

FCC PART 15.407 TEST REPORT

For

Chengdu Vantron Technology, Ltd.

No.5 GaoPeng Road, Hi-Tech Zone, Chengdu, SiChuan, P.R. China 610045

FCC ID: 2AAGEVTTABLET-5081

Report Type: Original Report	Product Name: Tablet Computer
Report Number: RSC181119002-0D	
Report Date: 2018-12-07 Sula Huang	
Reviewed By: EMC Director 	
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The **Chengdu Vantron Technology, Ltd.**'s product, model number: **VT-TABLET-5081** (FCC ID: **2AAGEVTTABLET-5081**) or the "EUT" as referred to in this report was the **Tablet Computer**.

Mechanical Description of EUT

The EUT was measured approximately: 235 mm (L) x 153 mm (W) x 21 mm (H).
Rated input voltage: DC 3.7V rechargeable Li-ion battery or DC 5V from adapter

Adapter Information

Manufacturer: Anthin

Model: APS318-0530

Input: AC 100-220V; 50/60Hz

Output: DC 5V, 3A

Note: The products, test model: VT-TABLET-5081, multiple model: ETAB-8-VAN-01-FNQ. Their differences were presented in Product Difference Statement provided by the applicant. So we selected model VT-TABLET-5081 to fully test.

**All measurement and test data in this report was gathered from final production sample, serial number: 181119002/01 (assigned by the BACL, Chengdu). It may have deviation from any other sample. The EUT supplied by the applicant was received on 2018-11-19, and EUT conformed to test requirement.*

Objective

This type approval report is prepared on behalf of **Chengdu Vantron Technology, Ltd.** in accordance with Part 2-Subpart J, Part 15-Subparts A, C and E of the Federal Communications Commission rules.

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

Related Submittal(s)/Grant(s)

FCC Part 15B JBP submissions with FCC ID: 2AAGEVTTABLET-5081
FCC Part 15C DSS submissions with FCC ID: 2AAGEVTTABLET-5081
FCC Part 15C DTS submissions with FCC ID: 2AAGEVTTABLET-5081
FCC Part 15C DXX submissions with FCC ID: 2AAGEVTTABLET-5081

Measurement Uncertainty

Item			Uncertainty
AC power line conducted emission			2.93 dB
Radiated Emission(Field Strength)	30MHz-200MHz	H	4.63 dB
		V	4.88 dB
	200MHz-1GHz	H	5.02 dB
		V	6.06 dB
	1GHz-6GHz		4.51 dB
	6GHz-18GHz		4.49 dB
	18GHz-40GHz		5.48 dB
Conducted RF Power			±0.61dB
Power Spectrum Density			±0.61dB
Occupied Bandwidth			±5%
Conducted Emission			±1.5dB
Humidity			±5%
Temperature			±1℃

Test Methodology

All measurements contained in this report were conducted with:

1. ANSI C63.10-2013 American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.
2. KDB789033 D02 UNII Meas Guidance v02r01.

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Chengdu) to collect test data is located No.5040, Huilongwan Plaza, No. 1, Shawan Road, Jinniu District, Chengdu, Sichuan, China.

Bay Area Compliance Laboratories Corp. (Chengdu) lab is accredited to ISO/IEC 17025 by A2LA (Lab code: 4324.01) and the FCC designation No. CN1186 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.

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, channels are provided to test as follows:

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

For 802.11a, 802.11ac20, 802.11n-HT20: Channel 36, 40 and 48 were tested; for 802.11ac40, 802.11n-HT40: Channel 38, 46 were tested; for ac80: Channel 42 was tested.

For 5725~5850 MHz band, channels are provided to test as follows:

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

For 802.11a, 802.11ac20, 802.11n-HT20: Channel 149, 157 and 165 were tested.

For 802.11n-HT40, 802.11ac40: Channel 151, 159 were tested; for ac80: Channel 155 was tested.

The worst-case data rates are determined to be as follows for each mode based upon investigations by measuring the average power and PSD across all data rates bandwidths, and modulations.

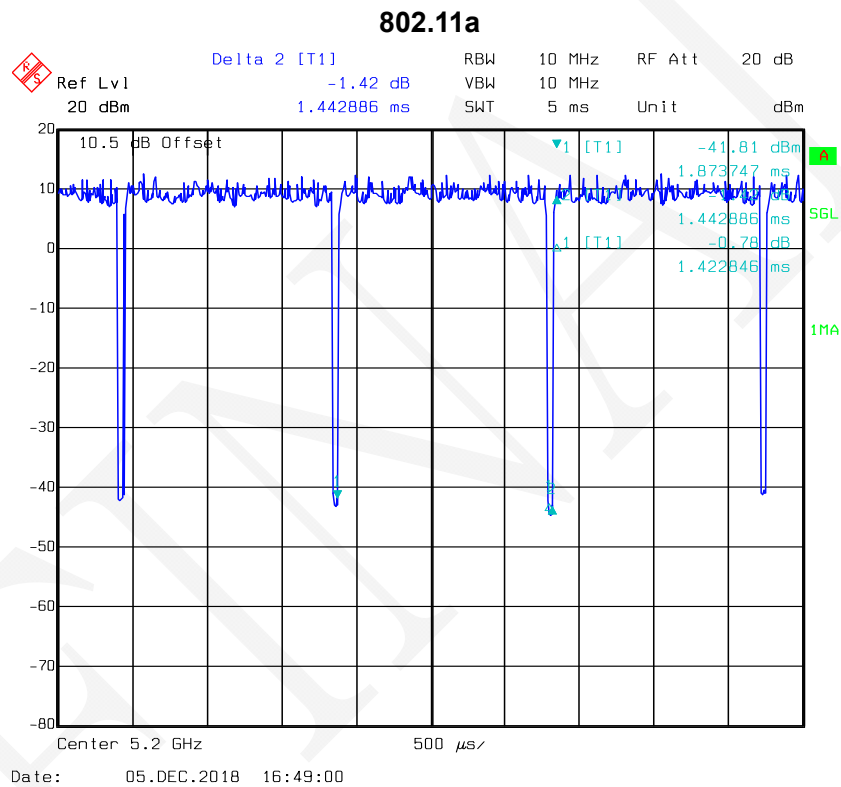
EUT Exercise Software

The software “RF test tool” was used for testing, which was provided by manufacturer. The maximum power with maximum duty cycle was set as below:

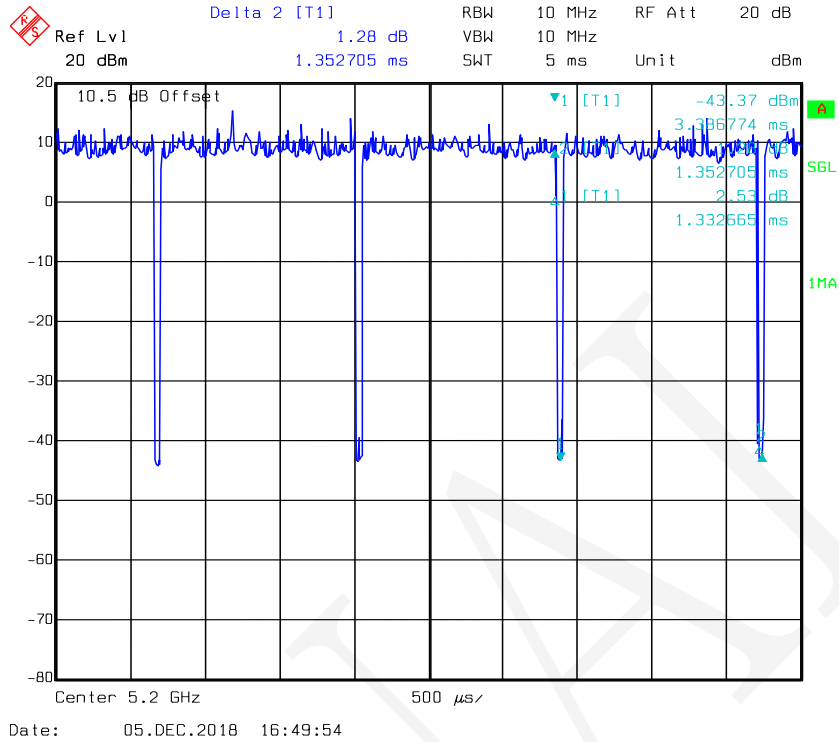
Software			RF test tool		
UNII Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Power Level
5150-5250MHz	802.11a	Low	5180	6	Default
		Middle	5200	6	Default
		High	5240	6	Default
	802.11n-HT20	Low	5180	MCS0	Default
		Middle	5200	MCS0	Default
		High	5240	MCS0	Default
	802.11n-HT40	Low	5190	MCS0	Default
		High	5230	MCS0	Default
	802.11ac20	Low	5180	MCS0	Default
		Middle	5200	MCS0	Default
		High	5240	MCS0	Default
	802.11ac40	Low	5190	MCS0	Default
		High	5230	MCS0	Default
	802.11ac80	Middle	5210	MCS0	Default
5725-5850MHz	802.11a	Low	5745	6	Default
		Middle	5785	6	Default
		High	5825	6	Default
	802.11n-HT20	Low	5745	MCS0	Default
		Middle	5785	MCS0	Default
		High	5825	MCS0	Default
	802.11n-HT40	Low	5755	MCS0	Default
		High	5795	MCS0	Default
	802.11ac20	Low	5745	MCS0	Default
		Middle	5785	MCS0	Default
		High	5825	MCS0	Default
	802.11ac40	Low	5755	MCS0	Default
		High	5795	MCS0	Default
	802.11ac80	Middle	5775	MCS0	Default

Duty Cycle information is below:

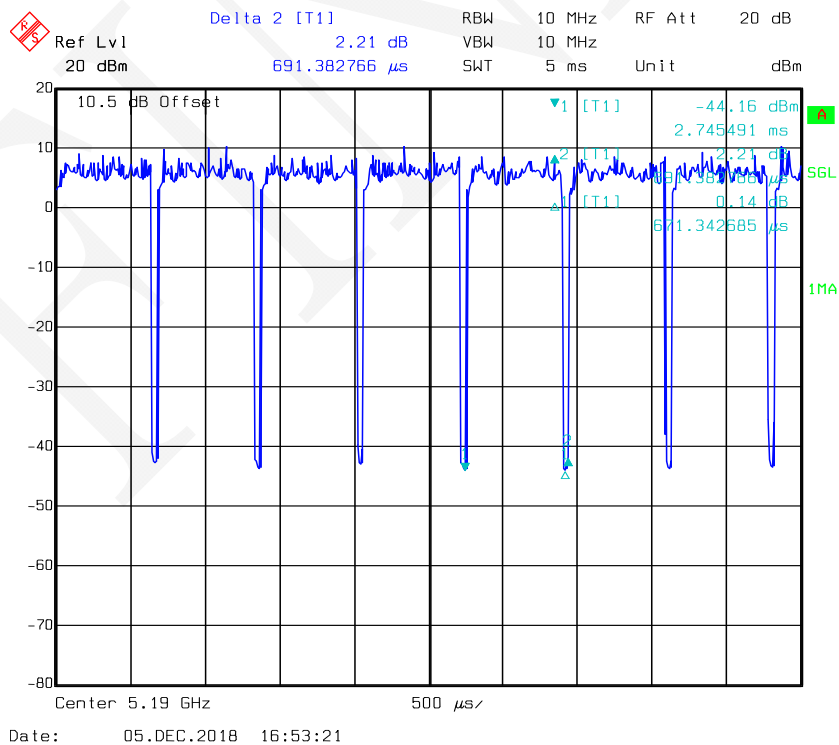
Mode	Ton(ms)	Ton+Toff(ms)	Duty Cycle(%)	Duty Cycle Factor (dB)
802.11a	1.42	1.44	98.61	0.06
802.11n-HT20	1.33	1.35	98.52	0.06
802.11n-HT40	0.67	0.69	97.10	0.13
802.11ac20	1.35	1.37	98.54	0.06
802.11ac40	0.67	0.69	97.10	0.13
802.11ac80	0.34	0.36	94.44	0.25

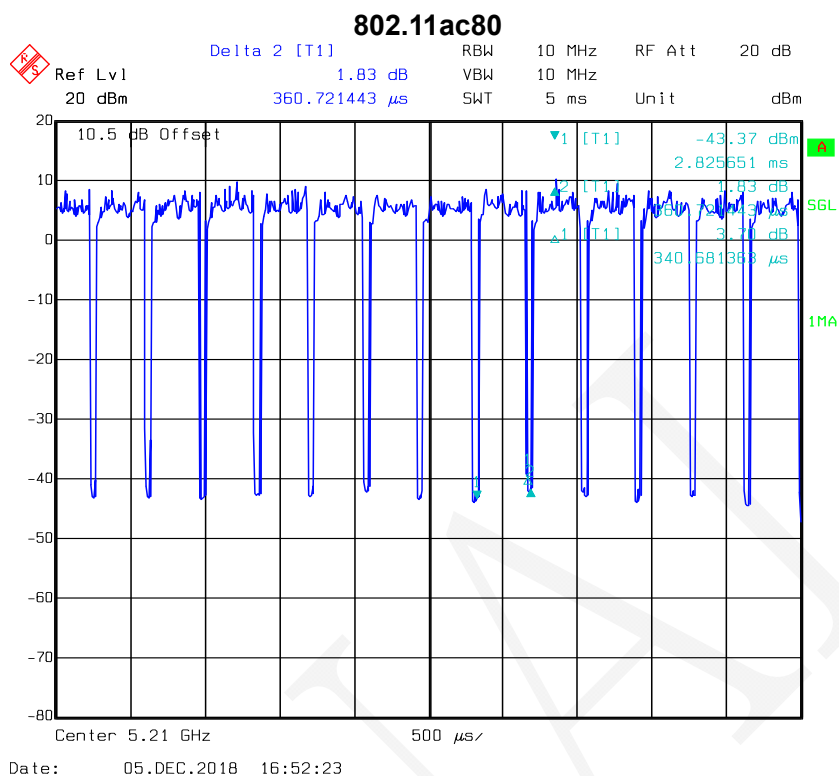


802.11n- HT20



802.11n- HT40





Support Equipment List and Details

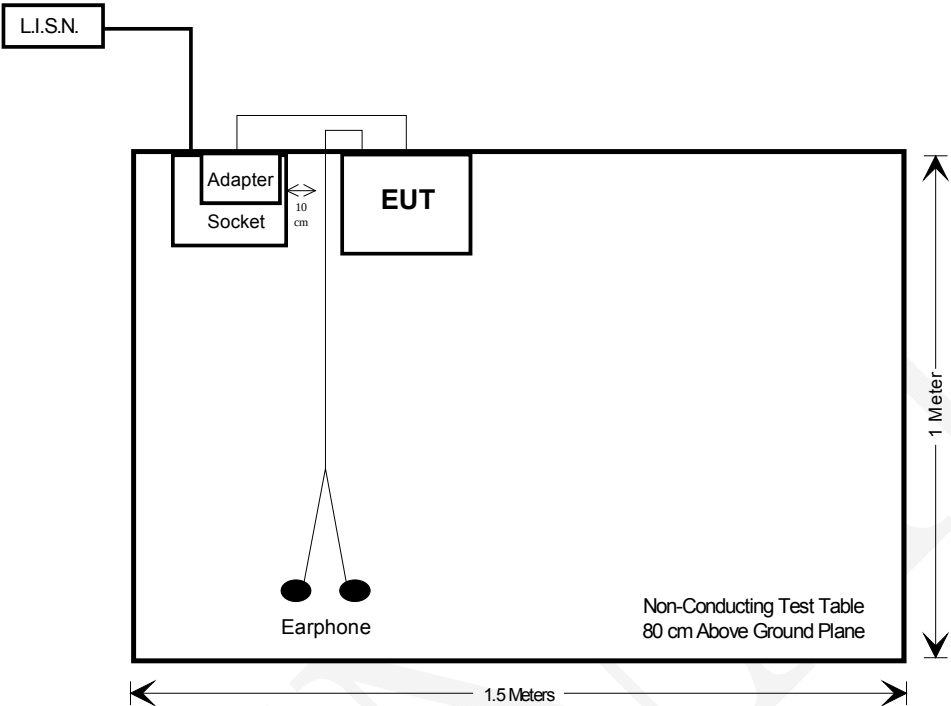
Manufacturer	Description	Model	Serial Number
CHOETECH	Wireless Charger	T517	None
HUAWEI	Adapter	HW-05200C01	None
HUAWEI	Earphone	P9	None

External I/O Cable

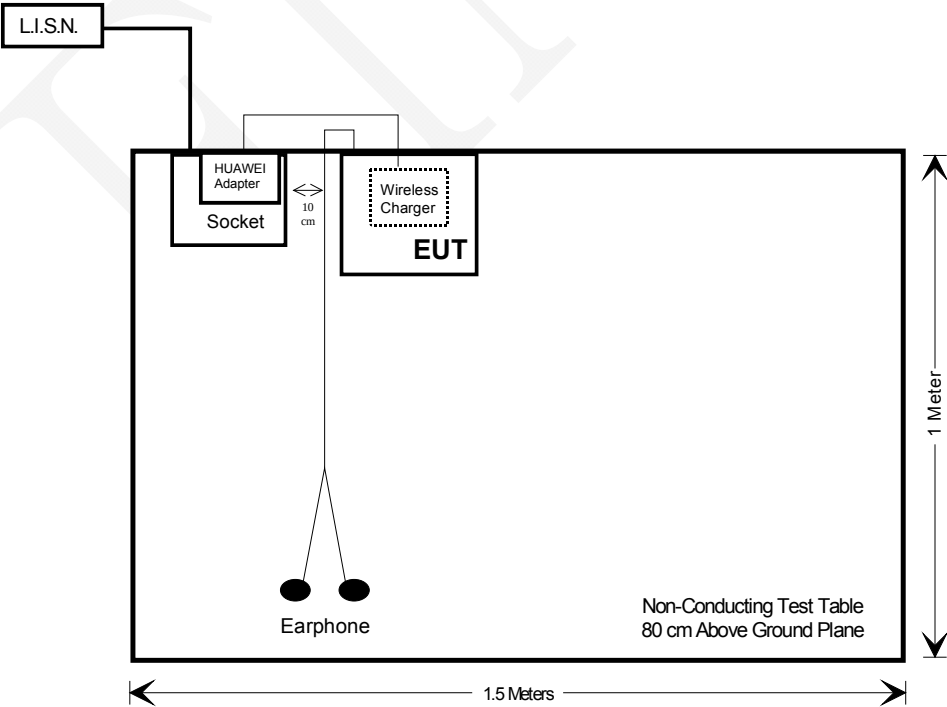
Cable Description	Length (m)	From	To
Adapter Mode			
Unshielded Power Cable	1.2	Adapter	EUT
Unshielded Earphone Cable	1.0	EUT	Earphone
Wireless Charging Mode			
Unshielded Power Cable	1.2	HUAWEI Adapter	Wireless Charger
Unshielded Earphone Cable	1.0	EUT	Earphone

Block Diagram of Test Setup

Conducted Emissions
Adapter Mode



Wireless Charging Mode



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.407(f) & §1.1310 & §2.1093	RF Exposure	Compliance
§15.203	Antenna Requirement	Compliance
§15.407(b)(6)& §15.207(a)	Conducted Emissions	Compliance
§15.205& §15.209 §15.407(b) (1), (4)(i), (6), (7)	Undesirable Emission& Restricted Bands	Compliance
§15.407(b) (1), (4)(i)	Band Edge	Compliance
§15.407(a) (1),(3) & (e)	26dB & 6dB Bandwidth	Compliance
§15.407(a)(1),(3)	Conducted Transmitter Output Power	Compliance
§15.407 (a)(1),(3),(5)	Power Spectral Density	Compliance

TEST EQUIPMENTS LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emission					
Rohde & Schwarz	EMI Test Receiver	ESCS 30	836858/0016	2018-04-18	2019-04-19
Rohde & Schwarz	L.I.S.N.	ENV216	100018	2018-04-18	2019-04-19
HP	RF Limiter	11947A	3107A01270	2018-08-13	2019-08-12
Unknown	Conducted Cable	L-E003	000003	2018-11-02	2019-11-01
Rohde & Schwarz	EMC32	EMC32	V 8.52.0	N/A	N/A
Radiated Emission					
EMCT	Semi-Anechoic Chamber	966	001	2017-05-18	2020-05-17
Sonoma	Pre-Amplifier	310N	186684	2018-08-24	2019-08-23
Rohde & Schwarz	EMI Test Receiver	ESIB 40	100215	2018-04-18	2019-04-17
Rohde & Schwarz	Spectrum Analyzer	FSU26	200835	2018-05-08	2019-05-09
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2018-04-18	2019-04-17
A.H. Systems, Inc	Amplifier	PAM-0118P	467	2018-10-19	2019-10-18
EM Electronics	RF Pre-Amplifier	EM18G40	060725	2018-03-28	2019-03-27
SUNOL SCIENCES	Broadband Antenna	JB3	A121808	2017-05-19	2020-05-18
ETS	Horn Antenna	3115	003-6076	2017-05-19	2020-05-18
A.H. Systems, Inc	Horn Antenna	SAS-574	510	2017-05-19	2020-05-18
INMET	Attenuator	18N-6dB	64671	2018-10-27	2019-10-26
Sinoscite.,Co Ltd	Reject Band Filter	BSF5150-5850MN	0899V2	2018-11-10	2019-11-09
Unknown	RF Cable (below 1GHz)	L-E005	000005	2018-10-27	2019-10-26
Unknown	RF Cable (below 1GHz)	T-E128	000128	2018-11-10	2019-11-09
Unknown	RF Cable (below 1GHz)	T-E129	000129	2018-11-10	2019-11-09
Unknown	RF Cable (above 1GHz)	T-E069	000069	2018-11-10	2019-11-09
Micro-coax	RF Cable (above 1GHz)	T-E209	MFR 64639 2310	2018-03-14	2019-03-13
Rohde & Schwarz	EMC32	EMC32	V 8.52.0	N/A	N/A

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde & Schwarz	Spectrum Analyzer	FSEM30	100018	2018-05-09	2019-05-08
WEINSCHTEL ENGINEERING	Attenuator	1A10dB	AA4135	2018-11-10	2019-11-09
Agilent	USB Wideband Power Sensor	U2021XA	MY53320008	2018-01-18	2019-01-17
E-Microwave	DC Block	EMDCB-00036	OE01304225	2018-10-27	2019-10-26
Unknown	RF Cable	No	000007	Each Time	/

* **Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

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

Applicable Standard

According to §15.407(f) and §1.1310 & §2.1093, 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:

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

- $f(\text{GHz})$ 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
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to 5) in section 4.1 is applied to determine SAR test exclusion.

Measurement Result

For 5.8 G Wi-Fi mode

Please refer to the SAR Report RSC181123050-20

For 5.2 G Wi-Fi mode

The max conducted power including tune-up tolerance is 7.5 dBm (5.62mW).

$[(\text{max. power of channel, mW})/(\text{min. test separation distance, mm})][\sqrt{f(\text{GHz})}]$
 $= 5.62/5 \cdot (\sqrt{5.24}) = 2.6 < 3.0$

So the stand-alone SAR evaluation is not necessary.

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

The EUT has one WIFI/BT antenna and one NFC antenna, which are permanently attached and fulfill the requirement of this section. Please refer to the EUT photos.

RF Module	Manufacturer	Antenna Model	Antenna Gain	Antenna Type
2.4G WLAN	shenzhen bogesi communication technology co.,ltd	WCC-005A	3dBi	FPC Antenna
5G WLAN				
Bluetooth				
NFC	SHENZHEN SUNSHINE GOOD ELECTRONICS CO.,LTD	P134FQ1990A0	0dBi	FPC Antenna

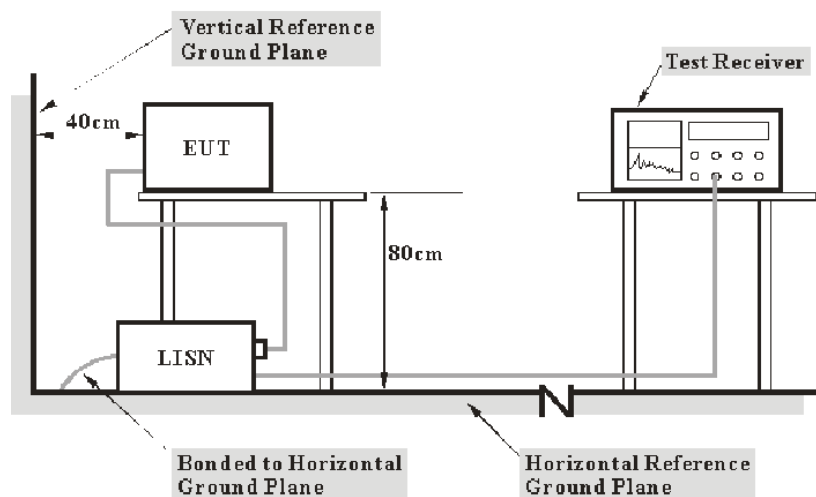
Result: Compliance.

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

Applicable Standard

FCC §15.207, §15.407(b) (6)

EUT Setup



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

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

The spacing between the peripherals was 10 cm.

The adapter was connected to AC 120V/60Hz power source.

EMI Test Receiver Setup

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

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

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

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$$V_C = V_R + A_C + VDF$$

$$C_f = A_C + VDF$$

Herein,

V_C (cord. Reading): corrected voltage amplitude

V_R : reading voltage amplitude

A_C : attenuation caused by cable loss

VDF: voltage division factor of AMN

C_f : Correction Factor

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

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

Test Procedure

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

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

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

Test Results Summary

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

Test Data

Environmental Conditions

Temperature:	24 °C
Relative Humidity:	57 %
ATM Pressure:	94.9 kPa

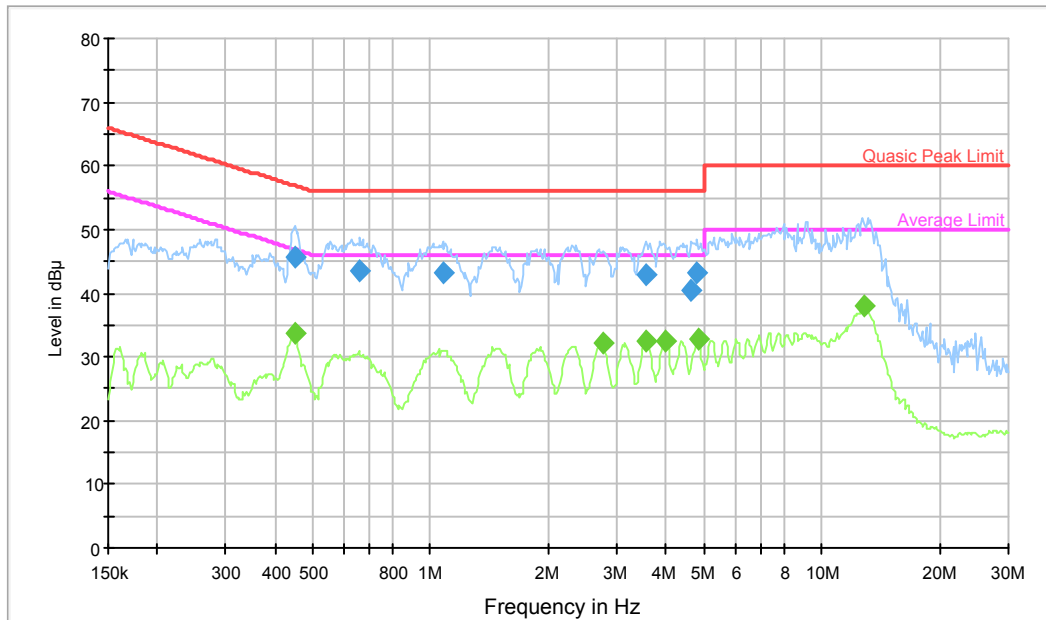
The testing was performed by Tom Tang on 2018-11-20.

Test Mode: Transmitting

5725-5850MHz band: 802.11ac40-high channel - worst case

Adapter Mode

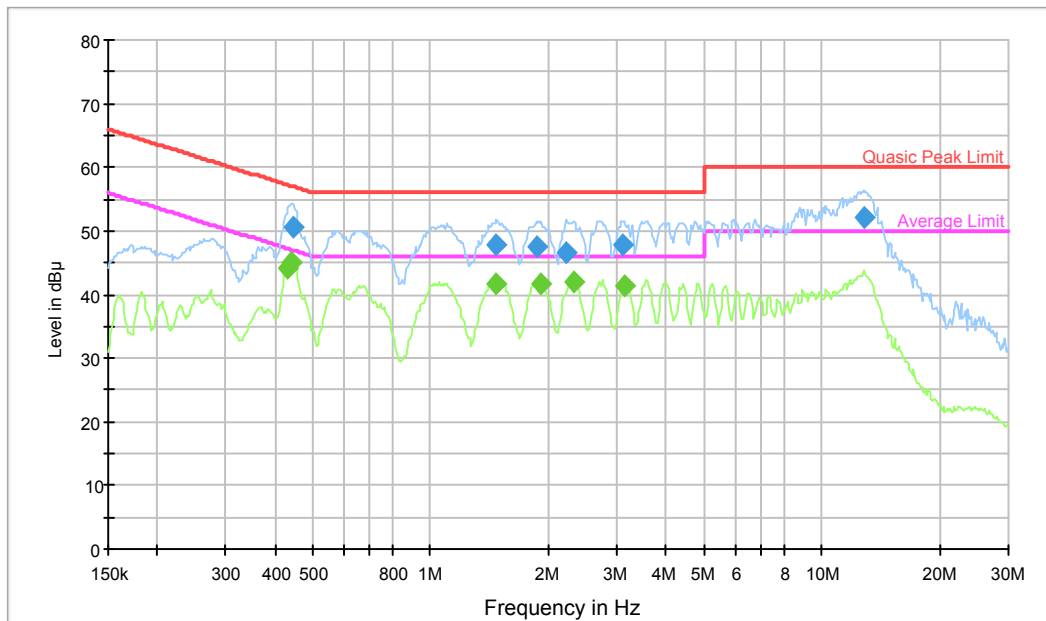
AC120V/60Hz, Line



Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBμV)
0.450448	45.8	9.000	L1	19.6	11.1	56.9
0.660314	43.7	9.000	L1	19.6	12.3	56.0
1.073601	43.2	9.000	L1	19.6	12.8	56.0
3.547503	43.0	9.000	L1	19.8	13.0	56.0
4.651370	40.6	9.000	L1	19.8	15.4	56.0
4.802010	43.2	9.000	L1	19.8	12.8	56.0

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBμV)
0.450448	33.6	9.000	L1	19.6	13.3	46.9
2.749070	32.1	9.000	L1	19.8	13.9	46.0
3.547503	32.6	9.000	L1	19.8	13.4	46.0
3.966160	32.5	9.000	L1	19.8	13.5	46.0
4.840426	32.7	9.000	L1	19.8	13.3	46.0
12.795830	37.9	9.000	L1	20.1	12.1	50.0

AC120V/60Hz, Neutral



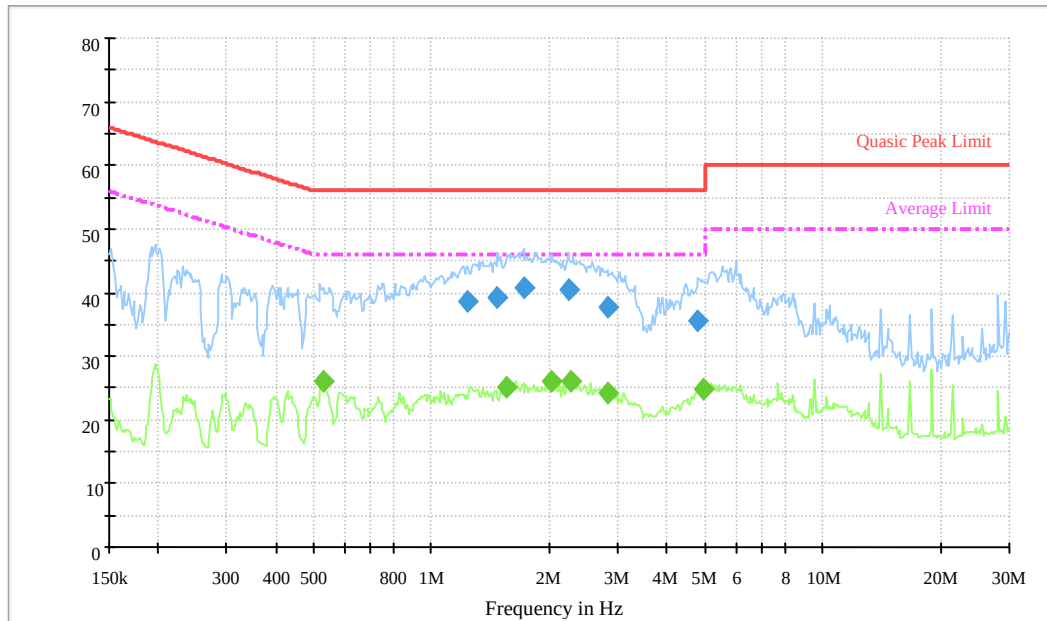
Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBμV)
0.446873	50.7	9.000	N	19.6	6.2	56.9
1.476605	47.8	9.000	N	19.8	8.2	56.0
1.860457	47.6	9.000	N	19.8	8.4	56.0
2.216927	46.7	9.000	N	19.9	9.3	56.0
3.098088	47.8	9.000	N	19.9	8.2	56.0
12.795830	52.0	9.000	N	20.2	8.0	60.0

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBμV)
0.429420	44.3	9.000	N	19.6	3.0	47.3
0.443327	45.1	9.000	N	19.6	*1.9	47.0
1.464886	41.7	9.000	N	19.8	4.3	46.0
1.905466	41.8	9.000	N	19.9	4.2	46.0
2.325491	41.9	9.000	N	19.9	4.1	46.0
3.122873	41.5	9.000	N	19.9	4.5	46.0

*Within measurement uncertainty!

Wireless Charging Mode

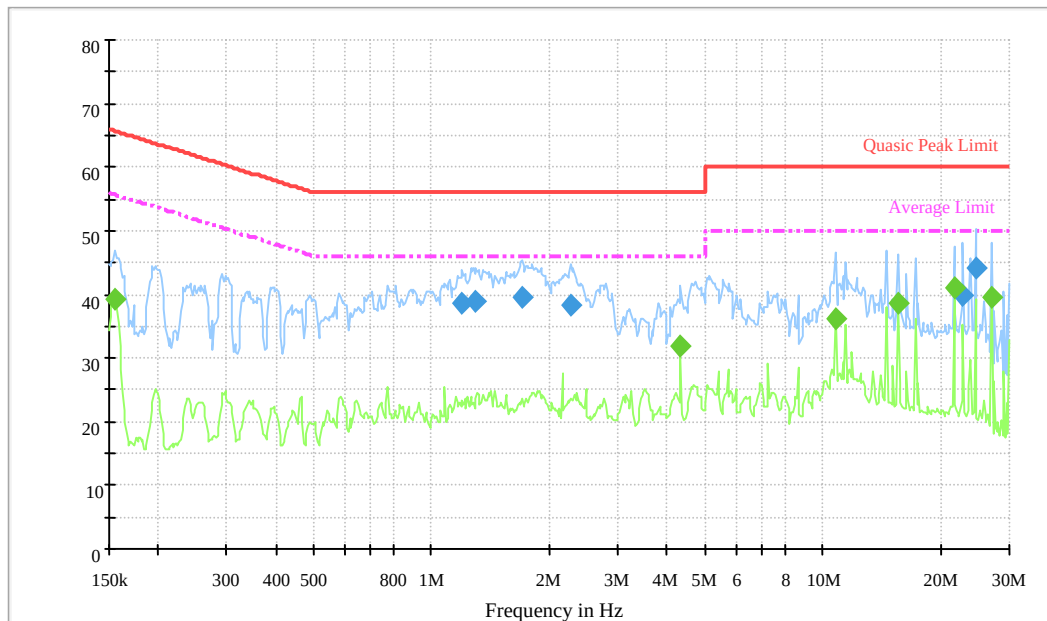
AC120V/60Hz, Line



Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBμV)
1.239175	38.5	9.000	L1	19.7	17.5	56.0
1.476605	39.3	9.000	L1	19.7	16.7	56.0
1.717965	40.9	9.000	L1	19.7	15.1	56.0
2.234662	40.4	9.000	L1	19.7	15.6	56.0
2.815577	37.7	9.000	L1	19.8	18.3	56.0
4.802010	35.5	9.000	L1	19.8	20.5	56.0

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBμV)
0.528270	26.2	9.000	L1	19.5	19.8	46.0
1.548915	25.2	9.000	L1	19.7	20.8	46.0
2.030886	26.2	9.000	L1	19.7	19.8	46.0
2.270560	26.1	9.000	L1	19.7	19.9	46.0
2.838101	24.1	9.000	L1	19.8	21.9	46.0
4.957528	24.7	9.000	L1	19.8	21.3	46.0

AC120V/60Hz, Neutral



Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBμV)
1.200302	38.6	9.000	N	19.8	17.4	56.0
1.299858	38.9	9.000	N	19.8	17.1	56.0
1.704331	39.5	9.000	N	19.8	16.5	56.0
2.270560	38.4	9.000	N	19.9	17.6	56.0
22.892188	39.8	9.000	N	20.4	20.2	60.0
24.594166	44.3	9.000	N	20.4	15.7	60.0

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBμV)
0.154858	39.4	9.000	N	19.5	16.3	55.7
4.329484	31.8	9.000	N	20.0	14.2	46.0
10.824237	36.3	9.000	N	20.2	13.7	50.0
15.616430	38.5	9.000	N	20.3	11.5	50.0
21.650283	40.7	9.000	N	20.3	9.3	50.0
27.061912	39.4	9.000	N	20.5	10.6	50.0

Note:

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

FCC §15.209, §15.205 & §15.407(b) (1) (4)(i) (6) (7) – UNDESIRABLE EMISSION, RESTRICTED BANDS

Applicable Standard

FCC §15.407 (b) (1) (4)(i), (6), (7); §15.209; §15.205

FCC 15.407 (b)

- (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85 GHz band:
 - (i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.
- (6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.
- (7) The provisions of §15.205 apply to intentional radiators operating under this section.

