



TESTING LABORATORY
CERTIFICATE #4820.01



**FCC PART 15.407
RSS-GEN, ISSUE 5, APRIL 2018
RSS-247, ISSUE 2, FEBRUARY 2017**

TEST REPORT

For

SZ DJI Osmo Technology Co.,Ltd.

2F, Building 3, Binhai Mingzhu Industrial Park No. 291 Louming Road, Xinhua Street
Guangming District, Shenzhen, China

**Model: AC001
FCC ID: 2ANDR-AC0011807
IC: 23060-AC0011807**

Report Type: Original Report	Product Name: OSMO ACTION
Report Number: RDG190117002-00C	
Report Date: 2019-02-13	
Reviewed By:	Jerry Zhang EMC 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	

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Dongguan). This report must not be used by the customer to claim product certification, approval, or endorsement by A2LA* or any agency of the Federal Government. * This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk “*”.

TABLE OF CONTENTS

GENERAL INFORMATION.....	4
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	4
OBJECTIVE	4
RELATED SUBMITTAL(S)/GRANT(S).....	4
TEST METHODOLOGY	4
MEASUREMENT UNCERTAINTY	5
TEST FACILITY	5
SYSTEM TEST CONFIGURATION.....	6
DESCRIPTION OF TEST CONFIGURATION	6
EQUIPMENT MODIFICATIONS	6
EUT EXERCISE SOFTWARE	6
SUPPORT EQUIPMENT LIST AND DETAILS	10
SUPPORT CABLE LIST AND DETAILS	10
BLOCK DIAGRAM OF TEST SETUP	11
SUMMARY OF TEST RESULTS	12
FCC §15.407 (f) & §1.1310 & §2.1093, RSS-102 CLAUSE 4- RF EXPOSURE	13
APPLICABLE STANDARD	13
TEST RESULT	13
FCC §15.203 ,RSS-GEN§6.8- ANTENNA REQUIREMENT.....	14
APPLICABLE STANDARD	14
ANTENNA CONNECTOR CONSTRUCTION	15
FCC §15.207(a) RSS-GEN CLAUSE 8.8– AC Line Conducted Emissions	16
APPLICABLE STANDARD	16
EUT SETUP	16
EMI TEST RECEIVER SETUP.....	16
CORRECTED AMPLITUDE & MARGIN CALCULATION	17
TEST PROCEDURE	17
TEST EQUIPMENT LIST AND DETAILS.....	17
TEST DATA	17
FCC §15.209, §15.205 , §15.407(b) &RSS-247 §6.2, RSS-GEN§8.10–UNWANTED EMISSION	20
APPLICABLE STANDARD	20
EUT SETUP	22
EMI TEST RECEIVER & SPECTRUM ANALYZER SETUP	23
TEST PROCEDURE	24
CORRECTED AMPLITUDE & MARGIN CALCULATION	24
TEST EQUIPMENT LIST AND DETAILS.....	25
TEST DATA	25
FCC §15.407(a)& RSS-247 §6.2,RSS-Gen §6.7– EMISSION BANDWIDTH.....	37
APPLICABLE STANDARD	37
TEST EQUIPMENT LIST AND DETAILS.....	37
TEST PROCEDURE	37
TEST DATA	37
FCC §15.407(a) & RSS-247 §6.2– MAXIMUM CONDUCTED OUTPUT POWER.....	53
APPLICABLE STANDARD	53
TEST EQUIPMENT LIST AND DETAILS.....	55

TEST PROCEDURE	55
TEST DATA	56
FCC §15.407(a)& RSS-247 §6.2 - POWER SPECTRAL DENSITY	57
APPLICABLE STANDARD	57
TEST PROCEDURE	59
TEST EQUIPMENT LIST AND DETAILS.....	59
TEST DATA	60
FCC §15.407(b)& RSS-247 §6.2 – OUT- OF-BAND EMISSIONS.....	68
APPLICABLE STANDARD	68
TEST PROCEDURE	70
TEST EQUIPMENT LIST AND DETAILS.....	70
TEST DATA	70

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:	OSMO ACTION
EUT Model:	AC001
Rated Input Voltage:	DC3.85V from Battery
External Dimension:	65mm(L)* 42mm(W)*35mm(H)
Serial Number:	190117002
EUT Received Date:	2019.01.17

Objective

This type approval report is prepared on behalf of **SZ DJI Osmo Technology Co.,Ltd.** in accordance with Part 2-Subpart J, Part 15-Subparts A and E of the Federal Communications Commission's rules. And RSS-247, Issue 2, February 2017, RSS-Gen Issue 5, April 2018 of the Innovation, Science and Economic Development Canada.

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, and RSS-247, Issue 2, February 2017, RSS-Gen Issue 5, April 2018 of the Innovation, Science and Economic Development Canada.

Related Submittal(s)/Grant(s)

FCC submissions with Part 15.247 DTS, FCC ID: 2ANDR-AC0011807.

FCC submissions with Part 15B JBP, FCC ID: 2ANDR-AC0011807

ISED submissions with RSS-247 DTSs, IC: 23060-AC0011807

Test Methodology

All measurements detailed in this Test Report were performed in accordance with ANSI C63.10-2013 "American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices". RSS-247, Issue 2, February 2017, RSS-Gen Issue 5, April 2018 of the Innovation, Science and Economic Development Canada. 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: 4.58 dB for Horizontal, 4.59 dB for Vertical 200M~1GHz: 4.83 dB for Horizontal, 5.85 dB for Vertical 1G~6GHz: 4.45 dB, 6G~40GHz: 5.23 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)

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.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The EUT was configured for testing in an engineering mode which was provided by the manufacturer.

For 5725~5850MHz band, The system support 802.11a/n ht20/n ht40/ac80, 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

802.11a, 802.11n ht20 were tested with Channel 149, 157 and 165,
802.11n ht40 were tested with Channel 151 and 159.
802.11ac80 mode was tested with channel 155.

Equipment Modifications

No modification was made to the EUT tested.

EUT Exercise Software

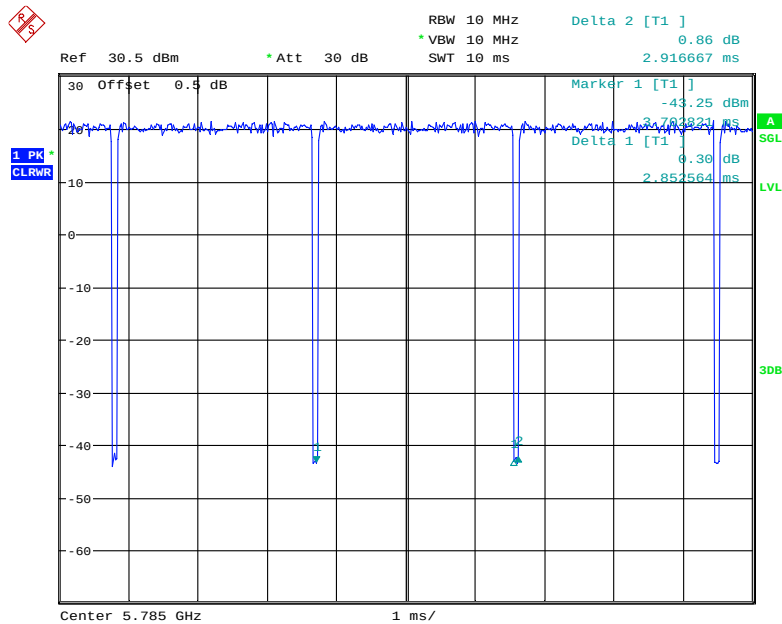
The software “DJI RF Certification.exe ” was used for testing, which was provided by manufacturer. The worst-case data rates are determined to be as follows for each mode based upon investigations by measuring the average power and PSD across all data rates, bandwidths, and modulations. The maximum power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

Mode	Channel	Frequency (MHz)	Data rate	Power level
802.11a	Low	5745	6 Mbps	16
	Middle	5785	6 Mbps	16
	High	5825	6 Mbps	16
802.11n ht20	Low	5745	MCS0	16
	Middle	5785	MCS0	16
	High	5825	MCS0	16
802.11n ht 40	Low	5755	MCS0	16
	High	5795	MCS0	16
802.11 ac20	Low	5745	MCS0	16
	Middle	5785	MCS0	16
	High	5825	MCS0	16
802.11 ac40	Low	5755	MCS0	16
	High	5795	MCS0	16
802.11 ac80	Middle	5775	MCS0	17

The duty cycle as below:

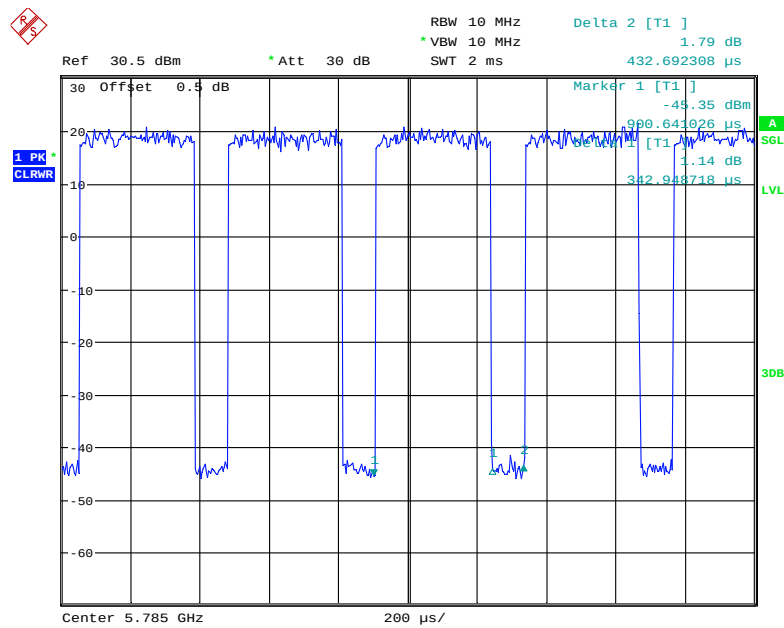
Mode	T _{on} (ms)	T _{on+off} (ms)	Duty Cycle (%)
802.11a	2.85	2.92	97.60
802.11n ht20	0.343	0.433	79.21
802.11n ht40	1.321	1.382	95.59
802.11ac20	0.349	0.439	79.50
802.11ac40	1.301	1.372	94.83
802.11ac 80	0.628	0.713	88.08

802.11a mode



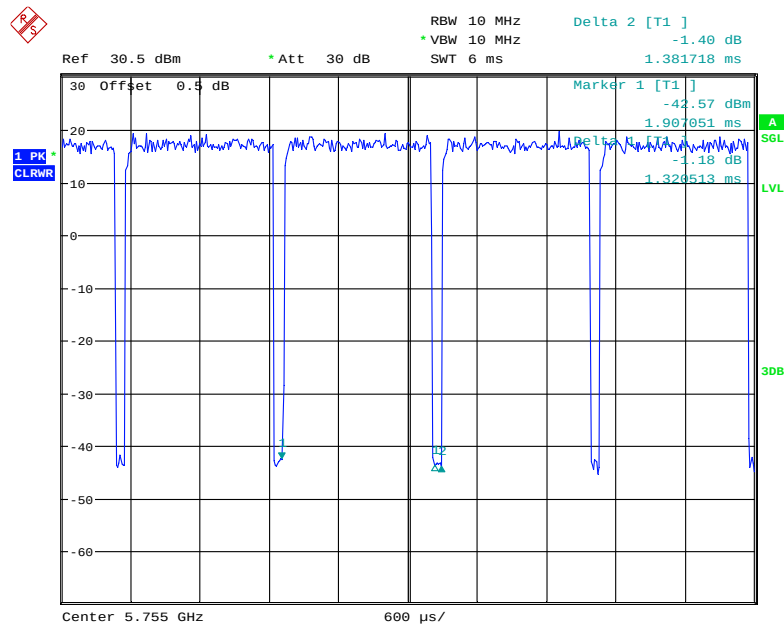
Date: 20.JAN.2019 13:50:29

802.11n ht20 mode



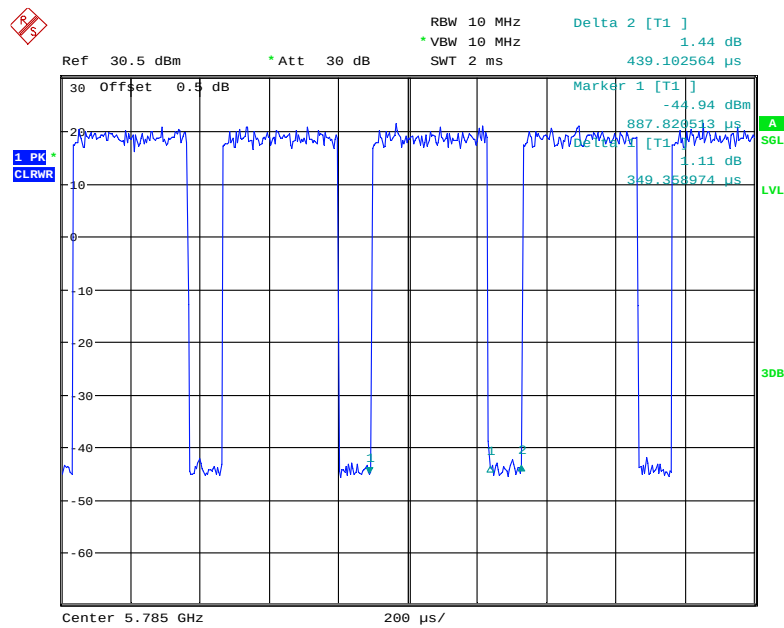
Date: 20.JAN.2019 13:51:22

802.11n ht40 mode



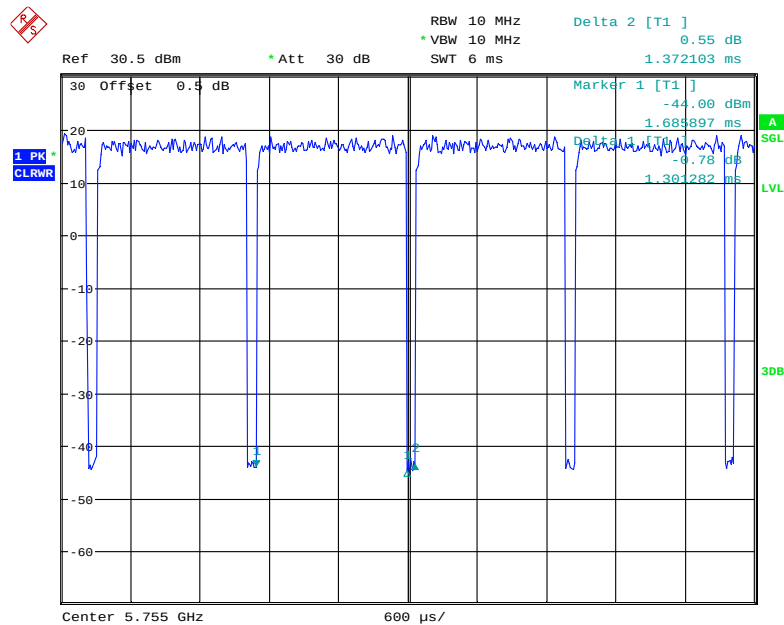
Date: 20.JAN.2019 13:54:20

802.11ac20 mode

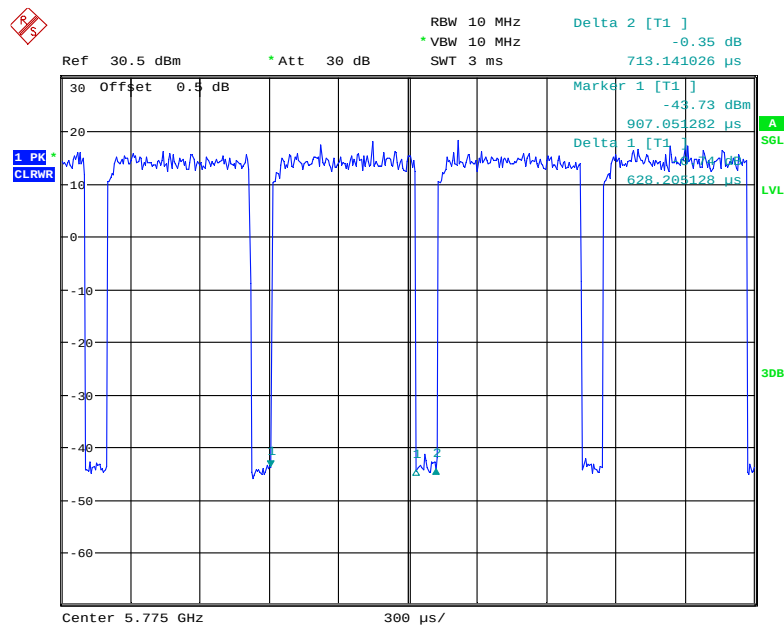


Date: 20.JAN.2019 13:51:52

802.11ac40 mode



Date: 20.JAN.2019 13:55:03

802.11ac80 mode

Date: 20.JAN.2019 13:56:44

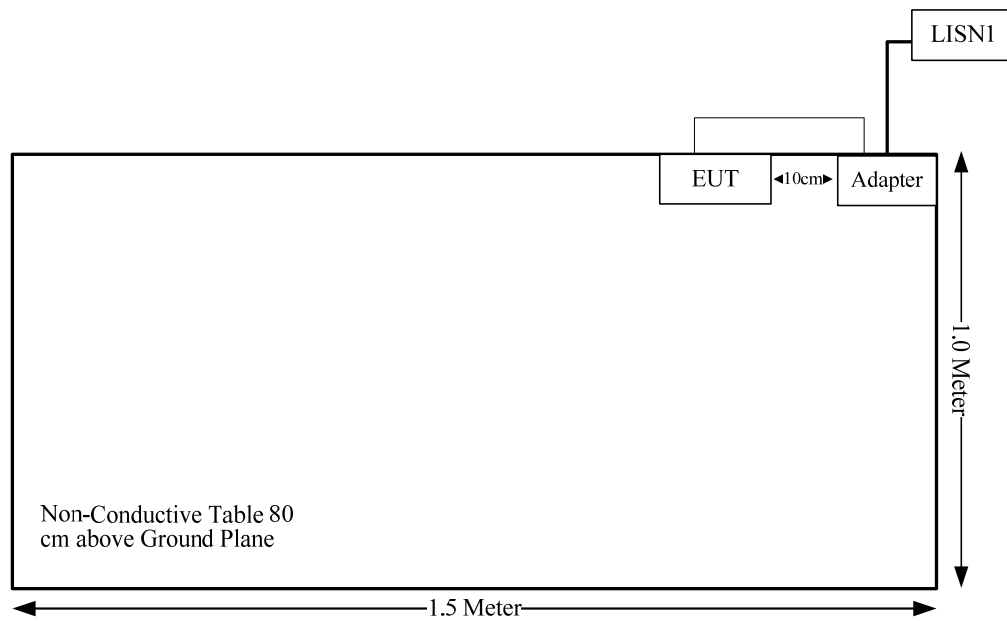
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Huajia	Adapter	PS10J050K2000US	/

Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
USB Cable	Yes	No	0.5	EUT	Adapter

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

Rules	Description of Test	Result
FCC §15.407 (f) & §1.1310 & §2.1093 RSS-102 Clause 4	RF Exposure	Compliance
FCC§15.203, RSS-Gen Clause 6.8	Antenna Requirement	Compliance
FCC§15.407(b)(6)& §15.207(a), RSS-Gen Clause 8.8	AC Line Conducted Emissions	Compliance
FCC§15.205& §15.209 &§15.407(b), RSS-247 Clause 6.2	Undesirable Emission& Restricted Bands	Compliance
FCC§15.407(b) RSS-247 Clause 6.2	Out Of Band Emissions	Compliance
FCC§15.407(a) (e), RSS-247 Clause 6.2 RSS-Gen Clause 6.7	Emission Bandwidth	Compliance
FCC§15.407(a) RSS-247 Clause 6.2	Conducted Transmitter Output Power	Compliance
FCC§15.407 (a), RSS-247 Clause 6.2	Power Spectral Density	Compliance

FCC §15.407 (f) & §1.1310 & §2.1093, RSS-102 CLAUSE 4- RF EXPOSURE**Applicable Standard**

According to §15.407(f), §1.1310 and §2.1093.

According to RSS-102 Clause 4 Table 3, SAR limits for device used by the general public

Body Region	Average SAR (W/Kg)	Averaging Time (minutes)	Mass Average (g)
Whole Body	0.08	6	Whole Body
Localized Head, Neck and Trunk	1.6	6	1
Localized Limbs	4	6	10

Test Result

Compliant, please refer to the SAR report: RDG190117002-20.

