



FCC PART 15.407 TEST REPORT

For

Chengdu XGimi Technology Co., Ltd.

5F, Building A7, Tianfu Software Park, Tianfu Avenue, Hi-tech Zone, Chengdu, China

FCC ID: 2AFENG03V

Report Type: Original Report	Product Name: LED Projector
Report Number:	RSC170825002D
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The **Chengdu XGimi Technology Co., Ltd.**, model number: **G03V (FCC ID: 2AFENG03V)** or the "EUT" as referred to in this report was one **LED Projector**.

Mechanical Description of EUT

The EUT was measured approximately: 138 mm (L) x 135 mm (W) x 119 mm (H).
Rated input voltage: DC10.89V from rechargeable Li-ion battery or DC 17.5V from adapter.

AC/DC Adapter information:

Model: ADP-60HD B

Input: 100-240V AC, 50/60Hz, 1.5A

Output: 17.5V DC, 3.42A

Note 1: The products, test model: G03V, multiple models: G02V, G04V, G05V, G06V, G07V. Their differences were presented in Product Difference Statement provided by the applicant of this report. So, we selected model G03V to fully test.

**All measurement and test data in this report was gathered from final production sample, serial number: 170825002/02 (assigned by the BACL, Chengdu). It may have deviation from any other sample. The EUT supplied by the applicant was received on 2017-08-11, and EUT conformed to test requirement.*

Objective

This type approval report is prepared on behalf of **Chengdu XGimi Technology Co., 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 15.247 DSS submissions with FCC ID: 2AFENG03V

FCC Part 15.247 DTS submissions with FCC ID: 2AFENG03V

FCC Part 15.247 DTS submissions with FCC ID: 2AFENB914C

Measurement Uncertainty

Item			Uncertainty
AC power line conducted emission			2.71 dB
Radiated Emission(Field Strength)	30MHz-200MHz	H	4.57 dB
		V	4.81 dB
	200MHz-1GHz	H	5.69 dB
		V	6.07 dB
	1GHz-6GHz		5.49 dB
	6GHz-18GHz		5.57 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 v01r04.

Test Facility

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

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

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

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

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.

802.11a supports SISO, 802.11n/ac supports SISO and MIMO mode. For Radiated Emission, according to pretest, the worst case of 802.11a is antenna 1, the worst case of 802.11ac/n are MIMO mode. So 802.11a antenna 1 and 802.11ac/n MIMO mode test data were recorded in the report.

EUT Exercise Software

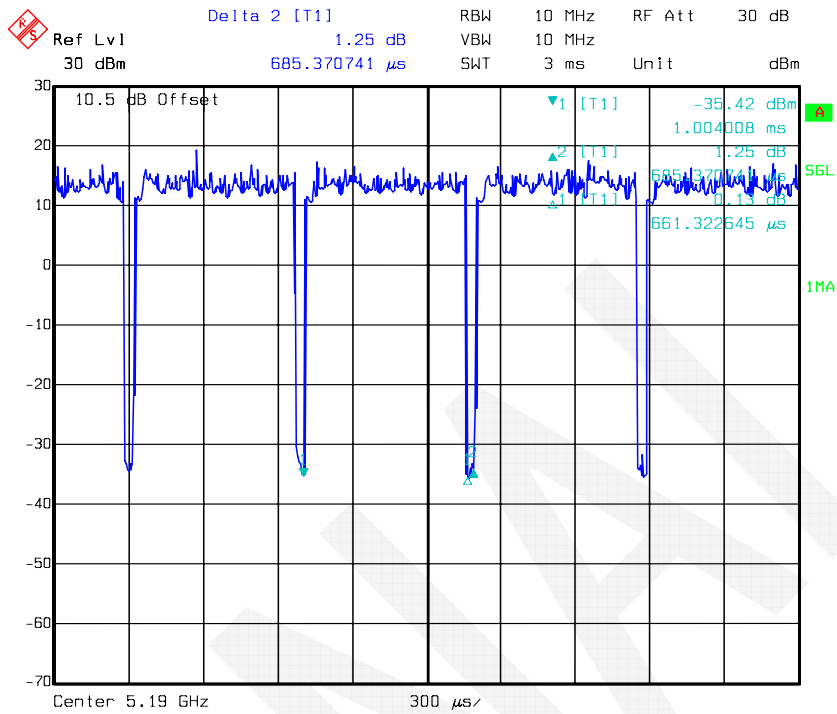
The software "RF Tool" was used for testing, which was provided by manufacturer. The maximum power with maximum duty cycle was set as below:

Software				RF Tool			
UNII Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)		Power Level	
				Antenna 0	Antenna 1	Antenna 0	Antenna 1
5150-5250MHz	802.11a	Low	5180	6	6	11	11
		Middle	5200	6	6	11	11
		High	5240	6	6	11	11
	802.11n-HT20	Low	5180	MCS0	MCS0	11	11
		Middle	5200	MCS0	MCS0	11	11
		High	5240	MCS0	MCS0	11	11
	802.11n-HT40	Low	5190	MCS0	MCS0	9	9
		High	5230	MCS0	MCS0	9	9
	802.11ac20	Low	5180	MCS0	MCS0	11	11
		Middle	5200	MCS0	MCS0	11	11
		High	5240	MCS0	MCS0	11	11
	802.11ac40	Low	5190	MCS0	MCS0	9	9
		High	5230	MCS0	MCS0	9	9
5725-5850MHz	802.11a	Low	5745	6	6	11	11
		Middle	5785	6	6	11	11
		High	5825	6	6	11	11
	802.11n-HT20	Low	5745	MCS0	MCS0	11	11
		Middle	5785	MCS0	MCS0	11	11
		High	5825	MCS0	MCS0	11	11
	802.11n-HT40	Low	5755	MCS0	MCS0	11	11
		High	5795	MCS0	MCS0	11	11
	802.11ac20	Low	5745	MCS0	MCS0	11	11
		Middle	5785	MCS0	MCS0	11	11
		High	5825	MCS0	MCS0	11	11
	802.11ac40	Low	5755	MCS0	MCS0	11	11
		High	5795	MCS0	MCS0	11	11
5725-5850MHz	802.11ac80	Middle	5775	MCS0	MCS0	11	11

Duty Cycle information is below:

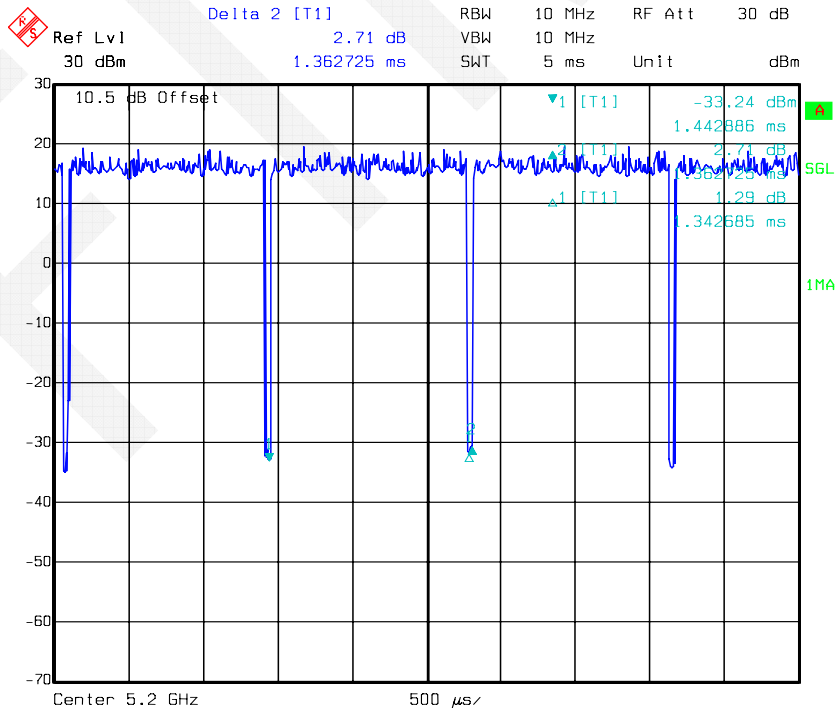
Mode	Ton (ms)	Ton+Toff(ms)	Duty (%)
802.11a	1.41	1.43	98.60
802.11n-HT20	1.33	1.34	99.25
802.11n-HT40	0.66	0.69	95.65
802.11ac20	1.34	1.36	98.53
802.11ac40	0.68	0.71	95.77
802.11ac80	0.35	0.38	92.11