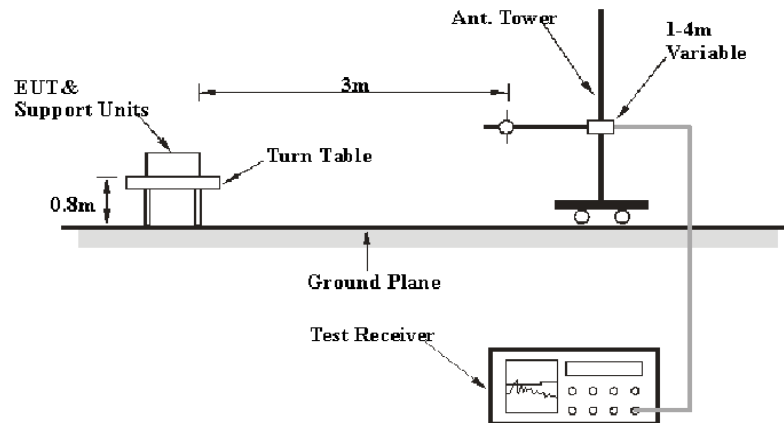
According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, emission shall be computed as:

$$E[\text{dB}\mu\text{V}/\text{m}] = \text{EIRP}[\text{dBm}] + 95.2, \text{ for } d = 3 \text{ meters.}$$

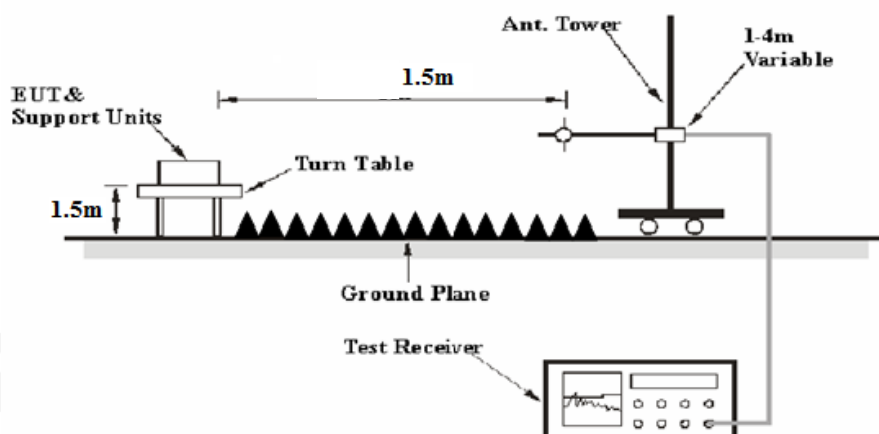
- 1) For 75 MHz above or below the band edge, a level of -27 dBm/MHz (68.2dB μ V/m) was applied.
- 2) For 25MHz-75 MHz above or below the band edge, a level of 10 dBm/MHz (105.2dB μ V/m) was applied.
- 3) For 5MHz-25 MHz above or below the band edge, a level of 15.6 dBm/MHz (110.8dB μ V/m) was applied.
- 4) For 0 MHz-5 MHz above or below the band edge, a level of 27 dBm/MHz (122.2dB μ V/m) was applied.

EUT Setup

Below 1GHz:



Above 1 GHz:



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

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

The spacing between the peripherals was 10 cm.

The adapter was connected to AC 120V/60Hz power source.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 40 GHz.

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

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

Frequency Range	RBW	Video B/W	Duty Cycle	Measurement
Above 1 GHz	1MHz	3 MHz	Any	PK
	1MHz	10Hz	>98%	AV
	1MHz	1/T	<98%	AV

Note: T is Transmission Duration

Test Procedure

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

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

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, emission shall be computed as: $E [dB\mu V/m] = EIRP[dBm] + 95.2$, for $d = 3$ meters.

According to C63.10, the above 1G test result shall be extrapolated to the specified distance using an extrapolation factor of 20dB/decade from 3m to 1.5m

Distance extrapolation factor = $20 \log (\text{specific distance } [3m] / \text{test distance } [1.5m])$ dB

Extrapolation result = Corrected Amplitude (dB μ V/m) - distance extrapolation factor (6dB)

Corrected Amplitude & Margin Calculation

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

Corrected Amplitude = Receiver Reading + Cable loss + Antenna Factor – Amplifier Gain

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

Margin = Limit-Corrected Amplitude

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Subpart C, Section 15.205 and 15.209, Subpart E, Section 15.407.

Test Data

Environmental Conditions

Temperature:	24 °C
Relative Humidity:	59 %
ATM Pressure:	96.0 kPa

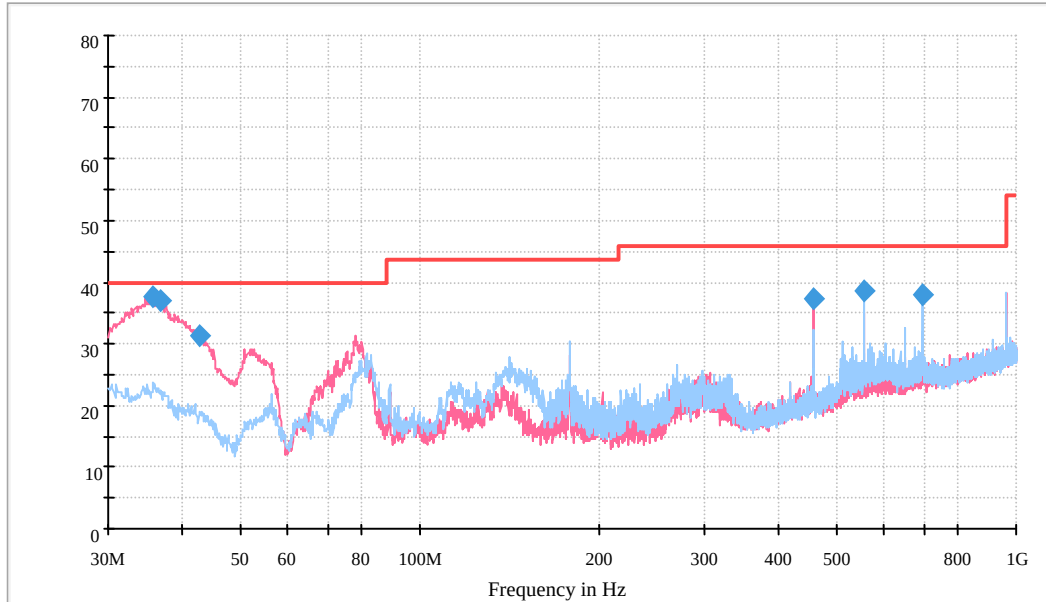
The testing was performed by Tom Tang from 2018-11-26.

Test mode: Transmitting

1) 30 MHz to 1 GHz:

5725-5850MHz band: 802.11ac40-high channel - worst case

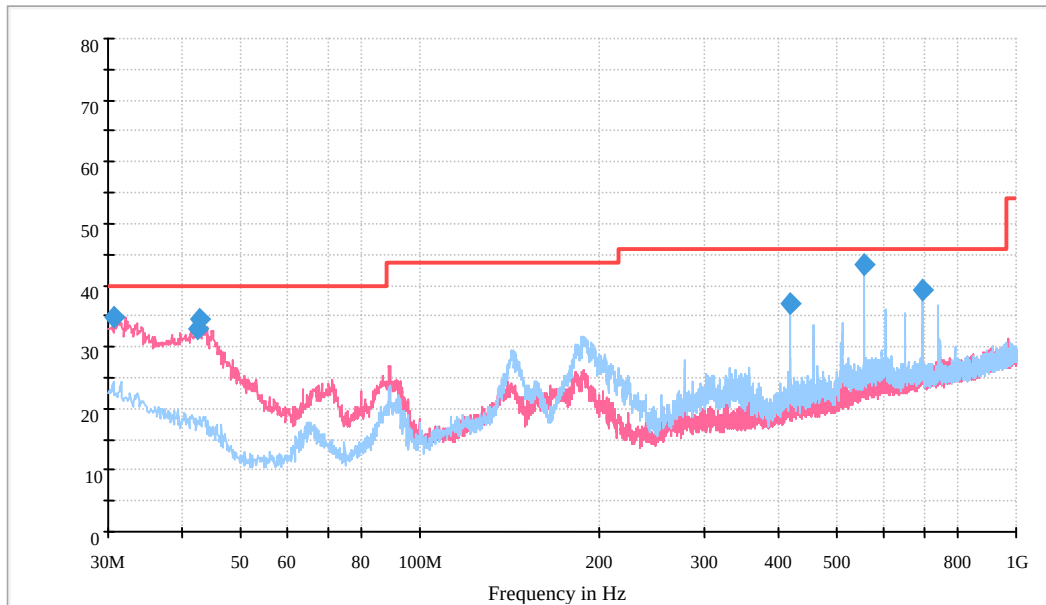
Adapter Mode



Frequency (MHz)	QuaiscPeak (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corrected Factor (dB/m)	Margin (dB)	Limit (dBμV/m)
35.698750	37.5	100.0	V	239.0	-8.6	*2.5	40.0
36.668750	37.0	150.0	V	180.0	-9.2	*3.0	40.0
42.610000	31.3	100.0	V	254.0	-12.9	8.7	40.0
456.193750	37.3	150.0	V	46.0	-7.9	8.7	46.0
556.952500	38.5	135.0	H	108.0	-5.1	7.5	46.0
696.268750	38.1	150.0	H	79.0	-3.0	7.9	46.0

**Within measurement uncertainty!*

Wireless Charging Mode



Frequency (MHz)	QuaiscPeak (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corrected Factor (dB/m)	Margin (dB)	Limit (dBμV/m)
30.727500	34.8	110.0	V	121.0	-5.3	5.2	40.0
42.488750	32.8	105.0	V	172.0	-12.8	7.2	40.0
42.731250	34.4	100.0	V	172.0	-13.0	5.6	40.0
417.757500	37.1	120.0	H	269.0	-8.3	8.9	46.0
556.952500	43.2	150.0	H	331.0	-5.1	*2.8	46.0
696.268750	39.2	150.0	H	339.0	-3.0	6.8	46.0

**Within measurement uncertainty!*

2) 1GHz-40GHz

(Note: Above 1GHz was performed at distance 1.5m)

For 5150-5250 MHz:

For 802.11a mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Measurement (PK /AV)	Polar (H/V)	Factor (dB/m)						
Frequency: 5180 MHz										
5180	63.31	PK	H	34.51	4.54	0.00	102.36	96.36	N/A	N/A
5180	52.92	AV	H	34.51	4.54	0.00	91.97	85.97	N/A	N/A
5180	73.69	PK	V	34.51	4.54	0.00	112.74	106.74	N/A	N/A
5180	63.63	AV	V	34.51	4.54	0.00	102.68	96.68	N/A	N/A
5150	33.32	PK	V	34.49	4.53	0.00	72.34	66.34	74.00	7.66
5150	16.03	AV	V	34.49	4.53	0.00	55.05	49.05	54.00	4.95
10360	47.31	PK	V	38.67	6.52	44.50	48.00	42.00	74.00	32.00
10360	33.37	AV	V	38.67	6.52	44.50	34.06	28.06	54.00	25.94
Frequency: 5200 MHz										
5200	62.25	PK	H	34.52	4.55	0.00	101.32	95.32	N/A	N/A
5200	51.45	AV	H	34.52	4.55	0.00	90.52	84.52	N/A	N/A
5200	72.57	PK	V	34.52	4.55	0.00	111.64	105.64	N/A	N/A
5200	62.53	AV	V	34.52	4.55	0.00	101.60	95.60	N/A	N/A
10400	46.98	PK	V	38.68	6.53	44.53	47.66	41.66	74.00	32.34
10400	33.13	AV	V	38.68	6.53	44.53	33.81	27.81	54.00	26.19
Frequency: 5240 MHz										
5240	61.59	PK	H	34.54	4.57	0.00	100.70	94.70	N/A	N/A
5240	50.43	AV	H	34.54	4.57	0.00	89.54	83.54	N/A	N/A
5240	71.67	PK	V	34.54	4.57	0.00	110.78	104.78	N/A	N/A
5240	61.66	AV	V	34.54	4.57	0.00	100.77	94.77	N/A	N/A
5350	25.71	PK	V	34.61	4.62	0.00	64.94	58.94	74.00	15.06
5350	14.82	AV	V	34.61	4.62	0.00	54.05	48.05	54.00	5.95
10480	46.89	PK	V	38.70	6.55	44.59	47.55	41.55	74.00	32.45
10480	33.17	AV	V	38.70	6.55	44.59	33.83	27.83	54.00	26.17

For 802.11n-HT20 mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Measurement (PK /AV)	Polar (H/V)	Factor (dB/m)						
Frequency: 5180 MHz										
5180	63.34	PK	H	34.51	4.54	0.00	102.39	96.39	N/A	N/A
5180	52.57	AV	H	34.51	4.54	0.00	91.62	85.62	N/A	N/A
5180	73.78	PK	V	34.51	4.54	0.00	112.83	106.83	N/A	N/A
5180	63.07	AV	V	34.51	4.54	0.00	102.12	96.12	N/A	N/A
5150	33.51	PK	V	34.49	4.53	0.00	72.53	66.53	74.00	7.47
5150	16.19	AV	V	34.49	4.53	0.00	55.21	49.21	54.00	4.79
10360	47.17	PK	V	38.67	6.52	44.50	47.86	41.86	74.00	32.14
10360	34.82	AV	V	38.67	6.52	44.50	35.51	29.51	54.00	24.49
Frequency: 5200 MHz										
5200	62.64	PK	H	34.52	4.55	0.00	101.71	95.71	N/A	N/A
5200	52.02	AV	H	34.52	4.55	0.00	91.09	85.09	N/A	N/A
5200	72.63	PK	V	34.52	4.55	0.00	111.70	105.70	N/A	N/A
5200	62.31	AV	V	34.52	4.55	0.00	101.38	95.38	N/A	N/A
10400	46.54	PK	V	38.68	6.53	44.53	47.22	41.22	74.00	32.78
10400	33.96	AV	V	38.68	6.53	44.53	34.64	28.64	54.00	25.36
Frequency: 5240 MHz										
5240	62.56	PK	H	34.54	4.57	0.00	101.67	95.67	N/A	N/A
5240	52.14	AV	H	34.54	4.57	0.00	91.25	85.25	N/A	N/A
5240	72.03	PK	V	34.54	4.57	0.00	111.14	105.14	N/A	N/A
5240	61.69	AV	V	34.54	4.57	0.00	100.80	94.80	N/A	N/A
5350	26.44	PK	V	34.61	4.62	0.00	65.67	59.67	74.00	14.33
5350	14.83	AV	V	34.61	4.62	0.00	54.06	48.06	54.00	5.94
10480	46.55	PK	V	38.70	6.55	44.59	47.21	41.21	74.00	32.79
10480	33.38	AV	V	38.70	6.55	44.59	34.04	28.04	54.00	25.96

For 802.11n-HT40 mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Measurement (PK /AV)	Polar (H/V)	Factor (dB/m)						
Frequency: 5190 MHz										
5190	62.31	PK	H	34.51	4.55	0.00	101.37	95.37	N/A	N/A
5190	51.06	AV	H	34.51	4.55	0.00	90.12	84.12	N/A	N/A
5190	71.72	PK	V	34.51	4.55	0.00	110.78	104.78	N/A	N/A
5190	59.89	AV	V	34.51	4.55	0.00	98.95	92.95	N/A	N/A
5150	38.61	PK	V	34.49	4.53	0.00	77.63	71.63	74.00	*2.37
5150	19.56	AV	V	34.49	4.53	0.00	58.58	52.58	54.00	*1.42
10380	47.82	PK	V	38.68	6.52	44.52	48.50	42.50	74.00	31.50
10380	34.12	AV	V	38.68	6.52	44.52	34.80	28.80	54.00	25.20
Frequency: 5230 MHz										
5230	60.73	PK	H	34.54	4.57	0.00	99.84	93.84	N/A	N/A
5230	50.48	AV	H	34.54	4.57	0.00	89.59	83.59	N/A	N/A
5230	70.49	PK	V	34.54	4.57	0.00	109.60	103.60	N/A	N/A
5230	59.42	AV	V	34.54	4.57	0.00	98.53	92.53	N/A	N/A
5350	26.82	PK	V	34.61	4.62	0.00	66.05	60.05	74.00	13.95
5350	14.82	AV	V	34.61	4.62	0.00	54.05	48.05	54.00	5.95
10460	46.58	PK	V	38.69	6.55	44.57	47.25	41.25	74.00	32.75
10460	33.59	AV	V	38.69	6.55	44.57	34.26	28.26	54.00	25.74

*Within measurement uncertainty!

For 802.11ac20 mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Measurement (PK /AV)	Polar (H/V)	Factor (dB/m)						
Frequency: 5180 MHz										
5180	63.17	PK	H	34.51	4.54	0.00	102.22	96.22	N/A	N/A
5180	52.59	AV	H	34.51	4.54	0.00	91.64	85.64	N/A	N/A
5180	74.16	PK	V	34.51	4.54	0.00	113.21	107.21	N/A	N/A
5180	63.34	AV	V	34.51	4.54	0.00	102.39	96.39	N/A	N/A
5150	37.15	PK	V	34.49	4.53	0.00	76.17	70.17	74.00	*3.83
5150	16.24	AV	V	34.49	4.53	0.00	55.26	49.26	54.00	4.74
10360	47.25	PK	V	38.67	6.52	44.50	47.94	41.94	74.00	32.06
10360	33.22	AV	V	38.67	6.52	44.50	33.91	27.91	54.00	26.09
Frequency: 5200 MHz										
5200	62.12	PK	H	34.52	4.55	0.00	101.19	95.19	N/A	N/A
5200	51.41	AV	H	34.52	4.55	0.00	90.48	84.48	N/A	N/A
5200	72.87	PK	V	34.52	4.55	0.00	111.94	105.94	N/A	N/A
5200	62.37	AV	V	34.52	4.55	0.00	101.44	95.44	N/A	N/A
10400	47.52	PK	V	38.68	6.53	44.53	48.20	42.20	74.00	31.80
10400	33.19	AV	V	38.68	6.53	44.53	33.87	27.87	54.00	26.13
Frequency: 5240 MHz										
5240	60.87	PK	H	34.54	4.57	0.00	99.98	93.98	N/A	N/A
5240	50.02	AV	H	34.54	4.57	0.00	89.13	83.13	N/A	N/A
5240	71.24	PK	V	34.54	4.57	0.00	110.35	104.35	N/A	N/A
5240	61.18	AV	V	34.54	4.57	0.00	100.29	94.29	N/A	N/A
5350	25.84	PK	V	34.61	4.62	0.00	65.07	59.07	74.00	14.93
5350	14.86	AV	V	34.61	4.62	0.00	54.09	48.09	54.00	5.91
10480	47.61	PK	V	38.70	6.55	44.59	48.27	42.27	74.00	31.73
10480	33.09	AV	V	38.70	6.55	44.59	33.75	27.75	54.00	26.25

*Within measurement uncertainty!

For 802.11ac40 mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Measurement (PK /AV)	Polar (H/V)	Factor (dB/m)						
Frequency: 5190 MHz										
5190	61.63	PK	H	34.51	4.55	0.00	100.69	94.69	N/A	N/A
5190	51.29	AV	H	34.51	4.55	0.00	90.35	84.35	N/A	N/A
5190	70.57	PK	V	34.51	4.55	0.00	109.63	103.63	N/A	N/A
5190	59.93	AV	V	34.51	4.55	0.00	98.99	92.99	N/A	N/A
5150	39.26	PK	V	34.49	4.53	0.00	78.28	72.28	74.00	*1.72
5150	19.43	AV	V	34.49	4.53	0.00	58.45	52.45	54.00	*1.55
10380	47.56	PK	V	38.68	6.52	44.52	48.24	42.24	74.00	31.76
10380	34.12	AV	V	38.68	6.52	44.52	34.80	28.80	54.00	25.20
Frequency: 5230 MHz										
5230	61.04	PK	H	34.54	4.57	0.00	100.15	94.15	N/A	N/A
5230	50.83	AV	H	34.54	4.57	0.00	89.94	83.94	N/A	N/A
5230	70.94	PK	V	34.54	4.57	0.00	110.05	104.05	N/A	N/A
5230	59.35	AV	V	34.54	4.57	0.00	98.46	92.46	N/A	N/A
5350	26.02	PK	V	34.61	4.62	0.00	65.25	59.25	74.00	14.75
5350	14.82	AV	V	34.61	4.62	0.00	54.05	48.05	54.00	5.95
10460	46.95	PK	V	38.69	6.55	44.57	47.62	41.62	74.00	32.38
10460	33.07	AV	V	38.69	6.55	44.57	33.74	27.74	54.00	26.26

*Within measurement uncertainty!

For 802.11ac80 mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Measurement (PK /AV)	Polar (H/V)	Factor (dB/m)						
Frequency: 5210 MHz										
5210	62.91	PK	H	34.53	4.56	0.00	102.00	96.00	N/A	N/A
5210	51.45	AV	H	34.53	4.56	0.00	90.54	84.54	N/A	N/A
5210	70.97	PK	V	34.53	4.56	0.00	110.06	104.06	N/A	N/A
5210	59.64	AV	V	34.53	4.56	0.00	98.73	92.73	N/A	N/A
5150	38.82	PK	V	34.49	4.53	0.00	77.84	71.84	74.00	*2.16
5150	19.13	AV	V	34.49	4.53	0.00	58.15	52.15	54.00	*1.85
5350	28.43	PK	V	34.61	4.62	0.00	67.66	61.66	74.00	12.34
5350	15.71	AV	V	34.61	4.62	0.00	54.94	48.94	54.00	5.06
10420	45.89	PK	V	38.68	6.54	44.55	46.56	40.56	74.00	33.44
10420	32.71	AV	V	38.68	6.54	44.55	33.38	27.38	54.00	26.62

*Within measurement uncertainty!

Note:

Corrected Amplitude = Corrected Factor + Reading

Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor

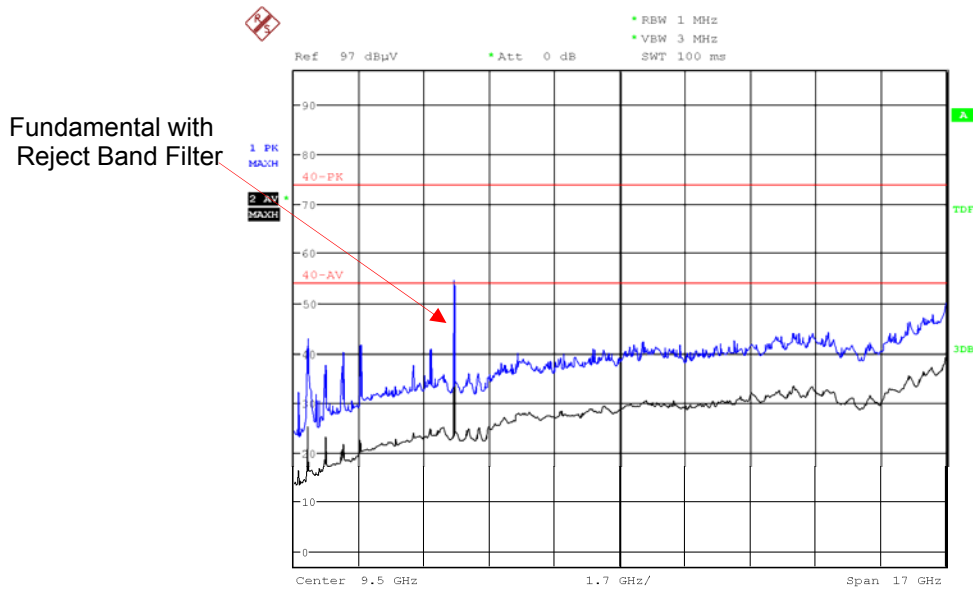
Margin = Limit- Corr. Amplitude

Spurious emissions more than 20 dB below the limit were not reported.

Please refer to the below pre-scan plot of worst case:

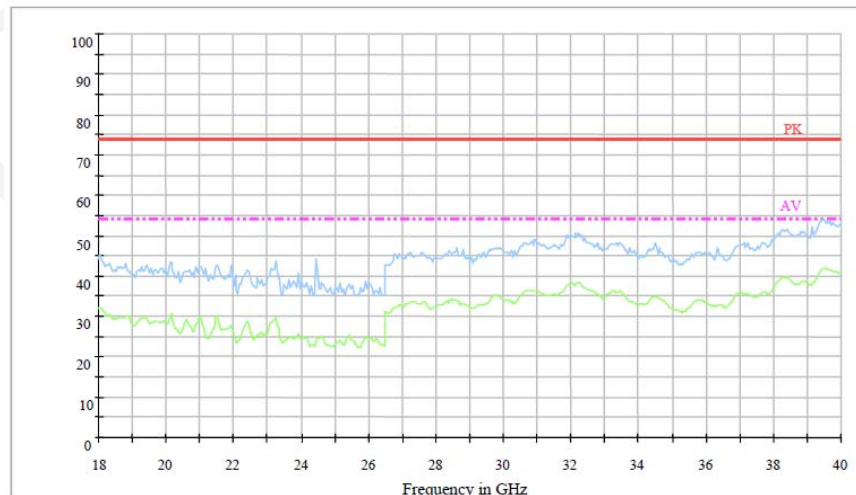
Note: The test distance is 1.5m and distance factor was corrected to the total factor.

802.11n-HT40 Mode: High Channel_Horizontal_1GHz-18GHz

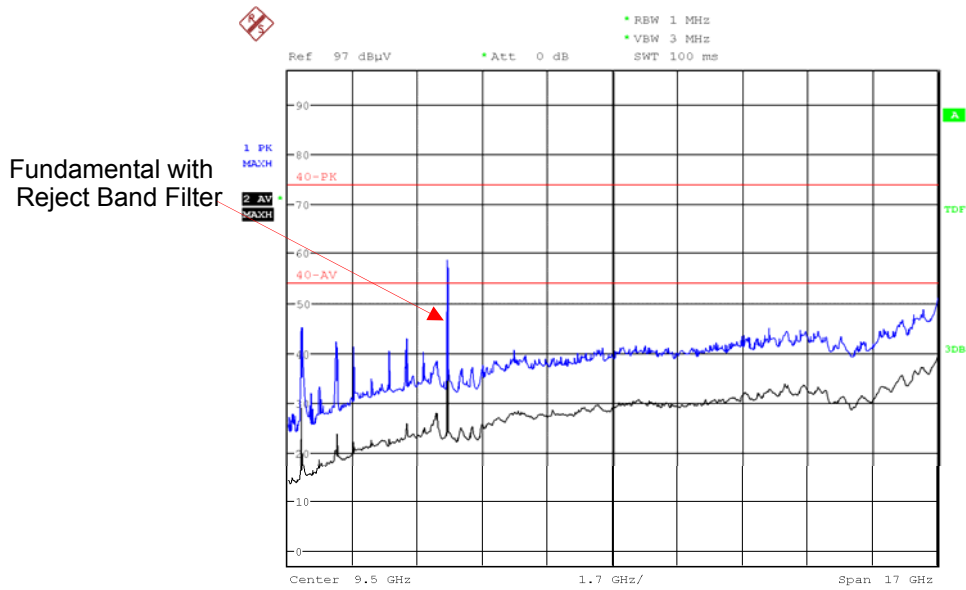


Date: 26.NOV.2018 19:09:38

802.11n-HT40 Mode: High Channel_Horizontal_18GHz-40GHz

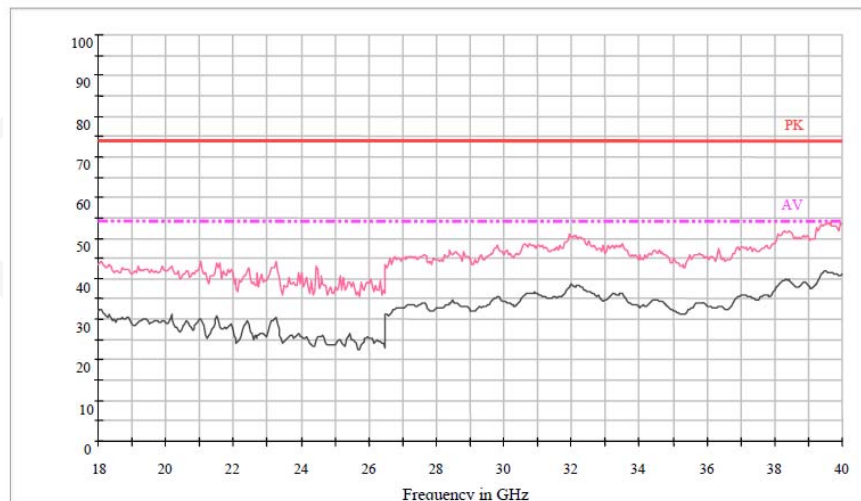


802.11n-HT40 Mode: High Channel_Vertical_1GHz-18GHz



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802.11n-HT40 Mode: High Channel_Vertical_18GHz-40GHz



For 5725-5850 MHz

For 802.11a mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Measurement (PK /AV)	Polar (H/V)	Factor (dB/m)						
Frequency: 5745 MHz										
5745	64.97	PK	H	34.75	4.81	0.00	104.53	98.53	N/A	N/A
5745	54.49	AV	H	34.75	4.81	0.00	94.05	88.05	N/A	N/A
5745	75.86	PK	V	34.75	4.81	0.00	115.42	109.42	N/A	N/A
5745	65.24	AV	V	34.75	4.81	0.00	104.80	98.80	N/A	N/A
5650	27.22	PK	V	34.73	4.76	0.00	66.71	60.71	68.20	7.49
5700	28.52	PK	V	34.74	4.79	0.00	68.05	62.05	105.20	43.15
5720	42.03	PK	V	34.74	4.80	0.00	81.57	75.57	110.80	35.23
5725	41.94	PK	V	34.75	4.80	0.00	81.49	75.49	122.20	46.71
11490	46.42	PK	V	38.90	6.89	44.64	47.57	41.57	74.00	32.43
11490	32.24	AV	V	38.90	6.89	44.64	33.39	27.39	54.00	26.61
Frequency: 5785 MHz										
5785	65.14	PK	H	34.76	4.83	0.00	104.73	98.73	N/A	N/A
5785	54.97	AV	H	34.76	4.83	0.00	94.56	88.56	N/A	N/A
5785	75.52	PK	V	34.76	4.83	0.00	115.11	109.11	N/A	N/A
5785	64.80	AV	V	34.76	4.83	0.00	104.39	98.39	N/A	N/A
11570	46.30	PK	V	38.91	6.91	44.46	47.66	41.66	74.00	32.34
11570	32.53	AV	V	38.91	6.91	44.46	33.89	27.89	54.00	26.11
Frequency: 5825 MHz										
5825	65.58	PK	H	34.77	4.85	0.00	105.20	99.20	N/A	N/A
5825	55.66	AV	H	34.77	4.85	0.00	95.28	89.28	N/A	N/A
5825	75.38	PK	V	34.77	4.85	0.00	115.00	109.00	N/A	N/A
5825	64.91	AV	V	34.77	4.85	0.00	104.53	98.53	N/A	N/A
5850	39.31	PK	V	34.77	4.86	0.00	78.94	72.94	122.20	49.26
5855	33.59	PK	V	34.77	4.86	0.00	73.22	67.22	110.80	43.58
5875	28.74	PK	V	34.78	4.87	0.00	68.39	62.39	105.20	42.81
5925	26.94	PK	V	34.79	4.89	0.00	66.62	60.62	68.20	7.58
11650	46.67	PK	V	38.93	6.94	44.27	48.27	42.27	74.00	31.73
11650	33.04	AV	V	38.93	6.94	44.27	34.64	28.64	54.00	25.36

For 802.11n-HT20 mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Measurement (PK /AV)	Polar (H/V)	Factor (dB/m)						
Frequency: 5745 MHz										
5745	65.43	PK	H	34.75	4.81	0.00	104.99	98.99	N/A	N/A
5745	54.99	AV	H	34.75	4.81	0.00	94.55	88.55	N/A	N/A
5745	75.17	PK	V	34.75	4.81	0.00	114.73	108.73	N/A	N/A
5745	64.72	AV	V	34.75	4.81	0.00	104.28	98.28	N/A	N/A
5650	26.09	PK	V	34.73	4.76	0.00	65.58	59.58	68.20	8.62
5700	32.16	PK	V	34.74	4.79	0.00	71.69	65.69	105.20	39.51
5720	44.31	PK	V	34.74	4.80	0.00	83.85	77.85	110.80	32.95
5725	43.14	PK	V	34.75	4.80	0.00	82.69	76.69	122.20	45.51
11490	46.81	PK	V	38.90	6.89	44.64	47.96	41.96	74.00	32.04
11490	35.49	AV	V	38.90	6.89	44.64	36.64	30.64	54.00	23.36
Frequency: 5785 MHz										
5785	64.93	PK	H	34.76	4.83	0.00	104.52	98.52	N/A	N/A
5785	54.22	AV	H	34.76	4.83	0.00	93.81	87.81	N/A	N/A
5785	74.79	PK	V	34.76	4.83	0.00	114.38	108.38	N/A	N/A
5785	64.53	AV	V	34.76	4.83	0.00	104.12	98.12	N/A	N/A
11570	46.39	PK	V	38.91	6.91	44.46	47.75	41.75	74.00	32.25
11570	34.44	AV	V	38.91	6.91	44.46	35.80	29.80	54.00	24.20
Frequency: 5825 MHz										
5825	64.76	PK	H	34.77	4.85	0.00	104.38	98.38	N/A	N/A
5825	54.03	AV	H	34.77	4.85	0.00	93.65	87.65	N/A	N/A
5825	74.52	PK	V	34.77	4.85	0.00	114.14	108.14	N/A	N/A
5825	64.57	AV	V	34.77	4.85	0.00	104.19	98.19	N/A	N/A
5850	41.39	PK	V	34.77	4.86	0.00	81.02	75.02	122.20	47.18
5855	37.06	PK	V	34.77	4.86	0.00	76.69	70.69	110.80	40.11
5875	29.06	PK	V	34.78	4.87	0.00	68.71	62.71	105.20	42.49
5925	26.48	PK	V	34.79	4.89	0.00	66.16	60.16	68.20	8.04
11650	46.02	PK	V	38.93	6.94	44.27	47.62	41.62	74.00	32.38
11650	33.43	AV	V	38.93	6.94	44.27	35.03	29.03	54.00	24.97

For 802.11n-HT40 mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Measurement (PK /AV)	Polar (H/V)	Factor (dB/m)						
Frequency: 5755 MHz										
5755	62.45	PK	H	34.75	4.81	0.00	102.01	96.01	N/A	N/A
5755	52.01	AV	H	34.75	4.81	0.00	91.57	85.57	N/A	N/A
5755	72.89	PK	V	34.75	4.81	0.00	112.45	106.45	N/A	N/A
5755	62.01	AV	V	34.75	4.81	0.00	101.57	95.57	N/A	N/A
5650	27.46	PK	V	34.73	4.76	0.00	66.95	60.95	68.20	7.25
5700	36.82	PK	V	34.74	4.79	0.00	76.35	70.35	105.20	34.85
5720	43.29	PK	V	34.74	4.80	0.00	82.83	76.83	110.80	33.97
5725	45.72	PK	V	34.75	4.80	0.00	85.27	79.27	122.20	42.93
11510	46.34	PK	V	38.90	6.89	44.61	47.52	41.52	74.00	32.48
11510	33.27	AV	V	38.90	6.89	44.61	34.45	28.45	54.00	25.55
Frequency: 5795 MHz										
5795	62.41	PK	H	34.76	4.83	0.00	102.00	96.00	N/A	N/A
5795	51.57	AV	H	34.76	4.83	0.00	91.16	85.16	N/A	N/A
5795	72.72	PK	V	34.76	4.83	0.00	112.31	106.31	N/A	N/A
5795	62.13	AV	V	34.76	4.83	0.00	101.72	95.72	N/A	N/A
5850	33.31	PK	V	34.77	4.86	0.00	72.94	66.94	122.20	55.26
5855	31.69	PK	V	34.77	4.86	0.00	71.32	65.32	110.80	45.48
5875	28.32	PK	V	34.78	4.87	0.00	67.97	61.97	105.20	43.23
5925	27.78	PK	V	34.79	4.89	0.00	67.46	61.46	68.20	6.74
11590	45.78	PK	V	38.92	6.92	44.41	47.21	41.21	74.00	32.79
11590	32.69	AV	V	38.92	6.92	44.41	34.12	28.12	54.00	25.88

For 802.11ac20 mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Measurement (PK /AV)	Polar (H/V)	Factor (dB/m)						
Frequency: 5745 MHz										
5745	65.03	PK	H	34.75	4.81	0.00	104.59	98.59	N/A	N/A
5745	54.87	AV	H	34.75	4.81	0.00	94.43	88.43	N/A	N/A
5745	75.12	PK	V	34.75	4.81	0.00	114.68	108.68	N/A	N/A
5745	64.71	AV	V	34.75	4.81	0.00	104.27	98.27	N/A	N/A
5650	26.43	PK	V	34.73	4.76	0.00	65.92	59.92	68.20	8.28
5700	29.82	PK	V	34.74	4.79	0.00	69.35	63.35	105.20	41.85
5720	41.73	PK	V	34.74	4.80	0.00	81.27	75.27	110.80	35.53
5725	44.94	PK	V	34.75	4.80	0.00	84.49	78.49	122.20	43.71
11490	46.65	PK	V	38.90	6.89	44.64	47.80	41.80	74.00	32.20
11490	33.76	AV	V	38.90	6.89	44.64	34.91	28.91	54.00	25.09
Frequency: 5785 MHz										
5785	64.92	PK	H	34.76	4.83	0.00	104.51	98.51	N/A	N/A
5785	54.65	AV	H	34.76	4.83	0.00	94.24	88.24	N/A	N/A
5785	75.00	PK	V	34.76	4.83	0.00	114.59	108.59	N/A	N/A
5785	64.70	AV	V	34.76	4.83	0.00	104.29	98.29	N/A	N/A
11570	46.53	PK	V	38.91	6.91	44.46	47.89	41.89	74.00	32.11
11570	33.36	AV	V	38.91	6.91	44.46	34.72	28.72	54.00	25.28
Frequency: 5825 MHz										
5825	64.43	PK	H	34.77	4.85	0.00	104.05	98.05	N/A	N/A
5825	53.97	AV	H	34.77	4.85	0.00	93.59	87.59	N/A	N/A
5825	74.76	PK	V	34.77	4.85	0.00	114.38	108.38	N/A	N/A
5825	64.39	AV	V	34.77	4.85	0.00	104.01	98.01	N/A	N/A
5850	42.31	PK	V	34.77	4.86	0.00	81.94	75.94	122.20	46.26
5855	35.96	PK	V	34.77	4.86	0.00	75.59	69.59	110.80	41.21
5875	28.72	PK	V	34.78	4.87	0.00	68.37	62.37	105.20	42.83
5925	28.23	PK	V	34.79	4.89	0.00	67.91	61.91	68.20	6.29
11650	45.99	PK	V	38.93	6.94	44.27	47.59	41.59	74.00	32.41
11650	32.78	AV	V	38.93	6.94	44.27	34.38	28.38	54.00	25.62

Bay Area Compliance Laboratories Corp. (Chengdu)

For 802.11ac40 mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Extrapolation Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Measurement (PK /AV)	Polar (H/V)	Factor (dB/m)						
Frequency: 5755 MHz										
5755	61.92	PK	H	34.75	4.81	0.00	101.48	95.48	N/A	N/A
5755	50.87	AV	H	34.75	4.81	0.00	90.43	84.43	N/A	N/A
5755	72.12	PK	V	34.75	4.81	0.00	111.68	105.68	N/A	N/A
5755	62.12	AV	V	34.75	4.81	0.00	101.68	95.68	N/A	N/A
5650	26.61	PK	V	34.73	4.76	0.00	66.10	60.10	68.20	8.10
5700	35.51	PK	V	34.74	4.79	0.00	75.04	69.04	105.20	36.16
5720	42.71	PK	V	34.74	4.80	0.00	82.25	76.25	110.80	34.55
5725	44.54	PK	V	34.75	4.80	0.00	84.09	78.09	122.20	44.11
11510	46.21	PK	V	38.90	6.89	44.61	47.39	41.39	74.00	32.61
11510	33.07	AV	V	38.90	6.89	44.61	34.25	28.25	54.00	25.75
Frequency: 5795 MHz										
5795	62.95	PK	H	34.76	4.83	0.00	102.54	96.54	N/A	N/A
5795	51.57	AV	H	34.76	4.83	0.00	91.16	85.16	N/A	N/A
5795	72.49	PK	V	34.76	4.83	0.00	112.08	106.08	N/A	N/A
5795	62.07	AV	V	34.76	4.83	0.00	101.66	95.66	N/A	N/A
5850	31.18	PK	V	34.77	4.86	0.00	70.81	64.81	122.20	57.39
5855	30.44	PK	V	34.77	4.86	0.00	70.07	64.07	110.80	46.73
5875	28.06	PK	V	34.78	4.87	0.00	67.71	61.71	105.20	43.49
5925	27.29	PK	V	34.79	4.89	0.00	66.97	60.97	68.20	7.23
11590	45.84	PK	V	38.92	6.92	44.41	47.27	41.27	74.00	32.73
11590	32.79	AV	V	38.92	6.92	44.41	34.22	28.22	54.00	25.78

For 802.11ac80 mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Measurem ent (PK /AV)	Polar (H/V)	Factor (dB/m)						
Frequency: 5775 MHz										
5775	63.51	PK	H	34.76	4.82	0.00	103.09	97.09	N/A	N/A
5775	51.96	AV	H	34.76	4.82	0.00	91.54	85.54	N/A	N/A
5775	73.52	PK	V	34.76	4.82	0.00	113.10	107.10	N/A	N/A
5775	61.92	AV	V	34.76	4.82	0.00	101.50	95.50	N/A	N/A
5650	32.11	PK	V	34.73	4.76	0.00	71.60	65.60	68.20	*2.60
5700	48.99	PK	V	34.74	4.79	0.00	88.52	82.52	105.20	22.68
5720	50.77	PK	V	34.74	4.80	0.00	90.31	84.31	110.80	26.49
5725	50.54	PK	V	34.75	4.80	0.00	90.09	84.09	122.20	38.11
5850	47.51	PK	V	34.77	4.86	0.00	87.14	81.14	122.20	41.06
5855	46.93	PK	V	34.77	4.86	0.00	86.56	80.56	110.80	30.24
5875	43.55	PK	V	34.78	4.87	0.00	83.20	77.20	105.20	28.00
5925	30.98	PK	V	34.79	4.89	0.00	70.66	64.66	68.20	*3.54
11550	45.88	PK	V	38.91	6.91	44.51	47.19	41.19	74.00	32.81
11550	32.21	AV	V	38.91	6.91	44.51	33.52	27.52	54.00	26.48

*Within measurement uncertainty!

