FCC PART 15.407

TEST REPORT

For

Qingdao Hisense Intelligent Commercial System Co., Ltd.

Bldg 3, 151 Zhuzhou Lu, Laoshan, Qingdao, China

FCC ID: GQK-HM618

Report Type:	Product Type:
Original Report	Tablet POS

Test Engineer:	Kyle Xu
Report Number:	RSHA170823001-00D
Report Date:	2017-10-14
Reviewed By:	Oscar Ye RF Leader
Prepared By:	Bay Area Compliance Laboratories Corp. (Kunshan) No.248 Chenghu Road,Kunshan,Jiangsu province,China Tel: +86-0512-86175000 Fax: +86-0512-88934268 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant	Qingdao Hisense Intelligent Commercial System Co., Ltd.
Tested Model	HM618
Series Model	HM616
Product Type	Tablet POS
Dimension	Tablet: 282 mm(L)×198 mm(W)×18 mm(H) Dock: 151 mm(L)×121 mm(W)×92 mm(H) Multifunctional dock: 236 mm(L)×218 mm(W)×370 mm(H)
Power Supply	Tablet: DC 3.7V from battery and DC 5.0V charging by adapter Dock: DC5.0V charging by adapter Multifunctional dock: DC24.0V charging by adapter

Adapter-1 Information:
Model: ADS-25SGP-06 05020E
Input: AC100-240V, 50/60Hz, 0.7A
Output:5.0V, 4.0A

Adapter-2 Information:
Model: FSP060-DAAN2
Input: AC100-240V, 50/60Hz, 0.7A
Output:24.0V, 2.5A

** Note: The difference between tested model and series model was explained in the declaration letter.*

**All measurement and test data in this report was gathered from production sample serial number: 20170823001 (Assigned by the BACL. The EUT supplied by the applicant was received on 2017-08-23)*

Objective

This type approval report is prepared on behalf of Qingdao Hisense Intelligent Commercial System Co., Ltd. in accordance with Part 2-Subpart J, Part 15-Subparts A and E of the Federal Communication Commissions rules.

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

Related Submittal(s)/Grant(s)

FCC Part 15.247 DSS, Part 15.247 DTS and Part15.225 DXX submission with FCC ID: GQK-HM618.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Kunshan).

Measurement Uncertainty

Item		Uncertainty
AC Power Lines Conducted Emissions		3.19 dB
RF conducted test with spectrum		0.9dB
RF Output Power with Power meter		0.5dB
Radiated emission	30MHz~1GHz	6.11dB
	1GHz~6GHz	4.45dB
	6GHz~18GHz	5.23dB
	18 GHz~40GHz	4.88dB
Occupied Bandwidth		0.5kHz
Temperature		1.0℃
Humidity		6%

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road,Kunshan,Jiangsu province,China.

Bay Area Compliance Laboratories Corp. (Kunshan) Lab is accredited to ISO/IEC 17025 by A2LA (Lab code: 4323.01) and the FCC designation No. CN1185 under the FCC KDB 974614 D01. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 815570. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

For 5150~5250 MHz band,

802.11a/802.11ac20/n20 mode Channel 36, 40, 48 were tested.
802.11n40/802.11ac40 mode Channel 38, 46 were tested.
802.11ac80 mode Channel 42 was tested.

For 5725~5850 MHz band,

802.11a/802.11ac20/n20 mode Channel 149, 157, 165 were tested.
802.11n40/802.11ac40 mode Channel 155, 159 were tested.
802.11ac80 mode Channel 155 was tested.

Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	…	…
38	5190	149	5745
40	5200	151	5755
42	5210	153	5765
44	5220	155	5775
46	5230	157	5785
48	5240	159	5795
…	…	161	5805
…	…	165	5825

EUT Exercise Software

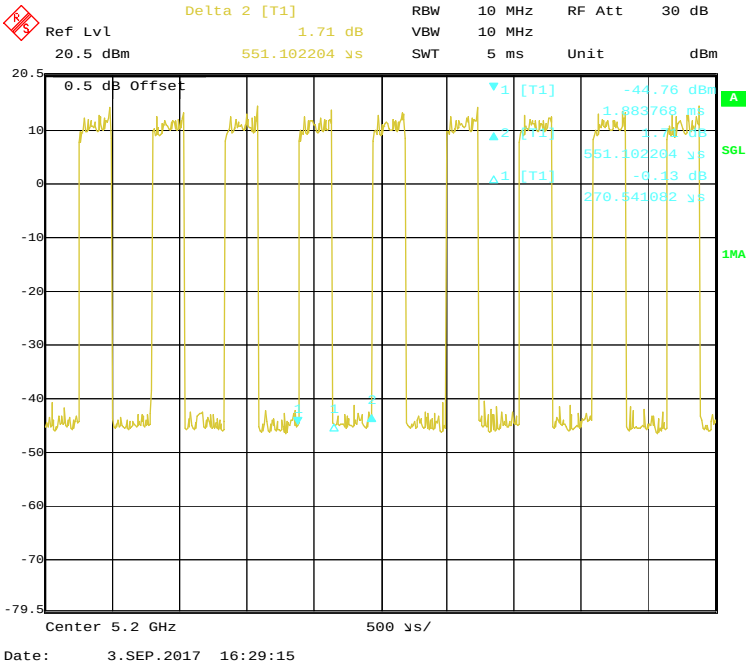
RF test tool: CMD

The worst case was performed under:

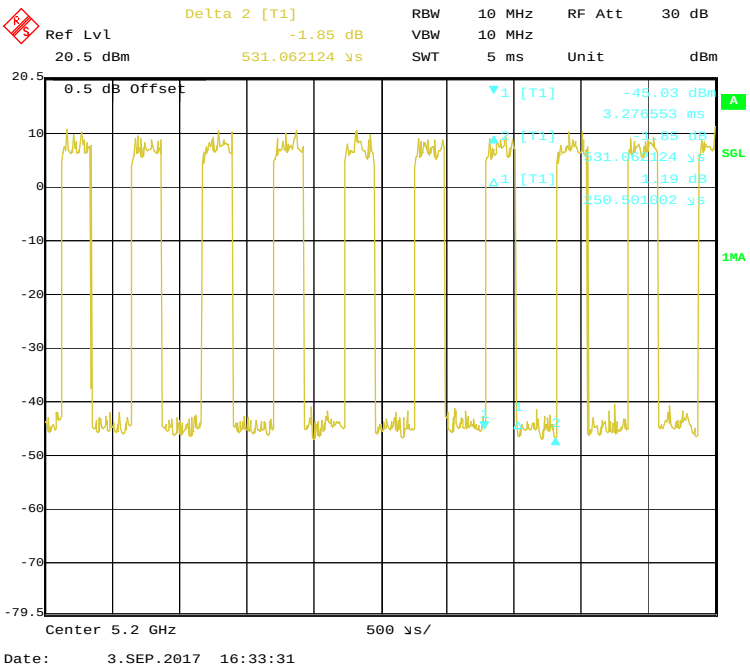
Mode	Data rate	Power level
802.11a	6 Mbps	11
802.11ac20	MCS0	11
802.11n-HT20	MCS0	11
802.11ac40	MCS0	11
802.11n-HT40	MCS0	11
802.11ac80	MCS0	11

5150MHz-5250MHz Band:

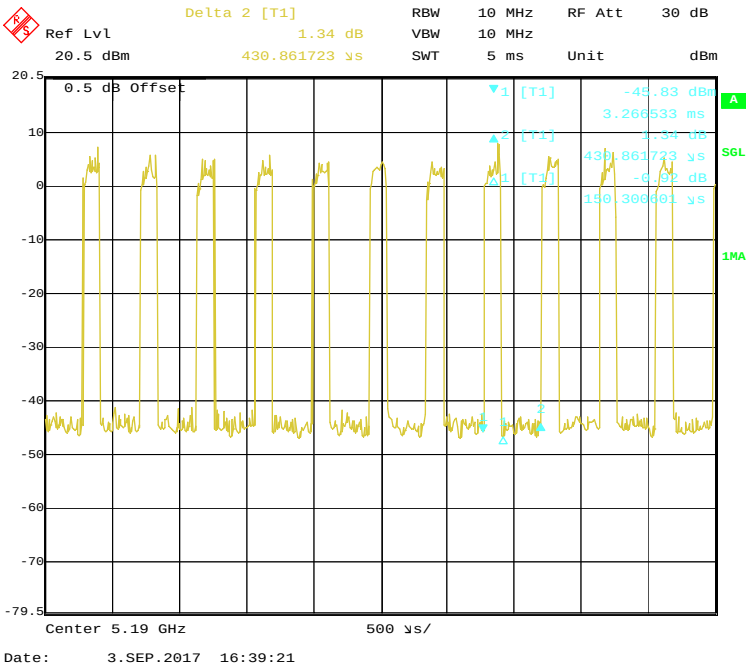
Mode: 802.11a Duty Cycle



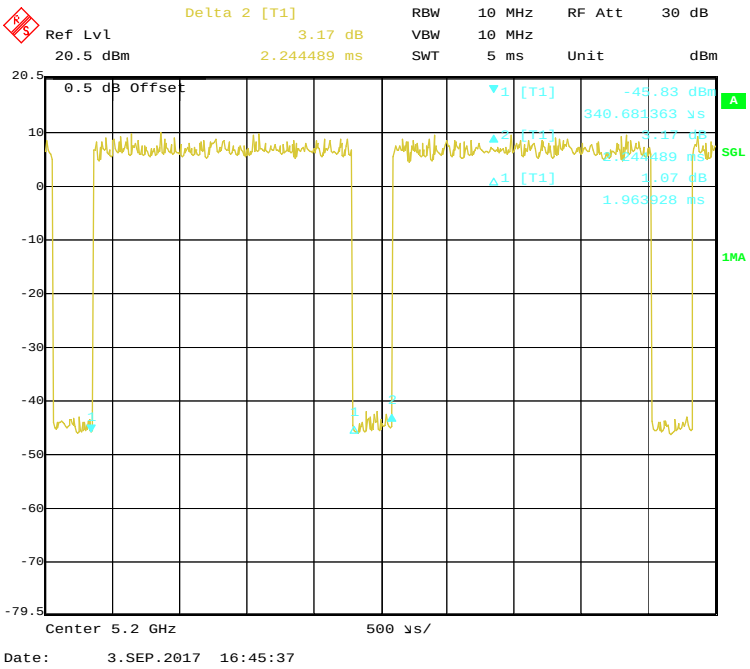
Mode: 802.11n20 Duty Cycle



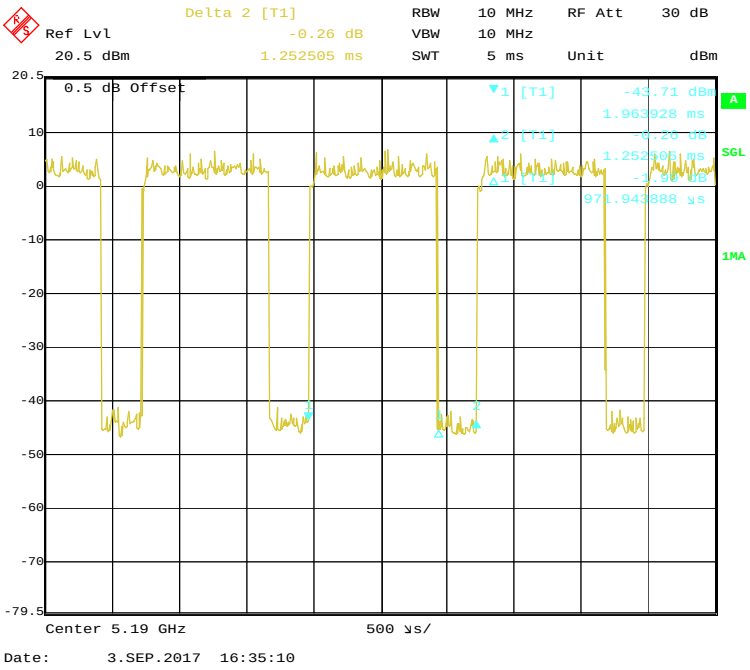
Mode: 802.11n40 Duty Cycle



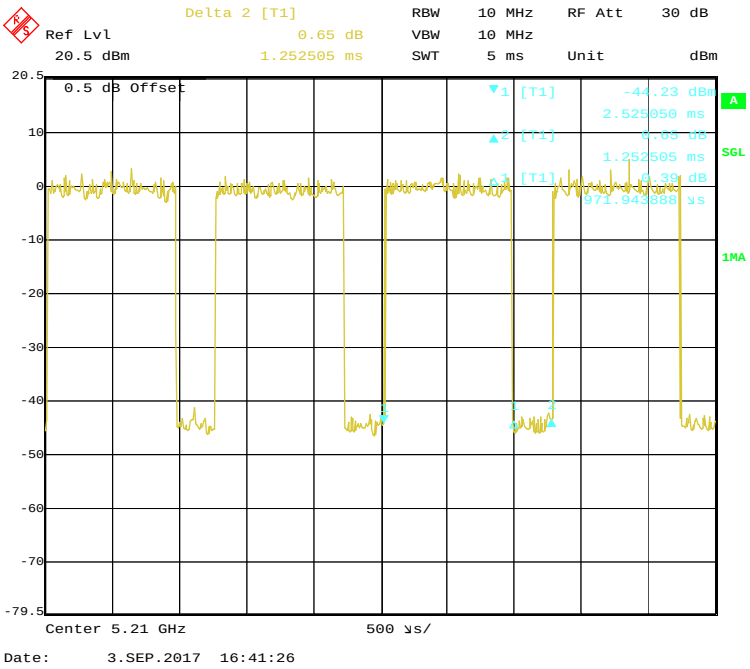
Mode: 802.11ac20 Duty Cycle



Mode: 802.11ac40 Duty Cycle

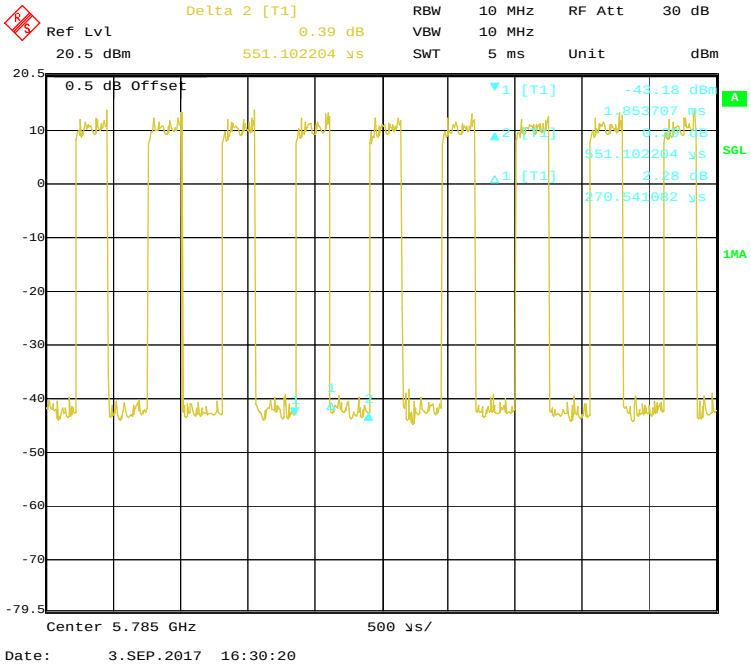


Mode: 802.11ac80 Duty Cycle

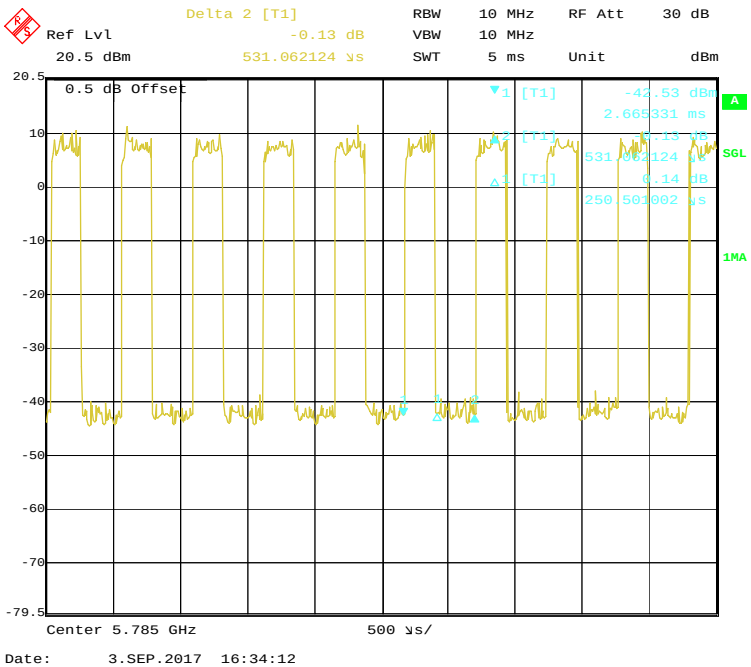


5725MHz-5850MHz Band:

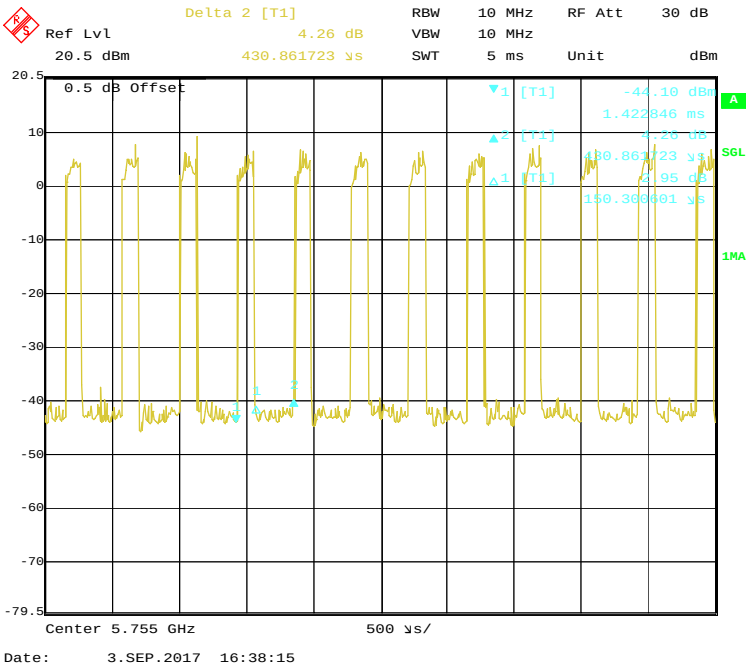
Mode: 802.11a Duty Cycle



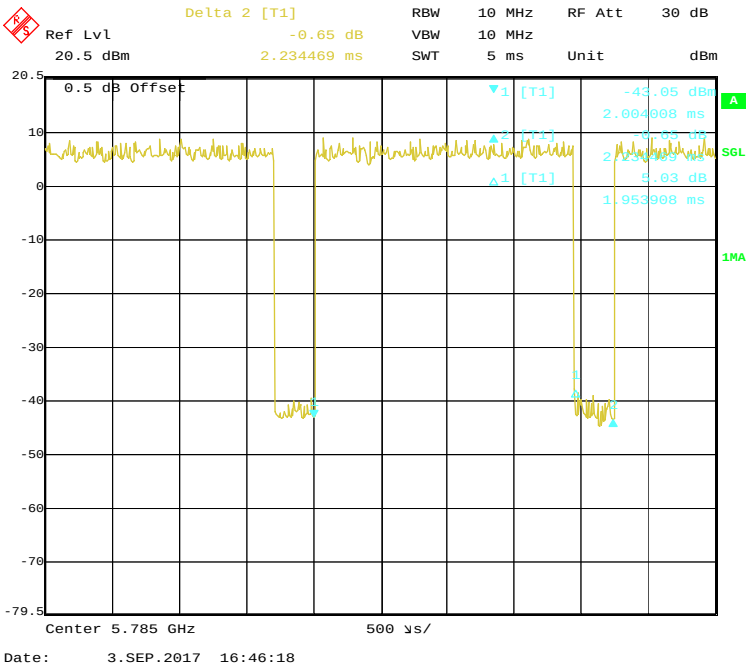
Mode: 802.11n20 Duty Cycle



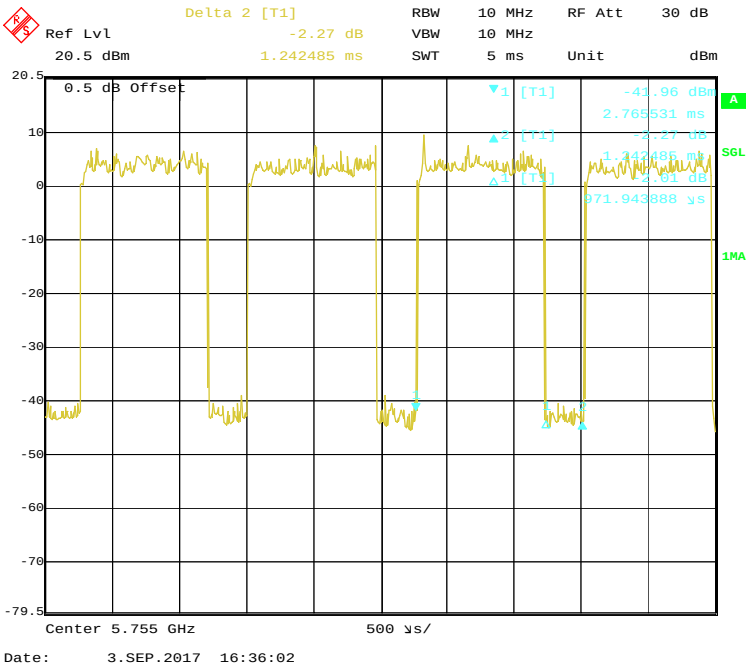
Mode: 802.11n40 Duty Cycle



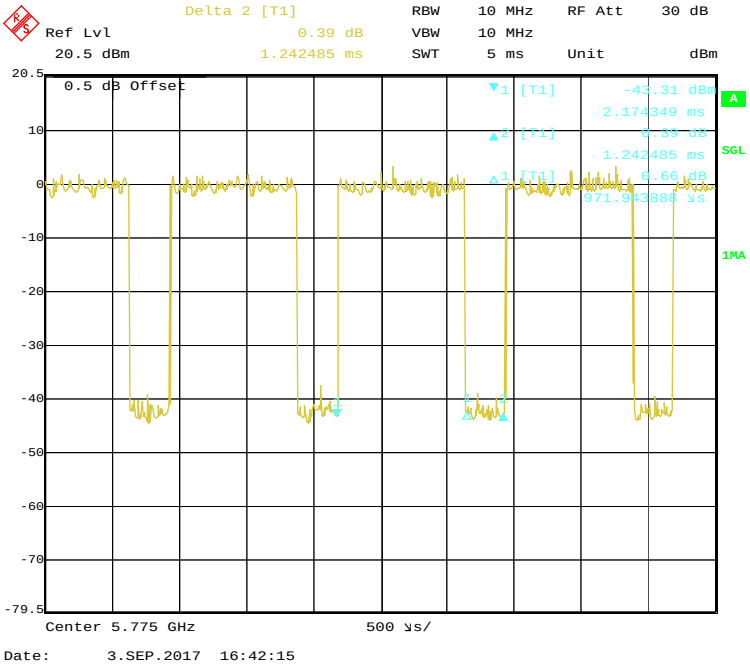
Mode: 802.11ac20 Duty Cycle



Mode: 802.11ac40 Duty Cycle



Mode: 802.11ac80 Duty Cycle



5150MHz-5250MHz Band:

Mode	Duty Cycle	T(ms)	1/T(kHz)	VBW Setting	10log(1/x)
802.11a	49.09%	0.271	3.690	10kHz	3.09
802.11n-HT20	47.17%	0.251	3.984	10kHz	3.26
802.11n-HT40	34.88%	0.150	6.667	10kHz	4.57
802.11ac20	87.50%	1.964	0.509	1kHz	0.58
802.11ac40	77.60%	0.972	1.029	3kHz	1.10
802.11ac80	77.60%	0.972	1.029	3kHz	1.10

5725MHz-5850MHz Band:

Mode	Duty Cycle	T(ms)	1/T(kHz)	VBW Setting	10log(1/x)
802.11a	49.09%	0.271	3.690	10kHz	3.09
802.11n-HT20	47.17%	0.251	3.984	10kHz	3.26
802.11n-HT40	34.88%	0.150	6.667	10kHz	4.57
802.11ac20	87.44%	1.954	0.512	1kHz	0.58
802.11ac40	78.23%	0.972	1.029	3kHz	1.07
802.11ac80	78.23%	0.972	1.029	3kHz	1.07

Equipment Modifications

N/A.

Support Equipment List and Details

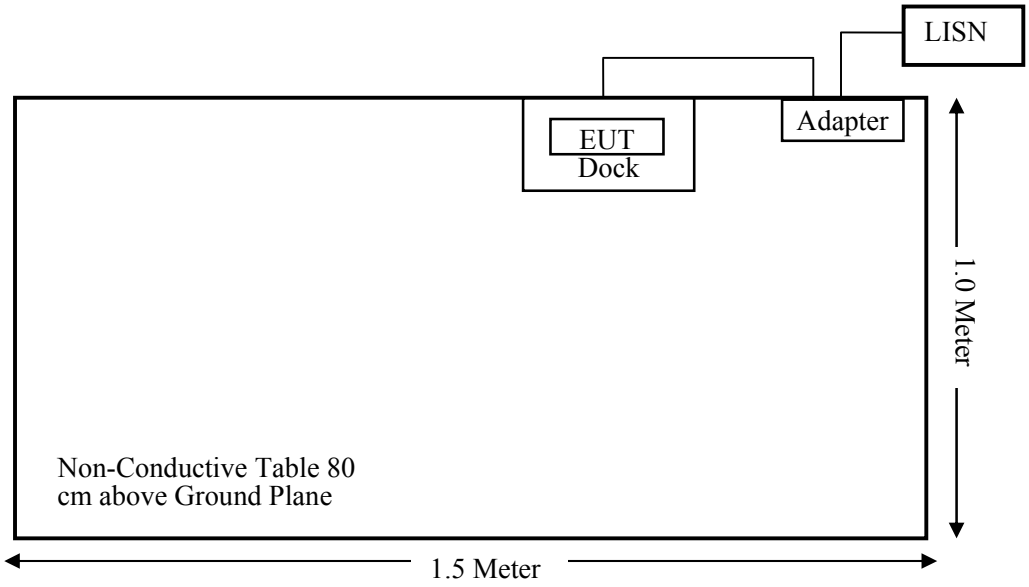
Manufacturer	Description	Model	Serial Number
/	/	/	/

External I/O Cable

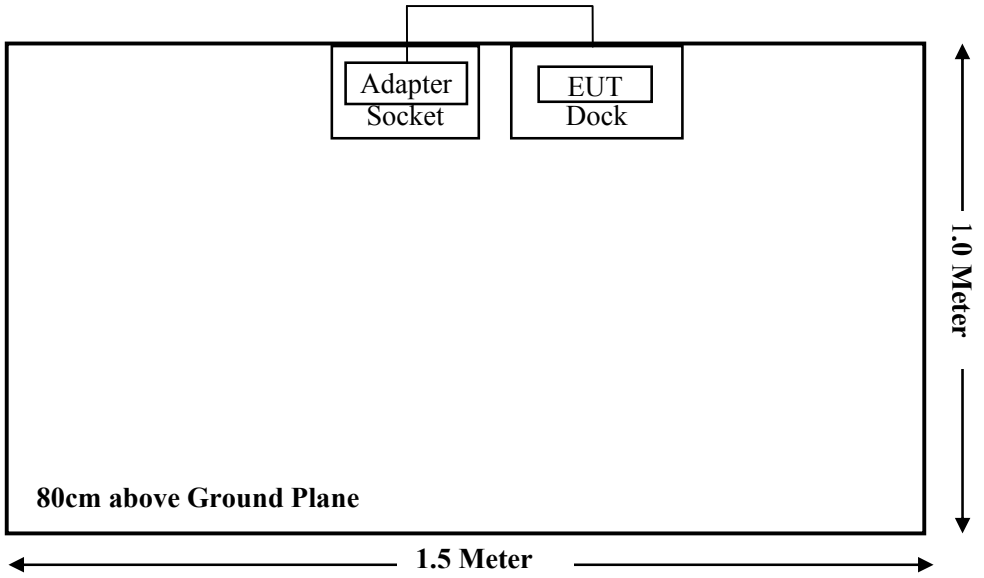
Cable Description	Shielding Type	Length (m)	From Port	To
/	/	/	/	/

Block Diagram of Test Setup

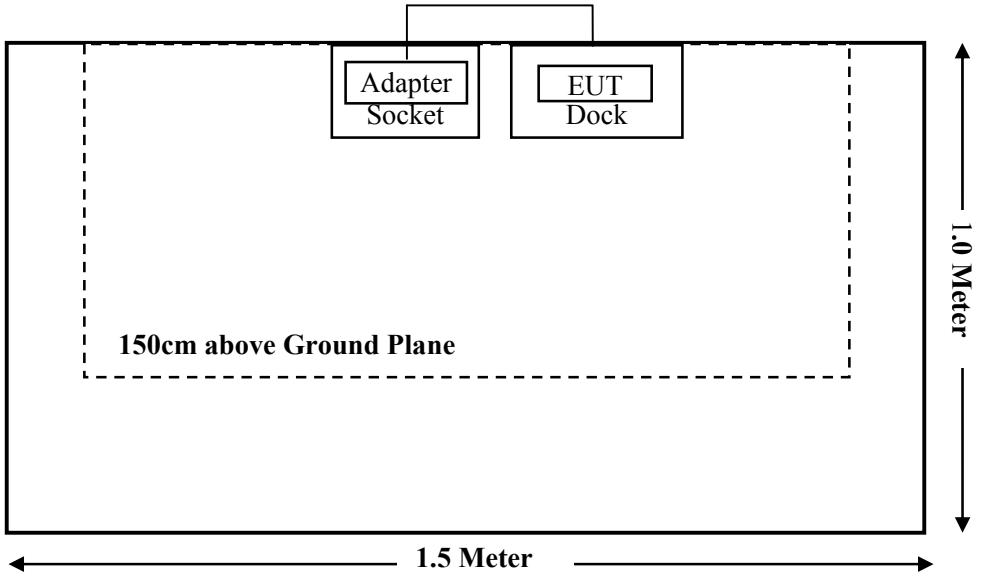
For Conducted Emissions:



For Radiated Emissions(Below 1GHz):



For Radiated Emissions(Above 1GHz):



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
FCC §1.1310 &§2.1093	RF Exposure	Compliance
FCC §15.203	Antenna Requirement	Compliance
FCC §15.207 & §15.407(b) (6)	AC Power Line Conducted Emissions	Compliance
§15.205 & §15.209 & §15.407(b) (1) ,(6) ,(7)	Undesirable Emission & Restricted Bands	Compliance
§15.407(b) (1) (4)	Band Edge	Compliance
§15.407(a)(1) (5) & §15.407 (e)	Emission Bandwidth	Compliance
§15.407 (a)(1)	Conducted Transmitter Output Power	Compliance
§15.407 (a)(1) (3)	Power Spectral Density	Compliance
§15.407 (g)	Frequency stability	Compliance

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test（Chamber 1#）					
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2016-11-25	2017-11-24
Sunol Sciences	Broadband Antenna	JB3	A040914-2	2016-01-09	2019-01-08
Sonoma Instrunent	Pre-amplifier	310N	171205	2017-08-15	2018-08-14
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
MICRO-COAX	Coaxial Cable	Cable-8	008	2017-08-15	2018-08-14
MICRO-COAX	Coaxial Cable	Cable-9	009	2017-08-15	2018-08-14
MICRO-COAX	Coaxial Cable	Cable-10	010	2017-08-15	2018-08-14
Radiated Emission Test（Chamber 2#）					
Rohde & Schwarz	Signal Analyzer	FSIQ26	100048	2016-11-25	2017-11-24
Rohde & Schwarz	Signal Analyzer	FSV40	101116	2017-07-22	2018-07-21
ETS-LINDGREN	Horn Antenna	3115	6229	2016-01-11	2019-01-10
ETS-LINDGREN	Horn Antenna	3116	00084159	2016-10-18	2019-10-17
Narda	Pre-amplifier	AFS42-00101800	2001270	2016-12-12	2017-12-11
Heatsink Required	Amplifier	QLW-18405536-J0	15964001009	2016-12-12	2017-12-11
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
MICRO-COAX	Coaxial Cable	Cable-6	006	2017-08-15	2018-08-14
MICRO-COAX	Coaxial Cable	Cable-11	011	2017-08-15	2018-08-14
MICRO-COAX	Coaxial Cable	Cable-12	012	2017-08-15	2018-08-14
MICRO-COAX	Coaxial Cable	Cable-13	013	2017-08-15	2018-08-14
RF Conducted Test					
Rohde & Schwarz	Signal Analyzer	FSIQ26	836131/009	2016-09-21	2017-09-20
Rohde & Schwarz	Signal Analyzer	FSV40	101116	2017-07-22	2018-07-21
BACL	Temperature & Humidity Chamber	BTH-150	30023	2016-10-10	2017-10-09
Hisense	RF Cable	N/A	N/A	2017-08-28	2018-08-27
Conducted Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2016-11-25	2017-11-24
Rohde & Schwarz	LISN	ESH3-Z5	862770/011	2016-10-10	2017-10-09
Rohde & Schwarz	LISN	ENV216	3560655016	2016-11-25	2017-11-24
BACL	BACL-EMC	V1.0	CE001	/	/
Narda	Attenuator/6dB	10690812-2	26850-6	2017-01-10	2018-01-09
MICRO-COAX	Coaxial Cable	Cable-15	015	2017-08-15	2018-08-14

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

§1.1310 &§2.1093 –RF EXPOSURE

Applicable Standard

According to§2.1093and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB447498 D01 General RF Exposure Guidance v06:

For 100 MHz to 6 GHz and test separation distances ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:
[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR, and ≤ 7.5 for 10-g extremity SAR

·f(GHz) is the RF channel transmit frequency in GHz
·Power and distance are rounded to the nearest mW and mm before calculation
·The result is rounded to one decimal place for comparison
·When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion

Standalone SAR test exclusion

Mode	Frequency Range (MHz)	Conducted Output Power			Minimum Distance (mm)	Calculated Value	Threshold (1-g)	SAR Test Exclusion
		ANT0 (dBm)	ANT1 (dBm)	ANT0+ANT1 (dBm)				
Bluetooth	2402-2480	-1.00	/	/	5.00	0.3	3.00	Yes
BLE	2402-2480	-1.00	/	/	5.00	0.3	3.00	Yes
802.11b	2412~2462	8.50	8.00	/	5.00	2.2	3.00	Yes
802.11g	2412~2462	8.00	7.50	/	5.00	2.0	3.00	Yes
802.11n20	2412~2462	6.00	5.00	8.00	5.00	2.0	3.00	Yes
802.11n40	2422~2452	5.00	4.50	8.00	5.00	2.0	3.00	Yes
802.11a	5180~5240	7.50	7.00	/	5.00	2.6	3.00	Yes
	5745~5825	7.50	7.00	/	5.00	2.7	3.00	Yes
802.11n20	5180~5240	5.00	4.00	7.50	5.00	2.6	3.00	Yes
	5745~5825	4.50	4.00	7.00	5.00	2.4	3.00	Yes
802.11n40	5190~5230	4.50	4.00	7.00	5.00	2.3	3.00	Yes
	5755~5795	5.00	4.00	7.50	5.00	2.7	3.00	Yes
802.11ac20	5180~5240	5.00	4.00	7.50	5.00	2.6	3.00	Yes
	5745~5825	5.00	4.00	7.50	5.00	2.7	3.00	Yes
802.11ac40	5180~5240	5.00	4.00	7.50	5.00	2.6	3.00	Yes
	5755~5795	5.00	4.00	7.50	5.00	2.7	3.00	Yes
802.11ac80	5210	4.50	3.50	7.00	5.00	2.3	3.00	Yes
	5775	5.00	4.00	7.50	5.00	2.7	3.00	Yes

Standalone SAR estimation:

Mode	Frequency Range (MHz)	Max tune-up power (dBm)		Max tune-up power (mW)		Distance (mm)	Estimated $_{1-g}$ (W/kg)	
		ANT 0	ANT 1	ANT 0	ANT 1		ANT 0	ANT 1
Bluetooth	2402-2480	-1.00	/	0.79	/	5	0.03	/
BLE	2402-2480	-1.00	/	0.79	/	5	0.03	/
802.11b	2412~2462	8.50	8.00	7.08	6.31	5	0.30	0.26
802.11g	2412~2462	8.00	7.50	6.31	5.62	5	0.26	0.24
802.11n20	2412~2462	6.00	5.00	3.98	3.16	5	0.17	0.13
802.11n40	2422~2452	5.00	4.50	3.16	2.82	5	0.13	0.12
802.11a	5180~5240	7.50	7.00	5.62	5.01	5	0.34	0.31
	5745~5825	7.50	7.00	5.62	5.01	5	0.36	0.32
802.11n20	5180~5240	5.00	4.00	3.16	2.51	5	0.19	0.15
	5745~5825	4.50	4.00	2.82	2.51	5	0.18	0.16
802.11n40	5190~5230	4.50	4.00	2.82	2.51	5	0.17	0.15
	5755~5795	5.00	4.00	3.16	2.51	5	0.20	0.16
802.11ac20	5180~5240	5.00	4.00	3.16	2.51	5	0.19	0.15
	5745~5825	5.00	4.00	3.16	2.51	5	0.20	0.16
802.11ac40	5180~5240	5.00	4.00	3.16	2.51	5	0.19	0.15
	5755~5795	5.00	4.00	3.16	2.51	5	0.20	0.16
802.11ac80	5210	4.50	3.50	2.82	2.24	5	0.17	0.14
	5775	5.00	4.00	3.16	2.51	5	0.20	0.16

When standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:
[(*max. power of channel, including* ***tune-up tolerance****, mW*)/(*min. test separation distance, mm*)]·[√f(GHz)/*x*] W/kg for *test separation distances* ≤ 50 mm;
where $x = 7.5$ for 1-g SAR.
When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion

Simultaneous Transmission:

Description of Simultaneous Transmit Capabilities		
Transmitter Combination		Simultaneous?
ANT 0	ANT 1	
2.4G BT/BLE	2.4GWi-Fi	×
2.4G BT/BLE	5G Wi-Fi	√
2.4G Wi-Fi	2.4G Wi-Fi	√
2.4G Wi-Fi	5G Wi-Fi	×
5G Wi-Fi	2.4G Wi-Fi	×
5G Wi-Fi	5G Wi-Fi	√

Simultaneous SAR test exclusion considerations:

Mode (ANT 0+ ANT 1)	Reported SAR (W/kg)		ΣSAR < 1.6W/kg
	ANT 0	ANT 1	
2.4G BT +5G Wi-Fi	0.03	0.32	0.35
2.4G Wi-Fi	0.30	0.26	0.56
5G Wi-Fi	0.36	0.32	0.68

Conclusion: ΣSAR < 1.6 W/kg therefore simultaneous transmission SAR is not required.

FCC §15.203 – ANTENNA REQUIREMENT

Applicable Standard

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

a. Antenna must be permanently attached to the unit.
b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

Antenna Connector Construction

Chain	Manufacturer	Antenna Type	Max. Antenna Gain
0	AMPAK	FPCB	2.0 dBi
1	AMPAK	FPCB	2.0 dBi

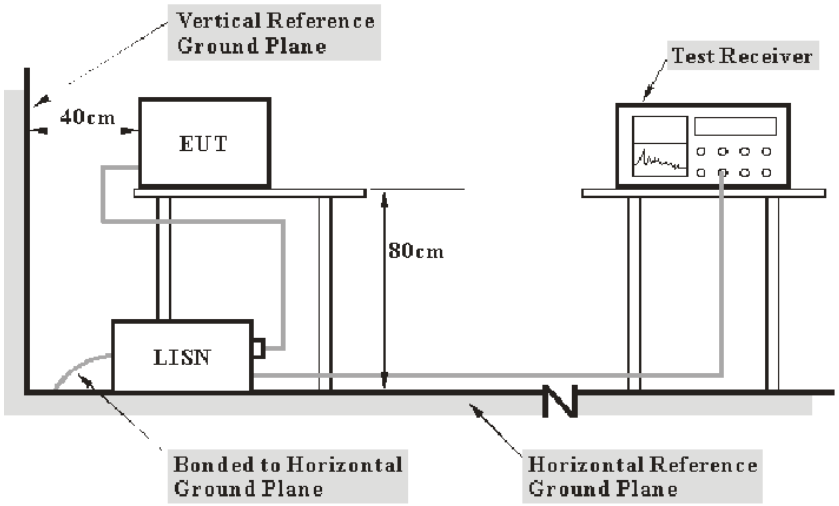
Result: Compliance.

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

Applicable Standard

FCC §15.207, §15.407(b) (6)

EUT Setup



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

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

EMI Test Receiver Setup

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

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

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

Test Procedure

During the conducted emission test, the adapter was connected to the first LISN and the other support equipments were connected to the outlet of the second LISN.

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

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

Test Data

Environmental Conditions

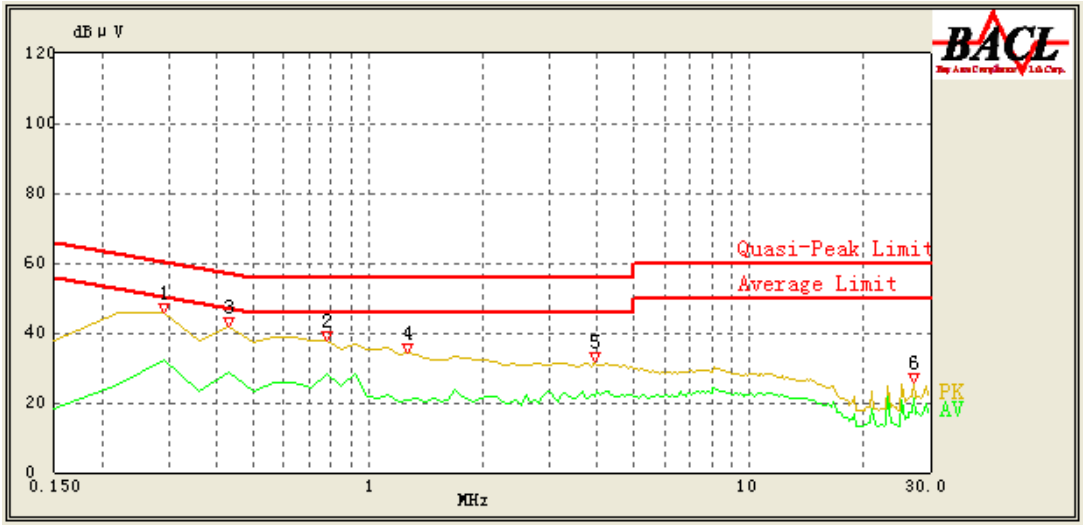
Temperature:	20.2 ℃
Relative Humidity:	51 %
ATM Pressure:	101.3 kPa

The testing was performed by Kyle Xu on 2017-08-29.

Adapter 1

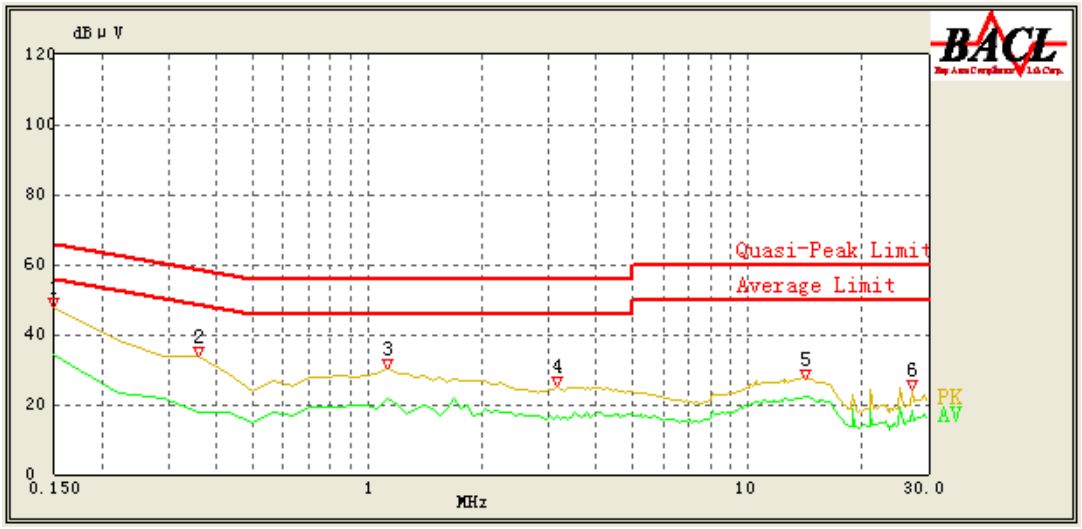
Test Mode: Transmitting in 802.11a(5725-5850) mode low channel of chain 0(worst case)

AC 120V/60 Hz, Line



Frequency (MHz)	Reading (dBµV)	Detector (PK/AV/QP)	Bandwidth (kHz)	Line	Corr. (dB)	Limit (dBµV)	Margin (dB)	Comment
0.290	45.77	PK	9.000	L1	16.03	62.00	16.23	Compliance
0.290	32.44	AV	9.000	L1	16.03	52.00	19.56	Compliance
0.780	37.68	PK	9.000	L1	15.93	56.00	18.32	Compliance
0.780	28.07	AV	9.000	L1	15.93	46.00	17.93	Compliance
0.430	41.95	PK	9.000	L1	16.06	58.00	16.05	Compliance
0.430	28.82	AV	9.000	L1	16.06	48.00	19.18	Compliance
1.270	34.08	PK	9.000	L1	15.87	56.00	21.92	Compliance
1.270	20.82	AV	9.000	L1	15.87	46.00	25.18	Compliance
3.930	31.52	PK	9.000	L1	15.85	56.00	24.48	Compliance
3.930	21.82	AV	9.000	L1	15.85	46.00	24.18	Compliance
27.100	25.76	PK	9.000	L1	16.51	60.00	34.24	Compliance
27.100	21.26	AV	9.000	L1	16.51	50.00	28.74	Compliance

AC 120V/60 Hz, Neutral



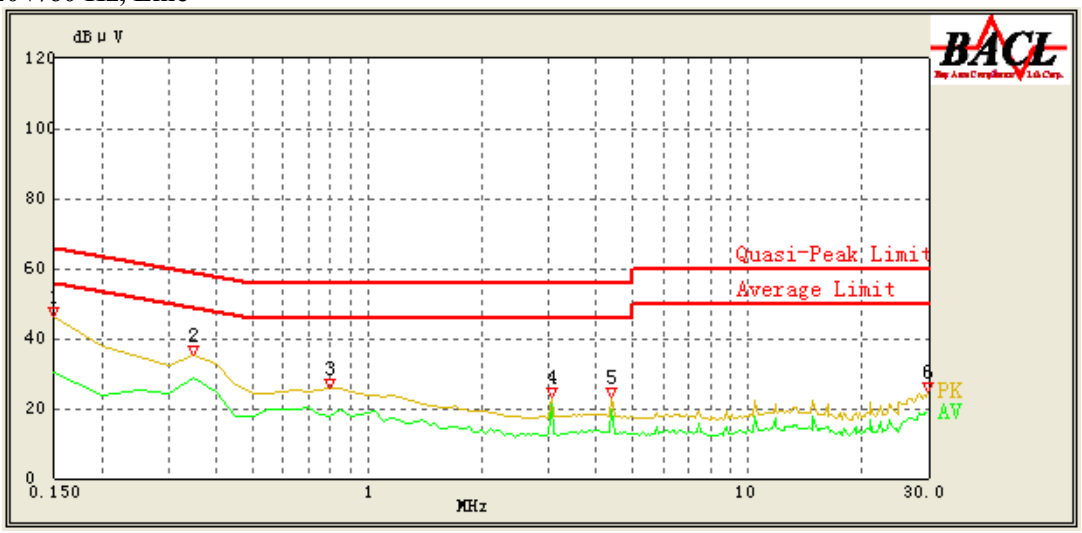
Frequency (MHz)	Reading (dBµV)	Detector (PK/AV/QP)	Bandwidth (kHz)	Line	Corr. (dB)	Limit (dBµV)	Margin (dB)	Comment
0.150	47.95	PK	9.000	N	16.06	66.00	18.05	Compliance
0.150	34.48	AV	9.000	N	16.06	56.00	21.52	Compliance
0.360	33.66	PK	9.000	N	16.08	60.00	26.34	Compliance
0.360	17.86	AV	9.000	N	16.08	50.00	32.14	Compliance
1.130	30.17	PK	9.000	N	15.94	56.00	25.83	Compliance
1.130	21.75	AV	9.000	N	15.94	46.00	24.25	Compliance
3.160	25.22	PK	9.000	N	15.89	56.00	30.78	Compliance
3.160	16.83	AV	9.000	N	15.89	46.00	29.17	Compliance
14.220	27.50	PK	9.000	N	16.01	60.00	32.50	Compliance
14.150	22.05	AV	9.000	N	16.01	50.00	27.95	Compliance
27.100	24.43	PK	9.000	N	16.28	60.00	35.57	Compliance
27.100	18.20	AV	9.000	N	16.28	50.00	31.80	Compliance

Note:

1) Corr.=LISN VDF (Voltage Division Factor) + Cable Loss
2) Corrected Amplitude = Reading + Corr.
3) Margin = Limit –Corrected Amplitude

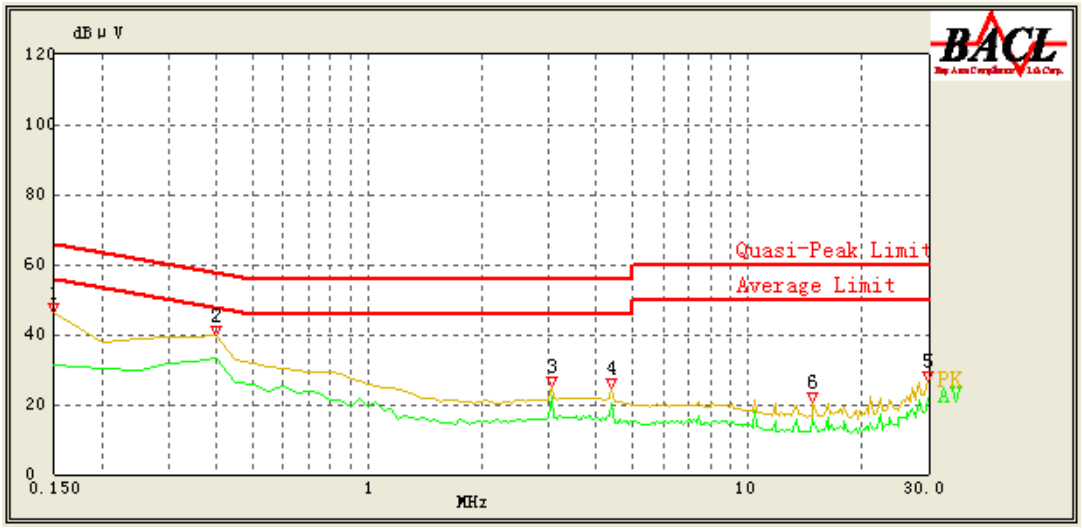
Adapter 2

AC 120V/60 Hz, Line



Frequency (MHz)	Reading (dBµV)	Detector (PK/AV/QP)	Bandwidth (kHz)	Line	Corr. (dB)	Limit (dBµV)	Margin (dB)	Comment
0.150	46.10	PK	9.000	L1	16.06	66.00	19.90	Compliance
0.150	30.16	AV	9.000	L1	16.06	56.00	25.84	Compliance
0.350	35.17	PK	9.000	L1	16.05	60.29	25.12	Compliance
0.350	28.69	AV	9.000	L1	16.05	50.29	21.60	Compliance
0.800	25.69	PK	9.000	L1	15.93	56.00	30.31	Compliance
0.800	17.98	AV	9.000	L1	15.93	46.00	28.02	Compliance
3.050	23.35	PK	9.000	L1	15.85	56.00	32.65	Compliance
3.050	21.09	AV	9.000	L1	15.85	46.00	24.91	Compliance
4.400	23.27	PK	9.000	L1	15.85	56.00	32.73	Compliance
4.400	19.78	AV	9.000	L1	15.85	46.00	26.22	Compliance
29.800	24.70	PK	9.000	L1	16.58	60.00	35.30	Compliance
29.800	18.99	AV	9.000	L1	16.58	50.00	31.01	Compliance

AC 120V/60 Hz, Neutral



Frequency (MHz)	Reading (dBµV)	Detector (PK/AV/QP)	Bandwidth (kHz)	Line	Corr. (dB)	Limit (dBµV)	Margin (dB)	Comment
0.150	46.11	PK	9.000	N	16.06	66.00	19.89	Compliance
0.150	31.06	AV	9.000	N	16.06	56.00	24.94	Compliance
0.400	39.61	PK	9.000	N	16.09	58.86	19.25	Compliance
0.400	33.24	AV	9.000	N	16.09	48.86	15.62	Compliance
3.050	25.32	PK	9.000	N	15.90	56.00	30.68	Compliance
3.050	22.19	AV	9.000	N	15.90	46.00	23.81	Compliance
4.400	24.72	PK	9.000	N	15.88	56.00	31.28	Compliance
4.400	20.14	AV	9.000	N	15.88	46.00	25.86	Compliance
29.800	26.65	PK	9.000	N	16.34	60.00	33.35	Compliance
29.800	22.42	AV	9.000	N	16.34	50.00	27.58	Compliance
14.900	20.76	PK	9.000	N	16.01	60.00	39.24	Compliance
14.900	15.57	AV	9.000	N	16.01	50.00	34.43	Compliance

Note:

1) Corr.=LISN VDF (Voltage Division Factor) + Cable Loss
2) Corrected Amplitude = Reading + Corr.
3) Margin = Limit –Corrected Amplitude

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

Applicable Standard

FCC §15.407 (b) (1), (6), (7); §15.209; §15.205;

For transmitters operating in the 5.15–5.25 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of –27dBm/MHz

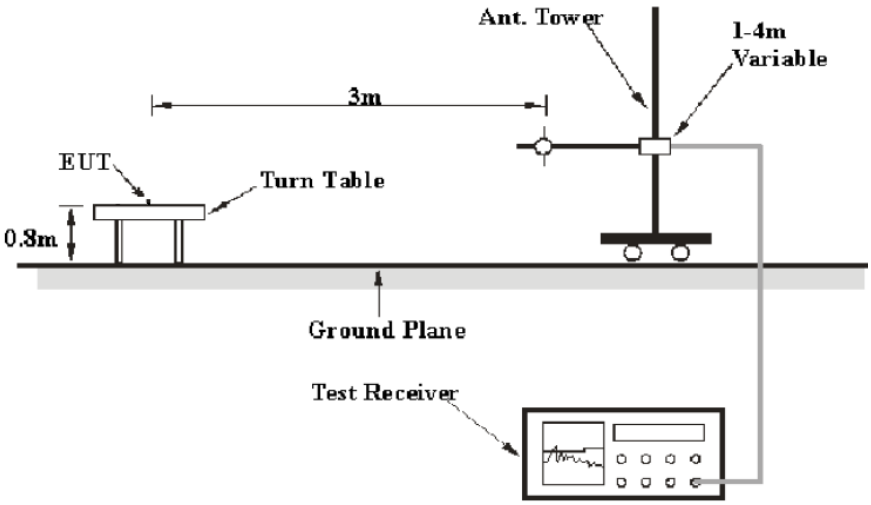
For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

As per FCC §15.35(d):Unless otherwise specified, on any frenquency or frequencies above 1000MHz,the radiated emission limits are based on the use of measurement instrunmentation employing an average detector function. Unless otherwise specified, measurements above 1000MHz shall be performed using a minimum resolution bandwidth of 1MHz.