802.11n- HT40



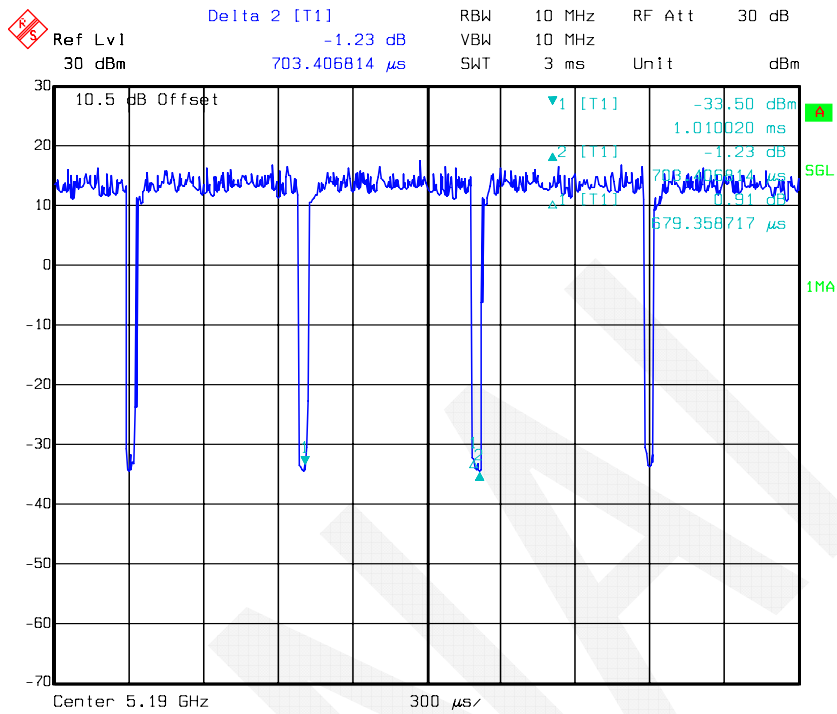
Date: 26.SEP.2017 17:45:23

802.11ac20

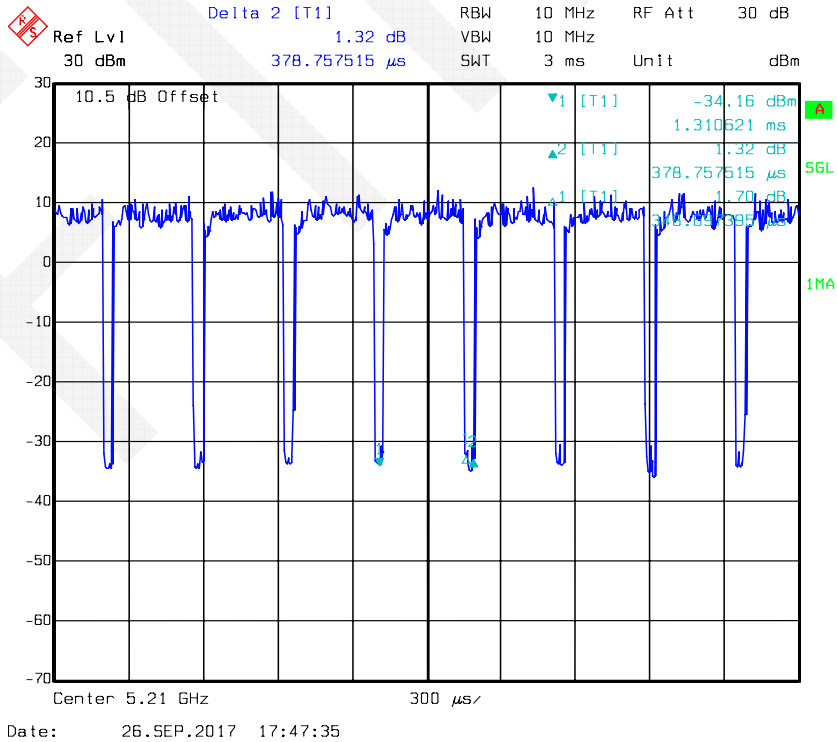


Date: 26.SEP.2017 17:16:17

802.11ac40



802.11ac80



Support Equipment List and Details

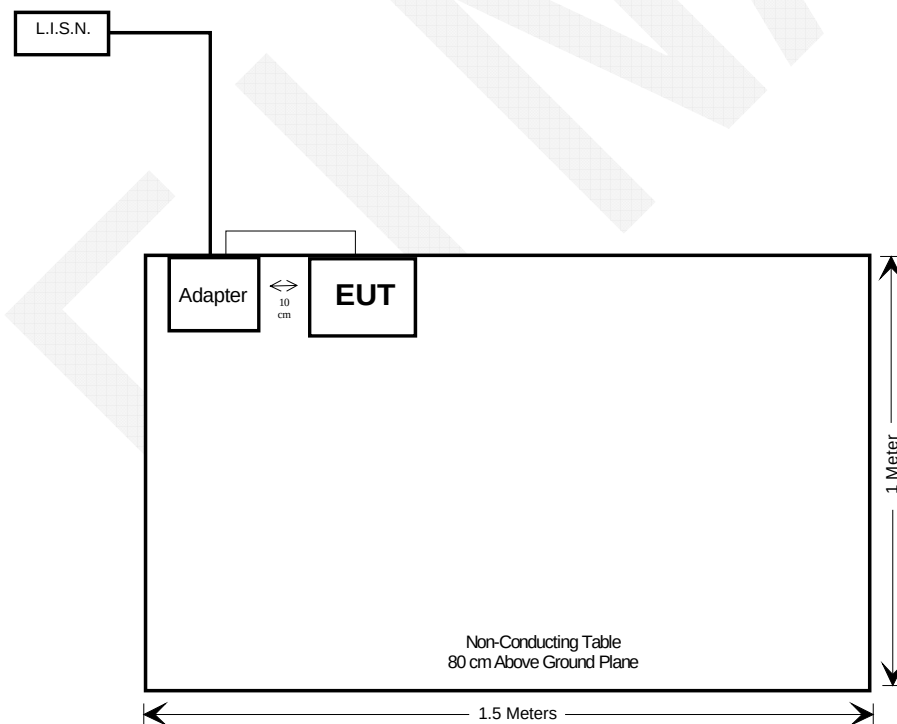
Manufacturer	Description	Model	Serial Number
-	-	-	-

External I/O Cable

Cable Description	Length (m)	From	To
Adapter DC cable	1.70	Adapter	EUT

Block Diagram of Test Setup

AC power line conducted emission test



Test Equipments List

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emissions Test					
Rohde & Schwarz	EMI Test Receiver	ESCS 30	836858/0016	2016-12-02	2017-12-01
Rohde & Schwarz	L.I.S.N.	ENV216	100018	2017-05-20	2018-05-19
EMCO	L.I.S.N.	3810-2/NM	9803-1907	2016-10-31	2017-10-30
Rohde & Schwarz	PULSE LIMITER	ESH3Z2	DE14781	2016-11-10	2017-11-09
N/A	Conducted Cable	NO.5	N/A	2016-11-10	2017-11-09
Rohde & Schwarz	EMC32	N/A	V 8.52.0	N/A	N/A
Radiated Emissions Test					
Sonoma	Pre-Amplifier	310N	186684	2017-08-18	2018-08-17
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2017-05-20	2018-05-19
Sunol Sciences	Broadband Antenna	JB3	A121808	2017-05-18	2020-05-17
Rohde & Schwarz	EMI Test Receiver	ESIB 40	100215	2017-09-12	2018-09-11
ETS	Horn Antenna	3115	003-6076	2017-05-19	2020-05-18
A.H.Systems,inc	Horn Antenna	SAS-574	505	2016-12-02	2017-12-01
Mini-circuits	Pre-Amplifier	ZVA-183-S+	771001215	2017-05-20	2018-05-19
Quinstar	Pre-Amplifier	QLW-18405536-JO	15964004001	2017-05-20	2018-05-19
INMET	Attenuator	N-6dB	/	2016-11-10	2017-11-09
Sinoscite.,Co Ltd	Reject Band Filter	BSF 5150-5850MN	0899V2	2016-11-10	2017-11-09
EMCT	Semi-Anechoic Chamber	966	N/A	2015-04-24	2018-04-23
N/A	RF Cable (below 1GHz)	NO.1	N/A	2016-11-10	2017-11-09
N/A	RF Cable (below 1GHz)	NO.4	N/A	2016-11-10	2017-11-09
N/A	RF Cable (above 1GHz)	NO.2	N/A	2016-11-10	2017-11-09
Rohde & Schwarz	EMC32	N/A	V 8.52.0	N/A	N/A
RF Conducted Test					
Rohde & Schwarz	Spectrum Analyzer	FSEM30	100018	2017-05-18	2018-05-17
WEINSCHL ENGINEERING	Attenuator	1A10dB	AA4135	2016-11-10	2017-11-09
Agilent	USB Wideband Power Sensor	U2021XA	MY53320008	2016-12-02	2017-12-01
ZHAOXIN	DC Power Supply	RXN-305D	17R305D050045	2017-07-02	2018-07-01
Shenzhen BACL	High Temperature Test Chamber	BTH-150	30024	2016-12-02	2017-12-01
FLUKE	Multimeter	114	28810293WS	2017-05-18	2018-05-17
N/A	RF Cable	NO.3	N/A	2016-11-10	2017-11-09
E-Microwave	DC Block	EMDCB-00036	OE01304225	Each Time	/
N/A	RF Cable	N/A	N/A	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).

SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.407(f) & §1.1310 & §2.1091	Maximum Permissible Exposure(MPE)	Compliance
§15.203	Antenna Requirement	Compliance
§15.407(b)(6)& §15.207(a)	Conducted Emissions	Compliance
§15.205& §15.209 §15.407(b) (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(g)	Frequency Stability	Compliance
§15.407(a)(1),(3)	Conducted Transmitter Output Power	Compliance
§15.407 (a)(1),(3),(5)	Power Spectral Density	Compliance

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

Applicable Standard

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

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

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

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

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

Per 447498 D01 General RF Exposure Guidance v05r02, simultaneous transmission MPE test exclusion applies when the sum of the MPE for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modeled or measured field strengths or power density, is ≤ 1.0.