Note:

Corrected Amplitude = Corrected Factor + Reading

Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor

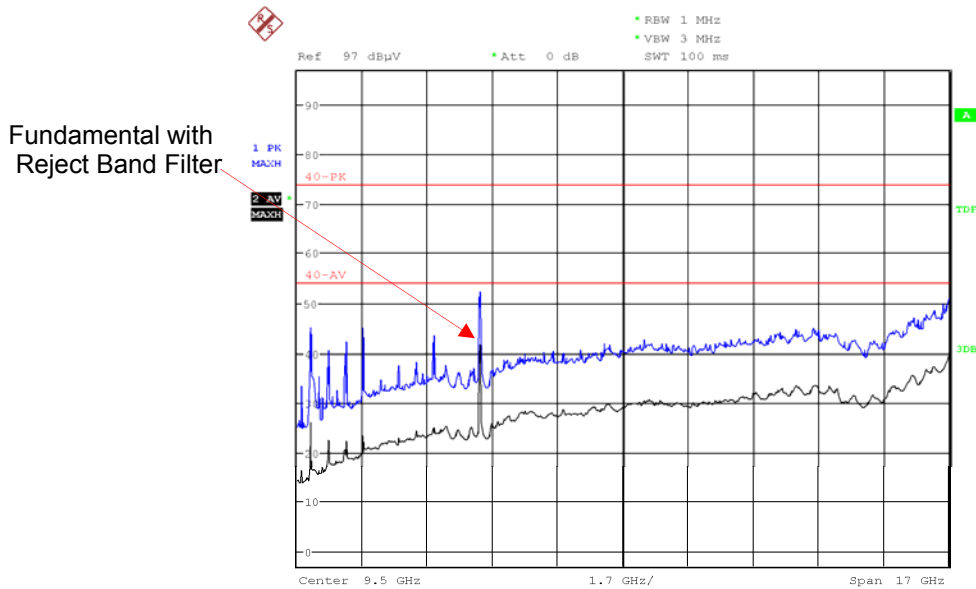
Margin = Limit- Corr. Amplitude

Spurious emissions more than 20 dB below the limit were not reported.

Please refer to the below pre-scan plot of worst case:

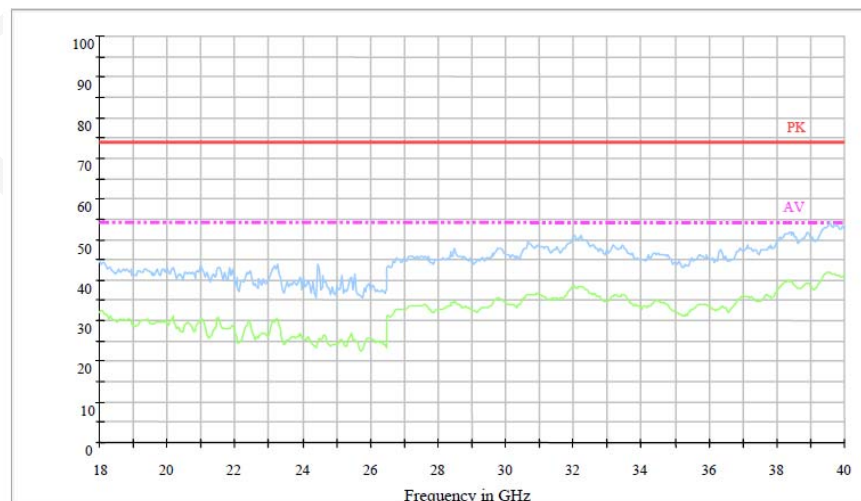
Note: The test distance is 1.5m and distance factor was corrected to the total factor.

802.11ac80 Mode: High Channel_Horizontal_1GHz-18GHz

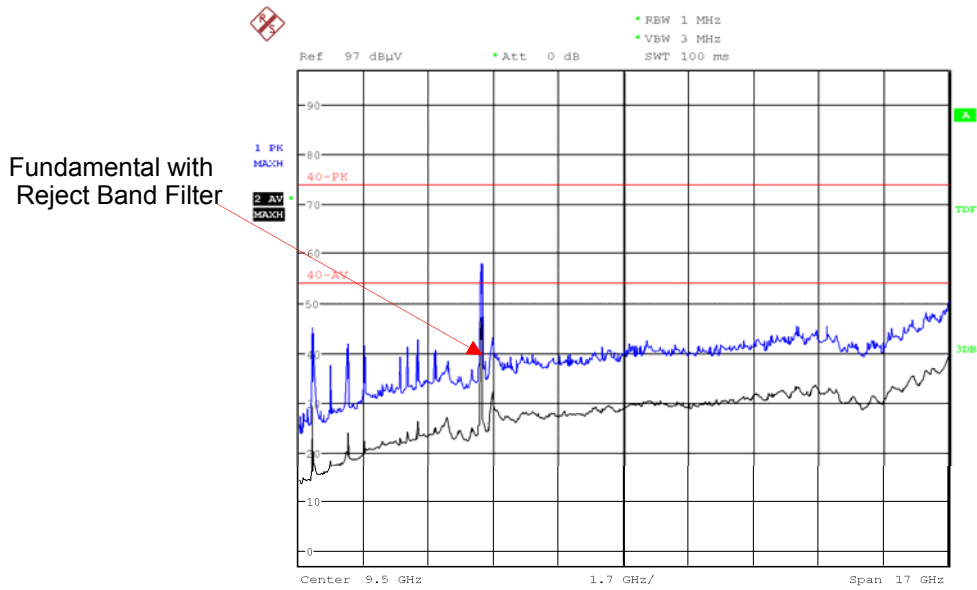


Date: 26.NOV.2018 19:03:34

802.11ac80 Mode: High Channel_Horizontal_18GHz-40GHz

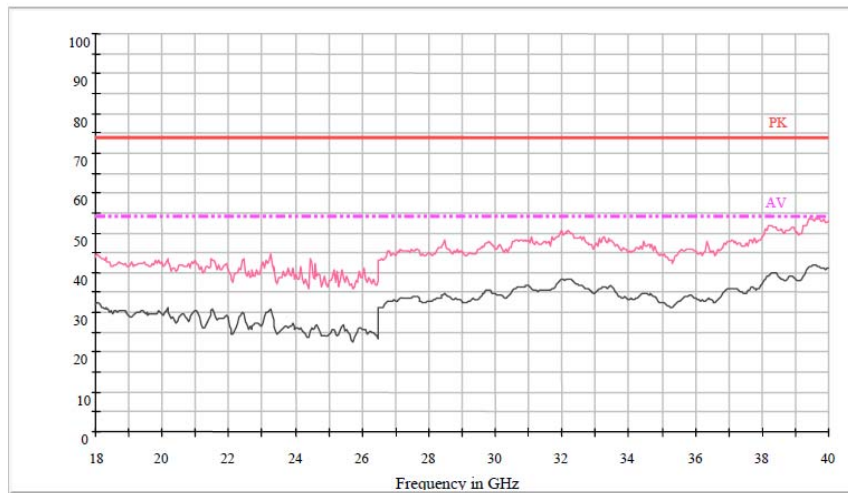


802.11ac80 Mode: High Channel_Vertical_1GHz-18GHz



Date: 26.NOV.2018 19:04:06

802.11ac80 Mode: High Channel_Vertical_18GHz-40GHz



FCC §15.407(b) (1), (4) (i) – BAND EDGE

Applicable Standard

FCC §15.407(b) (1), (4) (i)

- (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85 GHz band:
 - (i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

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 measurement 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 3 MHz 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:	21 °C
Relative Humidity:	57 %
ATM Pressure:	96.0 kPa

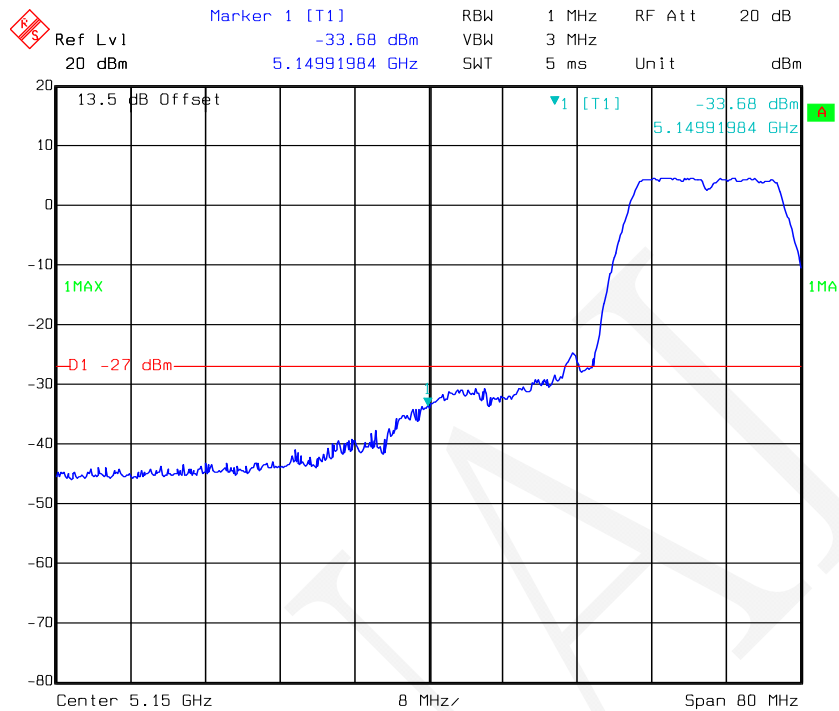
* The testing was performed by Tom Tang on 2018-12-05.

Test mode: Transmitting

Test Result: Compliance. Please refer to following table and plots.