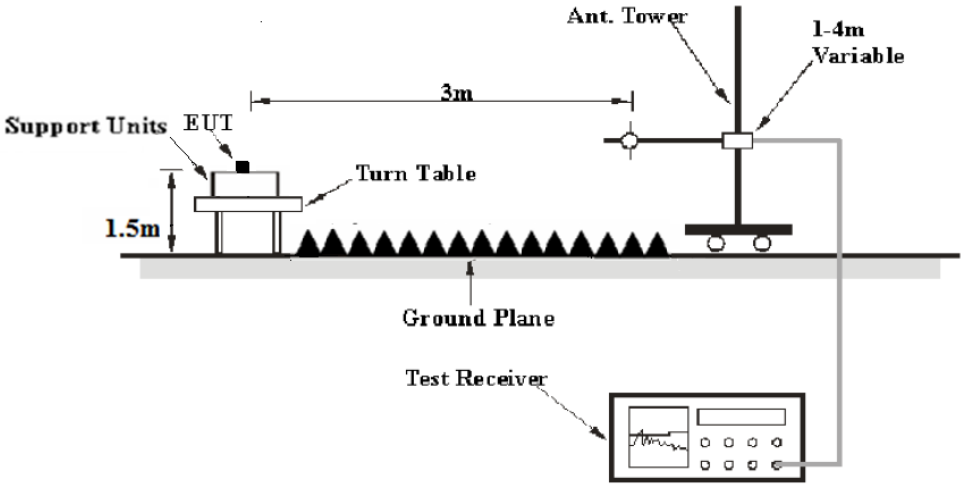
According to KDB 789033 D02 General UNII Test Procedures New Rules v01, emission shall be computed as: E [dBμV/m] = EIRP[dBm] + 95.2, for d = 3 meters.

EUT Setup

Below 1 G:



Above 1 G:



The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC 15.209 and FCC 15.407 limits.

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

The 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:

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

Frequency Range	RBW	Video B/W	Duty cycle	Detector
1GHz – 25GHz	1MHz	3 MHz	Any	PK
	1MHz	10 Hz	>98%	Ave.
	1MHz	1/T	<98%	

Test Procedure

During the radiated emission test, the adapter was connected to the first AC floor outlet and the other support equipments were connected to the second 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.

The Radiated measurements was performed, The EIRP converted to field strength as follows:

According to C63.4, 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)
or Limit line = Specific limits(dBμV) + 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 Loss + Cable Loss - Amplifier Gain

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

Margin = Limit –Extrapolation result

Test Data

Environmental Conditions

Temperature:	23.5 °C
Relative Humidity:	58 %
ATM Pressure:	101.3 kPa

The testing was performed by Kyle Xu on 2017-09-05.

EUT operation mode:Transmitting (Scan with X-Axis, Y-Axis and Z-Axis position, the worst case is X-Axis with adapter 2)

Note: For above 1GHz, the test distance is 1.5m.

30MHz~40GHz (5150-5250 MHz & 5725-5850 MHz)

802.11a Mode: **Chain0 (Worst Case)**

Frequency	Receiver		Turntable Degree	Rx Antenna		Corrected Factor	Corrected Amplitude	Extrapolation Result	Limit	Margin
	Reading	Detector		Height	Polar					
(MHz)	(dBµV)	(PK/QP/AV)		(cm)	(H/V)	(dB)	(dBµV/m)	(dBµV/m)	(dBµV/m)	(dB)
5150-5250 MHz band-Low Channel:5180 MHz										
81.88	49.59	QP	217	145	V	-17.49	32.10	/	40.00	7.90
298.35	50.68	QP	309	114	H	-10.25	40.43	/	46.00	5.57
5180.00	101.25	PK	203	135	V	3.31	104.56	98.56	/	/
5180.00	84.56	AV	203	135	V	3.31	87.87	81.87	/	/
5180.00	99.78	PK	326	226	H	3.31	103.09	97.09	/	/
5180.00	82.35	AV	326	226	H	3.31	85.66	79.66	/	/
5150.00	50.32	PK	295	202	V	3.24	53.56	47.56	74.00	26.44
5150.00	34.17	AV	295	202	V	3.24	37.41	31.41	54.00	22.59
10360.00	44.36	PK	18	206	H	16.39	60.75	54.75	74.00	19.25
10360.00	28.97	AV	18	206	H	16.39	45.36	39.36	54.00	14.64
15540.00	37.35	PK	355	245	V	16.25	53.60	47.60	74.00	26.40
15540.00	22.96	AV	355	245	V	16.25	39.21	33.21	54.00	20.79
6874.52	42.32	PK	53	237	H	9.18	51.50	45.50	74.00	28.50
6874.52	27.63	AV	53	237	H	9.18	36.81	30.81	54.00	23.19
5150-5250 MHz band-Middle Channel:5200MHz										
81.88	49.35	QP	66	174	V	-17.49	31.86	/	40.00	8.14
298.35	50.11	QP	11	158	H	-10.25	39.86	/	46.00	6.14
5200.00	101.35	PK	160	220	V	3.35	104.70	98.70	/	/
5200.00	84.67	AV	160	220	V	3.35	88.02	82.02	/	/
5200.00	99.58	PK	210	214	H	3.35	102.93	96.93	/	/
5200.00	82.07	AV	210	214	H	3.35	85.42	79.42	/	/
10400.00	43.78	PK	318	190	V	16.56	60.34	54.34	74.00	19.66
10400.00	27.91	AV	318	190	V	16.56	44.47	38.47	54.00	15.53
15600.00	38.31	PK	262	195	V	16.44	54.75	48.75	74.00	25.25
15600.00	22.89	AV	262	195	V	16.44	39.33	33.33	54.00	20.67
2318.34	40.74	PK	45	149	H	-5.16	35.58	29.58	74.00	44.42
2318.34	25.37	AV	45	149	H	-5.16	20.21	14.21	54.00	39.79
6874.52	41.65	PK	226	240	V	9.18	50.83	44.83	74.00	29.17
6874.52	27.37	AV	226	240	V	9.18	36.55	30.55	54.00	23.45
5150-5250 MHz band-High Channel:5240MHz										
81.88	49.35	QP	241	114	V	-17.49	31.86	/	40.00	8.14
298.35	50.38	QP	322	200	H	-10.25	40.13	/	46.00	5.87
5240.00	102.21	PK	22	194	V	3.44	105.65	99.65	/	/
5240.00	86.74	AV	22	194	V	3.44	90.18	84.18	/	/
5240.00	100.34	PK	183	159	H	3.44	103.78	97.78	/	/
5240.00	84.04	AV	183	159	H	3.44	87.48	81.48	/	/
5350.00	43.35	PK	26	156	H	3.68	47.03	41.03	74.00	32.97
5350.00	27.12	AV	26	156	H	3.68	30.80	24.80	54.00	29.20
10480.00	44.35	PK	68	139	H	16.90	61.25	55.25	74.00	18.75
10480.00	27.93	AV	68	139	H	16.90	44.83	38.83	54.00	15.17
15720.00	37.88	PK	0	153	V	16.83	54.71	48.71	74.00	25.29
15720.00	22.94	AV	0	153	V	16.83	39.77	33.77	54.00	20.23
6874.52	40.32	PK	146	127	V	9.18	49.50	43.50	74.00	30.50
6874.52	27.03	AV	146	127	V	9.18	36.21	30.21	54.00	23.79

Frequency	Receiver		Turntable Degree	Rx Antenna		Corrected Factor	Corrected Amplitude	Extrapolation Result	Limit	Margin
	Reading	Detector		Height	Polar					
(MHz)	(dBµV)	(PK/QP/AV)		(cm)	(H/V)	(dB)	(dBµV/m)	(dBµV/m)	(dBµV/m)	(dB)
5725-5850 MHz band-Low Channel:5745 MHz										
81.88	49.12	QP	162	188	V	-17.49	31.63	/	40.00	8.37
298.35	50.37	QP	49	178	H	-10.25	40.12	/	46.00	5.88
5745.00	101.25	PK	328	185	V	4.84	106.09	100.09	/	/
5745.00	85.04	AV	328	185	V	4.84	89.88	83.88	/	/
5745.00	100.35	PK	120	186	H	4.84	105.19	99.19	/	/
5745.00	84.34	AV	120	186	H	4.84	89.18	83.18	/	/
5725.00	48.32	PK	228	179	V	4.77	53.09	47.09	74	26.91
5725.00	32.87	AV	228	179	V	4.77	37.64	31.64	54	22.36
11490.00	45.32	PK	224	214	H	18.24	63.56	57.56	74	16.44
11490.00	28.96	AV	224	214	H	18.24	47.20	41.20	54	12.80
17235.00	38.58	PK	296	156	H	22.26	60.84	54.84	74	19.16
17235.00	22.19	AV	296	156	H	22.26	44.45	38.45	54	15.55
6768.22	40.03	PK	35	218	V	8.92	48.95	42.95	74	31.05
6768.22	25.11	AV	35	218	V	8.92	34.03	28.03	54	25.97
5725-5850 MHz band-Middle Channel:5785MHz										
81.88	49.67	QP	295	181	V	-17.49	32.18	/	40.00	7.82
298.35	50.77	QP	158	224	H	-10.25	40.52	/	46.00	5.48
5785.00	100.84	PK	44	219	V	4.97	105.81	99.81	/	/
5785.00	84.02	AV	44	219	V	4.97	88.99	82.99	/	/
5785.00	98.35	PK	237	228	H	4.97	103.32	97.32	/	/
5785.00	83.01	AV	237	228	H	4.97	87.98	81.98	/	/
11570.00	43.51	PK	335	112	V	18.01	61.52	55.52	74	18.48
11570.00	27.02	AV	335	112	V	18.01	45.03	39.03	54	14.97
17355.00	38.06	PK	22	114	H	22.80	60.86	54.86	74	19.14
17355.00	22.71	AV	22	114	H	22.80	45.51	39.51	54	14.49
2335.64	37.06	PK	7	222	H	-5.11	31.95	25.95	74	48.05
2335.64	23.65	AV	7	222	H	-5.11	18.54	12.54	54	41.46
6768.22	40.02	PK	109	175	V	8.92	48.94	42.94	74	31.06
6768.22	24.37	AV	109	175	V	8.92	33.29	27.29	54	26.71
5725-5850 MHz band-High Channel:5825MHz										
81.88	49.02	QP	10	244	V	-17.49	31.53	/	40.00	8.47
298.35	50.17	QP	251	189	H	-10.25	39.92	/	46.00	6.08
5825.00	100.89	PK	223	151	V	5.11	106.00	100.00	/	/
5825.00	84.67	AV	223	151	V	5.11	89.78	83.78	/	/
5825.00	98.35	PK	263	100	H	5.11	103.46	97.46	/	/
5825.00	82.74	AV	263	100	H	5.11	87.85	81.85	/	/
5850.00	51.35	PK	1	125	V	5.19	56.54	50.54	74	23.46
5850.00	35.71	AV	1	125	V	5.19	40.90	34.90	54	19.10
11650.00	43.35	PK	216	131	H	17.72	61.07	55.07	74	18.93
11650.00	27.56	AV	216	131	H	17.72	45.28	39.28	54	14.72
17475.00	38.03	PK	257	102	H	23.55	61.58	55.58	74	18.42
17475.00	22.99	AV	257	102	H	23.55	46.54	40.54	54	13.46
6768.22	39.57	PK	327	203	V	8.92	48.49	42.49	74	31.51
6768.22	23.87	AV	327	203	V	8.92	32.79	26.79	54	27.21

802.11n-HT20 Mode: Chain0+Chian1:

Frequency	Receiver		Turntable Degree	Rx Antenna		Corrected Factor	Corrected Amplitude	Extrapolation Result	Limit	Margin
	Reading	Detector		Height	Polar					
(MHz)	(dBμV)	(PK/QP/AV)		(cm)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dBμV/m)	(dB)
5150-5250 MHz band-Low Channel:5180 MHz										
81.88	49.36	QP	267	179	V	-17.49	31.87	/	40.00	8.13
298.35	50.99	QP	42	161	H	-10.25	40.74	/	46.00	5.26
5180.00	102.32	PK	335	180	V	3.31	105.63	99.63	/	/
5180.00	86.14	AV	335	180	V	3.31	89.45	83.45	/	/
5180.00	100.25	PK	179	119	H	3.31	103.56	97.56	/	/
5180.00	83.54	AV	179	119	H	3.31	86.85	80.85	/	/
5150.00	49.35	PK	39	232	V	3.24	52.59	46.59	74	27.41
5150.00	33.17	AV	39	232	V	3.24	36.41	30.41	54	23.59
10360.00	43.52	PK	287	239	H	16.39	59.91	53.91	74	20.09
10360.00	27.94	AV	287	239	H	16.39	44.33	38.33	54	15.67
15540.00	36.58	PK	75	184	V	16.25	52.83	46.83	74	27.17
15540.00	22.65	AV	75	184	V	16.25	38.90	32.90	54	21.10
6874.52	41.32	PK	33	176	H	9.18	50.50	44.50	74	29.50
6874.52	26.85	AV	33	176	H	9.18	36.03	30.03	54	23.97
5150-5250 MHz band-Middle Channel:5200MHz										
81.88	49.38	QP	335	130	V	-17.49	31.89	/	40.00	8.11
298.35	50.77	QP	17	177	H	-10.25	40.52	/	46.00	5.48
5200.00	101.02	PK	319	148	V	3.35	104.37	98.37	/	/
5200.00	83.52	AV	319	148	V	3.35	86.87	80.87	/	/
5200.00	99.71	PK	58	103	H	3.35	103.06	97.06	/	/
5200.00	82.64	AV	58	103	H	3.35	85.99	79.99	/	/
10400.00	42.98	PK	164	155	V	16.56	59.54	53.54	74	20.46
10400.00	27.35	AV	164	155	V	16.56	43.91	37.91	54	16.09
15600.00	38.15	PK	86	194	V	16.44	54.59	48.59	74	25.41
15600.00	22.91	AV	86	194	V	16.44	39.35	33.35	54	20.65
2318.34	40.53	PK	176	184	H	-5.16	35.37	29.37	74	44.63
2318.34	24.97	AV	176	184	H	-5.16	19.81	13.81	54	40.19
6874.52	40.08	PK	201	241	V	9.18	49.26	43.26	74	30.74
6874.52	26.93	AV	201	241	V	9.18	36.11	30.11	54	23.89
5150-5250 MHz band-High Channel:5240MHz										
81.88	49.35	QP	174	185	V	-17.49	31.86	/	40.00	8.14
298.35	50.18	QP	318	117	H	-10.25	39.93	/	46.00	6.07
5240.00	101.32	PK	153	202	V	3.44	104.76	98.76	/	/
5240.00	85.35	AV	153	202	V	3.44	88.79	82.79	/	/
5240.00	99.35	PK	355	180	H	3.44	102.79	96.79	/	/
5240.00	83.71	AV	355	180	H	3.44	87.15	81.15	/	/
5350.00	42.12	PK	24	122	H	3.68	45.80	39.80	74	34.20
5350.00	26.25	AV	24	122	H	3.68	29.93	23.93	54	30.07
10480.00	43.77	PK	336	174	H	16.90	60.67	54.67	74	19.33
10480.00	26.67	AV	336	174	H	16.90	43.57	37.57	54	16.43
15720.00	38.35	PK	352	177	V	16.83	55.18	49.18	74	24.82
15720.00	23.14	AV	352	177	V	16.83	39.97	33.97	54	20.03
6874.52	39.87	PK	243	215	V	9.18	49.05	43.05	74	30.95
6874.52	26.74	AV	243	215	V	9.18	35.92	29.92	54	24.08

Frequency	Receiver		Turntable Degree	Rx Antenna		Corrected Factor	Corrected Amplitude	Extrapolation Result	Limit	Margin
	Reading	Detector		Height	Polar					
(MHz)	(dBµV)	(PK/QP/AV)		(cm)	(H/V)	(dB)	(dBµV/m)	(dBµV/m)	(dBµV/m)	(dB)
5725-5850 MHz band-Low Channel:5745 MHz										
81.88	49.36	QP	315	166	V	-17.49	31.87	/	40.00	8.13
298.35	50.87	QP	356	132	H	-10.25	40.62	/	46.00	5.38
5745.00	102.55	PK	53	221	V	4.84	107.39	101.39	/	/
5745.00	86.23	AV	53	221	V	4.84	91.07	85.07	/	/
5745.00	100.54	PK	234	150	H	4.84	105.38	99.38	/	/
5745.00	85.23	AV	234	150	H	4.84	90.07	84.07	/	/
5725.00	47.65	PK	203	102	V	4.77	52.42	46.42	74	27.58
5725.00	31.56	AV	203	102	V	4.77	36.33	30.33	54	23.67
11490.00	46.54	PK	302	110	H	18.24	64.78	58.78	74	15.22
11490.00	29.97	AV	302	110	H	18.24	48.21	42.21	54	11.79
17235.00	37.35	PK	42	230	H	22.26	59.61	53.61	74	20.39
17235.00	23.45	AV	42	230	H	22.26	45.71	39.71	54	14.29
6768.22	40.11	PK	6	167	V	8.92	49.03	43.03	74	30.97
6768.22	26.87	AV	6	167	V	8.92	35.79	29.79	54	24.21
5725-5850 MHz band-Middle Channel:5785MHz										
81.88	49.33	QP	303	244	V	-17.49	31.84	/	40.00	8.16
298.35	50.09	QP	177	152	H	-10.25	39.84	/	46.00	6.16
5785.00	100.71	PK	11	203	V	4.97	105.68	99.68	/	/
5785.00	83.25	AV	11	203	V	4.97	88.22	82.22	/	/
5785.00	98.24	PK	244	187	H	4.97	103.21	97.21	/	/
5785.00	82.74	AV	244	187	H	4.97	87.71	81.71	/	/
11570.00	42.32	PK	314	187	V	18.01	60.33	54.33	74	19.67
11570.00	26.71	AV	314	187	V	18.01	44.72	38.72	54	15.28
17355.00	37.96	PK	8	144	H	22.80	60.76	54.76	74	19.24
17355.00	23.02	AV	8	144	H	22.80	45.82	39.82	54	14.18
2335.64	38.99	PK	322	248	H	-5.11	33.88	27.88	74	46.12
2335.64	21.32	AV	322	248	H	-5.11	16.21	10.21	54	43.79
6768.22	39.74	PK	26	187	V	8.92	48.66	42.66	74	31.34
6768.22	23.85	AV	26	187	V	8.92	32.77	26.77	54	27.23
5725-5850 MHz band-High Channel:5825MHz										
81.88	49.63	QP	331	128	V	-17.49	32.14	/	40.00	7.86
298.35	50.87	QP	16	215	H	-10.25	40.62	/	46.00	5.38
5825.00	100.15	PK	331	186	V	5.11	105.26	99.26	/	/
5825.00	84.35	AV	331	186	V	5.11	89.46	83.46	/	/
5825.00	98.66	PK	200	114	H	5.11	103.77	97.77	/	/
5825.00	83.17	AV	200	114	H	5.11	88.28	82.28	/	/
5850.00	50.02	PK	342	104	V	5.19	55.21	49.21	74	24.79
5850.00	34.32	AV	342	104	V	5.19	39.51	33.51	54	20.49
11650.00	42.74	PK	19	211	H	17.72	60.46	54.46	74	19.54
11650.00	26.02	AV	19	211	H	17.72	43.74	37.74	54	16.26
17475.00	38.88	PK	151	183	H	23.55	62.43	56.43	74	17.57
17475.00	23.74	AV	151	183	H	23.55	47.29	41.29	54	12.71
6768.22	39.26	PK	81	149	V	8.92	48.18	42.18	74	31.82
6768.22	23.96	AV	81	149	V	8.92	32.88	26.88	54	27.12

802.11n-HT40 Mode: Chain0+Chian1:

Frequency	Receiver		Turntable Degree	Rx Antenna		Corrected Factor	Corrected Amplitude	Extrapolation Result	Limit	Margin
	Reading	Detector		Height	Polar					
(MHz)	(dBµV)	(PK/QP/AV)		(cm)	(H/V)	(dB)	(dBµV/m)	(dBµV/m)	(dBµV/m)	(dB)
5150-5250 MHz band-Low Channel:5190 MHz										
81.88	49.11	QP	171	111	V	-17.49	31.62	/	40.00	8.38
298.35	50.25	QP	129	207	H	-10.25	40.00	/	46.00	6.00
5190.00	98.35	PK	172	161	V	3.33	101.68	95.68	/	/
5190.00	76.88	AV	172	161	V	3.33	80.21	74.21	/	/
5190.00	96.36	PK	4	197	H	3.33	99.69	93.69	/	/
5190.00	74.96	AV	4	197	H	3.33	78.29	72.29	/	/
5150.00	45.35	PK	168	165	H	3.24	48.59	42.59	74	31.41
5150.00	32.11	AV	168	165	H	3.24	35.35	29.35	54	24.65
10380.00	45.23	PK	147	160	V	16.48	61.71	55.71	74	18.29
10380.00	32.02	AV	147	160	V	16.48	48.50	42.50	54	11.50
15570.00	37.38	PK	151	198	H	16.35	53.73	47.73	74	26.27
15570.00	24.13	AV	151	198	H	16.35	40.48	34.48	54	19.52
6735.00	37.35	PK	123	152	V	8.84	46.19	40.19	74	33.81
6735.00	25.32	AV	123	152	V	8.84	34.16	28.16	54	25.84
5150-5250 MHz band-High Channel:5230MHz										
81.88	49.35	QP	193	125	V	-17.49	31.86	/	40.00	8.14
298.35	50.97	QP	344	147	H	-10.25	40.72	/	46.00	5.28
5230.00	99.35	PK	349	235	V	3.42	102.77	96.77	/	/
5230.00	77.57	AV	349	235	V	3.42	80.99	74.99	/	/
5230.00	96.87	PK	169	149	H	3.42	100.29	94.29	/	/
5230.00	75.02	AV	169	149	H	3.42	78.44	72.44	/	/
5350.00	45.84	PK	193	145	V	3.68	49.52	43.52	74	30.48
5350.00	31.26	AV	193	145	V	3.68	34.94	28.94	54	25.06
10460.00	35.18	PK	175	240	H	16.81	51.99	45.99	74	28.01
10460.00	21.45	AV	175	240	H	16.81	38.26	32.26	54	21.74
15690.00	33.06	PK	63	203	V	16.74	49.80	43.80	74	30.20
15690.00	20.35	AV	63	203	V	16.74	37.09	31.09	54	22.91
6735.00	40.51	PK	300	114	V	8.84	49.35	43.35	74	30.65
6735.00	28.64	AV	300	114	V	8.84	37.48	31.48	54	22.52

Frequency	Receiver		Turntable Degree	Rx Antenna		Corrected Factor	Corrected Amplitude	Extrapolation Result	Limit	Margin
	Reading	Detector		Height	Polar					
(MHz)	(dBµV)	(PK/QP/AV)		(cm)	(H/V)	(dB)	(dBµV/m)	(dBµV/m)	(dBµV/m)	(dB)
5725-5850 MHz band-Low Channel:5755 MHz										
81.88	49.33	QP	79	231	V	-17.49	31.84	/	40.00	8.16
298.35	50.27	QP	251	235	H	-10.25	40.02	/	46.00	5.98
5755.00	99.32	PK	229	240	V	4.87	104.19	98.19	/	/
5755.00	76.02	AV	229	240	V	4.87	80.89	74.89	/	/
5755.00	98.35	PK	291	105	H	4.87	103.22	97.22	/	/
5755.00	75.14	AV	291	105	H	4.87	80.01	74.01	/	/
5725.00	51.25	PK	15	199	H	4.77	56.02	50.02	74	23.98
5725.00	35.74	AV	15	199	H	4.77	40.51	34.51	54	19.49
11510.00	38.52	PK	273	200	V	18.22	56.74	50.74	74	23.26
11510.00	25.21	AV	273	200	V	18.22	43.43	37.43	54	16.57
17265.00	36.01	PK	319	223	H	22.43	58.44	52.44	74	21.56
17265.00	23.41	AV	319	223	H	22.43	45.84	39.84	54	14.16
6725.00	35.32	PK	187	188	V	8.81	44.13	38.13	74	35.87
6725.00	23.11	AV	187	188	V	8.81	31.92	25.92	54	28.08
5725-5850 MHz band-High Channel:5795MHz										
81.88	49.08	QP	239	176	V	-17.49	31.59	/	40.00	8.41
298.35	50.56	QP	271	237	H	-10.25	40.31	/	46.00	5.69
5795.00	98.32	PK	69	249	V	5.01	103.33	97.33	/	/
5795.00	75.14	AV	69	249	V	5.01	80.15	74.15	/	/
5795.00	97.16	PK	125	112	H	5.01	102.17	96.17	/	/
5795.00	74.35	AV	125	112	H	5.01	79.36	73.36	/	/
5850.00	51.26	PK	293	211	V	5.19	56.45	50.45	74	23.55
5850.00	37.66	AV	293	211	V	5.19	42.85	36.85	54	17.15
11590.00	45.32	PK	46	233	V	17.94	63.26	57.26	74	16.74
11590.00	32.74	AV	46	233	V	17.94	50.68	44.68	54	9.32
17385.00	36.25	PK	334	107	H	23.07	59.32	53.32	74	20.68
17385.00	23.47	AV	334	107	H	23.07	46.54	40.54	54	13.46
6725.00	38.85	PK	254	129	V	8.81	47.66	41.66	74	32.34
6725.00	24.32	AV	254	129	V	8.81	33.13	27.13	54	26.87

802.11ac20 mode: Chain0+Chain1:

Frequency	Receiver		Turntable Degree	Rx Antenna		Corrected Factor	Corrected Amplitude	Extrapolation result	Limit	Margin
	Reading	Detector		Height	Polar					
(MHz)	(dBμV)	(PK/QP/AV)		(cm)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dBμV/m)	(dB)
5150-5250 MHz band-Low Channel:5180 MHz										
81.88	49.36	QP	92	155	V	-17.49	31.87	/	40.00	8.13
298.35	50.16	QP	299	118	H	-10.25	39.91	/	46.00	6.09
5180.00	101.35	PK	234	122	V	3.31	104.66	98.66	/	/
5180.00	85.61	AV	234	122	V	3.31	88.92	82.92	/	/
5180.00	99.96	PK	71	135	H	3.31	103.27	97.27	/	/
5180.00	82.87	AV	71	135	H	3.31	86.18	80.18	/	/
5150.00	48.35	PK	50	119	V	3.24	51.59	45.59	74	28.41
5150.00	32.08	AV	50	119	V	3.24	35.32	29.32	54	24.68
10360.00	42.35	PK	51	124	H	16.39	58.74	52.74	74	21.26
10360.00	27.33	AV	51	124	H	16.39	43.72	37.72	54	16.28
15540.00	36.74	PK	111	176	V	16.25	52.99	46.99	74	27.01
15540.00	23.74	AV	111	176	V	16.25	39.99	33.99	54	20.01
6874.52	39.87	PK	209	143	H	9.18	49.05	43.05	74	30.95
6874.52	25.13	AV	209	143	H	9.18	34.31	28.31	54	25.69
5150-5250 MHz band-Middle Channel:5200MHz										
81.88	49.66	QP	64	221	V	-17.49	32.17	/	40.00	7.83
298.35	50.87	QP	183	102	H	-10.25	40.62	/	46.00	5.38
5200.00	100.74	PK	299	107	V	3.35	104.09	98.09	/	/
5200.00	82.13	AV	299	107	V	3.35	85.48	79.48	/	/
5200.00	98.54	PK	97	109	H	3.35	101.89	95.89	/	/
5200.00	81.36	AV	97	109	H	3.35	84.71	78.71	/	/
10400.00	40.63	PK	97	212	V	16.56	57.19	51.19	74	22.81
10400.00	26.47	AV	97	212	V	16.56	43.03	37.03	54	16.97
15600.00	38.63	PK	154	117	V	16.44	55.07	49.07	74	24.93
15600.00	22.98	AV	154	117	V	16.44	39.42	33.42	54	20.58
2318.34	39.32	PK	126	188	H	-5.16	34.16	28.16	74	45.84
2318.34	25.31	AV	126	188	H	-5.16	20.15	14.15	54	39.85
6874.52	40.65	PK	121	113	V	9.18	49.83	43.83	74	30.17
6874.52	25.74	AV	121	113	V	9.18	34.92	28.92	54	25.08
5150-5250 MHz band-High Channel:5240MHz										
81.88	49.25	QP	287	161	V	-17.49	31.76	/	40.00	8.24
298.35	50.08	QP	207	147	H	-10.25	39.83	/	46.00	6.17
5230.00	98.64	PK	245	171	V	3.44	102.08	96.08	/	/
5230.00	78.35	AV	245	171	V	3.44	81.79	75.79	/	/
5230.00	97.35	PK	47	173	H	3.44	100.79	94.79	/	/
5230.00	76.35	AV	47	173	H	3.44	79.79	73.79	/	/
5350.00	45.22	PK	99	124	H	3.68	48.90	42.90	74	31.10
5350.00	30.23	AV	99	124	H	3.68	33.91	27.91	54	26.09
10460.00	34.25	PK	351	219	H	16.90	51.15	45.15	74	28.85
10460.00	21.03	AV	351	219	H	16.90	37.93	31.93	54	22.07
15690.00	34.18	PK	142	155	V	16.83	51.01	45.01	74	28.99
15690.00	20.74	AV	142	155	V	16.83	37.57	31.57	54	22.43
6735.00	40.27	PK	100	228	V	9.18	49.45	43.45	74	30.55
6735.00	28.12	AV	100	228	V	9.18	37.30	31.30	54	22.70

Frequency	Receiver		Turntable Degree	Rx Antenna		Corrected Factor	Corrected Amplitude	Extrapolation Result	Limit	Margin
	Reading	Detector		Height	Polar					
(MHz)	(dBµV)	(PK/QP/AV)		(cm)	(H/V)	(dB)	(dBµV/m)	(dBµV/m)	(dBµV/m)	(dB)
5725-5850 MHz band-Low Channel:5745 MHz										
81.88	49.39	QP	168	133	V	-17.49	31.90	/	40.00	8.10
298.35	50.97	QP	203	105	H	-10.25	40.72	/	46.00	5.28
5745.00	101.98	PK	5	153	V	4.84	106.82	100.82	/	/
5745.00	85.74	AV	5	153	V	4.84	90.58	84.58	/	/
5745.00	99.74	PK	185	182	H	4.84	104.58	98.58	/	/
5745.00	84.36	AV	185	182	H	4.84	89.20	83.20	/	/
5725.00	46.48	PK	141	179	V	4.77	51.25	45.25	74	28.75
5725.00	32.15	AV	141	179	V	4.77	36.92	30.92	54	23.08
11490.00	45.23	PK	232	118	H	18.24	63.47	57.47	74	16.53
11490.00	30.85	AV	232	118	H	18.24	49.09	43.09	54	10.91
17235.00	36.14	PK	100	202	H	22.26	58.40	52.40	74	21.60
17235.00	24.23	AV	100	202	H	22.26	46.49	40.49	54	13.51
6768.22	39.25	PK	299	140	V	8.92	48.17	42.17	74	31.83
6768.22	25.74	AV	299	140	V	8.92	34.66	28.66	54	25.34
5725-5850 MHz band-Middle Channel:5785MHz										
81.88	49.39	QP	59	250	V	-17.49	31.90	/	40.00	8.10
298.35	50.22	QP	69	141	H	-10.25	39.97	/	46.00	6.03
5785.00	101.52	PK	26	170	V	4.97	106.49	100.49	/	/
5785.00	84.36	AV	26	170	V	4.97	89.33	83.33	/	/
5785.00	97.23	PK	97	123	H	4.97	102.20	96.20	/	/
5785.00	83.12	AV	97	123	H	4.97	88.09	82.09	/	/
11570.00	43.23	PK	342	239	V	18.01	61.24	55.24	74	18.76
11570.00	27.74	AV	342	239	V	18.01	45.75	39.75	54	14.25
17355.00	36.78	PK	265	227	H	22.80	59.58	53.58	74	20.42
17355.00	22.96	AV	265	227	H	22.80	45.76	39.76	54	14.24
2335.64	37.48	PK	50	195	H	-5.11	32.37	26.37	74	47.63
2335.64	20.65	AV	50	195	H	-5.11	15.54	9.54	54	44.46
6768.22	38.24	PK	106	244	V	8.92	47.16	41.16	74	32.84
6768.22	23.54	AV	106	244	V	8.92	32.46	26.46	54	27.54
5725-5850 MHz band-High Channel:5825MHz										
81.88	49.87	QP	57	225	V	-17.49	32.38	/	40.00	7.62
298.35	50.16	QP	182	110	H	-10.25	39.91	/	46.00	6.09
5825.00	100.54	PK	350	189	V	5.11	105.65	99.65	/	/
5825.00	84.63	AV	350	189	V	5.11	89.74	83.74	/	/
5825.00	98.15	PK	304	161	H	5.11	103.26	97.26	/	/
5825.00	83.62	AV	304	161	H	5.11	88.73	82.73	/	/
5850.00	50.15	PK	134	185	V	5.19	55.34	49.34	74	24.66
5850.00	34.68	AV	134	185	V	5.19	39.87	33.87	54	20.13
11650.00	41.69	PK	332	224	H	17.72	59.41	53.41	74	20.59
11650.00	25.96	AV	332	224	H	17.72	43.68	37.68	54	16.32
17475.00	38.14	PK	78	101	H	23.55	61.69	55.69	74	18.31
17475.00	24.47	AV	78	101	H	23.55	48.02	42.02	54	11.98
6768.22	39.77	PK	187	205	V	8.92	48.69	42.69	74	31.31
6768.22	23.74	AV	187	205	V	8.92	32.66	26.66	54	27.34

802.11ac40 mode: Chain0+Chain1:

Frequency	Receiver		Turntable Degree	Rx Antenna		Corrected Factor	Corrected Amplitude	Extrapolation result	Limit	Margin
	Reading	Detector		Height	Polar					
(MHz)	(dBμV)	(PK/QP/AV)		(cm)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dBμV/m)	(dB)
5150-5250 MHz band-Low Channel:5190 MHz										
81.88	49.35	QP	227	145	V	-17.49	31.86	/	40.00	8.14
298.35	50.52	QP	231	164	H	-10.25	40.27	/	46.00	5.73
5190.00	99.36	PK	262	184	V	3.33	102.69	96.69	/	/
5190.00	76.85	AV	262	184	V	3.33	80.18	74.18	/	/
5190.00	96.32	PK	312	207	H	3.33	99.65	93.65	/	/
5190.00	75.63	AV	312	207	H	3.33	78.96	72.96	/	/
5150.00	44.36	PK	12	183	H	3.24	47.60	41.60	74	32.40
5150.00	31.95	AV	12	183	H	3.24	35.19	29.19	54	24.81
10380.00	44.21	PK	193	126	V	16.48	60.69	54.69	74	19.31
10380.00	31.35	AV	193	126	V	16.48	47.83	41.83	54	12.17
15570.00	38.02	PK	10	171	H	16.35	54.37	48.37	74	25.63
15570.00	23.32	AV	10	171	H	16.35	39.67	33.67	54	20.33
6735.00	36.25	PK	230	233	V	8.84	45.09	39.09	74	34.91
6735.00	25.01	AV	230	233	V	8.84	33.85	27.85	54	26.15
5150-5250 MHz band-High Channel:5230MHz										
81.88	49.97	QP	174	242	V	-17.49	32.48	/	40.00	7.52
298.35	50.33	QP	261	246	H	-10.25	40.08	/	46.00	5.92
5230.00	99.74	PK	189	193	V	3.42	103.16	97.16	/	/
5230.00	77.36	AV	189	193	V	3.42	80.78	74.78	/	/
5230.00	95.84	PK	28	230	H	3.42	99.26	93.26	/	/
5230.00	76.36	AV	28	230	H	3.42	79.78	73.78	/	/
5350.00	44.37	PK	201	153	V	3.68	48.05	42.05	74	31.95
5350.00	32.24	AV	201	153	V	3.68	35.92	29.92	54	24.08
10460.00	36.12	PK	185	192	H	16.81	52.93	46.93	74	27.07
10460.00	23.23	AV	185	192	H	16.81	40.04	34.04	54	19.96
15690.00	35.26	PK	353	112	V	16.74	52.00	46.00	74	28.00
15690.00	23.57	AV	353	112	V	16.74	40.31	34.31	54	19.69
6735.00	38.12	PK	330	115	V	8.84	46.96	40.96	74	33.04
6735.00	27.61	AV	330	115	V	8.84	36.45	30.45	54	23.55

Frequency	Receiver		Turntable Degree	Rx Antenna		Corrected Factor	Corrected Amplitude	Extrapolation result	Limit	Margin
	Reading	Detector		Height	Polar					
(MHz)	(dBμV)	(PK/QP/AV)		(cm)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dBμV/m)	(dB)
5725-5850 MHz band-Low Channel:5755 MHz										
81.88	48.95	QP	256	147	V	-17.49	31.46	/	40.00	8.54
298.35	50.58	QP	61	107	H	-10.25	40.33	/	46.00	5.67
5755.00	100.23	PK	272	240	V	4.87	105.10	99.10	/	/
5755.00	77.36	AV	272	240	V	4.87	82.23	76.23	/	/
5755.00	98.02	PK	186	124	H	4.87	102.89	96.89	/	/
5755.00	74.36	AV	186	124	H	4.87	79.23	73.23	/	/
5725.00	50.63	PK	280	100	H	4.77	55.40	49.40	74	24.60
5725.00	34.12	AV	280	100	H	4.77	38.89	32.89	54	21.11
11510.00	38.58	PK	117	218	V	18.22	56.80	50.80	74	23.20
11510.00	25.27	AV	117	218	V	18.22	43.49	37.49	54	16.51
17265.00	36.84	PK	90	203	H	22.43	59.27	53.27	74	20.73
17265.00	23.46	AV	90	203	H	22.43	45.89	39.89	54	14.11
6725.00	35.31	PK	251	159	V	8.81	44.12	38.12	74	35.88
6725.00	23.18	AV	251	159	V	8.81	31.99	25.99	54	28.01
5725-5850 MHz band-High Channel:5795MHz										
81.88	49.05	QP	53	201	V	-17.49	31.56	/	40.00	8.44
298.35	50.74	QP	330	245	H	-10.25	40.49	/	46.00	5.51
5795.00	99.38	PK	172	143	V	5.01	104.39	98.39	/	/
5795.00	75.19	AV	172	143	V	5.01	80.20	74.20	/	/
5795.00	98.35	PK	143	228	H	5.01	103.36	97.36	/	/
5795.00	74.42	AV	143	228	H	5.01	79.43	73.43	/	/
5850.00	52.78	PK	269	151	V	5.19	57.97	51.97	74	22.03
5850.00	37.54	AV	269	151	V	5.19	42.73	36.73	54	17.27
11590.00	46.38	PK	228	121	V	17.94	64.32	58.32	74	15.68
11590.00	33.21	AV	228	121	V	17.94	51.15	45.15	54	8.85
17385.00	37.24	PK	92	107	H	23.07	60.31	54.31	74	19.69
17385.00	24.48	AV	92	107	H	23.07	47.55	41.55	54	12.45
6725.00	37.86	PK	289	135	V	8.81	46.67	40.67	74	33.33
6725.00	25.72	AV	289	135	V	8.81	34.53	28.53	54	25.47

802.11ac80 mode: Chain0+Chain1:

Frequency	Receiver		Turntable Degree	Rx Antenna		Corrected Factor	Corrected Amplitude	Extrapolation result	Limit	Margin
	Reading	Detector		Height	Polar					
(MHz)	(dBμV)	(PK/QP/AV)		(cm)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dBμV/m)	(dB)
5150-5250 MHz band-Low Channel:5210 MHz										
81.88	49.16	QP	277	208	V	-17.49	31.67	/	40.00	8.33
298.35	50.85	QP	343	222	H	-10.25	40.60	/	46.00	5.40
5210.00	96.36	PK	286	159	V	2.29	98.65	92.65	/	/
5210.00	74.32	AV	286	159	V	2.29	76.61	70.61	/	/
5210.00	95.38	PK	101	231	H	2.29	97.67	91.67	/	/
5210.00	73.54	AV	101	231	H	2.29	75.83	69.83	/	/
5150.00	51.41	PK	259	162	H	2.23	53.64	47.64	74	26.36
5150.00	38.57	AV	259	162	H	2.23	40.80	34.80	54	19.20
10420.00	42.11	PK	20	141	H	13.75	55.86	49.86	74	24.14
10420.00	30.22	AV	20	141	H	13.75	43.97	37.97	54	16.03
15630.00	33.45	PK	275	195	H	12.84	46.29	40.29	74	33.71
15630.00	21.58	AV	275	195	H	12.84	34.42	28.42	54	25.58
6928.00	35.42	PK	182	234	V	7.13	42.55	36.55	74	37.45
6928.00	22.55	AV	182	234	V	7.13	29.68	23.68	54	30.32
5725-5850 MHz band-High Channel:5775MHz										
81.88	49.63	QP	136	210	V	-17.49	32.14	/	40.00	7.86
298.35	50.08	QP	310	169	H	-10.25	39.83	/	46.00	6.17
5775.00	96.56	PK	192	114	V	3.41	99.97	93.97	/	/
5775.00	74.30	AV	192	114	V	3.41	77.71	71.71	/	/
5775.00	94.32	PK	52	143	H	3.41	97.73	91.73	/	/
5775.00	73.21	AV	52	143	H	3.41	76.62	70.62	/	/
5725.00	42.12	PK	229	102	V	3.27	45.39	39.39	74	34.61
5725.00	29.39	AV	229	102	V	3.27	32.66	26.66	54	27.34
11550.00	43.54	PK	334	132	H	14.96	58.50	52.50	74	21.50
11550.00	30.21	AV	334	132	H	14.96	45.17	39.17	54	14.83
17325.00	34.85	PK	254	244	H	19.88	54.73	48.73	74	25.27
17325.00	20.61	AV	254	244	H	19.88	40.49	34.49	54	19.51
6928.00	36.31	PK	152	240	V	7.13	43.44	37.44	74	36.56
6928.00	25.02	AV	152	240	V	7.13	32.15	26.15	54	27.85

FCC §15.407(b) (1) (4) –BAND EDGE

Applicable Standard

FCC §15.407 (b) (1), (4);

For transmitters operating in the 5.15–5.25 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of -27dBm/MHz

For transmitters operating in the 5.725–5.850 GHz band: all emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibration or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measuremen instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 1 MHz and VBW to 3MHz of spectrum analyzer. Offset the antenna gain and cable loss.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

Test Data

Environmental Conditions

Temperature:	23.5 °C
Relative Humidity:	55 %
ATM Pressure:	101.2 kPa

The testing was performed by Kyle Xu on 2017-09-03 to 2017-09-11.

5150-5250 MHz

Band (MHz)	BAND EDGE	Reading Level (dBm/MHz)		E.I.R.P PSD (dBm/MHz)			Limits (dBm/MHz)	Result
		Chain0	Chain1	Chain0	Chain1	Total		
802.11a	left	-49.36	-51.26	-47.36	-49.26	/	-27	PASS
	right	-63.48	-62.79	-61.48	-60.79	/	-27	PASS
802.11n20	left	-58.62	-51.81	-56.62	-49.81	-48.99	-27	PASS
	right	-65.98	-64.24	-63.98	-62.24	-60.01	-27	PASS
802.11n40	left	-56.62	-52.20	-54.62	-50.20	-48.86	-27	PASS
	right	-68.16	-65.98	-66.16	-63.98	-61.92	-27	PASS
802.11ac20	left	-62.14	-60.98	-60.14	-58.98	-56.51	-27	PASS
	right	-67.00	-64.24	-65.00	-62.24	-60.39	-27	PASS
802.11ac40	left	-57.46	-58.22	-55.46	-56.22	-52.81	-27	PASS
	right	-67.00	-65.07	-65.00	-63.07	-60.92	-27	PASS
802.11ac80	left	-62.79	-59.96	-60.79	-57.96	-56.14	-27	PASS
	right	-67.00	-65.07	-65.00	-63.07	-60.92	-27	PASS

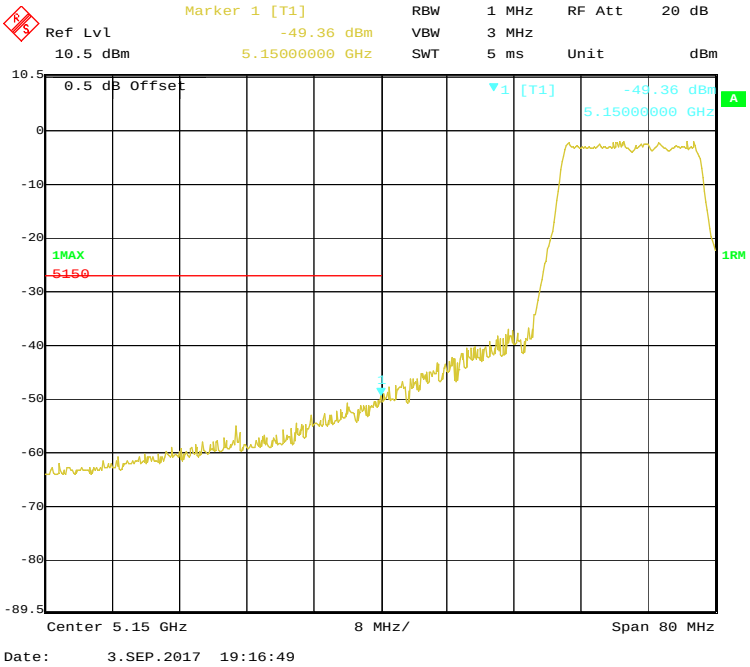
5725-5850 MHz

Band (MHz)	BAND EDGE	Reading Level (dBm/MHz)		E.I.R.P PSD (dBm/MHz)			Margin (dB)	Result
		Chain0	Chain1	Chain0	Chain1	Total		
802.11a	left	-43.46	-44.48	-41.46	-42.48	/	>10dB	PASS
	right	-46.98	-44.48	-44.98	-42.48	/	>10dB	PASS
802.11n20	left	-47.74	-45.64	-45.74	-43.64	-41.55	>10dB	PASS
	right	-45.04	-44.48	-43.04	-42.48	-39.74	>10dB	PASS
802.11n40	left	-45.64	-43.96	-43.64	-41.96	-39.71	>10dB	PASS
	right	-45.64	-43.96	-43.64	-41.96	-39.71	>10dB	PASS
802.11ac20	left	-47.74	-46.48	-45.74	-44.48	-42.05	>10dB	PASS
	right	-46.29	-43.46	-44.29	-41.46	-39.64	>10dB	PASS
802.11ac40	left	-45.64	-45.04	-43.64	-43.04	-40.32	>10dB	PASS
	right	-45.64	-43.96	-43.64	-41.96	-39.71	>10dB	PASS
802.11ac80	left	-46.29	-45.64	-44.29	-43.64	-40.94	>10dB	PASS
	right	-46.98	-43.46	-44.98	-41.46	-39.86	>10dB	PASS

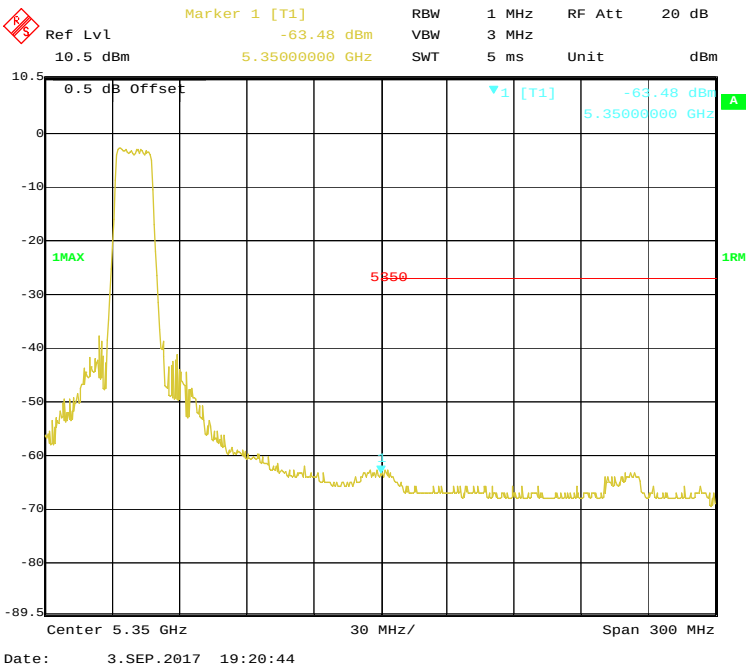
Note: The antenna gain is 2.0dBi.

