FCC PART 15.407

TEST REPORT

For

Iconnect

No.9, Aly. 58, Ln. 112, Ruiguang Rd., Neihu Dist.,Taipei City,Taiwan

FCC ID: 2AB8788121
Tested Model: AWUS036ACH
Multiple Model: AWUS036NHU, AWUS036ACMH, NU-AC, NU-ACM, NU-ACMH, UBDo-ACH, UBDo-ACM, UBDo-ACMH, Tube-UACH, Tube-UACM, Tube-UACMH

Report Type: Original Report	**Product Name:** 802.11ac ultra-Range AC1200 USB adapter

Test Engineer:	*Tom Tang*
Report Number:	RDG170525007B
Report Date:	2017-08-25
Reviewed By:	Henry Ding EMC Leader
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Chengdu) No.5040, Huilongwan Plaza, No.1, Shawan Road, Jinniu District, Chengdu, Sichuan, China Tel: 028-65525123, Fax: 028-65525125 www.baclcorp.com

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The ***Iconnect***'s product, model number: ***AWUS036ACH (FCC ID: 2AB8788121)*** (the "EUT") in this report was a ***802.11ac ultra-Range AC1200 USB adapter***, which was measured approximately: 8.7 cm (L) × 6.2 cm (W) × 2.2 cm (H), rated input voltage: DC 5V from USB port.

Note: The series product, model AWUS036ACH, AWUS036NHU, AWUS036ACMH, NU-AC, NU-ACM, NU-ACMH, UBDo-ACH, UBDo-ACM, UBDo-ACMH, Tube-UACH, Tube-UACM, Tube-UACMH are electrically identical, the difference between them is the model name, we selected AWUS036ACH for fully testing, the details was explained in the eclaration letter.

**All measurement and test data in this report was gathered from final production sample, serial number: 170525007 (assigned by the BACL, Chengdu). It may have deviation from any other sample. The EUT supplied by the applicant was received on 2017-05-26, and EUT conformed to test requirement.*

Objective

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

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

Related Submittal(s)/Grant(s)

FCC Part 15C DTS submissions with FCC ID: 2AB8788121.

Test Methodology

All measurements detailed in this Test Report were performed in accordance with ANSI C63.10-2013 "American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices".

All of the measurements detailed in this Test Report were performed by Bay Area Compliance Laboratories Corp. (Chengdu).

The Bay Area Compliance Laboratories Corp. Chengdu's measurement Uncertainties (calculated for a k=2 Coverage Factor corresponding to approximately 95% Coverage) were as follows:

-For all of the AC Line Conducted Emissions Tests reported herein: ±3.17 dB.
-For of all of the Direct Antenna Conducted Emissions Tests reported herein: ±0.56 dB.

-For of all of the direct Radiated Emissions Tests reported herein are:
30 MHz to 200 MHz: ±4.7 dB;
200 MHz to 1 GHz: ±6.0 dB;
1 GHz to 6 GHz: ±5.13dB; and,
6 GHz to 40 GHz: ±5.47dB.

And the uncertainty will not be taken into consideration for all test data recorded in the report.

Test Facility

The test site used by BACL to collect test data is located No. 5040, Huilongwan Plaza, No. 1, Shawan Road, Jinniu District, Chengdu, China

BACL(Chengdu) is accredited by A2LA in accordance with the recognized international standard ISO/IEC 17025, A2LA cert No.: 4324.01. The Federal communications commission has on file and is listed under FCC Test Firm Registration No.: 910975.

BACL(Chengdu) has been fully described in reports on file and registered with the Innovation, Science and Economic Development Canada under Registration Numbers: 3062C-1.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

The system support 802.11a/n ht20/n ht40/ac vht20/ac vht40 and ac vht80, the ac vh20/ac vht40 were reduced since the identical parameters with 802.11n ht20 and ht40.

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

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

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

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

The worst-case data rates are determined to be as follows for each mode based upon investigations by measuring the average power and PSD across all data rates bandwidths, and modulations.Preliminary tests were perfrmed in difference data rate and all the possible configurations, the worst cases as below table and shown in the report.

Configurations	Test Mode	Data Rate	Channel	Antenna Chain
SISO	802.11a	6Mbps	36,40,48,149, 157, 165	0, 1
	802.11n ht20	MCS0	36,40,48,149, 157, 165	0, 1
	802.11n ht40	MCS0	38,46,151, 159	0, 1
	802.11ac 80	Nss1-MCS0	42, 155	0, 1
2*2 MIMO	802.11n ht20	MCS8	36,40,48,149, 157, 165	0+1
	802.11n ht40	MCS8	38,46,151, 159	0+1
	802.11ac 80	Nss2-MCS8	42, 155	0+1

EUT Exercise Software

The software "MP_Kit_RTL11ac_8812AU_USB_v60.1" was used for testing, and the commands were provided by manufacturer. The maximum power level and duty cycle was set by commands as following table:

SISO:

UNII Band	Test Mode	Test Software Version	MP_Kit_RTL11ac_8812AU_USB_v60.1		
5150-5250MHz	802.11a	Test Frequency	5180MHz	5200MHz	5240MHz
		Data Rate	6Mbps	6Mbps	6Mbps
		Chain 0	50	55	55
		Chain 1	54	59	59
	802.11n ht20	Test Frequency	5180MHz	5200MHz	5240MHz
		Data Rate	MCS0	MCS0	MCS0
		Chain 0	45	55	55
		Chain 1	51	59	59
	802.11n ht40	Test Frequency	5190MHz	/	5230MHz
		Data Rate	MCS0	/	MCS0
		Chain 0	45	/	55
		Chain 1	50	/	59
	802.11ac 80	Test Frequency	/	5210MHz	/
		Data Rate	/	Nss1-MCS0	/
		Chain 0	/	44	/
		Chain 1	/	47	/
5725-5850MHz	802.11a	Test Frequency	5745MHz	5785MHz	5825MHz
		Data Rate	6Mbps	6Mbps	6Mbps
		Chain 0	45	43	36
		Chain 1	38	36	31
	802.11n ht20	Test Frequency	5745MHz	5785MHz	5825MHz
		Data Rate	MCS0	MCS0	MCS0
		Chain 0	45	43	36
		Chain 1	38	36	31
	802.11n ht40	Test Frequency	5755MHz	/	5795MHz
		Data Rate	MCS0	/	MCS0
		Chain 0	52	/	42
		Chain 1	43	/	35
	802.11ac 80	Test Frequency	/	5775MHz	/
		Data Rate	/	Nss1-MCS0	/
		Chain 0	/	48	/
		Chain 1	/	38	/

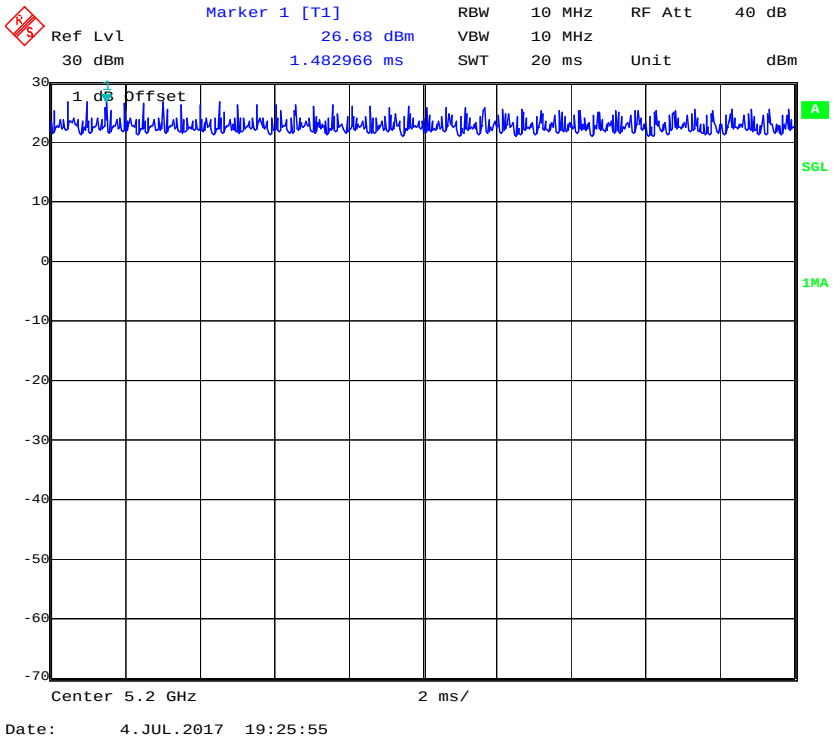
MIMO:

UNII Band	Test Mode	Test Software Version	MP_Kit_RTL11ac_8812AU_USB_v60.1		
5150-5250MHz	**802.11n ht20**	Test Frequency	5180MHz	5200MHz	5240MHz
		Data Rate	MCS8	MCS8	MCS8
		Chain 0&1	51	57	57
	802.11n ht40	Test Frequency	5190MHz	/	5230MHz
		Data Rate	MCS8	/	MCS8
		Chain 0&1	48	/	55
	802.11ac 80	Test Frequency	/	5210MHz	/
		Data Rate	/	Nss2-MCS0	/
		Chain 0&1	/	51	/
5725-5850MHz	**802.11n ht20**	Test Frequency	5745MHz	5785MHz	5825MHz
		Data Rate	MCS8	MCS8	MCS8
		Chain 0&1	43	43	37
	802.11n ht40	Test Frequency	5755MHz	/	5795MHz
		Data Rate	MCS8	/	MCS8
		Chain 0&1	42	/	37
	802.11ac 80	Test Frequency	/	5775MHz	/
		Data Rate	/	Nss2-MCS0	/
		Chain 0&1	/	47	/

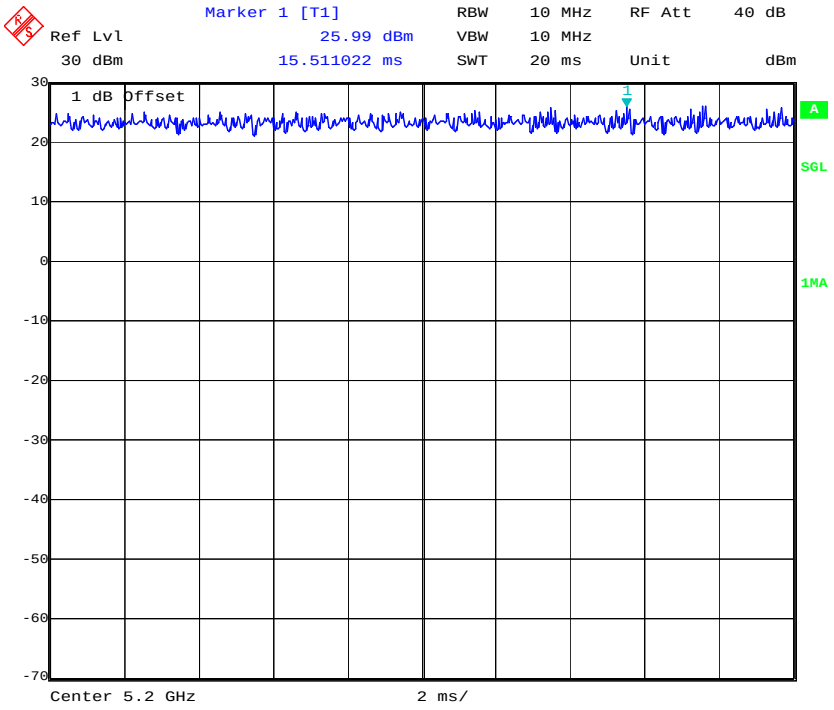
The duty cycle as below:

Mode	T_{on} (ms)	T_{on+off} (ms)	Duty Cycle (%)
802.11 a	20	20	100
802.11n ht20	20	20	100
802.11n ht40	20	20	100
802.11 ac80	20	20	100

802.11a



802.11 n20



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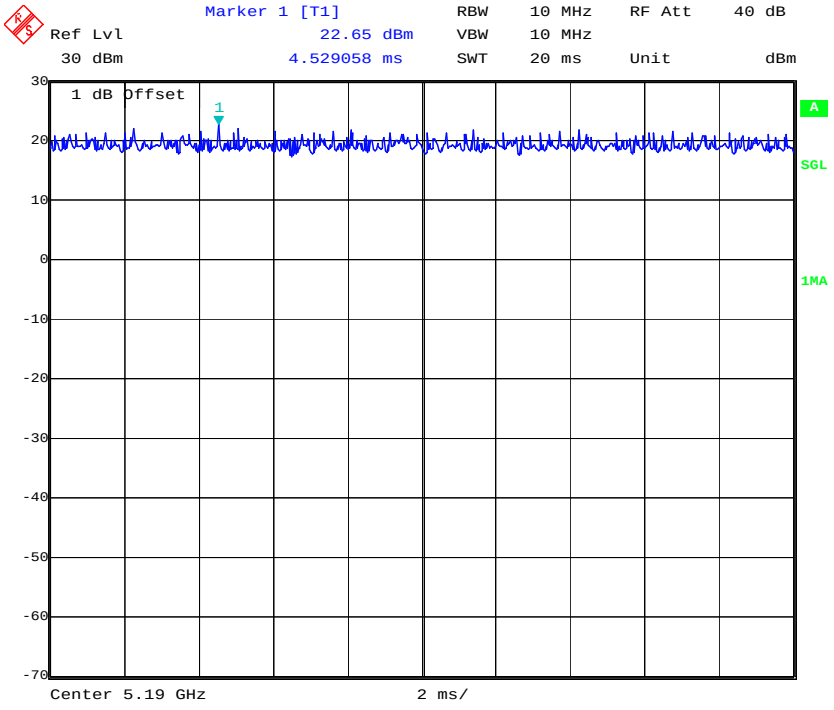

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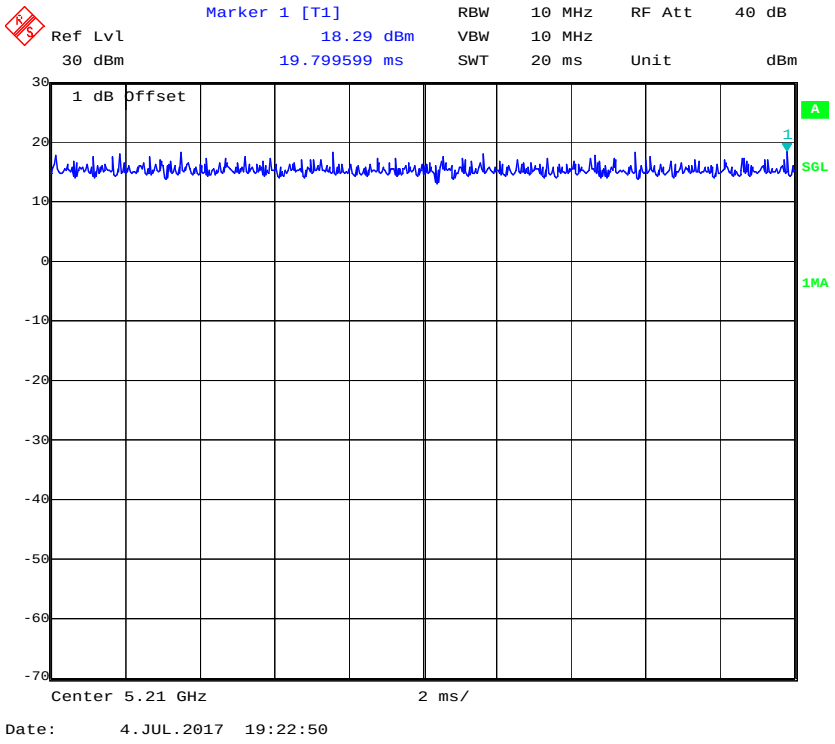
802.11 ac80



Equipment Modifications

No modification was made to the EUT.

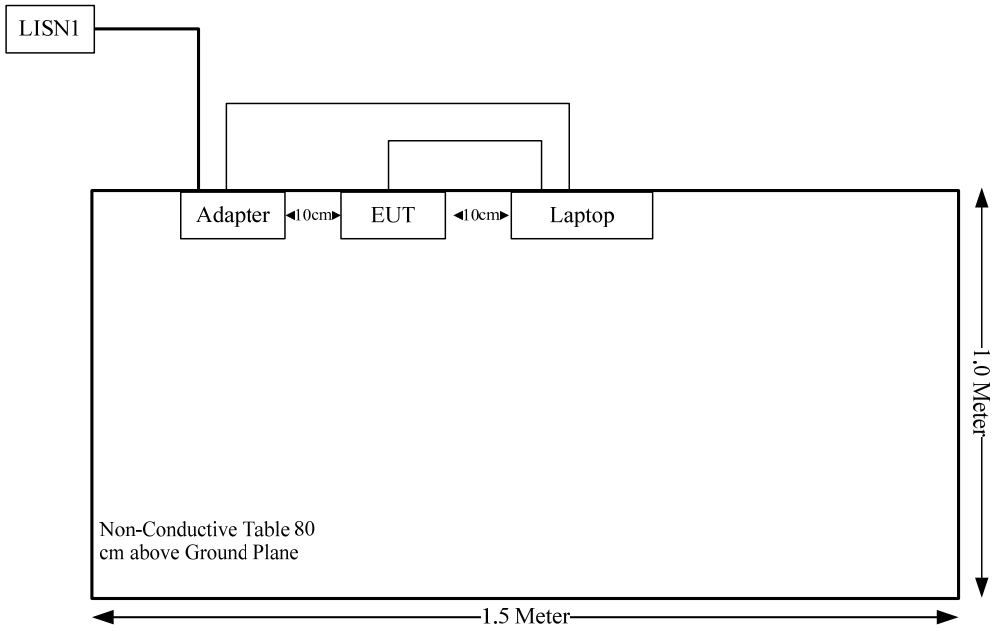
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
DELL	Laptop	PP11L	QDS-BRCM1017

Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
DC Cable	yes	No	1.3	Adapter	Laptop
USB Cable	yes	No	1.03	USB Port of PC	EUT

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
FCC §15.407 (f) & §1.1310 & §2.1091	Maximum Permissable Exposure (MPE)	Compliance
§15.203	Antenna Requirement	Compliance
§15.407(b)(6)& §15.207(a)	Conducted Emissions	Compliance
§15.205& §15.209 &§15.407(b)	Undesirable Emission& Restricted Bands	Compliance
§15.407(b)	Out Of Band Emissions	Compliance
§15.407(a) (1)	6 dB Emission Bandwidth	Compliance
§15.407(g)	Frequency Stability	Compliance
§15.407(a)(1),	Conducted Transmitter Output Power	Compliance
§15.407 (a)(1),(5)	Power Spectral Density	Compliance

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

Applicable Standard

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

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

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm^2)**	**Averaging Time (minutes)**
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f²)	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

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

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

Calculation Formula:

prediction of power density at the distance of the applicable MPE limit
$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm^2);
P = power input to the antenna (in appropriate units, e.g., mW);
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

Calculated Data:

Frequency (MHz)	**Antenna Gain**		**Tune-up Power**		**Evaluation Distance (cm)**	**Power Density (mW/cm^2)**	**MPE Limit (mW/cm^2)**
	(dBi)	**(numeric)**	**(dBm)**	**(mW)**			
2400-2483.5	3	2.00	30	1000.00	20.00	0.40	1.0
5150-5850	4	2.51	23	199.53	20.00	0.10	1.0

Note: The 2.4GHz and 5GHz band can`t transmit simultaneously

Result: The device meet FCC MPE at 20 cm distance

FCC §15.203 – ANTENNA REQUIREMENT

Applicable Standard

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.
And according to FCC 47 CFR section 15.407 (a)(1),if transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT have 2 dipole antennas with RP-SMA connector, all the antenna gains are 3.0 dBi in 2.4G band, 4dBi in 5GHz bands, fulfill the requirement of this section. Please refer to the EUT photos.

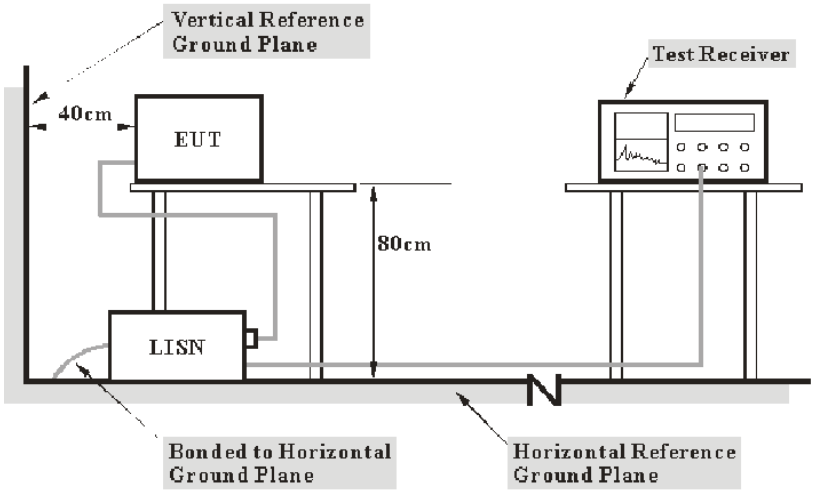
Result: Compliance.

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

Applicable Standard

FCC §15.207(a), §15.407(b) (6).

EUT Setup



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

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

The spacing between the peripherals was 10 cm.

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

EMI Test Receiver Setup

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

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

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

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

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

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

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

Margin = Limit – Corrected Amplitude

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS 30	836858/0016	2016-12-02	2017-12-01
Rohde & Schwarz	L.I.S.N.	ENV216	100018	2016-12-02	2017-12-01
Rohde & Schwarz	PULSE LIMITER	ESH3Z2	DE14781	2016-10-31	2017-10-30
Unknown	Conducted Cable	Unknown	NO.5	2016-11-10	2017-11-09
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A

*** Statement of Traceability:** BACL(Chengdu) attests that all of the calibrations on the equipment items listed above were traceable to NIM or to another internationally recognized National Metrology Institute (NMI), and were compliant with the NIST HB 150-2016 Normative Annex B "Implementation of traceability policy in accredited laboratories".

Test Procedure

During the conducted emission test, the adapter was connected to the first LISN.

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

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

Test Results Summary

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

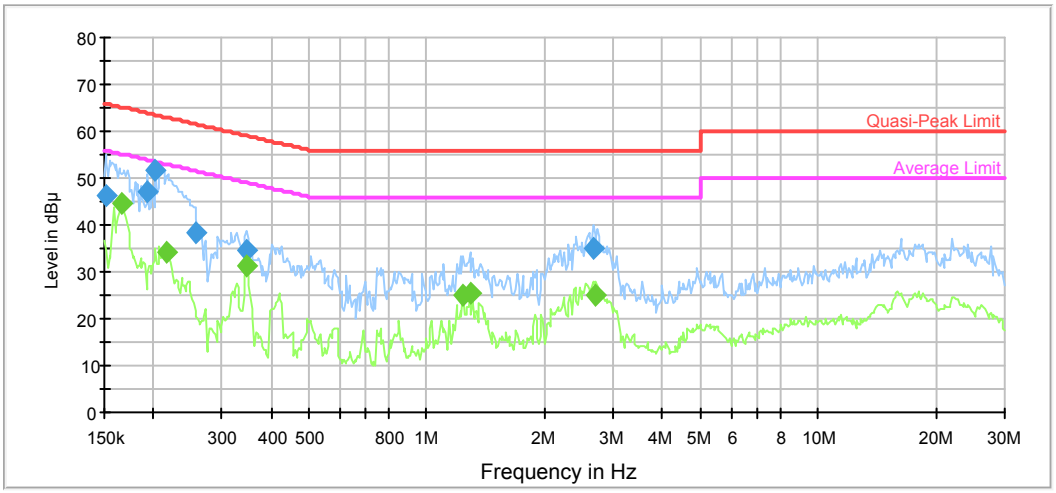
Test Data

Environmental Conditions

Temperature:	27.4 °C
Relative Humidity:	46.9 %
ATM Pressure:	100.1 kPa

The testing was performed by Tom Tang on 2017-06-26.

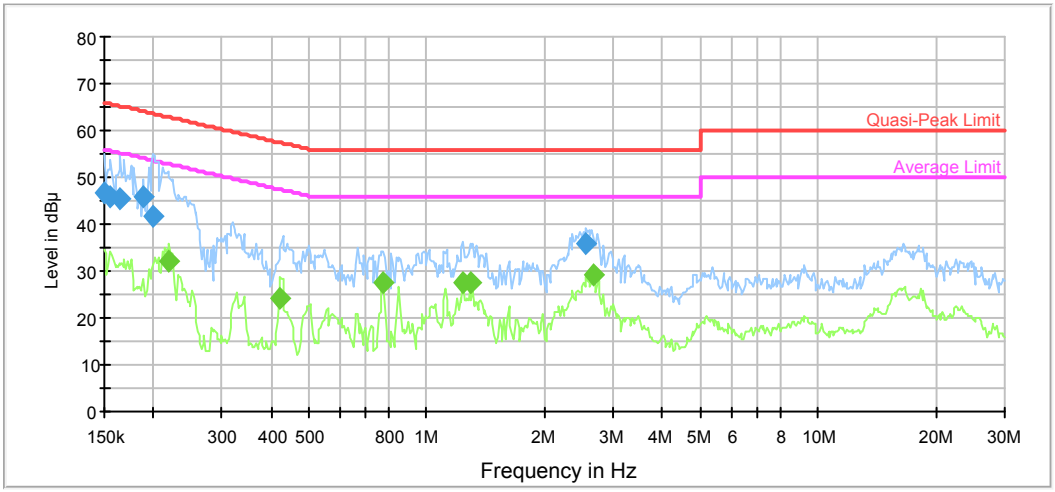
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.151200	46.3	9.000	L1	19.7	19.6	65.9	Compliance
0.193566	47.3	9.000	L1	19.7	16.6	63.9	Compliance
0.203045	51.7	9.000	L1	19.7	11.8	63.5	Compliance
0.255827	38.3	9.000	L1	19.7	23.3	61.6	Compliance
0.346296	34.8	9.000	L1	19.7	24.3	59.1	Compliance
2.662831	34.8	9.000	L1	19.7	21.2	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.166371	44.5	9.000	L1	19.7	10.6	55.1	Compliance
0.216409	34.0	9.000	L1	19.7	19.0	53.0	Compliance
0.346296	31.2	9.000	L1	19.7	17.8	49.1	Compliance
1.239175	24.9	9.000	L1	19.7	21.1	46.0	Compliance
1.289541	25.4	9.000	L1	19.7	20.6	46.0	Compliance
2.705607	25.2	9.000	L1	19.7	20.8	46.0	Compliance

AC120 V, 60 Hz, Neutral:



requency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.150000	46.9	9.000	N	19.7	19.1	66.0	Compliance
0.156097	45.7	9.000	N	19.7	20.0	65.7	Compliance
0.165051	45.3	9.000	N	19.7	19.9	65.2	Compliance
0.188994	45.7	9.000	N	19.6	18.4	64.1	Compliance
0.199835	41.8	9.000	N	19.6	21.8	63.6	Compliance
2.558827	35.7	9.000	N	19.7	20.3	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.219886	32.1	9.000	N	19.6	20.7	52.8	Compliance
0.422630	24.1	9.000	N	19.6	23.3	47.4	Compliance
0.774393	27.4	9.000	N	19.6	18.6	46.0	Compliance
1.239175	27.5	9.000	N	19.6	18.5	46.0	Compliance
1.289541	27.7	9.000	N	19.6	18.3	46.0	Compliance
2.662831	29.1	9.000	N	19.7	16.9	46.0	Compliance

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

Applicable Standard

FCC §15.407; §15.209; §15.205;

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

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

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

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

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

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

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

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

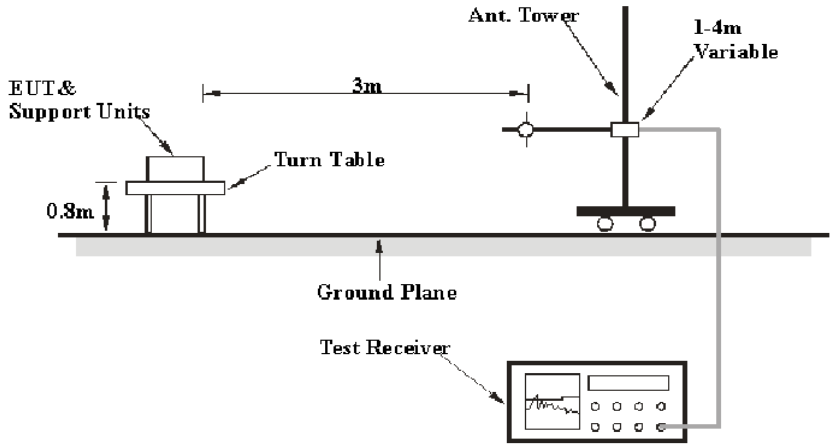
(6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

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

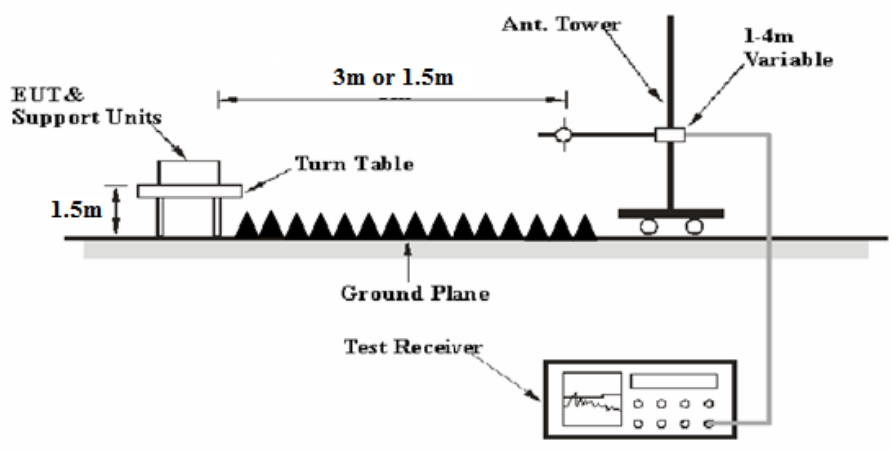
(8) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits.

EUT Setup

Below 1 GHz:



Above 1 GHz:



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

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

The spacing between the peripherals was 10 cm.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 40 GHz.

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

30-1000MHz:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP

1GHz- 40GHz:

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

Test Procedure

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

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

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

According to KDB 789033 D02 General UNII Test Procedures New Rules v01r04, emission shall be computed as: E [dBμV/m] = EIRP[dBm] + 95.2, for d = 3 meters.

According to C63.10, the above 1G test result shall be extrapolated to the specified distance using an extrapolation factor of 20dB/decade from 3m to 1.5m
Distance extrapolation factor =20 log (specific distance [3m]/test distance [1.5m]) dB
Extrapolation result = Corrected Amplitude (dBμV/m) - distance extrapolation factor (6dB)

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Loss 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 = Extrapolation result -Limit

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Amplifier	8447D	2944A10442	2016-12-02	2017-12-01
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2016-12-02	2017-12-01
Sunol Sciences	Broadband Antenna	JB3	A121808	2016-04-10	2019-04-09
Rohde & Schwarz	Spectrum Analyzer	FSEM30	100018	2016-12-02	2017-12-01
ETS	Horn Antenna	3115	003-6076	2016-12-02	2017-12-01
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-0113024	2017-06-16	2020-06-15
Mini-circuits	Amplifier	ZVA-183-S+	771001215	2017-05-20	2018-05-19
EMCT	Semi-Anechoic Chamber	966	966-1	2015-04-24	2018-04-23
Unknown	RF Cable (below 1GHz)	Unknown	NO.1	2016-11-10	2017-11-09
Unknown	RF Cable (below 1GHz)	Unknown	NO.4	2016-11-10	2017-11-09
Unknown	RF Cable (above 1GHz)	Unknown	NO.2	2016-11-10	2017-11-09
Ducommun Technolagies	Horn Antenna	ARH-2823-02	1007726-01 1312	2016-08-18	2017-08-18
Quinstar	Amplifier	QLW-18405536-JO	15964001032	2016-08-18	2017-08-18
Agilent	Spectrum Analyzer	8564E	5943A01752	2016-08-18	2017-08-18

*** Statement of Traceability:** BACL(Chengdu) attests that all of the calibrations on the equipment items listed above were traceable to NIM or to another internationally recognized National Metrology Institute (NMI), and were compliant with the NIST HB 150-2016 Normative Annex B “Implementation of traceability policy in accredited laboratories”.

Test Data

Environmental Conditions

Temperature:	28.9~29.0 °C
Relative Humidity:	50.1~53.2 %
ATM Pressure:	100.1 kPa

** The testing was performed by Tom Tang from 2017-06-30 to 2017-07-01.*

Test Mode: Transmitting(Above 1GHz test performed at distance 1.5m from EUT to Antenna)

5150-5250MHz, SISO mode:
802.11a mode(Chain 0 was the worst)

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation Result dBμV/m	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)						
Low Channel:5180 MHz										
5180	74.72	PK	H	33.59	4.78	0.00	113.09	107.09	N/A	N/A
5180	66.17	AV	H	33.59	4.78	0.00	104.54	98.54	N/A	N/A
5180	82.39	PK	V	33.59	4.78	0.00	120.76	114.76	N/A	N/A
5180	74.32	AV	V	33.59	4.78	0.00	112.69	106.69	N/A	N/A
5150	34.22	PK	V	33.54	4.67	0.00	72.43	66.43	74.00	7.57
5150	20.41	AV	V	33.54	4.67	0.00	58.62	52.62	54.00	1.38
10360	56.98	PK	V	38.17	6.56	36.38	65.33	59.33	74.00	14.67
10360	39.14	AV	V	38.17	6.56	36.38	47.49	41.49	54.00	12.51
15540	55.96	PK	V	38.06	8.67	38.13	64.56	58.56	74.00	15.44
15540	33.69	AV	V	38.06	8.67	38.13	42.29	36.29	54.00	17.71
8975	44.59	PK	V	37.69	6.01	36.24	52.05	46.05	74.00	27.95
8975	30.46	AV	V	37.69	6.01	36.24	37.92	31.92	54.00	22.08
210.42	51	QP	H	11.31	0.91	27.74	35.48	35.48	43.50	8.02
282.2	45.94	QP	H	13.92	1.20	27.51	33.55	33.55	46.00	12.45
Middle Channel:5200 MHz										
5200	75.63	PK	H	33.62	4.85	0.00	114.10	108.10	N/A	N/A
5200	67.39	AV	H	33.62	4.85	0.00	105.86	99.86	N/A	N/A
5200	83.04	PK	V	33.62	4.85	0.00	121.51	115.51	N/A	N/A
5200	74.38	AV	V	33.62	4.85	0.00	112.85	106.85	N/A	N/A
10400	59.89	PK	V	38.18	6.57	36.39	68.25	62.25	74.00	11.75
10400	39.84	AV	V	38.18	6.57	36.39	48.20	42.20	54.00	11.80
15600	56.57	PK	V	38.00	8.64	38.04	65.17	59.17	74.00	14.83
15600	32.51	AV	V	38.00	8.64	38.04	41.11	35.11	54.00	18.89
8996	44.61	PK	V	37.70	6.01	36.25	52.07	46.07	74.00	27.93
8996	30.46	AV	V	37.70	6.01	36.25	37.92	31.92	54.00	22.08
14355	44.72	PK	V	41.53	8.44	38.40	56.29	50.29	74.00	23.71
14355	30.59	AV	V	41.53	8.44	38.40	42.16	36.16	54.00	17.84
210.42	51.27	QP	H	11.31	0.91	27.74	35.75	35.75	43.50	7.75
282.2	46.08	QP	H	13.92	1.20	27.51	33.69	33.69	46.00	12.31
High Channel:5240 MHz										
5240	75.66	PK	H	33.68	4.71	0.00	114.05	108.05	N/A	N/A
5240	67.68	AV	H	33.68	4.71	0.00	106.07	100.07	N/A	N/A
5240	82.92	PK	V	33.68	4.71	0.00	121.31	115.31	N/A	N/A
5240	74.23	AV	V	33.68	4.71	0.00	112.62	106.62	N/A	N/A
5350	28.12	PK	V	33.86	4.52	0.00	66.50	60.50	74.00	13.50
5350	15.69	AV	V	33.86	4.52	0.00	54.07	48.07	54.00	5.93
10480	60.14	PK	V	38.20	6.59	36.40	68.53	62.53	74.00	11.47
10480	39.87	AV	V	38.20	6.59	36.40	48.26	42.26	54.00	11.74
15720	55.26	PK	V	37.88	8.57	37.86	63.85	57.85	74.00	16.15
15720	33.62	AV	V	37.88	8.57	37.86	42.21	36.21	54.00	17.79
7985	44.89	PK	V	36.79	5.86	36.09	51.45	45.45	74.00	28.55
7985	30.76	AV	V	36.79	5.86	36.09	37.32	31.32	54.00	22.68
210.42	52.11	QP	H	11.31	0.91	27.74	36.59	36.59	43.50	6.91
282.2	46.5	QP	H	13.92	1.20	27.51	34.11	34.11	46.00	11.89

802.11n ht20 mode(Chain 0 was the worst)

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation Result dBμV/m	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)						
Low Channel:5180 MHz										
5180	69.35	PK	H	33.59	4.78	0.00	107.72	101.72	N/A	N/A
5180	57.39	AV	H	33.59	4.78	0.00	95.76	89.76	N/A	N/A
5180	79.88	PK	V	33.59	4.78	0.00	118.25	112.25	N/A	N/A
5180	69.24	AV	V	33.59	4.78	0.00	107.61	101.61	N/A	N/A
5150	31.81	PK	V	33.54	4.67	0.00	70.02	64.02	74.00	9.98
5150	15.44	AV	V	33.54	4.67	0.00	53.65	47.65	54.00	6.35
10360	57.33	PK	V	38.17	6.56	36.38	65.68	59.68	74.00	14.32
10360	38.34	AV	V	38.17	6.56	36.38	46.69	40.69	54.00	13.31
15540	54.06	PK	V	38.06	8.67	38.13	62.66	56.66	74.00	17.34
15540	36.92	AV	V	38.06	8.67	38.13	45.52	39.52	54.00	14.48
7498	48.22	PK	V	36.49	5.64	35.99	54.36	48.36	74.00	25.64
7498	32.45	AV	V	36.49	5.64	35.99	38.59	32.59	54.00	21.41
210.42	51.64	QP	H	11.31	0.91	27.74	36.12	36.12	43.50	7.38
282.2	46.94	QP	H	13.92	1.20	27.51	34.55	34.55	46.00	11.45
Middle Channel:5200 MHz										
5200	84.43	PK	H	33.62	4.85	0.00	122.90	116.90	N/A	N/A
5200	73.29	AV	H	33.62	4.85	0.00	111.76	105.76	N/A	N/A
5200	85.09	PK	V	33.62	4.85	0.00	123.56	117.56	N/A	N/A
5200	74.86	AV	V	33.62	4.85	0.00	113.33	107.33	N/A	N/A
10400	59.21	PK	V	38.18	6.57	36.39	67.57	61.57	74.00	12.43
10400	39.53	AV	V	38.18	6.57	36.39	47.89	41.89	54.00	12.11
15600	65.38	PK	V	38.00	8.64	38.04	73.98	67.98	74.00	6.02
15600	43.53	AV	V	38.00	8.64	38.04	52.13	46.13	54.00	7.87
6058	49.35	PK	V	34.29	4.74	35.84	52.54	46.54	74.00	27.46
6058	32.63	AV	V	34.29	4.74	35.84	35.82	29.82	54.00	24.18
7228	45.21	PK	V	35.79	5.47	35.97	50.50	44.50	74.00	29.50
7228	32.25	AV	V	35.79	5.47	35.97	37.54	31.54	54.00	22.46
210.42	51.17	QP	H	11.31	0.91	27.74	35.65	35.65	43.50	7.85
282.2	47.38	QP	H	13.92	1.20	27.51	34.99	34.99	46.00	11.01
High Channel:5240 MHz										
5240	73.65	PK	H	33.68	4.71	0.00	112.04	106.04	N/A	N/A
5240	62.89	AV	H	33.68	4.71	0.00	101.28	95.28	N/A	N/A
5240	84.41	PK	V	33.68	4.71	0.00	122.80	116.80	N/A	N/A
5240	73.49	AV	V	33.68	4.71	0.00	111.88	105.88	N/A	N/A
5350	27.41	PK	V	33.86	4.52	0.00	65.79	59.79	74.00	14.21
5350	14.74	AV	V	33.86	4.52	0.00	53.12	47.12	54.00	6.88
10480	61.33	PK	V	38.20	6.59	36.40	69.72	63.72	74.00	10.28
10480	42.54	AV	V	38.20	6.59	36.40	50.93	44.93	54.00	9.07
15720	65.09	PK	V	37.88	8.57	37.86	73.68	67.68	74.00	6.32
15720	40.44	AV	V	37.88	8.57	37.86	49.03	43.03	54.00	10.97
6022	48.85	PK	V	34.30	4.70	35.85	52.00	46.00	74.00	28.00
6022	33.56	AV	V	34.30	4.70	35.85	36.71	30.71	54.00	23.29
210.42	51.05	QP	H	11.31	0.91	27.74	35.53	35.53	43.50	7.97
282.2	45.15	QP	H	13.92	1.20	27.51	32.76	32.76	46.00	13.24

802.11n ht40 mode(Chain 0 was the worst)

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation Result dBμV/m	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)						
Low Channel:5190 MHz										
5190	66.44	PK	H	33.60	4.81	0.00	104.85	98.85	N/A	N/A
5190	54.91	AV	H	33.60	4.81	0.00	93.32	87.32	N/A	N/A
5190	76.81	PK	V	33.60	4.81	0.00	115.22	109.22	N/A	N/A
5190	64.51	AV	V	33.60	4.81	0.00	102.92	96.92	N/A	N/A
5150	34.13	PK	V	33.54	4.67	0.00	72.34	66.34	74.00	7.66
5150	17.78	AV	V	33.54	4.67	0.00	55.99	49.99	54.00	4.01
10380	46.69	PK	V	38.18	6.57	36.38	55.06	49.06	74.00	24.94
10380	32.31	AV	V	38.18	6.57	36.38	40.68	34.68	54.00	19.32
15570	47.25	PK	V	38.03	8.65	38.09	55.84	49.84	74.00	24.16
15570	33.34	AV	V	38.03	8.65	38.09	41.93	35.93	54.00	18.07
6125	45.21	PK	V	34.28	4.82	35.82	48.49	42.49	74.00	31.51
6125	32.76	AV	V	34.28	4.82	35.82	36.04	30.04	54.00	23.96
210.42	51.32	QP	H	11.31	0.91	27.74	35.80	35.80	43.50	7.70
282.2	45.29	QP	H	13.92	1.20	27.51	32.90	32.90	46.00	13.10
High Channel:5230 MHz										
5230	70.11	PK	H	33.67	4.74	0.00	108.52	102.52	N/A	N/A
5230	58.66	AV	H	33.67	4.74	0.00	97.07	91.07	N/A	N/A
5230	81.75	PK	V	33.67	4.74	0.00	120.16	114.16	N/A	N/A
5230	69.06	AV	V	33.67	4.74	0.00	107.47	101.47	N/A	N/A
5350	33.55	PK	V	33.86	4.52	0.00	71.93	65.93	74.00	8.07
5350	14.14	AV	V	33.86	4.52	0.00	52.52	46.52	54.00	7.48
10460	54.71	PK	V	38.19	6.59	36.39	63.10	57.10	74.00	16.90
10460	40.41	AV	V	38.19	6.59	36.39	48.80	42.80	54.00	11.20
15690	58.42	PK	V	37.91	8.59	37.91	67.01	61.01	74.00	12.99
15690	39.33	AV	V	37.91	8.59	37.91	47.92	41.92	54.00	12.08
5968	46.95	PK	V	34.29	4.65	35.85	50.04	44.04	74.00	29.96
5968	33.09	AV	V	34.29	4.65	35.85	36.18	30.18	54.00	23.82
210.42	52.16	QP	H	11.31	0.91	27.74	36.64	36.64	43.50	6.86
282.2	45.71	QP	H	13.92	1.20	27.51	33.32	33.32	46.00	12.68

802.11n ac80 mode(chain 0 was the worst):

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation Result dBμV/m	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)						
Middle Channel:5210 MHz										
5210	64.19	PK	H	33.64	4.81	0.00	102.64	96.64	N/A	N/A
5210	54.19	AV	H	33.64	4.81	0.00	92.64	86.64	N/A	N/A
5210	73.75	PK	V	33.64	4.81	0.00	112.20	106.20	N/A	N/A
5210	62.41	AV	V	33.64	4.81	0.00	100.86	94.86	N/A	N/A
5150	32.35	PK	V	33.54	4.67	0.00	70.56	64.56	74.00	9.44
5150	19.15	AV	V	33.54	4.67	0.00	57.36	51.36	54.00	2.64
5350	28.87	PK	V	33.86	4.52	0.00	67.25	61.25	74.00	12.75
5350	14.67	AV	V	33.86	4.52	0.00	53.05	47.05	54.00	6.95
10420	46.36	PK	V	38.18	6.58	36.39	54.73	48.73	74.00	25.27
10420	32.35	AV	V	38.18	6.58	36.39	40.72	34.72	54.00	19.28
15630	46.66	PK	V	37.97	8.62	38.00	55.25	49.25	74.00	24.75
15630	32.58	AV	V	37.97	8.62	38.00	41.17	35.17	54.00	18.83
6325	45.67	PK	V	34.24	5.06	35.78	49.19	43.19	74.00	30.81
6325	33.69	AV	V	34.24	5.06	35.78	37.21	31.21	54.00	22.79
210.42	51.69	QP	H	11.31	0.91	27.74	36.17	36.17	43.50	7.33
282.2	46.15	QP	H	13.92	1.20	27.51	33.76	33.76	46.00	12.24