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

Applicable Standard

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

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

According to RSS-Gen §6.8,

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

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

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

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

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

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

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

Antenna Connector Construction

The EUT has one internal antenna arrangement for BLE/WIFI, fulfill the requirement of this section. Please refer to the EUT photos.

Antenna Type	Antenna Connector	input impedance (Ohm)	Antenna Gain /Frequency
PIFA	Thimble	50	-1.93 dBi/2.4-2.5GHz 0.34 dBi/5.725-5.85GHz

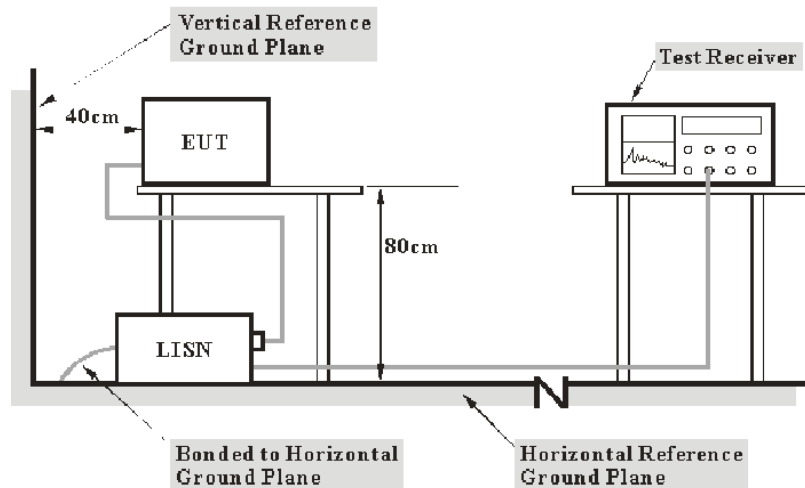
Result: Compliance.

FCC §15.207(a) RSS-GEN CLAUSE 8.8– AC Line Conducted Emissions

Applicable Standard

FCC §15.207(a), §15.407(b) (6), RSS-GEN CLAUSE 8.8.

EUT Setup



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

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits and RSS-Gen clause 8.8 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:

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

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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCS 30	830245/006	2018-12-10	2019-12-10
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-01	2018-09-05	2019-09-05
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

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

Test Data

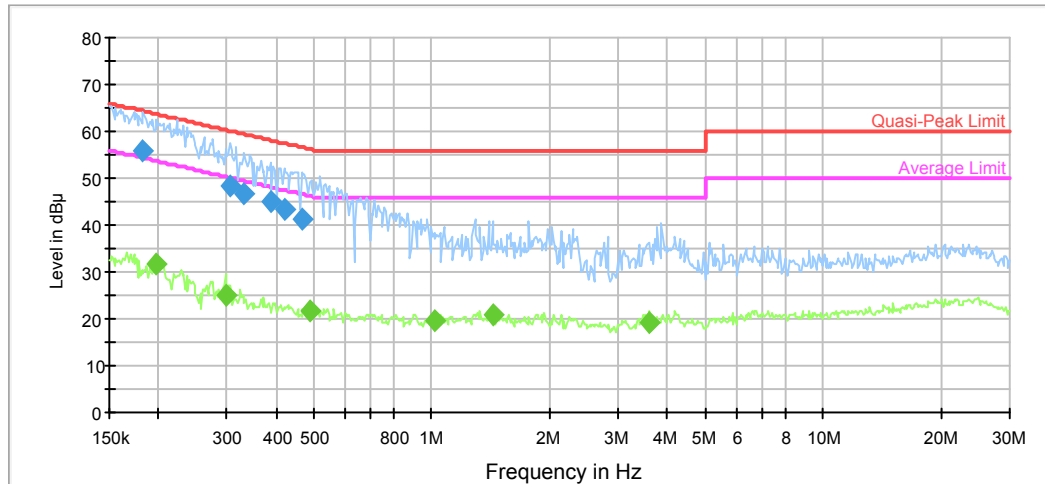
Environmental Conditions

Temperature:	22.9 °C
Relative Humidity:	33 %
ATM Pressure:	100.5 kPa

The testing was performed by Lily Xie on 2019-01-25.

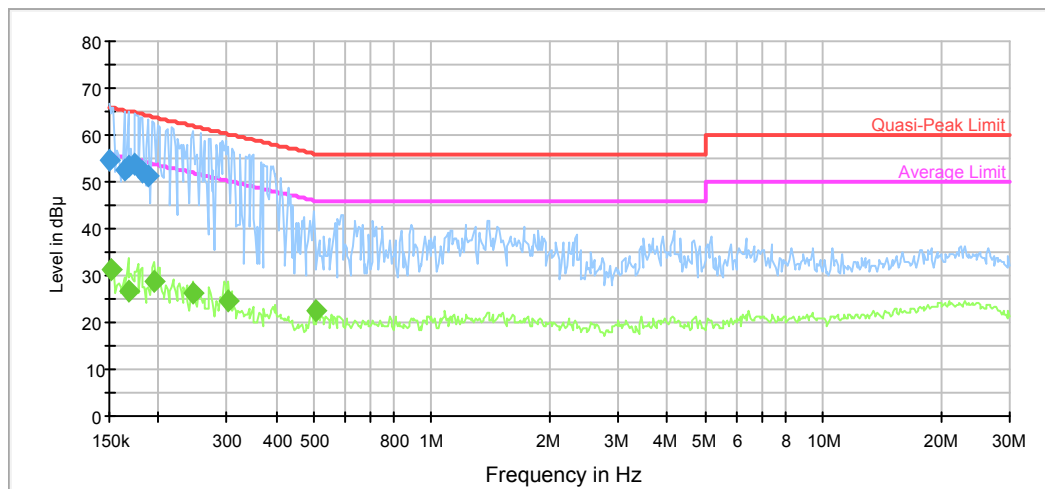
Test Mode: Transmitting

AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.183065	55.8	9.000	L1	10.8	8.5	64.3	Compliance
0.304845	48.4	9.000	L1	10.1	11.7	60.1	Compliance
0.332770	46.7	9.000	L1	10.1	12.7	59.4	Compliance
0.387164	45.0	9.000	L1	10.0	13.1	58.1	Compliance
0.419276	43.3	9.000	L1	10.0	14.2	57.5	Compliance
0.465037	41.4	9.000	L1	9.9	15.2	56.6	Compliance

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.198249	31.5	9.000	L1	10.6	22.2	53.7	Compliance
0.297644	25.0	9.000	L1	10.2	25.3	50.3	Compliance
0.487810	21.8	9.000	L1	9.9	24.4	46.2	Compliance
1.023481	19.5	9.000	L1	9.8	26.5	46.0	Compliance
1.430284	20.7	9.000	L1	9.7	25.3	46.0	Compliance
3.604490	19.1	9.000	L1	9.8	26.9	46.0	Compliance

AC120 V, 60 Hz, Neutral:

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	54.6	9.000	N	11.2	11.4	66.0	Compliance
0.163741	52.6	9.000	N	11.0	12.7	65.3	Compliance
0.167702	53.3	9.000	N	10.9	11.8	65.1	Compliance
0.174519	53.7	9.000	N	10.9	11.0	64.7	Compliance
0.181612	52.0	9.000	N	10.8	12.4	64.4	Compliance
0.188994	51.1	9.000	N	10.7	13.0	64.1	Compliance

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.152410	31.1	9.000	N	11.1	24.8	55.9	Compliance
0.167702	26.8	9.000	N	10.9	28.3	55.1	Compliance
0.195114	28.6	9.000	N	10.7	25.2	53.8	Compliance
0.245835	26.3	9.000	N	10.3	25.6	51.9	Compliance
0.302425	24.6	9.000	N	10.1	25.6	50.2	Compliance
0.503608	22.4	9.000	N	9.9	23.6	46.0	Compliance

FCC §15.209, §15.205 , §15.407(b) & RSS-247 §6.2, RSS-GEN §8.10– UNWANTED EMISSION

Applicable Standard

According to 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.

(8) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits.

According to RSS-247§6.2

Frequency band 5150-5250 MHz

6.2.1.2 Unwanted emission limits

For transmitters with operating frequencies in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. Any unwanted emissions that fall into the band 5250-5350 MHz shall be attenuated below the channel power by at least 26 dB, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth (i.e. 99% bandwidth), above 5250 MHz. The 26 dB bandwidth may fall into the 5250-5350 MHz band; however, if the occupied bandwidth also falls within the 5250-5350 MHz band, the transmission is considered as intentional and the devices shall comply with all requirements in the band 5250-5350 MHz including implementing dynamic frequency selection (DFS) and TPC, on the portion of the emission that resides in the 5250-5350 MHz band.

Frequency band 5250-5350 MHz

6.2.2.2 Unwanted emission limits

Devices shall comply with the following:

- a) All emissions outside the band 5250-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p.; or
- b) All emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. and its power shall comply with the spectral power density for operation within the band 5150-5250 MHz. The device, except devices installed in vehicles, shall be labelled or include in the user manual the following text “for indoor use only.”

Frequency bands 5470-5600 MHz and 5650-5725 MHz:

6.2.3.2 Unwanted emission limits

Emissions outside the band 5470-5600 MHz and 5650-5725 MHz shall not exceed -27 dBm/MHz e.i.r.p. However, devices with bandwidth overlapping the band edge of 5725 MHz can meet the emission limit of -27 dBm/MHz e.i.r.p. at 5850 MHz instead of 5725 MHz.

Frequency band 5725-5850 MHz

6.2.4.2 Unwanted emission limits

Devices operating in the band 5725-5850 MHz with antenna gain greater than 10 dBi can have unwanted emissions that comply with either the limits in this section or in section 5.5 until six (6) months after the publication date of this standard for certification. Certified devices that do not comply with emission limits in this section shall not be manufactured, imported, distributed, leased, offered for sale or sold after April 1, 2018.

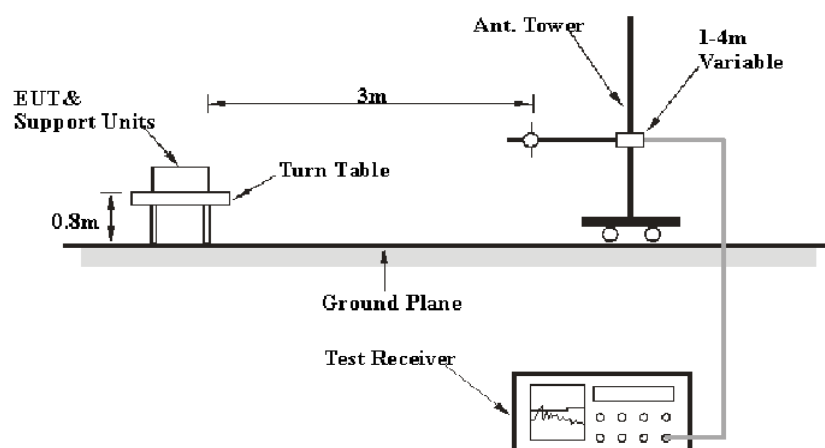
Devices operating in the band 5725-5850 MHz with antenna gain of 10 dBi or less can have unwanted emissions that comply with either the limits in this section or in section 5.5 until April 1, 2018 for certification. Certified devices that do not comply with emission limits in this section shall not be manufactured, imported, distributed, leased, offered for sale or sold after April 1, 2020.

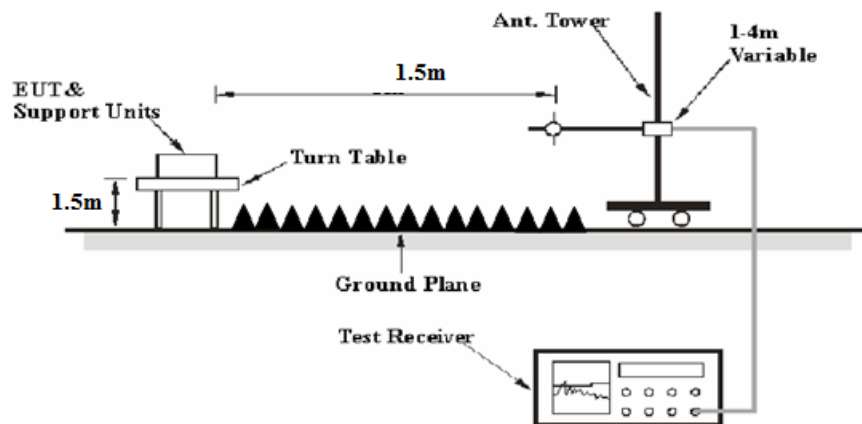
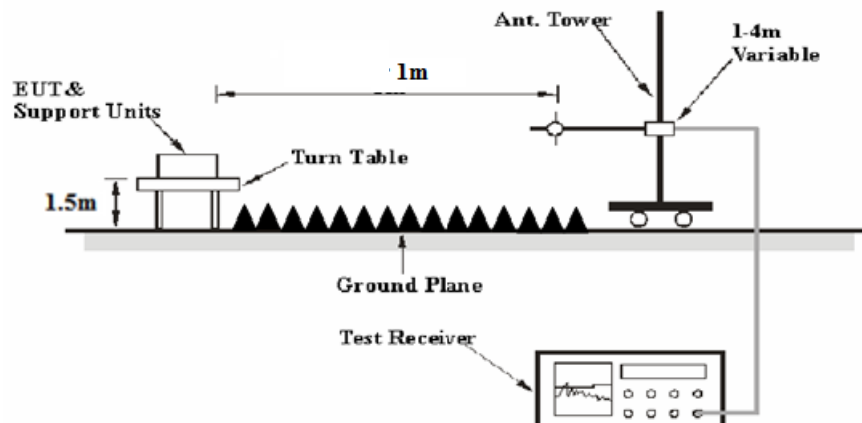
Devices operating in the band 5725-5850 MHz shall have e.i.r.p. of unwanted emissions comply with the following:

- 27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 dBm/MHz at 5 MHz above or below the band edges;
- 15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges;
- 10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges; and
- 27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.

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 and RSS-247, RSS-Gen 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

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

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-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, 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:

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

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:

$$\text{Margin} = \text{Limit} - \text{Extrapolation result}$$

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100224	2018-12-10	2019-12-10
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	2018-09-05	2019-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2018-09-05	2019-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-1400-01	2018-05-06	2019-05-06
HP	Amplifier	8447D	2727A05902	2018-09-05	2019-09-05
Agilent	Spectrum Analyzer	E4440A	SG43360054	2019-01-04	2020-01-04
R&S	Spectrum Analyzer	FSP 38	100478	2018-12-10	2019-12-10
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-01 1304	2016-11-18	2019-11-18
Ducommun Technologies	Horn Antenna	ARH-2823-02	1007726-01 1302	2016-11-18	2019-11-18
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2018-09-05	2019-09-05
Unknown	Coaxial Cable	C-2.4J2.4J-50	C-0700-02	2018-06-27	2019-06-27
MITEQ	Amplifier	AFS42-00101800- 25-S-42	2001271	2018-09-05	2019-09-05
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2018-06-27	2019-06-27
Sinoscite	Bandstop Filters	BSF5150-5850MN- 0899-003	0899003	2018-05-06	2019-05-06

* **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

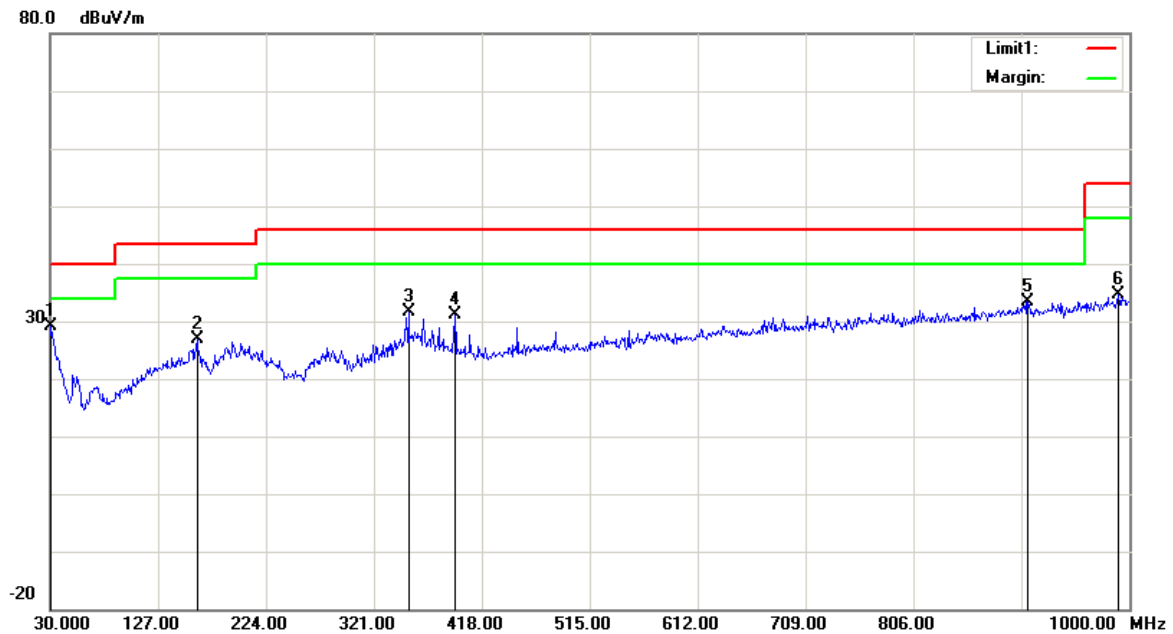
Temperature:	21.3~22.3°C
Relative Humidity:	31~36 %
ATM Pressure:	100.4~100.5 kPa

* The testing was performed by Neil Liao & Tyler Pan on 2019-01-24 & 2019-01-25

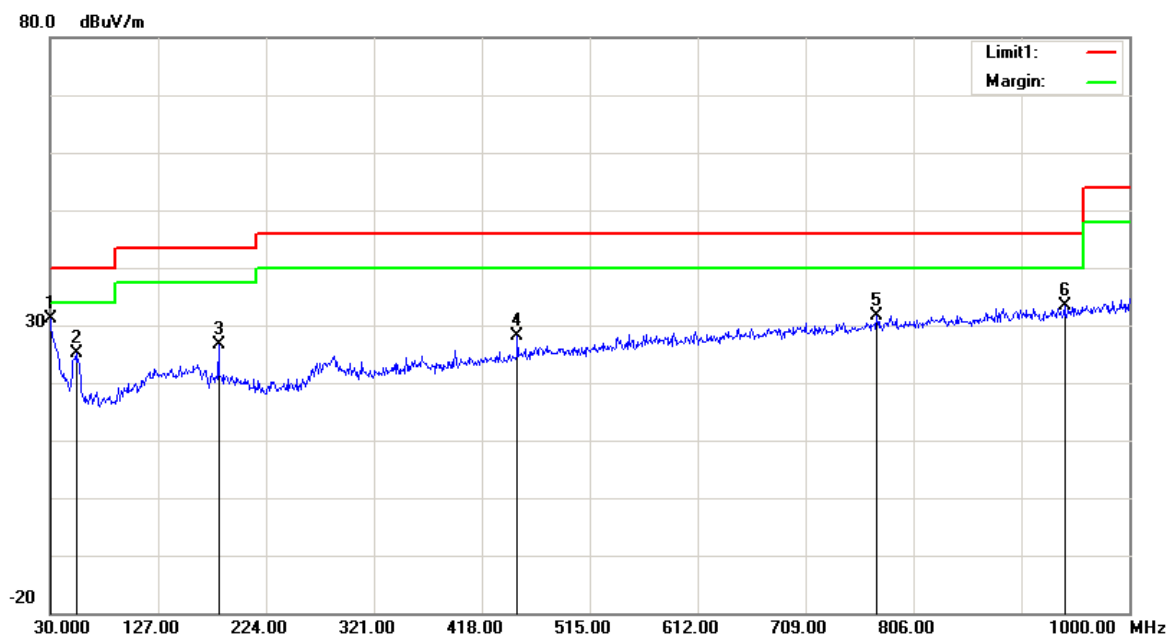
Test Mode: Transmitting

1) 30MHz-1GHz(802.11a High channel 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	34.16	peak	-5.01	29.15	40.00	10.85
161.9200	39.02	peak	-12.04	26.98	43.50	16.52
352.0400	40.74	peak	-9.02	31.72	46.00	14.28
393.7500	39.33	peak	-8.19	31.14	46.00	14.86
908.8200	37.16	peak	-3.75	33.41	46.00	12.59
990.3000	11.43	peak	23.20	34.63	54.00	19.37

Vertical:

Frequency (MHz)	Receiver Reading (dB μ V)	Detector	Correction Factor (dB/m)	Cord. Amp. (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
30.0000	35.21	peak	-4.20	31.01	40.00	8.99
53.2800	42.96	peak	-17.90	25.06	40.00	14.94
181.3200	39.82	peak	-13.24	26.58	43.50	16.92
450.0100	35.39	peak	-7.22	28.17	46.00	17.83
773.0200	33.33	peak	-1.77	31.56	46.00	14.44
941.8000	36.69	peak	-3.41	33.28	46.00	12.72

2) 1-40GHz:

802.11a

Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Extrapolation result	Limit	Margin
	Reading	Detector	Polar	Factor						
MHz	dBμV	PK/QP/AV	H/V	dB/m	dB	dB	dBμV/m	dBμV/m	dBμV/m	dB
Low Channel: 5745 MHz										
5745.00	67.70	PK	H	34.20	3.69	0.00	105.59	99.57	N/A	N/A
5745.00	59.42	AV	H	34.20	3.69	0.00	97.31	91.29	N/A	N/A
5745.00	69.45	PK	V	34.20	3.69	0.00	107.34	101.32	N/A	N/A
5745.00	61.01	AV	V	34.20	3.69	0.00	98.90	92.88	N/A	N/A
5725.00	41.51	PK	V	34.19	3.69	0.00	79.39	73.37	122.20	48.83
5720.00	37.29	PK	V	34.19	3.69	0.00	75.17	69.15	110.80	41.65
5700.00	28.35	PK	V	34.18	3.68	0.00	66.21	60.19	105.20	45.01
5650.00	26.90	PK	V	34.16	3.63	0.00	64.69	58.67	68.20	9.53
11490.00	47.65	PK	V	38.99	6.59	37.35	55.88	49.86	74.00	24.14
11490.00	34.97	AV	V	38.99	6.59	37.35	43.20	37.18	54.00	16.82
17235.00	47.74	PK	V	41.56	8.78	38.61	59.47	53.45	68.20	14.75
Middle Channel: 5785MHz										
5785.00	66.98	PK	H	34.21	3.71	0.00	104.90	98.88	N/A	N/A
5785.00	57.21	AV	H	34.21	3.71	0.00	95.13	89.11	N/A	N/A
5785.00	68.81	PK	V	34.21	3.71	0.00	106.73	100.71	N/A	N/A
5785.00	58.75	AV	V	34.21	3.71	0.00	96.67	90.65	N/A	N/A
11570.00	46.02	PK	V	39.00	6.61	37.44	54.19	48.17	74.00	25.83
11570.00	33.12	AV	V	39.00	6.61	37.44	41.29	35.27	54.00	18.73
17355.00	47.77	PK	V	42.26	8.81	38.52	60.32	54.3	68.20	13.90
High Channel: 5825MHz										
5825.00	65.99	PK	H	34.23	3.73	0.00	103.95	97.93	N/A	N/A
5825.00	58.62	AV	H	34.23	3.73	0.00	96.58	90.56	N/A	N/A
5825.00	67.80	PK	V	34.23	3.73	0.00	105.76	99.74	N/A	N/A
5825.00	59.64	AV	V	34.23	3.73	0.00	97.60	91.58	N/A	N/A
5850.00	32.63	PK	V	34.24	3.75	0.00	70.62	64.6	122.20	57.60
5855.00	30.49	PK	V	34.24	3.75	0.00	68.48	62.46	110.80	48.34
5875.00	26.68	PK	V	34.25	3.77	0.00	64.70	58.68	105.20	46.52
5925.00	26.99	PK	V	34.27	3.80	0.00	65.06	59.04	68.20	9.16
11650.00	50.72	PK	V	39.00	6.64	37.53	58.83	52.81	74.00	21.19
11650.00	37.03	AV	V	39.00	6.64	37.53	45.14	39.12	54.00	14.88
17475.00	47.52	PK	V	42.96	8.84	38.44	60.88	54.86	68.20	13.34

802.11n20

Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Extrapolation result	Limit	Margin
	Reading	Detector	Polar	Factor						
MHz	dBμV	PK/QP/AV	H/V	dB/m	dB	dB	dBμV/m	dBμV/m	dBμV/m	dB
Low Channel: 5745 MHz										
5745.00	65.91	PK	H	34.20	3.69	0.00	103.80	97.78	N/A	N/A
5745.00	56.93	AV	H	34.20	3.69	0.00	94.82	88.8	N/A	N/A
5745.00	68.18	PK	V	34.20	3.69	0.00	106.07	100.05	N/A	N/A
5745.00	59.21	AV	V	34.20	3.69	0.00	97.10	91.08	N/A	N/A
5725.00	41.04	PK	V	34.19	3.69	0.00	78.92	72.9	122.20	49.30
5720.00	36.14	PK	V	34.19	3.69	0.00	74.02	68	110.80	42.80
5700.00	28.76	PK	V	34.18	3.68	0.00	66.62	60.6	105.20	44.60
5650.00	26.84	PK	V	34.16	3.63	0.00	64.63	58.61	68.20	9.59
11490.00	47.50	PK	V	38.99	6.59	37.35	55.73	49.71	74.00	24.29
11490.00	34.26	AV	V	38.99	6.59	37.35	42.49	36.47	54.00	17.53
17235.00	46.56	PK	V	41.56	8.78	38.61	58.29	52.27	68.20	15.93
Middle Channel: 5785 MHz										
5785.00	67.83	PK	H	34.21	3.71	0.00	105.75	99.73	N/A	N/A
5785.00	58.74	AV	H	34.21	3.71	0.00	96.66	90.64	N/A	N/A
5785.00	68.15	PK	V	34.21	3.71	0.00	106.07	100.05	N/A	N/A
5785.00	59.01	AV	V	34.21	3.71	0.00	96.93	90.91	N/A	N/A
11570.00	46.64	PK	V	39.00	6.61	37.44	54.81	48.79	74.00	25.21
11570.00	32.87	AV	V	39.00	6.61	37.44	41.04	35.02	54.00	18.98
17355.00	47.00	PK	V	42.26	8.81	38.52	59.55	53.53	68.20	14.67
High Channel: 5825 MHz										
5825.00	68.01	PK	H	34.23	3.73	0.00	105.97	99.95	N/A	N/A
5825.00	59.21	AV	H	34.23	3.73	0.00	97.17	91.15	N/A	N/A
5825.00	68.20	PK	V	34.23	3.73	0.00	106.16	100.14	N/A	N/A
5825.00	59.62	AV	V	34.23	3.73	0.00	97.58	91.56	N/A	N/A
5850.00	30.53	PK	V	34.24	3.75	0.00	68.52	62.5	122.20	59.70
5855.00	29.96	PK	V	34.24	3.75	0.00	67.95	61.93	110.80	48.87
5875.00	26.67	PK	V	34.25	3.77	0.00	64.69	58.67	105.20	46.53
5925.00	26.88	PK	V	34.27	3.80	0.00	64.95	58.93	68.20	9.27
11650.00	50.63	PK	V	39.00	6.64	37.53	58.74	52.72	74.00	21.28
11650.00	37.23	AV	V	39.00	6.64	37.53	45.34	39.32	54.00	14.68
17475.00	47.20	PK	V	42.96	8.84	38.44	60.56	54.54	68.20	13.66

802.11n40

Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Extrapolation result	Limit	Margin
	Reading	Detector	Polar	Factor						
MHz	dBμV	PK/QP/AV	H/V	dB/m	dB	dB	dBμV/m	dBμV/m	dBμV/m	dB
Low Channel: 5755 MHz										
5755.00	64.05	PK	H	34.20	3.70	0.00	101.95	95.93	N/A	N/A
5755.00	55.25	AV	H	34.20	3.70	0.00	93.15	87.13	N/A	N/A
5755.00	66.76	PK	V	34.20	3.70	0.00	104.66	98.64	N/A	N/A
5755.00	56.93	AV	V	34.20	3.70	0.00	94.83	88.81	N/A	N/A
5725.00	41.11	PK	V	34.19	3.69	0.00	78.99	72.97	122.20	49.23
5720.00	39.20	PK	V	34.19	3.69	0.00	77.08	71.06	110.80	39.74
5700.00	30.46	PK	V	34.18	3.68	0.00	68.32	62.3	105.20	42.90
5650.00	26.26	PK	V	34.16	3.63	0.00	64.05	58.03	68.20	10.17
11510.00	46.04	PK	V	39.00	6.59	37.37	54.26	48.24	74.00	25.76
11510.00	32.15	AV	V	39.00	6.59	37.37	40.37	34.35	54.00	19.65
17265.00	47.23	PK	V	41.74	8.79	38.58	59.18	53.16	68.20	15.04
High Channel: 5795 MHz										
5795.00	64.47	PK	H	34.22	3.71	0.00	102.40	96.38	N/A	N/A
5795.00	55.19	AV	H	34.22	3.71	0.00	93.12	87.1	N/A	N/A
5795.00	65.39	PK	V	34.22	3.71	0.00	103.32	97.3	N/A	N/A
5795.00	56.25	AV	V	34.22	3.71	0.00	94.18	88.16	N/A	N/A
5850.00	27.42	PK	V	34.24	3.75	0.00	65.41	59.39	122.20	62.81
5855.00	27.02	PK	V	34.24	3.75	0.00	65.01	58.99	110.80	51.81
5875.00	27.27	PK	V	34.25	3.77	0.00	65.29	59.27	105.20	45.93
5925.00	27.29	PK	V	34.27	3.80	0.00	65.36	59.34	68.20	8.86
11590.00	46.37	PK	V	39.00	6.62	37.46	54.53	48.51	74.00	25.49
11590.00	32.65	AV	V	39.00	6.62	37.46	40.81	34.79	54.00	19.21
17385.00	47.71	PK	V	42.43	8.82	38.50	60.46	54.44	68.20	13.76

802.11ac20

Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Extrapolation result	Limit	Margin
	Reading	Detector	Polar	Factor						
MHz	dBμV	PK/QP/AV	H/V	dB/m	dB	dB	dBμV/m	dBμV/m	dBμV/m	dB
Low Channel: 5745 MHz										
5745.00	66.31	PK	H	34.20	3.69	0.00	104.20	98.18	N/A	N/A
5745.00	58.69	AV	H	34.20	3.69	0.00	96.58	90.56	N/A	N/A
5745.00	69.59	PK	V	34.20	3.69	0.00	107.48	101.46	N/A	N/A
5745.00	61.17	AV	V	34.20	3.69	0.00	99.06	93.04	N/A	N/A
5725.00	41.26	PK	V	34.19	3.69	0.00	79.14	73.12	122.20	49.08
5720.00	38.06	PK	V	34.19	3.69	0.00	75.94	69.92	110.80	40.88
5700.00	28.10	PK	V	34.18	3.68	0.00	65.96	59.94	105.20	45.26
5650.00	26.33	PK	V	34.16	3.63	0.00	64.12	58.1	68.20	10.10
11490.00	46.65	PK	V	38.99	6.59	37.35	54.88	48.86	74.00	25.14
11490.00	33.21	AV	V	38.99	6.59	37.35	41.44	35.42	54.00	18.58
17235.00	48.34	PK	V	41.56	8.78	38.61	60.07	54.05	68.20	14.15
Middle Channel: 5785 MHz										
5785.00	67.14	PK	H	34.21	3.71	0.00	105.06	99.04	N/A	N/A
5785.00	57.99	AV	H	34.21	3.71	0.00	95.91	89.89	N/A	N/A
5785.00	68.76	PK	V	34.21	3.71	0.00	106.68	100.66	N/A	N/A
5785.00	59.63	AV	V	34.21	3.71	0.00	97.55	91.53	N/A	N/A
11570.00	46.01	PK	V	39.00	6.61	37.44	54.18	48.16	74.00	25.84
11570.00	32.90	AV	V	39.00	6.61	37.44	41.07	35.05	54.00	18.95
17355.00	47.16	PK	V	42.26	8.81	38.52	59.71	53.69	68.20	14.51
High Channel: 5825 MHz										
5825.00	66.38	PK	H	34.23	3.73	0.00	104.34	98.32	N/A	N/A
5825.00	58.36	AV	H	34.23	3.73	0.00	96.32	90.3	N/A	N/A
5825.00	68.04	PK	V	34.23	3.73	0.00	106.00	99.98	N/A	N/A
5825.00	59.89	AV	V	34.23	3.73	0.00	97.85	91.83	N/A	N/A
5850.00	33.43	PK	V	34.24	3.75	0.00	71.42	65.4	122.20	56.80
5855.00	29.66	PK	V	34.24	3.75	0.00	67.65	61.63	110.80	49.17
5875.00	26.71	PK	V	34.25	3.77	0.00	64.73	58.71	105.20	46.49
5925.00	27.33	PK	V	34.27	3.80	0.00	65.40	59.38	68.20	8.82
11650.00	46.03	PK	V	39.00	6.64	37.53	54.14	48.12	74.00	25.88
11650.00	33.29	AV	V	39.00	6.64	37.53	41.40	35.38	54.00	18.62
17475.00	47.13	PK	V	42.96	8.84	38.44	60.49	54.47	68.20	13.73

802.11ac40

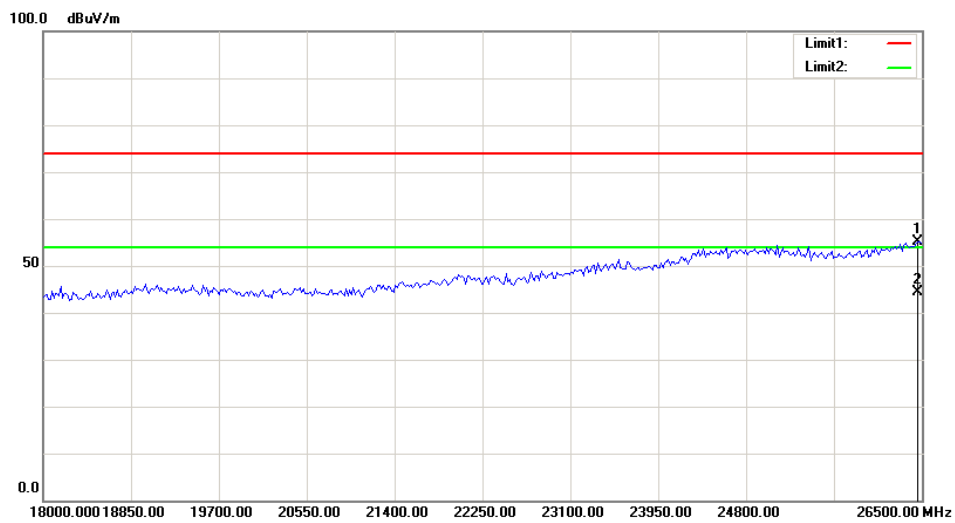
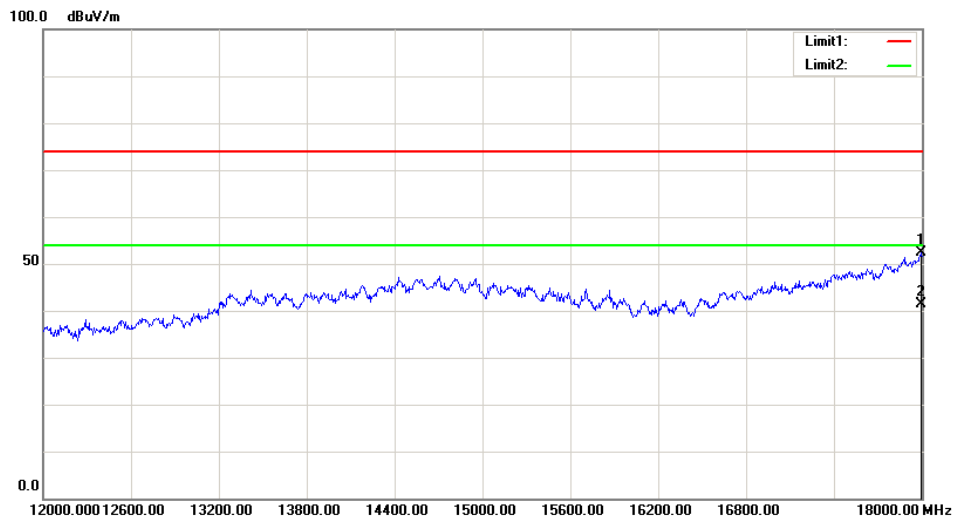
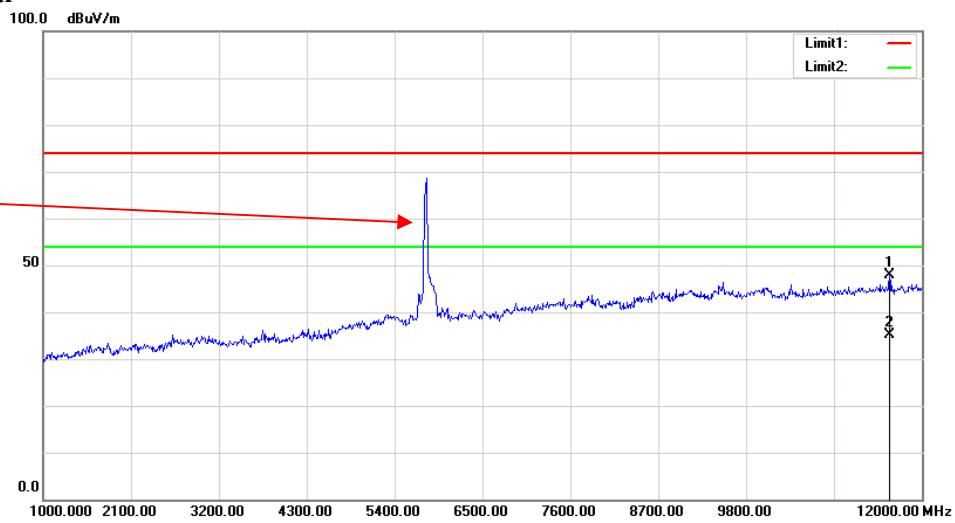
Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Extrapolation result	Limit	Margin
	Reading	Detector	Polar	Factor						
MHz	dBμV	PK/QP/AV	H/V	dB/m	dB	dB	dBμV/m	dBμV/m	dBμV/m	dB
Low Channel: 5755 MHz										
5755.00	65.63	PK	H	34.20	3.70	0.00	103.53	97.51	N/A	N/A
5755.00	55.65	AV	H	34.20	3.70	0.00	93.55	87.53	N/A	N/A
5755.00	66.62	PK	V	34.20	3.70	0.00	104.52	98.5	N/A	N/A
5755.00	56.93	AV	V	34.20	3.70	0.00	94.83	88.81	N/A	N/A
5725.00	40.96	PK	V	34.19	3.69	0.00	78.84	72.82	122.20	49.38
5720.00	39.20	PK	V	34.19	3.69	0.00	77.08	71.06	110.80	39.74
5700.00	30.70	PK	V	34.18	3.68	0.00	68.56	62.54	105.20	42.66
5650.00	27.56	PK	V	34.16	3.63	0.00	65.35	59.33	68.20	8.87
11510.00	46.38	PK	V	39.00	6.59	37.37	54.60	48.58	74.00	25.42
11510.00	33.58	AV	V	39.00	6.59	37.37	41.80	35.78	54.00	18.22
17265.00	47.75	PK	V	41.74	8.79	38.58	59.70	53.68	68.20	14.52
High Channel: 5795 MHz										
5795.00	63.86	PK	H	34.22	3.71	0.00	101.79	95.77	N/A	N/A
5795.00	54.25	AV	H	34.22	3.71	0.00	92.18	86.16	N/A	N/A
5795.00	66.01	PK	V	34.22	3.71	0.00	103.94	97.92	N/A	N/A
5795.00	56.96	AV	V	34.22	3.71	0.00	94.89	88.87	N/A	N/A
5850.00	28.25	PK	V	34.24	3.75	0.00	66.24	60.22	122.20	61.98
5855.00	28.54	PK	V	34.24	3.75	0.00	66.53	60.51	110.80	50.29
5875.00	26.98	PK	V	34.25	3.77	0.00	65.00	58.98	105.20	46.22
5925.00	26.68	PK	V	34.27	3.80	0.00	64.75	58.73	68.20	9.47
11590.00	46.01	PK	V	39.00	6.62	37.46	54.17	48.15	74.00	25.85
11590.00	33.14	AV	V	39.00	6.62	37.46	41.30	35.28	54.00	18.72
17385.00	48.38	PK	V	42.43	8.82	38.50	61.13	55.11	68.20	13.09