5150-5250 MHz Band:

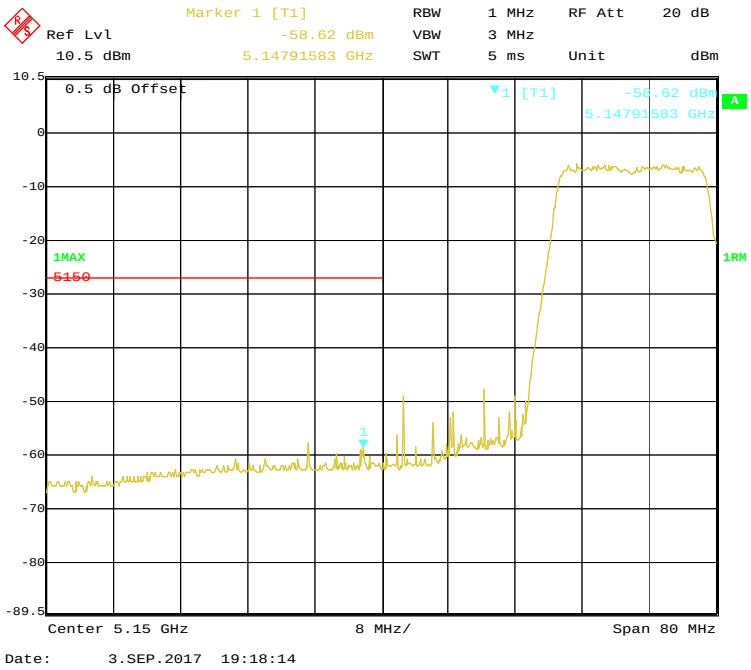
802.11a Chain0 Band Edge, Left Side



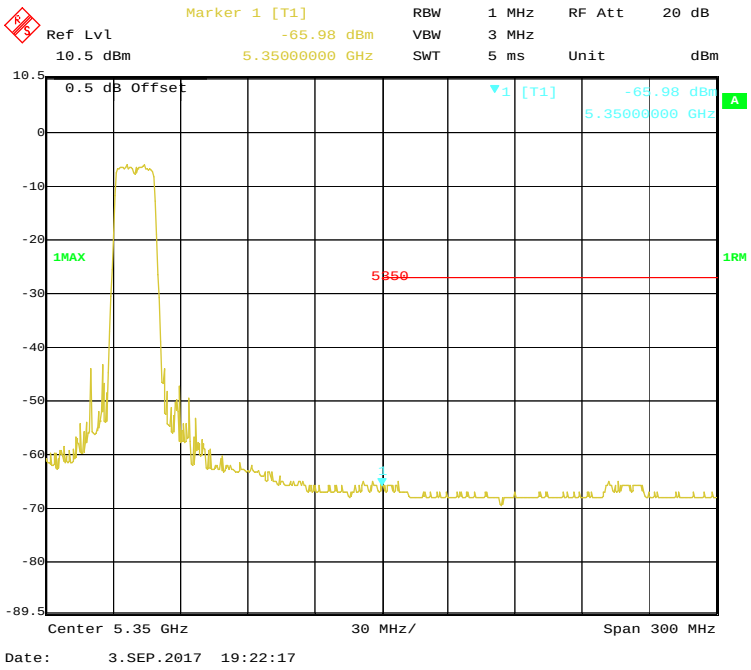
802.11a Chain0 Band Edge, Right Side



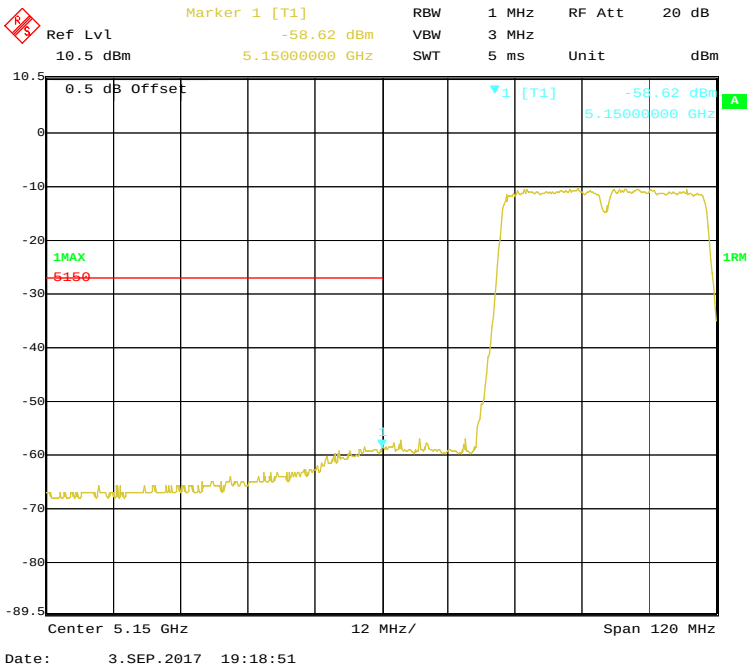
802.11n-HT20 Chain0 Band Edge, Left Side



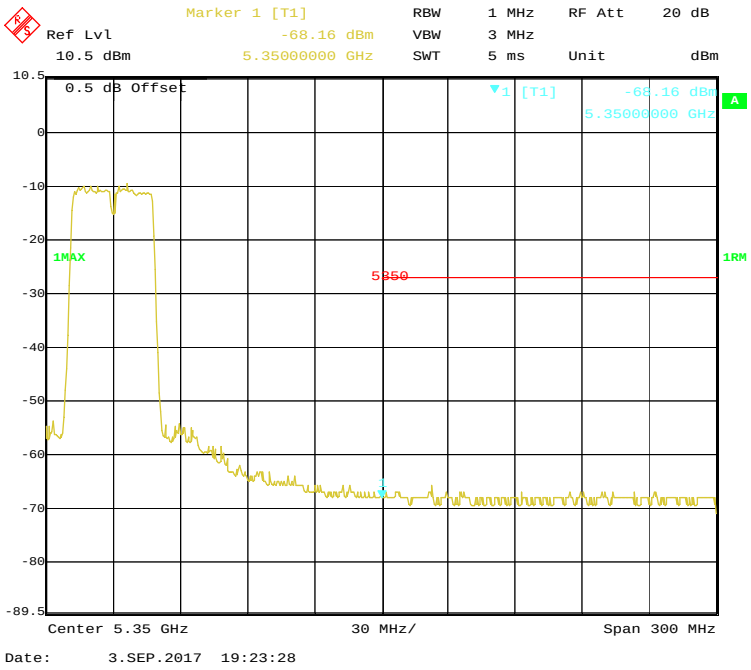
802.11n-HT20 Chain0 Band Edge, Right Side



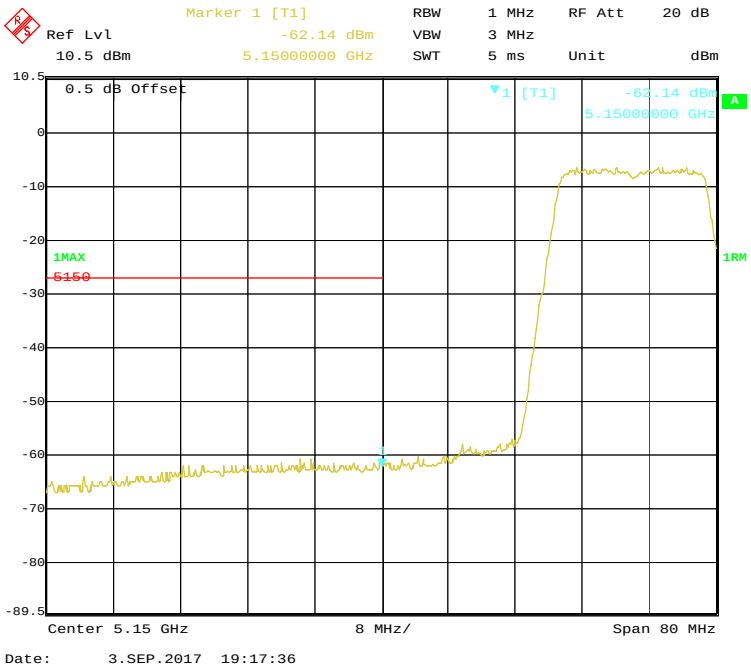
802.11n-HT40 Chain0 Band Edge, Left Side



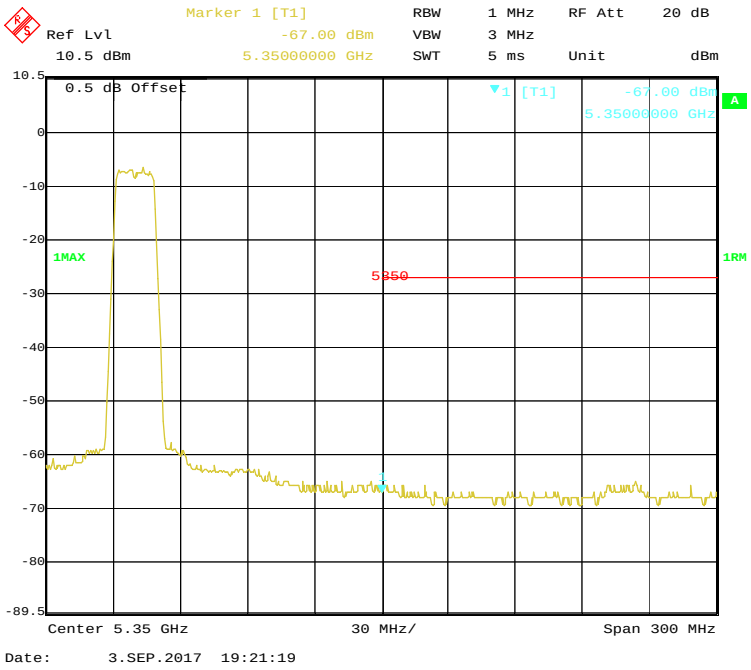
802.11n-HT40 Chain0 Band Edge, Right Side



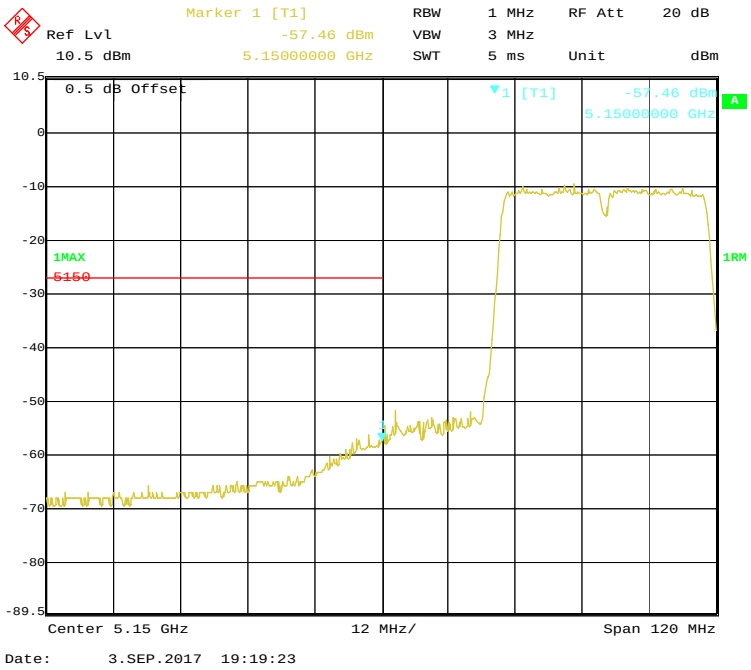
802.11ac20 Chain0 Band Edge, Left Side



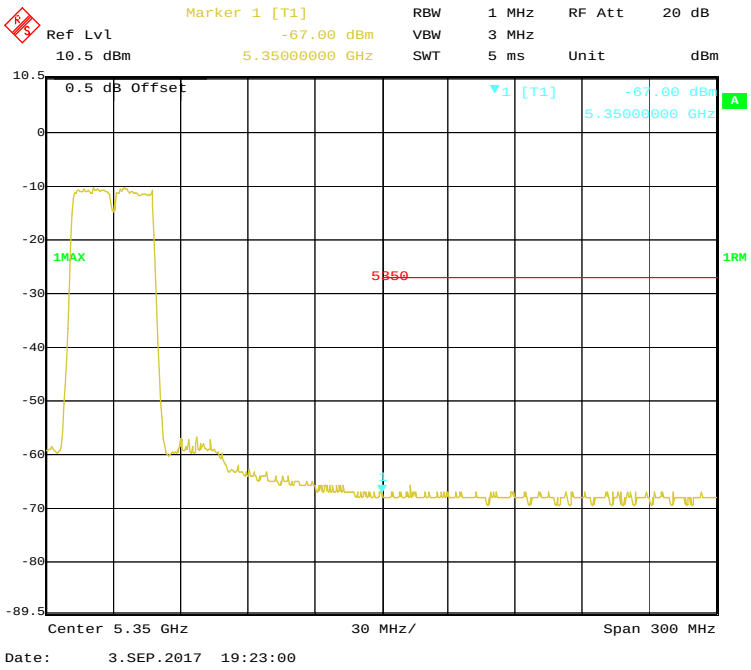
802.11ac20 Chain0 Band Edge, Right Side



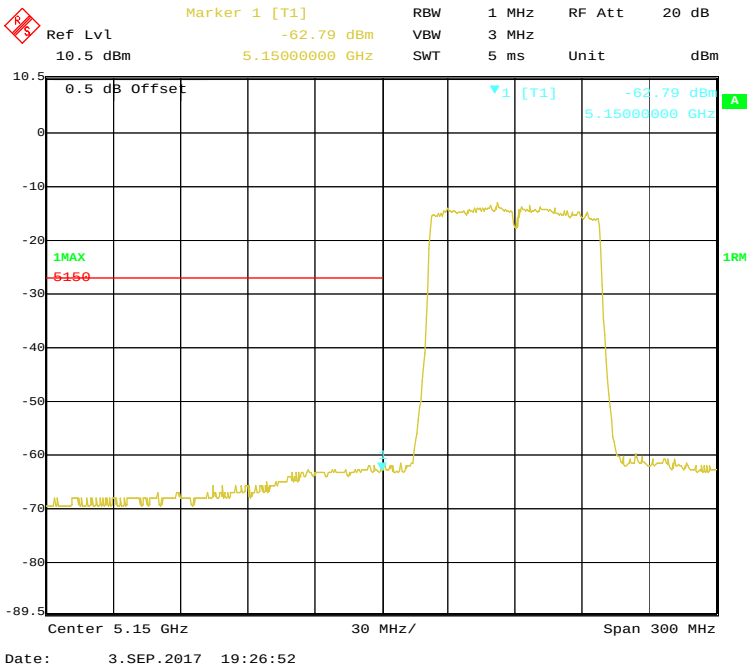
802.11ac40 Chain0 Band Edge, Left Side



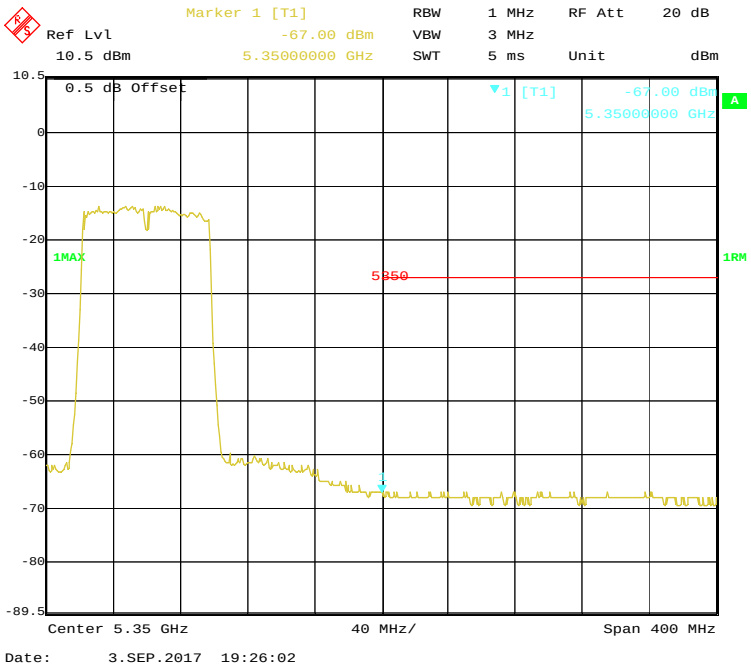
802.11ac40 Chain0 Band Edge, Right Side



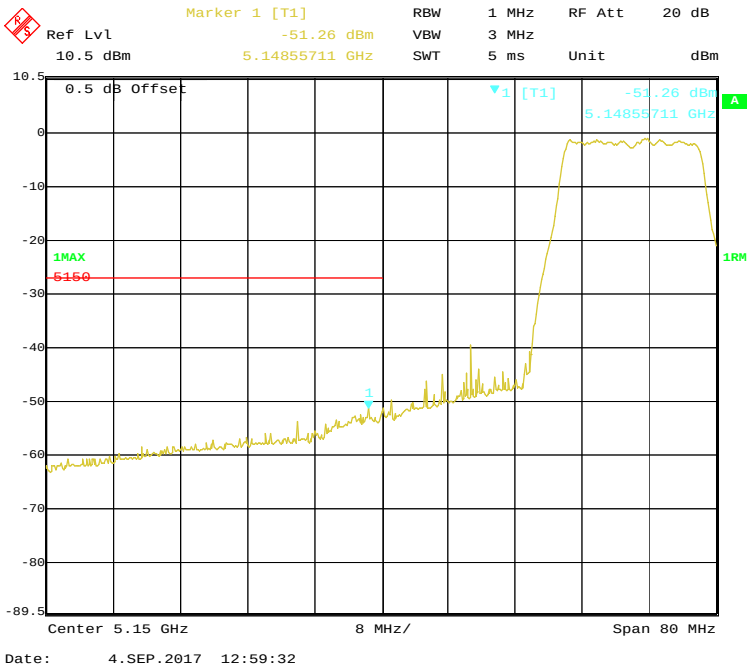
802.11ac80 Chain0 Band Edge, Left Side



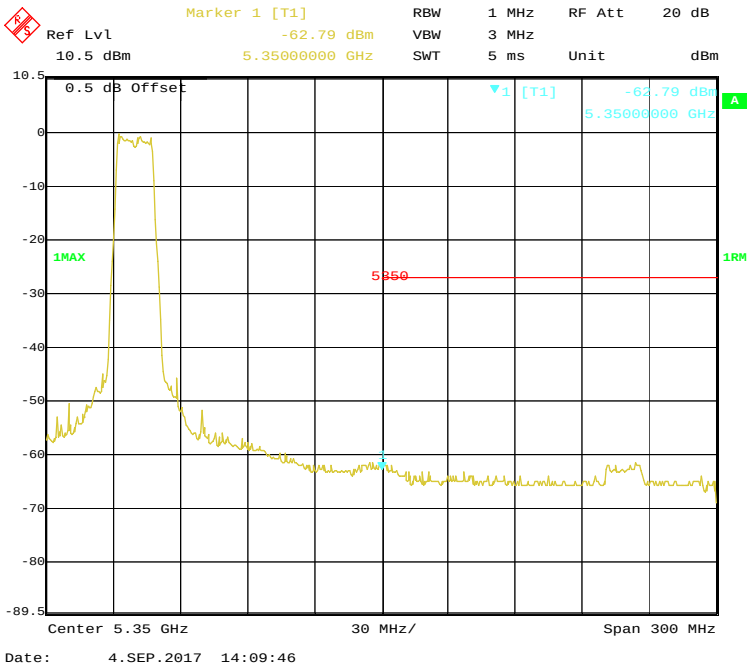
802.11ac80 Chain0 Band Edge, Right Side



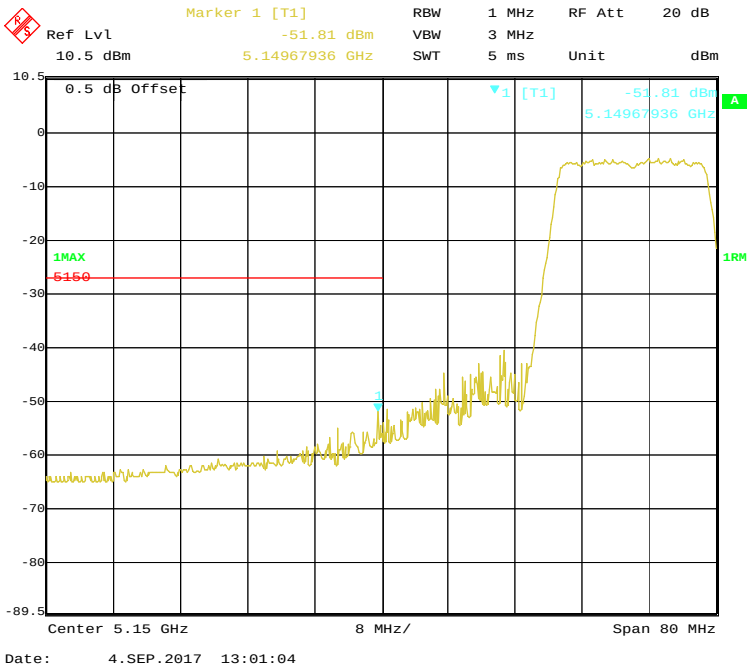
802.11a Chain1 Band Edge, Left Side



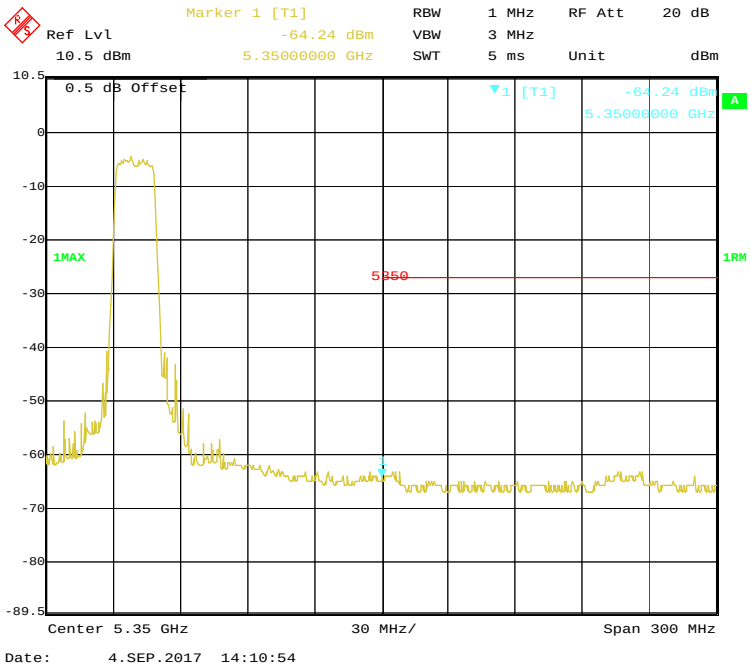
802.11a Chain1 Band Edge, Right Side



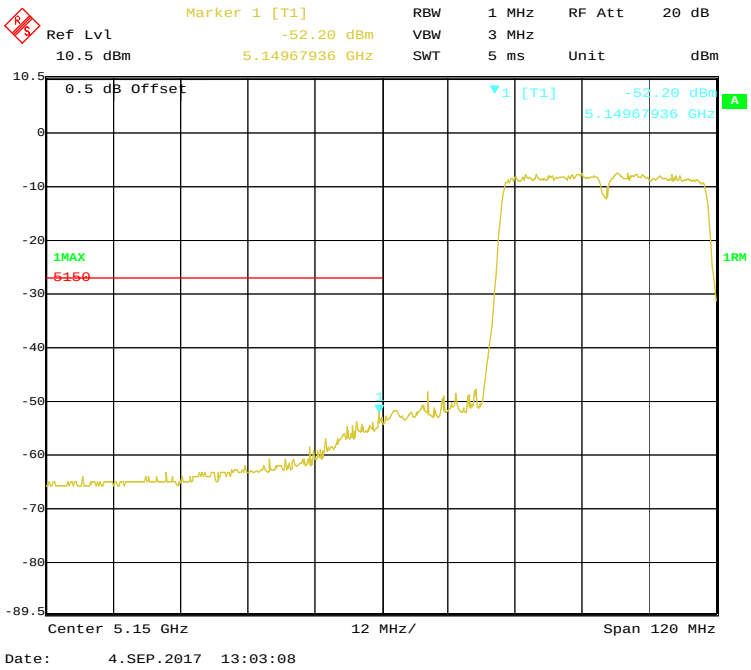
802.11n-HT20 Chain1 Band Edge, Left Side



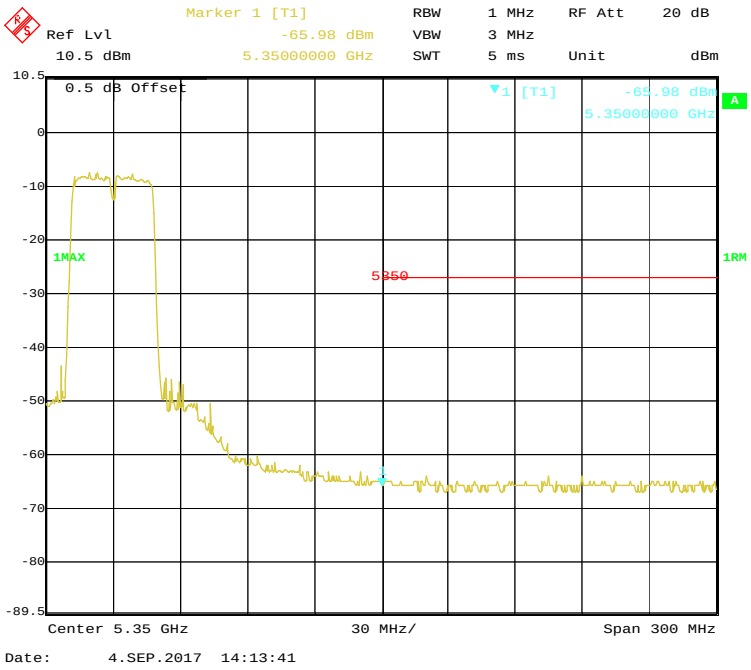
802.11n-HT20 Chain1 Band Edge, Right Side



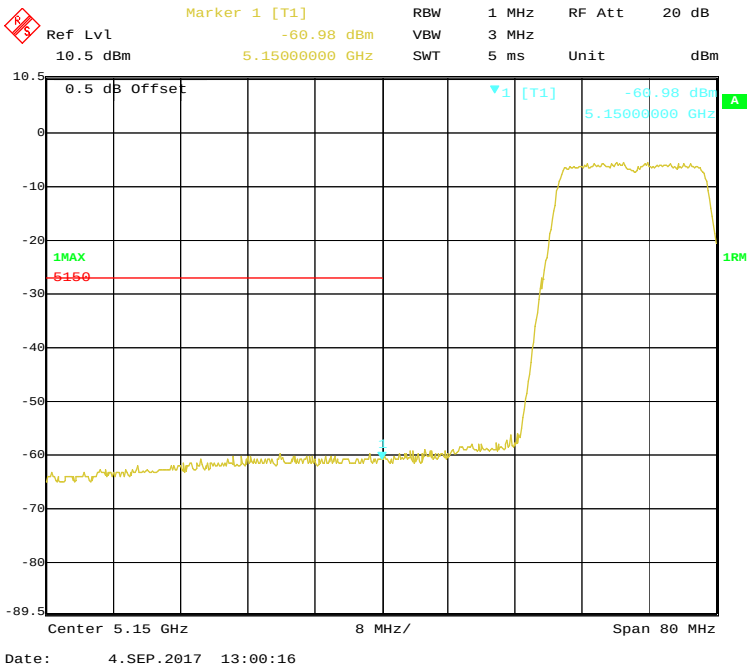
802.11n-HT40 Chain1 Band Edge, Left Side



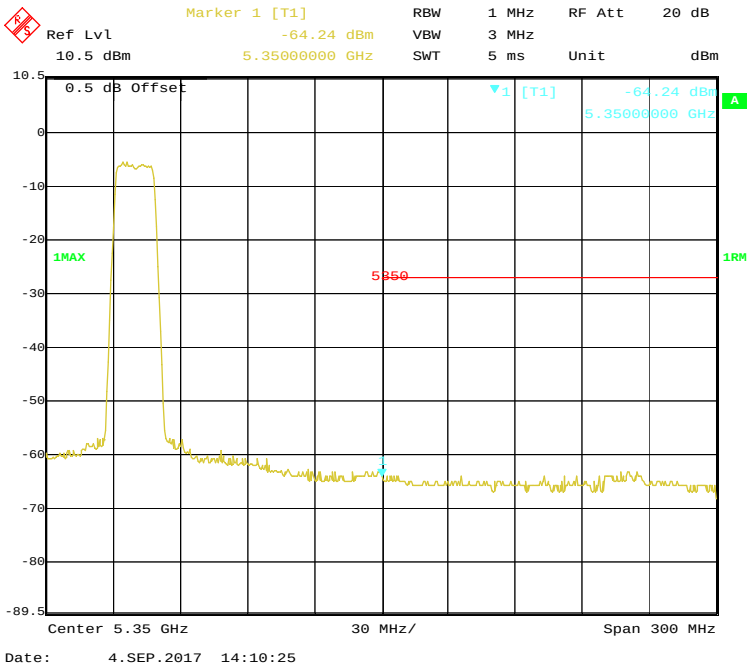
802.11n-HT40 Chain1 Band Edge, Right Side



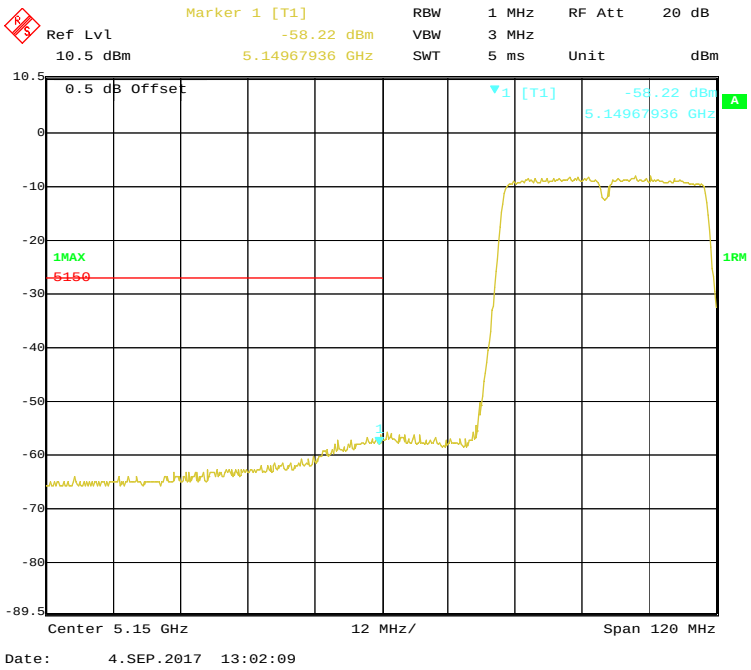
802.11ac20 Chain1 Band Edge, Left Side



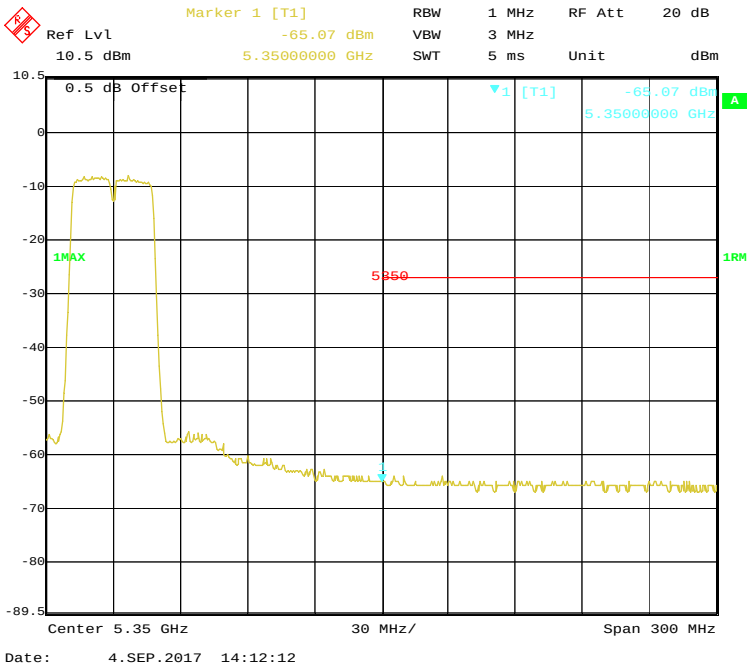
802.11ac20 Chain1 Band Edge, Right Side



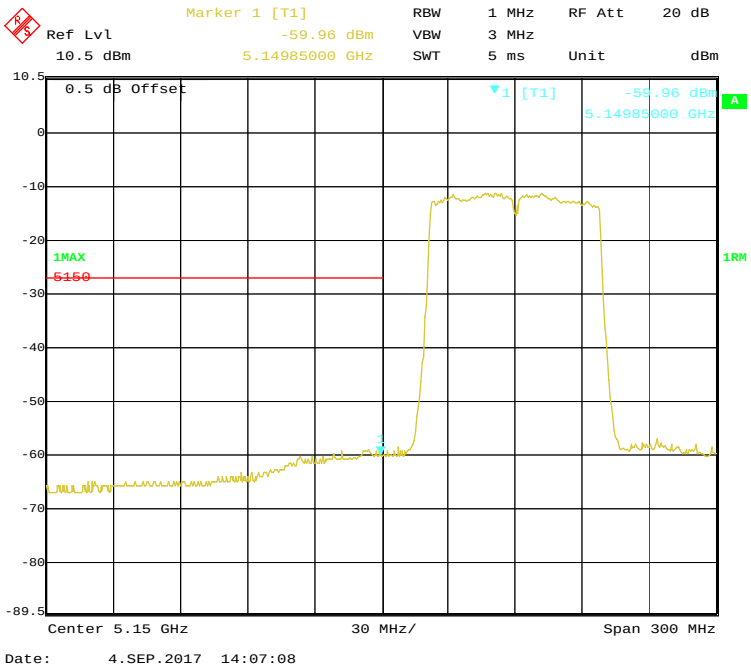
802.11ac40 Chain1 Band Edge, Left Side



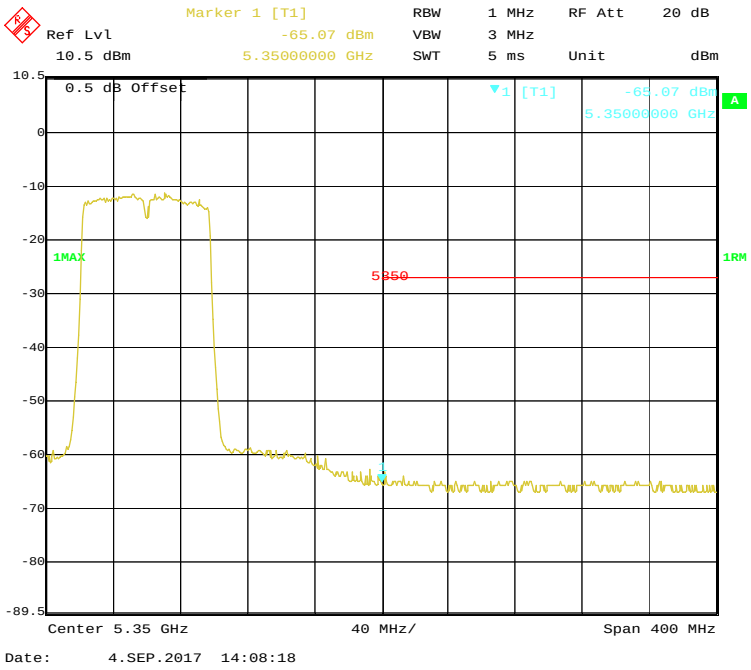
802.11ac40 Chain1 Band Edge, Right Side



802.11ac80 Chain1 Band Edge, Left Side

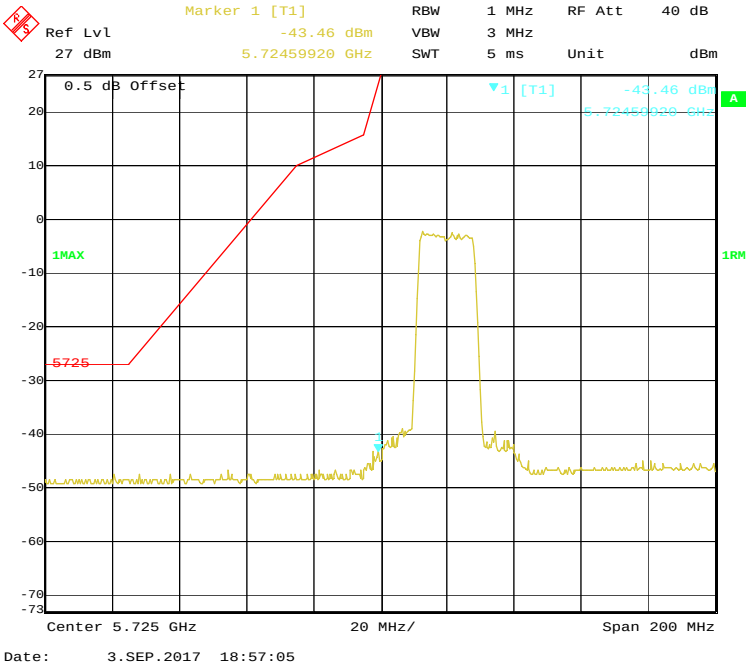


802.11ac80 Chain1 Band Edge, Right Side

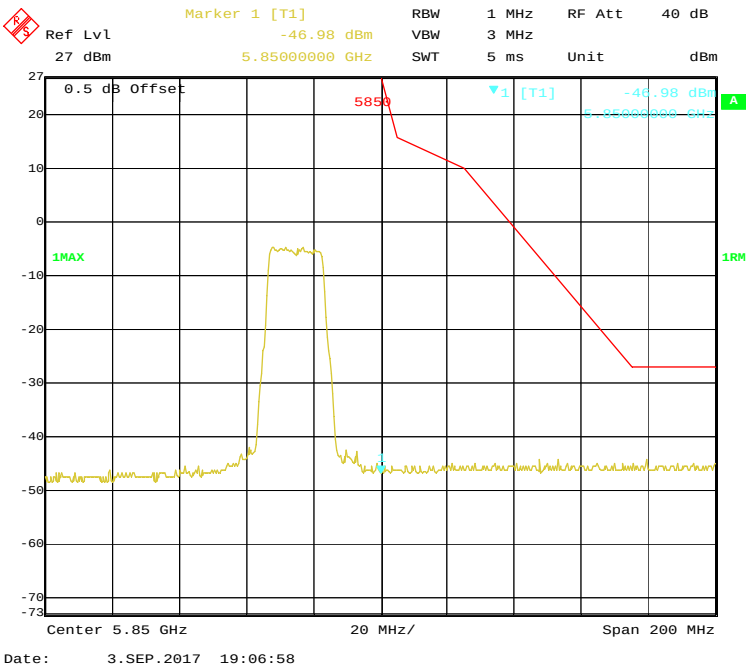


5725-5850 MHz Band:

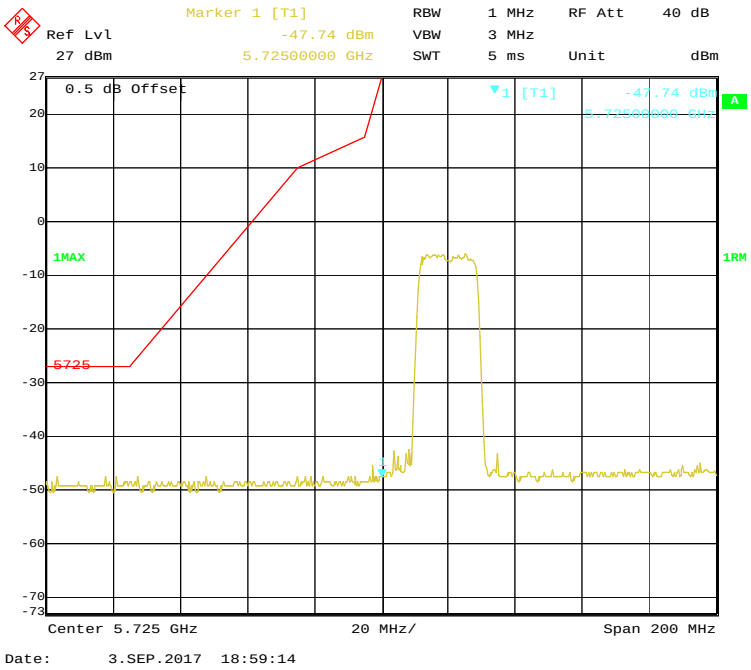
802.11a Chain0 Band Edge, Left Side



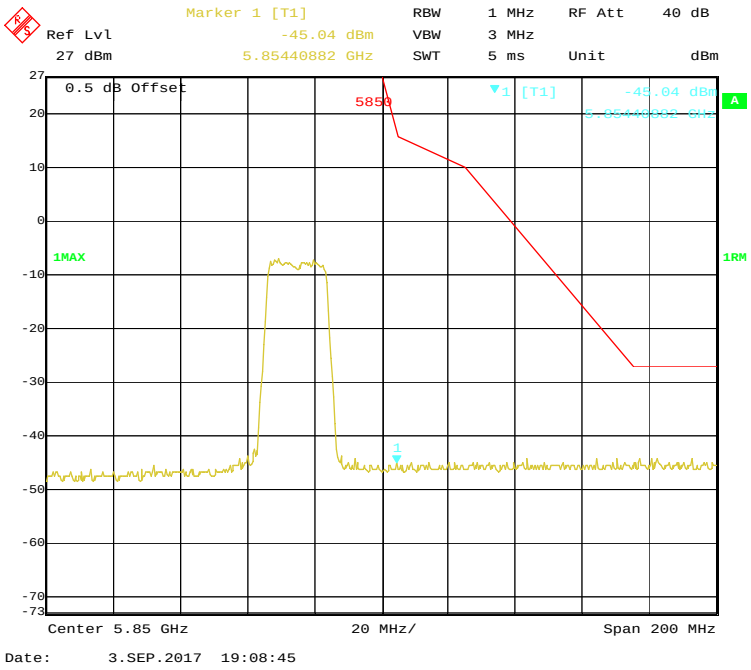
802.11a Chain0 Band Edge, Right Side



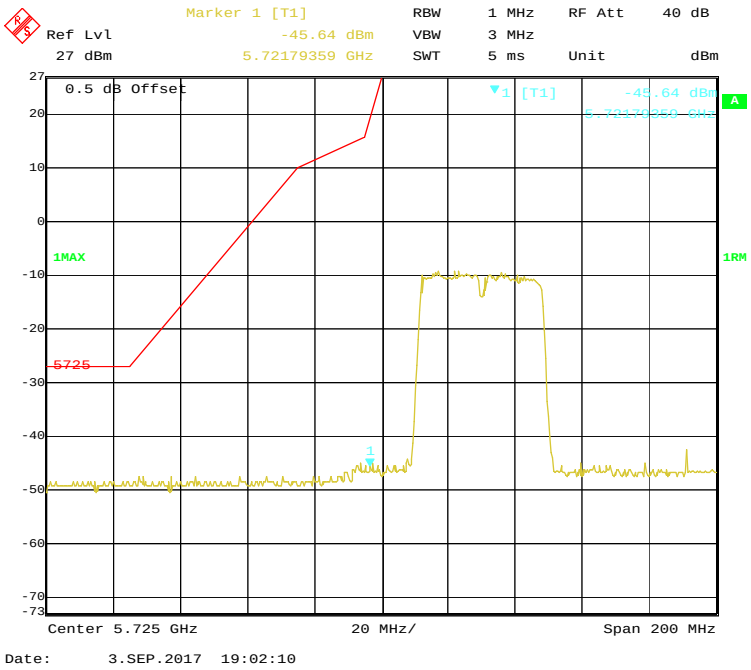
802.11n Chain0 ht20 Band Edge, Left Side



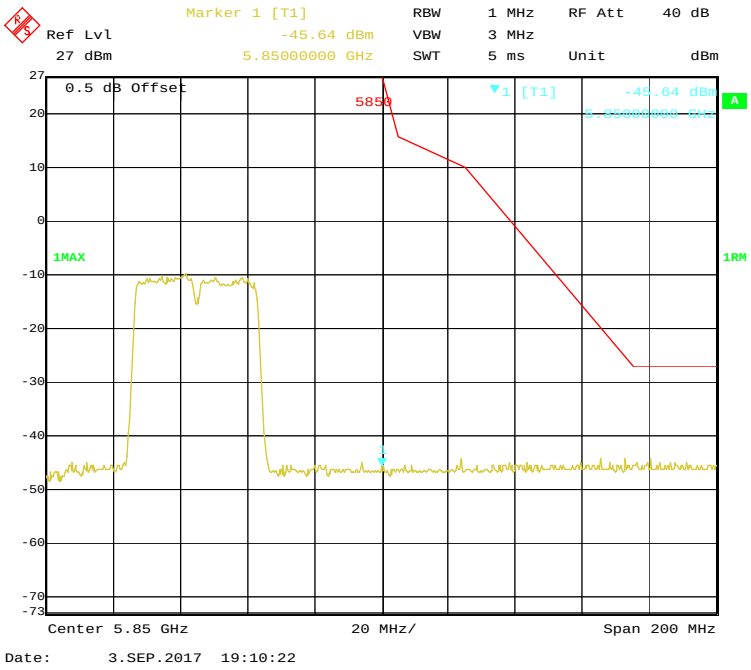
802.11n Chain0 ht20 Band Edge, Right Side



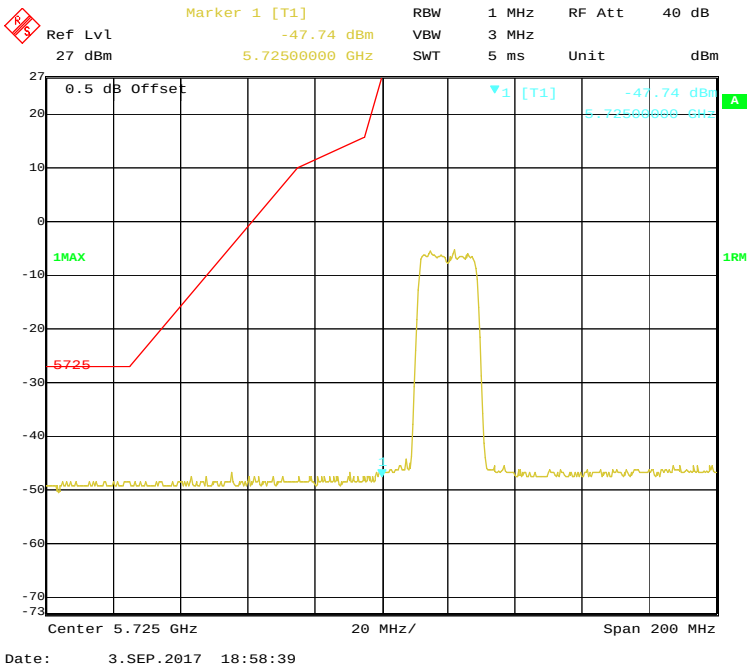
802.11n Chain0 ht40 Band Edge, Left Side



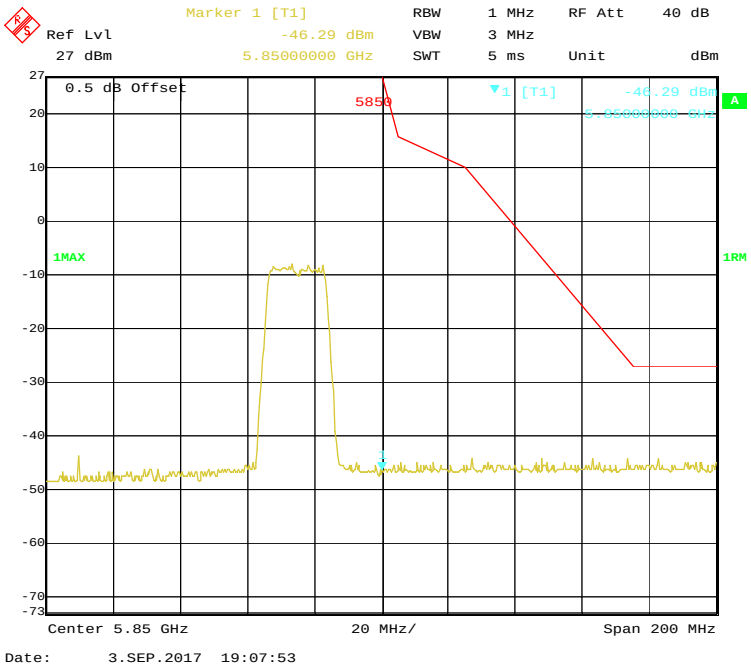
802.11n Chain0 ht40 Band Edge, Right Side