MIMO mode:
802.11n ht20 mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation Result dBμV/m	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)						
Low Channel:5180 MHz										
5180	72.58	PK	H	33.59	4.78	0.00	110.95	104.95	N/A	N/A
5180	61.62	AV	H	33.59	4.78	0.00	99.99	93.99	N/A	N/A
5180	82.28	PK	V	33.59	4.78	0.00	120.65	114.65	N/A	N/A
5180	71.49	AV	V	33.59	4.78	0.00	109.86	103.86	N/A	N/A
5150	32.48	PK	V	33.54	4.67	0.00	70.69	64.69	74.00	9.31
5150	18.36	AV	V	33.54	4.67	0.00	56.57	50.57	54.00	3.43
10360	43.65	PK	V	38.17	6.56	36.38	52.00	46.00	74.00	28.00
10360	30.12	AV	V	38.17	6.56	36.38	38.47	32.47	54.00	21.53
15540	43.24	PK	V	38.06	8.67	38.13	51.84	45.84	74.00	28.16
15540	30.12	AV	V	38.06	8.67	38.13	38.72	32.72	54.00	21.28
9850	43.51	PK	V	38.04	6.39	36.30	51.64	45.64	74.00	28.36
9850	30.23	AV	V	38.04	6.39	36.30	38.36	32.36	54.00	21.64
210.42	51.22	QP	H	11.31	0.91	27.74	35.70	35.70	43.50	7.80
282.2	46.59	QP	H	13.92	1.20	27.51	34.20	34.20	46.00	11.80
Middle Channel:5200 MHz										
5200	73.64	PK	H	33.62	4.85	0.00	112.11	106.11	N/A	N/A
5200	62.18	AV	H	33.62	4.85	0.00	100.65	94.65	N/A	N/A
5200	82.37	PK	V	33.62	4.85	0.00	120.84	114.84	N/A	N/A
5200	73.79	AV	V	33.62	4.85	0.00	112.26	106.26	N/A	N/A
10400	43.85	PK	V	38.18	6.57	36.39	52.21	46.21	74.00	27.79
10400	30.32	AV	V	38.18	6.57	36.39	38.68	32.68	54.00	21.32
15600	43.44	PK	V	38.00	8.64	38.04	52.04	46.04	74.00	27.96
15600	30.22	AV	V	38.00	8.64	38.04	38.82	32.82	54.00	21.18
7895	43.71	PK	V	36.74	5.82	36.07	50.20	44.20	74.00	29.80
7895	30.43	AV	V	36.74	5.82	36.07	36.92	30.92	54.00	23.08
13315	43.52	PK	V	40.07	7.89	37.49	53.99	47.99	74.00	26.01
13315	30.17	AV	V	40.07	7.89	37.49	40.64	34.64	54.00	19.36
210.42	51.62	QP	H	11.31	0.91	27.74	36.10	36.10	43.50	7.40
282.2	46.06	QP	H	13.92	1.20	27.51	33.67	33.67	46.00	12.33
High Channel:5240 MHz										
5240	74.18	PK	H	33.68	4.71	0.00	112.57	106.57	N/A	N/A
5240	62.88	AV	H	33.68	4.71	0.00	101.27	95.27	N/A	N/A
5240	82.67	PK	V	33.68	4.71	0.00	121.06	115.06	N/A	N/A
5240	74.13	AV	V	33.68	4.71	0.00	112.52	106.52	N/A	N/A
5350	32.68	PK	V	33.86	4.52	0.00	71.06	65.06	74.00	8.94
5350	19.14	AV	V	33.86	4.52	0.00	57.52	51.52	54.00	2.48
10480	43.72	PK	V	38.20	6.59	36.40	52.11	46.11	74.00	27.89
10480	30.63	AV	V	38.20	6.59	36.40	39.02	33.02	54.00	20.98
15720	44.54	PK	V	37.88	8.57	37.86	53.13	47.13	74.00	26.87
15720	30.19	AV	V	37.88	8.57	37.86	38.78	32.78	54.00	21.22
9925	43.38	PK	V	38.07	6.42	36.32	51.55	45.55	74.00	28.45
9925	32.07	AV	V	38.07	6.42	36.32	40.24	34.24	54.00	19.76
210.42	51.89	QP	H	11.31	0.91	27.74	36.37	36.37	43.50	7.13
282.2	46.2	QP	H	13.92	1.20	27.51	33.81	33.81	46.00	12.19

802.11n ht40 mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation Result dBμV/m	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)						
Low Channel:5190 MHz										
5190	68.17	PK	H	33.60	4.81	0.00	106.58	100.58	N/A	N/A
5190	57.48	AV	H	33.60	4.81	0.00	95.89	89.89	N/A	N/A
5190	76.68	PK	V	33.60	4.81	0.00	115.09	109.09	N/A	N/A
5190	66.36	AV	V	33.60	4.81	0.00	104.77	98.77	N/A	N/A
5150	30.64	PK	V	33.54	4.67	0.00	68.85	62.85	74.00	11.15
5150	17.81	AV	V	33.54	4.67	0.00	56.02	50.02	54.00	3.98
10380	43.64	PK	V	38.18	6.57	36.38	52.01	46.01	74.00	27.99
10380	30.42	AV	V	38.18	6.57	36.38	38.79	32.79	54.00	21.21
15570	43.91	PK	V	38.03	8.65	38.09	52.50	46.50	74.00	27.50
15570	30.63	AV	V	38.03	8.65	38.09	39.22	33.22	54.00	20.78
8975	43.72	PK	V	37.69	6.01	36.24	51.18	45.18	74.00	28.82
8975	30.37	AV	V	37.69	6.01	36.24	37.83	31.83	54.00	22.17
210.42	52.73	QP	H	11.31	0.91	27.74	37.21	37.21	43.50	6.29
282.2	46.62	QP	H	13.92	1.20	27.51	34.23	34.23	46.00	11.77
High Channel:5230 MHz										
5230	69.49	PK	H	33.67	4.74	0.00	107.90	101.90	N/A	N/A
5230	58.63	AV	H	33.67	4.74	0.00	97.04	91.04	N/A	N/A
5230	77.84	PK	V	33.67	4.74	0.00	116.25	110.25	N/A	N/A
5230	66.79	AV	V	33.67	4.74	0.00	105.20	99.20	N/A	N/A
5350	27.23	PK	V	33.86	4.52	0.00	65.61	59.61	74.00	14.39
5350	16.63	AV	V	33.86	4.52	0.00	55.01	49.01	54.00	4.99
10460	43.45	PK	V	38.19	6.59	36.39	51.84	45.84	74.00	28.16
10460	30.42	AV	V	38.19	6.59	36.39	38.81	32.81	54.00	21.19
15690	43.51	PK	V	37.91	8.59	37.91	52.10	46.10	74.00	27.90
15690	30.63	AV	V	37.91	8.59	37.91	39.22	33.22	54.00	20.78
8695	43.64	PK	V	37.52	6.02	36.12	51.06	45.06	74.00	28.94
8695	30.32	AV	V	37.52	6.02	36.12	37.74	31.74	54.00	22.26
13455	44.28	PK	V	40.32	8.09	37.54	55.15	49.15	74.00	24.85
13455	30.54	AV	V	40.32	8.09	37.54	41.41	35.41	54.00	18.59
210.42	52.26	QP	H	11.31	0.91	27.74	36.74	36.74	43.50	6.76
282.2	47.06	QP	H	13.92	1.20	27.51	34.67	34.67	46.00	11.33

802.11n ac80 mode:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation Result dBμV/m	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)						
Middle Channel:5210 MHz										
5210	68.14	PK	H	33.64	4.81	0.00	106.59	100.59	N/A	N/A
5210	57.22	AV	H	33.64	4.81	0.00	95.67	89.67	N/A	N/A
5210	76.63	PK	V	33.64	4.81	0.00	115.08	109.08	N/A	N/A
5210	65.42	AV	V	33.64	4.81	0.00	103.87	97.87	N/A	N/A
5150	34.36	PK	V	33.54	4.67	0.00	72.57	66.57	74.00	7.43
5150	20.23	AV	V	33.54	4.67	0.00	58.44	52.44	54.00	1.56
5350	32.25	PK	V	33.86	4.52	0.00	70.63	64.63	74.00	9.37
5350	20.18	AV	V	33.86	4.52	0.00	58.56	52.56	54.00	1.44
10420	44.35	PK	V	38.18	6.58	36.39	52.72	46.72	74.00	27.28
10420	30.72	AV	V	38.18	6.58	36.39	39.09	33.09	54.00	20.91
15630	43.68	PK	V	37.97	8.62	38.00	52.27	46.27	74.00	27.73
15630	30.43	AV	V	37.97	8.62	38.00	39.02	33.02	54.00	20.98
8865	43.79	PK	V	37.62	6.02	36.19	51.24	45.24	74.00	28.76
8865	30.38	AV	V	37.62	6.02	36.19	37.83	31.83	54.00	22.17
210.42	51.79	QP	H	11.31	0.91	27.74	36.27	36.27	43.50	7.23
282.2	47.5	QP	H	13.92	1.20	27.51	35.11	35.11	46.00	10.89

5725-5850MHz,SISO:
802.11a mode (chain 0 was the worst):

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation Result dBμV/m	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)						
Low Channel:5745 MHz										
5745	70.46	PK	H	34.20	4.68	0.00	109.34	103.34	N/A	N/A
5745	60.68	AV	H	34.20	4.68	0.00	99.56	93.56	N/A	N/A
5745	75.13	PK	V	34.20	4.68	0.00	114.01	108.01	N/A	N/A
5745	65.49	AV	V	34.20	4.68	0.00	104.37	98.37	N/A	N/A
5725	28.21	PK	V	34.19	4.67	0.00	67.07	61.07	122.20	61.13
5720	26.86	PK	V	34.19	4.66	0.00	65.71	59.71	110.80	51.09
5700	25.63	PK	V	34.18	4.65	0.00	64.46	58.46	105.20	46.74
5650	26.12	PK	V	34.16	4.60	0.00	64.88	58.88	68.20	9.32
11490	64.96	PK	V	38.99	6.85	36.60	74.20	68.20	74.00	5.80
11490	49.01	AV	V	38.99	6.85	36.60	58.25	52.25	54.00	1.75
17235	58.42	PK	V	41.56	8.68	36.97	71.69	65.69	74.00	8.31
17235	42.37	AV	V	41.56	8.68	36.97	55.64	49.64	54.00	4.36
210.42	51.34	QP	H	11.31	0.91	27.74	35.82	35.82	43.50	7.68
282.2	45.74	QP	H	13.92	1.20	27.51	33.35	33.35	46.00	12.65
Middle Channel:5785 MHz										
5785	69.68	PK	H	34.21	4.71	0.00	108.60	102.60	N/A	N/A
5785	59.77	AV	H	34.21	4.71	0.00	98.69	92.69	N/A	N/A
5785	75.29	PK	V	34.21	4.71	0.00	114.21	108.21	N/A	N/A
5785	64.22	AV	V	34.21	4.71	0.00	103.14	97.14	N/A	N/A
11570	65.43	PK	V	39.00	6.87	36.61	74.69	68.69	74.00	5.31
11570	49.14	AV	V	39.00	6.87	36.61	58.40	52.40	54.00	1.60
17355	60.26	PK	V	42.26	8.67	36.79	74.40	68.40	74.00	5.60
17355	42.81	AV	V	42.26	8.67	36.79	56.95	50.95	54.00	3.05
5122	55.32	PK	V	33.50	4.57	35.68	57.71	51.71	74.00	22.29
5122	42.37	AV	V	33.50	4.57	35.68	44.76	38.76	54.00	15.24
7658	56.98	PK	V	36.59	5.71	36.02	63.26	57.26	74.00	16.74
7658	43.85	AV	V	36.59	5.71	36.02	50.13	44.13	54.00	9.87
210.42	51.61	QP	H	11.31	0.91	27.74	36.09	36.09	43.50	7.41
282.2	45.88	QP	H	13.92	1.20	27.51	33.49	33.49	46.00	12.51
High Channel:5825 MHz										
5825	67.13	PK	H	34.23	4.69	0.00	106.05	100.05	N/A	N/A
5825	55.89	AV	H	34.23	4.69	0.00	94.81	88.81	N/A	N/A
5825	72.68	PK	V	34.23	4.69	0.00	111.60	105.60	N/A	N/A
5825	61.76	AV	V	34.23	4.69	0.00	100.68	94.68	N/A	N/A
5850	26.33	PK	V	34.24	4.67	0.00	65.24	59.24	122.20	62.96
5855	26.69	PK	V	34.24	4.66	0.00	65.59	59.59	110.80	51.21
5875	26.97	PK	V	34.25	4.64	0.00	65.86	59.86	105.20	45.34
5925	26.38	PK	V	34.27	4.63	0.00	65.28	59.28	68.20	8.92
11650	65.17	PK	V	39.00	6.89	36.63	74.43	68.43	74.00	5.57
11650	50.06	AV	V	39.00	6.89	36.63	59.32	53.32	54.00	0.68
17475	60.51	PK	V	42.96	8.65	36.62	75.50	69.50	74.00	4.50
17475	42.65	AV	V	42.96	8.65	36.62	57.64	51.64	54.00	2.36
5512	55.72	PK	V	34.10	4.49	35.85	58.46	52.46	74.00	21.54
5512	43.13	AV	V	34.10	4.49	35.85	45.87	39.87	54.00	14.13
210.42	52.45	QP	H	11.31	0.91	27.74	36.93	36.93	43.50	6.57
282.2	46.3	QP	H	13.92	1.20	27.51	33.91	33.91	46.00	12.09

802.11n ht20 mode(chain 0 was the worst):

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation Result dBμV/m	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)						
Low Channel:5745 MHz										
5745	68.23	PK	H	34.20	4.68	0.00	107.11	101.11	N/A	N/A
5745	57.58	AV	H	34.20	4.68	0.00	96.46	90.46	N/A	N/A
5745	74.47	PK	V	34.20	4.68	0.00	113.35	107.35	N/A	N/A
5745	63.66	AV	V	34.20	4.68	0.00	102.54	96.54	N/A	N/A
5725	29.47	PK	V	34.19	4.67	0.00	68.33	62.33	122.20	59.87
5720	27.35	PK	V	34.19	4.66	0.00	66.20	60.20	110.80	50.60
5700	26.63	PK	V	34.18	4.65	0.00	65.46	59.46	105.20	45.74
5650	26.68	PK	V	34.16	4.60	0.00	65.44	59.44	68.20	8.76
11490	64.75	PK	V	38.99	6.85	36.60	73.99	67.99	74.00	6.01
11490	48.96	AV	V	38.99	6.85	36.60	58.20	52.20	54.00	1.80
17235	58.24	PK	V	41.56	8.68	36.97	71.51	65.51	74.00	8.49
17235	43.58	AV	V	41.56	8.68	36.97	56.85	50.85	54.00	3.15
210.42	51.98	QP	H	11.31	0.91	27.74	36.46	36.46	43.50	7.04
282.2	46.74	QP	H	13.92	1.20	27.51	34.35	34.35	46.00	11.65
Middle Channel:5785 MHz										
5785	68.71	PK	H	34.21	4.71	0.00	107.63	101.63	N/A	N/A
5785	58.57	AV	H	34.21	4.71	0.00	97.49	91.49	N/A	N/A
5785	74.03	PK	V	34.21	4.71	0.00	112.95	106.95	N/A	N/A
5785	63.21	AV	V	34.21	4.71	0.00	102.13	96.13	N/A	N/A
11570	66.51	PK	V	39.00	6.87	36.61	75.77	69.77	74.00	4.23
11570	48.06	AV	V	39.00	6.87	36.61	57.32	51.32	54.00	2.68
17355	60.66	PK	V	42.26	8.67	36.79	74.80	68.80	74.00	5.20
17355	43.09	AV	V	42.26	8.67	36.79	57.23	51.23	54.00	2.77
5122	56.36	PK	V	33.50	4.57	35.68	58.75	52.75	74.00	21.25
5122	44.06	AV	V	33.50	4.57	35.68	46.45	40.45	54.00	13.55
7596	59.58	PK	V	36.56	5.68	36.01	65.81	59.81	74.00	14.19
7596	47.25	AV	V	36.56	5.68	36.01	53.48	47.48	54.00	6.52
210.42	51.51	QP	H	11.31	0.91	27.74	35.99	35.99	43.50	7.51
282.2	47.18	QP	H	13.92	1.20	27.51	34.79	34.79	46.00	11.21
High Channel:5825 MHz										
5825	66.59	PK	H	34.23	4.69	0.00	105.51	99.51	N/A	N/A
5825	53.97	AV	H	34.23	4.69	0.00	92.89	86.89	N/A	N/A
5825	72.31	PK	V	34.23	4.69	0.00	111.23	105.23	N/A	N/A
5825	60.21	AV	V	34.23	4.69	0.00	99.13	93.13	N/A	N/A
5850	27.14	PK	V	34.24	4.67	0.00	66.05	60.05	122.20	62.15
5855	27.21	PK	V	34.24	4.66	0.00	66.11	60.11	110.80	50.69
5875	27.65	PK	V	34.25	4.64	0.00	66.54	60.54	105.20	44.66
5925	27.47	PK	V	34.27	4.63	0.00	66.37	60.37	68.20	7.83
11650	65.75	PK	V	39.00	6.89	36.63	75.01	69.01	74.00	4.99
11650	49.48	AV	V	39.00	6.89	36.63	58.74	52.74	54.00	1.26
17475	60.12	PK	V	42.96	8.65	36.62	75.11	69.11	74.00	4.89
17475	41.25	AV	V	42.96	8.65	36.62	56.24	50.24	54.00	3.76
5512	54.36	PK	V	34.10	4.49	35.85	57.10	51.10	74.00	22.90
5512	43.33	AV	V	34.10	4.49	35.85	46.07	40.07	54.00	13.93
210.42	52.09	QP	H	11.31	0.91	27.74	36.57	36.57	43.50	6.93
282.2	46.94	QP	H	13.92	1.20	27.51	34.55	34.55	46.00	11.45

802.11n ht40 mode(chain 0 was the worst):

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation Result dBμV/m	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)						
Low Channel:5755 MHz										
5755	68.21	PK	H	34.20	4.69	0.00	107.10	101.10	N/A	N/A
5755	58.16	AV	H	34.20	4.69	0.00	97.05	91.05	N/A	N/A
5755	74.21	PK	V	34.20	4.69	0.00	113.10	107.10	N/A	N/A
5755	61.22	AV	V	34.20	4.69	0.00	100.11	94.11	N/A	N/A
5725	33.64	PK	V	34.19	4.67	0.00	72.50	66.50	122.20	55.70
5720	30.55	PK	V	34.19	4.66	0.00	69.40	63.40	110.80	47.40
5700	27.17	PK	V	34.18	4.65	0.00	66.00	60.00	105.20	45.20
5650	27.33	PK	V	34.16	4.60	0.00	66.09	60.09	68.20	8.11
11510	62.71	PK	V	39.00	6.85	36.60	71.96	65.96	74.00	8.04
11510	48.73	AV	V	39.00	6.85	36.60	57.98	51.98	54.00	2.02
17265	56.02	PK	V	41.74	8.68	36.92	69.52	63.52	74.00	10.48
17265	41.68	AV	V	41.74	8.68	36.92	55.18	49.18	54.00	4.82
5248	58.28	PK	V	33.70	4.68	35.74	60.92	54.92	74.00	19.08
5248	45.32	AV	V	33.70	4.68	35.74	47.96	41.96	54.00	12.04
210.42	52.36	QP	H	11.31	0.91	27.74	36.84	36.84	43.50	6.66
282.2	47.08	QP	H	13.92	1.20	27.51	34.69	34.69	46.00	11.31
High Channel:5795 MHz										
5795	64.98	PK	H	34.22	4.72	0.00	103.92	97.92	N/A	N/A
5795	54.04	AV	H	34.22	4.72	0.00	92.98	86.98	N/A	N/A
5795	70.75	PK	V	34.22	4.72	0.00	109.69	103.69	N/A	N/A
5795	59.76	AV	V	34.22	4.72	0.00	98.70	92.70	N/A	N/A
5850	27.01	PK	V	34.24	4.67	0.00	65.92	59.92	122.20	62.28
5855	27.68	PK	V	34.24	4.66	0.00	66.58	60.58	110.80	50.22
5875	27.25	PK	V	34.25	4.64	0.00	66.14	60.14	105.20	45.06
5925	27.14	PK	V	34.27	4.63	0.00	66.04	60.04	68.20	8.16
11590	63.08	PK	V	39.00	6.88	36.62	72.34	66.34	74.00	7.66
11590	48.12	AV	V	39.00	6.88	36.62	57.38	51.38	54.00	2.62
17385	55.92	PK	V	42.43	8.66	36.75	70.26	64.26	74.00	9.74
17385	42.25	AV	V	42.43	8.66	36.75	56.59	50.59	54.00	3.41
5158	56.04	PK	V	33.55	4.70	35.70	58.59	52.59	74.00	21.41
5158	43.36	AV	V	33.55	4.70	35.70	45.91	39.91	54.00	14.09
210.42	53.2	QP	H	11.31	0.91	27.74	37.68	37.68	43.50	5.82
282.2	47.5	QP	H	13.92	1.20	27.51	35.11	35.11	46.00	10.89

802.11n ac80 mode(chain 0 was the worst):

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation Result dBμV/m	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)						
Middle Channel:5775 MHz										
5775	65.39	PK	H	34.21	4.70	0.00	104.30	98.30	N/A	N/A
5775	54.71	AV	H	34.21	4.70	0.00	93.62	87.62	N/A	N/A
5775	70.88	PK	V	34.21	4.70	0.00	109.79	103.79	N/A	N/A
5775	59.15	AV	V	34.21	4.70	0.00	98.06	92.06	N/A	N/A
5725	30.09	PK	V	34.19	4.67	0.00	68.95	62.95	122.20	59.25
5720	28.55	PK	V	34.19	4.66	0.00	67.40	61.40	110.80	49.40
5700	28.21	PK	V	34.18	4.65	0.00	67.04	61.04	105.20	44.16
5650	27.69	PK	V	34.16	4.60	0.00	66.45	60.45	68.20	7.75
5850	29.15	PK	V	34.24	4.67	0.00	68.06	62.06	122.20	60.14
5855	28.67	PK	V	34.24	4.66	0.00	67.57	61.57	110.80	49.23
5875	28.54	PK	V	34.25	4.64	0.00	67.43	61.43	105.20	43.77
5925	28.64	AV	V	34.27	4.63	0.00	67.54	61.54	68.20	6.66
11550	62.65	PK	V	39.00	6.86	36.61	71.90	65.90	74.00	8.10
11550	48.95	AV	V	39.00	6.86	36.61	58.20	52.20	54.00	1.80
17325	57.44	PK	V	42.09	8.67	36.84	71.36	65.36	74.00	8.64
17325	41.98	AV	V	42.09	8.67	36.84	55.90	49.90	54.00	4.10
5212	55.66	PK	V	33.64	4.81	35.72	58.39	52.39	74.00	21.61
5212	43.85	AV	V	33.64	4.81	35.72	46.58	40.58	54.00	13.42
210.42	52.73	QP	H	11.31	0.91	27.74	37.21	37.21	43.50	6.29
282.2	47.94	QP	H	13.92	1.20	27.51	35.55	35.55	46.00	10.45

MIMO mode:
802.11n ht20 mode:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation Result dBμV/m	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)						
Low Channel:5745 MHz										
5745	69.37	PK	H	34.20	4.68	0.00	108.25	102.25	N/A	N/A
5745	60.16	AV	H	34.20	4.68	0.00	99.04	93.04	N/A	N/A
5745	78.38	PK	V	34.20	4.68	0.00	117.26	111.26	N/A	N/A
5745	69.03	AV	V	34.20	4.68	0.00	107.91	101.91	N/A	N/A
5725	37.36	PK	V	34.19	4.67	0.00	76.22	70.22	122.20	51.98
5720	34.51	PK	V	34.19	4.66	0.00	73.36	67.36	110.80	43.44
5700	31.41	PK	V	34.18	4.65	0.00	70.24	64.24	105.20	40.96
5650	29.88	PK	V	34.16	4.60	0.00	68.64	62.64	68.20	5.56
11490	64.75	PK	V	38.99	6.85	36.60	73.99	67.99	74.00	6.01
11490	49.59	AV	V	38.99	6.85	36.60	58.83	52.83	54.00	1.17
17235	58.46	PK	V	41.56	8.68	36.97	71.73	65.73	74.00	8.27
17235	44.73	AV	V	41.56	8.68	36.97	58.00	52.00	54.00	2.00
210.42	52.26	QP	H	11.31	0.91	27.74	36.74	36.74	43.50	6.76
282.2	48.38	QP	H	13.92	1.20	27.51	35.99	35.99	46.00	10.01
Middle Channel:5785 MHz										
5785	68.61	PK	H	34.21	4.71	0.00	107.53	101.53	N/A	N/A
5785	59.36	AV	H	34.21	4.71	0.00	98.28	92.28	N/A	N/A
5785	78.17	PK	V	34.21	4.71	0.00	117.09	111.09	N/A	N/A
5785	68.89	AV	V	34.21	4.71	0.00	107.81	101.81	N/A	N/A
11570	63.84	PK	V	39.00	6.87	36.61	73.10	67.10	74.00	6.90
11570	49.55	AV	V	39.00	6.87	36.61	58.81	52.81	54.00	1.19
17355	58.34	PK	V	42.26	8.67	36.79	72.48	66.48	74.00	7.52
17355	44.52	AV	V	42.26	8.67	36.79	58.66	52.66	54.00	1.34
6585	53.21	PK	V	34.37	5.28	35.78	57.08	51.08	74.00	22.92
6585	42.53	AV	V	34.37	5.28	35.78	46.40	40.40	54.00	13.60
9435	46.38	PK	V	37.87	6.18	36.24	54.19	48.19	74.00	25.81
9435	34.37	AV	V	37.87	6.18	36.24	42.18	36.18	54.00	17.82
210.42	52.16	QP	H	11.31	0.91	27.74	36.64	36.64	43.50	6.86
282.2	45.96	QP	H	13.92	1.20	27.51	33.57	33.57	46.00	12.43
High Channel:5825 MHz										
5825	64.39	PK	H	34.23	4.69	0.00	103.31	97.31	N/A	N/A
5825	55.64	AV	H	34.23	4.69	0.00	94.56	88.56	N/A	N/A
5825	74.55	PK	V	34.23	4.69	0.00	113.47	107.47	N/A	N/A
5825	65.27	AV	V	34.23	4.69	0.00	104.19	98.19	N/A	N/A
5850	36.84	PK	V	34.24	4.67	0.00	75.75	69.75	122.20	52.45
5855	33.96	PK	V	34.24	4.66	0.00	72.86	66.86	110.80	43.94
5875	31.58	PK	V	34.25	4.64	0.00	70.47	64.47	105.20	40.73
5925	29.57	PK	V	34.27	4.63	0.00	68.47	62.47	68.20	5.73
11650	63.78	PK	V	39.00	6.89	36.63	73.04	67.04	74.00	6.96
11650	49.16	AV	V	39.00	6.89	36.63	58.42	52.42	54.00	1.58
17475	54.13	PK	V	42.96	8.65	36.62	69.12	63.12	74.00	10.88
17475	41.39	AV	V	42.96	8.65	36.62	56.38	50.38	54.00	3.62
8365	46.38	PK	V	37.24	5.99	36.05	53.56	47.56	74.00	26.44
8365	32.26	AV	V	37.24	5.99	36.05	39.44	33.44	54.00	20.56
210.42	52.43	QP	H	11.31	0.91	27.74	36.91	36.91	43.50	6.59
282.2	46.1	QP	H	13.92	1.20	27.51	33.71	33.71	46.00	12.29

802.11n ht40 mode:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation Result dBμV/m	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)						
Low Channel:5755 MHz										
5755	63.69	PK	H	34.20	4.69	0.00	102.58	96.58	N/A	N/A
5755	54.37	AV	H	34.20	4.69	0.00	93.26	87.26	N/A	N/A
5755	71.27	PK	V	34.20	4.69	0.00	110.16	104.16	N/A	N/A
5755	61.81	AV	V	34.20	4.69	0.00	100.70	94.70	N/A	N/A
5725	36.68	PK	V	34.19	4.67	0.00	75.54	69.54	122.20	52.66
5720	34.41	PK	V	34.19	4.66	0.00	73.26	67.26	110.80	43.54
5700	31.44	PK	V	34.18	4.65	0.00	70.27	64.27	105.20	40.93
5650	29.14	PK	V	34.16	4.60	0.00	67.90	61.90	68.20	6.30
11510	61.87	PK	V	39.00	6.85	36.60	71.12	65.12	74.00	8.88
11510	49.65	AV	V	39.00	6.85	36.60	58.90	52.90	54.00	1.10
17265	56.79	PK	V	41.74	8.68	36.92	70.29	64.29	74.00	9.71
17265	43.35	AV	V	41.74	8.68	36.92	56.85	50.85	54.00	3.15
8355	46.87	PK	V	37.23	5.98	36.05	54.03	48.03	74.00	25.97
8355	32.61	AV	V	37.23	5.98	36.05	39.77	33.77	54.00	20.23
210.42	53.27	QP	H	11.31	0.91	27.74	37.75	37.75	43.50	5.75
282.2	46.52	QP	H	13.92	1.20	27.51	34.13	34.13	46.00	11.87
High Channel:5795 MHz										
5795	63.28	PK	H	34.22	4.72	0.00	102.22	96.22	N/A	N/A
5795	52.76	AV	H	34.22	4.72	0.00	91.70	85.70	N/A	N/A
5795	69.97	PK	V	34.22	4.72	0.00	108.91	102.91	N/A	N/A
5795	59.82	AV	V	34.22	4.72	0.00	98.76	92.76	N/A	N/A
5850	35.43	PK	V	34.24	4.67	0.00	74.34	68.34	122.20	53.86
5855	34.14	PK	V	34.24	4.66	0.00	73.04	67.04	110.80	43.76
5875	32.14	PK	V	34.25	4.64	0.00	71.03	65.03	105.20	40.17
5925	29.85	PK	V	34.27	4.63	0.00	68.75	62.75	68.20	5.45
11590	62.62	PK	V	39.00	6.88	36.62	71.88	65.88	74.00	8.12
11590	49.38	AV	V	39.00	6.88	36.62	58.64	52.64	54.00	1.36
17385	56.34	PK	V	42.43	8.66	36.75	70.68	64.68	74.00	9.32
17385	43.13	AV	V	42.43	8.66	36.75	57.47	51.47	54.00	2.53
9145	46.56	PK	V	37.76	6.07	36.25	54.14	48.14	74.00	25.86
9145	32.28	AV	V	37.76	6.07	36.25	39.86	33.86	54.00	20.14
210.42	52.8	QP	H	11.31	0.91	27.74	37.28	37.28	43.50	6.22
282.2	46.96	QP	H	13.92	1.20	27.51	34.57	34.57	46.00	11.43

802.11n ac80 mode:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation Result dBμV/m	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)						
Middle Channel:5775 MHz										
5775	64.98	PK	H	34.21	4.70	0.00	103.89	97.89	N/A	N/A
5775	52.76	AV	H	34.21	4.70	0.00	91.67	85.67	N/A	N/A
5775	72.27	PK	V	34.21	4.70	0.00	111.18	105.18	N/A	N/A
5775	60.85	AV	V	34.21	4.70	0.00	99.76	93.76	N/A	N/A
5725	36.48	PK	V	34.19	4.67	0.00	75.34	69.34	122.20	52.86
5720	34.55	PK	V	34.19	4.66	0.00	73.40	67.40	110.80	43.40
5700	32.41	PK	V	34.18	4.65	0.00	71.24	65.24	105.20	39.96
5650	30.14	PK	V	34.16	4.60	0.00	68.90	62.90	68.20	5.30
5850	37.17	PK	V	34.24	4.67	0.00	76.08	70.08	122.20	52.12
5855	37.06	PK	V	34.24	4.66	0.00	75.96	69.96	110.80	40.84
5875	38.37	PK	V	34.25	4.64	0.00	77.26	71.26	105.20	33.94
5925	25.03	AV	V	34.27	4.63	0.00	63.93	57.93	68.20	10.27
11550	61.59	PK	V	39.00	6.86	36.61	70.84	64.84	74.00	9.16
11550	49.37	AV	V	39.00	6.86	36.61	58.62	52.62	54.00	1.38
17325	58.37	PK	V	42.09	8.67	36.84	72.29	66.29	74.00	7.71
17325	42.58	AV	V	42.09	8.67	36.84	56.50	50.50	54.00	3.50
7835	46.49	PK	V	36.70	5.79	36.06	52.92	46.92	74.00	27.08
7835	32.14	AV	V	36.70	5.79	36.06	38.57	32.57	54.00	21.43
210.42	52.33	QP	H	11.31	0.91	27.74	36.81	36.81	43.50	6.69
282.2	47.4	QP	H	13.92	1.20	27.51	35.01	35.01	46.00	10.99

FCC §15.407(b)–OUT- OF-BAND EMISSIONS

Applicable Standard

FCC §15.407

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

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

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

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

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

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

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

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

Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v01r04.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	831929/005	2016-09-21	2017-09-20
Unknown	RF Cable	Unknown	C-2	Each Time	/

*** Statement of Traceability:** BACL(Chengdu) attests that all of the calibrations on the equipment items listed above were traceable to NIM or to another internationally recognized National Metrology Institute (NMI), and were compliant with the NIST HB 150-2016 Normative Annex B “Implementation of traceability policy in accredited laboratories”.

Test Data

Environmental Conditions

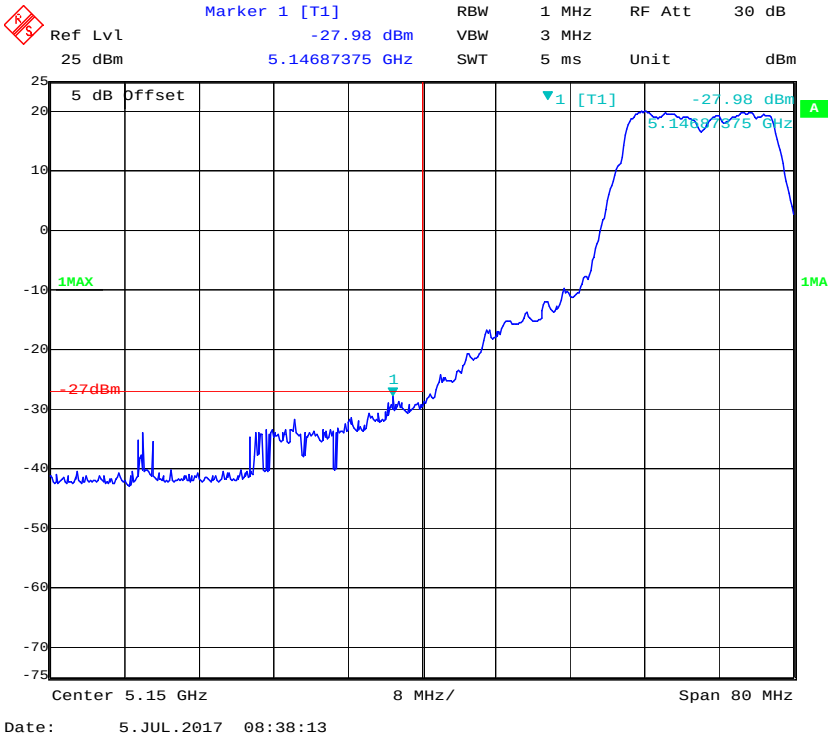
Temperature:	25.8~28.9 °C
Relative Humidity:	51.3~58.6 %
ATM Pressure:	100.1 kPa

The testing was performed by Tom Tang from 2017-07-04 to 2017-07-05.

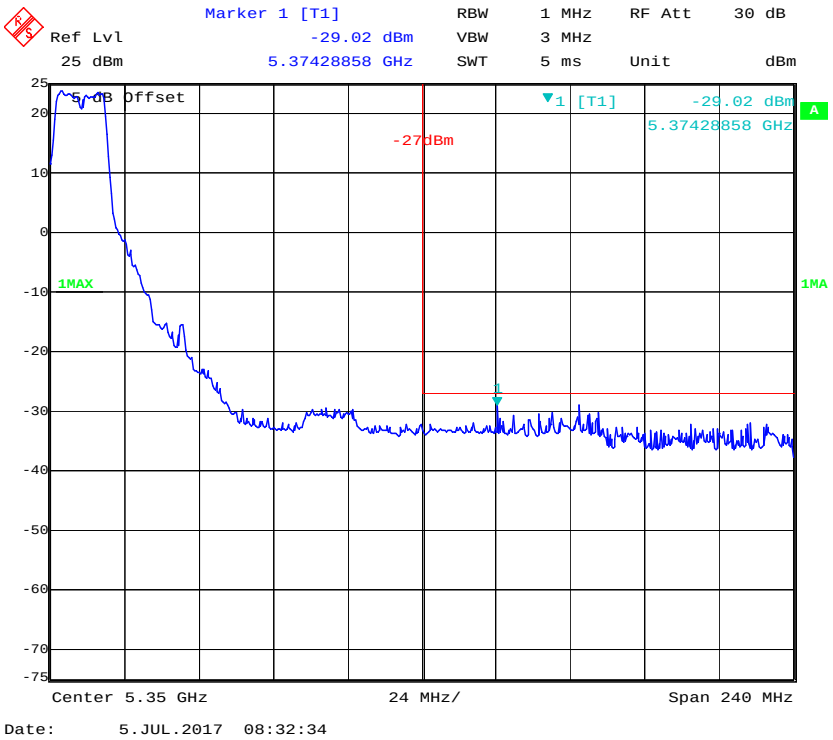
Test Result: Pass.
Please refer to the following tables and plots.

SISO:
5150-5250MHz(the atenna gain was offset in the display)
Chain 0:

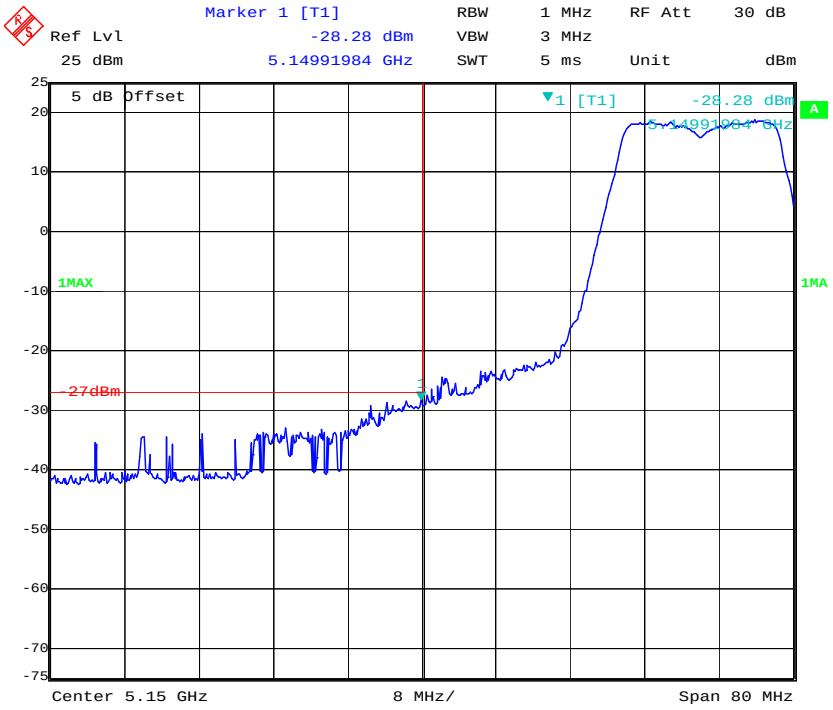
802.11a Low Channel



802.11a High Channel



802.11n ht20 Low Channel



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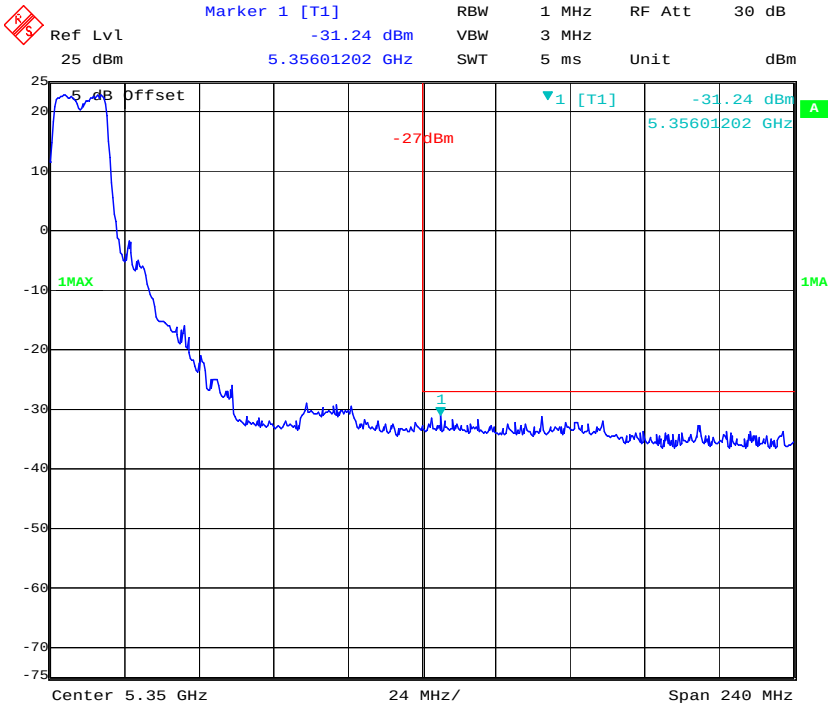
802.11n ht20 High Channel



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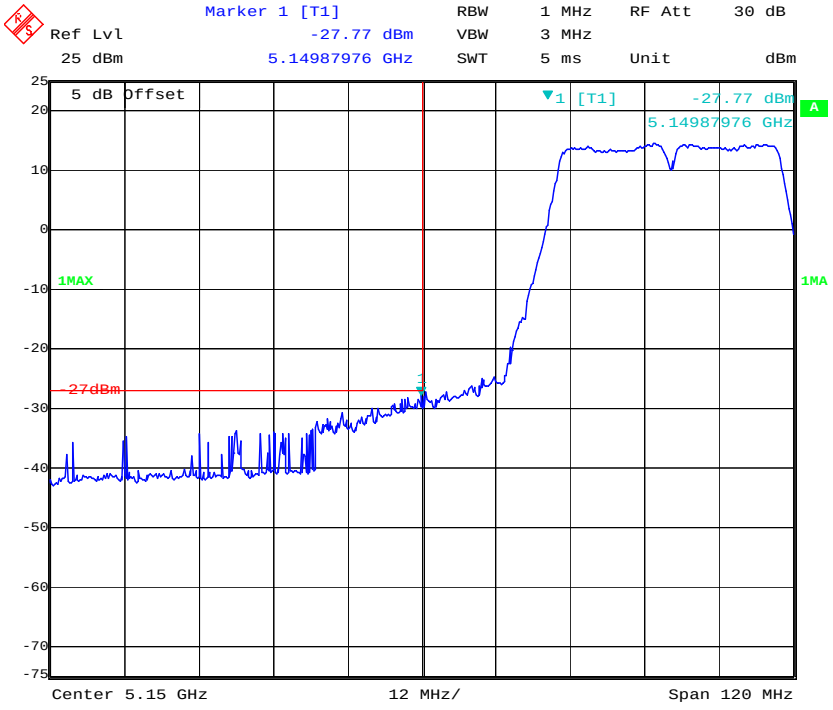
802.11n ht40 Low Channel



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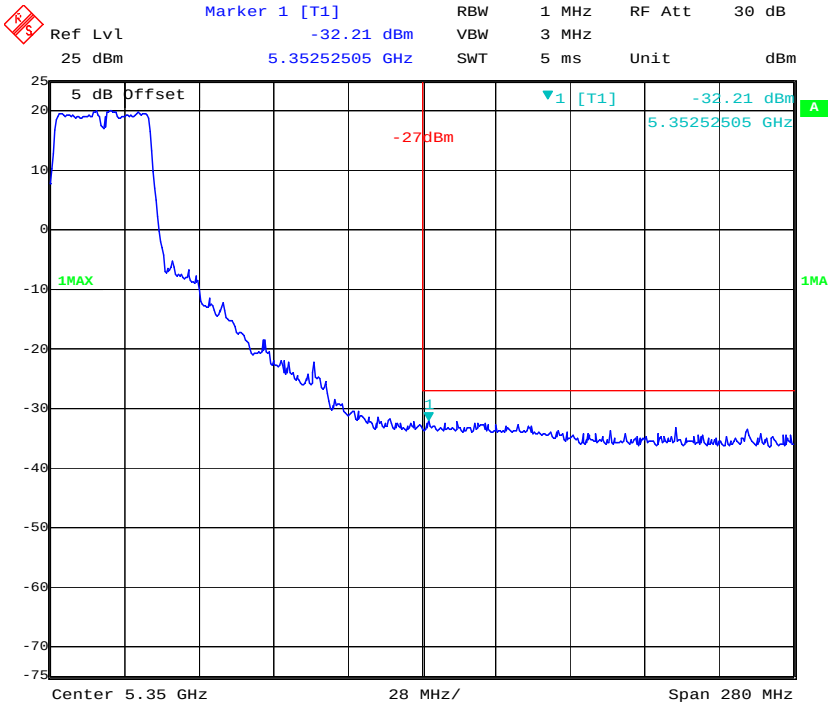
8802.11n ht40 High Channel



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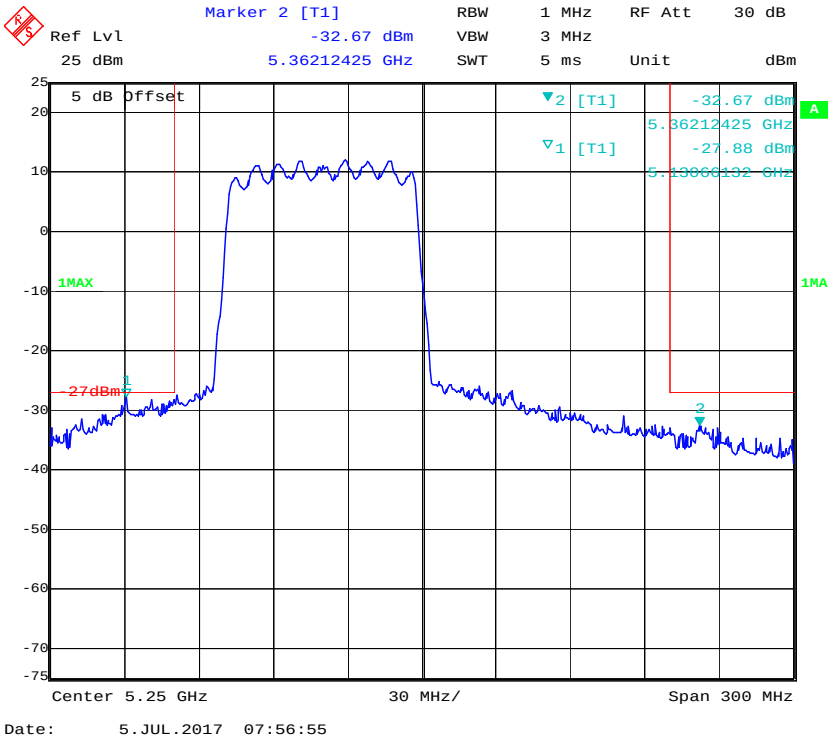
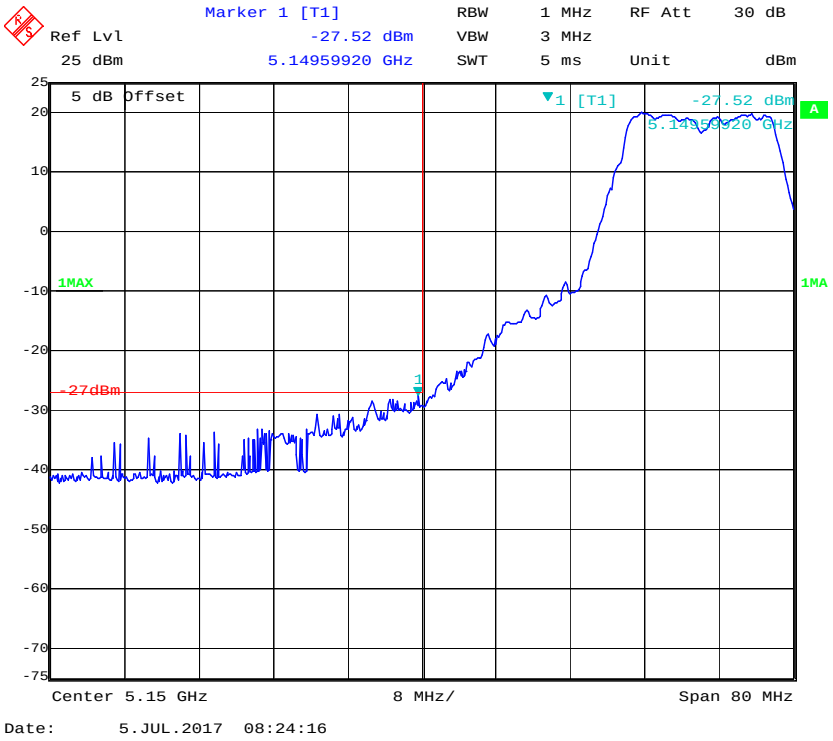
802.11n ac80 Middle Channel