Calculated Formulary:

Predication of MPE limit at a given distance

$$S = PG/4\pi R^2$$

Where:

S = power density (in appropriate units, e.g. mW/cm²);

P = power input to the antenna (in appropriate units, e.g., mW);

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

The rated tune-up output power and antenna gain in the below table:

Calculated Data:

MPE evaluation for single transmission:

Mode	Frequency Range (MHz)	Antenna Gain		Tune-up Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
		(dBi)	(numeric)	(dBm)	(mW)			
WLAN	2412-2462	2.81	1.91	25.0	316.23	20	0.120	1.0
	5180-5240	3.66	2.32	15.0	31.62	20	0.015	1.0
	5745-5825	3.66	2.32	15.0	31.62	20	0.015	1.0
Bluetooth	2402-2480	2.55	1.80	5.0	3.16	20	0.001	1.0

Note: Wi-Fi (2.4G) & Bluetooth or Wi-Fi (5G) & Bluetooth can transmit simultaneously.

MPE evaluation for simultaneous transmission:

The MPE evaluation is as below formula:

$PD1/Limit1 + PD2/Limit2 + \dots < 1$, PD (Power Density)

MPE evaluation (Worst case):

Wi-Fi (2.4G) & Bluetooth:

Max MPE of Wi-Fi (2.4G) + Max MPE of Bluetooth = $0.12/1 + 0.001/1 = 0.121 < 1.0$

Result: MPE evaluation of single and simultaneous transmission meet the requirement of standard.

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 used three internal FPC antennas and with I-PEX connector, two of them are for Wi-Fi (2.4GHz/5GHz), the other is for Bluetooth, which were permanently attached, fulfill the requirement of this section. Please refer to the EUT internal photos and the below table for detail.

Antenna Information

Antenna Model Number	Manufacturer	Band	Antenna Gain	Antenna type	Connector
AG-041533-1144 FPC(26mm*25mm)	ZHONGSHAN B&T TECHONLOGY Co.,Ltd	Wi-Fi 2.4GHz	2.58dBi	Omni-directional	IPEX
		Wi-Fi 5GHz	3.55dBi	Omni-directional	IPEX
AG-041533-1145 FPC(42mm*7mm)	ZHONGSHAN B&T TECHONLOGY Co.,Ltd	Wi-Fi 2.4GHz	2.81dBi	Omni-directional	IPEX
		Wi-Fi 5GHz	3.66dBi	Omni-directional	IPEX
AG-041300-1146 FPC(21.3mm*20.3mm)	ZHONGSHAN B&T TECHONLOGY Co.,Ltd	Bluetooth 2.4GHz	2.55dBi	Omni-directional	IPEX

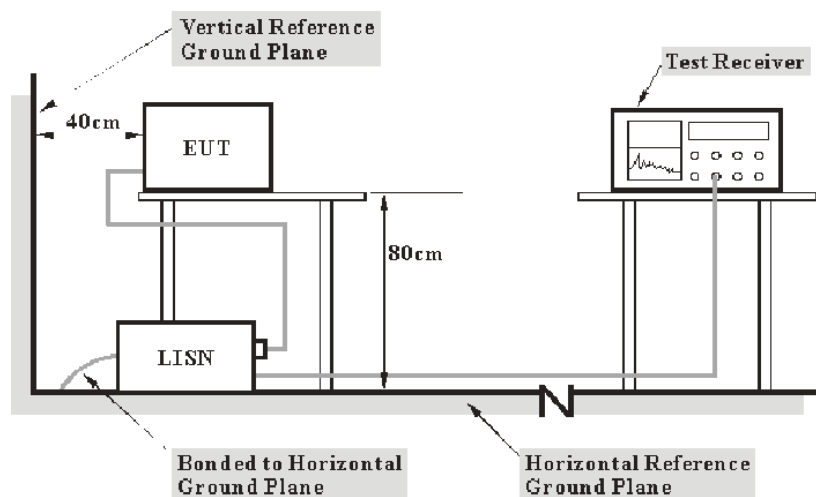
Result: Compliance.

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

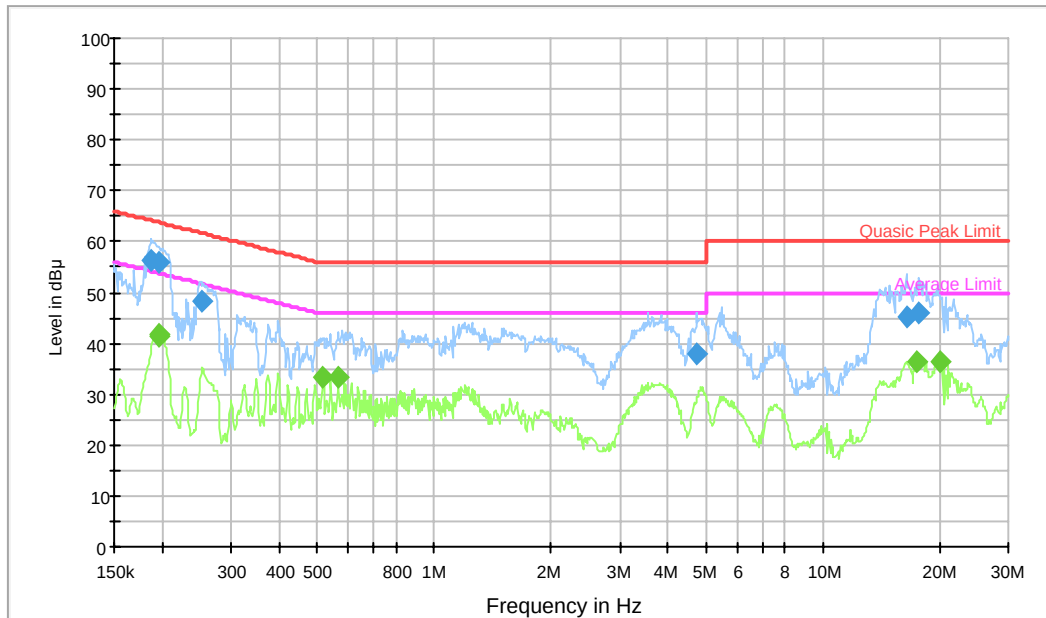
Environmental Conditions

Temperature:	28 °C
Relative Humidity:	50 %
ATM Pressure:	95.5 kPa

The testing was performed by Tom Tang on 2017-09-12.

Test Mode: Transmitting

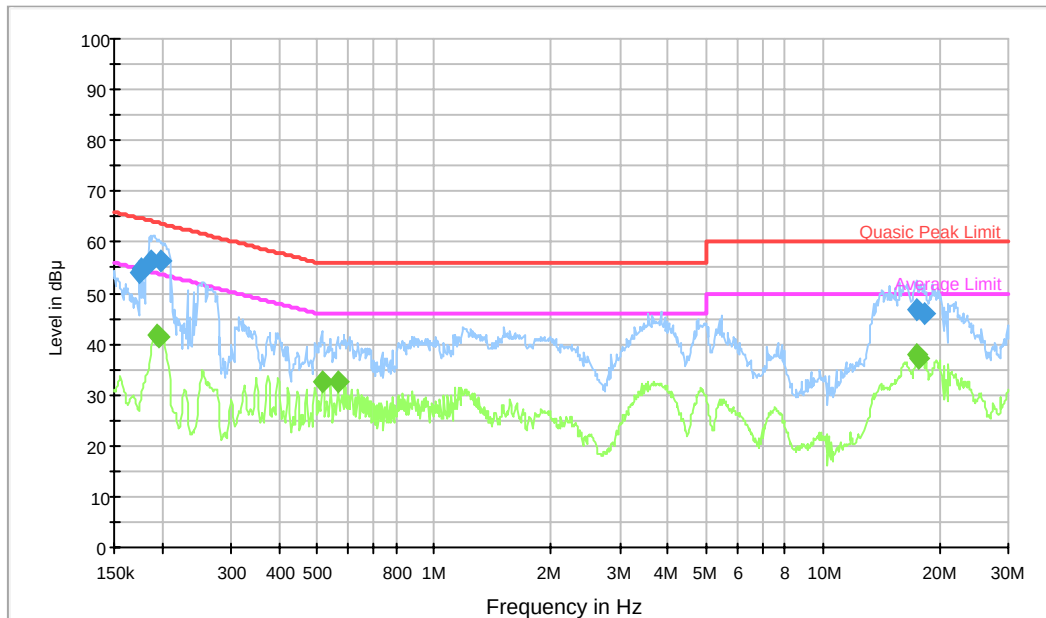
AC120V/60Hz, Line



Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBμV)
0.189809	56.3	9.000	L1	15.3	7.9	64.2
0.196363	56.4	9.000	L1	15.1	7.4	63.8
0.250724	48.4	9.000	L1	14.5	13.3	61.7
4.731581	37.7	9.000	L1	13.5	18.3	56.0
16.381575	45.3	9.000	L1	14.9	14.7	60.0
17.782412	46.4	9.000	L1	15.0	13.6	60.0

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBμV)
0.197386	41.4	9.000	L1	15.1	12.4	53.8
0.196363	41.3	9.000	L1	15.1	12.5	53.8
0.516743	33.5	9.000	L1	13.4	12.5	46.0
0.565280	33.4	9.000	L1	13.4	12.6	46.0
17.478915	36.2	9.000	L1	15.0	13.8	50.0
19.988533	36.5	9.000	L1	15.2	13.5	50.0

AC120V/60Hz, Neutral



Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBμV)
0.175210	54.3	9.000	N	15.5	10.5	64.8
0.176836	54.6	9.000	N	15.5	10.0	64.6
0.187809	56.5	9.000	N	15.3	7.7	64.2
0.197344	56.1	9.000	N	15.1	7.6	63.7
17.479915	46.8	9.000	N	15.0	13.2	60.0
18.192430	45.6	9.000	N	15.1	14.4	60.0

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBμV)
0.194484	41.4	9.000	N	15.2	12.5	53.9
0.196363	41.2	9.000	N	15.1	12.5	53.8
0.516743	32.6	9.000	N	13.4	13.4	46.0
0.567280	32.5	9.000	N	13.4	13.5	46.0
17.478915	37.7	9.000	N	15.0	12.3	50.0
17.742412	37.4	9.000	N	15.0	12.6	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.

