0
4.785525	25.4	9.000	N	9.8	20.6	46.0

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 manufacturing, 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 manufacturing, marketing and importing of devices certified under this alternative must cease before March 2, 2020.

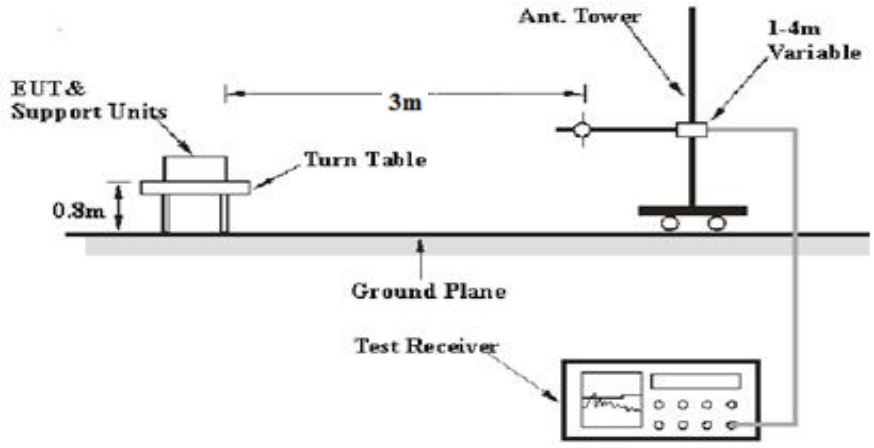
(5) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

(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.

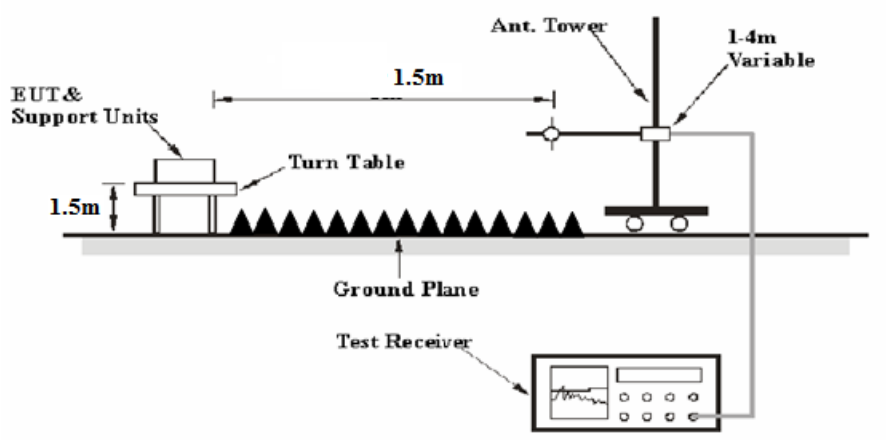
(7) The provisions of §15.205 apply to intentional radiators operating under this section.

EUT Setup

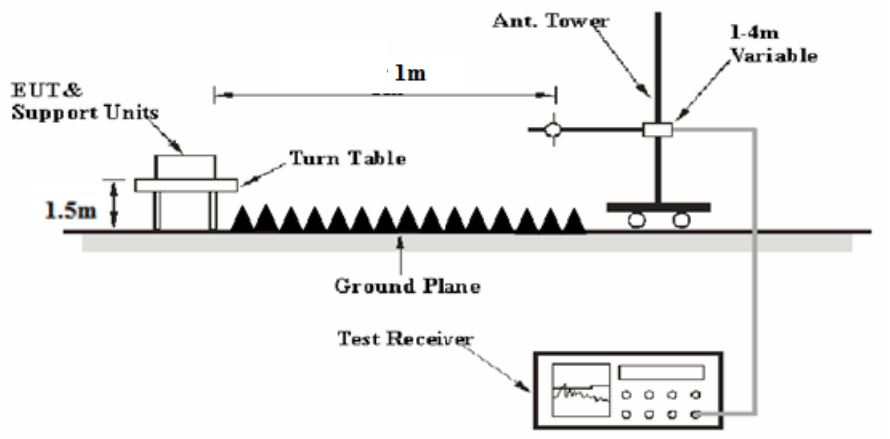
Below 1 GHz:



1-26.5 GHz:



26.5-40 GHz:



The radiated emission Below 1GHz tests were performed in the 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 15.407 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

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

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 [dBμV/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 (specific distance [3m]/test distance [1.5m]) dB= 6.02 dB
or
Distance extrapolation factor =20 log (specific distance [3m]/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:

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

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:

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

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					
R&S	EMI Test Receiver	ESR3	102453	2019-09-12	2020-09-12
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
Sunol Sciences	Antenna	JB3	A060611-1	2017-11-10	2020-11-10
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-1400-01	2019-05-06	2020-05-06
HP	Amplifier	8447D	2727A05902	2019-09-05	2020-09-05
Radiation Above 1GHz					
Agilent	Spectrum Analyzer	E4440A	SG43360054	2019-05-09	2020-05-09
R&S	Spectrum Analyzer	FSP 38	100478	2019-05-09	2020-05-09
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
Ducommun Technolagies	Horn Antenna	ARH-4223-02	1007726-01 1304	2019-11-18	2022-11-18
Ducommun Technolagies	Horn Antenna	ARH-2823-02	1007726-01 1302	2019-11-18	2022-11-18
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	2019-06-27	2020-06-27
Mini-Circuit	Amplifier	ZVA-213-S+	54201245	2019-09-05	2020-09-05
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2019-06-27	2020-06-27
Sinoscite	Bandstop Filters	BSF5150-5850MN-0899-003	0899003	2019-05-06	2020-05-06
Micro-tronics	High Pass Filter	HPM50111	S/N-G217	2019-06-16	2020-06-16

*** 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

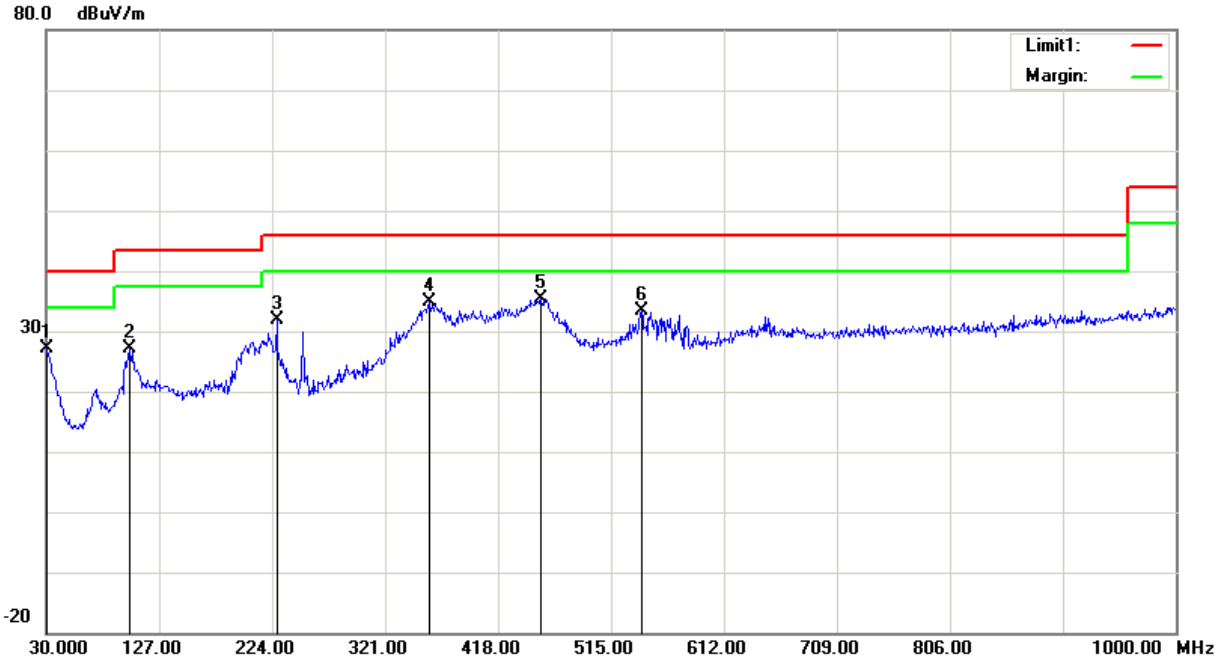
Environmental Conditions

Test Items	Radiation Below 1GHz	Radiation Above 1GHz
Temperature:	24.5 °C	24.4 °C
Relative Humidity:	43%	42%
ATM Pressure:	102.1 kPa	102.5 kPa
Tester:	Tyler Pan	Lucy Lu
Test Date:	2019-12-18	2019-11-29

Test Mode: Transmitting

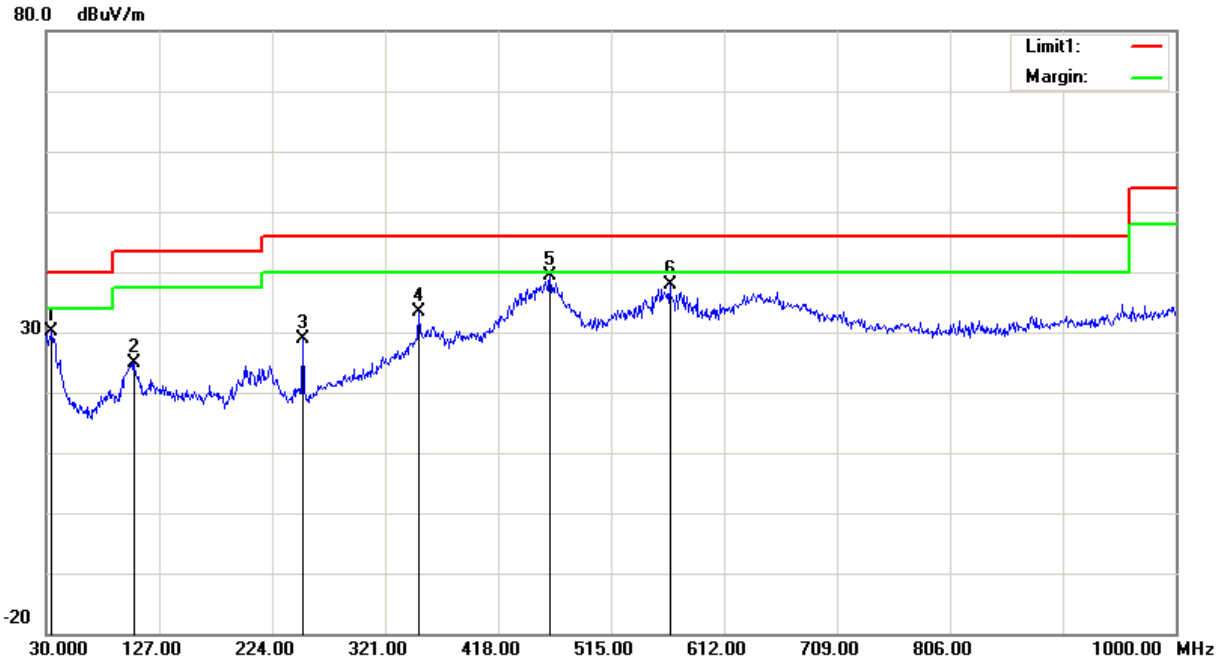
Below 1GHz (802.11n ht20, 5240 MHz was the worst):

Horizontal:



Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
30.9700	26.20	peak	0.91	27.11	40.00	12.89
101.7800	35.40	peak	-8.34	27.06	43.50	16.44
227.8800	38.52	peak	-6.57	31.95	46.00	14.05
358.8300	37.75	peak	-2.81	34.94	46.00	11.06
454.8600	36.44	peak	-0.99	35.45	46.00	10.55
541.1900	33.16	peak	0.32	33.48	46.00	12.52

Vertical:



Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
34.8500	32.09	peak	-1.94	30.15	40.00	9.85
105.6600	32.27	peak	-7.32	24.95	43.50	18.55
250.1900	35.03	peak	-6.03	29.00	46.00	17.00
350.1000	36.48	peak	-3.05	33.43	46.00	12.57
462.6200	40.06	peak	-0.67	39.39	46.00	6.61
565.4400	37.05	peak	0.92	37.97	46.00	8.03

1GHz-40GHz:

5150-5250 MHz:

802.11a

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	77.62	PK	H	33.59	3.58	0.00	114.79	108.77	N/A	N/A
5180.00	67.42	AV	H	33.59	3.58	0.00	104.59	98.57	N/A	N/A
5180.00	73.42	PK	V	33.59	3.58	0.00	110.59	104.57	N/A	N/A
5180.00	63.57	AV	V	33.59	3.58	0.00	100.74	94.72	N/A	N/A
5150.00	35.23	PK	H	33.54	3.56	0.00	72.33	66.31	74.00	7.69
5150.00	16.82	AV	H	33.54	3.56	0.00	53.92	47.9	54.00	6.10
10360.00	35.19	PK	H	38.17	6.29	25.46	54.19	48.17	68.20	20.03
15540.00	34.56	PK	H	38.06	8.85	24.27	57.20	51.18	74.00	22.82
15540.00	21.35	AV	H	38.06	8.85	24.27	43.99	37.97	54.00	16.03
Middle Channel: 5200 MHz										
5200.00	77.02	PK	H	33.62	3.60	0.00	114.24	108.22	N/A	N/A
5200.00	66.58	AV	H	33.62	3.60	0.00	103.80	97.78	N/A	N/A
5200.00	72.34	PK	V	33.62	3.60	0.00	109.56	103.54	N/A	N/A
5200.00	62.54	AV	V	33.62	3.60	0.00	99.76	93.74	N/A	N/A
10400.00	35.34	PK	H	38.18	6.32	25.46	54.38	48.36	68.20	19.84
15600.00	34.64	PK	H	38.00	8.83	24.31	57.16	51.14	74.00	22.86
15600.00	22.01	AV	H	38.00	8.83	24.31	44.53	38.51	54.00	15.49
High Channel: 5240 MHz										
5240.00	76.43	PK	H	33.68	3.52	0.00	113.63	107.61	N/A	N/A
5240.00	67.19	AV	H	33.68	3.52	0.00	104.39	98.37	N/A	N/A
5240.00	72.06	PK	V	33.68	3.52	0.00	109.26	103.24	N/A	N/A
5240.00	62.35	AV	V	33.68	3.52	0.00	99.55	93.53	N/A	N/A
5350.00	28.08	PK	H	33.86	3.52	0.00	65.46	59.44	74.00	14.56
5350.00	15.36	AV	H	33.86	3.52	0.00	52.74	46.72	54.00	7.28
10480.00	35.14	PK	H	38.20	6.37	25.47	54.24	48.22	68.20	19.98
15720.00	34.63	PK	H	37.88	8.79	24.39	56.91	50.89	74.00	23.11
15720.00	23.01	AV	H	37.88	8.79	24.39	45.29	39.27	54.00	14.73

