FCC PART 15.407

TEST REPORT

For

Shenzhen HC Tech Co.,Ltd

Room 601, Building 21, District B, Dongbian, Minzhi Road, Longhua, Shenzhen, 518131, China

FCC ID: 2AN27OTOSYSIM600

Report Type:	**Product Type:**
Original Report	OtoSys

Report Number:	RSZ171016001-00D
Report Date:	2018-01-08
Reviewed By:	Rocky Kang RF Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Shenzhen HC Tech Co.,Ltd's* product, model number: *OtoSys IM600 (FCC ID: 2AN27OTOSYSIM600)* in this report was a *OtoSys,* which was measured approximately: 300 mm (L) × 220 mm (W) × 50 mm (H) , rated with input voltage: DC 3.8 V battery or DC 12V from adapter.

Adapter Information:
Model: GME36A-120300FDS
Input: AC 100-240V, 50/60Hz, 1.2A
Output: DC 12.0V, 3.0 A

**All measurement and test data in this report was gathered from production sample serial number: 1702239. (Assigned by BACL, shenzhen).The EUT supplied by the applicant was received on 2017-10-16.*

Objective

This type approval report is prepared on behalf of *Shenzhen HC Tech Co.,Ltd* in accordance with Part 2-Subpart J, Part 15-Subparts A and E of the Federal Communication Commissions rules.

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

Related Submittal(s)/Grant(s)

FCC Part 15.247 DTS&DSS and part 15B JBP submissions with FCC ID: 2AN27OTOSYSIM600.

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

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Parameter	uncertainty
Occupied Channel Bandwidth	±5%
RF Output Power with Power meter	±0.5dB
RF conducted test with spectrum	±1.5dB
AC Power Lines Conducted Emissions	±1.95dB
All emissions, radiated	±4.88dB
Temperature	-30~60 ℃
Humidity	±6%
Supply voltages	±0.4%

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China.

Bay Area Compliance Laboratories Corp. (Shenzhen) has been accredited to ISO/IEC 17025 by CNAS (Lab code: L2408). And accredited to ISO/IEC 17025 by NVLAP (Lab code: 200707-0), the FCC Designation No. CN5001 under the KDB 974614 D01.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Bay Area Compliance Laboratories Corp. (Shenzhen) was registered with ISED Canada under ISED Canada Registration Number 3062B.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in an engineering mode, which was provided by manufacturer.

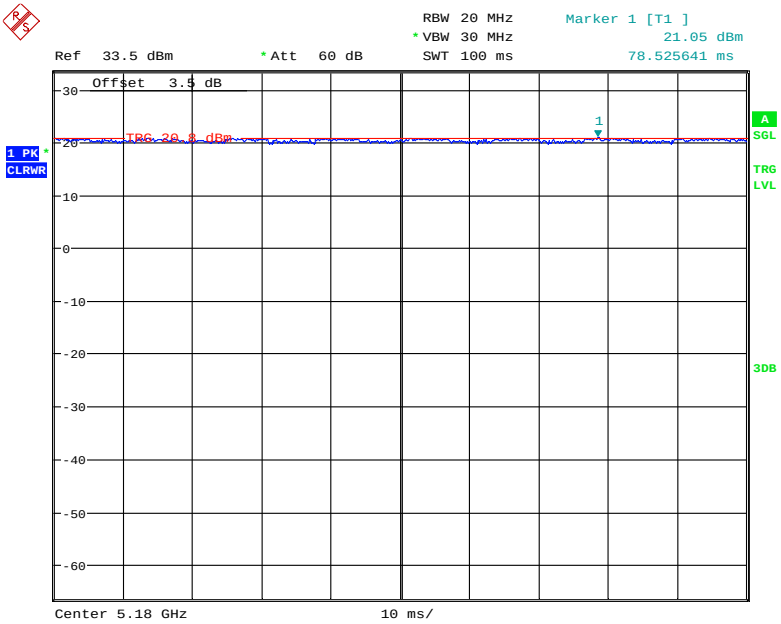
EUT Exercise Software

“RF test tool” software was used for wifi testing.

Mode	Data rate	Power level		
		Low channel	Middle channel	High channel
802.11a	24 Mbps	Default	Default	Default
802.11n20	MCS1	Default	Default	Default
802.11n40	MCS0	Default	Default	Default
802.11ac20	MCS1	Default	Default	Default
802.11ac40	MCS0	Default	Default	Default
802.11ac80	MCS0	Default	Default	Default

Duty cycle

802.11a Mode



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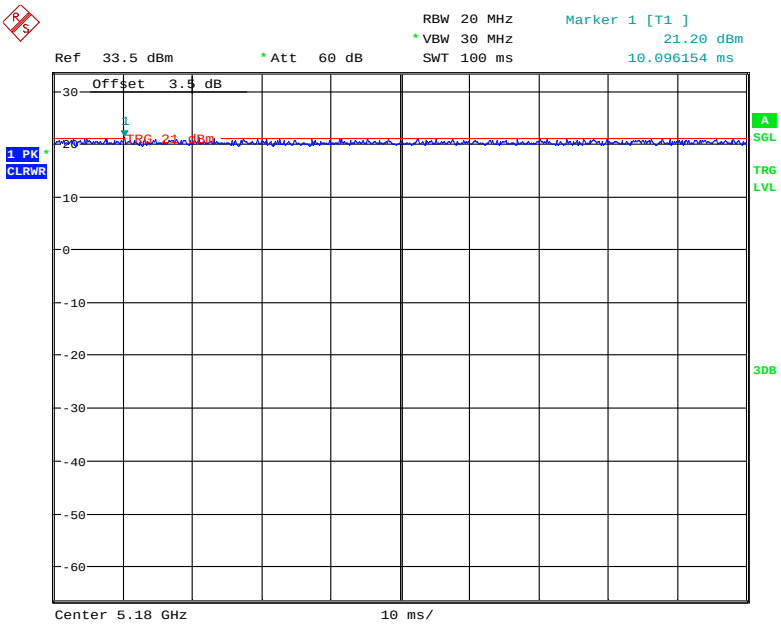
802.11n20 mode



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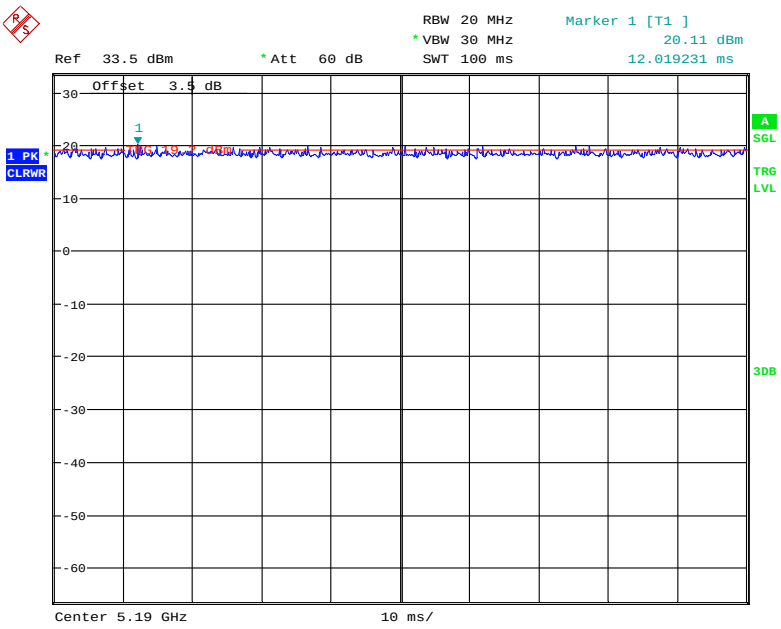

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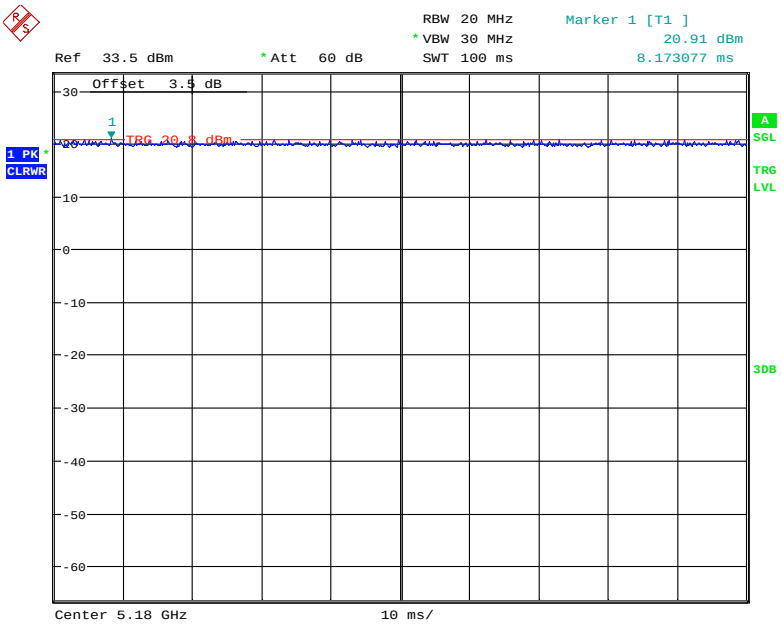
802.11ac20 Mode



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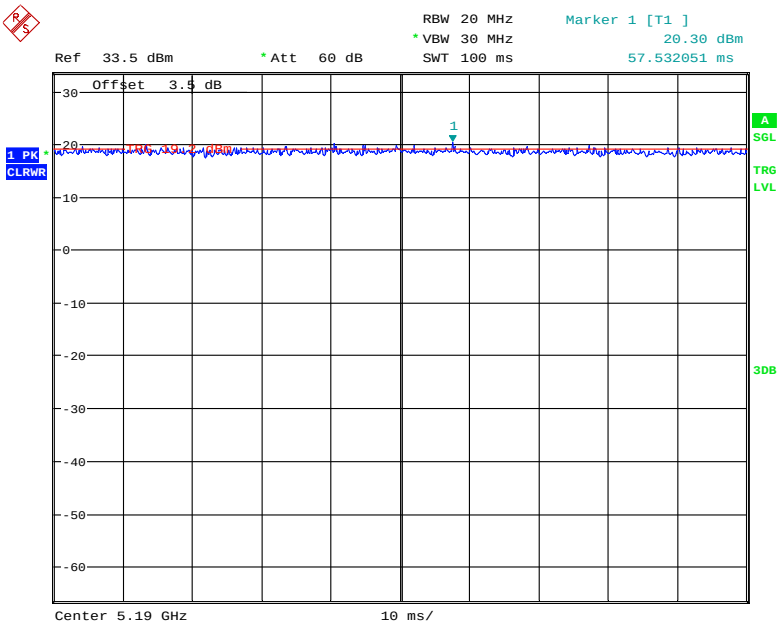

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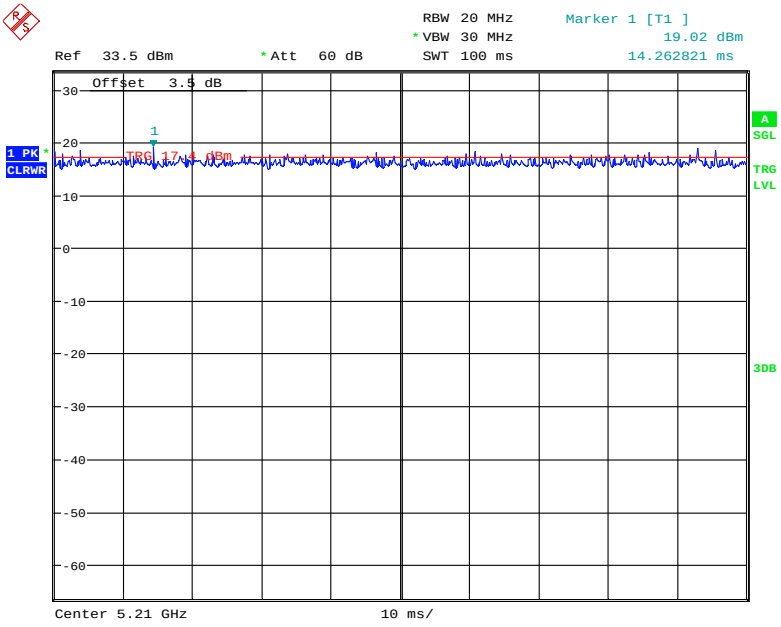
802.11ac80 Mode



Date: 30.OCT.2017 10:01:06

Band	Duty Cycle (%)	T(ms)	1/T(kHz)	VBW Setting	10log(1/ Duty Cycle)
802.11a	100	-	-	10Hz	-
802.11n20	100	-	-	10Hz	-
802.11n40	100	-	-	10Hz	-
802.11ac20	100	-	-	10Hz	-
802.11ac40	100	-	-	10Hz	-
802.11ac80	100	-	-	10Hz	-

Equipment Modifications

No modification was made to the EUT tested.

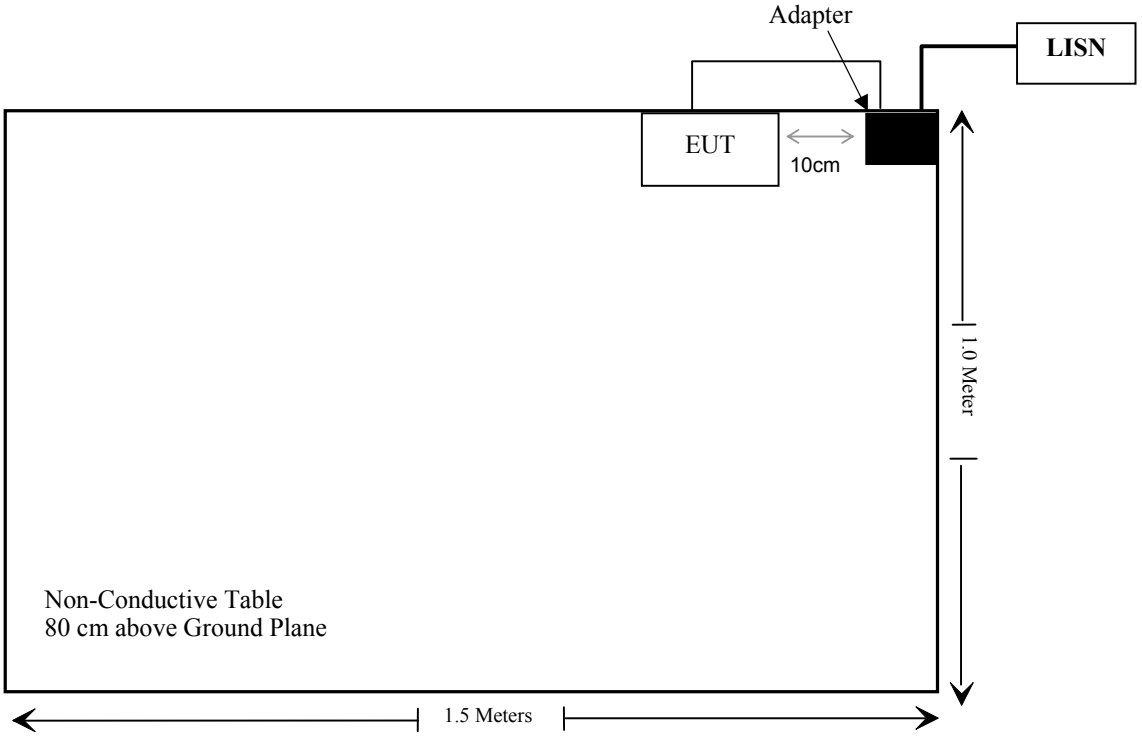
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	/	/	/

External I/O Cable

Cable Description	Length (m)	From Port	To
Un-Shielding Detachable USB Cable	1.0	EUT	Adapter

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1307 & §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) (1),(4),(7)	Undesirable Emission& Restricted Bands	Compliance
§15.407(b) (1),(4)	Out Of Band Emission	Compliance
§15.407(a) (1),(5),(e)	26 dB Emission Bandwidth & 6dB Bandwidth	Compliance
§15.407(g)	Frequency Stability	Compliance
§15.407(a)(1),(3)	Conducted Transmitter Output Power	Compliance
§15.407 (a)(1),(3)	Power Spectral Density	Compliance

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emissions Test					
Rohde & Schwarz	EMI Test Receiver	ESCS30	100176	2017-08-04	2018-08-04
Rohde & Schwarz	LISN	ENV216	3560.6650.12-101613-Yb	2016-12-07	2017-12-07
Rohde & Schwarz	Transient Limiter	ESH3Z2	DE25985	2017-05-21	2017-11-19
Rohde & Schwarz	CE Test software	EMC 32	V8.53.0	NCR	NCR
N/A	Conducted Emission Cable	N/A	UF A210B-1-0720-504504	2017-11-12	2018-05-12
Radiated Emission Test					
Sunol Sciences	Horn Antenna	DRH-118	A052604	2014-12-29	2017-12-28
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2017-04-24	2018-04-24
Sunol Sciences	Bi-log Antenna	JB1	A040904-2	2014-12-17	2017-12-16
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2017-02-14	2018-02-14
HP	Amplifier	HP8447E	1937A01046	2017-11-19	2018-05-21
Anritsu	Signal Generator	68369B	004114	2016-12-05	2017-12-05
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2016-12-07	2017-12-07
Ducommun technologies	RF Cable	UFA210A-1-4724-30050U	MFR64369 223410-001	2017-11-19	2018-05-21
Ducommun technologies	RF Cable	104PEA	218124002	2017-11-19	2018-05-21
Ducommun technologies	RF Cable	RG-214	1	2017-11-19	2018-05-21
Ducommun technologies	RF Cable	RG-214	2	2017-05-22	2017-11-22
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-04	2014-12-29	2017-12-28
Ducommun Technologies	Horn Antenna	ARH-4823-02	1007726-04	2014-12-29	2017-12-28
Ducommun Technologies	Pre-amplifier	ALN-22093530-01	991373-01	2017-08-03	2018-08-03

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde & Schwarz	Signal Analyzer	FSIQ26	837405/023	2017-04-24	2018-04-24
ESPEC	Temperature & Humidity Chamber	EL-10KA	09107726	2016-11-22	2017-11-22
Rohde & Schwarz	SPECTRUM ANALYZER	FSU26	200120	2016-12-05	2017-12-05
Long Wei	DC Power Supply	TPR-6420D	398363	NCR	NCR
Fluke	Digital Multimeter	287	19000011	2017-04-09	2018-04-09
Agilent	Power Meter	N1912A	MY5000492	2016-11-18	2017-11-17
Agilent	Power Sensor	N1921A	MY54210024	2016-11-18	2017-11-17
Ducommun technologies	RF Cable	RG-214	3	2017-05-22	2017-11-22
WEINSCHEL	6dB Attenuator	HJ2365	54S5G0GG	2017-06-15	2018-06-15
WEINSCHEL	3dB Attenuator	N/A	N/A	2017-05-23	2017-11-22

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

FCC §1.1307 & §2.1093 - RF EXPOSURE

Applicable Standard

FCC§1.1307 and §2.1093.

Test Result

Compliance, please refer to the SAR report: RSZ171016001-20.

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 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.

And according to FCC 47 CFR section 15.407 (a), if the transmitting antennas of directional gain greater than 6dBi are used, the transmit power and power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

This product has an internal wifi antenna which was permanently attached with maximum gain 1.3 dBi, fulfill the requirement of this section, and please refer to the EUT photo.

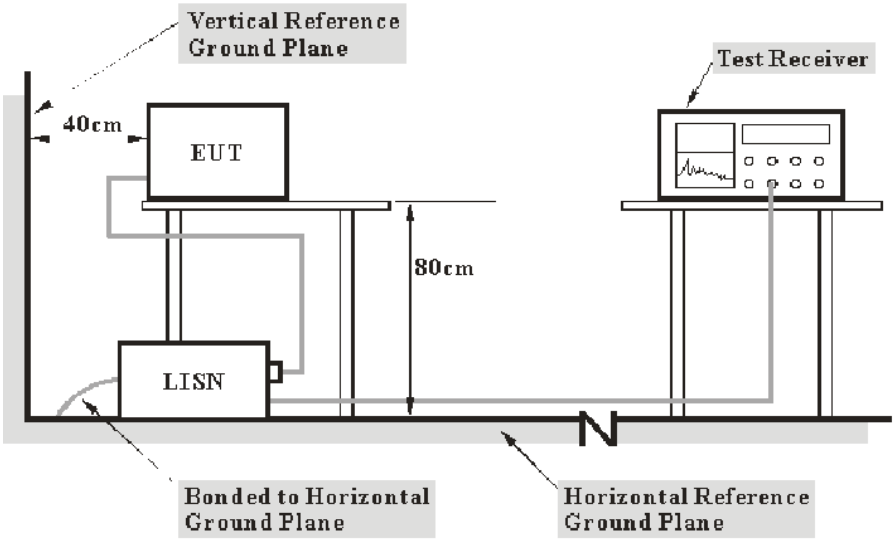
Result: Compliance.

FCC §15.407 (b) (6) §15.207 (a) – CONDUCTED EMISSIONS

Applicable Standard

FCC §15.207, §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 a 120 VAC/60 Hz power source.

EMI Test Receiver Setup

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

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

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

Test Procedure

During the conducted emission test, the adapter was connected to the 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 Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207.

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level complies with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

In BACL, $U_{(Lm)}$ is less than U_{cispr}, if L_m is less than L_{lim}, it implies that the EUT complies with the limit.

Test Data

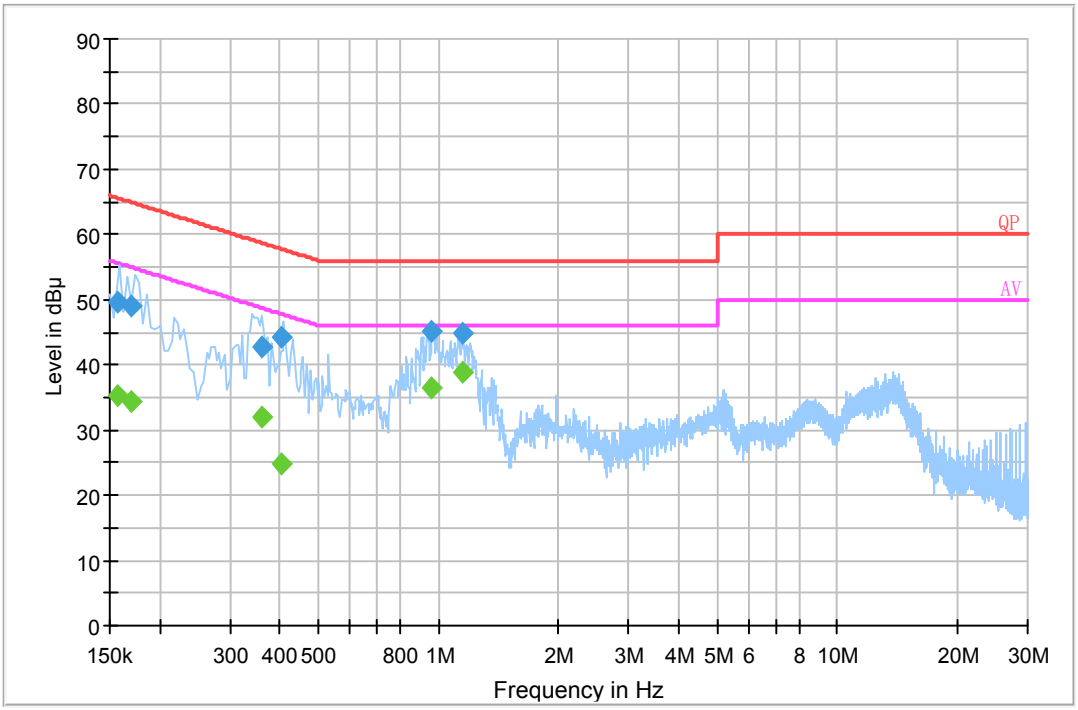
Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Dylan Li on 2017-11-18.

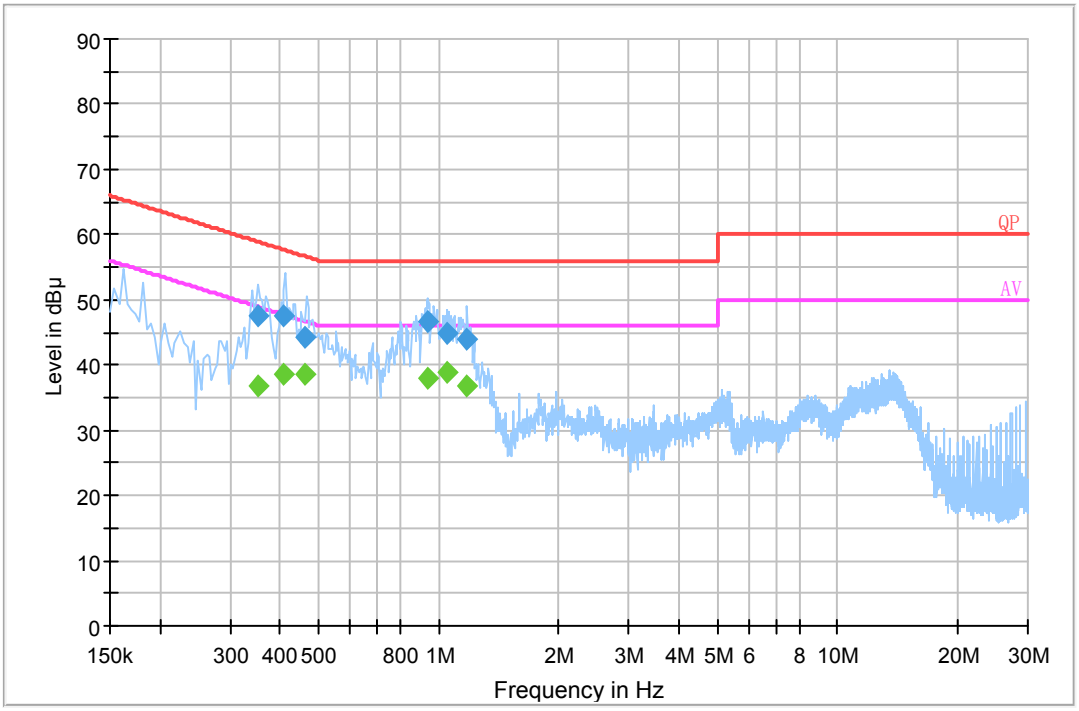
EUT operation mode: Transmitting

AC 120V/60 Hz, Line:



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/Ave./QP)
0.157500	49.6	20.2	65.6	16.0	QP
0.169500	49.0	20.2	65.0	16.0	QP
0.360570	42.9	20.2	58.7	15.8	QP
0.403850	44.4	20.2	57.8	13.4	QP
0.959510	45.2	20.1	56.0	10.8	QP
1.152690	44.8	20.1	56.0	11.2	QP
0.157500	35.4	20.2	55.6	20.2	Ave.
0.169500	34.5	20.2	55.0	20.5	Ave.
0.360570	32.1	20.2	48.7	16.6	Ave.
0.403850	24.8	20.2	47.8	23.0	Ave.
0.959510	36.4	20.1	46.0	9.6	Ave.
1.152690	38.8	20.1	46.0	7.2	Ave.

AC120V, 60 Hz, Neutral:



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/Ave./QP)
0.352690	47.4	20.2	58.9	11.5	QP
0.407790	47.5	20.2	57.7	10.2	QP
0.463010	44.3	20.2	56.6	12.3	QP
0.935990	46.6	20.1	56.0	9.4	QP
1.046250	44.9	20.1	56.0	11.1	QP
1.176330	43.9	20.1	56.0	12.1	QP
0.352690	36.6	20.2	48.9	12.3	Ave.
0.407790	38.6	20.2	47.7	9.1	Ave.
0.463010	38.7	20.2	46.6	7.9	Ave.
0.935990	38.1	20.1	46.0	7.9	Ave.
1.046250	38.8	20.1	46.0	7.2	Ave.
1.176330	36.9	20.1	46.0	9.1	Ave.

Note:
1) Correction Factor =LISN VDF (Voltage Division Factor) + Cable Loss + Transient Limiter Attenuation
2) Corrected Amplitude = Reading + Correction Factor
3) Margin = Limit – Corrected Amplitude

§15.205 & §15.209 & §15.407(B) (1),(4),(6),(7) – UNDESIRABLE EMISSION

Applicable Standard

FCC §15.407 (b) (1), (4), (6), (7); §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.
(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.
Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.

KDB 789033 D02 General UNII Test Procedures New Rulesv01r04, clause II.G 1 d),
(ii) E [dBμV/m] = EIRP [dBm] + 95.2, for d = 3 meters.

KDB 644545 D03 Guidance for IEEE 802 11ac New Rules v01 clause E.3)

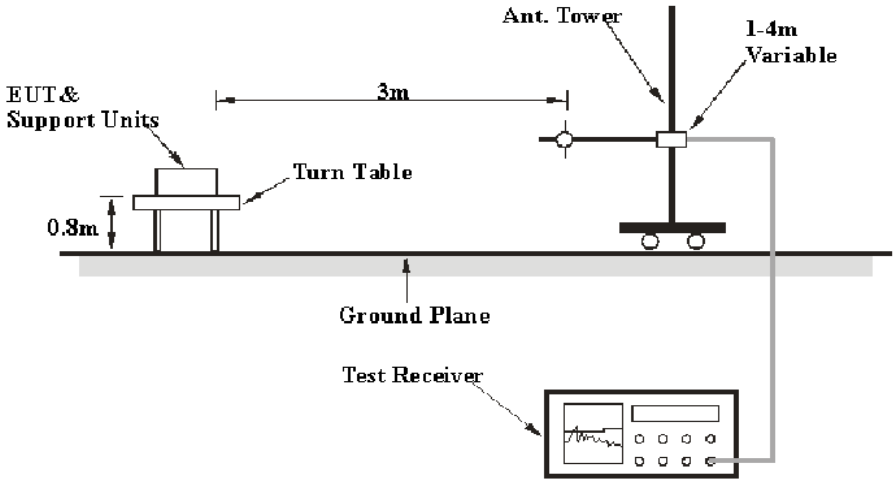
The general limit of -27 dBm EIRP (= 68 dBμV/m) is applied for unwanted emission of U-NII devices.
However, compliance with unwanted emissions in restricted bands may need to be considered, *e.g.*, some harmonics may land in the restricted bands below 5.15 GHz and above 5.35 GHz (refer
The general limit of -27 dBm EIRP (= 68 dBμV/m) is applied for unwanted emission of U-NII devices.
However, compliance with unwanted emissions in restricted bands may need to be considered, *e.g.*, some harmonics may land in the restricted bands below 5.15 GHz and above 5.35 GHz (refer to § 15.205 for restricted bands) that have average and peak limits specified in §§ 15.209 and 15.35(b), respectively.
Although the peak limit of 74 dBμV/m (20 dB above 54 dBμV/m) in the restricted band appears to be higher than 68 dBμV/m, the lower average limit of 54 dBμV/m in the restricted bands needs to be complied to

As to transmitters operating in the 5.725-5.85 GHz band, the strictest limit was applied for undesirable emissions, performed as below:

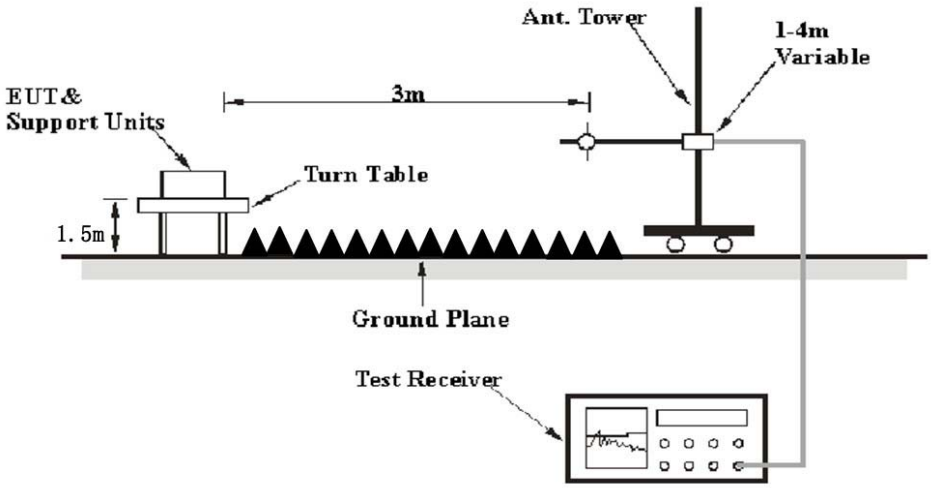
1) For 25MHz-75 MHz above or below the band edge, a level of −27 dBm/MHz (68.2dBμV/m) was applied.
2) For 5MHz-25 MHz above or below the band edge, a level of 10 dBm/MHz (105.2dBμV/m) was applied.
2) For 0MHz-5 MHz above or below the band edge, a level of 15.6 dBm/MHz (110.8dBμV/m) was applied.

EUT Setup

Below 1 GHz:



Above 1 GHz:



The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with 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 adapter was connected to a 120 VAC/60 Hz power source,

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:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	PK
	1MHz	10 Hz Note 1	/	Ave.
	1MHz	＞1/T Note 2	/	Ave.

Note 1: when duty cycle is no less than 98%
Note 2: when duty cycle is less than 98%

Test Procedure

Radiated Spurious Emission

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

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

Corrected Amplitude & Margin Calculation

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

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

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

Margin = Limit – Corrected Amplitude

Test Results Summary

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level is in compliance with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

In BACL, $U_{(Lm)}$ is less than U_{cispr}, if L_m is less than L_{lim}, it implies that the EUT complies with the limit.