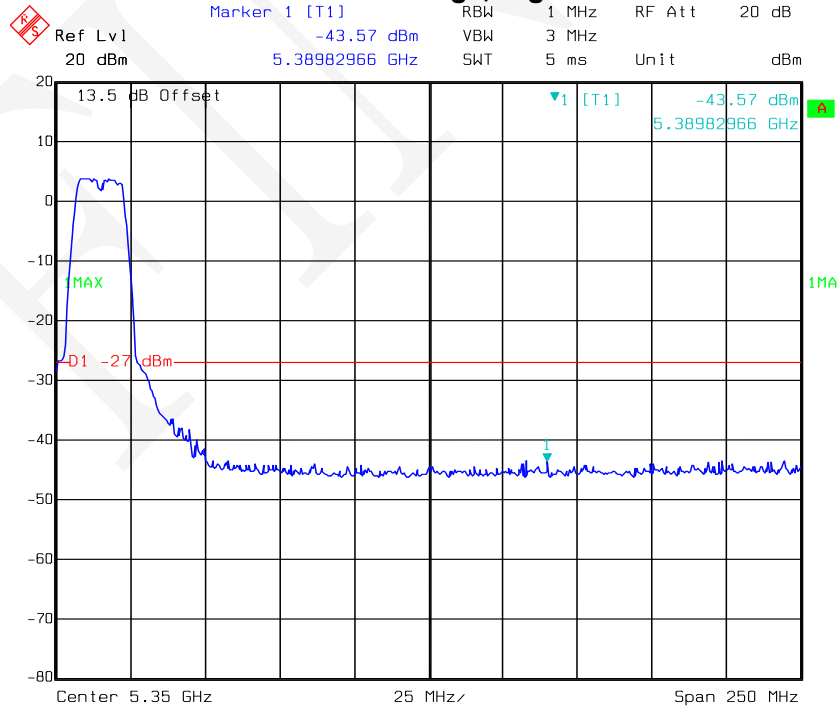
For 5150-5250 MHz

802.11a: Band Edge, Left Side



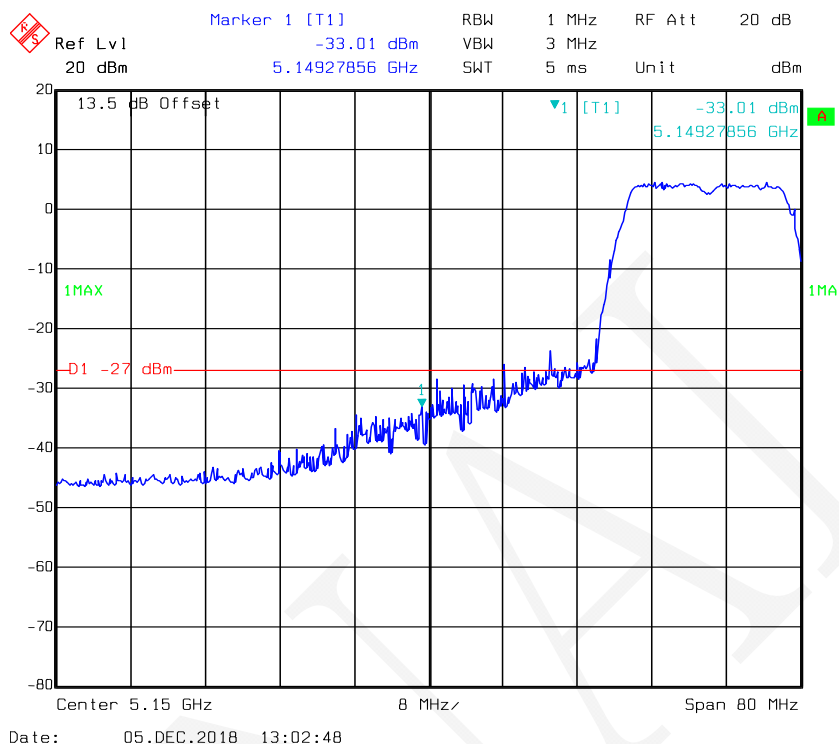
Date: 05.DEC.2018 13:01:40

802.11a: Band Edge, Right Side

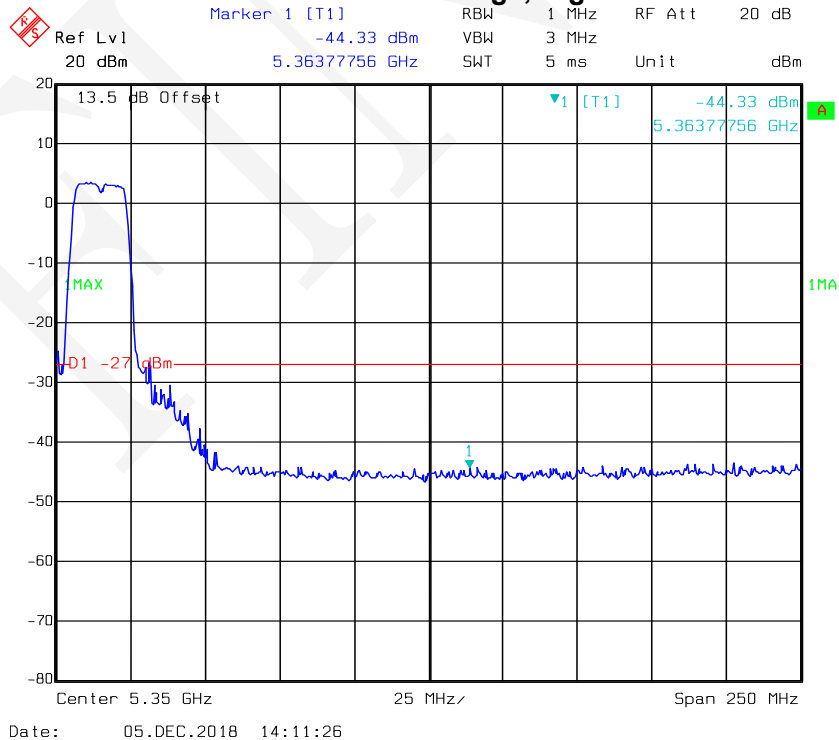


Date: 05.DEC.2018 14:10:36

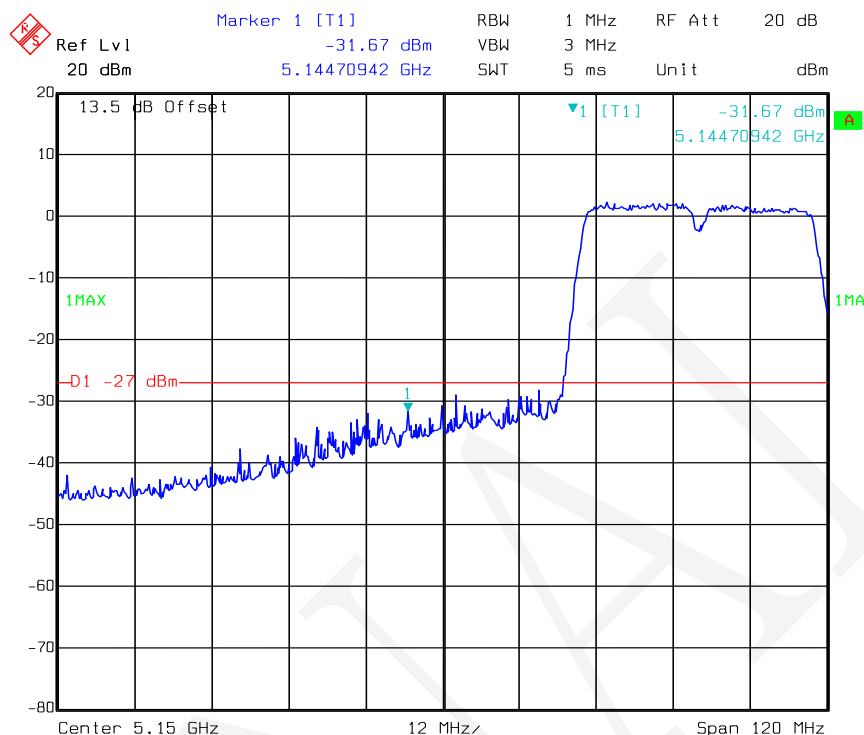
802.11n-HT20: Band Edge, Left Side



802.11n-HT20: Band Edge, Right Side

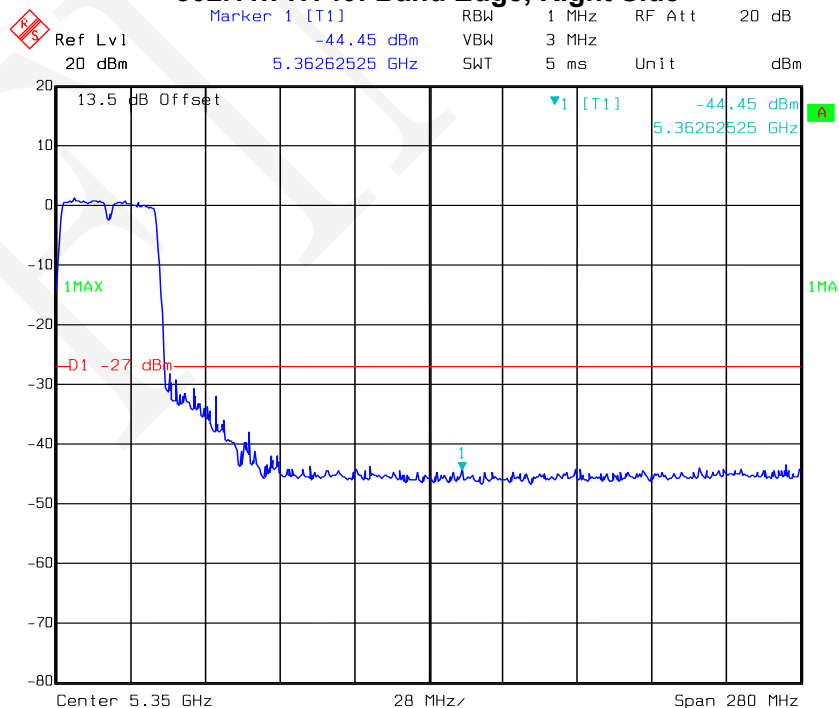


802.11n-HT40: Band Edge, Left Side



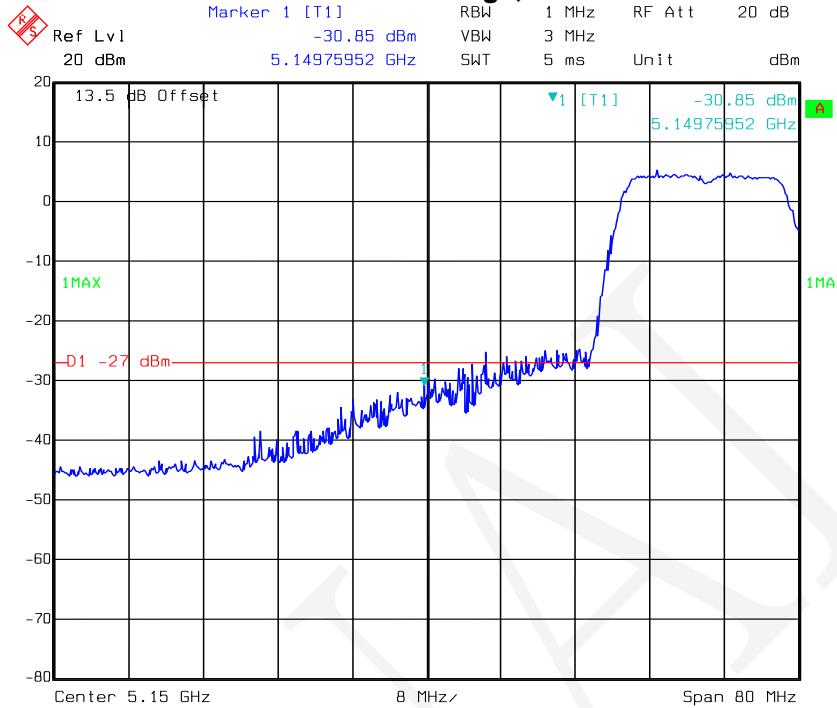
Date: 05.DEC.2018 13:07:13

802.11n-HT40: Band Edge, Right Side



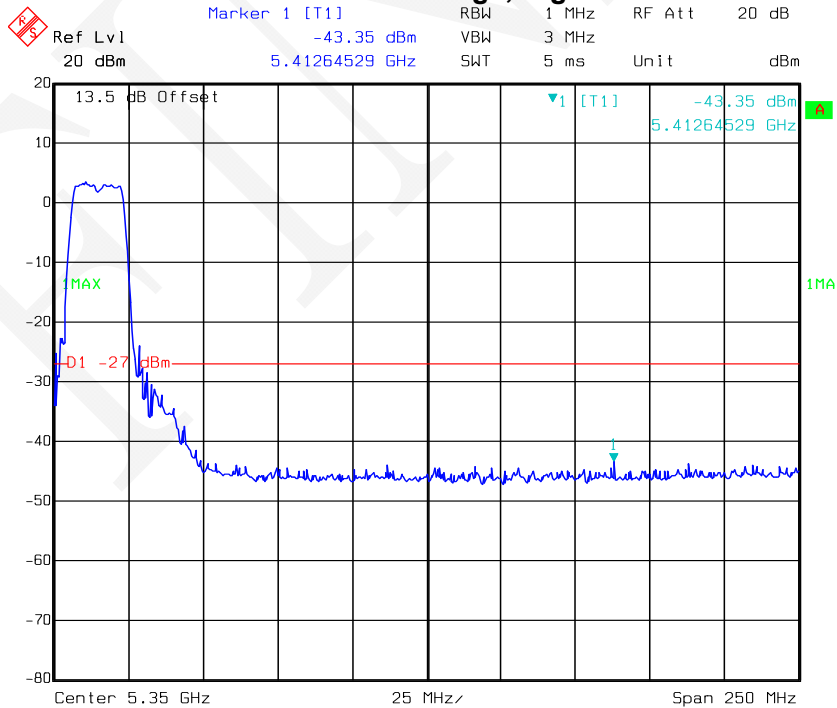
Date: 05.DEC.2018 14:12:17

802.11ac20: Band Edge, Left Side



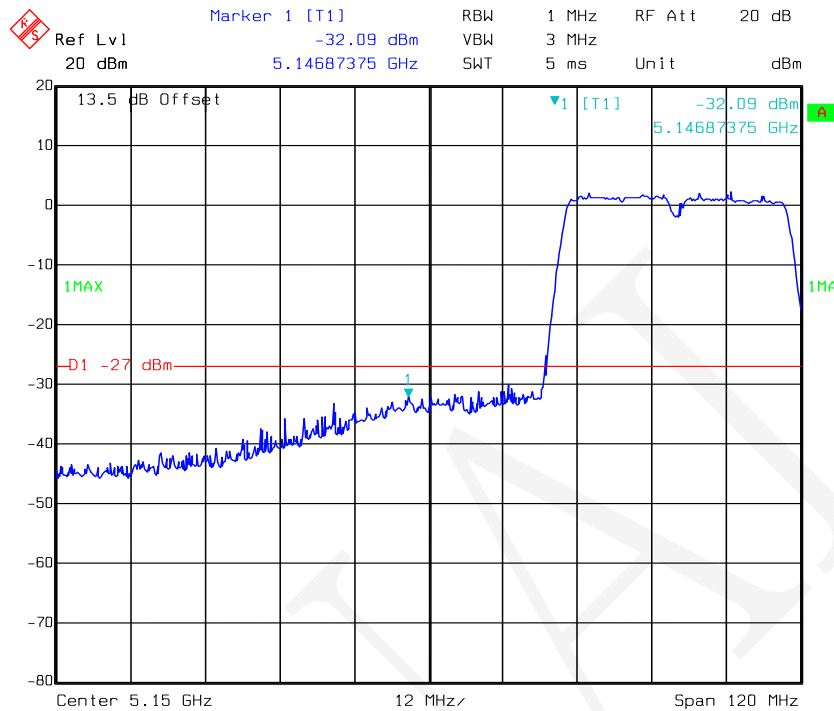
Date: 05.DEC.2018 13:03:44

802.11ac20: Band Edge, Right Side



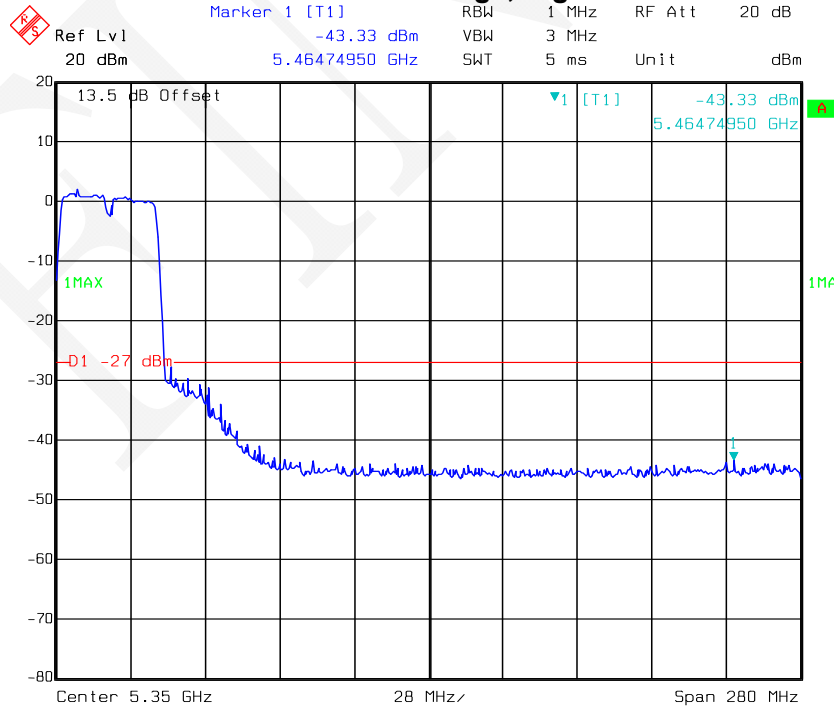
Date: 05.DEC.2018 14:13:42

802.11ac40: Band Edge, Left Side



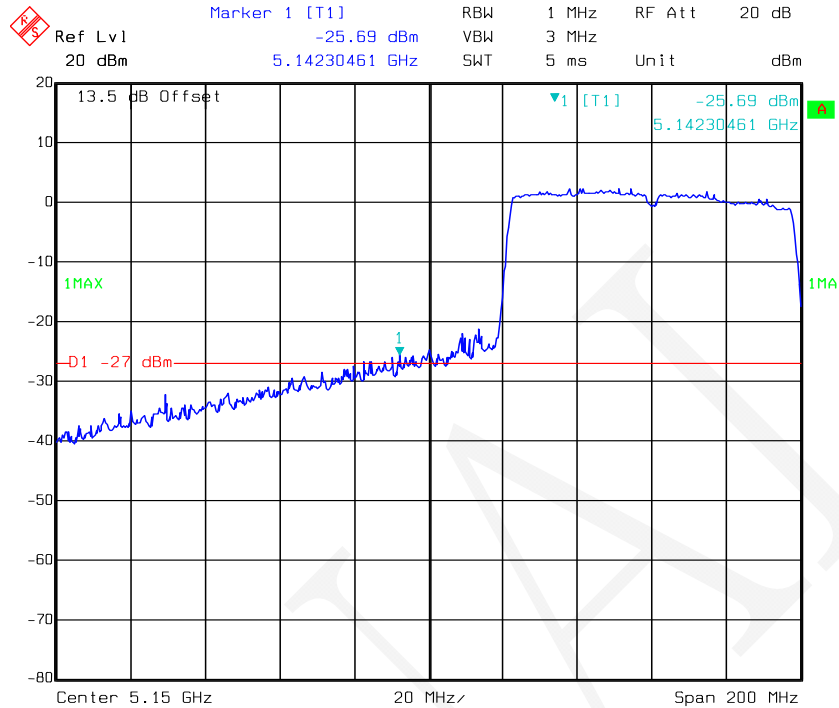
Date: 05.DEC.2018 13:04:55

802.11ac40: Band Edge, Right Side



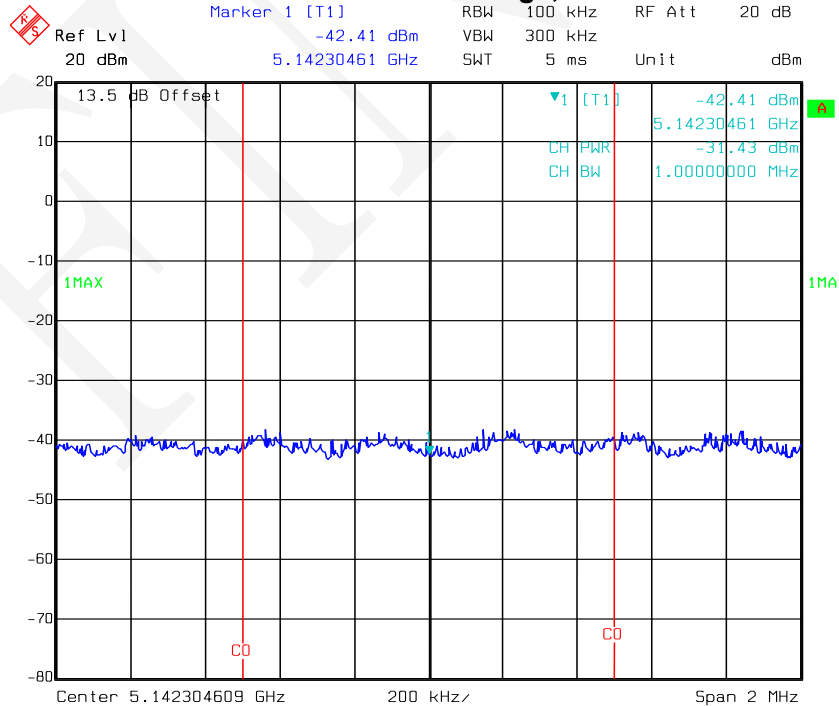
Date: 05.DEC.2018 14:13:02

802.11ac80: Band Edge, Left



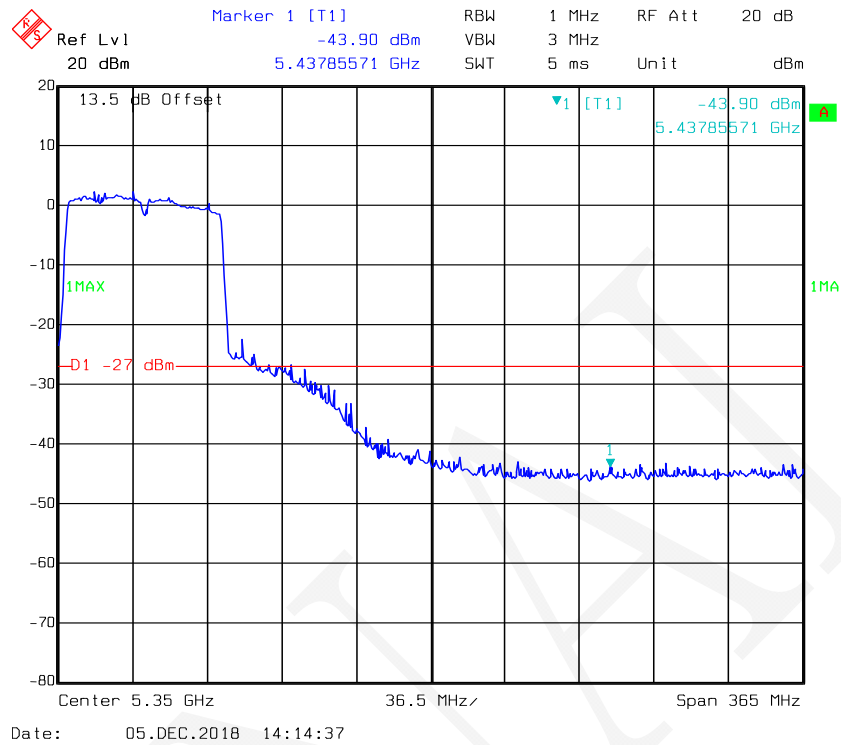
Date: 05.DEC.2018 13:40:35

802.11ac80: Band Edge, Left



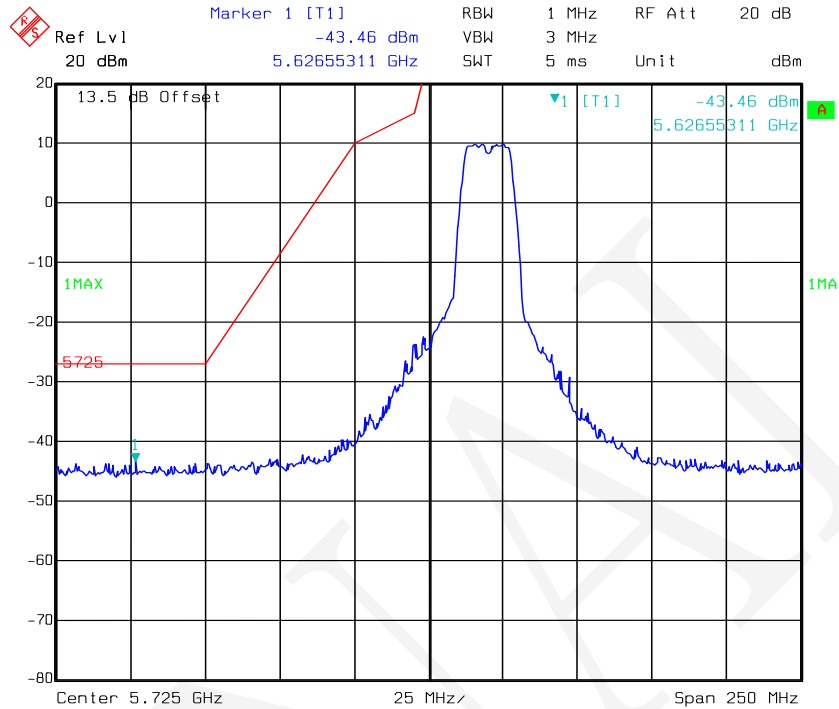
Date: 05.DEC.2018 13:56:06

802.11ac80: Band Edge, Right



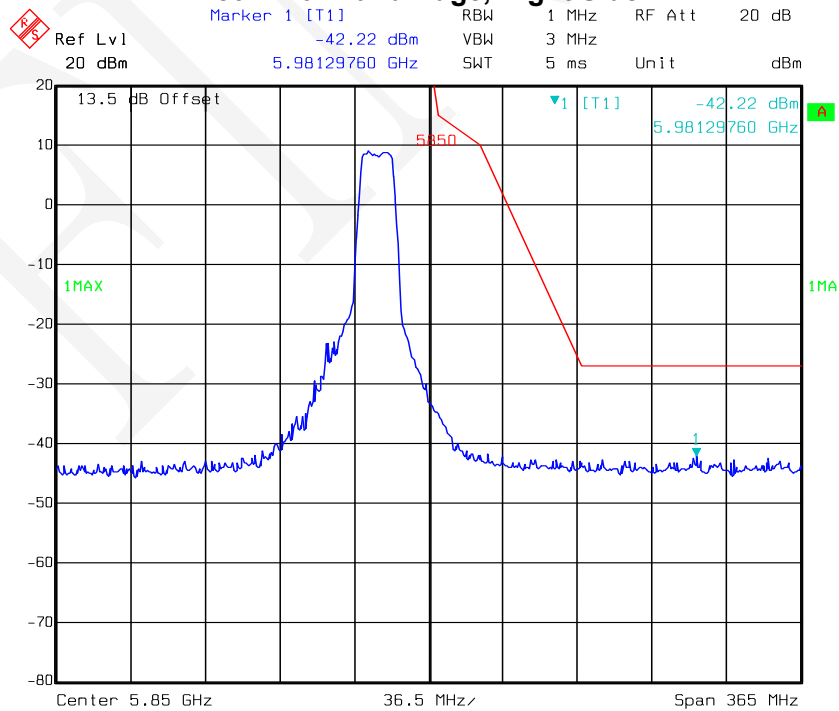
For 5725-5850 MHz

802.11a: Band Edge, Left Side



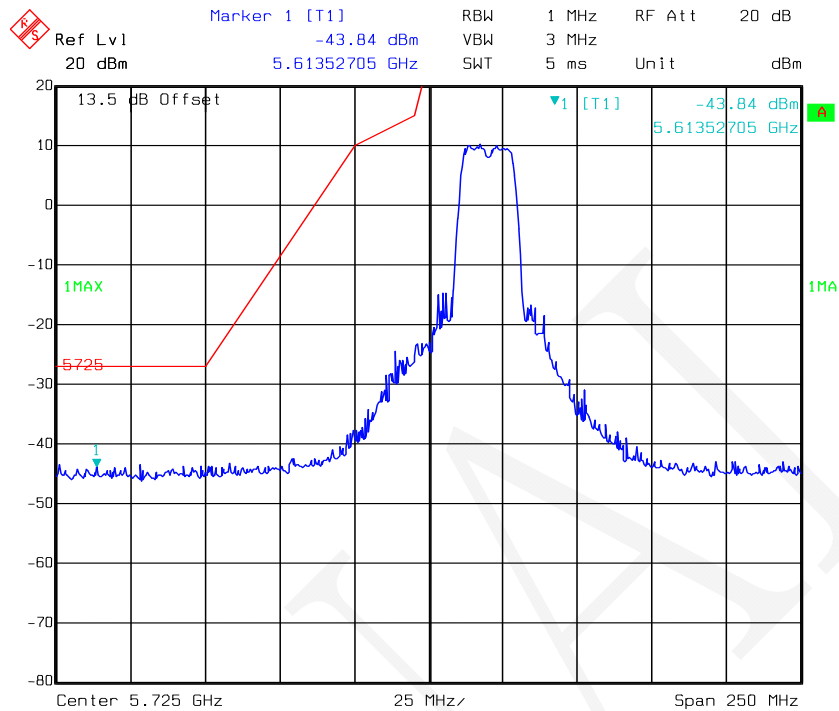
Date: 05.DEC.2018 14:28:39

802.11a: Band Edge, Right Side



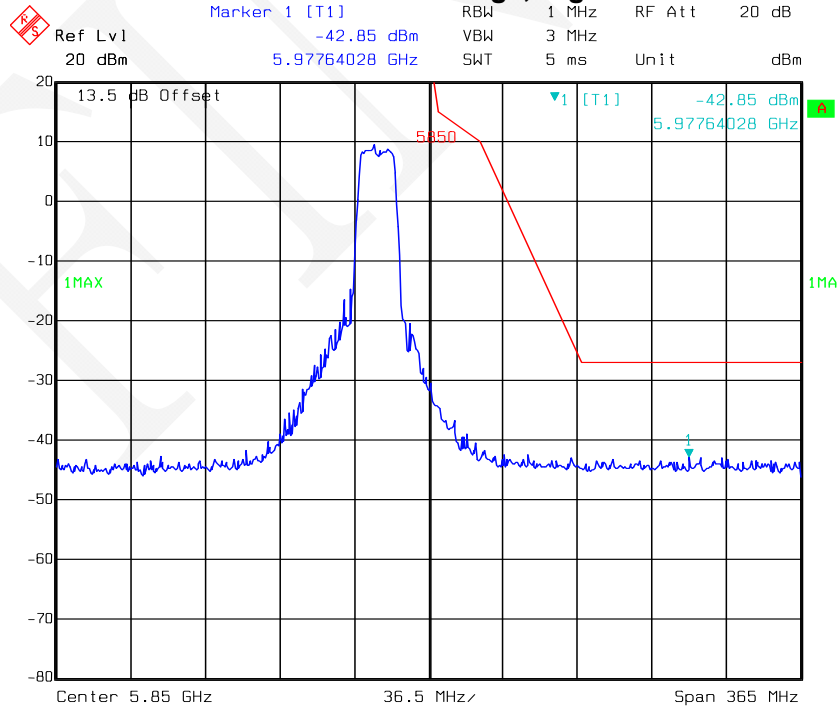
Date: 05.DEC.2018 14:38:44

802.11n-HT20: Band Edge, Left Side



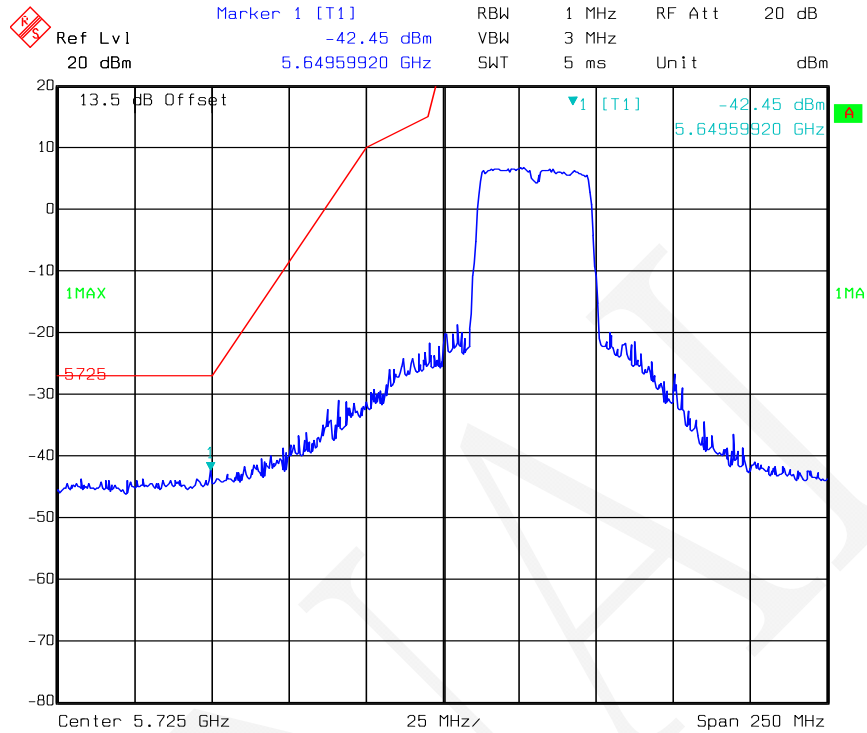
Date: 05.DEC.2018 14:29:25

802.11n-HT20: Band Edge, Right Side



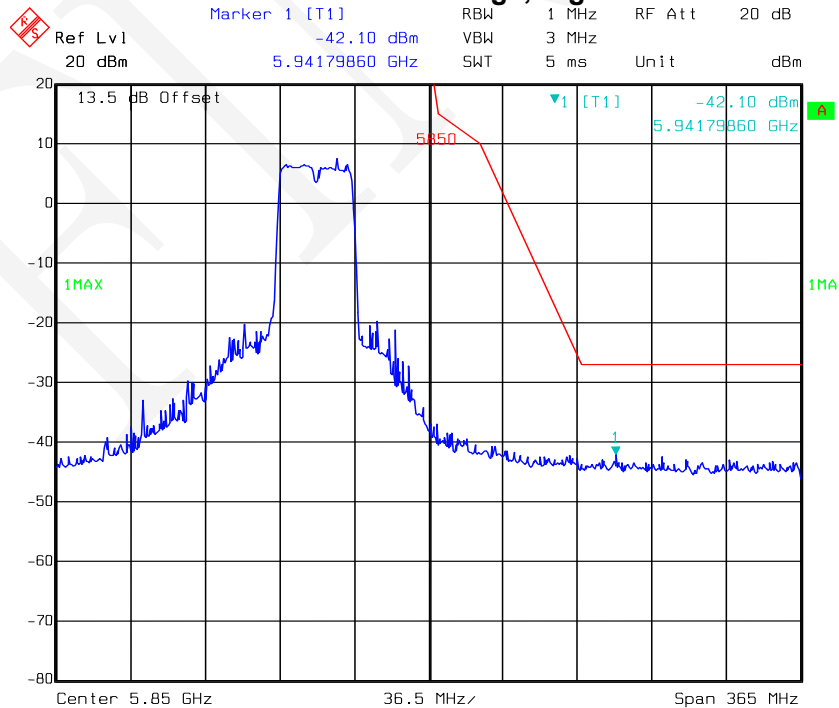
Date: 05.DEC.2018 14:39:25

802.11n-HT40: Band Edge, Left Side



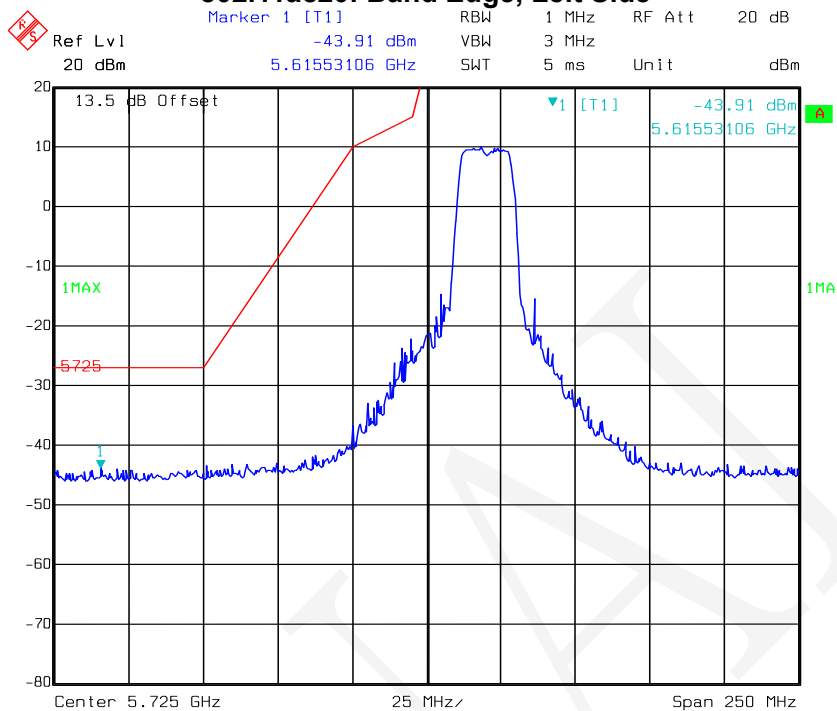
Date: 05.DEC.2018 14:31:18

802.11n-HT40: Band Edge, Right Side



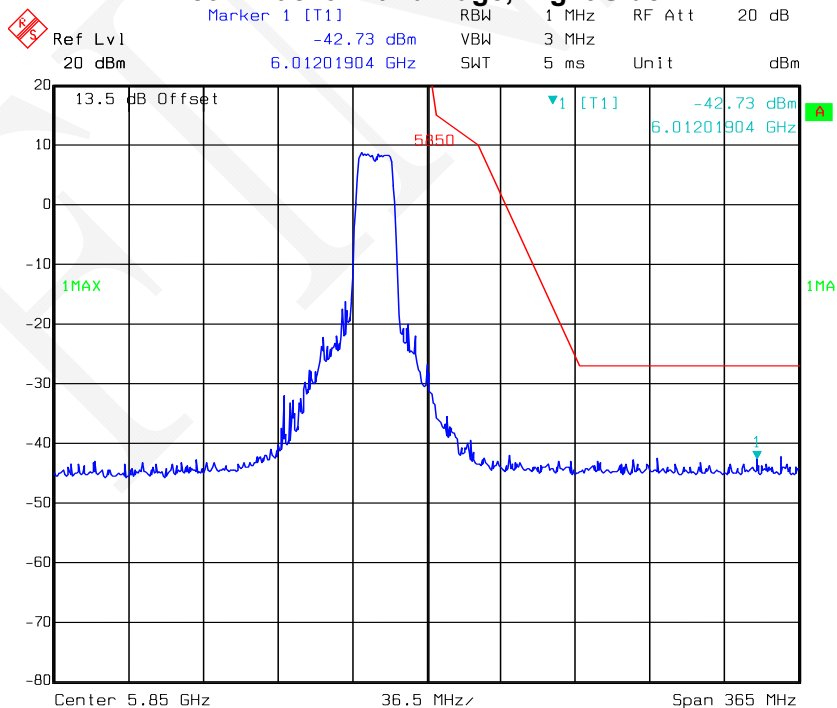
Date: 05.DEC.2018 14:41:28

802.11ac20: Band Edge, Left Side



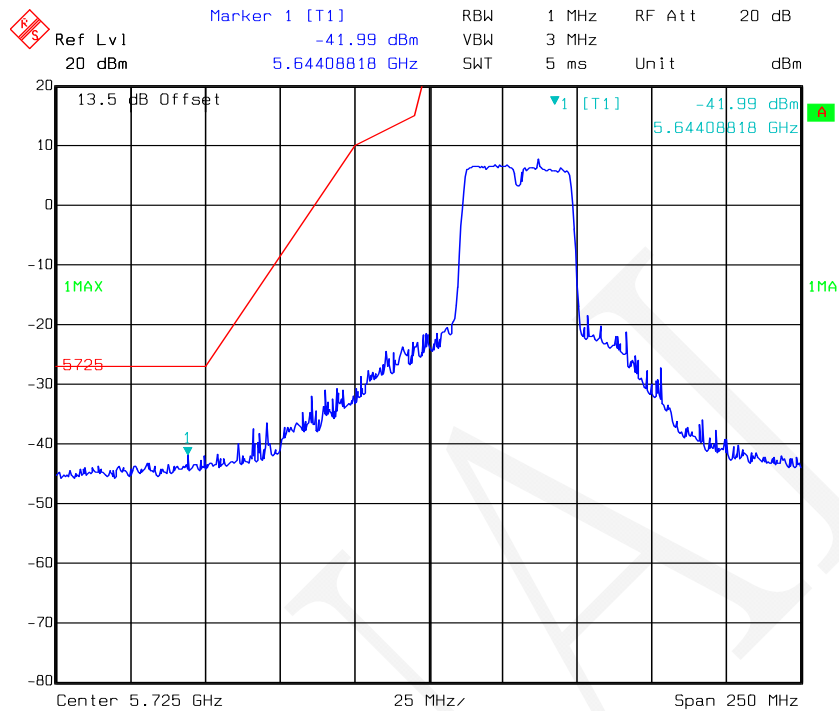
Date: 05.DEC.2018 14:30:05

802.11ac20: Band Edge, Right Side



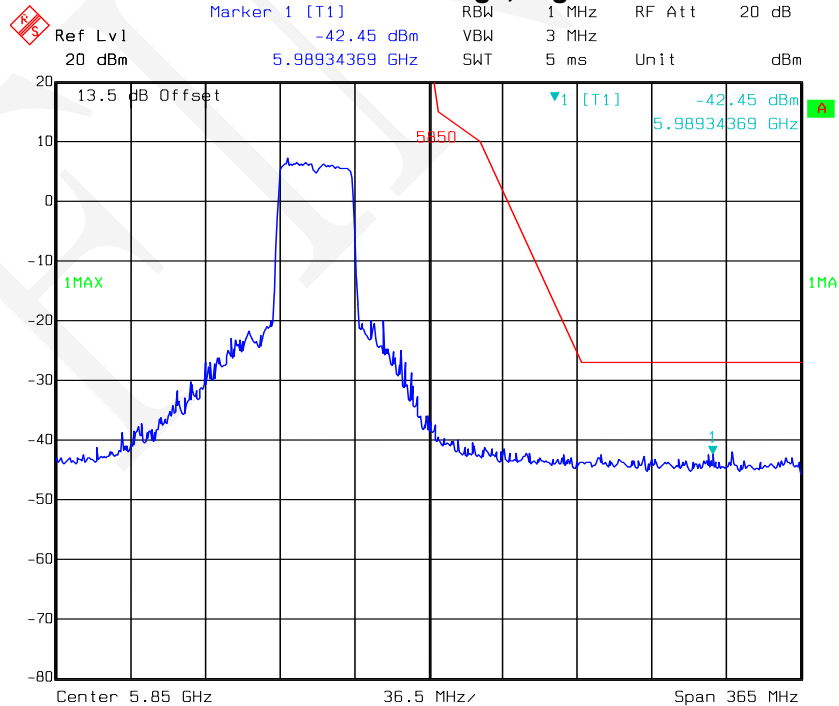
Date: 05.DEC.2018 14:40:12

802.11ac40: Band Edge, Left Side

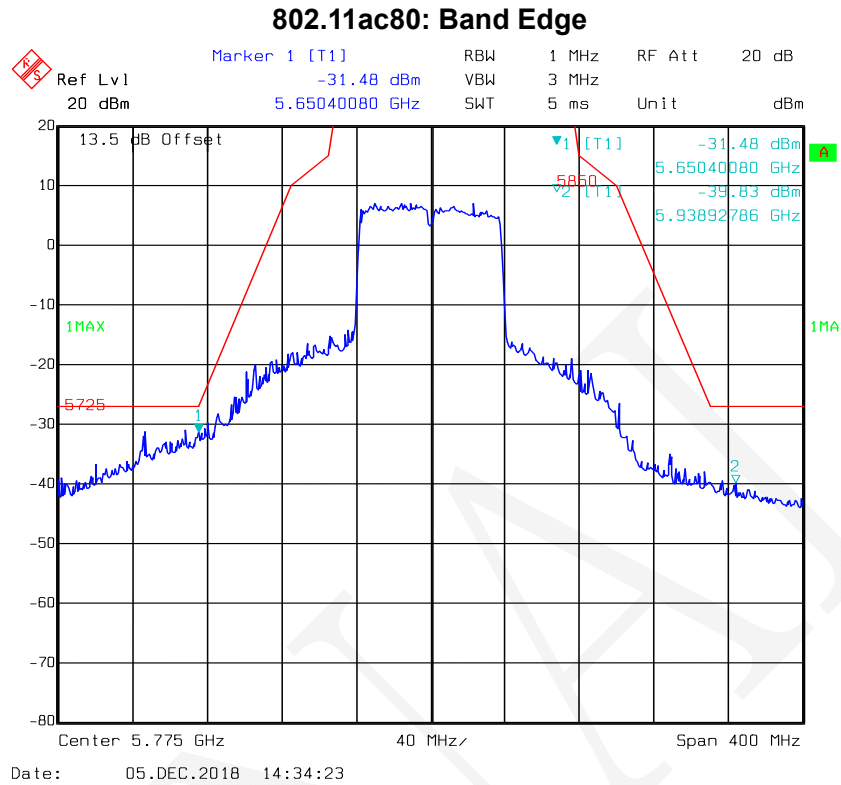


Date: 05.DEC.2018 14:30:42

802.11ac40: Band Edge, Right Side



Date: 05.DEC.2018 14:40:58



FCC §15.407(a) (5) & (e) – 26dB & 6dB BANDWIDTH

Applicable Standard

(a)(5) The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band are made over a reference bandwidth of 500 kHz or the 26 dB emission bandwidth of the device, whichever is less. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.

(e) 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. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3.
 - (A) 26dB Bandwidth
Set RBW = approximately 1% of the emission bandwidth.
Set the VBW > RBW. Detector= Peak. Trace mode = max hold. 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%.
 - (B) 6dB Bandwidth
Set RBW = 100 kHz. Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
Detector = Peak. Trace mode = max hold. Sweep = auto couple. Allow the trace to stabilize. 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.
 - (C) 99% Occupied Bandwidth
The following procedure shall be used for measuring (99 %) power bandwidth:
 1. Set center frequency to the nominal EUT channel center frequency.
 2. Set span = 1.5 times to 5.0 times the OBW.
 3. Set RBW = 1 % to 5 % of the OBW
 4. Set VBW $\geq 3 \cdot$ RBW
 5. Use the 99 % power bandwidth function of the instrument.
4. Repeat above procedures until all frequencies measured were complete.

Test Data

Environmental Conditions

Temperature:	21 °C
Relative Humidity:	57 %
ATM Pressure:	96.0 kPa

* The testing was performed by Tom Tang on 2018-12-05.

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

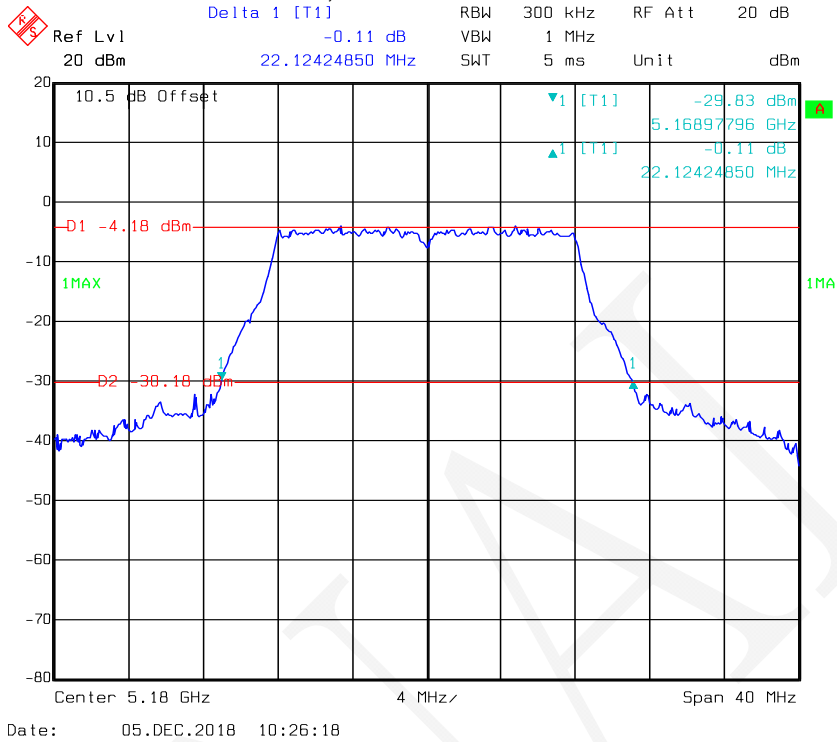
Test mode: Transmitting

For 5150-5250 MHz:

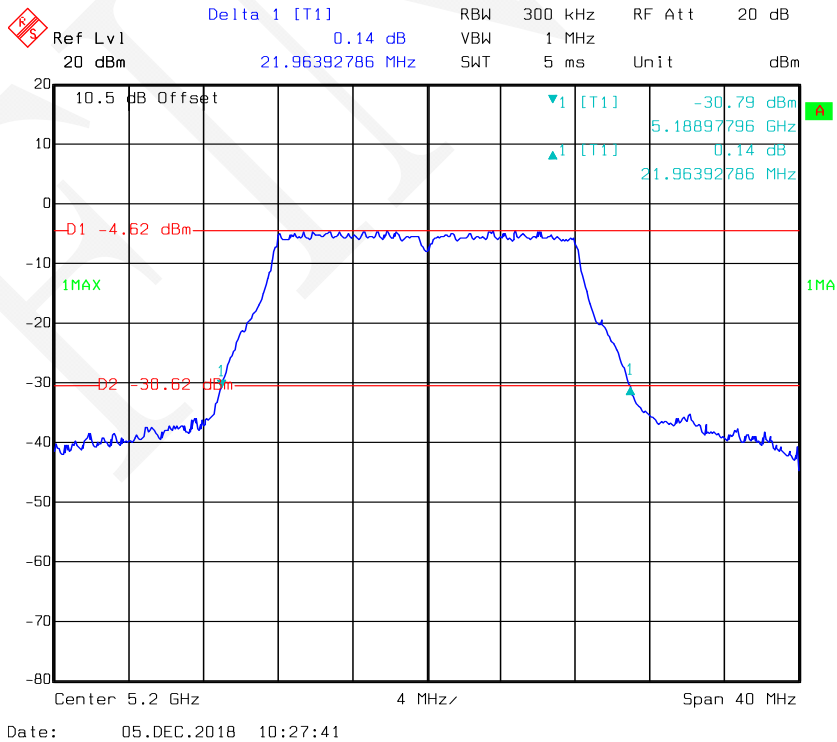
Mode	Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	Low	5180	22.12	17.31
	Middle	5200	21.96	17.23
	High	5240	21.88	17.31
802.11n-HT20	Low	5180	22.28	18.36
	Middle	5200	22.12	18.44
	High	5240	22.20	18.44
802.11n-HT40	Low	5190	40.24	37.03
	High	5230	40.08	37.03
802.11ac20	Low	5180	22.20	18.36
	Middle	5200	22.04	18.44
	High	5240	22.12	18.44
802.11ac40	Low	5190	40.24	37.03
	High	5230	40.08	37.03
802.11ac80	-	5210	93.31	76.31

Note: the 99% Occupied Bandwidth doesn't extend U-NII-2A band 5250-5350MHz.