802.11n ht20

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	74.87	PK	H	33.59	3.58	0.00	112.04	106.02	N/A	N/A
5180.00	65.34	AV	H	33.59	3.58	0.00	102.51	96.49	N/A	N/A
5180.00	70.25	PK	V	33.59	3.58	0.00	107.42	101.4	N/A	N/A
5180.00	60.83	AV	V	33.59	3.58	0.00	98.00	91.98	N/A	N/A
5150.00	34.52	PK	H	33.54	3.56	0.00	71.62	65.6	74.00	8.40
5150.00	18.02	AV	H	33.54	3.56	0.00	55.12	49.1	54.00	4.90
10360.00	35.43	PK	H	38.17	6.29	25.46	54.43	48.41	68.20	19.79
15540.00	34.36	PK	H	38.06	8.85	24.27	57.00	50.98	74.00	23.02
15540.00	22.47	AV	H	38.06	8.85	24.27	45.11	39.09	54.00	14.91
Middle Channel: 5200 MHz										
5200.00	74.31	PK	H	33.62	3.60	0.00	111.53	105.51	N/A	N/A
5200.00	65.39	AV	H	33.62	3.60	0.00	102.61	96.59	N/A	N/A
5200.00	70.12	PK	V	33.62	3.60	0.00	107.34	101.32	N/A	N/A
5200.00	61.54	AV	V	33.62	3.60	0.00	98.76	92.74	N/A	N/A
10400.00	35.74	PK	H	38.18	6.32	25.46	54.78	48.76	68.20	19.44
15600.00	34.63	PK	H	38.00	8.83	24.31	57.15	51.13	74.00	22.87
15600.00	22.16	AV	H	38.00	8.83	24.31	44.68	38.66	54.00	15.34
High Channel: 5240 MHz										
5240.00	73.54	PK	H	33.68	3.52	0.00	110.74	104.72	N/A	N/A
5240.00	64.35	AV	H	33.68	3.52	0.00	101.55	95.53	N/A	N/A
5240.00	69.87	PK	V	33.68	3.52	0.00	107.07	101.05	N/A	N/A
5240.00	60.12	AV	V	33.68	3.52	0.00	97.32	91.3	N/A	N/A
5350.00	27.31	PK	H	33.86	3.52	0.00	64.69	58.67	74.00	15.33
5350.00	15.61	AV	H	33.86	3.52	0.00	52.99	46.97	54.00	7.03
10480.00	35.14	PK	H	38.20	6.37	25.47	54.24	48.22	68.20	19.98
15720.00	34.74	PK	H	37.88	8.79	24.39	57.02	51	74.00	23.00
15720.00	22.95	AV	H	37.88	8.79	24.39	45.23	39.21	54.00	14.79

802.11n ht40

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	70.76	PK	H	33.60	3.59	0.00	107.95	101.93	N/A	N/A
5190.00	60.90	AV	H	33.60	3.59	0.00	98.09	92.07	N/A	N/A
5190.00	66.12	PK	V	33.60	3.59	0.00	103.31	97.29	N/A	N/A
5190.00	56.34	AV	V	33.60	3.59	0.00	93.53	87.51	N/A	N/A
5150.00	36.36	PK	H	33.54	3.56	0.00	73.46	67.44	74.00	6.56
5150.00	21.22	AV	H	33.54	3.56	0.00	58.32	52.3	54.00	1.70
10380.00	35.42	PK	H	38.18	6.31	25.46	54.45	48.43	68.20	19.77
15570.00	34.84	PK	H	38.03	8.84	24.29	57.42	51.4	74.00	22.60
15570.00	23.01	AV	H	38.03	8.84	24.29	45.59	39.57	54.00	14.43
High Channel: 5230 MHz										
5230.00	69.52	PK	H	33.67	3.54	0.00	106.73	100.71	N/A	N/A
5230.00	59.33	AV	H	33.67	3.54	0.00	96.54	90.52	N/A	N/A
5230.00	65.01	PK	V	33.67	3.54	0.00	102.22	96.2	N/A	N/A
5230.00	55.48	AV	V	33.67	3.54	0.00	92.69	86.67	N/A	N/A
5350.00	27.73	PK	H	33.86	3.52	0.00	65.11	59.09	74.00	14.91
5350.00	15.89	AV	H	33.86	3.52	0.00	53.27	47.25	54.00	6.75
10460.00	35.06	PK	H	38.19	6.36	25.47	54.14	48.12	68.20	20.08
15690.00	34.35	PK	H	37.91	8.80	24.37	56.69	50.67	74.00	23.33
15690.00	22.84	AV	H	37.91	8.80	24.37	45.18	39.16	54.00	14.84

5725-5850 MHz:

802.11a

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	69.38	PK	H	34.20	3.69	0.00	107.27	101.25	N/A	N/A
5745.00	59.79	AV	H	34.20	3.69	0.00	97.68	91.66	N/A	N/A
5745.00	65.14	PK	V	34.20	3.69	0.00	103.03	97.01	N/A	N/A
5745.00	55.84	AV	V	34.20	3.69	0.00	93.73	87.71	N/A	N/A
5725.00	46.71	PK	H	34.19	3.69	0.00	84.59	78.57	122.20	43.63
5720.00	36.71	PK	H	34.19	3.69	0.00	74.59	68.57	110.80	42.23
5700.00	27.94	PK	H	34.18	3.68	0.00	65.80	59.78	105.20	45.42
5650.00	27.35	PK	H	34.16	3.63	0.00	65.14	59.12	68.20	9.08
11490.00	33.54	PK	H	38.99	6.59	25.51	53.61	47.59	74.00	26.41
11490.00	21.64	AV	H	38.99	6.59	25.51	41.71	35.69	54.00	18.31
17235.00	34.25	PK	H	41.56	8.78	23.72	60.87	54.85	68.20	13.35
Middle Channel: 5785MHz										
5785.00	68.52	PK	H	34.21	3.71	0.00	106.44	100.42	N/A	N/A
5785.00	58.93	AV	H	34.21	3.71	0.00	96.85	90.83	N/A	N/A
5785.00	64.35	PK	V	34.21	3.71	0.00	102.27	96.25	N/A	N/A
5785.00	54.74	AV	V	34.21	3.71	0.00	92.66	86.64	N/A	N/A
11570.00	34.27	PK	H	39.00	6.61	25.46	54.42	48.4	74.00	25.60
11570.00	22.36	AV	H	39.00	6.61	25.46	42.51	36.49	54.00	17.51
17355.00	34.50	PK	H	42.26	8.81	23.60	61.97	55.95	68.20	12.25
High Channel: 5825 MHz										
5825.00	66.86	PK	H	34.23	3.73	0.00	104.82	98.8	N/A	N/A
5825.00	57.26	AV	H	34.23	3.73	0.00	95.22	89.2	N/A	N/A
5825.00	61.97	PK	V	34.23	3.73	0.00	99.93	93.91	N/A	N/A
5825.00	52.83	AV	V	34.23	3.73	0.00	90.79	84.77	N/A	N/A
5850.00	36.26	PK	H	34.24	3.75	0.00	74.25	68.23	122.20	53.97
5855.00	33.86	PK	H	34.24	3.75	0.00	71.85	65.83	110.80	44.97
5875.00	26.75	PK	H	34.25	3.77	0.00	64.77	58.75	105.20	46.45
5925.00	26.31	PK	H	34.27	3.80	0.00	64.38	58.36	68.20	9.84
11650.00	34.54	PK	H	39.00	6.64	25.41	54.77	48.75	74.00	25.25
11650.00	22.14	AV	H	39.00	6.64	25.41	42.37	36.35	54.00	17.65
17475.00	35.32	PK	H	42.96	8.84	23.48	63.64	57.62	68.20	10.58

802.11n ht20

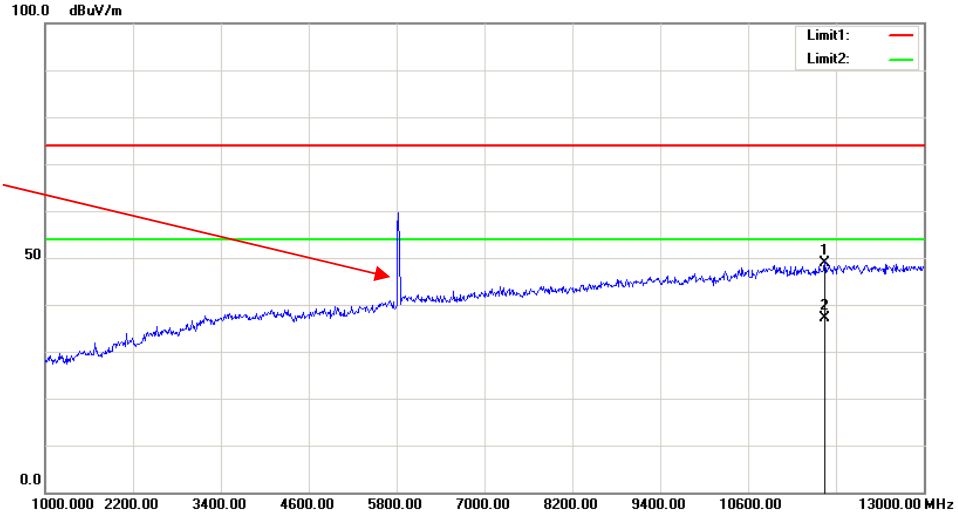
Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Extrapolation result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector	Polar (H/V)	Factor (dB/m)						
Low Channel: 5745 MHz										
5745.00	69.17	PK	H	34.20	3.69	0.00	107.06	101.04	N/A	N/A
5745.00	60.21	AV	H	34.20	3.69	0.00	98.10	92.08	N/A	N/A
5745.00	64.35	PK	V	34.20	3.69	0.00	102.24	96.22	N/A	N/A
5745.00	55.38	AV	V	34.20	3.69	0.00	93.27	87.25	N/A	N/A
5725.00	48.69	PK	H	34.19	3.69	0.00	86.57	80.55	122.20	41.65
5720.00	46.57	PK	H	34.19	3.69	0.00	84.45	78.43	110.80	32.37
5700.00	41.81	PK	H	34.18	3.68	0.00	79.67	73.65	105.20	31.55
5650.00	28.30	PK	H	34.16	3.63	0.00	66.09	60.07	68.20	8.13
11490.00	34.24	PK	H	38.99	6.59	25.51	54.31	48.29	74.00	25.71
11490.00	22.16	AV	H	38.99	6.59	25.51	42.23	36.21	54.00	17.79
17235.00	34.33	PK	H	41.56	8.78	23.72	60.95	54.93	68.20	13.27
Middle Channel: 5785 MHz										
5785.00	67.98	PK	H	34.21	3.71	0.00	105.90	99.88	N/A	N/A
5785.00	58.33	AV	H	34.21	3.71	0.00	96.25	90.23	N/A	N/A
5785.00	62.79	PK	V	34.21	3.71	0.00	100.71	94.69	N/A	N/A
5785.00	53.34	AV	V	34.21	3.71	0.00	91.26	85.24	N/A	N/A
11570.00	34.16	PK	H	39.00	6.61	25.46	54.31	48.29	74.00	25.71
11570.00	22.88	AV	H	39.00	6.61	25.46	43.03	37.01	54.00	16.99
17355.00	35.01	PK	H	42.26	8.81	23.60	62.48	56.46	68.20	11.74
High Channel: 5825 MHz										
5825.00	66.76	PK	H	34.23	3.73	0.00	104.72	98.7	N/A	N/A
5825.00	57.12	AV	H	34.23	3.73	0.00	95.08	89.06	N/A	N/A
5825.00	61.92	PK	V	34.23	3.73	0.00	99.88	93.86	N/A	N/A
5825.00	52.34	AV	V	34.23	3.73	0.00	90.30	84.28	N/A	N/A
5850.00	33.48	PK	H	34.24	3.75	0.00	71.47	65.45	122.20	56.75
5855.00	31.94	PK	H	34.24	3.75	0.00	69.93	63.91	110.80	46.89
5875.00	26.87	PK	H	34.25	3.77	0.00	64.89	58.87	105.20	46.33
5925.00	26.35	PK	H	34.27	3.80	0.00	64.42	58.4	68.20	9.80
11650.00	34.70	PK	H	39.00	6.64	25.41	54.93	48.91	74.00	25.09
11650.00	22.51	AV	H	39.00	6.64	25.41	42.74	36.72	54.00	17.28
17475.00	34.38	PK	H	42.96	8.84	23.48	62.70	56.68	68.20	11.52

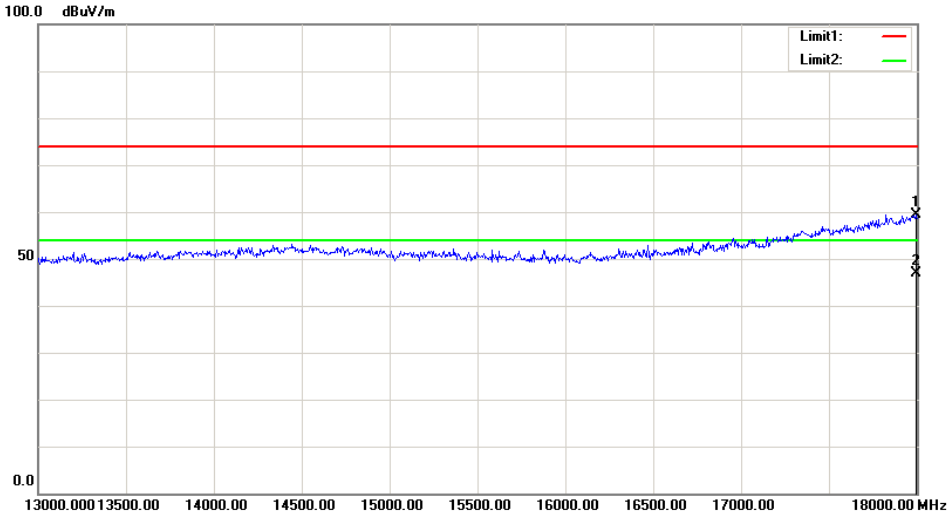
802.11n ht40

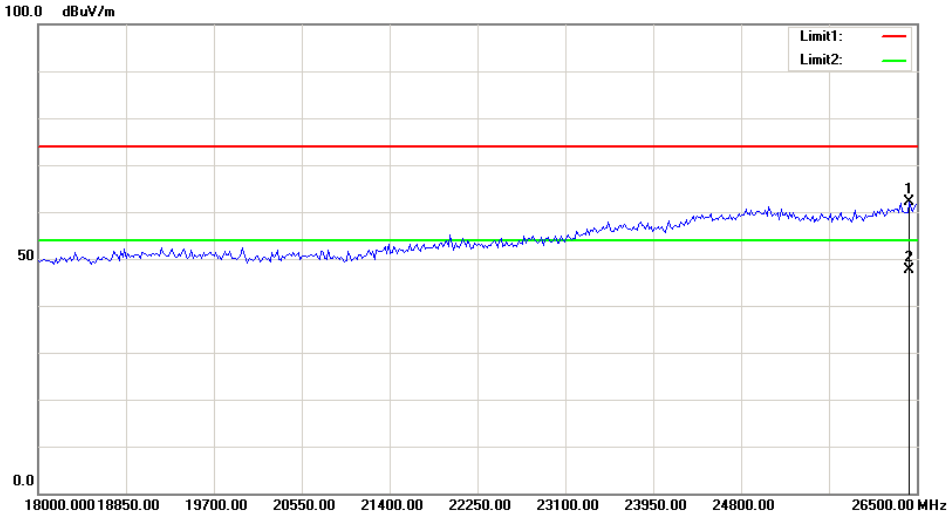
Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Extrapolation result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector	Polar (H/V)	Factor (dB/m)						
Low Channel: 5755 MHz										
5755.00	65.87	PK	H	34.20	3.70	0.00	103.77	97.75	N/A	N/A
5755.00	56.35	AV	H	34.20	3.70	0.00	94.25	88.23	N/A	N/A
5755.00	61.52	PK	V	34.20	3.70	0.00	99.42	93.4	N/A	N/A
5755.00	52.17	AV	V	34.20	3.70	0.00	90.07	84.05	N/A	N/A
5725.00	49.86	PK	H	34.19	3.69	0.00	87.74	81.72	122.20	40.48
5720.00	48.44	PK	H	34.19	3.69	0.00	86.32	80.3	110.80	30.50
5700.00	32.19	PK	H	34.18	3.68	0.00	70.05	64.03	105.20	41.17
5650.00	27.56	PK	H	34.16	3.63	0.00	65.35	59.33	68.20	8.87
11510.00	35.41	PK	H	39.00	6.59	25.50	55.50	49.48	74.00	24.52
11510.00	22.67	AV	H	39.00	6.59	25.50	42.76	36.74	54.00	17.26
17265.00	33.61	PK	H	41.74	8.79	23.69	60.45	54.43	68.20	13.77
High Channel: 5795 MHz										
5795.00	64.50	PK	H	34.22	3.71	0.00	102.43	96.41	N/A	N/A
5795.00	55.14	AV	H	34.22	3.71	0.00	93.07	87.05	N/A	N/A
5795.00	60.35	PK	V	34.22	3.71	0.00	98.28	92.26	N/A	N/A
5795.00	50.46	AV	V	34.22	3.71	0.00	88.39	82.37	N/A	N/A
5850.00	29.21	PK	H	34.24	3.75	0.00	67.20	61.18	122.20	61.02
5855.00	29.12	PK	H	34.24	3.75	0.00	67.11	61.09	110.80	49.71
5875.00	28.04	PK	H	34.25	3.77	0.00	66.06	60.04	105.20	45.16
5925.00	27.65	PK	H	34.27	3.80	0.00	65.72	59.7	68.20	8.50
11590.00	34.87	PK	H	39.00	6.62	25.45	55.04	49.02	74.00	24.98
11590.00	22.54	AV	H	39.00	6.62	25.45	42.71	36.69	54.00	17.31
17385.00	33.97	PK	H	42.43	8.82	23.57	61.65	55.63	68.20	12.57