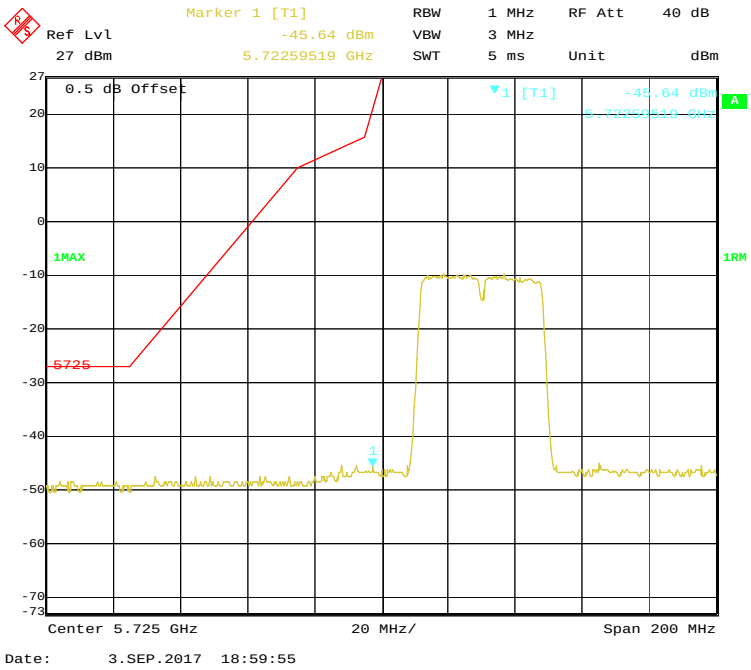
802.11ac20 Chain0 Band Edge, Left Side



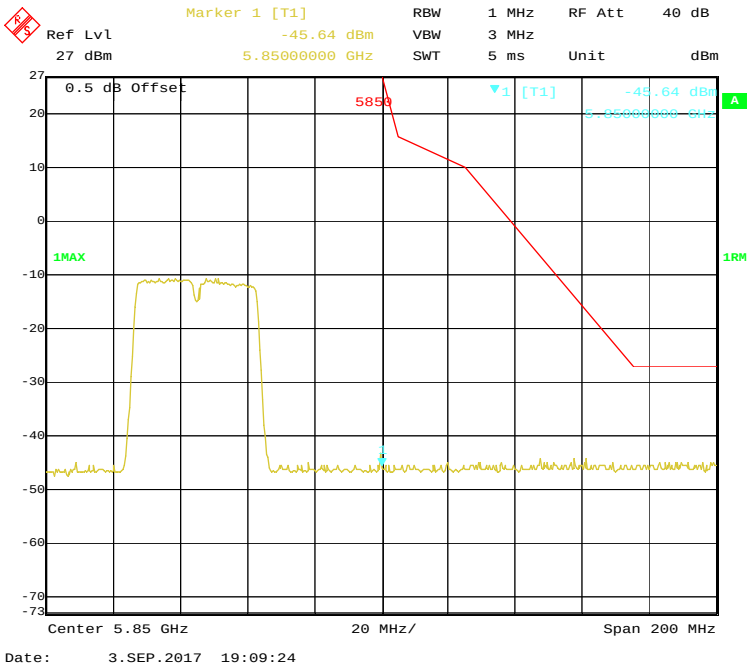
802.11ac20 Chain0 Band Edge, Right Side



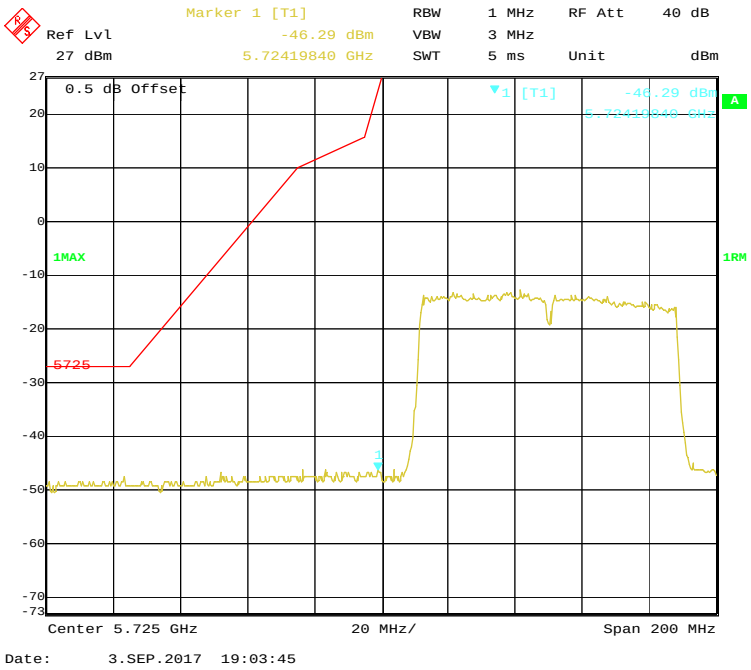
802.11ac40 Chain0 Band Edge, Left Side



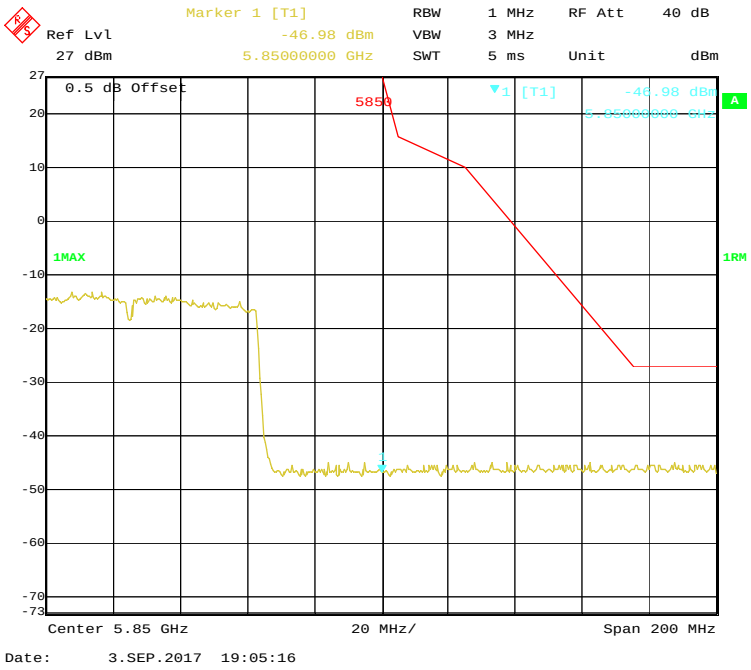
802.11ac40 Chain0 Band Edge, Right Side



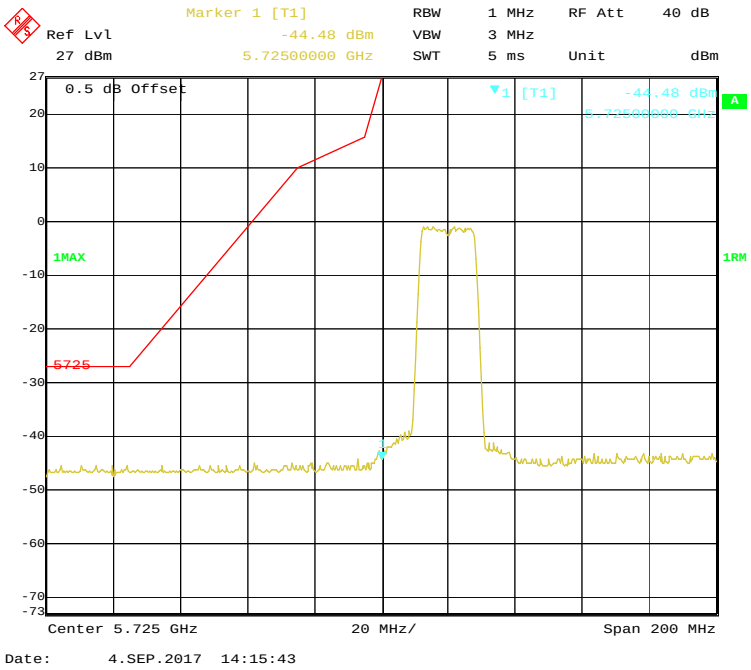
802.11ac80 Chain0 Band Edge, Left Side



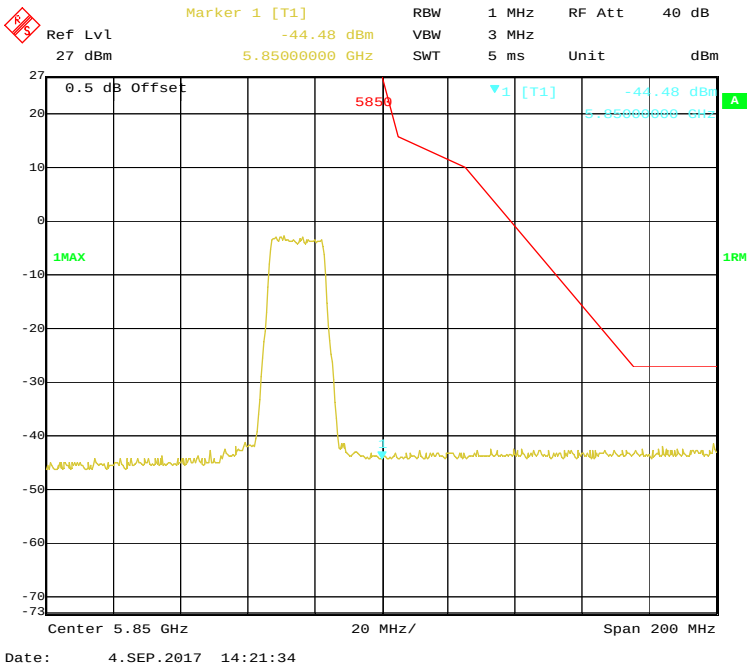
802.11ac80 Chain0 Band Edge, Right Side



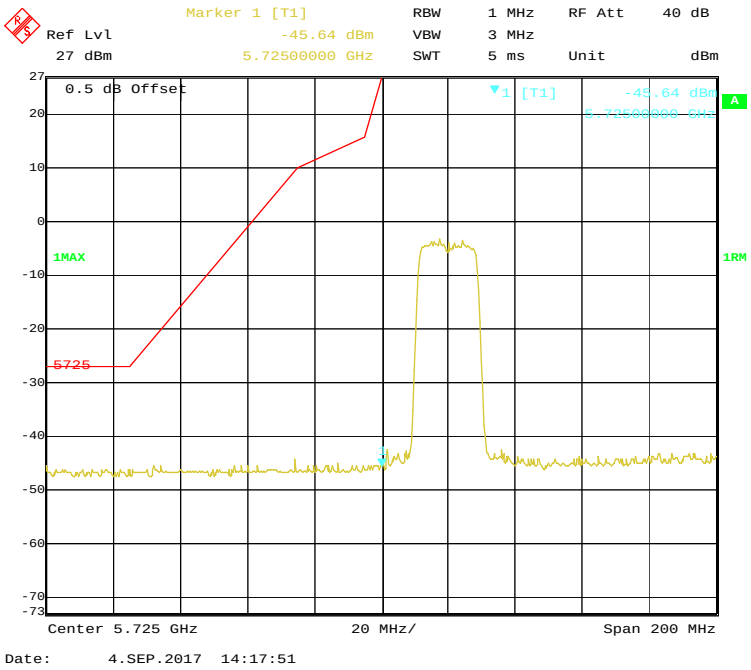
802.11a Chain1 Band Edge, Left Side



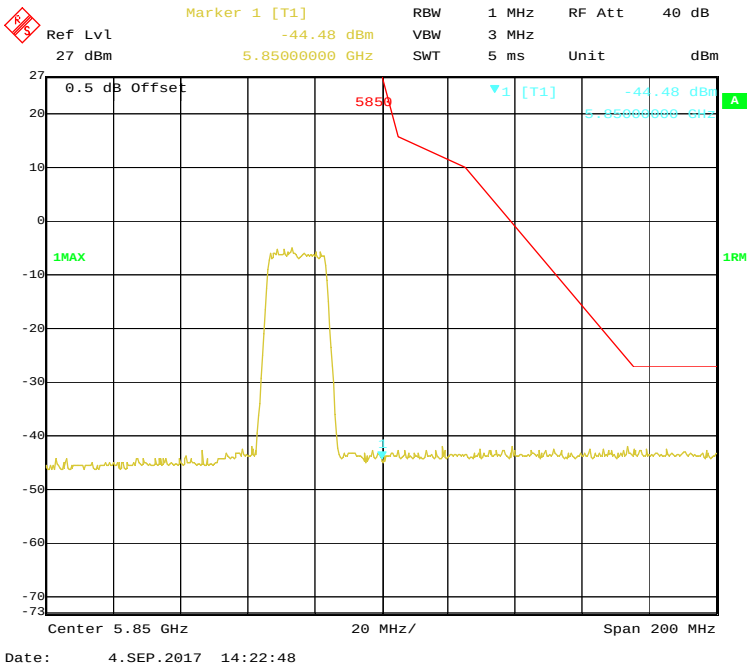
802.11a Chain1 Band Edge, Right Side



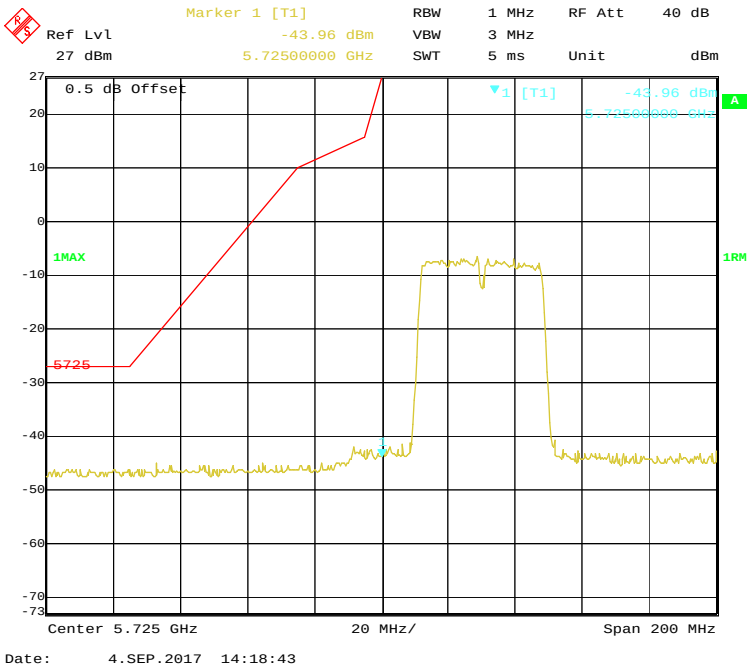
802.11n-HT20 Chain1 Band Edge, Left Side



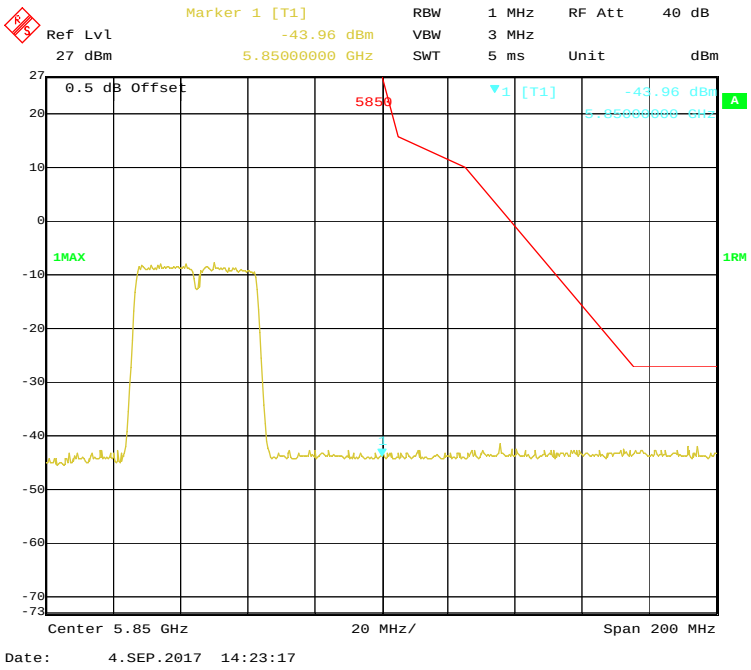
802.11n-HT20 Chain1 Band Edge, Right Side



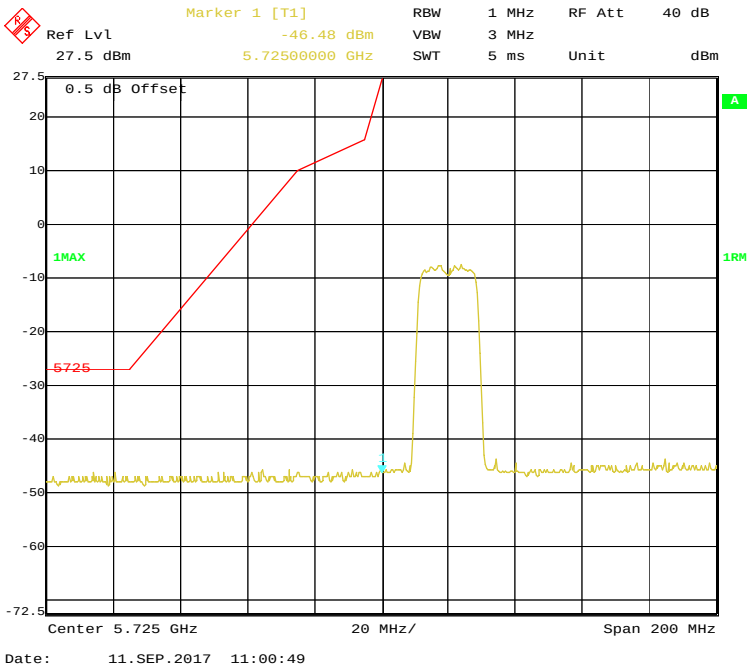
802.11n-HT40 Chain1 Band Edge, Left Side



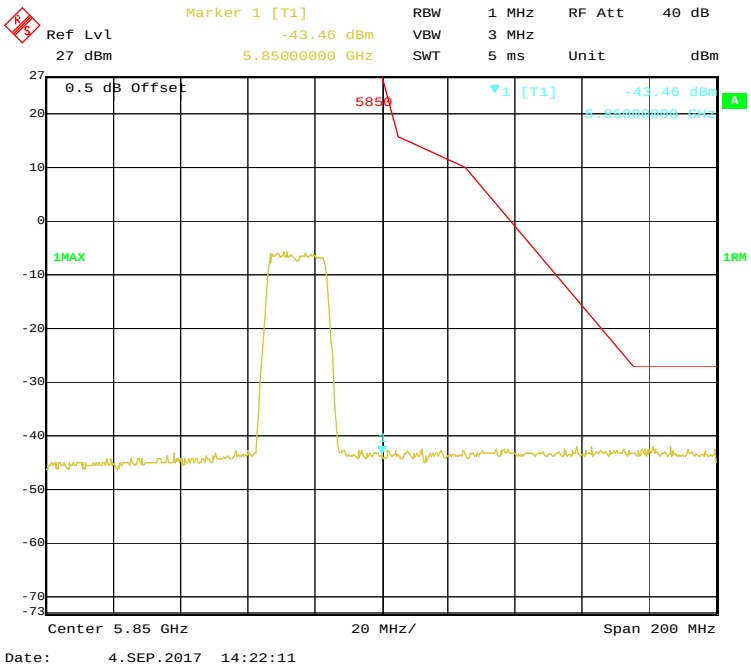
802.11n-HT40 Chain1 Band Edge, Right Side



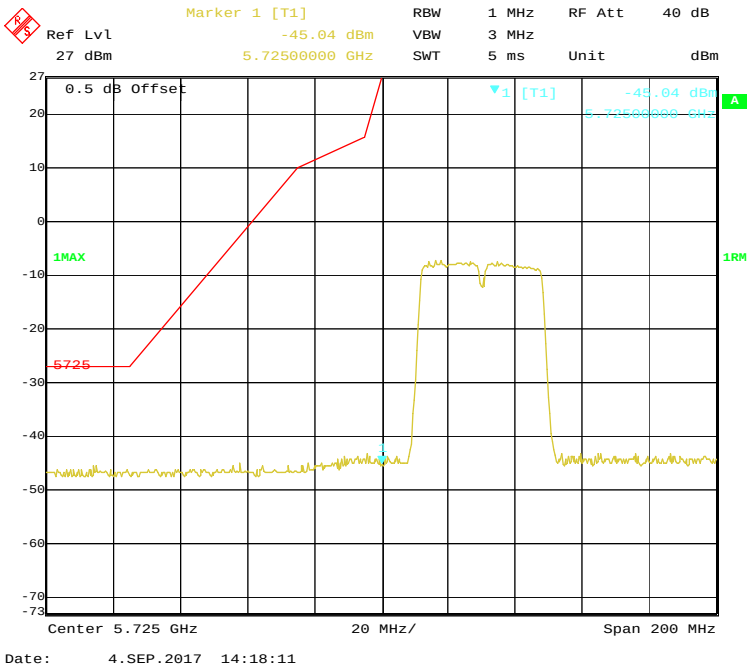
802.11ac20 Chain1 Band Edge, Left Side



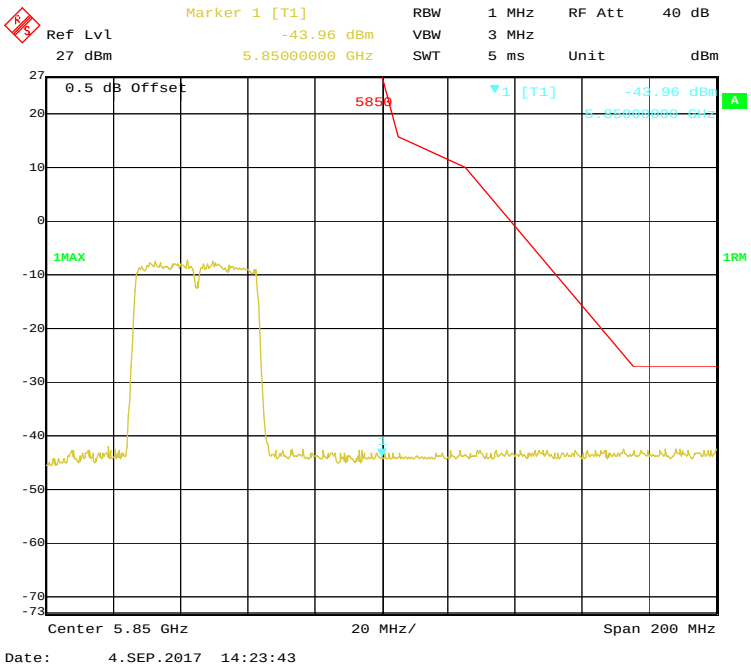
802.11ac20 Chain1 Band Edge, Right Side



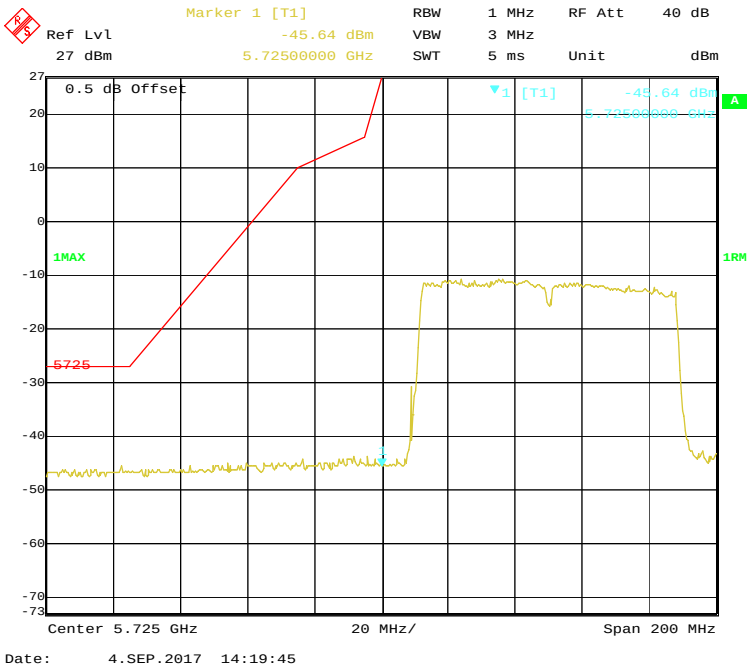
802.11ac40 Chain1 Band Edge, Left Side



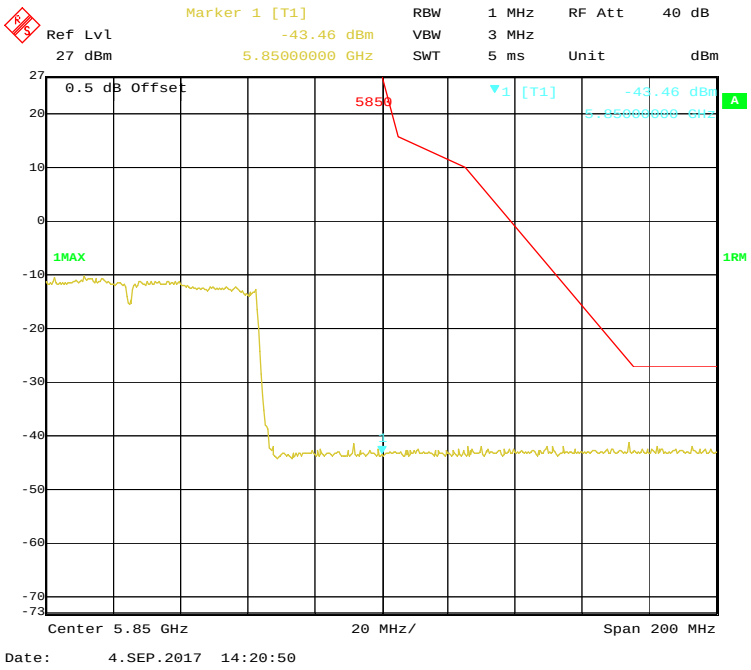
802.11ac40 Chain1 Band Edge, Right Side



802.11ac80 Chain1 Band Edge, Left Side



802.11ac80 Chain1 Band Edge, Right Side



FCC §15.407(a) &§15.407(e)–EMISSION BANDWIDTH

Applicable Standard

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

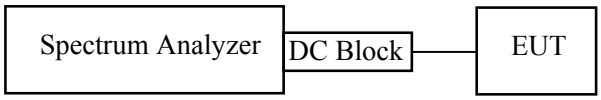
Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

Test Procedure

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

2. **Minimum Emission Bandwidth for the band 5.725-5.85 GHz**
Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.725-5.85 GHz. The following procedure shall be used for measuring this bandwidth:
a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3 × RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.

g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.



Test Data

Environmental Conditions

Temperature:	23.5 °C
Relative Humidity:	55 %
ATM Pressure:	101.2 kPa

The testing was performed by Kyle Xu on 2017-09-03 to 2017-09-04.

Test Result: Pass.

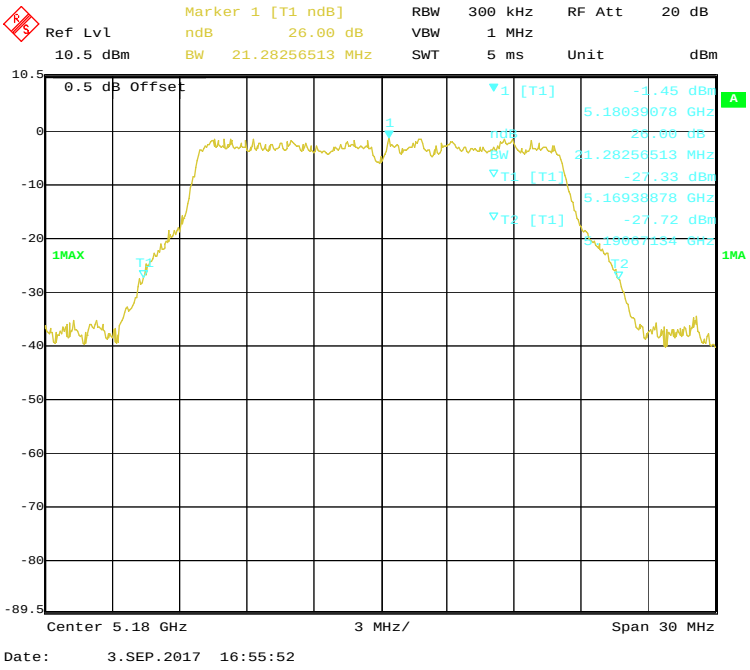
5150-5250 MHz:

Test mode	Channel	Frequency (MHz)	26dB Bandwidth (MHz)		99% Occupied Bandwidth (MHz)	
			Chain0	Chain1	Chain0	Chain1
802.11a	Low	5180	21.28	21.28	16.77	16.83
	Middle	5200	21.28	21.16	16.83	16.77
	High	5240	21.28	21.10	16.77	16.77
802.11n-HT20	Low	5180	21.58	21.58	18.16	18.04
	Middle	5200	21.58	21.64	18.04	18.04
	High	5240	21.64	21.64	18.10	18.10
802.11n-HT40	Low	5190	39.88	40.18	36.77	36.77
	High	5230	39.88	39.88	36.67	36.27
802.11ac20	Low	5180	22.06	22.18	18.28	18.34
	Middle	5200	22.00	22.06	18.22	18.22
	High	5240	22.00	22.12	18.28	18.28
802.11ac40	Low	5190	40.58	40.48	36.87	36.97
	High	5230	40.48	40.48	36.77	36.77
802.11ac80	/	5210	82.73	82.48	75.75	75.75

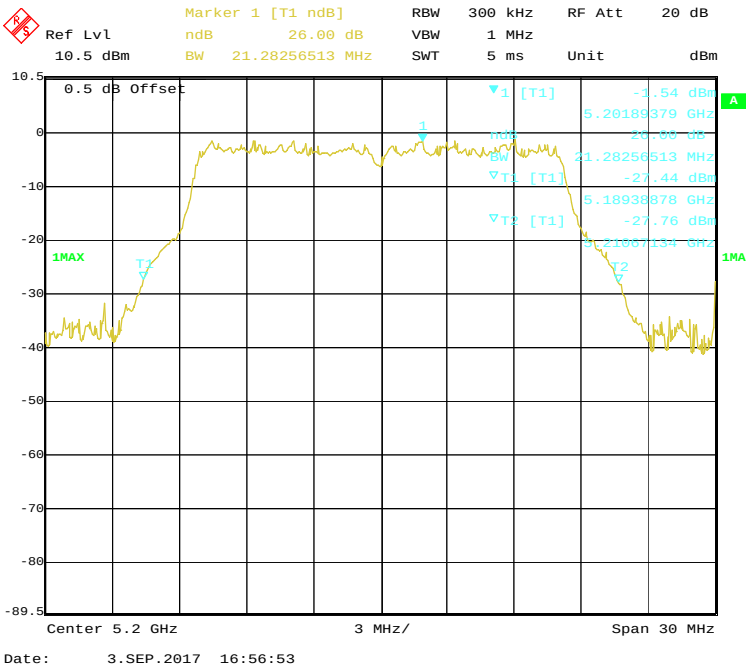
5150-5250 MHz Band:

26 Bandwidth

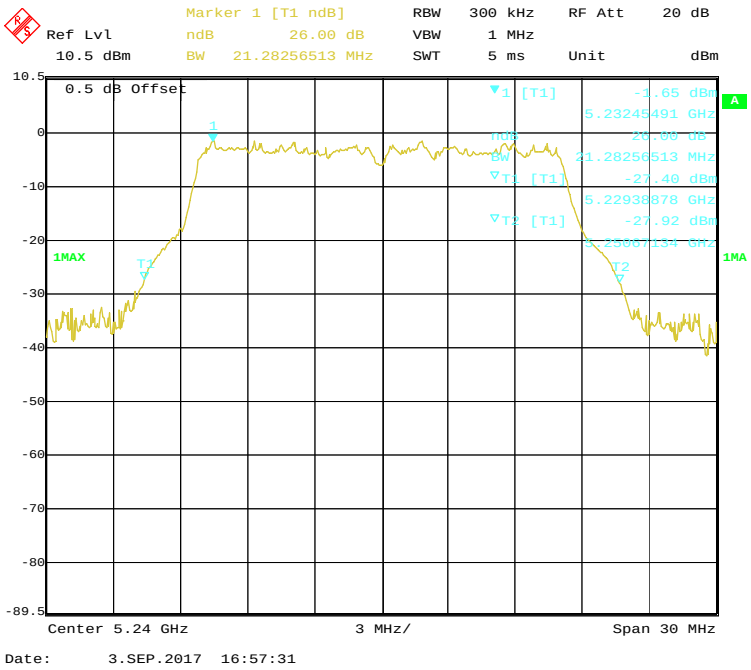
802.11a mode, Chain 0: -5180MHz



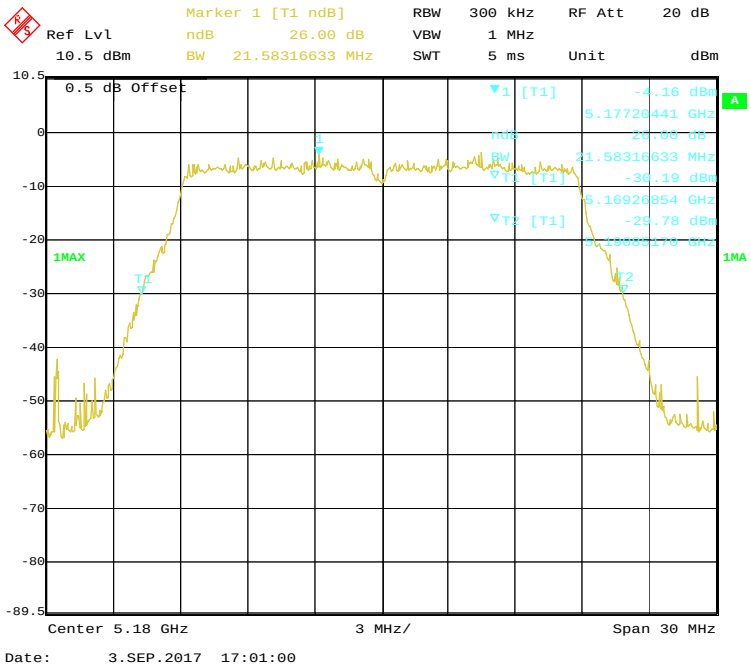
802.11a mode, Chain 0: -5200MHz



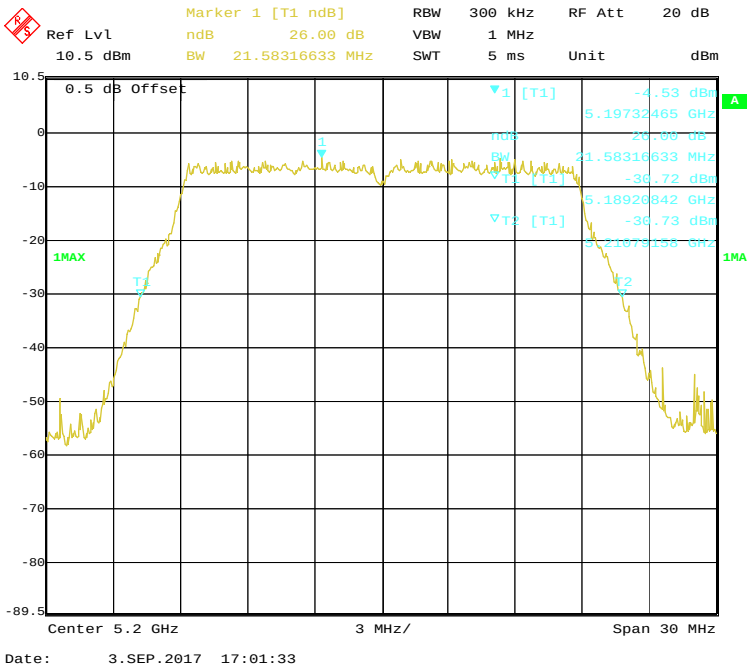
802.11a mode, Chain 0: -5240MHz



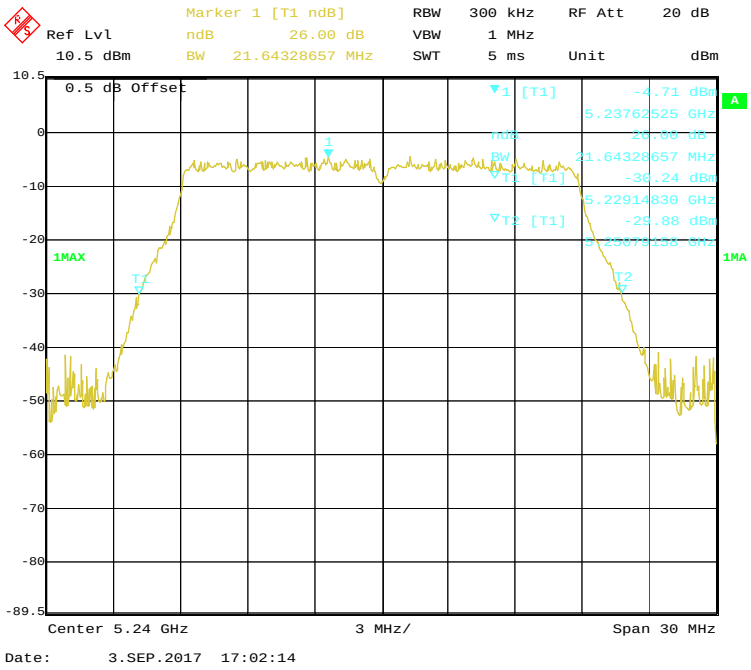
802.11n-HT20 mode, Chain 0: -5180MHz



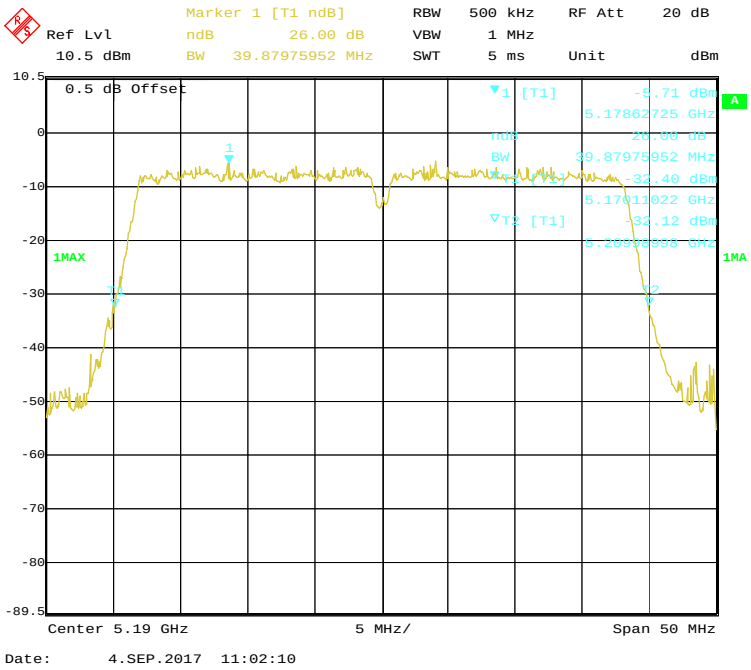
802.11n-HT20 mode, Chain 0: -5200MHz



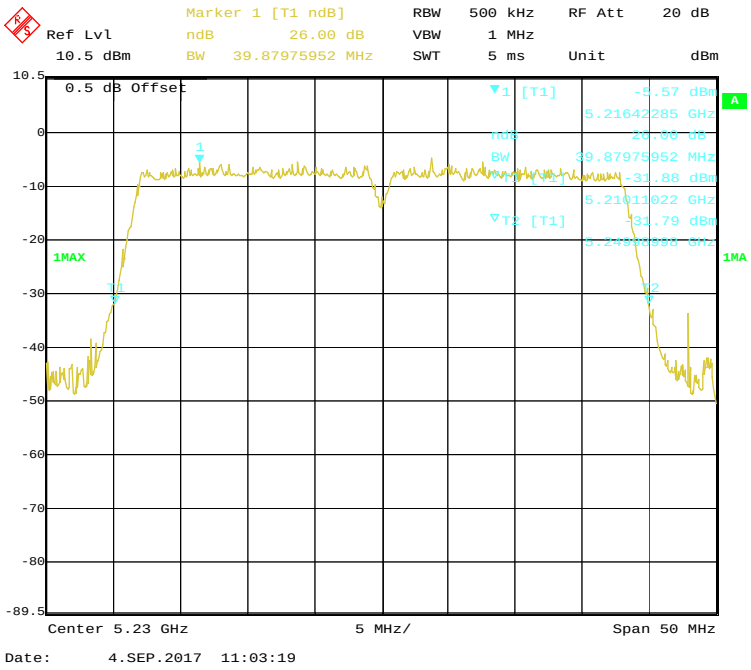
802.11n-HT20 mode, Chain 0: -5240MHz



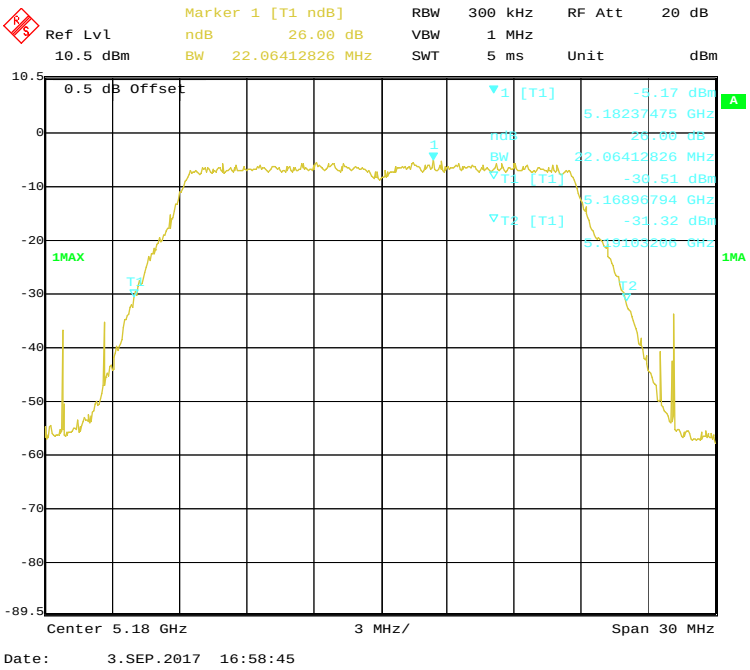
802.11n-HT40 mode, Chain 0: -5190MHz



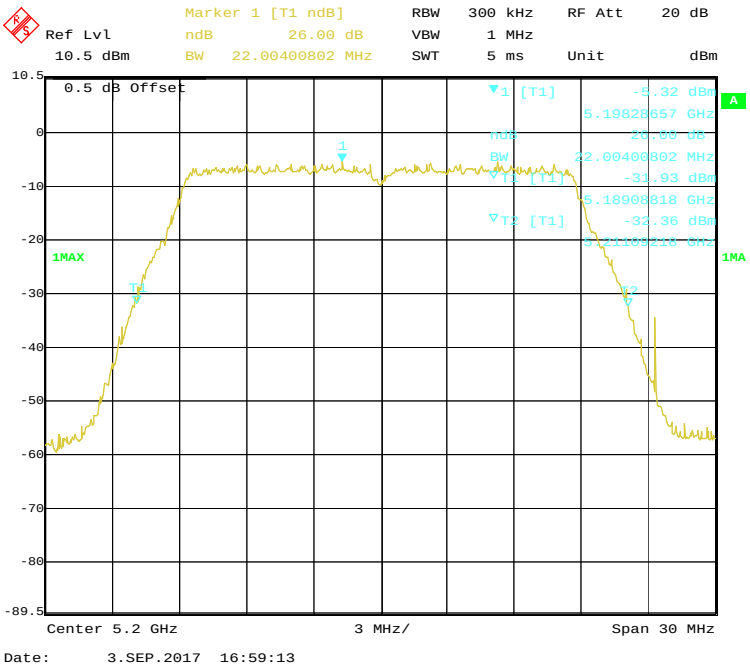
802.11n-HT40 mode, Chain 0: -5230MHz



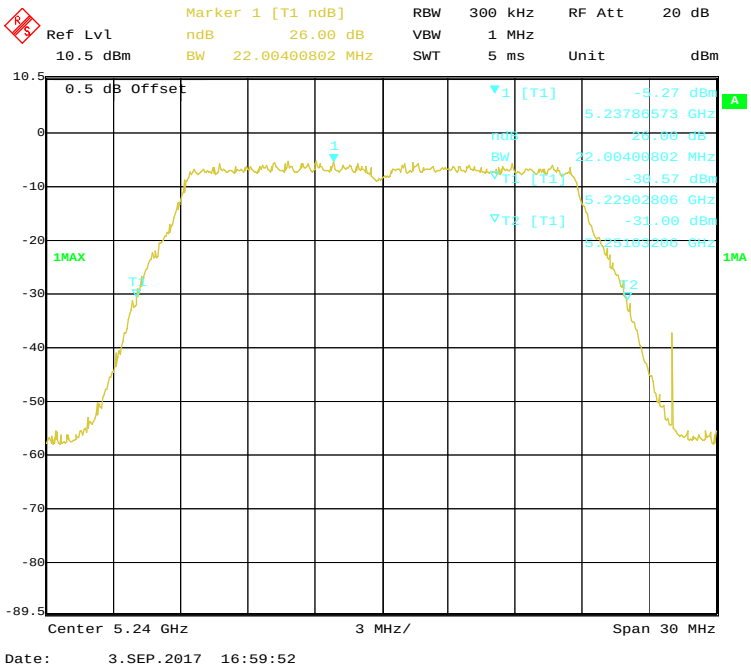
802.11ac20 mode, Chain 0: -5180MHz



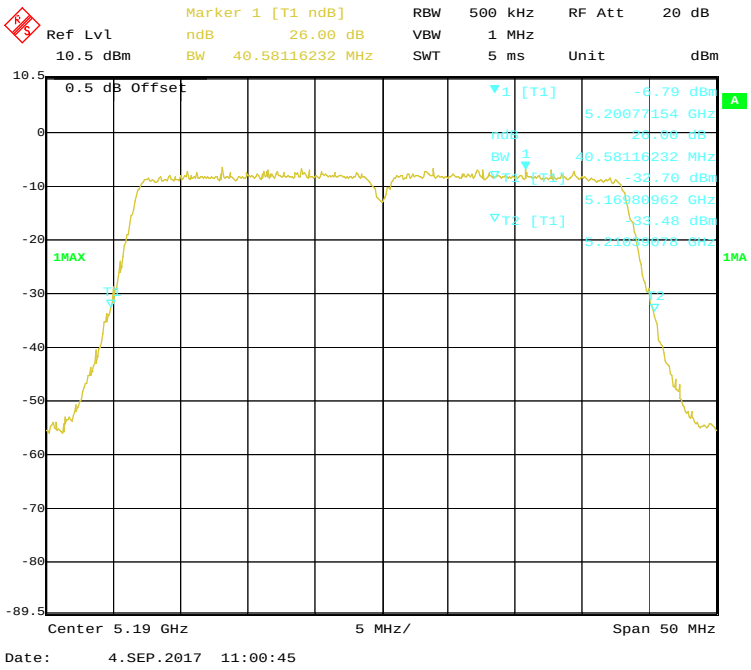
802.11ac20 mode, Chain 0: -5200MHz



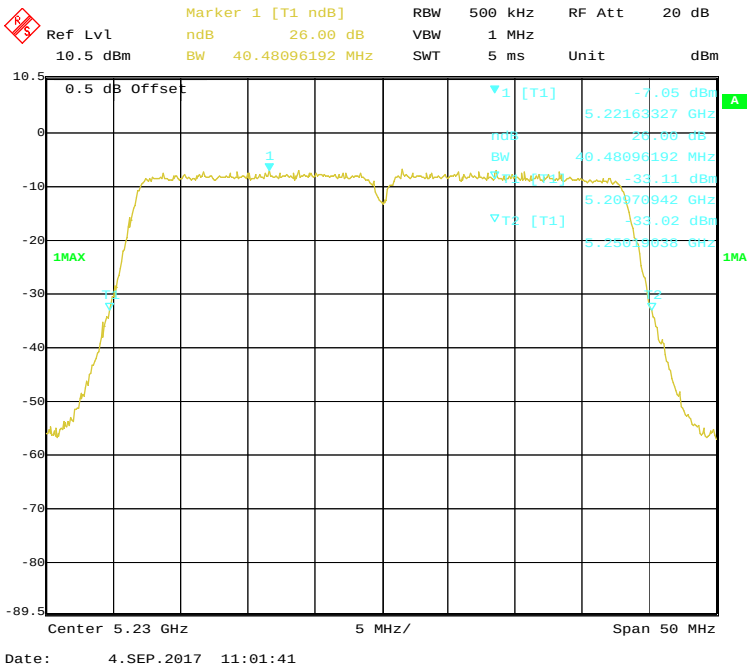
802.11ac20 mode, Chain 0: -5240MHz



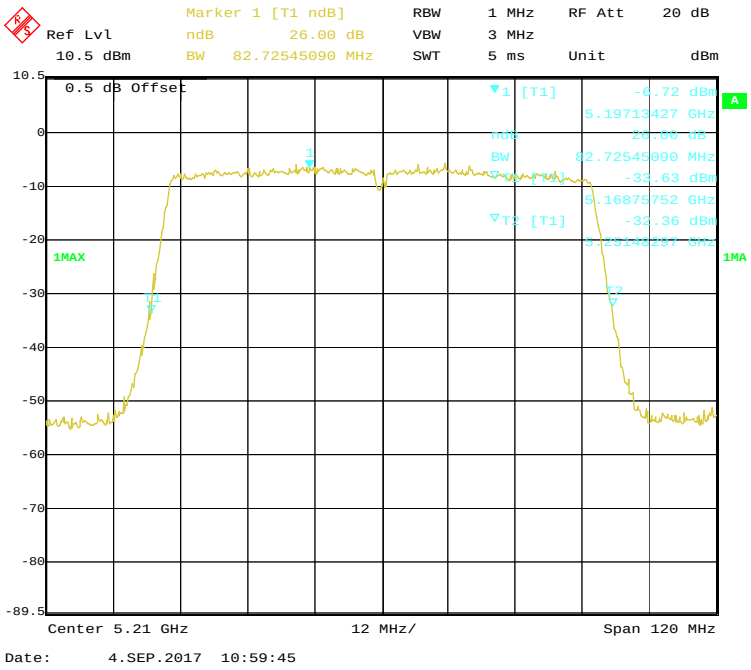
802.11ac40 mode, Chain 0: -5190MHz



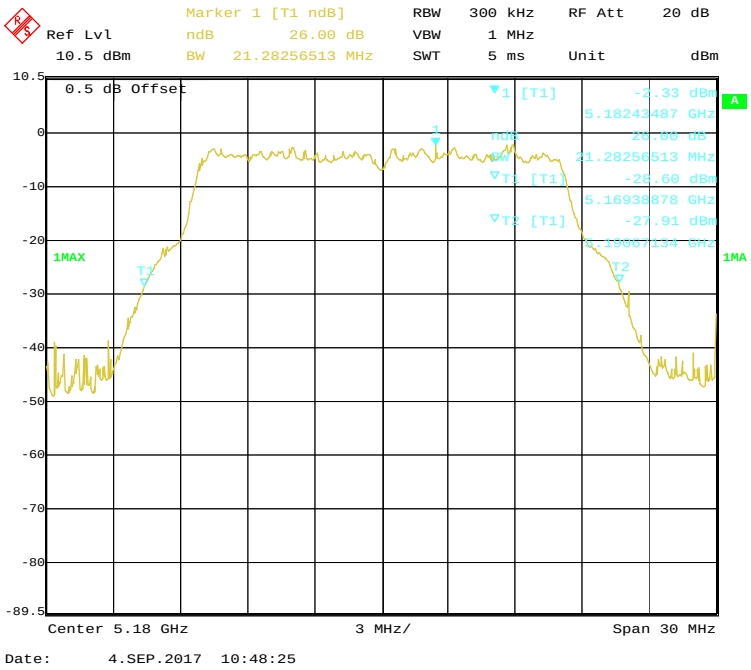
802.11ac40 mode, Chain 0: -5230MHz



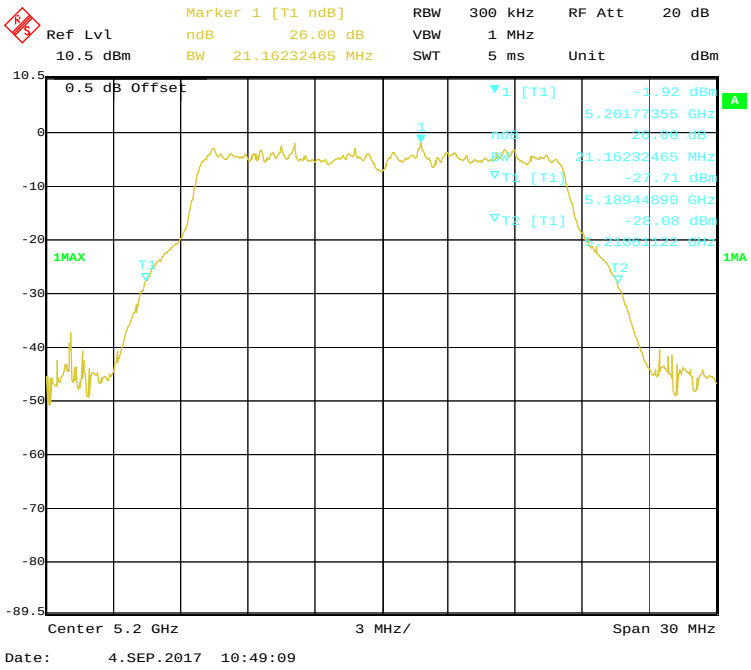
802.11ac80 mode, Chain 0: -5210MHz



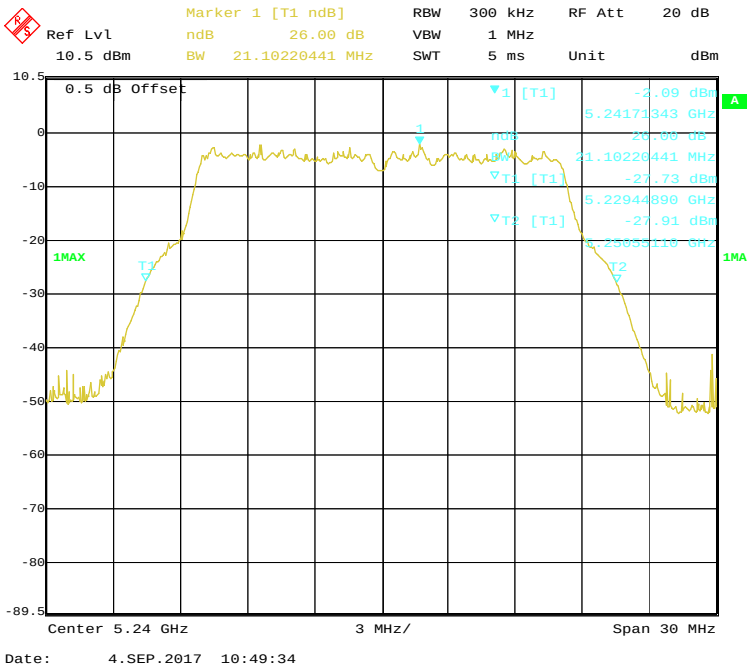
802.11a mode, Chain 1: -5180MHz



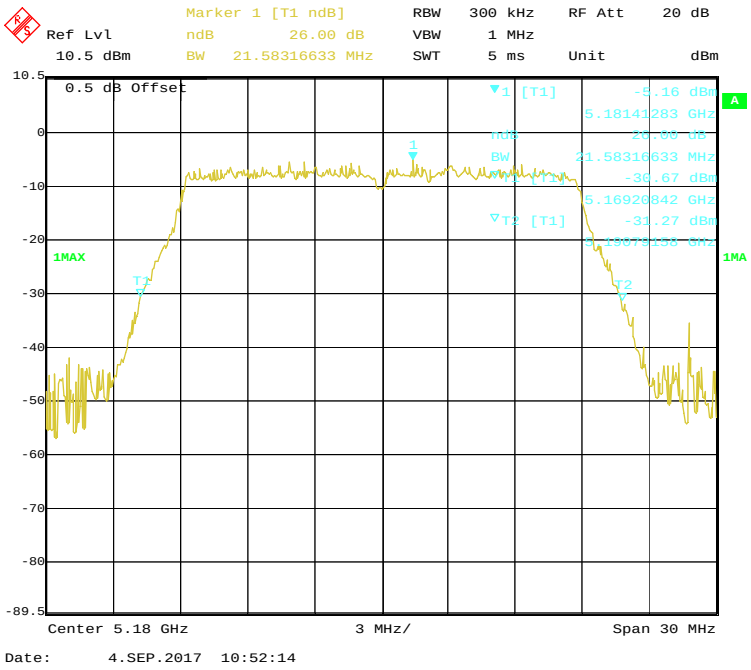
802.11a mode, Chain 1: -5200MHz



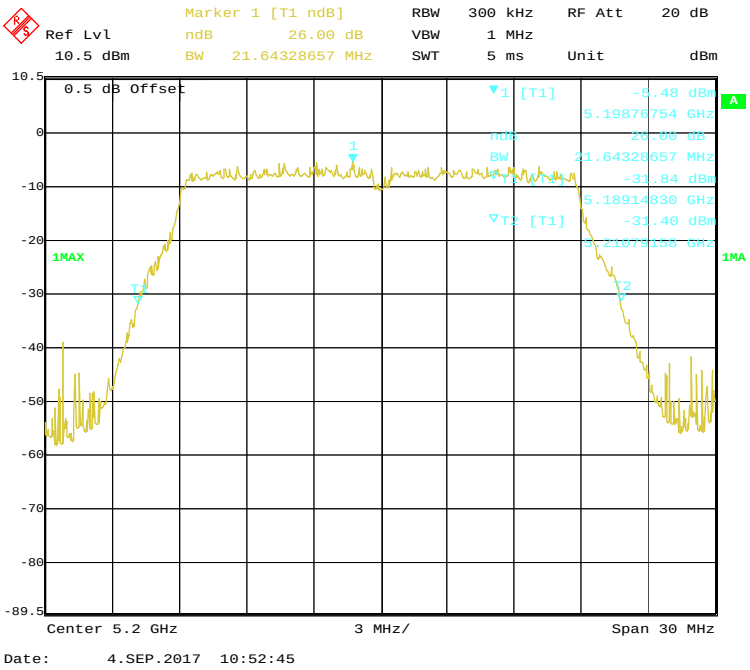
802.11a mode, Chain 1: -5240MHz



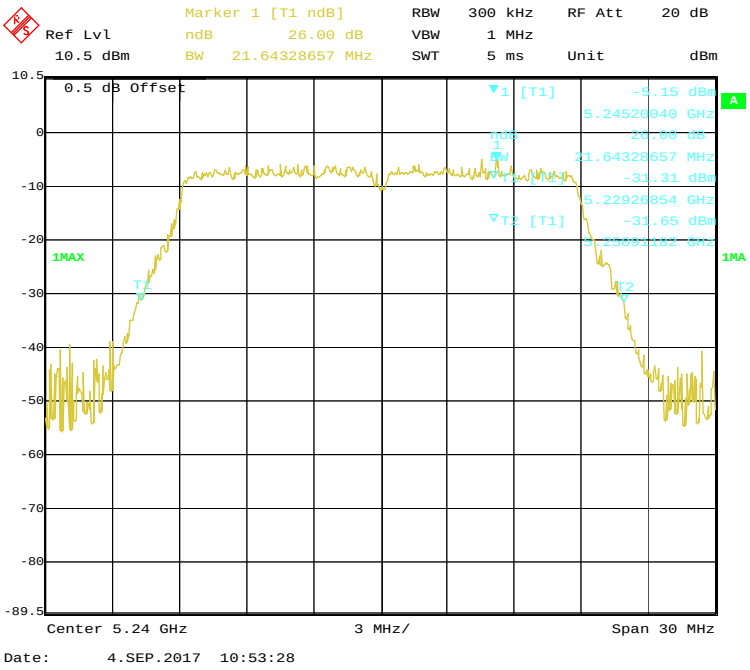
802.11n-HT20 mode, Chain 1: -5180MHz



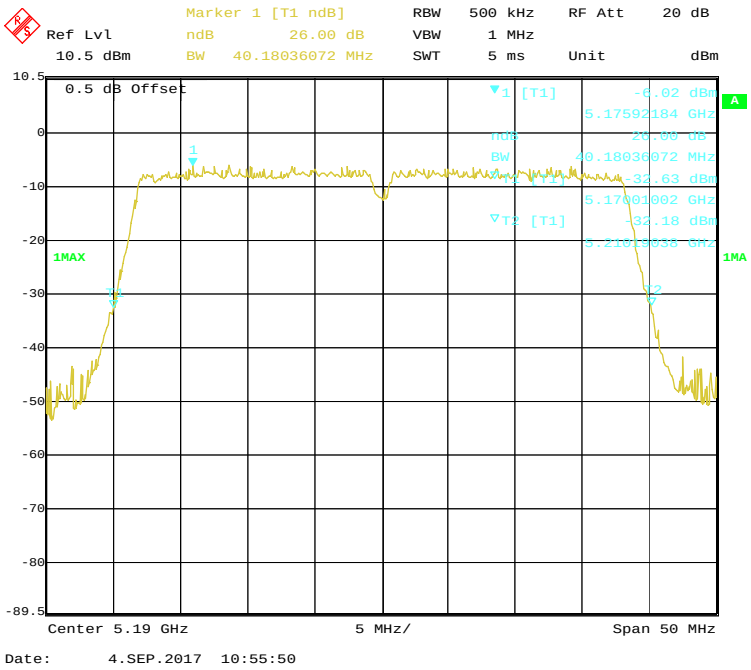
802.11n-HT20 mode, Chain 1: -5200MHz



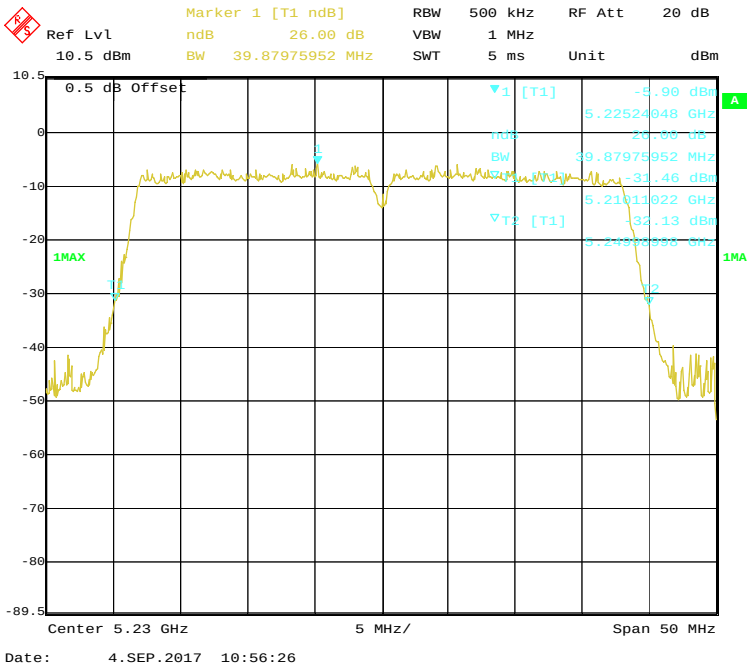
802.11n-HT20 mode, Chain 1: -5240MHz



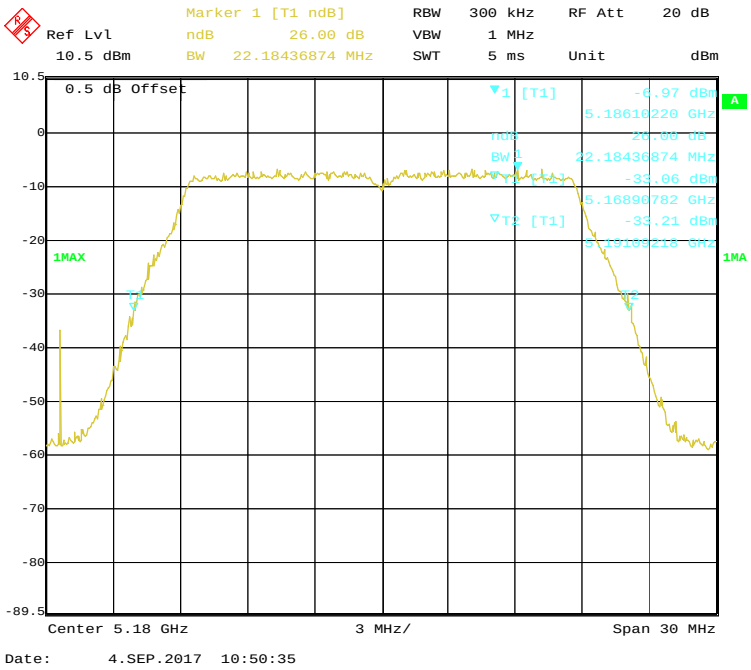
802.11n-HT40 mode, Chain 1: -5190MHz



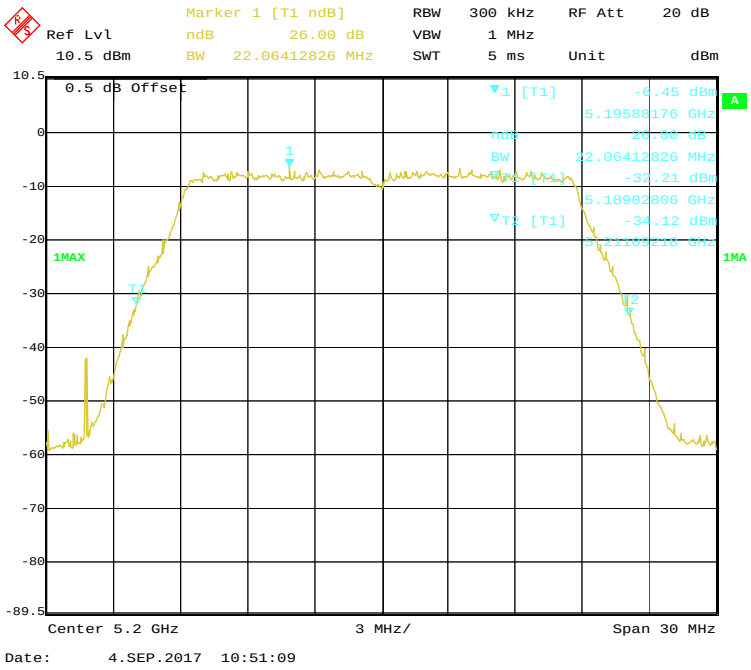
802.11n-HT40 mode, Chain 1: -5230MHz



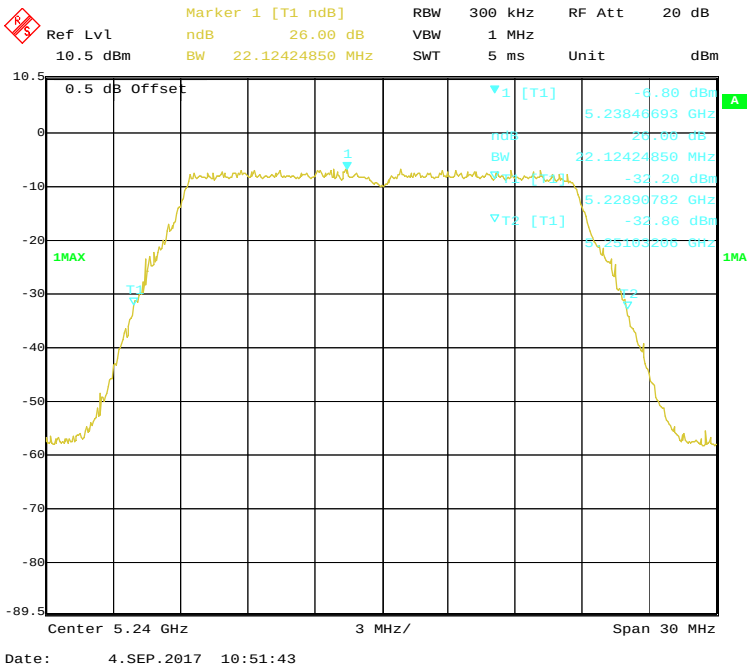
802.11ac20 mode, Chain 1: -5180MHz



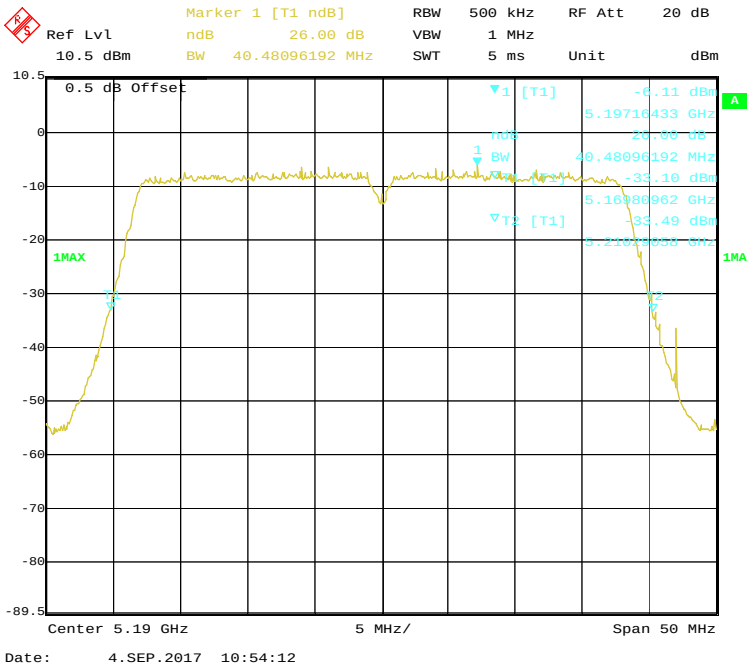
802.11ac20 mode, Chain 1: -5200MHz



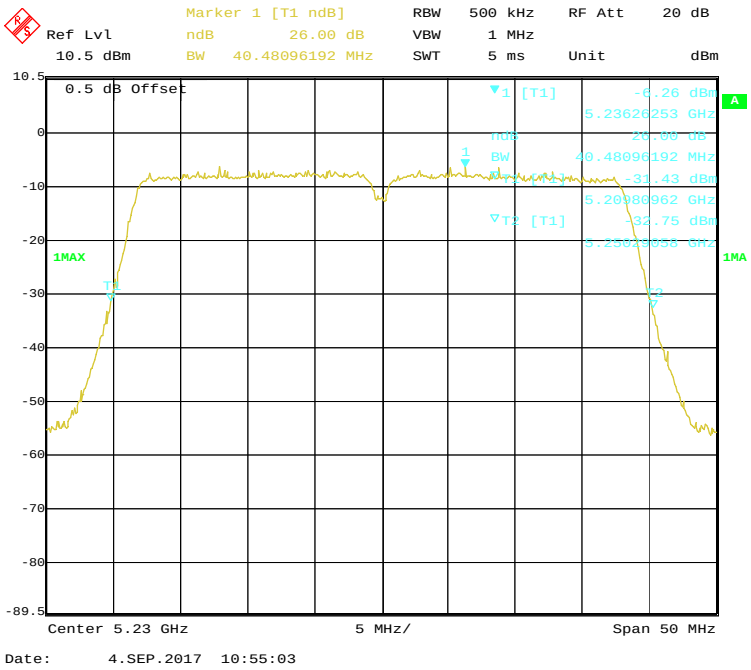
802.11ac20 mode, Chain 1: -5240MHz



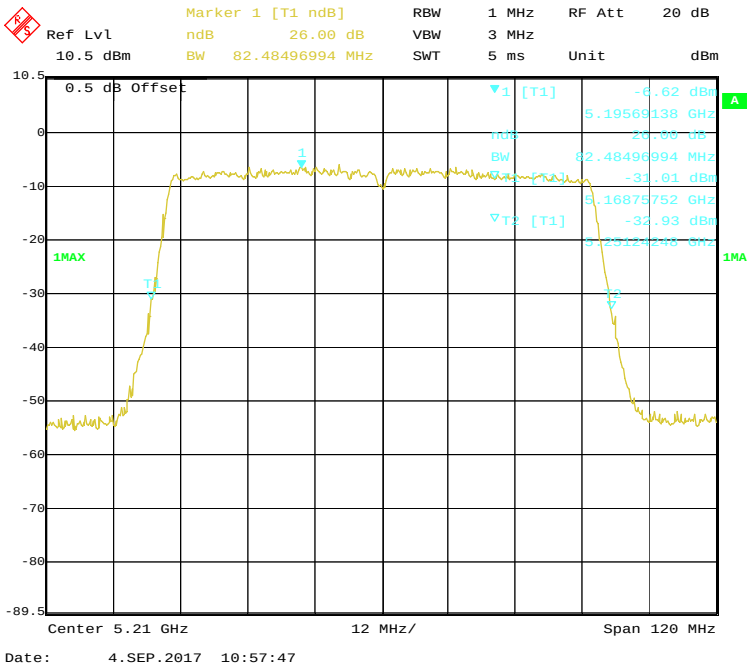
802.11ac40 mode, Chain 1: -5190MHz



802.11ac40 mode, Chain 1: -5230MHz

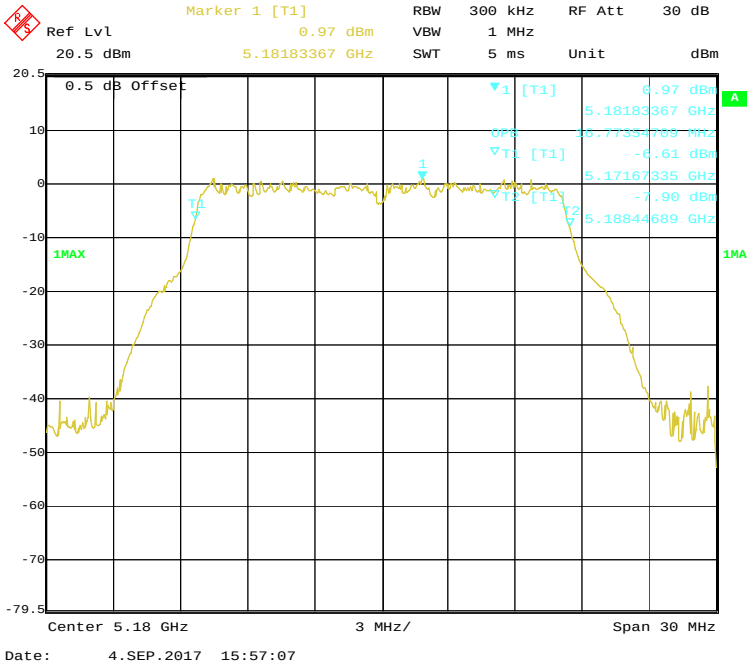


802.11ac80 mode, Chain 1: -5210MHz

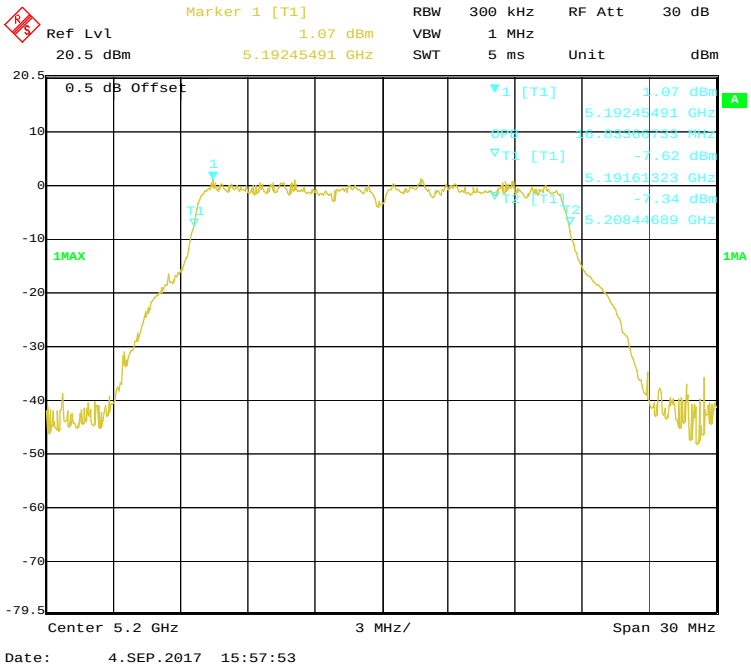


99% Occupied Bandwidth

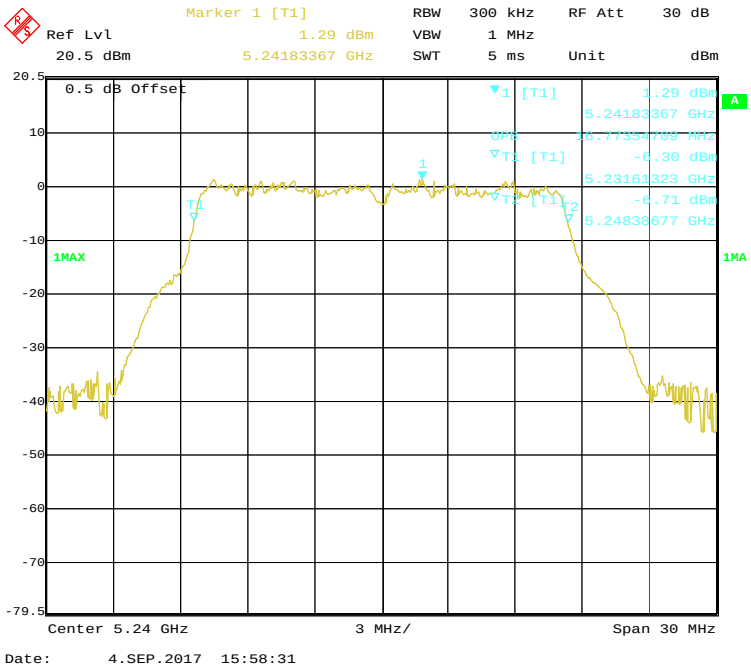
802.11a mode, Chain 0: -5180MHz



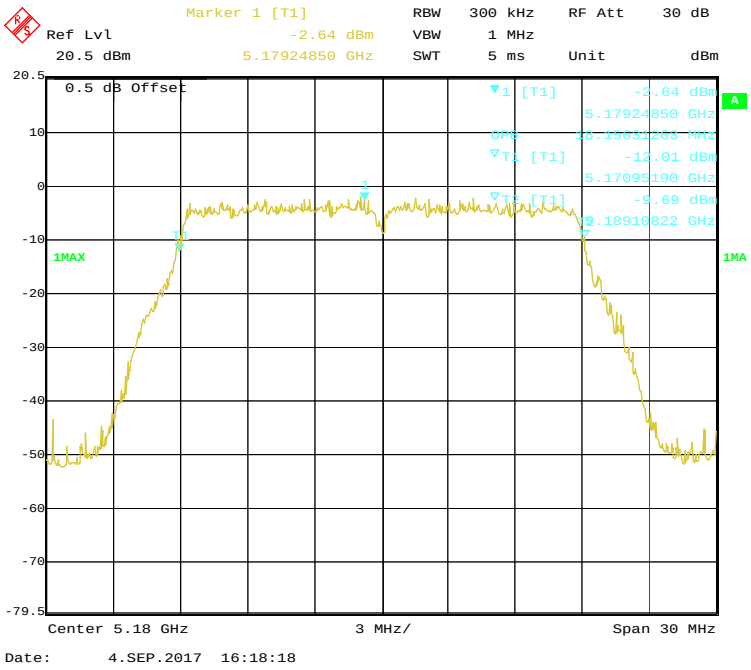
802.11a mode, Chain 0: -5200MHz



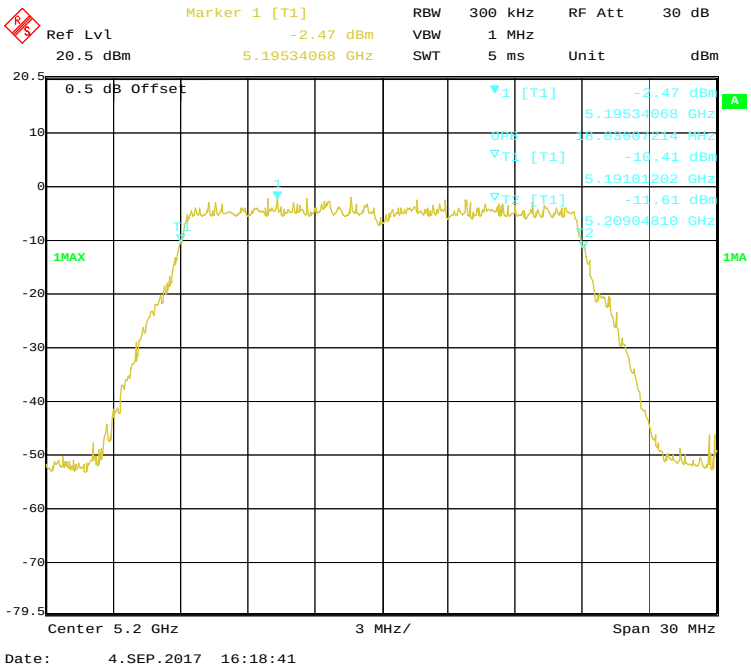
802.11a mode, Chain 0: -5240MHz



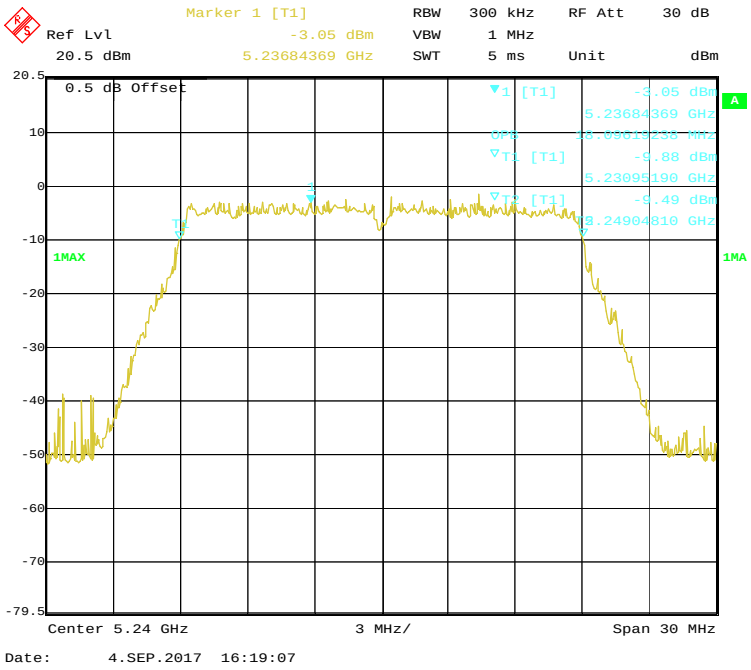
802.11n-HT20 mode, Chain 0: -5180MHz



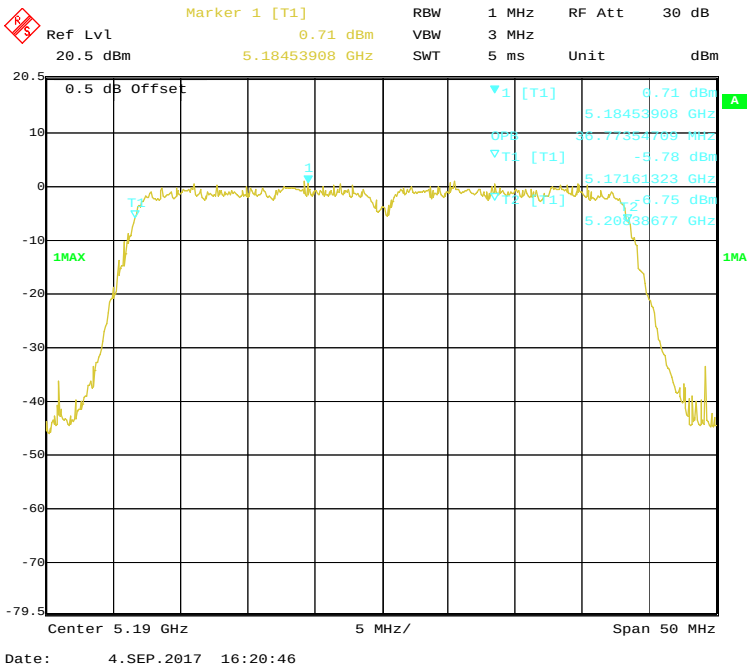
802.11n-HT20 mode, Chain 0: -5200MHz



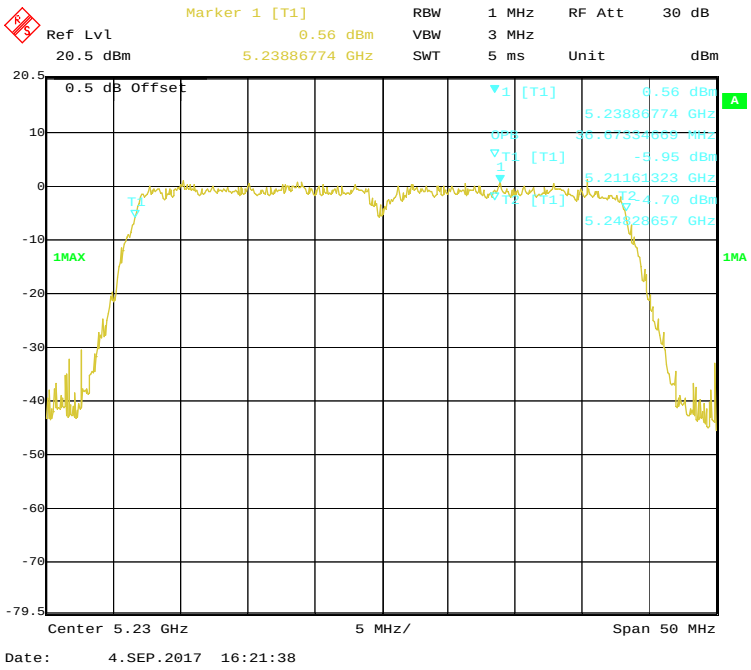
802.11n-HT20 mode, Chain 0: -5240MHz



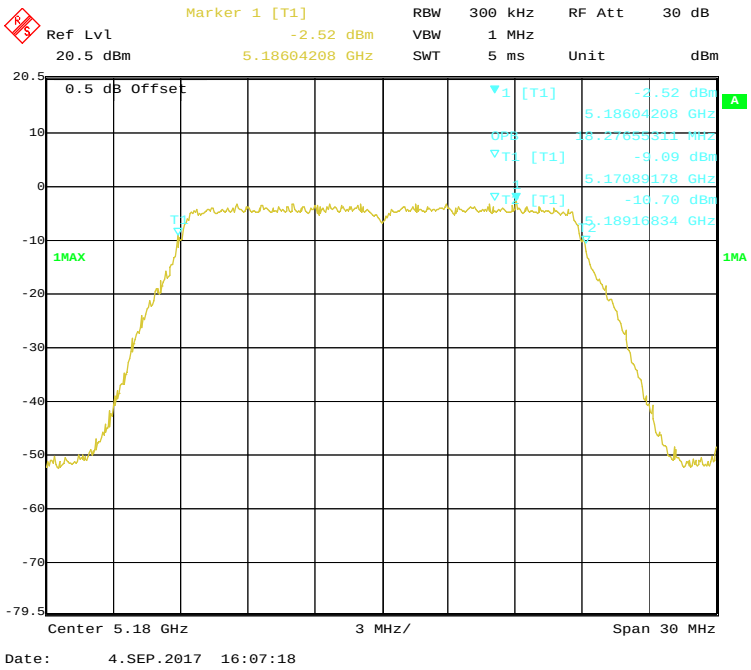
802.11n-HT40 mode, Chain 0: -5190MHz



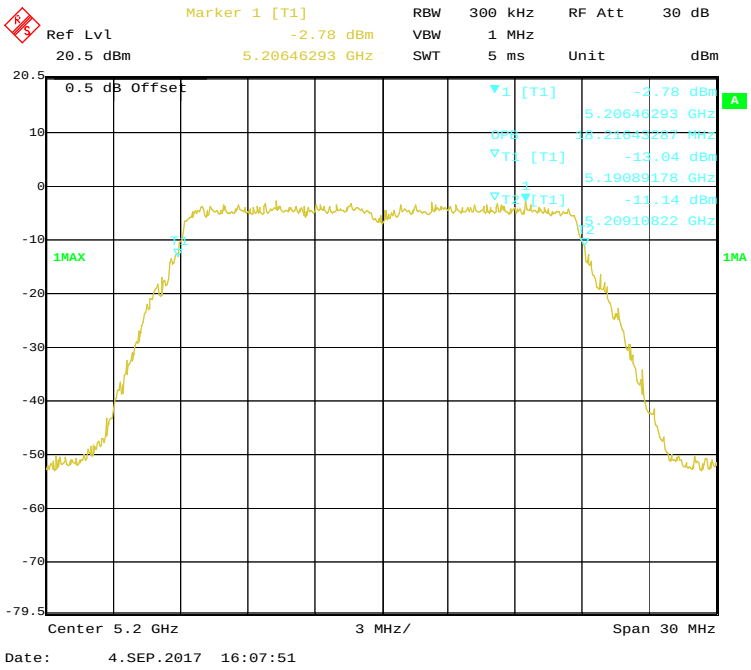
802.11n-HT40 mode, Chain 0: -5230MHz



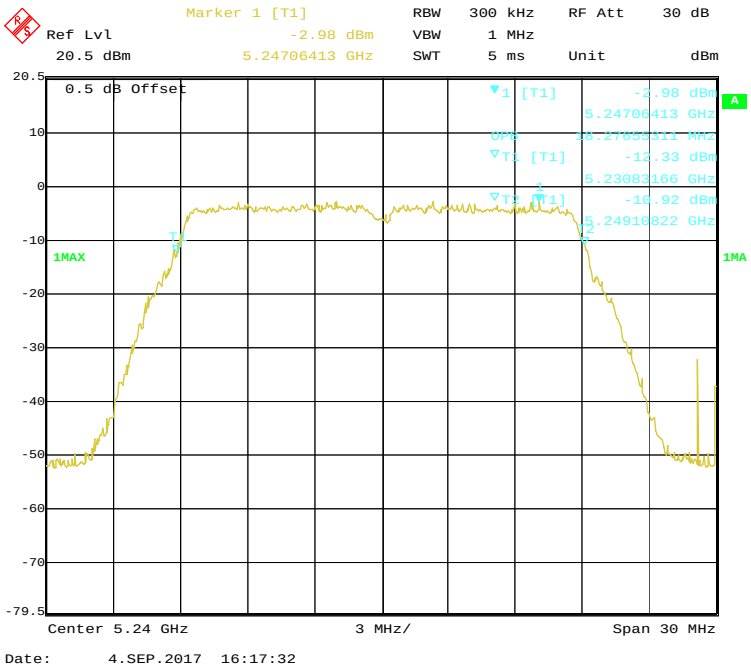
802.11ac20 mode, Chain 0: -5180MHz



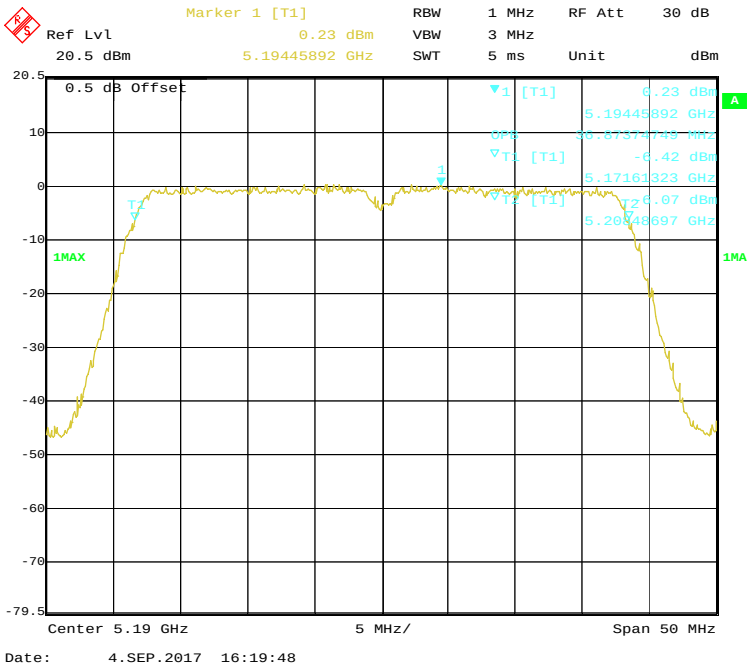
802.11ac20 mode, Chain 0: -5200MHz



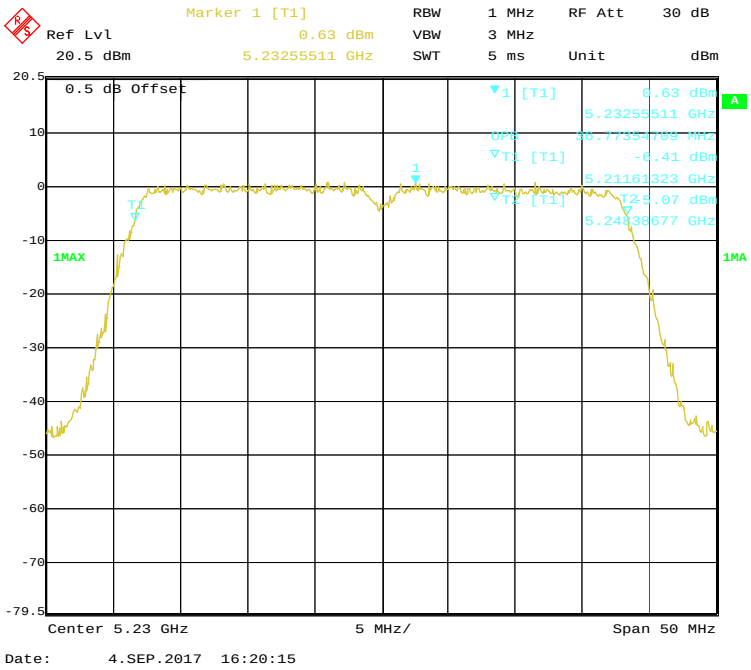
802.11ac20 mode, Chain 0: -5240MHz



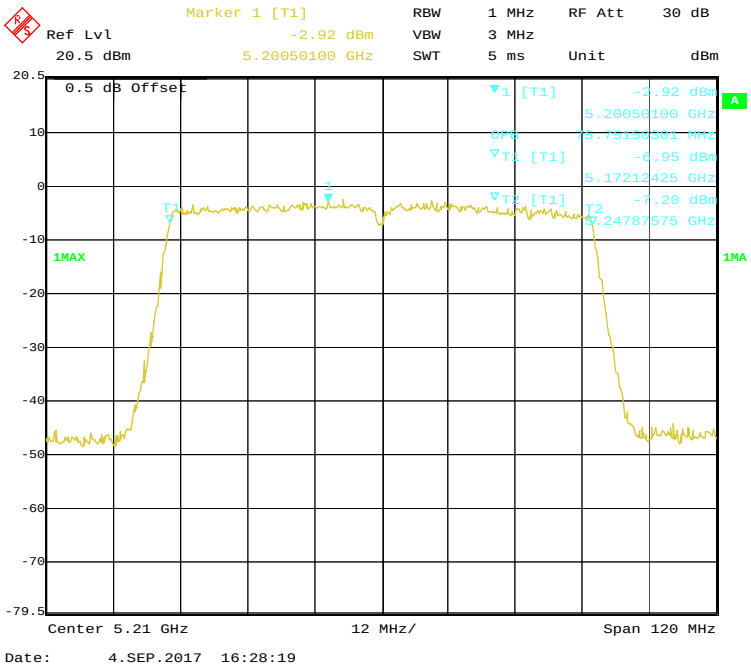
802.11ac40 mode, Chain 0: -5190MHz



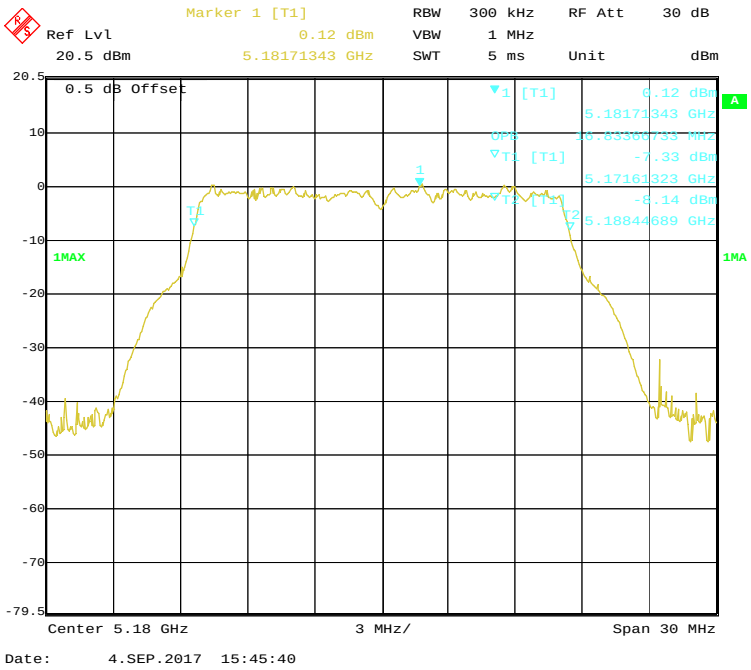
802.11ac40 mode, Chain 0: -5230MHz



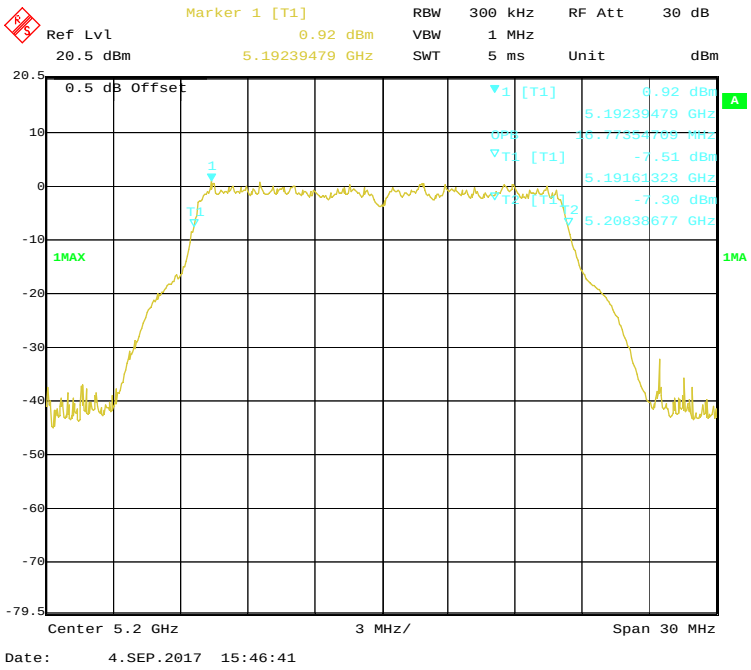
802.11ac80 mode, Chain 0: -5210MHz



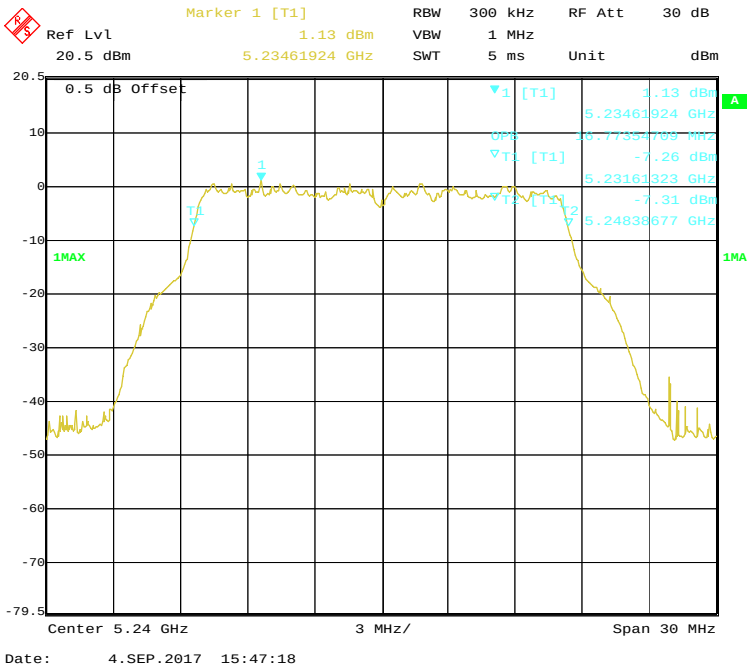
802.11a mode, Chain 1: -5180MHz



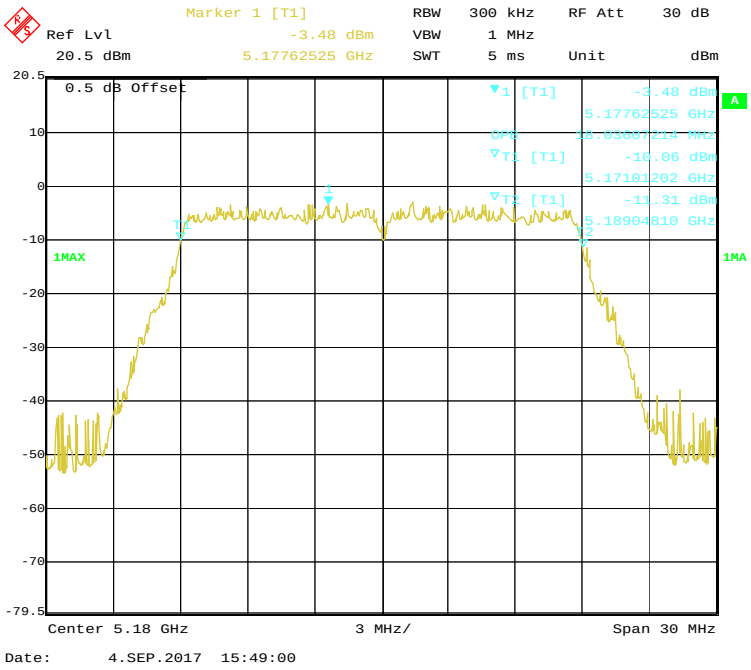
802.11a mode, Chain 1: -5200MHz



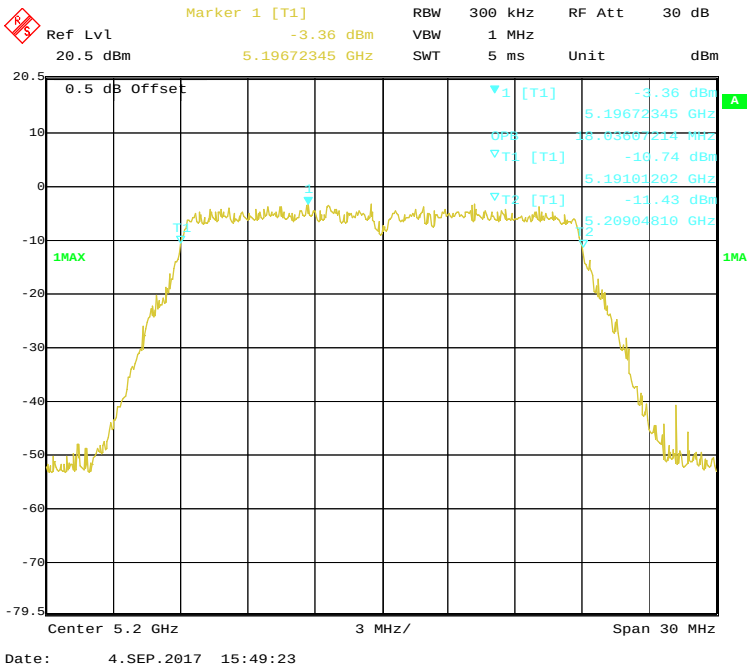
802.11a mode, Chain 1: -5240MHz



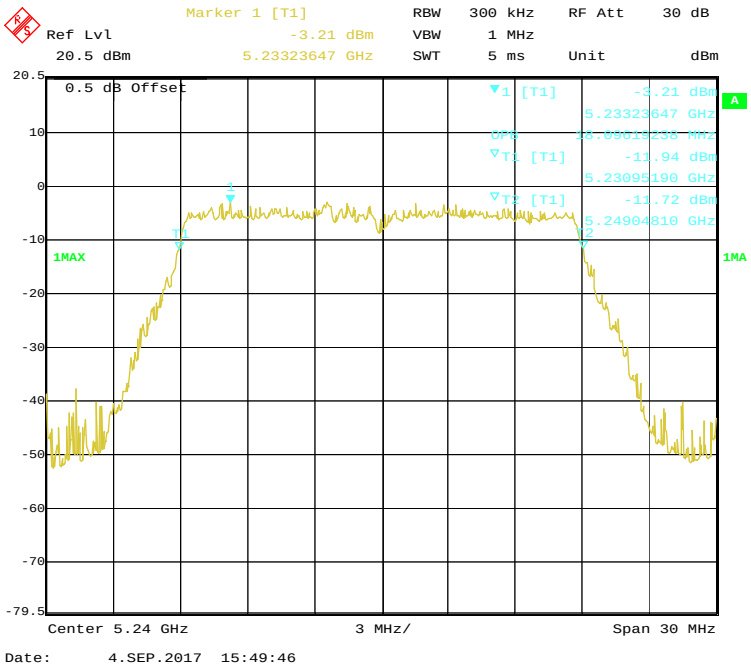
802.11n-HT20 mode, Chain 1: -5180MHz



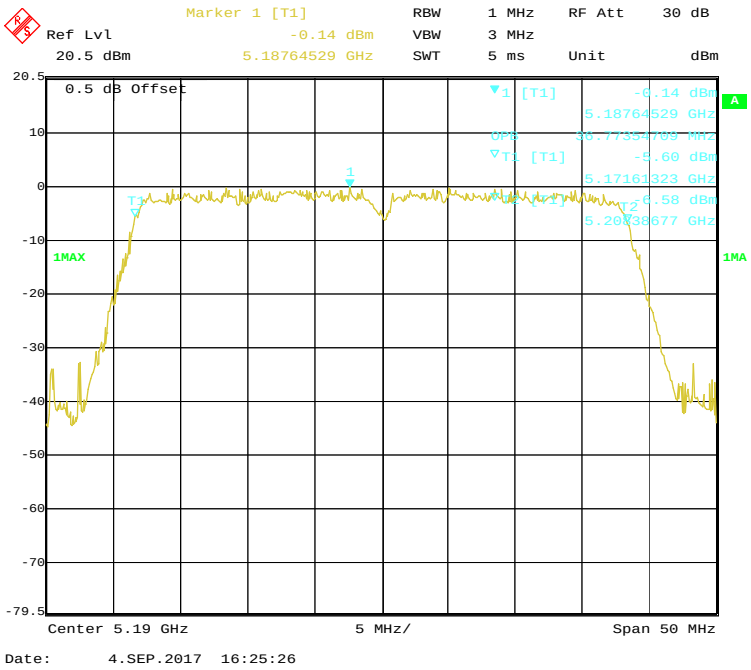
802.11n-HT20 mode, Chain 1: -5200MHz



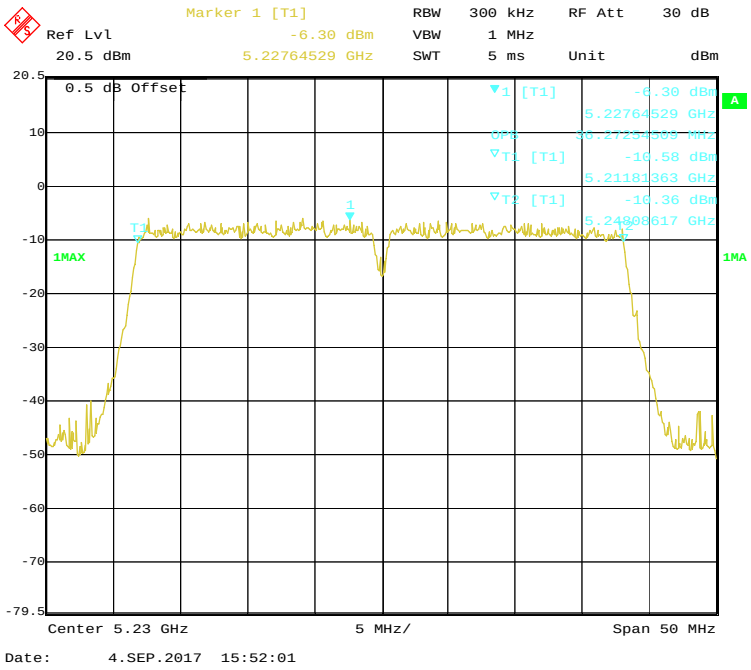
802.11n-HT20 mode, Chain 1: -5240MHz



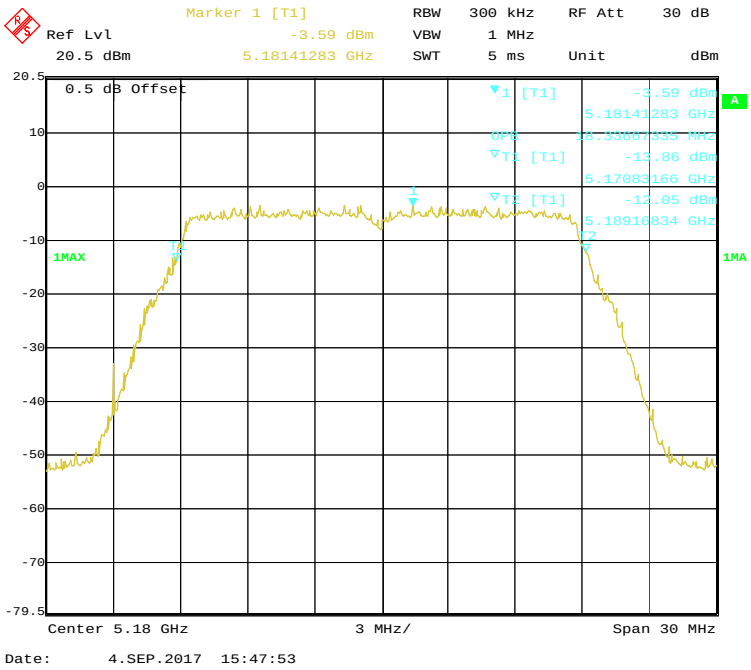
802.11n-HT40 mode, Chain 1: -5190MHz



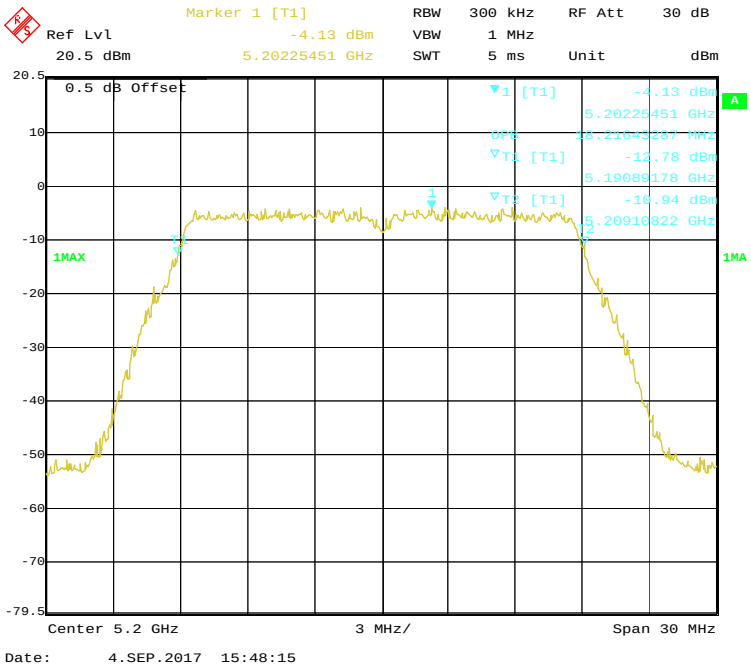
802.11n-HT40 mode, Chain 1: -5230MHz