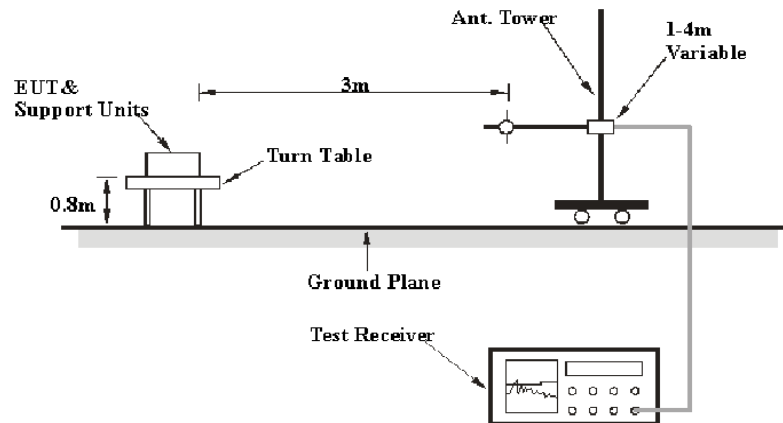
According to KDB 789033 D02 General UNII Test Procedures v01, emission shall be computed as:

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

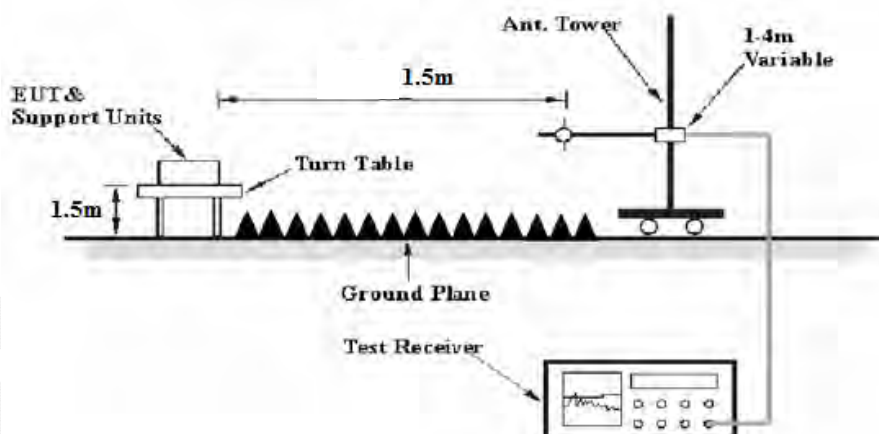
- 1) For 75 MHz above or below the band edge, a level of -27 dBm/MHz (68.2dBμV/m) was applied.
- 2) For 25MHz-75 MHz above or below the band edge, a level of 10 dBm/MHz (105.2dBμV/m) was applied.
- 3) For 5MHz-25 MHz above or below the band edge, a level of 15.6 dBm/MHz (110.8dBμV/m) was applied.
- 4) For 0 MHz-5 MHz above or below the band edge, a level of 27 dBm/MHz (122.2dBμV/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 & 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	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 v01r03, 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

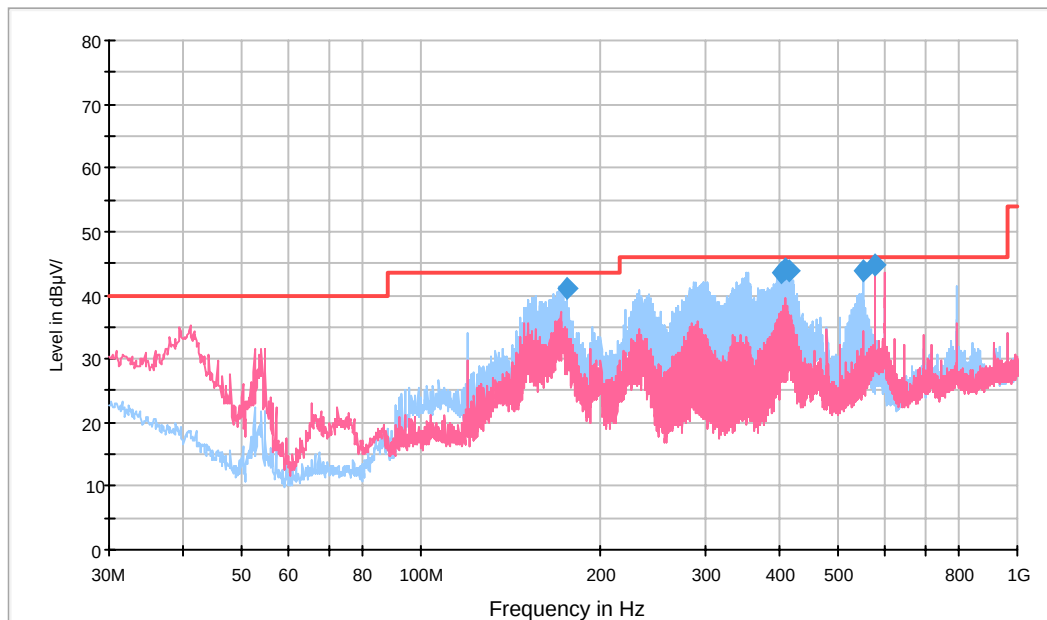
Environmental Conditions

Temperature:	29 °C
Relative Humidity:	55 %
ATM Pressure:	95.5 kPa

The testing was performed by Tom Tang on 2017-09-27.

Test mode: Transmitting

1) 30 MHz to 1 GHz:



Frequency (MHz)	QuasicPeak (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corrected Factor (dB/m)	Margin (dB)	Limit (dBμV/m)
175.378750	41.1	150.0	H	96.0	-12.7	*2.4	43.5
401.025000	43.5	100.0	H	263.0	-8.9	*2.5	46.0
408.057500	44.0	200.0	H	54.0	-8.8	*2.0	46.0
415.090000	43.7	100.0	H	38.0	-8.7	*2.3	46.0
552.102500	43.9	165.0	H	23.0	-5.7	*2.1	46.0
575.988750	44.8	150.0	V	81.0	-5.3	*1.2	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 (SISO) (Antenna 1-Worst Case)

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	72.38	PK	H	34.51	5.21	0.00	112.10	106.10	N/A	N/A
5180	62.56	AV	H	34.51	5.21	0.00	102.28	96.28	N/A	N/A
5180	70.19	PK	V	34.51	5.21	0.00	109.91	103.91	N/A	N/A
5180	68.34	AV	V	34.51	5.21	0.00	108.06	102.06	N/A	N/A
5150	31.32	PK	H	34.49	5.18	0.00	70.99	64.99	74.00	9.01
5150	16.45	AV	H	34.49	5.18	0.00	56.12	50.12	54.00	*3.88
10360	39.19	PK	H	38.67	7.76	26.37	59.25	53.25	74.00	20.75
10360	34.43	AV	H	38.67	7.76	26.37	54.49	48.49	54.00	5.51
Frequency: 5200 MHz										
5200	71.28	PK	H	34.52	5.23	0.00	111.03	105.03	N/A	N/A
5200	61.36	AV	H	34.52	5.23	0.00	101.11	95.11	N/A	N/A
5200	69.26	PK	V	34.52	5.23	0.00	109.01	103.01	N/A	N/A
5200	63.27	AV	V	34.52	5.23	0.00	103.02	97.02	N/A	N/A
10400	37.96	PK	H	38.68	7.79	26.36	58.07	52.07	74.00	21.93
10400	28.34	AV	H	38.68	7.79	26.36	48.45	42.45	54.00	11.55
Frequency: 5240 MHz										
5240	70.48	PK	H	34.54	5.27	0.00	110.29	104.29	N/A	N/A
5240	60.47	AV	H	34.54	5.27	0.00	100.28	94.28	N/A	N/A
5240	68.81	PK	V	34.54	5.27	0.00	108.62	102.62	N/A	N/A
5240	58.44	AV	V	34.54	5.27	0.00	98.25	92.25	N/A	N/A
5350	31.11	PK	H	34.61	5.37	0.00	71.09	65.09	74.00	8.91
5350	17.34	AV	H	34.61	5.37	0.00	57.32	51.32	54.00	*2.68
10480	37.07	PK	H	38.70	7.84	26.35	57.26	51.26	74.00	22.74
10480	22.49	AV	H	38.70	7.84	26.35	42.68	36.68	54.00	17.32

*Within measurement uncertainty!