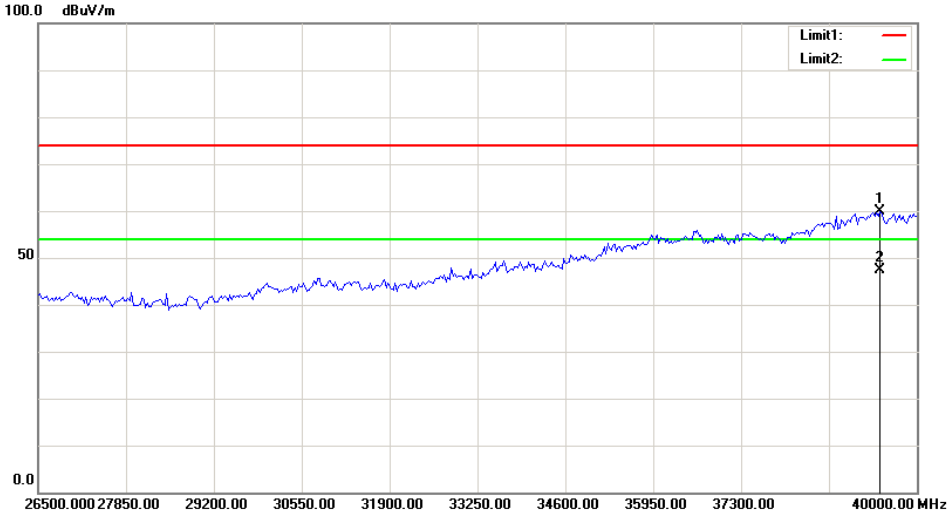
Test Plots(For worst mode 802.11a 5825MHz)
Horizontal

Fundamental Test with Band Rejection Filter



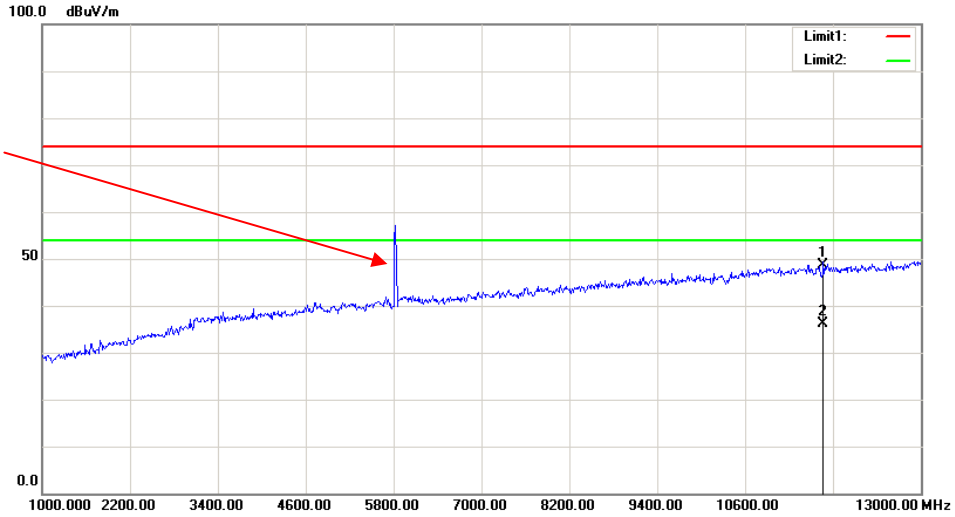


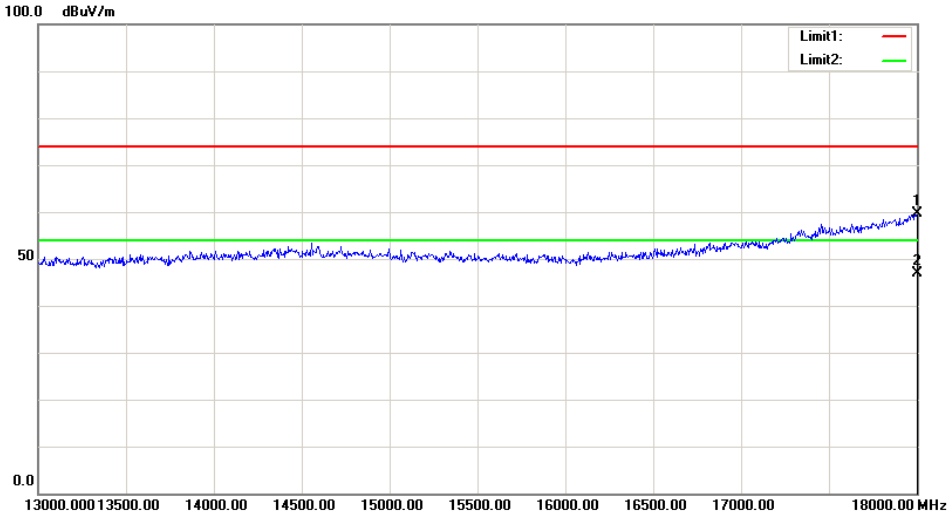


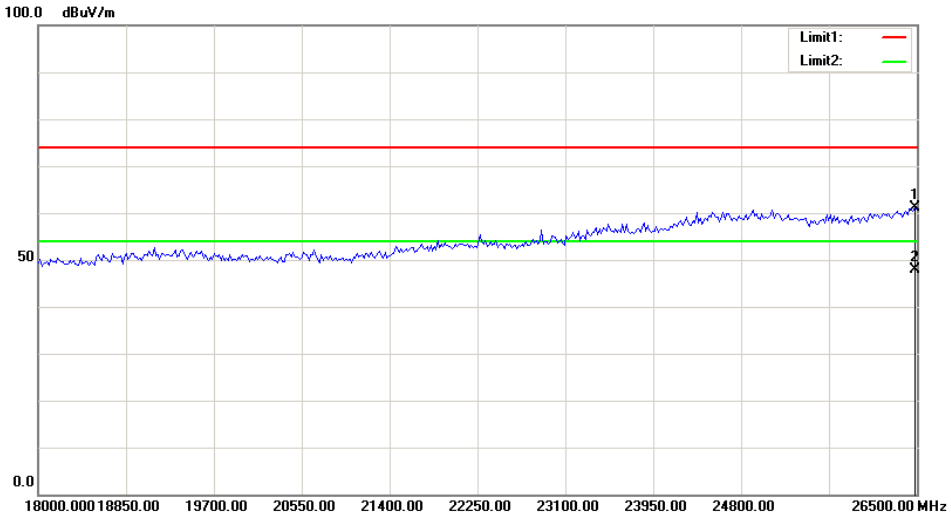


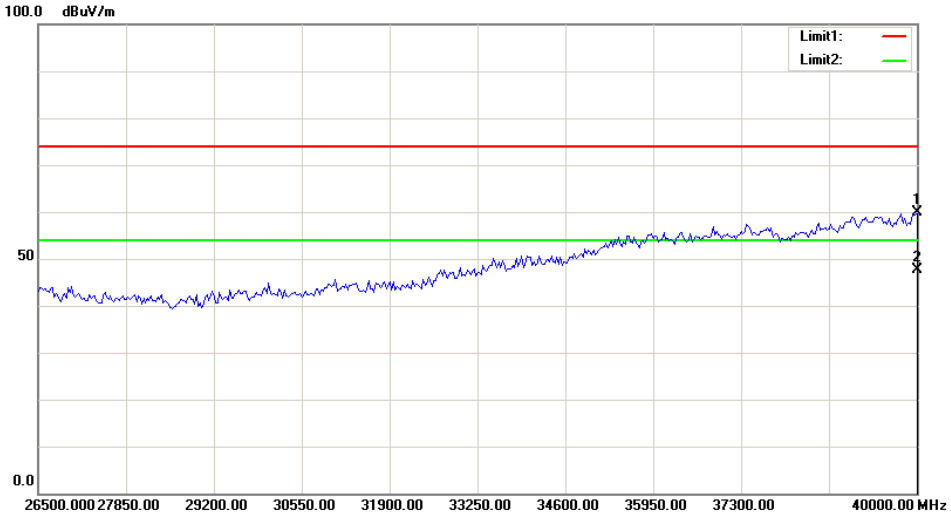
Vertical

Fundamental Test with Band Rejection Filter






100.0 dBuV/m
Limit1:
Limit2:
50
0.0
18000.000 18850.00 19700.00 20550.00 21400.00 22250.00 23100.00 23950.00 24800.00 26500.00 MHz


100.0 dBuV/m
Limit1:
Limit2:
50
0.0
26500.000 27850.00 29200.00 30550.00 31900.00 33250.00 34600.00 35950.00 37300.00 40000.00 MHz

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	FSU 26	200256	2019-01-04	2020-01-04
Unknown	Coaxial Cable	C-SJ00-0010	C0010/31	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:	26.8 °C
Relative Humidity:	56 %
ATM Pressure:	100.2kPa
Tester:	Elena Lei
Test Date:	2019-10-23

Test Result: Pass.

Please refer to the following tables and plots.

Test mode: Transmitting

5150-5250MHz:

Mode	Frequency (MHz)	26 dB Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11 a	5180	27.280	16.720
	5200	23.600	17.440
	5240	25.280	16.720
802.11n ht20	5180	22.640	17.600
	5200	27.280	17.760
	5240	30.960	18.080
802.11n ht40	5190	43.200	36.480
	5230	53.440	36.480

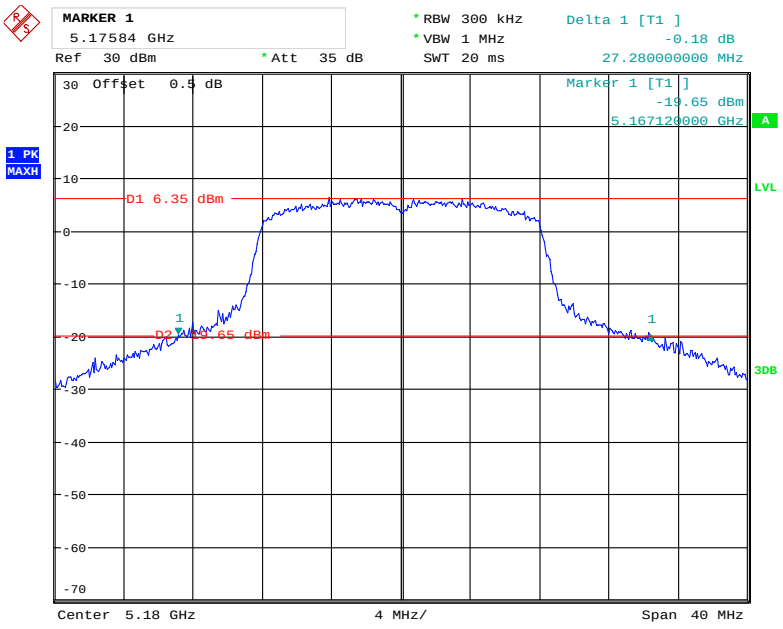
5725-5850MHz:

Mode	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	6 dB Emission Bandwidth Limit (MHz)
802.11 a	5745	15.440	16.960	≥0.5
	5785	15.440	16.720	≥0.5
	5825	15.440	16.720	≥0.5
802.11n ht20	5745	15.440	17.680	≥0.5
	5785	15.440	17.680	≥0.5
	5825	15.360	17.600	≥0.5
802.11n ht40	5755	35.360	36.480	≥0.5
	5795	35.040	36.320	≥0.5

Note: the 99% Occupied Bandwidth have not fall into the band 5250-5350MHz or 5470-5725MHz, please refer to the test plots of 99% Occupied Bandwidth.