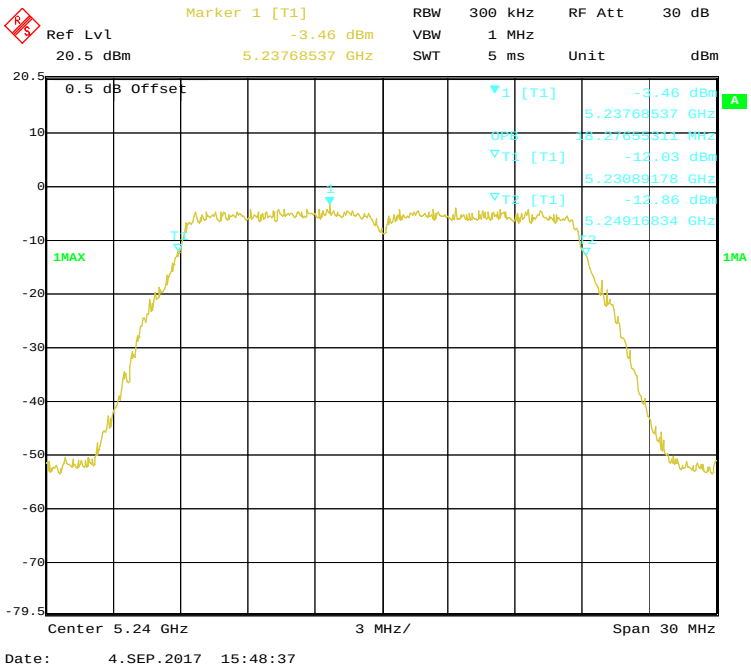
802.11ac20 mode, Chain 1: -5180MHz



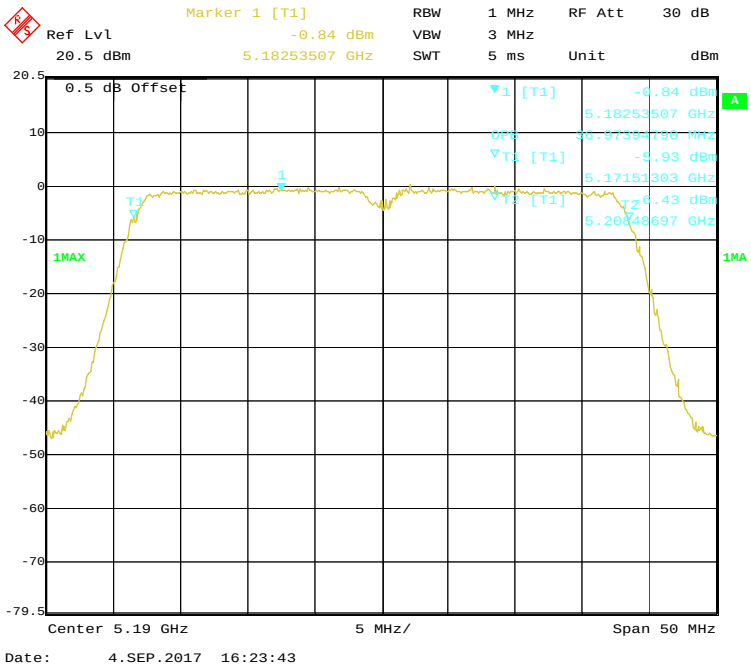
802.11ac20 mode, Chain 1: -5200MHz



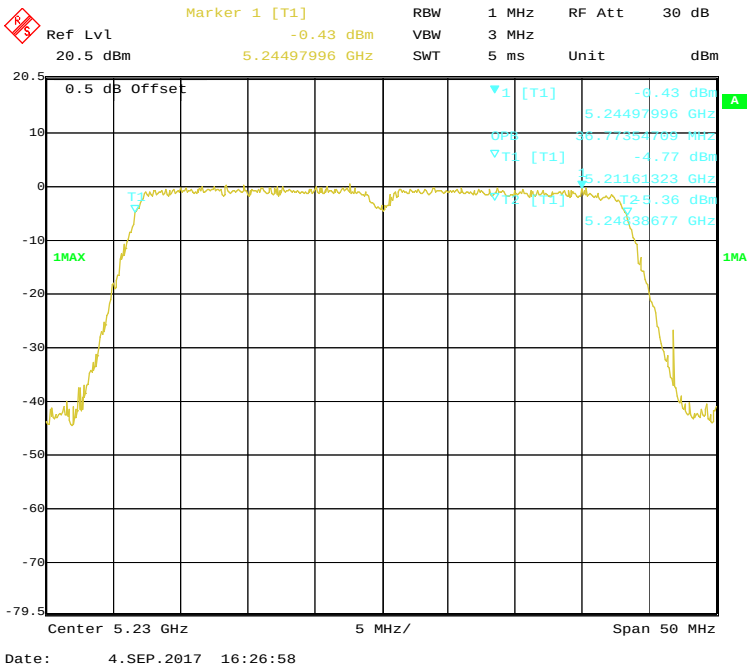
802.11ac20 mode, Chain 1: -5240MHz



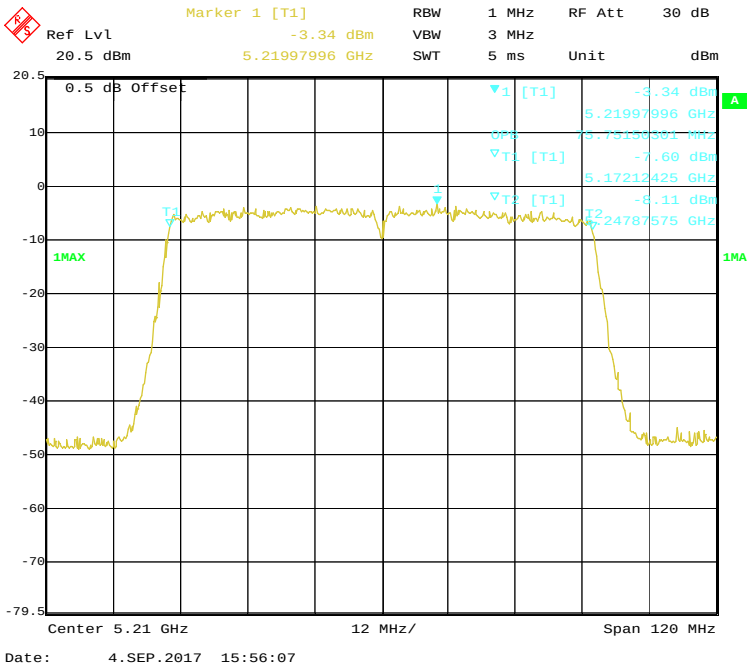
802.11ac40 mode, Chain 1: -5190MHz



802.11ac40 mode, Chain 1: -5230MHz



802.11ac80 mode, Chain 1: -5210MHz

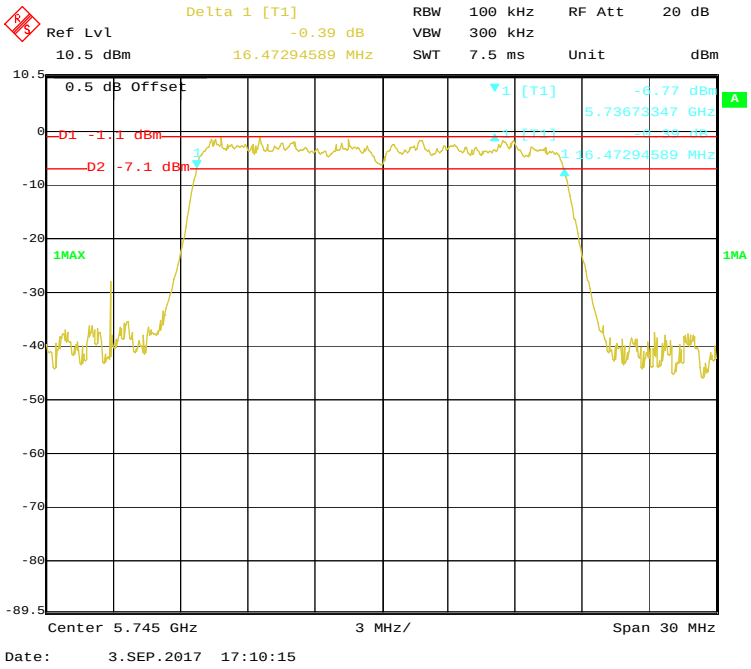


5725-5850MHz:

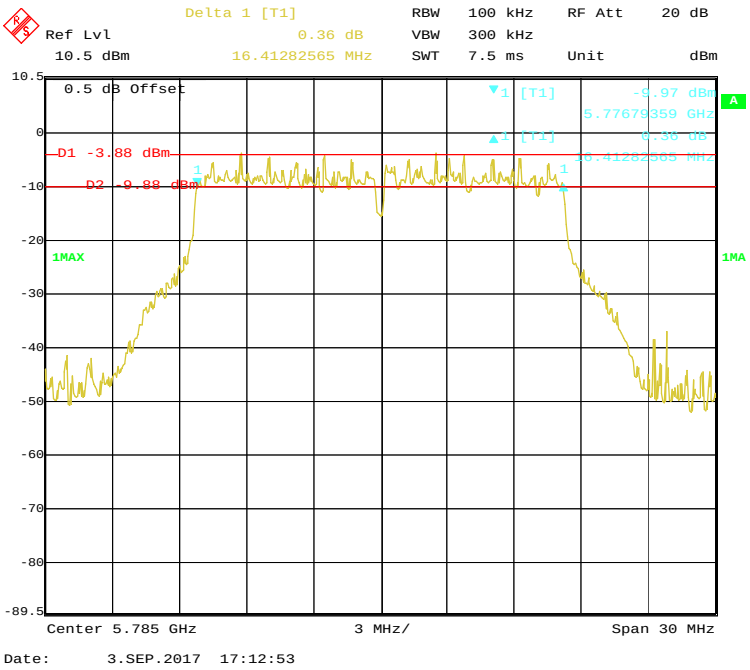
Test mode	Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Limit (MHz)
			Chain0	Chain1	
802.11a	Low	5745	16.47	16.41	≥0.5
	Middle	5785	16.41	16.41	≥0.5
	High	5825	16.41	16.47	≥0.5
802.11n-HT20	Low	5745	17.62	17.62	≥0.5
	Middle	5785	17.80	17.74	≥0.5
	High	5825	17.74	17.80	≥0.5
802.11n-HT40	Low	5755	36.57	36.57	≥0.5
	High	5795	36.57	36.57	≥0.5
802.11ac20	Low	5745	17.07	17.25	≥0.5
	Middle	5785	17.68	17.68	≥0.5
	High	5825	17.62	17.62	≥0.5
802.11ac40	Low	5755	36.47	36.17	≥0.5
	High	5795	36.37	36.37	≥0.5
802.11ac80	/	5775	75.95	76.23	≥0.5

5725-5850 MHz Band:

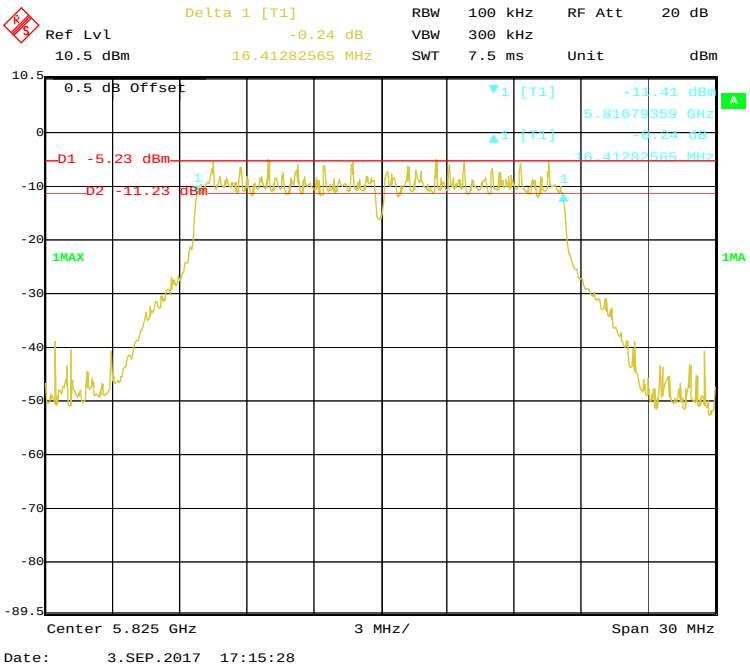
802.11a mode, Chain 0: 6 Bandwidth-5745MHz



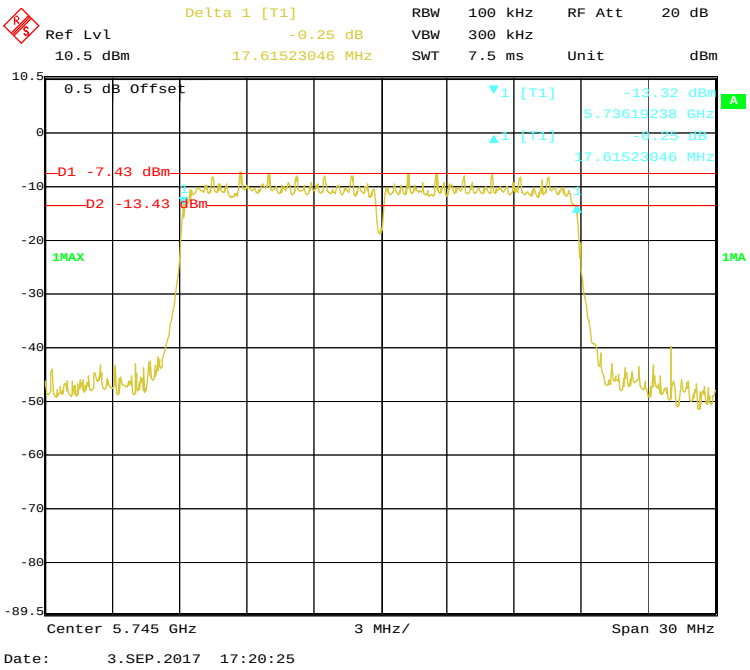
802.11a mode, Chain 0: 6 Bandwidth-5785MHz



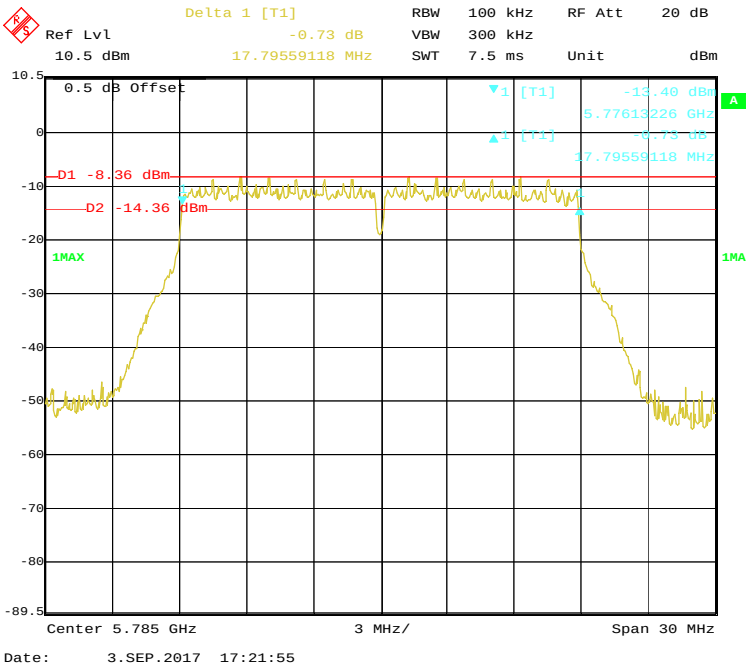
802.11a mode, Chain 0: 6 Bandwidth-5825MHz



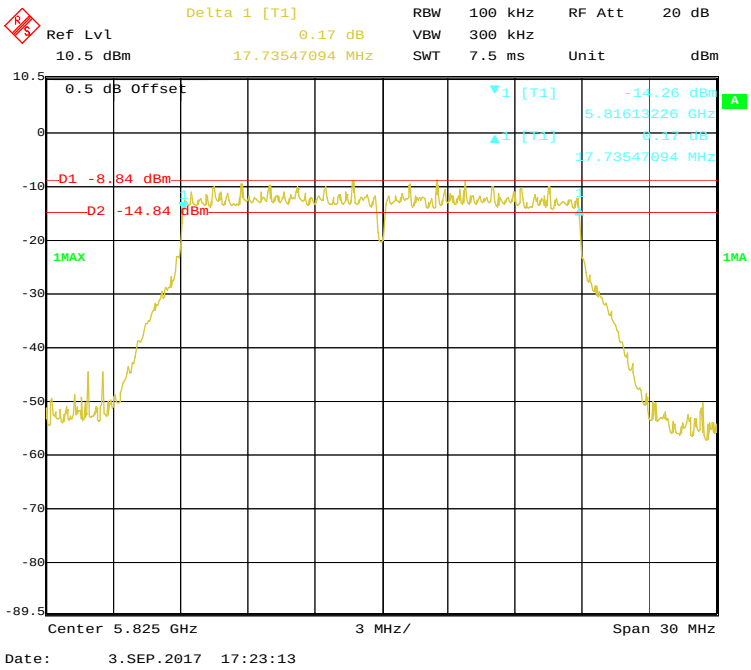
802.11n-HT20 mode, Chain 0: 6 Bandwidth-5745MHz



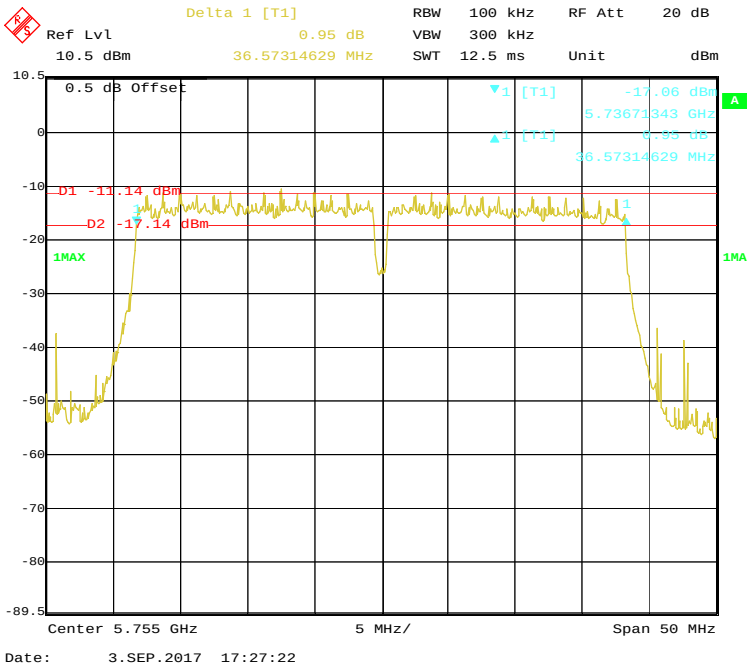
802.11n-HT20 mode, Chain 0: 6 Bandwidth-5785MHz



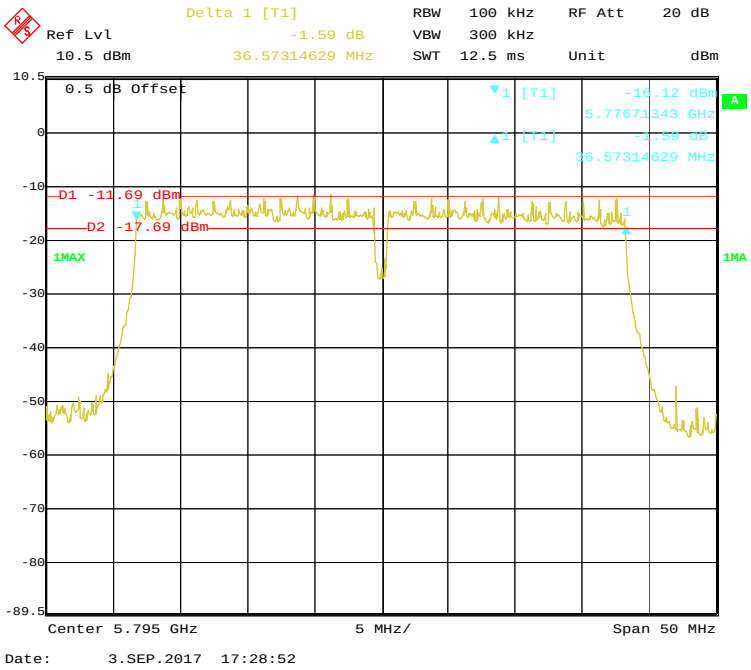
802.11n-HT20 mode, Chain 0: 6 Bandwidth-5825MHz



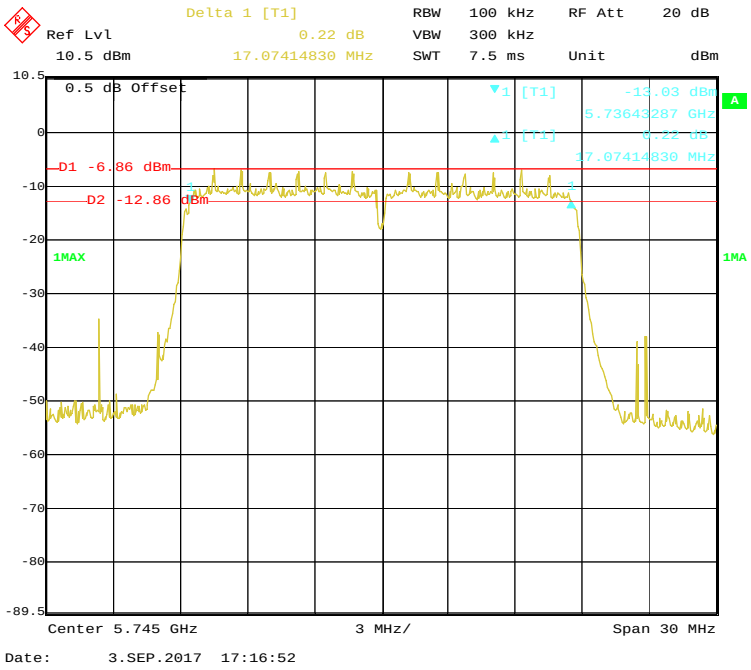
802.11n-HT40 mode, Chain 0: 6 Bandwidth-5755MHz



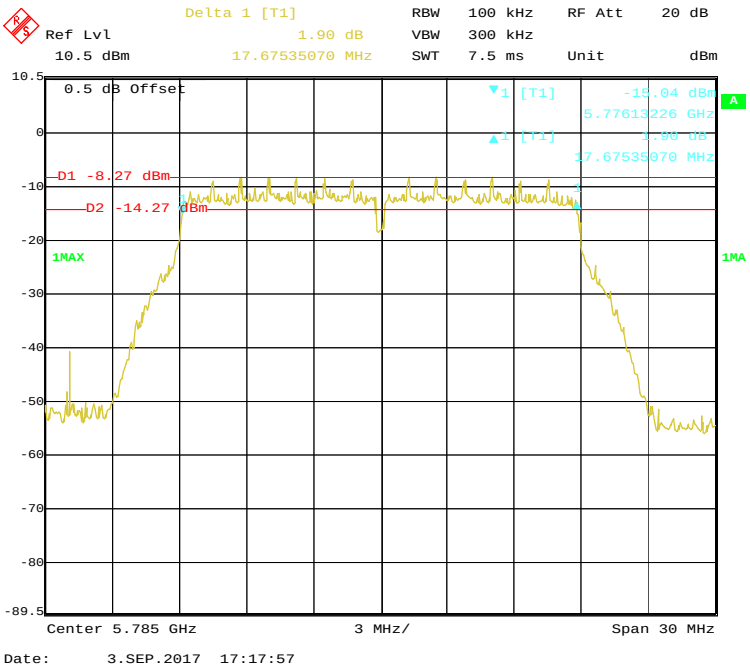
802.11n-HT40 mode, Chain 0: 6 Bandwidth-5795MHz



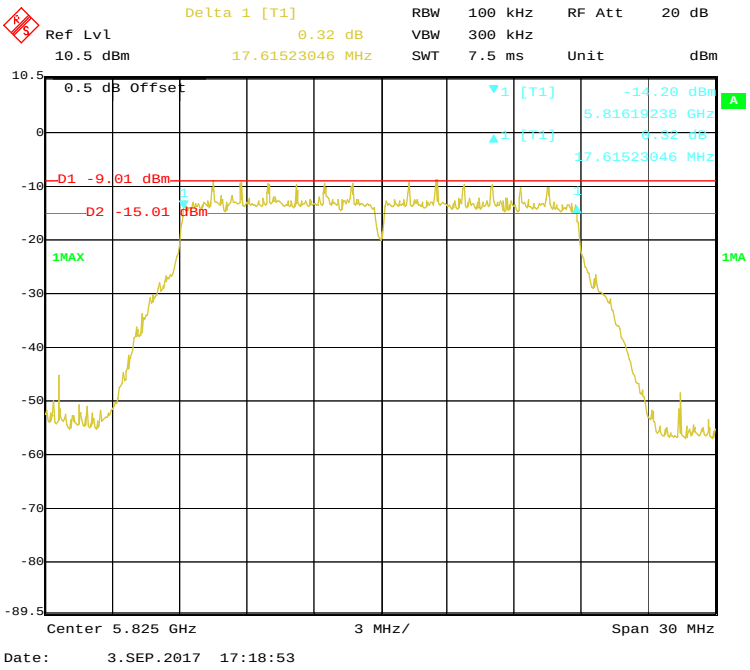
802.11ac20 mode, Chain 0: 6 Bandwidth-5745MHz



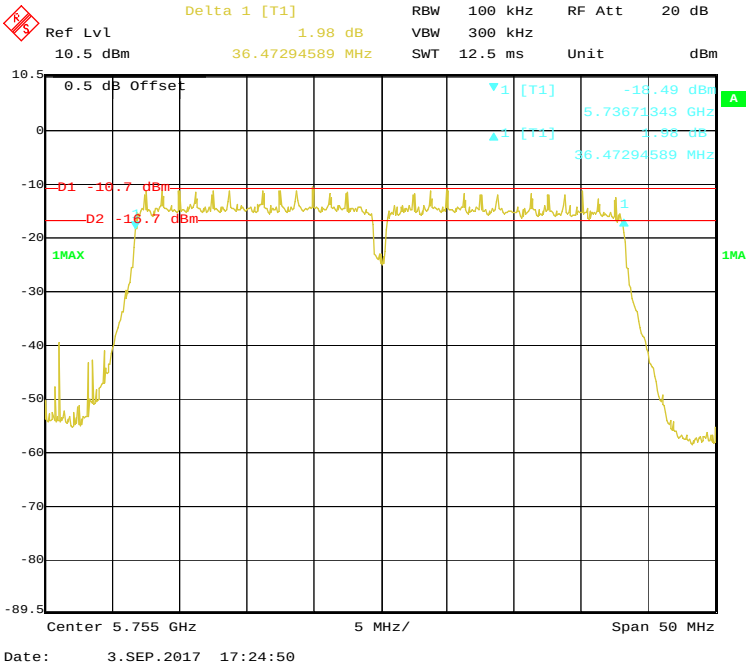
802.11ac20 mode, Chain 0: 6 Bandwidth-5785MHz



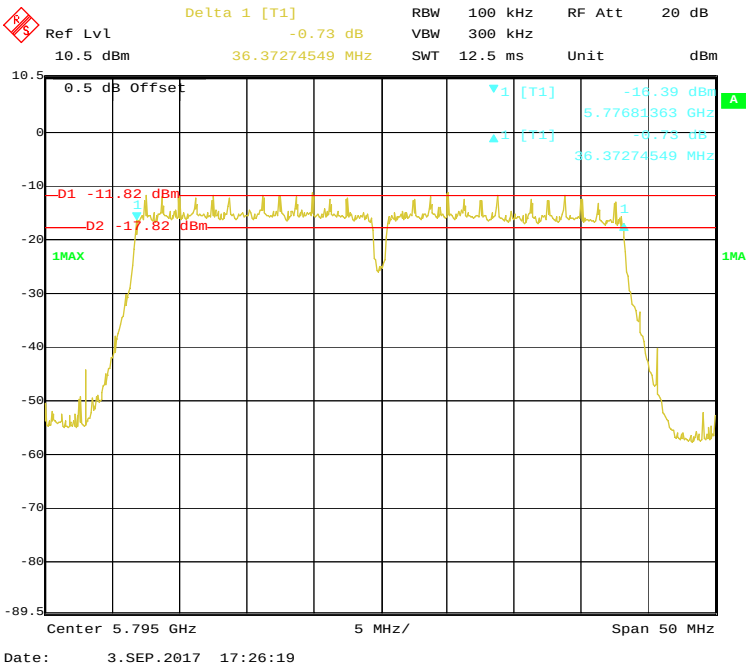
802.11ac20 mode, Chain 0: 6 Bandwidth-5825MHz



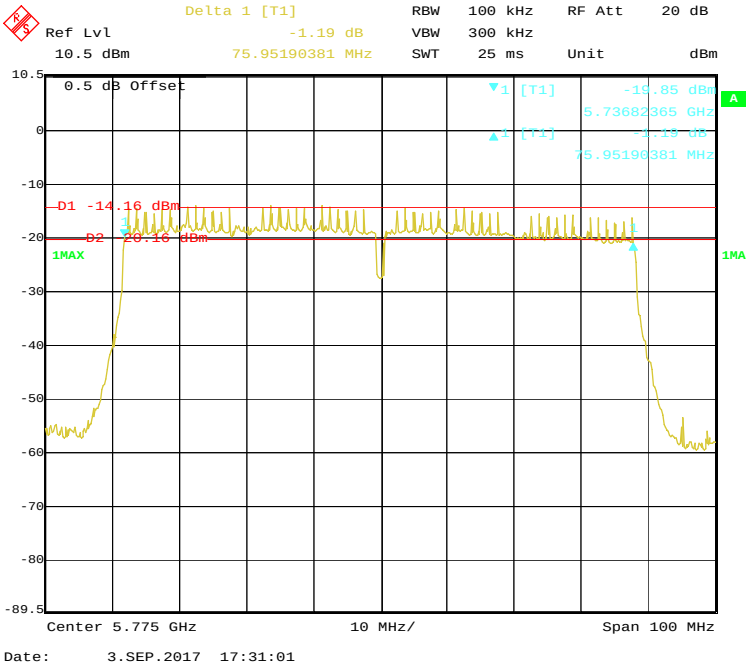
802.11ac40 mode, Chain 0: 6 Bandwidth-5755MHz



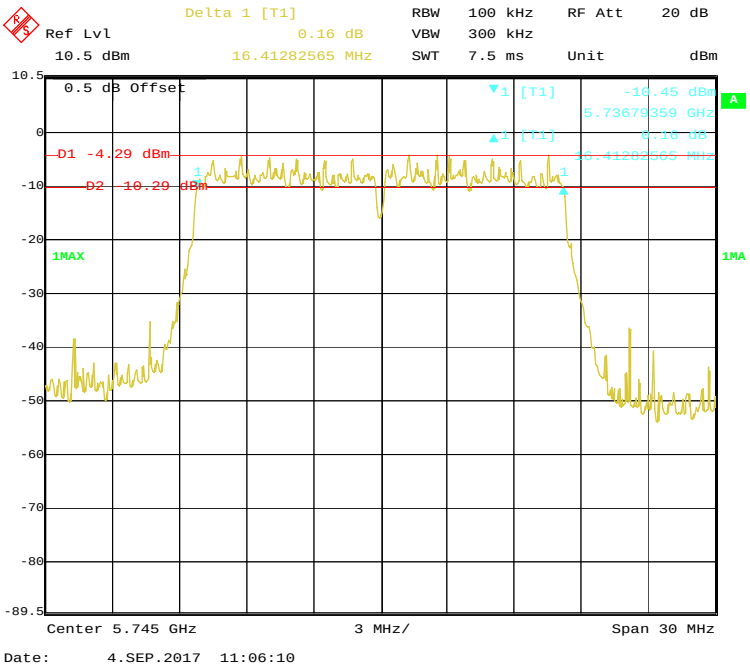
802.11ac40 mode, Chain 0: 6 Bandwidth-5795MHz



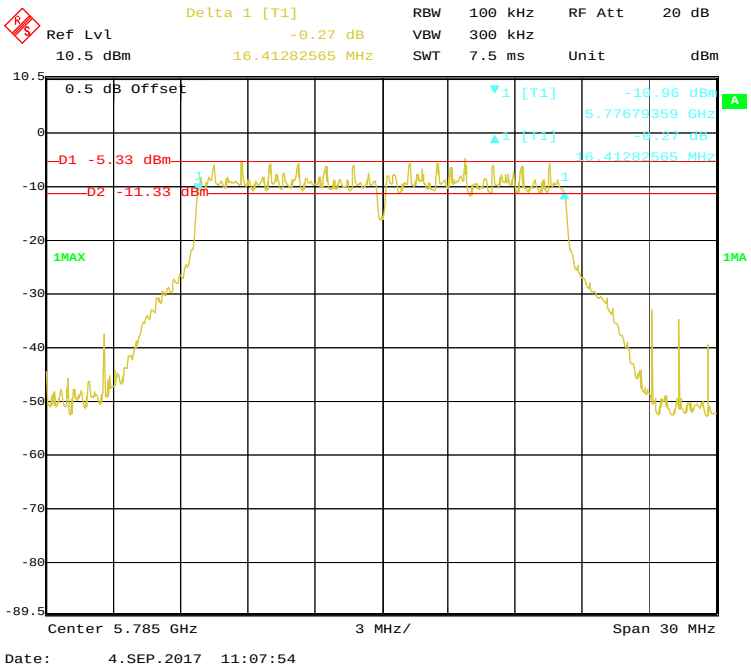
802.11ac80 mode, Chain 0: 6 Bandwidth-5775MHz



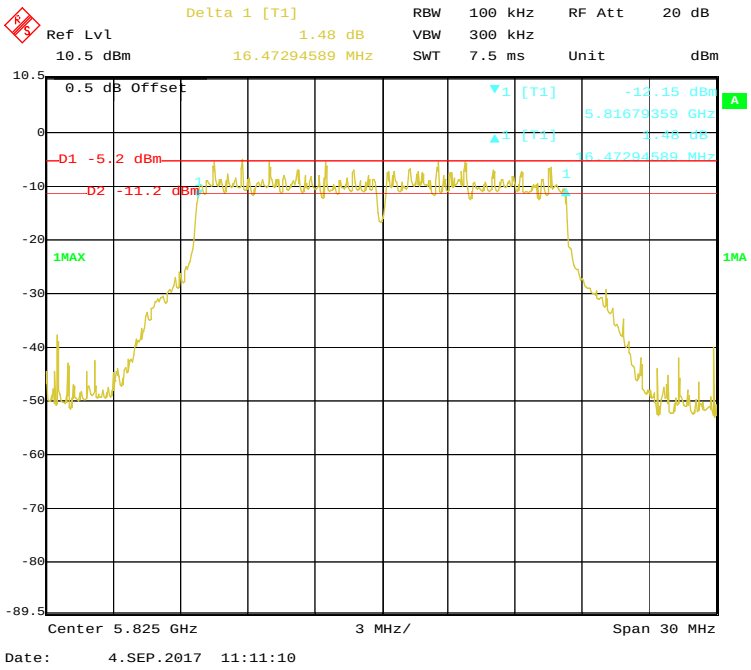
802.11a mode, Chain 1: 6 Bandwidth-5745MHz



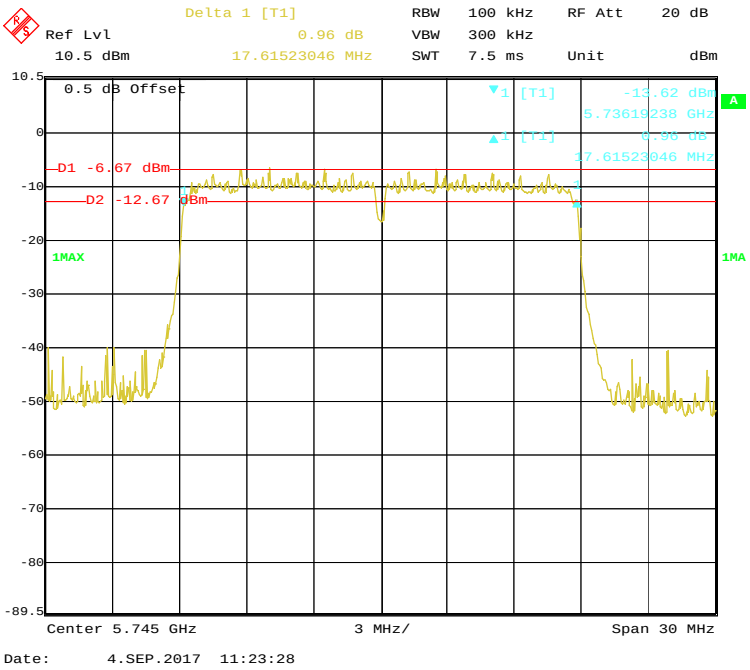
802.11a mode, Chain 1: 6 Bandwidth-5785MHz



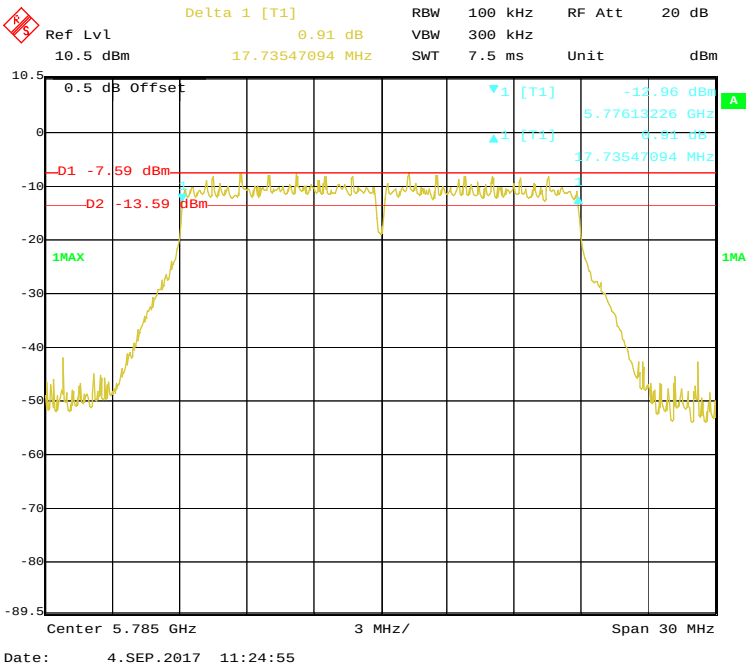
802.11a mode, Chain 1: 6 Bandwidth-5825MHz



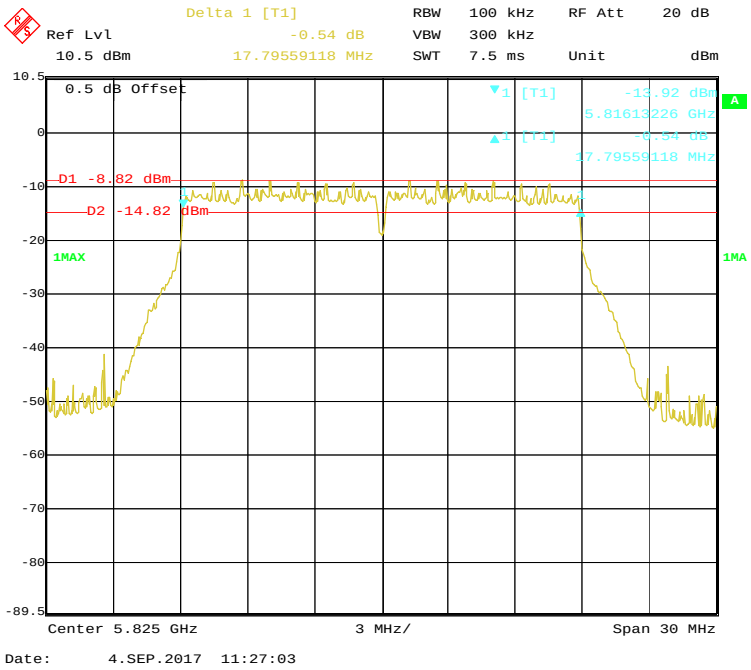
802.11n-HT20 mode, Chain 1: 6 Bandwidth-5745MHz



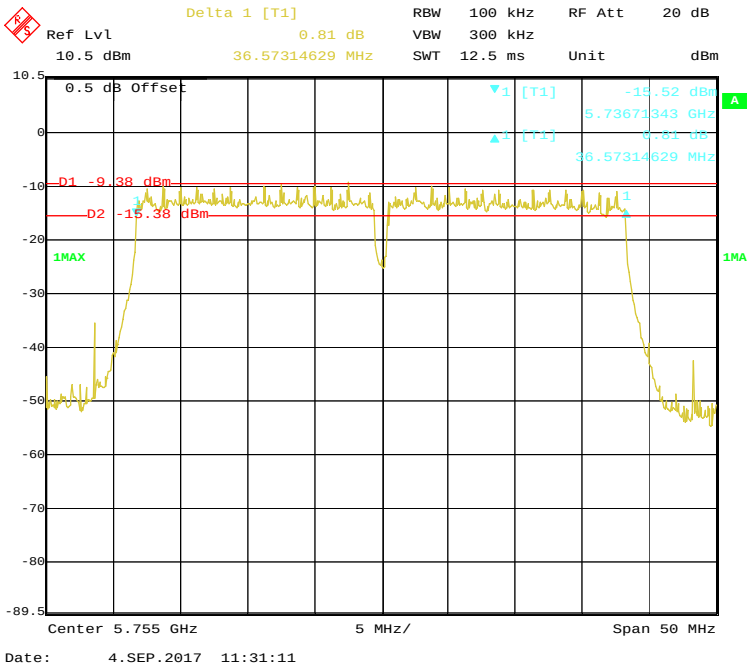
802.11n-HT20 mode, Chain 1: 6 Bandwidth-5785MHz



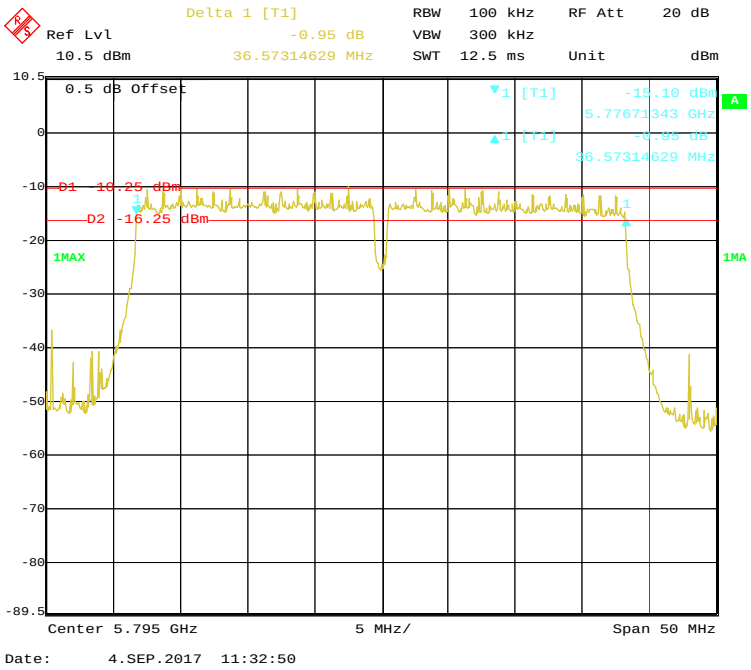
802.11n-HT20 mode, Chain 1: 6 Bandwidth-5825MHz



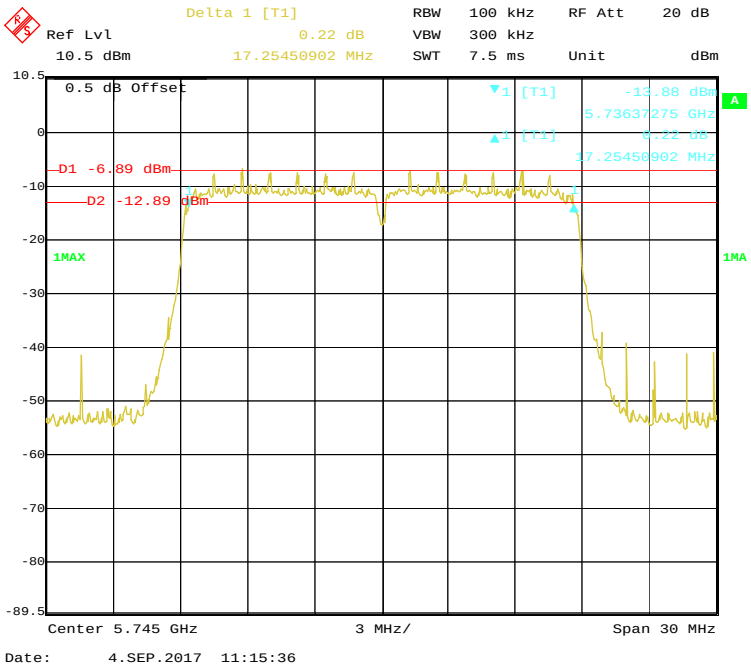
802.11n-HT40 mode, Chain 1: 6 Bandwidth-5755MHz



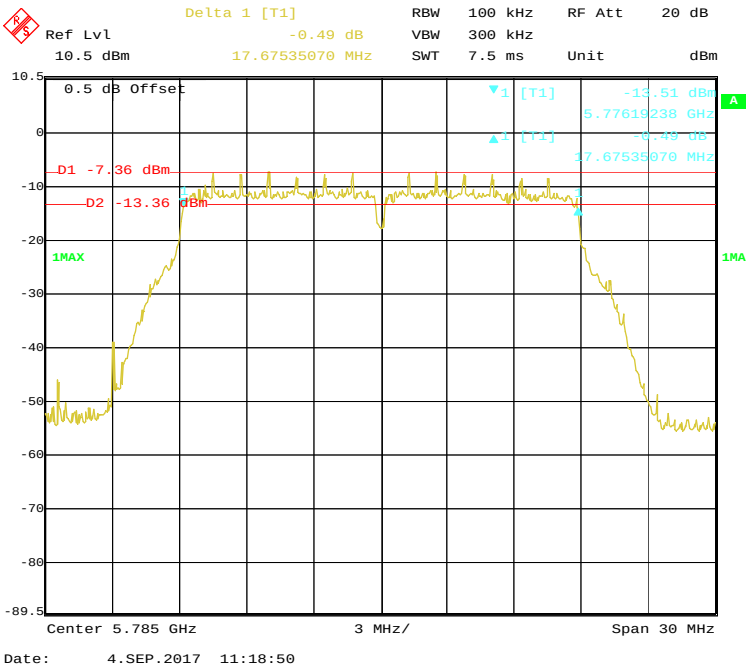
802.11n-HT40 mode, Chain 1: 6 Bandwidth-5795MHz



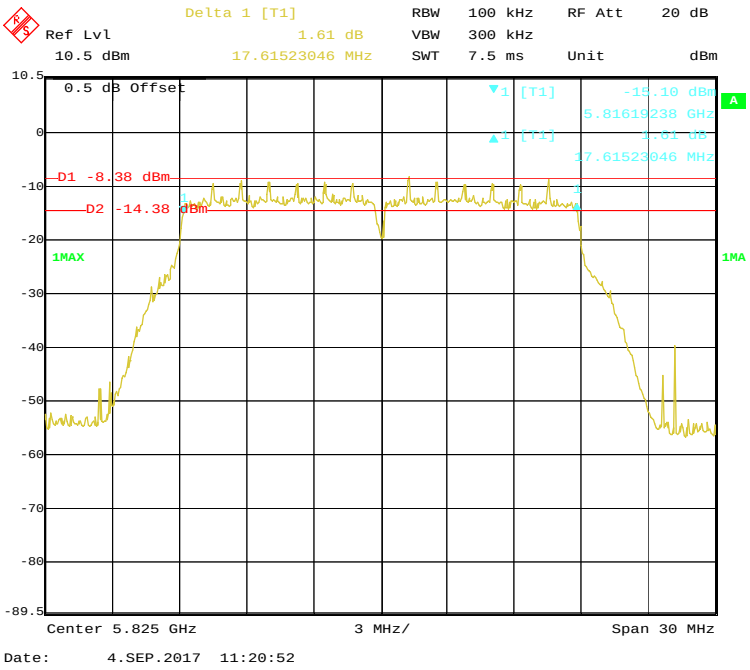
802.11ac20 mode, Chain 1: 6 Bandwidth-5745MHz



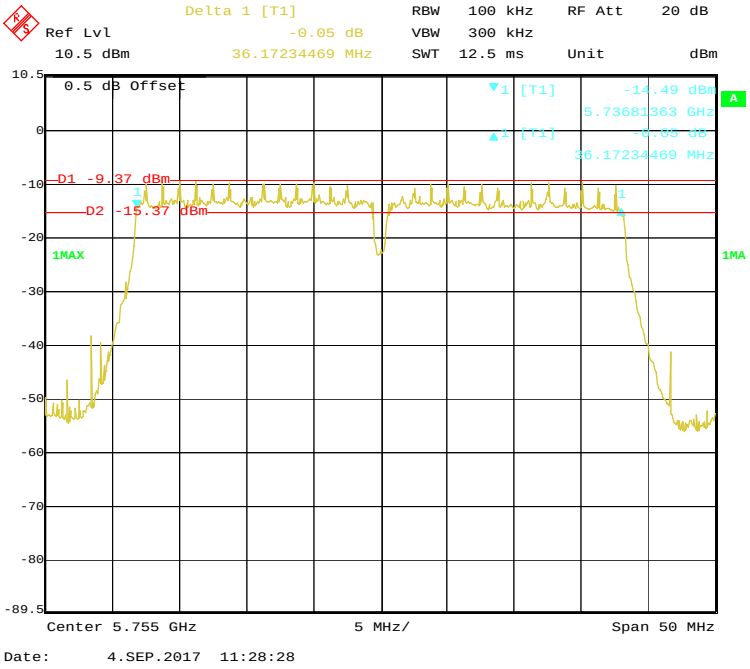
802.11ac20 mode, Chain 1: 6 Bandwidth-5785MHz



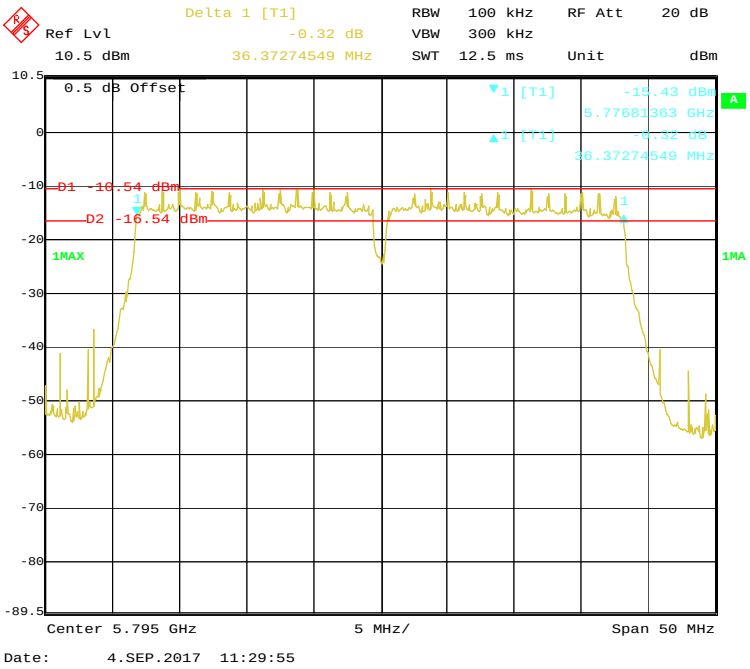
802.11ac20 mode, Chain 1: 6 Bandwidth-5825MHz



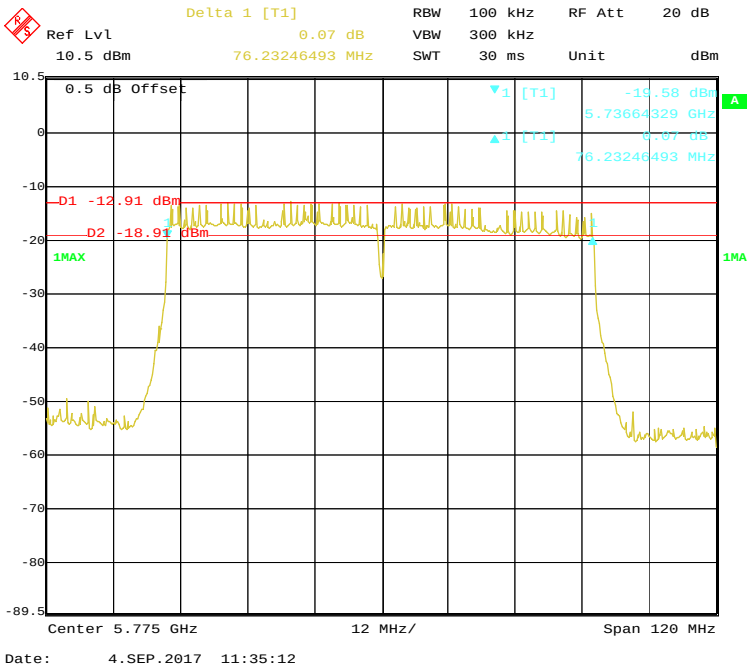
802.11ac40 mode, Chain 1: 6 Bandwidth-5755MHz



802.11ac40 mode, Chain 1: 6 Bandwidth-5795MHz



802.11ac80 mode, Chain 1: 6 Bandwidth-5775MHz



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

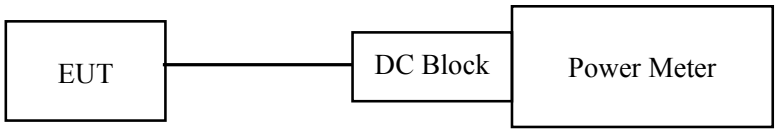
Applicable Standard

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

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

Test Procedure

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



Test Data

Environmental Conditions

Temperature:	23.5 °C
Relative Humidity:	55 %
ATM Pressure:	101.2 kPa

The testing was performed by Kyle Xu on 2017-09-03 to 2017-09-04.