Test Data

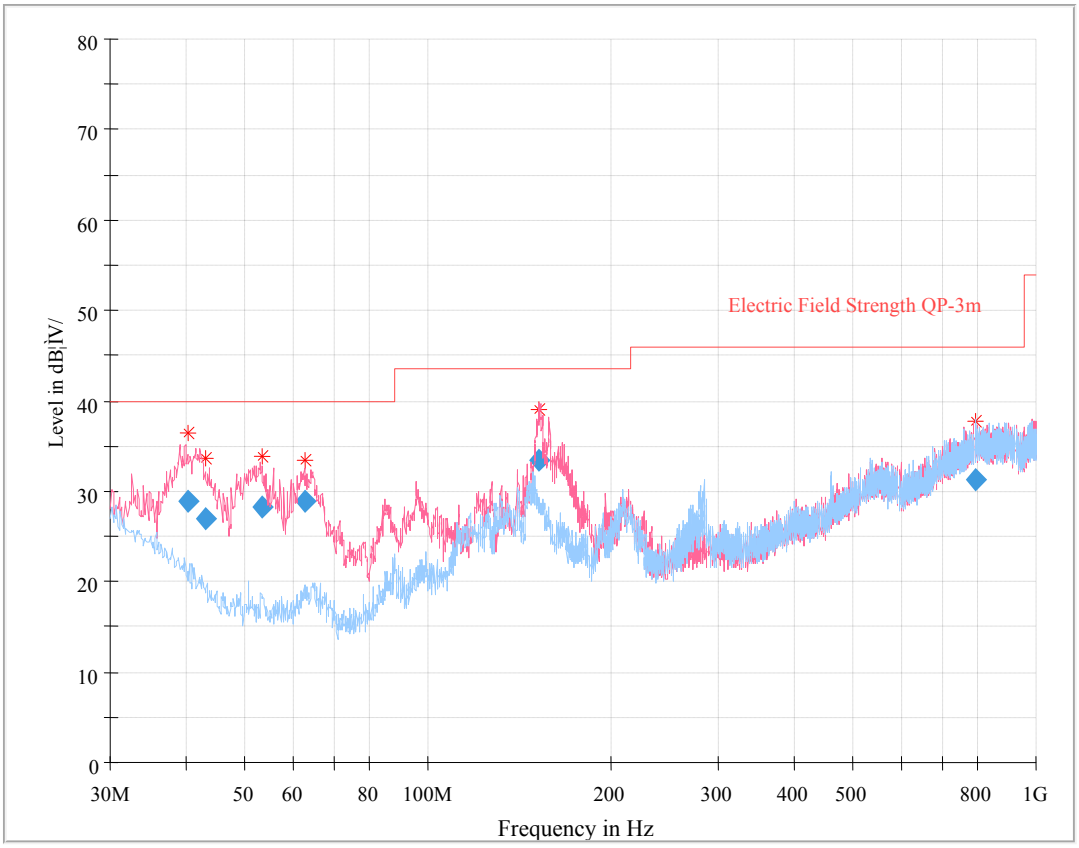
Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Dylan Li on 2017-11-20.

EUT operation mode: Transmitting

30 MHz~1 GHz: (Worst case is 5180MHz in 802.11ac 20 mode)



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna height (cm)	Antenna Polarity	Turntable position (degree)	Correction Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
40.275750	28.80	108.0	V	163.0	-6.2	40.00	11.20
42.944875	26.93	132.0	V	112.0	-8.3	40.00	13.07
53.365875	28.34	101.0	V	351.0	-11.3	40.00	11.66
62.573125	28.94	112.0	V	118.0	-11.9	40.00	11.06
152.313750	33.41	102.0	V	87.0	-4.6	43.50	10.09
797.254875	31.24	174.0	H	61.0	9.0	46.00	14.76

1000 MHz ~ 40 GHz: (5150-5250 MHz & 5725-5825 MHz)

802.11a mode:

Frequency (MHz)	Measurement		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.407/205/209	
	Reading (dBμV)	(PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
5180 MHz									
5180.00	70.26	PK	258	1.7	H	41.8	112.06	/	/
5180.00	57.94	Ave.	258	1.7	H	41.8	99.74	/	/
5180.00	67.82	PK	350	2.1	V	41.8	109.62	/	/
5180.00	55.75	Ave.	350	2.1	V	41.8	97.55	/	/
5145.79	21.38	PK	8	2.1	H	45.3	66.68	74	7.32
5145.79	5.64	Ave.	8	2.1	H	45.3	50.94	54	3.06
5432.44	17.63	PK	235	1.5	H	45.33	62.96	74	11.04
5432.44	3.85	Ave.	235	1.5	H	45.33	49.18	54	4.82
10360.00	38.77	PK	68	1.2	H	16.34	55.11	74	18.89
10360.00	24.96	Ave.	68	1.2	H	16.34	41.30	54	12.70
5200 MHz									
5200.00	70.05	PK	191	1.7	H	41.8	111.85	/	/
5200.00	57.88	Ave.	191	1.7	H	41.8	99.68	/	/
5200.00	67.45	PK	270	2.0	V	41.8	109.25	/	/
5200.00	55.42	Ave.	270	2.0	V	41.8	97.22	/	/
5113.92	17.68	PK	161	1.4	H	45.3	62.98	74	11.02
5113.92	3.89	Ave.	161	1.4	H	45.3	49.19	54	4.81
5386.55	17.79	PK	243	1.4	H	45.33	63.12	74	10.88
5386.55	3.94	Ave.	243	1.4	H	45.33	49.27	54	4.73
10400.00	39.20	PK	237	2.4	H	16.34	55.54	74	18.46
10400.00	25.52	Ave.	237	2.4	H	16.34	41.86	54	12.14
5240 MHz									
5240.00	70.12	PK	342	1.4	H	41.8	111.92	/	/
5240.00	57.46	Ave.	342	1.4	H	41.8	99.26	/	/
5240.00	68.09	PK	0	1.8	V	41.8	109.89	/	/
5240.00	55.88	Ave.	0	1.8	V	41.8	97.68	/	/
5021.64	16.45	PK	152	2.4	H	45.1	61.55	74	12.45
5021.64	3.61	Ave.	152	2.4	H	45.1	48.71	54	5.29
5443.56	18.03	PK	44	1.8	H	45.33	63.36	74	10.64
5443.56	4.22	Ave.	44	1.8	H	45.33	49.55	54	4.45
10480.00	39.03	PK	121	1.3	H	17.24	56.27	74	17.73
10480.00	25.18	Ave.	121	1.3	H	17.24	42.42	54	11.58

Frequency (MHz)	Measurement		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.407/205/209	
	Reading (dBμV)	(PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
5745 MHz									
5745.00	78.14	PK	304	1.8	H	42.15	110.79	/	/
5745.00	65.85	Ave.	304	1.8	H	42.15	98.50	/	/
5745.00	74.66	PK	152	1.2	V	42.15	107.31	/	/
5745.00	64.00	Ave.	152	1.2	V	42.15	96.65	/	/
5684.56	28.64	PK	347	2.0	H	42.15	70.79	93.77	22.98
5714.57	28.43	PK	347	2.0	H	42.15	70.58	109.28	38.70
5723.69	28.46	PK	55	2.0	H	42.15	70.61	119.21	48.60
5853.64	28.10	PK	55	2.0	H	42.55	70.65	113.9	43.25
11490.00	49.53	PK	67	1.2	H	17.56	57.59	74	16.41
11490.00	36.04	Ave.	67	1.2	H	17.56	44.10	54	9.90
5785 MHz									
5785.00	77.29	PK	246	1.3	H	42.08	109.87	/	/
5785.00	65.13	Ave.	246	1.3	H	42.08	97.71	/	/
5785.00	74.32	PK	182	1.7	V	42.08	106.90	/	/
5785.00	62.93	Ave.	182	1.7	V	42.08	95.51	/	/
5721.69	31.85	PK	165	2.2	H	42.15	74.00	114.65	40.65
5708.44	28.97	PK	165	2.2	H	42.15	71.12	107.56	36.44
5684.56	28.69	PK	125	1.4	H	42.15	70.84	93.77	22.93
5854.52	28.10	PK	125	1.4	H	42.55	70.65	111.89	41.24
11570.00	49.02	PK	346	2.0	H	18.32	57.84	74	16.16
11570.00	34.94	Ave.	346	2.0	H	18.32	43.76	54	10.24
5825 MHz									
5825.00	77.88	PK	131	2.4	H	42.08	110.46	/	/
5825.00	65.64	Ave.	131	2.4	H	42.08	98.22	/	/
5825.00	74.51	PK	194	1.4	V	42.08	107.09	/	/
5825.00	62.98	Ave.	194	1.4	V	42.08	95.56	/	/
5855.16	30.12	PK	268	1.3	H	42.55	72.67	110.44	37.77
5863.11	28.95	PK	268	1.3	H	42.55	71.50	108.53	37.03
5882.43	28.42	PK	345	1.7	H	42.55	70.97	99.70	28.73
5723.97	28.34	PK	345	1.7	H	42.15	70.49	119.85	49.36
11650.00	48.29	PK	186	2.4	H	18.32	57.11	74	16.89
11650.00	34.46	Ave.	186	2.4	H	18.32	43.28	54	10.72

802.11n20 mode:

Frequency (MHz)	Measurement		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.407/205/209	
	Reading (dBμV)	(PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
5180 MHz									
5180.00	70.08	PK	65	1.5	H	41.8	111.88	/	/
5180.00	57.28	Ave.	65	1.5	H	41.8	99.08	/	/
5180.00	67.18	PK	103	1.6	V	41.8	108.98	/	/
5180.00	55	Ave.	103	1.6	V	41.8	96.80	/	/
5147.89	20.63	PK	25	1.3	H	45.3	65.93	74	8.07
5147.89	5.48	PK	25	1.3	H	45.3	50.78	54	3.22
5364.32	18.46	PK	25	2.5	H	45.33	63.79	74	10.21
5364.32	4.55	PK	25	2.5	H	45.33	49.88	54	4.12
10360.00	37.46	PK	202	1.5	H	16.34	53.80	74	20.20
10360.00	24.33	Ave.	202	1.5	H	16.34	40.67	54	13.33
5200 MHz									
5200.00	69.36	PK	342	2.3	H	41.8	111.16	/	/
5200.00	56.84	Ave.	342	2.3	H	41.8	98.64	/	/
5200.00	67.92	PK	142	1.7	V	41.8	109.72	/	/
5200.00	55.35	Ave.	142	1.7	V	41.8	97.15	/	/
5026.15	16.52	PK	333	2.1	H	45.1	61.62	74	12.38
5026.15	3.63	PK	333	2.1	H	45.1	48.73	54	5.27
5387.69	18.06	PK	21	2.4	H	45.33	63.39	74	10.61
5387.69	4.34	PK	21	2.4	H	45.33	49.67	54	4.33
10400.00	39.37	PK	190	1.4	H	16.34	55.71	74	18.29
10400.00	25.38	Ave.	190	1.4	H	16.34	41.72	54	12.28
5240 MHz									
5240.00	70.07	PK	198	1.9	H	41.8	111.87	/	/
5240.00	57.58	Ave.	198	1.9	H	41.8	99.38	/	/
5240.00	67.63	PK	276	2.1	V	41.8	109.43	/	/
5240.00	55.38	Ave.	276	2.1	V	41.8	97.18	/	/
5058.16	16.74	PK	117	1.4	H	45.3	62.04	74	11.96
5058.16	3.71	PK	117	1.4	H	45.3	49.01	54	4.99
5396.29	18.22	PK	147	1.6	H	45.33	63.55	74	10.45
5396.29	4.56	PK	147	1.6	H	45.33	49.89	54	4.11
10480.00	39.08	PK	5	2.0	H	17.24	56.32	74	17.68
10480.00	25.54	Ave.	5	2.0	H	17.24	42.78	54	11.22

Frequency (MHz)	Measurement		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.407/205/209	
	Reading (dBμV)	(PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
5745 MHz									
5745.00	77.16	PK	306	1.4	H	42.15	109.81	/	/
5745.00	64.60	Ave.	306	1.4	H	42.15	97.25	/	/
5745.00	74.59	PK	269	1.3	V	42.15	107.24	/	/
5745.00	62.17	Ave.	269	1.3	V	42.15	94.82	/	/
5674.35	29.58	PK	125	1.8	H	42.15	71.73	86.22	14.49
5711.43	30.12	PK	288	1.4	H	42.15	72.27	108.4	36.13
5723.62	29.55	PK	155	2.5	H	42.15	71.70	119.05	47.35
5852.37	30.14	PK	34	1.7	H	42.55	72.69	116.8	44.11
11490.00	50.93	PK	35	2.1	H	17.56	58.99	74	15.01
11490.00	36.51	Ave.	35	2.1	H	17.56	44.57	54	9.43
5785 MHz									
5785.00	77.74	PK	133	2.0	H	42.08	110.32	/	/
5785.00	65.96	Ave.	133	2.0	H	42.08	98.54	/	/
5785.00	75.20	PK	183	2.0	V	42.08	107.78	/	/
5785.00	62.12	Ave.	183	2.0	V	42.08	94.70	/	/
5720.73	31.27	PK	225	1.9	H	42.15	73.42	112.46	39.04
5718.64	30.12	PK	225	1.9	H	42.15	72.27	110.42	38.15
5693.25	29.46	PK	223	1.0	H	42.15	71.61	100.21	28.60
5854.12	28.93	PK	223	1.0	H	42.55	71.48	112.81	41.33
11570.00	49.47	PK	41	1.3	H	18.32	58.29	74	15.71
11570.00	35.54	Ave.	41	1.3	H	18.32	44.36	54	9.64
5825 MHz									
5825.00	77.81	PK	97	1.3	H	42.08	110.39	/	/
5825.00	66.09	Ave.	97	1.3	H	42.08	98.67	/	/
5825.00	74.96	PK	206	2.1	V	42.08	107.54	/	/
5825.00	62.09	Ave.	206	2.1	V	42.08	94.67	/	/
5853.14	32.15	PK	185	1.9	H	42.55	74.70	115.04	40.34
5860.18	30.04	PK	185	1.9	H	42.55	72.59	109.35	36.76
5879.20	29.17	PK	137	1.8	H	42.55	71.72	102.09	30.37
5723.16	29.20	PK	137	1.8	H	42.15	71.35	118.00	46.65
11650.00	49.32	PK	250	1.0	H	18.32	58.14	74	15.86
11650.00	35.02	Ave.	250	1.0	H	18.32	43.84	54	10.16

802.11n40 mode:

Frequency (MHz)	Measurement		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.407/205/209	
	Reading (dBμV)	(PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
5190 MHz									
5190.00	66.24	PK	350	2.2	H	41.8	108.04	/	/
5190.00	54.19	Ave.	350	2.2	H	41.8	95.99	/	/
5190.00	64.31	PK	276	1.6	V	41.8	106.11	/	/
5190.00	52.28	Ave.	276	1.6	V	41.8	94.08	/	/
5149.09	25.45	PK	243	1.6	H	45.3	70.75	74	3.25
5149.09	7.22	PK	243	1.6	H	45.3	52.52	54	1.48
5416.13	17.43	PK	143	2.1	H	45.33	62.76	74	11.24
5416.13	3.75	PK	143	2.1	H	45.33	49.08	54	4.92
10380.00	39.05	PK	238	1.4	H	16.34	55.39	74	18.61
10380.00	24.67	Ave.	238	1.4	H	16.34	41.01	54	12.99
5230 MHz									
5230.00	66.25	PK	205	1.6	H	41.8	108.05	/	/
5230.00	54.44	Ave.	205	1.6	H	41.8	96.24	/	/
5230.00	63.69	PK	262	2.1	V	41.8	105.49	/	/
5230.00	51.73	Ave.	262	2.1	V	41.8	93.53	/	/
5090.78	18.15	PK	60	1.7	H	45.3	63.45	74	10.55
5090.78	4.37	PK	60	1.7	H	45.3	49.67	54	4.33
5420.32	18.52	PK	351	1.4	H	45.33	63.85	74	10.15
5420.32	4.61	PK	351	1.4	H	45.33	49.94	54	4.06
10460.00	39.83	PK	311	2.1	H	17.24	57.07	74	16.93
10460.00	26.1	Ave.	311	2.1	H	17.24	43.34	54	10.66

Frequency (MHz)	Measurement		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.407/205/209	
	Reading (dBμV)	(PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
5755 MHz									
5755.00	73.93	PK	271	1.6	H	42.08	106.51	/	/
5755.00	62.35	Ave.	271	1.6	H	42.08	94.93	/	/
5755.00	71.11	PK	192	1.9	V	42.08	103.69	/	/
5755.00	59.54	Ave.	192	1.9	V	42.08	92.12	/	/
5724.32	31.02	PK	83	1.3	H	42.15	73.17	120.65	47.48
5710.68	29.89	PK	83	1.3	H	42.15	72.04	108.19	36.15
5689.11	29.12	PK	250	1.0	H	42.15	71.27	97.14	25.87
5853.94	28.78	PK	250	1.0	H	42.55	71.33	113.22	41.89
11510.00	49.60	PK	299	1.1	H	17.56	57.66	74	16.34
11510.00	36.58	Ave.	299	1.1	H	17.56	44.64	54	9.36
5795 MHz									
5795.00	70.86	PK	354	2.3	H	42.08	103.44	/	/
5795.00	59.59	Ave.	354	2.3	H	42.08	92.17	/	/
5795.00	71.14	PK	168	1.4	V	42.08	103.72	/	/
5795.00	59.07	Ave.	168	1.4	V	42.08	91.65	/	/
5853.14	30.17	PK	161	1.4	H	42.55	72.72	115.04	42.32
5872.32	29.61	PK	161	1.4	H	42.55	72.16	105.95	33.79
5890.19	29.15	PK	284	1.4	H	42.55	71.70	93.96	22.26
5723.12	28.63	PK	284	1.4	H	42.15	70.78	117.91	47.13
11590.00	49.42	PK	103	1.0	H	18.32	58.24	74	15.76
11590.00	35.02	Ave.	103	1.0	H	18.32	43.84	54	10.16

802.11ac20 mode:

Frequency (MHz)	Measurement		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.407/205/209	
	Reading (dBμV)	(PK/QP/Ave.)		Height (m)	Polar (H/V)			Reading (dBμV)	(PK/QP/Ave.)
5180 MHz									
5180.00	69.81	PK	312	2.3	H	41.8	111.61	/	/
5180.00	57.51	Ave.	312	2.3	H	41.8	99.31	/	/
5180.00	66.87	PK	145	2.4	V	41.8	108.67	/	/
5180.00	54.3	Ave.	145	2.4	V	41.8	96.10	/	/
5147.89	19.66	PK	356	1.4	H	45.3	64.96	74	9.04
5147.89	5.68	PK	356	1.4	H	45.3	50.98	54	3.02
5373.14	18.15	PK	214	1.0	H	45.33	63.48	74	10.52
5373.14	4.34	PK	214	1.0	H	45.33	49.67	54	4.33
10360.00	38.11	PK	271	1.4	H	16.34	54.45	74	19.55
10360.00	24.96	Ave.	271	1.4	H	16.34	41.30	54	12.70
5200 MHz									
5200.00	70.17	PK	103	1.9	H	41.8	111.97	/	/
5200.00	57.91	Ave.	103	1.9	H	41.8	99.71	/	/
5200.00	66.79	PK	177	1.3	V	41.8	108.59	/	/
5200.00	54.58	Ave.	177	1.3	V	41.8	96.38	/	/
5052.91	16.88	PK	228	1.6	H	45.3	62.18	74	11.82
5052.91	3.39	PK	228	1.6	H	45.3	48.69	54	5.31
5363.21	18.06	PK	206	2.0	H	45.33	63.39	74	10.61
5363.21	4.27	PK	206	2.0	H	45.33	49.60	54	4.40
10400.00	38.9	PK	253	1.9	H	16.34	55.24	74	18.76
10400.00	25.11	Ave.	253	1.9	H	16.34	41.45	54	12.55
High channel(5240MHz)									
5240.00	69.72	PK	97	1.8	H	41.8	111.52	/	/
5240.00	57.26	Ave.	97	1.8	H	41.8	99.06	/	/
5240.00	66.95	PK	111	1.4	V	41.8	108.75	/	/
5240.00	54.13	Ave.	111	1.4	V	41.8	95.93	/	/
5066.13	16.64	PK	80	1.4	H	45.3	61.94	74	12.06
5066.13	3.61	PK	80	1.4	H	45.3	48.91	54	5.09
5406.21	17.41	PK	21	1.8	H	45.33	62.74	74	11.26
5406.21	3.74	PK	21	1.8	H	45.33	49.07	54	4.93
10480.00	39.36	PK	261	2.3	H	17.24	56.60	74	17.40
10480.00	25.63	Ave.	261	2.3	H	17.24	42.87	54	11.13

Frequency (MHz)	Measurement		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.407/205/209	
	Reading (dBμV)	(PK/QP/Ave.)		Height (m)	Polar (H/V)			Reading (dBμV)	(PK/QP/Ave.)
5745 MHz									
5745.00	77.43	PK	259	2.1	H	42.15	110.08	/	/
5745.00	64.81	Ave.	259	2.1	H	42.15	97.46	/	/
5745.00	74.33	PK	75	2.1	V	42.15	106.98	/	/
5745.00	61.59	Ave.	75	2.1	V	42.15	94.24	/	/
5721.63	30.93	PK	360	1.6	H	42.15	73.08	114.52	41.44
5709.87	29.18	PK	360	1.6	H	42.15	71.33	107.96	36.63
5686.14	29.04	PK	154	2.1	H	42.15	71.19	94.94	23.75
5854.85	29.41	PK	154	2.1	H	42.55	71.96	111.14	39.18
11490.00	49.94	PK	235	2.5	H	17.56	58.00	74	16.00
11490.00	36.51	Ave.	235	2.5	H	17.56	44.57	54	9.43
5785 MHz									
5785.00	77.35	PK	189	2.1	H	42.08	109.93	/	/
5785.00	64.62	Ave.	189	2.1	H	42.08	97.20	/	/
5785.00	73.72	PK	247	1.7	V	42.08	106.30	/	/
5785.00	61.61	Ave.	247	1.7	V	42.08	94.19	/	/
5723.10	34.15	PK	289	1.7	H	42.15	76.30	115.04	38.74
5713.64	31.05	PK	289	1.7	H	42.15	73.20	109.35	36.15
5687.61	30.42	PK	87	2.2	H	42.15	72.57	102.09	29.52
5854.11	29.68	PK	87	2.2	H	42.55	72.23	112.83	40.60
11570.00	49.07	PK	101	1.9	H	18.32	57.89	74	16.11
11570.00	35.94	Ave.	101	1.9	H	18.32	44.76	54	9.24
5825 MHz									
5825.00	78.13	PK	26	1.4	H	42.08	110.71	/	/
5825.00	65.93	Ave.	26	1.4	H	42.08	98.51	/	/
5825.00	74.63	PK	346	1.9	V	42.08	107.21	/	/
5825.00	62.37	Ave.	346	1.9	V	42.08	94.95	/	/
5852.38	34.61	PK	175	1.2	H	42.55	77.16	116.77	39.61
5870.21	31.02	PK	175	1.2	H	42.55	73.57	106.54	32.97
5886.10	29.12	PK	295	2.1	H	42.55	71.67	96.99	25.32
5723.96	29.41	PK	295	2.1	H	42.15	71.56	119.83	48.27
11650.00	48.76	PK	328	1.5	H	18.32	57.58	74	16.42
11650.00	36.34	Ave.	328	1.5	H	18.32	45.16	54	8.84

802.11ac40 mode:

Frequency (MHz)	Measurement		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.407/205/209	
	Reading (dBμV)	(PK/QP/Ave.)		Height (m)	Polar (H/V)			Reading (dBμV)	(PK/QP/Ave.)
5190 MHz									
5190.00	66.23	PK	162	1.7	H	41.8	108.03	/	/
5190.00	54.18	Ave.	162	1.7	H	41.8	95.98	/	/
5190.00	64.01	PK	226	1.2	V	41.8	105.81	/	/
5190.00	52.21	Ave.	226	1.2	V	41.8	94.01	/	/
5149.69	23.81	PK	21	2.4	H	45.3	69.11	74	4.89
5149.69	7.29	PK	21	2.4	H	45.3	52.59	54	1.41
5376.89	18.27	PK	35	2.3	H	45.33	63.60	74	10.40
5376.89	4.61	PK	35	2.3	H	45.33	49.94	54	4.06
10380.00	39.21	PK	144	2.4	H	16.34	55.55	74	18.45
10380.00	25.74	Ave.	144	2.4	H	16.34	42.08	54	11.92
5230 MHz									
5230.00	65.45	PK	98	2.5	H	41.8	107.25	/	/
5230.00	53.85	Ave.	98	2.5	H	41.8	95.65	/	/
5230.00	63.34	PK	290	1.6	V	41.8	105.14	/	/
5230.00	51.89	Ave.	290	1.6	V	41.8	93.69	/	/
5132.86	17.29	PK	344	2.0	H	45.3	62.59	74	11.41
5132.86	3.74	PK	344	2.0	H	45.3	49.04	54	4.96
5419.38	17.58	PK	255	1.1	H	45.33	62.91	74	11.09
5419.38	3.81	PK	255	1.1	H	45.33	49.14	54	4.86
10460.00	40.25	PK	58	1.4	H	17.24	57.49	74	16.51
10460.00	26.14	Ave.	58	1.4	H	17.24	43.38	54	10.62

Frequency (MHz)	Measurement		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.407/205/209	
	Reading (dBμV)	(PK/QP/Ave.)		Height (m)	Polar (H/V)			Reading (dBμV)	(PK/QP/Ave.)
5755 MHz									
5755.00	69.94	PK	187	1.5	H	42.08	102.52	/	/
5755.00	58.50	Ave.	187	1.5	H	42.08	91.08	/	/
5755.00	69.85	PK	38	1.6	V	42.08	102.43	/	/
5755.00	58.06	Ave.	38	1.6	V	42.08	90.64	/	/
5722.16	30.94	PK	143	1.3	H	42.15	73.09	115.72	42.63
5706.39	30.05	PK	143	1.3	H	42.15	72.20	106.99	34.79
5670.20	29.17	PK	333	2.1	H	42.15	71.32	83.15	11.83
5854.38	29.42	PK	333	2.1	H	42.55	71.97	112.21	40.24
11510.00	48.17	PK	297	2.4	H	17.56	56.23	74	17.77
11510.00	34.38	Ave.	297	2.4	H	17.56	42.44	54	11.56
5795 MHz									
5795.00	69.33	PK	285	1.8	H	42.08	101.91	/	/
5795.00	58.68	Ave.	285	1.8	H	42.08	91.26	/	/
5795.00	70.74	PK	357	2.5	V	42.08	103.32	/	/
5795.00	59.56	Ave.	357	2.5	V	42.08	92.14	/	/
5852.34	30.11	PK	233	1.6	H	42.55	72.66	116.86	44.20
5870.23	29.63	PK	233	1.6	H	42.55	72.18	106.54	34.36
5880.12	28.74	PK	54	1.6	H	42.55	71.29	101.41	30.12
5723.61	29.05	PK	54	1.6	H	42.15	71.20	119.03	47.83
11590.00	48.65	PK	57	1.5	H	18.32	57.47	74	16.53
11590.00	34.84	Ave.	57	1.5	H	18.32	43.66	54	10.34

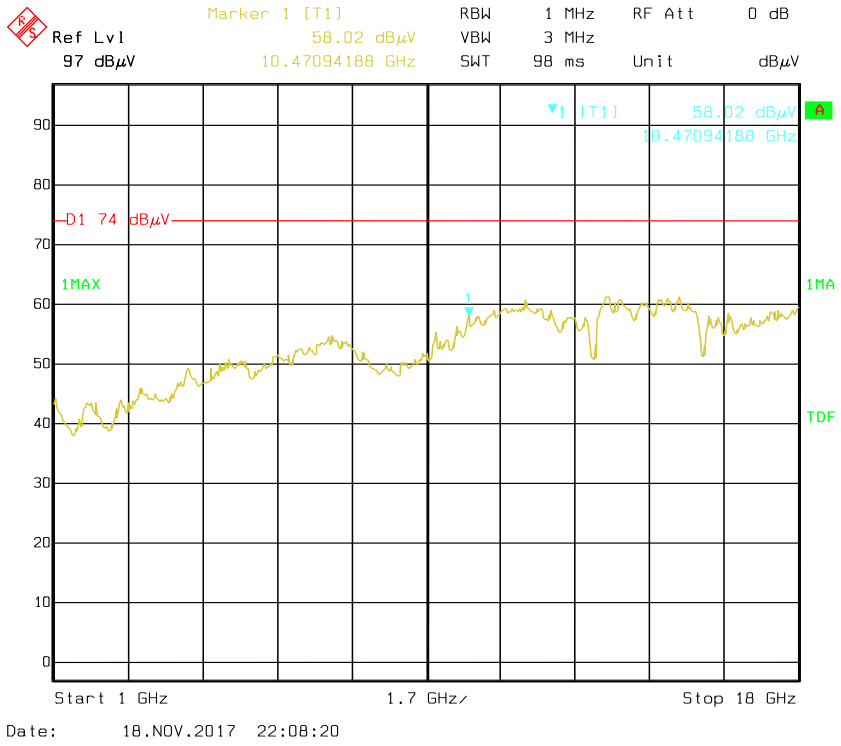
802.11ac80 mode:

Frequency (MHz)	Measurement		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.407/205/209	
	Reading (dBμV)	(PK/QP/Ave.)		Height (m)	Polar (H/V)			Reading (dBμV)	(PK/QP/Ave.)
5210 MHz									
5210.00	63.03	PK	291	1.2	H	41.8	104.83	/	/
5210.00	51.06	Ave.	291	1.2	H	41.8	92.86	/	/
5210.00	61.37	PK	327	2.3	V	41.8	103.17	/	/
5210.00	49.29	Ave.	327	2.3	V	41.8	91.09	/	/
5149.09	23.78	PK	114	2.5	H	45.3	69.08	74	4.92
5149.09	8.48	PK	114	2.5	H	45.3	53.78	54	0.22
5403.12	17.8	PK	246	2.5	H	45.33	63.13	74	10.87
5403.12	4.73	PK	246	2.5	H	45.33	50.06	54	3.94
10420.00	39.75	PK	57	1.4	H	16.34	56.09	74	17.91
10420.00	25.87	Ave.	57	1.4	H	16.34	42.21	54	11.79
5775 MHz									
5775.00	69.35	PK	290	1.7	H	42.08	101.93	/	/
5775.00	58.39	Ave.	290	1.7	H	42.08	90.97	/	/
5775.00	71.15	PK	311	2.0	V	42.08	103.73	/	/
5775.00	58.65	Ave.	311	2.0	V	42.08	91.23	/	/
5721.32	31.45	PK	288	1.9	H	42.15	73.60	113.81	40.21
5710.12	30.15	PK	288	1.9	H	42.15	72.30	108.03	35.73
5853.16	32.41	PK	289	1.9	H	42.55	74.96	115.00	40.04
5864.23	29.45	PK	289	1.9	H	42.55	72.00	108.22	36.22
11550.00	49.73	PK	248	1.7	H	18.32	58.55	74	15.45
11550.00	36.04	Ave.	248	1.7	H	18.32	44.86	54	9.14

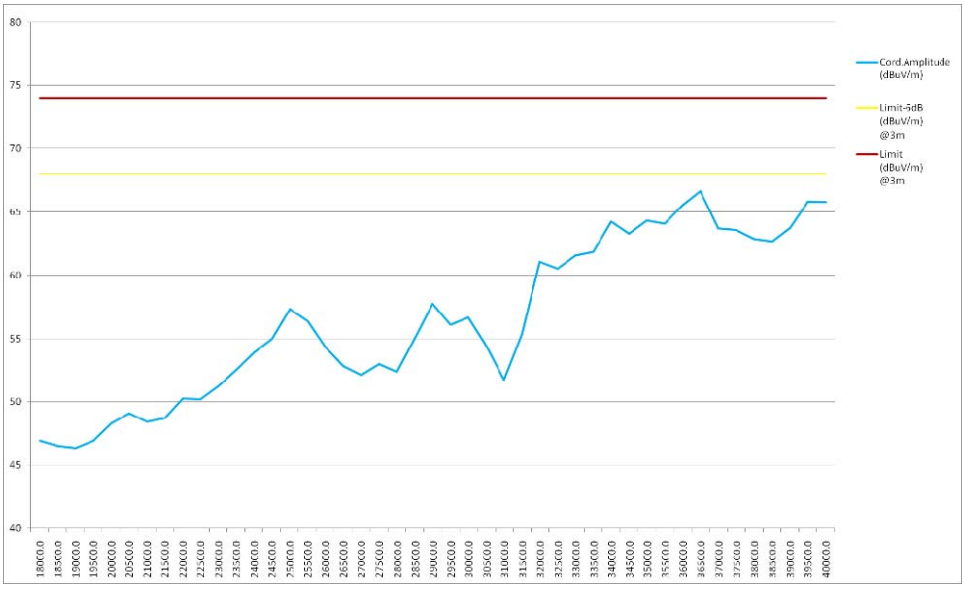
Note:
Corrected Amplitude = Corrected Factor + Reading
Corrected Factor=Antenna factor (RX) + Cable Loss – Amplifier Factor
Margin = Limit- Corr. Amplitude
Spurious emissions more than 20 dB below the limit were not reported.