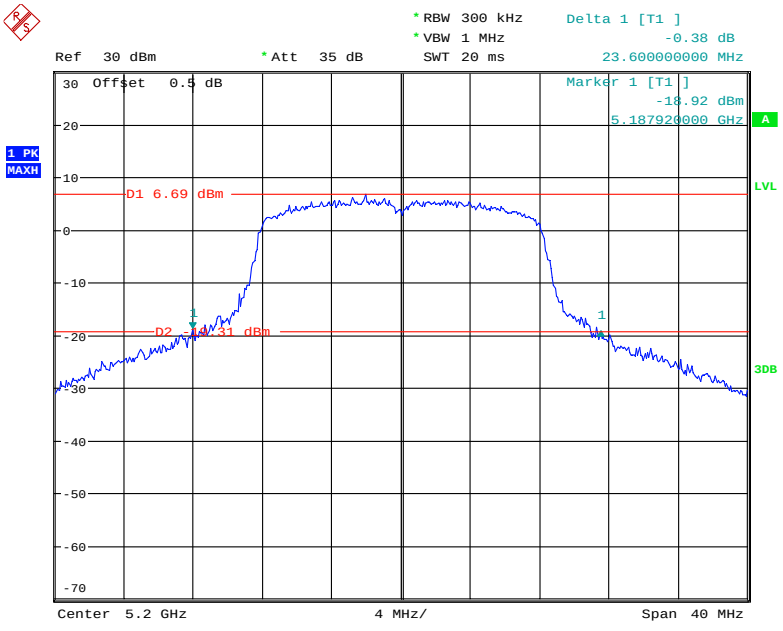
5150-5250MHz:
26dB Emission Bandwidth:

802.11a Low Channel



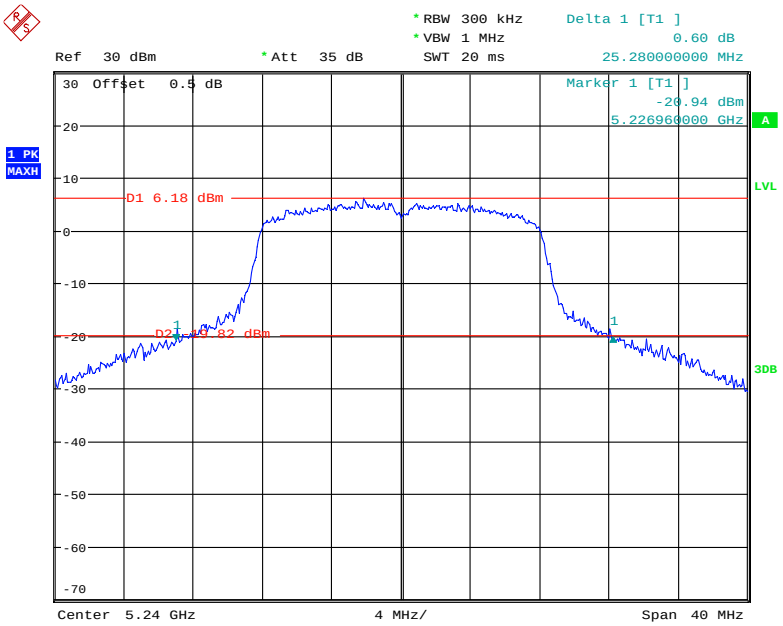
Date: 23.OCT.2019 13:33:20

802.11a Middle Channel



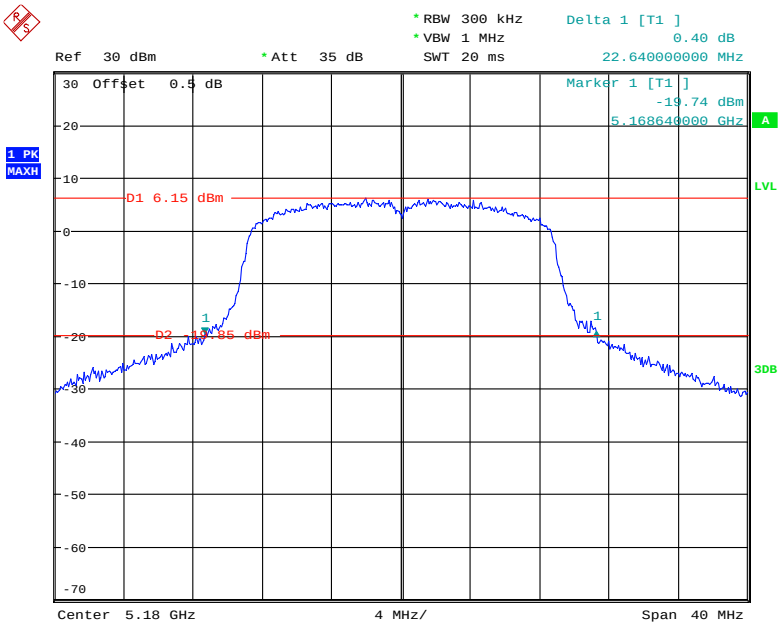
Date: 23.OCT.2019 13:47:21

802.11a High Channel



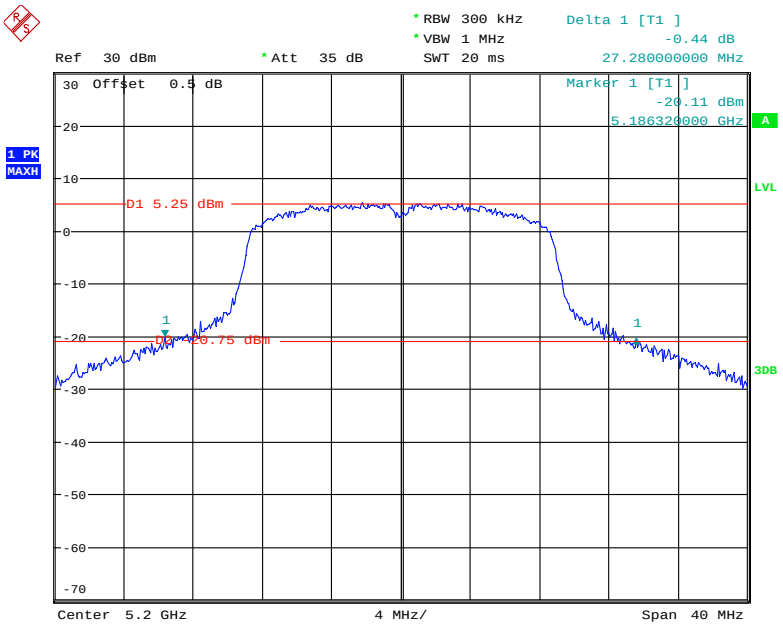
Date: 23.OCT.2019 13:35:34

802.11n ht20 Low Channel



Date: 23.OCT.2019 13:38:08

802.11n ht20 Middle Channel



Date: 23.OCT.2019 13:39:21

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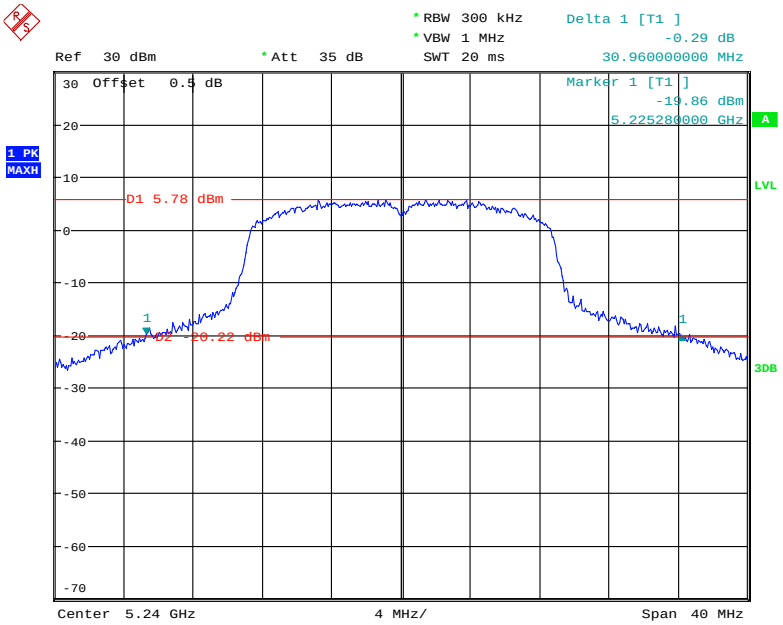
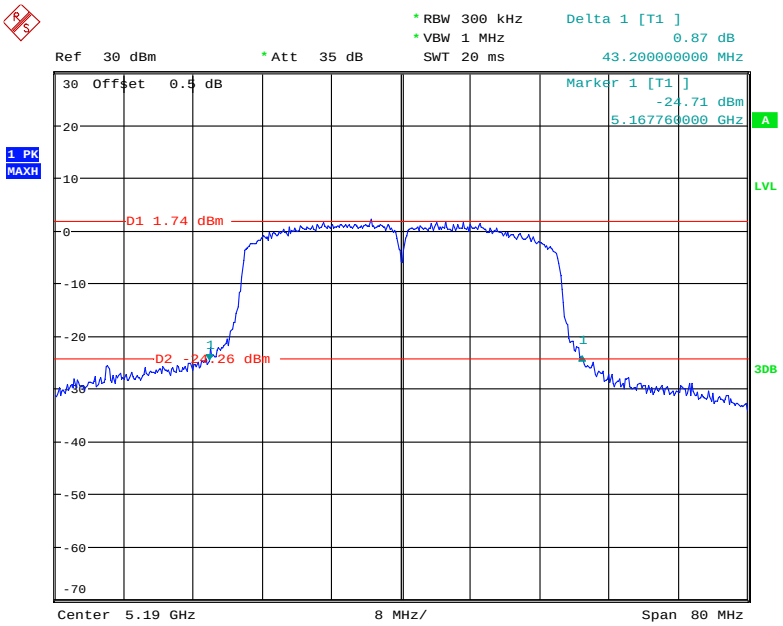


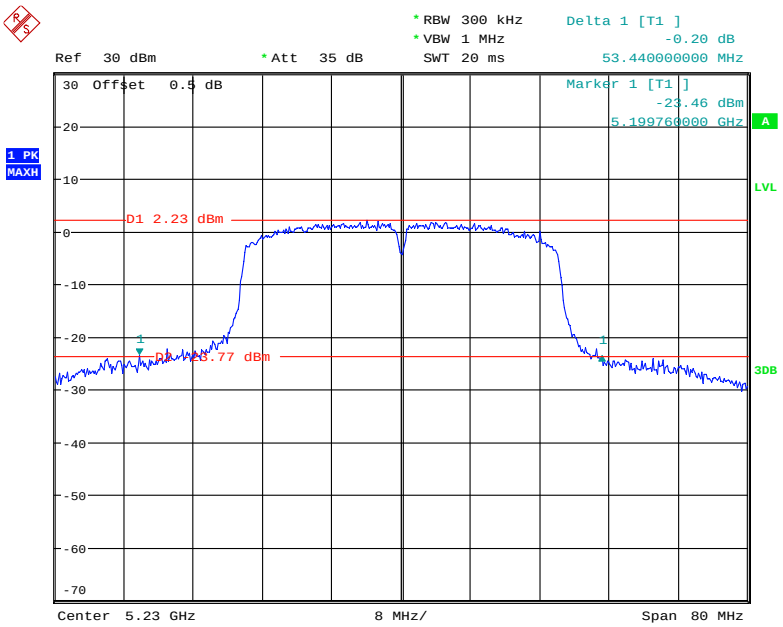
Date: 23.OCT.2019 13:40:46

802.11n ht40 Low Channel



Date: 23.OCT.2019 13:52:26

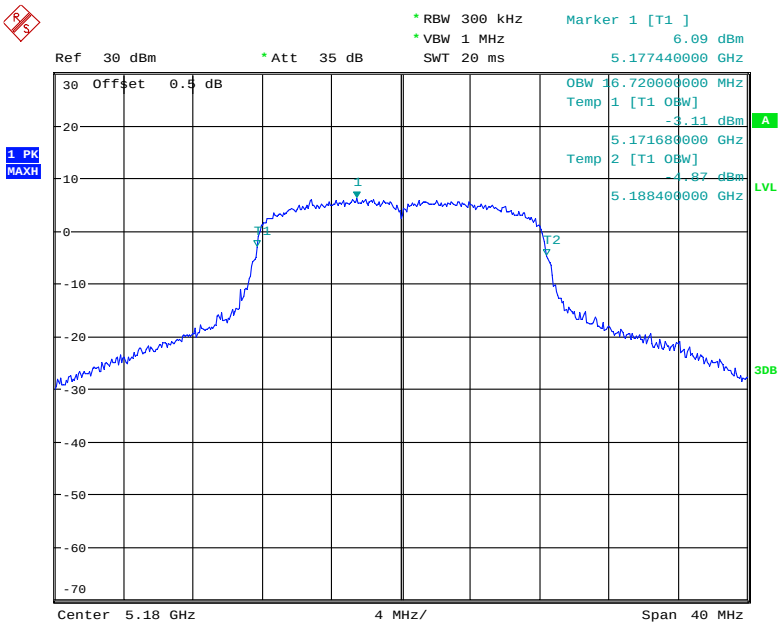
802.11n ht40 High Channel



Date: 23.OCT.2019 13:50:34

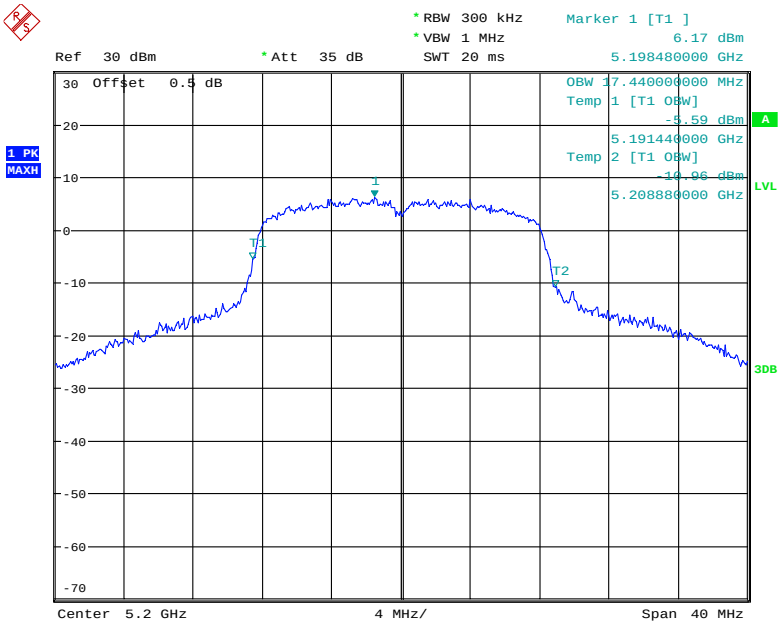
99% Occupied Bandwidth:

802.11a Low Channel



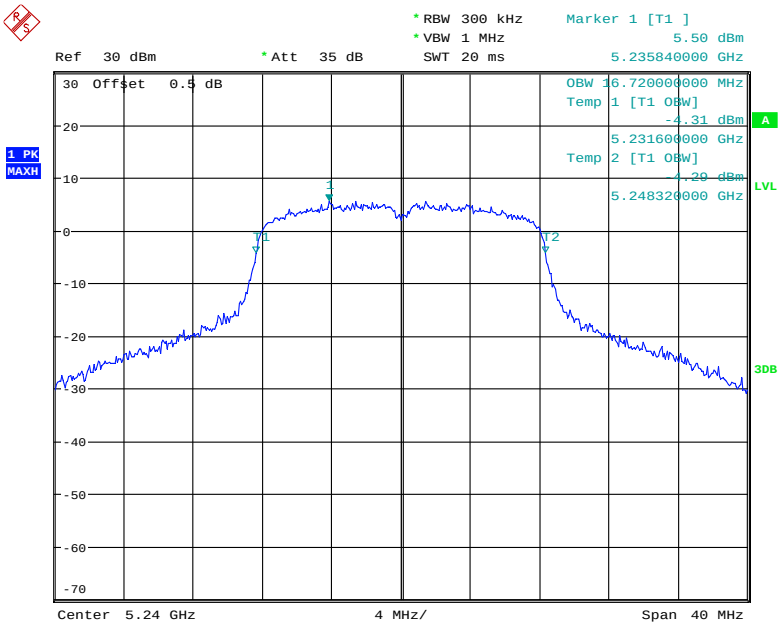
Date: 23.OCT.2019 13:33:33

802.11a Middle Channel



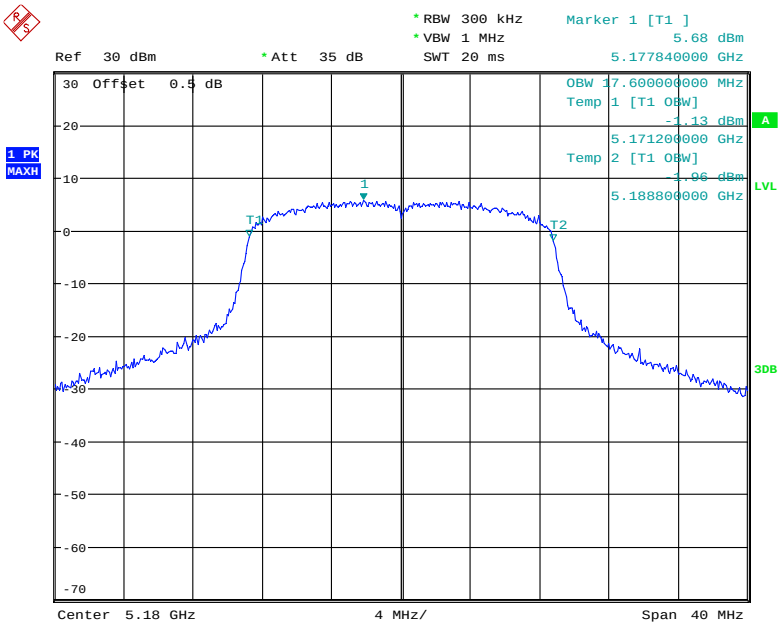
Date: 23.OCT.2019 13:34:21

802.11a High Channel



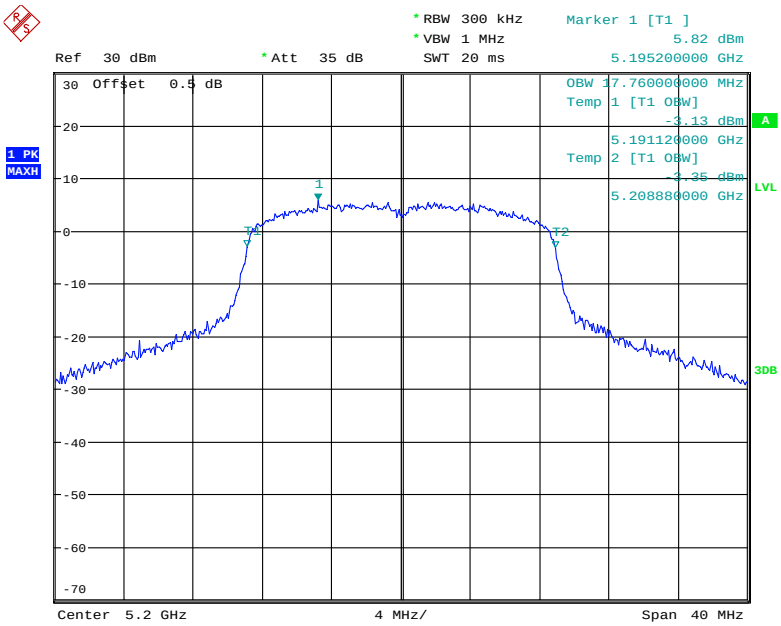
Date: 23.OCT.2019 13:35:46

802.11n ht20 Low Channel



Date: 23.OCT.2019 13:38:21

802.11n ht20 Middle Channel



Date: 23.OCT.2019 13:39:33

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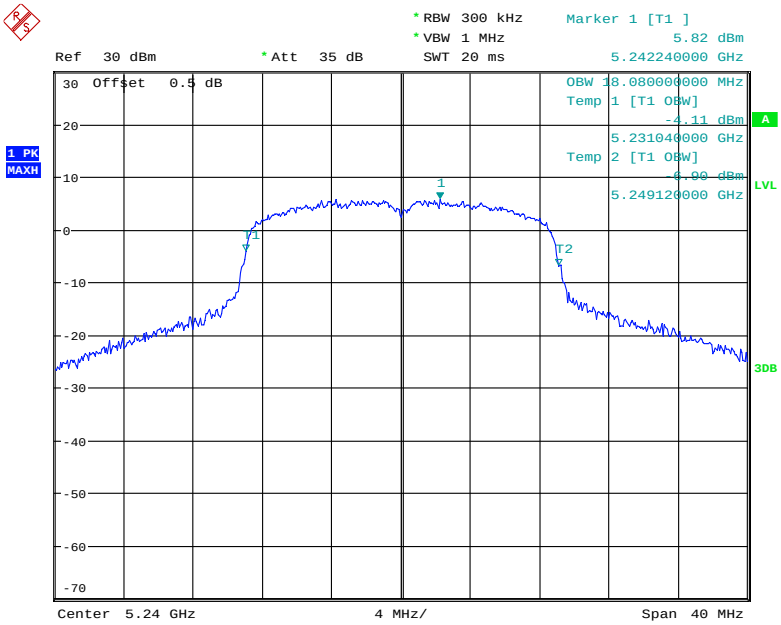
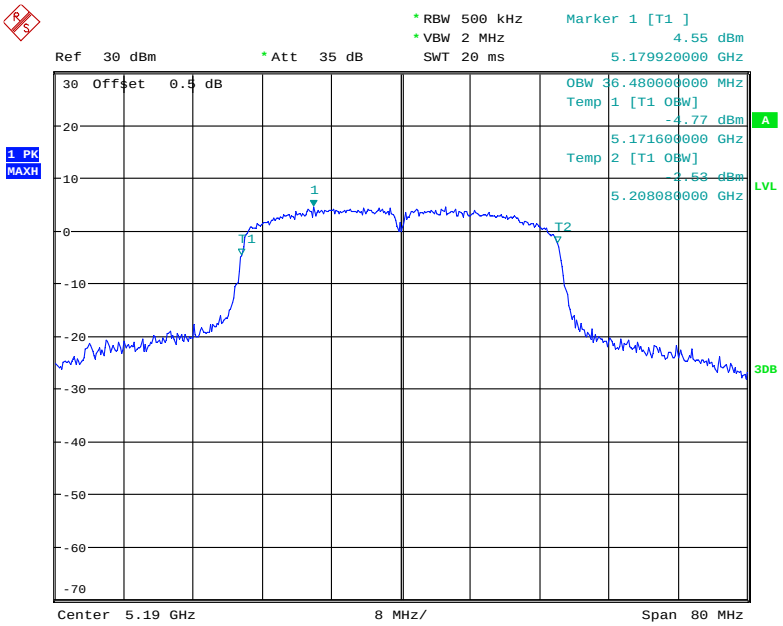


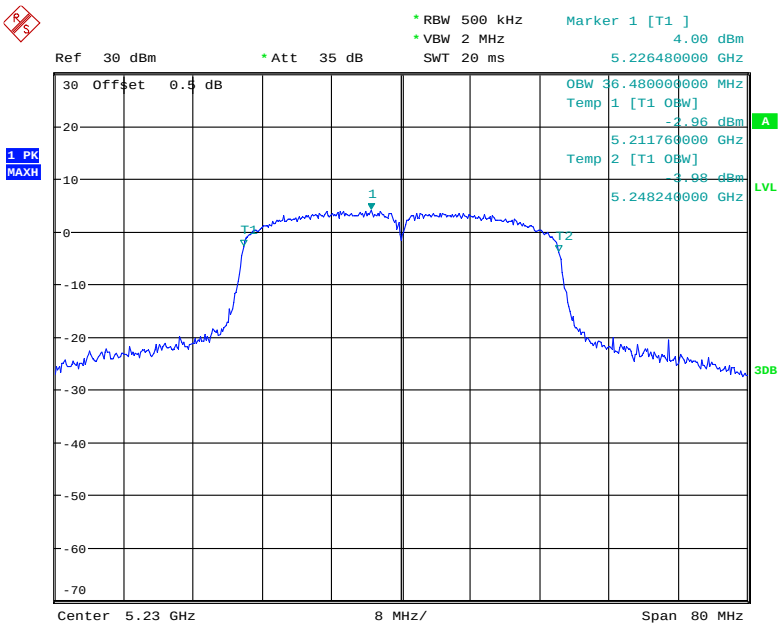
Date: 23.OCT.2019 13:40:58

802.11n ht40 Low Channel



Date: 23.OCT.2019 13:50:06

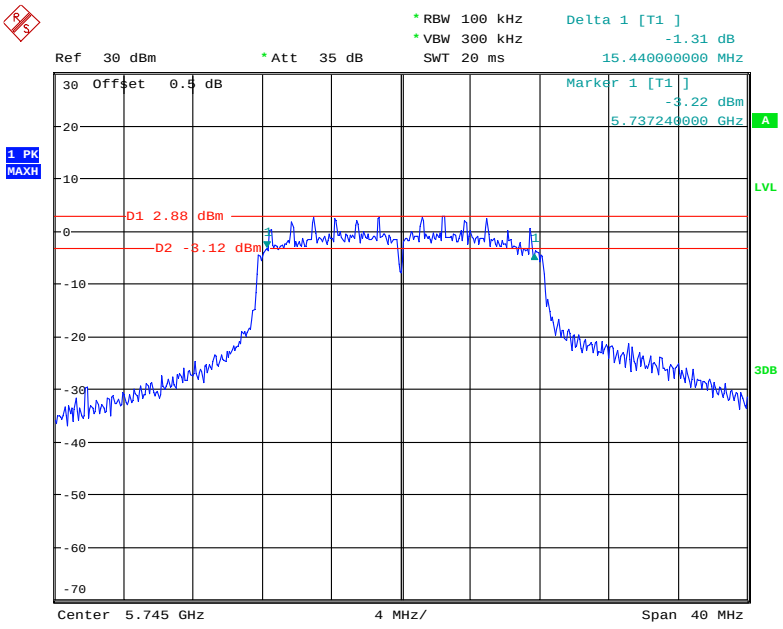
802.11n ht40 High Channel



Date: 23.OCT.2019 13:50:47

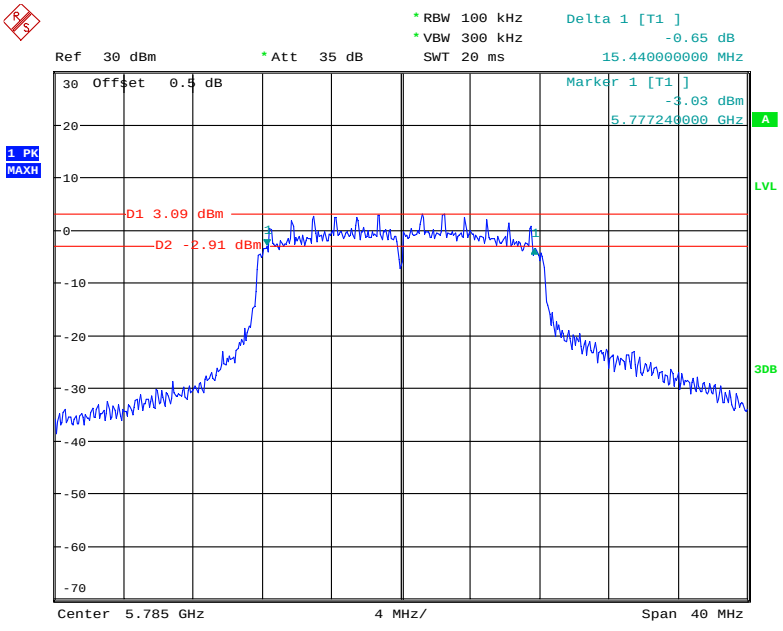
5725-5850MHz:
6dB Emission Bandwidth:

802.11a Low Channel



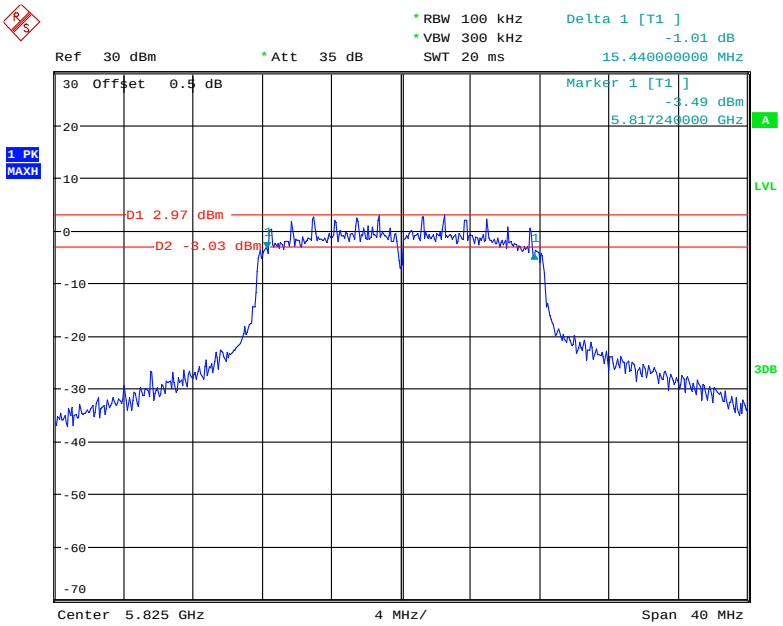
Date: 23.OCT.2019 14:06:56

802.11a Middle Channel



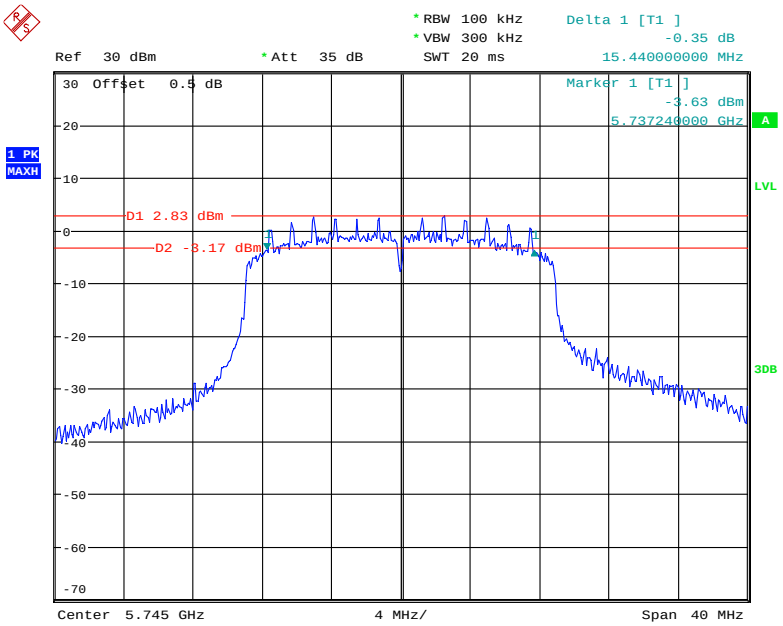
Date: 23.OCT.2019 14:05:31

802.11a High Channel



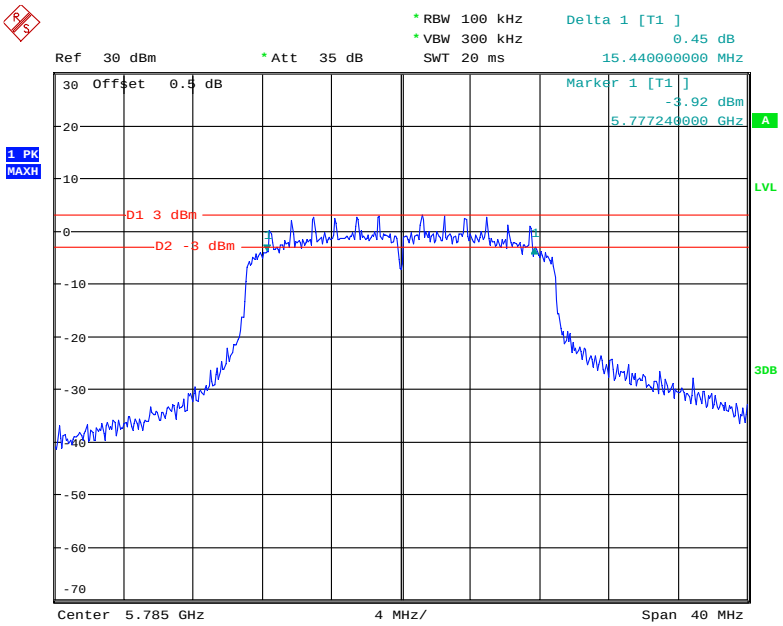
Date: 23.OCT.2019 14:04:21

802.11n ht20 Low Channel



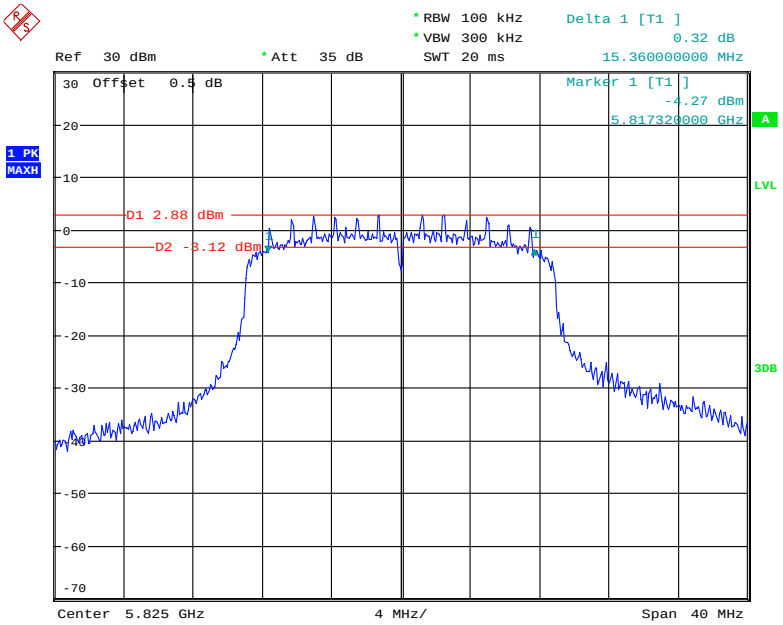
Date: 23.OCT.2019 14:08:31

802.11n ht20 Middle Channel



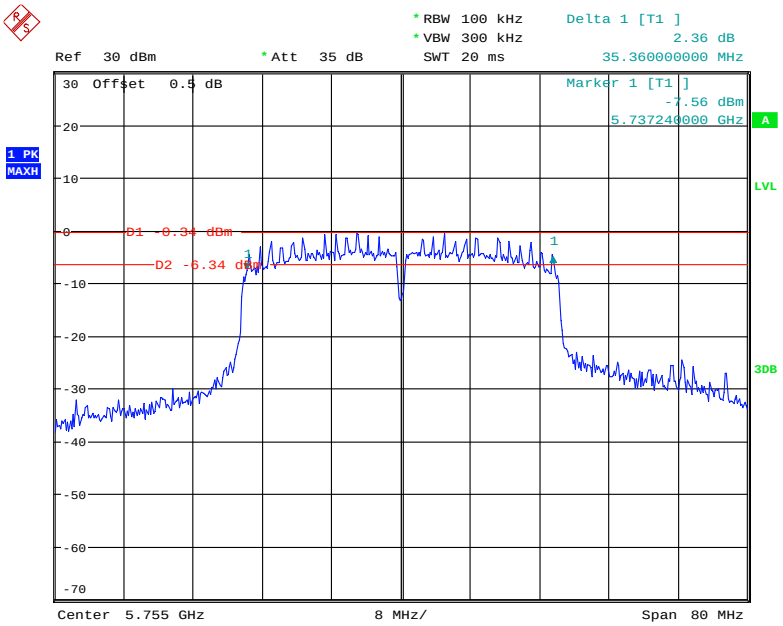
Date: 23.OCT.2019 14:09:41

802.11n ht20 High Channel



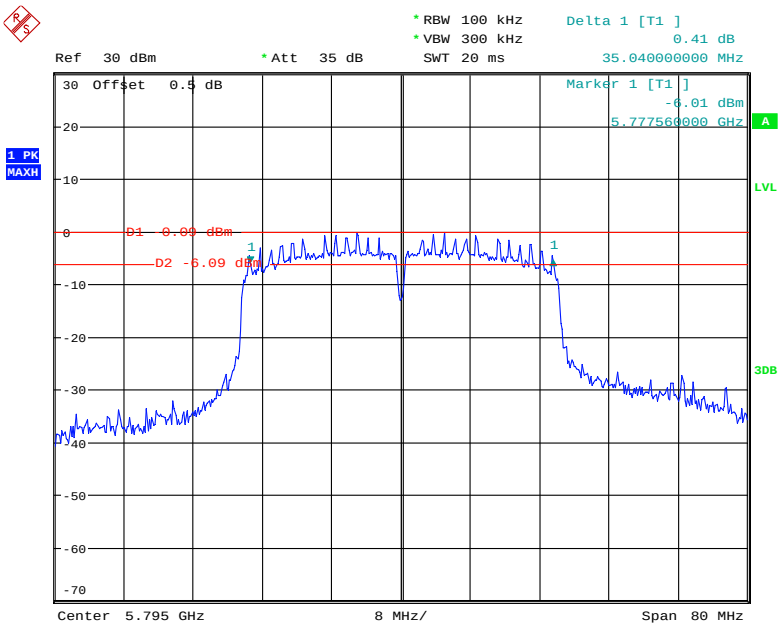
Date: 23.OCT.2019 14:11:27

802.11n ht40 Low Channel



Date: 23.OCT.2019 14:00:56

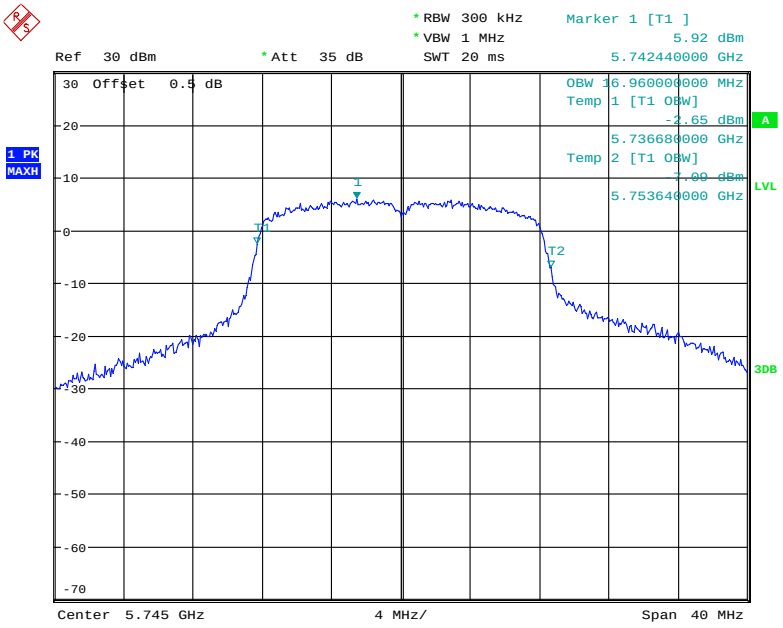
802.11n ht40 High Channel



Date: 23.OCT.2019 14:02:04

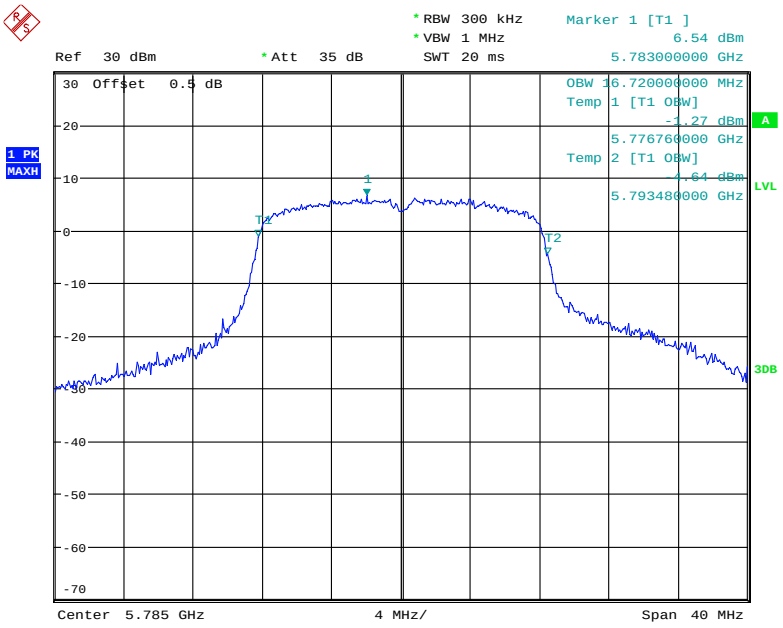
99% Occupied Bandwidth:

802.11a Low Channel



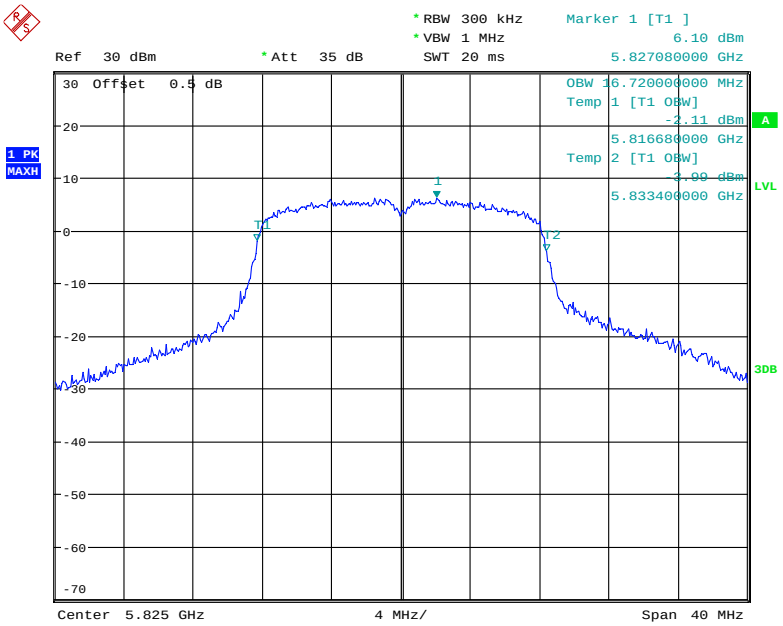
Date: 23.OCT.2019 14:07:08

802.11a Middle Channel



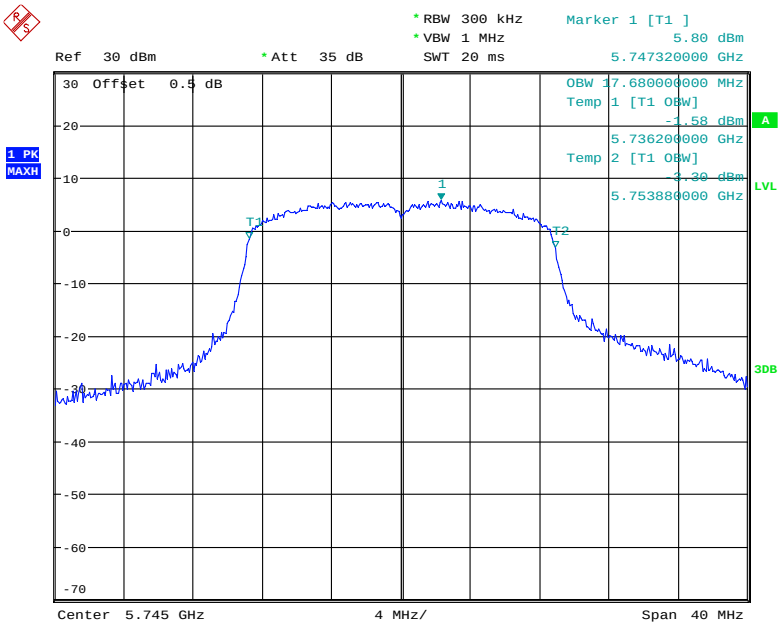
Date: 23.OCT.2019 14:05:43

802.11a High Channel



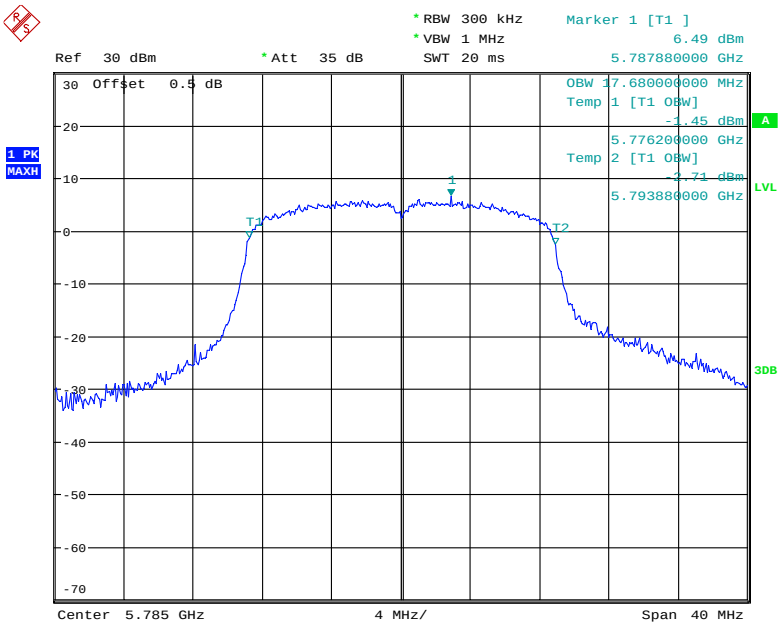
Date: 23.OCT.2019 14:04:34

802.11n ht20 Low Channel



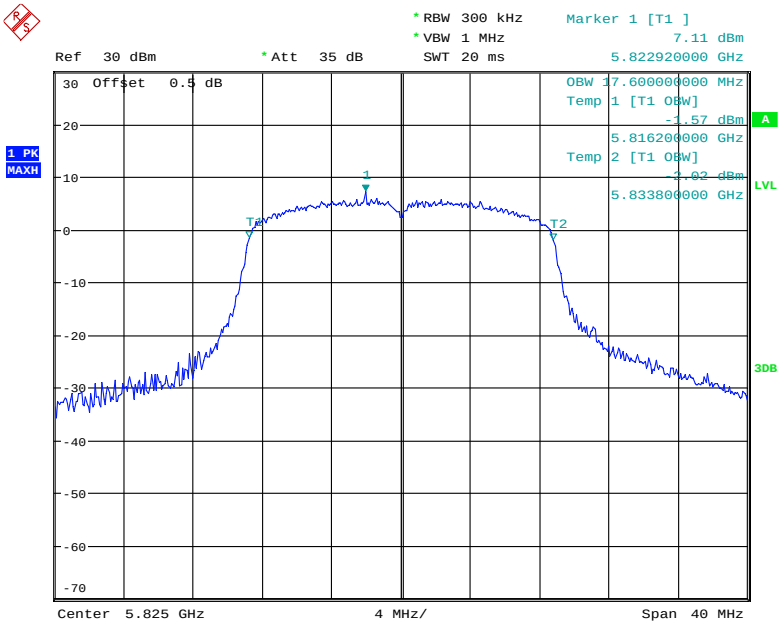
Date: 23.OCT.2019 14:08:44

802.11n ht20 Middle Channel



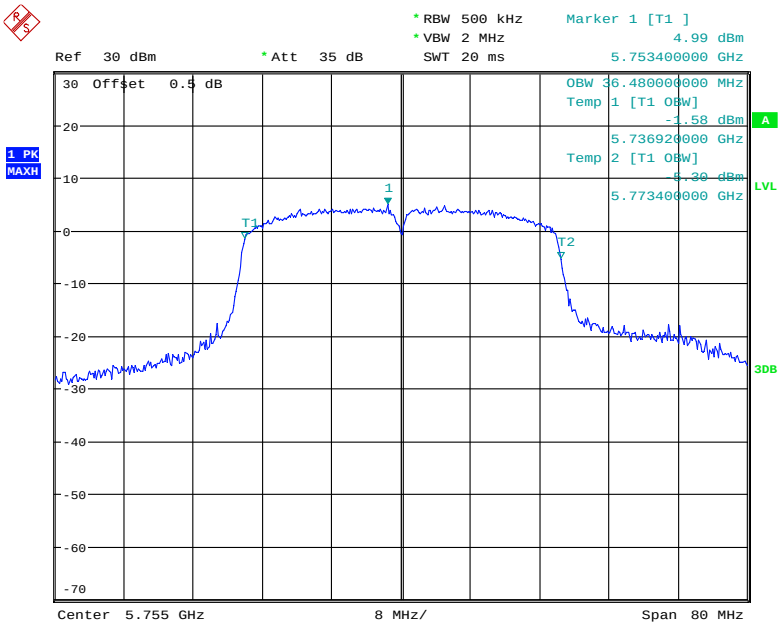
Date: 23.OCT.2019 14:09:53

802.11n ht20 High Channel



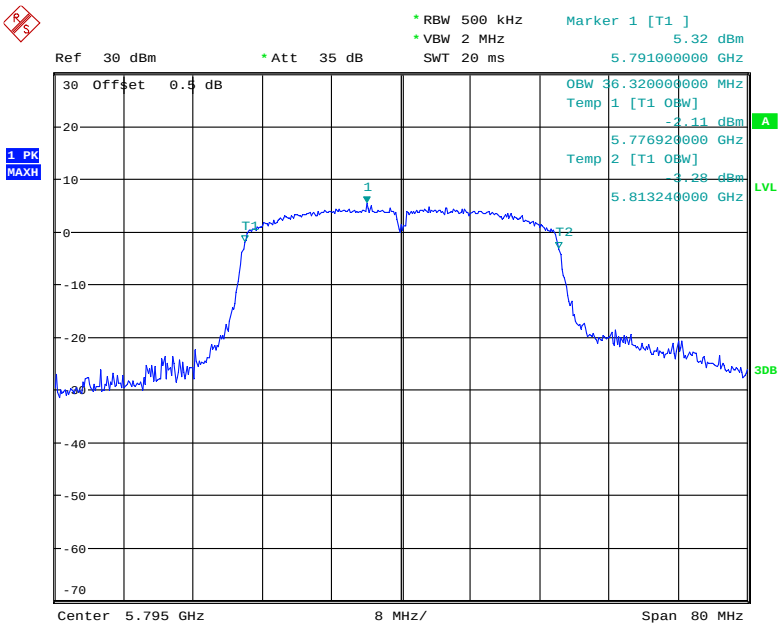
Date: 23.OCT.2019 14:11:40

802.11n ht40 Low Channel



Date: 23.OCT.2019 14:01:09

802.11n ht40 High Channel



Date: 23.OCT.2019 14:02:17

FCC §15.407(a) –MAXIMUM CONDUCTED OUTPUT POWER

Applicable Standard

(a) Power limits:

(1) For the band 5.15-5.25 GHz.

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(4) The maximum conducted output power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	USB Wideband Power Sensor	U2022XA	MY5417006	2018-12-10	2019-12-10
Unknown	Coaxial Cable	C-SJ00-0010	C0010/31	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:	26.8 °C
Relative Humidity:	56 %
ATM Pressure:	100.2kPa
Tester:	Elena Lei
Test Date:	2019-10-23

Test Mode: Transmitting

Band	Mode	Frequency (MHz)	Conducted Average Output Power (dBm)	Limit (dBm)
5150 - 5250 MHz	802.11 a	5180	13.13	24
		5200	13.11	24
		5240	12.51	24
	802.11n ht20	5180	13.17	24
		5200	12.89	24
		5240	13.16	24
	802.11n ht40	5190	12.85	24
		5230	12.39	24
5725 - 5850 MHz	802.11 a	5745	12.89	30
		5785	13.61	30
		5825	13.23	30
	802.11n ht20	5745	12.81	30
		5785	13.23	30
		5825	13.08	30
	802.11n ht40	5755	12.88	30
		5795	13.05	30

Note:
The duty cycle factor has been calculated into the test data.

FCC §15.407(a) - POWER SPECTRAL DENSITY

Applicable Standard

(a) Power limits:

(1) For the band 5.15-5.25 GHz.

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output

power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

Test Procedure

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSU 26	200256	2019-01-04	2020-01-04
Unknown	Coaxial Cable	C-SJ00-0010	C0010/31	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:	26.8 °C
Relative Humidity:	56 %
ATM Pressure:	100.2kPa
Tester:	Elena Lei
Test Date:	2019-10-23

Test Mode: Transmitting

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

5150-5250MHz

Mode	Frequency (MHz)	Maximum Power Spectral Density (dBm/MHz)	Limit (dBm/MHz)
802.11a	5180	3.47	11
	5200	3.46	11
	5240	2.50	11
802.11n ht20	5180	3.56	11
	5200	3.22	11
	5240	3.60	11
802.11n ht40	5190	-0.31	11
	5230	-0.70	11

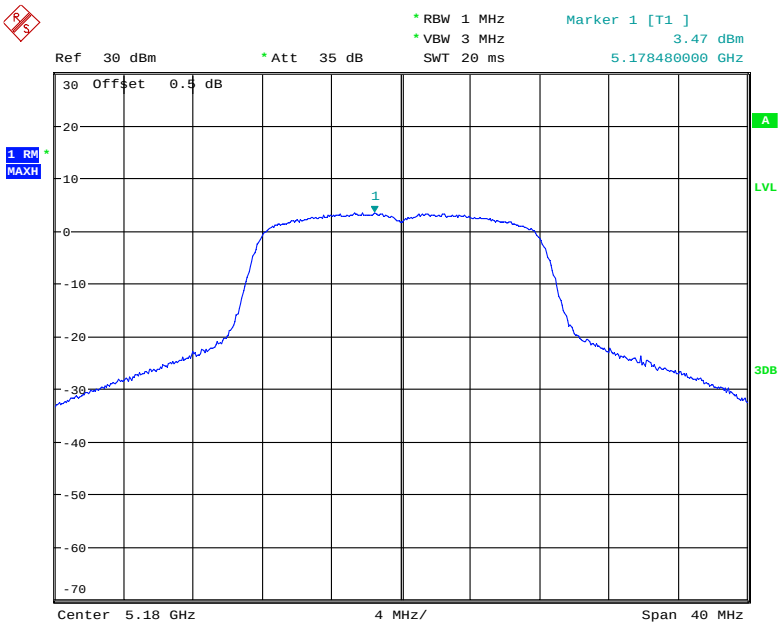
5725-5850MHz

Mode	Frequency (MHz)	Maximum Power Spectral Density (dBm/500kHz)	Limit (dBm/500kHz)
802.11a	5745	1.37	30
	5785	-0.16	30
	5825	1.29	30
802.11n ht20	5745	1.70	30
	5785	0.82	30
	5825	1.58	30
802.11n ht40	5755	-2.02	30
	5795	-3.20	30

Note: Method SA-3 in KDB 789033 D02 General UNII Test Procedures New Rules v02r01was used for PSD test.

5150-5250MHz

802.11a Low Channel



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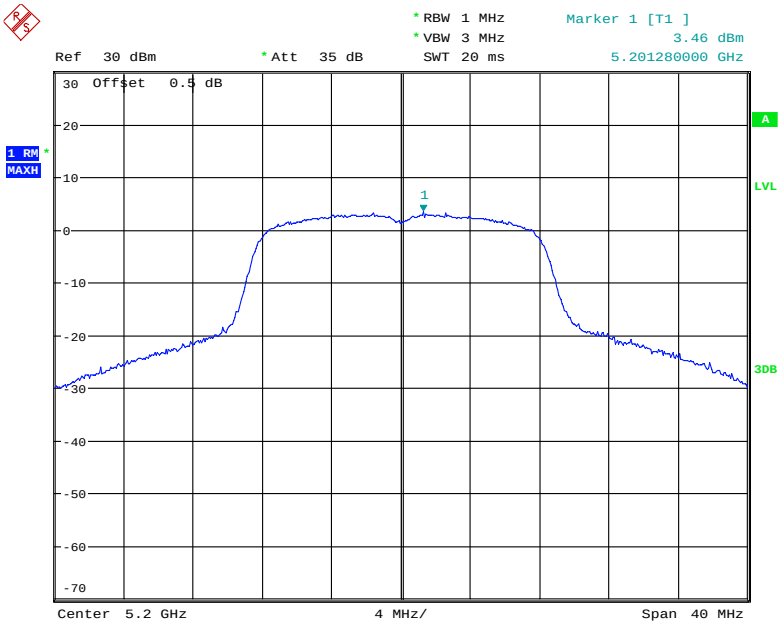
802.11a Middle Channel



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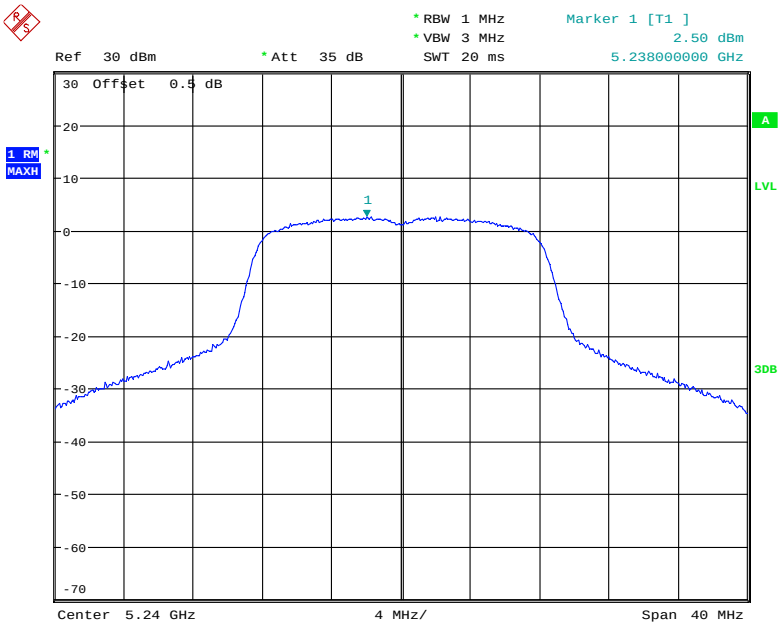

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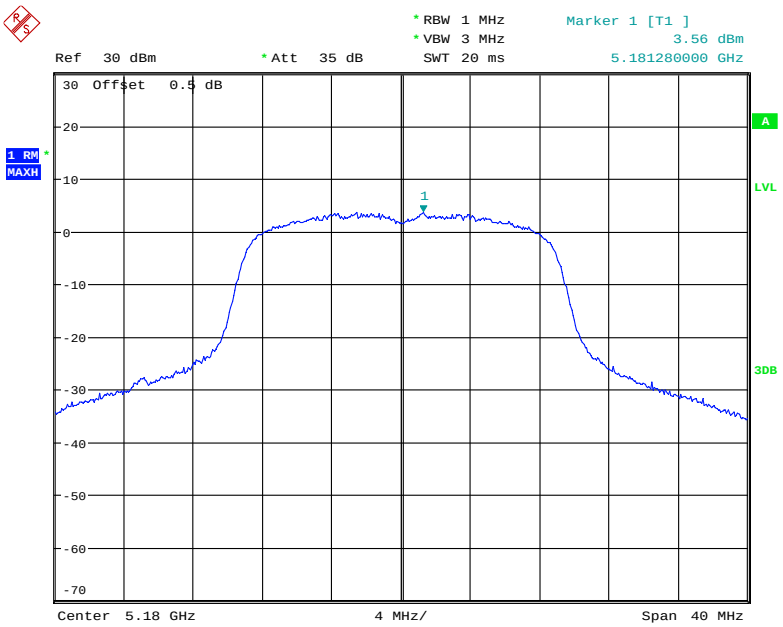

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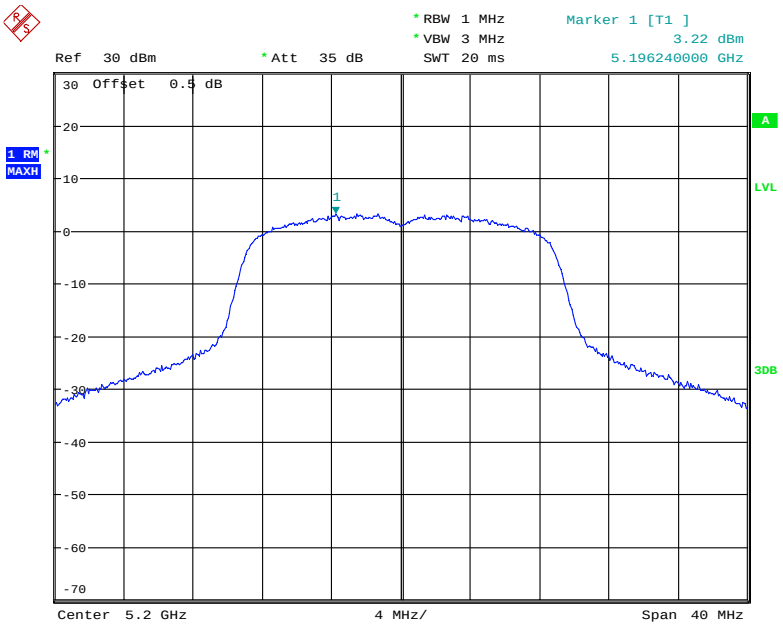

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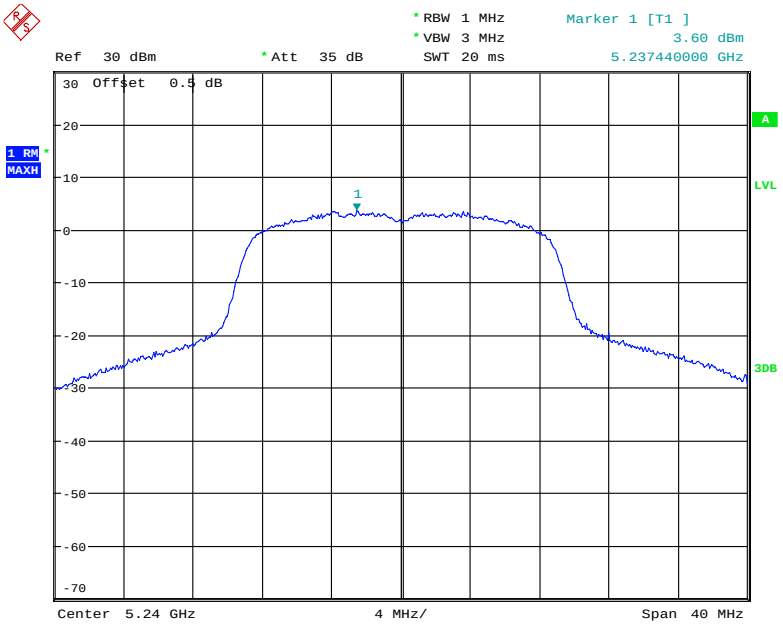