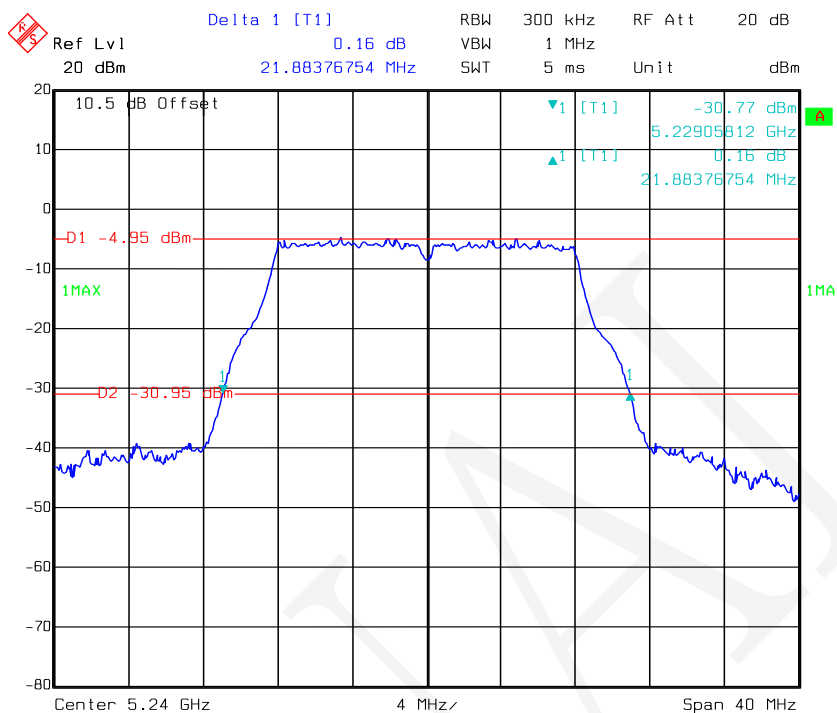
802.11a mode, 26 dB Bandwidth-5180 MHz



802.11a mode, 26 dB Bandwidth-5200 MHz

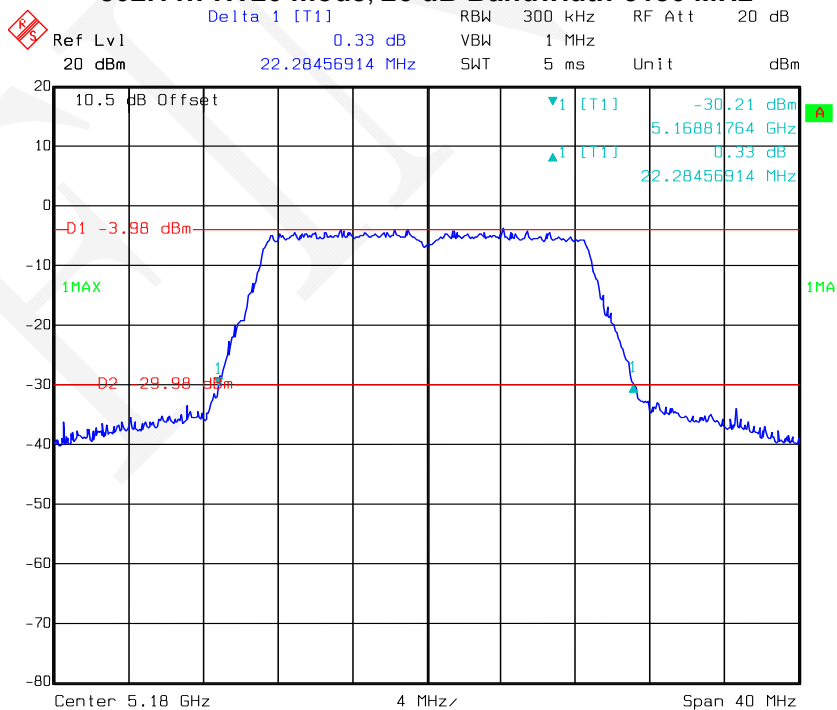


802.11a mode, 26 dB Bandwidth-5240 MHz



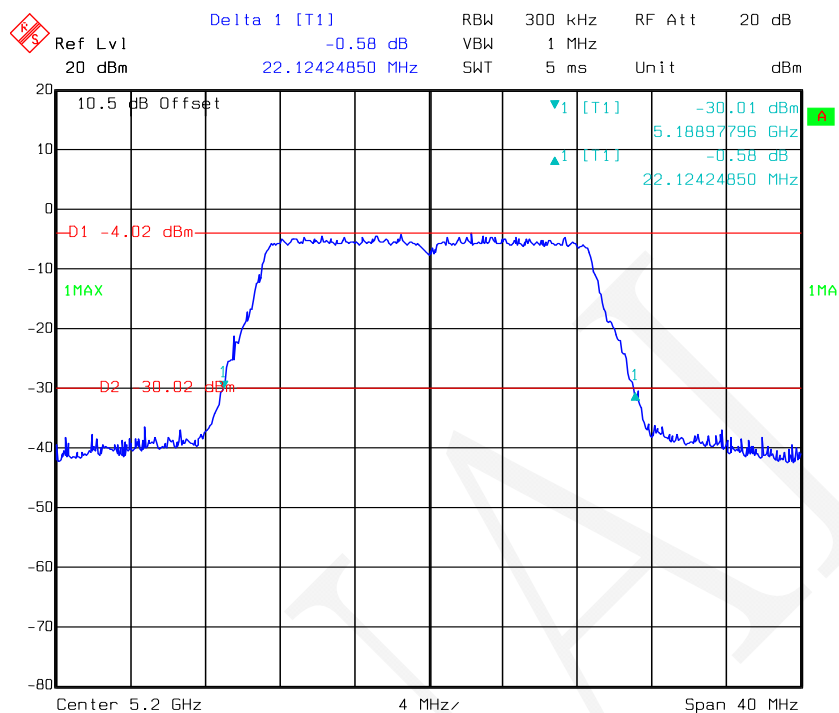
Date: 05.DEC.2018 10:29:02

802.11n-HT20 mode, 26 dB Bandwidth-5180 MHz



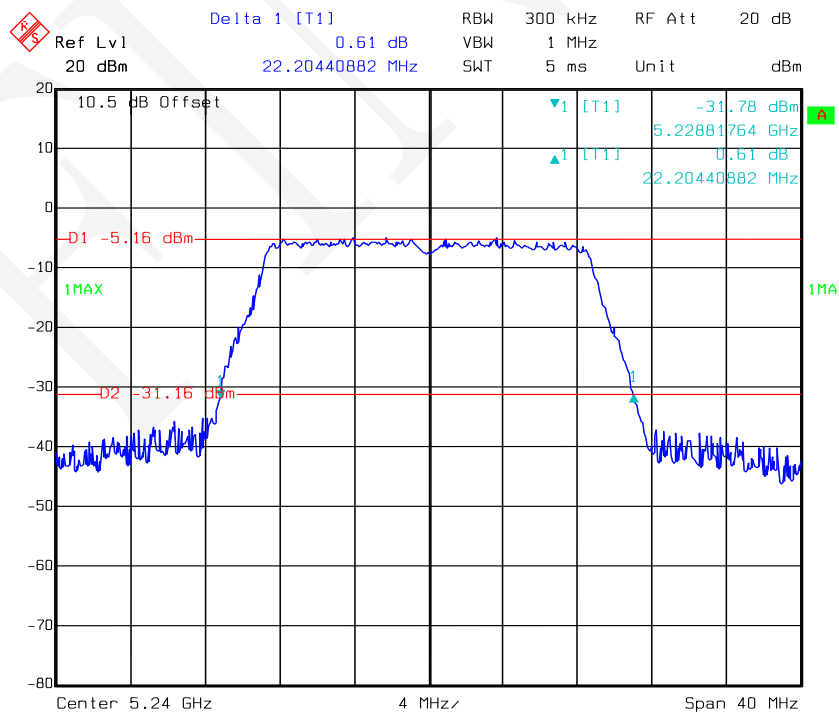
Date: 05.DEC.2018 10:31:26

802.11n-HT20 mode, 26 dB Bandwidth-5200 MHz



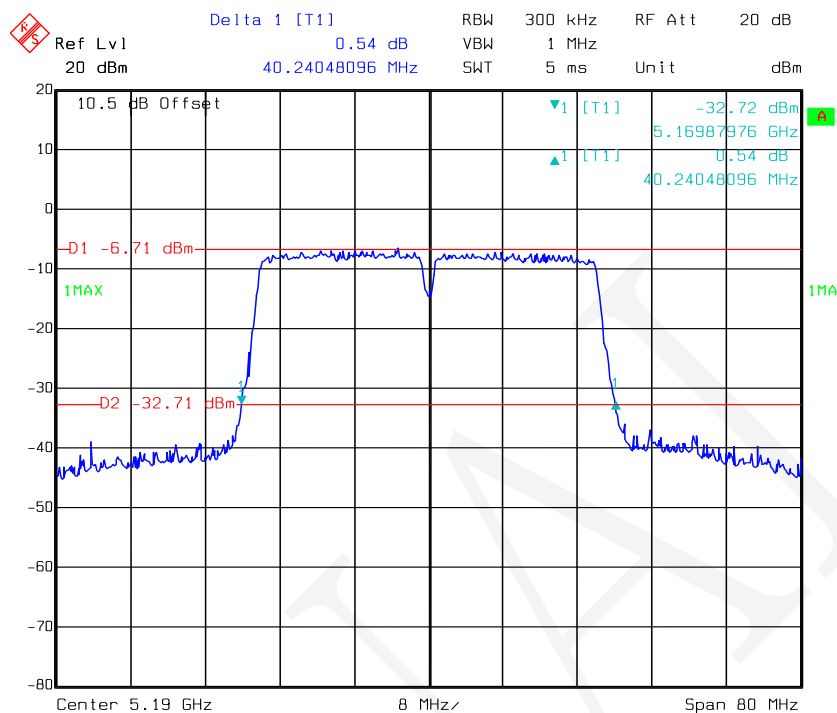
Date: 05.DEC.2018 10:32:47

802.11n-HT20 mode, 26 dB Bandwidth-5240 MHz



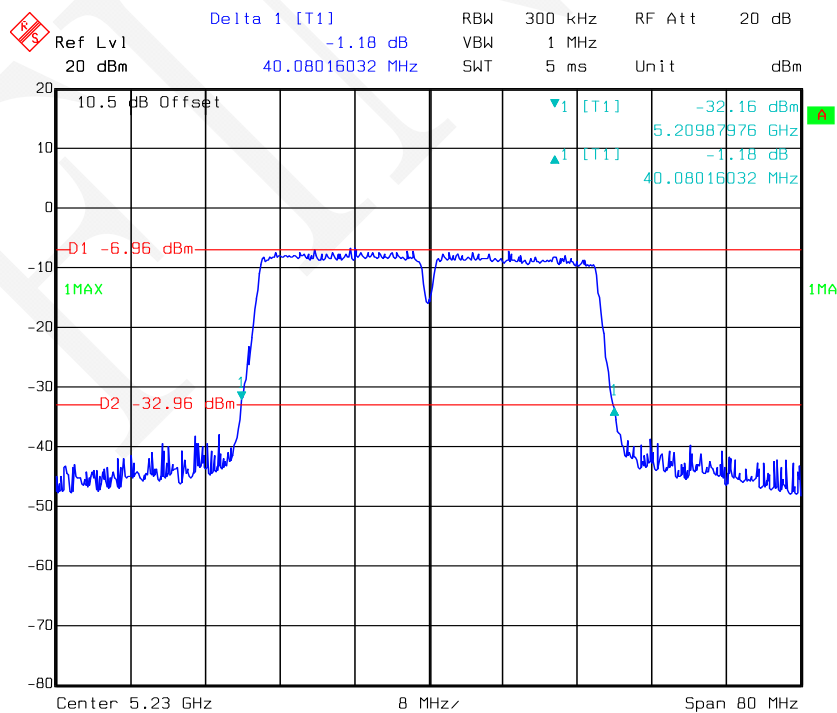
Date: 05.DEC.2018 10:34:42

802.11n-HT40 mode, 26 dB Bandwidth-5190 MHz



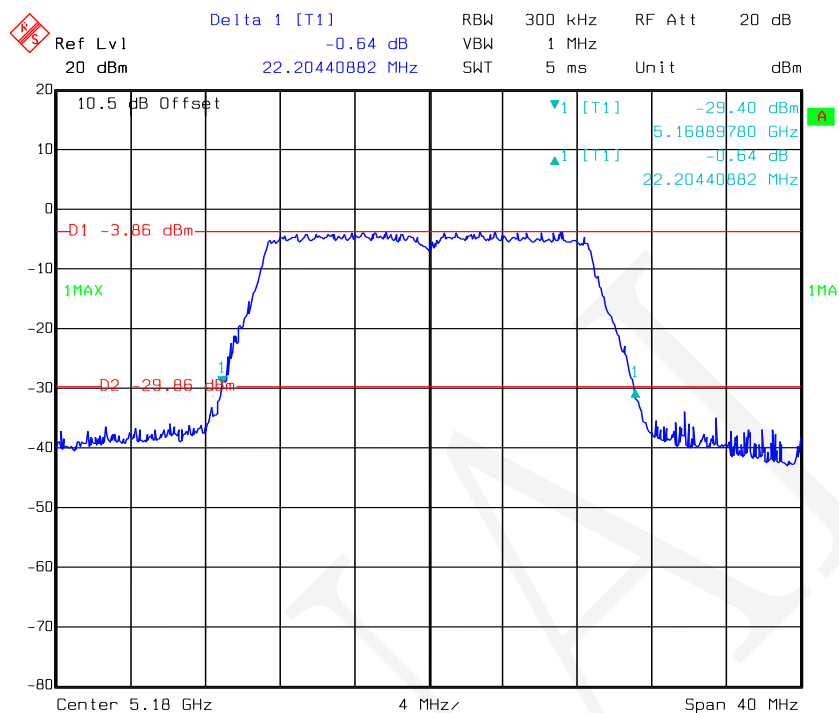
Date: 05.DEC.2018 10:36:46

802.11n-HT40 mode, 26 dB Bandwidth-5230 MHz



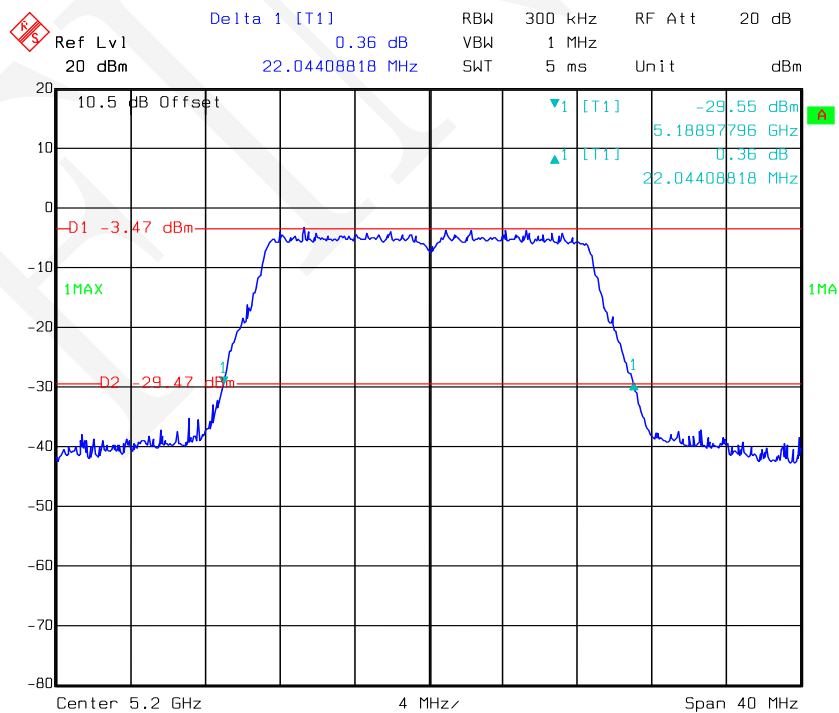
Date: 05.DEC.2018 10:38:05

802.11ac20 mode, 26 dB Bandwidth-5180 MHz



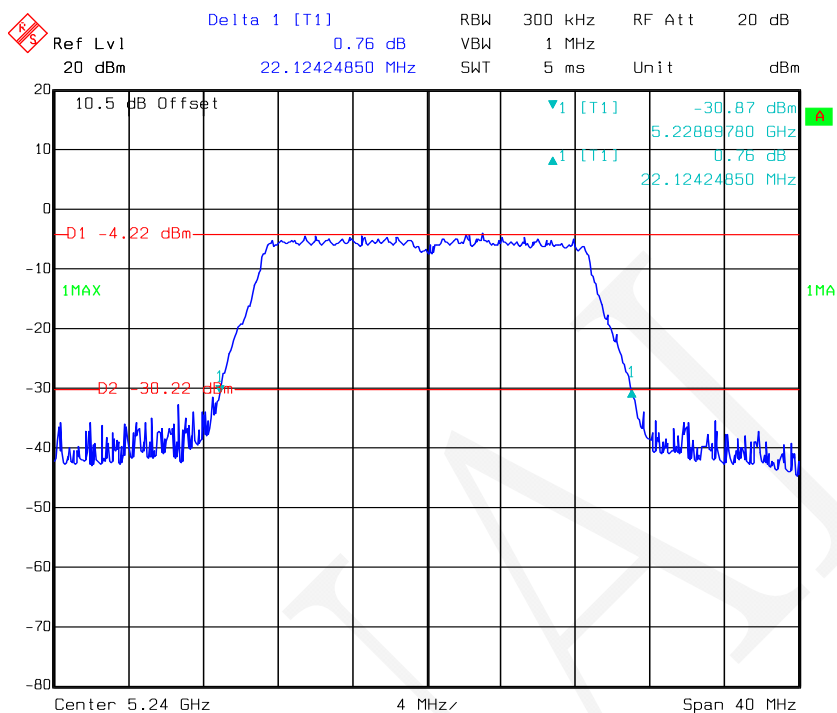
Date: 05.DEC.2018 10:40:23

802.11ac20 mode, 26 dB Bandwidth-5200 MHz



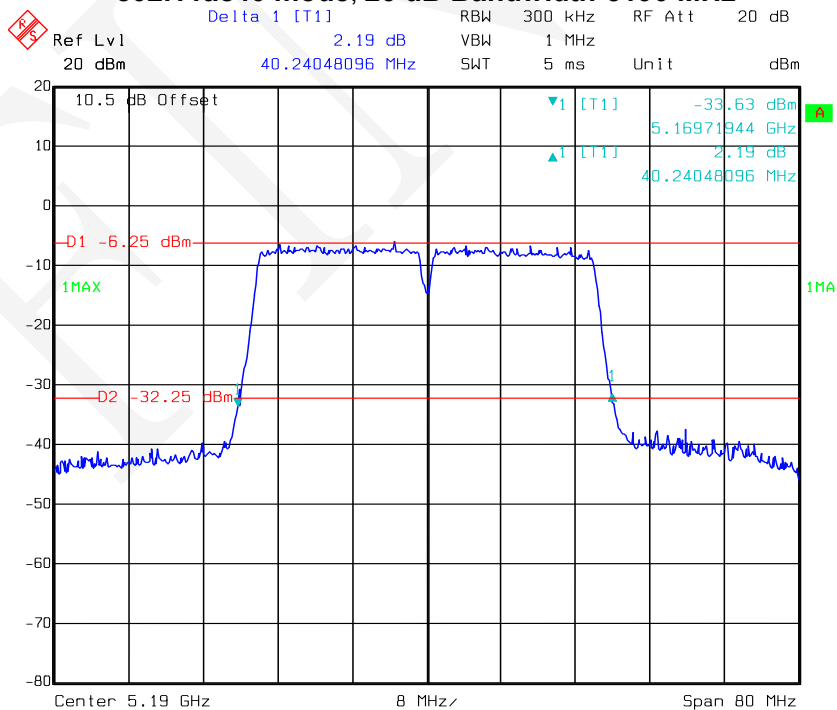
Date: 05.DEC.2018 10:41:57

802.11ac20 mode, 26 dB Bandwidth-5240 MHz



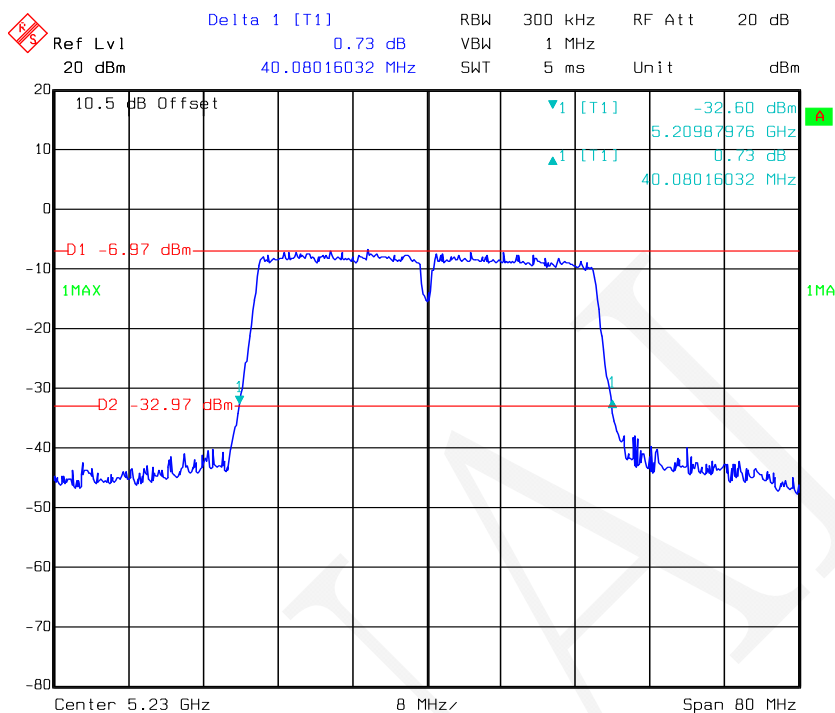
Date: 05.DEC.2018 10:43:51

802.11ac40 mode, 26 dB Bandwidth-5190 MHz



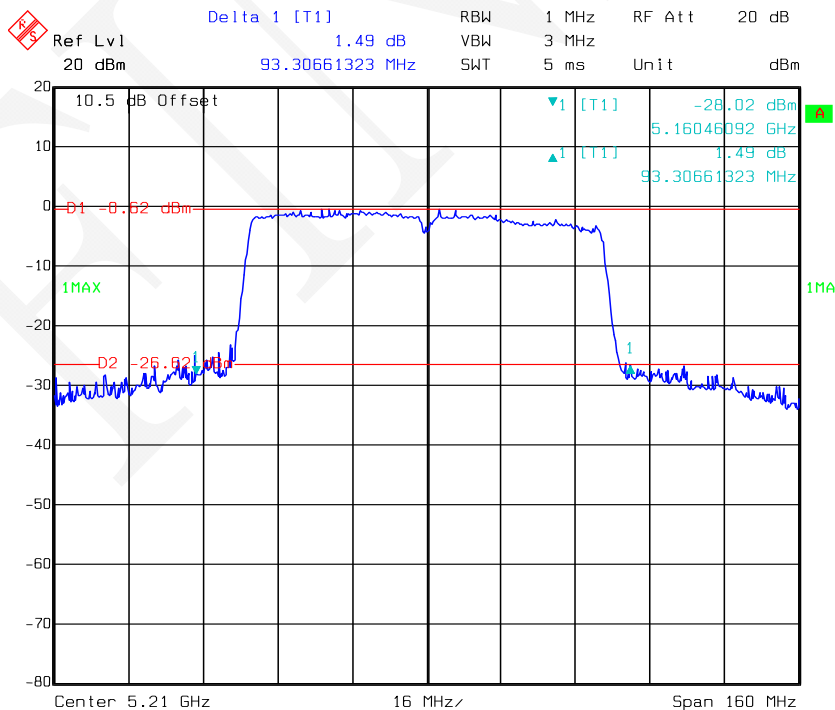
Date: 05.DEC.2018 10:45:53

802.11ac40 mode, 26 dB Bandwidth-5230 MHz



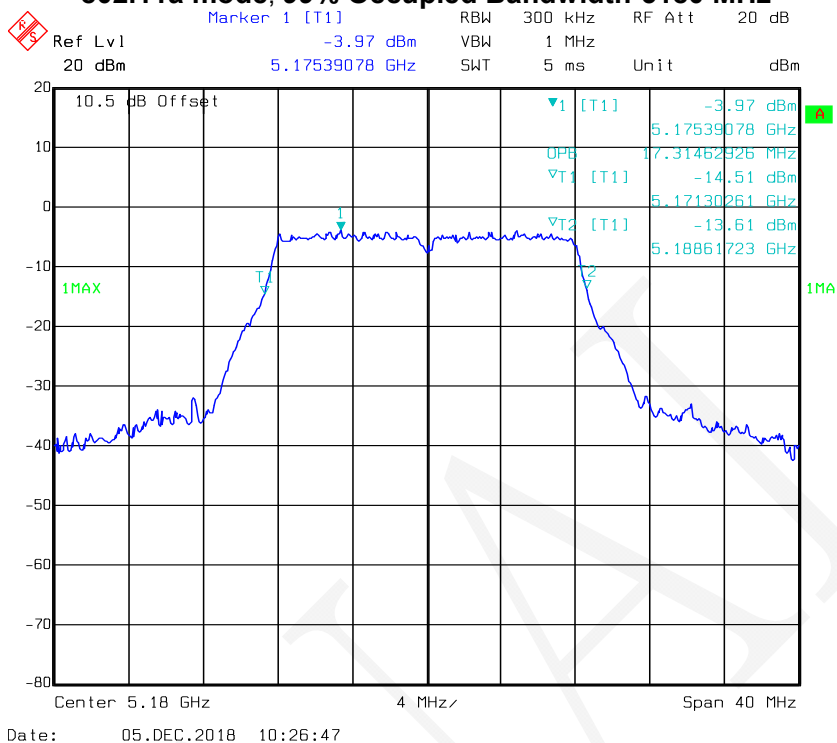
Date: 05.DEC.2018 10:47:26

802.11ac80 mode, 26 dB Bandwidth-5210 MHz

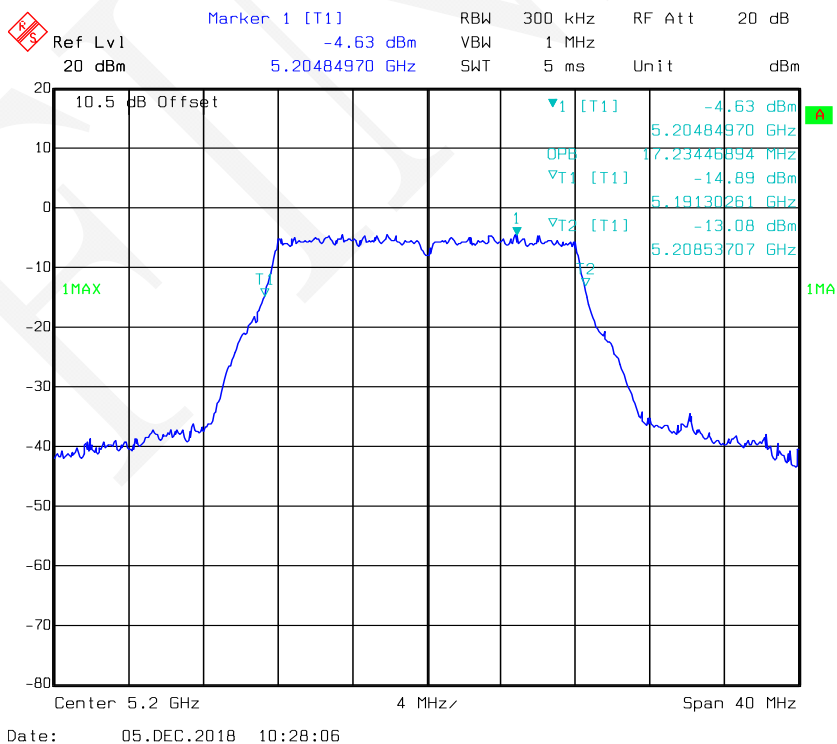


Date: 05.DEC.2018 10:49:01

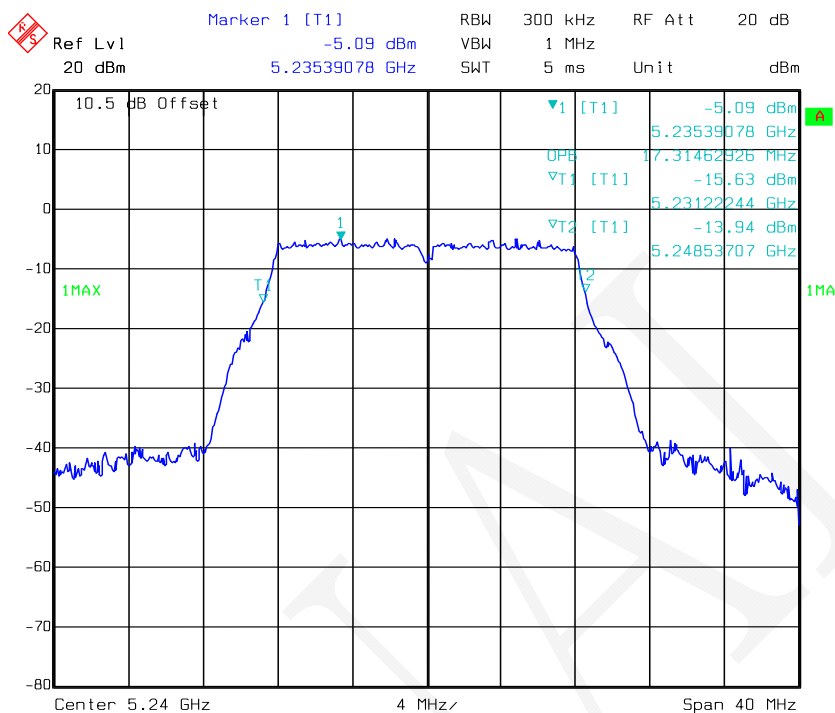
802.11a mode, 99% Occupied Bandwidth-5180 MHz



802.11a mode, 99% Occupied Bandwidth -5200 MHz

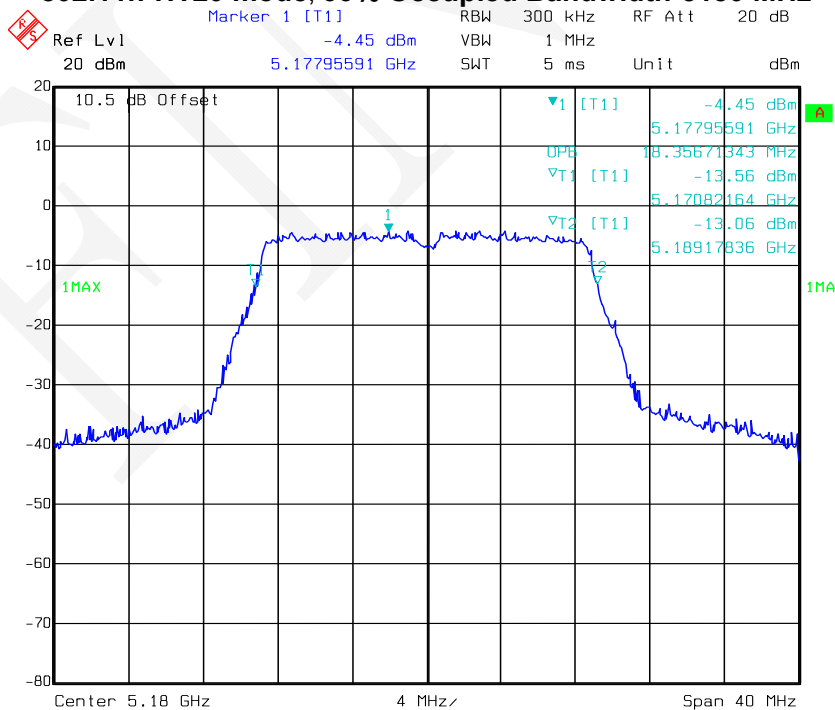


802.11a mode, 99% Occupied Bandwidth -5240 MHz



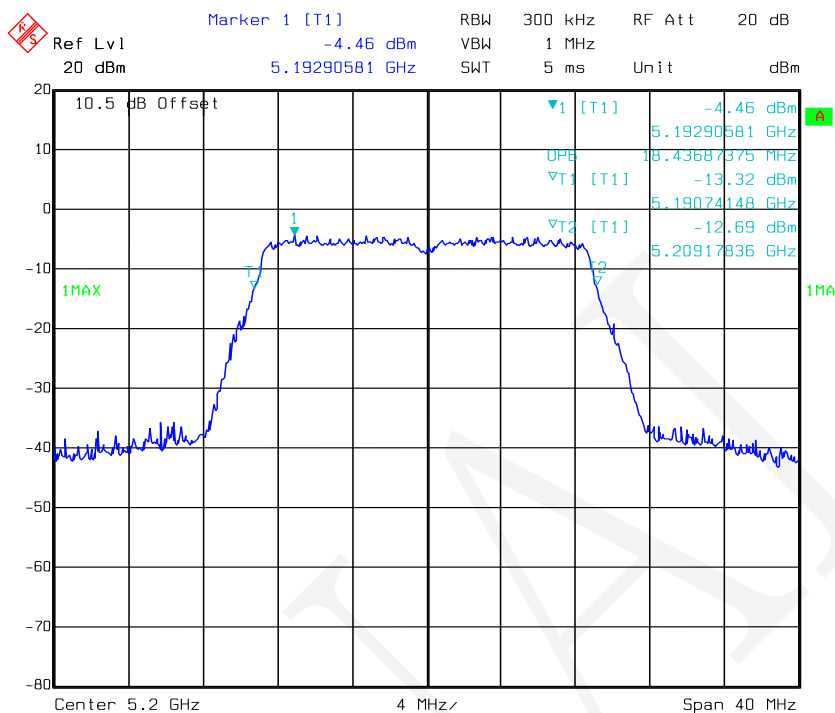
Date: 05.DEC.2018 10:29:37

802.11n-HT20 mode, 99% Occupied Bandwidth-5180 MHz



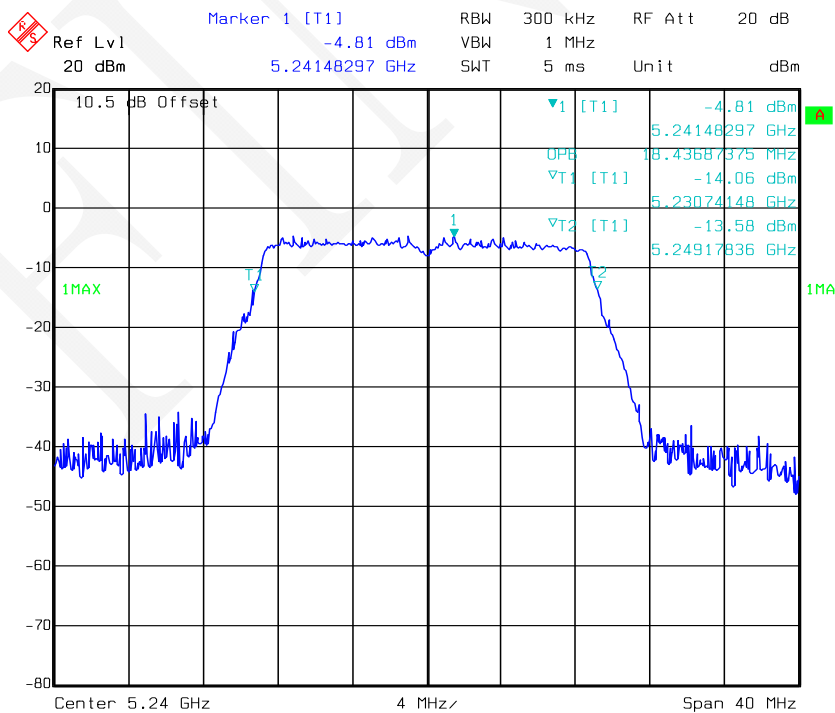
Date: 05.DEC.2018 10:31:54

802.11n-HT20 mode, 99% Occupied Bandwidth -5200 MHz



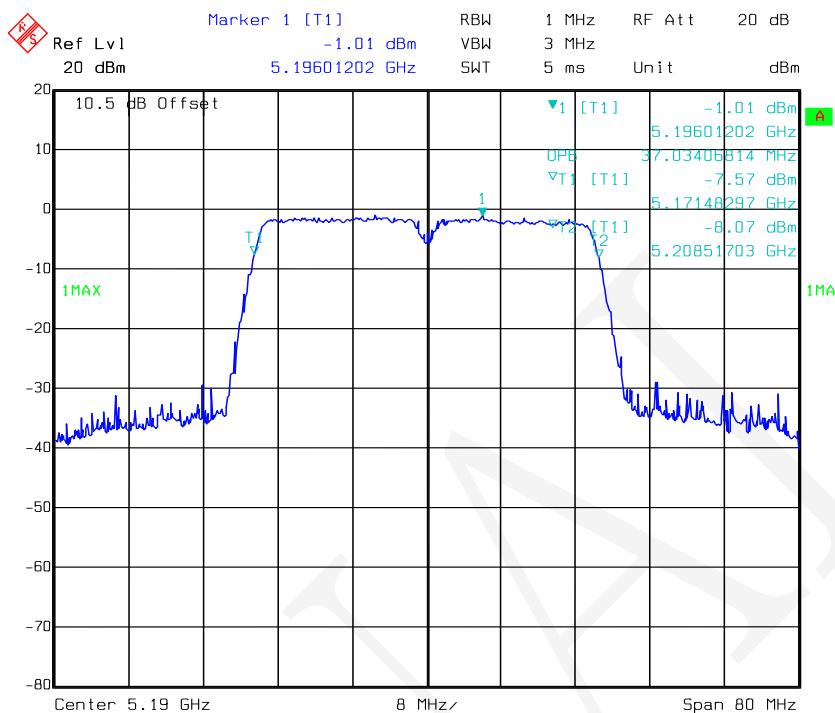
Date: 05.DEC.2018 10:33:25

802.11n-HT20 mode, 99% Occupied Bandwidth -5240 MHz



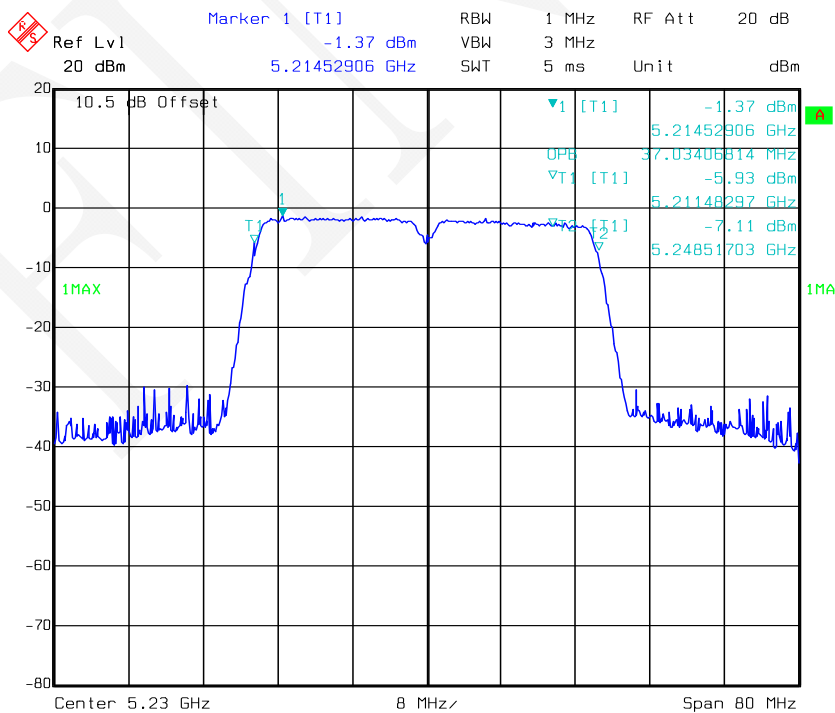
Date: 05.DEC.2018 10:35:26

802.11n-HT40 mode, 99% Occupied Bandwidth-5190 MHz



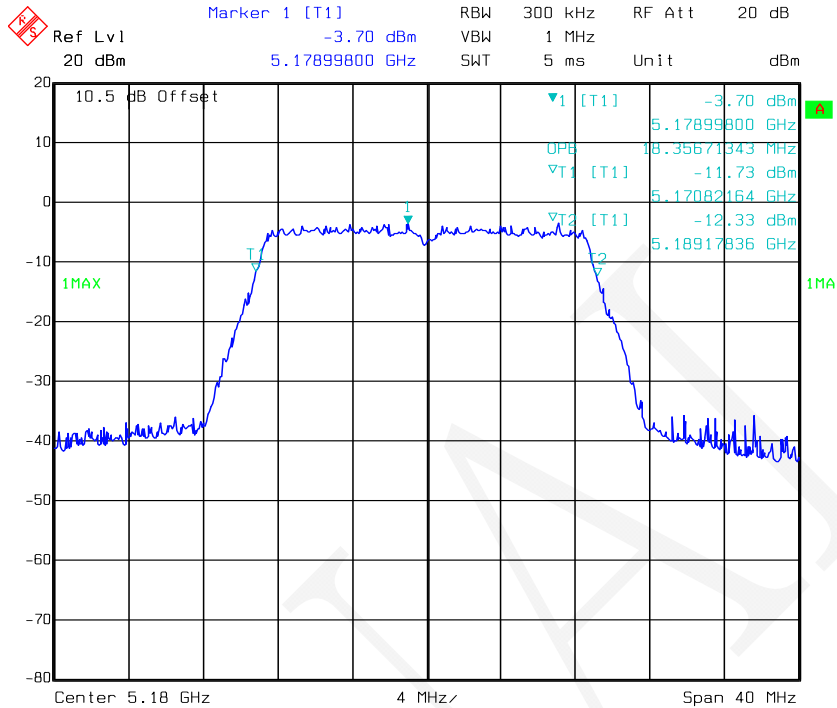
Date: 05.DEC.2018 10:37:04

802.11n-HT40 mode, 99% Occupied Bandwidth-5230 MHz



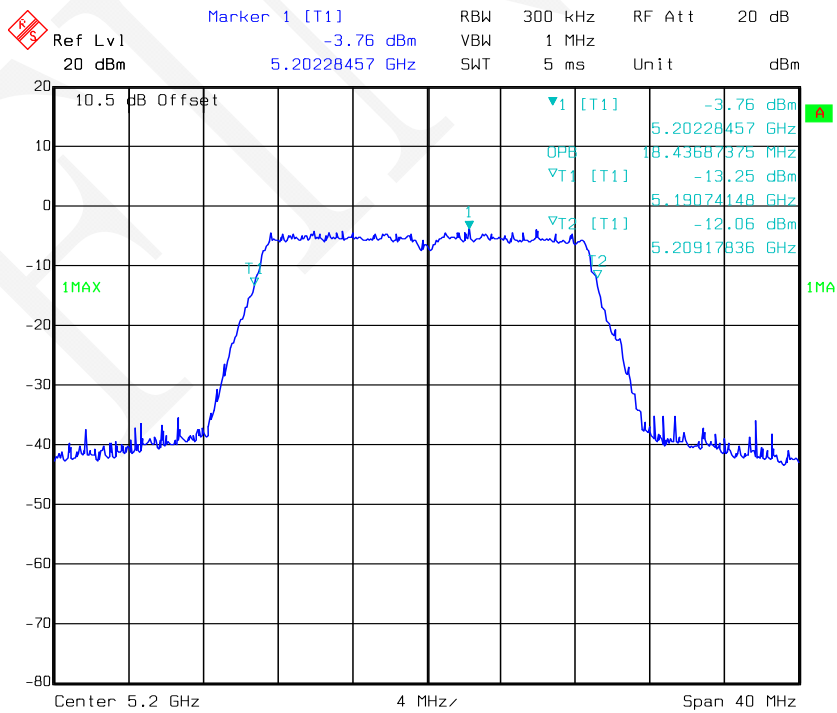
Date: 05.DEC.2018 10:38:36

802.11ac20 mode, 99% Occupied Bandwidth-5180 MHz



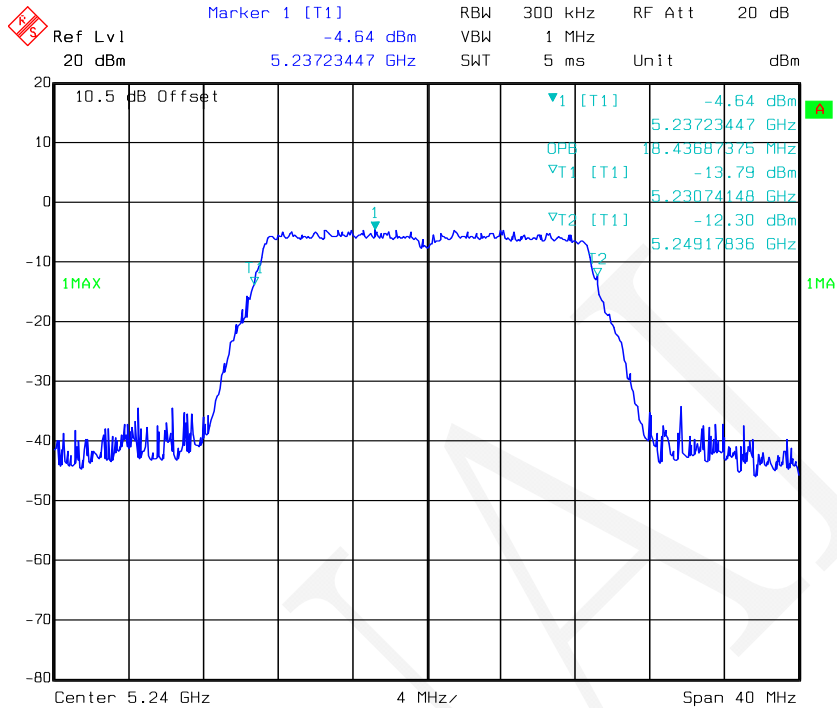
Date: 05.DEC.2018 10:40:54

802.11ac20 mode, 99% Occupied Bandwidth-5200 MHz

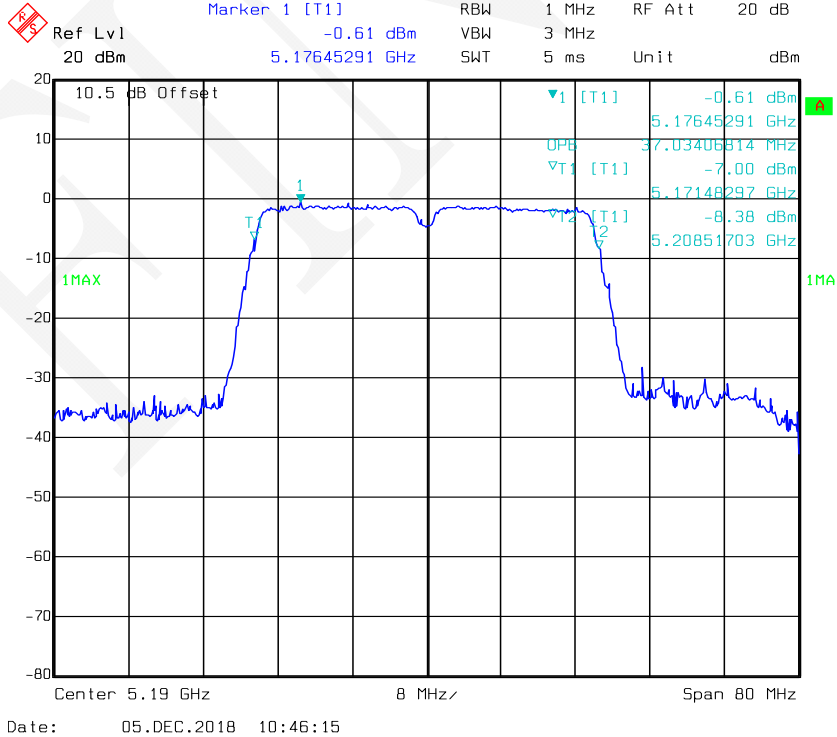


Date: 05.DEC.2018 10:42:29

802.11ac20 mode, 99% Occupied Bandwidth-5240 MHz



802.11ac40 mode, 99% Occupied Bandwidth-5190 MHz

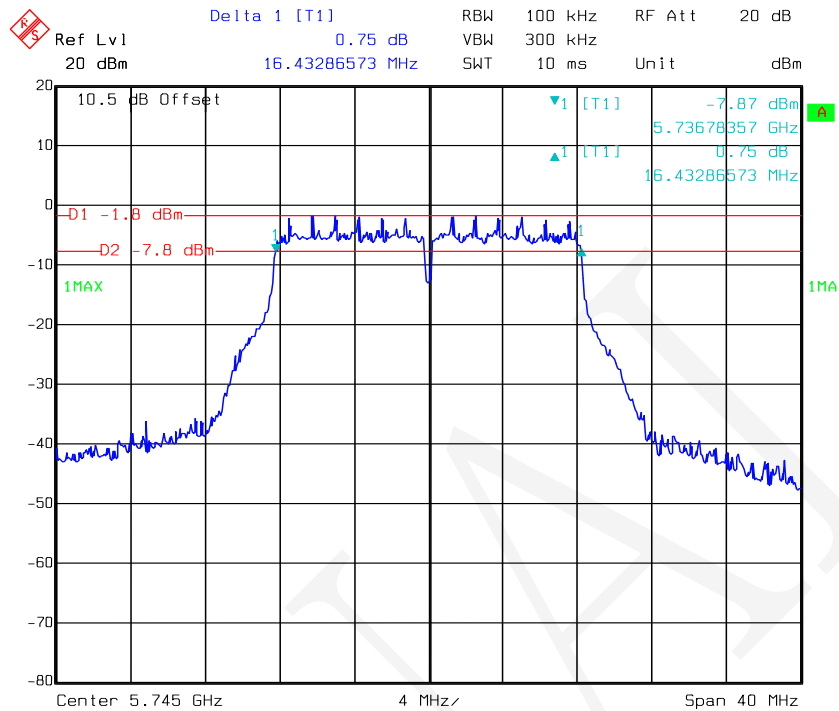


For 5725-5850 MHz:

Mode	Channel	Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	Low	5745	16.43	17.23
	Middle	5785	16.43	17.23
	High	5825	16.43	17.31
802.11n-HT20	Low	5745	17.72	18.52
	Middle	5785	17.72	18.52
	High	5825	17.72	18.44
802.11n-HT40	Low	5755	36.55	37.19
	High	5795	36.55	37.19
802.11ac20	Low	5745	17.72	18.36
	Middle	5785	17.72	18.44
	High	5825	17.72	18.36
802.11ac40	Low	5755	36.55	37.19
	High	5795	36.23	37.19
802.11ac80	-	5775	76.31	76.95

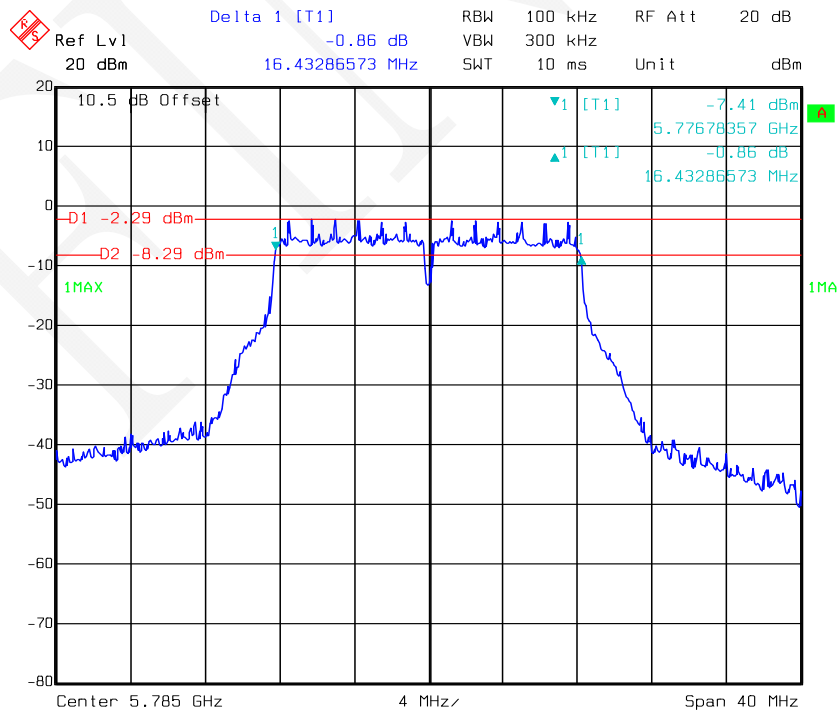
Note: the 99% Occupied Bandwidth doesn't extend U-NII-2C band 5470-5725MHz.