802.11ac80 mode

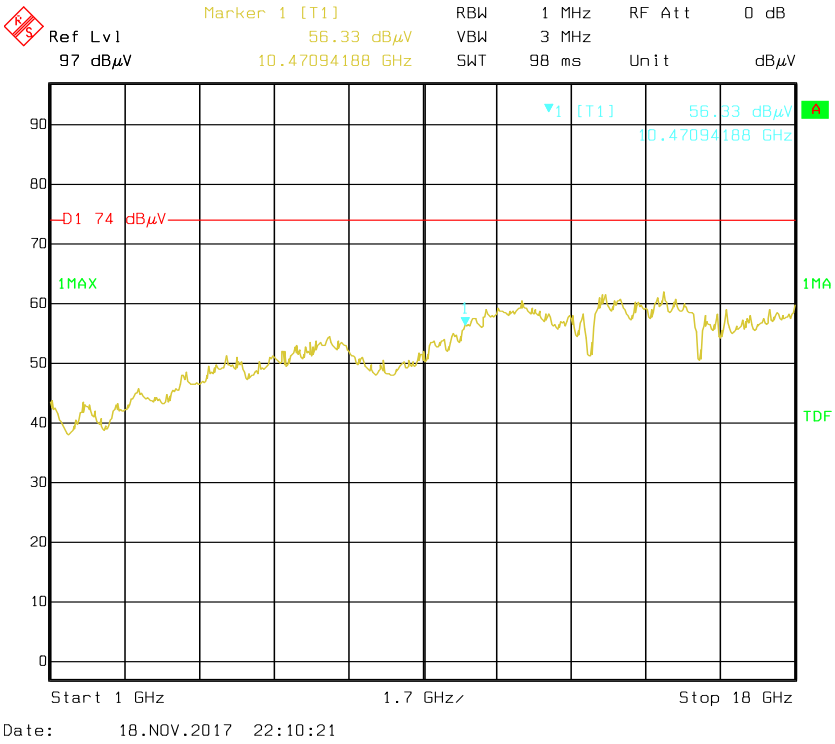
5210 MHz, 1~18 GHz, H



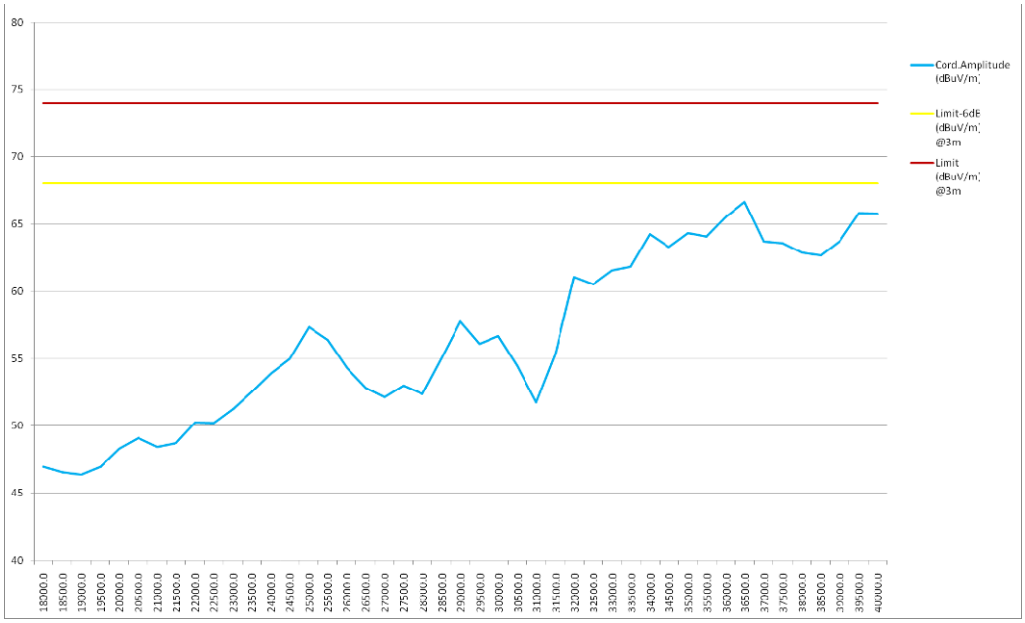
5210 MHz, 18~40 GHz, H



5210 MHz, 1~18 GHz, V



5230 MHz, 18~40 GHz, V



§15.407(B) (1),(4) –OUT OF BAND EMISSION

Applicable Standard

FCC §15.407 (b) (1), (4);

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 EIRP of –27dBm/MHz.

For transmitters operating in the 5.725–5.825 GHz band: 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.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. The Resolution bandwidth is set to 1MHz, The Video bandwidth is set to ≥ 1MHz, report the peak value out of the oprating band.
3. Repeat above procedures until all frequencies measured were complete.

Test Data

Environmental Conditions

Temperature:	23.5~25 ℃
Relative Humidity:	52~56 %
ATM Pressure:	100.0~101.0 kPa

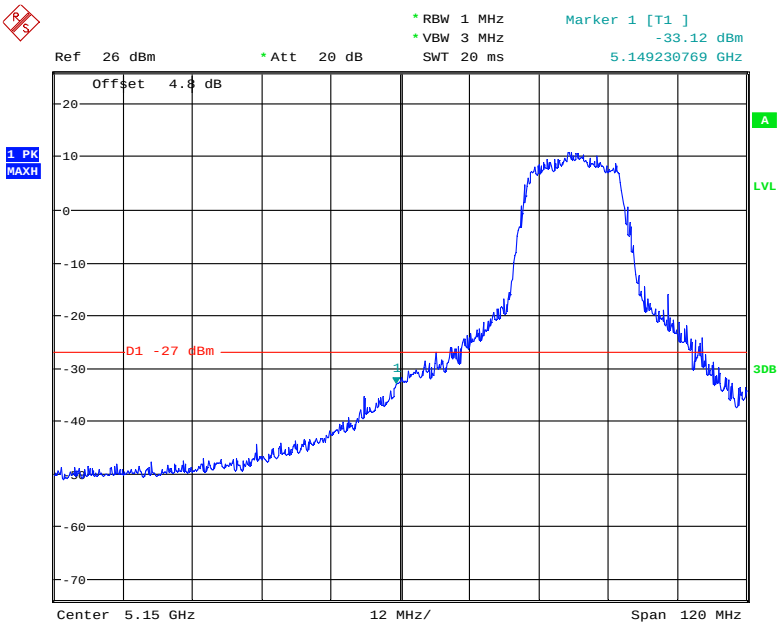
The testing was performed by Dylan Li from 2017-10-26 to 2017-10-30.

EUT operation mode: Transmitting

Note: The antenna gain had been offset in the plots, the limit is EIRP.

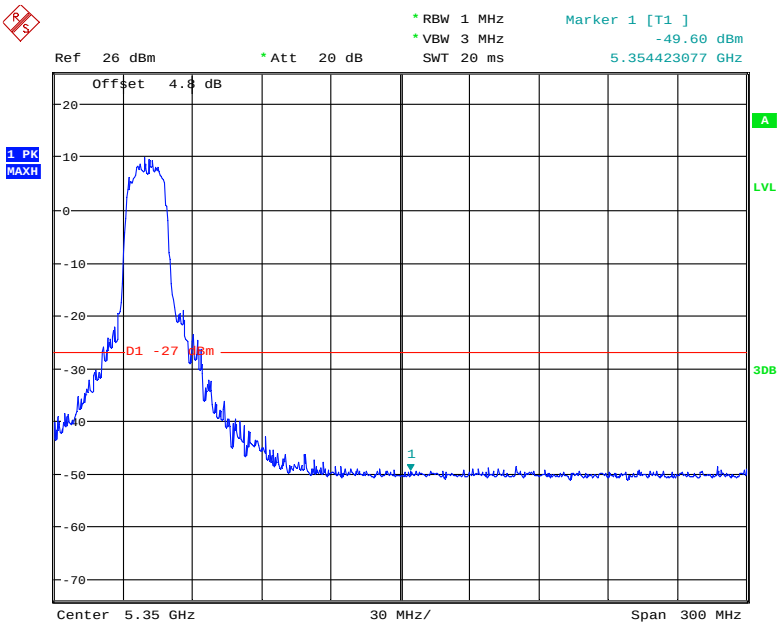
5150 – 5250 MHz:

802.11a mode, Band Edge, Left Side



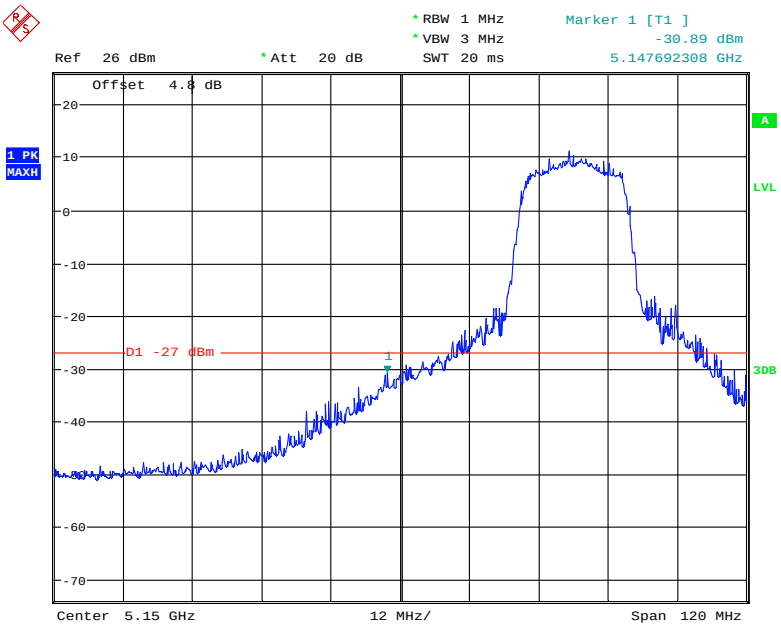
Date: 30.OCT.2017 12:28:49

802.11a mode, Band Edge, Right Side



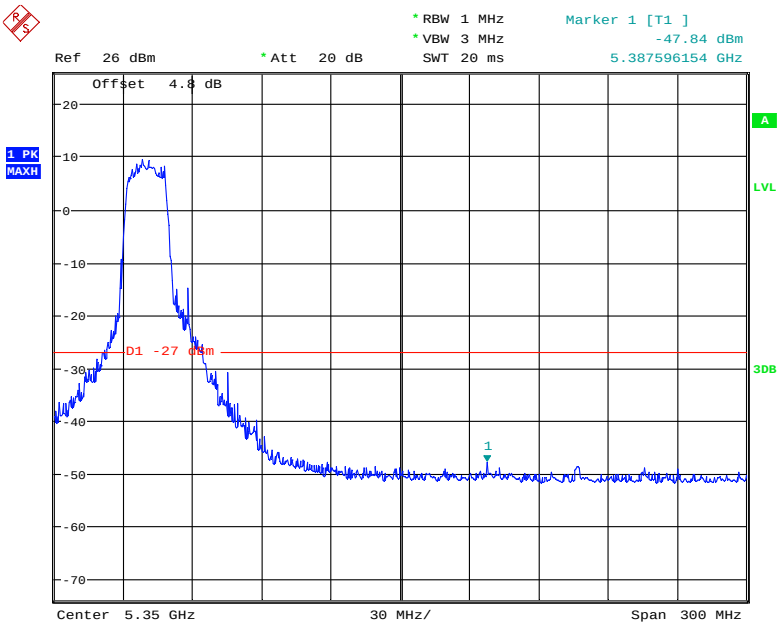
Date: 30.OCT.2017 12:22:50

802.11n20 mode, Band Edge, Left Side



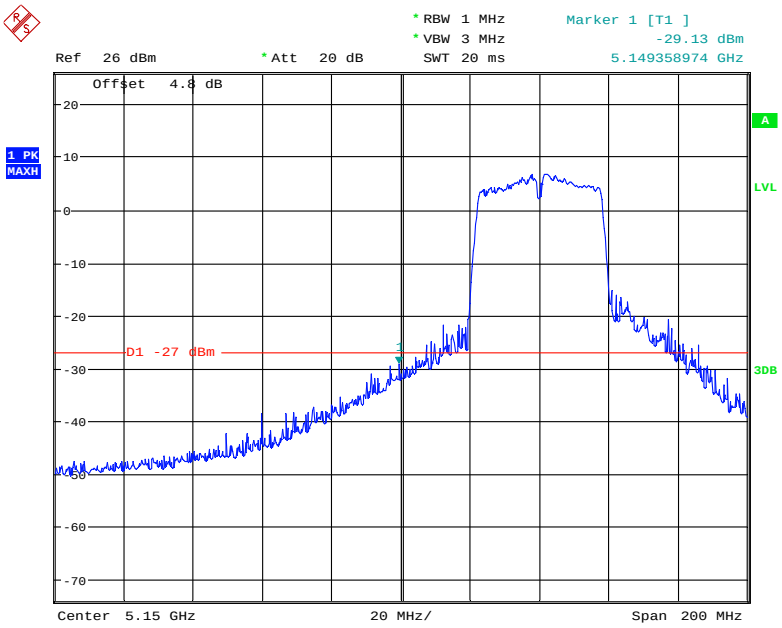
Date: 30.OCT.2017 12:24:47

802.11n20 mode, Band Edge, Right Side



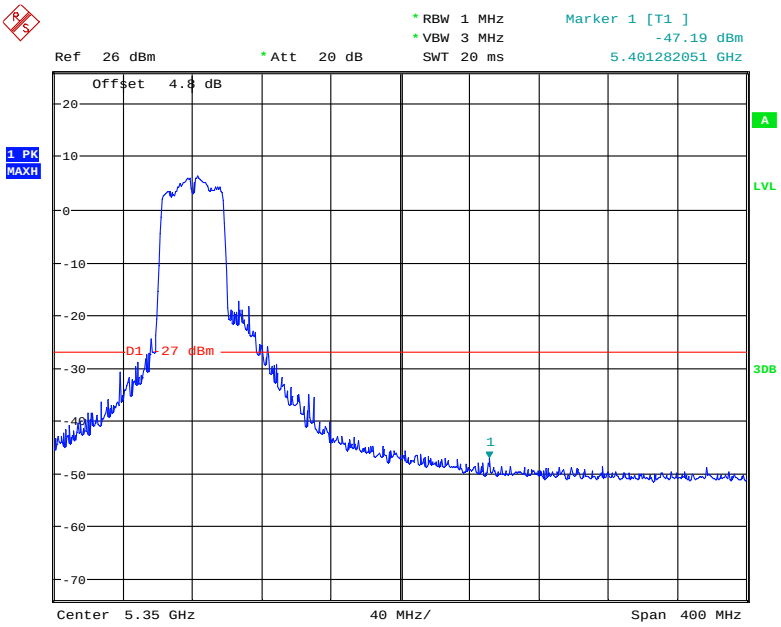
Date: 30.OCT.2017 12:23:45

802.11n40 mode, Band Edge, Left Side



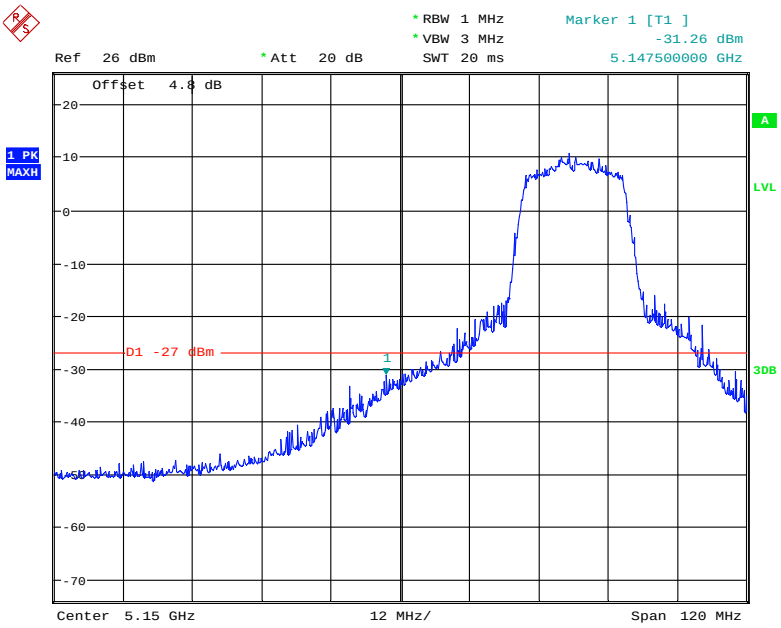
Date: 30.OCT.2017 12:32:18

802.11n40 mode, Band Edge, Right Side



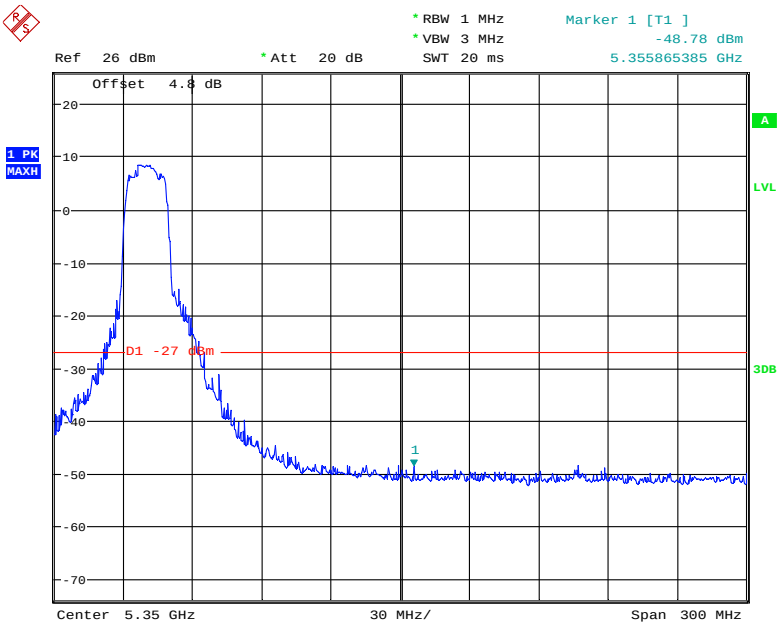
Date: 30.OCT.2017 12:31:31

802.11ac20 mode, Band Edge, Left Side



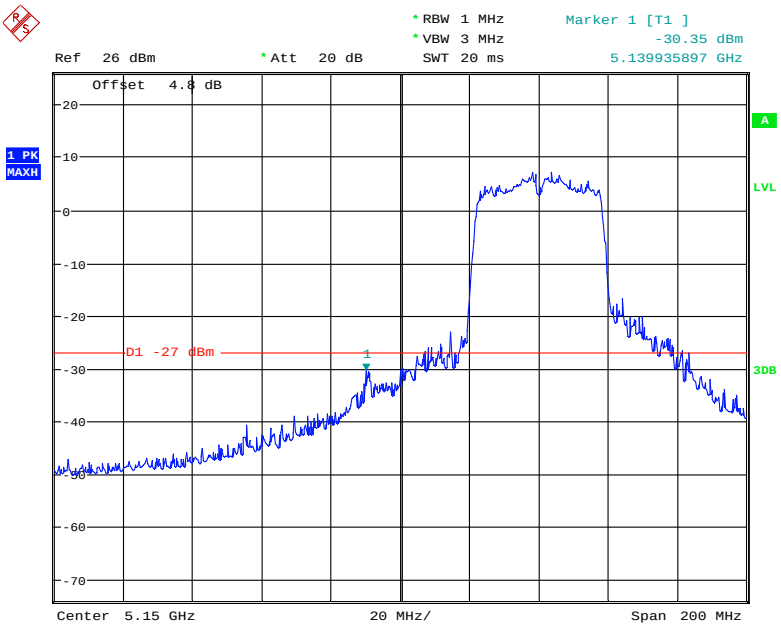
Date: 30.OCT.2017 12:25:23

802.11ac20 mode, Band Edge, Right Side



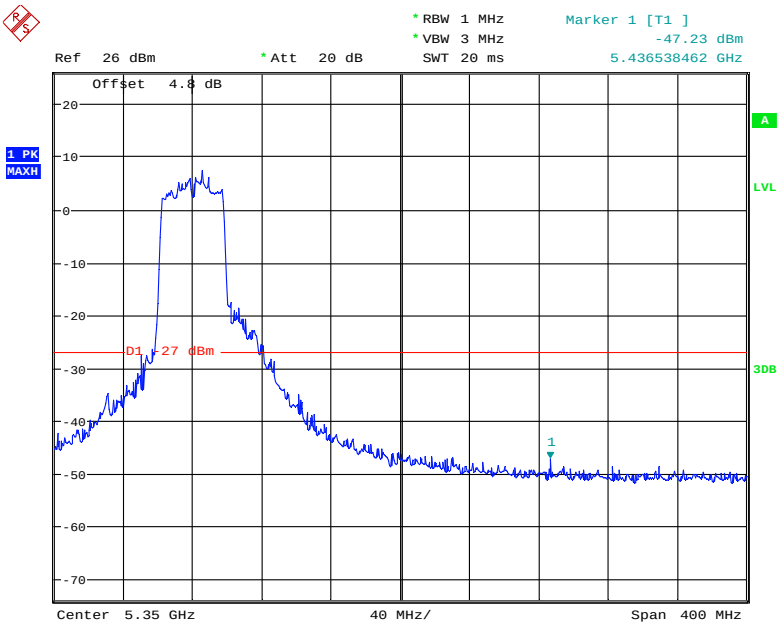
Date: 30.OCT.2017 12:26:31

802.11ac40 mode, Band Edge, Left Side



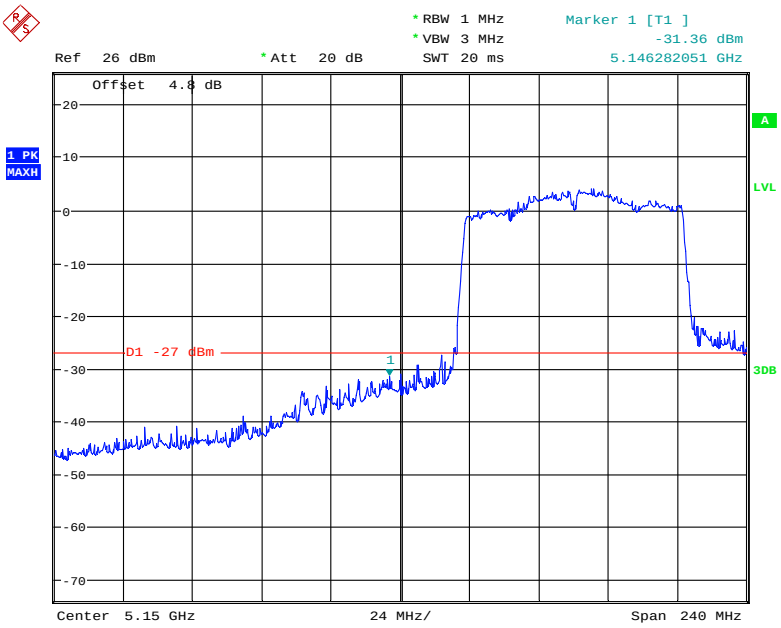
Date: 30.OCT.2017 12:30:02

802.11ac40 mode, Band Edge, Right Side



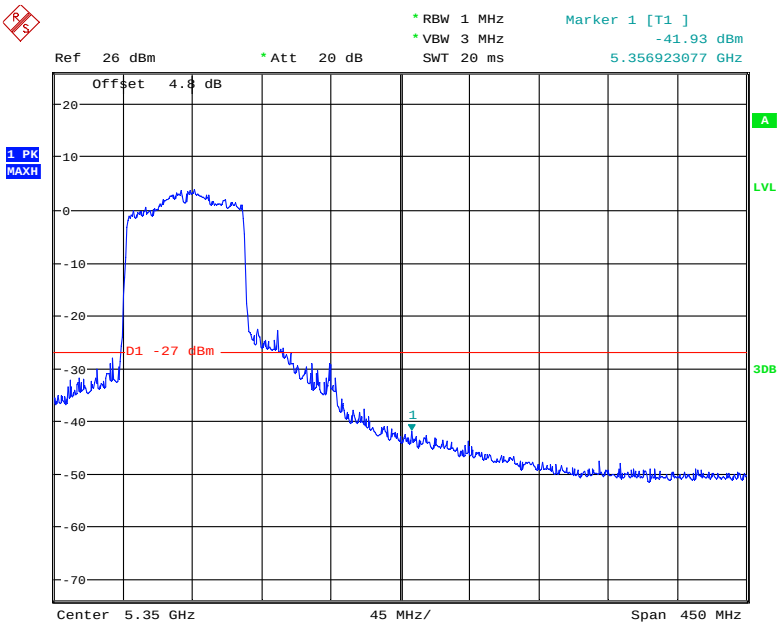
Date: 30.OCT.2017 12:30:53

802.11ac80 mode, Band Edge, Left Side



Date: 30.OCT.2017 12:33:15

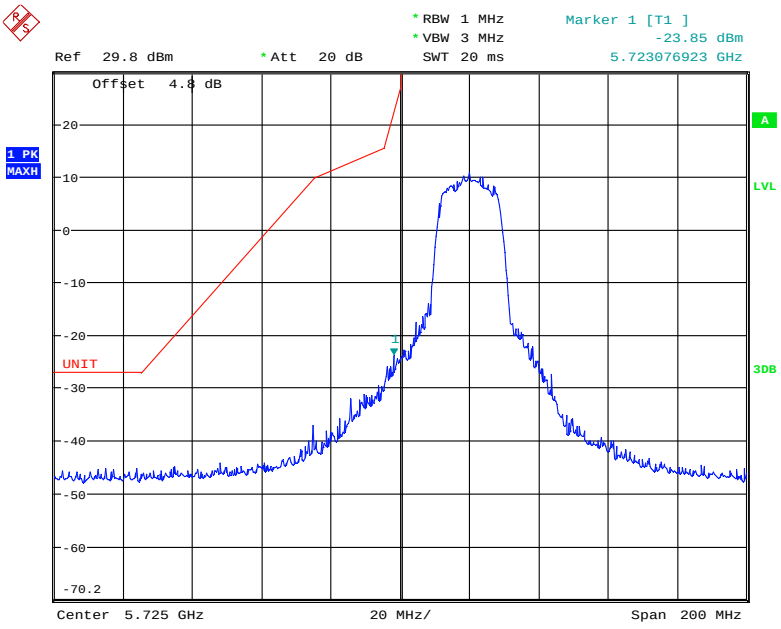
802.11ac80 mode, Band Edge, Right Side



Date: 30.OCT.2017 12:33:59

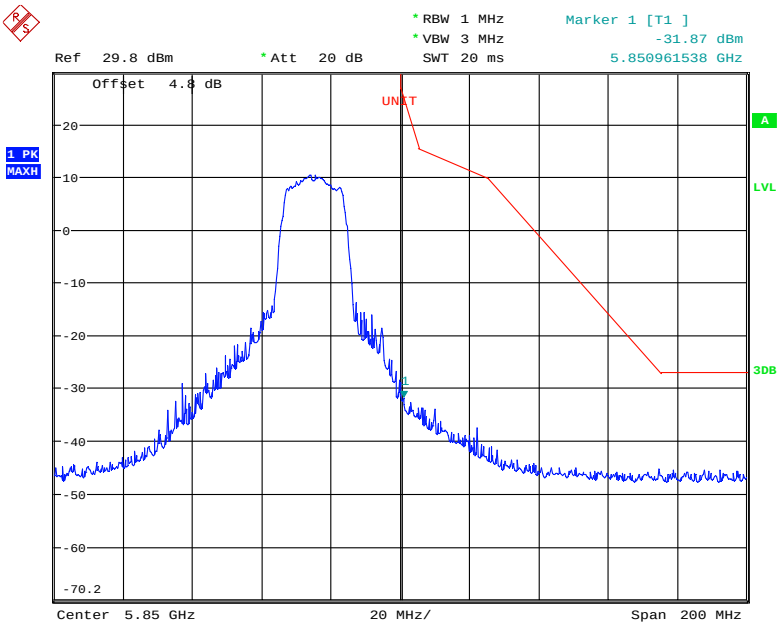
5725 – 5850 MHz:

802.11a mode, Band Edge, Left Side



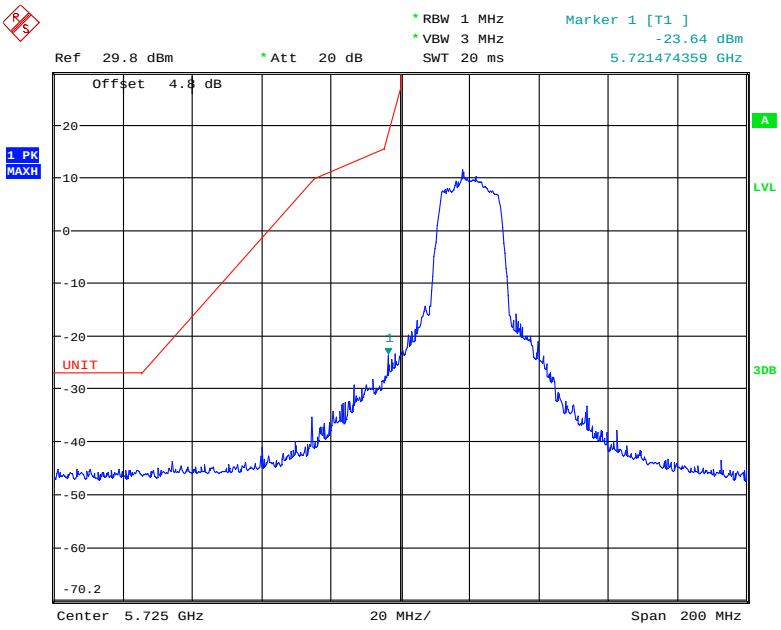
Date: 26.OCT.2017 16:53:38

802.11a mode, Band Edge, Right Side



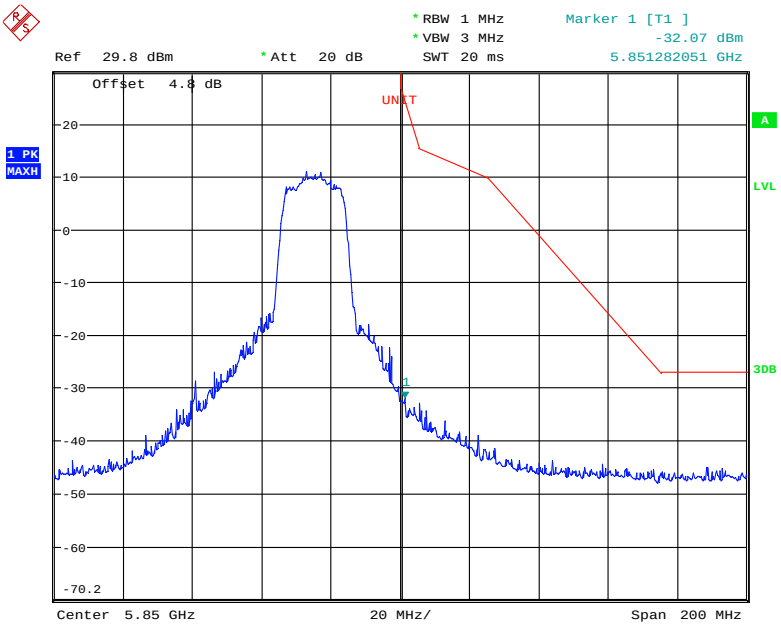
Date: 26.OCT.2017 17:10:56

802.11n20 mode, Band Edge, Left Side



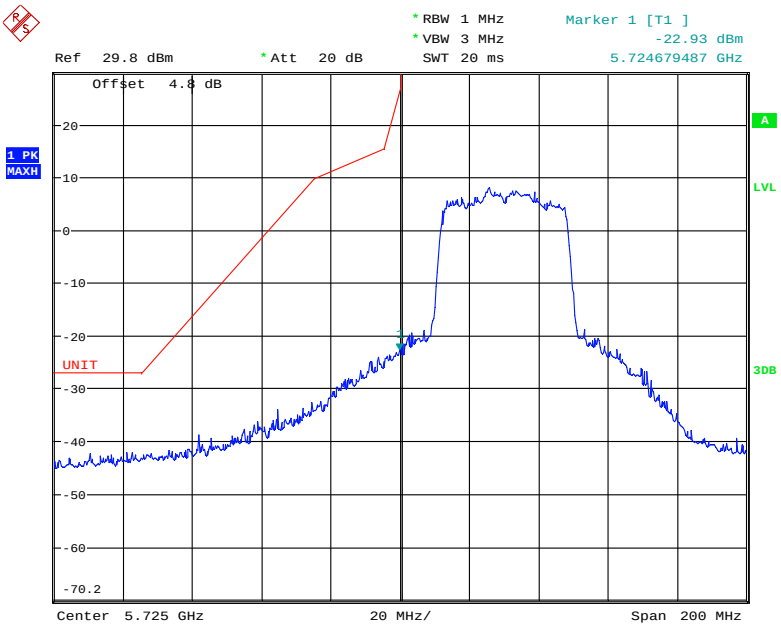
Date: 26.OCT.2017 16:52:35

802.11n20 mode, Band Edge, Right Side



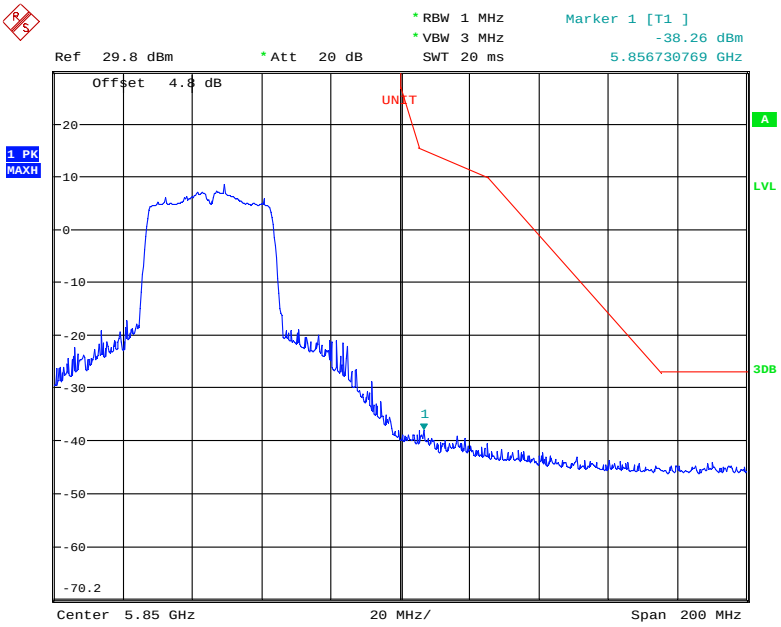
Date: 26.OCT.2017 17:09:11

802.11n40 mode, Band Edge, Left Side



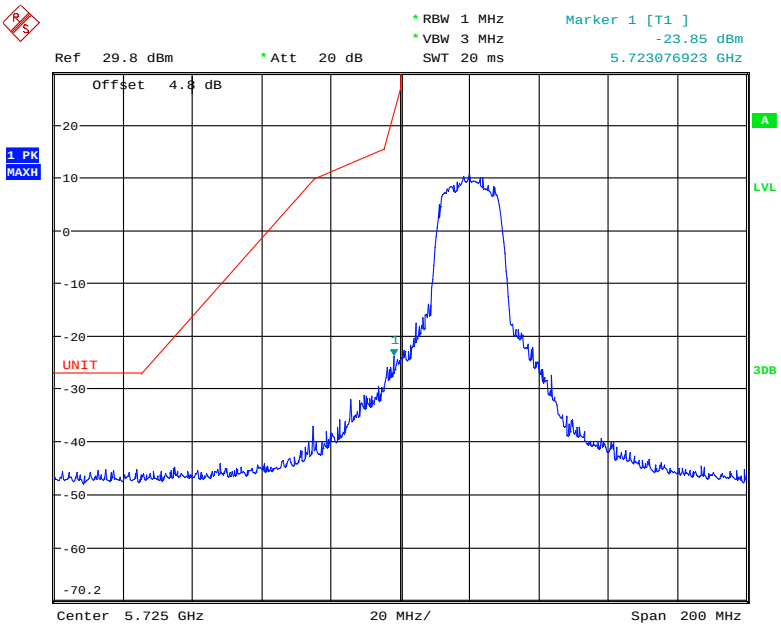
Date: 26.OCT.2017 16:55:35

802.11n40 mode, Band Edge, Right Side



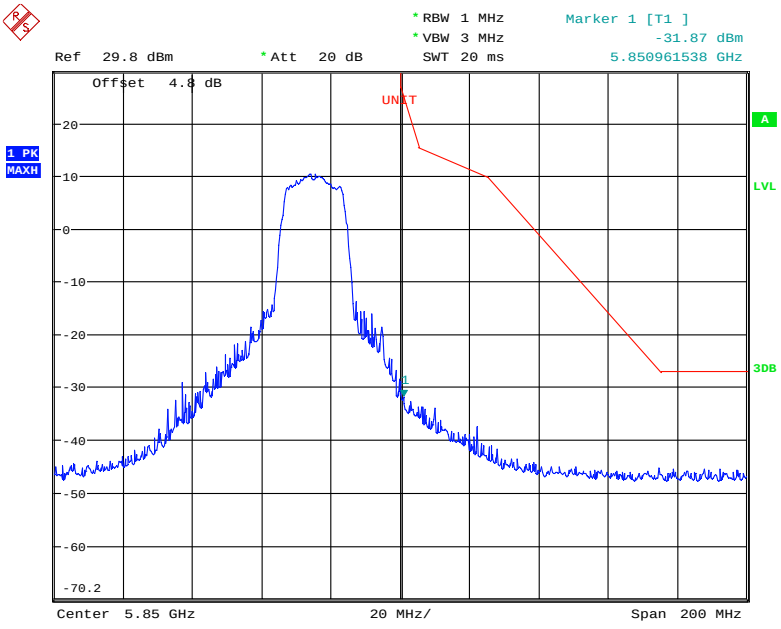
Date: 26.OCT.2017 17:12:48

802.11ac20 mode, Band Edge, Left Side



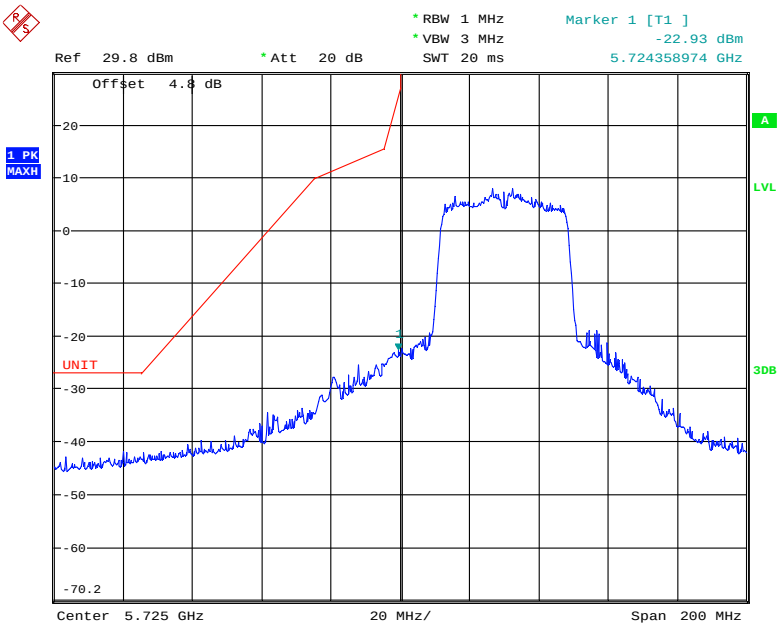
Date: 26.OCT.2017 16:53:38

802.11ac20 mode, Band Edge, Right Side



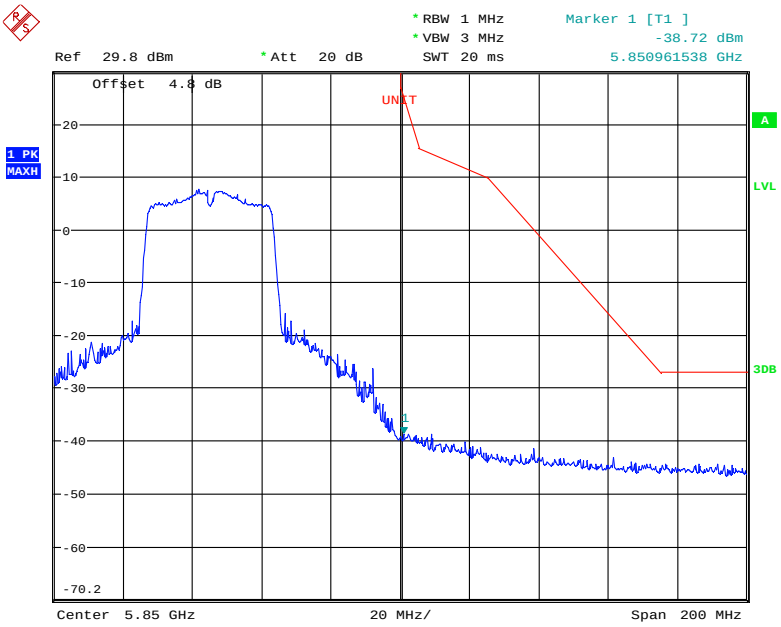
Date: 26.OCT.2017 17:10:56

802.11ac40 mode, Band Edge, Left Side



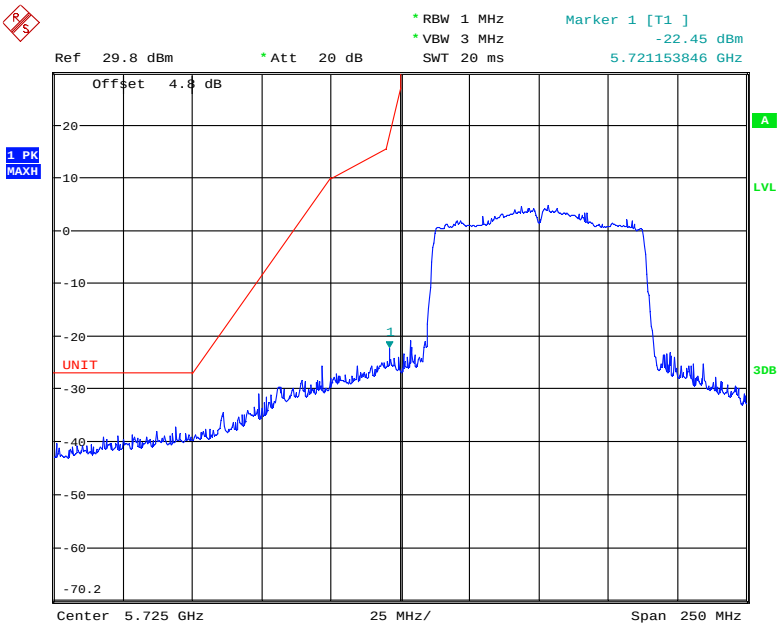
Date: 26.OCT.2017 16:56:45

802.11ac40 mode, Band Edge, Right Side



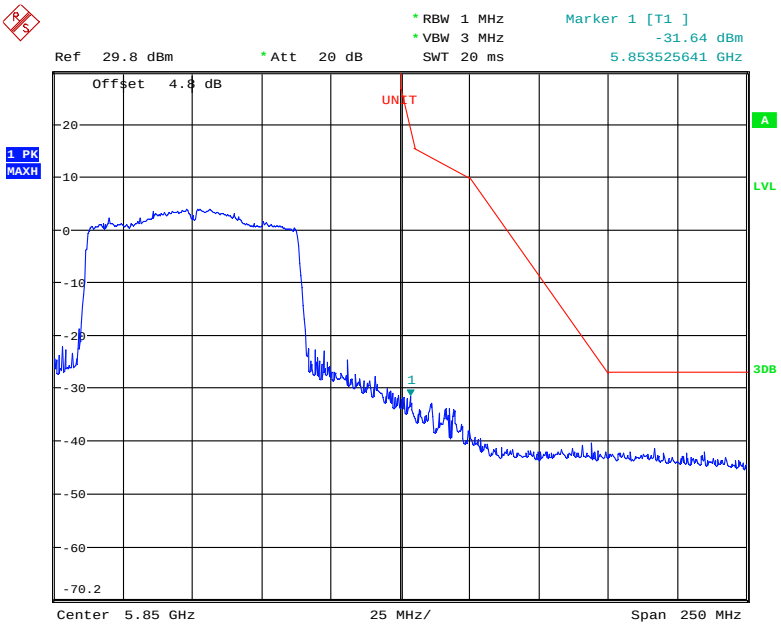
Date: 26.OCT.2017 17:11:59

802.11ac80 mode, Band Edge, Left Side



Date: 26.OCT.2017 16:57:48

802.11ac80 mode, Band Edge, Right Side



Date: 26.OCT.2017 17:13:33

FCC §15.407(a) (1) – 26 dB & 6dB EMISSION BANDWIDTH

Applicable Standard

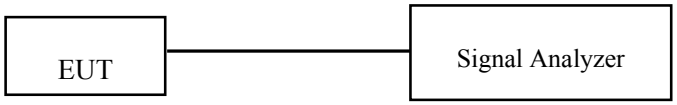
The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band are made over a reference bandwidth of 500 kHz or the 26 dB emission bandwidth of the device, whichever is less. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

Test Procedure

1. Emission Bandwidth (EBW)
a) Set RBW = approximately 1% of the emission bandwidth.
b) Set the VBW > RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

2. **Minimum Emission Bandwidth for the band 5.725-5.85 GHz**
Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:
a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3 × RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.



Test Data

Environmental Conditions

Temperature:	22~24 ℃
Relative Humidity:	45~50 %
ATM Pressure:	100.0~101.0 kPa

The testing was performed by Dylan Li from 2017-10-26 to 2017-10-27.

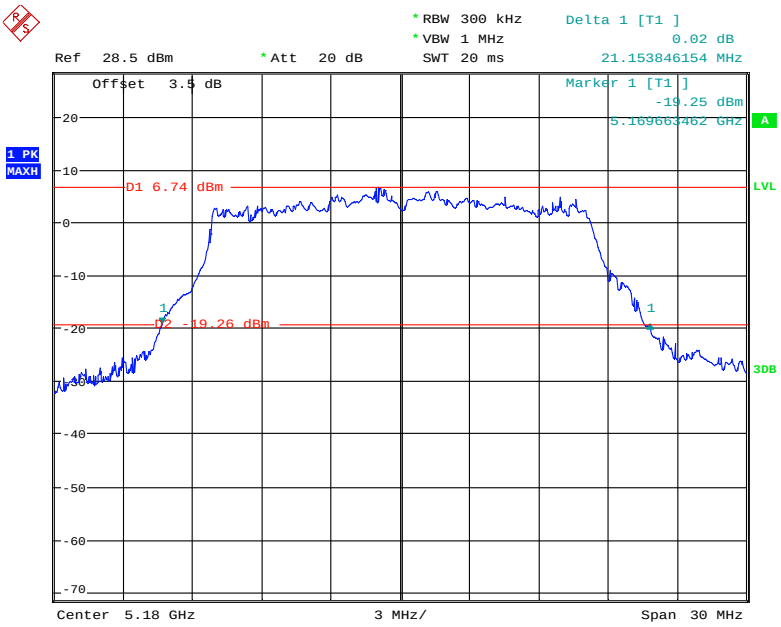
EUT operation mode: Transmitting

Test Result: Pass; please refer to the following tables and plots.

5120 MHz - 5250 MHz:

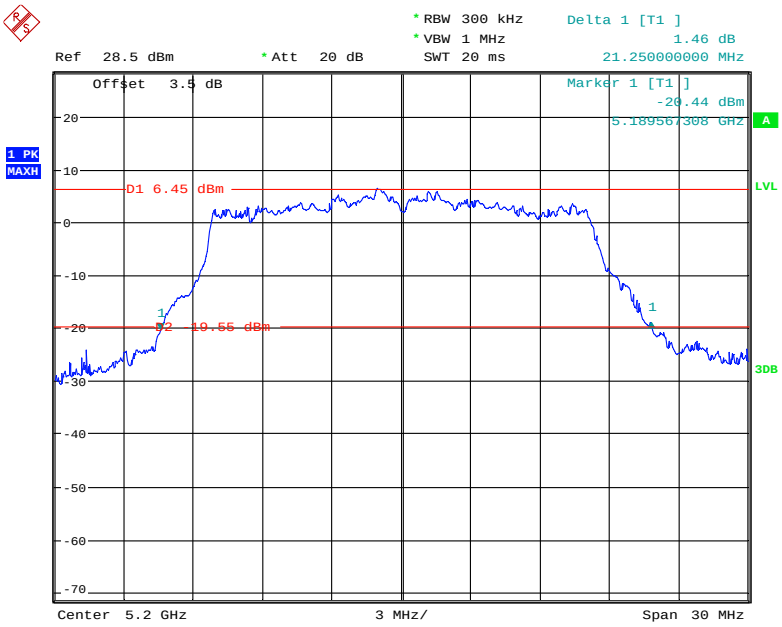
Frequency (MHz)	99% bandwidth (MHz)	26dB Bandwidth (MHz)	Remark
802.11a			No transmitted signal in the 99% bandwidth extends into the U-NII-2A band
5180	16.92	21.15	
5200	16.92	21.25	
5240	16.99	21.95	
802.11n20			
5180	18.08	22.12	
5200	18.01	22.07	
5240	18.01	22.36	
802.11n40			
5190	36.54	49.62	
5230	36.44	49.10	
802.11ac20			No transmitted signal in the 99% bandwidth extends into the U-NII-2A band
5180	18.08	21.78	
5200	18.01	22.02	
5240	18.08	22.50	
802.11ac40			
5190	36.44	49.62	
5230	36.44	49.10	
802.11ac80			
5210	75.77	75.77	