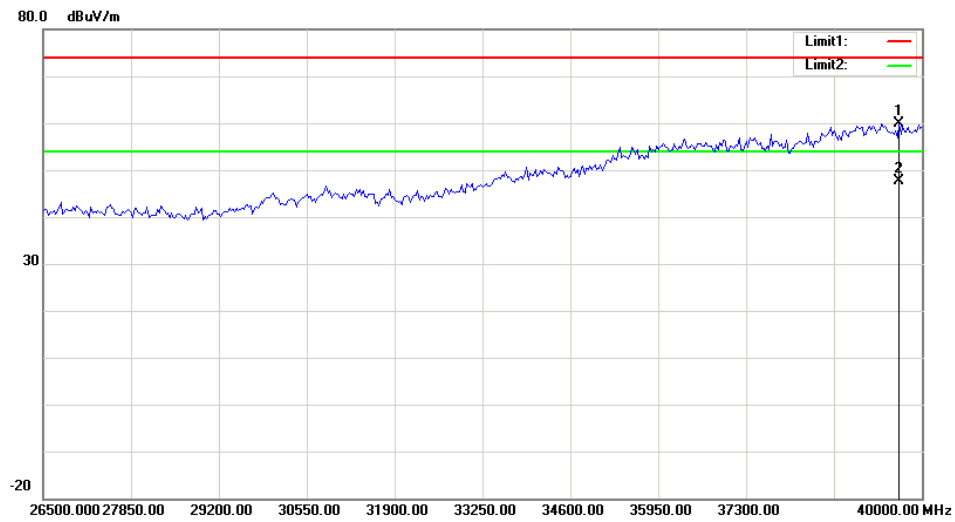
802.11ac80

Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Extrapolation result	Limit	Margin
	Reading	Detector	Polar	Factor						
MHz	dBμV	PK/QP/AV	H/V	dB/m	dB	dB	dBμV/m	dBμV/m	dBμV/m	dB
Low Channel: 5775 MHz										
5775.00	62.99	PK	H	34.21	3.70	0.00	100.90	94.88	N/A	N/A
5775.00	53.48	AV	H	34.21	3.70	0.00	91.39	85.37	N/A	N/A
5775.00	64.82	PK	V	34.21	3.70	0.00	102.73	96.71	N/A	N/A
5775.00	55.96	AV	V	34.21	3.70	0.00	93.87	87.85	N/A	N/A
5725.00	41.98	PK	V	34.19	3.69	0.00	79.86	73.84	122.20	48.36
5720.00	41.37	PK	V	34.19	3.69	0.00	79.25	73.23	110.80	37.57
5700.00	36.45	PK	V	34.18	3.68	0.00	74.31	68.29	105.20	36.91
5650.00	29.68	PK	V	34.16	3.63	0.00	67.47	61.45	68.20	6.75
5850.00	34.47	PK	V	34.24	3.75	0.00	72.46	66.44	122.20	55.76
5855.00	32.72	PK	V	34.24	3.75	0.00	70.71	64.69	110.80	46.11
5875.00	28.68	PK	V	34.25	3.77	0.00	66.70	60.68	105.20	44.52
5925.00	26.68	PK	V	34.27	3.80	0.00	64.75	58.73	68.20	9.47
11550.00	46.09	PK	V	39.00	6.61	37.42	54.28	48.26	74.00	25.74
11550.00	33.11	AV	V	39.00	6.61	37.42	41.30	35.28	54.00	18.72
17325.00	47.24	PK	V	42.09	8.80	38.54	59.59	53.57	68.20	14.63

Worst plots(802.11a High channel) **Horizontal**

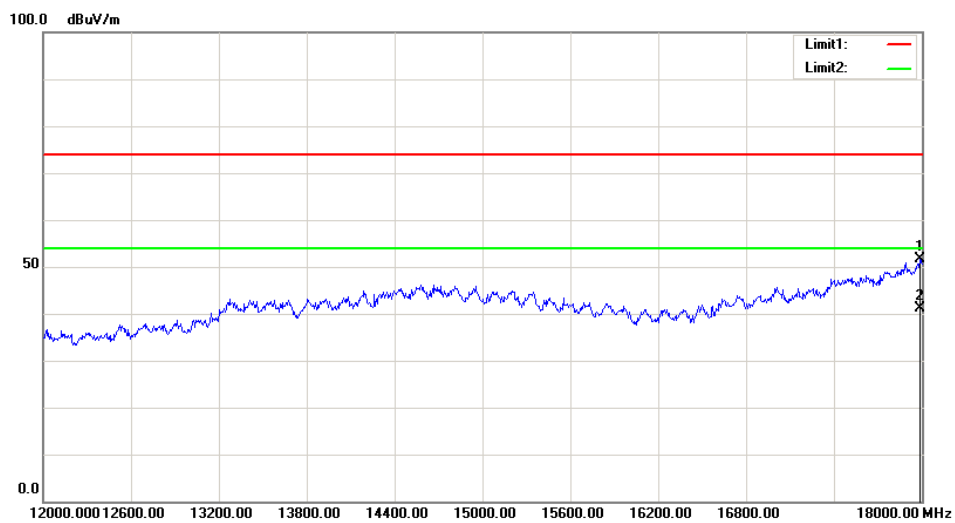
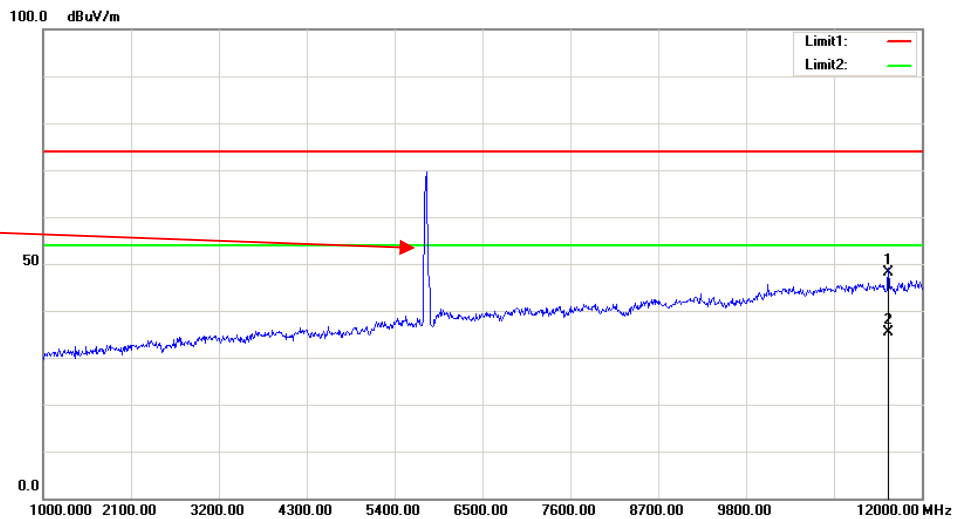
Fundamental
Test with Band
Rejection Filter

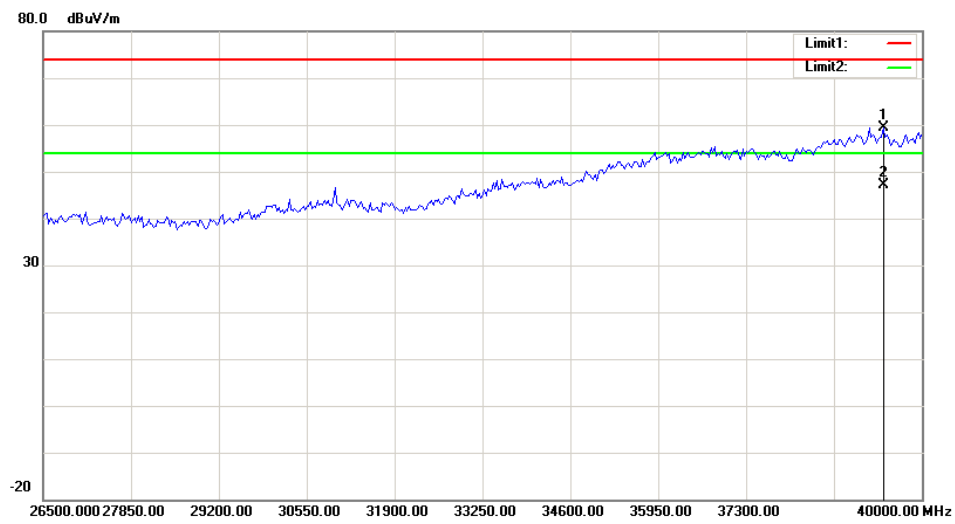
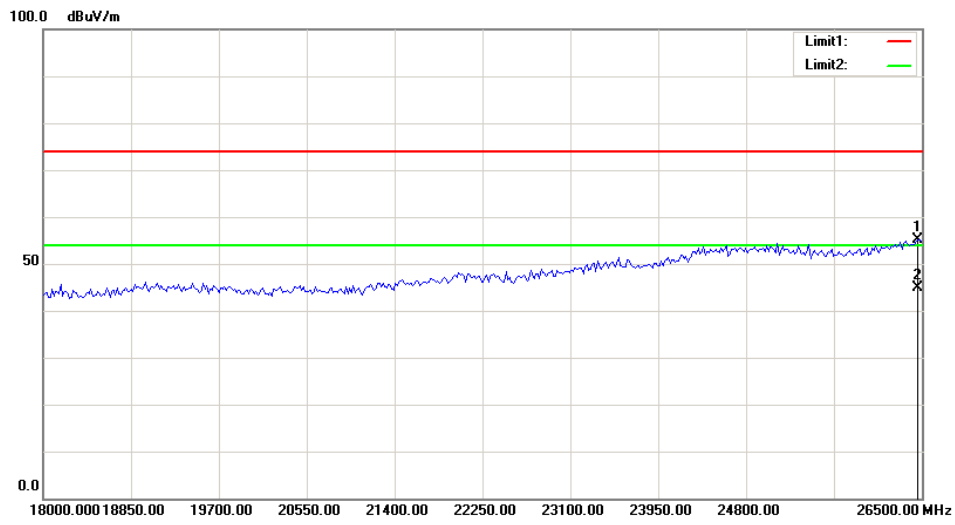




Vertical

Fundamental
Test with Band
Rejection Filter





FCC §15.407(a)& RSS-247 §6.2,RSS-Gen §6.7– EMISSION BANDWIDTH**Applicable Standard**

15.407(a), RSS-247 §6.2 and RSS-Gen §6.7

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	C0010/01	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:	25.2 °C
Relative Humidity:	42 %
ATM Pressure:	100.8 ~ 102.1 kPa

* The testing was performed by Elena Lei from 2019-01-20 to 2019-01-21.

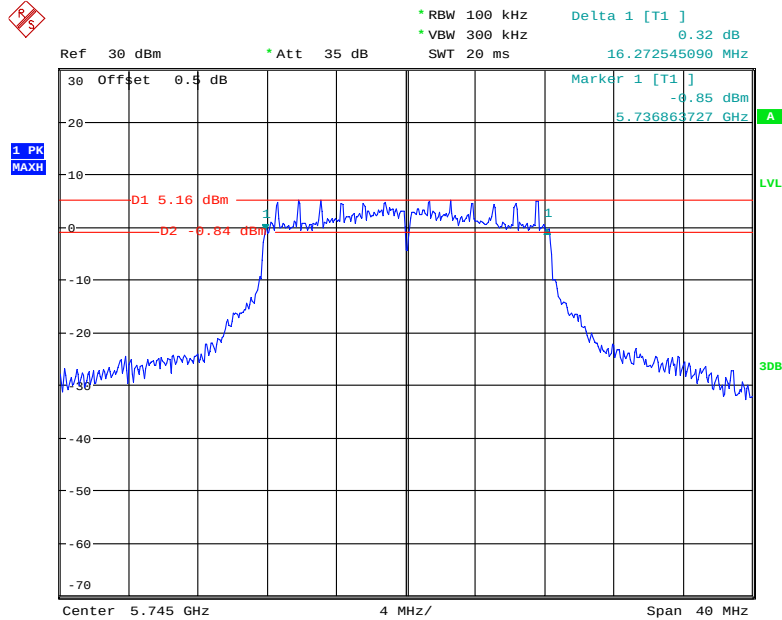
Test Result: Pass.

Please refer to the following tables and plots.

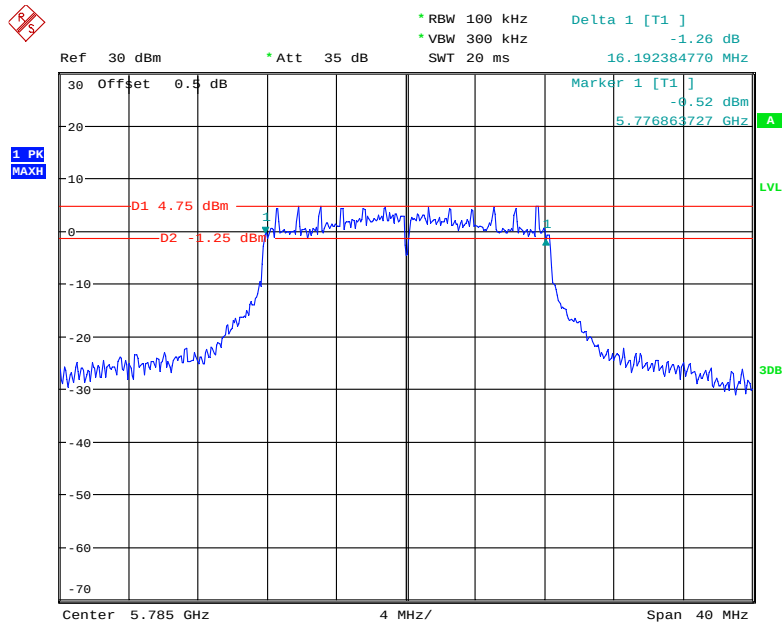
Test mode: Transmitting

Mode	Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limits (MHz)
802.11a	Low	5745	16.273	17.440	≥ 0.5
	Middle	5785	16.192	17.440	≥ 0.5
	High	5825	16.192	17.520	≥ 0.5
802.11n20	Low	5745	17.315	18.960	≥ 0.5
	Middle	5785	17.315	18.800	≥ 0.5
	High	5825	17.315	18.960	≥ 0.5
802.11n40	Low	5755	35.752	37.120	≥ 0.5
	High	5795	36.072	37.120	≥ 0.5
802.11ac20	Low	5745	17.315	18.640	≥ 0.5
	Middle	5785	17.395	18.640	≥ 0.5
	High	5825	17.395	18.560	≥ 0.5
802.11ac40	Low	5755	35.752	37.120	≥ 0.5
	High	5795	36.072	37.280	≥ 0.5
802.11ac80	Middle	5775	74.709	77.440	≥ 0.5

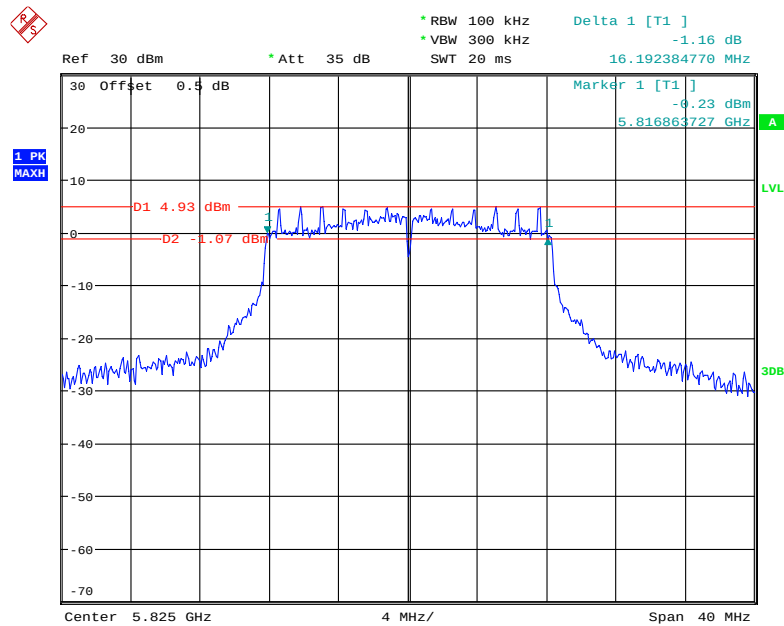
Note: the 99% Occupied bandwidth are not fall into 5470-5725MHz band