Test Mode: Transmitting

Test mode	Band	Channel	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)			Limit (dBm)	Result
				Chain0	Chain1	Total		
802.11a	5150-5250 MHz	Low	5180	13.48	12.09	/	24	PASS
		Middle	5200	13.52	11.02	/	24	PASS
		High	5240	13.43	12.80	/	24	PASS
	5725-5850 MHz	Low	5745	13.66	12.22	/	30	PASS
		Middle	5785	12.59	11.79	/	30	PASS
		High	5825	11.84	10.62	/	30	PASS
802.11n ht20	5150-5250 MHz	Low	5180	10.89	9.47	13.25	24	PASS
		Middle	5200	11.15	10.27	13.74	24	PASS
		High	5240	11.25	10.61	13.95	24	PASS
	5725-5850 MHz	Low	5745	11.62	10.47	14.09	30	PASS
		Middle	5785	10.73	9.88	13.34	30	PASS
		High	5825	9.81	8.12	12.06	30	PASS
802.11n-HT40	5150-5250 MHz	Low	5190	10.17	9.57	12.89	24	PASS
		High	5230	10.41	9.84	13.14	24	PASS
	5725-5850 MHz	Low	5755	10.91	9.85	13.42	30	PASS
		High	5795	10.22	9.60	12.93	30	PASS
802.11ac20	5150-5250 MHz	Low	5180	10.59	9.43	13.06	24	PASS
		Middle	5200	10.54	9.08	12.88	24	PASS
		High	5240	10.76	9.14	13.04	24	PASS
	5725-5850 MHz	Low	5745	11.16	10.11	13.68	30	PASS
		Middle	5785	10.40	9.41	12.94	30	PASS
		High	5825	9.28	8.31	11.83	30	PASS
802.11ac40	5150-5250 MHz	Low	5190	10.48	9.65	13.10	24	PASS
		High	5230	10.31	9.65	13.00	24	PASS
	5725-5850 MHz	Low	5755	10.73	9.31	13.09	30	PASS
		High	5795	10.37	9.73	13.07	30	PASS
802.11ac80	5150-5250 MHz	/	5210	10.14	9.68	12.93	24	PASS
	5725-5850 MHz	/	5775	10.38	9.16	12.82	30	PASS

Test mode	Band	Channel	Frequency (MHz)	Average Conducted Output Power (dBm)			Limit (dBm)	Result
				Chain0	Chain1	Total		
802.11a	5150-5250 MHz	Low	5180	7.44	6.49	/	24	PASS
		Middle	5200	7.39	5.82	/	24	PASS
		High	5240	6.58	6.98	/	24	PASS
	5725-5850 MHz	Low	5745	7.35	6.75	/	30	PASS
		Middle	5785	7.06	5.92	/	30	PASS
		High	5825	6.18	5.99	/	30	PASS
802.11n HT20	5150-5250 MHz	Low	5180	4.18	3.26	6.75	24	PASS
		Middle	5200	4.88	3.49	7.25	24	PASS
		High	5240	4.23	3.76	7.01	24	PASS
	5725-5850 MHz	Low	5745	4.39	3.61	7.03	30	PASS
		Middle	5785	4.08	2.93	6.55	30	PASS
		High	5825	3.96	3.84	6.91	30	PASS
802.11n-HT40	5150-5250 MHz	Low	5190	4.07	3.10	6.62	24	PASS
		High	5230	3.91	3.74	6.84	24	PASS
	5725-5850 MHz	Low	5755	4.04	3.98	7.02	30	PASS
		High	5795	4.14	3.44	6.81	30	PASS
802.11ac20	5150-5250 MHz	Low	5180	4.69	3.81	7.28	24	PASS
		Middle	5200	4.45	3.28	6.91	24	PASS
		High	5240	4.25	3.06	6.71	24	PASS
	5725-5850 MHz	Low	5745	4.05	3.34	6.72	30	PASS
		Middle	5785	4.53	3.58	7.09	30	PASS
		High	5825	3.82	3.45	6.65	30	PASS
802.11ac40	5150-5250 MHz	Low	5190	4.62	3.46	7.09	24	PASS
		High	5230	4.70	3.99	7.37	24	PASS
	5725-5850 MHz	Low	5755	4.59	3.81	7.23	30	PASS
		High	5795	4.82	3.49	7.22	30	PASS
802.11ac80	5150-5250 MHz	/	5210	4.41	3.38	6.94	24	PASS
	5725-5850 MHz	/	5775	4.84	3.76	7.34	30	PASS

Note:

The total output power=10Log10(10^(Chain 0/10)+10^(Chain 1/10))

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

Applicable Standard

According to §15.407(a)(1)

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

(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. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. 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.

According to §15.407(a)(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

The measurements are base on FCC KDB 789033 D02 General UNII Test Procedyres New Rules v01:Guidelines for Compliance Testing of Unlicensed National Information Infrastructure(U-NII)Devices section F: Maximum power spectral density(PPSD)

Test Data

Environmental Conditions

Temperature:	23.5 °C
Relative Humidity:	55 %
ATM Pressure:	101.2 kPa

The testing was performed by Kyle Xu on 2017-09-03 to 2017-09-04.

Test Mode: Transmitting

5150MHz-5250MHz:

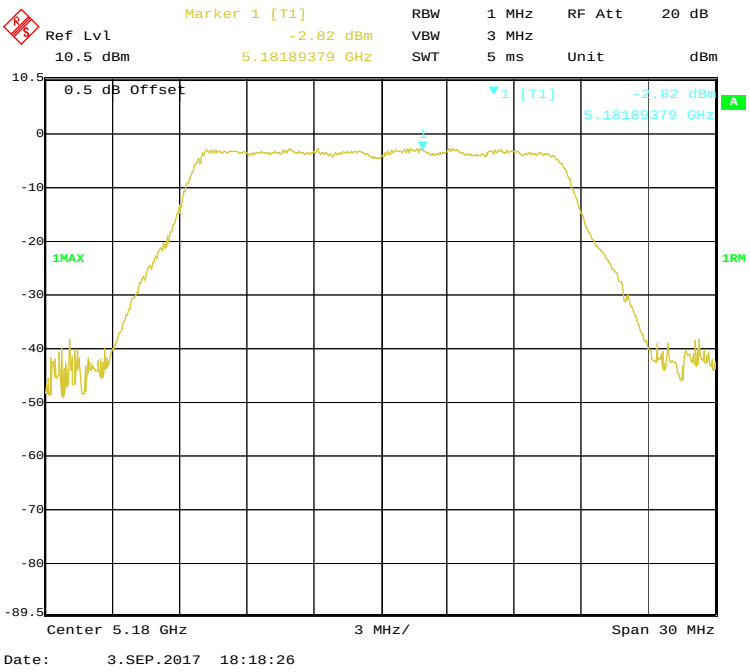
Mode	Channel	Frequency (MHz)	PSD (dBm/MHz)			Limit (dBm/MHz)	Result
			Chain0	Chain1	Total		
802.11a	Low	5180	-2.82	-2.15	/	11	PASS
	Middle	5200	-2.50	-1.87	/	11	PASS
	High	5240	-2.61	-2.02	/	11	PASS
802.11n20	Low	5180	-6.28	-5.94	-3.10	11	PASS
	Middle	5200	-6.50	-5.81	-3.13	11	PASS
	High	5240	-6.19	-5.82	-2.99	11	PASS
802.11n40	Low	5190	-9.95	-8.43	-6.11	11	PASS
	High	5230	-9.77	-9.19	-6.46	11	PASS
802.11ac20	Low	5180	-7.18	-6.35	-3.73	11	PASS
	Middle	5200	-6.71	-5.92	-3.29	11	PASS
	High	5240	-6.99	-6.20	-3.57	11	PASS
802.11ac40	Low	5190	-10.70	-9.10	-6.82	11	PASS
	High	5230	-10.77	-8.69	-6.60	11	PASS
802.11ac80	/	5210	-10.94	-12.22	-8.52	11	PASS

Note:

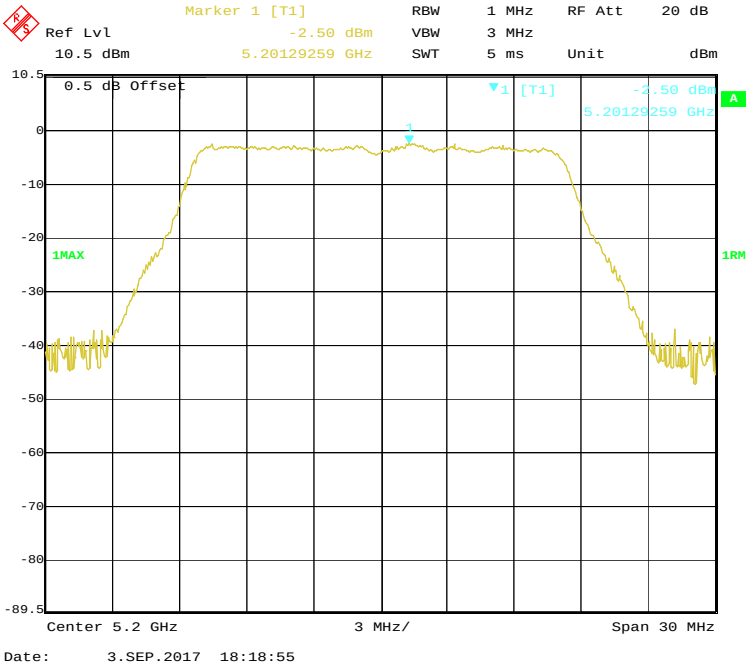
For 802.11n & 802.11ac:
Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
Directional gain = 3dBi + 10log (2) = 6dBi, so the limit shall be 11dBm

5150MHz-5250MHz Band:

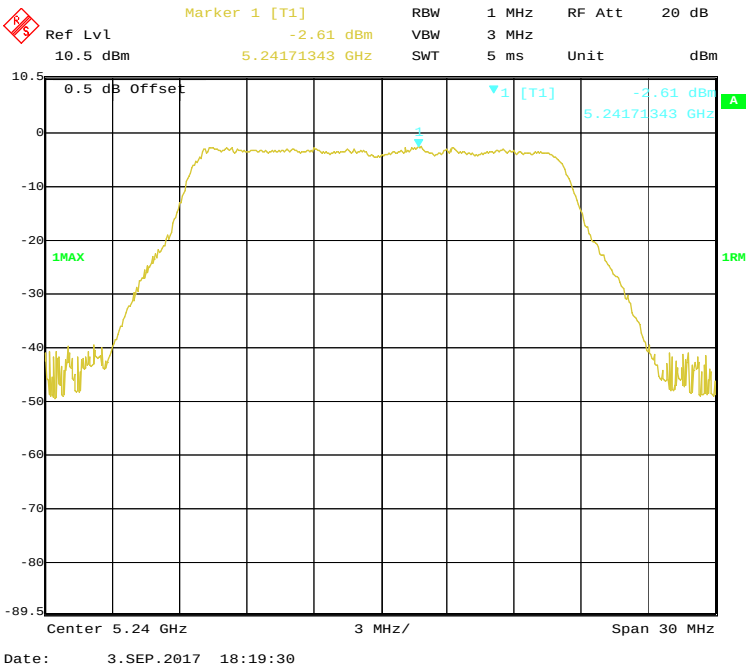
802.11a mode, Chain 0: Power spectral density-5180MHz



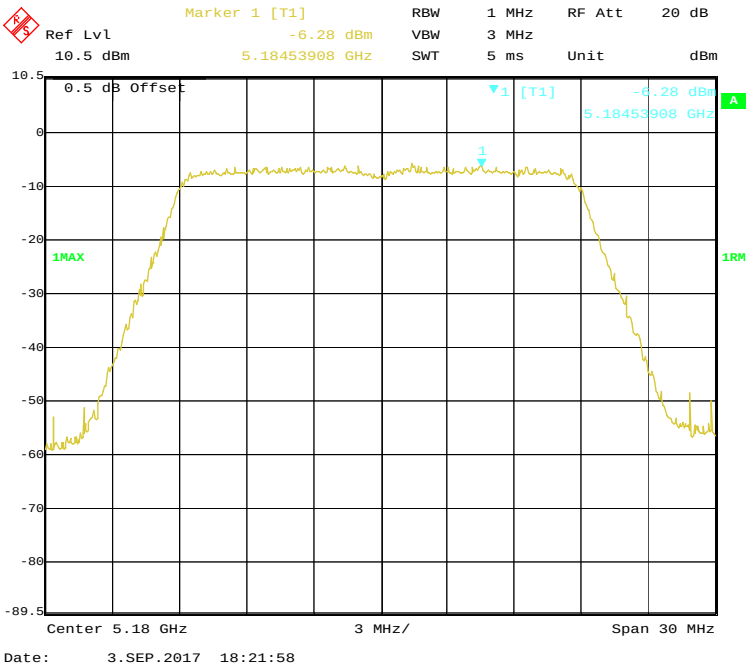
802.11a mode, Chain 0: Power spectral density-5200MHz



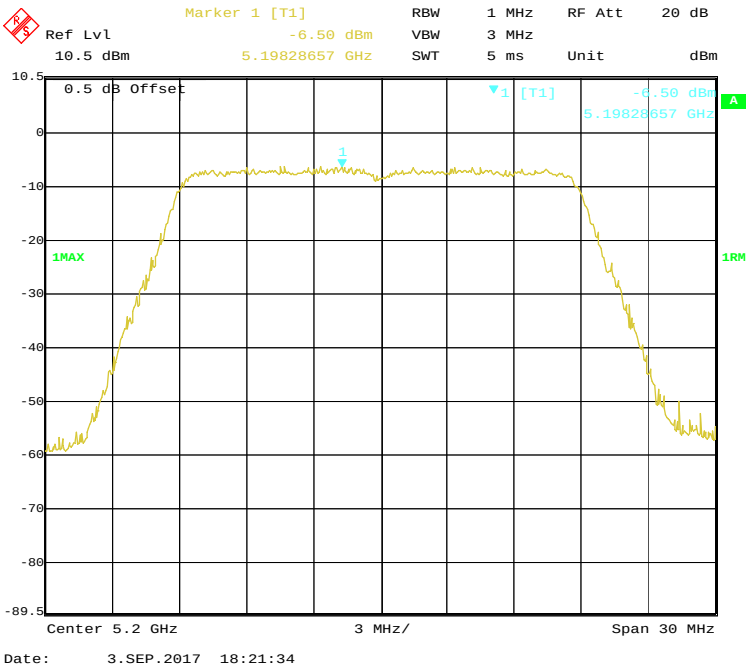
802.11a mode, Chain 0: Power spectral density-5240MHz



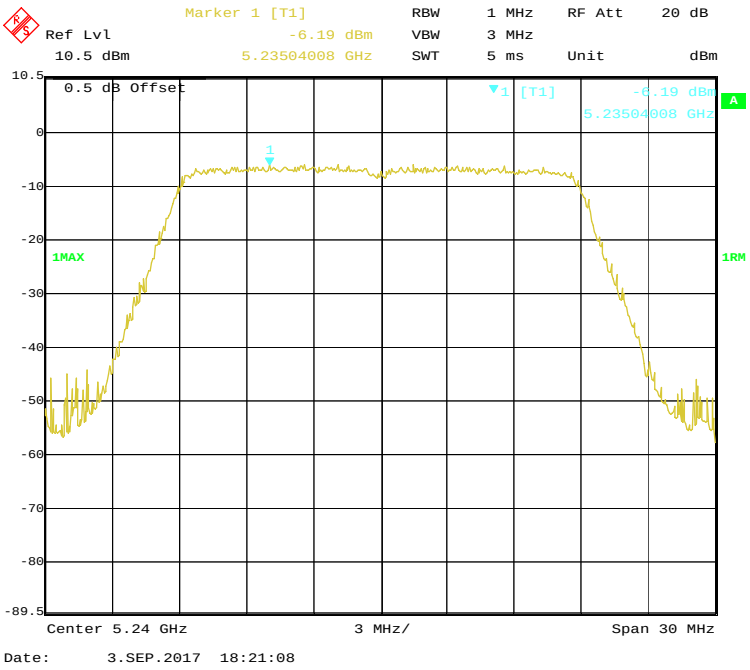
802.11n-HT20 mode, Chain 0: Power spectral density-5180MHz



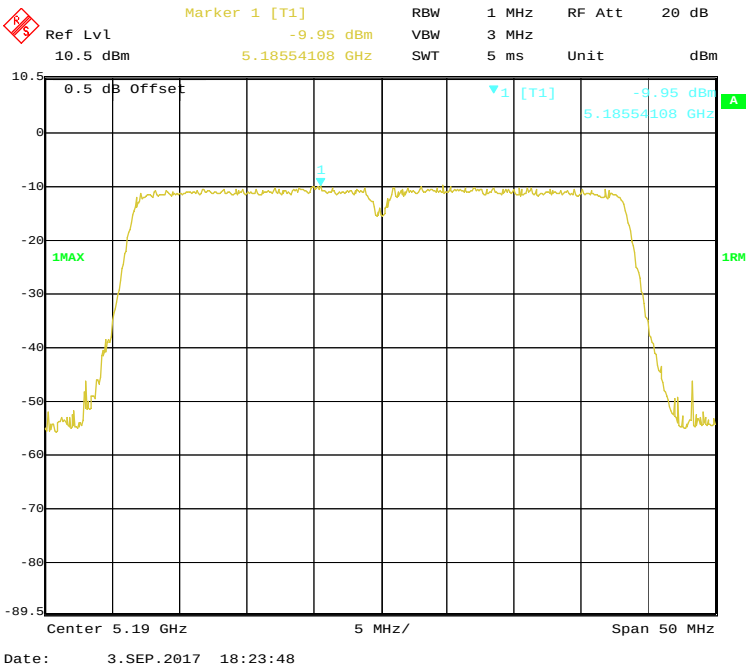
802.11n-HT20 mode, Chain 0: Power spectral density-5200MHz



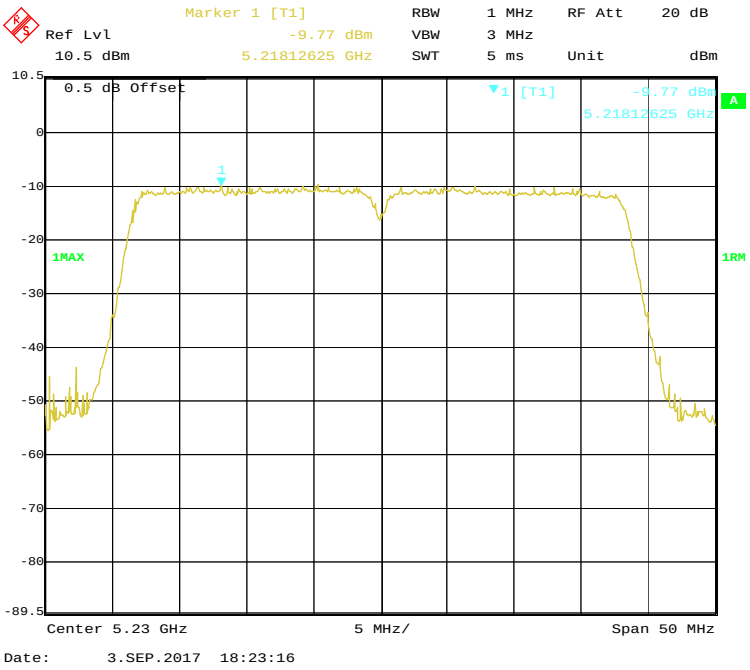
802.11n-HT20 mode, Chain 0: Power spectral density-5240MHz



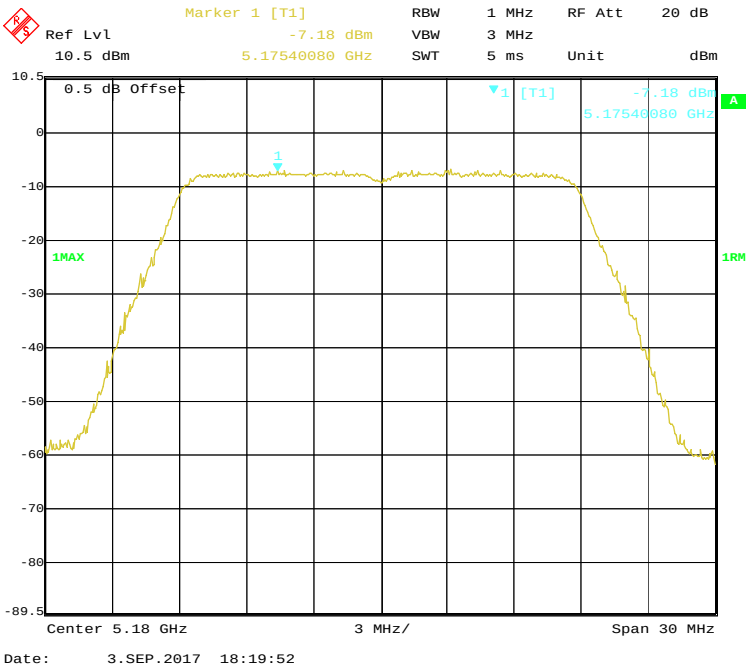
802.11n-HT40 mode, Chain 0: Power spectral density-5190MHz



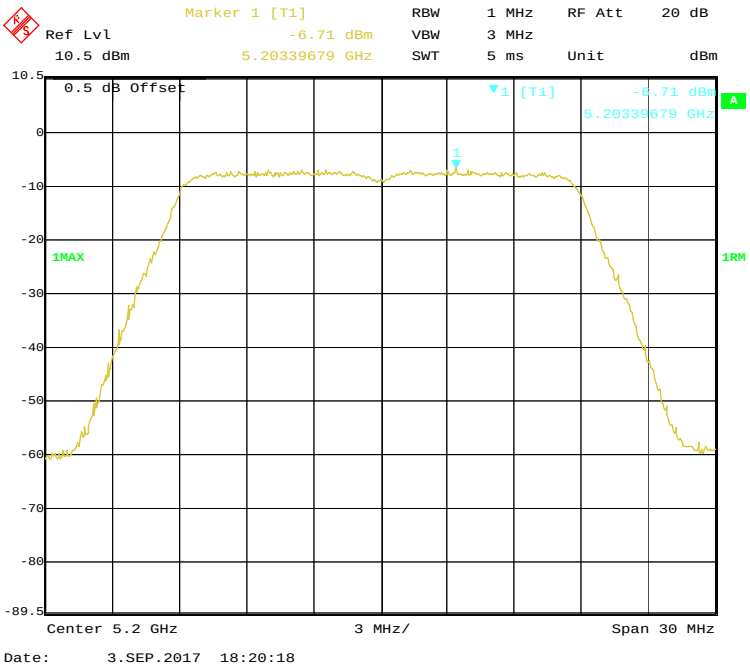
802.11n-HT40 mode, Chain 0: Power spectral density-5230MHz



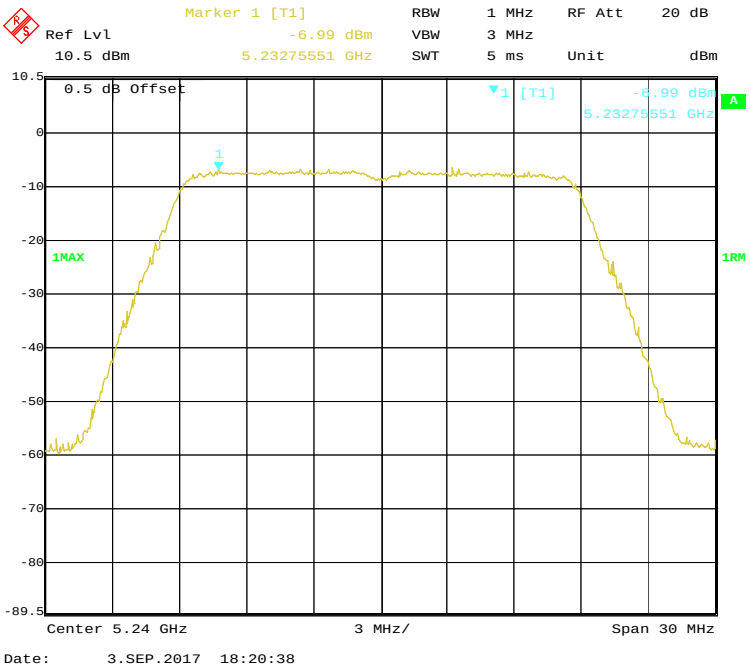
802.11ac20 mode, Chain 0: Power spectral density-5180MHz



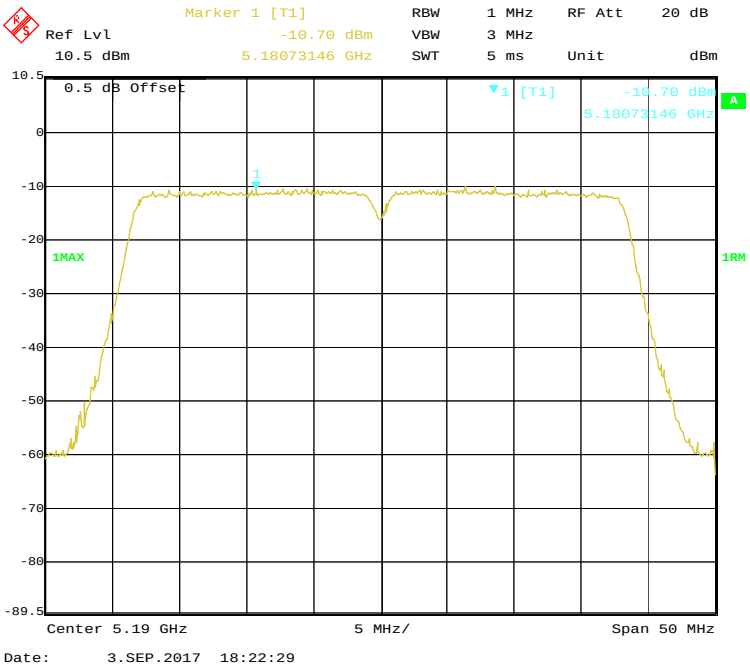
802.11ac20 mode, Chain 0: Power spectral density-5200MHz



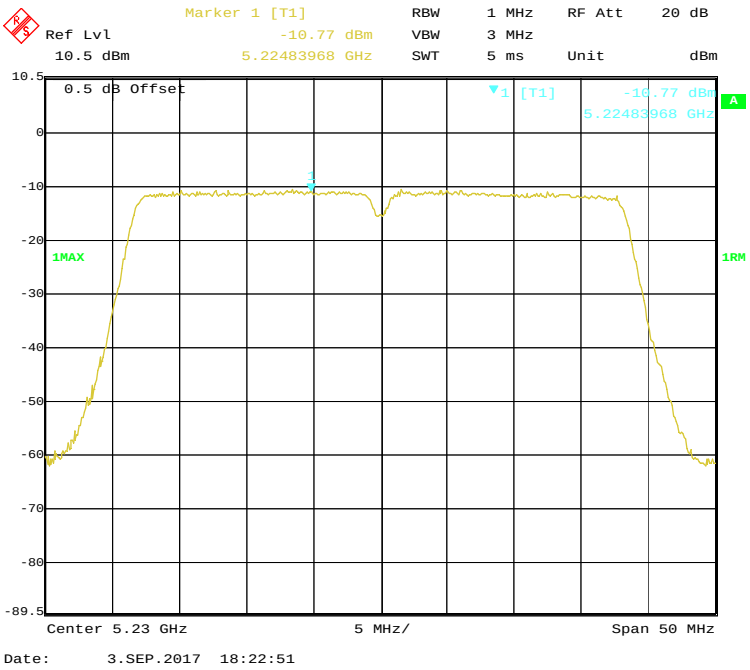
802.11ac20 mode, Chain 0: Power spectral density-5240MHz



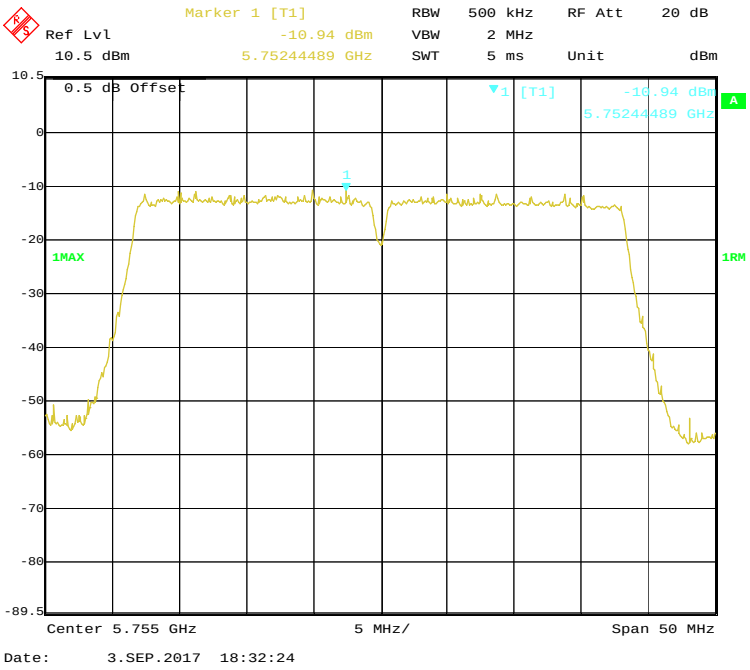
802.11ac40 mode, Chain 0: Power spectral density-5190MHz



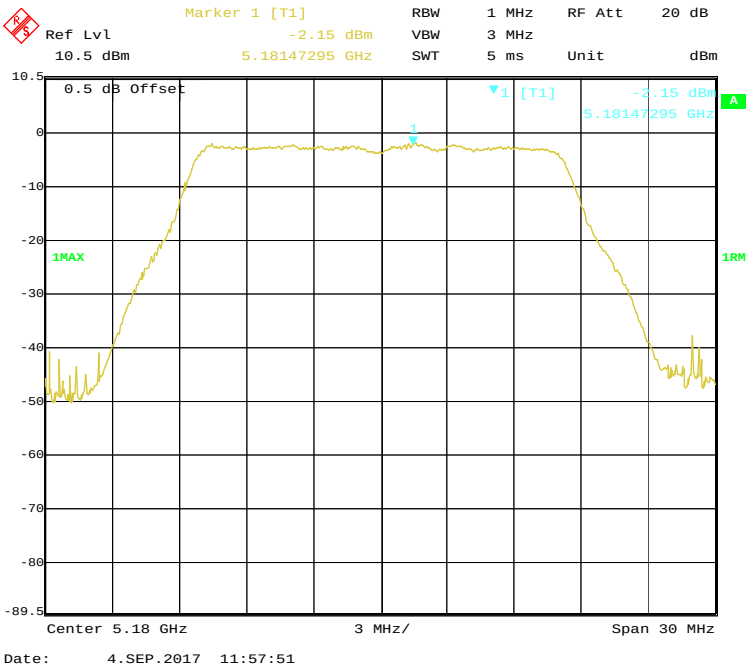
802.11ac40 mode, Chain 0: Power spectral density-5230MHz



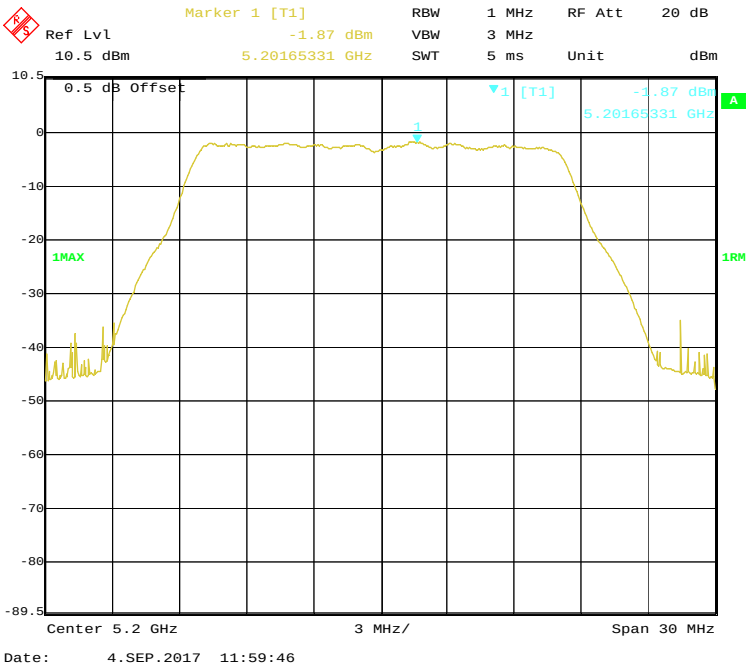
802.11ac80 mode, Chain 0: Power spectral density-5210MHz



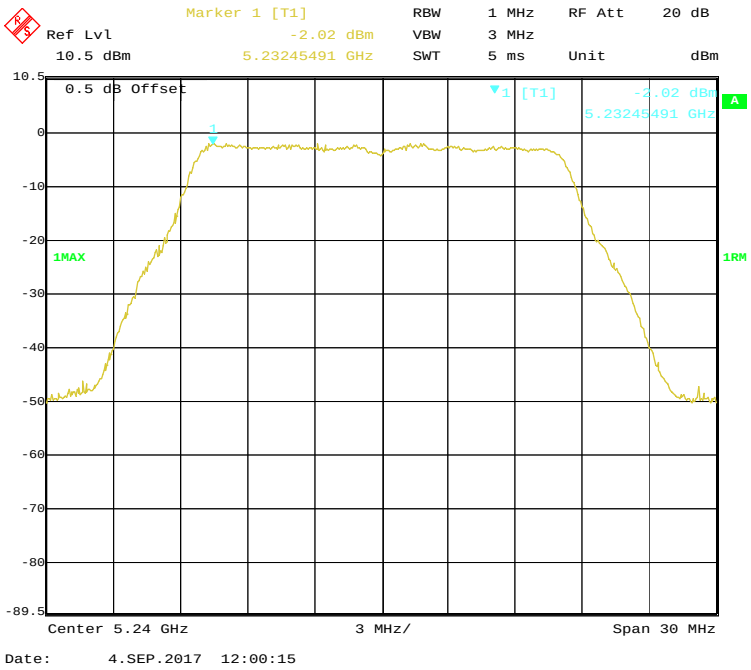
802.11a mode, Chain 1: Power spectral density-5180MHz



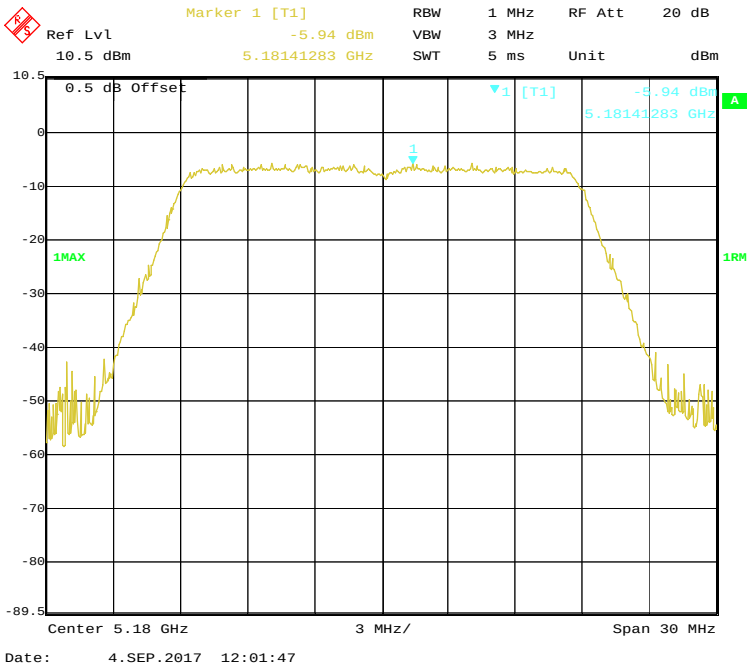
802.11a mode, Chain 1: Power spectral density-5200MHz



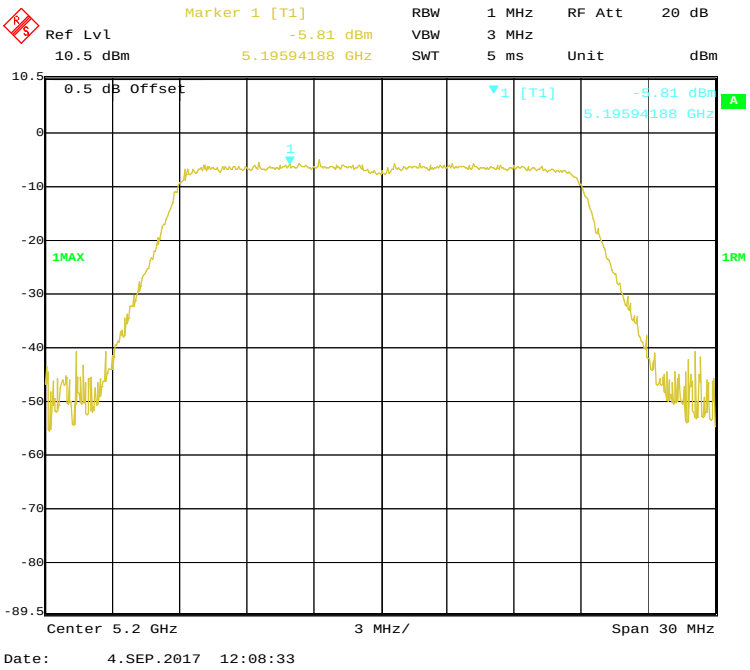
802.11a mode, Chain 1: Power spectral density-5240MHz



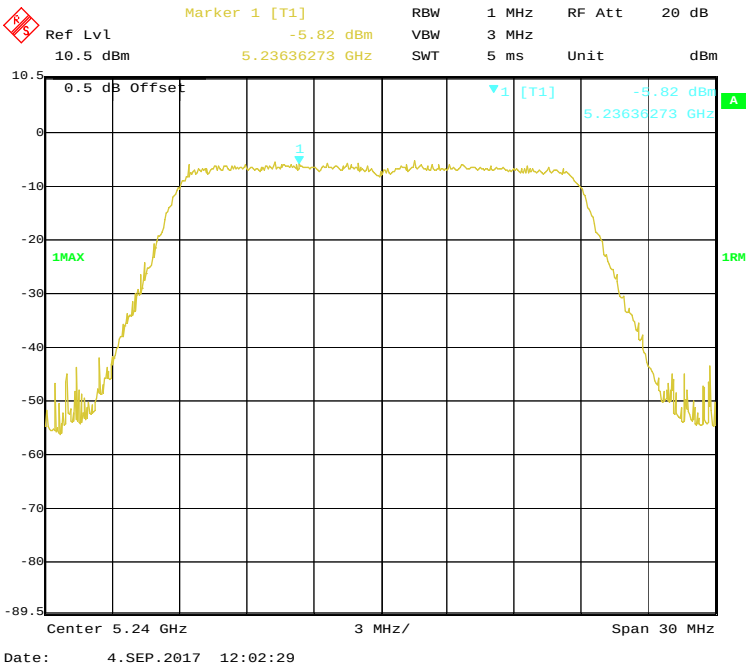
802.11n-HT20 mode, Chain 1: Power spectral density-5180MHz



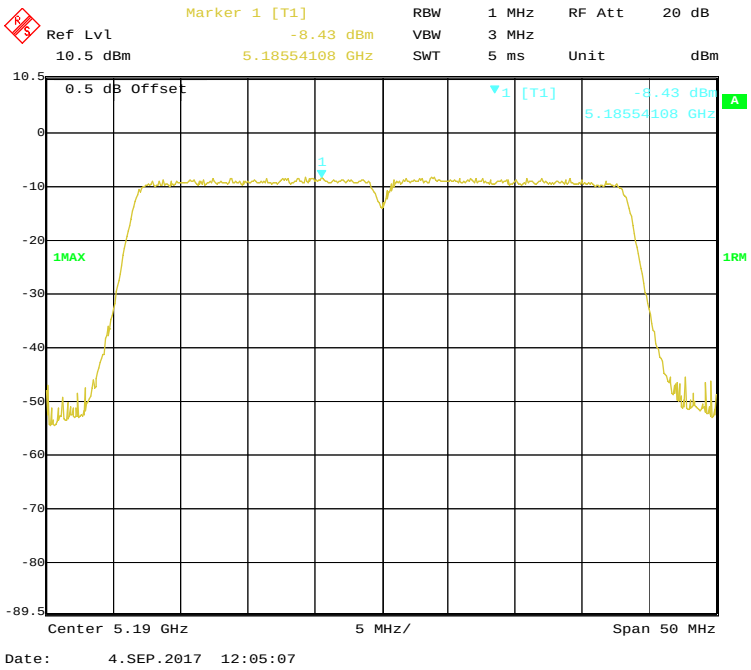
802.11n-HT20 mode, Chain 1: Power spectral density-5200MHz



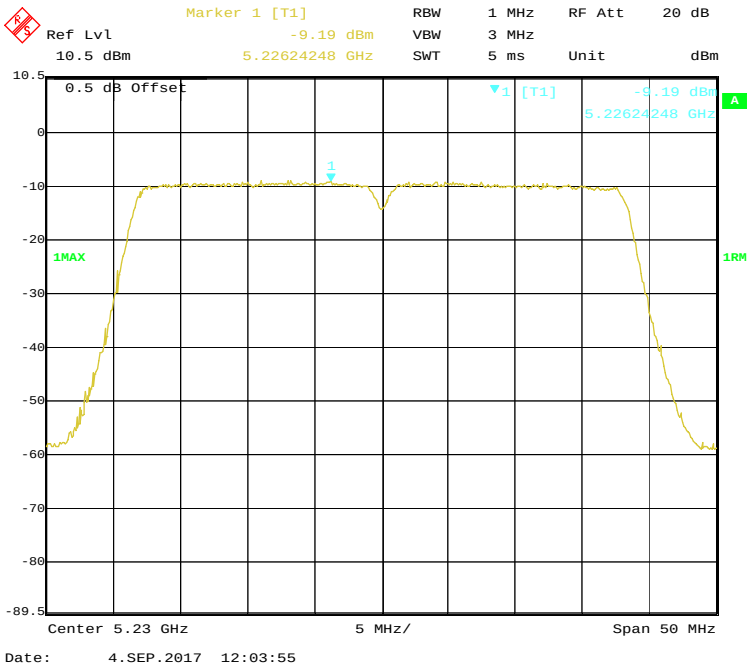
802.11n-HT20 mode, Chain 1: Power spectral density-5240MHz



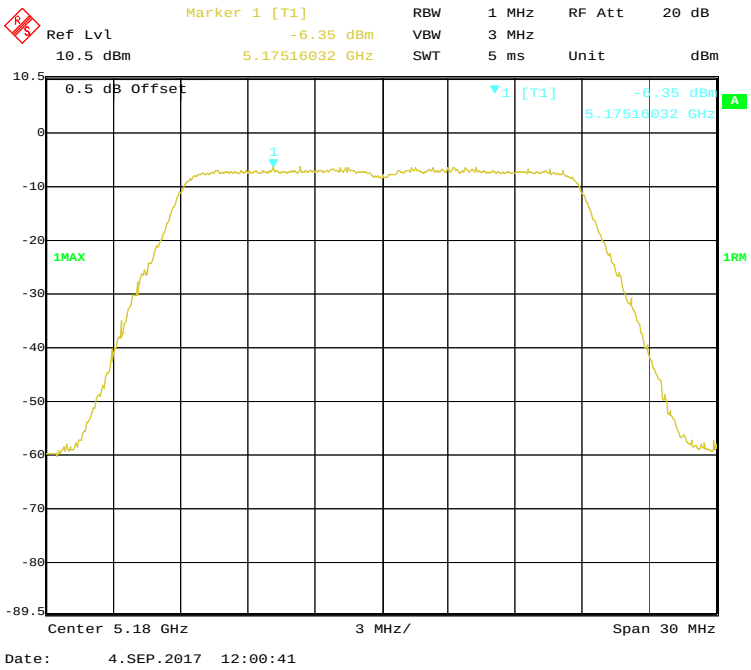
802.11n-HT40 mode, Chain 1: Power spectral density-5190MHz



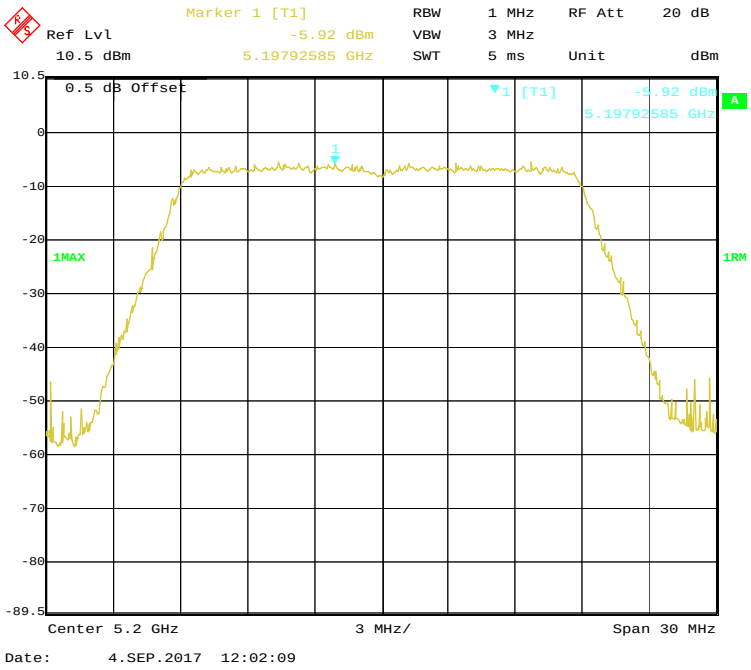
802.11n-HT40 mode, Chain 1: Power spectral density-5230MHz



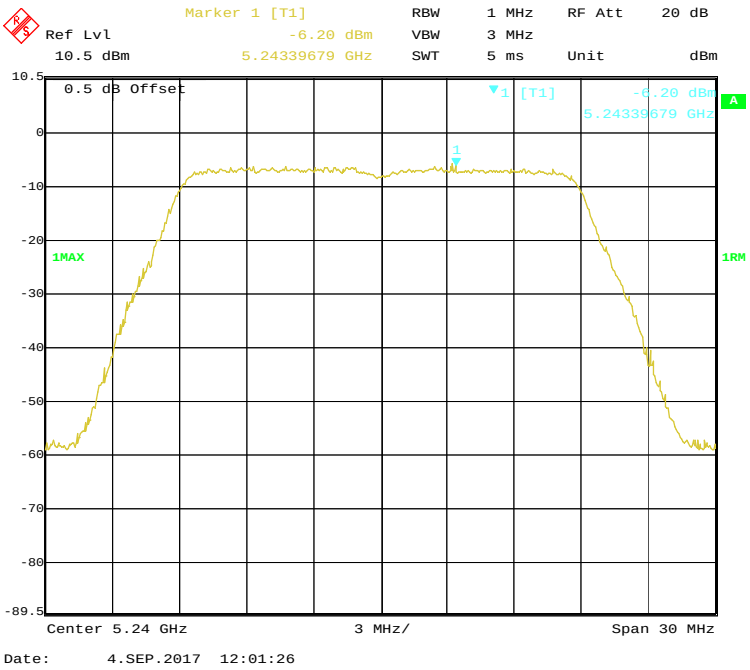
802.11ac20 mode, Chain 1: Power spectral density-5180MHz



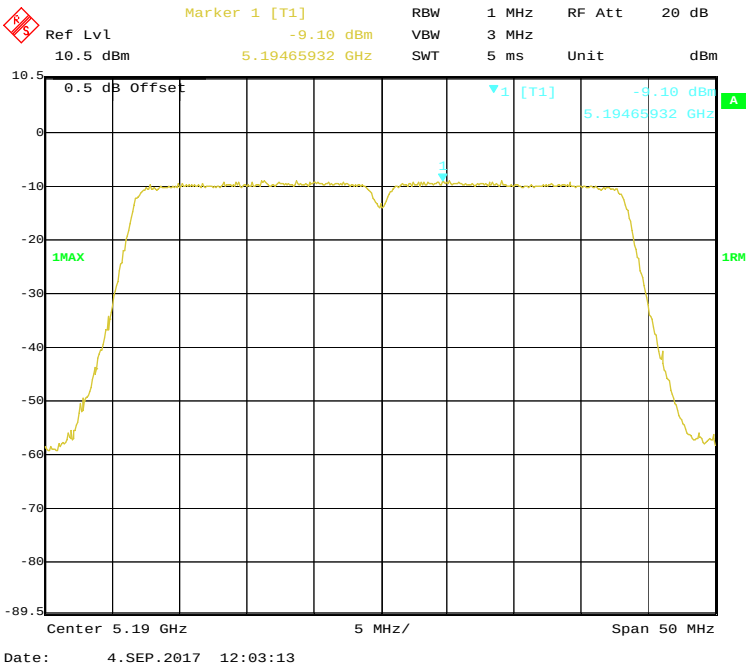
802.11ac20 mode, Chain 1: Power spectral density-5200MHz



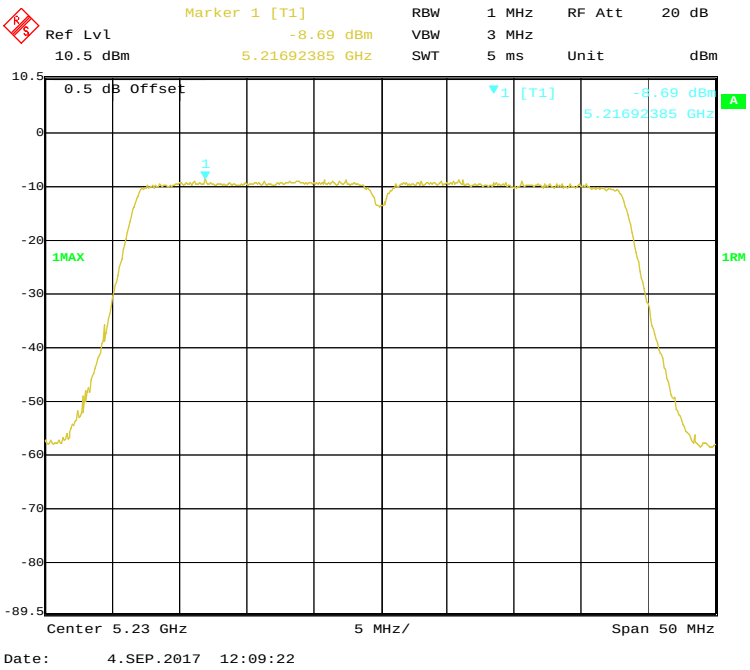
802.11ac20 mode, Chain 1: Power spectral density-5240MHz



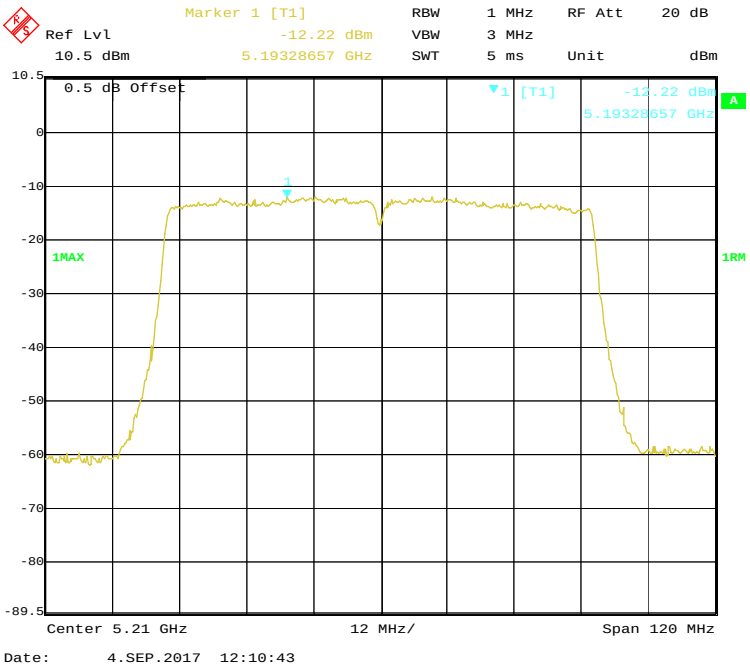
802.11ac40 mode, Chain 1: Power spectral density-5190MHz