802.11a mode, 26dB Emission Bandwidth, 5180 MHz



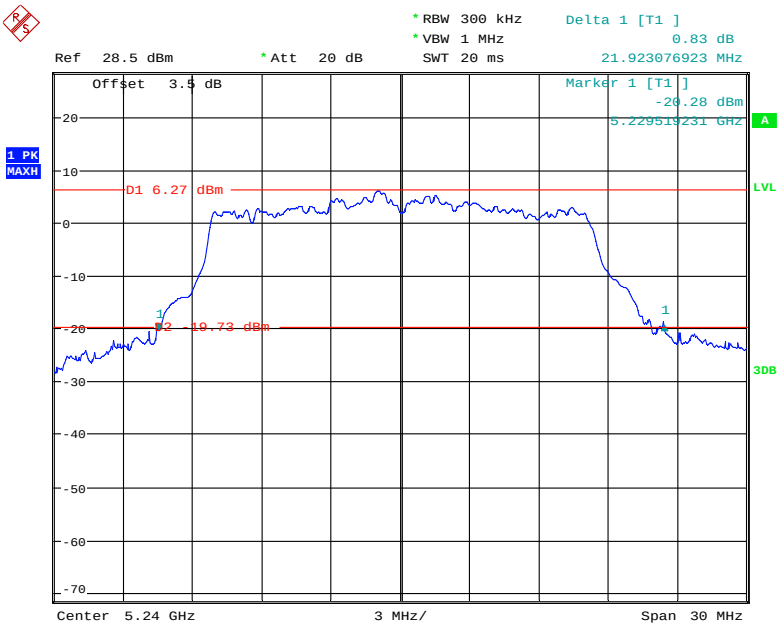
Date: 27.OCT.2017 09:23:25

802.11a mode, 26dB Emission Bandwidth, 5200 MHz



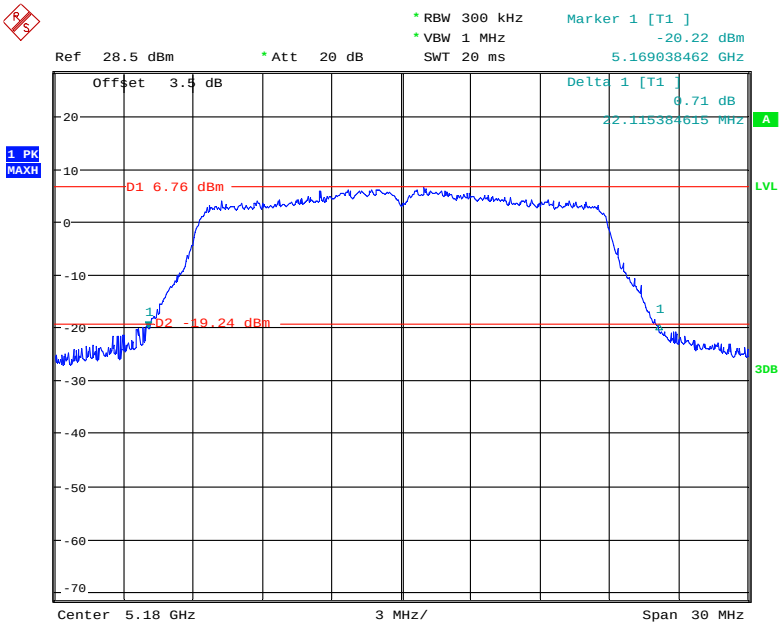
Date: 27.OCT.2017 09:30:07

802.11a mode, 26dB Emission Bandwidth, 5240 MHz



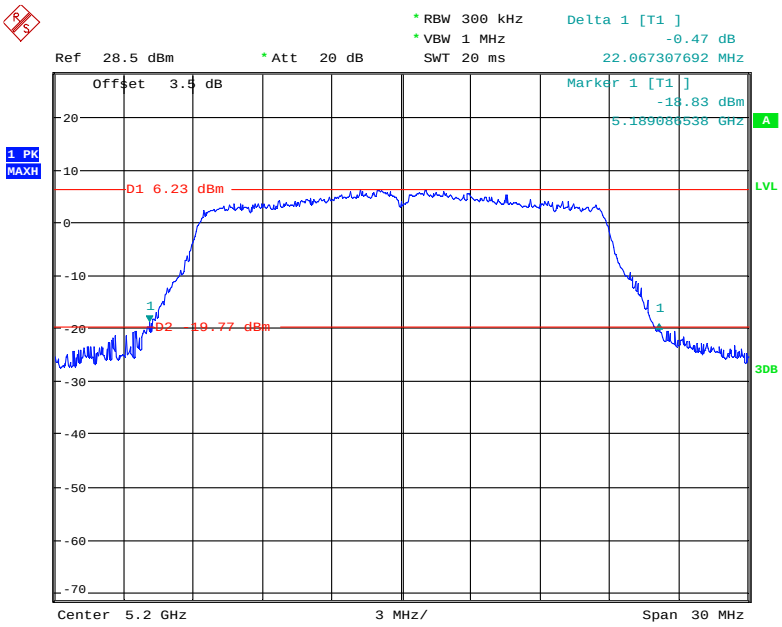
Date: 27.OCT.2017 09:31:43

802.11n20 mode, 26dB Emission Bandwidth, 5180 MHz



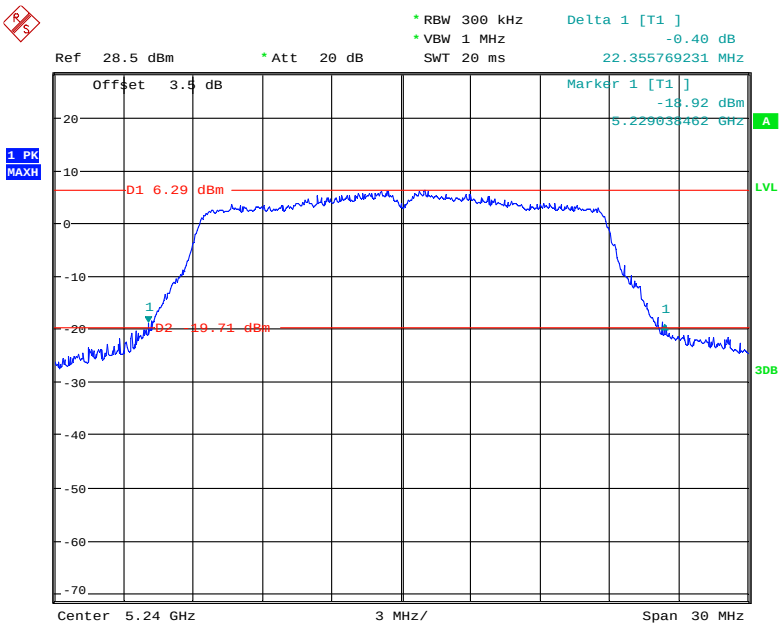
Date: 27.OCT.2017 09:39:51

802.11n20 mode, 26dB Emission Bandwidth, 5200 MHz



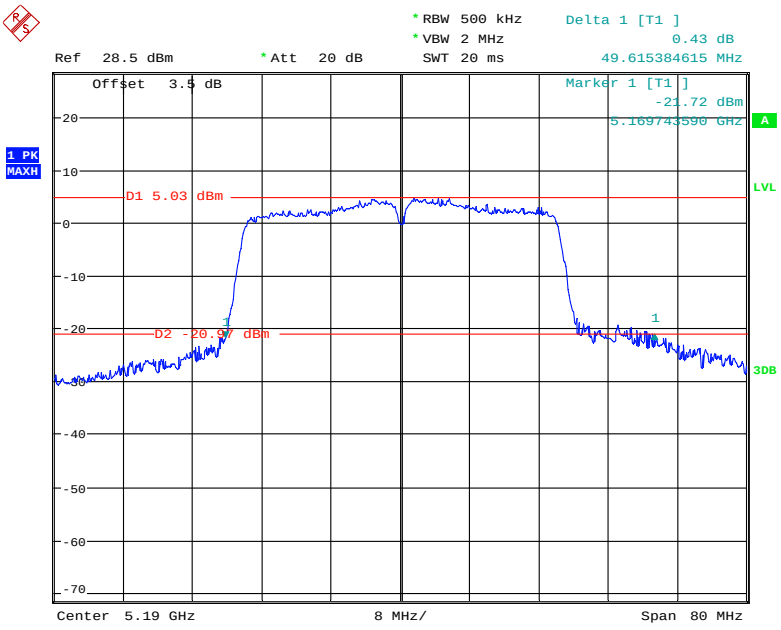
Date: 27.OCT.2017 09:41:10

802.11n20 mode, 26dB Emission Bandwidth, 5240 MHz



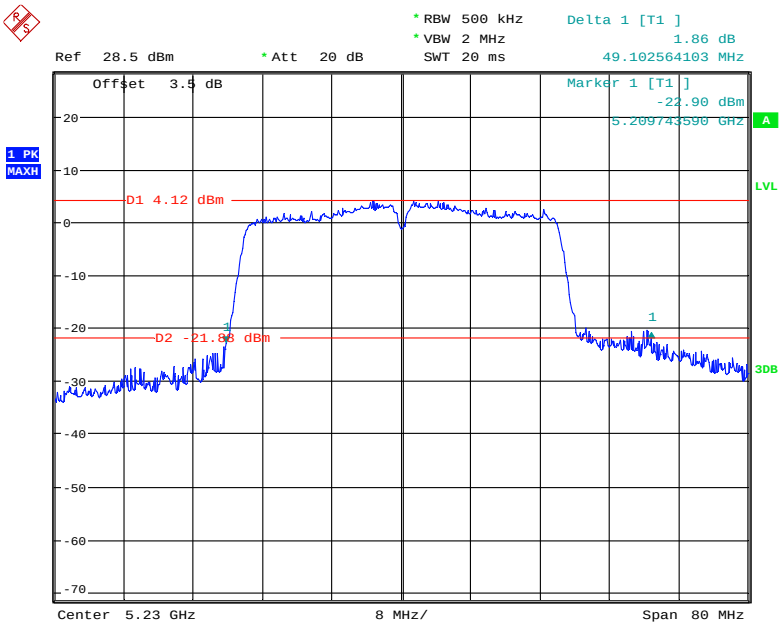
Date: 27.OCT.2017 09:43:07

802.11n40 mode, 26dB Emission Bandwidth, 5190 MHz



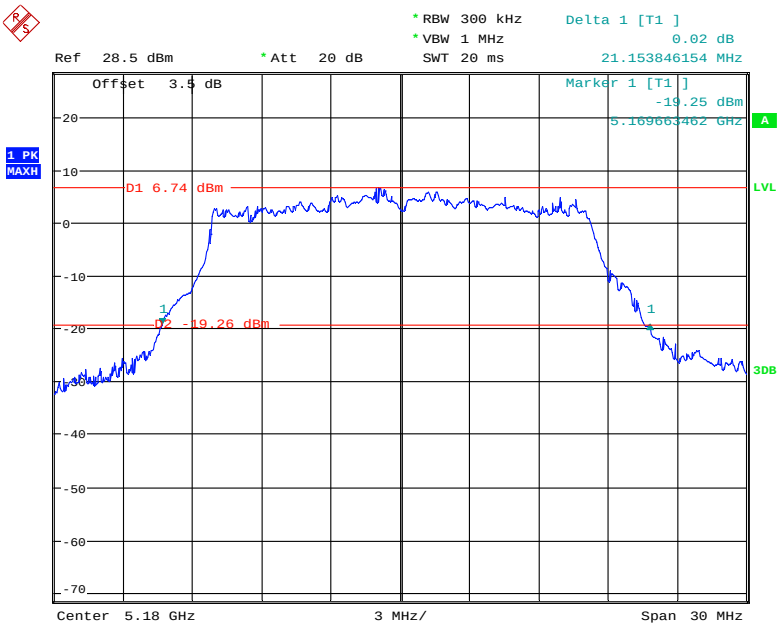
Date: 27.OCT.2017 09:48:19

802.11n40 mode, 26dB Emission Bandwidth, 5230 MHz



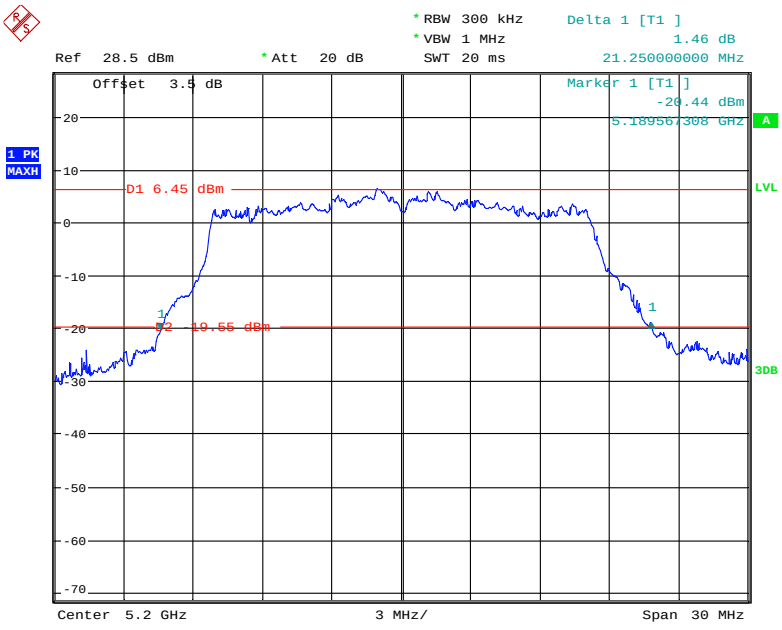
Date: 27.OCT.2017 09:49:34

802.11ac20 mode, 26dB Emission Bandwidth, 5180 MHz



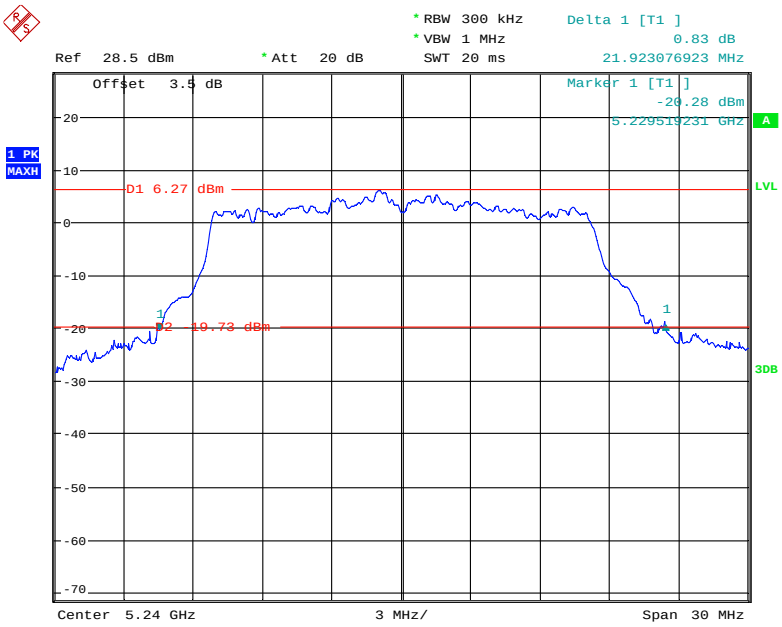
Date: 27.OCT.2017 09:23:25

802.11ac20 mode, 26dB Emission Bandwidth, 5200 MHz



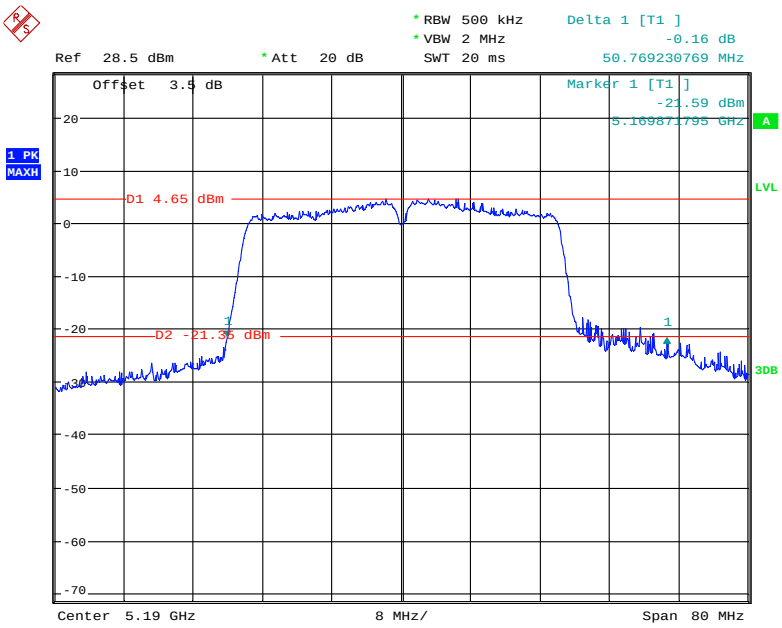
Date: 27.OCT.2017 09:30:07

802.11ac20 mode, 26dB Emission Bandwidth, 5240 MHz



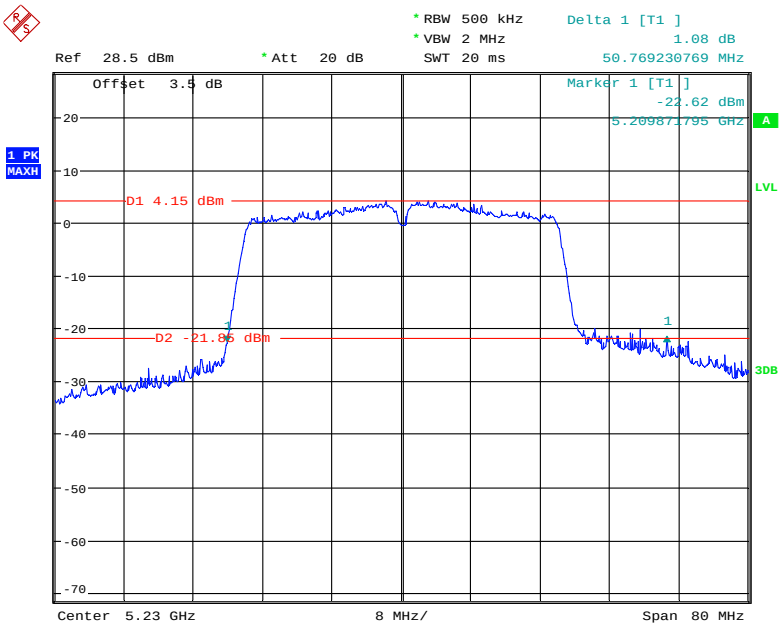
Date: 27.OCT.2017 09:31:43

802.11ac40 mode, 26dB Emission Bandwidth, 5190 MHz



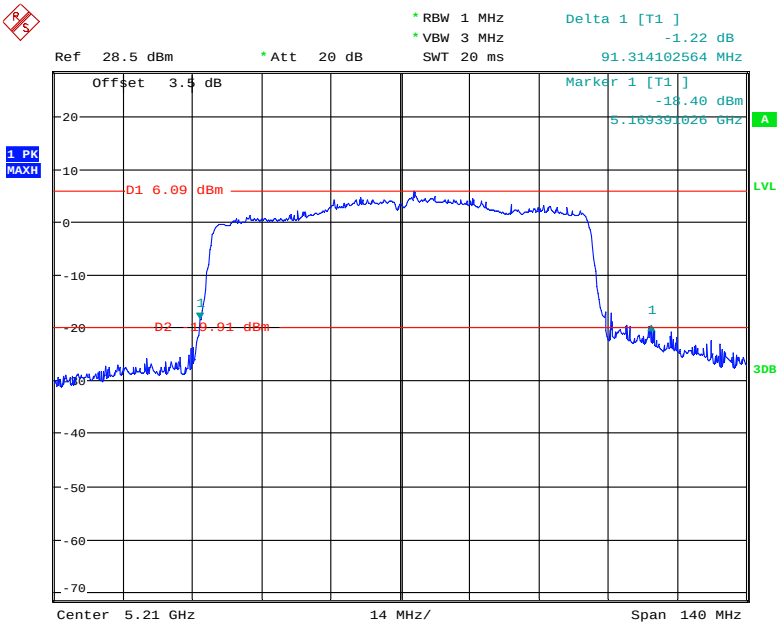
Date: 27.OCT.2017 09:51:19

802.11ac40 mode, 26dB Emission Bandwidth, 5230 MHz



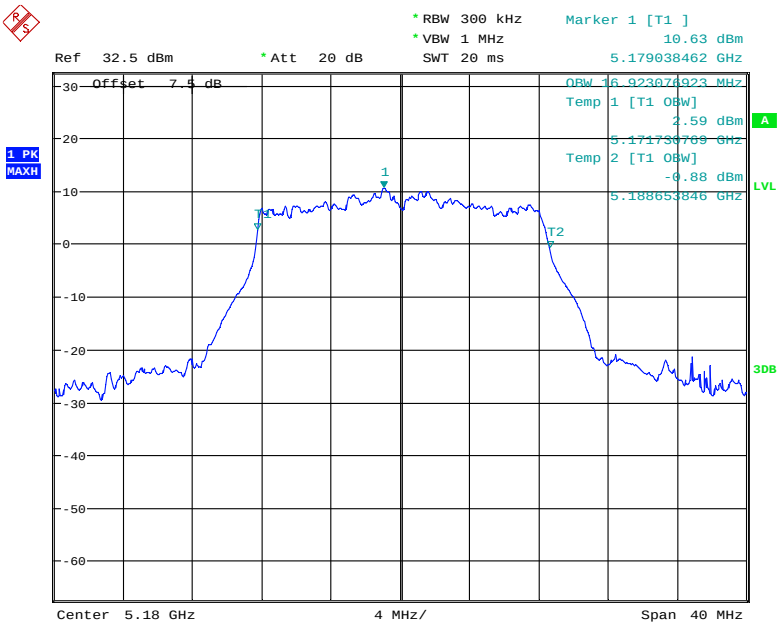
Date: 27.OCT.2017 10:00:13

802.11ac80 mode, 26dB Emission Bandwidth, 5210 MHz



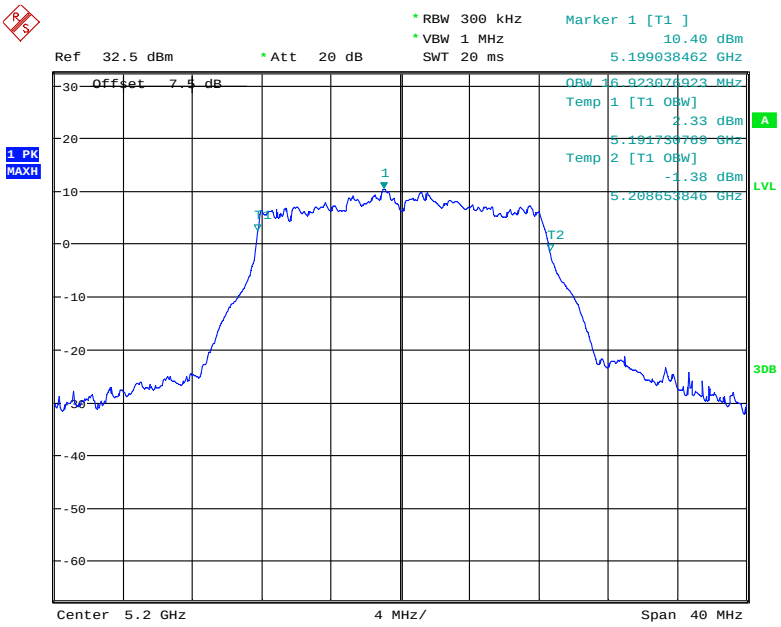
Date: 27.OCT.2017 09:53:09

802.11a mode, 99% Occupied Bandwidth, 5180 MHz



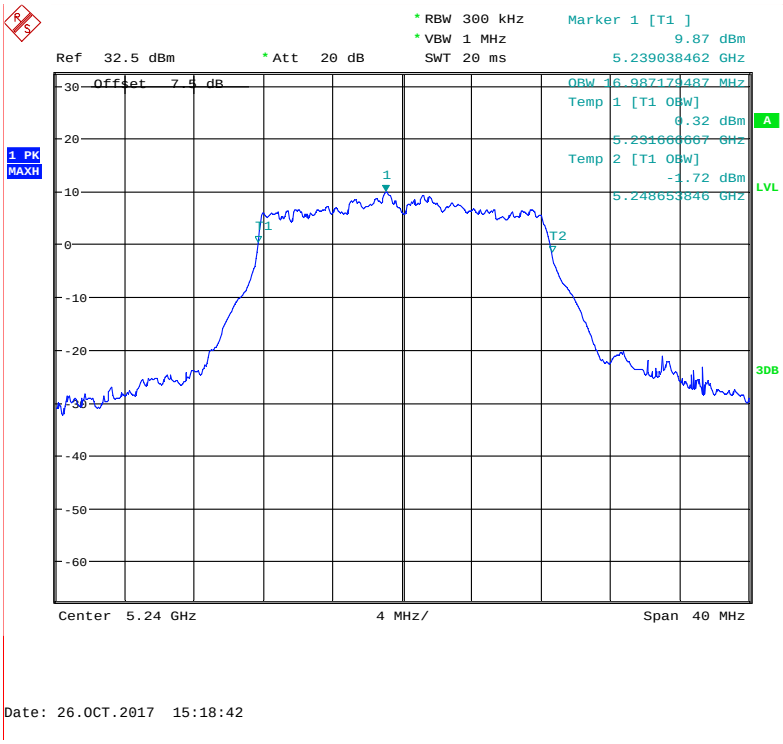
Date: 26.OCT.2017 15:19:30

802.11a mode, 99% Occupied Bandwidth, 5200 MHz

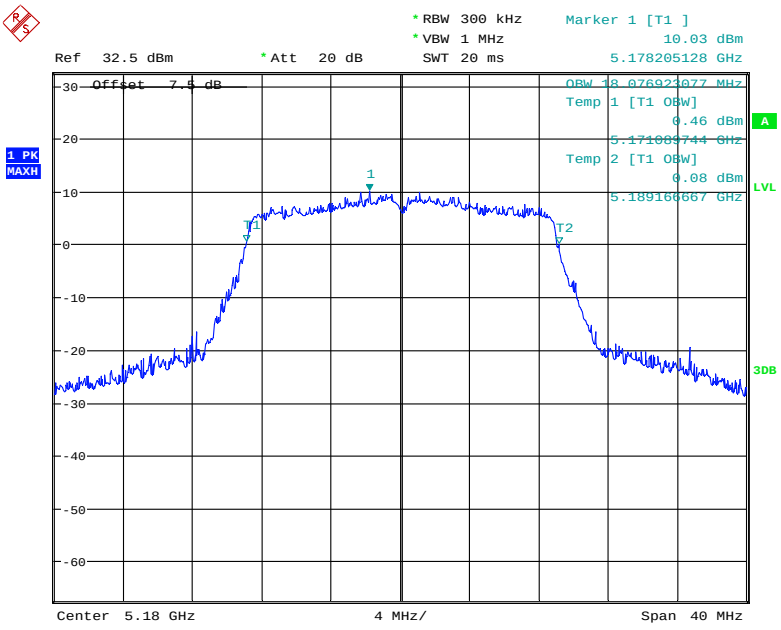


Date: 26.OCT.2017 15:19:08

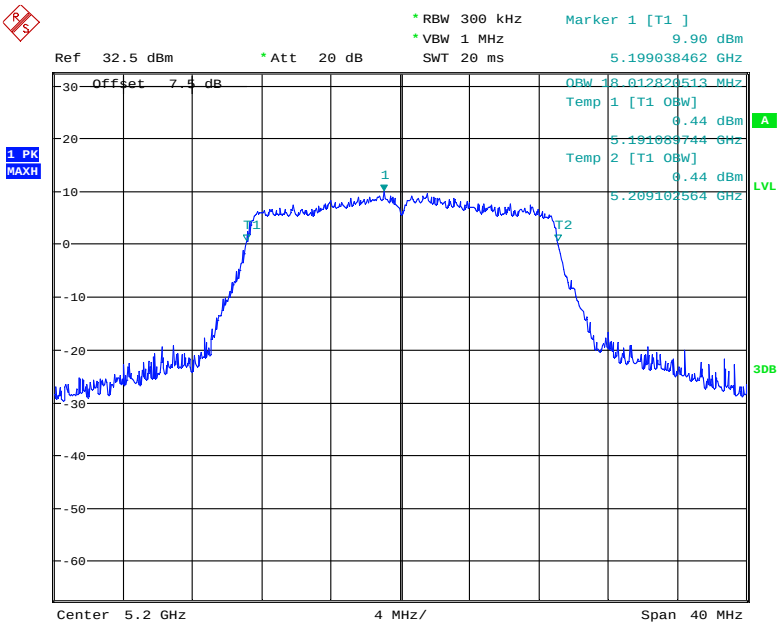
802.11a mode, 99% Occupied Bandwidth, 5240 MHz



802.11n20 mode, 99% Occupied Bandwidth, 5180 MHz

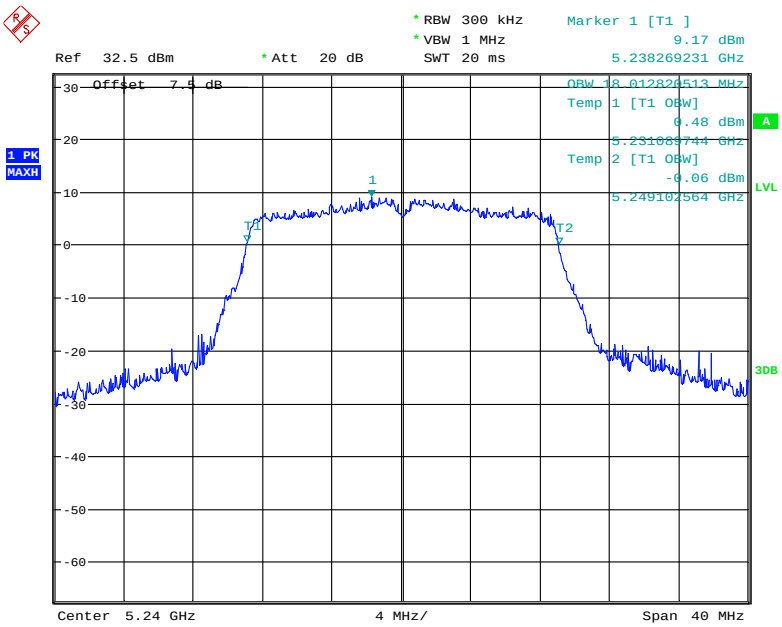


802.11n20 mode, 99% Occupied Bandwidth, 5200 MHz



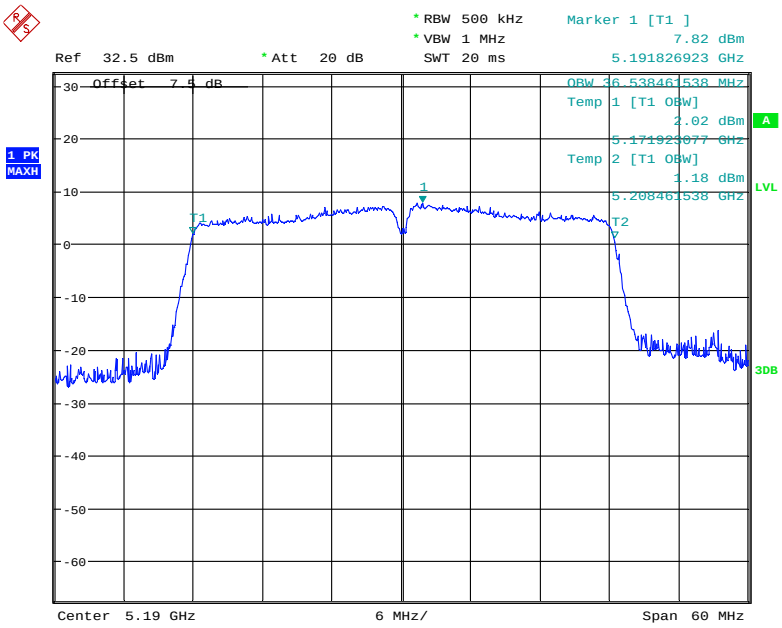
Date: 26.OCT.2017 15:20:22

802.11n20 mode, 99% Occupied Bandwidth, 5240 MHz



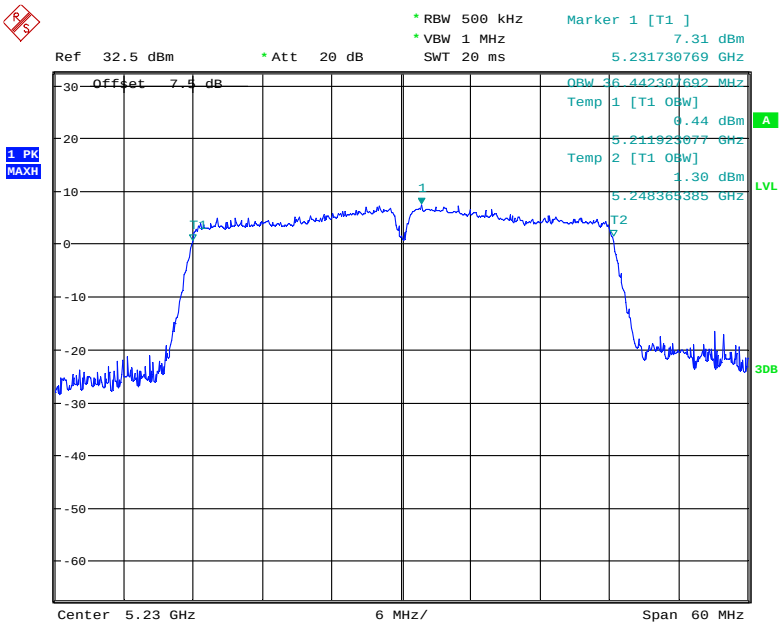
Date: 26.OCT.2017 15:21:00

802.11n40 mode, 99% Occupied Bandwidth, 5190 MHz



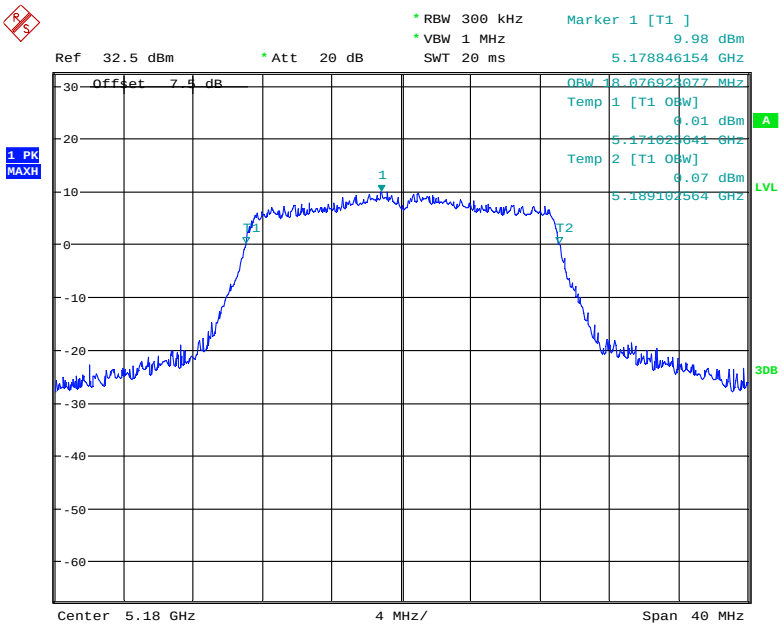
Date: 26.OCT.2017 15:23:53

802.11n40 mode, 99% Occupied Bandwidth, 5230 MHz



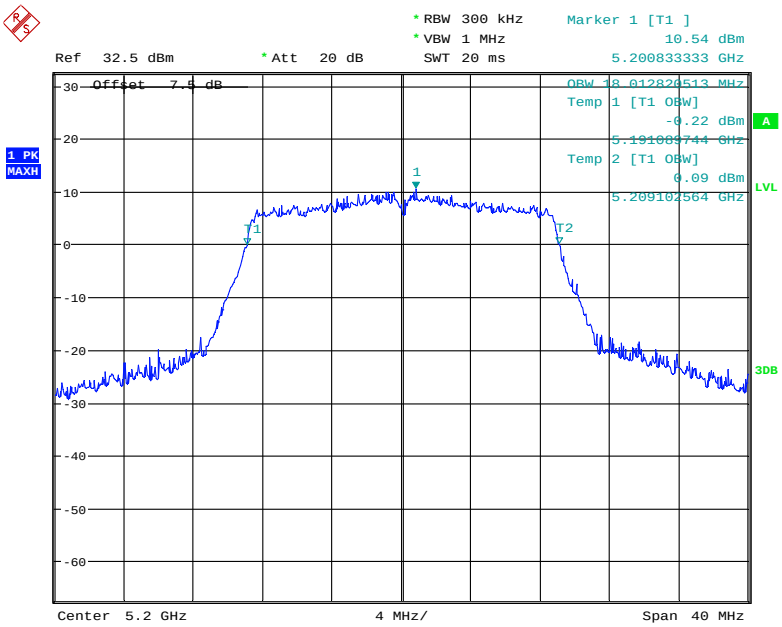
Date: 26.OCT.2017 15:24:34

802.11ac20 mode, 99% Occupied Bandwidth, 5180 MHz



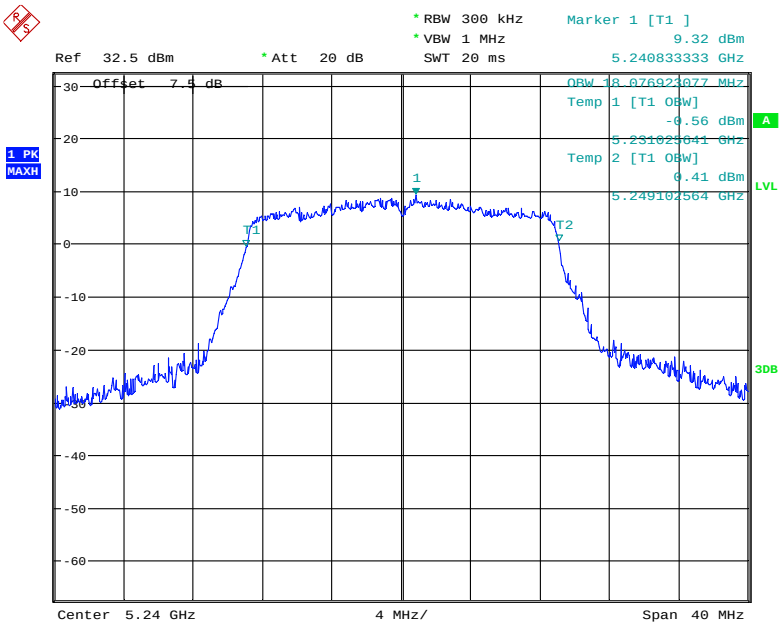
Date: 26.OCT.2017 15:21:29

802.11ac20 mode, 99% Occupied Bandwidth, 5200 MHz

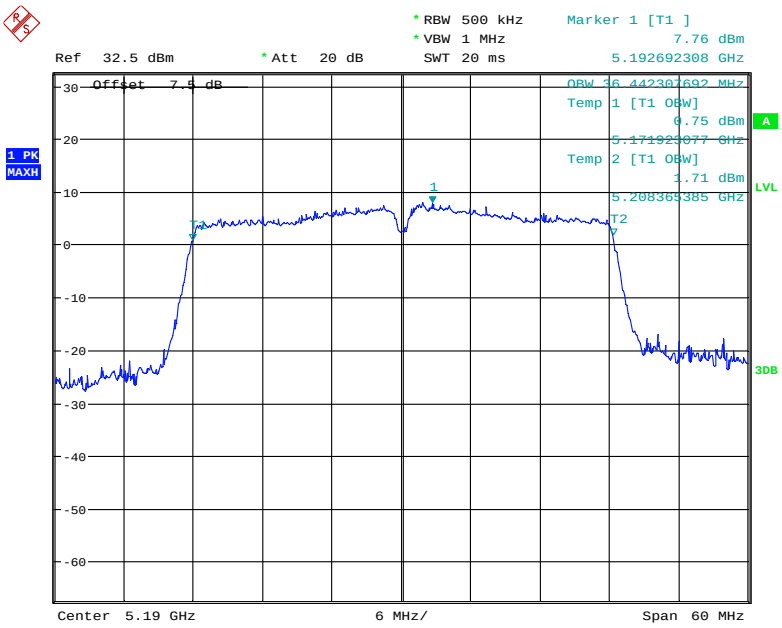


Date: 26.OCT.2017 15:21:56

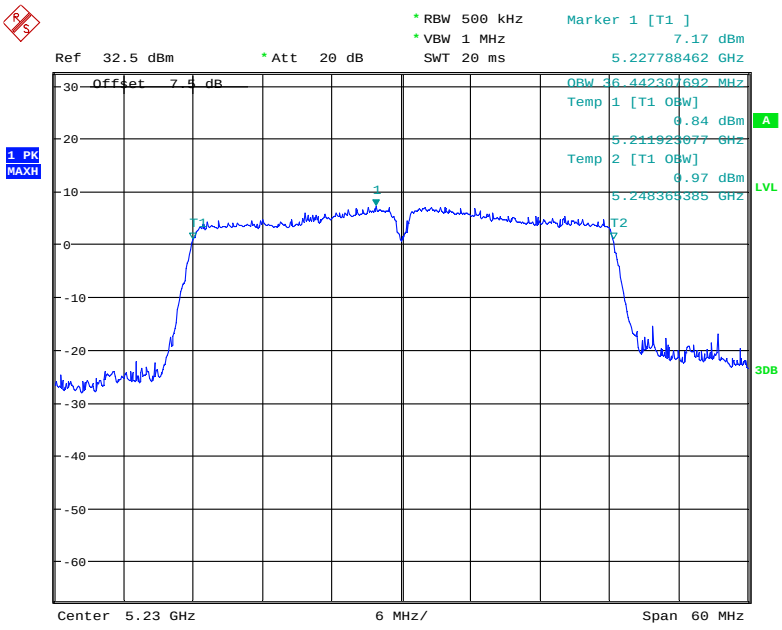
802.11ac20 mode, 99% Occupied Bandwidth, 5240 MHz



802.11ac40 mode, 99% Occupied Bandwidth, 5190 MHz

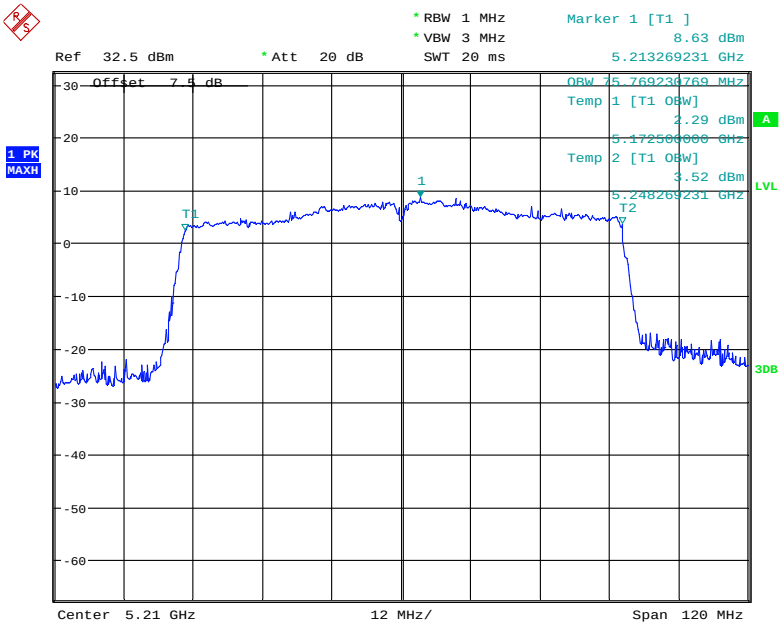


802.11ac40 mode, 99% Occupied Bandwidth, 5230 MHz



Date: 26.OCT.2017 15:25:27

802.11ac80 mode, 99% Occupied Bandwidth, 5210 MHz

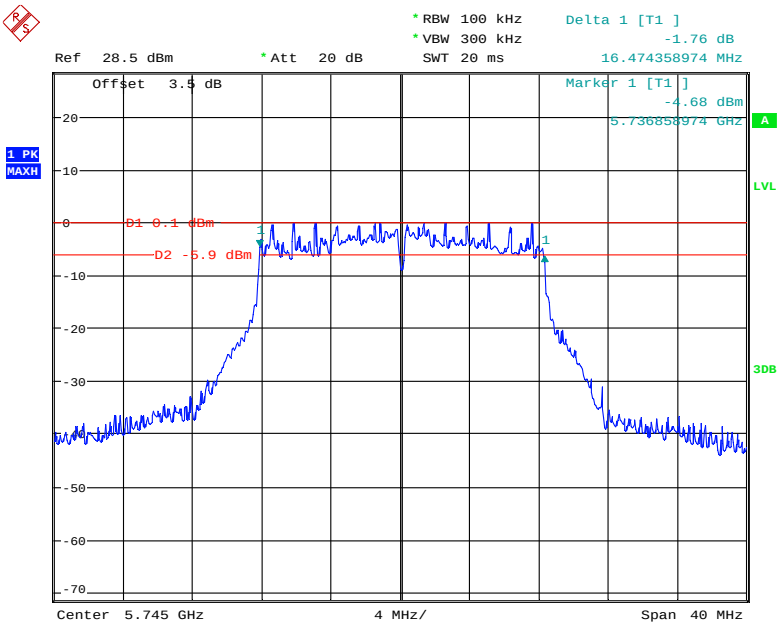


Date: 26.OCT.2017 15:26:37

5725 MHz – 5850 MHz:

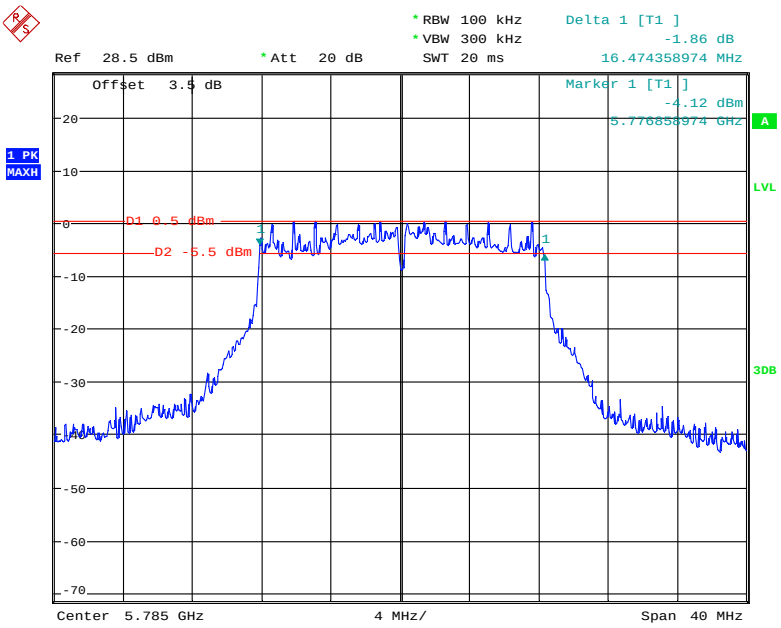
Frequency (MHz)	99% bandwidth (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
802.11a			
5745	16.92	16.47	0.5
5785	16.92	16.47	0.5
5825	16.92	16.47	0.5
802.11n20			
5745	18.01	17.50	0.5
5785	18.14	17.56	0.5
5825	18.01	17.56	0.5
802.11n40			
5755	36.54	36.15	0.5
5795	36.54	35.90	0.5
802.11ac20			
5745	18.08	17.63	0.5
5785	18.14	17.63	0.5
5825	18.14	17.56	0.5
802.11ac40			
5755	36.54	36.15	0.5
5795	36.54	36.15	0.5
802.11ac80			
5775	75.96	74.87	0.5