6dB Bandwidth:**802.11a, Low Channel**

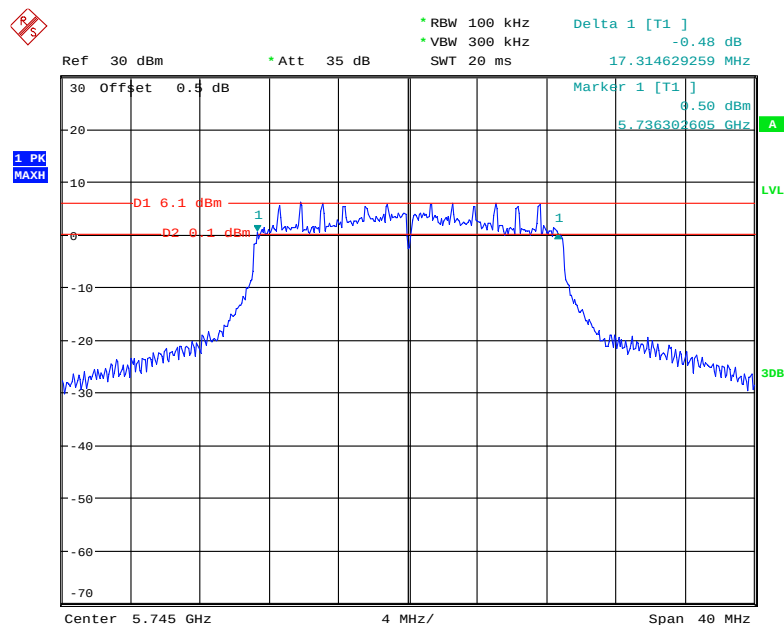
Date: 20.JAN.2019 10:28:15

802.11a, Middle Channel

Date: 20.JAN.2019 10:33:31

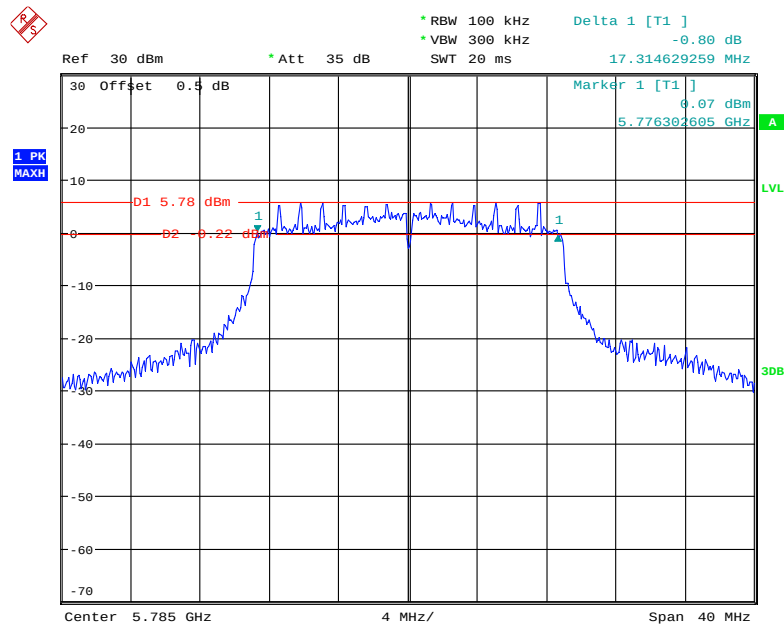
802.11a, High Channel

Date: 20.JAN.2019 10:36:45

802.11n20, Low Channel

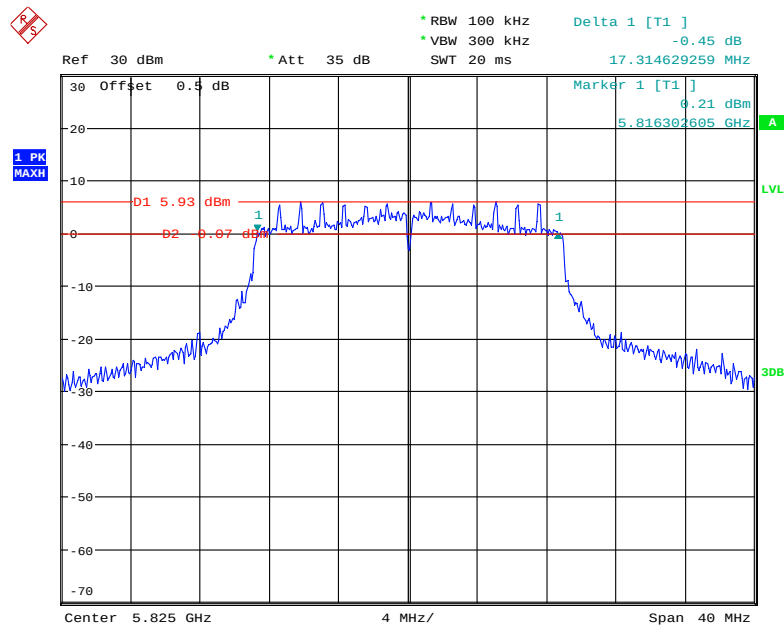
Date: 20.JAN.2019 10:45:53

802.11n20, Middle Channel



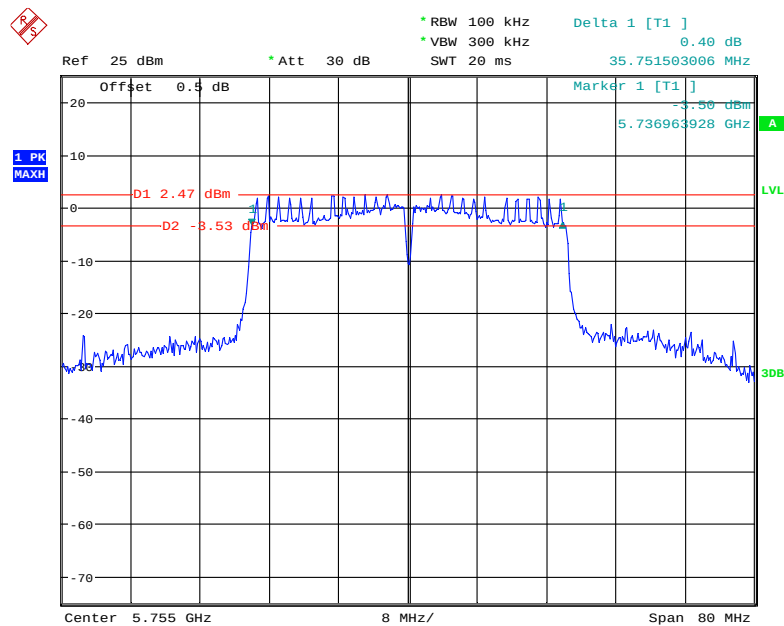
Date: 20.JAN.2019 10:50:19

802.11n20, High Channel



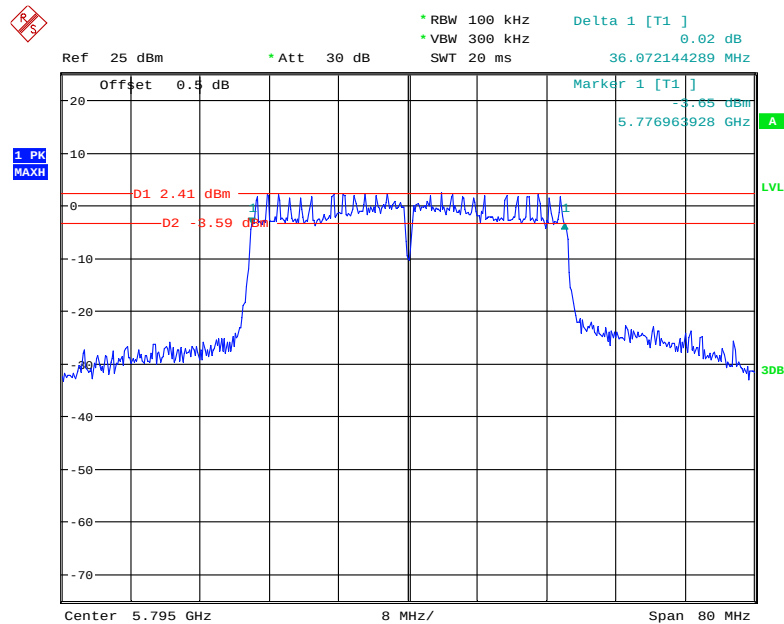
Date: 20.JAN.2019 10:54:02

802.11n40, Low Channel



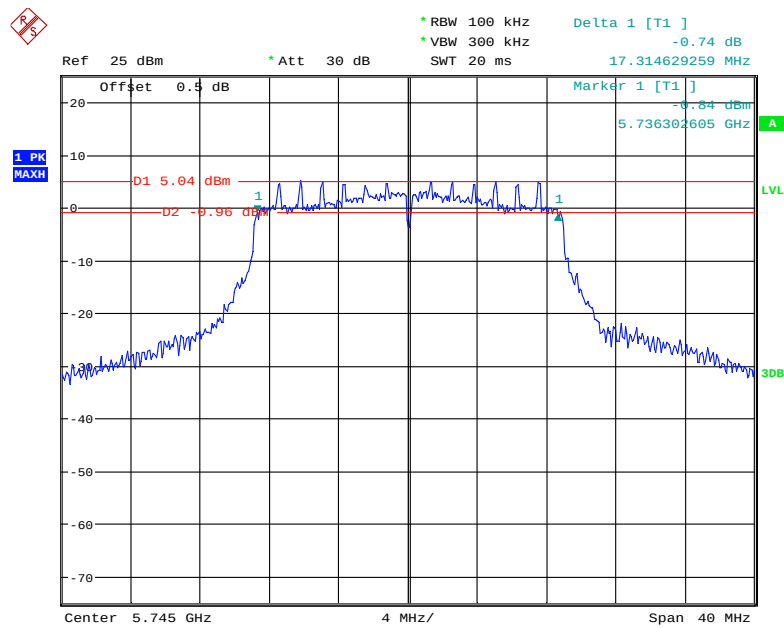
Date: 20.JAN.2019 11:19:09

802.11n40, High Channel



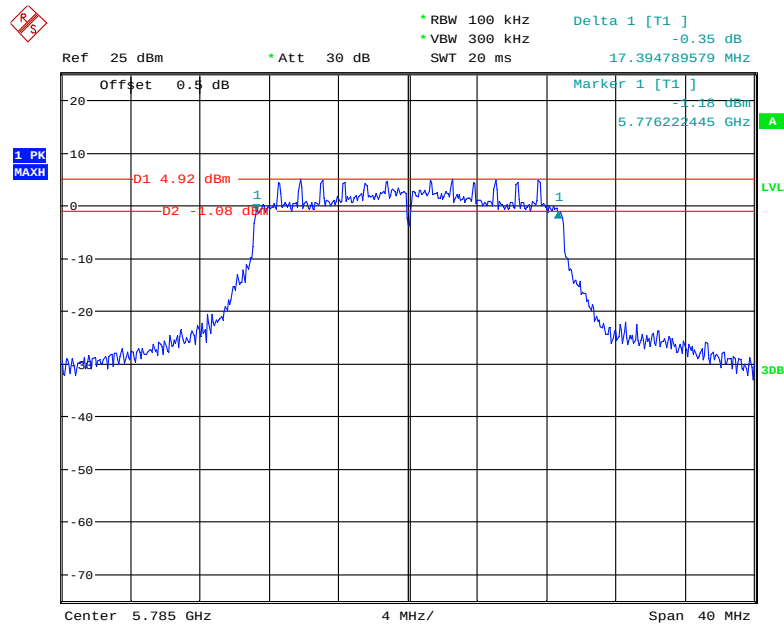
Date: 20.JAN.2019 11:23:54

802.11ac20, Low Channel



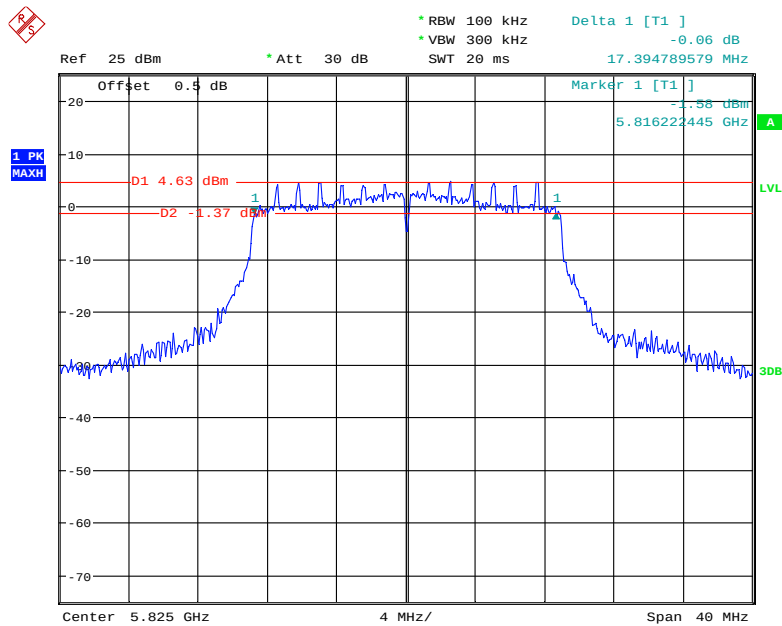
Date: 20.JAN.2019 11:00:28

802.11ac20, Middle Channel



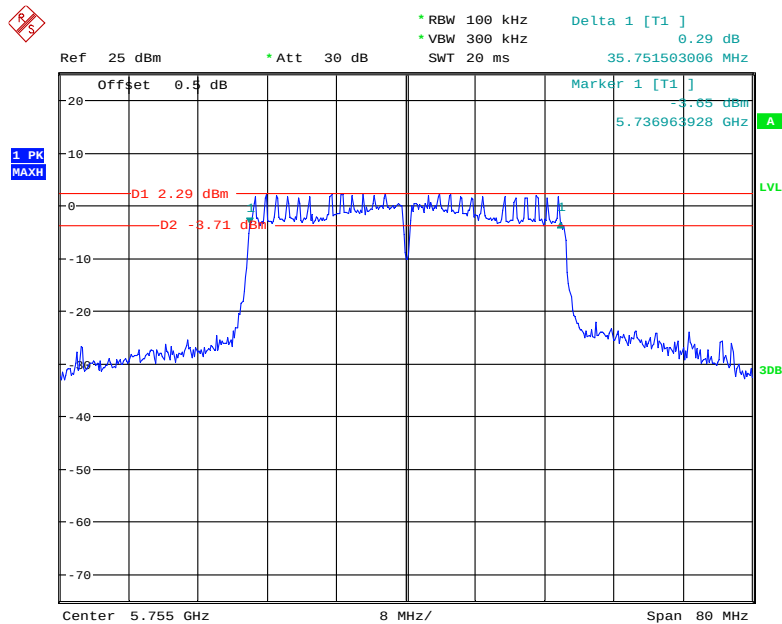
Date: 20.JAN.2019 11:05:00

802.11ac20, High Channel



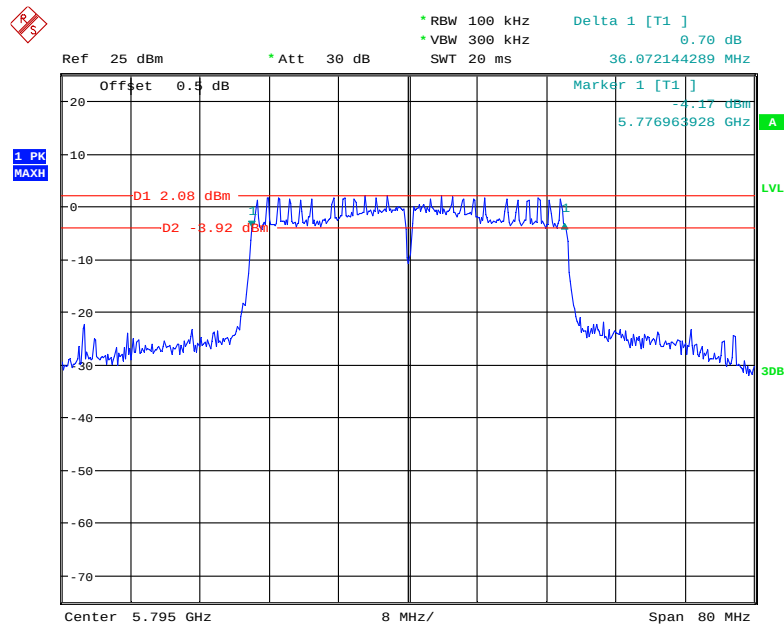
Date: 20.JAN.2019 11:14:00

802.11ac40, Low Channel



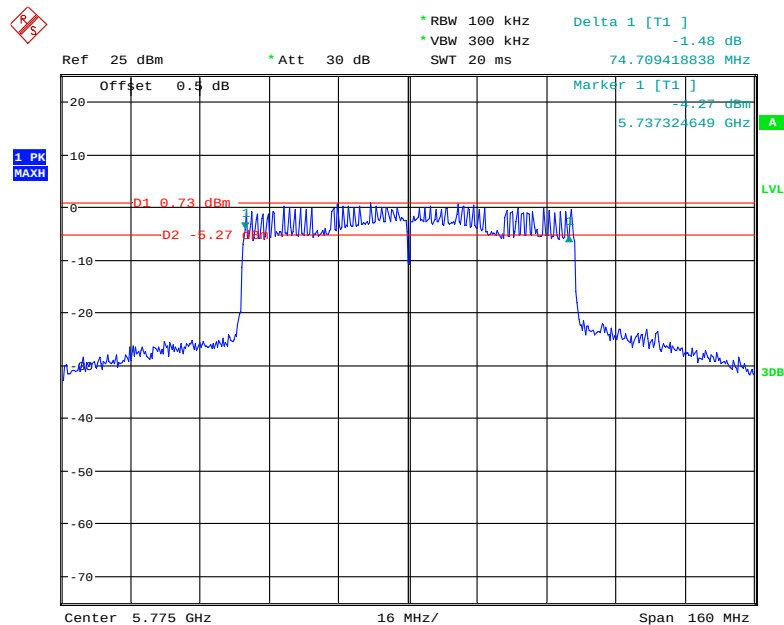
Date: 20.JAN.2019 11:28:47

802.11ac40, High Channel



Date: 21.JAN.2019 14:03:05

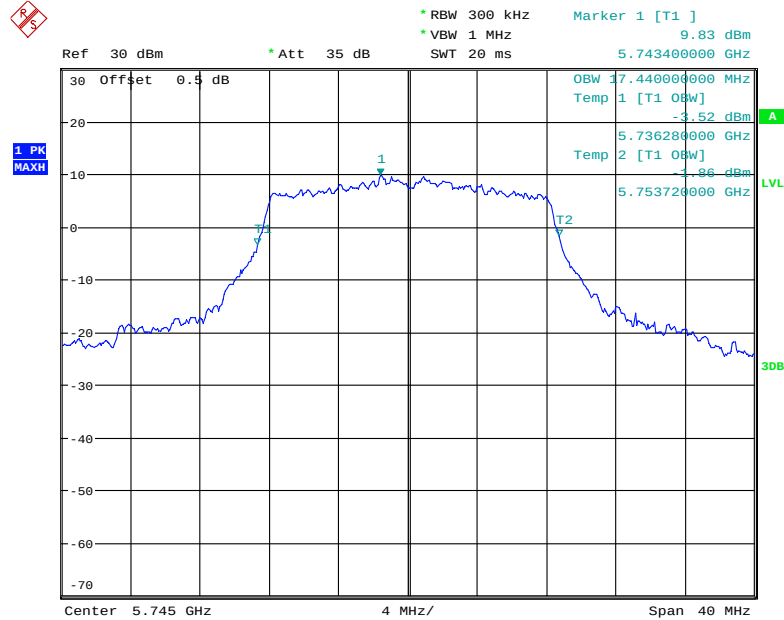
802.11 ac80, Middle Channel



Date: 20.JAN.2019 11:34:21

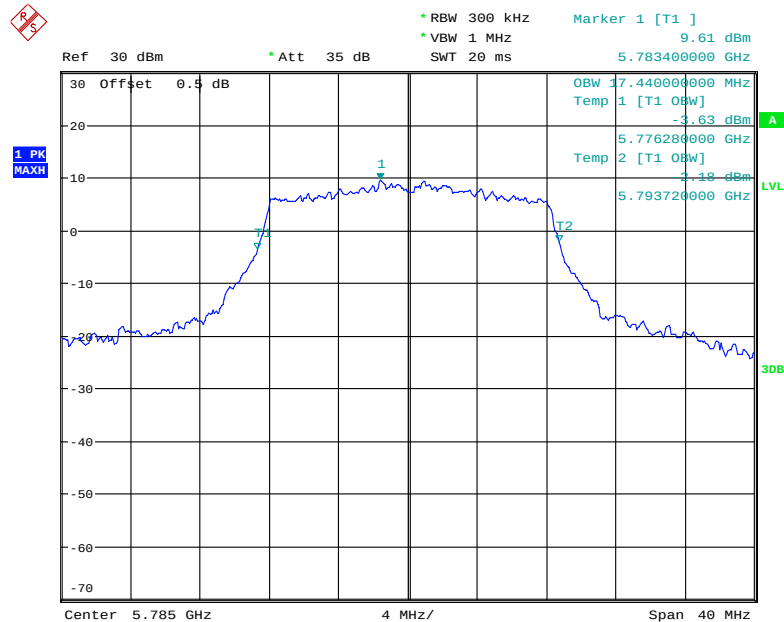
99% Occupied Bandwidth:

802.11a, Low Channel

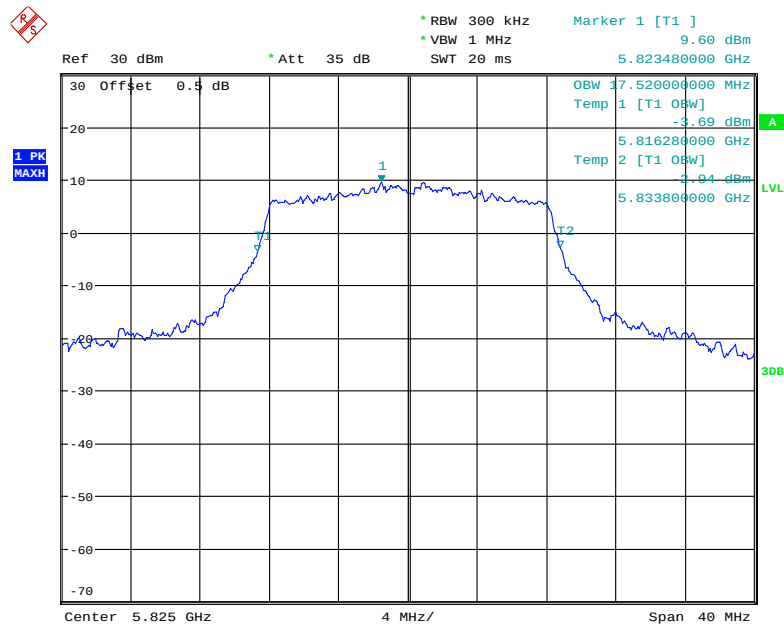


Date: 20.JAN.2019 10:28:33

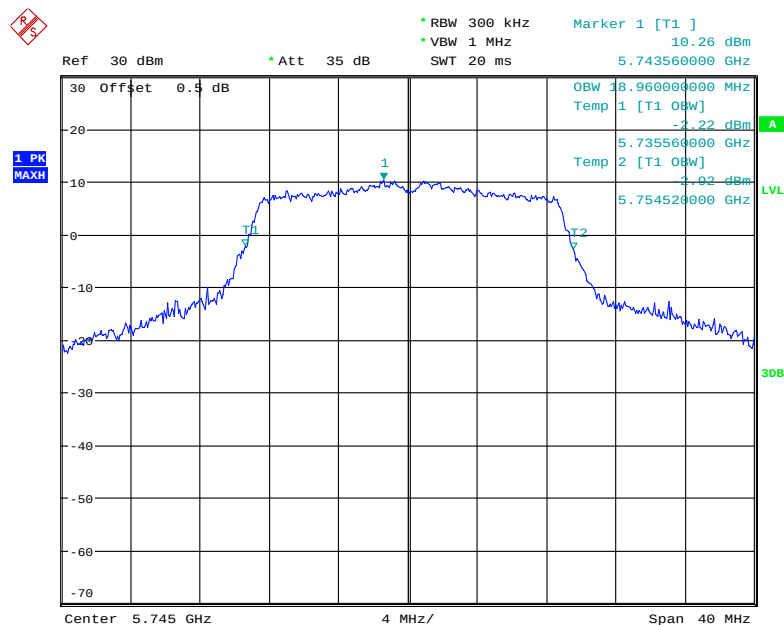
802.11a, Middle Channel



Date: 20.JAN.2019 10:33:49

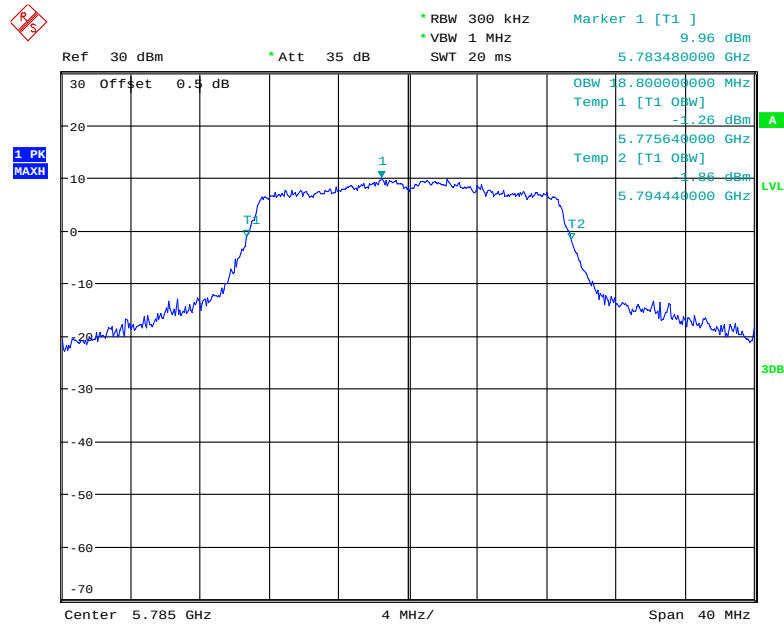
802.11a, High Channel

Date: 20.JAN.2019 10:37:03

802.11n20, Low Channel

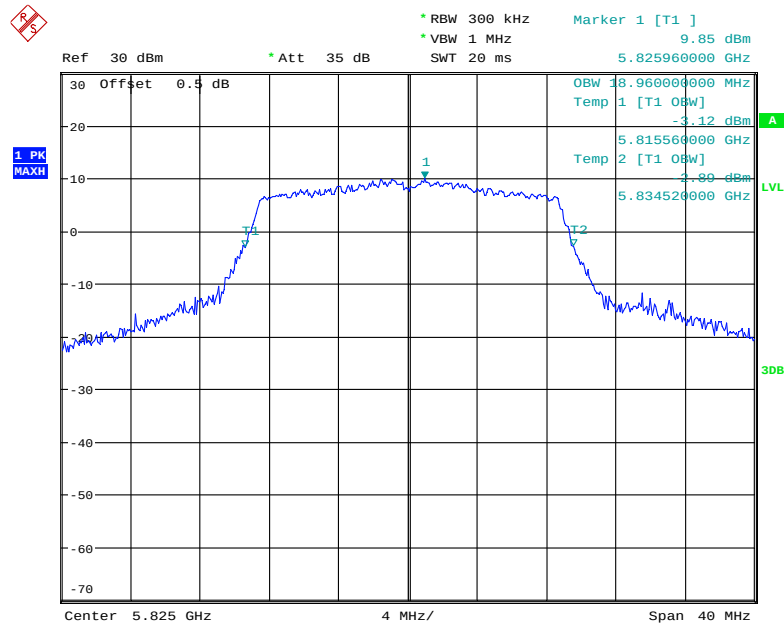
Date: 20.JAN.2019 10:46:25

802.11n20, Middle Channel



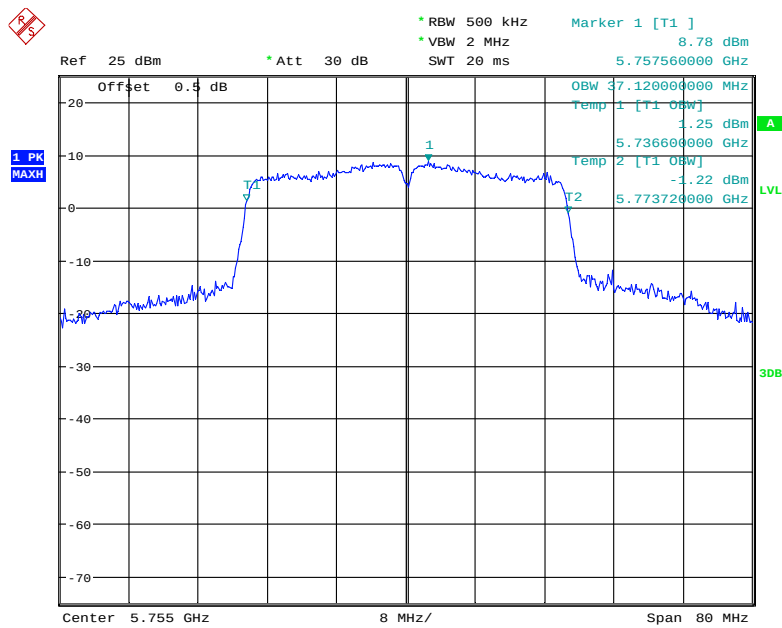
Date: 20.JAN.2019 10:50:52

802.11n20, High Channel



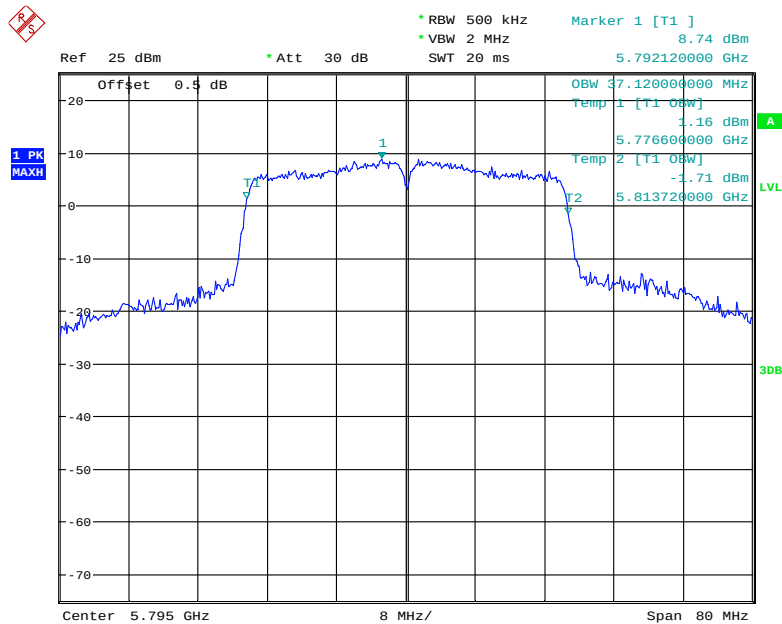
Date: 20.JAN.2019 10:54:31

802.11n40, Low Channel



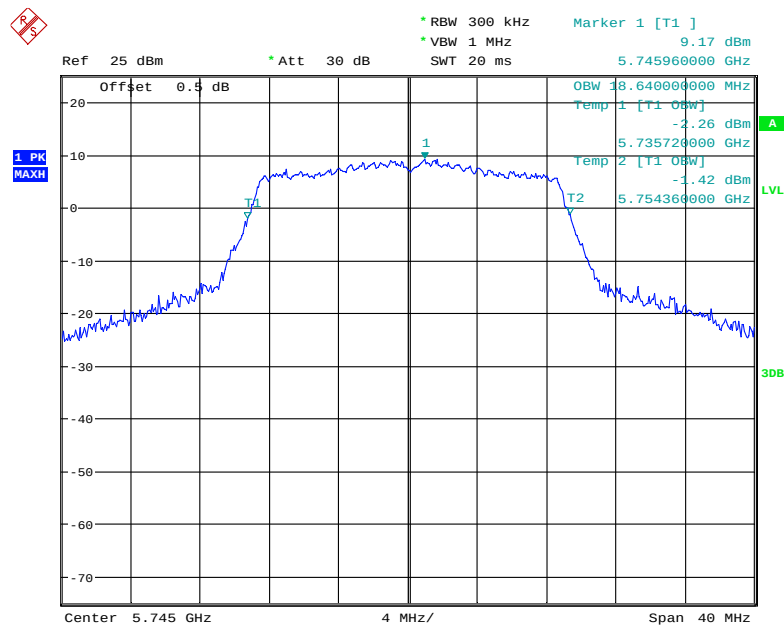
Date: 20.JAN.2019 11:19:42

802.11n40, High Channel



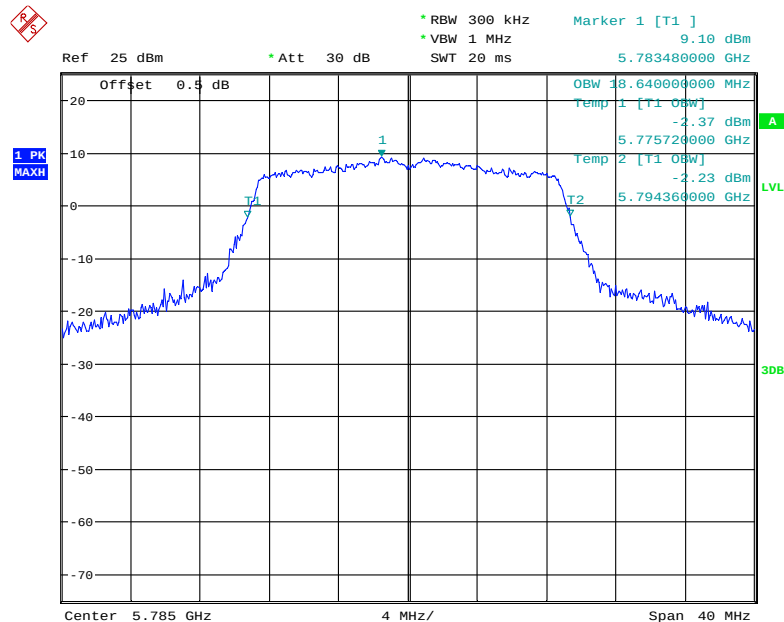
Date: 20.JAN.2019 11:24:27

802.11ac20, Low Channel



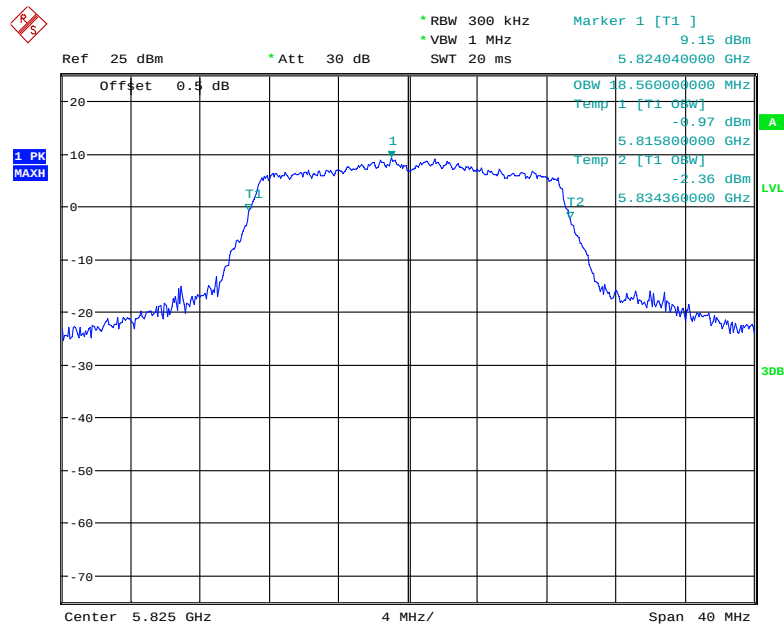
Date: 20.JAN.2019 11:00:53

802.11ac20, Middle Channel



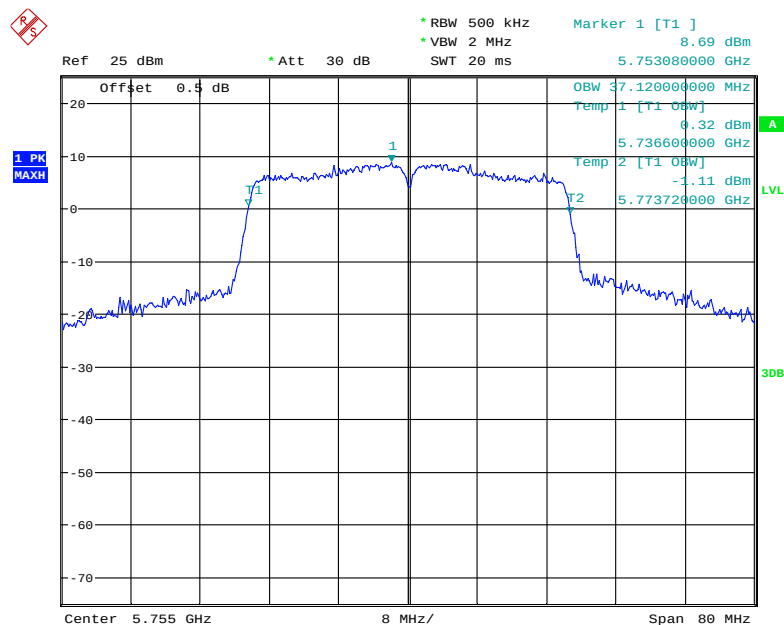
Date: 20.JAN.2019 11:05:26

802.11ac20, High Channel



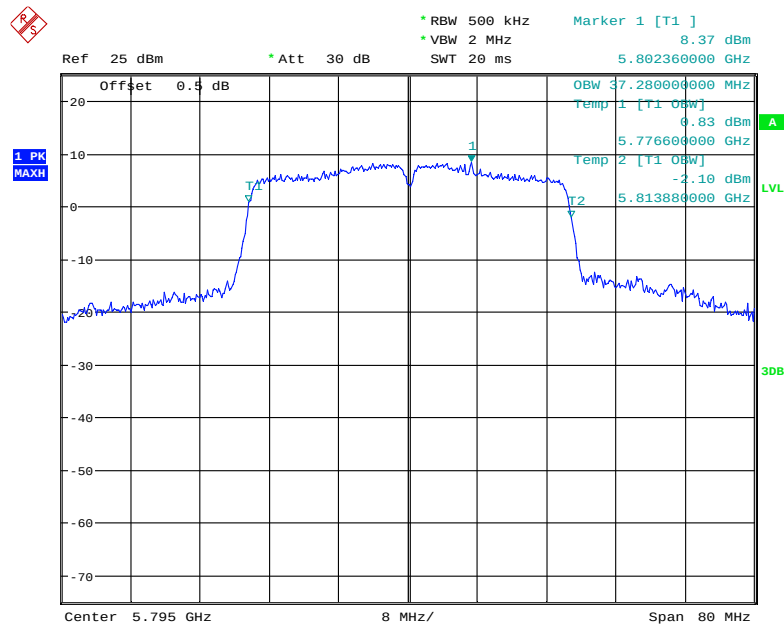
Date: 20.JAN.2019 11:14:33

802.11ac40, Low Channel



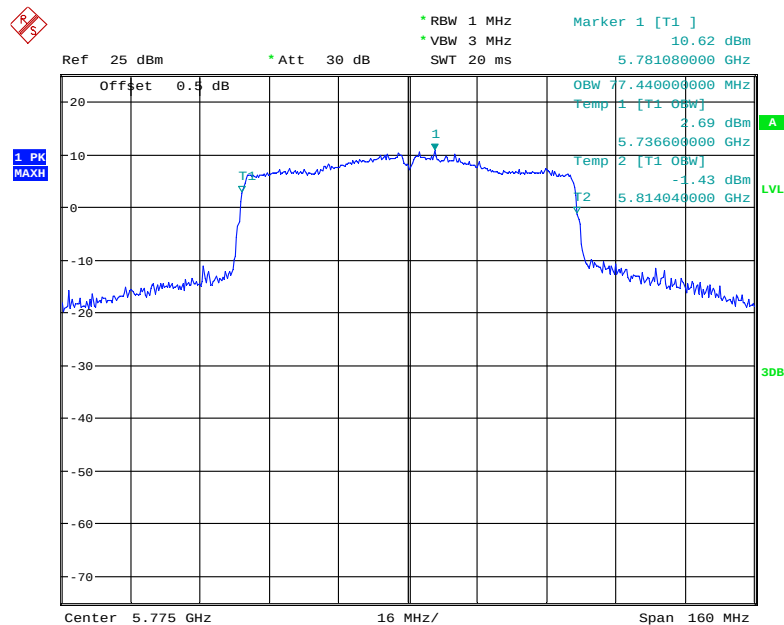
Date: 20.JAN.2019 11:29:38

802.11ac40, High Channel



Date: 21.JAN.2019 14:03:31

802.11 ac80, Middle Channel



Date: 20.JAN.2019 11:34:55

FCC §15.407(a) & RSS-247 §6.2– MAXIMUM CONDUCTED OUTPUT POWER

Applicable Standard

According to FCC §15.407(a)

(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 $11 \text{ dBm} + 10 \log B$, 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.

According to RSS-247 §6.2:

Frequency band 5150-5250 MHz

6.2.1.1 Power limits

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or $1.76 + 10 \log_{10}B$, dBm, whichever is less stringent. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For other devices, the maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10}B$, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

Frequency band 5250-5350 MHz

6.2.2.1 Power limits

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or $1.76 + 10 \log_{10}B$, dBm, whichever is less. Devices shall implement TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

Devices, other than devices installed in vehicles, shall comply with the following:

- a) The maximum conducted output power shall not exceed 250 mW or $11 + 10 \log_{10}B$, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;
- b) The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log_{10}B$, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

Frequency bands 5470-5600 MHz and 5650-5725 MHz**6.2.3.1 Power limits**

The maximum conducted output power shall not exceed 250 mW or $11 + 10 \log_{10} B$, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log_{10} B$, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

Frequency band 5725-5850 MHz**6.2.4.1 Power limits**

For equipment operating in the band 5725-5850 MHz, the minimum 6 dB bandwidth shall be at least 500 kHz.

The maximum conducted output power shall not exceed 1 W. The output 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 output 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 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-multipoint³ systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

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	C0010/01	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:	25.2 °C
Relative Humidity:	42 %
ATM Pressure:	100.8 kPa

* The testing was performed by Elena Lei on 2019-01-21.

Test Mode: Transmitting

Mode	Channel	Frequency (MHz)	RMS Conducted Output Power (dBm)	Limit (dBm)
802.11a	Low	5745	16.85	30.00
	Middle	5785	16.83	30.00
	High	5825	16.76	30.00
802.11n20	Low	5745	17.03	30.00
	Middle	5785	16.92	30.00
	High	5825	16.88	30.00
802.11n40	Low	5755	16.88	30.00
	High	5795	16.62	30.00
802.11ac20	Low	5745	17.11	30.00
	Middle	5785	16.85	30.00
	High	5825	16.95	30.00
802.11ac40	Low	5755	16.76	30.00
	High	5795	16.84	30.00
802.11ac80	Middle	5775	16.98	30.00

Note: the power sensor is a gated RF average power meter.

FCC §15.407(a)& RSS-247 §6.2 - POWER SPECTRAL DENSITY

Applicable Standard

According to FCC §15.407(a)

(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 $11 \text{ dBm} + 10 \log B$, 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.

According to RSS-247 §6.2:

Frequency band 5150-5250 MHz

6.2.1.1 Power limits

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or $1.76 + 10 \log_{10}B$, dBm, whichever is less stringent. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For other devices, the maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10}B$, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

Frequency band 5250-5350 MHz

6.2.2.1 Power limits

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or $1.76 + 10 \log_{10}B$, dBm, whichever is less. Devices shall implement TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

Devices, other than devices installed in vehicles, shall comply with the following:

- a) The maximum conducted output power shall not exceed 250 mW or $11 + 10 \log_{10}B$, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;
- b) The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log_{10}B$, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

Frequency bands 5470-5600 MHz and 5650-5725 MHz**6.2.3.1 Power limits**

The maximum conducted output power shall not exceed 250 mW or $11 + 10 \log_{10} B$, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log_{10} B$, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

Frequency band 5725-5850 MHz**6.2.4.1 Power limits**

For equipment operating in the band 5725-5850 MHz, the minimum 6 dB bandwidth shall be at least 500 kHz.

The maximum conducted output power shall not exceed 1 W. The output 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 output 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 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-multipoint³ systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

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	C0010/01	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:	25.2°C
Relative Humidity:	42 %
ATM Pressure:	100.8~102.1 kPa

* The testing was performed by Elena Lei on 2019-01-20 & 2019-01-21.