For 802.11n-HT20 mode (MIMO)

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	74.91	PK	H	34.51	5.21	0.00	114.63	108.63	N/A	N/A
5180	63.13	AV	H	34.51	5.21	0.00	102.85	96.85	N/A	N/A
5180	72.01	PK	V	34.51	5.21	0.00	111.73	105.73	N/A	N/A
5180	60.36	AV	V	34.51	5.21	0.00	100.08	94.08	N/A	N/A
5150	32.68	PK	H	34.49	5.18	0.00	72.35	66.35	74.00	7.65
5150	17.43	AV	H	34.49	5.18	0.00	57.10	51.10	54.00	*2.90
10360	39.89	PK	H	38.67	7.76	26.37	59.95	53.95	74.00	20.05
10360	24.62	AV	H	38.67	7.76	26.37	44.68	38.68	54.00	15.32
Frequency: 5200 MHz										
5200	74.23	PK	H	34.52	5.23	0.00	113.98	107.98	N/A	N/A
5200	62.61	AV	H	34.52	5.23	0.00	102.36	96.36	N/A	N/A
5200	71.71	PK	V	34.52	5.23	0.00	111.46	105.46	N/A	N/A
5200	60.62	AV	V	34.52	5.23	0.00	100.37	94.37	N/A	N/A
10400	38.55	PK	H	38.68	7.79	26.36	58.66	52.66	74.00	21.34
10400	23.47	AV	H	38.68	7.79	26.36	43.58	37.58	54.00	16.42
Frequency: 5240 MHz										
5240	73.64	PK	H	34.54	5.27	0.00	113.45	107.45	N/A	N/A
5240	61.99	AV	H	34.54	5.27	0.00	101.80	95.80	N/A	N/A
5240	71.64	PK	V	34.54	5.27	0.00	111.45	105.45	N/A	N/A
5240	60.60	AV	V	34.54	5.27	0.00	100.41	94.41	N/A	N/A
5350	30.87	PK	H	34.61	5.37	0.00	70.85	64.85	74.00	9.15
5350	17.68	AV	H	34.61	5.37	0.00	57.66	51.66	54.00	*2.34
10480	37.42	PK	H	38.70	7.84	26.35	57.61	51.61	74.00	22.39
10480	22.96	AV	H	38.70	7.84	26.35	43.15	37.15	54.00	16.85

*Within measurement uncertainty!

For 802.11n-HT40 mode (MIMO)

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	73.83	PK	H	34.51	5.22	0.00	113.56	107.56	N/A	N/A
5190	62.09	AV	H	34.51	5.22	0.00	101.82	95.82	N/A	N/A
5190	71.91	PK	V	34.51	5.22	0.00	111.64	105.64	N/A	N/A
5190	60.73	AV	V	34.51	5.22	0.00	100.46	94.46	N/A	N/A
5150	32.98	PK	H	34.49	5.18	0.00	72.65	66.65	74.00	7.35
5150	17.82	AV	H	34.49	5.18	0.00	57.49	51.49	54.00	*2.51
10380	39.11	PK	H	38.68	7.78	26.37	59.20	53.20	74.00	20.80
10380	24.35	AV	H	38.68	7.78	26.37	44.44	38.44	54.00	15.56
Frequency: 5230 MHz										
5230	72.89	PK	H	34.54	5.26	0.00	112.69	106.69	N/A	N/A
5230	60.45	AV	H	34.54	5.26	0.00	100.25	94.25	N/A	N/A
5230	71.68	PK	V	34.54	5.26	0.00	111.48	105.48	N/A	N/A
5230	60.70	AV	V	34.54	5.26	0.00	100.50	94.50	N/A	N/A
5350	31.49	PK	H	34.61	5.37	0.00	71.47	65.47	74.00	8.53
5350	17.75	AV	H	34.61	5.37	0.00	57.73	51.73	54.00	*2.27
10460	37.30	PK	H	38.69	7.83	26.36	57.46	51.46	74.00	22.54
10460	22.55	AV	H	38.69	7.83	26.36	42.71	36.71	54.00	17.29

*Within measurement uncertainty!

For 802.11ac20 mode (MIMO)

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	75.05	PK	H	34.51	5.21	0.00	114.77	108.77	N/A	N/A
5180	63.62	AV	H	34.51	5.21	0.00	103.34	97.34	N/A	N/A
5180	72.39	PK	V	34.51	5.21	0.00	112.11	106.11	N/A	N/A
5180	60.84	AV	V	34.51	5.21	0.00	100.56	94.56	N/A	N/A
5150	32.56	PK	H	34.49	5.18	0.00	72.23	66.23	74.00	7.77
5150	17.24	AV	H	34.49	5.18	0.00	56.91	50.91	54.00	*3.09
10360	39.81	PK	H	38.67	7.76	26.37	59.87	53.87	74.00	20.13
10360	24.36	AV	H	38.67	7.76	26.37	44.42	38.42	54.00	15.58
Frequency: 5200 MHz										
5200	74.27	PK	H	34.52	5.23	0.00	114.02	108.02	N/A	N/A
5200	62.65	AV	H	34.52	5.23	0.00	102.40	96.40	N/A	N/A
5200	71.84	PK	V	34.52	5.23	0.00	111.59	105.59	N/A	N/A
5200	60.71	AV	V	34.52	5.23	0.00	100.46	94.46	N/A	N/A
10400	38.39	PK	H	38.68	7.79	26.36	58.50	52.50	74.00	21.50
10400	23.38	AV	H	38.68	7.79	26.36	43.49	37.49	54.00	16.51
Frequency: 5240 MHz										
5240	73.79	PK	H	34.54	5.27	0.00	113.60	107.60	N/A	N/A
5240	62.06	AV	H	34.54	5.27	0.00	101.87	95.87	N/A	N/A
5240	71.76	PK	V	34.54	5.27	0.00	111.57	105.57	N/A	N/A
5240	60.78	AV	V	34.54	5.27	0.00	100.59	94.59	N/A	N/A
5350	30.82	PK	H	34.61	5.37	0.00	70.80	64.80	74.00	9.20
5350	17.46	AV	H	34.61	5.37	0.00	57.44	51.44	54.00	*2.56
10480	37.34	PK	H	38.70	7.84	26.35	57.53	51.53	74.00	22.47
10480	22.75	AV	H	38.70	7.84	26.35	42.94	36.94	54.00	17.06

*Within measurement uncertainty!

For 802.11ac40 mode (MIMO)

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	73.67	PK	H	34.51	5.22	0.00	113.40	107.40	N/A	N/A
5190	62.07	AV	H	34.51	5.22	0.00	101.80	95.80	N/A	N/A
5190	71.97	PK	V	34.51	5.22	0.00	111.70	105.70	N/A	N/A
5190	60.82	AV	V	34.51	5.22	0.00	100.55	94.55	N/A	N/A
5150	32.69	PK	H	34.49	5.18	0.00	72.36	66.36	74.00	7.64
5150	17.56	AV	H	34.49	5.18	0.00	57.23	51.23	54.00	*2.77
10380	38.99	PK	H	38.68	7.78	26.37	59.08	53.08	74.00	20.92
10380	24.07	AV	H	38.68	7.78	26.37	44.16	38.16	54.00	15.84
Frequency: 5230 MHz										
5230	72.49	PK	H	34.54	5.26	0.00	112.29	106.29	N/A	N/A
5230	59.93	AV	H	34.54	5.26	0.00	99.73	93.73	N/A	N/A
5230	71.11	PK	V	34.54	5.26	0.00	110.91	104.91	N/A	N/A
5230	60.33	AV	V	34.54	5.26	0.00	100.13	94.13	N/A	N/A
5350	31.42	PK	H	34.61	5.37	0.00	71.40	65.40	74.00	8.60
5350	17.68	AV	H	34.61	5.37	0.00	57.66	51.66	54.00	*2.34
10460	37.09	PK	H	38.69	7.83	26.36	57.25	51.25	74.00	22.75
10460	22.43	AV	H	38.69	7.83	26.36	42.59	36.59	54.00	17.41

*Within measurement uncertainty!

For 802.11ac80 mode (MIMO)

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	72.46	PK	H	34.53	5.24	0.00	112.23	106.23	N/A	N/A
5210	60.99	AV	H	34.53	5.24	0.00	100.76	94.76	N/A	N/A
5210	70.59	PK	V	34.53	5.24	0.00	110.36	104.36	N/A	N/A
5210	58.87	AV	V	34.53	5.24	0.00	98.64	92.64	N/A	N/A
5150	33.05	PK	H	34.49	5.18	0.00	72.72	66.72	74.00	7.28
5150	18.34	AV	H	34.49	5.18	0.00	58.01	52.01	54.00	*1.99
5350	30.22	PK	H	34.61	5.37	0.00	70.20	64.20	74.00	9.80
5350	17.18	AV	H	34.61	5.37	0.00	57.16	51.16	54.00	*2.84
10420	37.97	PK	H	38.68	7.80	26.36	58.09	52.09	74.00	21.91
10420	22.19	AV	H	38.68	7.80	26.36	42.31	36.31	54.00	17.69

*Within measurement uncertainty!