802.11a mode, 6 dB Bandwidth-5745 MHz



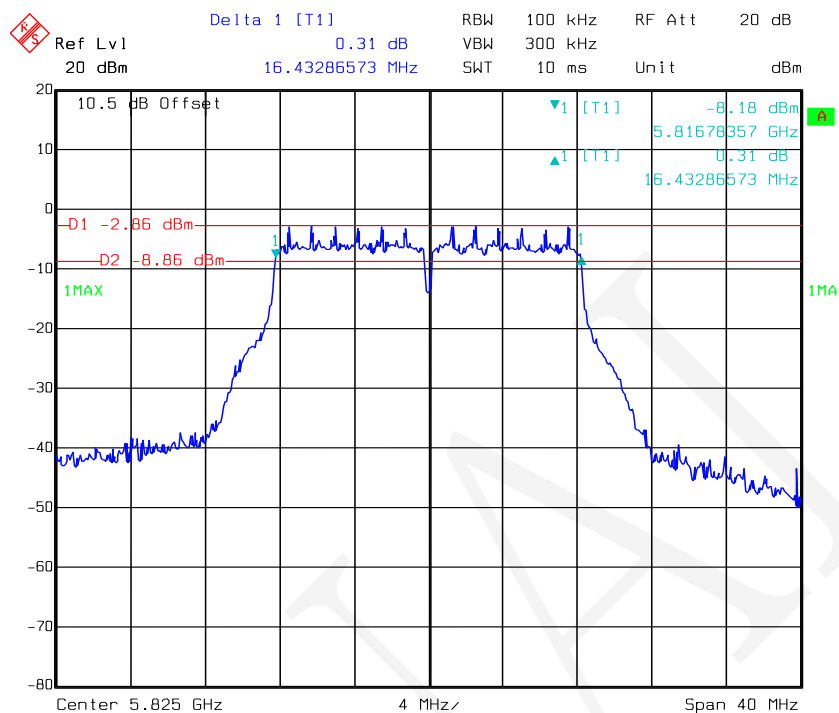
Date: 05.DEC.2018 11:03:31

802.11a mode, 6 dB Bandwidth-5785 MHz



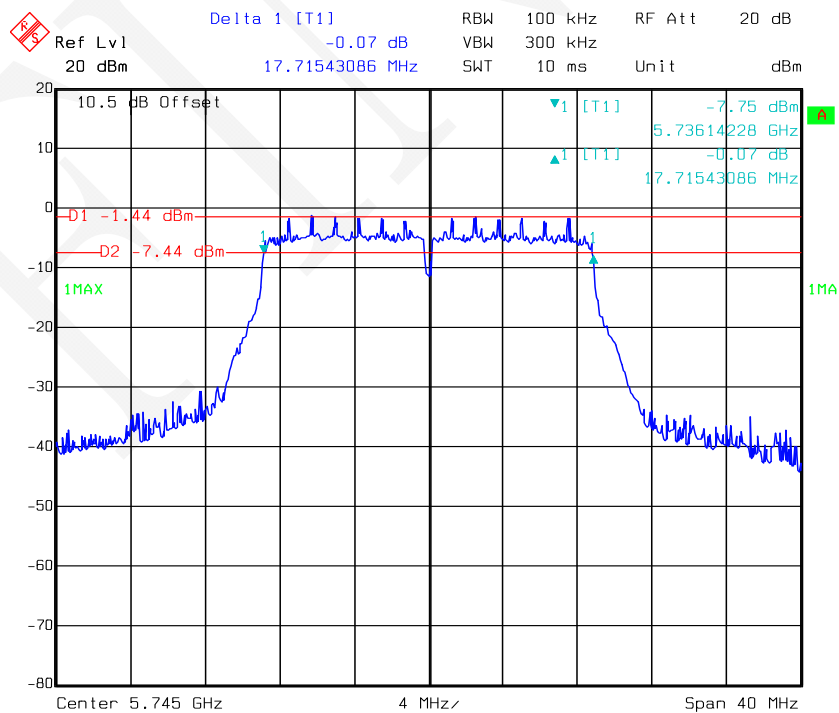
Date: 05.DEC.2018 11:06:00

802.11a mode, 6 dB Bandwidth-5825 MHz



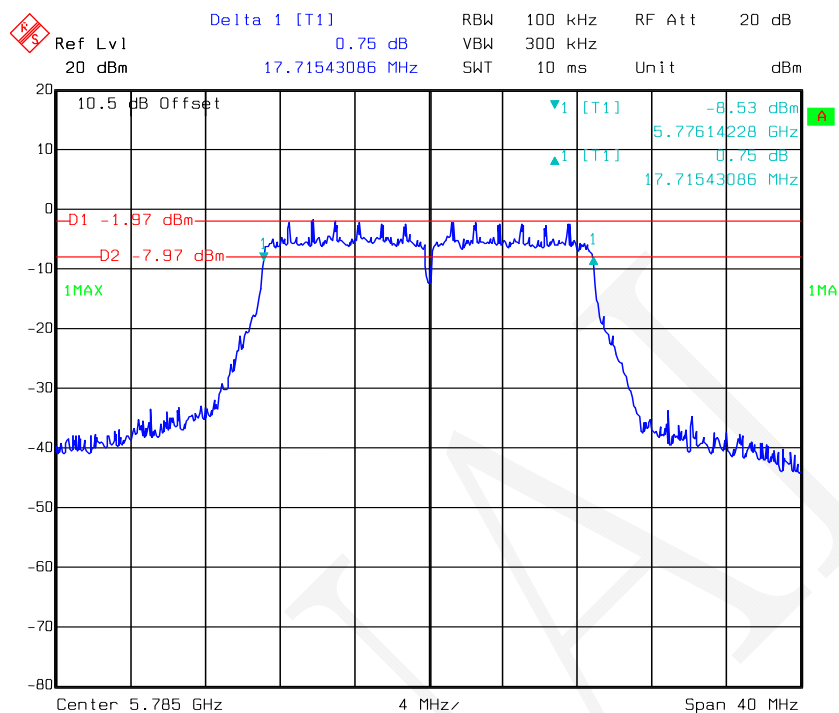
Date: 05.DEC.2018 11:06:50

802.11n-HT20 mode, 6 dB Bandwidth-5745 MHz



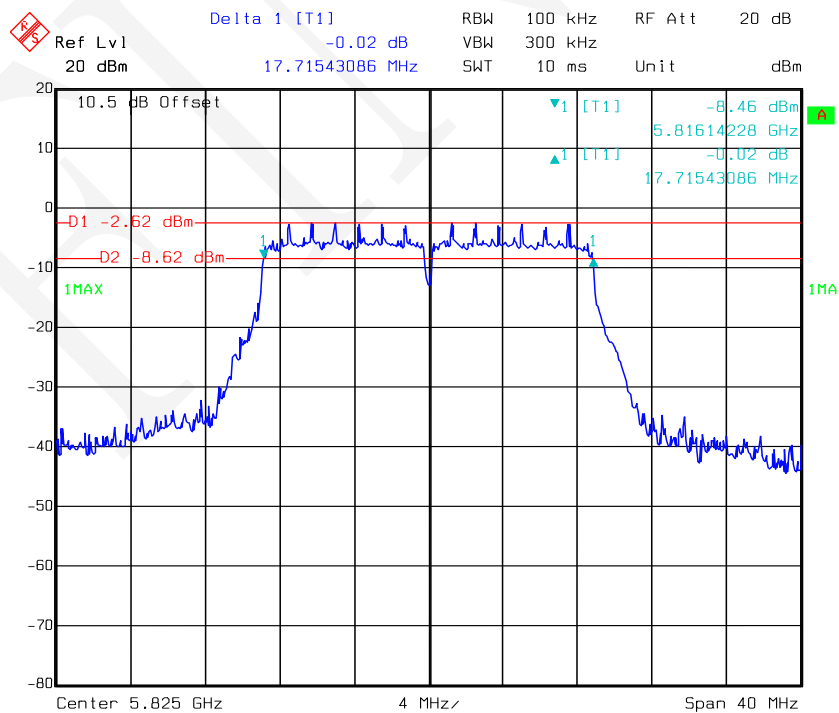
Date: 05.DEC.2018 11:08:21

802.11n-HT20 mode, 6 dB Bandwidth-5785 MHz



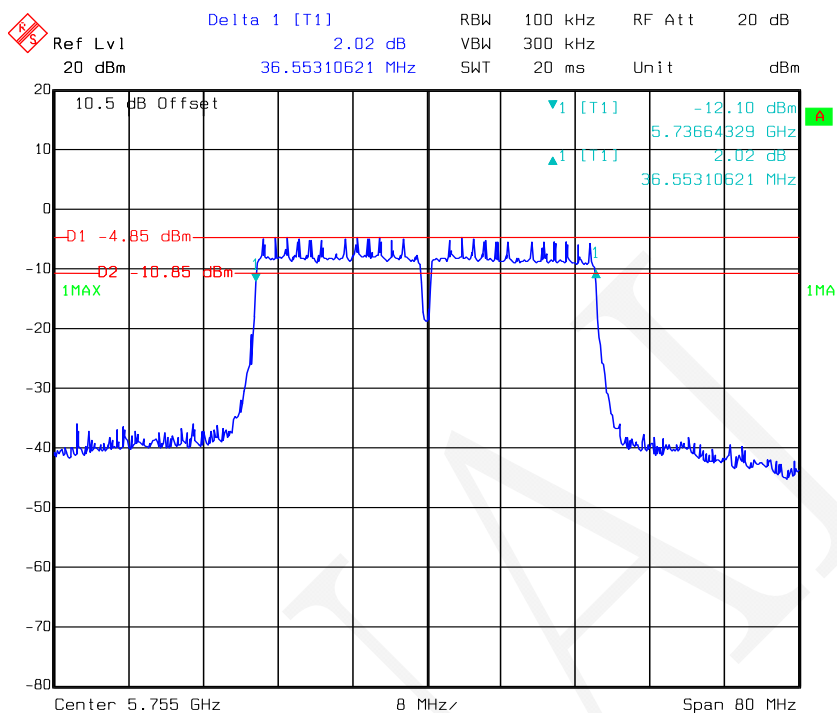
Date: 05.DEC.2018 11:10:20

802.11n-HT20 mode, 6 dB Bandwidth-5825 MHz



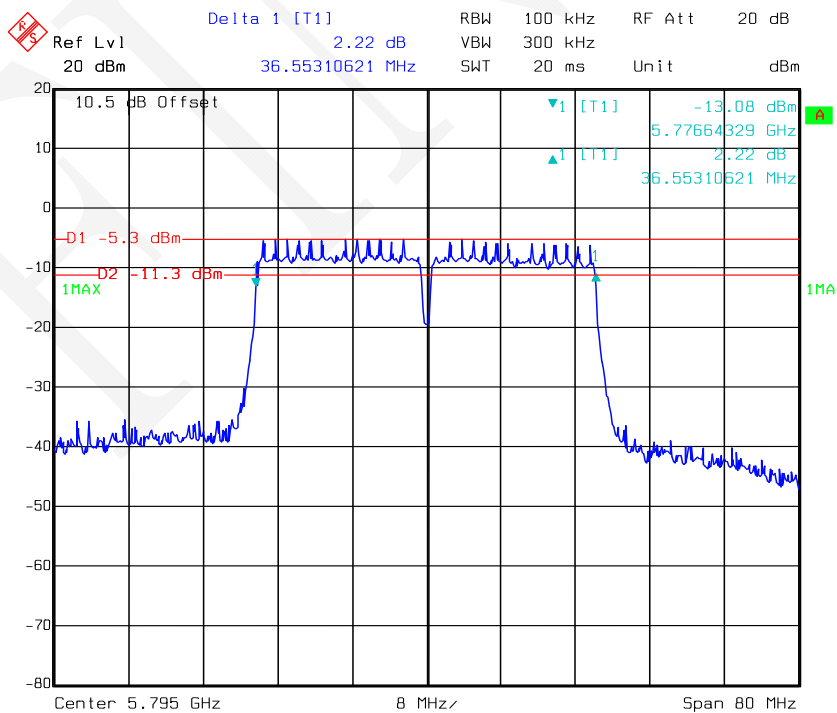
Date: 05.DEC.2018 11:11:49

802.11n-HT40 mode, 6 dB Bandwidth-5755 MHz



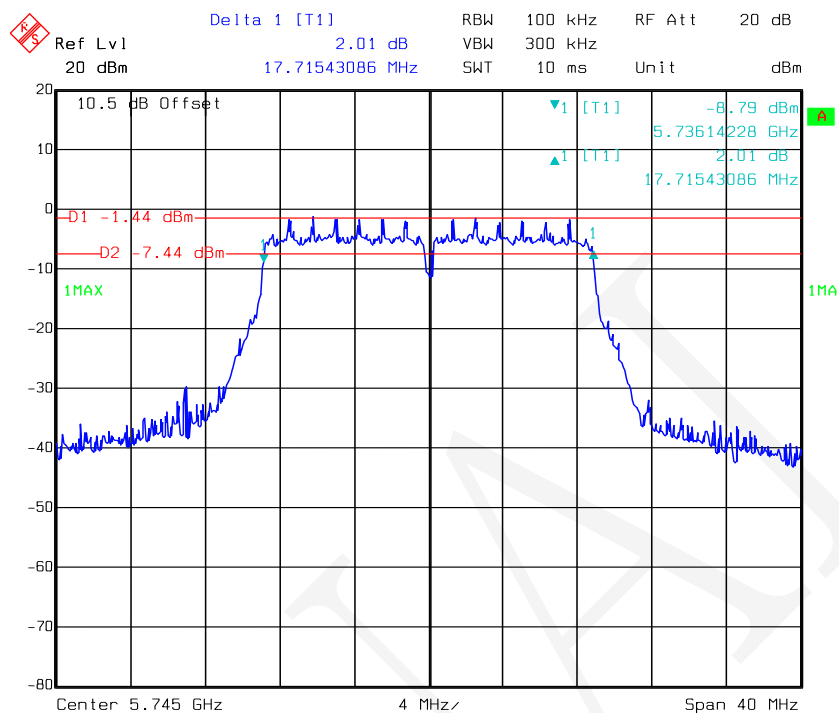
Date: 05.DEC.2018 11:13:14

802.11n-HT40 mode, 6 dB Bandwidth-5795 MHz



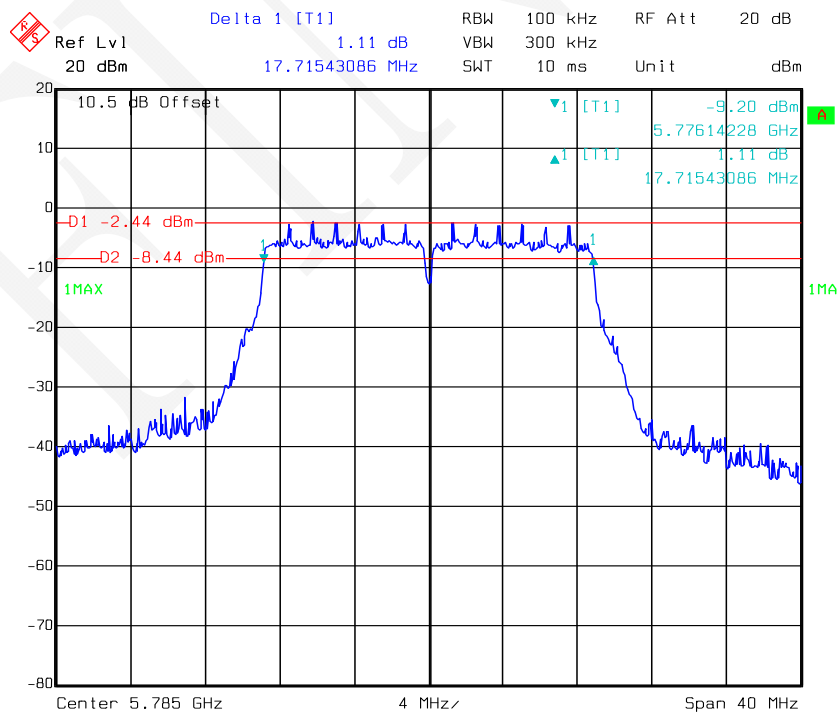
Date: 05.DEC.2018 11:14:18

802.11ac20 mode, 6 dB Bandwidth-5745 MHz



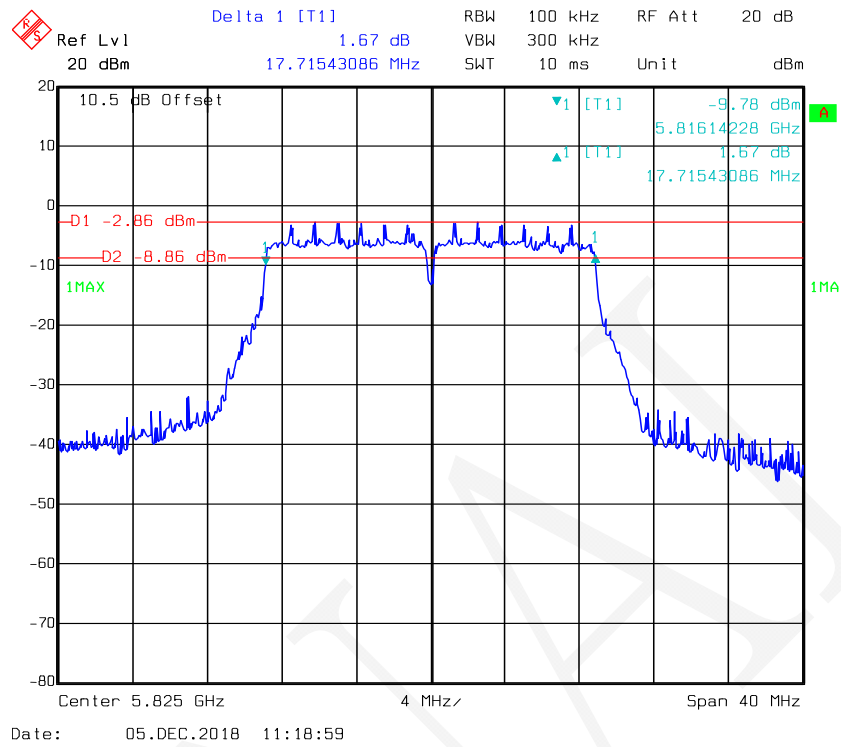
Date: 05.DEC.2018 11:15:38

802.11ac20 mode, 6 dB Bandwidth-5785 MHz

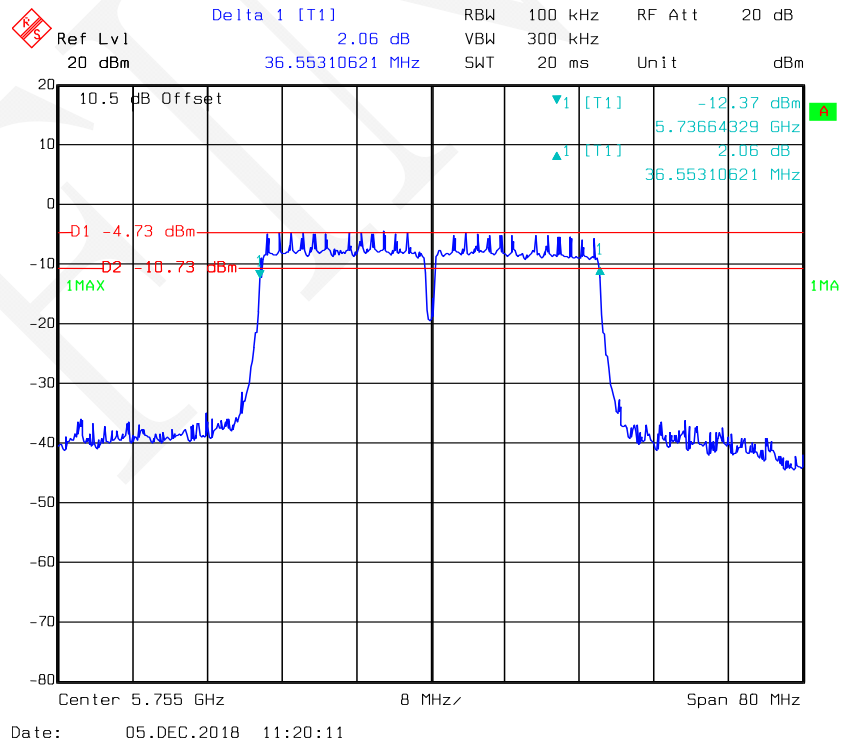


Date: 05.DEC.2018 11:17:19

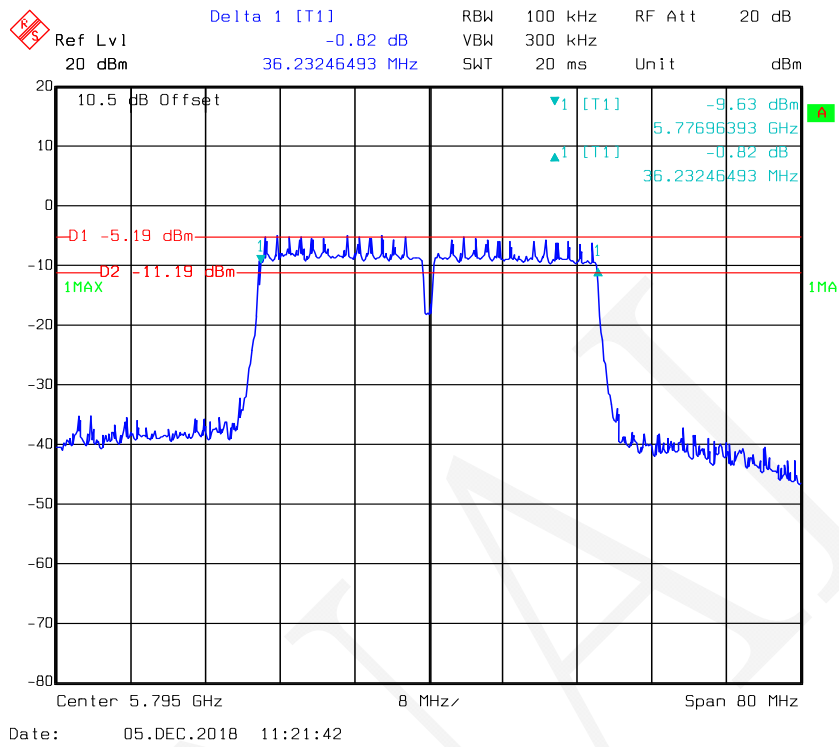
802.11ac20 mode, 6 dB Bandwidth-5825 MHz



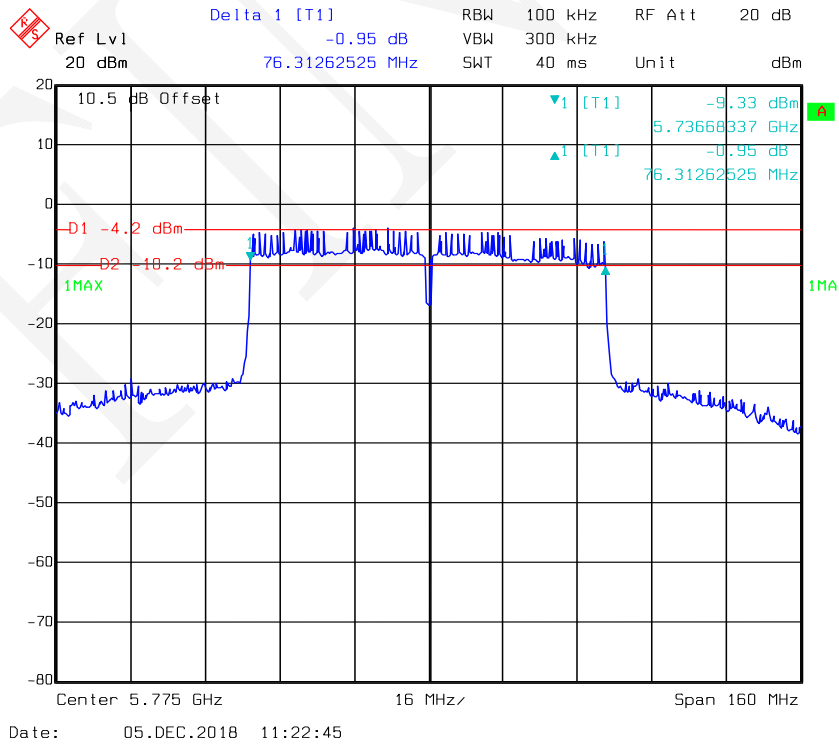
802.11ac40 mode, 6 dB Bandwidth-5755 MHz



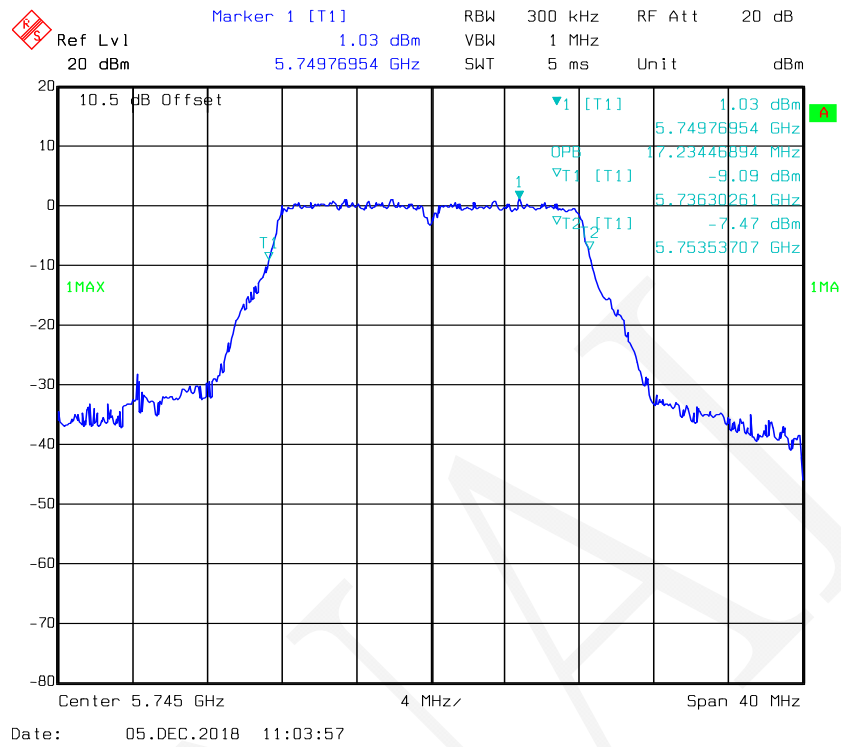
802.11ac40 mode, 6 dB Bandwidth-5795 MHz



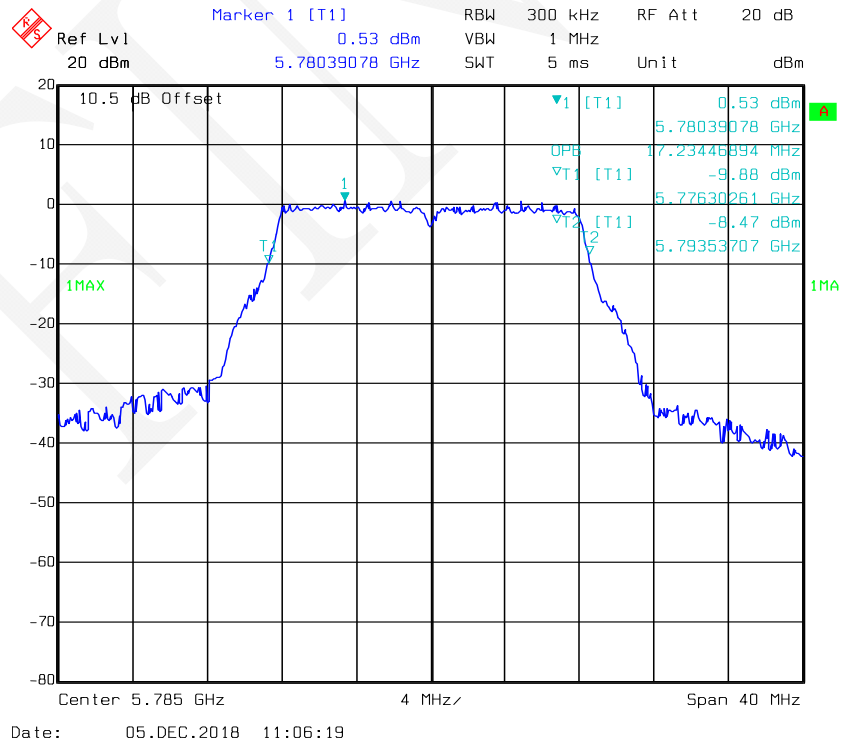
802.11ac80 mode, 6 dB Bandwidth-5775 MHz



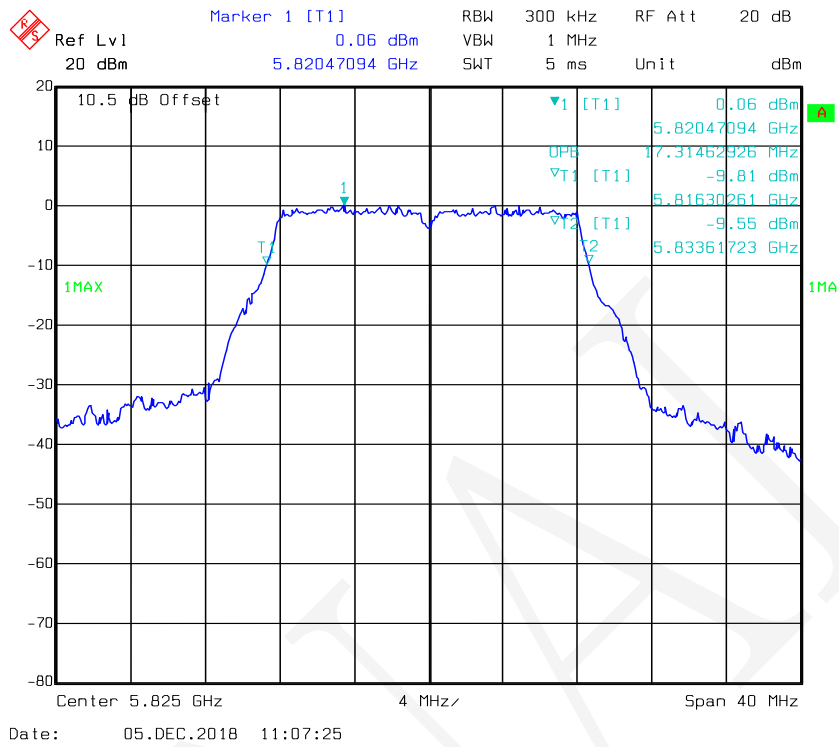
802.11a mode, 99% Occupied Bandwidth-5745 MHz



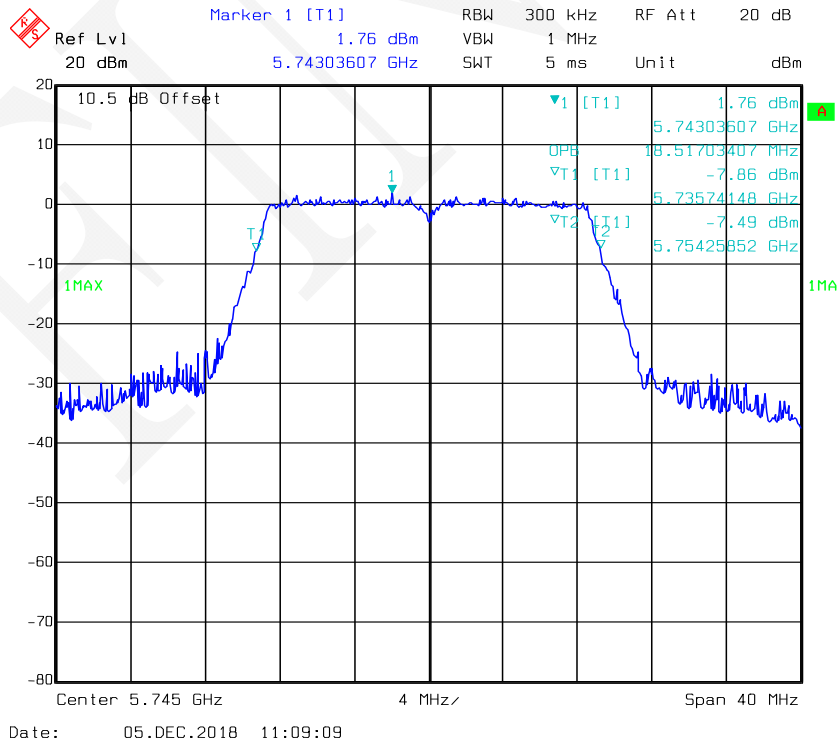
802.11a mode, 99% Occupied Bandwidth -5785 MHz



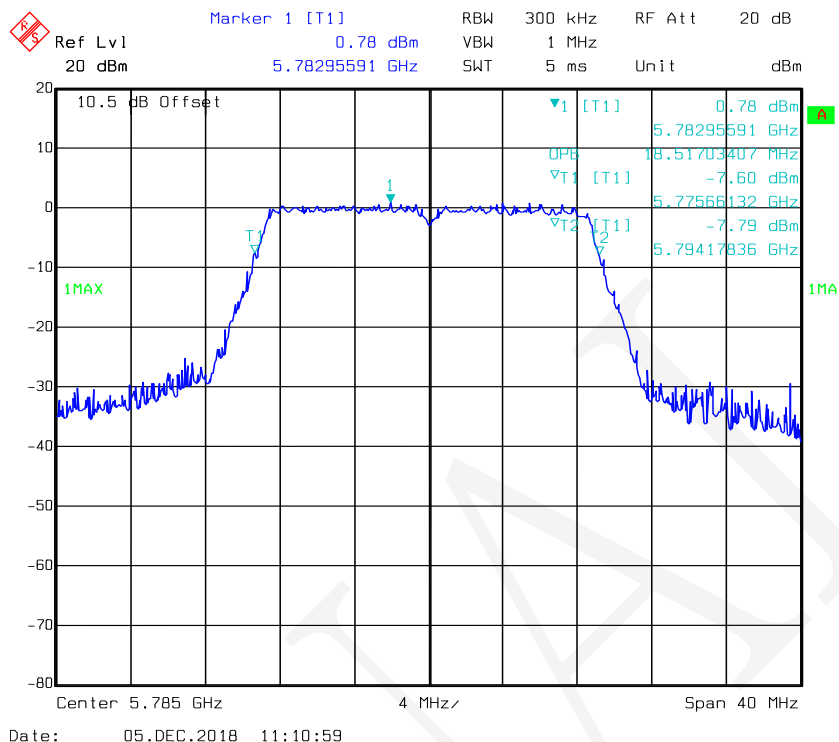
802.11a mode, 99% Occupied Bandwidth -5825 MHz