802.11ac40 mode, Chain 1: Power spectral density-5230MHz



802.11ac80 mode, Chain 1: Power spectral density-5210MHz



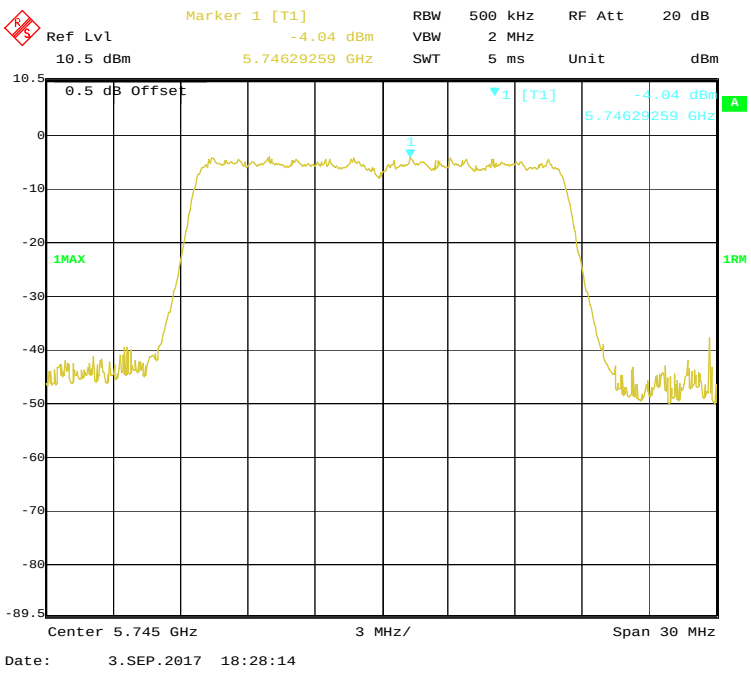
5725MHz-5850MHz:

Mode	Channel	Frequency MHz	PSD (dBm/500kHz)			Limit (dBm/500kHz)	Result
			Chain0	Chain1	Total		
802.11a	Low	5745	-4.04	-3.69	/	30	PASS
	Middle	5785	-5.24	-3.58	/	30	PASS
	High	5825	-6.24	-5.08	/	30	PASS
802.11n20	Low	5745	-6.72	-5.73	-3.19	30	PASS
	Middle	5785	-7.23	-6.9	-4.05	30	PASS
	High	5825	-9.06	-8.07	-5.53	30	PASS
802.11n40	Low	5755	-10.83	-8.75	-6.66	30	PASS
	High	5795	-11.53	-9.88	-7.62	30	PASS
802.11ac20	Low	5745	-6.19	-5.93	-3.05	30	PASS
	Middle	5785	-7.73	-7.71	-4.71	30	PASS
	High	5825	-8.98	-8.22	-5.57	30	PASS
802.11ac40	Low	5755	-10.94	-9.38	-7.08	30	PASS
	High	5795	-11.44	-9.82	-7.54	30	PASS
802.11ac80	/	5775	-14.08	-11.7	-9.72	30	PASS

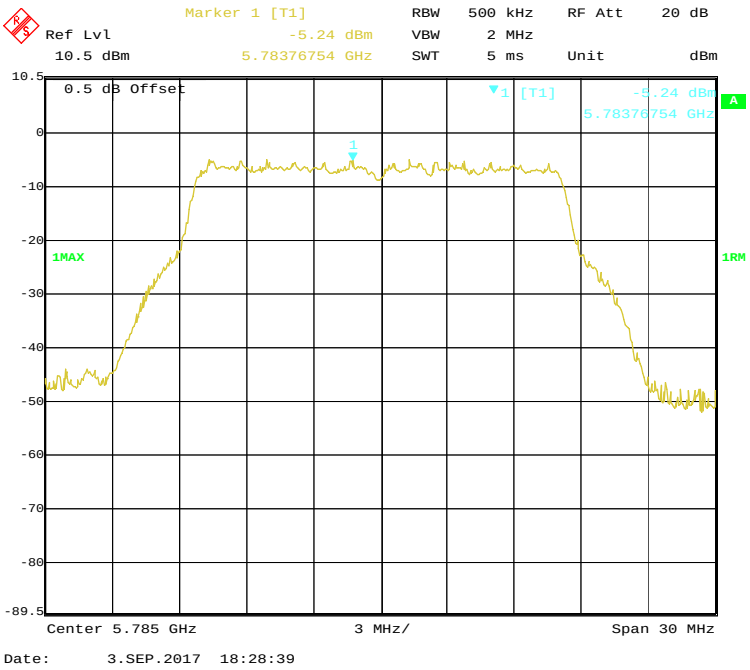
Note:The total PSD=10Log10(10^(Chain 0/10)+10^(Chain 1/10))

5725-5850 MHz:

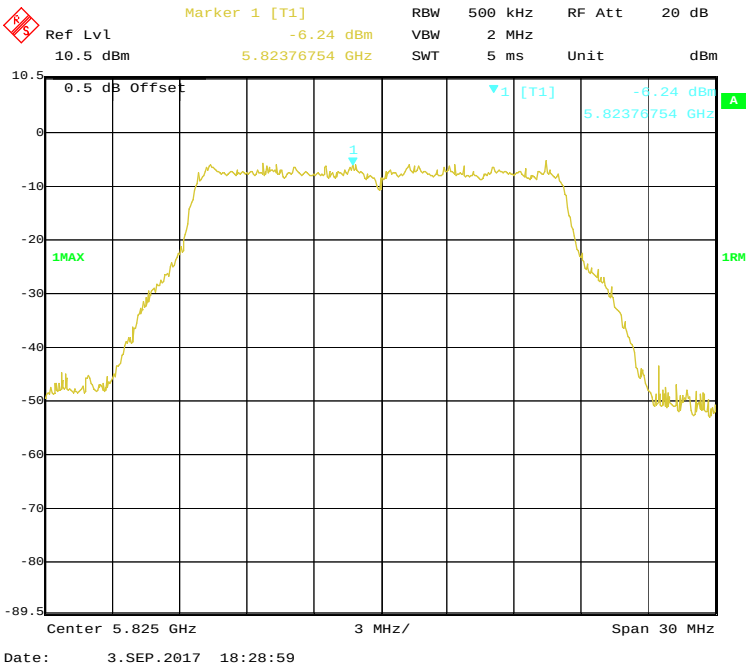
802.11a mode, Chain 0: Power spectral density-5745MHz



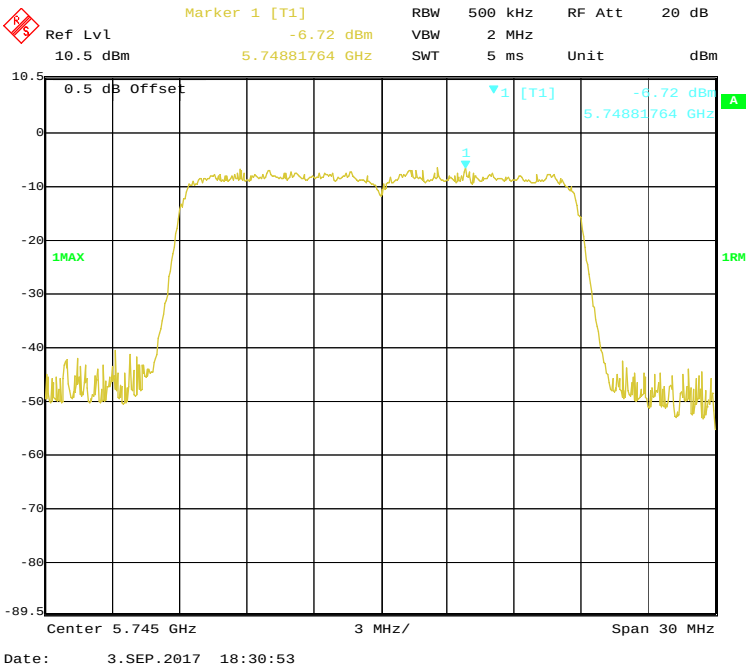
802.11a mode, Chain 0: Power spectral density-5785MHz



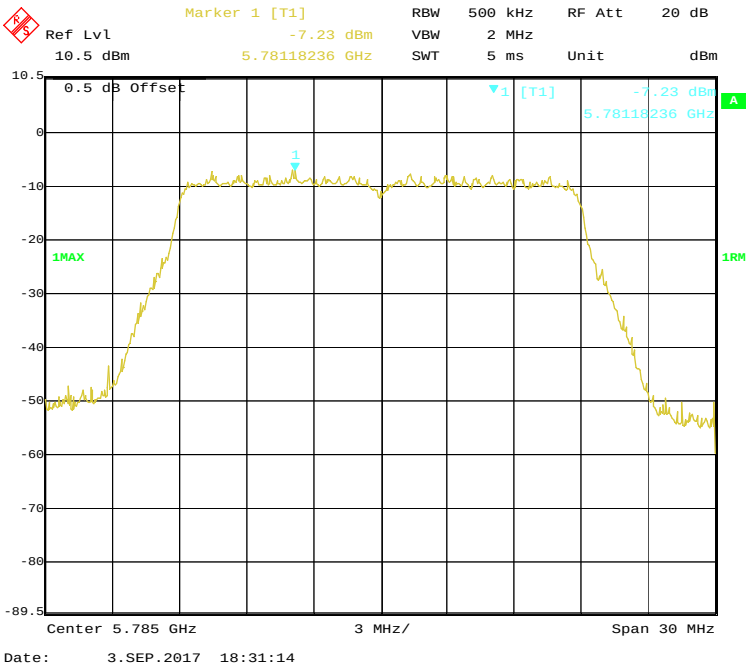
802.11a mode, Chain 0: Power spectral density-5825MHz



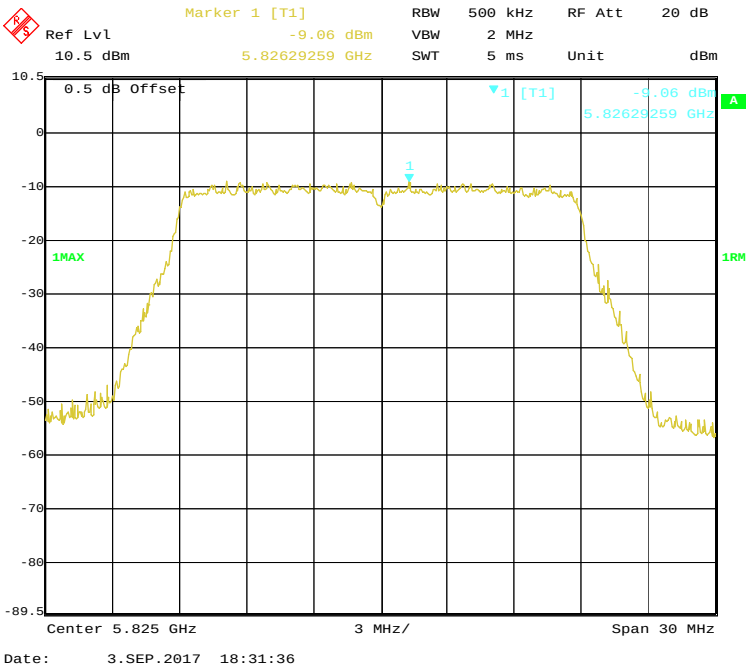
802.11n-HT20 mode, Chain 0: Power spectral density-5745MHz



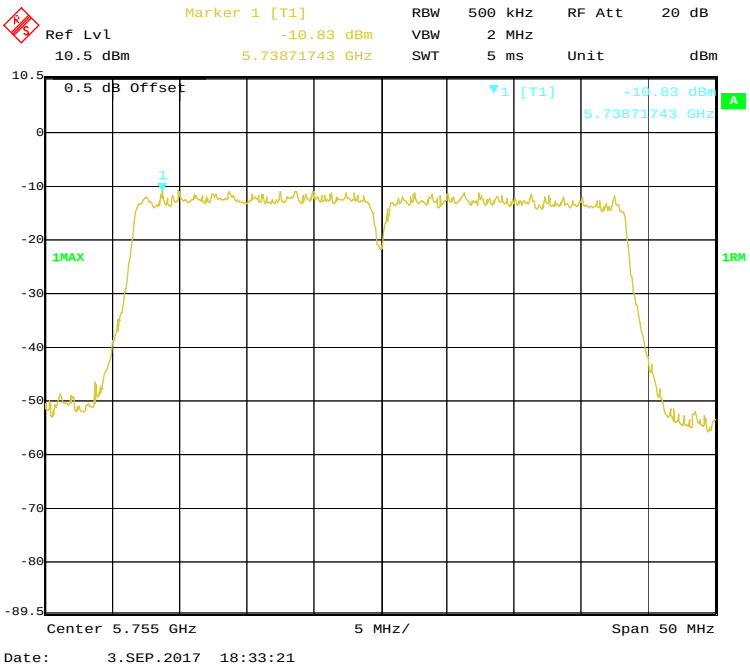
802.11n-HT20 mode, Chain 0: Power spectral density-5785MHz



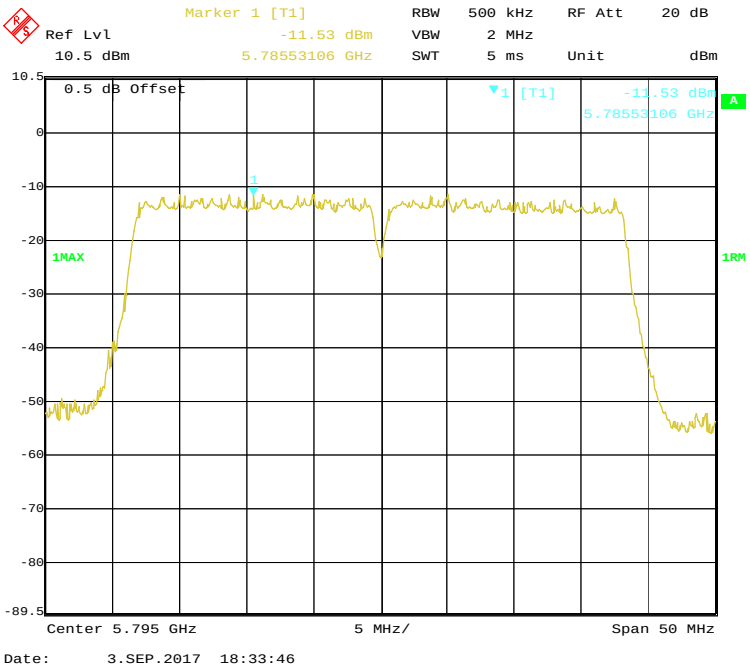
802.11n-HT20 mode, Chain 0: Power spectral density-5825MHz



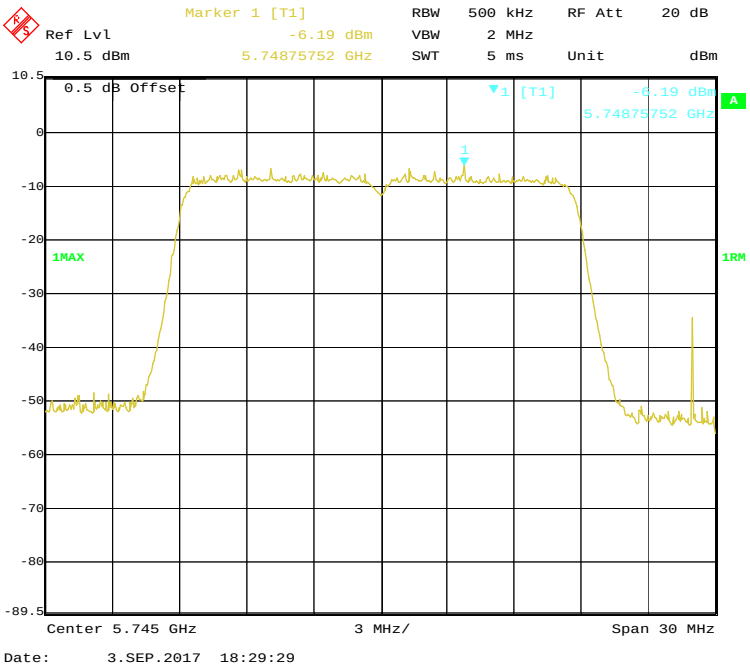
802.11n-HT40 mode, Chain 0: Power spectral density-5755MHz



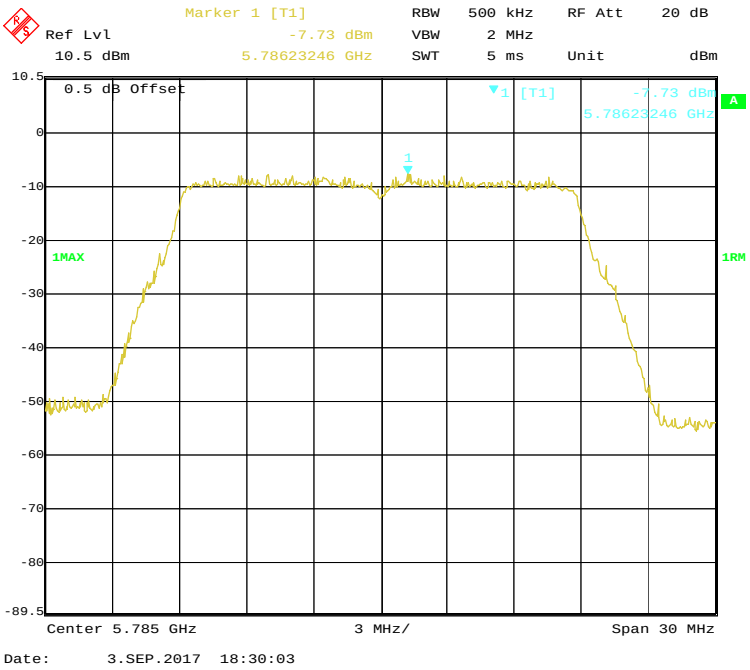
802.11n-HT40 mode, Chain 0: Power spectral density-5795MHz



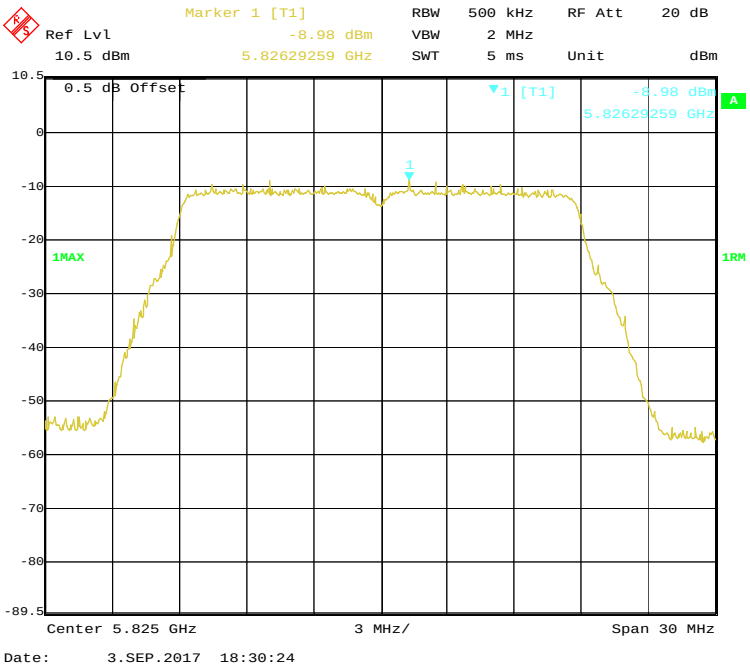
802.11ac20 mode, Chain 0: Power spectral density-5745MHz



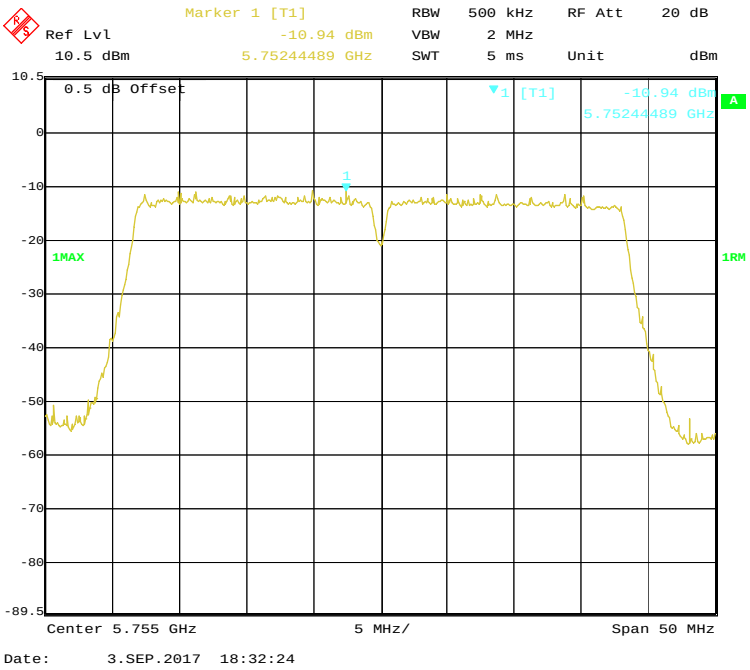
802.11ac20 mode, Chain 0: Power spectral density-5785MHz



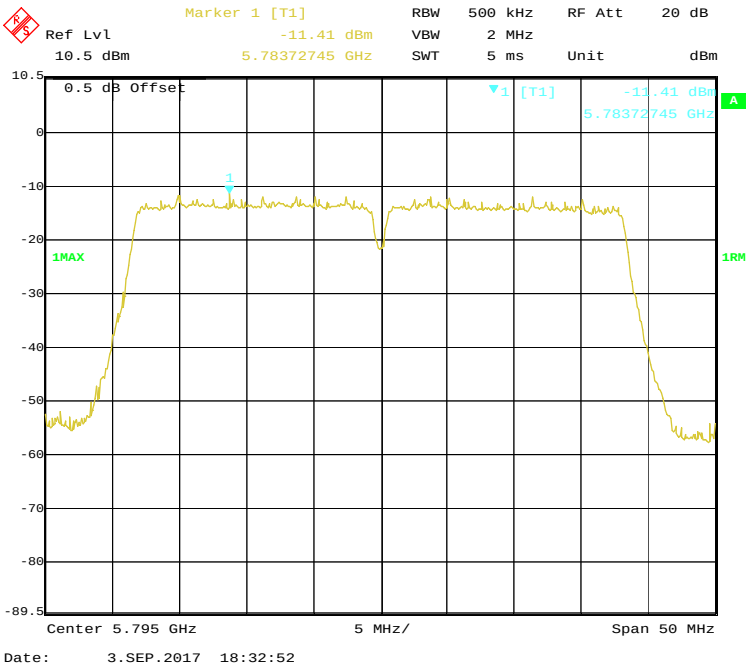
802.11ac20 mode, Chain 0: Power spectral density-5825MHz



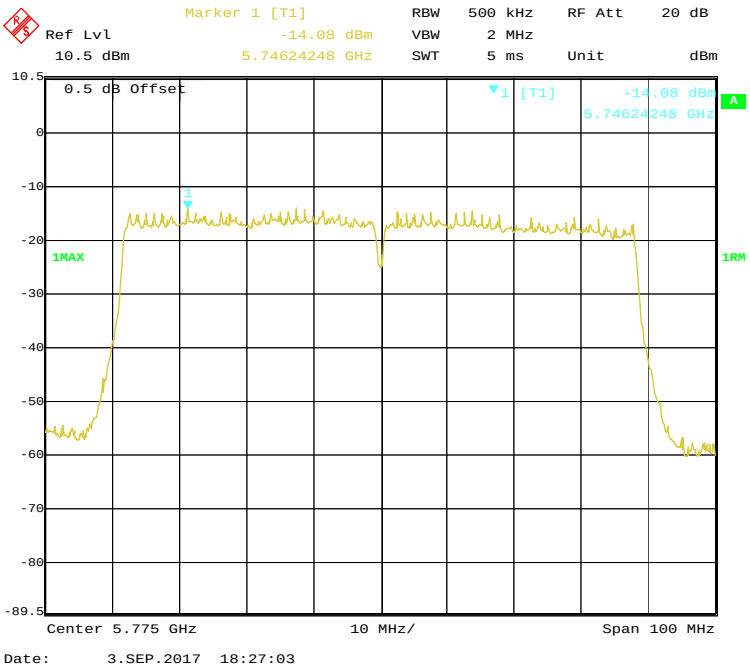
802.11ac40 mode, Chain 0: Power spectral density-5755MHz



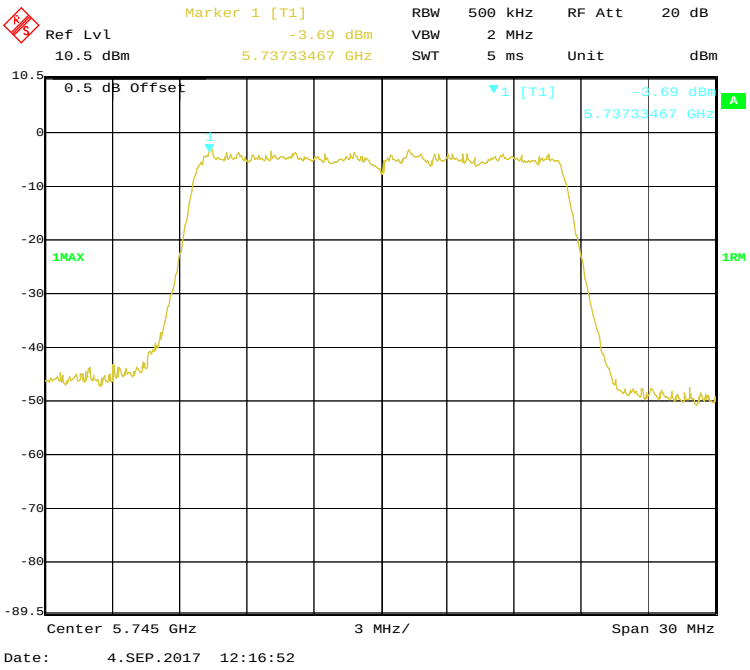
802.11ac40 mode, Chain 0: Power spectral density-5795MHz



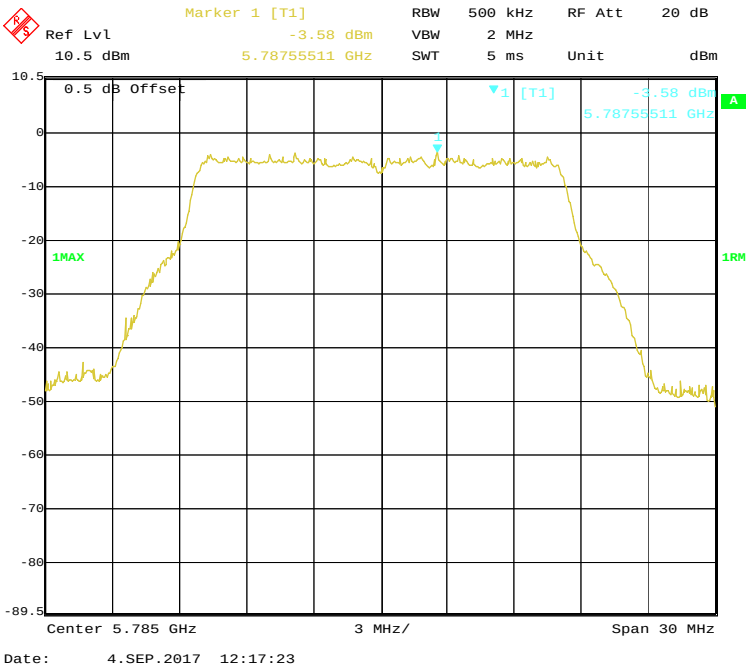
802.11ac80 mode, Chain 0: Power spectral density-5775MHz



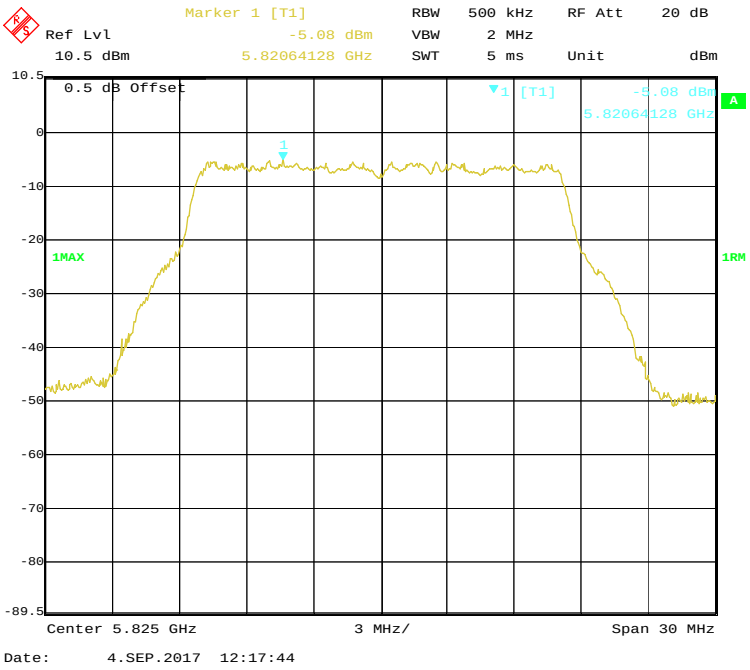
802.11a mode, Chain 1: Power spectral density-5745MHz



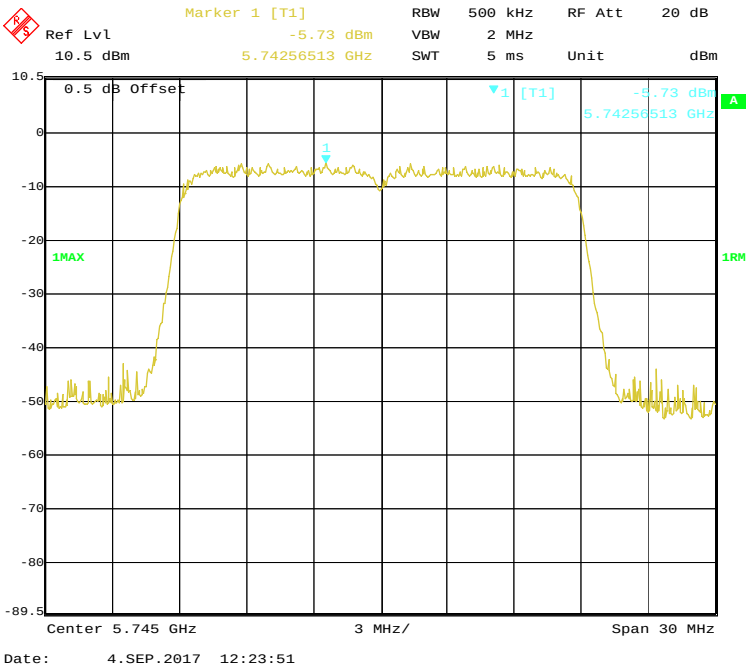
802.11a mode, Chain 1: Power spectral density-5785MHz



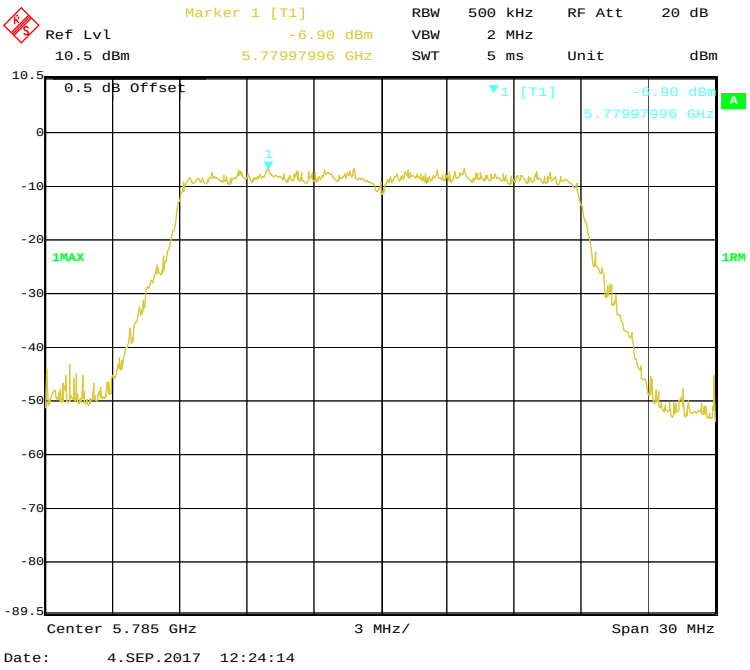
802.11a mode, Chain 1: Power spectral density-5825MHz



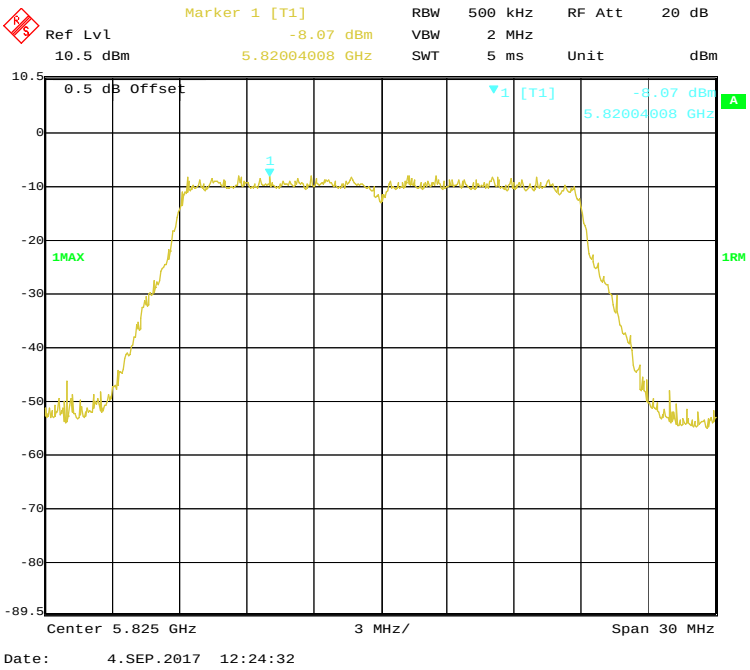
802.11n-HT20 mode, Chain 1: Power spectral density-5745MHz



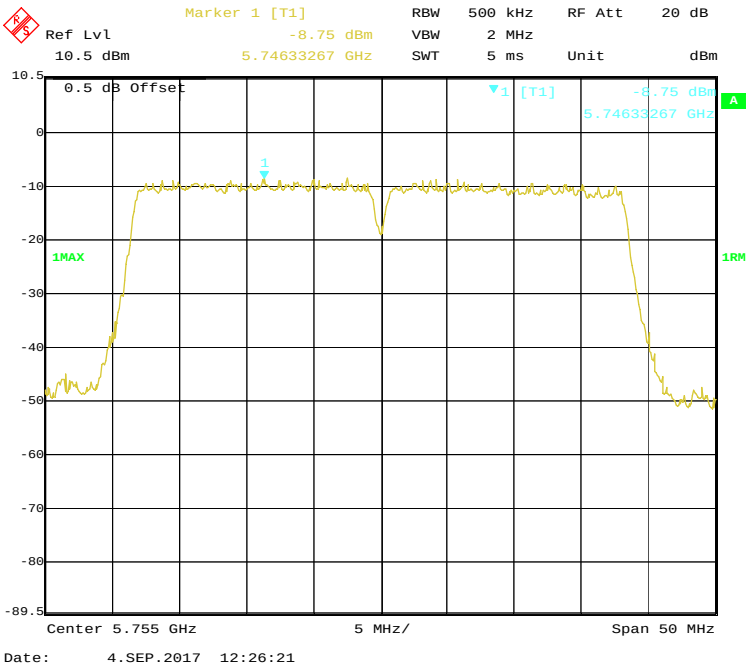
802.11n-HT20 mode, Chain 1: Power spectral density-5785MHz



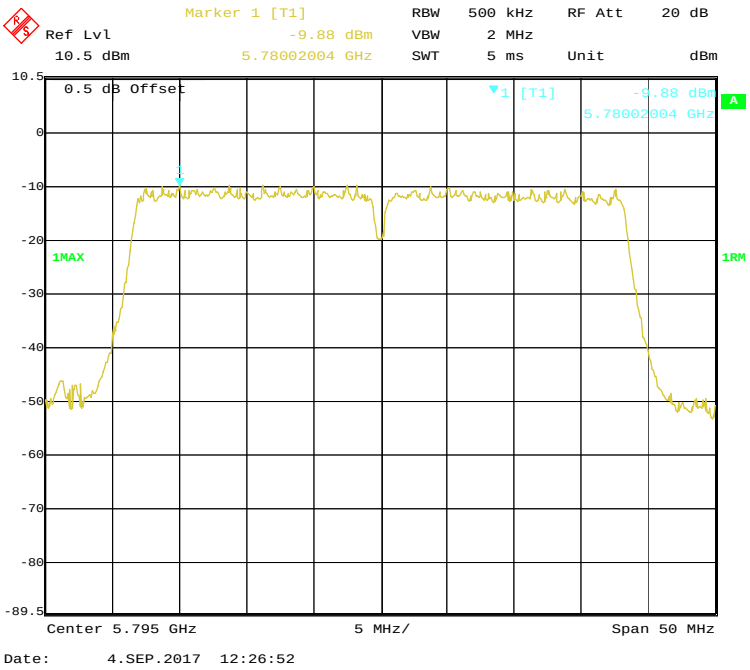
802.11n-HT20 mode, Chain 1: Power spectral density-5825MHz



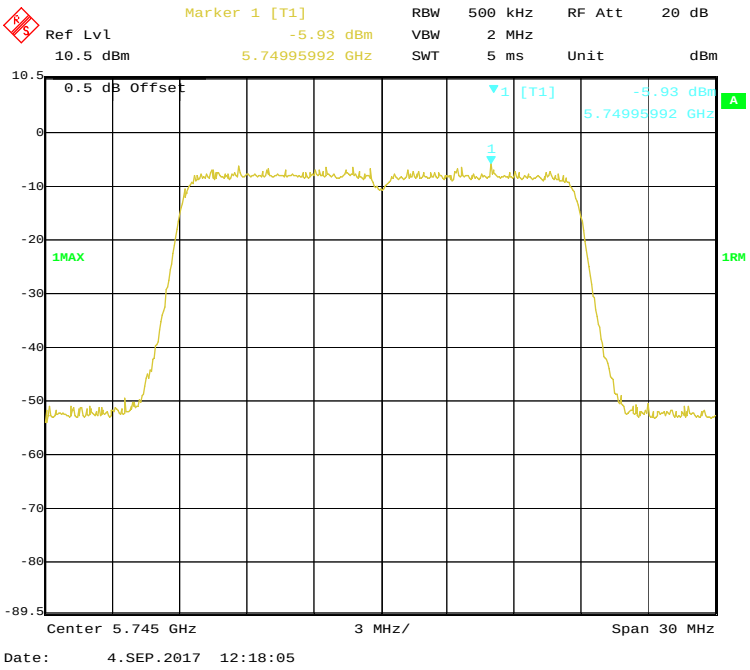
802.11n-HT40 mode, Chain 1: Power spectral density-5755MHz



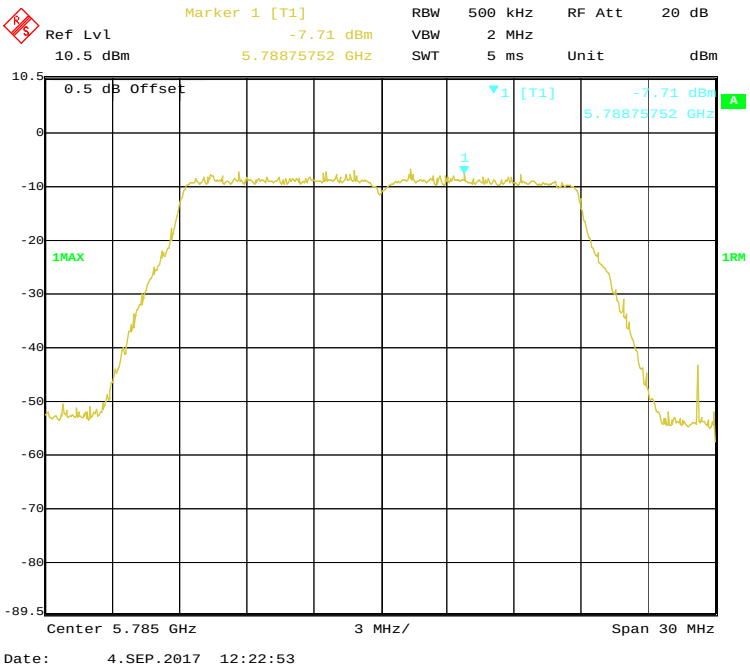
802.11n-HT40 mode, Chain 1: Power spectral density-5795MHz



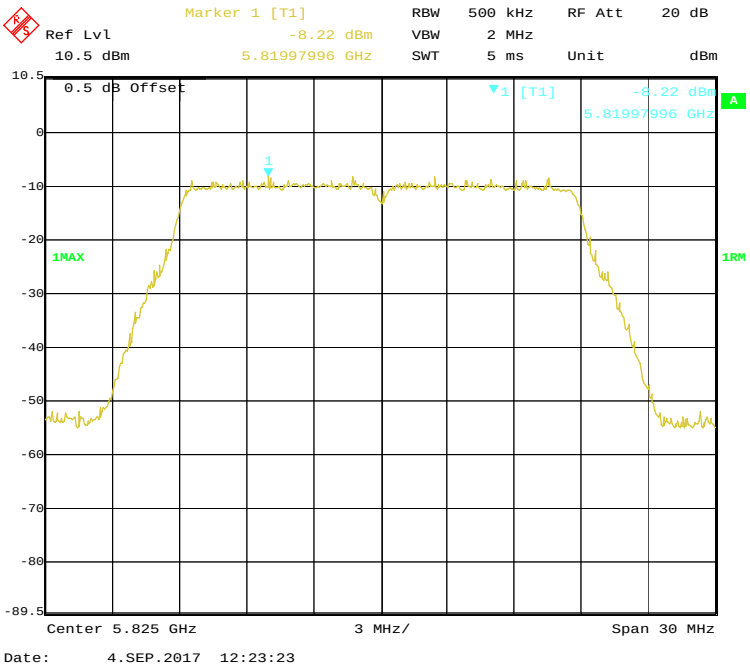
802.11ac20 mode, Chain 1: Power spectral density-5745MHz



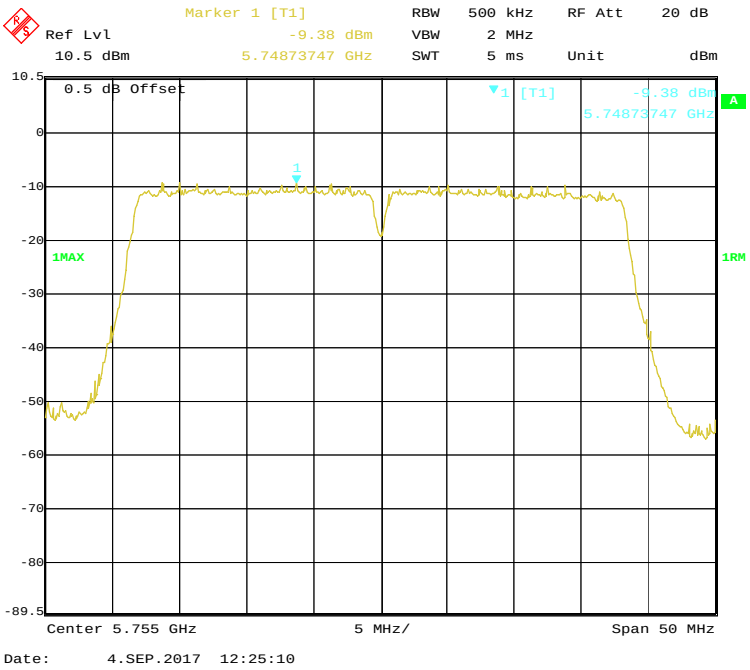
802.11ac20 mode, Chain 1: Power spectral density-5785MHz



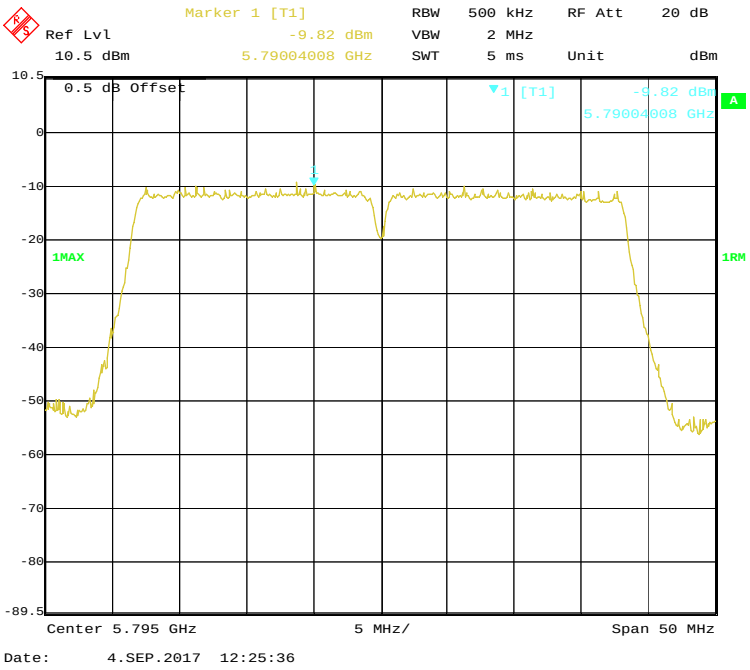
802.11ac20 mode, Chain 1: Power spectral density-5825MHz



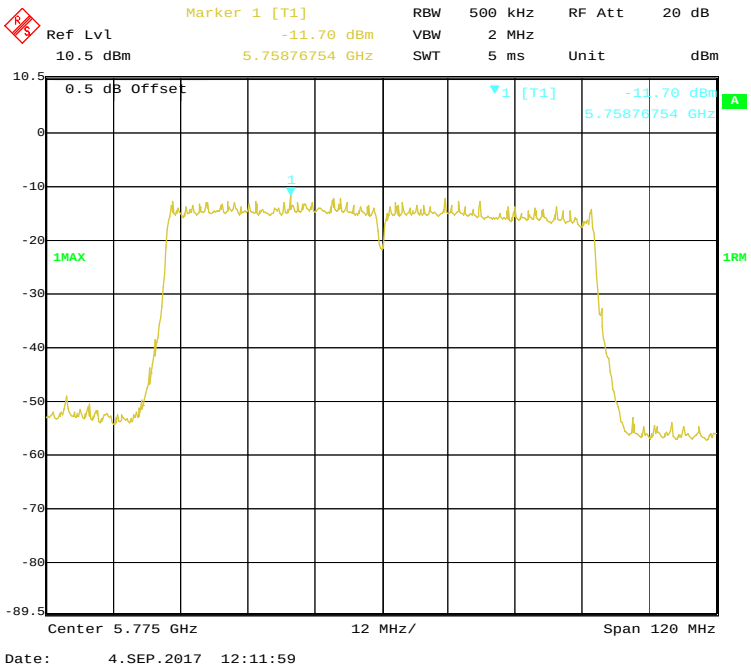
802.11ac40 mode, Chain 1: Power spectral density-5755MHz



802.11ac40 mode, Chain 1: Power spectral density-5795MHz



802.11ac80 mode, Chain 1: Power spectral density-5775MHz



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 ANSI C63.10-2013 American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

Test Data

Environmental Conditions

Temperature:	23.5 °C
Relative Humidity:	55 %
ATM Pressure:	101.2 kPa

The testing was performed by Kyle Xu on 2017-09-03

Test Mode: Transmitting

Mode	Power Supply	Temperature (℃)	FL at low Test Channel (MHz)	FH at low Test Channel (MHz)	Limit
802.11a	3.7V	-20	5171.72	5248.42	FL and FH within the 5150-5250MHz Range
		-10	5171.68	5248.36	
		0	5171.69	5248.39	
		10	5171.72	5248.40	
		20	5171.67	5248.39	
		30	5171.69	5248.43	
		40	5171.73	5248.43	
		50	5171.72	5248.37	
	3.5V	20	5171.67	5248.45	
	4.2V	20	5171.71	5248.38	
802.11n20	3.7V	-20	5170.95	5249.06	
		-10	5170.95	5249.05	
		0	5171.00	5249.10	
		10	5170.92	5249.08	
		20	5170.95	5249.05	
		30	5170.96	5249.05	
		40	5171.01	5249.07	
		50	5170.94	5249.05	
	3.5V	20	5170.93	5249.04	
	4.2V	20	5170.94	5249.07	
802.11n40	3.7V	-20	5171.64	5248.27	
		-10	5171.66	5248.29	
		0	5171.62	5248.33	
		10	5171.60	5248.31	
		20	5171.61	5248.29	
		30	5171.66	5248.30	
		40	5171.65	5248.27	
		50	5171.64	5248.33	
	3.5V	20	5171.61	5248.33	
	4.2V	20	5171.61	5248.30	

Mode	Power Supply	Temperature (℃)	FL at low Test Channel (MHz)	FH at low Test Channel (MHz)	Limit
802.11ac20	3.7V	-20	5170.88	5249.10	FL and FH within the 5150-5250MHz Range
		-10	5170.87	5249.11	
		0	5170.94	5249.14	
		10	5170.93	5249.15	
		20	5170.89	5249.11	
		30	5170.92	5249.09	
		40	5170.89	5249.14	
		50	5170.92	5249.13	
	3.5V	20	5170.90	5249.09	
	4.2V	20	5170.92	5249.13	
802.11ac40	3.7V	-20	5171.61	5248.44	
		-10	5171.62	5248.42	
		0	5171.60	5248.38	
		10	5171.64	5248.44	
		20	5171.61	5248.39	
		30	5171.59	5248.37	
		40	5171.60	5248.42	
		50	5171.65	5248.44	
	3.5V	20	5171.59	5248.44	
	4.2V	20	5171.60	5248.39	
802.11ac80	3.7V	-20	5172.16	5247.86	
		-10	5172.10	5247.91	
		0	5172.09	5247.86	
		10	5172.11	5247.93	
		20	5172.12	5247.88	
		30	5172.15	5247.87	
		40	5172.15	5247.88	
		50	5172.10	5247.93	
	3.5V	20	5172.14	5247.86	
	4.2V	20	5172.17	5247.88	

Mode	Power Supply	Temperature (℃)	FL at low Test Channel (MHz)	FH at low Test Channel (MHz)	Limit
802.11a	3.7V	-20	5736.71	5833.38	FL and FH within the 5725-5850MHz Range
		-10	5736.74	5833.42	
		0	5736.77	5833.38	
		10	5736.78	5833.39	
		20	5736.73	5833.39	
		30	5736.76	5833.42	
		40	5736.78	5833.44	
		50	5736.74	5833.41	
	3.5V	20	5736.75	5833.42	
	4.2V	20	5736.71	5833.38	
802.11n20	3.7V	-20	5736.31	5834.05	
		-10	5736.31	5834.08	
		0	5736.25	5834.07	
		10	5736.31	5834.03	
		20	5736.25	5834.05	
		30	5736.27	5834.05	
		40	5736.29	5834.04	
		50	5736.30	5834.04	
	3.5V	20	5736.28	5834.10	
	4.2V	20	5736.26	5834.06	
802.11n40	3.7V	-20	5736.62	5813.40	
		-10	5736.63	5813.42	
		0	5736.66	5813.39	
		10	5736.63	5813.43	
		20	5736.61	5813.39	
		30	5736.66	5813.36	
		40	5736.66	5813.45	
		50	5736.67	5813.43	
	3.5V	20	5736.65	5813.42	
	4.2V	20	5736.65	5813.44	

Mode	Power Supply	Temperature (℃)	FL at low Test Channel (MHz)	FH at low Test Channel (MHz)	Limit
802.11ac20	3.7V	-20	5736.27	5834.12	FL and FH within the 5725-5850MHz Range
		-10	5736.23	5834.08	
		0	5736.30	5834.11	
		10	5736.29	5834.15	
		20	5736.25	5834.10	
		30	5736.26	5834.11	
		40	5736.29	5834.09	
		50	5736.29	5834.08	
	3.5V	20	5736.28	5834.12	
	4.2V	20	5736.28	5834.16	
802.11ac40	3.7V	-20	5736.53	5813.44	
		-10	5736.51	5813.43	
		0	5736.50	5813.44	
		10	5736.48	5813.36	
		20	5736.51	5813.39	
		30	5736.48	5813.45	
		40	5736.52	5813.41	
		50	5736.49	5813.37	
	3.5V	20	5736.53	5813.37	
	4.2V	20	5736.57	5813.43	
802.11ac80	3.7V	-20	5736.86	5812.89	
		-10	5736.90	5812.91	
		0	5736.91	5812.92	
		10	5736.87	5812.89	
		20	5736.88	5812.88	
		30	5736.88	5812.89	
		40	5736.90	5812.91	
		50	5736.94	5812.93	
	3.5V	20	5736.93	5812.93	
	4.2V	20	5736.90	5812.87	

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