Note:

Corrected Amplitude = Corrected Factor + Reading

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

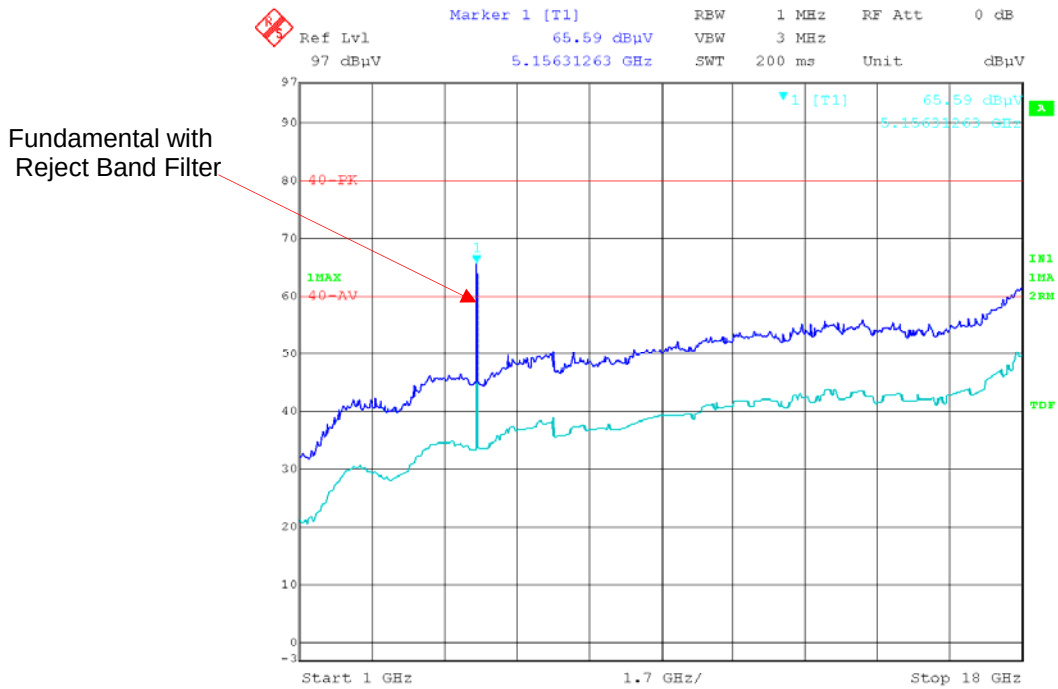
Margin = Limit- Corr. Amplitude

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

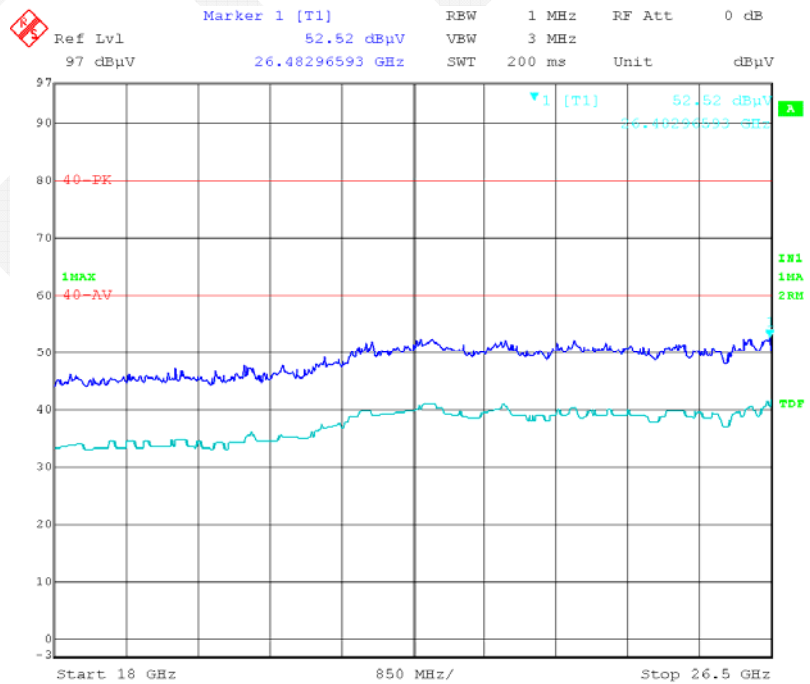
Please refer to the below pre-scan plot of worst case:

Note: The test distance is 1.5m. The limit is [74dBuV/m@3m, 80dBuV@1.5m](#) for PK, [60dBuV/m@3m, 80dBuV@1.5m](#) for AV.

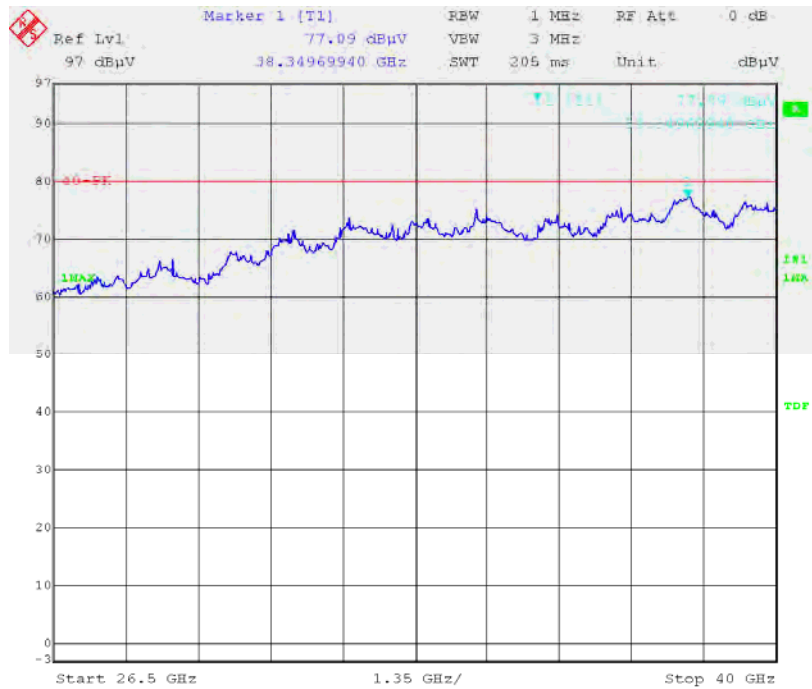
802.11n-HT20 Mode: Low Channel_Horizontal_1GHz-18GHz



802.11n-HT20 Mode: Low Channel_Horizontal_18GHz-26.5GHz

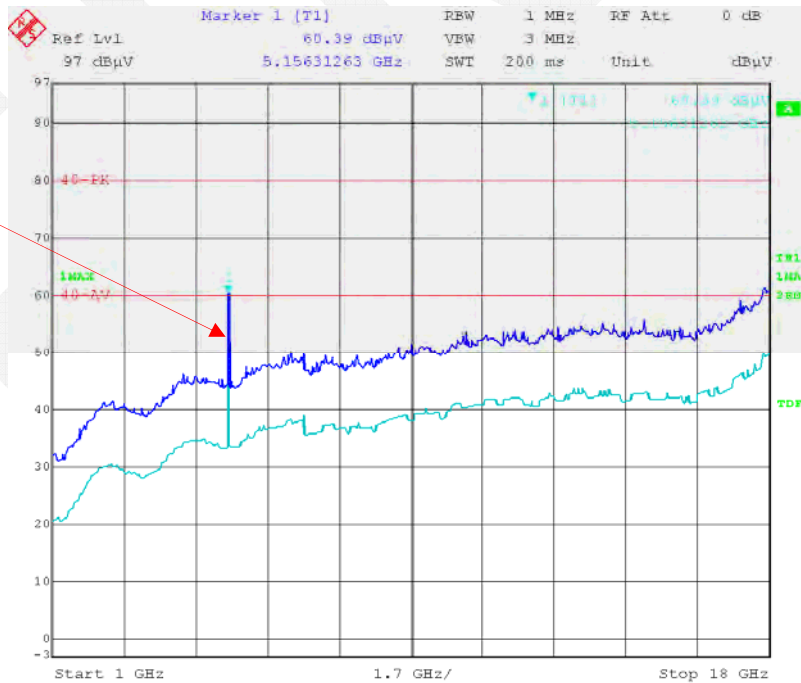


802.11n-HT20 Mode: Low Channel_Horizontal_26.5GHz-40GHz

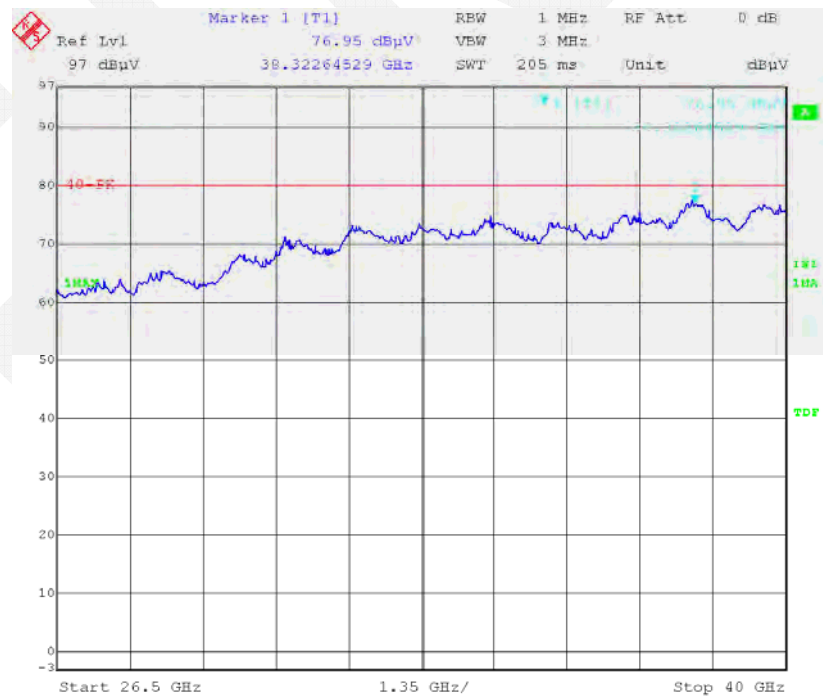


802.11n-HT20 Mode: Low Channel_Vertical_1GHz-18GHz

Fundamental with
Reject Band Filter



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For 5725-5850 MHz

For 802.11a mode (SISO) (Antenna 1-Worst Case)