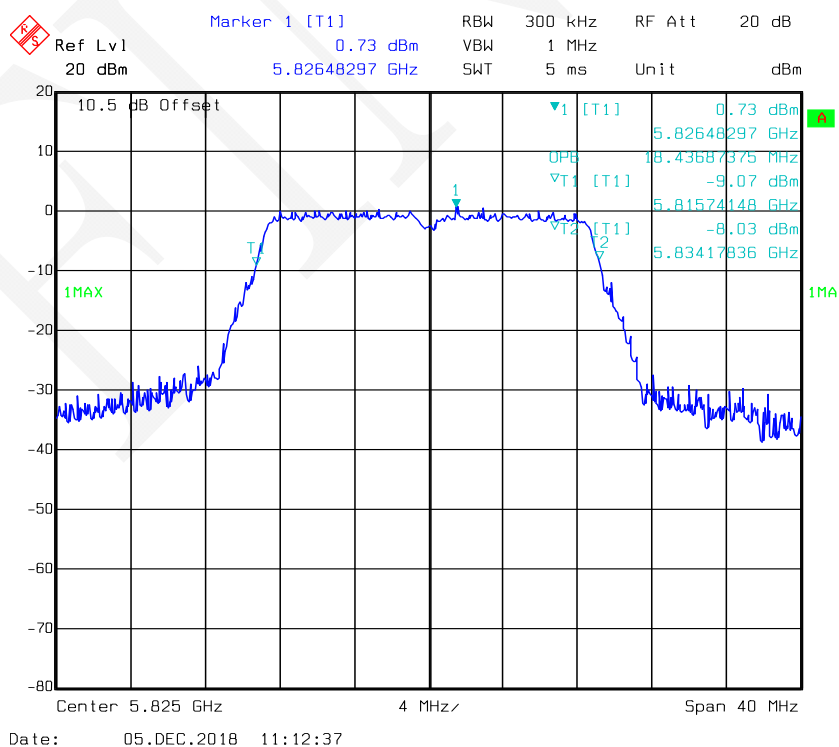
802.11n-HT20 mode, 99% Occupied Bandwidth-5745 MHz



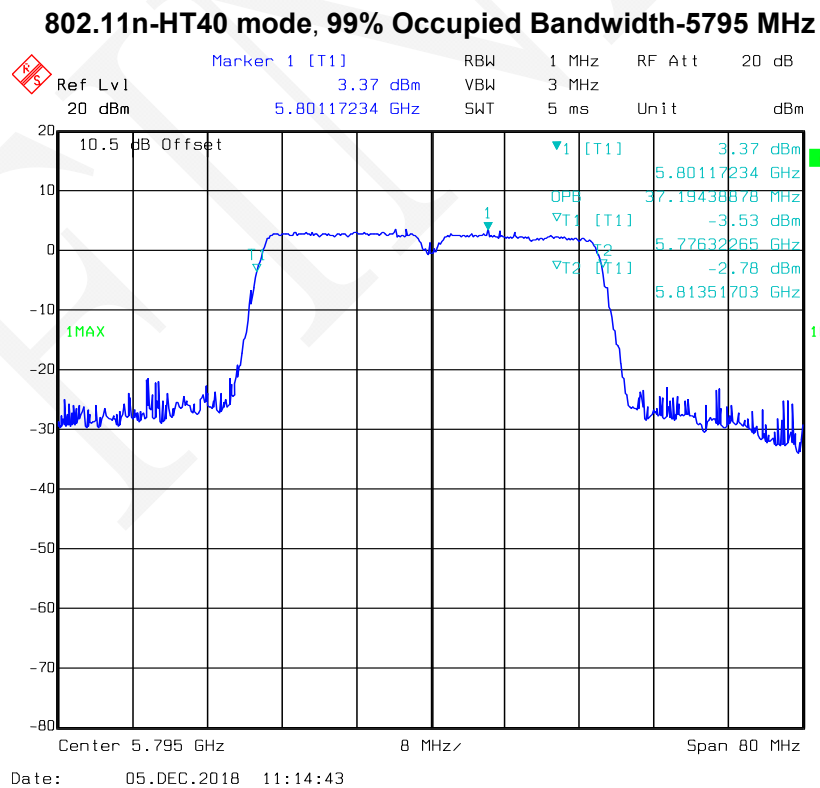
802.11n-HT20 mode, 99% Occupied Bandwidth-5785 MHz



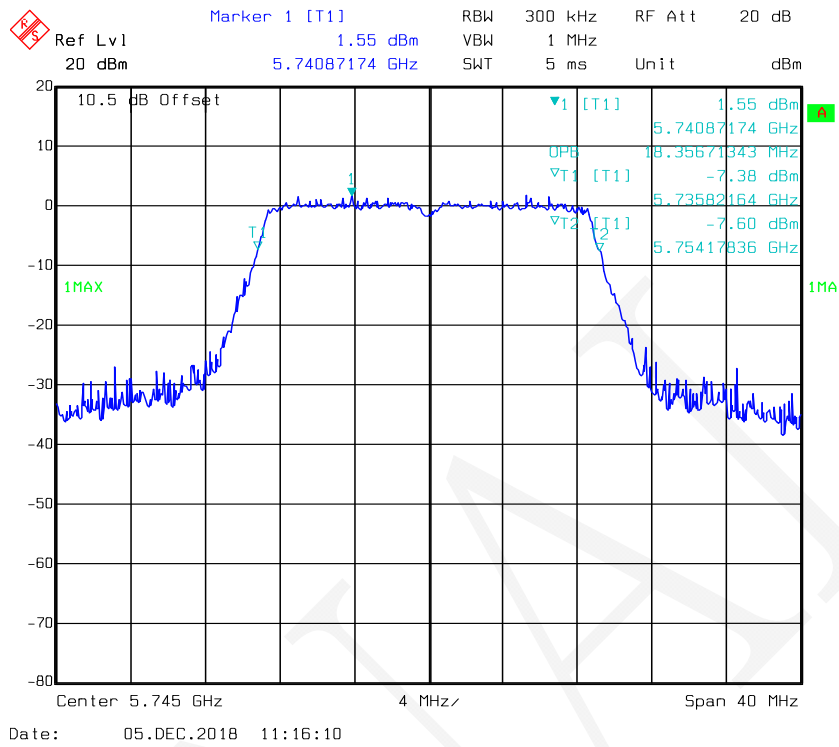
802.11n-HT20 mode, 99% Occupied Bandwidth-5825 MHz



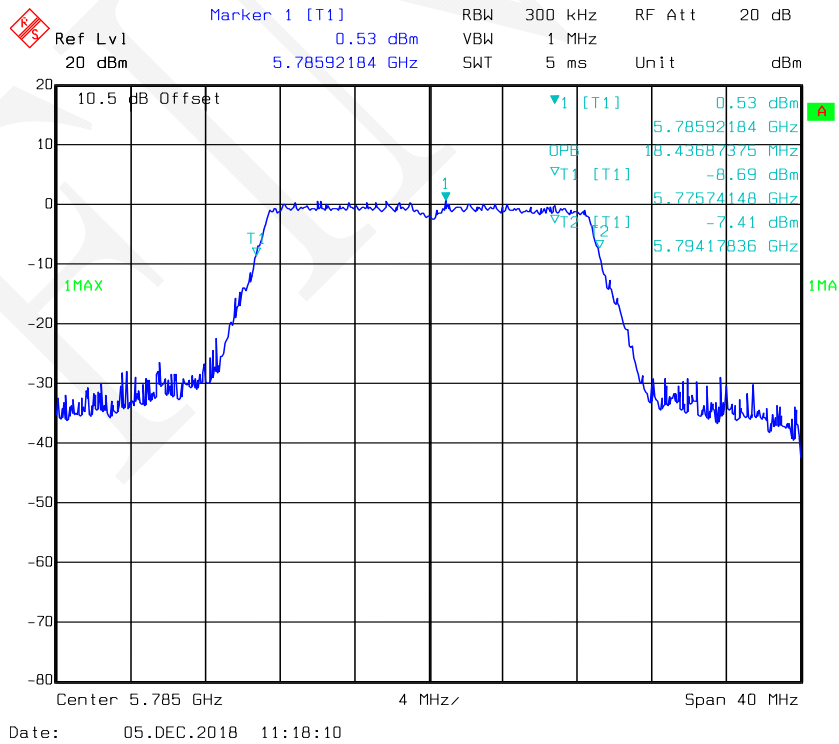
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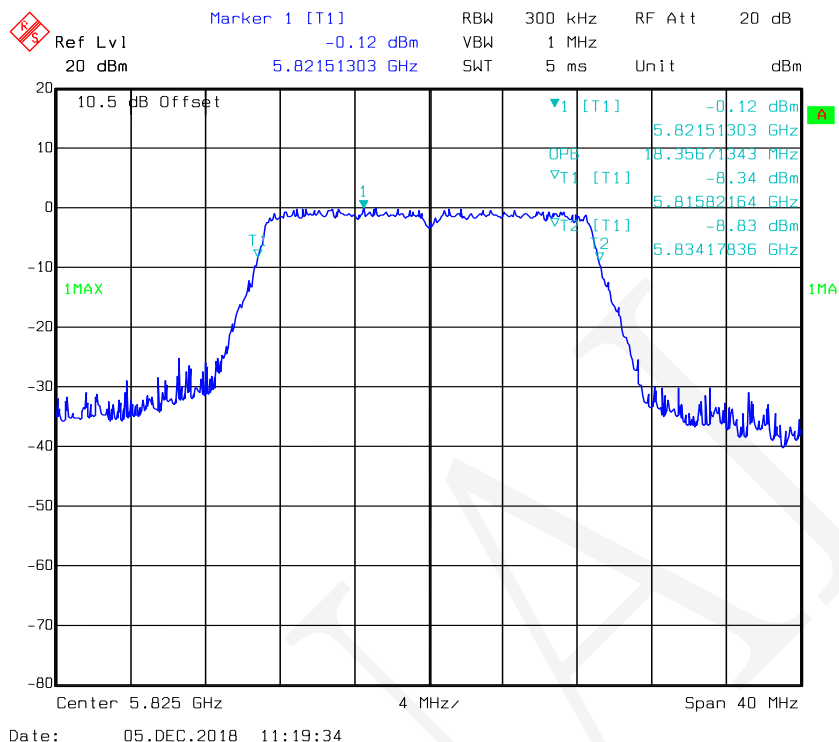
802.11ac20 mode, 99% Occupied Bandwidth-5745 MHz



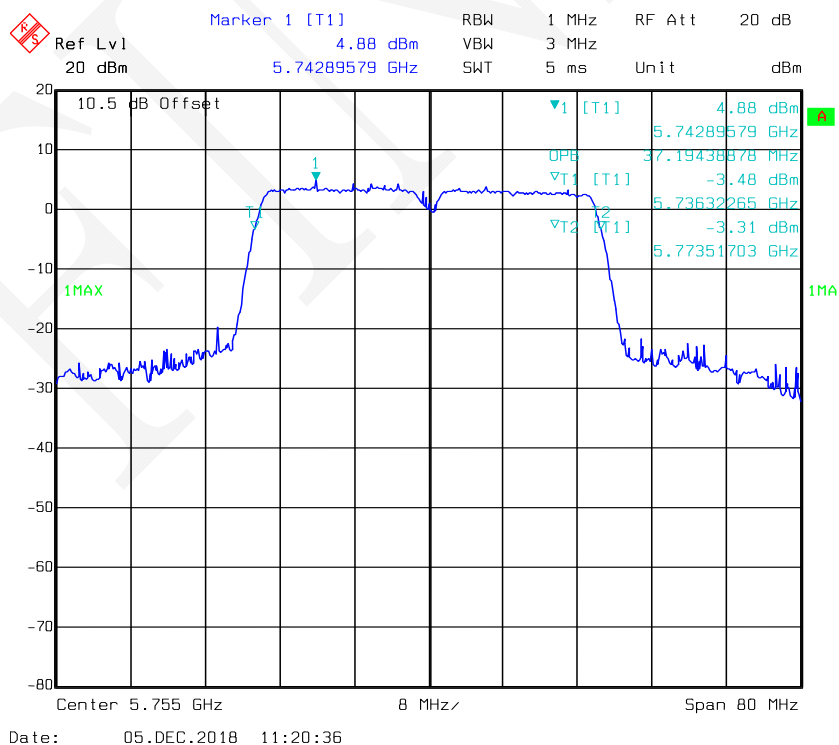
802.11ac20 mode, 99% Occupied Bandwidth-5785 MHz



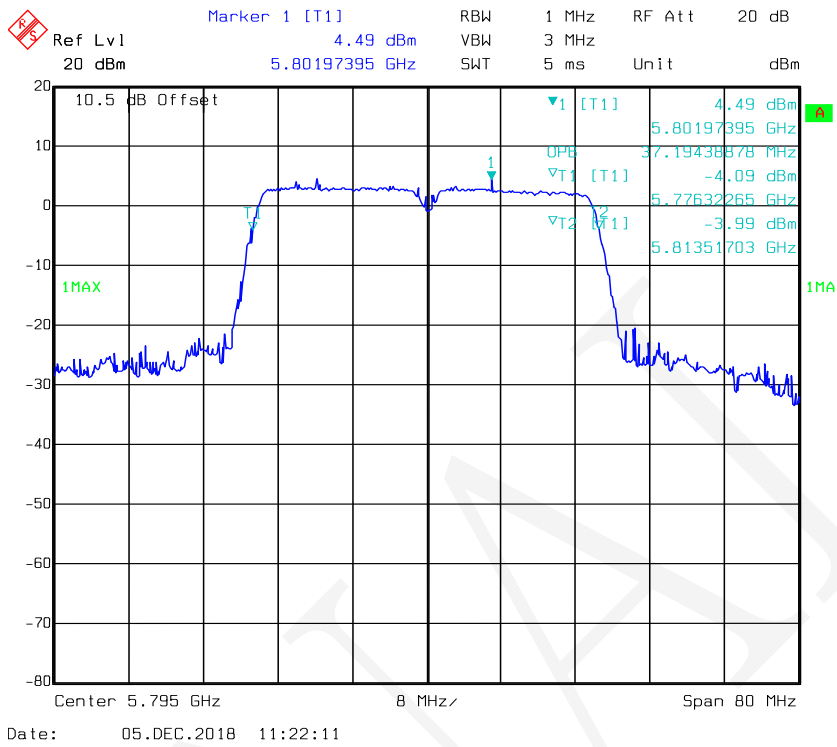
802.11ac20 mode, 99% Occupied Bandwidth-5825 MHz



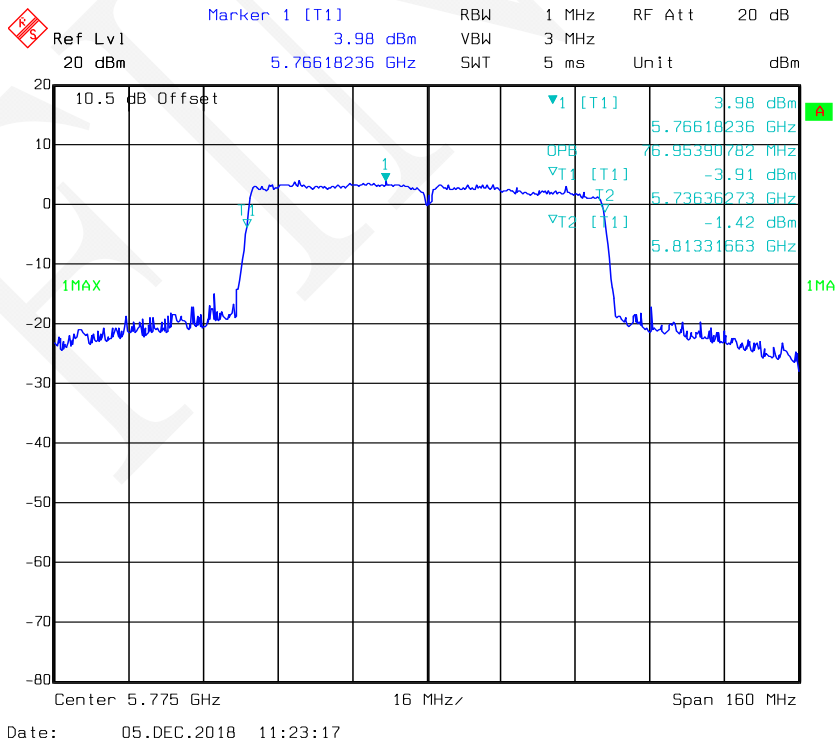
802.11ac40 mode, 99% Occupied Bandwidth-5755 MHz



802.11ac40 mode, 99% Occupied Bandwidth-5795 MHz



802.11ac80 mode, 99% Occupied Bandwidth-5775 MHz



FCC §15.407(a) (1)(IV), (3), (4) – CONDUCTED TRANSMITTER OUTPUT POWER

Applicable Standard

(a) Power limits:

(1) For the band 5.15-5.25 GHz.

(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.

(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.

NOTE TO PARAGRAPH (A)(3): The Commission strongly recommends that parties employing U-NII devices to provide critical communications services should determine if there are any nearby Government radar systems that could affect their operation.

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

Test Procedure

According to 789033 D02 General UNII Test Procedures New Rules v02r01

Test Data

Environmental Conditions

Temperature:	21 °C
Relative Humidity:	57 %
ATM Pressure:	96.0 kPa

* The testing was performed by Tom Tang on 2018-12-05.

Test Mode: Transmitting

For 5150-5250 MHz:

Mode	Channel	Frequency (MHz)	Conducted Average Power (dBm)	Duty Cycle Factor (dB)	Total (dBm)	Limit (dBm)
802.11a	Low	5180	5.49	0.06	5.55	24
	Middle	5200	5.23	0.06	5.29	24
	High	5240	4.75	0.06	4.81	24
802.11n-HT20	Low	5180	5.51	0.06	5.57	24
	Middle	5200	5.18	0.06	5.24	24
	High	5240	4.59	0.06	4.65	24
802.11n-HT40	Low	5190	5.39	0.13	5.52	24
	High	5230	4.78	0.13	4.91	24
802.11ac20	Low	5180	5.36	0.06	5.42	24
	Middle	5200	5.10	0.06	5.16	24
	High	5240	4.60	0.06	4.66	24
802.11ac40	Low	5190	5.37	0.13	5.50	24
	High	5230	4.70	0.13	4.83	24
802.11ac80	-	5210	7.13	0.25	7.38	24

For 5725-5850 MHz:

Mode	Channel	Frequency (MHz)	Conducted Average Power (dBm)	Duty Cycle Factor (dB)	Total (dBm)	Limit (dBm)
802.11a	Low	5745	9.59	0.06	9.65	30
	Middle	5785	9.09	0.06	9.15	30
	High	5825	8.61	0.06	8.67	30
802.11n-HT20	Low	5745	9.63	0.06	9.69	30
	Middle	5785	9.02	0.06	9.08	30
	High	5825	8.58	0.06	8.64	30
802.11n-HT40	Low	5755	9.48	0.13	9.61	30
	High	5795	9.15	0.13	9.28	30
802.11ac20	Low	5745	9.63	0.06	9.69	30
	Middle	5785	9.02	0.06	9.08	30
	High	5825	8.57	0.06	8.63	30
802.11ac40	Low	5755	9.41	0.13	9.54	30
	High	5795	9.12	0.13	9.25	30
802.11ac80	-	5775	12.16	0.25	12.41	30

FCC §15.407(a) (1) (iv) (3) (5) - POWER SPECTRAL DENSITY

Applicable Standard

(a) Power limits:

(1) For the band 5.15-5.25 GHz.

(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.

(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.

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

Test Procedure

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

Test Data

Environmental Conditions

Temperature:	21 °C
Relative Humidity:	57 %
ATM Pressure:	96.0 kPa

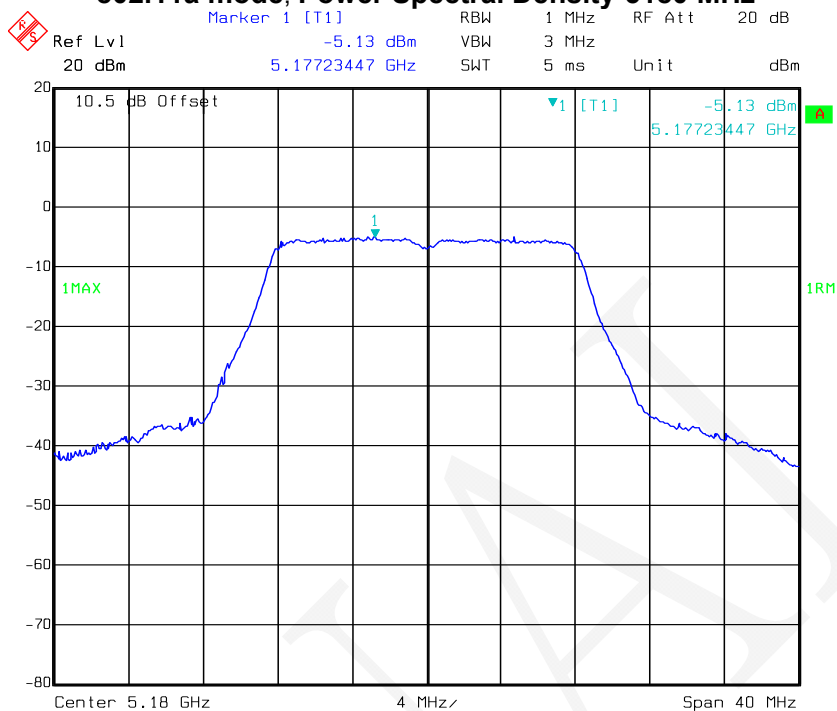
* The testing was performed by Tom Tang on 2018-12-05.

Test Mode: Transmitting

For 5150-5250 MHz:

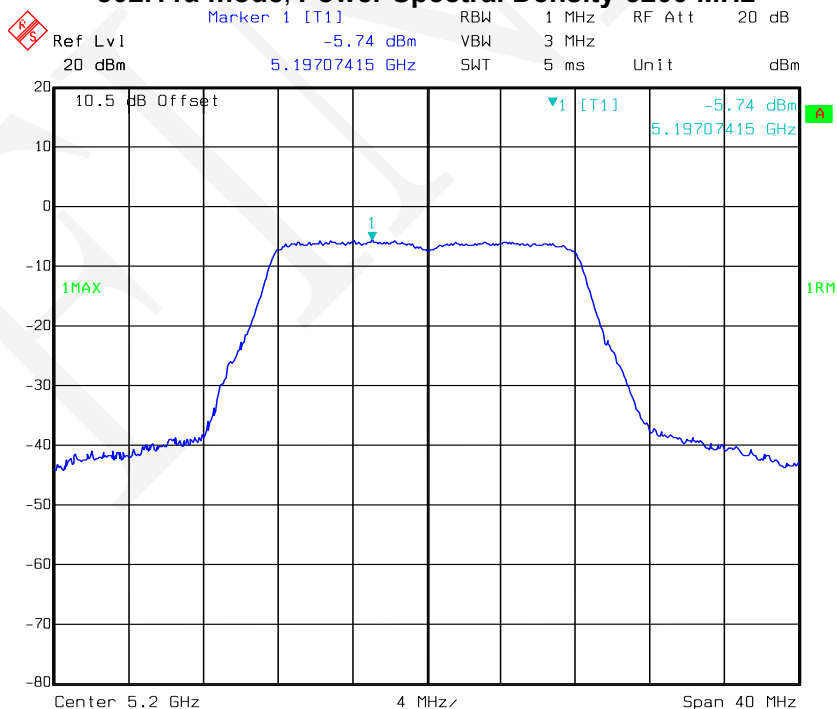
Mode	Channel	Frequency (MHz)	Power Spectral Density (dBm/MHz)	Duty Cycle Factor (dB)	Total (dBm/MHz)	Limit (dBm/MHz)
802.11a	Low	5180	-5.13	0.06	-5.07	11
	Middle	5200	-5.74	0.06	-5.68	11
	High	5240	-6.37	0.06	-6.31	11
802.11n-HT20	Low	5180	-5.60	0.06	-5.54	11
	Middle	5200	-5.86	0.06	-5.80	11
	High	5240	-6.16	0.06	-6.10	11
802.11n-HT40	Low	5190	-8.43	0.13	-8.30	11
	High	5230	-8.74	0.13	-8.61	11
802.11ac20	Low	5180	-5.21	0.06	-5.15	11
	Middle	5200	-5.66	0.06	-5.60	11
	High	5240	-6.16	0.06	-6.10	11
802.11ac40	Low	5190	-8.27	0.13	-8.14	11
	High	5230	-8.61	0.13	-8.48	11
802.11ac80	-	5210	-8.04	0.25	-7.79	11