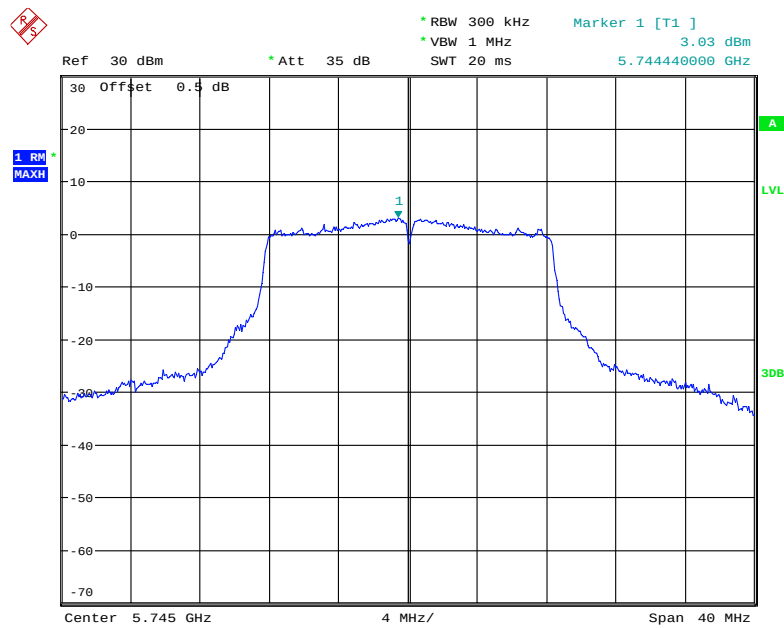
Test Mode: Transmitting

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

Mode	Frequency (MHz)	Reading (dBm/300kHz)	Reading (dBm/500kHz)	Limit (dBm/500kHz)
802.11 a	5745	3.03	5.25	30
	5785	2.82	5.04	
	5825	2.72	4.94	
802.11 n20	5745	3.96	6.18	
	5785	3.69	5.91	
	5825	3.85	6.07	
802.11 n40	5755	0.35	2.57	
	5795	0.11	2.33	
802.11 ac20	5745	2.87	5.09	
	5785	2.92	5.14	
	5825	2.56	4.78	
802.11 ac40	5755	0.53	2.75	
	5795	-0.43	1.79	
802.11 ac80	5775	-2.02	0.2	

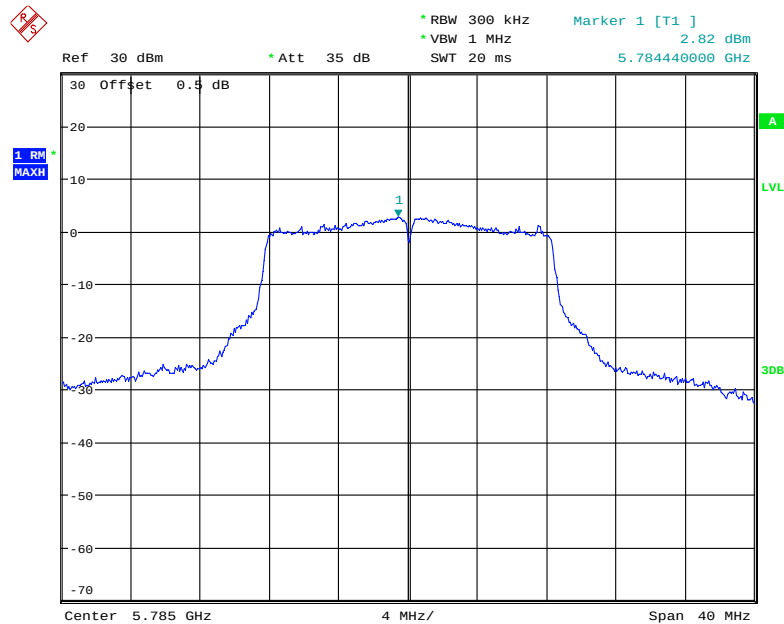
Note: SA-3 in KDB 789033 D02 General UNII Test Procedures New Rules v02r01 was used for PSD test.

802.11a, Low Channel



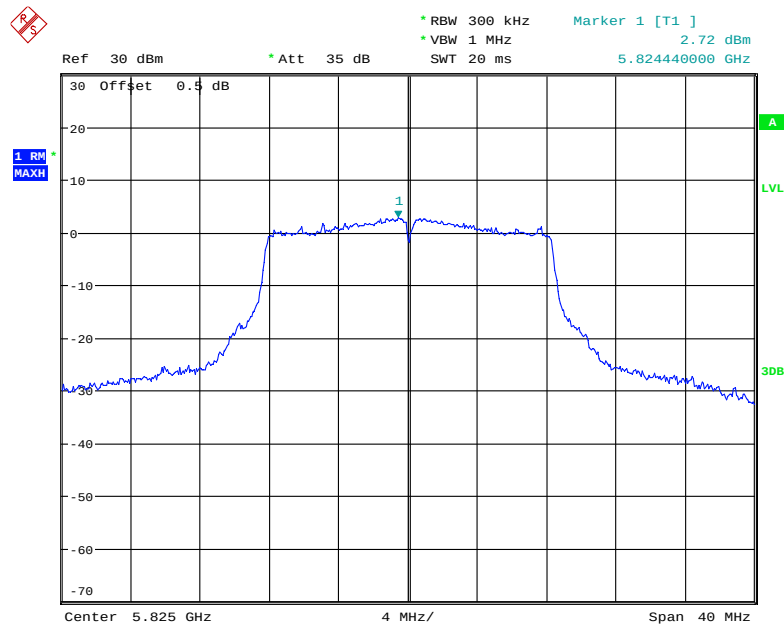
Date: 20.JAN.2019 10:28:54

802.11a, Middle Channel



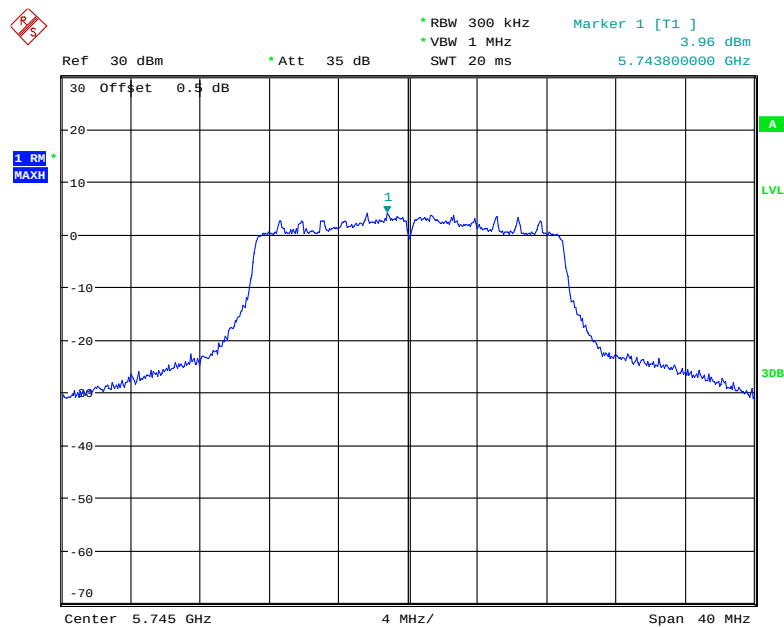
Date: 20.JAN.2019 10:34:07

802.11a, High Channel



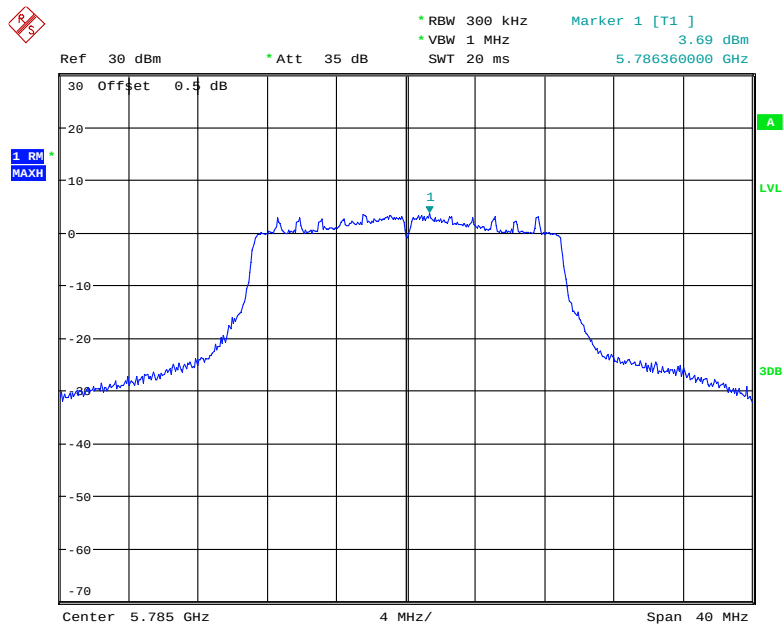
Date: 20.JAN.2019 10:37:21

802.11n20, Low Channel



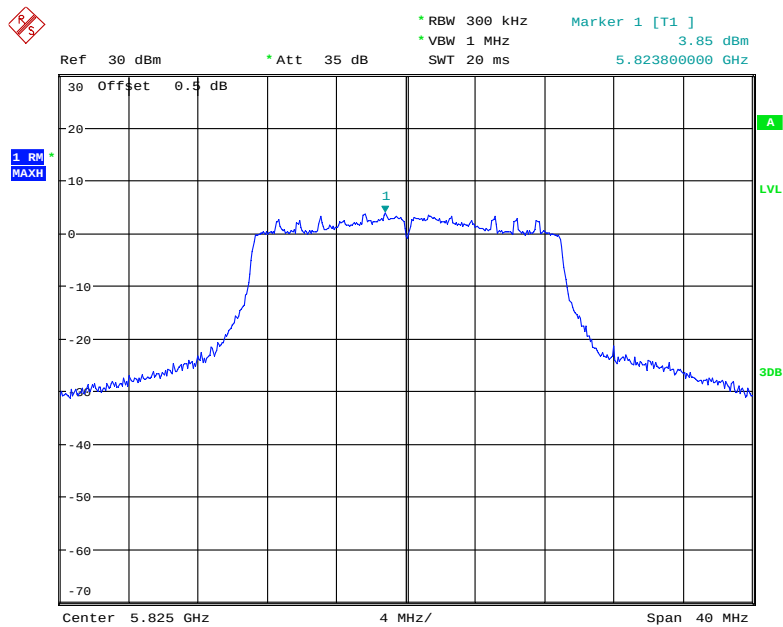
Date: 20.JAN.2019 10:46:50

802.11n20, Middle Channel



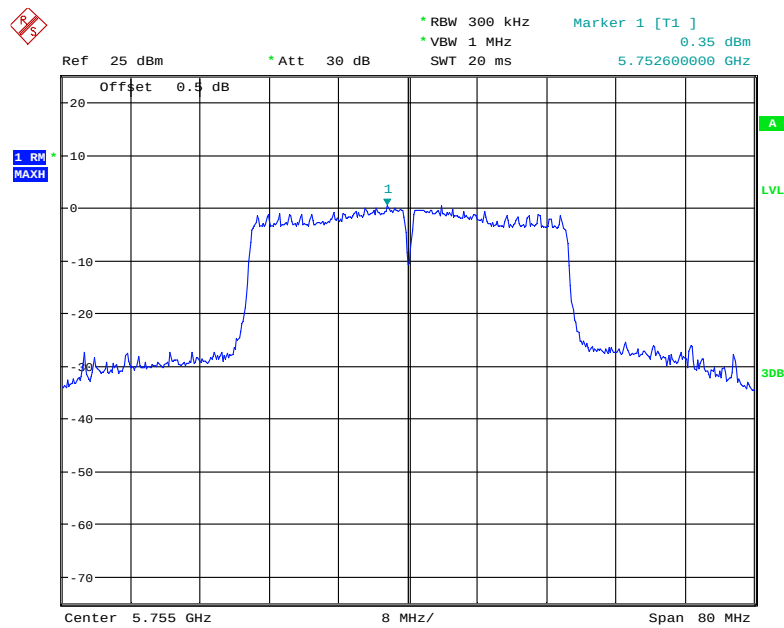
Date: 20.JAN.2019 10:51:13

802.11n20, High Channel



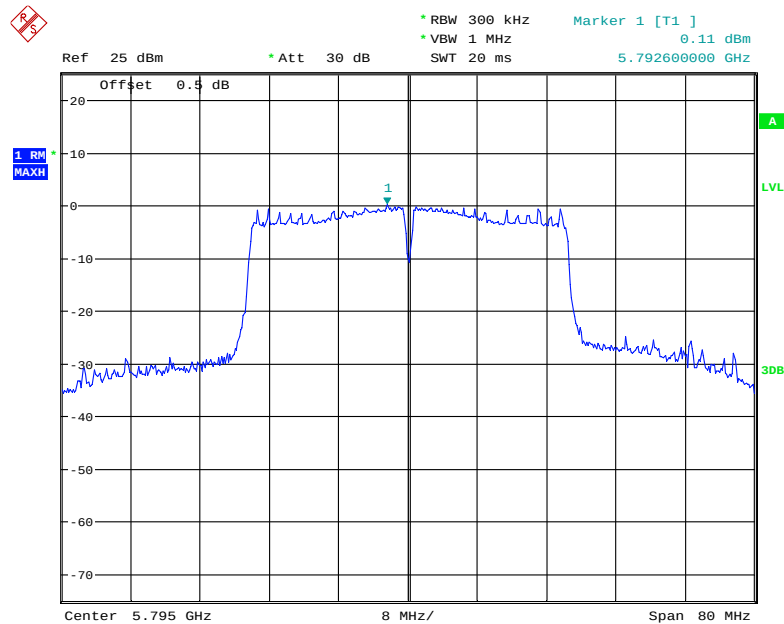
Date: 20.JAN.2019 10:54:56

802.11n40, Low Channel



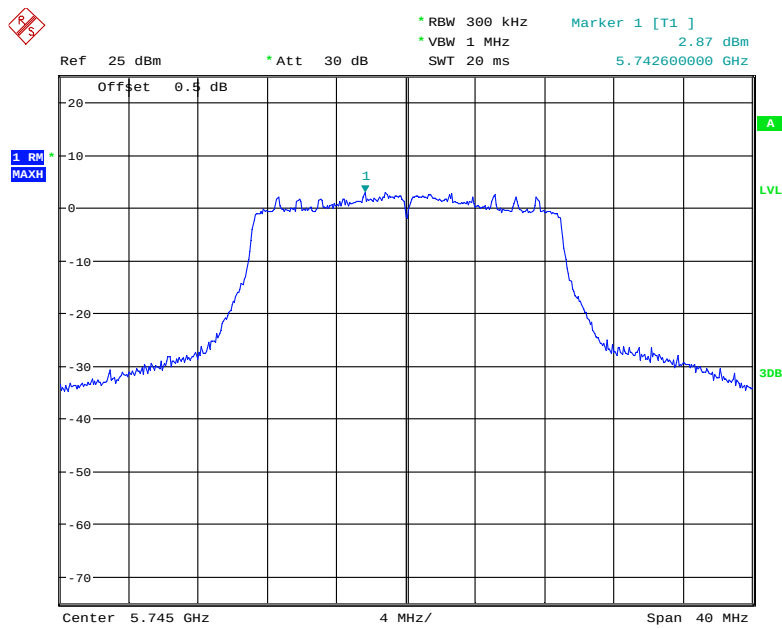
Date: 20.JAN.2019 11:20:03

802.11n40, High Channel



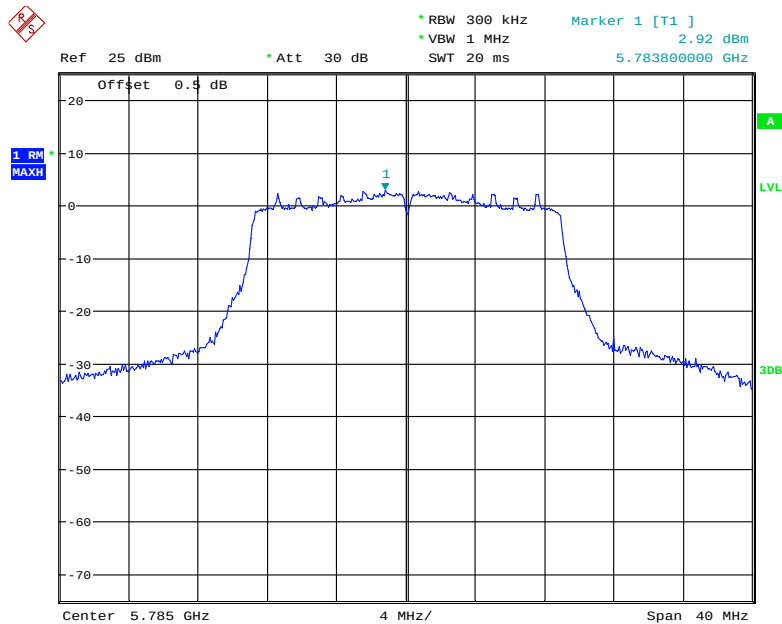
Date: 20.JAN.2019 11:24:48

802.11ac20, Low Channel



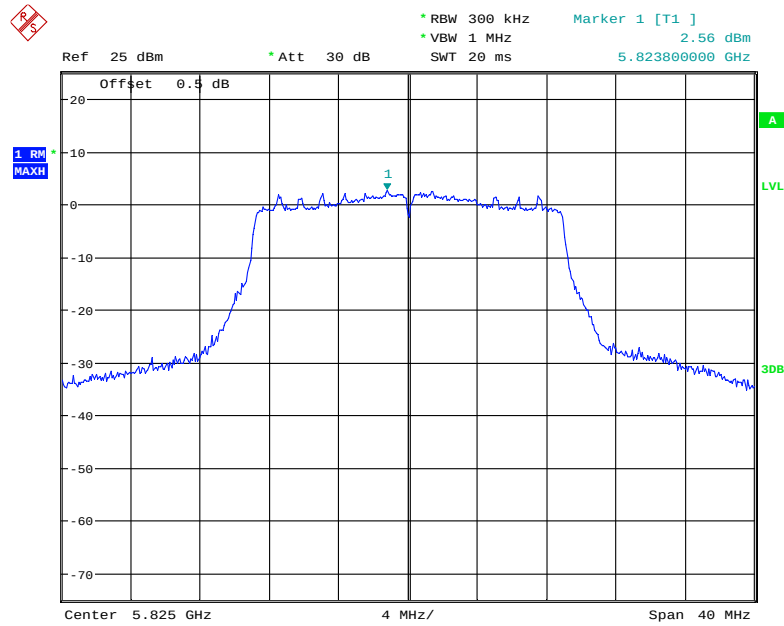
Date: 20.JAN.2019 11:01:14

802.11ac20, Middle Channel



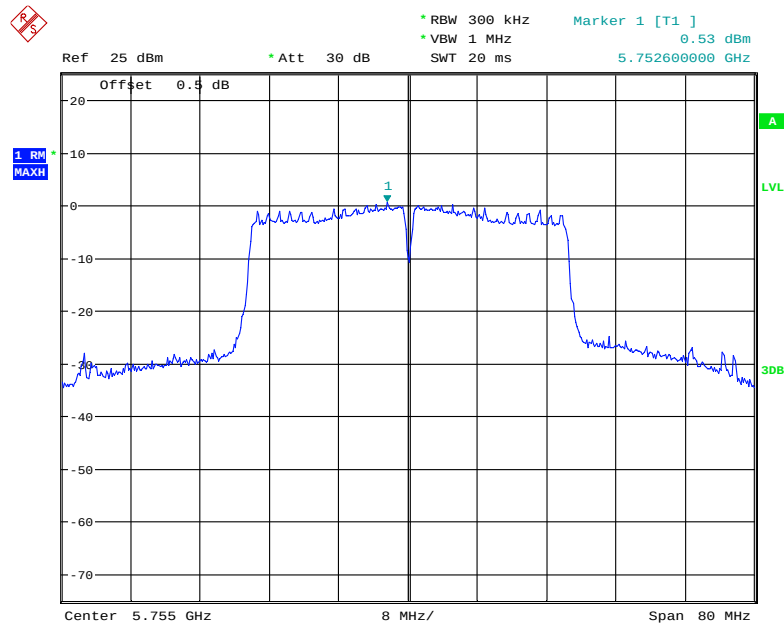
Date: 20.JAN.2019 11:05:54

802.11ac20, High Channel



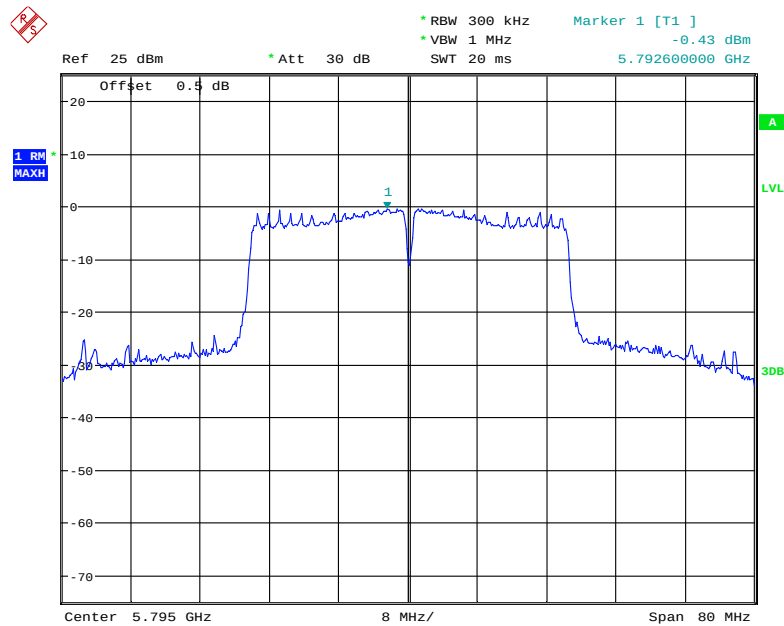
Date: 20.JAN.2019 11:14:54

802.11ac40, Low Channel



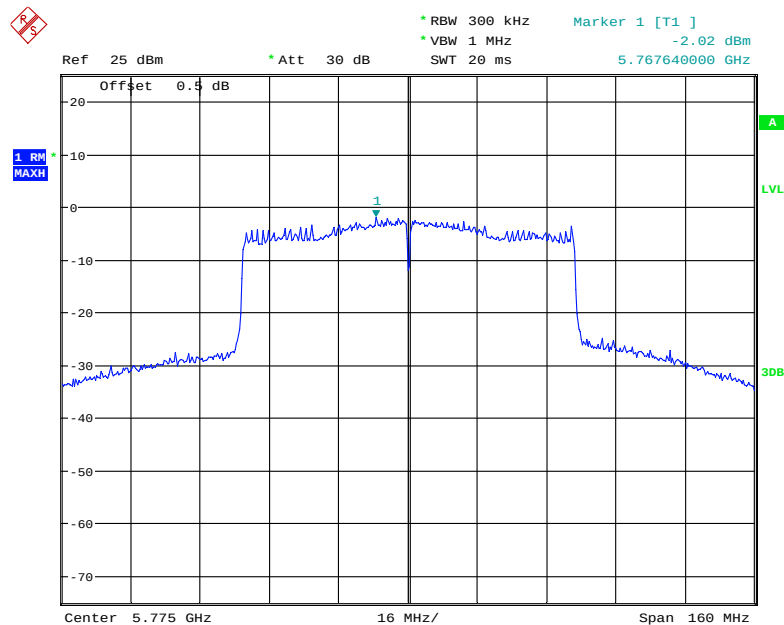
Date: 20.JAN.2019 11:29:59

802.11ac40, High Channel



Date: 21.JAN.2019 14:03:48

802.11 ac80, Middle Channel



Date: 20.JAN.2019 11:35:16

FCC §15.407(b)& RSS-247 §6.2 – OUT- OF-BAND EMISSIONS

Applicable Standard

FCC §15.407

(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.