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	72.24	PK	H	34.75	5.74	0.00	112.73	106.73	N/A	N/A
5745	62.63	AV	H	34.75	5.74	0.00	103.12	97.12	N/A	N/A
5745	71.04	PK	V	34.75	5.74	0.00	111.53	105.53	N/A	N/A
5745	60.39	AV	V	34.75	5.74	0.00	100.88	94.88	N/A	N/A
5650	30.81	PK	H	34.73	5.65	0.00	71.19	65.19	68.20	*3.01
5700	31.03	PK	H	34.74	5.70	0.00	71.47	65.47	105.20	39.73
5720	32.39	PK	H	34.74	5.71	0.00	72.84	66.84	110.80	43.96
5725	37.77	PK	H	34.75	5.72	0.00	78.24	72.24	122.20	49.96
11490	39.87	PK	H	38.90	8.22	26.02	60.97	54.97	74.00	19.03
11490	25.52	AV	H	38.90	8.22	26.02	46.62	40.62	54.00	13.38
Frequency: 5785 MHz										
5785	71.29	PK	H	34.76	5.77	0.00	111.82	105.82	N/A	N/A
5785	60.74	AV	H	34.76	5.77	0.00	101.27	95.27	N/A	N/A
5785	69.78	PK	V	34.76	5.77	0.00	110.31	104.31	N/A	N/A
5785	58.98	AV	V	34.76	5.77	0.00	99.51	93.51	N/A	N/A
11570	39.59	PK	H	38.91	8.21	26.00	60.71	54.71	74.00	19.29
11570	25.47	AV	H	38.91	8.21	26.00	46.59	40.59	54.00	13.41
Frequency: 5825 MHz										
5825	70.29	PK	H	34.77	5.81	0.00	110.87	104.87	N/A	N/A
5825	58.98	AV	H	34.77	5.81	0.00	99.56	93.56	N/A	N/A
5825	68.66	PK	V	34.77	5.81	0.00	109.24	103.24	N/A	N/A
5825	57.57	AV	V	34.77	5.81	0.00	98.15	92.15	N/A	N/A
5850	32.55	PK	H	34.77	5.83	0.00	73.15	67.15	122.20	55.05
5855	32.73	PK	H	34.77	5.83	0.00	73.33	67.33	110.80	43.47
5875	31.78	PK	H	34.78	5.85	0.00	72.41	66.41	105.20	38.79
5925	31.85	PK	H	34.79	5.89	0.00	72.53	66.53	68.20	*1.67
11650	39.07	PK	H	38.93	8.20	25.98	60.22	54.22	74.00	19.78
11650	25.13	AV	H	38.93	8.20	25.98	46.28	40.28	54.00	13.72

*Within measurement uncertainty!

For 802.11n-HT20 mode (MIMO)

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	75.39	PK	H	34.75	5.74	0.00	115.88	109.88	N/A	N/A
5745	63.59	AV	H	34.75	5.74	0.00	104.08	98.08	N/A	N/A
5745	73.27	PK	V	34.75	5.74	0.00	113.76	107.76	N/A	N/A
5745	60.60	AV	V	34.75	5.74	0.00	101.09	95.09	N/A	N/A
5650	30.74	PK	H	34.73	5.65	0.00	71.12	65.12	68.20	*3.08
5700	32.21	PK	H	34.74	5.70	0.00	72.65	66.65	105.20	38.55
5720	36.04	PK	H	34.74	5.71	0.00	76.49	70.49	110.80	40.31
5725	37.78	PK	H	34.75	5.72	0.00	78.25	72.25	122.20	49.95
11490	39.34	PK	H	38.90	8.22	26.02	60.44	54.44	74.00	19.56
11490	25.25	AV	H	38.90	8.22	26.02	46.35	40.35	54.00	13.65
Frequency: 5785 MHz										
5785	75.51	PK	H	34.76	5.77	0.00	116.04	110.04	N/A	N/A
5785	63.91	AV	H	34.76	5.77	0.00	104.44	98.44	N/A	N/A
5785	73.54	PK	V	34.76	5.77	0.00	114.07	108.07	N/A	N/A
5785	60.74	AV	V	34.76	5.77	0.00	101.27	95.27	N/A	N/A
11570	39.43	PK	H	38.91	8.21	26.00	60.55	54.55	74.00	19.45
11570	25.31	AV	H	38.91	8.21	26.00	46.43	40.43	54.00	13.57
Frequency: 5825 MHz										
5825	74.68	PK	H	34.77	5.81	0.00	115.26	109.26	N/A	N/A
5825	61.88	AV	H	34.77	5.81	0.00	102.46	96.46	N/A	N/A
5825	72.09	PK	V	34.77	5.81	0.00	112.67	106.67	N/A	N/A
5825	59.46	AV	V	34.77	5.81	0.00	100.04	94.04	N/A	N/A
5850	31.64	PK	H	34.77	5.83	0.00	72.24	66.24	122.20	55.96
5855	31.72	PK	H	34.77	5.83	0.00	72.32	66.32	110.80	44.48
5875	31.56	PK	H	34.78	5.85	0.00	72.19	66.19	105.20	39.01
5925	31.27	PK	H	34.79	5.89	0.00	71.95	65.95	68.20	*2.25
11650	38.62	PK	H	38.93	8.20	25.98	59.77	53.77	74.00	20.23
11650	24.87	AV	H	38.93	8.20	25.98	46.02	40.02	54.00	13.98

*Within measurement uncertainty!

For 802.11n-HT40 mode (MIMO)

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	74.49	PK	H	34.75	5.74	0.00	114.98	108.98	N/A	N/A
5755	61.41	AV	H	34.75	5.74	0.00	101.90	95.90	N/A	N/A
5755	71.48	PK	V	34.75	5.74	0.00	111.97	105.97	N/A	N/A
5755	59.39	AV	V	34.75	5.74	0.00	99.88	93.88	N/A	N/A
5650	30.75	PK	H	34.73	5.65	0.00	71.13	65.13	68.20	*3.07
5700	34.12	PK	H	34.74	5.70	0.00	74.56	68.56	105.20	36.64
5720	40.16	PK	H	34.74	5.71	0.00	80.61	74.61	110.80	36.19
5725	41.55	PK	H	34.75	5.72	0.00	82.02	76.02	122.20	46.18
11510	38.71	PK	H	38.90	8.22	26.02	59.81	53.81	74.00	20.19
11510	24.38	AV	H	38.90	8.22	26.02	45.48	39.48	54.00	14.52
Frequency: 5795 MHz										
5795	73.12	PK	H	34.76	5.78	0.00	113.66	107.66	N/A	N/A
5795	60.21	AV	H	34.76	5.78	0.00	100.75	94.75	N/A	N/A
5795	70.33	PK	V	34.76	5.78	0.00	110.87	104.87	N/A	N/A
5795	58.49	AV	V	34.76	5.78	0.00	99.03	93.03	N/A	N/A
5850	31.66	PK	H	34.77	5.83	0.00	72.26	66.26	122.20	55.94
5855	31.14	PK	H	34.77	5.83	0.00	71.74	65.74	110.80	45.06
5875	31.28	PK	H	34.78	5.85	0.00	71.91	65.91	105.20	39.29
5925	31.52	PK	H	34.79	5.89	0.00	72.20	66.20	68.20	*2.00
11590	37.88	PK	H	38.92	8.21	25.99	59.02	53.02	74.00	20.98
11590	24.25	AV	H	38.92	8.21	25.99	45.39	39.39	54.00	14.61

*Within measurement uncertainty!

For 802.11ac20 mode (MIMO)

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	76.02	PK	H	34.75	5.74	0.00	116.51	110.51	N/A	N/A
5745	63.79	AV	H	34.75	5.74	0.00	104.28	98.28	N/A	N/A
5745	73.76	PK	V	34.75	5.74	0.00	114.25	108.25	N/A	N/A
5745	61.08	AV	V	34.75	5.74	0.00	101.57	95.57	N/A	N/A
5650	31.23	PK	H	34.73	5.65	0.00	71.61	65.61	68.20	*2.59
5700	32.45	PK	H	34.74	5.70	0.00	72.89	66.89	105.20	38.31
5720	36.27	PK	H	34.74	5.71	0.00	76.72	70.72	110.80	40.08
5725	37.94	PK	H	34.75	5.72	0.00	78.41	72.41	122.20	49.79
11490	39.68	PK	H	38.90	8.22	26.02	60.78	54.78	74.00	19.22
11490	25.27	AV	H	38.90	8.22	26.02	46.37	40.37	54.00	13.63
Frequency: 5785 MHz										
5785	75.54	PK	H	34.76	5.77	0.00	116.07	110.07	N/A	N/A
5785	63.00	AV	H	34.76	5.77	0.00	103.53	97.53	N/A	N/A
5785	72.94	PK	V	34.76	5.77	0.00	113.47	107.47	N/A	N/A
5785	60.35	AV	V	34.76	5.77	0.00	100.88	94.88	N/A	N/A
11570	39.28	PK	H	38.91	8.21	26.00	60.40	54.40	74.00	19.60
11570	25.19	AV	H	38.91	8.21	26.00	46.31	40.31	54.00	13.69
Frequency: 5825 MHz										
5825	74.86	PK	H	34.77	5.81	0.00	115.44	109.44	N/A	N/A
5825	61.94	AV	H	34.77	5.81	0.00	102.52	96.52	N/A	N/A
5825	72.09	PK	V	34.77	5.81	0.00	112.67	106.67	N/A	N/A
5825	59.47	AV	V	34.77	5.81	0.00	100.05	94.05	N/A	N/A
5850	31.82	PK	H	34.77	5.83	0.00	72.42	66.42	122.20	55.78
5855	31.73	PK	H	34.77	5.83	0.00	72.33	66.33	110.80	44.47
5875	31.57	PK	H	34.78	5.85	0.00	72.20	66.20	105.20	39.00
5925	31.29	PK	H	34.79	5.89	0.00	71.97	65.97	68.20	*2.23
11650	38.69	PK	H	38.93	8.20	25.98	59.84	53.84	74.00	20.16
11650	24.89	AV	H	38.93	8.20	25.98	46.04	40.04	54.00	13.96

*Within measurement uncertainty!