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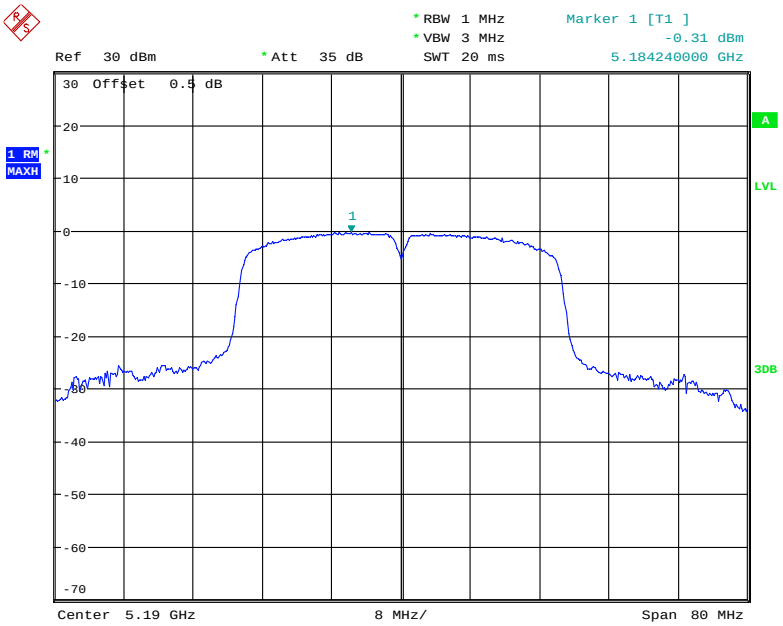

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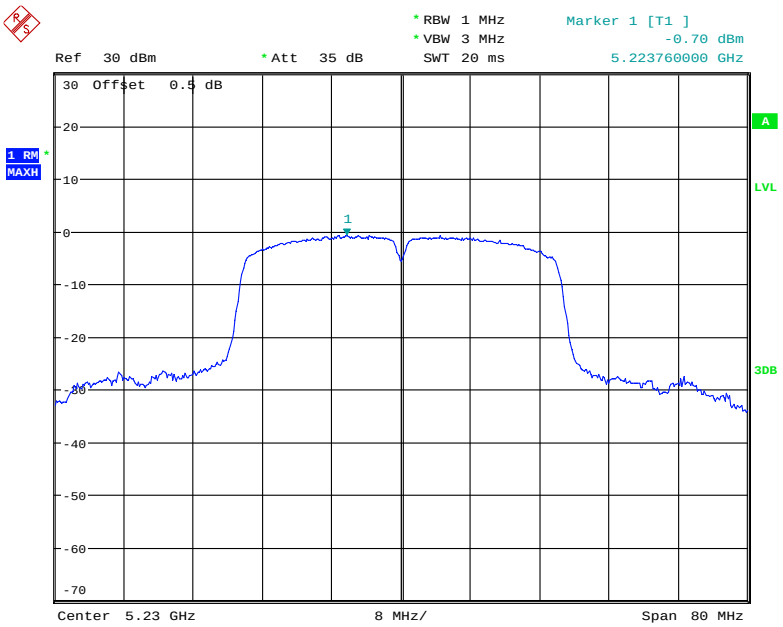

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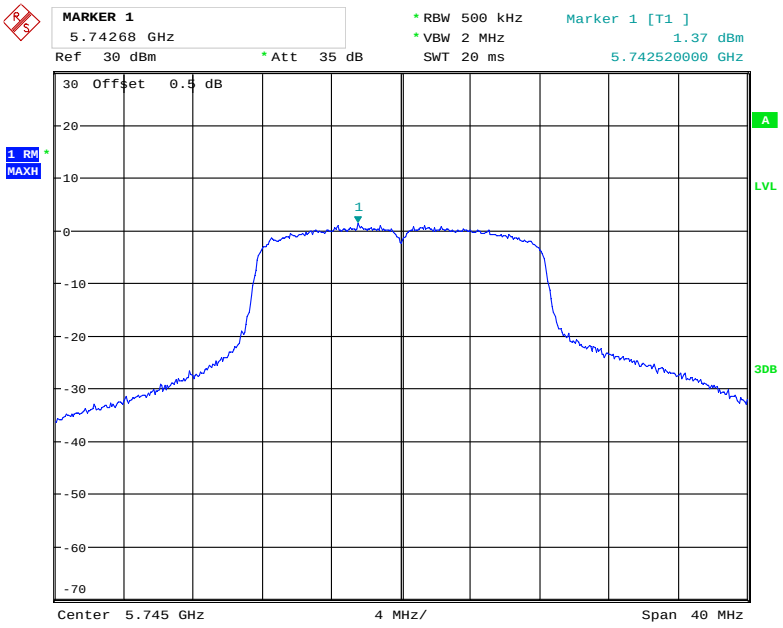
5725-5850MHz

802.11a Low Channel



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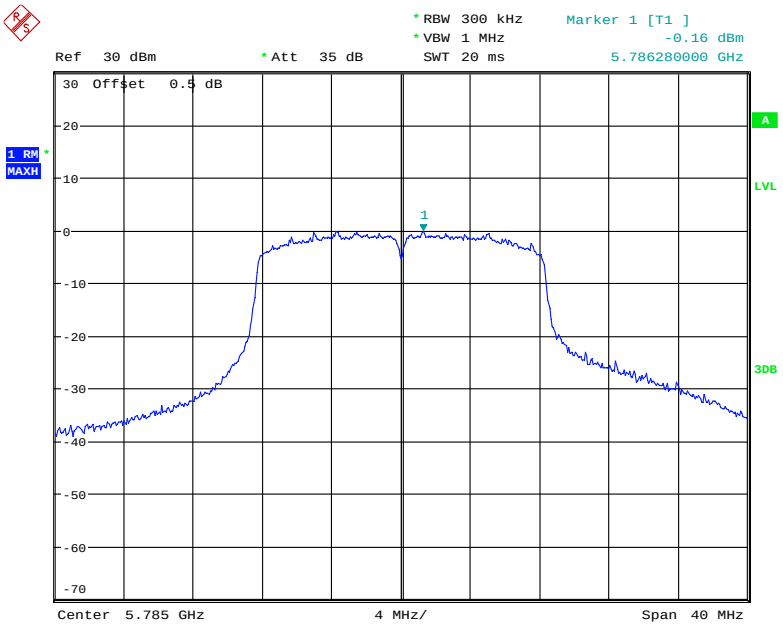

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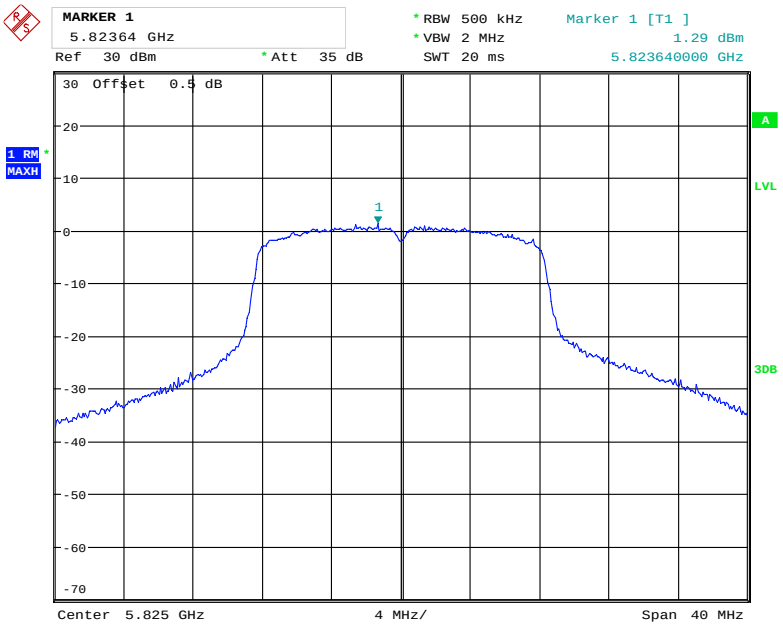

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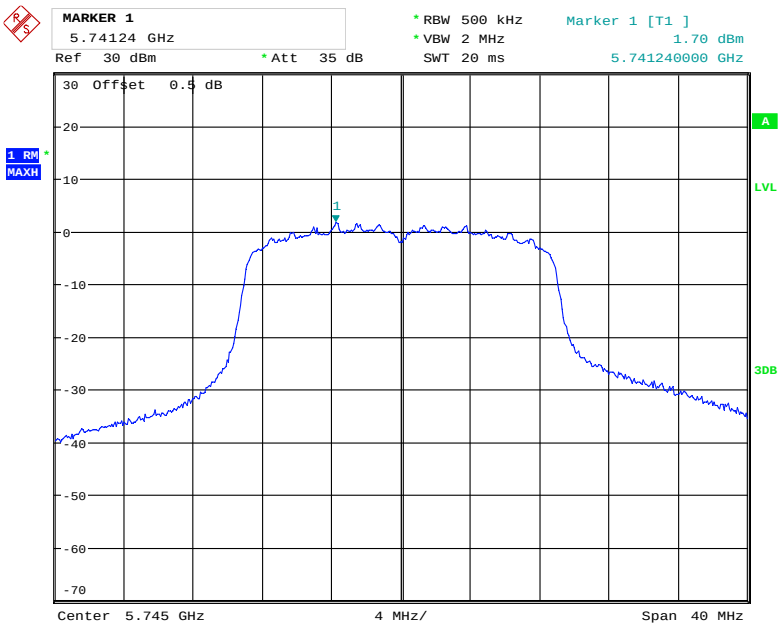

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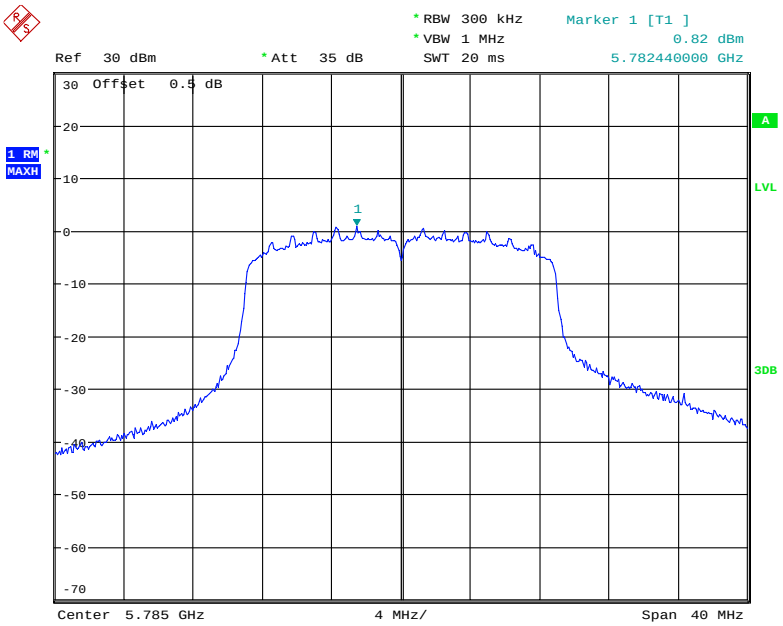
802.11n ht20 Middle Channel



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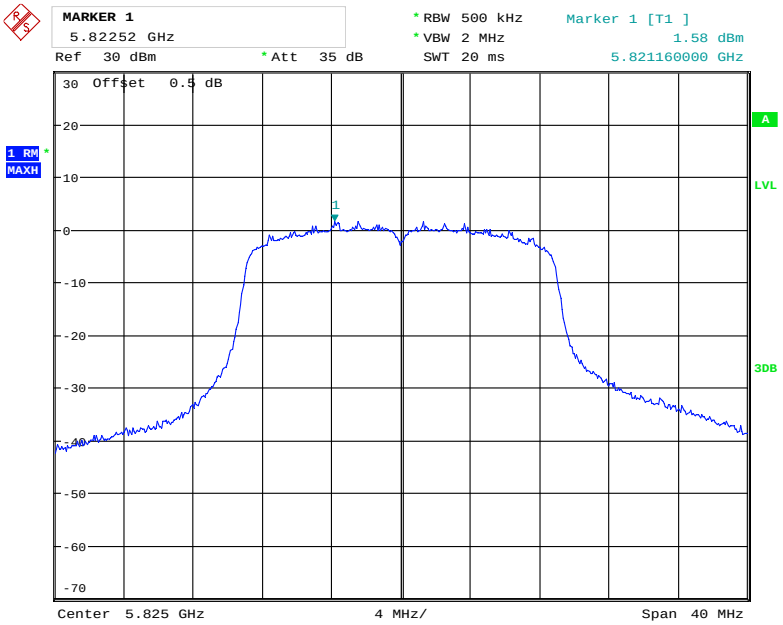

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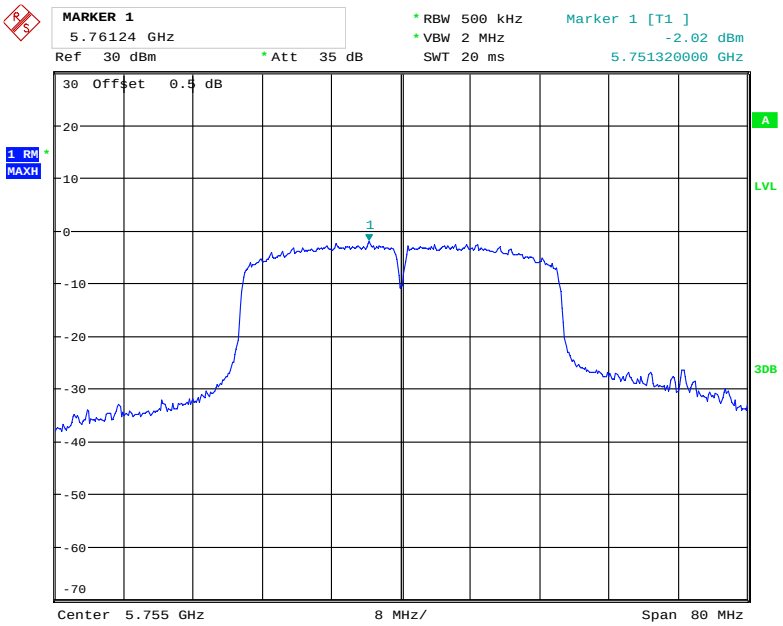

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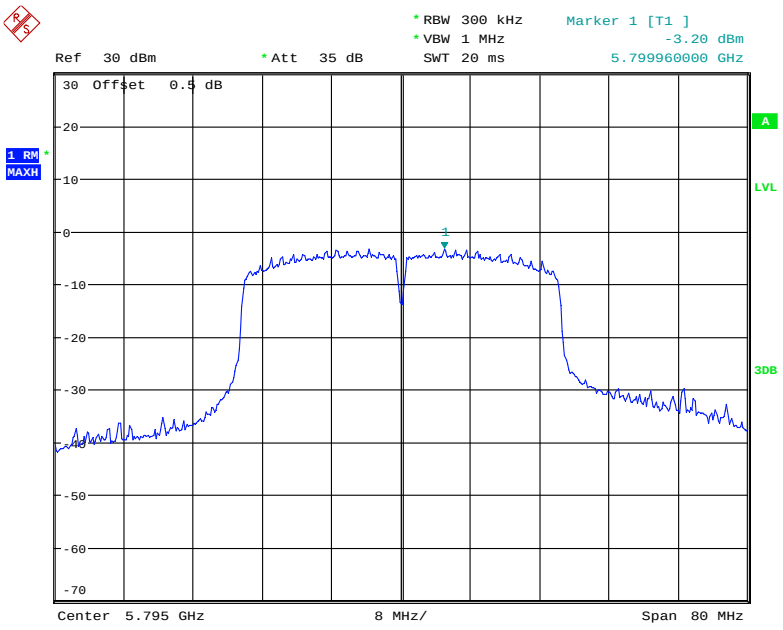

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******* END OF REPORT *******