802.11a mode, 6dB Emission Bandwidth, 5745 MHz



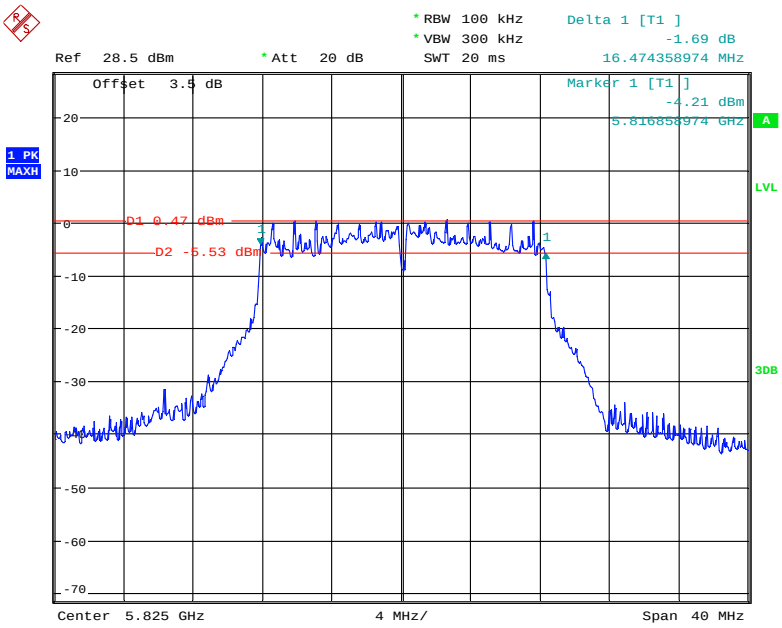
Date: 26.OCT.2017 14:30:31

802.11a mode, 6dB Emission Bandwidth, 5785 MHz



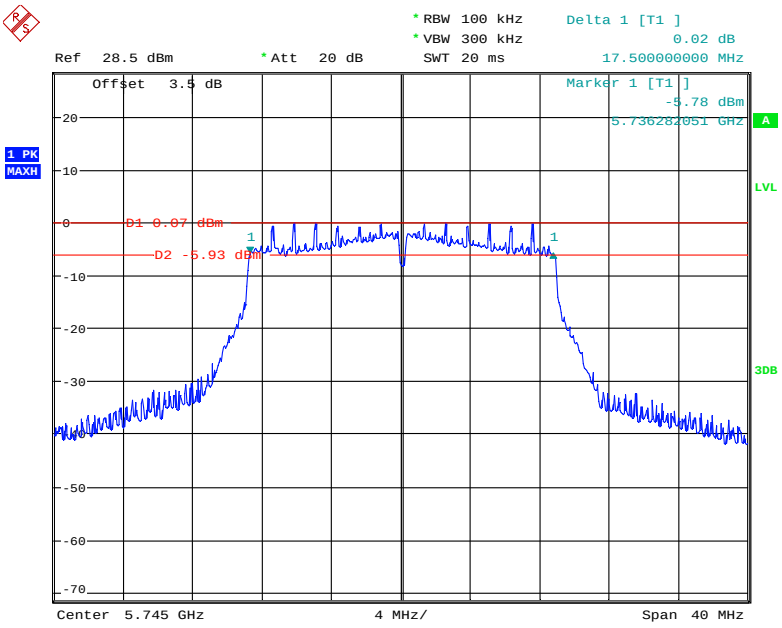
Date: 26.OCT.2017 14:32:13

802.11a mode, 6dB Emission Bandwidth, 5825 MHz



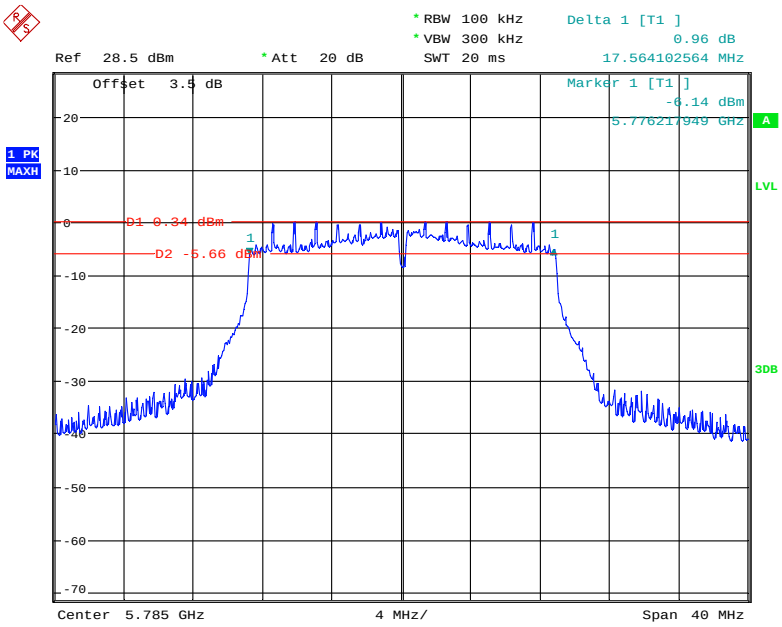
Date: 26.OCT.2017 14:33:24

802.11n20 mode, 6dB Emission Bandwidth, 5745 MHz



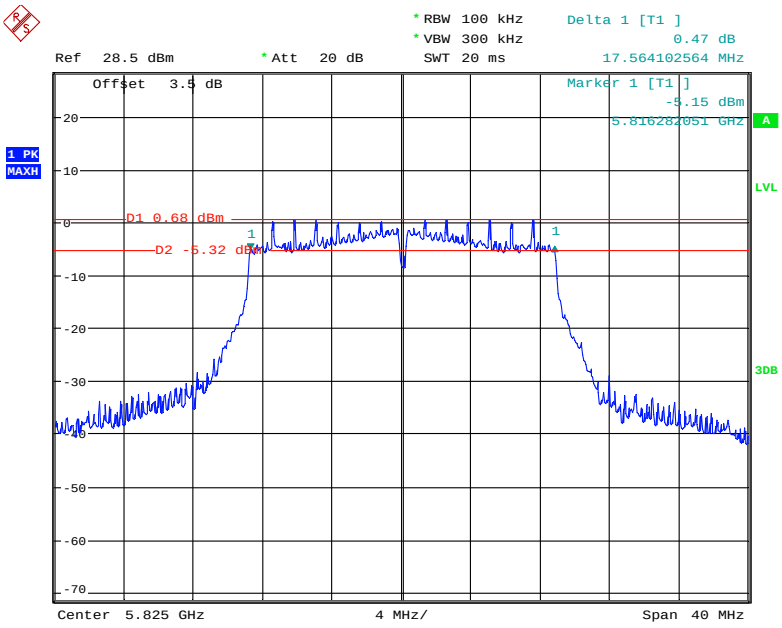
Date: 26.OCT.2017 14:34:59

802.11n20 mode, 6dB Emission Bandwidth, 5785 MHz



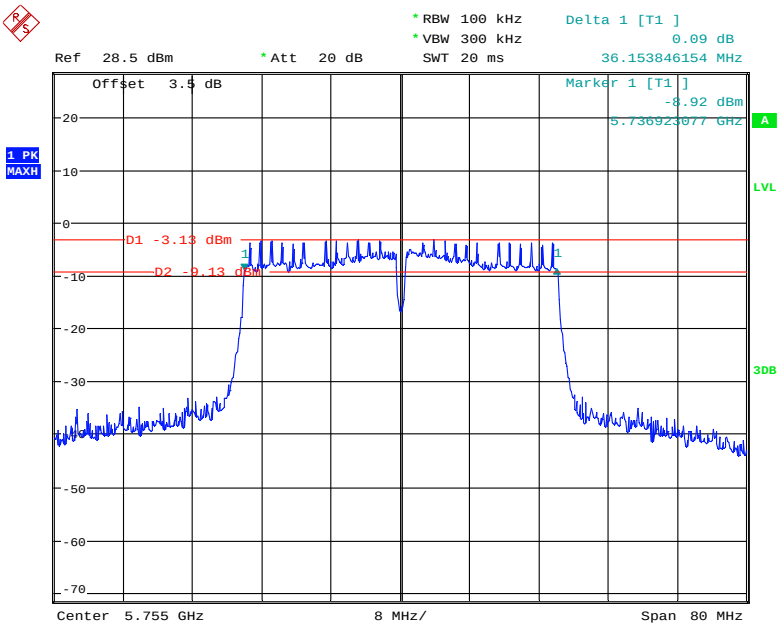
Date: 26.OCT.2017 14:36:01

802.11n20 mode, 6dB Emission Bandwidth, 5825 MHz



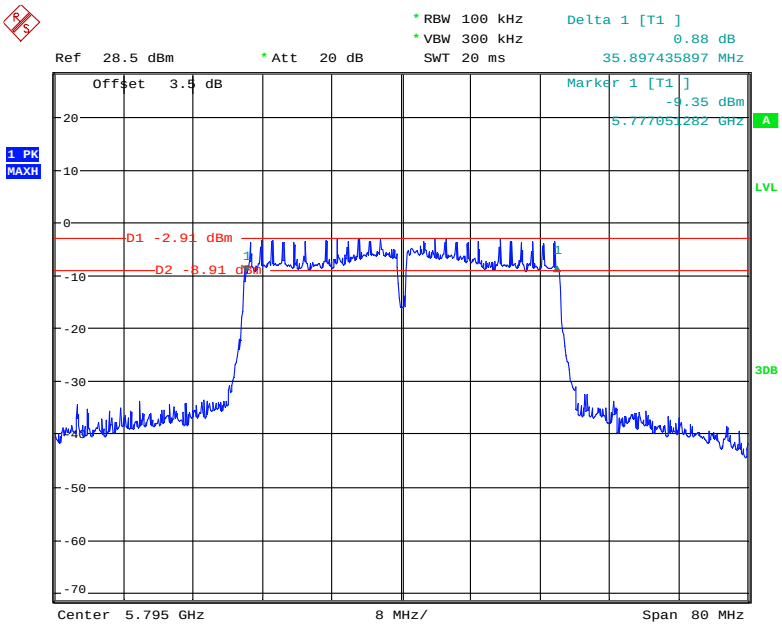
Date: 26.OCT.2017 14:36:55

802.11n40 mode, 6dB Emission Bandwidth, 5755 MHz



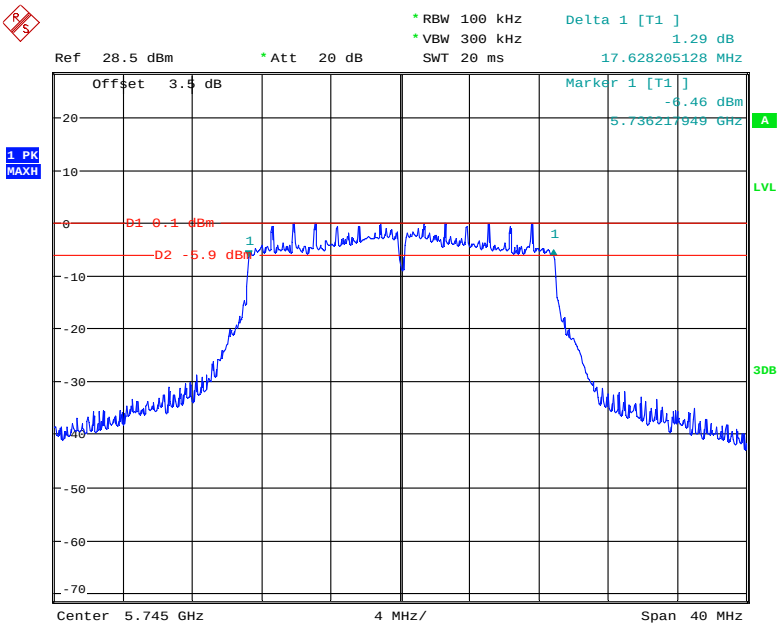
Date: 26.OCT.2017 14:43:32

802.11n40 mode, 6dB Emission Bandwidth, 5795 MHz



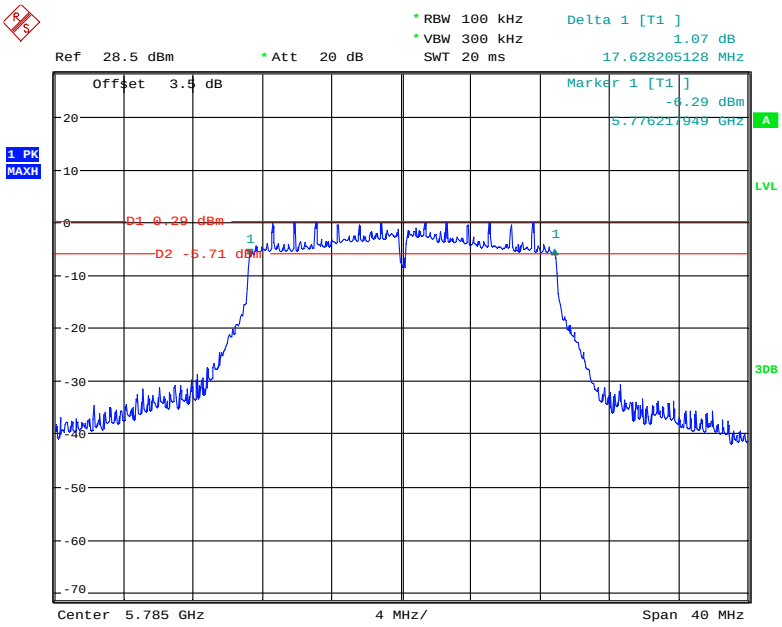
Date: 26.OCT.2017 14:45:11

802.11ac20 mode, 6dB Emission Bandwidth, 5745 MHz



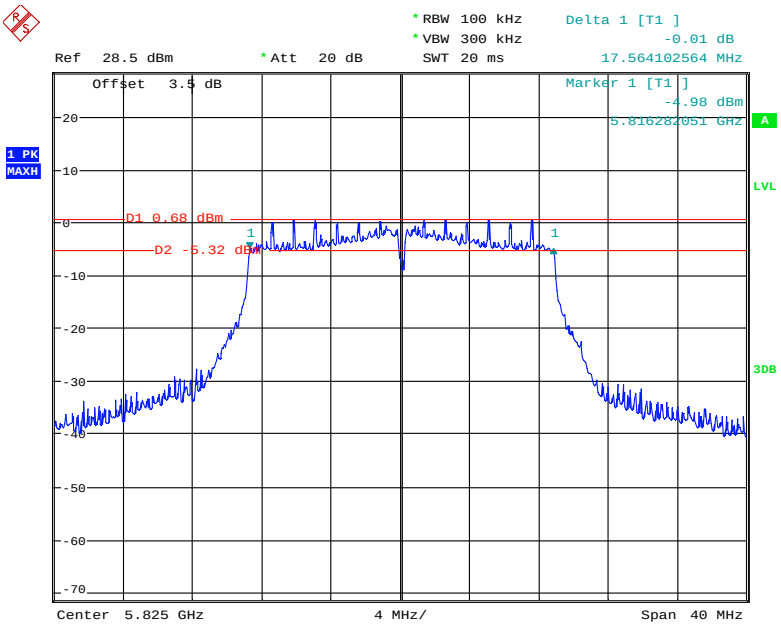
Date: 26.OCT.2017 14:38:24

802.11ac20 mode, 6dB Emission Bandwidth, 5785 MHz



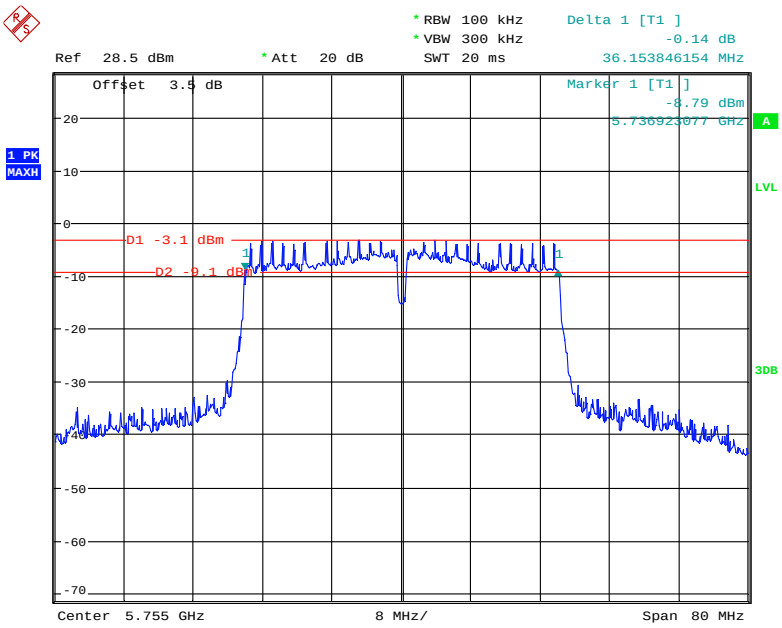
Date: 26.OCT.2017 14:39:43

802.11ac20 mode, 6dB Emission Bandwidth, 5825 MHz



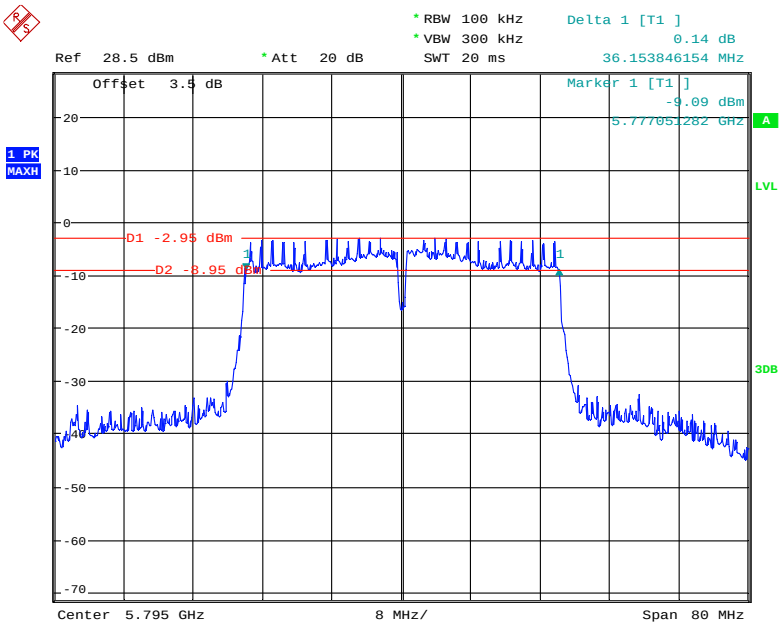
Date: 26.OCT.2017 14:41:09

802.11ac40 mode, 6dB Emission Bandwidth, 5755 MHz



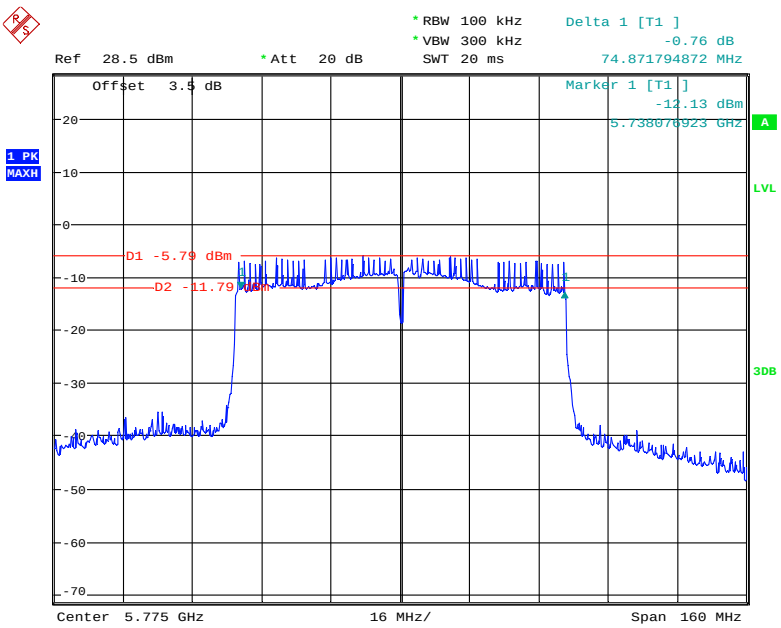
Date: 26.OCT.2017 14:46:38

802.11ac40 mode, 6dB Emission Bandwidth, 5795 MHz



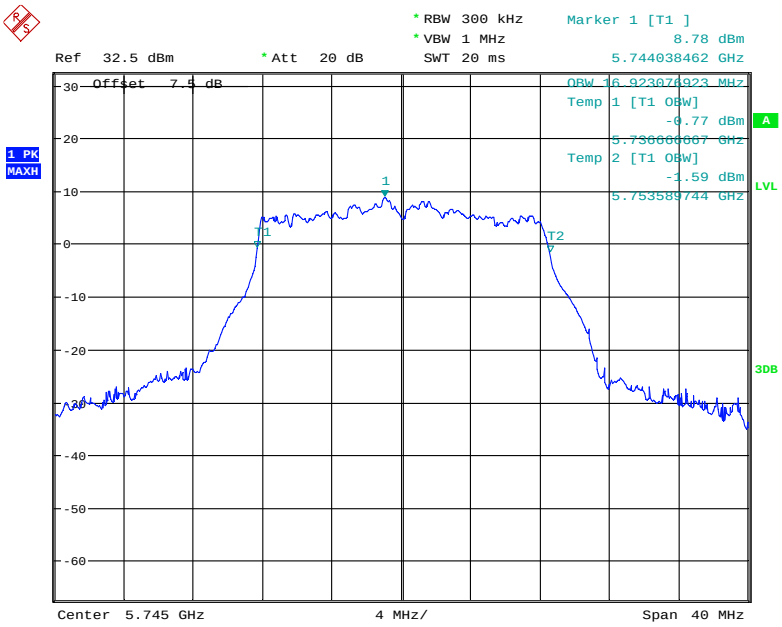
Date: 26.OCT.2017 14:47:34

802.11ac80 mode, 6dB Emission Bandwidth, 5775 MHz



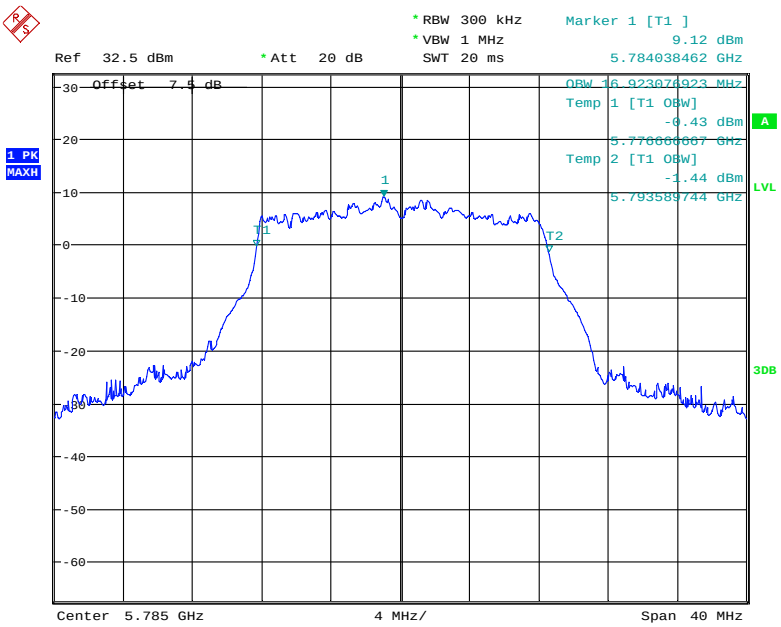
Date: 26.OCT.2017 14:48:49

802.11a mode, 99% Occupied Bandwidth, 5745 MHz



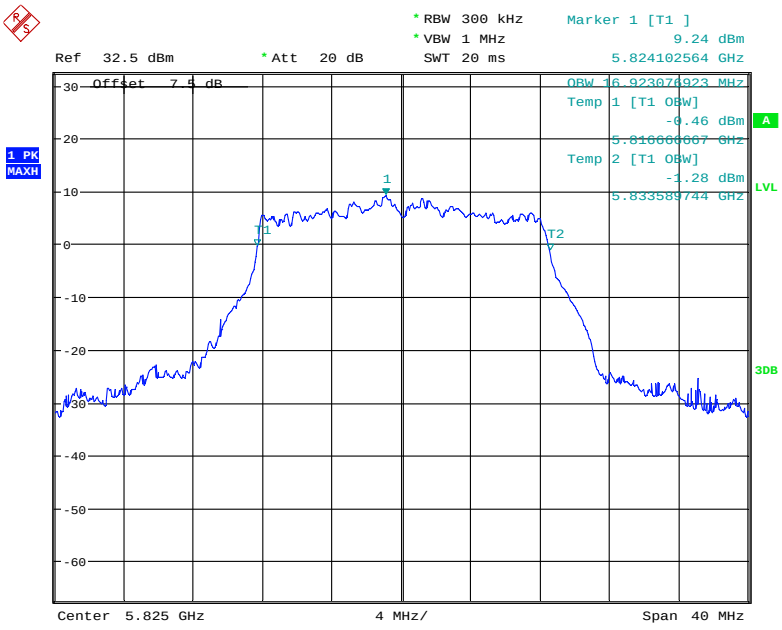
Date: 26.OCT.2017 15:27:36

802.11a mode, 99% Occupied Bandwidth, 5785 MHz



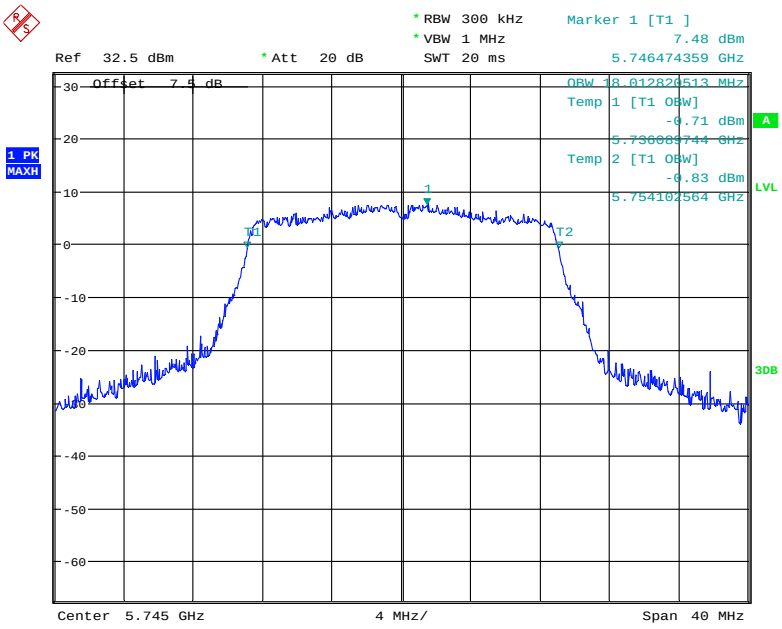
Date: 26.OCT.2017 15:28:28

802.11a mode, 99% Occupied Bandwidth, 5825 MHz



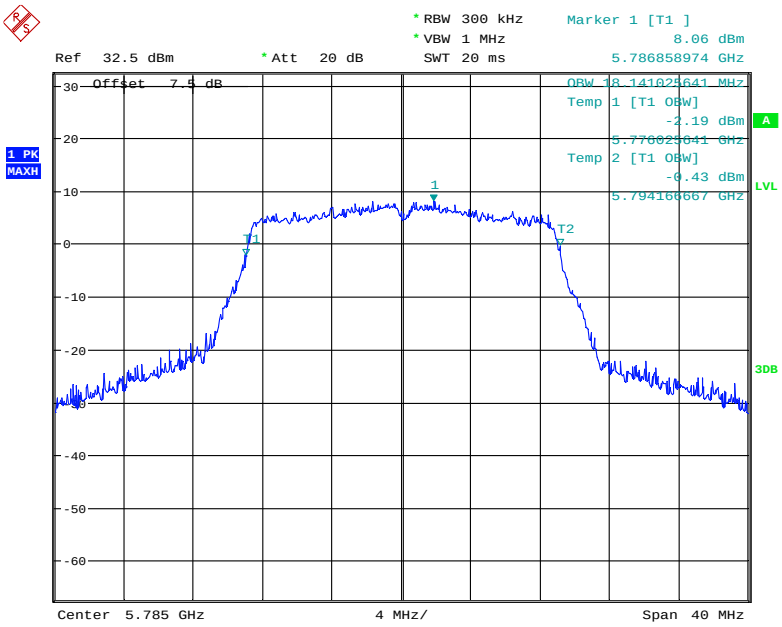
Date: 26.OCT.2017 15:29:23

802.11n20 mode, 99% Occupied Bandwidth, 5745 MHz



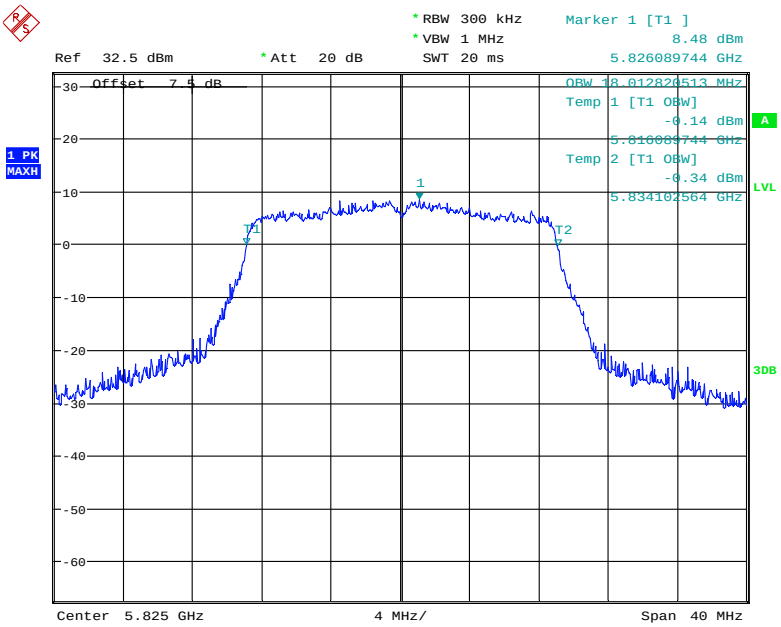
Date: 26.OCT.2017 15:30:09

802.11n20 mode, 99% Occupied Bandwidth, 5785 MHz



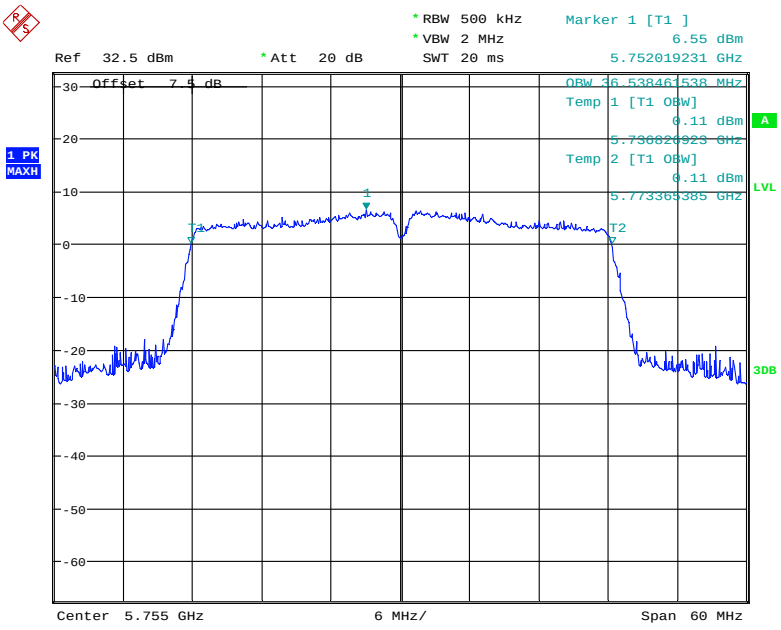
Date: 26.OCT.2017 15:30:40

802.11n20 mode, 99% Occupied Bandwidth, 5825 MHz



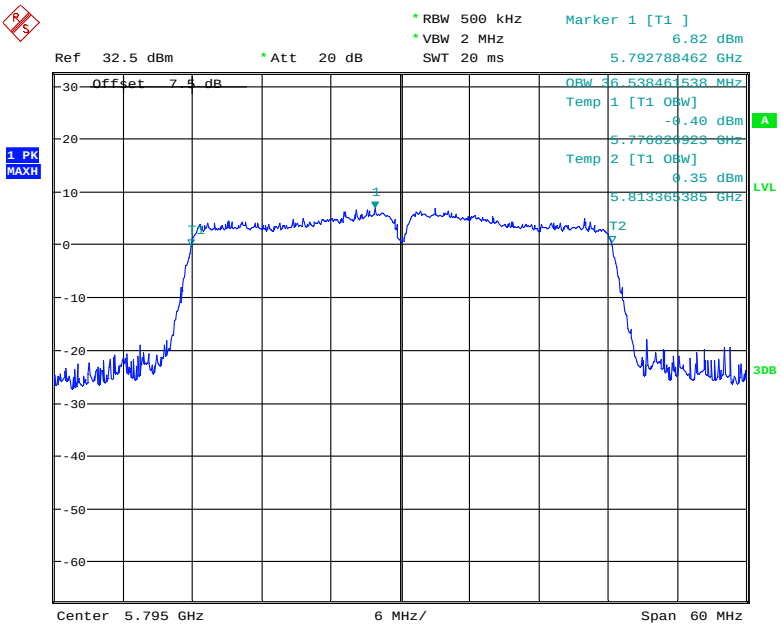
Date: 26.OCT.2017 15:31:10

802.11n40 mode, 99% Occupied Bandwidth, 5755 MHz



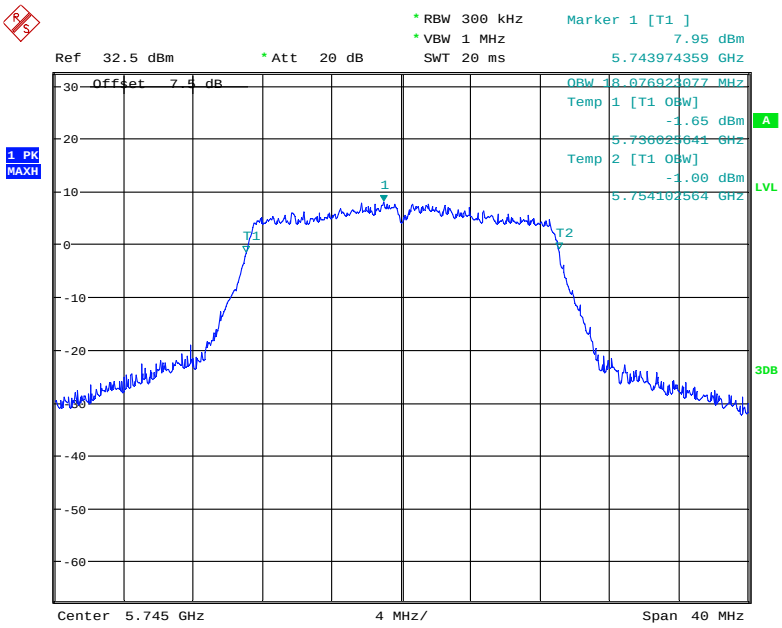
Date: 26.OCT.2017 15:33:56

802.11n40 mode, 99% Occupied Bandwidth, 5795 MHz



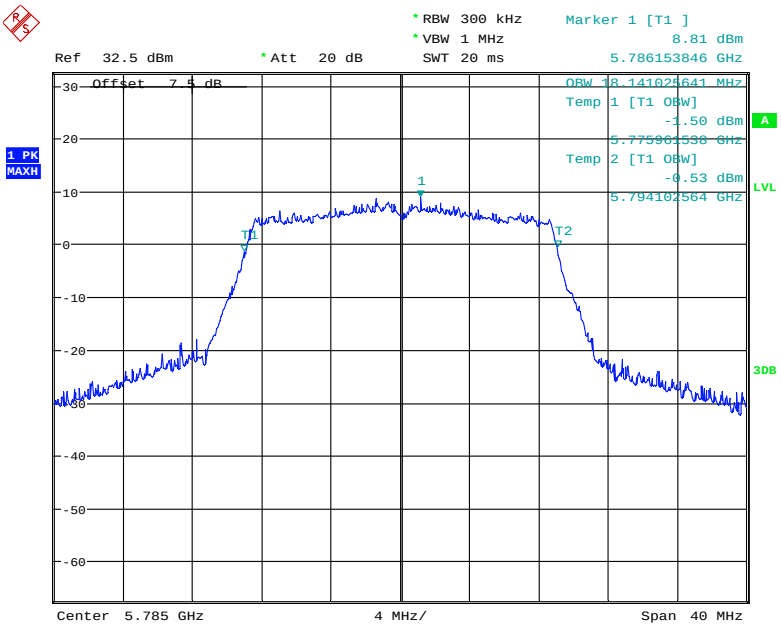
Date: 26.OCT.2017 15:34:34

802.11ac20 mode, 99% Occupied Bandwidth, 5745 MHz



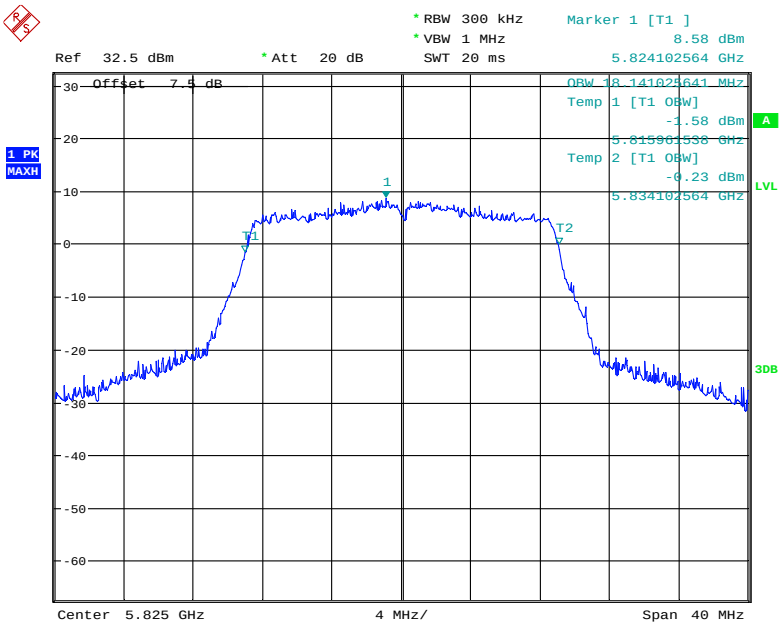
Date: 26.OCT.2017 15:31:45

802.11ac20 mode, 99% Occupied Bandwidth, 5785 MHz



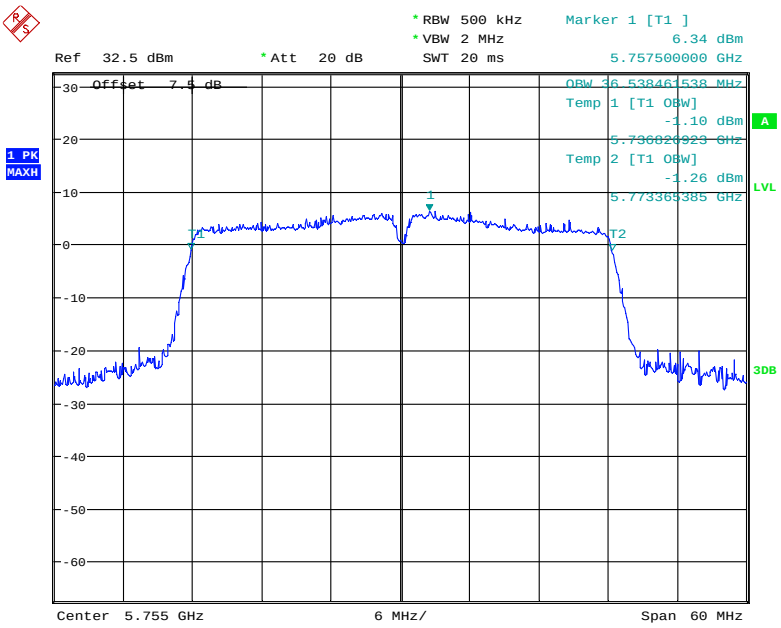
Date: 26.OCT.2017 15:32:15

802.11ac20 mode, 99% Occupied Bandwidth, 5825 MHz



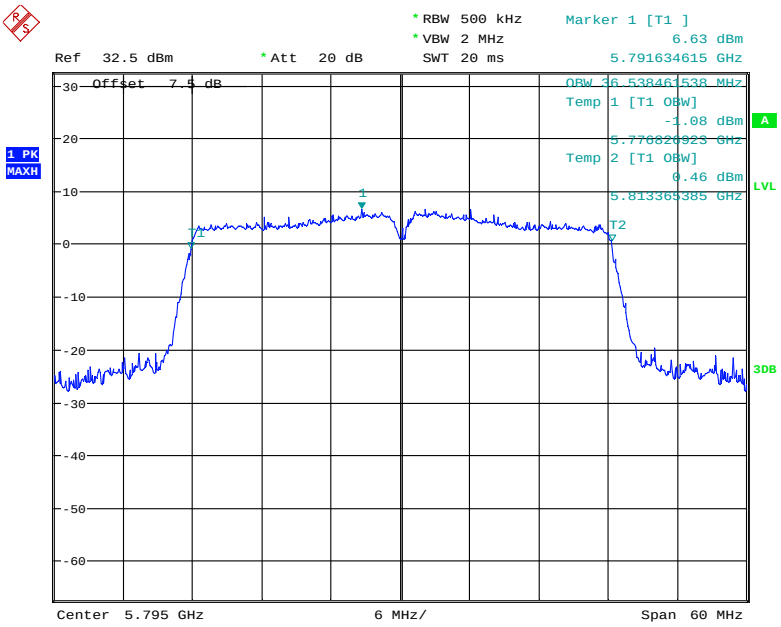
Date: 26.OCT.2017 15:32:42

802.11ac40 mode, 99% Occupied Bandwidth, 5755 MHz



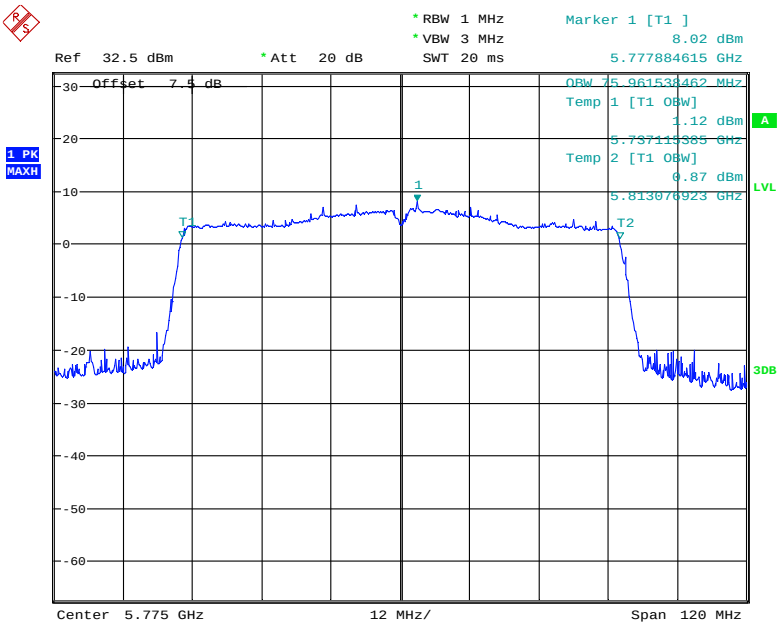
Date: 26.OCT.2017 15:35:05

802.11ac40 mode, 99% Occupied Bandwidth, 5795 MHz



Date: 26.OCT.2017 15:35:33

802.11ac80 mode, 99% Occupied Bandwidth, 5775 MHz



Date: 26.OCT.2017 15:36:20

FCC §15.407(a) (1) (3)– CONDUCTED TRANSMITTER OUTPUT POWER

Applicable Standard

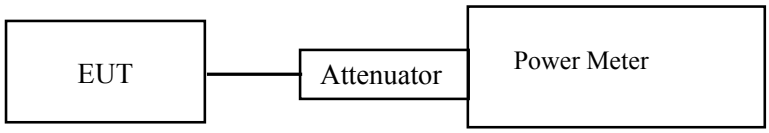
For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz 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.

For 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.

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

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



Test Data

Environmental Conditions

Temperature:	23 ℃
Relative Humidity:	54 %
ATM Pressure:	101.0 kPa

The testing was performed by Dylan Li 2017-10-26.

EUT operation mode: Transmitting

Test Result: Pass

Please refer to the following tables.

5150 MHz – 5250 MHz (EUT is a client device):

Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
802.11a		
5180	13.60	24
5200	13.38	
5240	13.41	
802.11n20		
5180	13.32	24
5200	13.20	
5240	13.01	
802.11n40		
5190	12.63	24
5230	12.42	
802.11ac20		
5180	14.04	24
5200	13.75	
5240	12.36	
802.11ac40		
5190	12.23	24
5230	12.07	
802.11ac80		
5210	12.04	24

5725 MHz – 5825 MHz:

Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
802.11a		
5745	12.04	30
5785	12.39	
5825	12.37	
802.11n20		
5745	12.00	30
5785	12.07	
5825	12.26	
802.11n40		
5755	11.33	30
5795	11.50	
802.11ac20		
5745	11.73	30
5785	12.05	
5825	12.03	
802.11ac40		
5755	11.29	30
5795	11.49	
802.11ac80		
5775	11.11	30

FCC §15.407(g) – FREQUENCY STABILITY

Applicable Standard

FCC §15.407(G)

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

Test Procedure

According to ANSI C63.10-2013 §6.8

Some unlicensed wireless device requirements specify frequency stability tests with variation of supply voltage and temperature; the requirements can be found in the regulatory specifications for each type of unlicensed wireless device. The procedures listed in 6.8.1 and 6.8.2 shall be used for frequency stability tests.

Test Data

Environmental Conditions

Temperature:	23 ℃
Relative Humidity:	54 %
ATM Pressure:	101.0 kPa

The testing was performed by Dylan Li 2017-10-26.

EUT operation mode: Transmitting

Test Result: Pass

802.11 a:

Test Condition		Frequency (MHz)			
Temperature (℃)	Voltage (V_{DC})	f_L at Low Channel	f_H at High Channel	f_L Limit	f_H Limit
5150-5250					
-30	3.8	5171.73112	5248.65374	5150	5250
-20		5171.73109	5248.65315	5150	5250
-10		5171.73130	5248.65347	5150	5250
0		5171.73056	5248.65362	5150	5250
10		5171.73077	5248.65385	5150	5250
20		5171.73091	5248.65388	5150	5250
30		5171.73068	5248.65381	5150	5250
40		5171.73099	5248.65371	5150	5250
50		5171.73085	5248.65368	5150	5250
20	4.2	5171.73034	5248.65345	5150	5250
	3.6	5171.73056	5248.65334	5150	5250
5725-5850					
-30	3.8	5736.66658	5833.58942	5725	5850
-20		5736.66681	5833.58952	5725	5850
-10		5736.66667	5833.58974	5725	5850
0		5736.66689	5833.58955	5725	5850
10		5736.66693	5833.58959	5725	5850
20		5736.66675	5833.58963	5725	5850
30		5736.66642	5833.58991	5725	5850
40		5736.66701	5833.58915	5725	5850
50		5736.66634	5833.58963	5725	5850
20	4.2	5736.66652	5833.58988	5725	5850
	3.6	5736.66616	5833.58953	5725	5850

802.11 n20:

Test Condition		Frequency (MHz)			
Temperature (℃)	Voltage (V_{DC})	f_L at Low Channel	f_H at High Channel	f_L Limit	f_H Limit