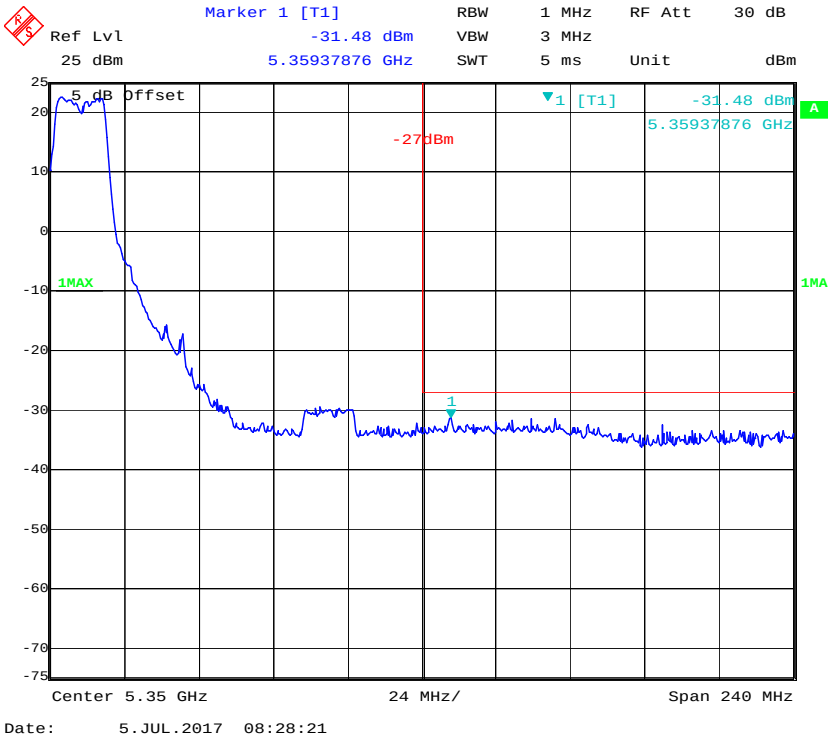


Chain 1:

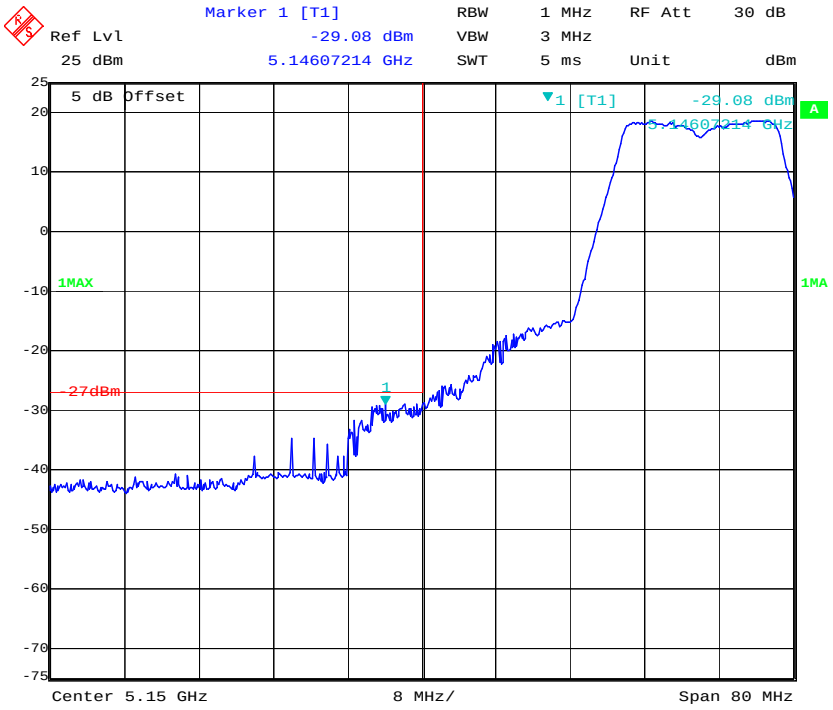
802.11a Low Channel



802.11a High Channel



802.11n ht20 Low Channel



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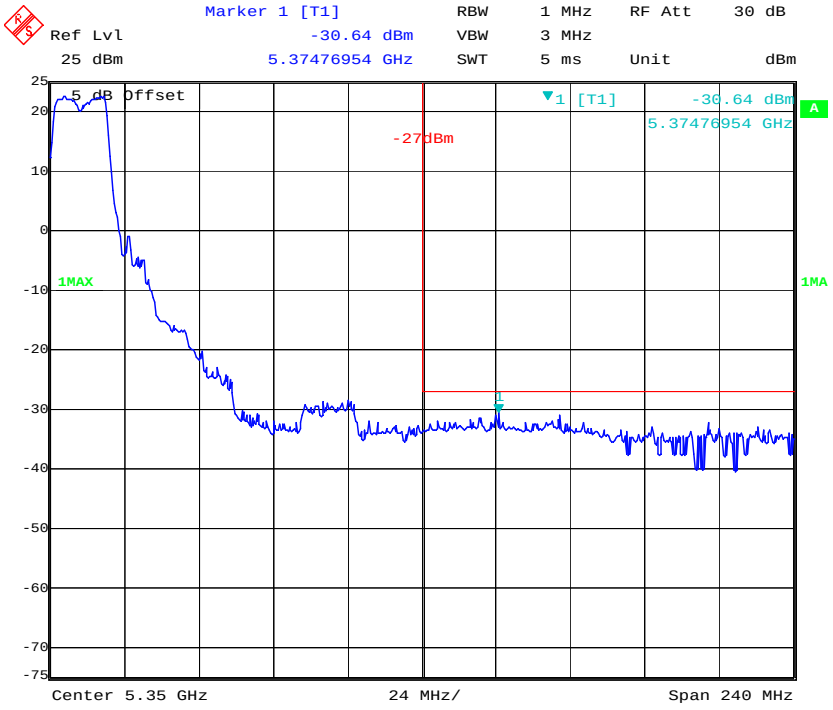
802.11n ht20 High Channel



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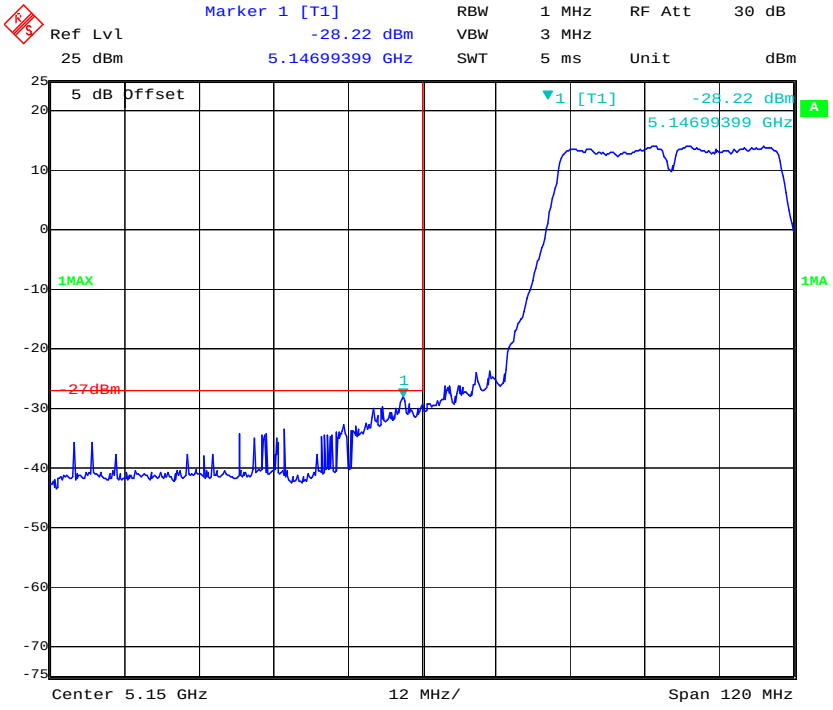
802.11n ht40 Low Channel



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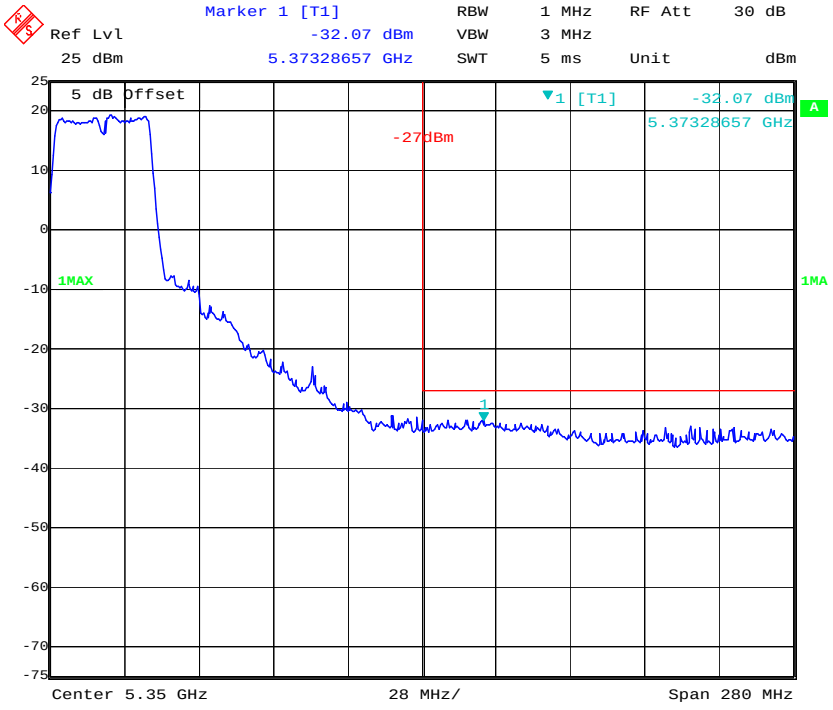
8802.11n ht40 High Channel



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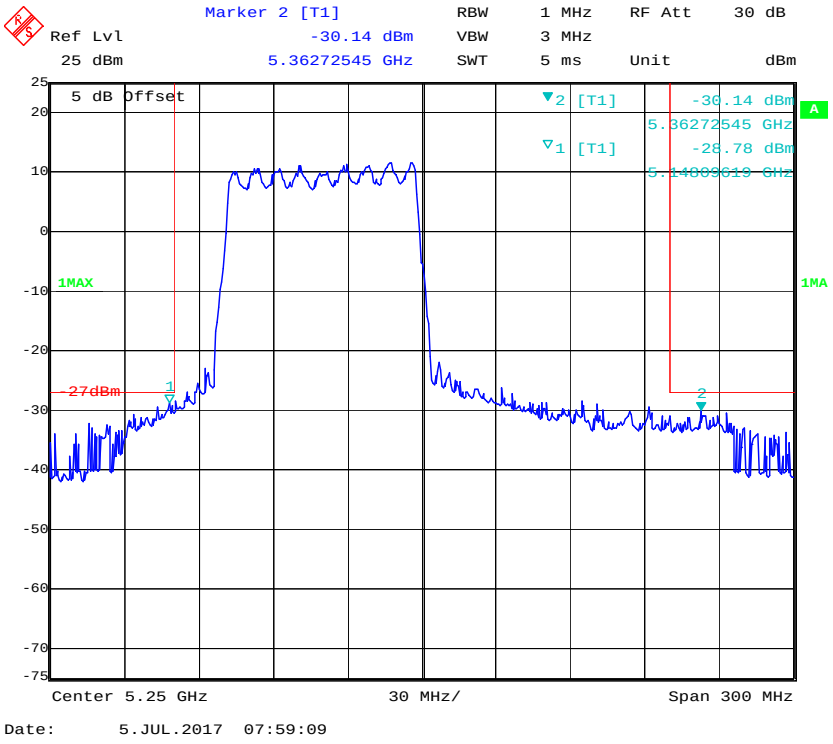
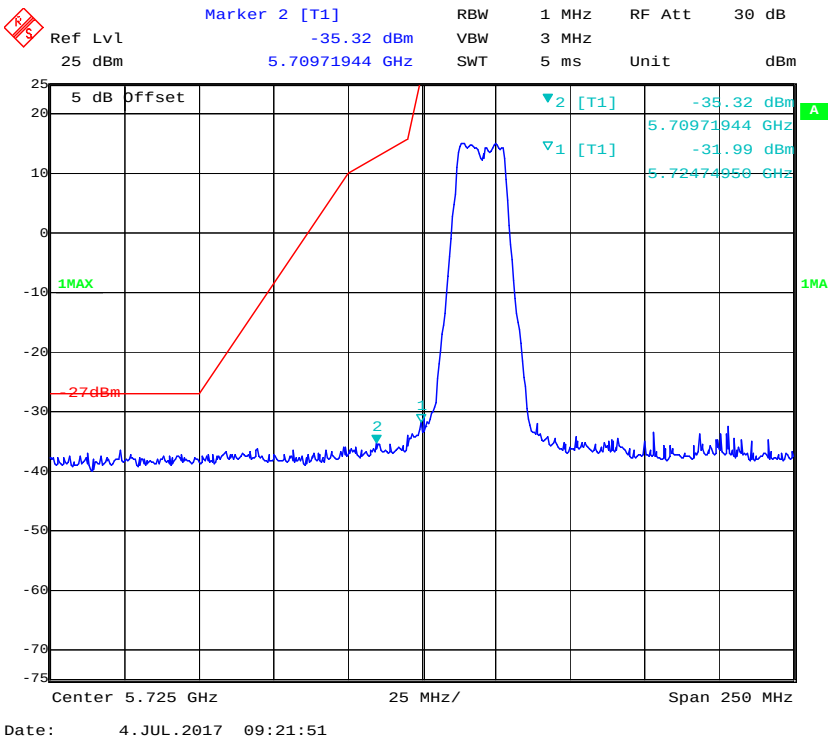
802.11n ac80 Middle Channel



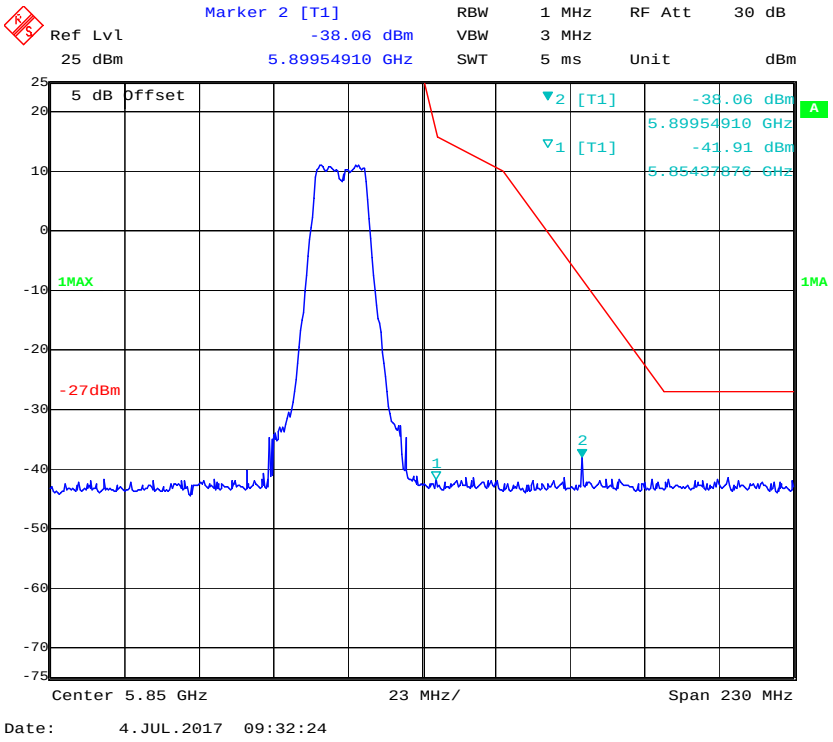
5725-5850MHz

Chain 0:

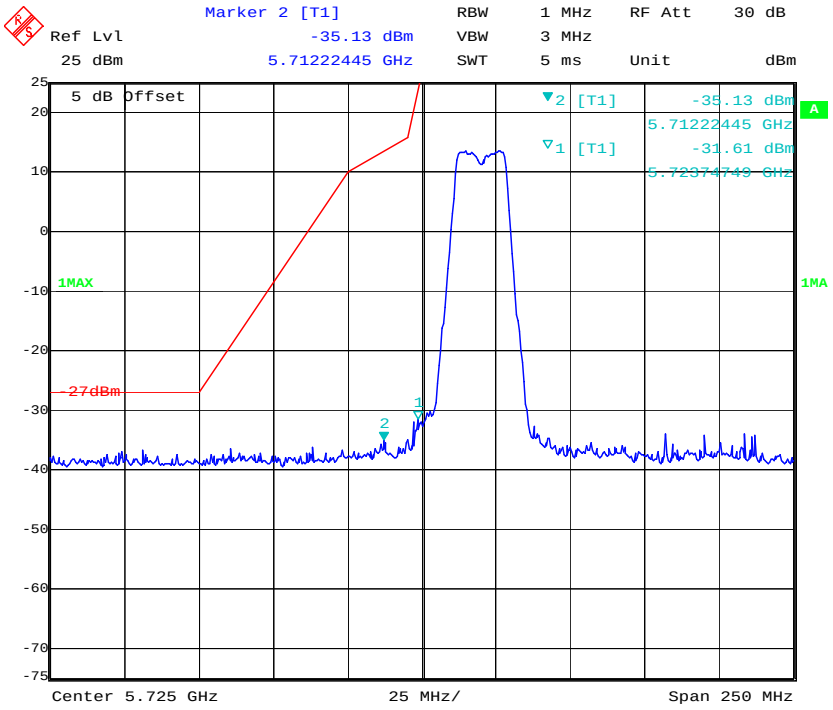
802.11a Low Channel



802.11a High Channel

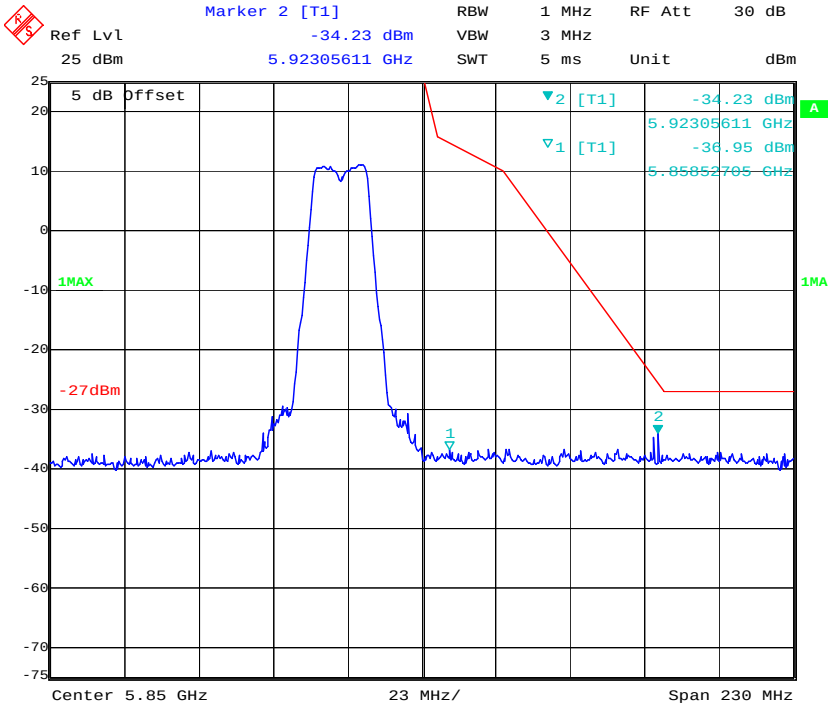


802.11n ht20 Low Channel



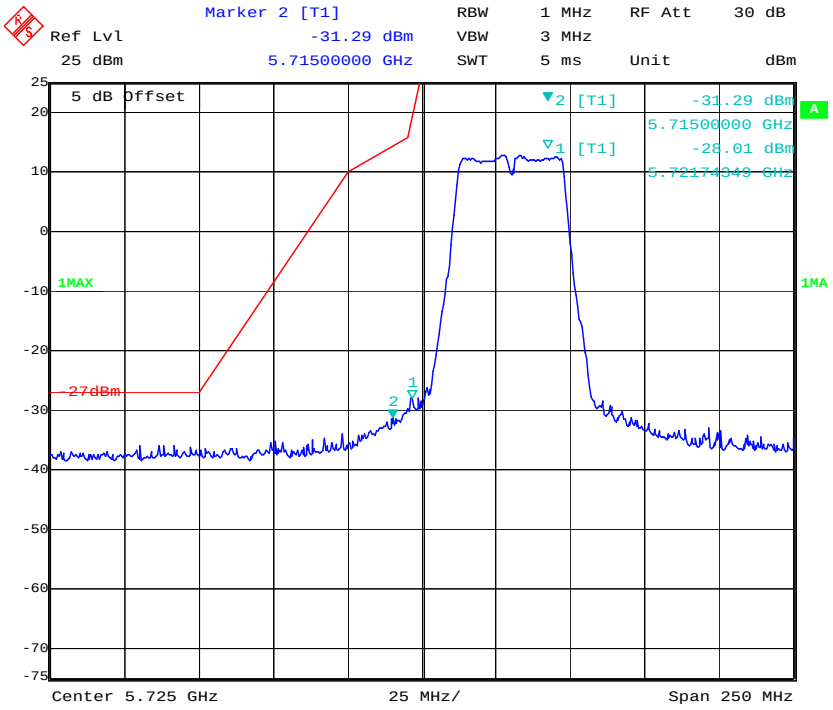
Date: 4.JUL.2017 10:19:17

802.11n ht20 High Channel



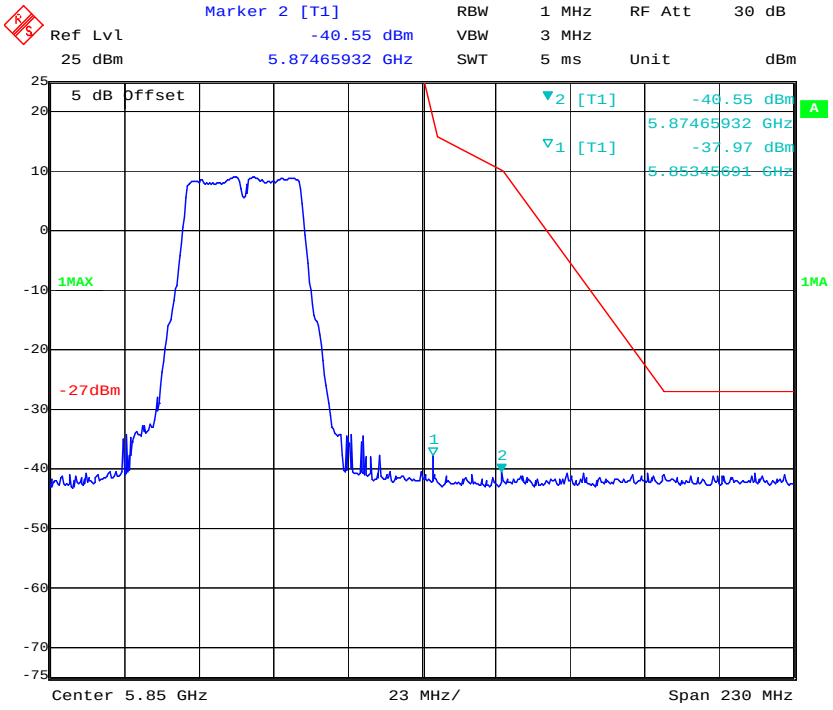
Date: 4.JUL.2017 09:41:31

802.11n ht40 Low Channel



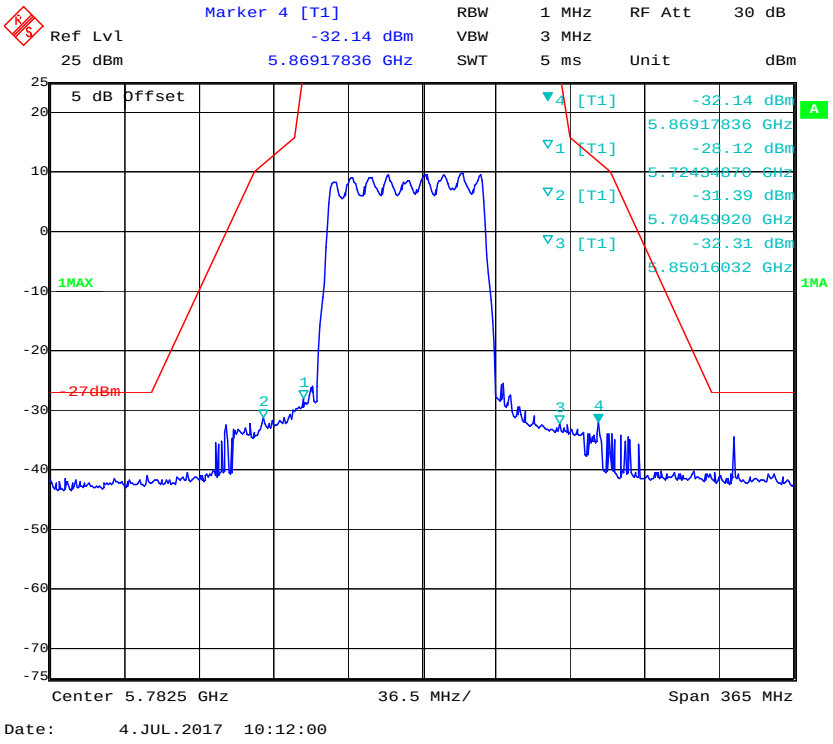
Date: 4.JUL.2017 10:03:39

802.11n ht40 High Channel



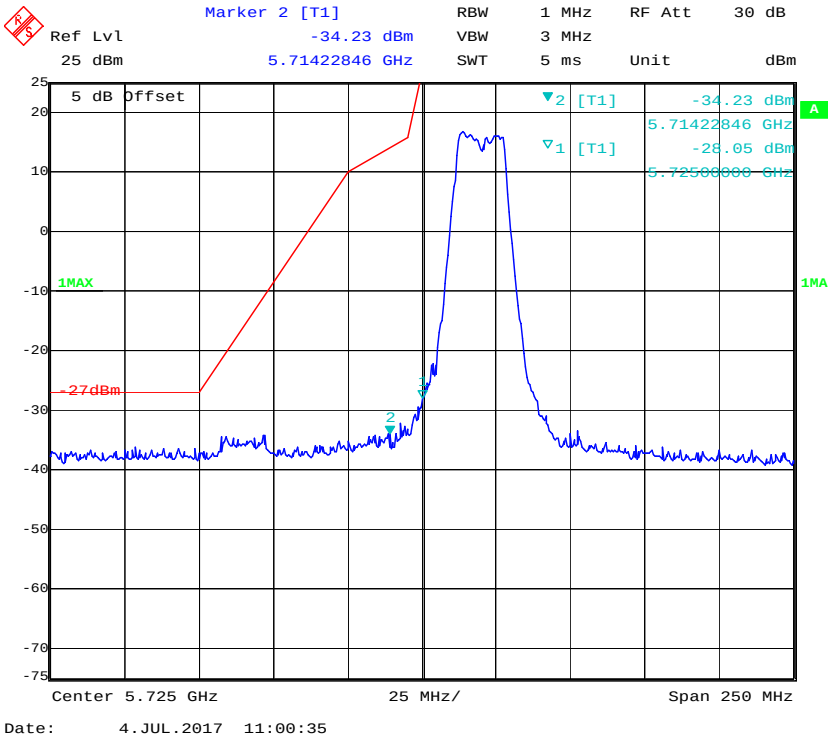
Date: 4.JUL.2017 10:09:39

802.11 ac80 Low Channel



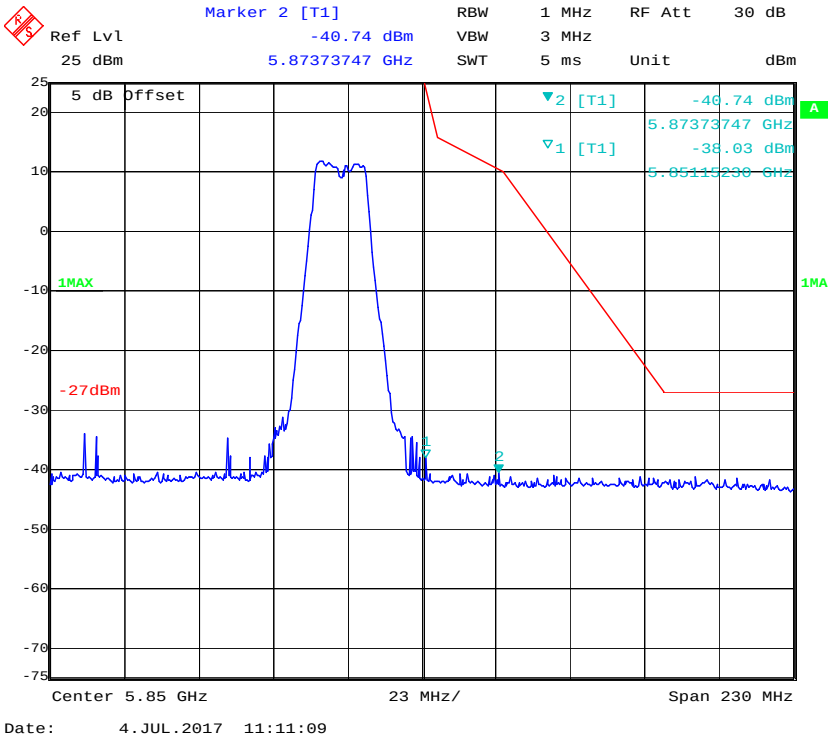
Chain 1:

802.11a Low Channel



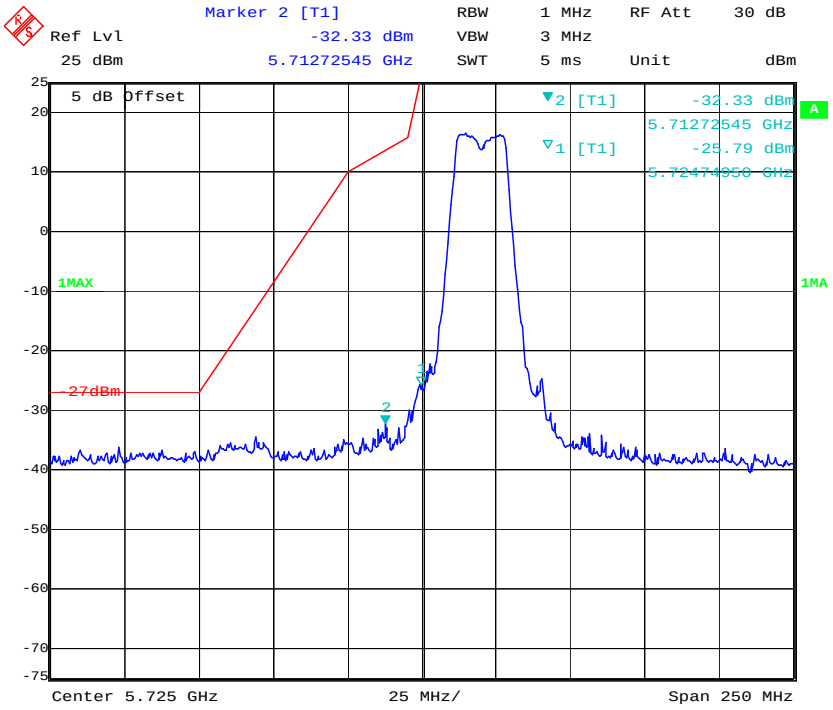
Date: 4.JUL.2017 11:00:35

802.11a High Channel



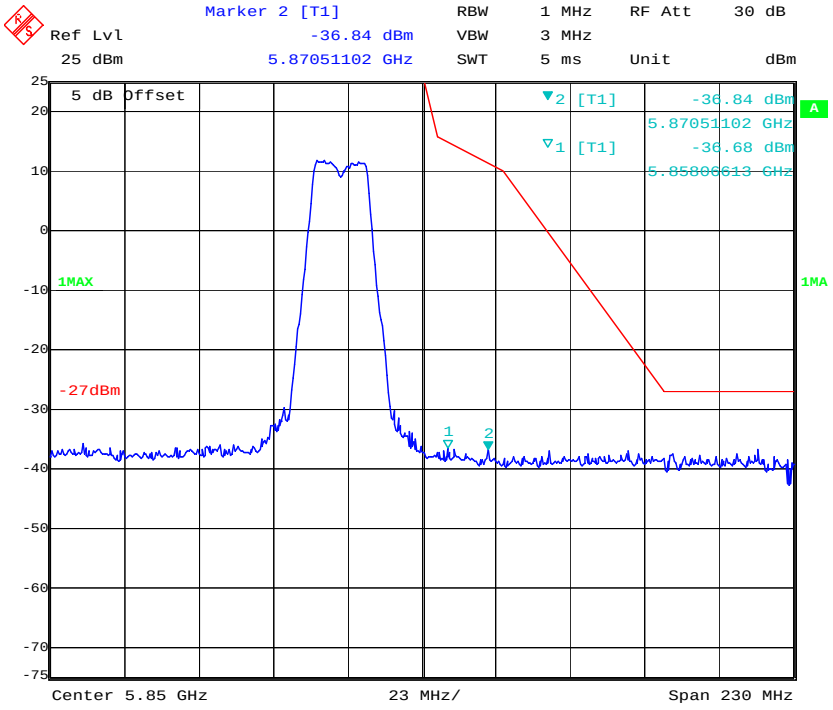
Date: 4.JUL.2017 11:11:09

802.11n ht20 Low Channel



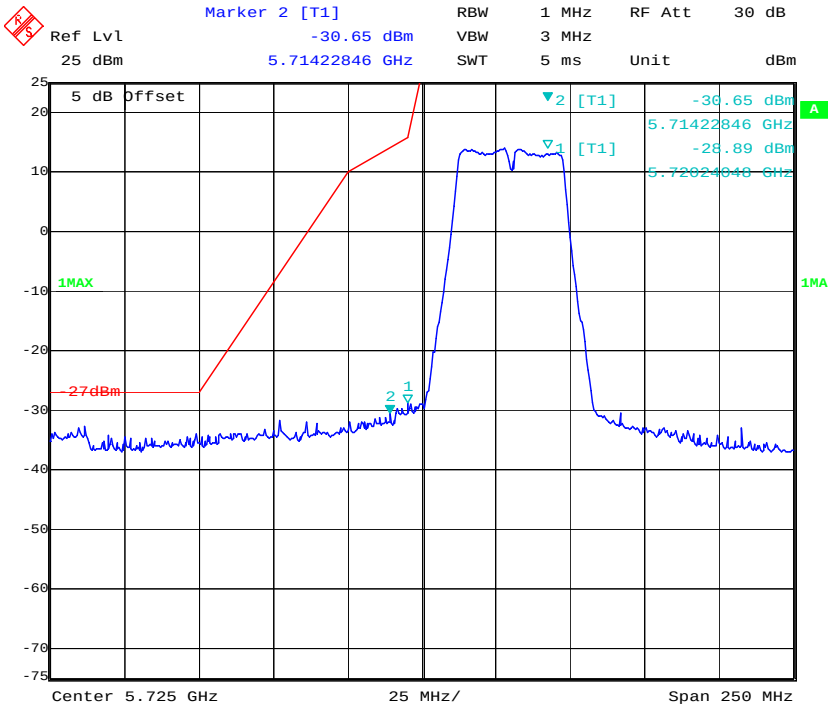
Date: 4.JUL.2017 11:29:32

802.11n ht20 High Channel



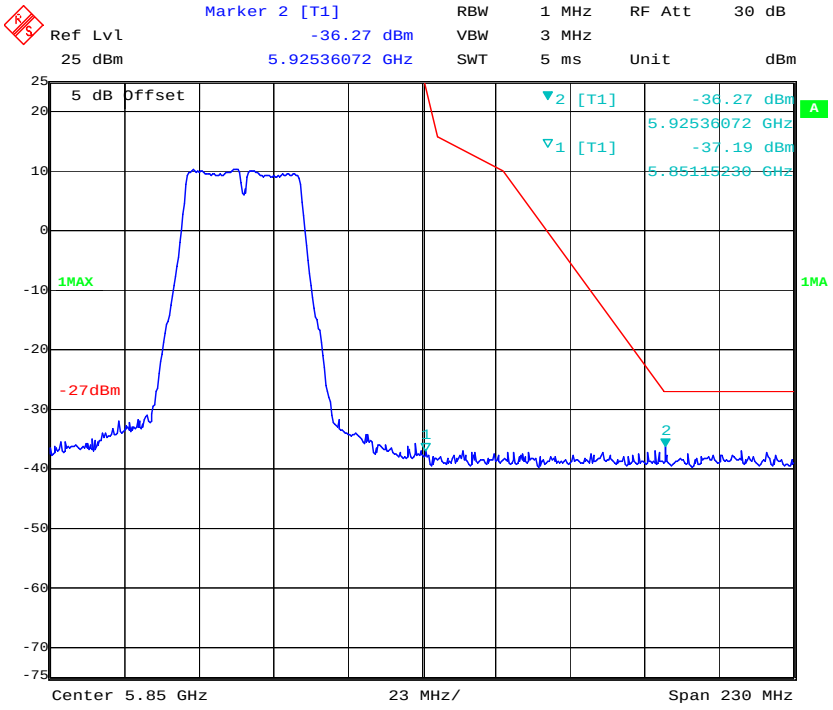
Date: 4.JUL.2017 11:18:08

802.11n ht40 Low Channel



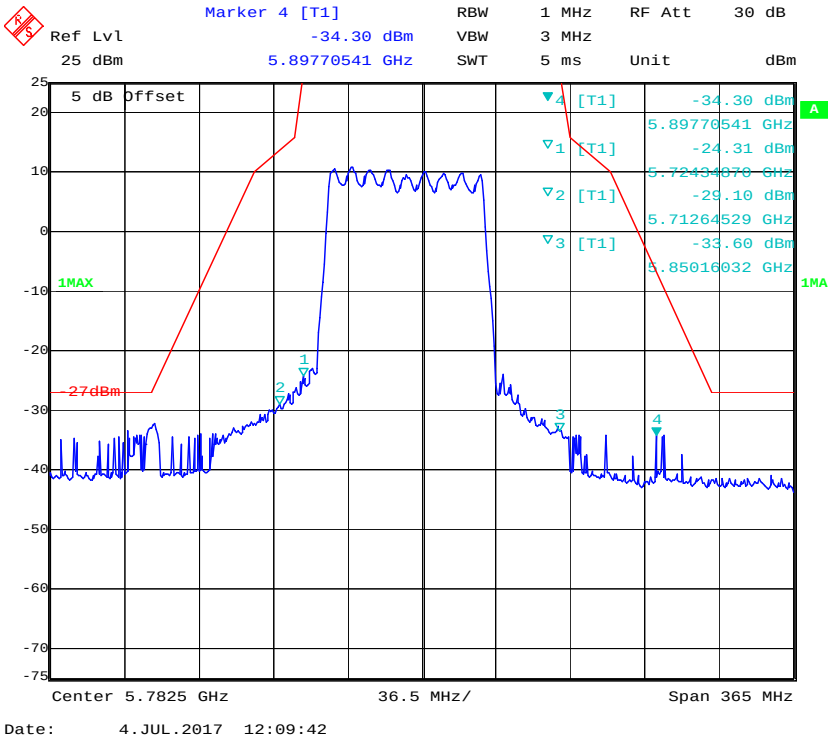
Date: 4.JUL.2017 11:37:42

802.11n ht40 High Channel



Date: 4.JUL.2017 11:42:33

802.11 ac80 Low Channel

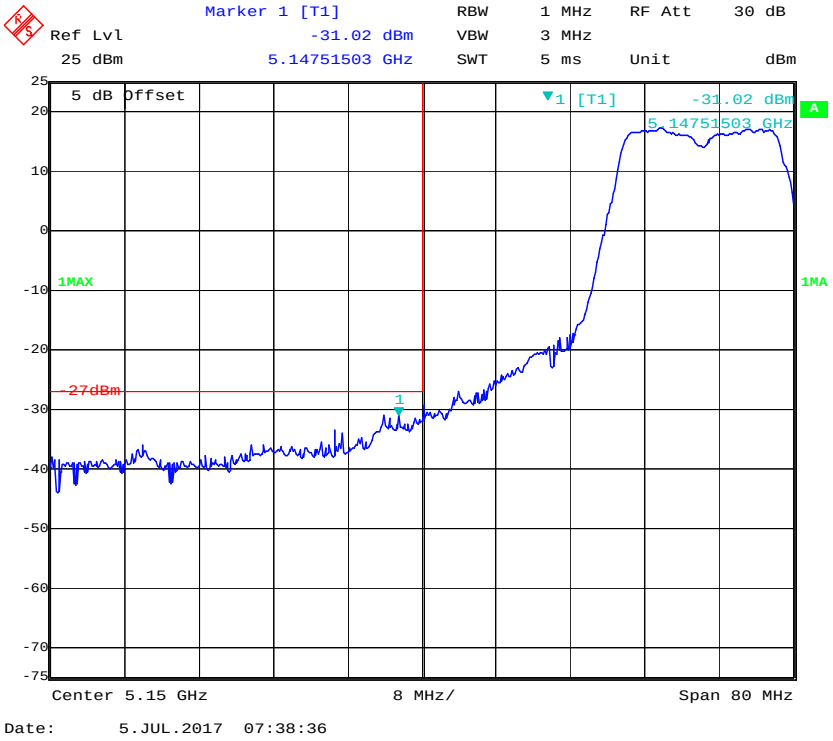


MIMO Mode:(the atenna gain was offset in the display, all emissions under limit 3dB, so combined results meet the requirement)

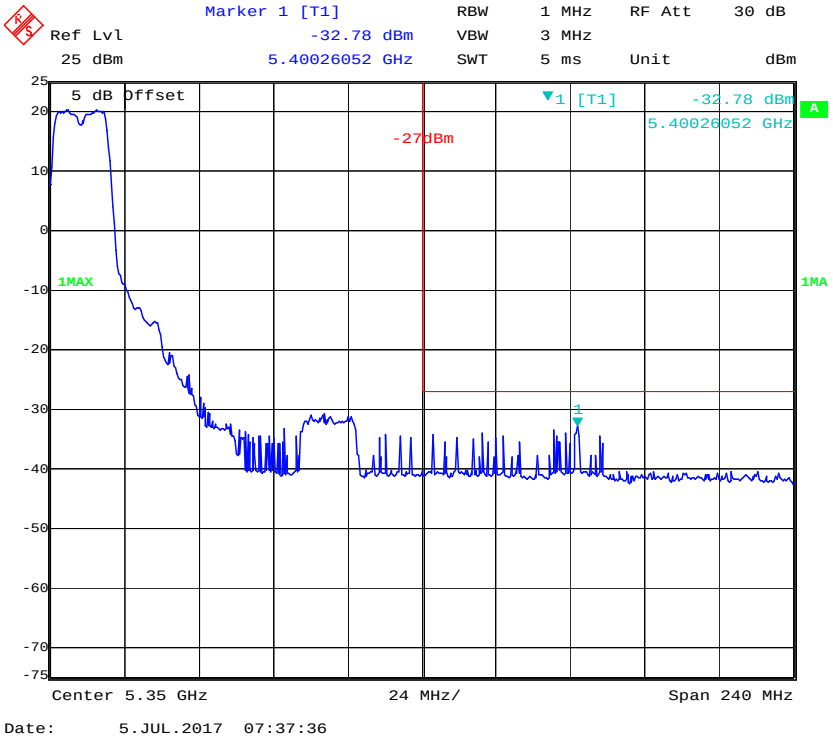
5150-5250MHz

Chain 0:

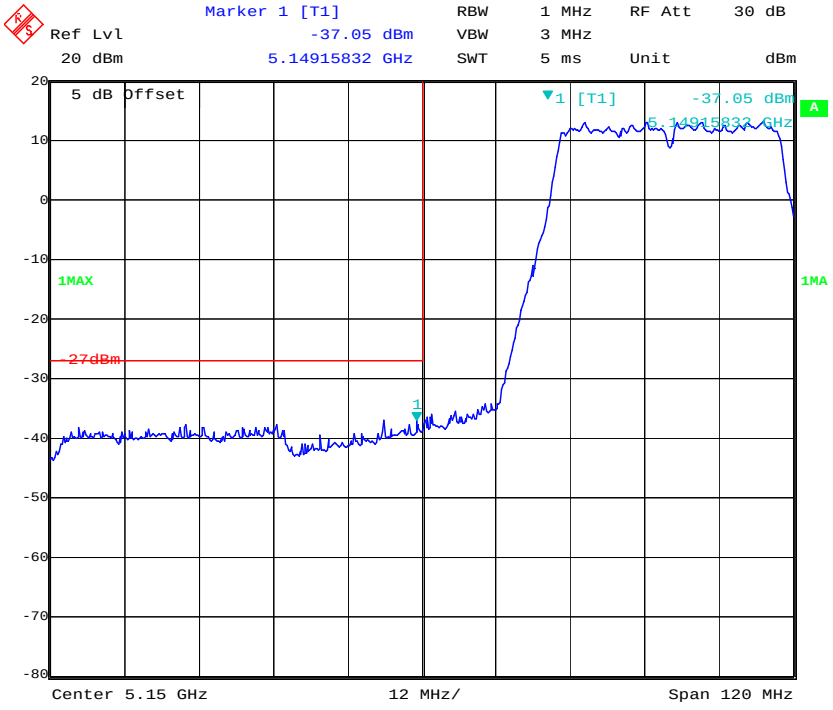
802.11n ht20 Low Channel



802.11n ht20 High Channel

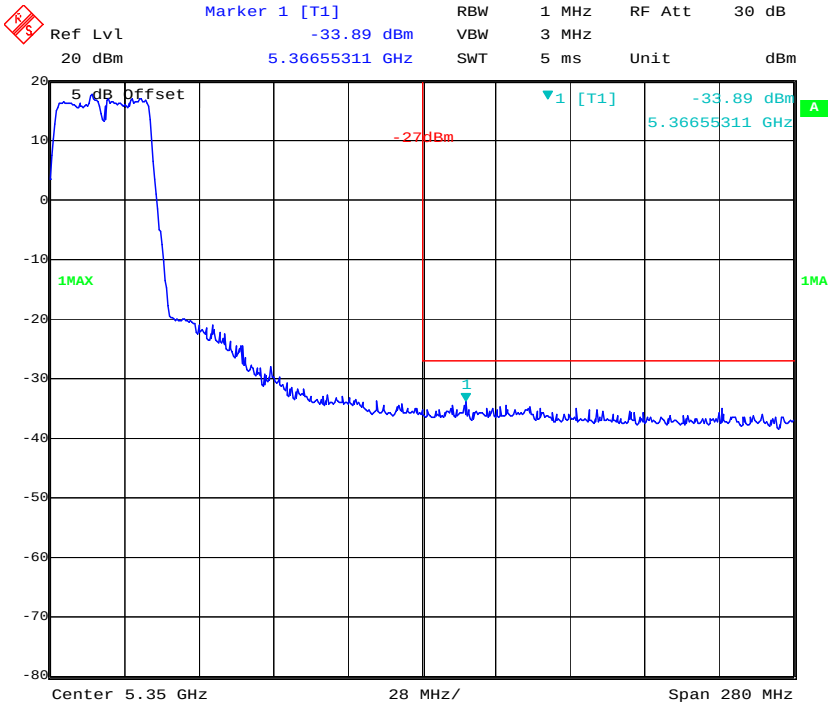


802.11n ht40 Low Channel



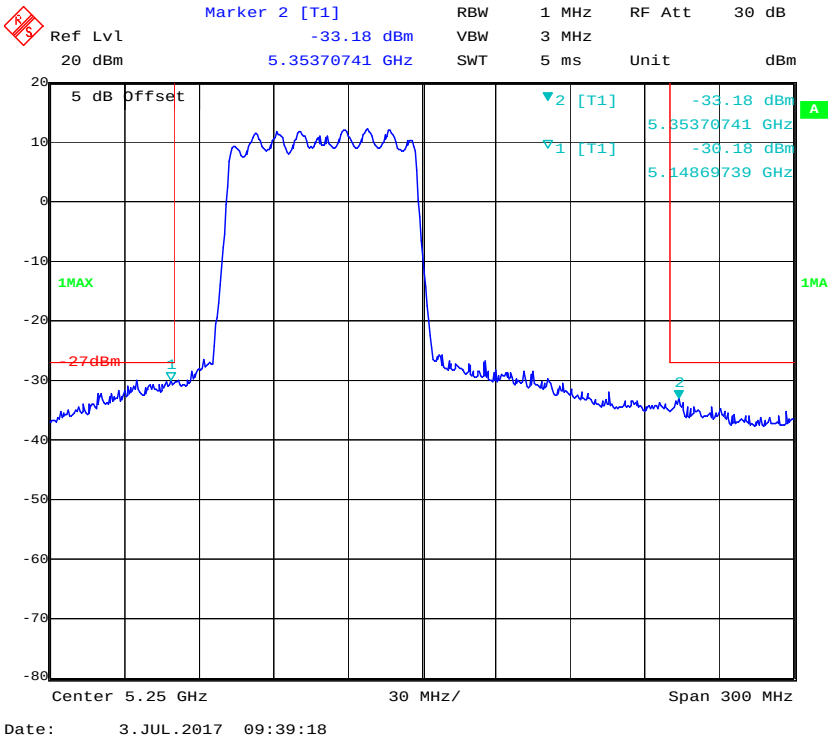
Date: 3.JUL.2017 16:44:28

8802.11n ht40 High Channel



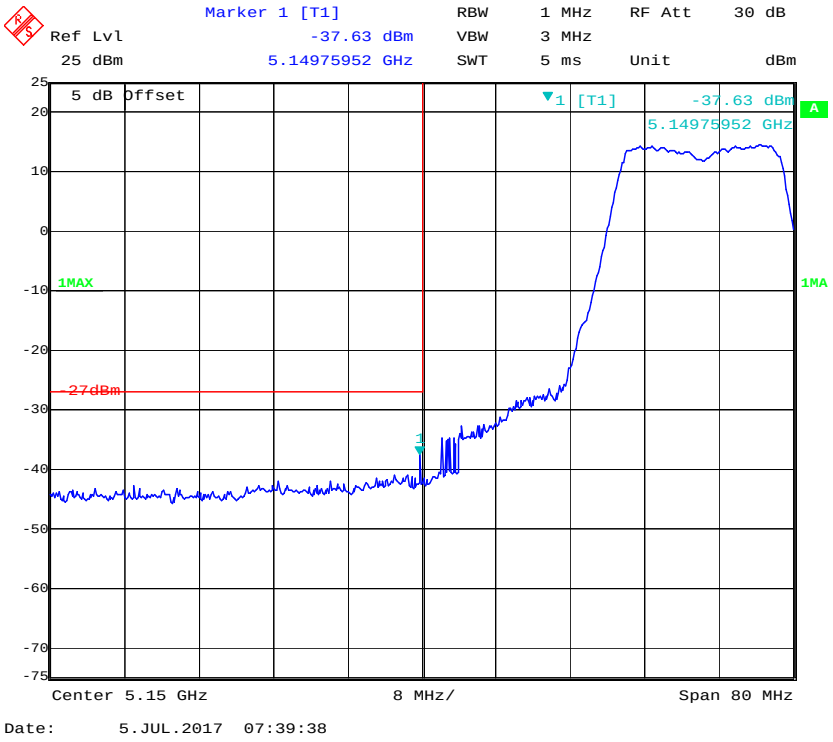
Date: 3.JUL.2017 11:56:18

802.11n ac80 Middle Channel



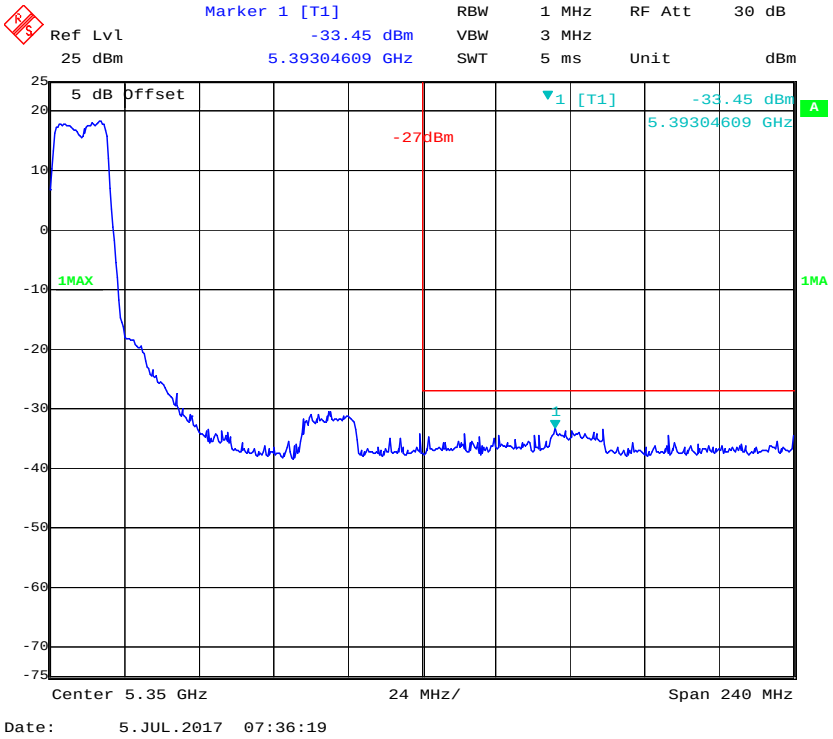
Chain 1:

802.11n ht20 Low Channel



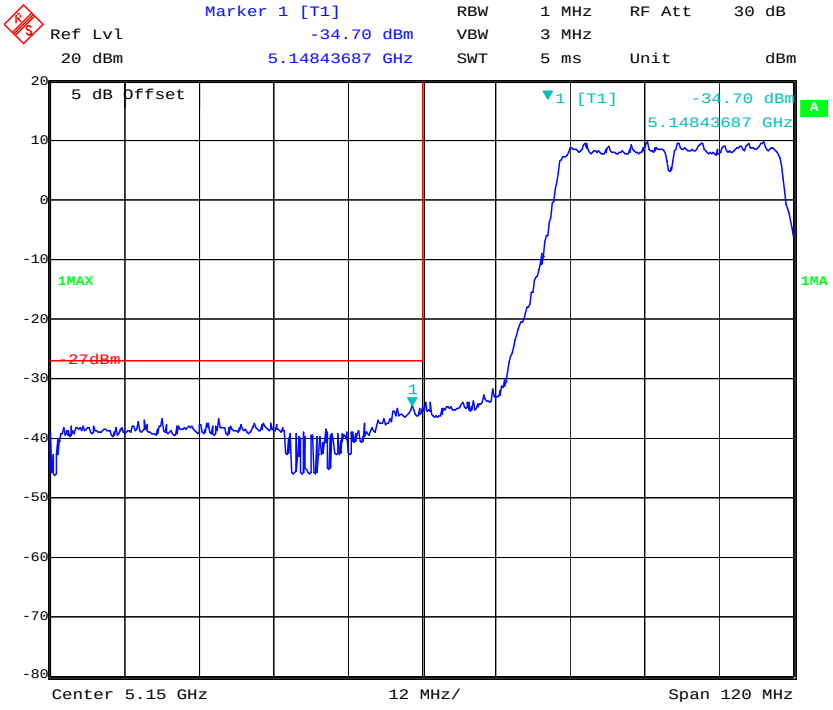
Date: 5.JUL.2017 07:39:38

802.11n ht20 High Channel



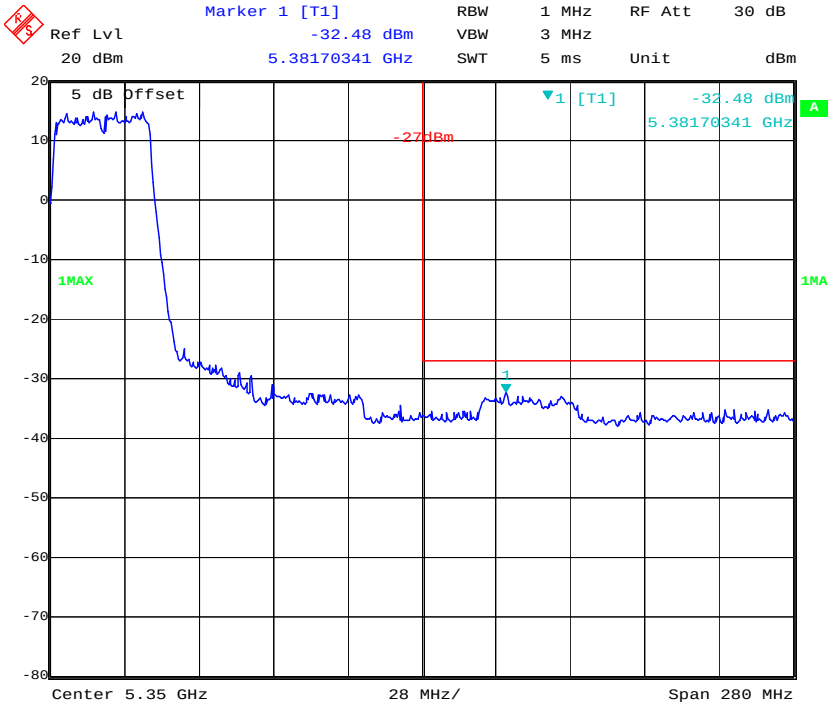
Date: 5.JUL.2017 07:36:19

802.11n ht40 Low Channel



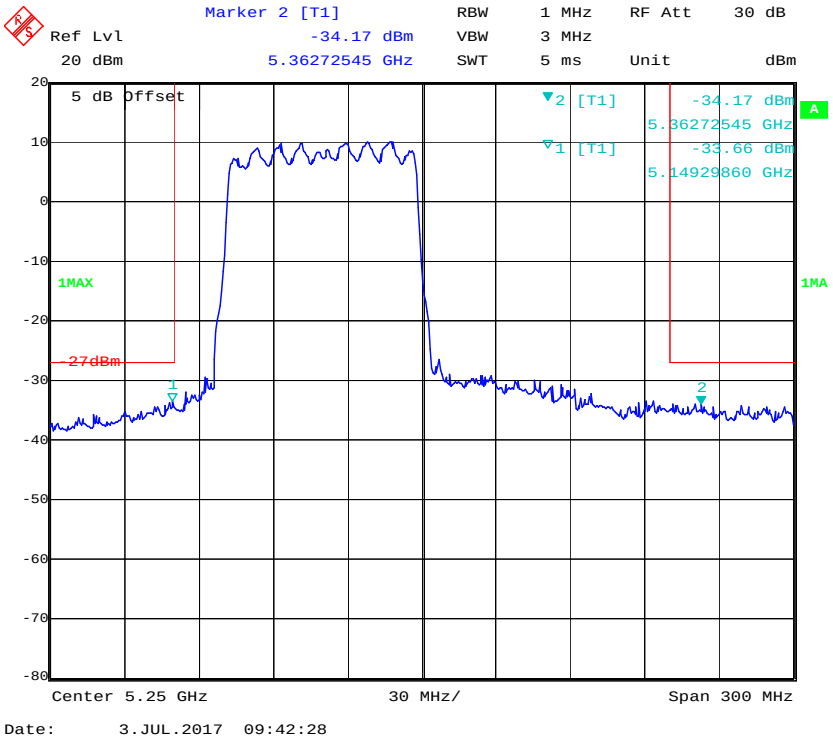
Date: 3.JUL.2017 11:50:46

8802.11n ht40 High Channel



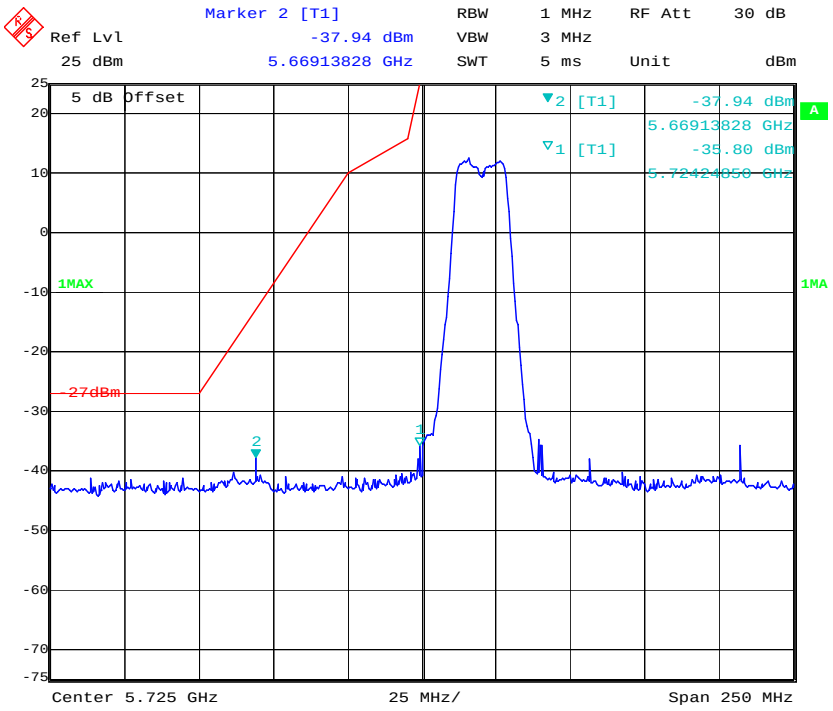
Date: 3.JUL.2017 11:59:27

802.11n ac80 Middle Channel



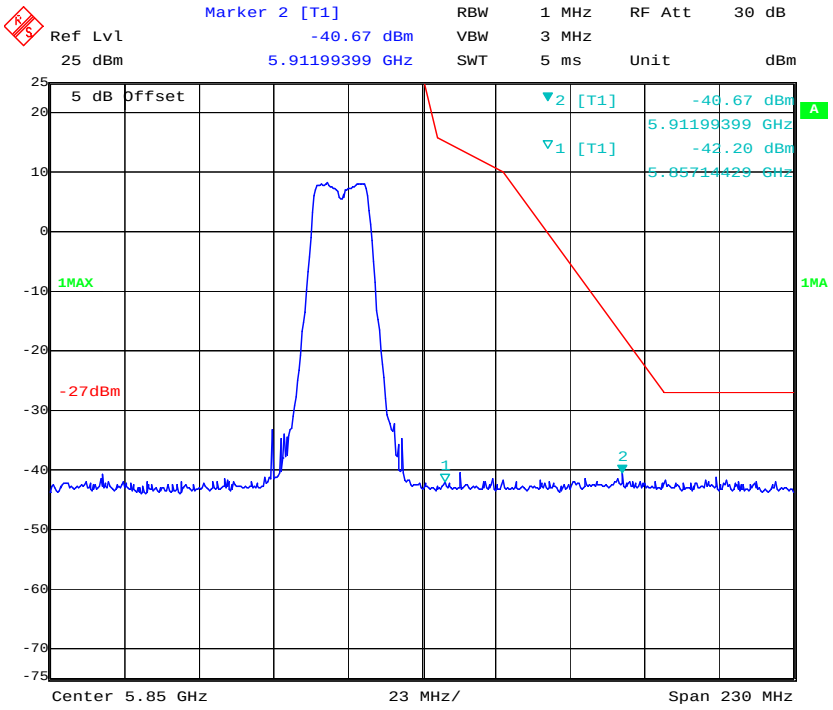
5725-5850MHz
Chain 0:

802.11n ht20 Low Channel



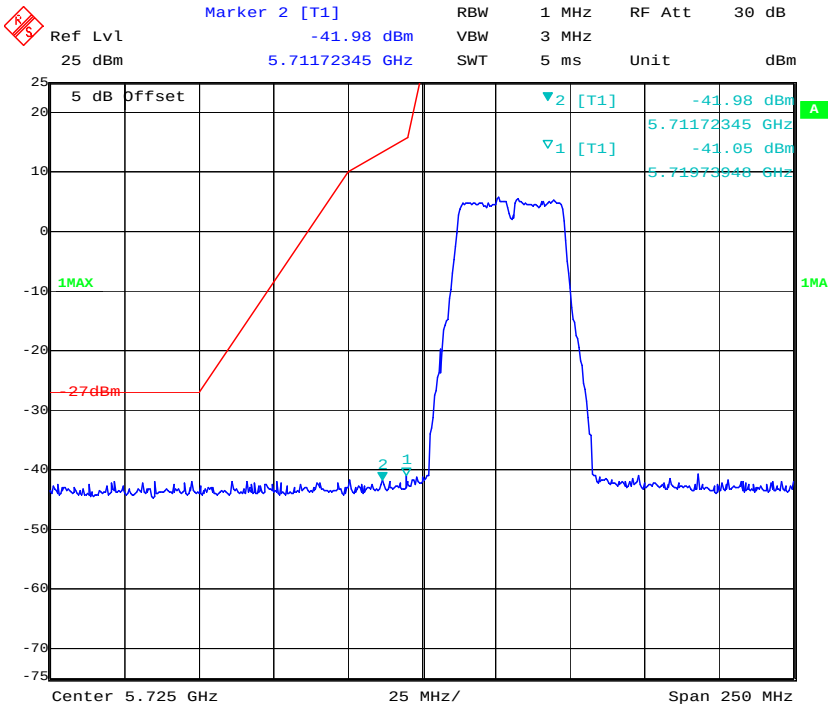
Date: 4.JUL.2017 13:17:08

802.11n ht20 High Channel



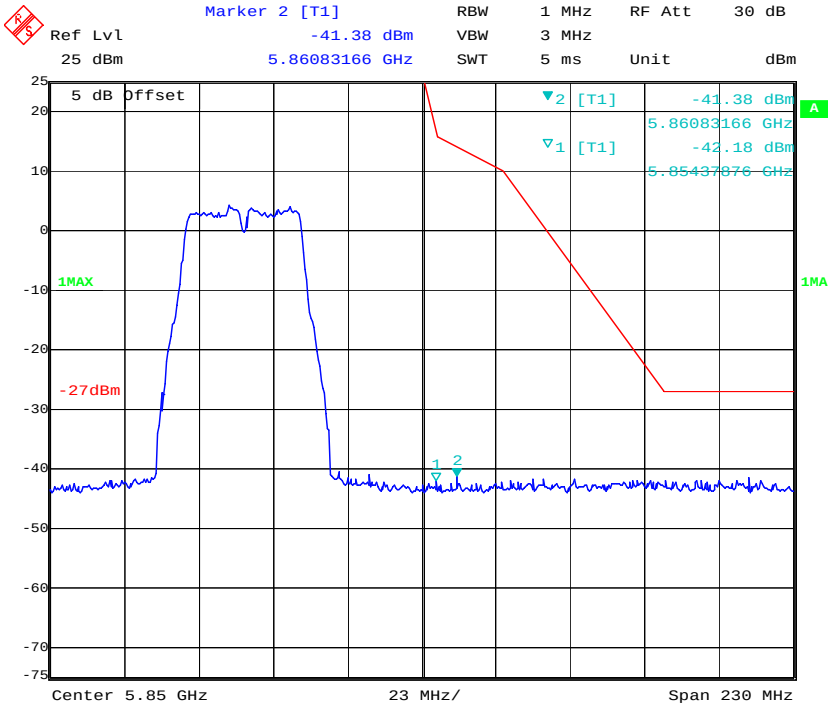
Date: 4.JUL.2017 14:09:06

802.11n ht40 Low Channel



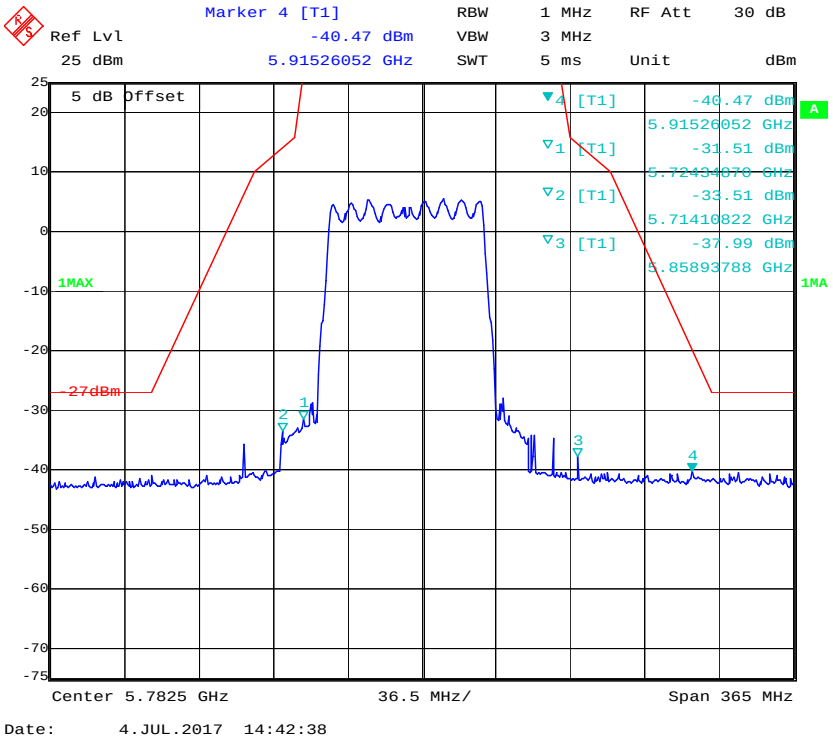
Date: 4.JUL.2017 14:12:24

802.11n ht40 High Channel



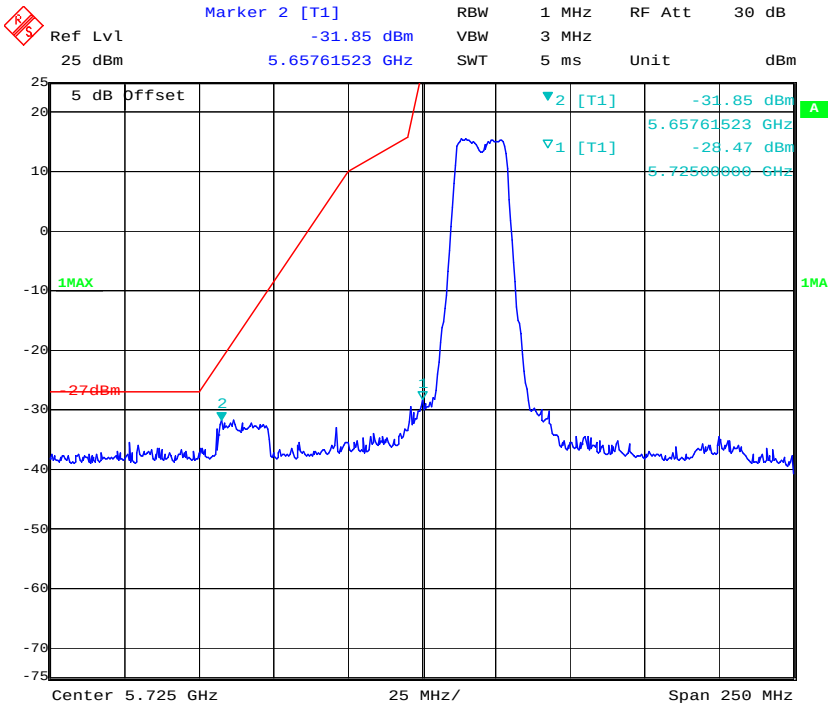
Date: 4.JUL.2017 14:36:35

802.11 ac80 Middle Channel



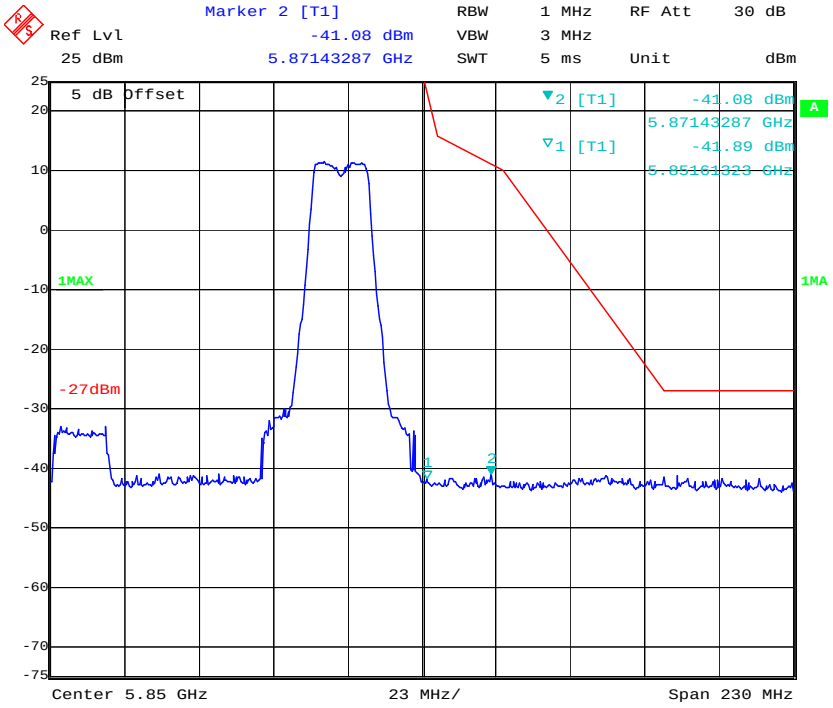
Chain 1:

802.11n ht20 Low Channel



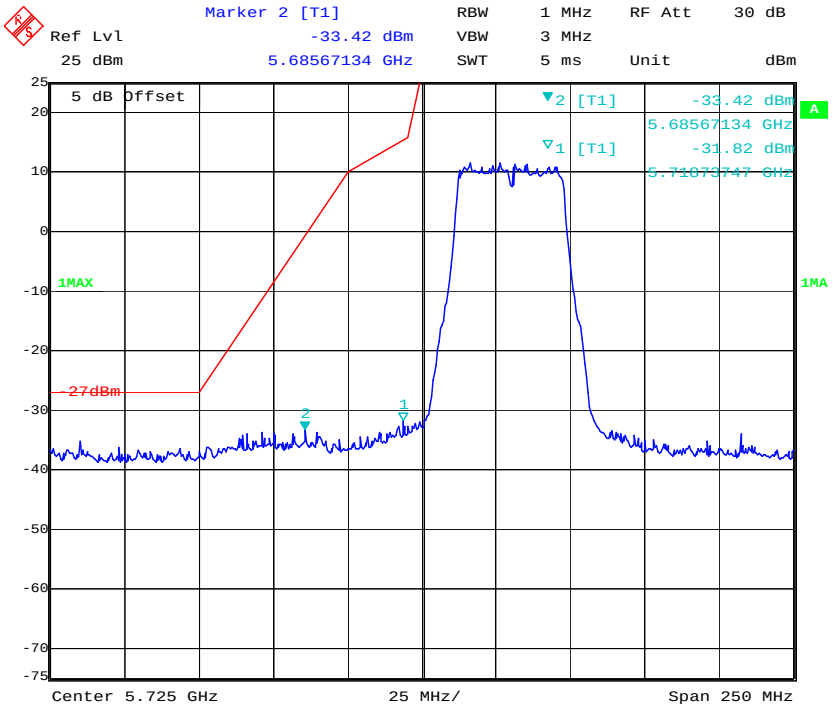
Date: 4.JUL.2017 15:09:13

802.11n ht20 High Channel



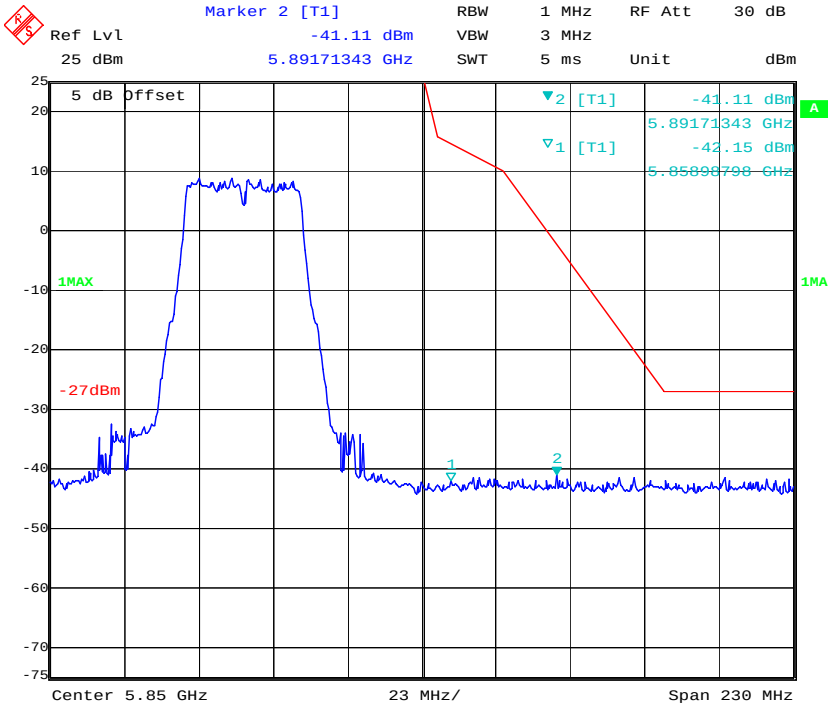
Date: 4.JUL.2017 15:19:00

802.11n ht40 Low Channel



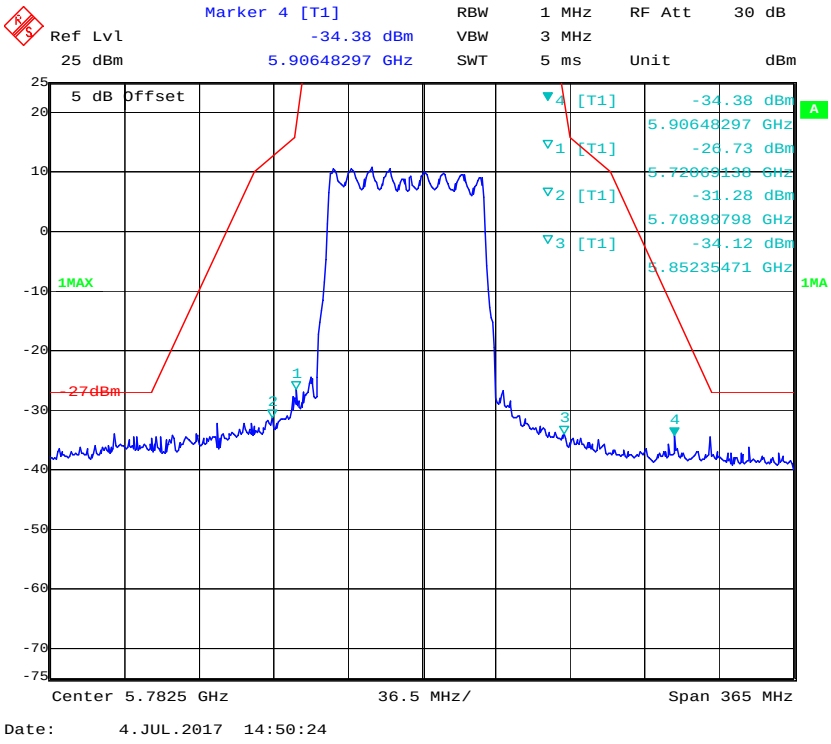
Date: 4.JUL.2017 14:59:15

802.11n ht40 High Channel



Date: 4.JUL.2017 15:05:41

802.11 ac80 Middle Channel



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

Applicable Standard

15.407(a) (e)

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	831929/005	2016-09-21	2017-09-20
Unknown	RF Cable	Unknown	C-2	Each Time	/

*** Statement of Traceability:** BACL(Chengdu) attests that all of the calibrations on the equipment items listed above were traceable to NIM or to another internationally recognized National Metrology Institute (NMI), and were compliant with the NIST HB 150-2016 Normative Annex B “Implementation of traceability policy in accredited laboratories”.

Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v01r04.

Test Data

Environmental Conditions

Temperature:	28.6~28.9 °C
Relative Humidity:	50.8~51.3 %
ATM Pressure:	100.1 kPa

The testing was performed by Tom Tang from 2017-07-03 to 2017-07-04.

Test Result: Pass.

Please refer to the following tables and plots.

Test mode: Transmitting (Test performed at SISO mode, chain 0)

5150-5250MHz:

Mode	Channel	Frequency (MHz)	26 dB Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11 a	Low	5180	21.56	16.99
	Middle	5200	27.25	17.15
	High	5240	27.17	17.15
802.11n ht20	Low	5180	22.20	18.04
	Middle	5200	22.85	18.04
	High	5240	26.13	18.04
802.11n ht40	Low	5190	44.73	37.52
	High	5230	52.28	37.68
802.11 ac80	Middle	5210	83.05	75.67

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

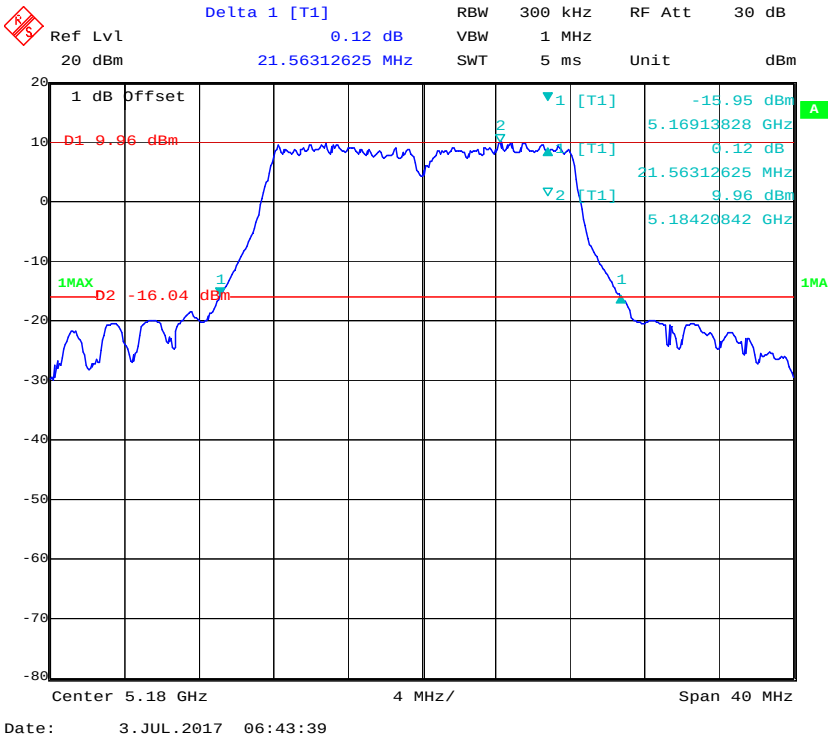
5725-5850MHz:

Mode	Channel	Frequency (MHz)	26 dB Emission Bandwidth (MHz)	6 dB Emission Bandwidth (MHz)	6dB Emission Bandwidth Limit (MHz)
802.11 a	Low	5745	21.40	16.59	≥0.5
	Middle	5785	22.53	16.59	≥0.5
	High	5825	22.61	16.59	≥0.5
802.11n ht20	Low	5745	23.17	17.80	≥0.5
	Middle	5785	23.17	17.80	≥0.5
	High	5825	23.17	17.80	≥0.5
802.11n ht40	Low	5755	44.57	36.71	≥0.5
	High	5795	44.57	36.71	≥0.5
802.11 ac80	Middle	5775	85.29	76.63	≥0.5

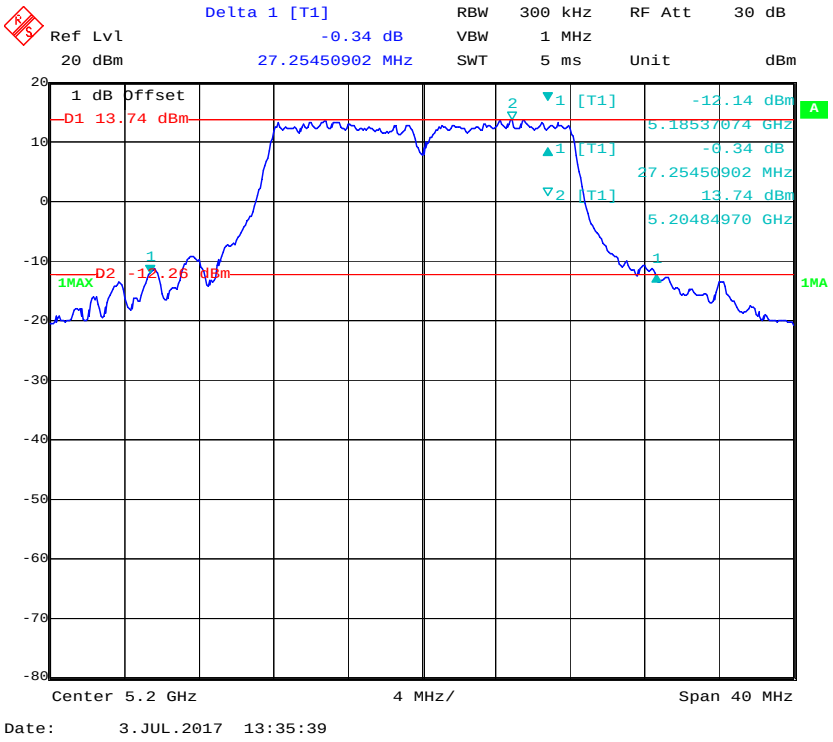
Note: For 5725-5850MHz band, 26dB bandwidth have not fall into the band 5470-5725MHz.

5150-5250MHz: 26dB Emission Bandwidth:

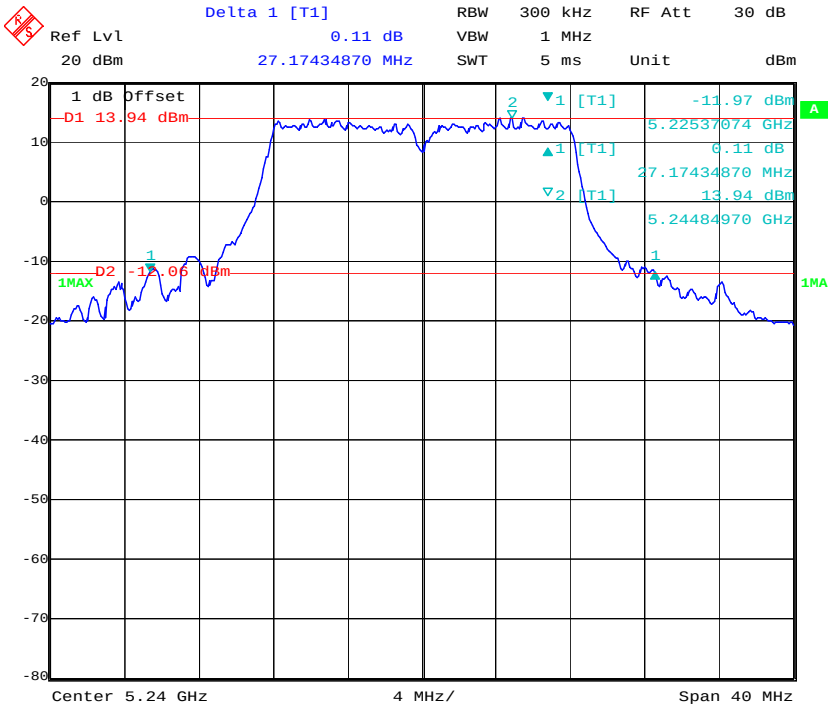
Chain 0 - 802.11a Low Channel



Chain 0 - 802.11a Middle Channel

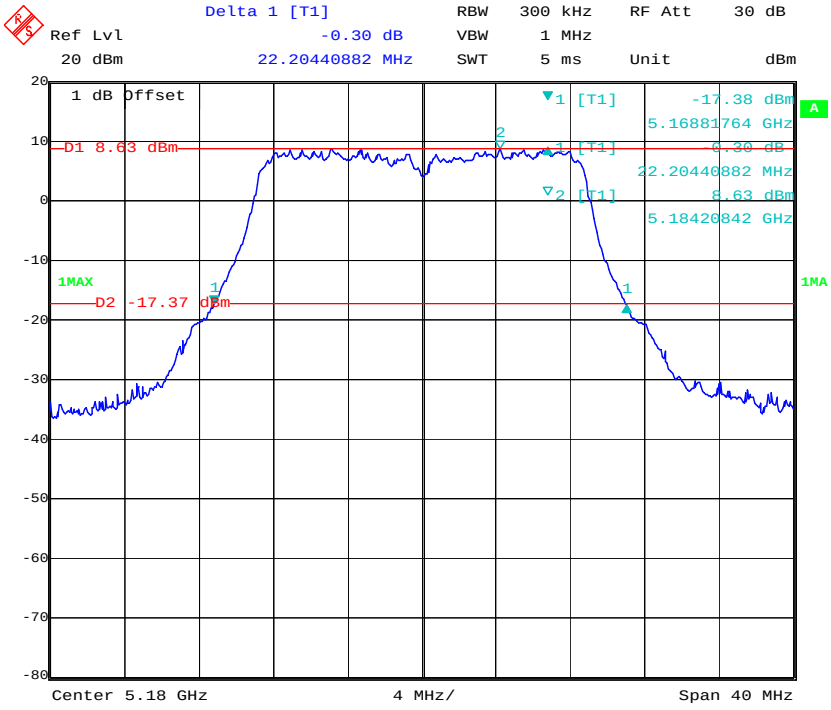


Chain 0 - 802.11a High Channel



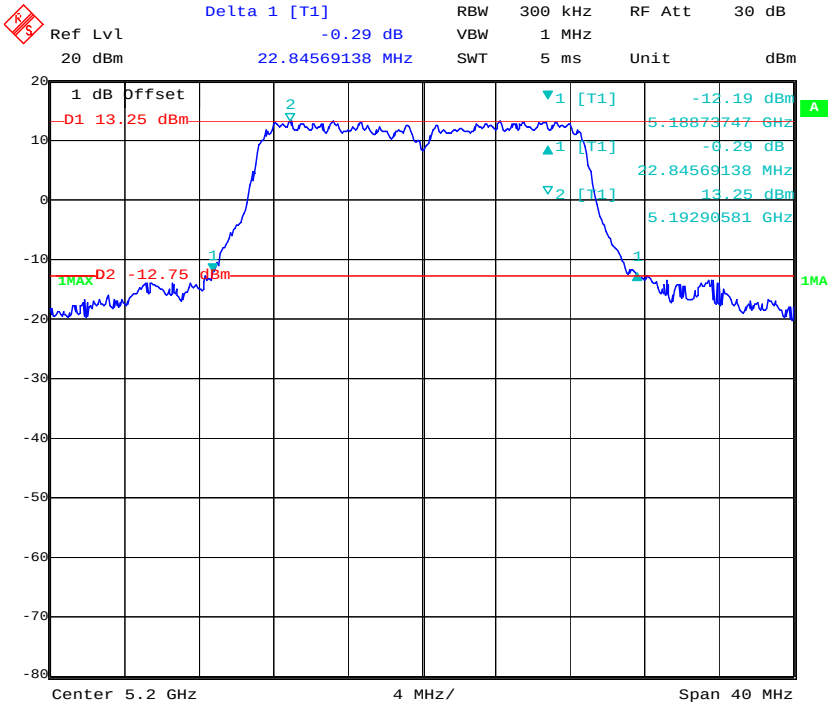
Date: 3.JUL.2017 13:38:34

Chain 0 - 802.11n ht20 Low Channel



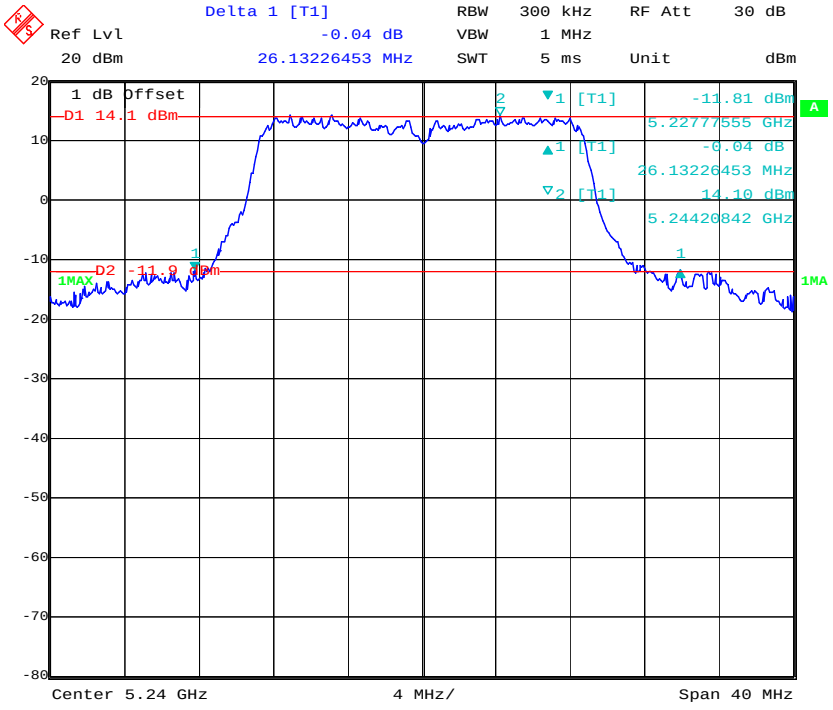
Date: 3.JUL.2017 07:50:31

Chain 0 - 802.11n ht20 Middle Channel



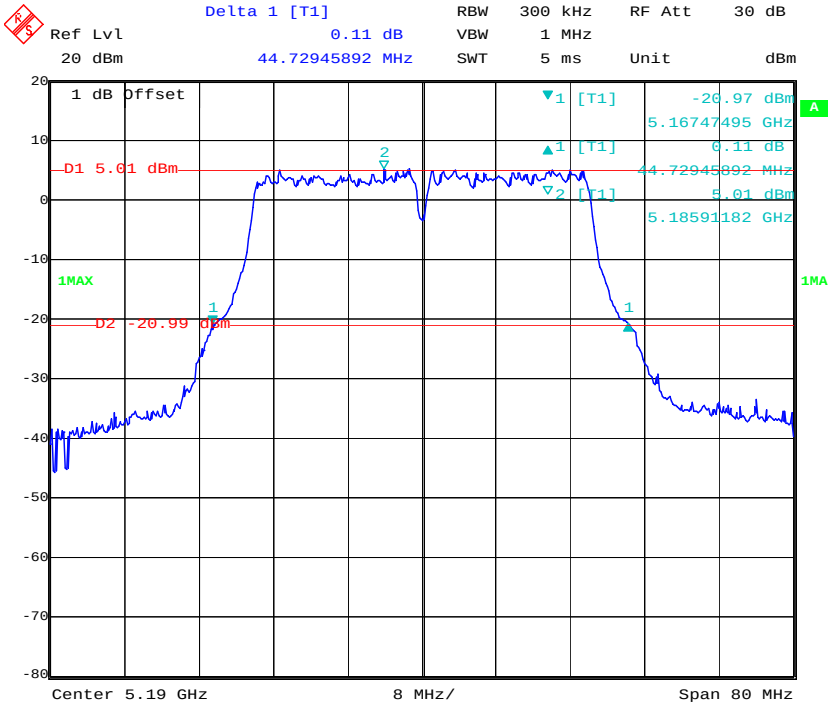
Date: 3.JUL.2017 13:32:45

Chain 0 - 802.11n ht20 High Channel



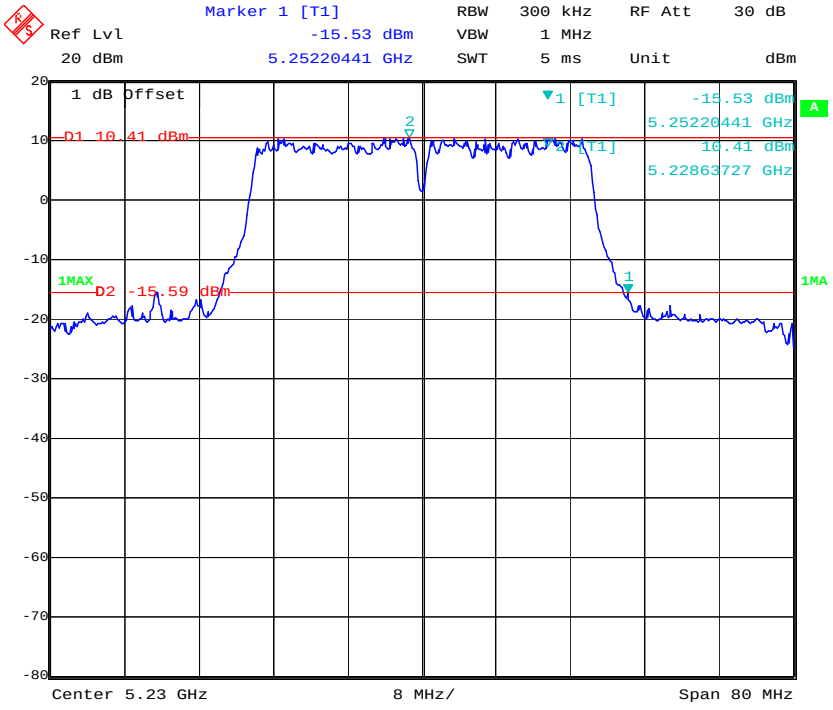
Date: 3.JUL.2017 13:29:30

Chain 0 - 802.11n ht40 Low Channel



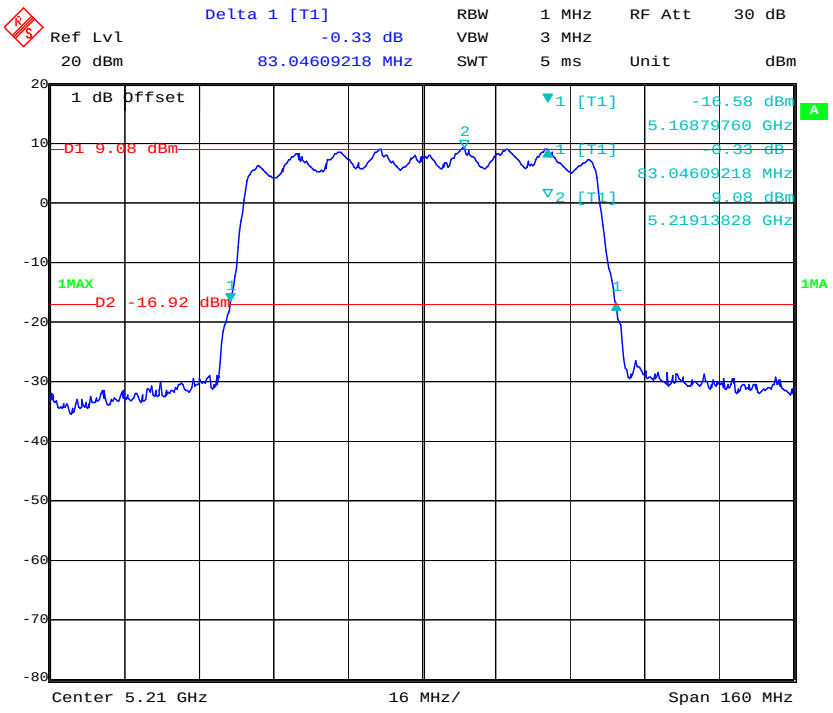
Date: 3.JUL.2017 08:08:33

Chain 0 - 802.11n ht40 High Channel



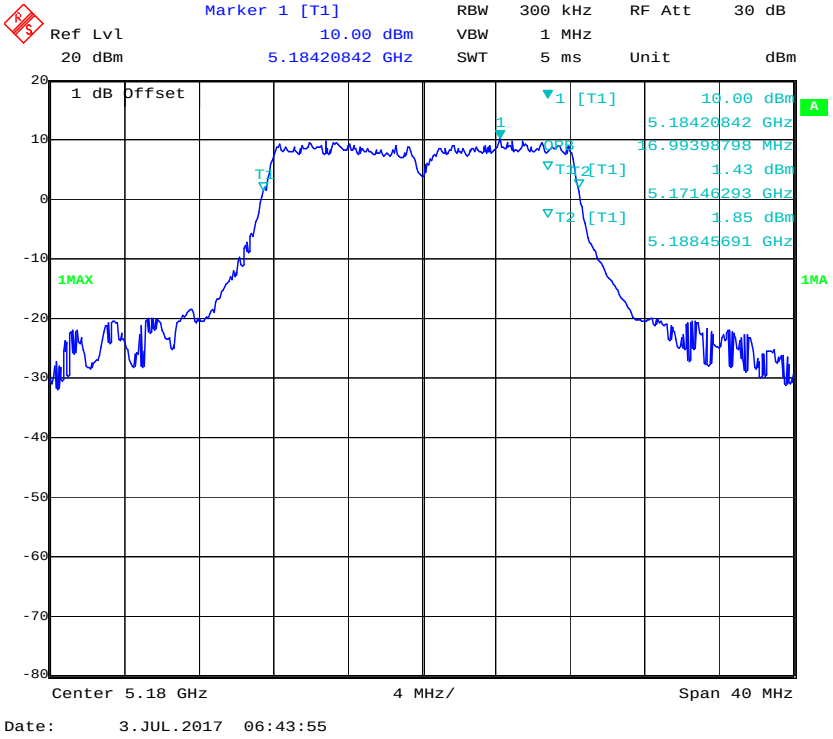
Date: 3.JUL.2017 13:26:11

Chain 0 - 802.11ac80 Middle Channel

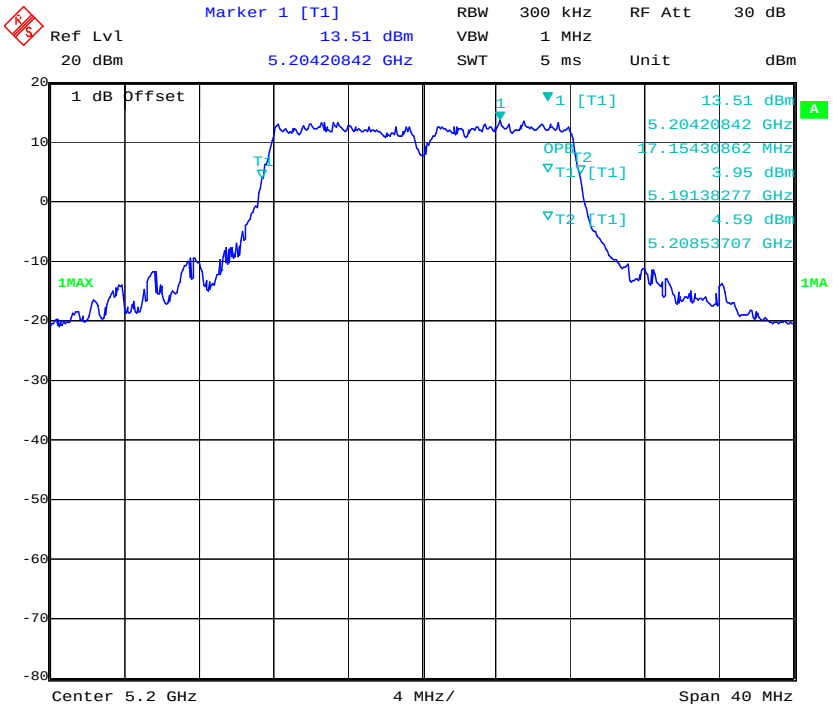


99% Occupied Bandwidth

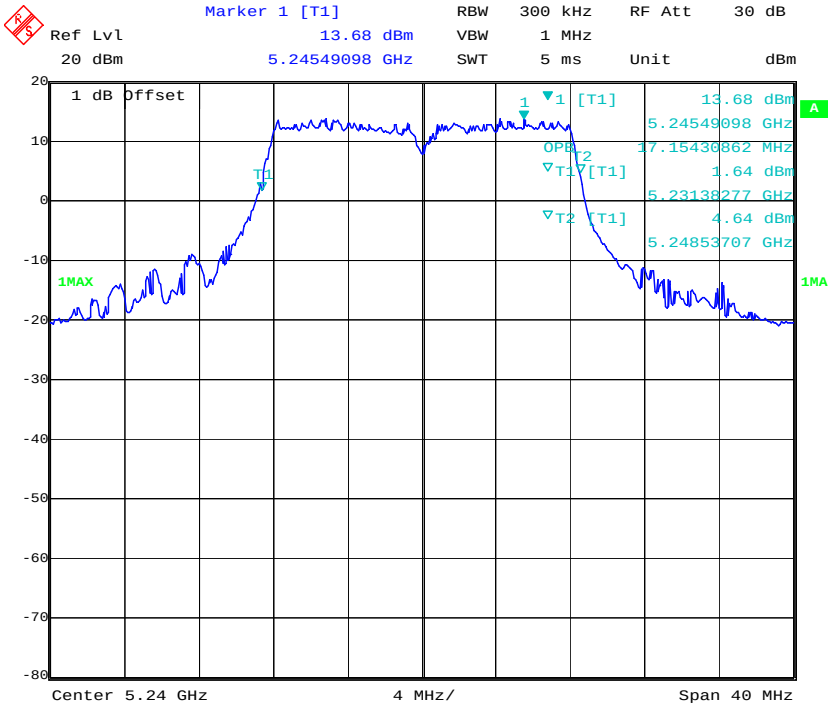
Chain 0 - 802.11a Low Channel



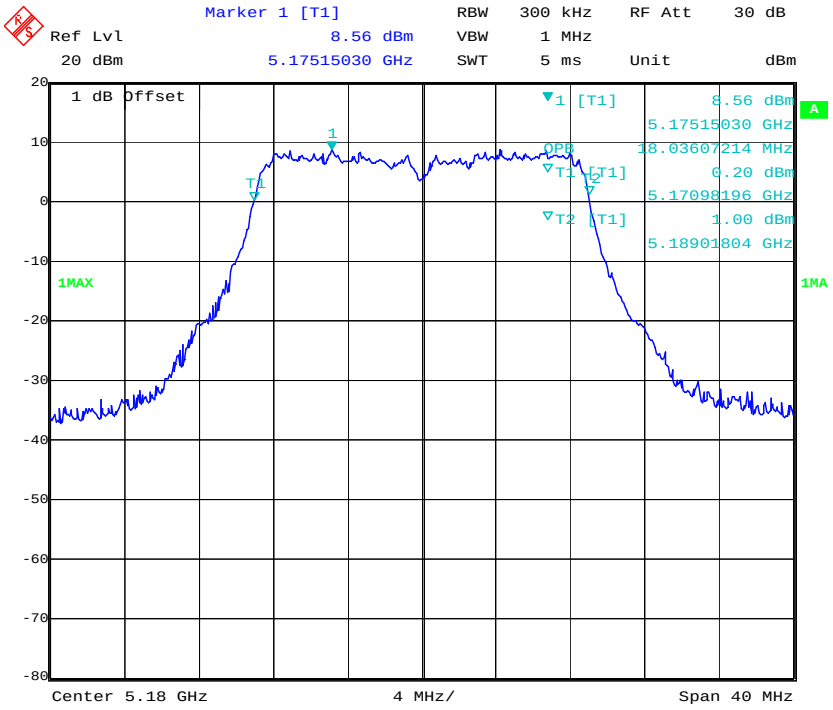
Chain 0 - 802.11a Middle Channel



Chain 0 - 802.11a High Channel

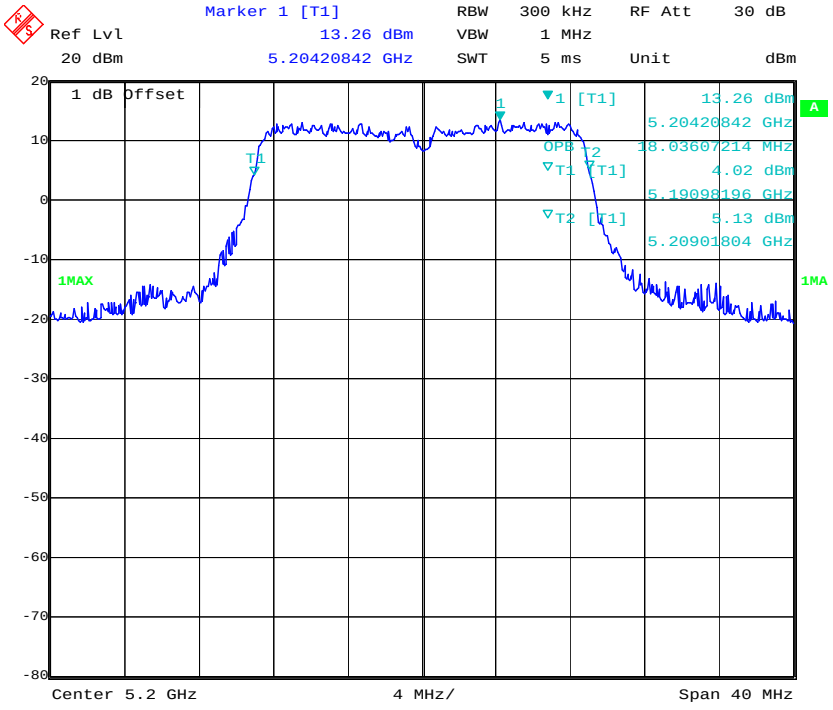


Chain 0 - 802.11n ht20 Low Channel



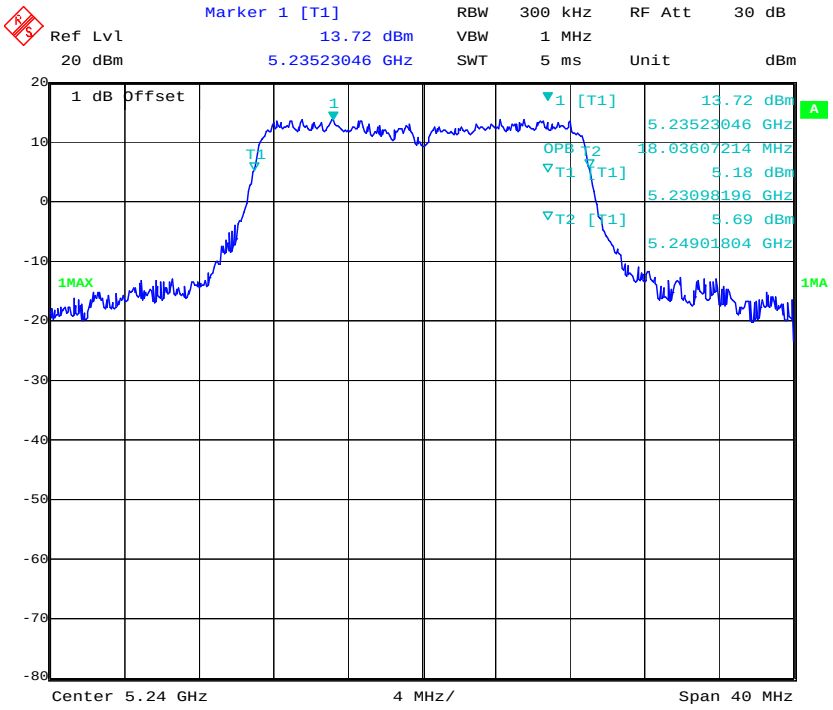
Date: 3.JUL.2017 07:50:47

Chain 0 - 802.11n ht20 Middle Channel



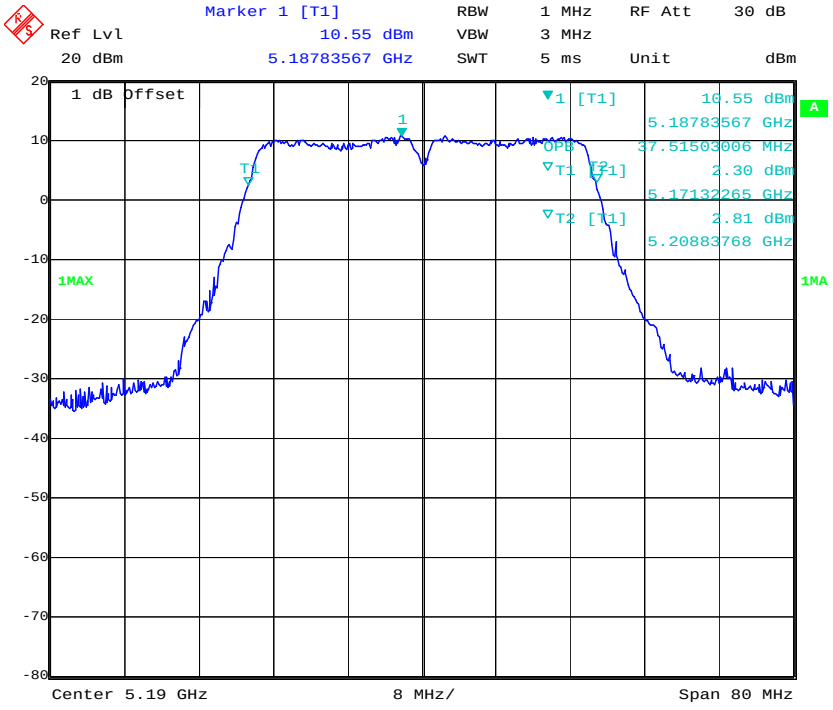
Date: 3.JUL.2017 13:33:00

Chain 0 - 802.11n ht20 High Channel



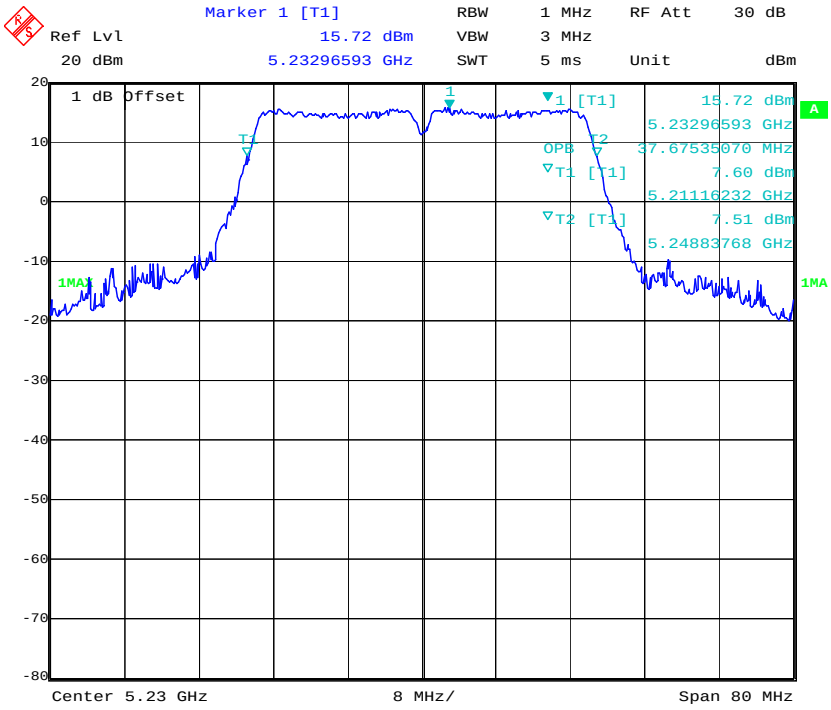
Date: 3.JUL.2017 13:29:45

Chain 0 - 802.11n ht40 Low Channel



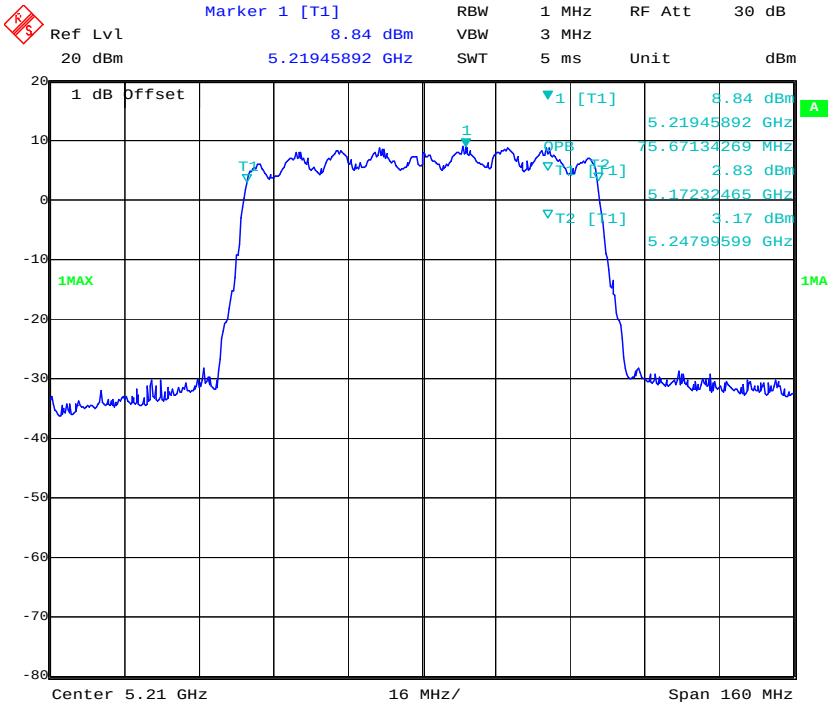
Date: 3.JUL.2017 08:08:48

Chain 0 - 802.11n ht40 High Channel



Date: 3.JUL.2017 13:26:26

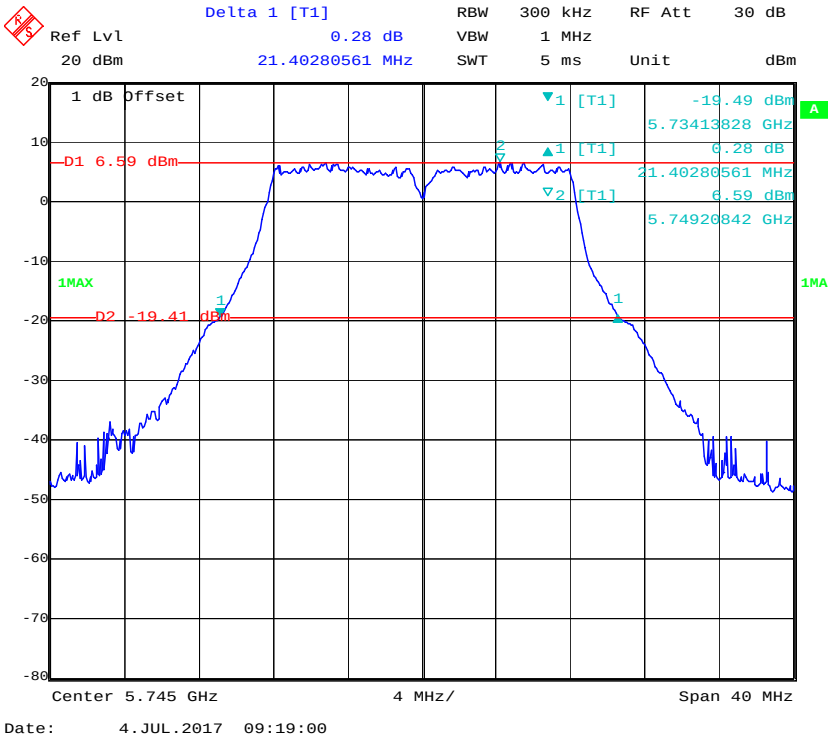
Chain 0 - 802.11ac80 Middle Channel



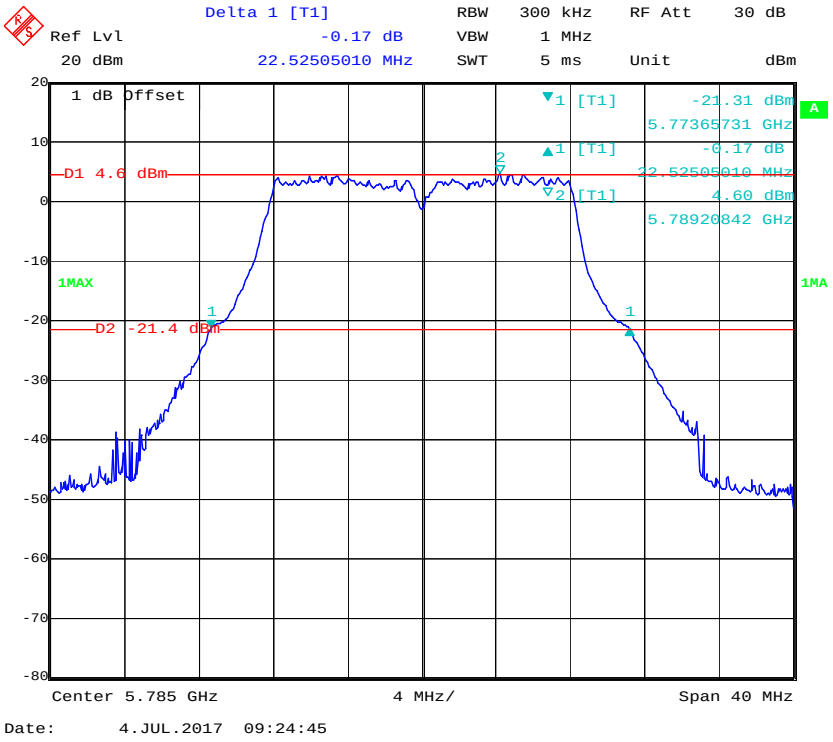
Date: 3.JUL.2017 08:43:49

5725-5850MHz:26dB bandwidth

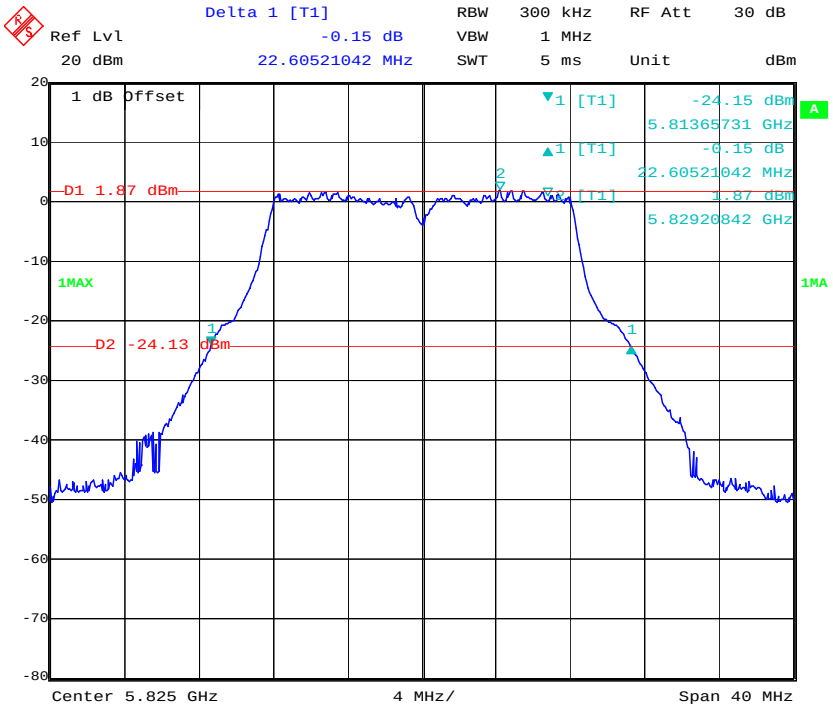
Chain 0 - 802.11a Low Channel



Chain 0 - 802.11a Middle Channel

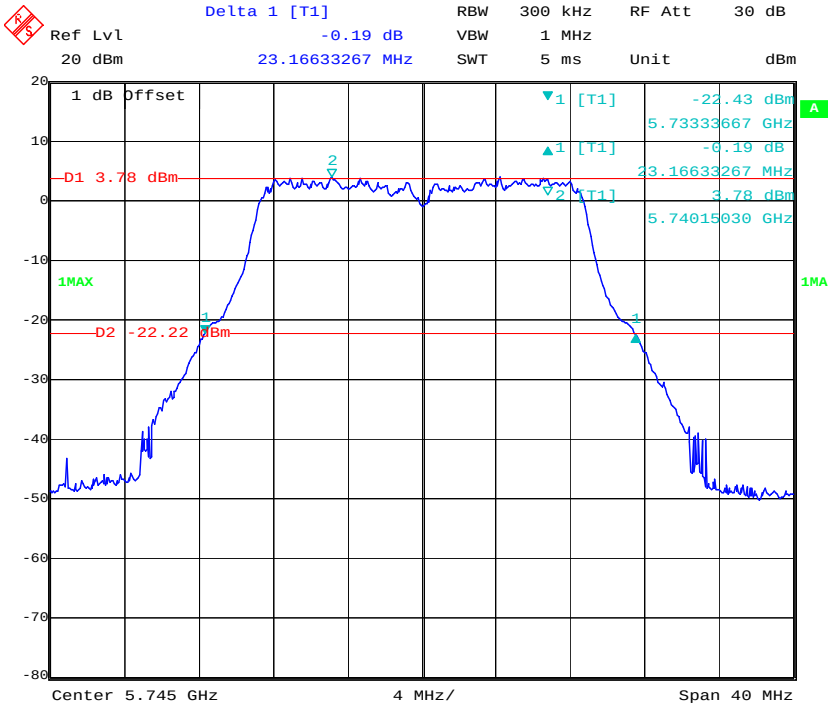


Chain 0 - 802.11a High Channel



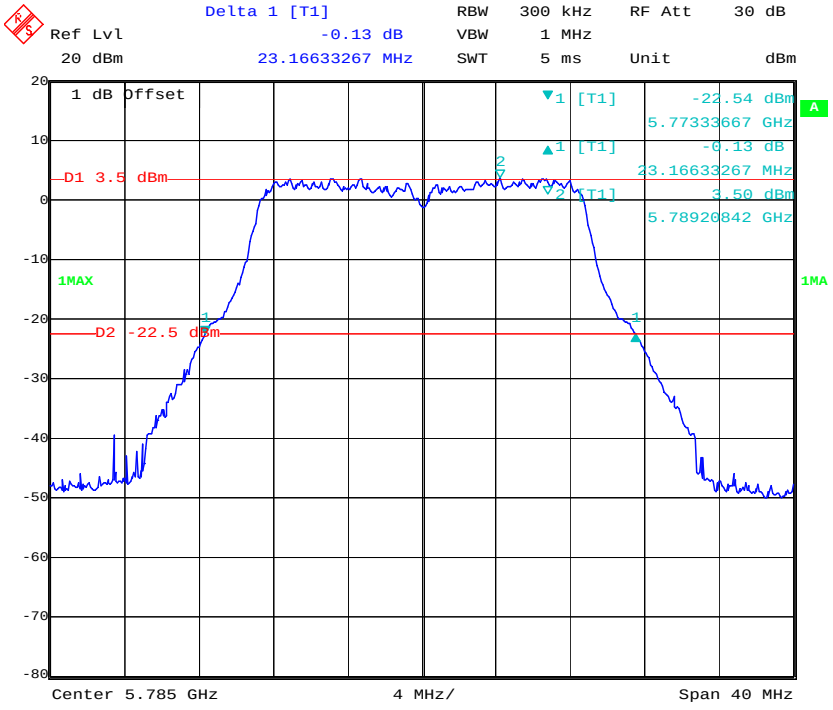
Date: 4.JUL.2017 09:29:55

Chain 0 - 802.11n ht20 Low Channel



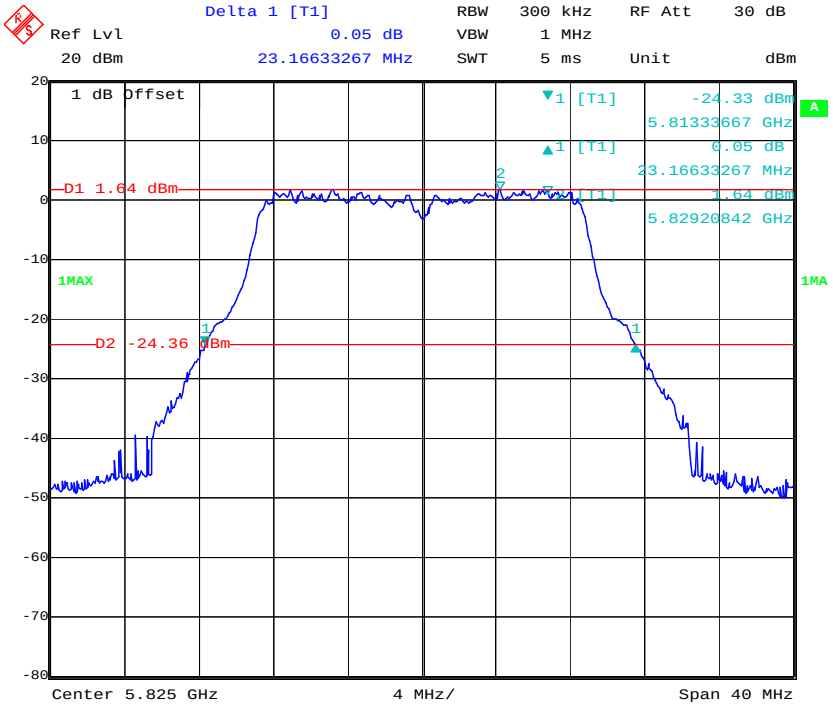
Date: 4.JUL.2017 10:16:23

Chain 0 - 802.11n ht20 Middle Channel



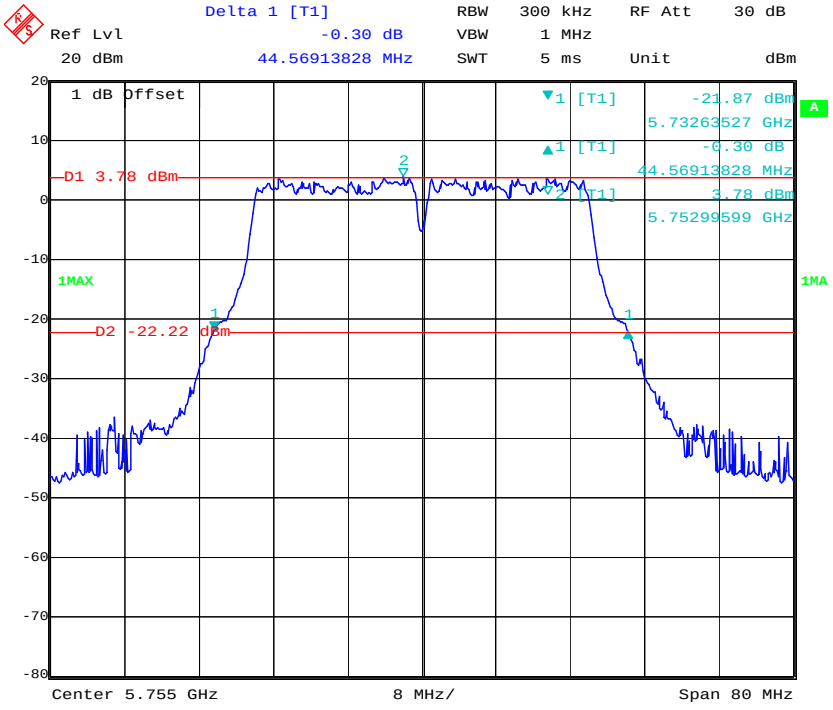
Date: 4.JUL.2017 09:42:21

Chain 0 - 802.11n ht20 High Channel



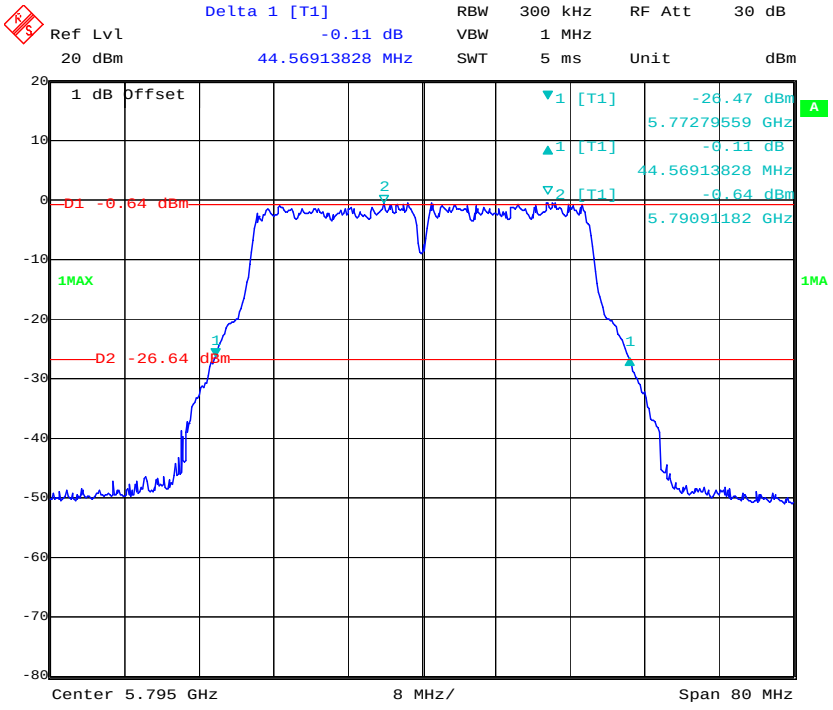
Date: 4.JUL.2017 09:33:49

Chain 0 - 802.11n ht40 Low Channel



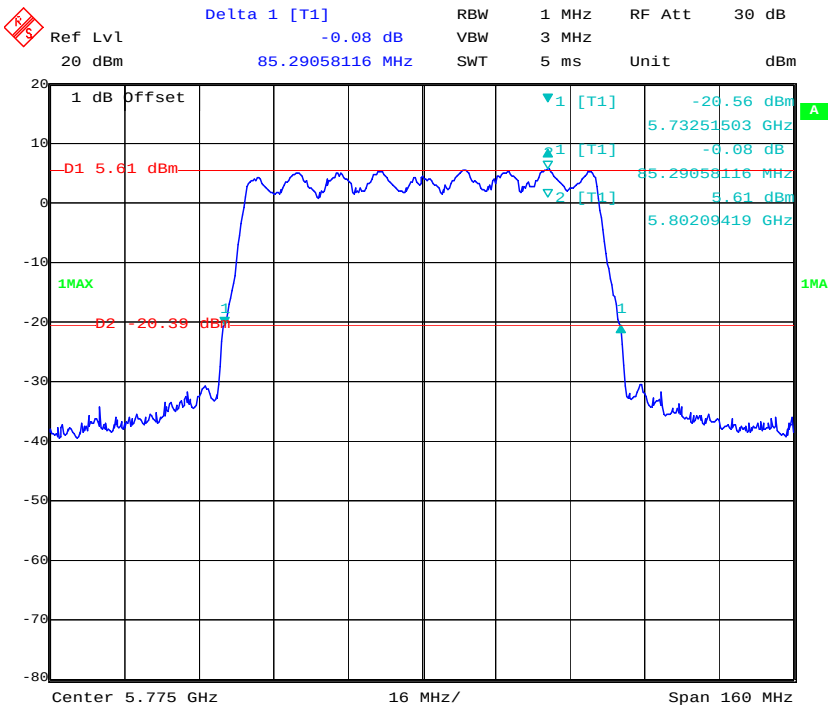
Date: 4.JUL.2017 09:59:28

Chain 0 - 802.11n ht40 High Channel



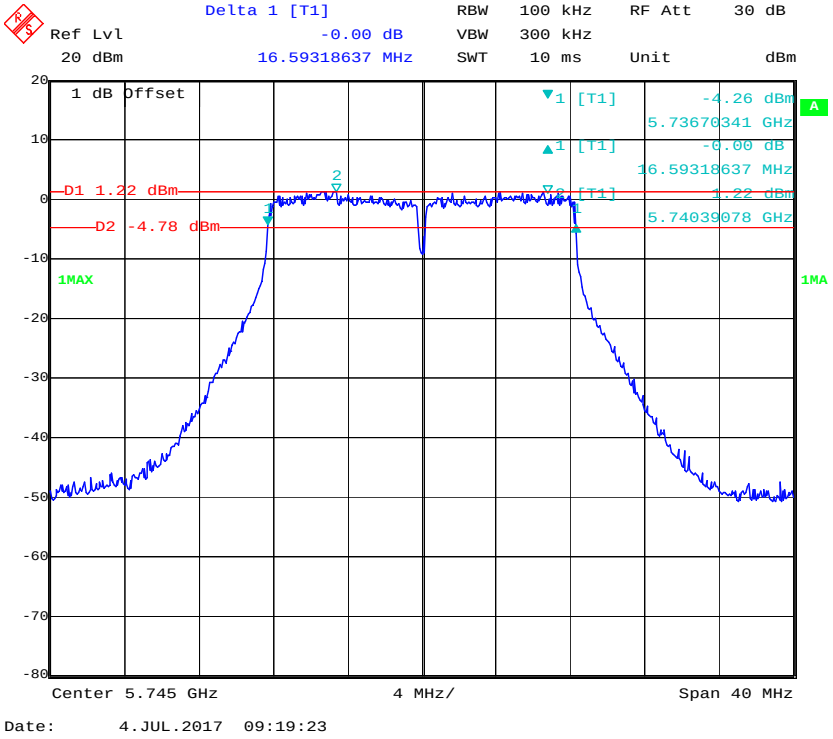
Date: 4.JUL.2017 10:04:47

Chain 0 - 802.11ac80 Middle Channel

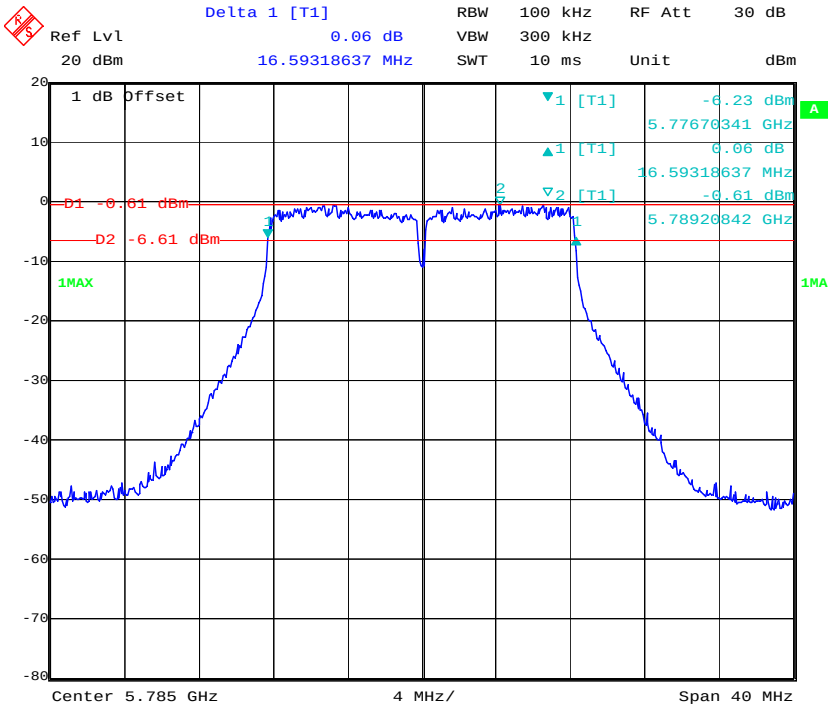


6dB Bandwidth:

Chain 0 - 802.11a Low Channel

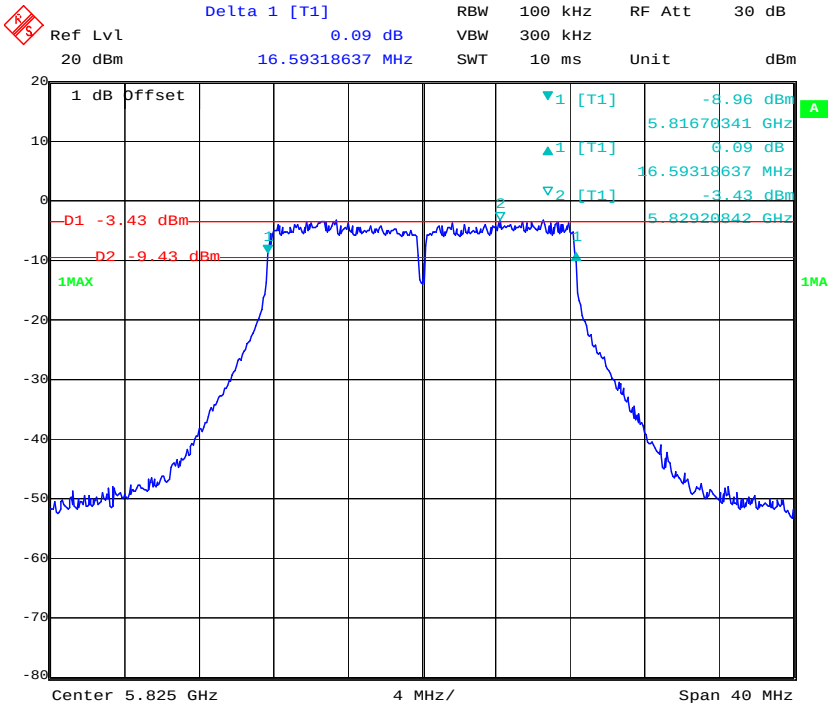


Chain 0 - 802.11a Middle Channel



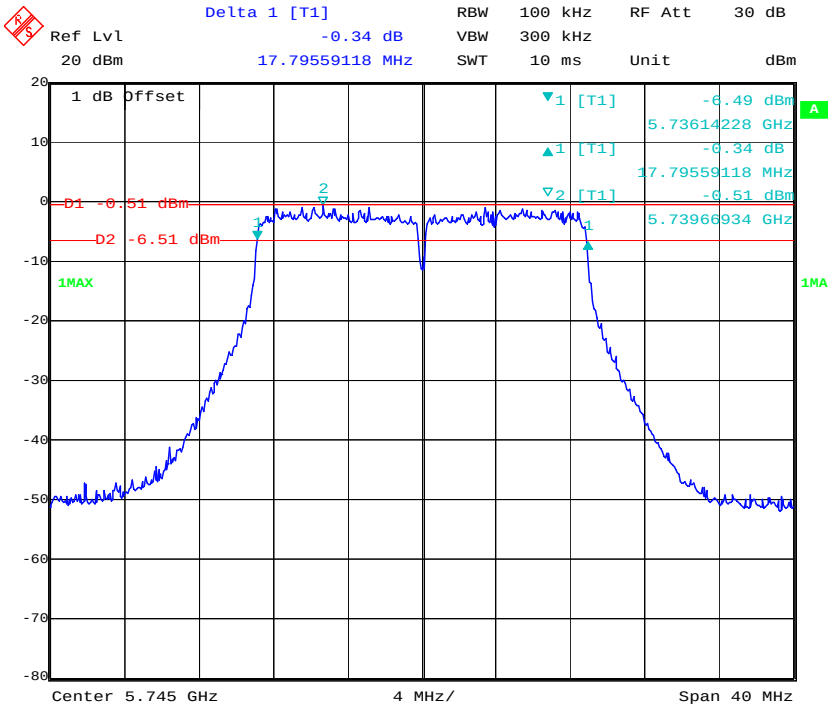
Date: 4.JUL.2017 09:25:06

Chain 0 - 802.11a High Channel



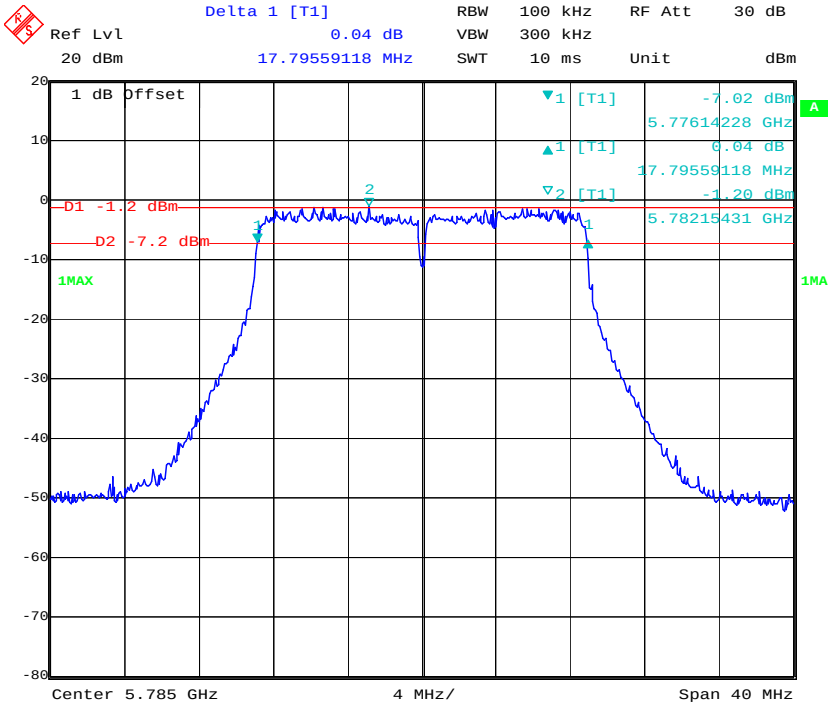
Date: 4.JUL.2017 09:30:14

Chain 0 - 802.11n ht20 Low Channel



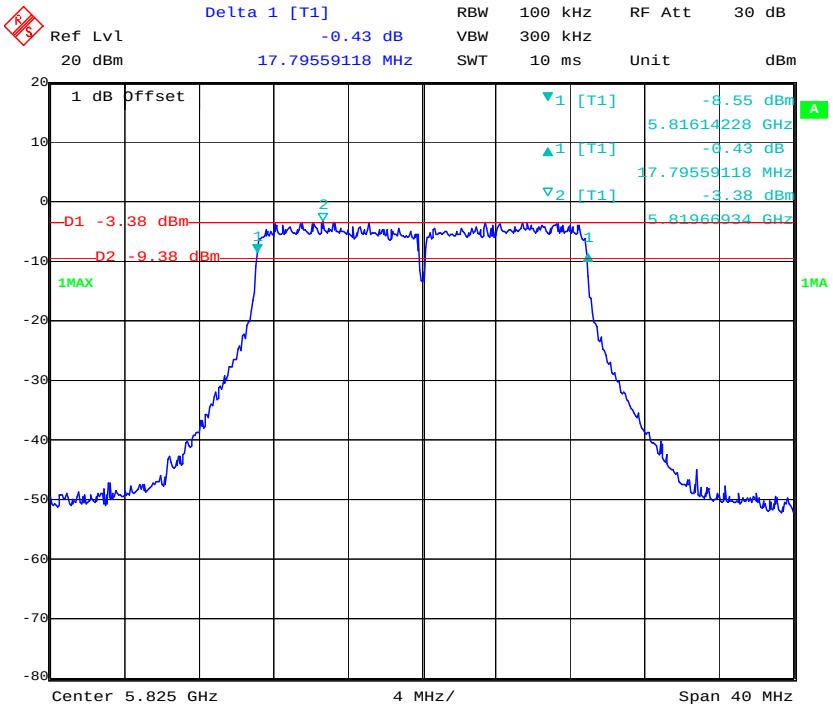
Date: 4.JUL.2017 10:16:42

Chain 0 - 802.11n ht20 Middle Channel



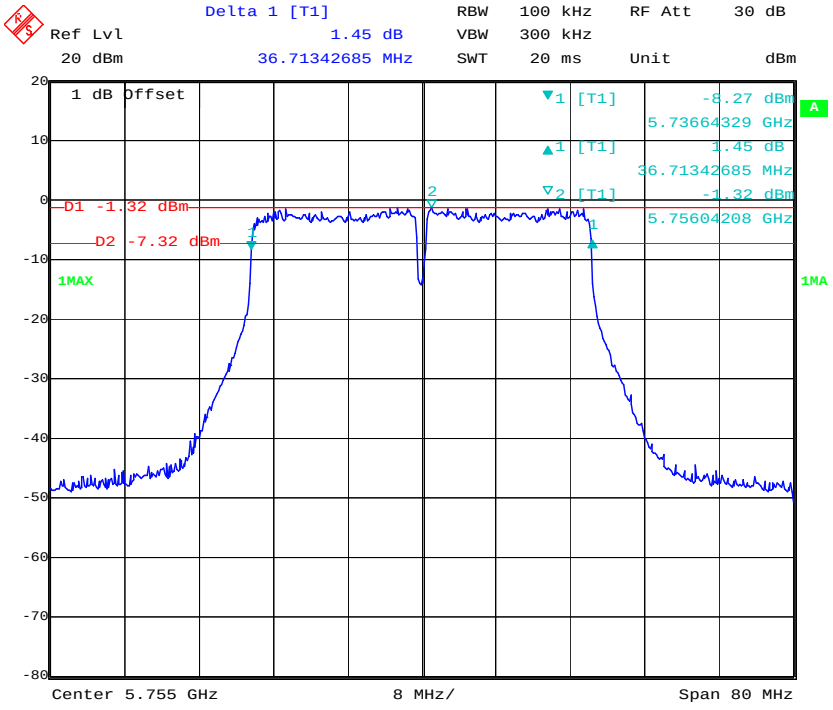
Date: 4.JUL.2017 09:42:41

Chain 0 - 802.11n ht20 High Channel



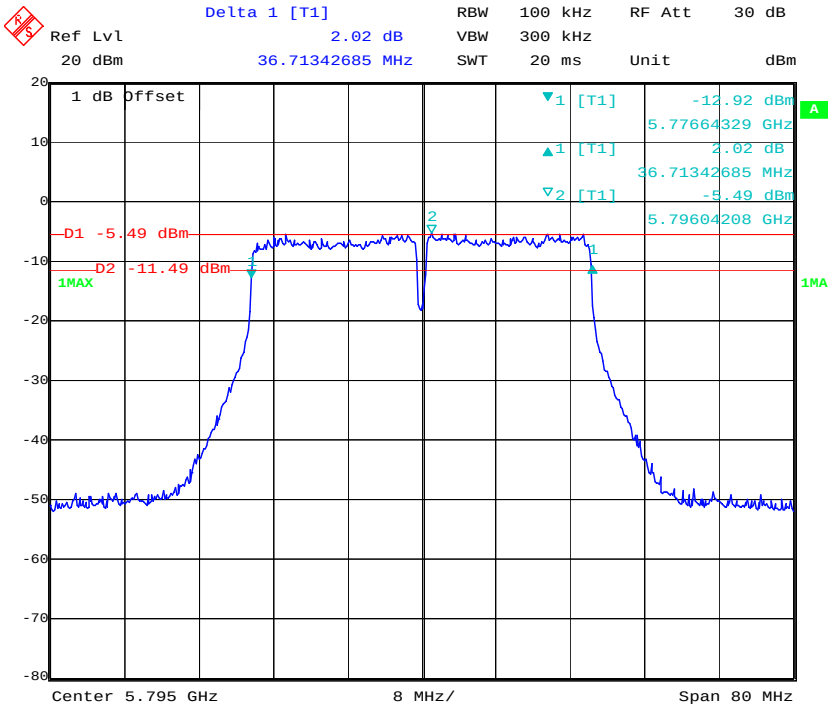
Date: 4.JUL.2017 09:34:09

Chain 0 - 802.11n ht40 Low Channel



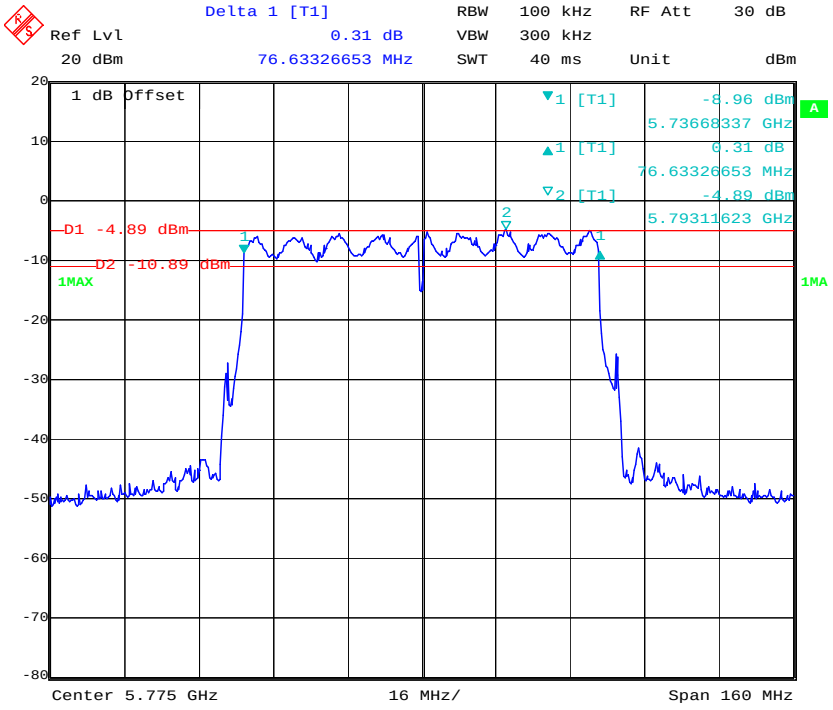
Date: 4.JUL.2017 09:59:48

Chain 0 - 802.11n ht40 High Channel



Date: 4.JUL.2017 10:05:07

Chain 0 - 802.11n ac80 Middle Channel



Date: 4.JUL.2017 10:12:49

FCC §15.407(g)–FREQUENCY STABILITY

Applicable Standard

FCC §15.407(g)

(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 C63.10-2013 clause 6.8.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	831929/005	2016-09-21	2017-09-20
Unknown	RF Cable	Unknown	C-2	Each Time	/
FLUKE	Multimeter	1587	27870099	2016-12-30	2017-12-29
BACL	High Temperature Test Chamber	BTH-150	30024	2016-12-02	2017-12-01

*** Statement of Traceability:** BACL(Chengdu) attests that all of the calibrations on the equipment items listed above were traceable to NIM or to another internationally recognized National Metrology Institute (NMI), and were compliant with the NIST HB 150-2016 Normative Annex B “Implementation of traceability policy in accredited laboratories”.

Test Data

Environmental Conditions

Temperature:	28.6~28.9 °C
Relative Humidity:	50.8~51.3 %
ATM Pressure:	100.1 kPa

The testing was performed by Tom Tang from 2017-07-03 to 2017-07-04.

Test Result: Pass(Test was performed at Chain 0).

5150-5250MHz:

802.11a

Temperature	Voltage	f_L at Low Test Channel	F_H at High Test Channel	Limit
℃	V_{DC}	MHz	MHz	
0	5	5170.7412	5248.6172	f_L and f_H Within 5150~5250MHz range
10		5170.7414	5248.6178	
20		5170.7417	5248.6178	
30		5170.7412	5248.6177	
40		5170.7402	5248.6165	

802.11n ht20:

Temperature	Voltage	f_L at Low Test Channel	F_H at High Test Channel	Limit
℃	V_{DC}	MHz	MHz	
0	5	5171.0624	5249.0178	f_L and f_H Within 5150~5250MHz range
10		5171.0625	5249.0187	
20		5171.0626	5249.0144	
30		5171.0627	5249.0175	
40		5171.0624	5249.0184	

802.11n ht40:

Temperature	Voltage	f_L at Low Test Channel	F_H at High Test Channel	Limit
℃	V_{DC}	MHz	MHz	
0	5	5171.3227	5248.3575	f_L and f_H Within 5150~5250MHz range
10		5171.3217	5248.3575	
20		5171.3218	5248.3571	
30		5171.3222	5248.3572	
40		5171.3224	5248.3577	

802.11ac80:

Temperature	Voltage	f_L at Low Test Channel	F_H at High Test Channel	Limit
℃	V_{DC}	MHz	MHz	
0	5	5172.0055	5247.9974	f_L and f_H Within 5150~5250MHz range
10		5172.0051	5247.9974	
20		5172.0051	5247.9971	
30		5172.0052	5247.9972	
40		5172.0025	5247.9973	

Note: the f_L and f_H determined by 99% Occupied bandwidth low edge at Low test channel and High edge at High test channel.

5725-5850MHz:

802.11a

Temperature	Voltage	f_L at Low Test Channel	F_H at High Test Channel	Limit
℃	V_{DC}	MHz	MHz	
0	5	5736.6273	5833.4557	f_L and f_H Within 5725~5850MHz range
10		5736.6257	5833.4578	
20		5736.6277	5833.4589	
30		5736.6255	5833.4578	
40		5736.6225	5833.4567	

802.11n ht20:

Temperature	Voltage	f_L at Low Test Channel	F_H at High Test Channel	Limit
℃	V_{DC}	MHz	MHz	
0	5	5735.9817	5834.0985	f_L and f_H Within 5725~5850MHz range
10		5735.9812	5834.0919	
20		5735.9818	5834.0915	
30		5735.9818	5834.0917	
40		5735.9813	5834.0922	

802.11n ht40:

Temperature	Voltage	f_L at Low Test Channel	F_H at High Test Channel	Limit
℃	V_{DC}	MHz	MHz	
0	5	5736.6433	5813.5164	f_L and f_H Within 5725~5850MHz range
10		5736.6442	5813.5155	
20		5736.6454	5813.5164	
30		5736.6457	5813.5152	
40		5736.6431	5813.5172	

802.11ac80:

Temperature	Voltage	f_L at Low Test Channel	F_H at High Test Channel	Limit
℃	V_{DC}	MHz	MHz	
0	5	5737.0047	5812.9952	f_L and f_H Within 5725~5850MHz range
10		5737.0045	5812.9959	
20		5737.0044	5812.9958	
30		5737.0042	5812.9959	
40		5737.0043	5812.9957	

Note: the f_L and f_H determined by 99% Occupied bandwidth low edge at Low test channel and High edge at High test channel.

FCC §15.407(a) –MAXIMUM CONDUCTED OUTPUT POWER

Applicable Standard

(a) Power limits:

(1) For the band 5.15-5.25 GHz.

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

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

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

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

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

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

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

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Wideband Power Sensor	N1921A	MY54170074	2017-01-03	2018-01-03
Agilent	P-Series Power Meter	N1912A	MY5000798	2017-01-03	2018-01-03
Unknown	RF Cable	Unknown	C-2	Each Time	/

*** Statement of Traceability:** BACL(Chengdu) attests that all of the calibrations on the equipment items listed above were traceable to NIM or to another internationally recognized National Metrology Institute (NMI), and were compliant with the NIST HB 150-2016 Normative Annex B “Implementation of traceability policy in accredited laboratories”.

Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v01r04.

Test Data

Environmental Conditions

Temperature:	28.6~28.9 °C
Relative Humidity:	50.8~51.3 %
ATM Pressure:	100.1 kPa

The testing was performed by Tom Tang from 2017-07-03 to 2017-07-04.

Test Mode: Transmitting

SISO mode:

UNII Band	Mode	Channel	Frequency (MHz)	RMS Channel Power (dBm)		Limit (dBm)	Result
				Chain 0	Chain 1		
5150-5250MHz	802.11 a	Low	5180	18.42	18.52	24	PASS
		Middle	5200	22.02	21.47	24	PASS
		High	5240	22.26	22.00	24	PASS
	802.11n ht20	Low	5180	17.37	17.62	24	PASS
		Middle	5200	21.90	21.00	24	PASS
		High	5240	22.50	21.80	24	PASS
	802.11n ht40	Low	5190	16.75	16.73	24	PASS
		High	5230	21.91	21.63	24	PASS
	802.11 ac80	Middle	5210	16.80	15.92	24	PASS
5725-5850MHz	802.11 a	Low	5745	14.36	15.75	30	PASS
		Middle	5785	12.77	14.03	30	PASS
		High	5825	10.12	10.60	30	PASS
	802.11n ht20	Low	5745	12.47	15.43	30	PASS
		Middle	5785	12.12	14.12	30	PASS
		High	5825	10.1	10.61	30	PASS
	802.11n ht40	Low	5755	15.14	16.05	30	PASS
		High	5795	11.21	12.4	30	PASS
	802.11 ac80	Middle	5775	13.67	14.64	30	PASS

MIMO mode:

UNII Band	Mode	Channel	Frequency (MHz)	RMS Channel Power (dBm)		Total (dBm)	Limit (dBm)	Result
				Chain 0	Chain 1			
5150-5250MHz	802.11n ht20	Low	5180	17.73	14.18	19.32	24	PASS
		Middle	5200	17.32	17.6	20.47	24	PASS
		High	5240	17.39	17.15	20.28	24	PASS
	802.11n ht40	Low	5190	15.39	11.4	16.85	24	PASS
		High	5230	19.12	15.88	20.81	24	PASS
	802.11 ac80	Middle	5210	16.1	13.79	18.11	24	PASS
5725-5850MHz	802.11n ht20	Low	5745	12.16	14.37	16.41	30	PASS
		Middle	5785	9.35	13.45	14.88	30	PASS
		High	5825	7.06	10.31	11.99	30	PASS
	802.11n ht40	Low	5755	7.54	12.78	13.92	30	PASS
		High	5795	5.86	10.1	11.49	30	PASS
	802.11 ac80	Middle	5775	9.39	14.29	15.51	30	PASS

Note: the 2 antenna maximum atenna gains are 4dBi, and employed Cyclic Delay Diversity (CDD) for 802.11 MIMO transmitting, per KDB 662911 D01 Multiple Transmitter Output v02r01, for power measurements on IEEE 802.11 devices:

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

So:

Directional gain = G_{ANT} + Array Gain = 4dBi < 6dBi

FCC §15.407(a) - POWER SPECTRAL DENSITY

Applicable Standard

(a) Power limits:

(1) For the band 5.15-5.25 GHz.

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

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

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

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

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

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

Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v01r04.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	831929/005	2016-09-21	2017-09-20
Rohde & Schwarz	Spectrum Analyzer	FSEM30	100018	2016-12-02	2017-12-01
Unknown	RF Cable	Unknown	C-2	Each Time	/

*** Statement of Traceability:** BACL(Chengdu) attests that all of the calibrations on the equipment items listed above were traceable to NIM or to another internationally recognized National Metrology Institute (NMI), and were compliant with the NIST HB 150-2016 Normative Annex B “Implementation of traceability policy in accredited laboratories”.

Test Data

Environmental Conditions

Temperature:	28.6~28.9 °C
Relative Humidity:	50.8~51.3 %
ATM Pressure:	100.1 kPa

The testing was performed by Tom Tang from 2017-07-03 to 2017-07-04.

Test Mode: Transmitting

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

5150-5250MHz

SISO:

Mode	Frequency (MHz)	Power Spectral Density (dBm/MHz)		Limits (dBm/MHz)
		Chain 0	Chain 1	
802.11a	5180	8.53	8.63	11
	5200	10.06	10.47	11
	5240	10.29	10.09	11
802.11n ht20	5180	7.20	7.45	11
	5200	10.00	10.88	11
	5240	10.26	10.57	11
802.11n ht40	5190	3.71	3.46	11
	5230	8.79	8.49	11
802.11 ac80	5210	2.09	1.04	11

MIMO:

Mode	Frequency (MHz)	Power Spectral Density (dBm/MHz)		Total (dBm/MHz)	Limits (dBm/MHz)
		Chain 0	Chain 1		
802.11n ht20	5180	7.53	4.72	9.36	10
	5200	6.65	7.21	9.95	10
	5240	6.76	7.18	9.99	10
802.11n ht40	5190	2.07	-1.24	3.73	10
	5230	5.73	3.62	7.81	10
802.11 ac80	5210	0.62	-1.02	2.89	10

Note: the 2 antenna maximum atenna gain are 4dBi, and employed Cyclic Delay Diversity (CDD) for 802.11 MIMO transmitting, per KDB 662911 D01 Multiple Transmitter Output v02r01, for power spectral density (PSD) measurements on the devices:

Array Gain = 10 log(NANT/NSS) dB.

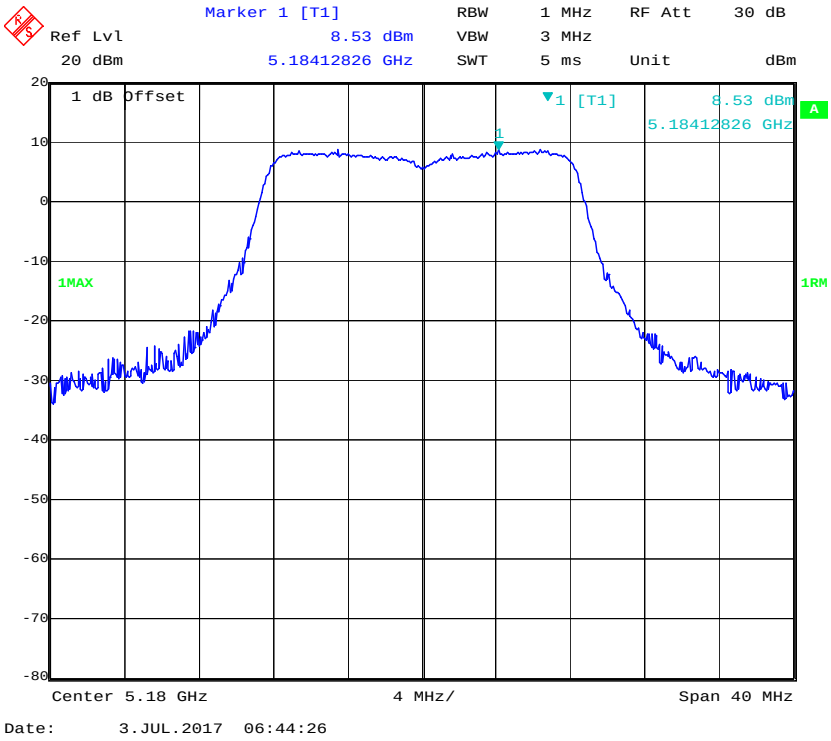
So:

Directional gain = GANT + Array Gain = 4+10*log(2) =7 dBi > 6dBi

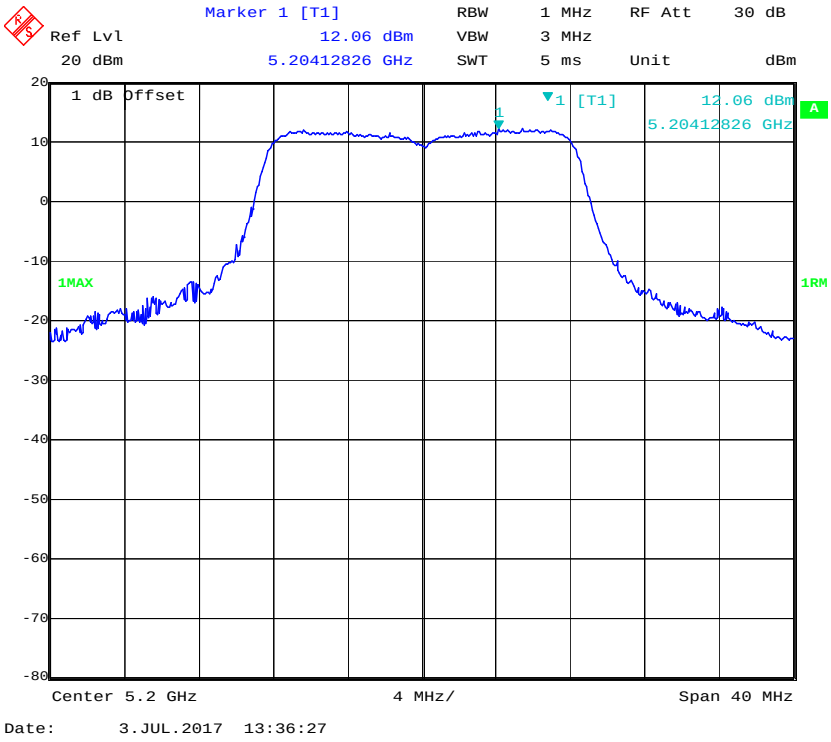
Power density Limit = 11 – (7-6) = 10dBm

SISO:

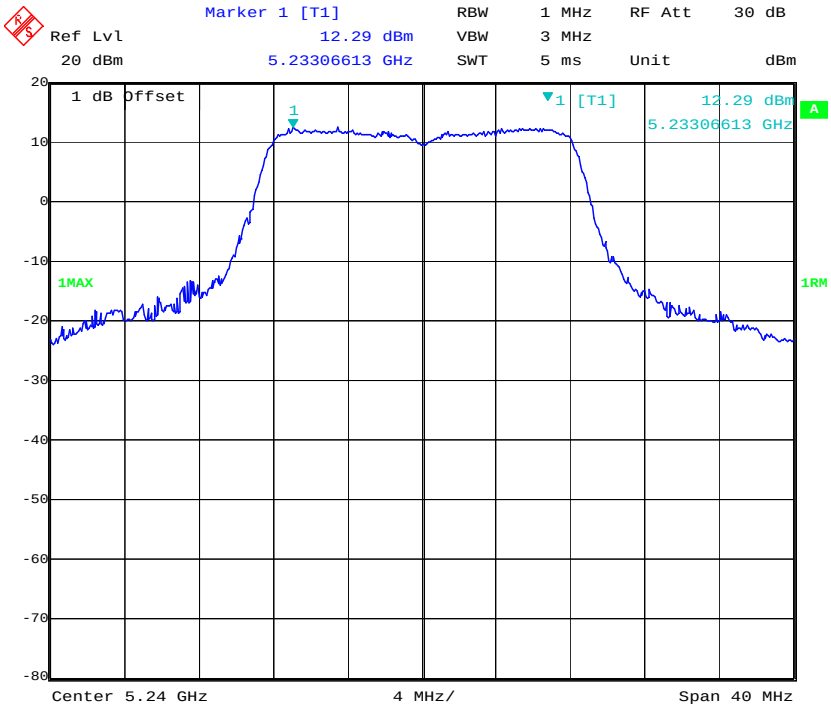
802.11a Low Channel – Chain0



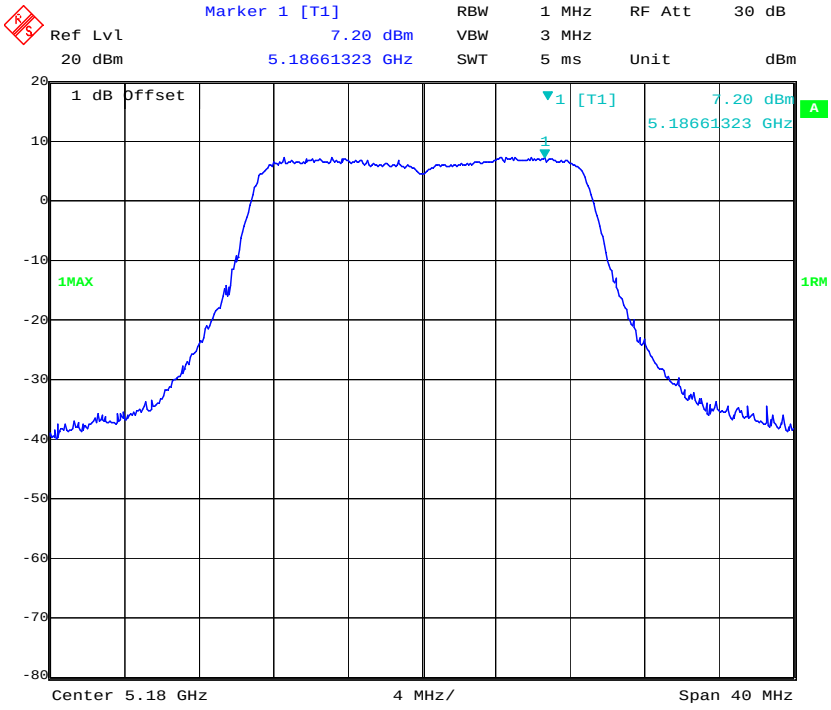
802.11a Middle Channel – Chain0



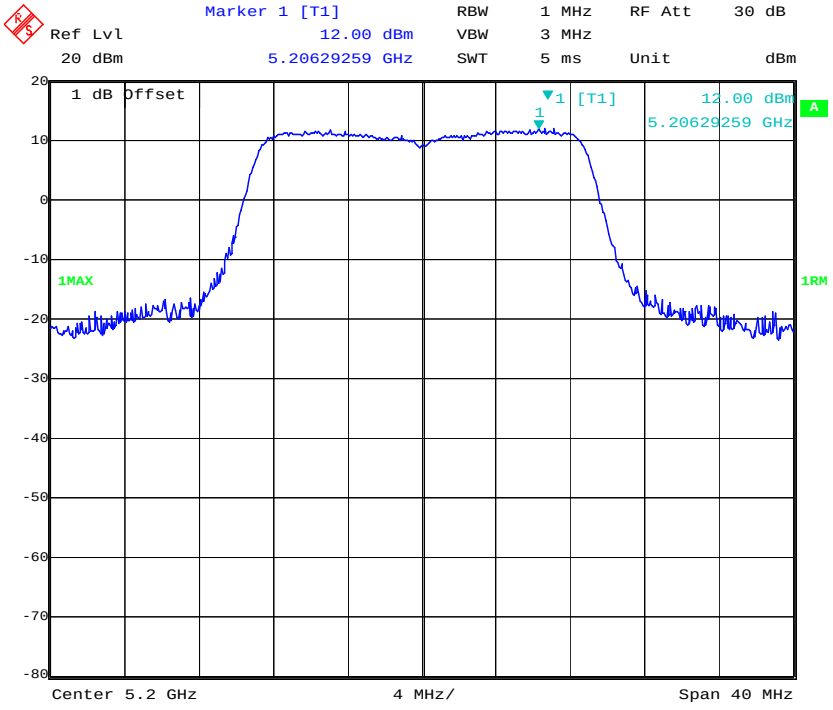
802.11a High Channel – Chain0



802.11n ht20 Low Channel – Chain0

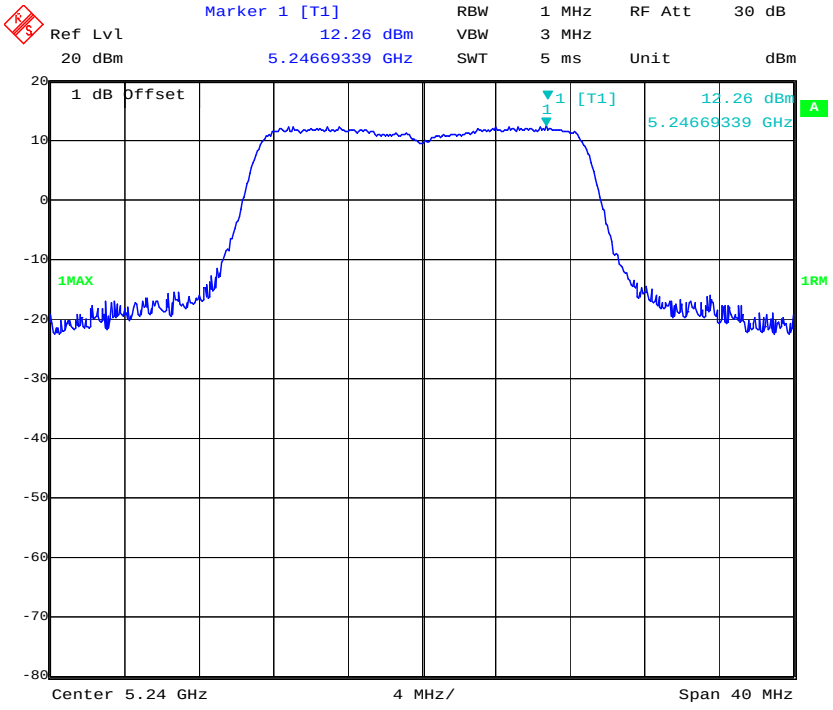


802.11n ht20 Middle Channel – Chain0



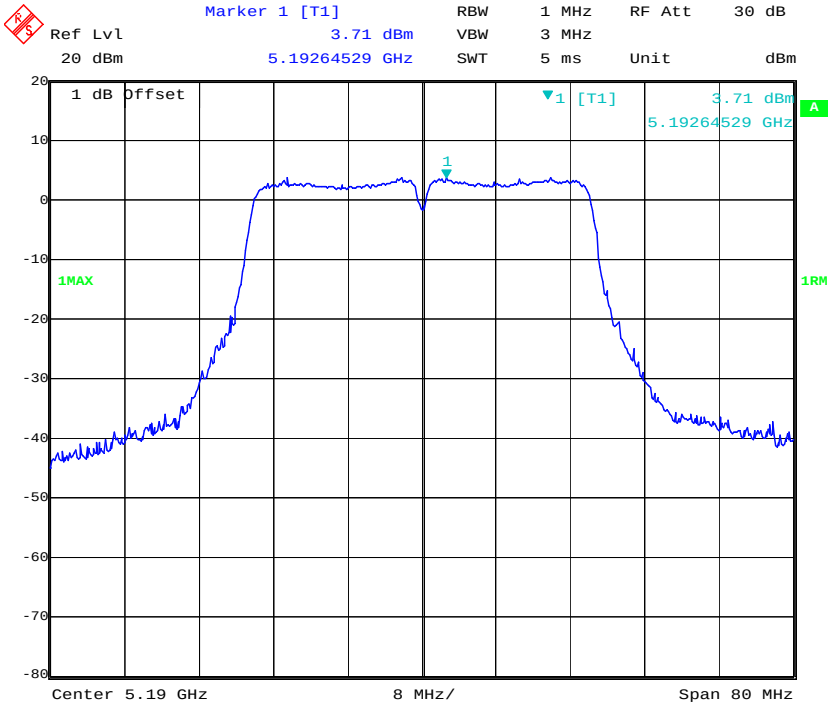
Date: 3.JUL.2017 13:33:31

802.11n ht20 High Channel – Chain0



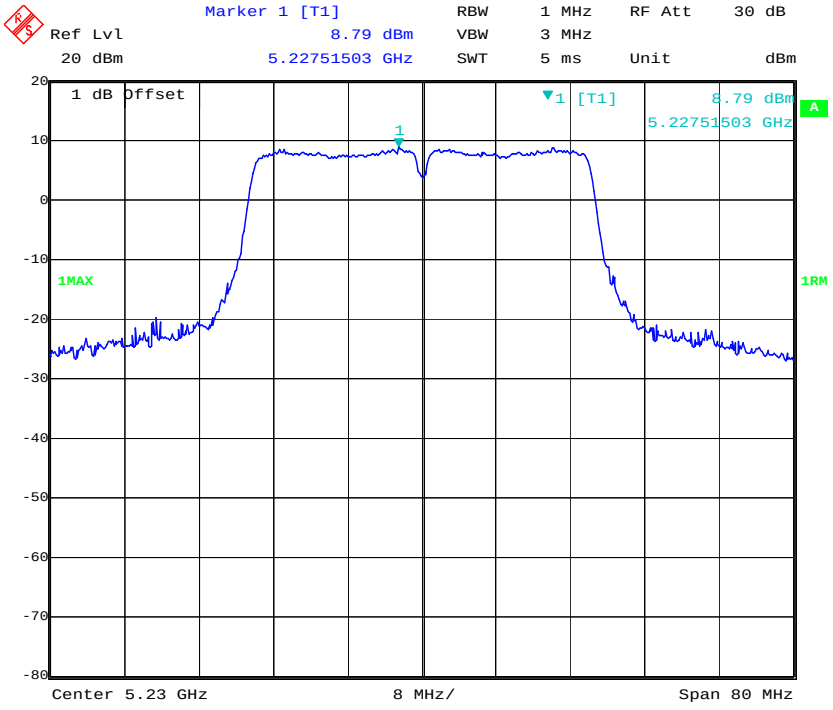
Date: 3.JUL.2017 13:30:16

802.11n ht40 Low Channel – Chain0



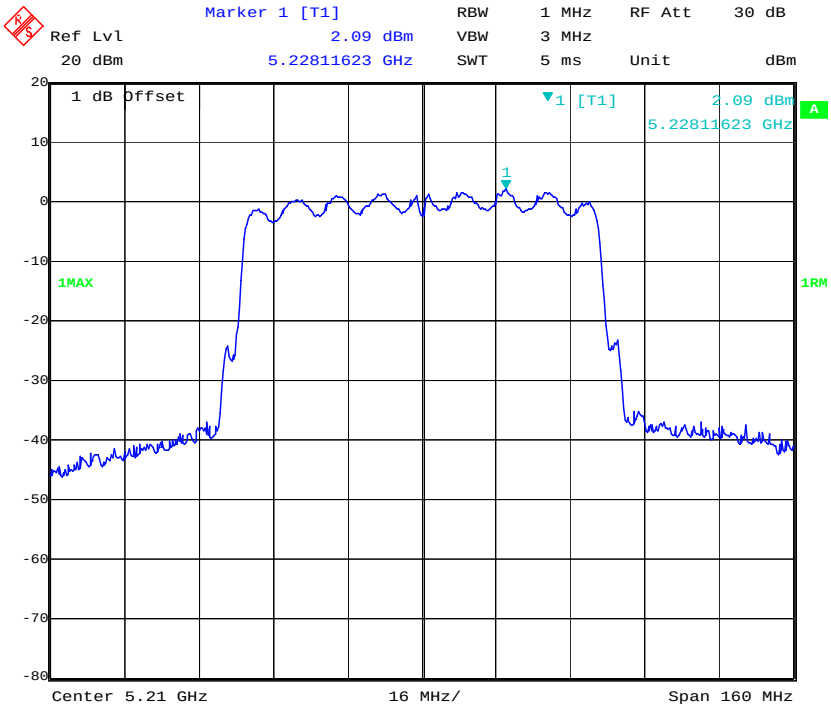
Date: 3.JUL.2017 08:09:19

802.11n ht40 High Channel – Chain0



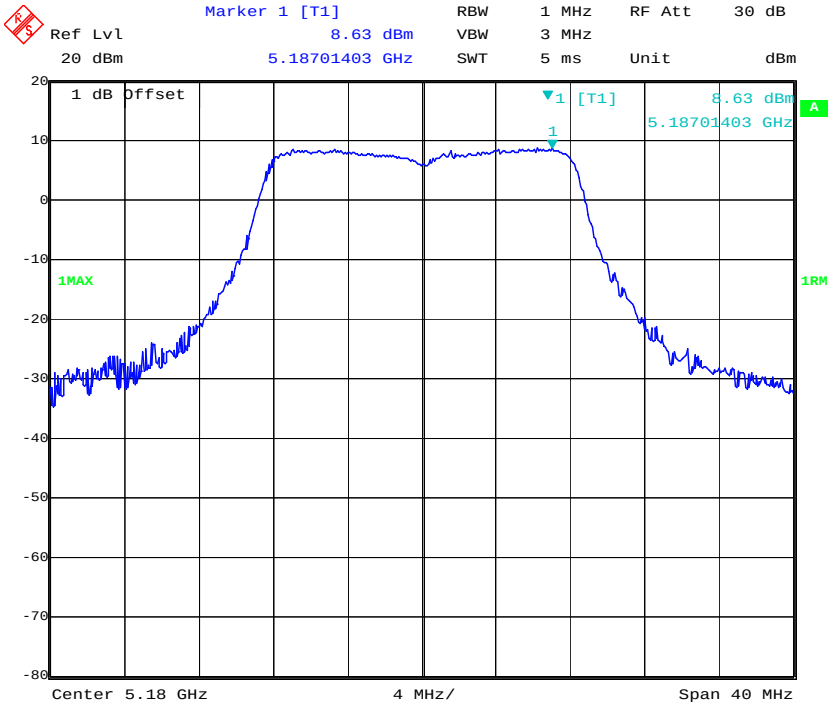
Date: 3.JUL.2017 13:26:59

802.11 ac80 Middle Channel – Chain0



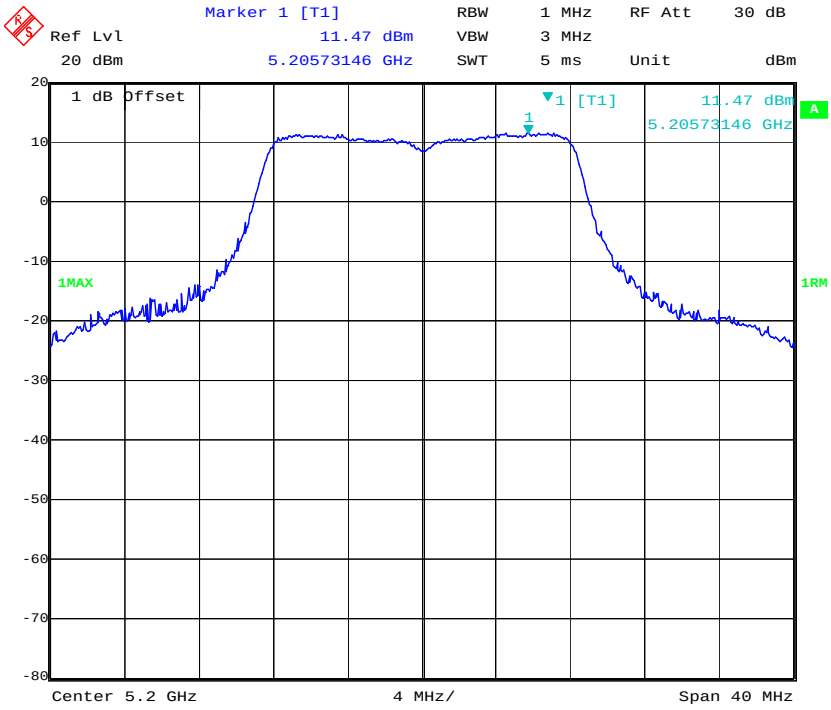
Date: 3.JUL.2017 08:44:20

802.11a Low Channel – Chain1



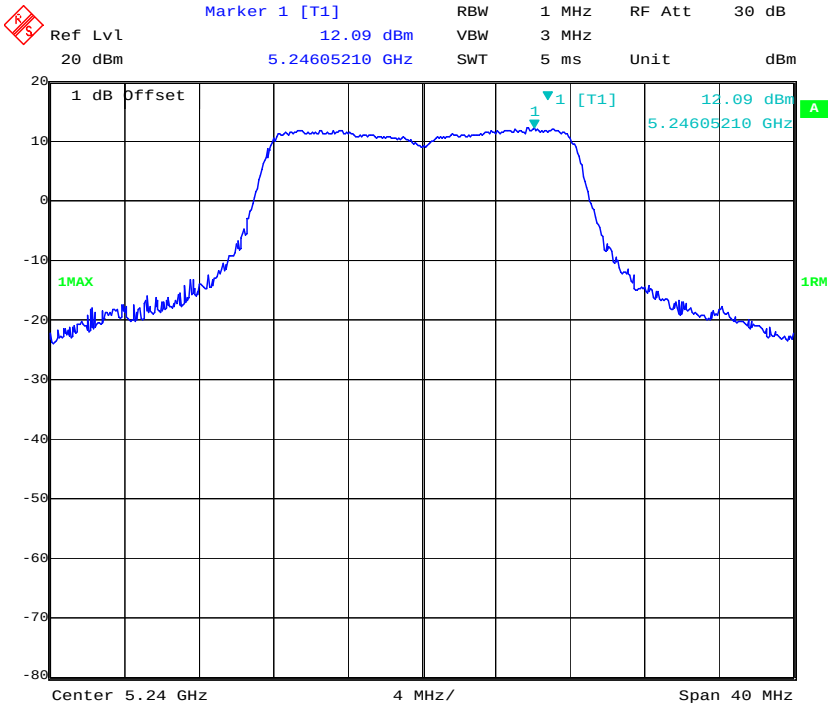
Date: 3.JUL.2017 07:08:12

802.11a Middle Channel – Chain1



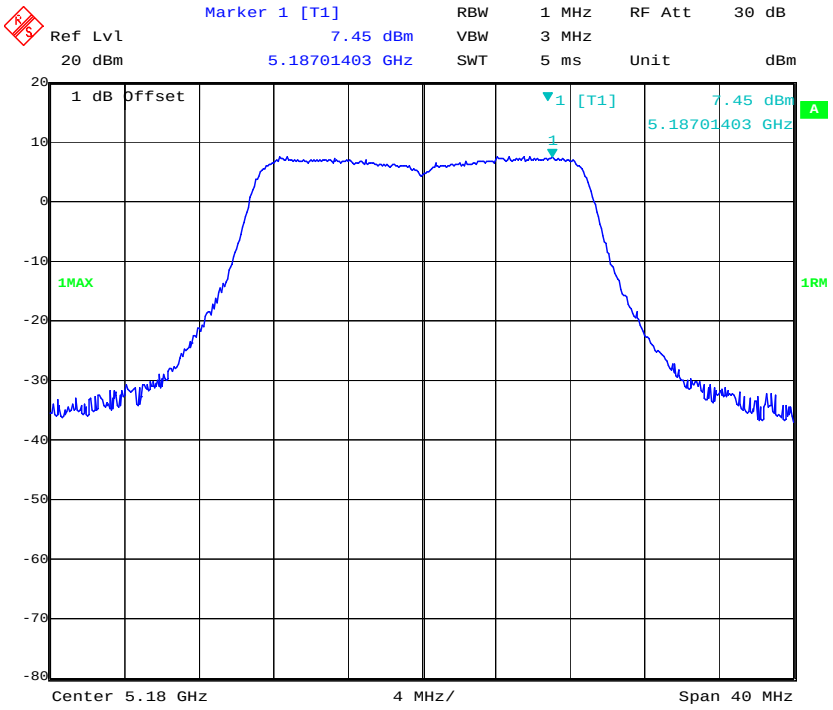
Date: 3.JUL.2017 13:08:53

802.11a High Channel – Chain1

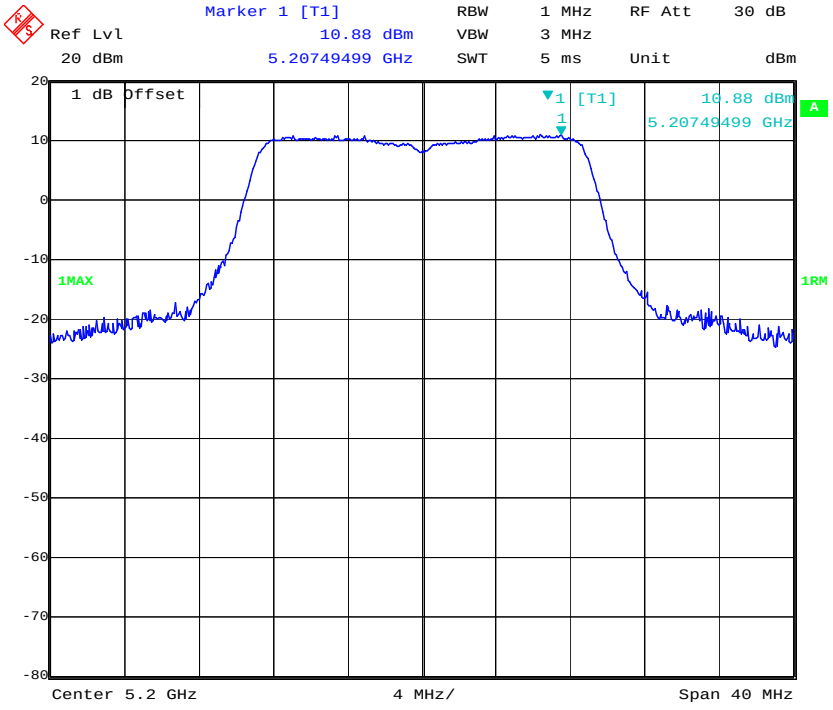


Date: 3.JUL.2017 13:11:27

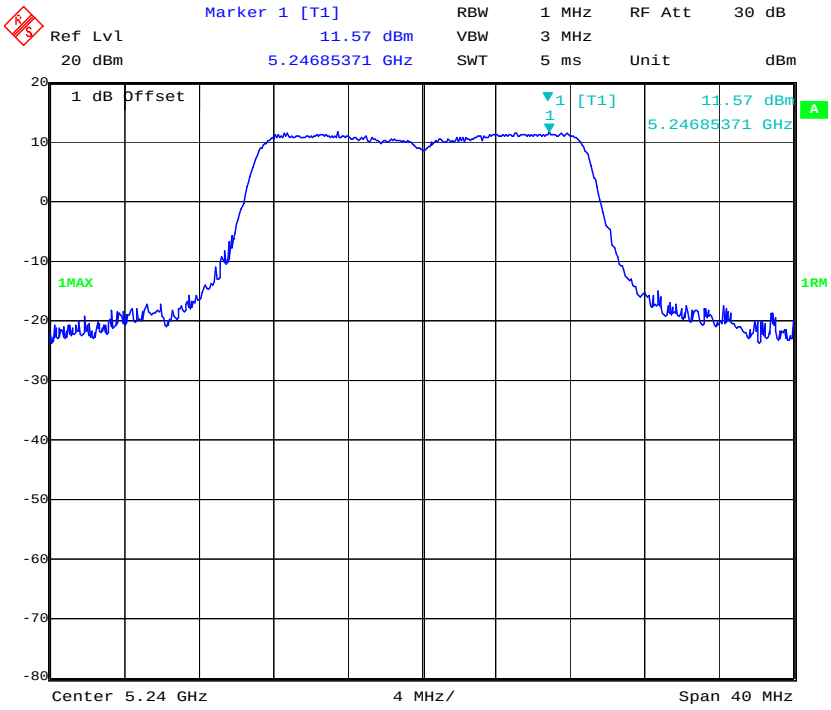
802.11n ht20 Low Channel – Chain1



802.11n ht20 Middle Channel – Chain1

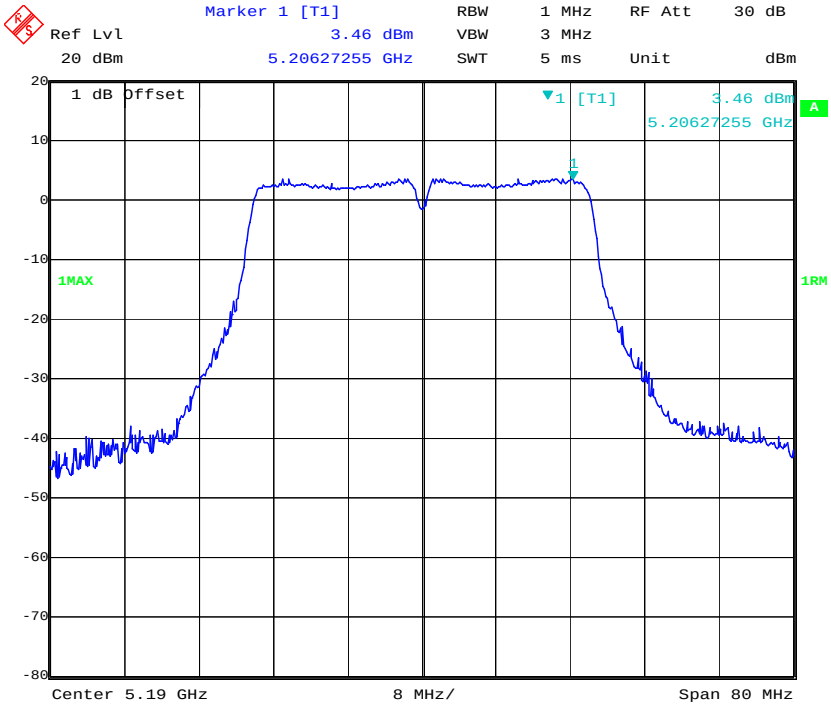


802.11n ht20 High Channel – Chain1



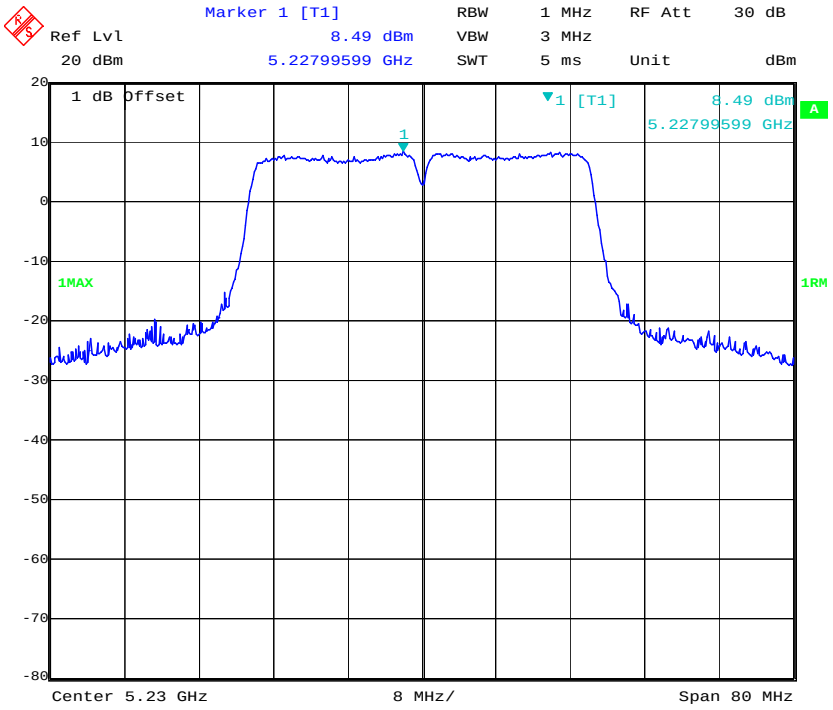
Date: 3.JUL.2017 13:14:35

802.11n ht40 Low Channel – Chain1



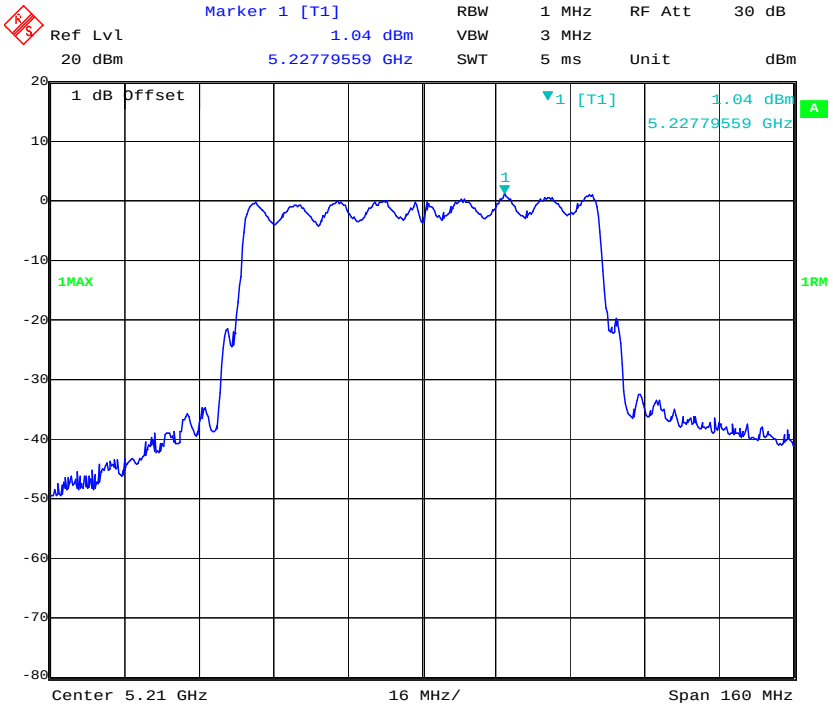
Date: 3.JUL.2017 08:33:08

802.11n ht40 High Channel – Chain1



Date: 3.JUL.2017 13:23:20

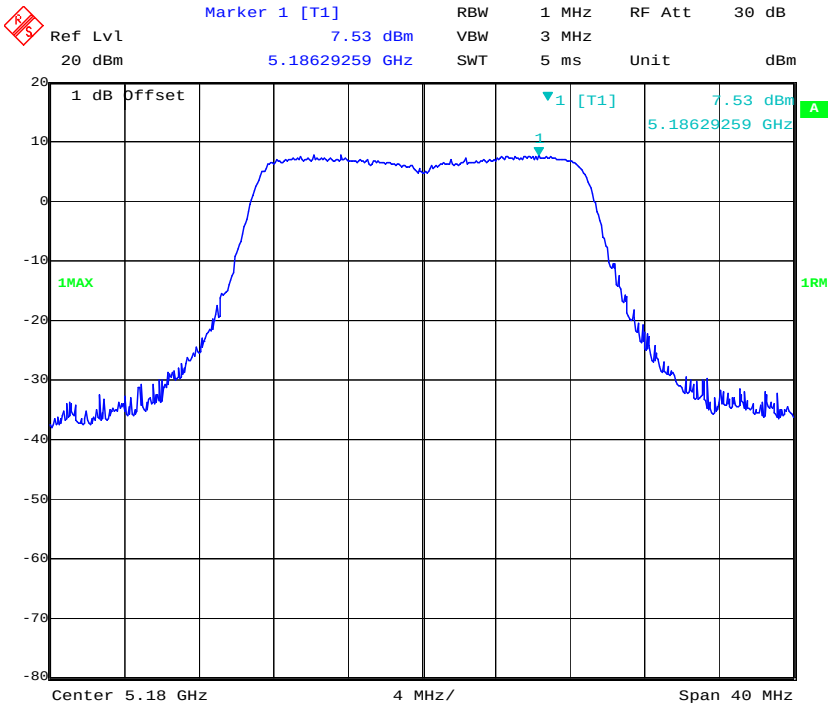
802.11 ac80 Middle Channel – Chain1



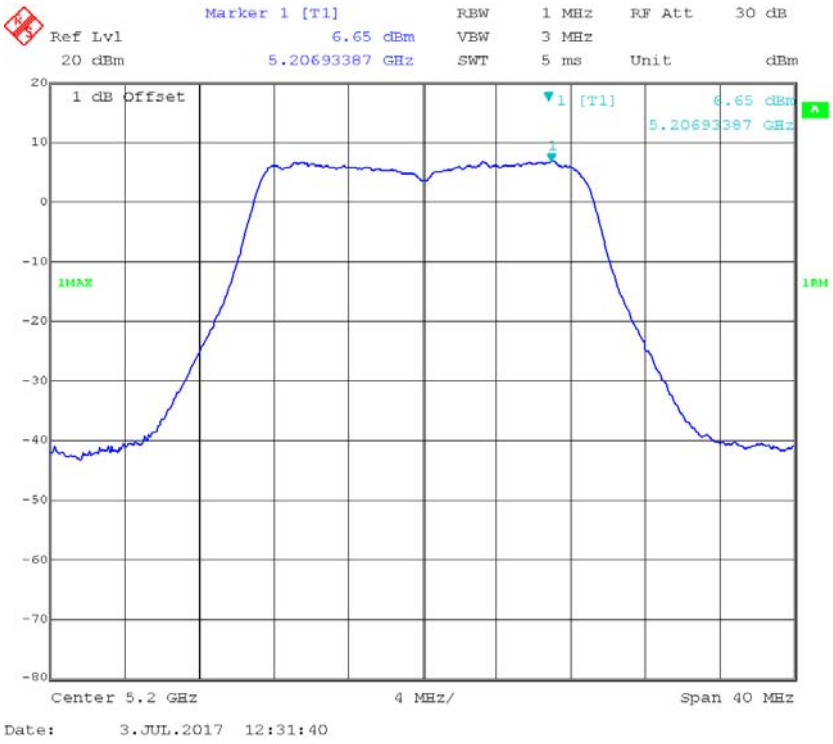
Date: 3.JUL.2017 08:39:54

MIMO:

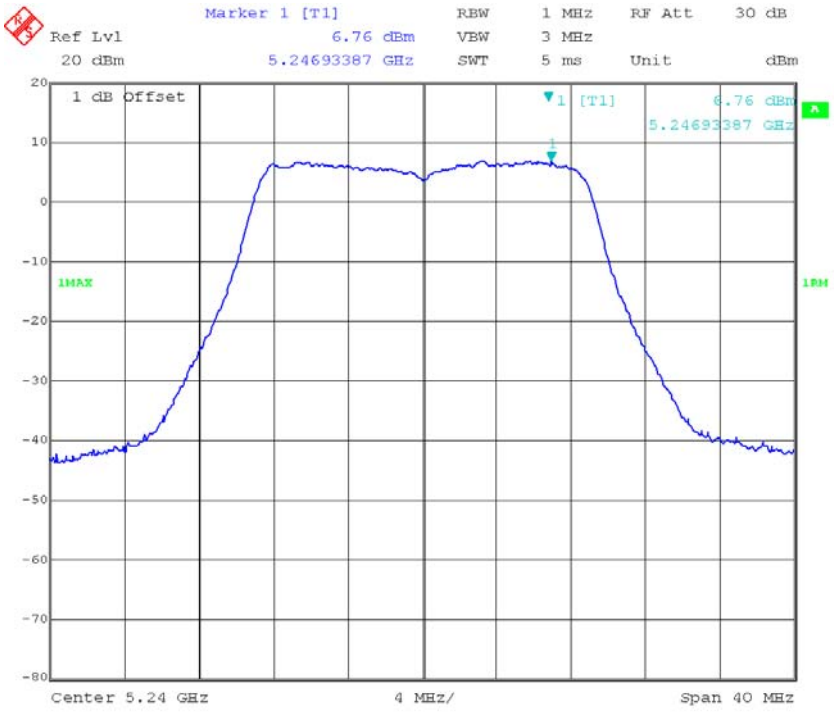
802.11n ht20 Low Channel – Chain0



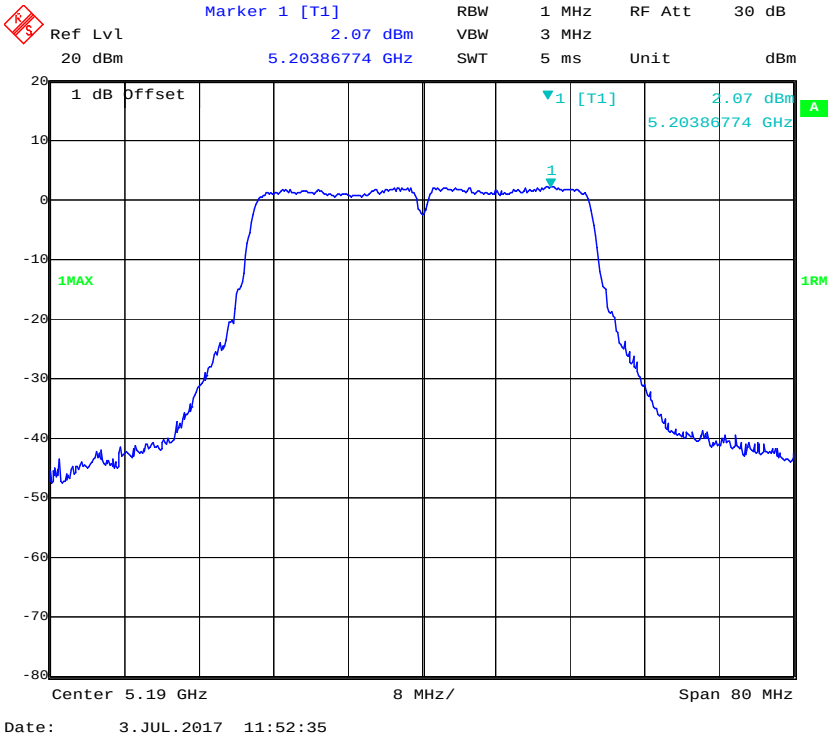
802.11n ht20 Middle Channel – Chain0



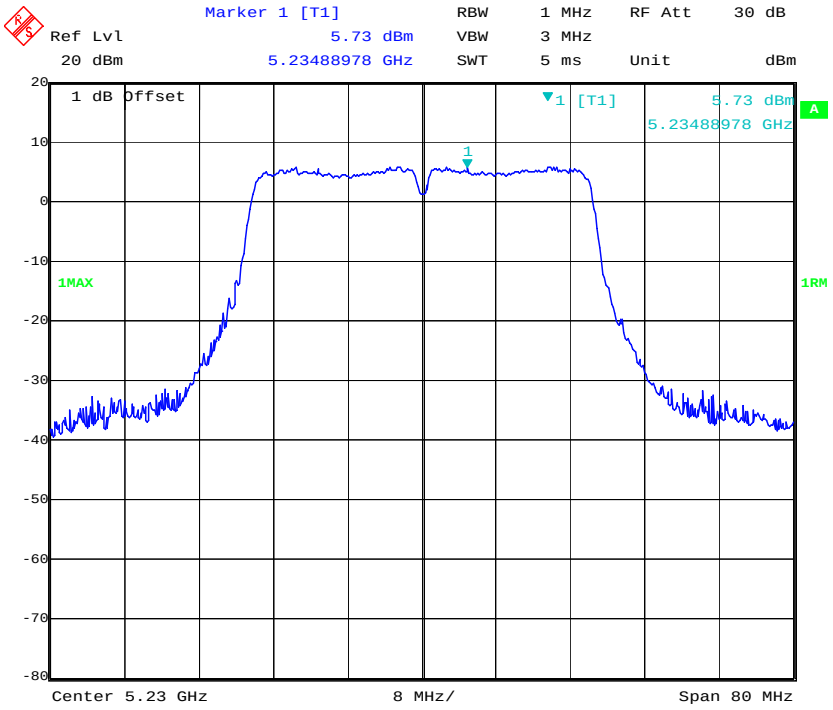
802.11n ht20 High Channel – Chain0



802.11n ht40 Low Channel – Chain0

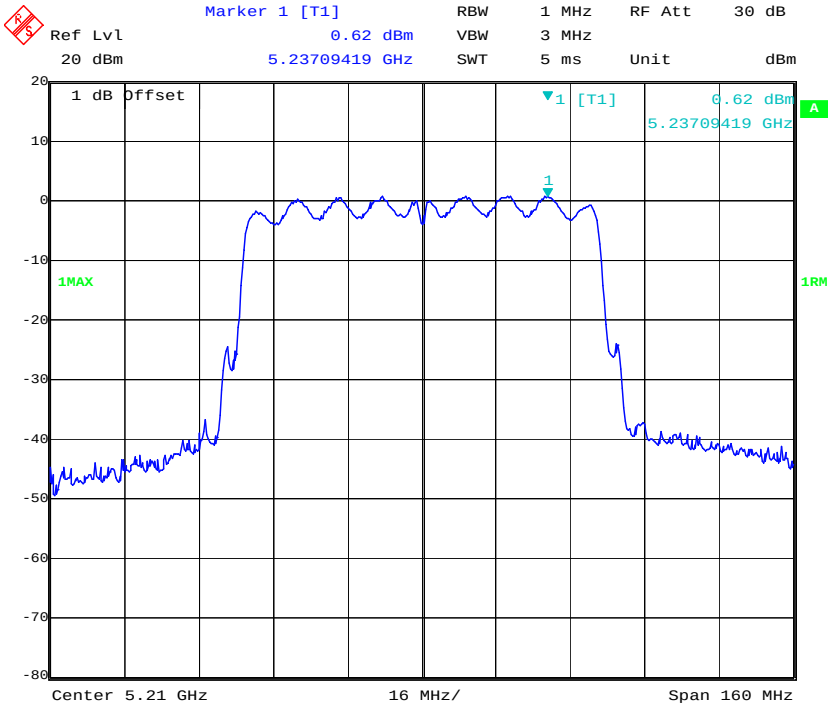


802.11n ht40 High Channel – Chain0



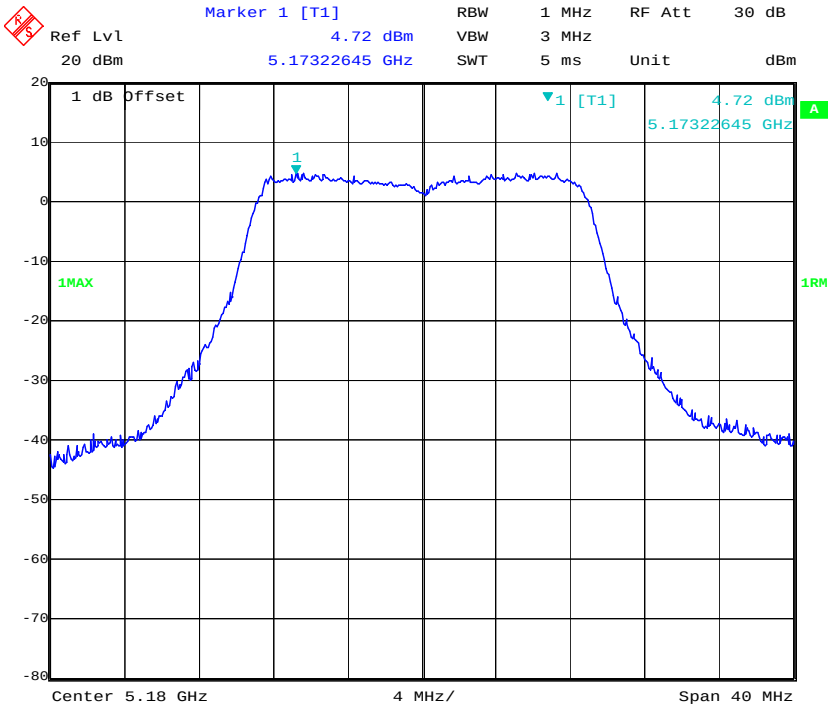
Date: 3.JUL.2017 11:55:17

802.11 ac80 Middle Channel – Chain0



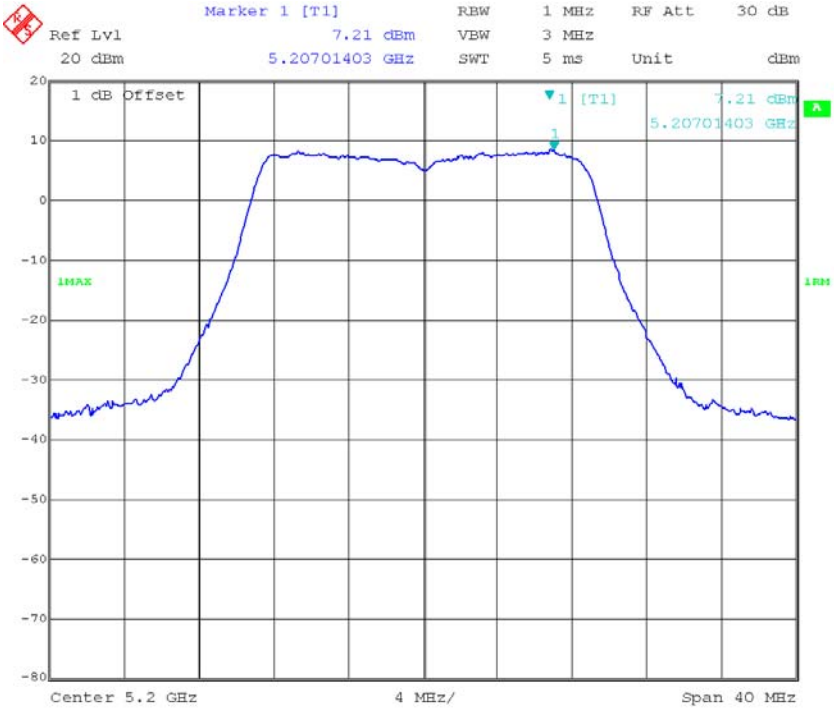
Date: 3.JUL.2017 09:17:43

802.11n ht20 Low Channel – Chain1



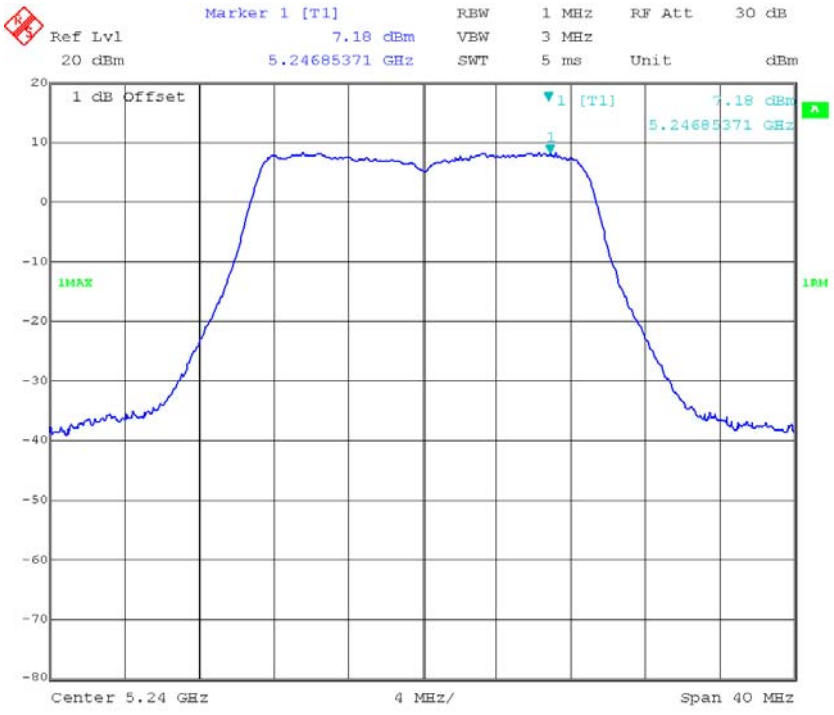
Date: 3.JUL.2017 12:08:57

802.11n ht20 Middle Channel – Chain1

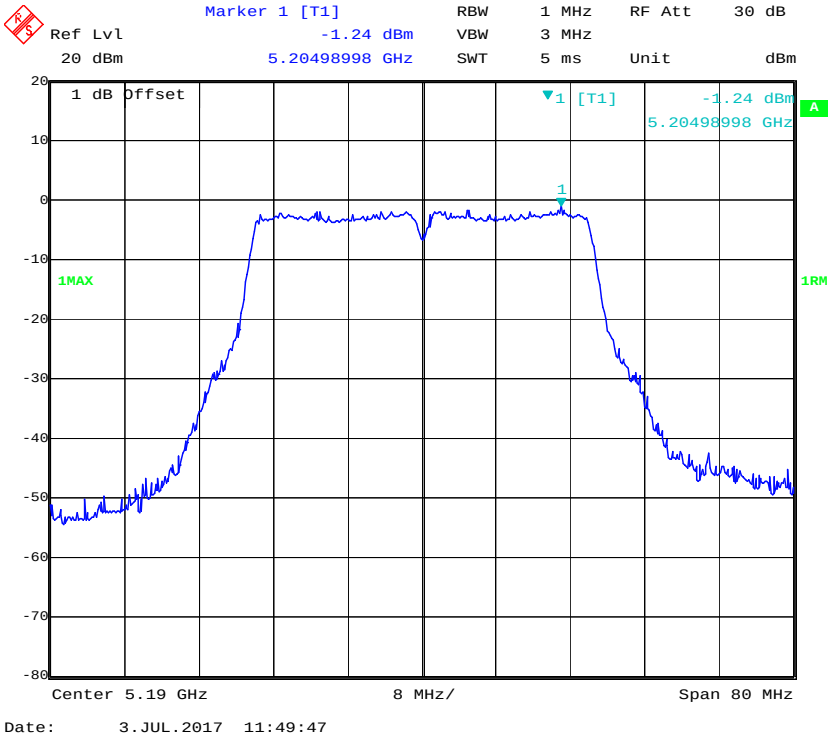


Date: 3.JUL.2017 12:29:33

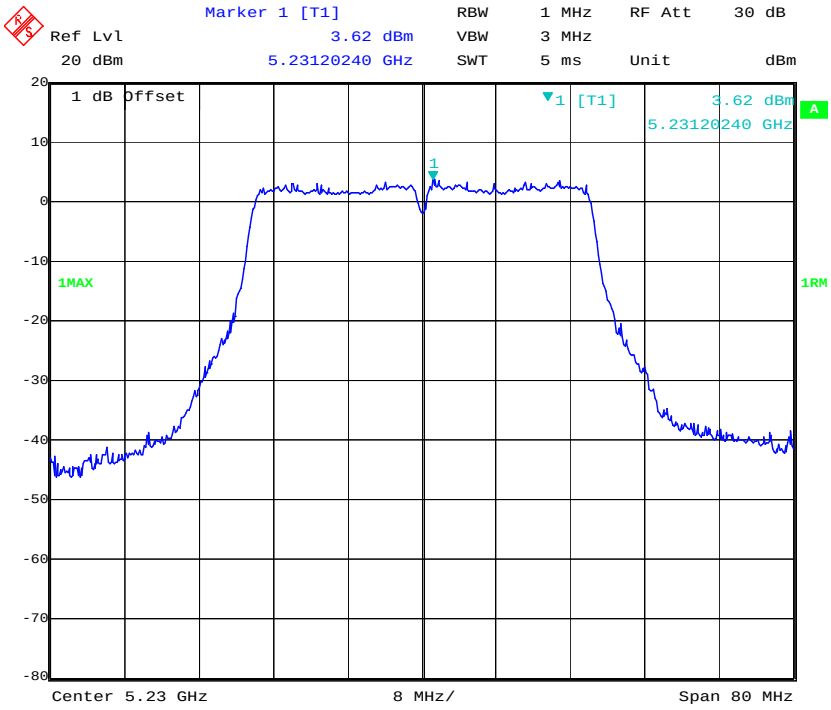
802.11n ht20 High Channel – Chain1



802.11n ht40 Low Channel – Chain1

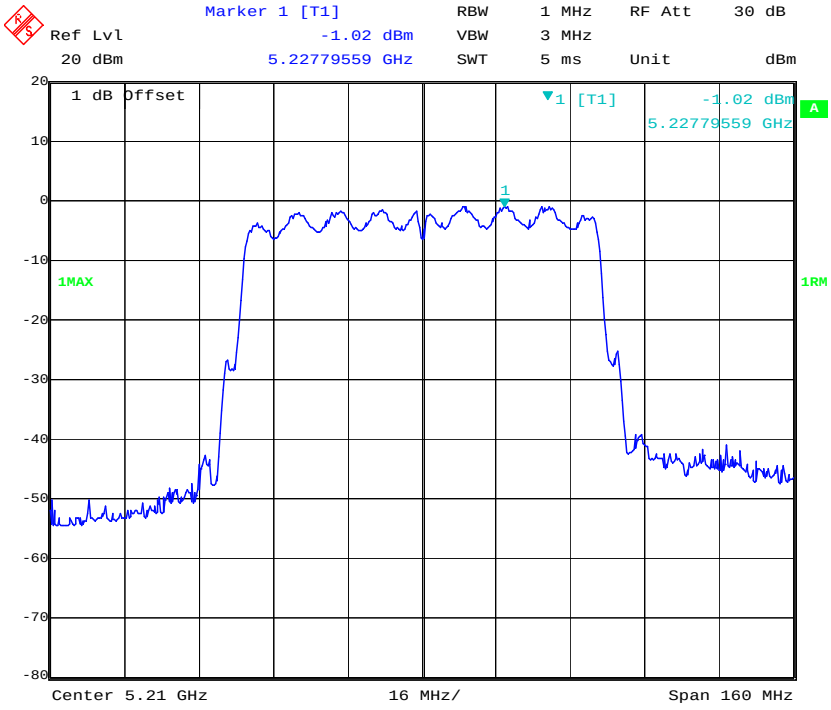


802.11n ht40 High Channel – Chain1



Date: 3.JUL.2017 11:58:23

802.11 ac80 Middle Channel – Chain1



Date: 3.JUL.2017 09:32:53

5725-5850MHz

SISO:

Mode	Frequency (MHz)	Power Spectral Density (dBm/300kHz)		Power Spectral Density (dBm/500kHz)		Limits
		Chain 0	Chain 1	Chain 0	Chain 1	
802.11a	5745	0.77	2.15	2.97	4.35	30
	5785	-0.74	0.44	1.46	2.64	30
	5825	-3.35	-3.01	-1.15	-0.81	30
802.11n ht20	5745	-1.14	1.76	1.06	3.96	30
	5785	-1.47	0.16	0.73	2.36	30
	5825	-3.84	-2.89	-1.64	-0.69	30
802.11n ht40	5755	-1.91	-0.44	0.29	1.76	30
	5795	-5.3	-4.56	-3.1	-2.36	30
802.11 ac80	5775	-5.21	-4.48	-3.01	-2.28	30

Note 1: If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (< 500 KHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.

MIMO:

Mode	Frequency (MHz)	Power Spectral Density (dBm/300kHz)		Total (dBm/500kHz)	Limits
		Chain 0	Chain 1		
802.11n ht20	5745	-1.83	1.48	5.34	29
	5785	-4.47	0.63	4.00	29
	5825	-6.63	-2.38	1.21	29
802.11n ht40	5755	-8.85	-1.84	1.15	29
	5795	-10.73	-5.49	-2.15	29
802.11 ac80	5775	-9.76	-3.94	-0.73	29

Note 1: If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (< 500 KHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
Note 2:. the 2 antenna maximum atenna gain are 4dBi, and employed Cyclic Delay Diversity (CDD) for 802.11 MIMO transmitting, per KDB 662911 D01 Multiple Transmitter Output v02r01, for power spectral density (PSD) measurements on the devices:

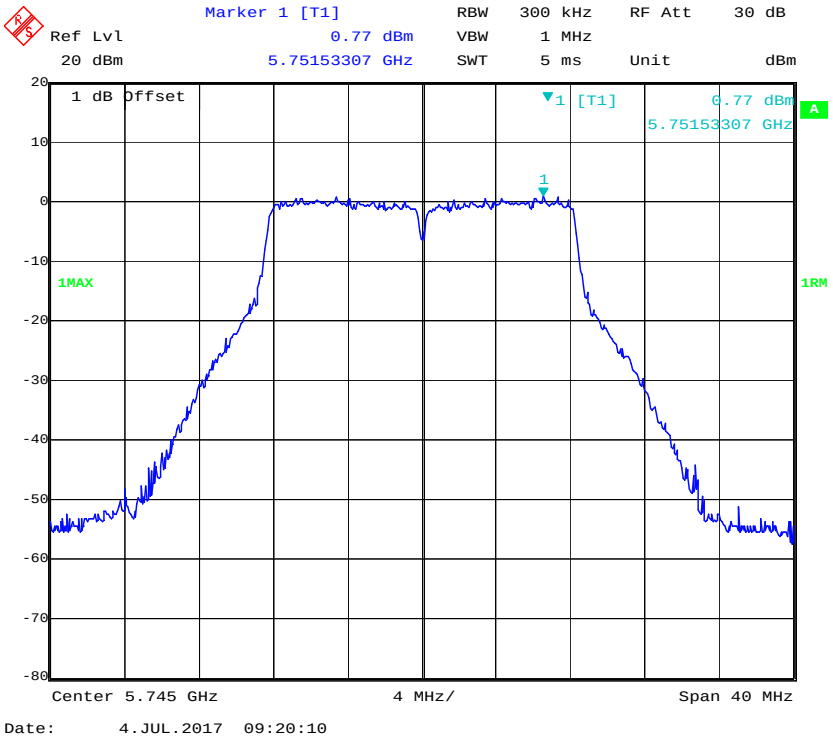
Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

So:

Directional gain = G_{ANT} + Array Gain = 4+10*log(2) =7 dBi > 6dBi
Power density Limit = 30 – (7-6) = 29dBm

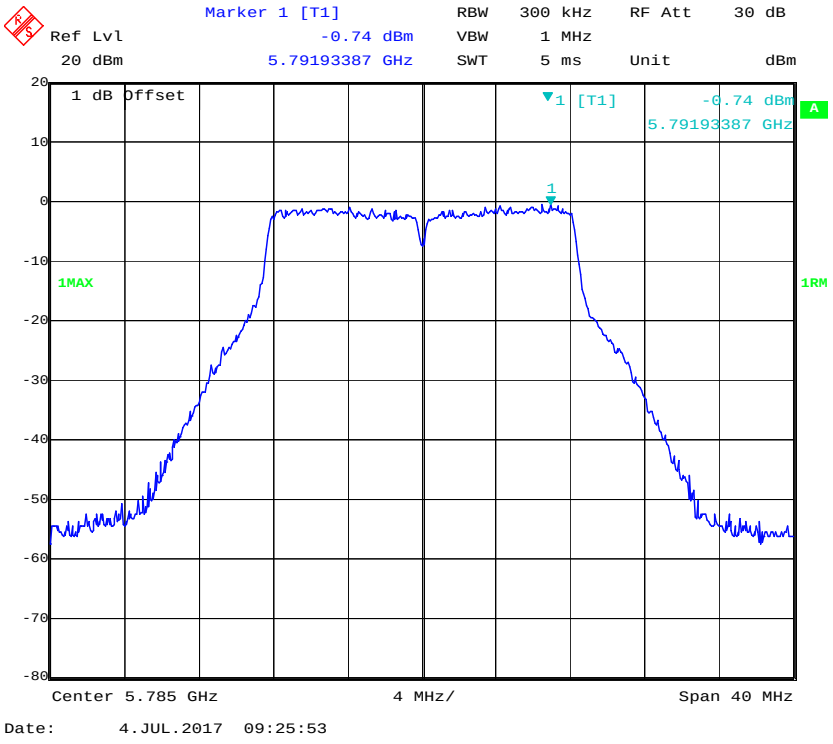
SISO:

802.11a Low Channel – Chain0



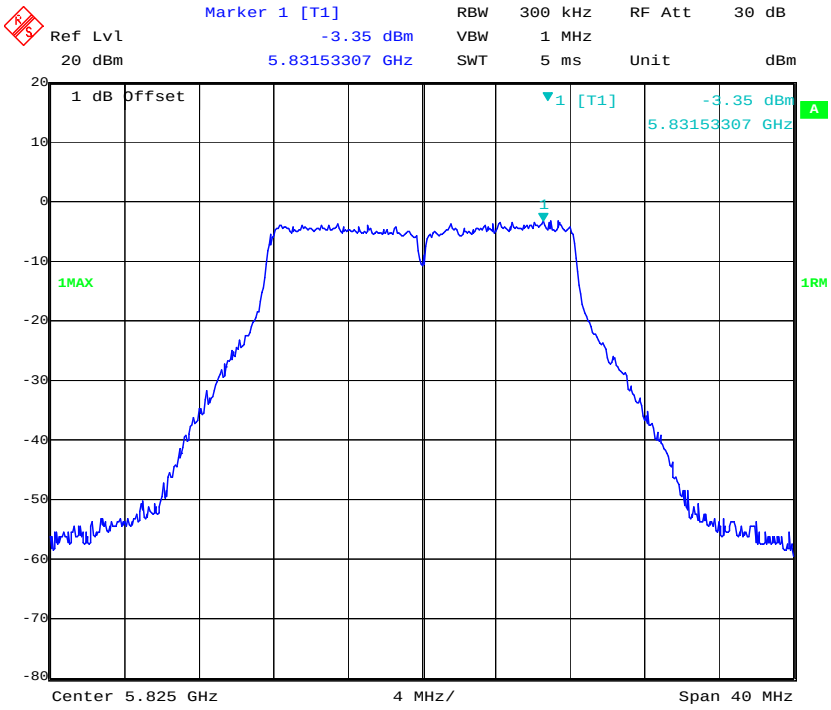
Date: 4.JUL.2017 09:20:10

802.11a Middle Channel – Chain0



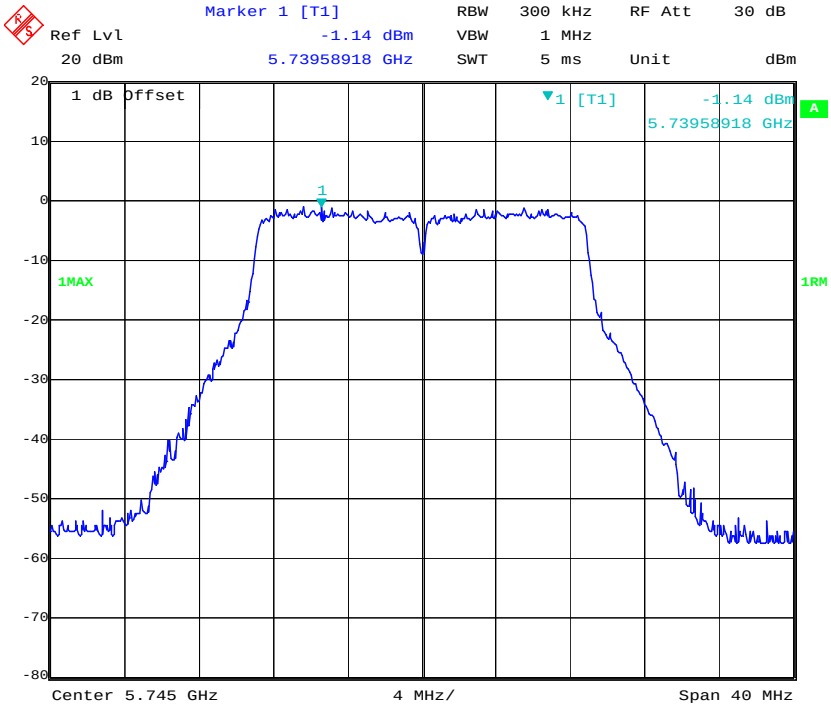
Date: 4.JUL.2017 09:25:53

802.11a High Channel – Chain0



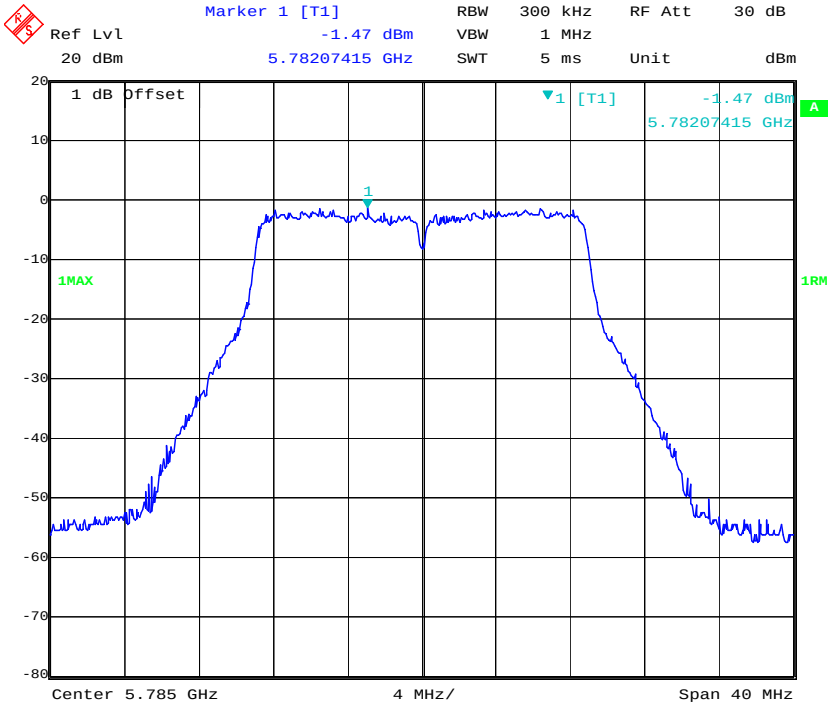
Date: 4.JUL.2017 09:31:01

802.11n ht20 Low Channel – Chain0



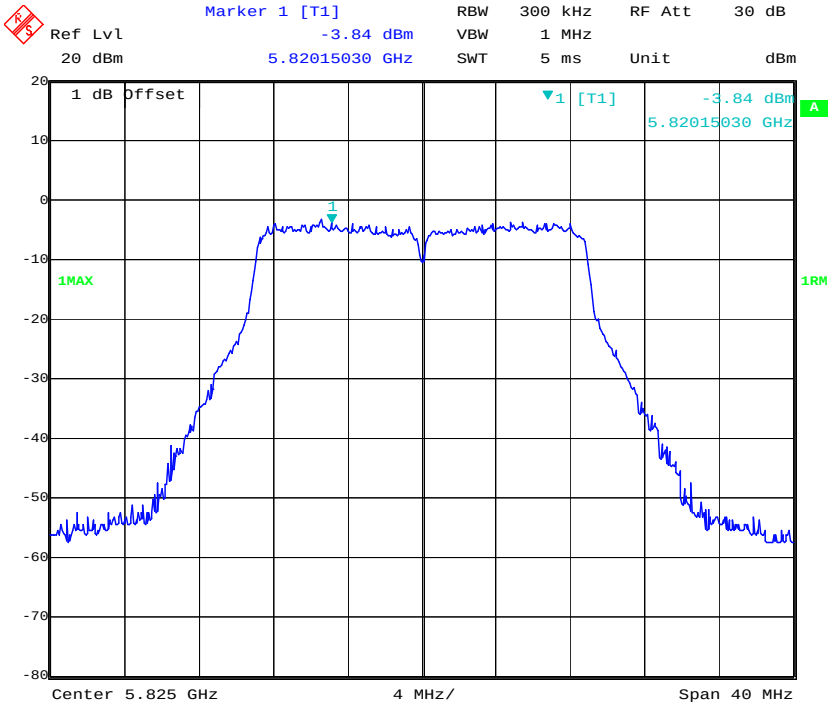
Date: 4.JUL.2017 10:17:30

802.11n ht20 Middle Channel – Chain0



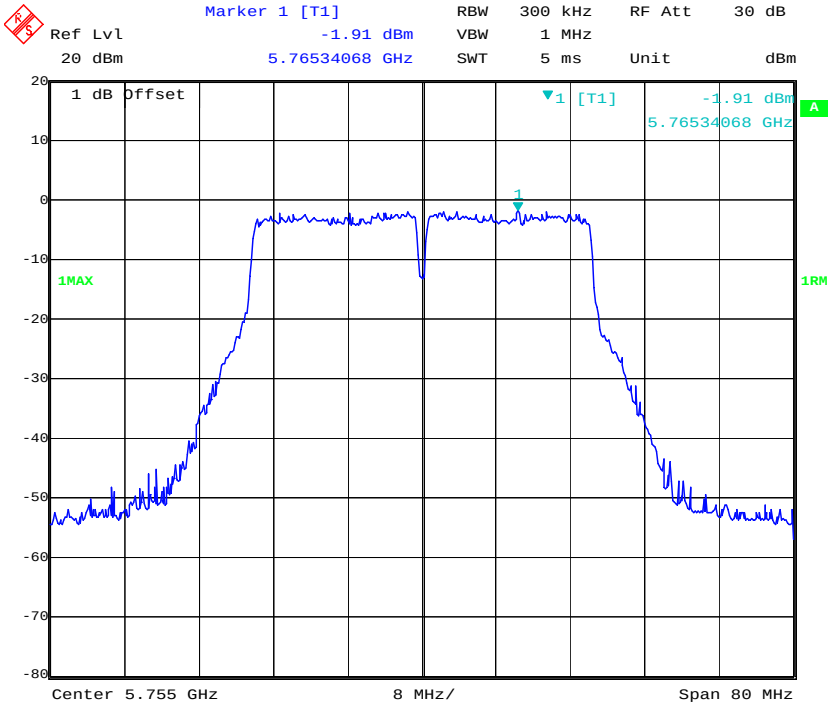
Date: 4.JUL.2017 09:43:29

802.11n ht20 High Channel – Chain0



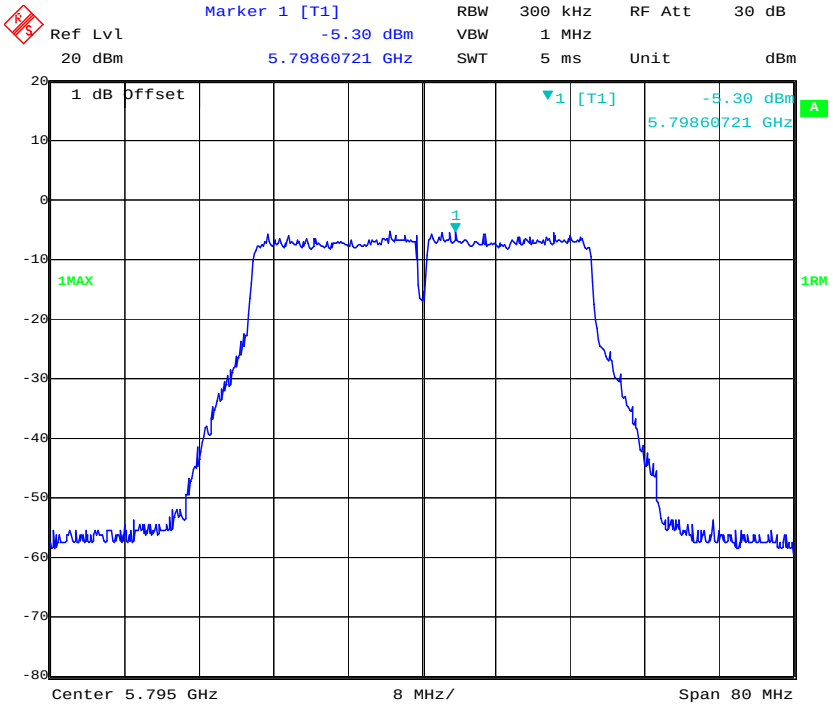
Date: 4.JUL.2017 09:34:56

802.11n ht40 Low Channel – Chain0



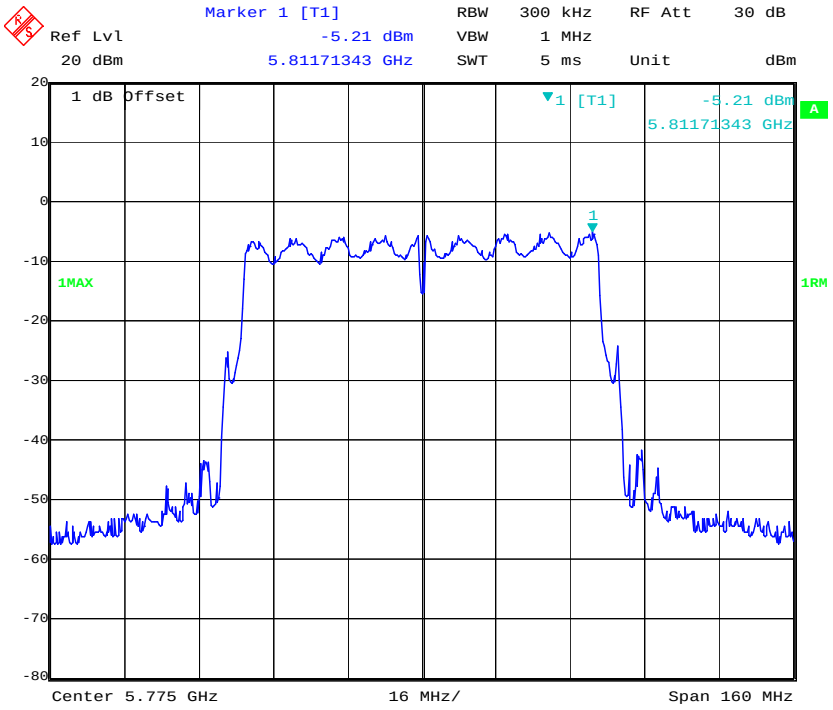
Date: 4.JUL.2017 10:00:35

802.11n ht40 High Channel – Chain0



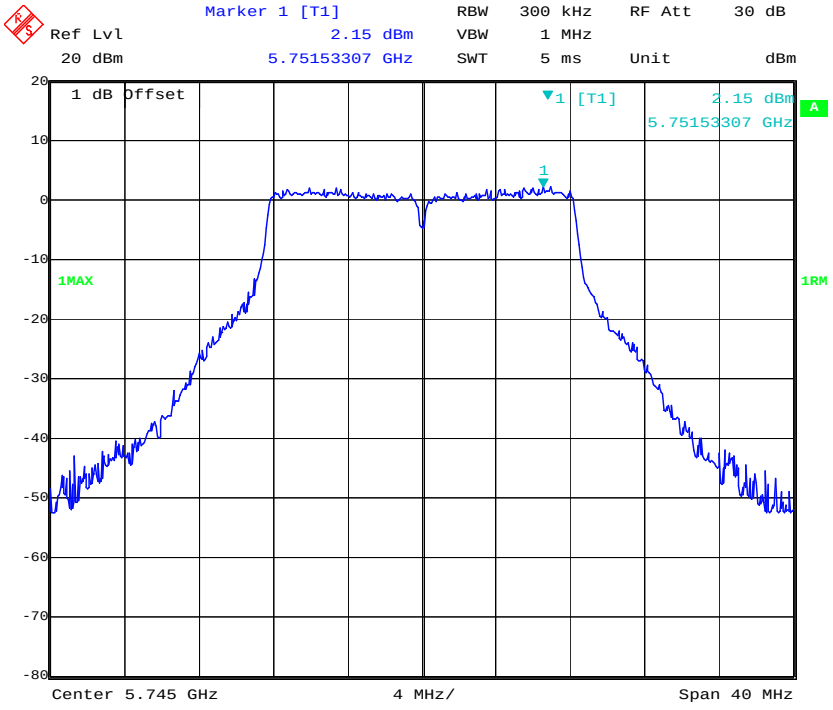
Date: 4.JUL.2017 10:05:54

802.11 ac80 Middle Channel – Chain0



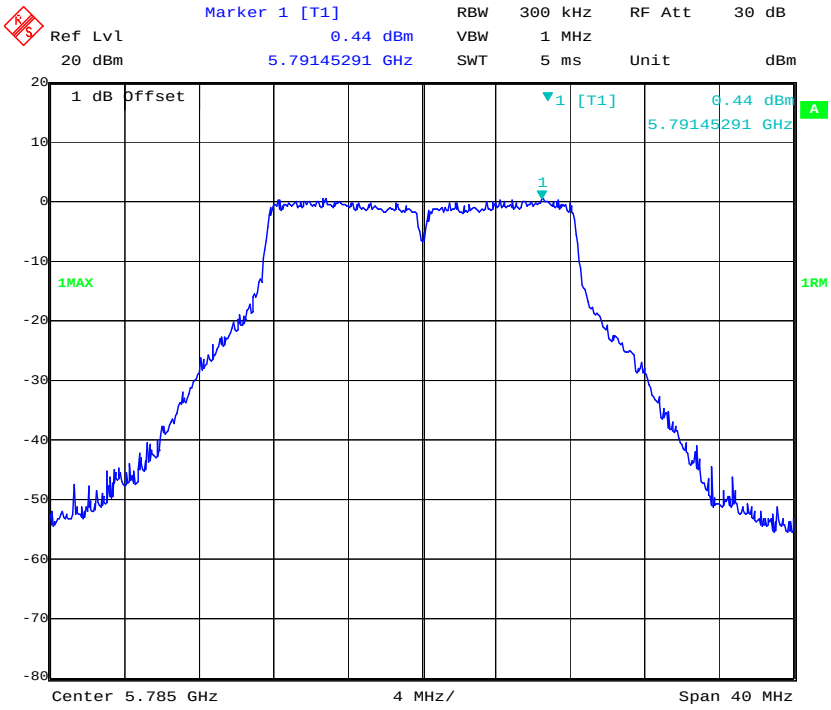
Date: 4.JUL.2017 10:13:35

802.11a Low Channel – Chain1



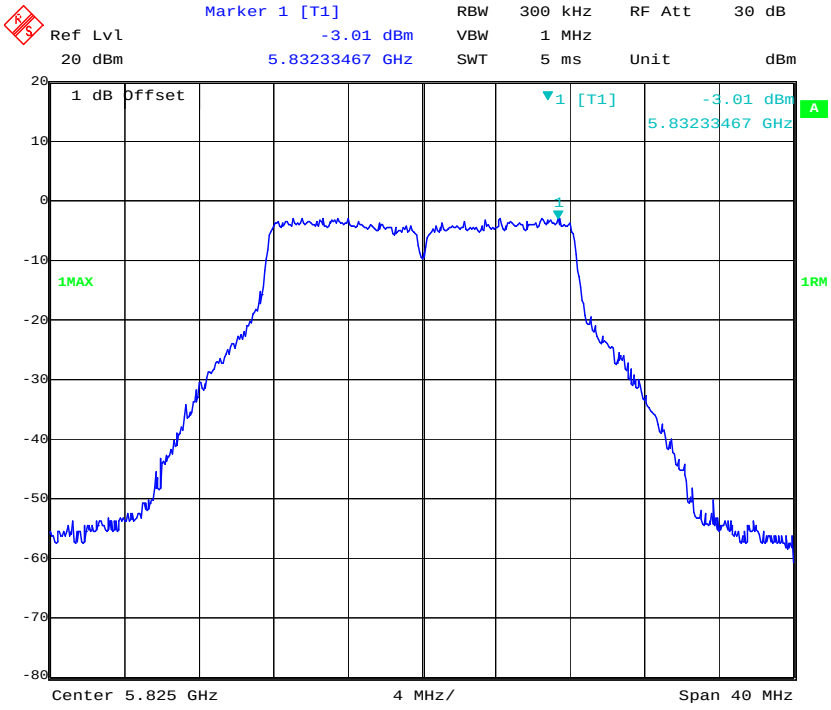
Date: 4.JUL.2017 10:42:32

802.11a Middle Channel – Chain1



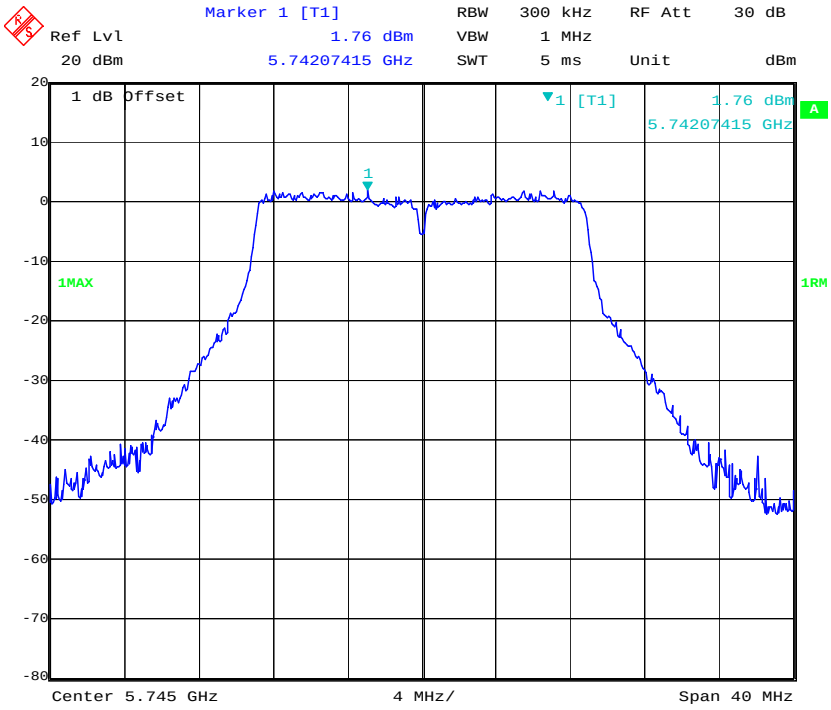
Date: 4.JUL.2017 11:02:54

802.11a High Channel – Chain1



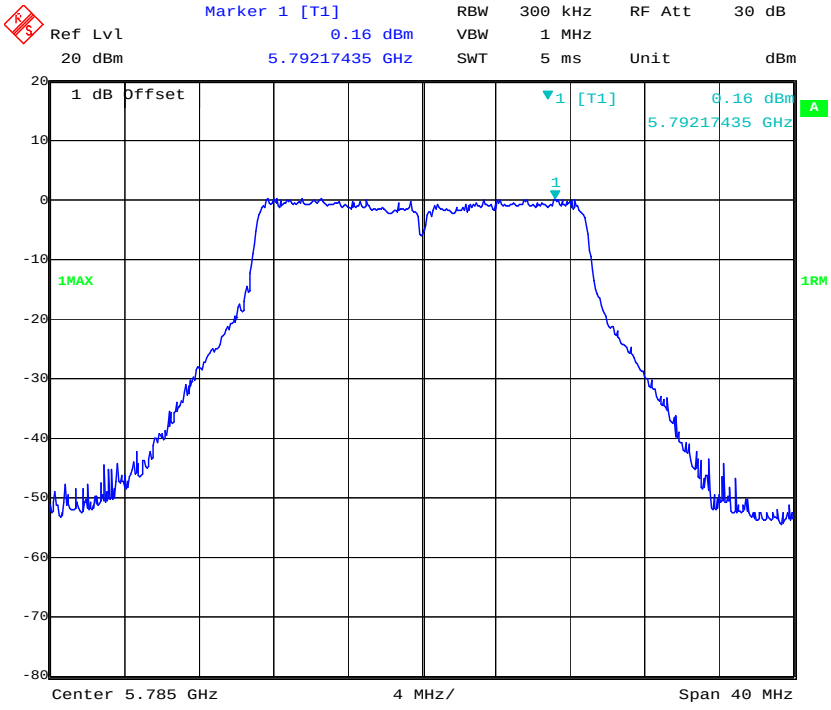
Date: 4.JUL.2017 11:06:42

802.11n ht20 Low Channel – Chain1



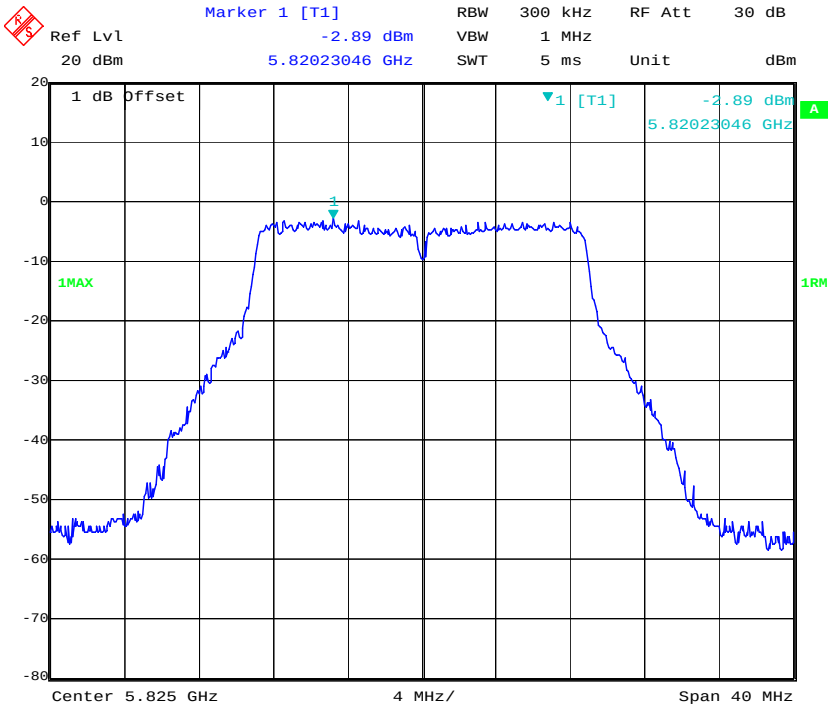
Date: 4.JUL.2017 11:26:48

802.11n ht20 Middle Channel – Chain1



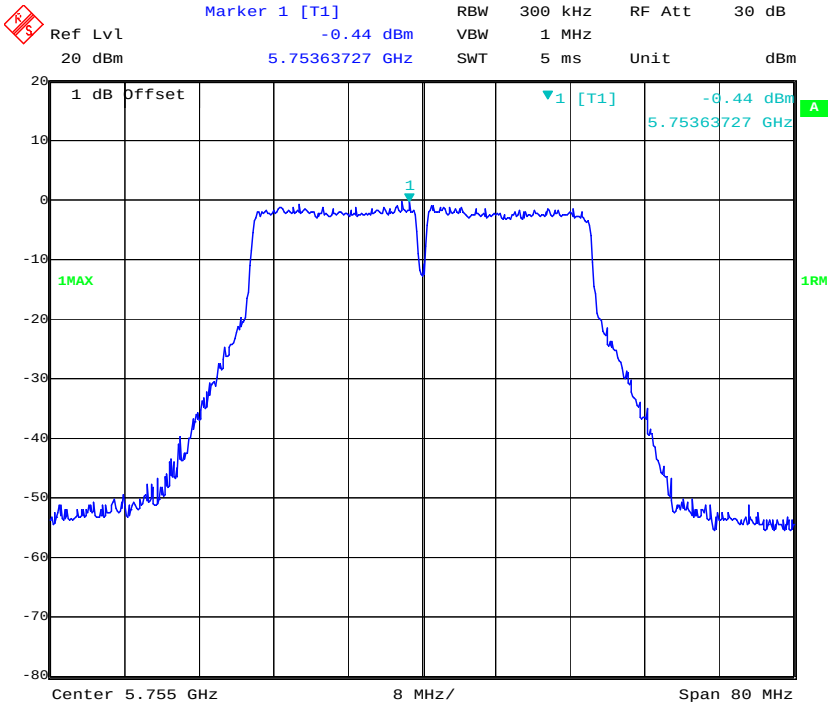
Date: 4.JUL.2017 11:23:25

802.11n ht20 High Channel – Chain1



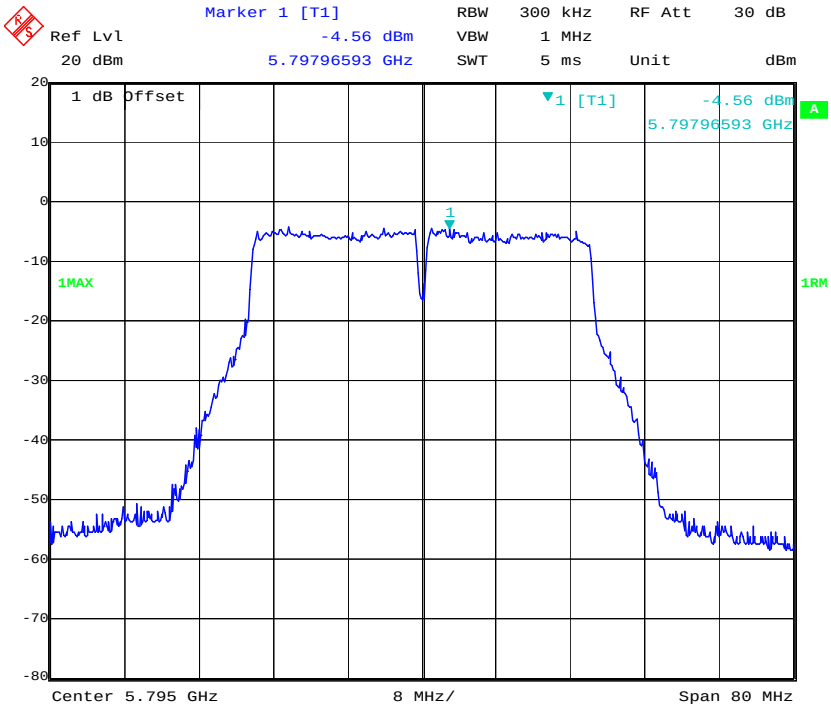
Date: 4.JUL.2017 11:14:04

802.11n ht40 Low Channel – Chain1

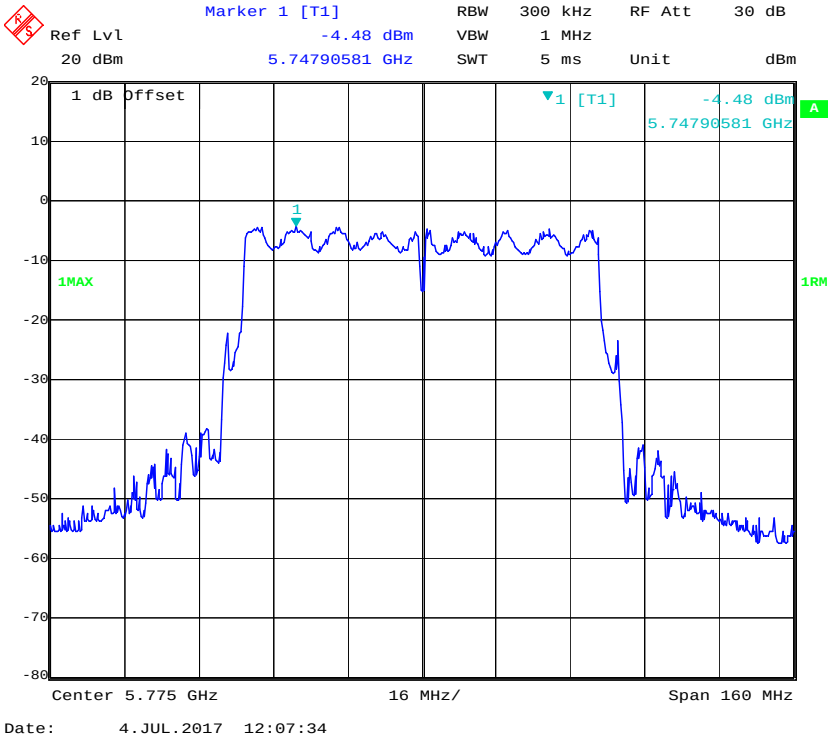


Date: 4.JUL.2017 11:35:58

802.11n ht40 High Channel – Chain1

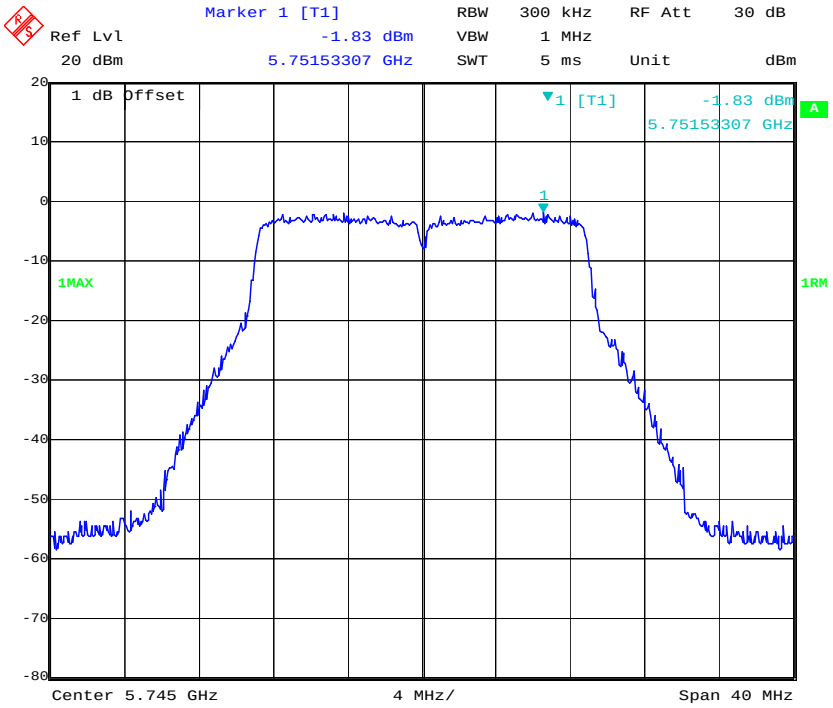


802.11 ac80 Middle Channel – Chain1



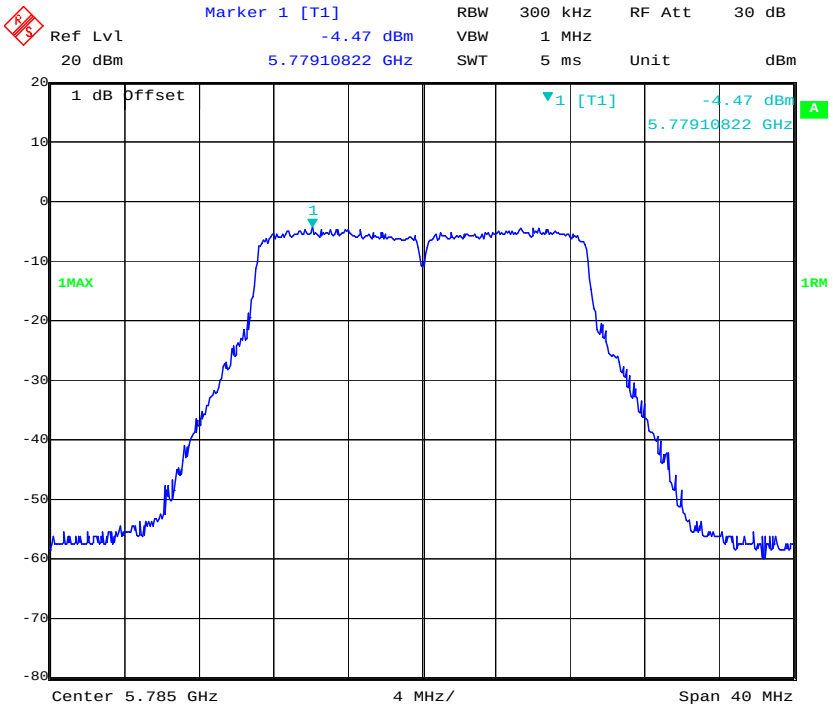
MIMO:

802.11n ht20 Low Channel – Chain0



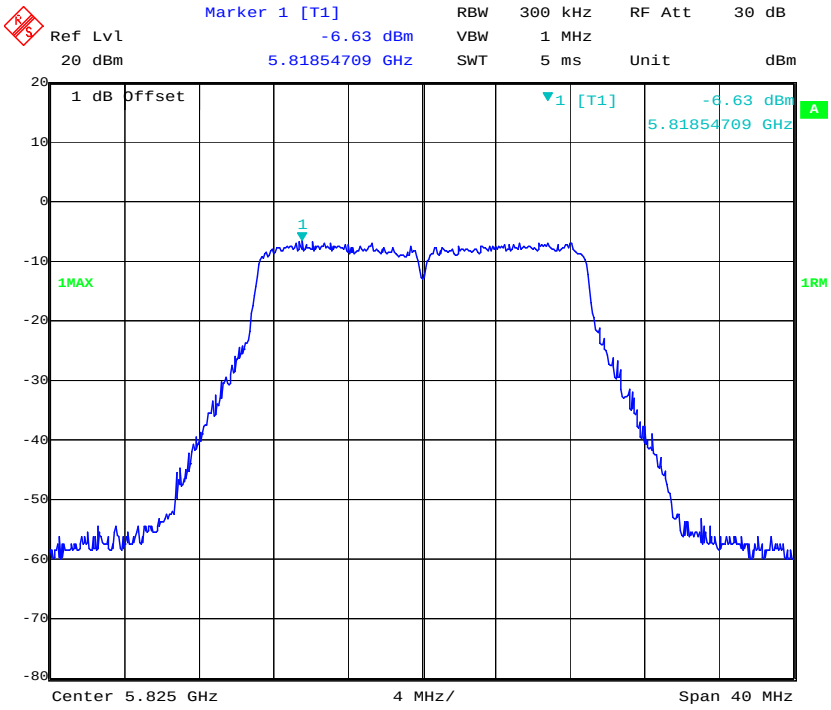
Date: 4.JUL.2017 13:15:46

802.11n ht20 Middle Channel – Chain0



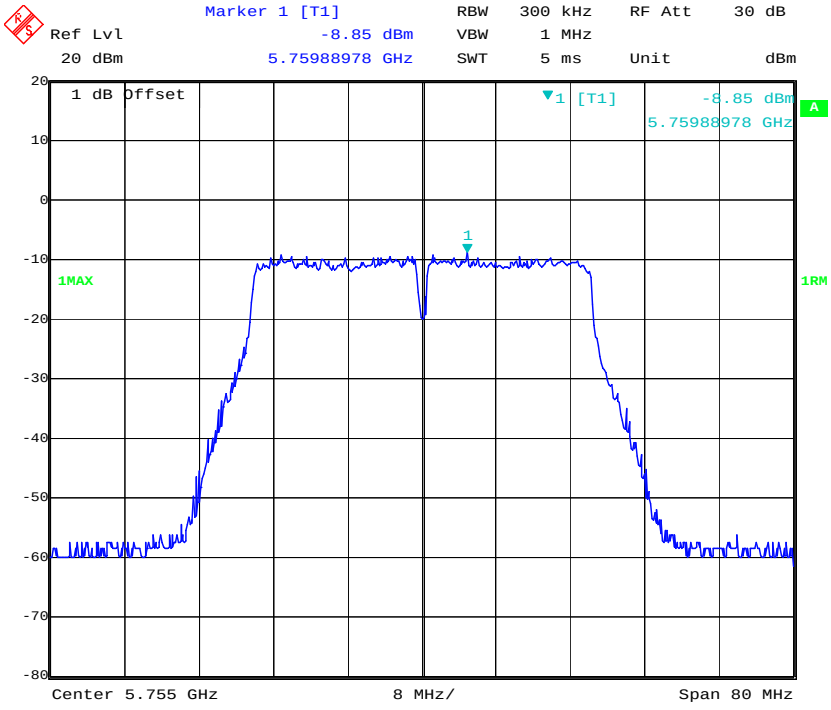
Date: 4.JUL.2017 13:26:58

802.11n ht20 High Channel – Chain0



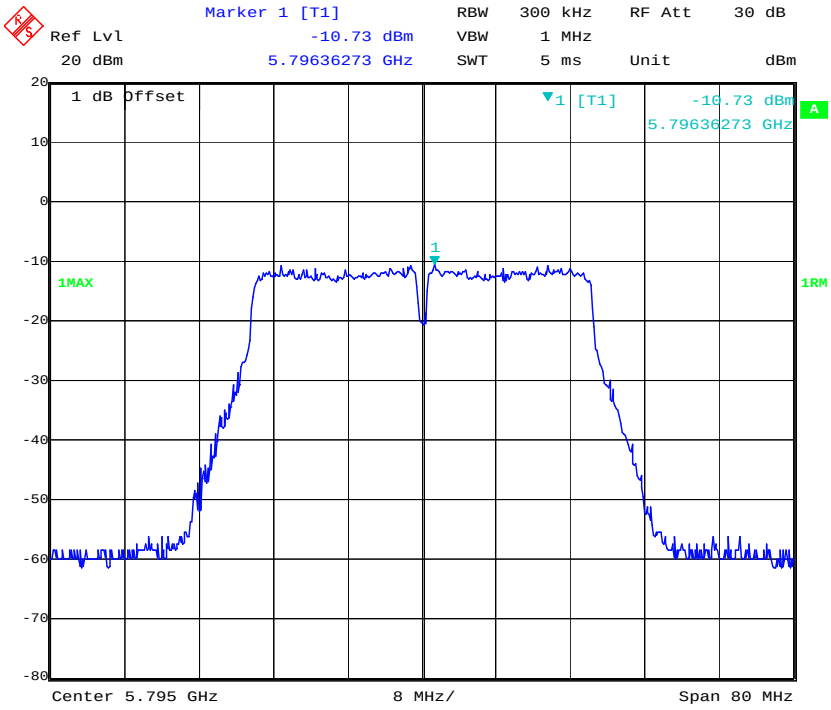
Date: 4.JUL.2017 14:08:11

802.11n ht40 Low Channel – Chain0



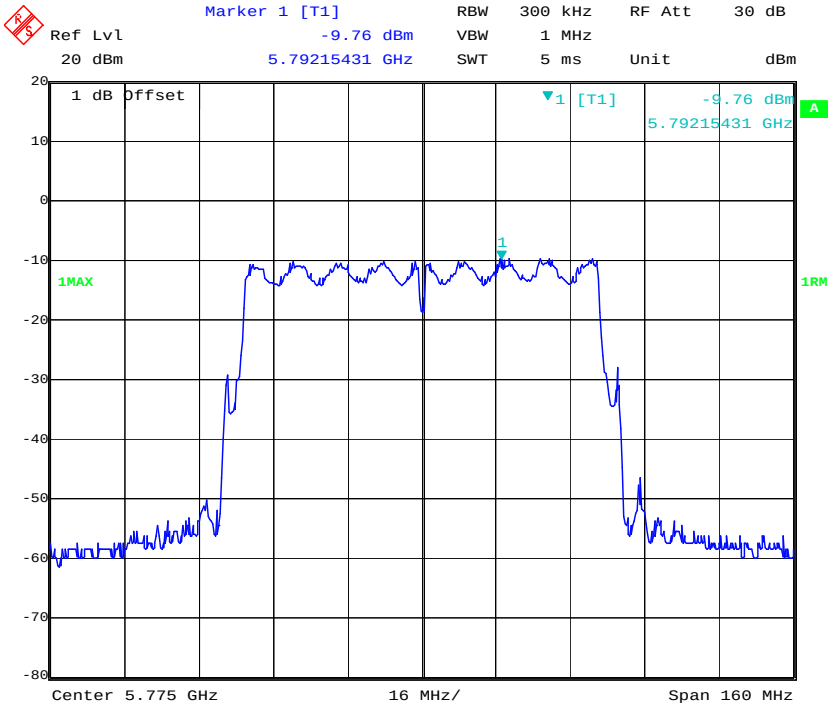
Date: 4.JUL.2017 14:11:52

802.11n ht40 High Channel – Chain0



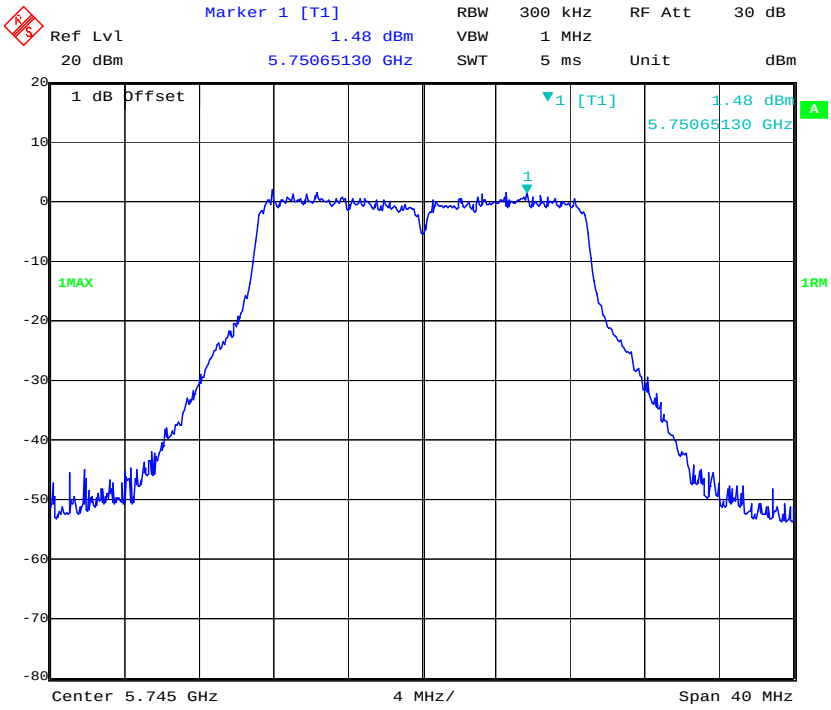
Date: 4.JUL.2017 14:20:48

802.11 ac80 Middle Channel – Chain0



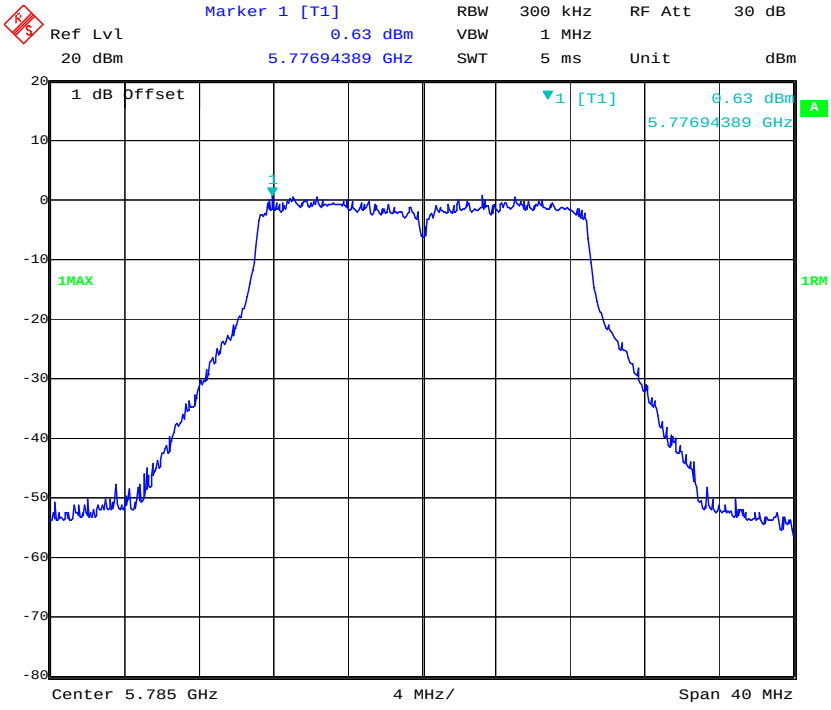
Date: 4.JUL.2017 14:45:08

802.11n ht20 Low Channel – Chain1



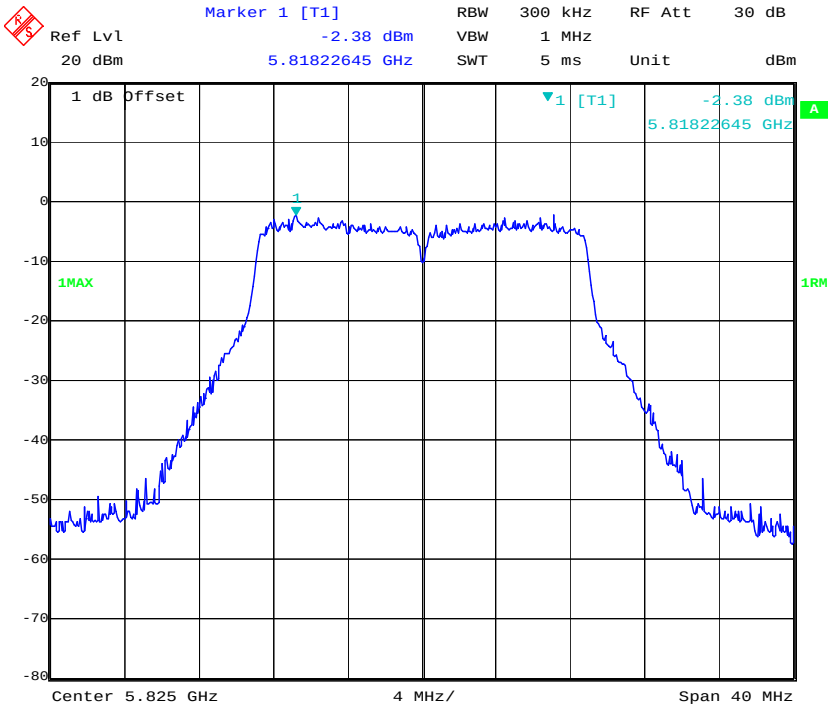
Date: 4.JUL.2017 15:07:59

802.11n ht20 Middle Channel – Chain1



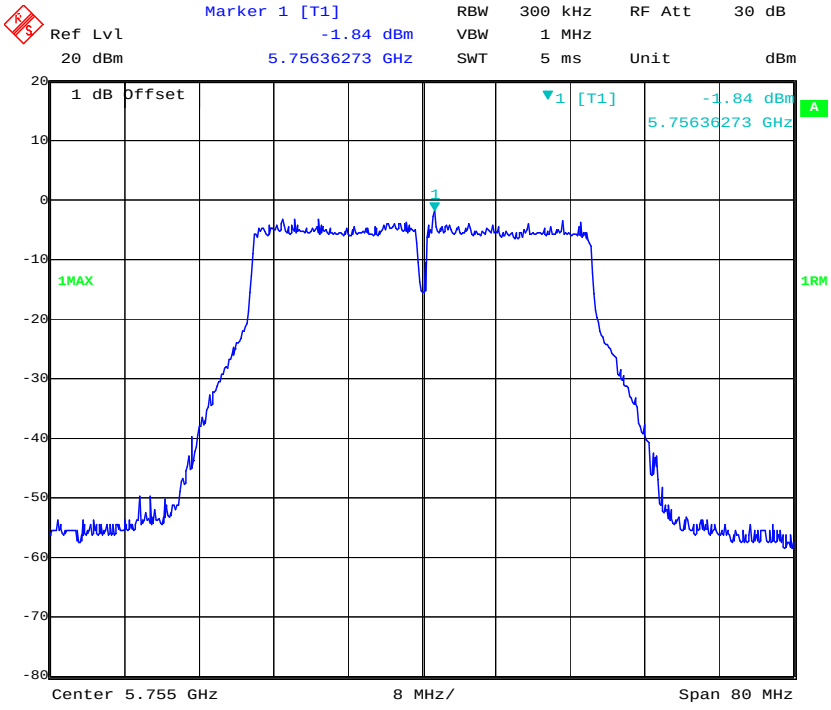
Date: 4.JUL.2017 15:11:06

802.11n ht20 High Channel – Chain1



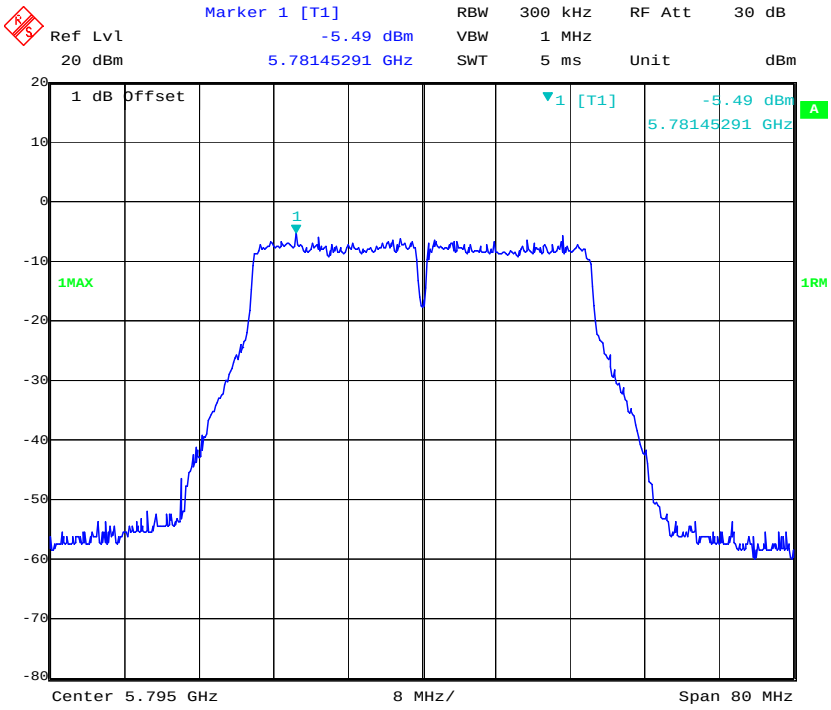
Date: 4.JUL.2017 15:14:26

802.11n ht40 Low Channel – Chain1

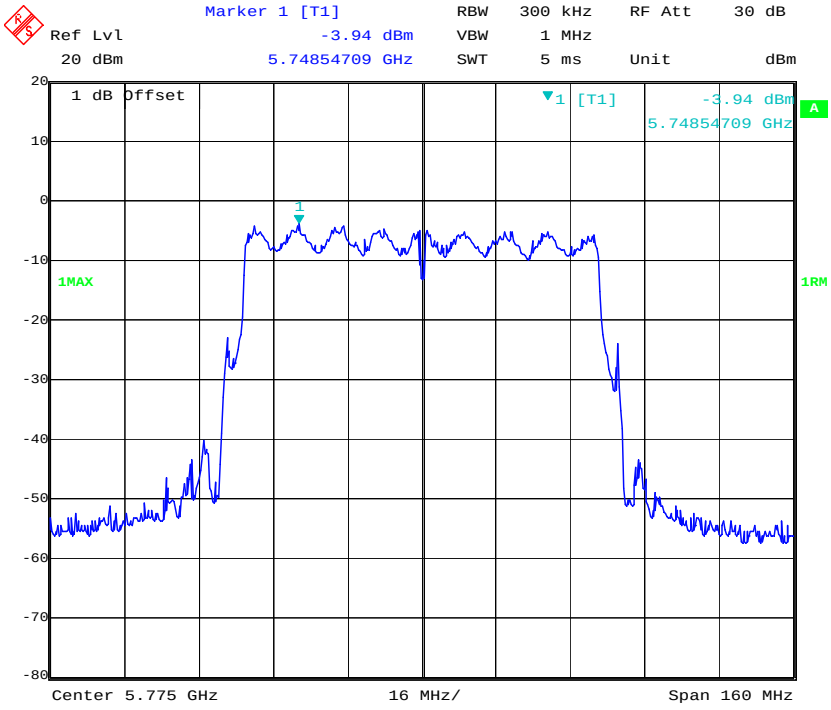


Date: 4.JUL.2017 14:53:16

802.11n ht40 High Channel – Chain1



802.11 ac80 Middle Channel – Chain1



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