802.11a mode, Power Spectral Density-5180 MHz



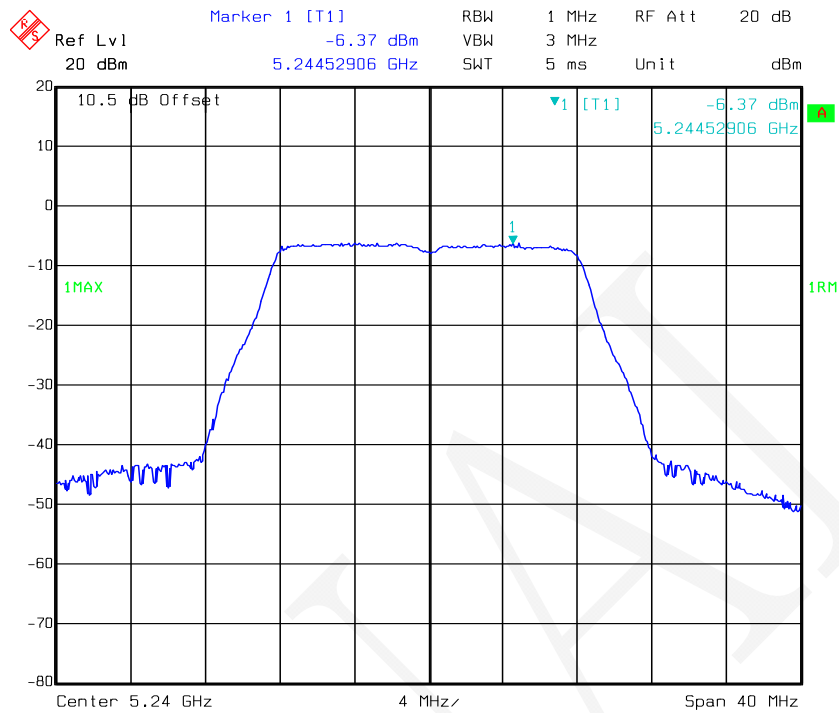
Date: 05.DEC.2018 10:27:11

802.11a mode, Power Spectral Density-5200 MHz



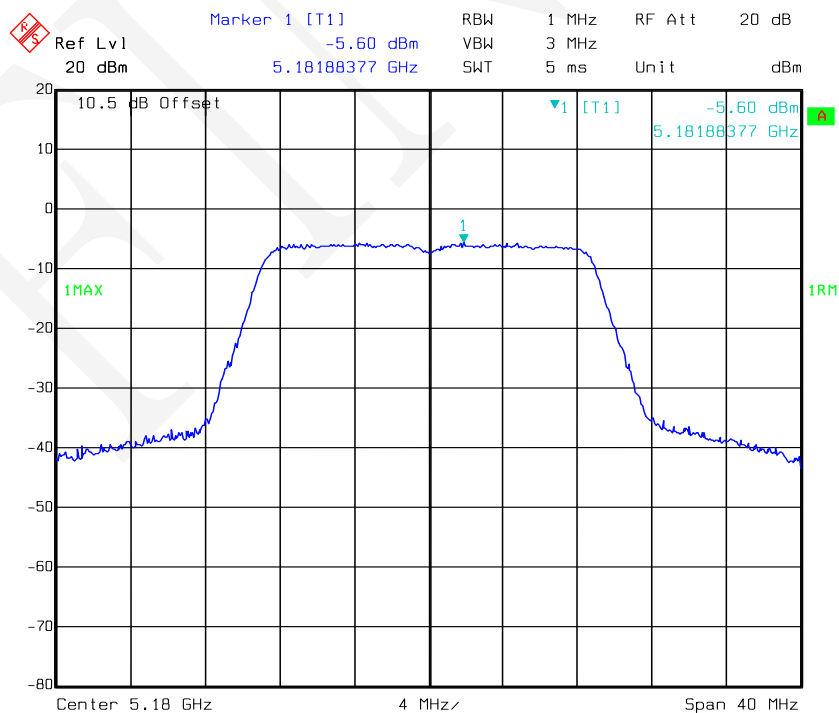
Date: 05.DEC.2018 10:28:24

802.11a mode, Power Spectral Density-5240 MHz



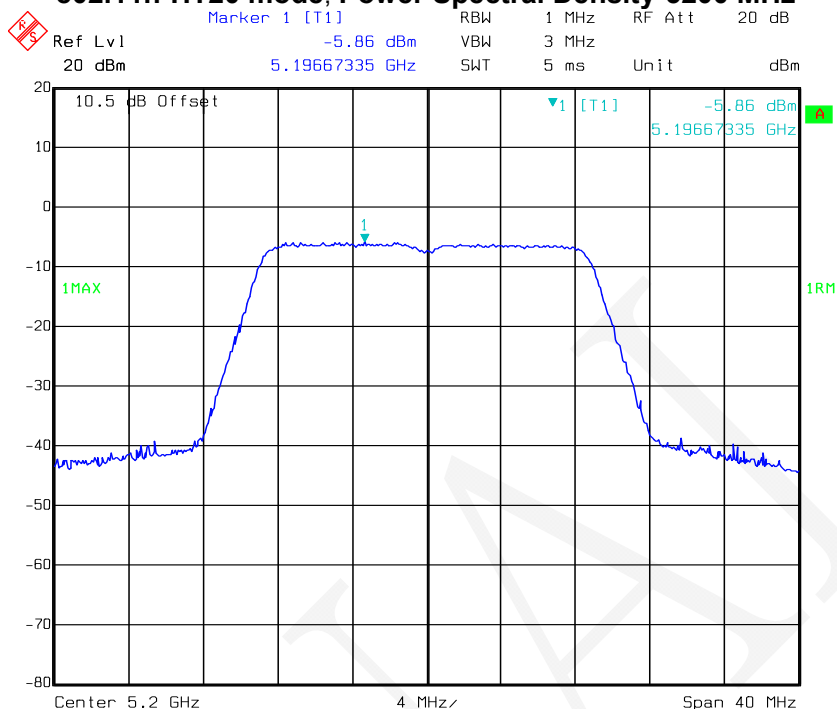
Date: 05.DEC.2018 10:30:07

802.11n-HT20 mode, Power Spectral Density-5180 MHz



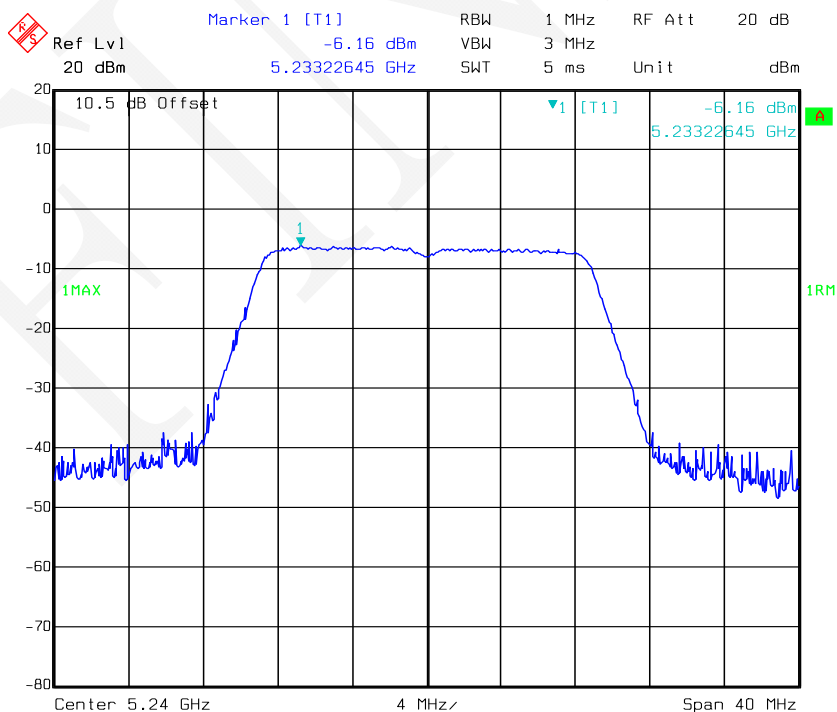
Date: 05.DEC.2018 10:32:15

802.11n-HT20 mode, Power Spectral Density-5200 MHz



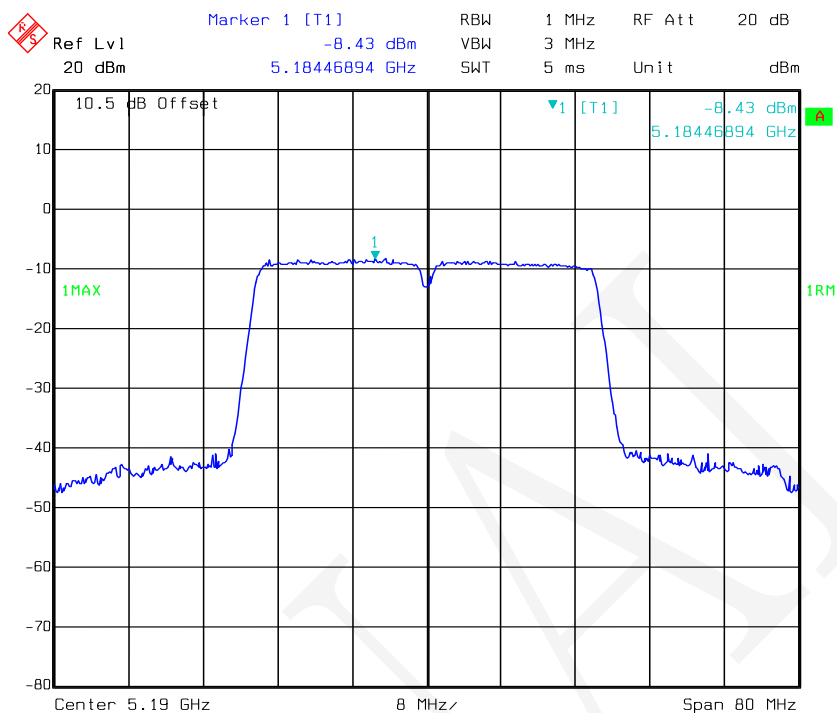
Date: 05.DEC.2018 10:33:48

802.11n-HT20 mode, Power Spectral Density-5240 MHz



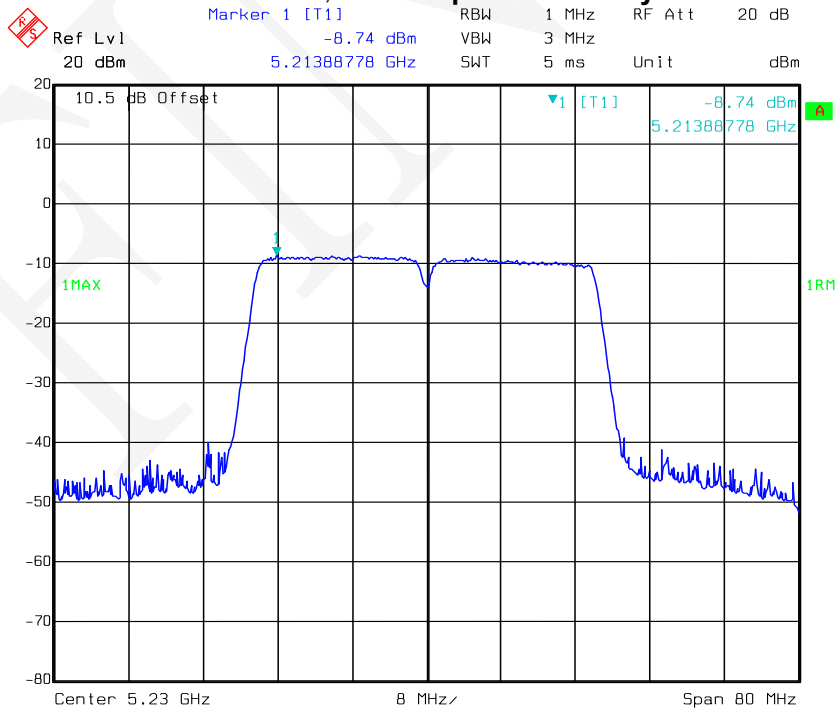
Date: 05.DEC.2018 10:36:02

802.11n-HT40 mode, Power Spectral Density-5190 MHz



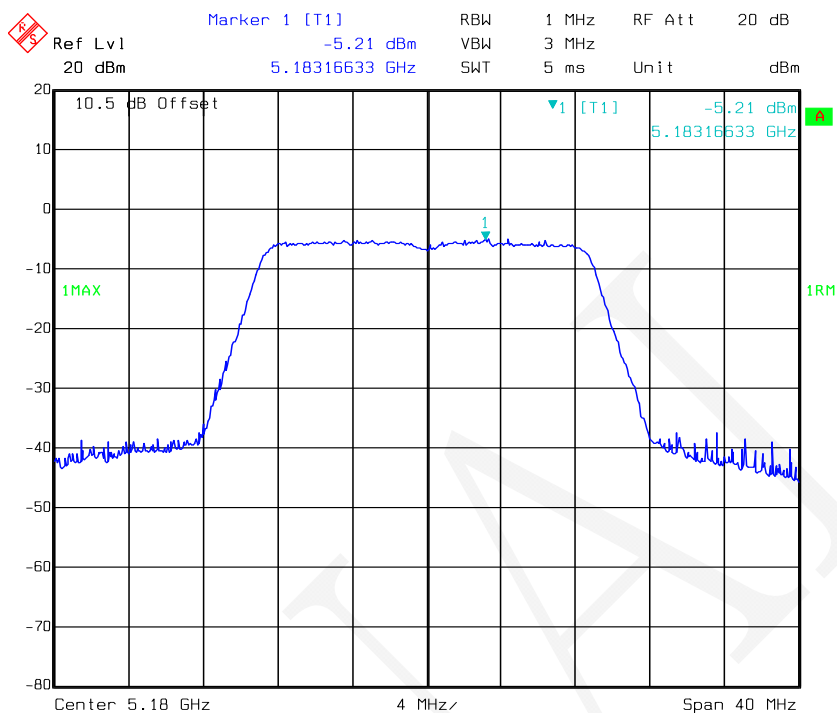
Date: 05.DEC.2018 10:37:22

802.11n-HT40 mode, Power Spectral Density-5230 MHz



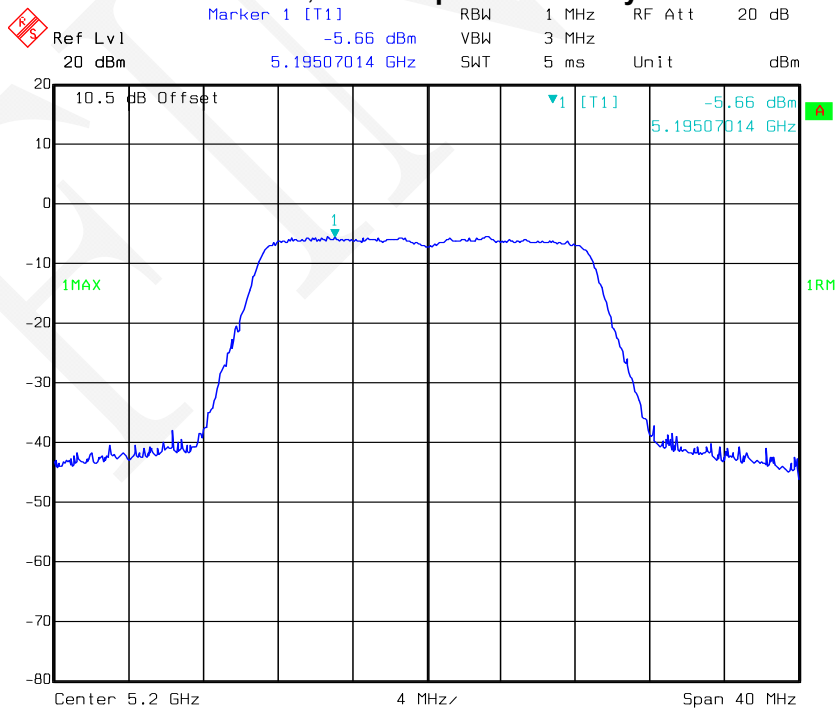
Date: 05.DEC.2018 10:39:12

802.11ac20 mode, Power Spectral Density-5180 MHz



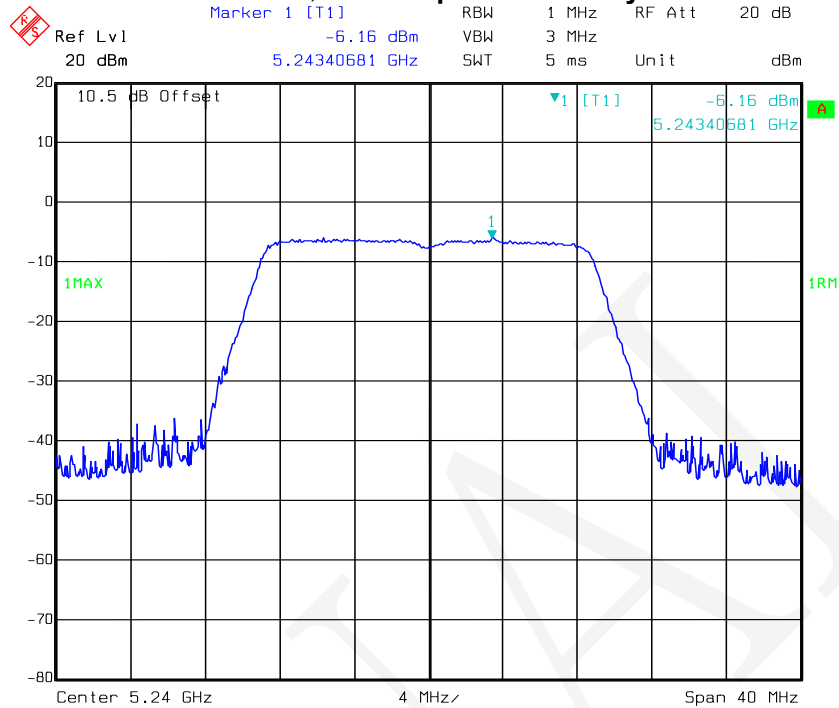
Date: 05.DEC.2018 10:41:18

802.11ac20 mode, Power Spectral Density-5200 MHz



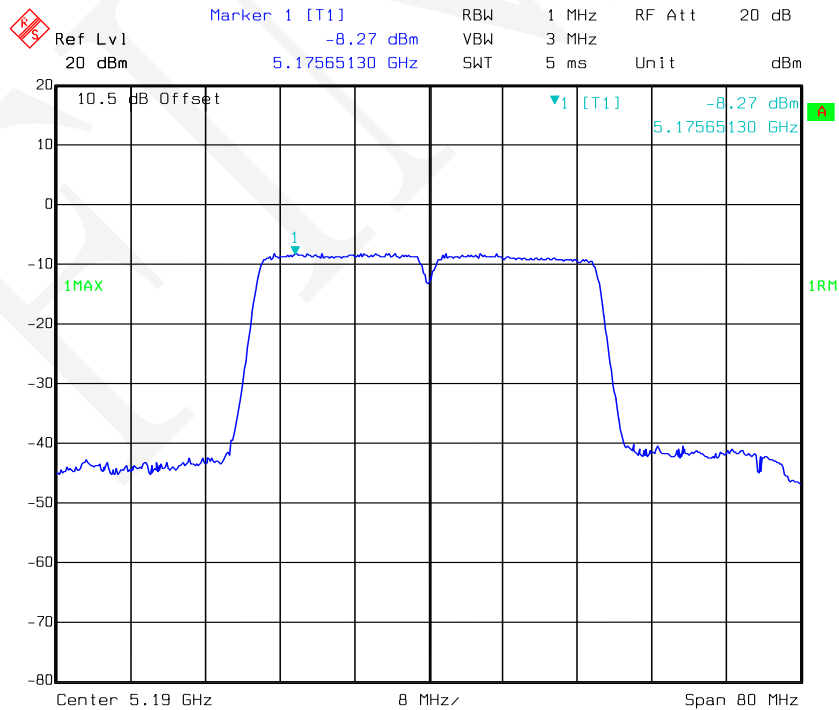
Date: 05.DEC.2018 10:42:52

802.11ac20 mode, Power Spectral Density-5240 MHz



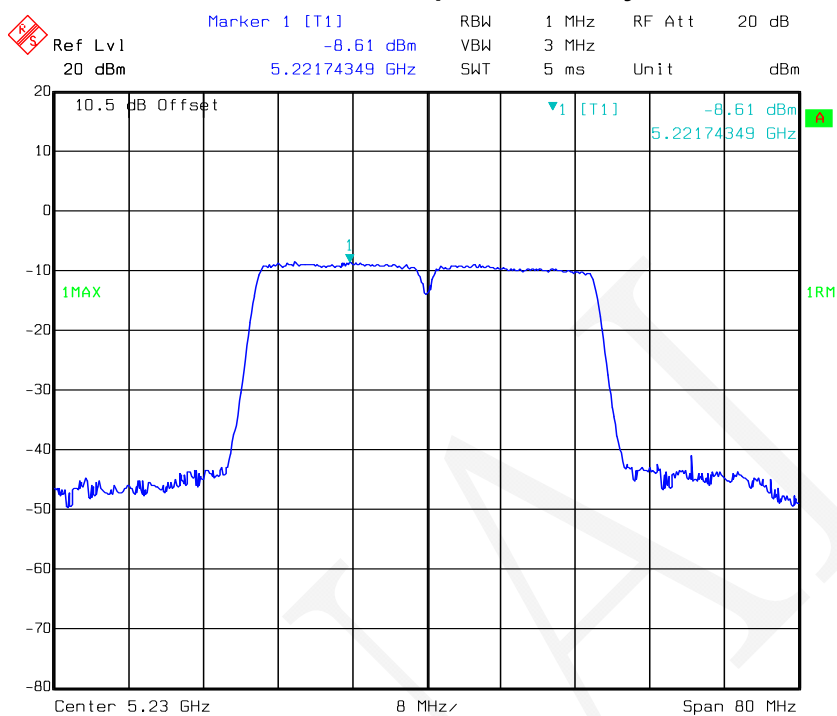
Date: 05.DEC.2018 10:45:13

802.11ac40 mode, Power Spectral Density-5190 MHz



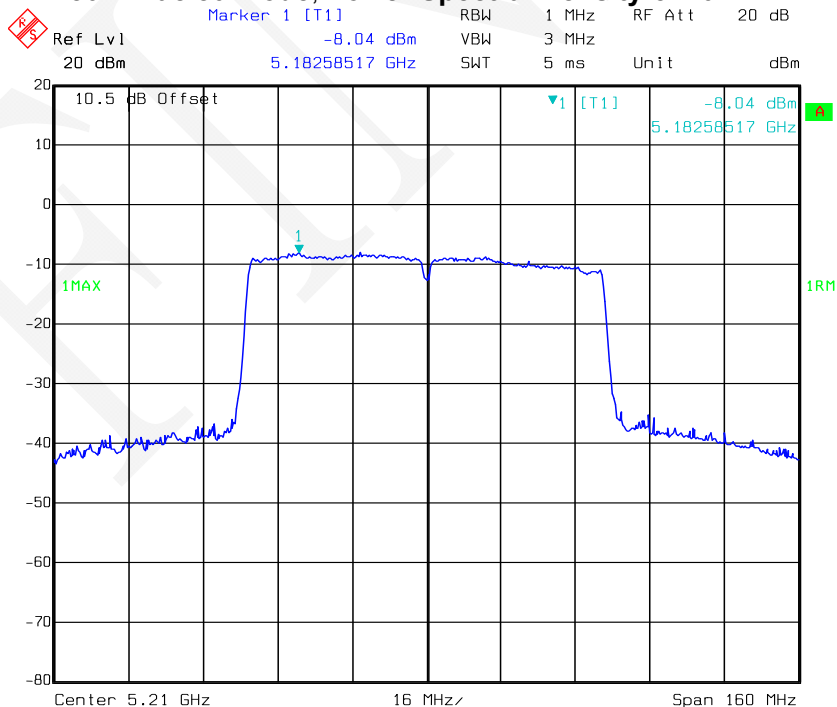
Date: 05.DEC.2018 10:46:41

802.11ac40 mode, Power Spectral Density-5230 MHz



Date: 05.DEC.2018 10:48:21

802.11ac 80 mode, Power Spectral Density-5210 MHz

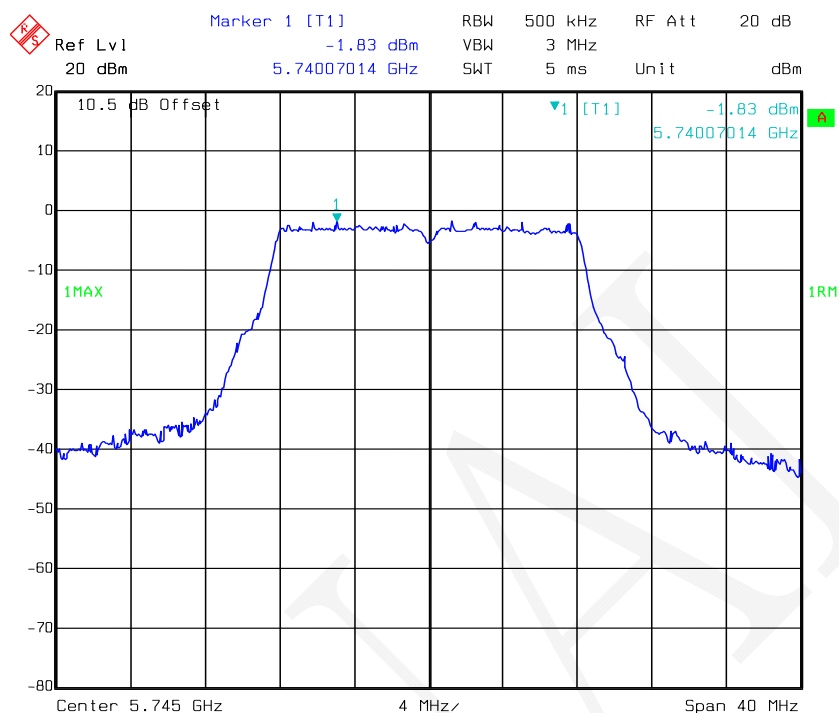


Date: 05.DEC.2018 10:49:53

For 5725-5850 MHz:

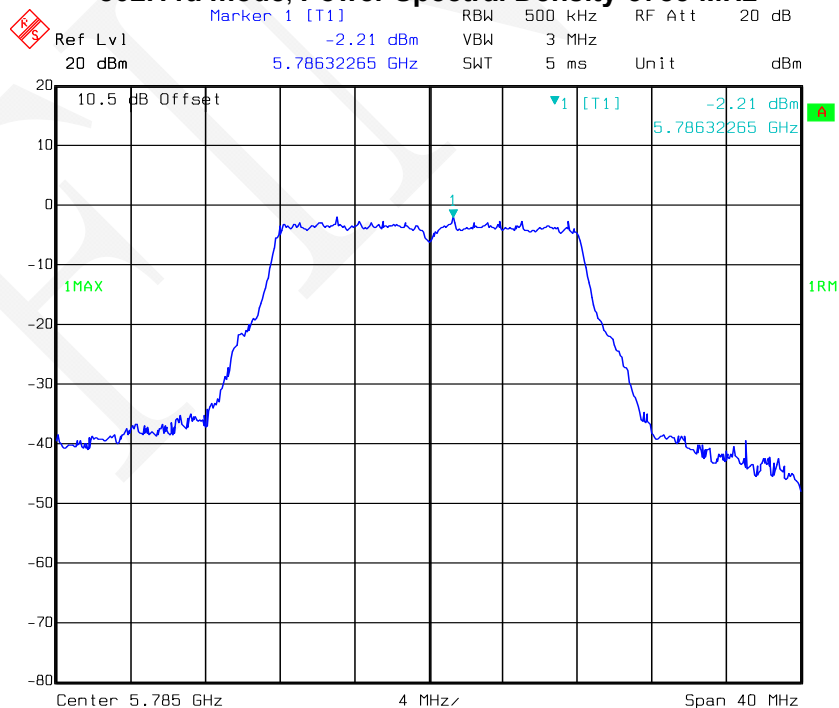
Mode	Channel	Frequency (MHz)	Power Spectral Density (dBm/500kHz)	Duty Cycle Factor (dB)	Total (dBm/500kHz)	Limit (dBm/500kHz)
802.11a	Low	5745	-1.83	0.06	-1.77	30
	Middle	5785	-2.21	0.06	-2.15	30
	High	5825	-3.09	0.06	-3.03	30
802.11n-HT20	Low	5745	-1.83	0.06	-1.77	30
	Middle	5785	-2.23	0.06	-2.17	30
	High	5825	-2.84	0.06	-2.78	30
802.11n-HT40	Low	5755	-4.85	0.13	-4.72	30
	High	5795	-5.35	0.13	-5.22	30
802.11ac20	Low	5745	-2.24	0.06	-2.18	30
	Middle	5785	-2.56	0.06	-2.50	30
	High	5825	-3.14	0.06	-3.08	30
802.11ac40	Low	5755	-4.69	0.13	-4.56	30
	High	5795	-5.04	0.13	-4.91	30
802.11ac80	-	5775	-3.89	0.25	-3.64	30

802.11a mode, Power Spectral Density-5745 MHz



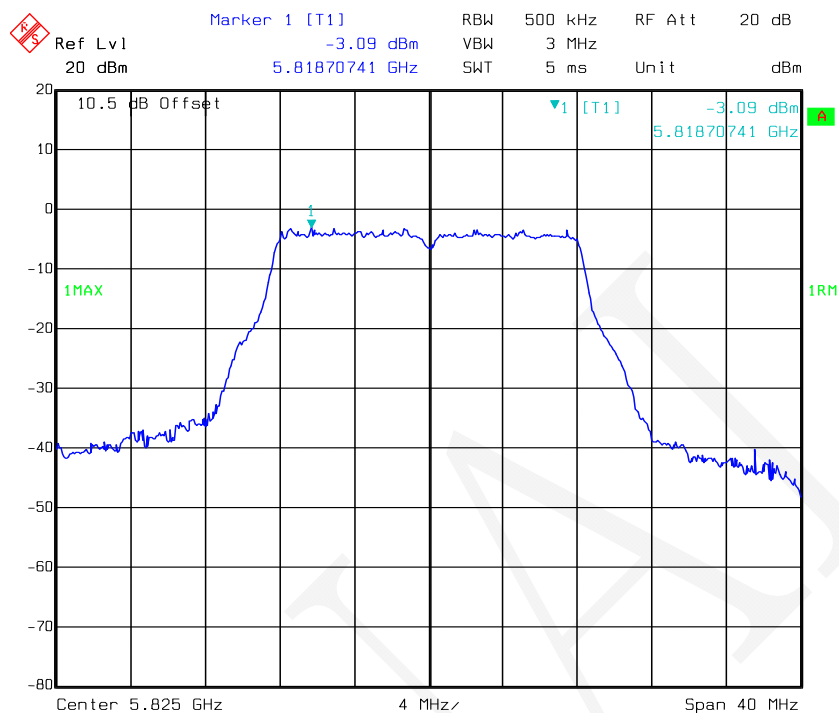
Date: 05.DEC.2018 14:16:52

802.11a mode, Power Spectral Density-5785 MHz



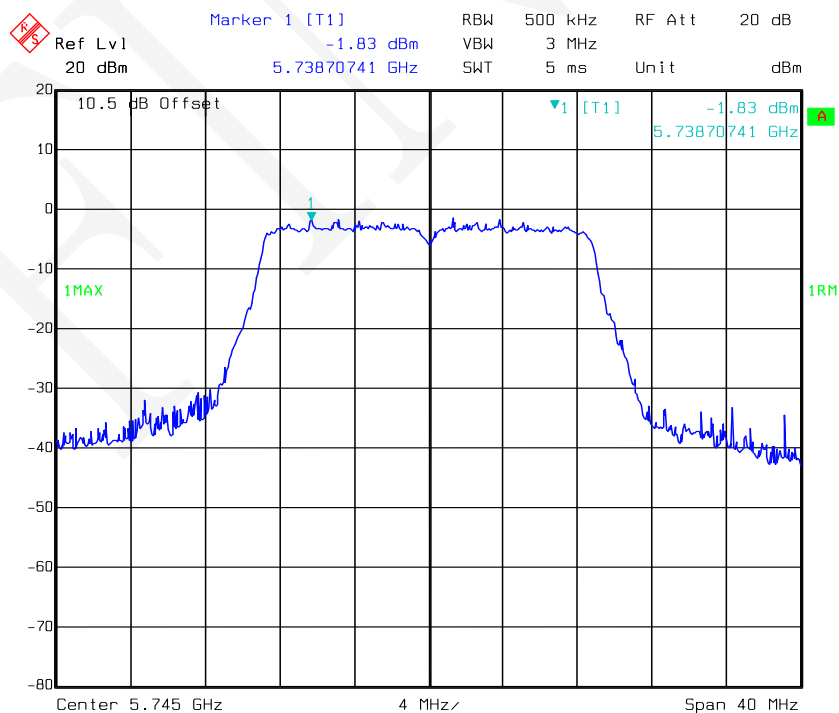
Date: 05.DEC.2018 14:17:19

802.11a mode, Power Spectral Density-5825 MHz



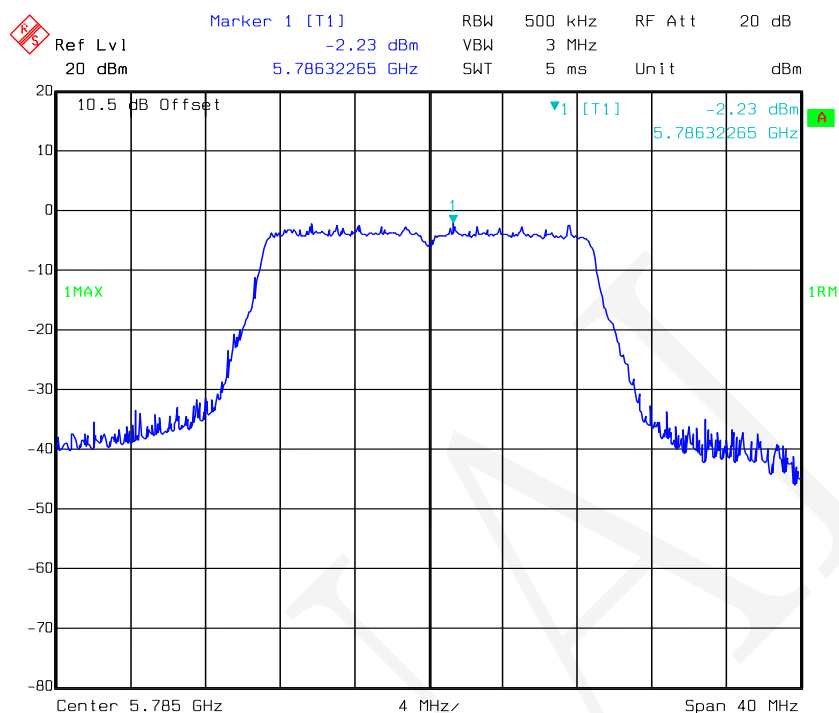
Date: 05.DEC.2018 14:17:52

802.11n-HT20 mode, Power Spectral Density-5745 MHz



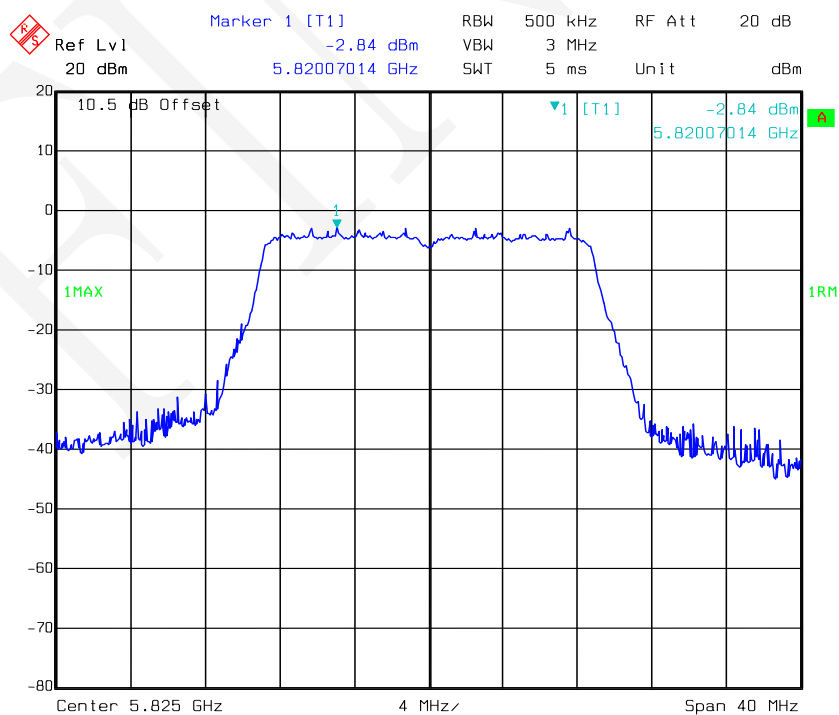
Date: 05.DEC.2018 14:19:13

802.11n-HT20 mode, Power Spectral Density-5785 MHz



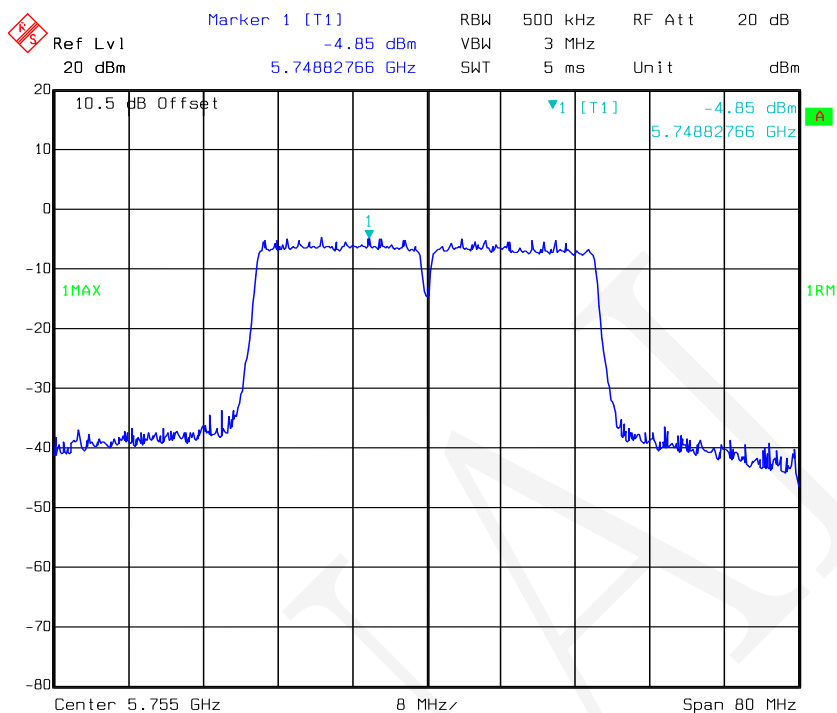
Date: 05.DEC.2018 14:19:41

802.11n-HT20 mode, Power Spectral Density-5825 MHz



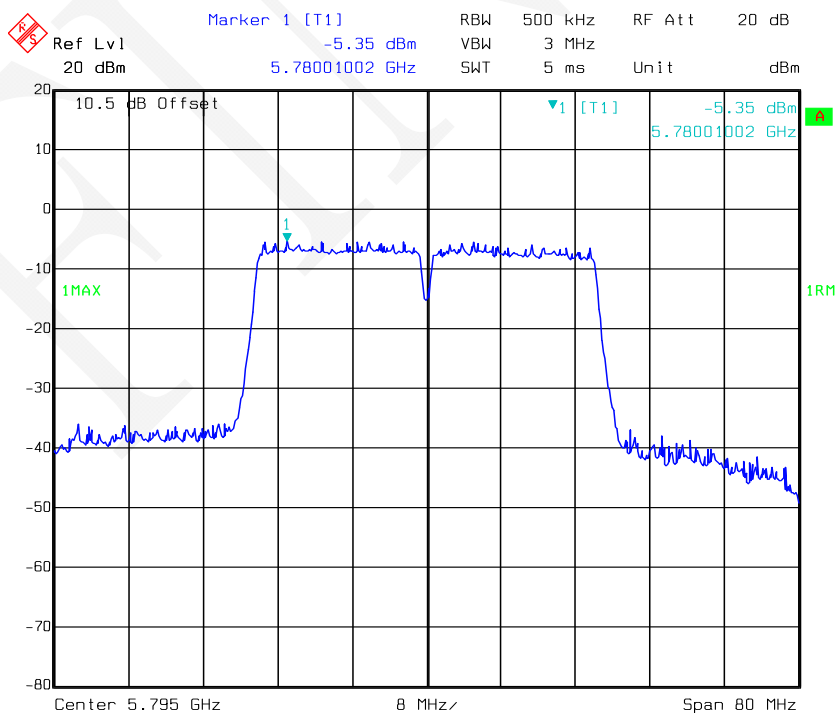
Date: 05.DEC.2018 14:20:12

802.11n-HT40 mode, Power Spectral Density-5755 MHz



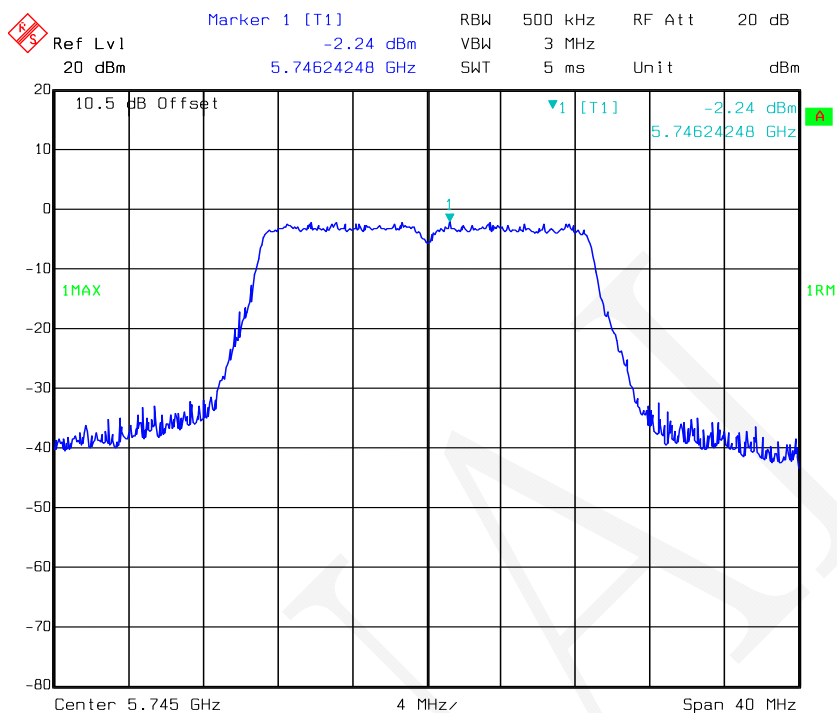
Date: 05.DEC.2018 14:24:30

802.11n-HT40 mode, Power Spectral Density-5795 MHz



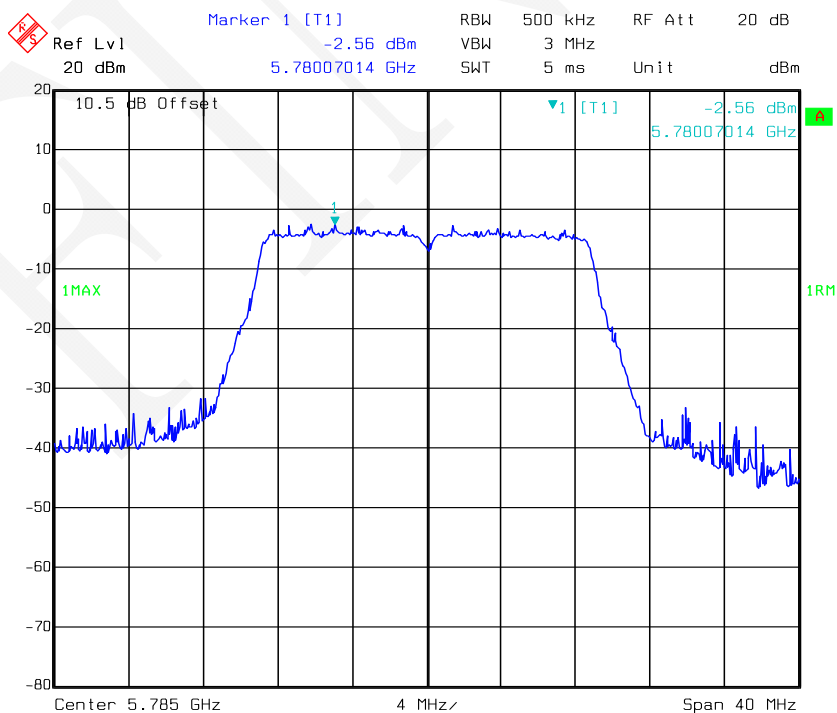
Date: 05.DEC.2018 14:24:51

802.11ac20 mode, Power Spectral Density-5745 MHz



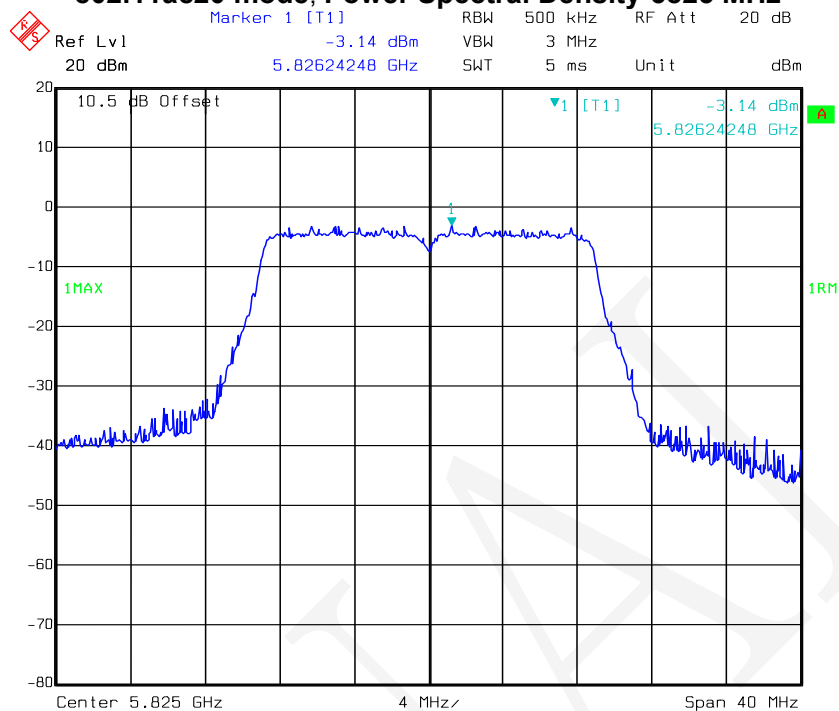
Date: 05.DEC.2018 14:21:17

802.11ac20 mode, Power Spectral Density-5785 MHz



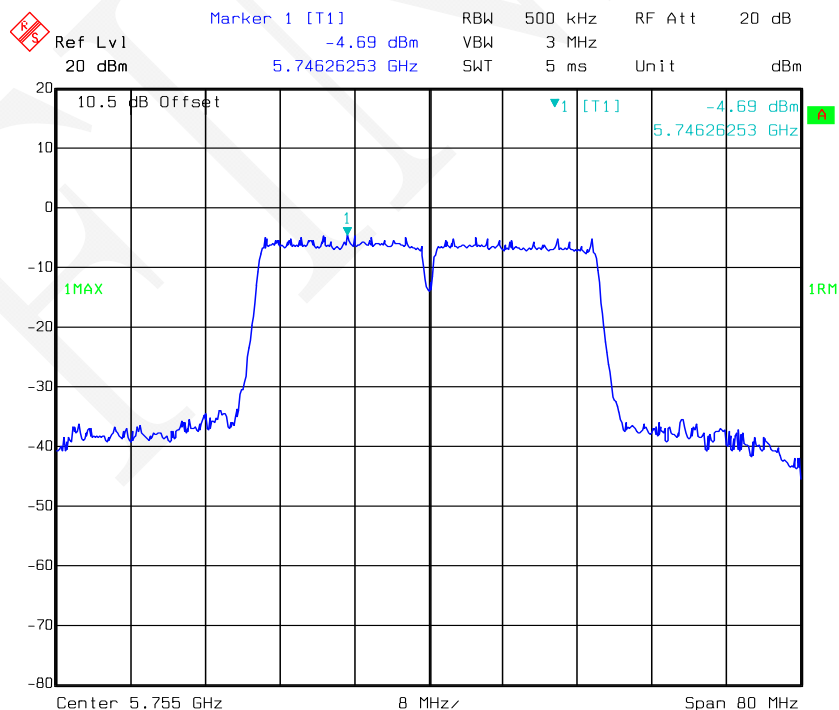
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802.11ac20 mode, Power Spectral Density-5825 MHz



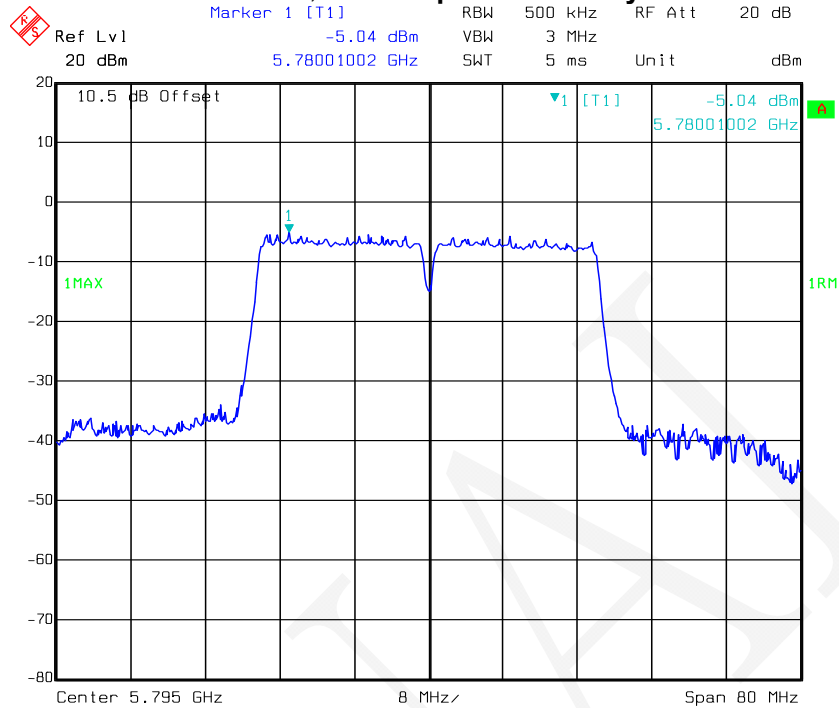
Date: 05.DEC.2018 14:22:05

802.11ac40 mode, Power Spectral Density-5755 MHz



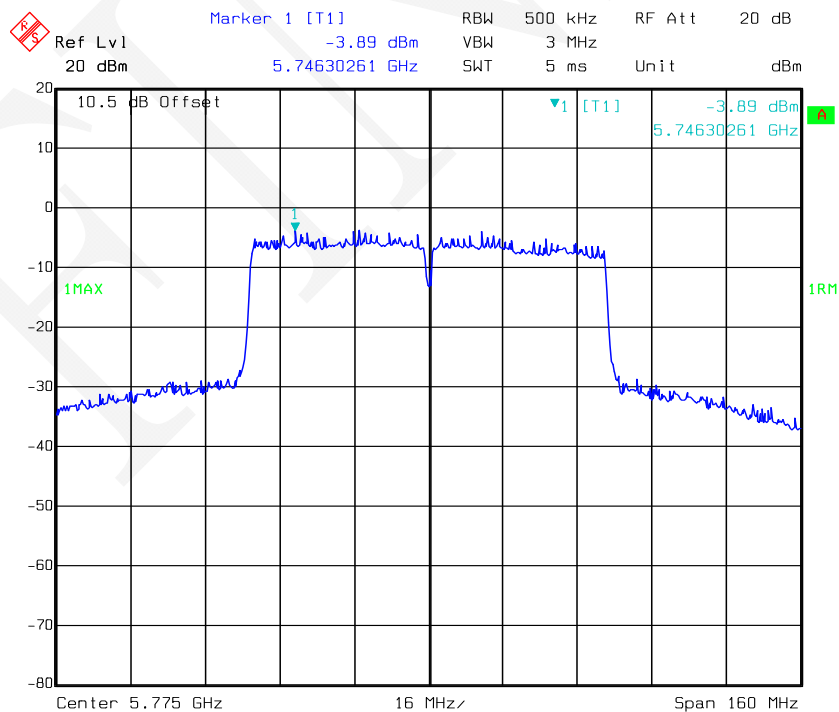
Date: 05.DEC.2018 14:23:07

802.11ac40 mode, Power Spectral Density-5795 MHz



Date: 05.DEC.2018 14:23:34

802.11ac80 mode, Power Spectral Density-5775 MHz



Date: 05.DEC.2018 14:26:03

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