5150-5250					
-30	3.8	5171.73124	5248.65357	5150	5250
-20		5171.73142	5248.65327	5150	5250
-10		5171.73112	5248.65337	5150	5250
0		5171.73024	5248.65385	5150	5250
10		5171.73077	5248.65385	5150	5250
20		5171.73034	5248.65376	5150	5250
30		5171.73057	5248.65358	5150	5250
40		5171.73066	5248.65368	5150	5250
50		5171.73076	5248.65367	5150	5250
20	4.2	5171.73085	5248.65336	5150	5250
	3.6	5171.73034	5248.65372	5150	5250
5725-5850					
-30	3.8	5736.08957	5834.10238	5725	5850
-20		5736.08968	5834.10265	5725	5850
-10		5736.08957	5834.10248	5725	5850
0		5736.08982	5834.10285	5725	5850
10		5736.08974	5834.10256	5725	5850
20		5736.08992	5834.10269	5725	5850
30		5736.08982	5834.10239	5725	5850
40		5736.08962	5834.10282	5725	5850
50		5736.08971	5834.10291	5725	5850
20	4.2	5736.08993	5834.10282	5725	5850
	3.6	5736.08938	5834.10271	5725	5850

802.11 N40:

Test Condition		Frequency (MHz)			
Temperature (℃)	Voltage (V_{DC})	f_L at Low Channel	f_H at High Channel	f_L Limit	f_H Limit
5150-5250					
-30	3.8	5171.92312	5248.36547	5150	5250
-20		5171.92325	5248.36535	5150	5250
-10		5171.92337	5248.36541	5150	5250
0		5171.92329	5248.36562	5150	5250
10		5171.92308	5248.36539	5150	5250
20		5171.92354	5248.36582	5150	5250
30		5171.92339	5248.36562	5150	5250
40		5171.92344	5248.36538	5150	5250
50		5171.92367	5248.36561	5150	5250
20	4.2	5171.92334	5248.36523	5150	5250
	3.6	5171.92383	5248.36587	5150	5250
5725-5850					
-30	3.8	5736.82647	5813.36557	5725	5850
-20		5736.82636	5813.36562	5725	5850
-10		5736.82662	5813.36581	5725	5850
0		5736.82686	5813.36577	5725	5850
10		5736.82692	5813.36539	5725	5850
20		5736.82646	5813.36556	5725	5850
30		5736.82652	5813.36558	5725	5850
40		5736.82674	5813.36562	5725	5850
50		5736.82663	5813.36547	5725	5850
20	4.2	5736.82634	5813.36569	5725	5850
	3.6	5736.82665	5813.36581	5725	5850

802.11 AC20:

Test Condition		Frequency (MHz)			
Temperature (℃)	Voltage (V_{DC})	f_L at Low Channel	f_H at High Channel	f_L Limit	f_H Limit
5150-5250					
-30	3.8	5171.02552	5249.10268	5150	5250
-20		5171.02542	5249.10247	5150	5250
-10		5171.02567	5249.10282	5150	5250
0		5171.02538	5249.10283	5150	5250
10		5171.02564	5249.10256	5150	5250
20		5171.02549	5249.10271	5150	5250
30		5171.02586	5249.10276	5150	5250
40		5171.02579	5249.10263	5150	5250
50		5171.02537	5249.10239	5150	5250
20	4.2	5171.02584	5249.10227	5150	5250
	3.6	5171.02535	5249.10293	5150	5250
5725-5850					
-30	3.8	5736.02556	5834.10267	5725	5850
-20		5736.02561	5834.10227	5725	5850
-10		5736.02571	5834.10245	5725	5850
0		5736.02569	5834.10269	5725	5850
10		5736.02564	5834.10256	5725	5850
20		5736.02538	5834.10236	5725	5850
30		5736.02555	5834.10285	5725	5850
40		5736.02557	5834.10271	5725	5850
50		5736.02568	5834.10278	5725	5850
20	4.2	5736.02583	5834.10212	5725	5850
	3.6	5736.02521	5834.10234	5725	5850

802.11 AC40:

Test Condition		Frequency (MHz)			
Temperature (℃)	Voltage (V_{DC})	f_L at Low Channel	f_H at High Channel	f_L Limit	f_H Limit
5150-5250					
-30	3.8	5171.92314	5248.36545	5150	5250
-20		5171.92321	5248.36544	5150	5250
-10		5171.92316	5248.36551	5150	5250
0		5171.92326	5248.36562	5150	5250
10		5171.92308	5248.36539	5150	5250
20		5171.92335	5248.36547	5150	5250
30		5171.92317	5248.36537	5150	5250
40		5171.92337	5248.36554	5150	5250
50		5171.92344	5248.36574	5150	5250
20	4.2	5171.92323	5248.36568	5150	5250
	3.6	5171.92354	5248.36594	5150	5250
5725-5850					
-30	3.8	5736.82647	5813.36541	5725	5850
-20		5736.82636	5813.36557	5725	5850
-10		5736.82685	5813.36562	5725	5850
0		5736.82629	5813.36547	5725	5850
10		5736.82692	5813.36539	5725	5850
20		5736.82665	5813.36568	5725	5850
30		5736.82671	5813.36592	5725	5850
40		5736.82676	5813.36556	5725	5850
50		5736.82639	5813.36588	5725	5850
20	4.2	5736.82645	5813.36572	5725	5850
	3.6	5736.82673	5813.36534	5725	5850

802.11 AC80:

Test Condition		Frequency (MHz)			
Temperature (℃)	Voltage (V_{DC})	f_L at Low Channel	f_H at High Channel	f_L Limit	f_H Limit
5150-5250					
-30	3.8	5172.50036	5248.26952	5150	5250
-20		5172.50025	5248.26943	5150	5250
-10		5172.50047	5248.26946	5150	5250
0		5172.50092	5248.26963	5150	5250
10		5172.50000	5248.26923	5150	5250
20		5172.50086	5248.26959	5150	5250
30		5172.50077	5248.26961	5150	5250
40		5172.50066	5248.26982	5150	5250
50		5172.50034	5248.26946	5150	5250
20	4.2	5172.50072	5248.26972	5150	5250
	3.6	5172.50023	5248.26979	5150	5250
5725-5850					
-30	3.8	5737.11547	5813.07668	5725	5850
-20		5737.11524	5813.07674	5725	5850
-10		5737.11571	5813.07688	5725	5850
0		5737.11537	5813.07668	5725	5850
10		5737.11539	5813.07692	5725	5850
20		5737.11567	5813.07675	5725	5850
30		5737.11557	5813.07695	5725	5850
40		5737.11568	5813.07668	5725	5850
50		5737.11569	5813.07686	5725	5850
20	4.2	5737.11583	5813.07624	5725	5850
	3.6	5737.11578	5813.07682	5725	5850

Note: F_L is the mark of low channel's OBW edge, and F_H is the mark of high channel's OBW edge.

FCC §15.407(a) (1) (5) - POWER SPECTRAL DENSITY

Applicable Standard

(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.

For 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.

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

For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, "provided that the measured power is integrated over the full reference bandwidth" to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 kHz bandwidth, the following adjustments to the procedures apply:

a) Set RBW $\geqslant$ 1/T, where T is defined in section II.B.l.a).
b) Set VBW $\geqslant$ 3 RBW.
c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10 log (500 kHz/RBW) to the measured result, whereas RBW (< 500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10 log (1MHz/RBW) to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.
e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Test Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Dylan Li on 2017-10-26.

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EUT operation mode: Transmitting

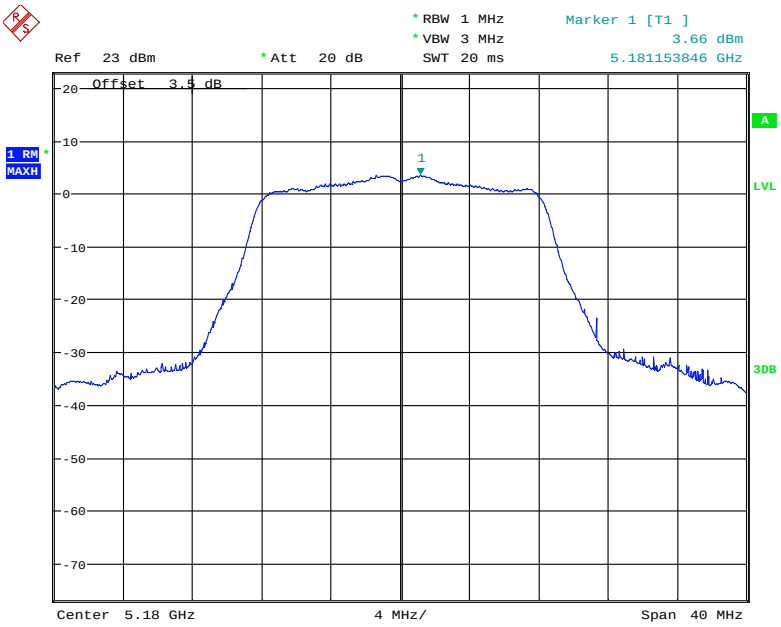
Test Result: Pass

Please refer to the following tables and plots.

5150 MHz – 5250 MHz:

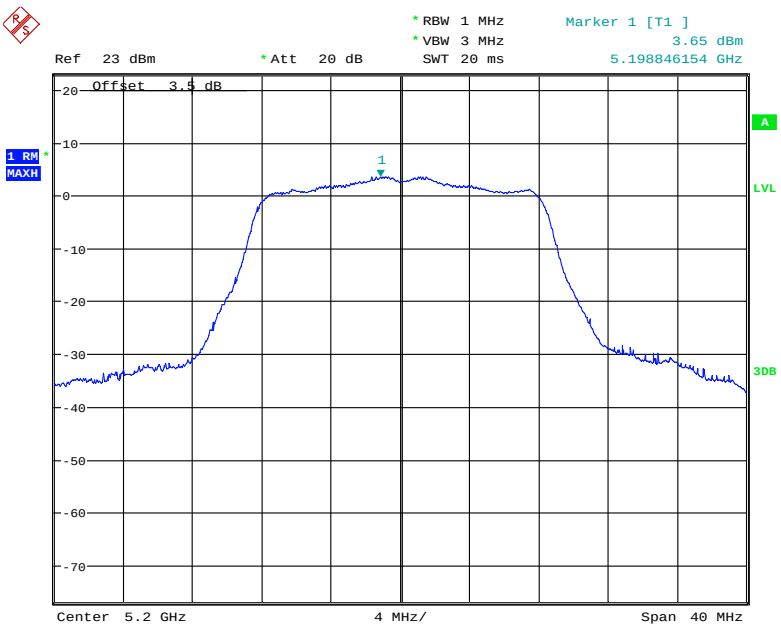
Frequency (MHz)	Power Spectral Density (dBm/MHz)	Limit (dBm/MHz)
802.11a		
5180	3.66	11
5200	3.65	
5240	2.73	
802.11n20		
5180	2.84	11
5200	2.71	
5240	1.88	
802.11n40		
5190	-1.07	11
5230	-1.58	
802.11ac20		
5180	3.31	11
5200	3.15	
5240	1.87	
802.11ac40		
5190	-0.98	11
5230	-1.76	
802.11ac80		
5210	-4.38	11