According to RSS-247§6.2

Frequency band 5150-5250 MHz**6.2.1.2 Unwanted emission limits**

For transmitters with operating frequencies in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. Any unwanted emissions that fall into the band 5250-5350 MHz shall be attenuated below the channel power by at least 26 dB, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth (i.e. 99% bandwidth), above 5250 MHz. The 26 dB bandwidth may fall into the 5250-5350 MHz band; however, if the occupied bandwidth also falls within the 5250-5350 MHz band, the transmission is considered as intentional and the devices shall comply with all requirements in the band 5250-5350 MHz including implementing dynamic frequency selection (DFS) and TPC, on the portion of the emission that resides in the 5250-5350 MHz band.

Frequency band 5250-5350 MHz**6.2.2.2 Unwanted emission limits**

Devices shall comply with the following:

- a) All emissions outside the band 5250-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p.; or
- b) All emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. and its power shall comply with the spectral power density for operation within the band 5150-5250 MHz. The device, except devices installed in vehicles, shall be labelled or include in the user manual the following text “for indoor use only.”

Frequency bands 5470-5600 MHz and 5650-5725 MHz:**6.2.3.2 Unwanted emission limits**

Emissions outside the band 5470-5600 MHz and 5650-5725 MHz shall not exceed -27 dBm/MHz e.i.r.p. However, devices with bandwidth overlapping the band edge of 5725 MHz can meet the emission limit of -27 dBm/MHz e.i.r.p. at 5850 MHz instead of 5725 MHz.

Frequency band 5725-5850 MHz**6.2.4.2 Unwanted emission limits**

Devices operating in the band 5725-5850 MHz with antenna gain greater than 10 dBi can have unwanted emissions that comply with either the limits in this section or in section 5.5 until six (6) months after the publication date of this standard for certification. Certified devices that do not comply with emission limits in this section shall not be manufactured, imported, distributed, leased, offered for sale or sold after April 1, 2018.

Devices operating in the band 5725-5850 MHz with antenna gain of 10 dBi or less can have unwanted emissions that comply with either the limits in this section or in section 5.5 until April 1, 2018 for certification. Certified devices that do not comply with emission limits in this section shall not be manufactured, imported, distributed, leased, offered for sale or sold after April 1, 2020.

Devices operating in the band 5725-5850 MHz shall have e.i.r.p. of unwanted emissions comply with the following:

- a) 27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 dBm/MHz at 5 MHz above or below the band edges;
- b) 15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges;
- c) 10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges; and
- d) -27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.

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	C0010/01	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**

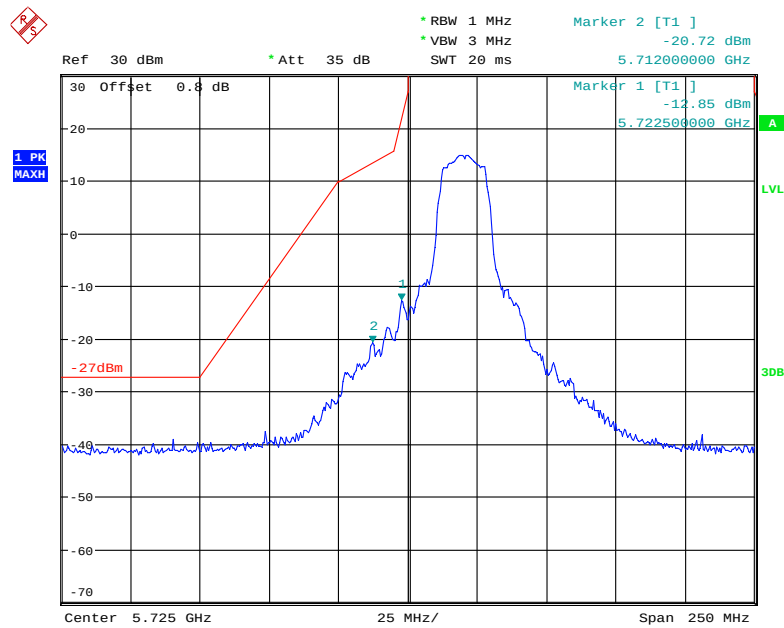
Temperature:	25.2 °C
Relative Humidity:	42 %
ATM Pressure:	100.8~102.1 kPa

* The testing was performed by Elena Lei from 2019-01-20 to 2019-02-13.

Test Result: Pass.

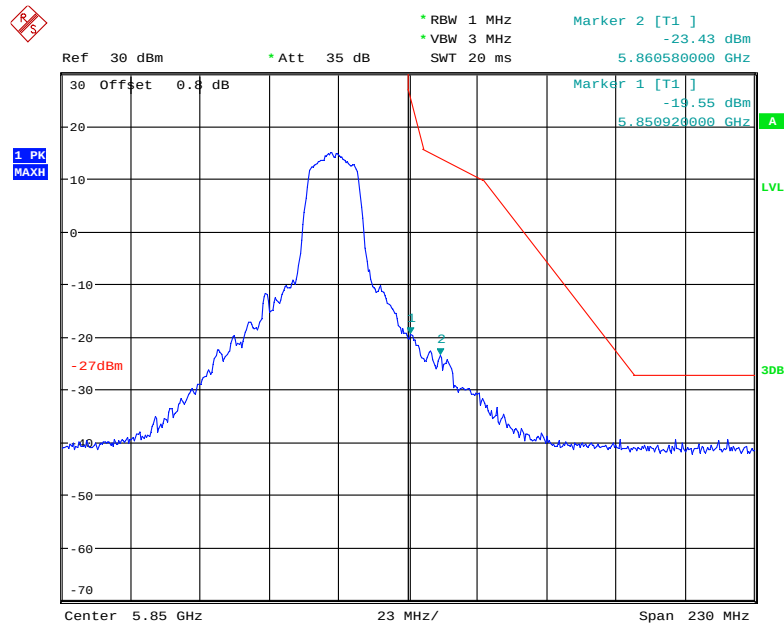
Please refer to the following plots(Antenna gain and cable loss was offset in the plots).

802.11a, Low Channel



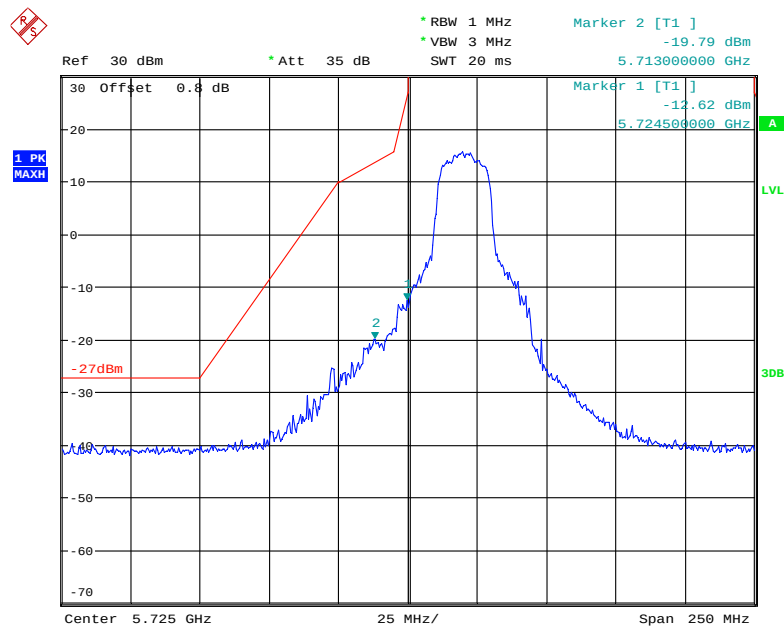
Date: 20.JAN.2019 10:30:53

802.11a, High Channel



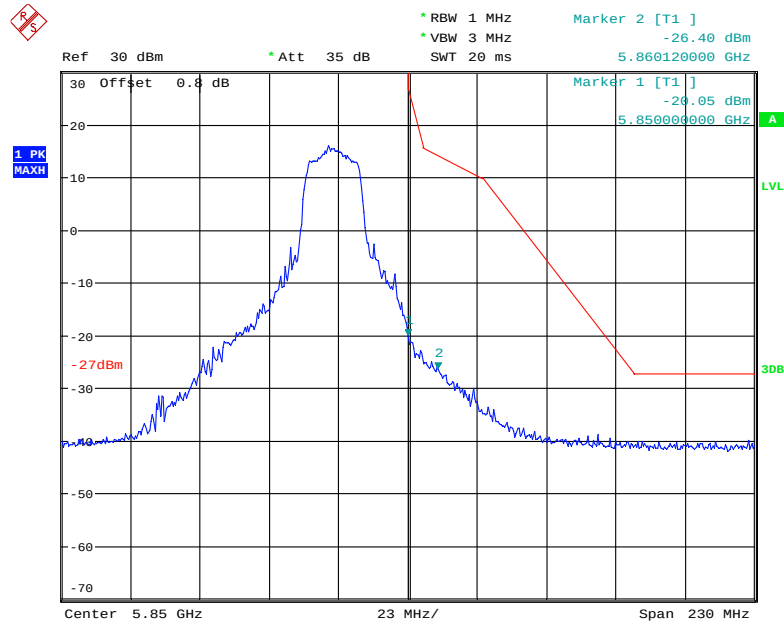
Date: 20.JAN.2019 10:39:30

802.11n20, Low Channel



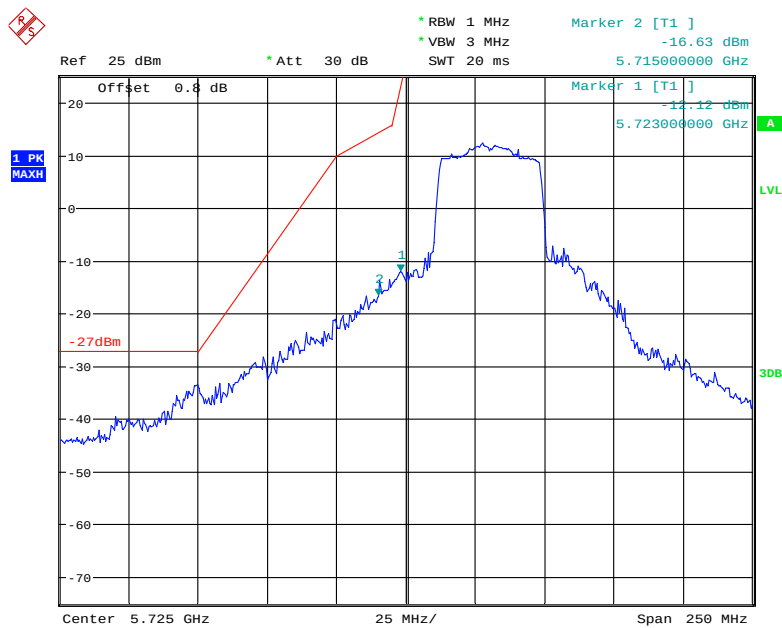
Date: 20.JAN.2019 10:49:07

802.11n20, High Channel



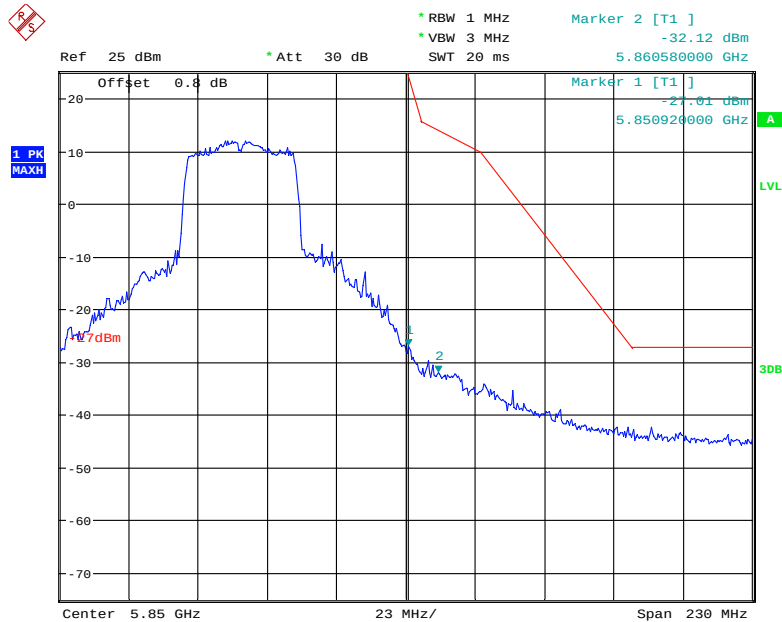
Date: 20.JAN.2019 10:57:26

802.11n40, Low Channel



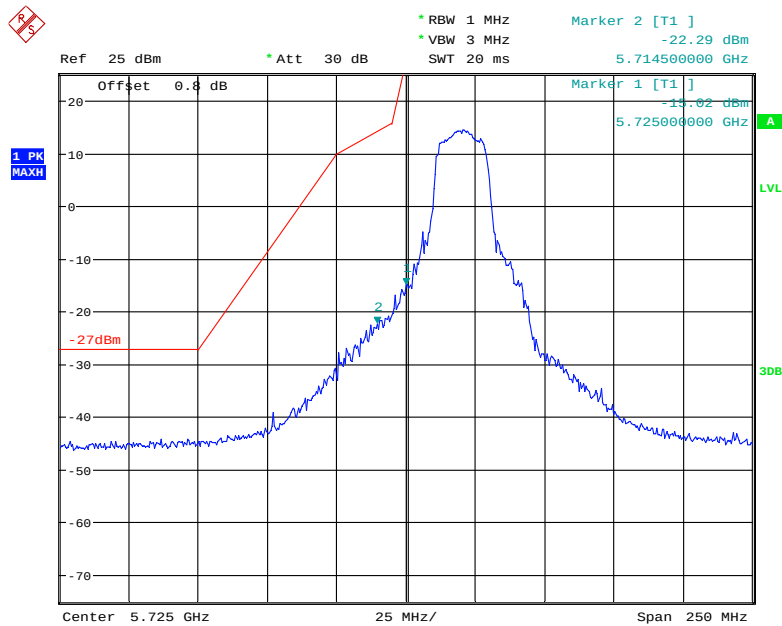
Date: 20.JAN.2019 11:22:33

802.11n40, High Channel



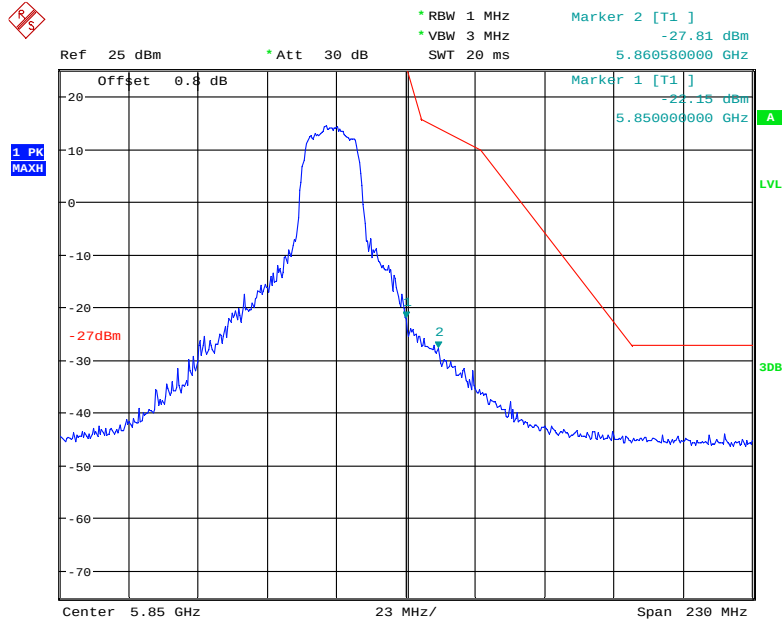
Date: 20.JAN.2019 11:27:15

802.11ac20, Low Channel



Date: 20.JAN.2019 11:03:49

802.11ac20, High Channel



Date: 20.JAN.2019 11:17:39

1 PK MAXH

Ref 25 dBm * Att 30 dB

* RBW 1 MHz
* VBW 3 MHz
SWT 20 ms

Marker 2 [T1]
-16.20 dBm
5.715000000 GHz

Marker 1 [T1]
-13.15 dBm
5.724000000 GHz

Offset 0.0 dB

Center 5.725 GHz 25 MHz/ Span 250 MHz

1 PK
MAXH

Ref 25 dBm
* Att 30 dB
* RBW 1 MHz
* VBW 3 MHz
SWT 20 ms

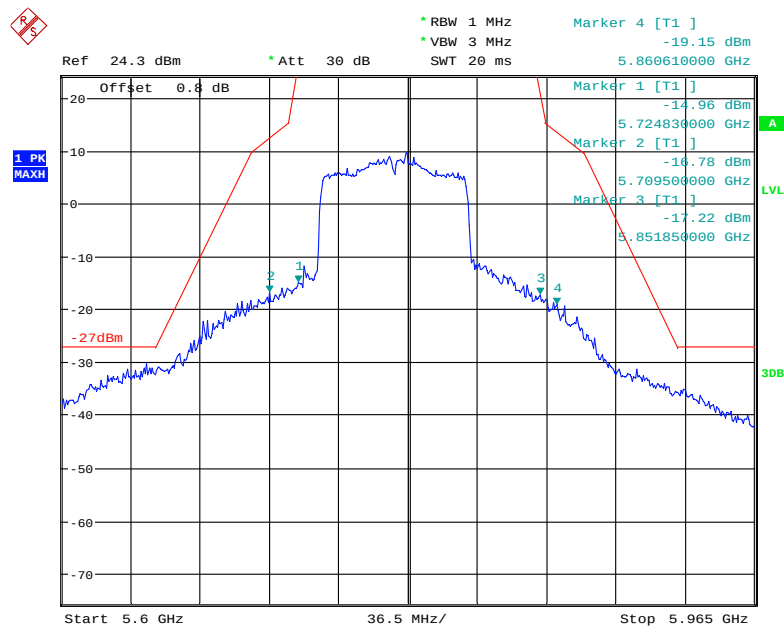
Marker 2 [T1]
-27.92 dBm
5.861040000 GHz

Marker 1 [T1]
-25.22 dBm
5.851380000 GHz

Center 5.85 GHz
23 MHz/
Span 230 MHz

Page 75 of 76

802.11 ac80, Middle Channel



Date: 13.FEB.2019 09:57:02

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