802.11a mode, Power Spectral Density, 5180 MHz



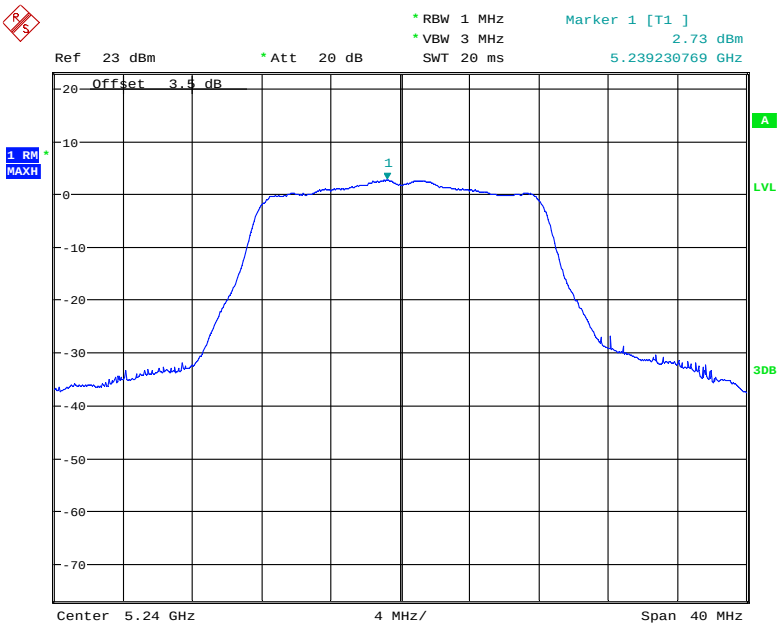
Date: 26.OCT.2017 10:46:33

802.11a mode, Power Spectral Density, 5200 MHz



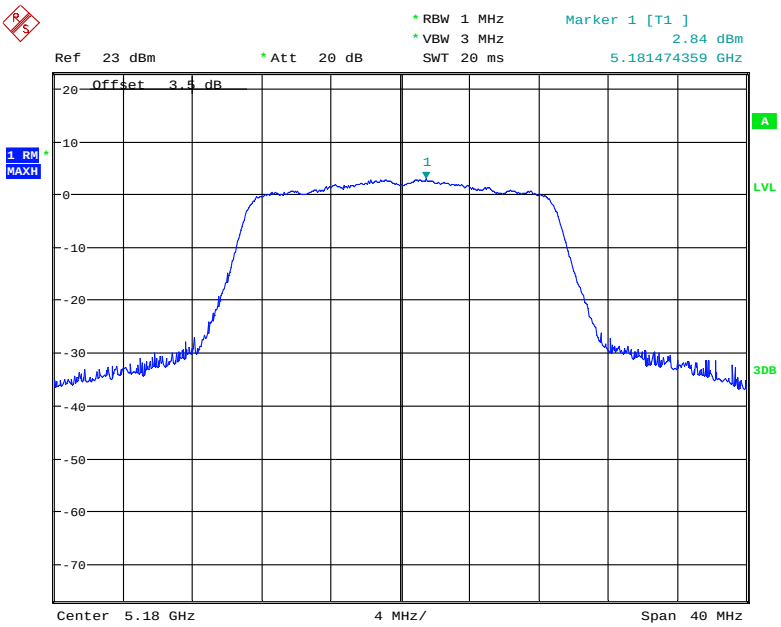
Date: 26.OCT.2017 10:48:04

802.11a mode, Power Spectral Density, 5240 MHz



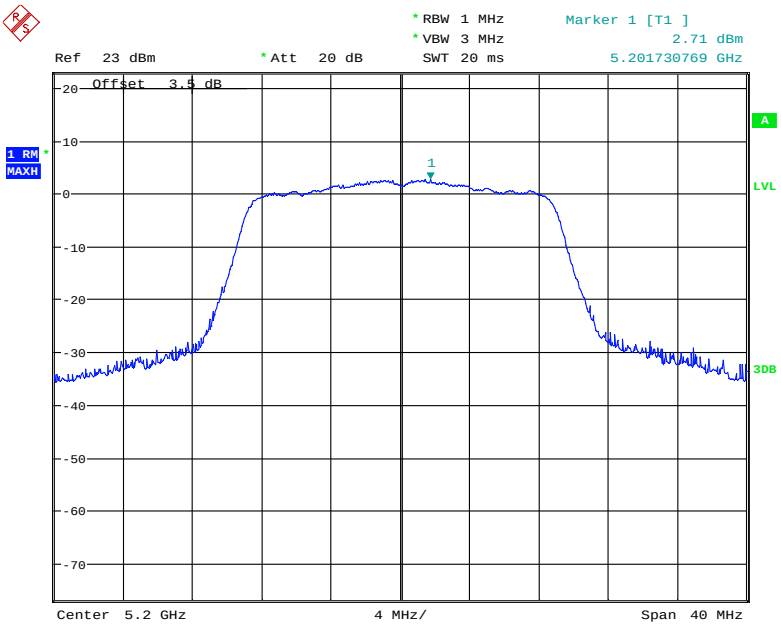
Date: 26.OCT.2017 10:48:57

802.11n20 mode, Power Spectral Density, 5180 MHz



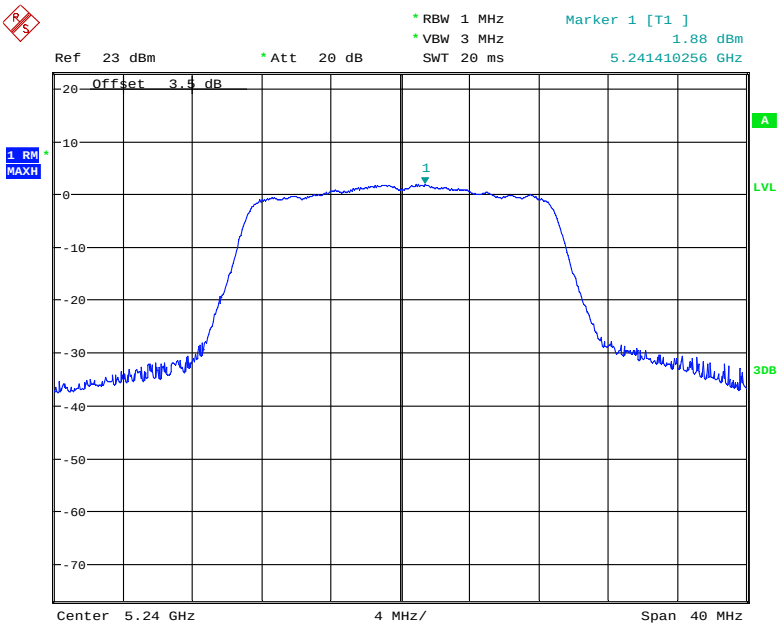
Date: 26.OCT.2017 10:49:45

802.11n20 mode, Power Spectral Density, 5200 MHz



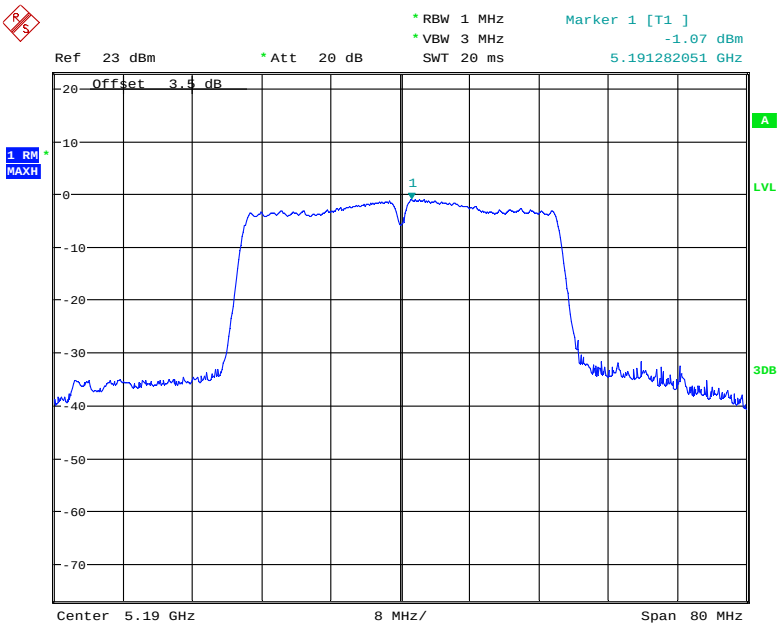
Date: 26.OCT.2017 10:50:36

802.11n20 mode, Power Spectral Density, 5240 MHz



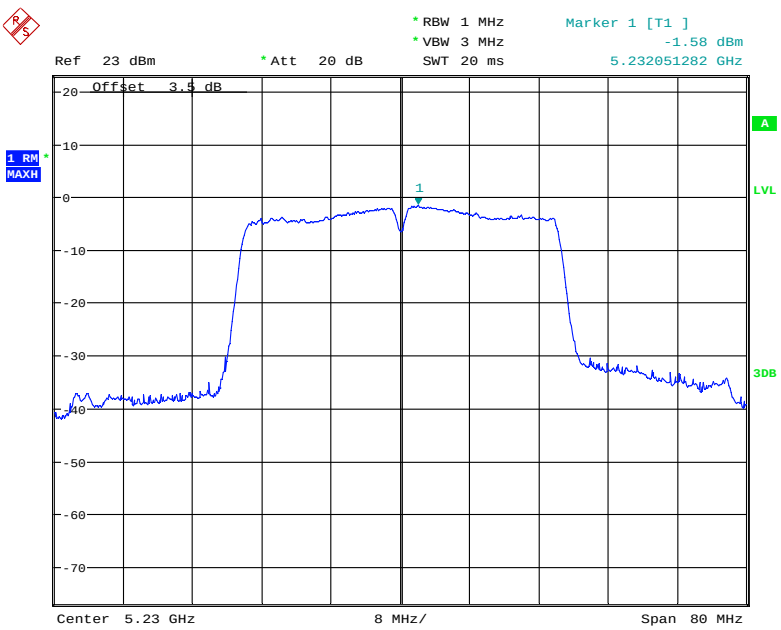
Date: 26.OCT.2017 10:51:34

802.11n40 mode, Power Spectral Density, 5190 MHz



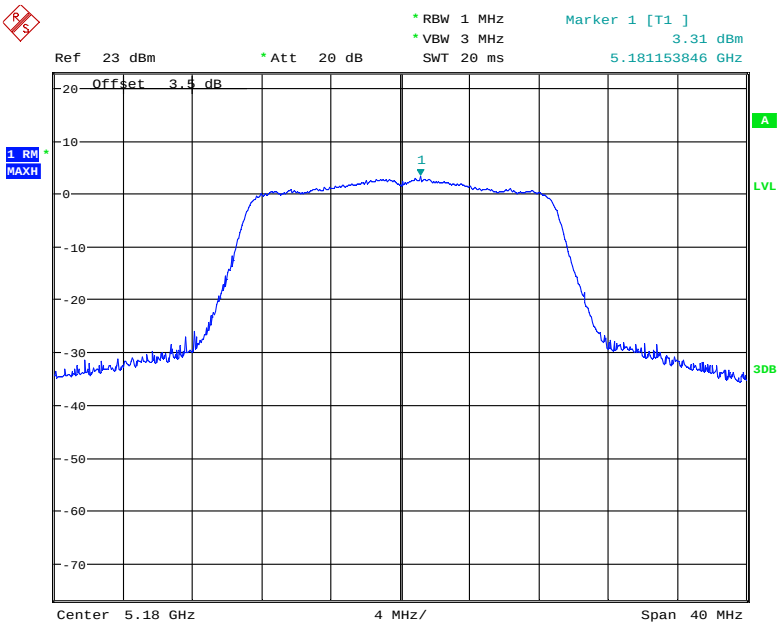
Date: 26.OCT.2017 10:55:17

802.11n40 mode, Power Spectral Density, 5230 MHz



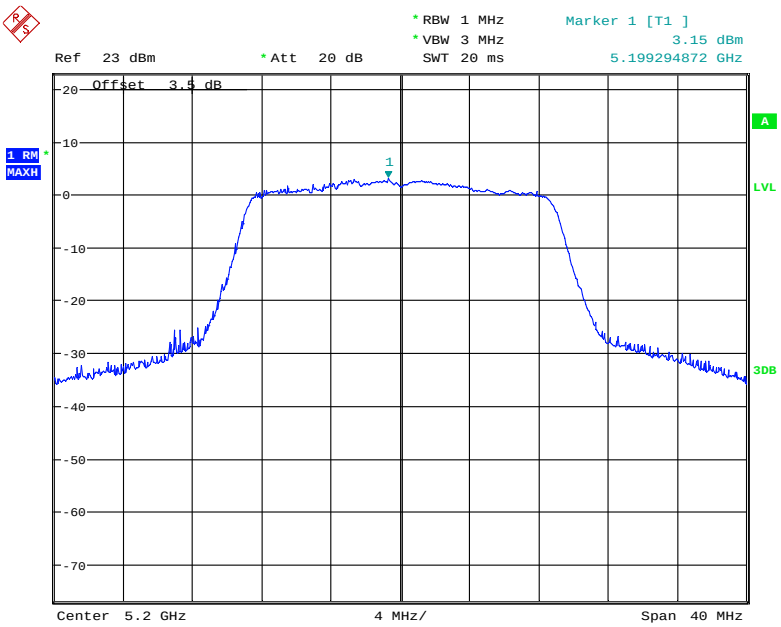
Date: 26.OCT.2017 10:55:47

802.11ac20 mode, Power Spectral Density, 5180 MHz



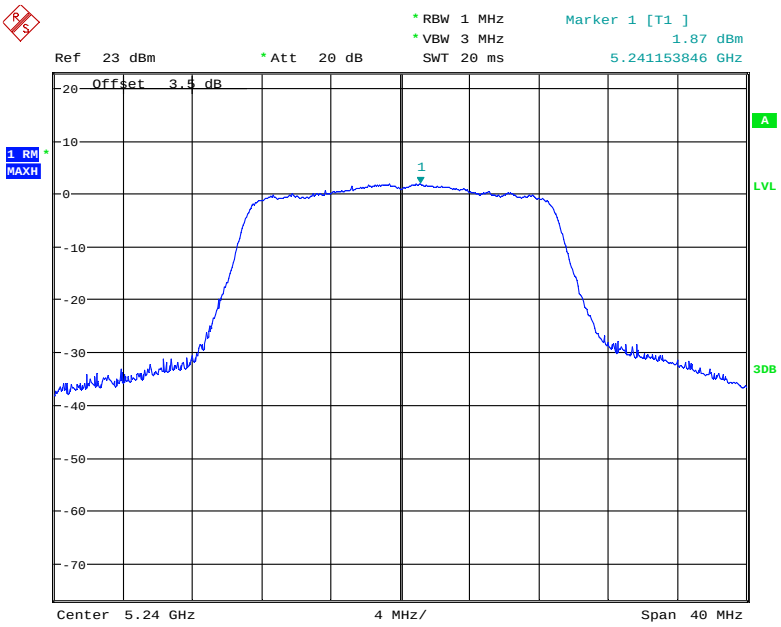
Date: 26.OCT.2017 10:52:20

802. 11ac20 mode, Power Spectral Density, 5200 MHz



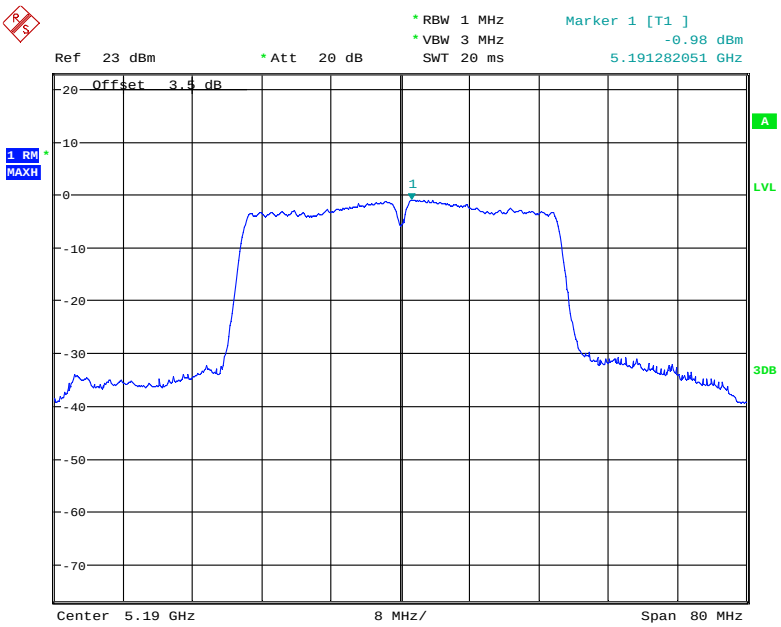
Date: 26.OCT.2017 10:53:19

802. 11ac20 mode, Power Spectral Density, 5240 MHz



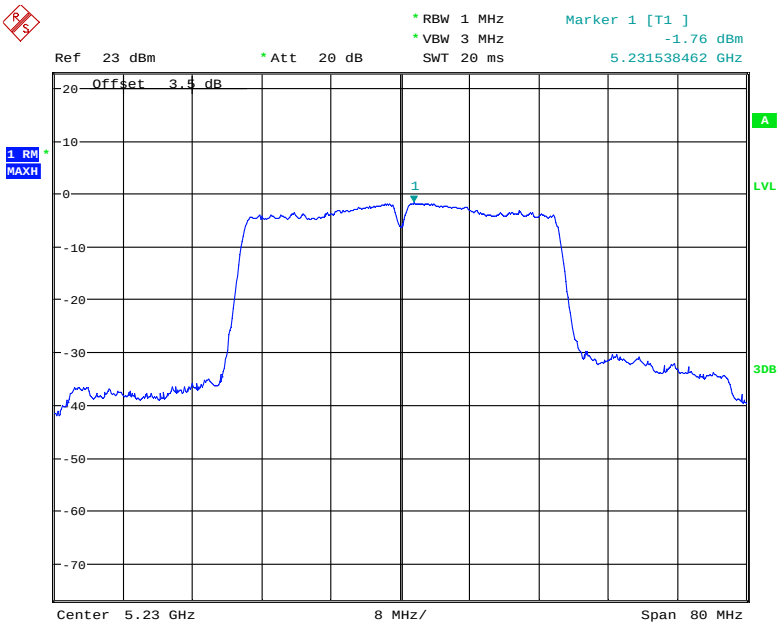
Date: 26.OCT.2017 10:54:20

802. 11ac40 mode, Power Spectral Density, 5190 MHz



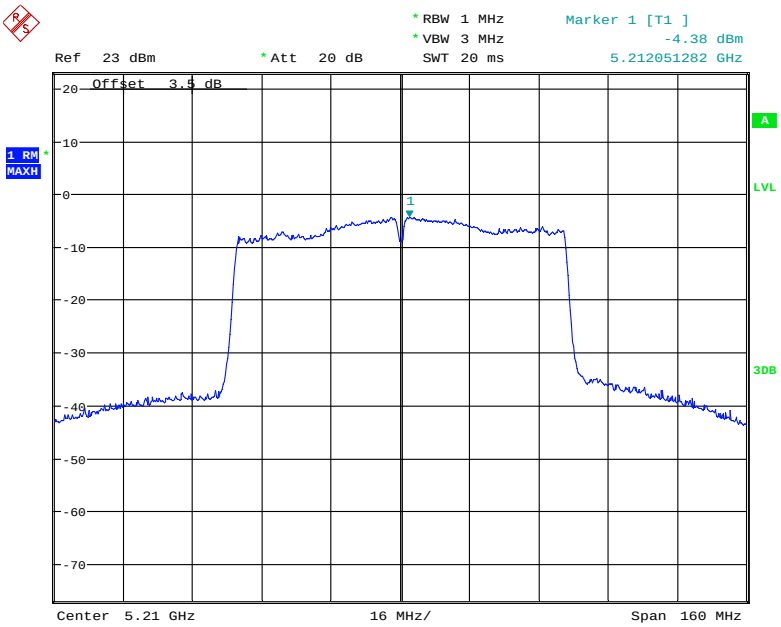
Date: 26.OCT.2017 10:56:41

802. 11ac40 mode, Power Spectral Density, 5230 MHz



Date: 26.OCT.2017 10:57:11

802. 11ac80 mode, Power Spectral Density, 5210 MHz

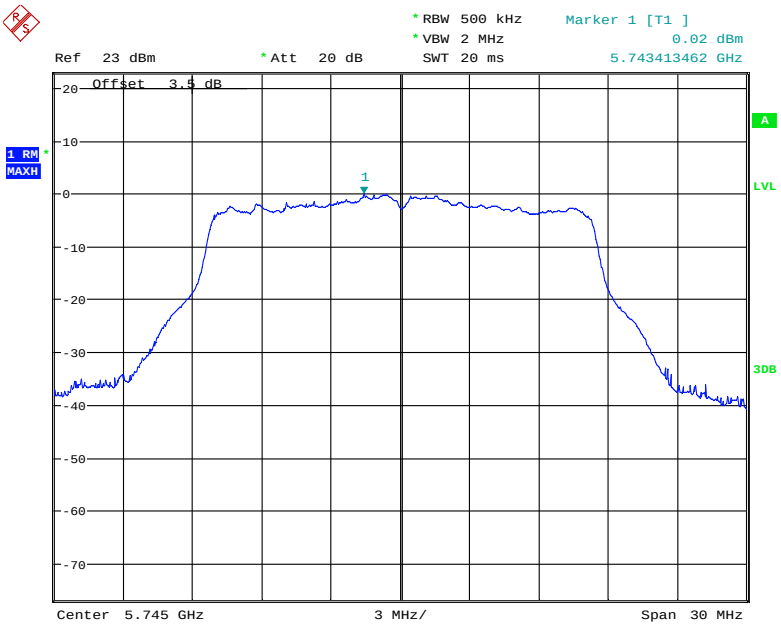


Date: 26.OCT.2017 10:57:51

5725 MHz – 5825 MHz:

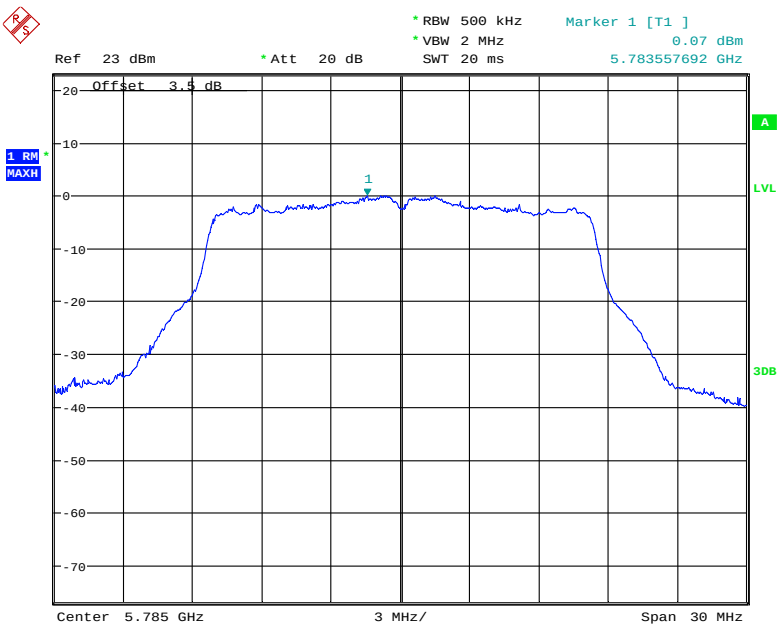
Mode	Frequency (MHz)	Power Spectral Density (dBm/500kHz)	Limit (dBm/500kHz)
802.11a	5745	0.02	30
	5785	0.07	
	5825	0.11	
802.11n20	5745	-0.58	30
	5785	-0.66	
	5825	-0.26	
802.11n40	5755	-4.44	30
	5795	-4.40	
802.11ac20	5745	-1.08	30
	5785	-0.71	
	5825	-0.42	
802.11ac40	5755	-4.49	30
	5795	-4.07	
802.11ac80	5775	-5.15	30

802.11a mode, Power Spectral Density, 5745 MHz



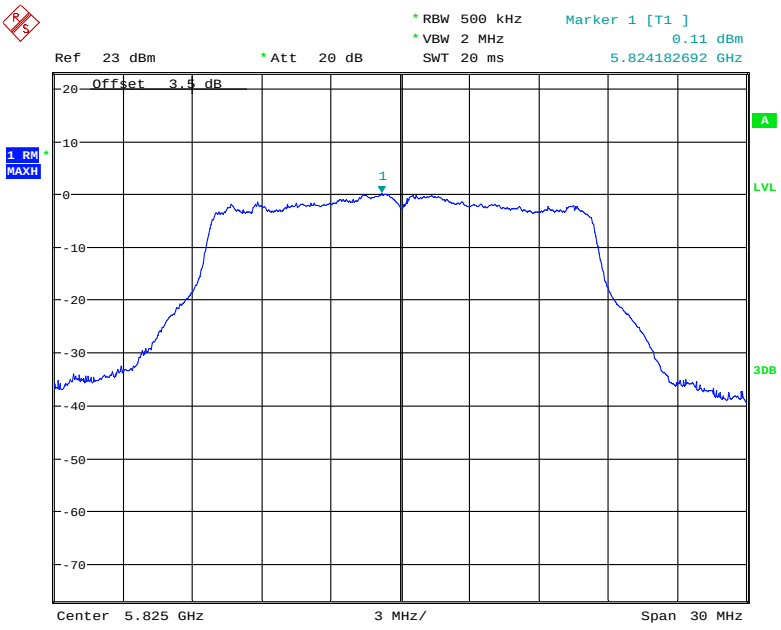
Date: 26.OCT.2017 11:23:47

802.11a mode, Power Spectral Density, 5785 MHz



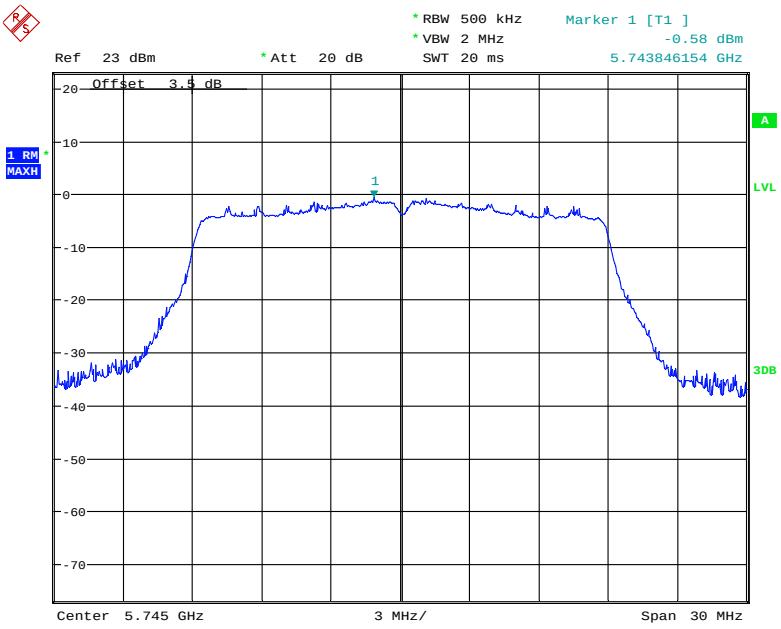
Date: 26.OCT.2017 11:24:47

802.11a mode, Power Spectral Density, 5825 MHz



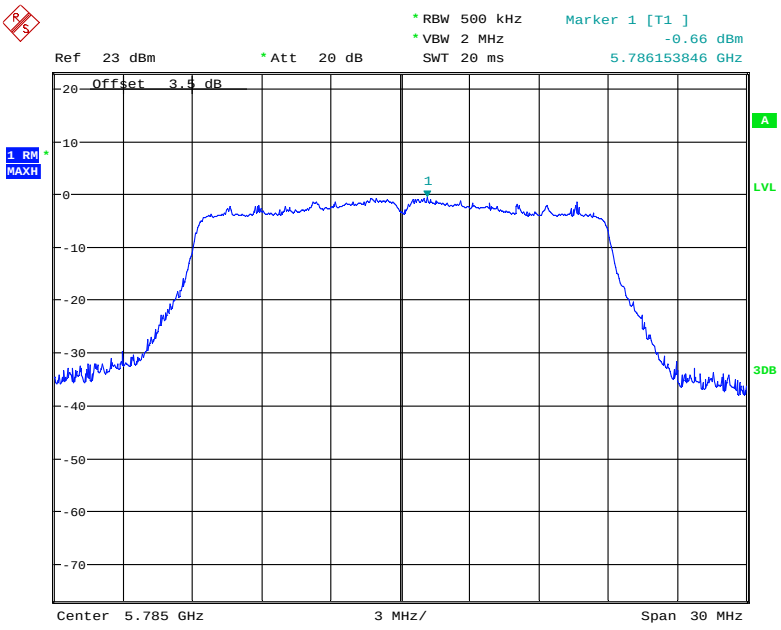
Date: 26.OCT.2017 11:25:15

802.11n20 mode, Power Spectral Density, 5745 MHz



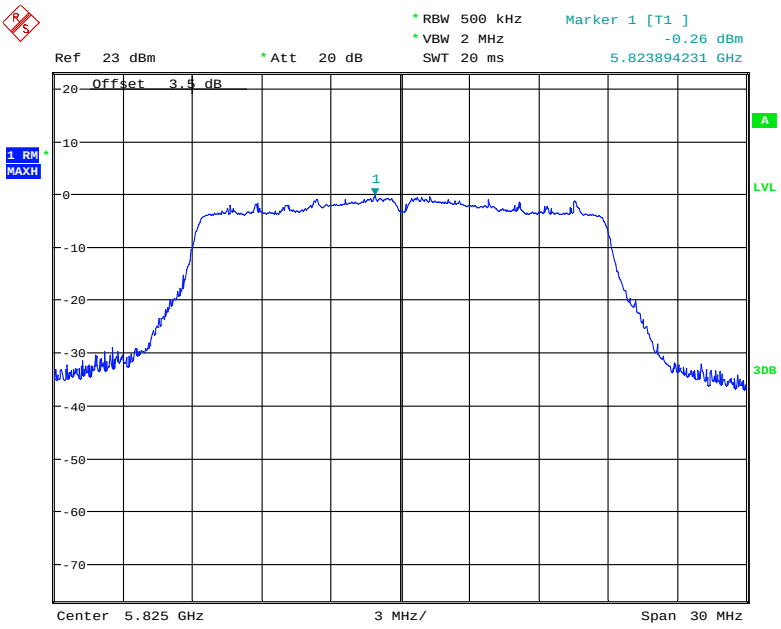
Date: 26.OCT.2017 11:26:14

802.11n20 mode, Power Spectral Density, 5785 MHz



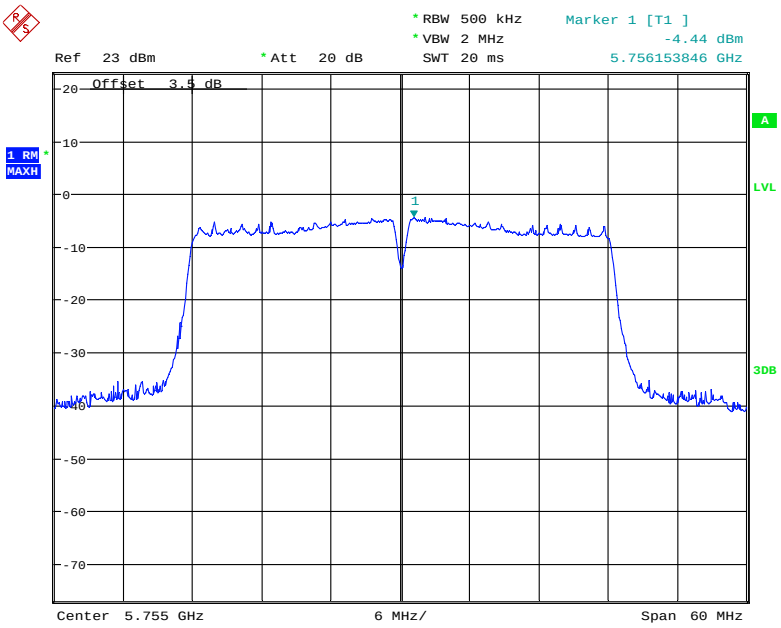
Date: 26.OCT.2017 11:26:46

802.11n20 mode, Power Spectral Density, 5825 MHz



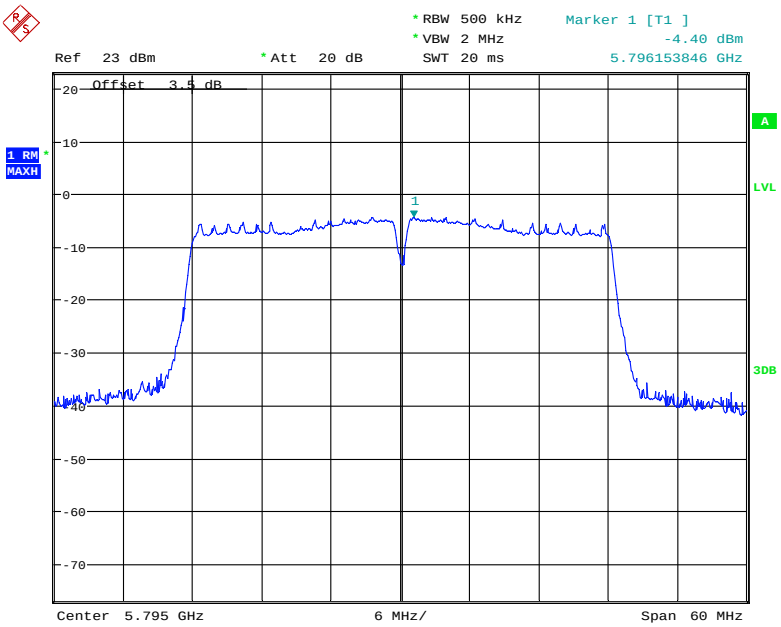
Date: 26.OCT.2017 11:27:18

802.11n40 mode, Power Spectral Density, 5755 MHz



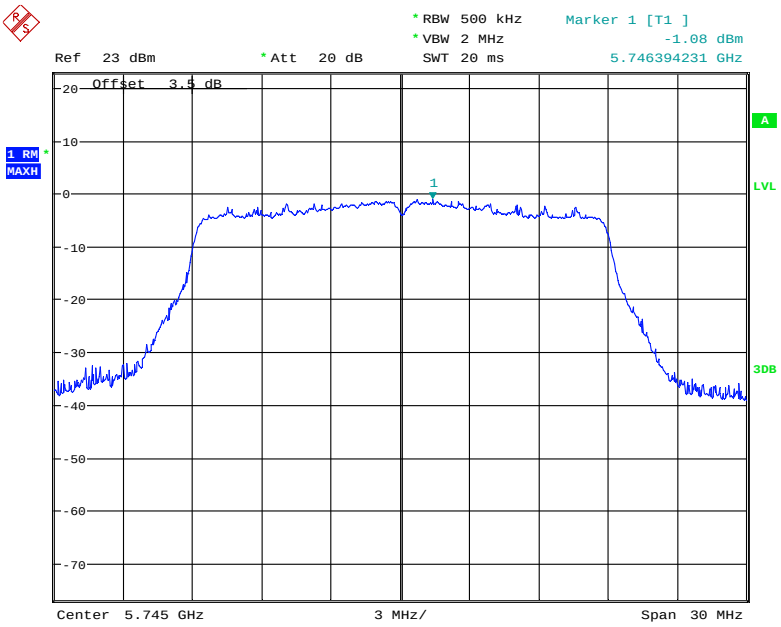
Date: 26.OCT.2017 11:30:00

802.11n40 mode, Power Spectral Density, 5795 MHz



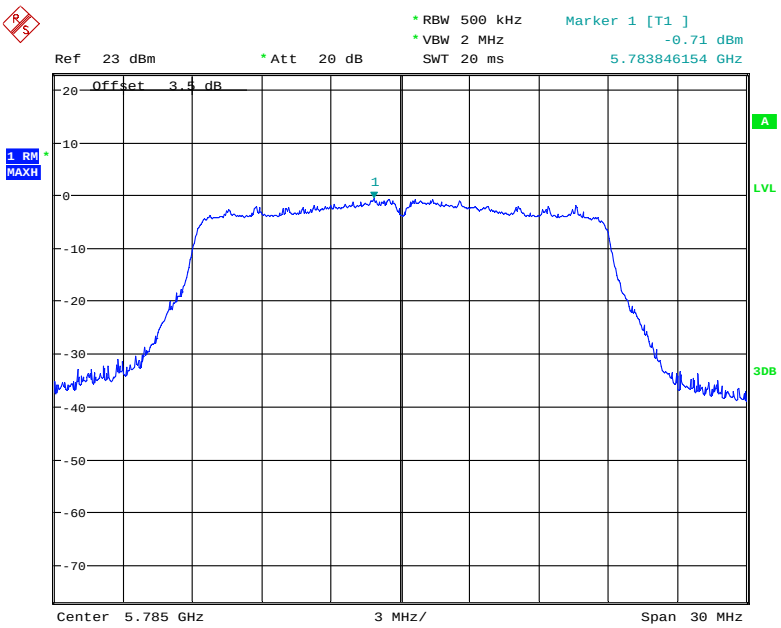
Date: 26.OCT.2017 11:30:39

802.11ac20 mode, Power Spectral Density, 5745 MHz



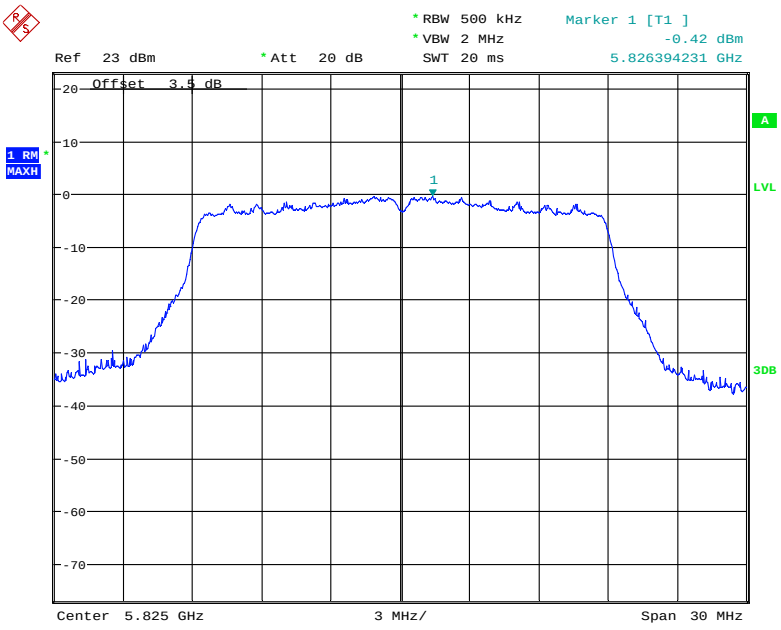
Date: 26.OCT.2017 11:27:55

802. 11ac20 mode, Power Spectral Density, 5785 MHz



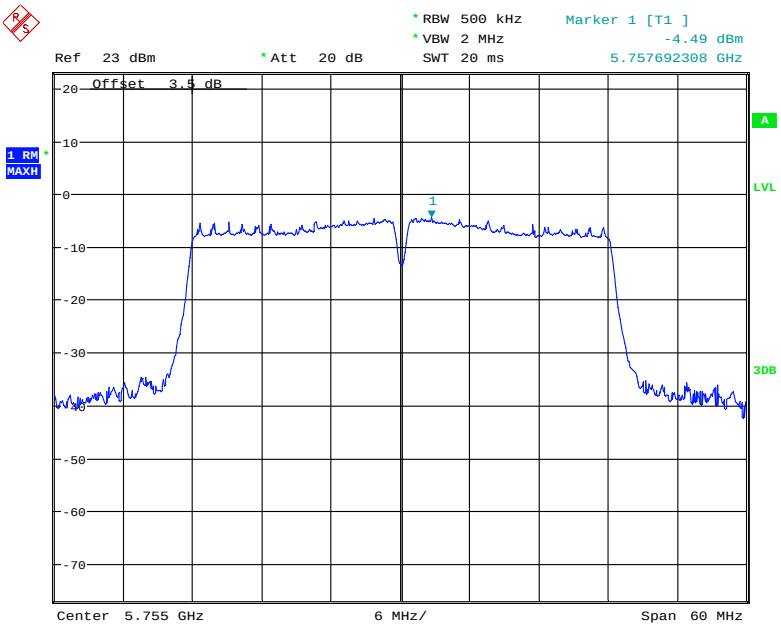
Date: 26.OCT.2017 11:28:34

802. 11ac20 mode, Power Spectral Density, 5825 MHz



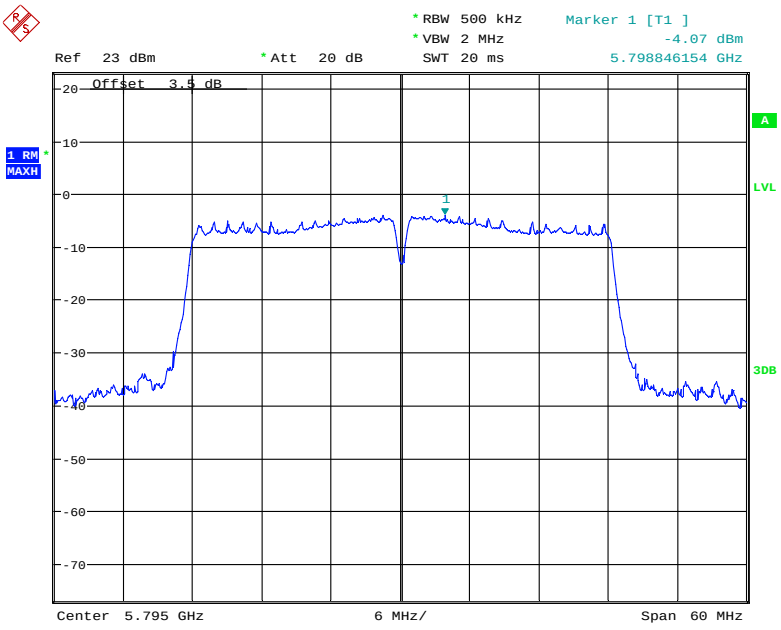
Date: 26.OCT.2017 11:29:04

802. 11ac40 mode, Power Spectral Density, 5755 MHz



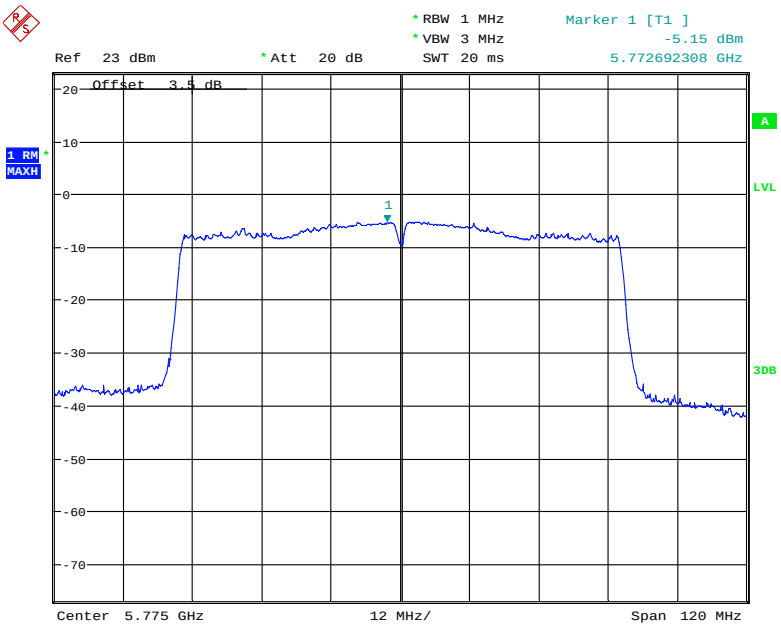
Date: 26.OCT.2017 11:31:24

802. 11ac40 mode, Power Spectral Density, 5795 MHz



Date: 26.OCT.2017 11:32:04

802. 11ac80 mode, Power Spectral Density, 5775 MHz



Date: 26.OCT.2017 11:33:27

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