Bay Area Compliance Laboratories Corp. (Chengdu)

For 802.11ac40 mode (MIMO)

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	74.83	PK	H	34.75	5.74	0.00	115.32	109.32	N/A	N/A
5755	61.56	AV	H	34.75	5.74	0.00	102.05	96.05	N/A	N/A
5755	71.56	PK	V	34.75	5.74	0.00	112.05	106.05	N/A	N/A
5755	59.49	AV	V	34.75	5.74	0.00	99.98	93.98	N/A	N/A
5650	31.21	PK	H	34.73	5.65	0.00	71.59	65.59	68.20	*2.61
5700	34.22	PK	H	34.74	5.70	0.00	74.66	68.66	105.20	36.54
5720	40.55	PK	H	34.74	5.71	0.00	81.00	75.00	110.80	35.80
5725	41.83	PK	H	34.75	5.72	0.00	82.30	76.30	122.20	45.90
11510	38.94	PK	H	38.90	8.22	26.02	60.04	54.04	74.00	19.96
11510	24.65	AV	H	38.90	8.22	26.02	45.75	39.75	54.00	14.25
Frequency: 5795 MHz										
5795	73.46	PK	H	34.76	5.78	0.00	114.00	108.00	N/A	N/A
5795	60.58	AV	H	34.76	5.78	0.00	101.12	95.12	N/A	N/A
5795	70.61	PK	V	34.76	5.78	0.00	111.15	105.15	N/A	N/A
5795	58.73	AV	V	34.76	5.78	0.00	99.27	93.27	N/A	N/A
5850	31.77	PK	H	34.77	5.83	0.00	72.37	66.37	122.20	55.83
5855	31.25	PK	H	34.77	5.83	0.00	71.85	65.85	110.80	44.95
5875	31.34	PK	H	34.78	5.85	0.00	71.97	65.97	105.20	39.23
5925	31.79	PK	H	34.79	5.89	0.00	72.47	66.47	68.20	*1.73
11590	38.04	PK	H	38.92	8.21	25.99	59.18	53.18	74.00	20.82
11590	24.31	AV	H	38.92	8.21	25.99	45.45	39.45	54.00	14.55

*Within measurement uncertainty!

For 802.11ac80 mode (MIMO)

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: 5775 MHz										
5775	71.99	PK	H	34.76	5.76	0.00	112.51	106.51	N/A	N/A
5775	60.87	AV	H	34.76	5.76	0.00	101.39	95.39	N/A	N/A
5775	70.39	PK	V	34.76	5.76	0.00	110.91	104.91	N/A	N/A
5775	58.68	AV	V	34.76	5.76	0.00	99.20	93.20	N/A	N/A
5650	32.27	PK	H	34.73	5.65	0.00	72.65	66.65	68.20	*1.55
5700	39.53	PK	H	34.74	5.70	0.00	79.97	73.97	105.20	31.23
5720	42.25	PK	H	34.74	5.71	0.00	82.70	76.70	110.80	34.10
5725	44.52	PK	H	34.75	5.72	0.00	84.99	78.99	122.20	43.21
5850	39.29	PK	H	34.77	5.83	0.00	79.89	73.89	122.20	48.31
5855	38.84	PK	H	34.77	5.83	0.00	79.44	73.44	110.80	37.36
5875	39.19	PK	H	34.78	5.85	0.00	79.82	73.82	105.20	31.38
5925	31.59	PK	H	34.79	5.89	0.00	72.27	66.27	68.20	*1.93
11550	38.46	PK	H	38.91	8.21	26.01	59.57	53.57	74.00	20.43
11550	24.41	AV	H	38.91	8.21	26.01	45.52	39.52	54.00	14.48

*Within measurement uncertainty!

Note:

Corrected Amplitude = Corrected Factor + Reading

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

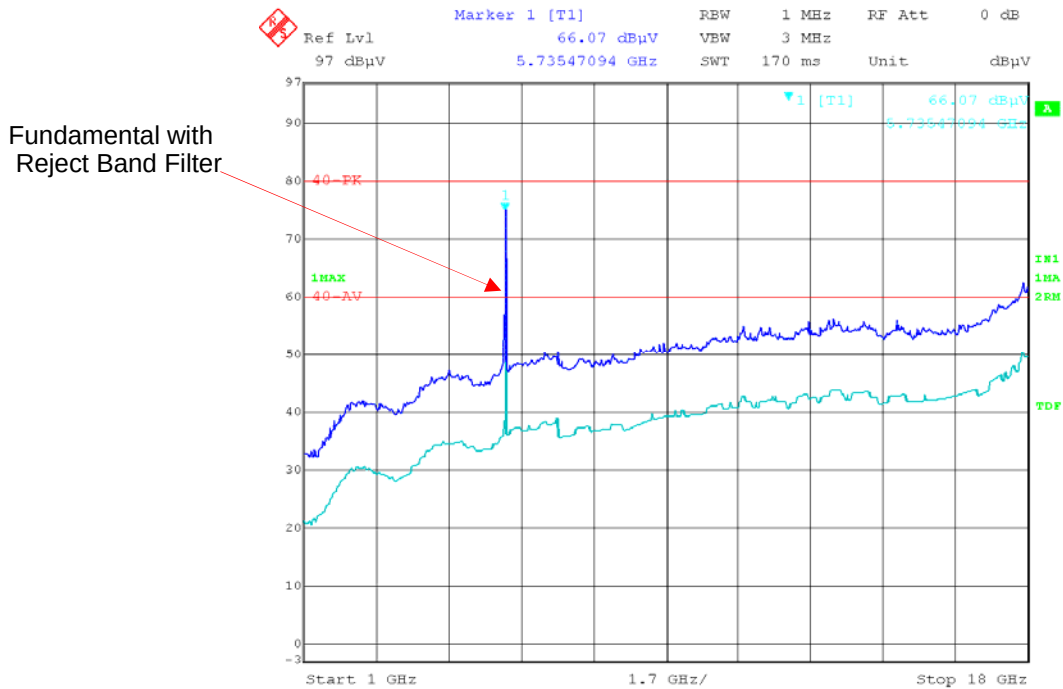
Margin = Limit- Corr. Amplitude

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

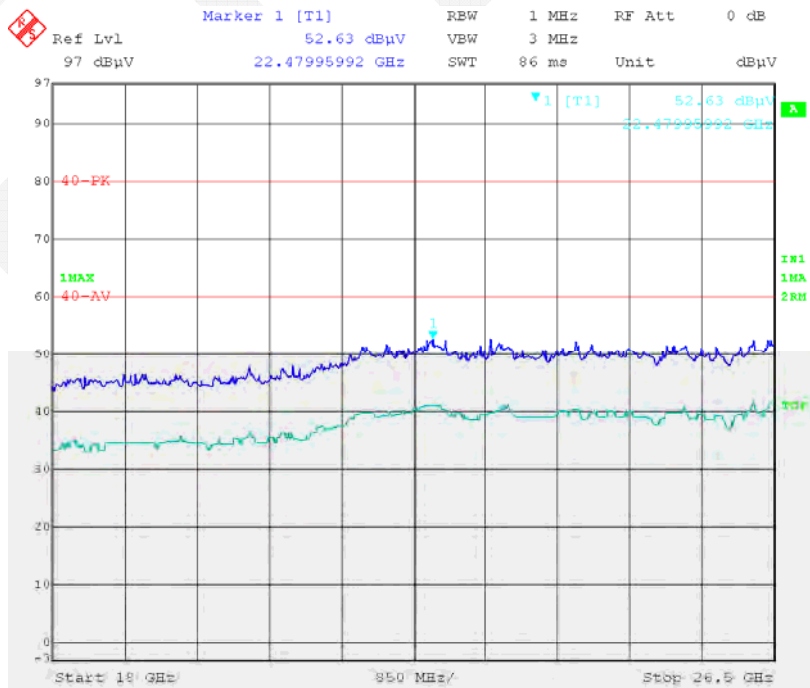
Please refer to the below pre-scan plot of worst case:

Note: The test distance is 1.5m. The limit is [74dBuV/m@3m, 80dBuV@1.5m](#) for PK, [60dBuV/m@3m, 80dBuV@1.5m](#) for AV.

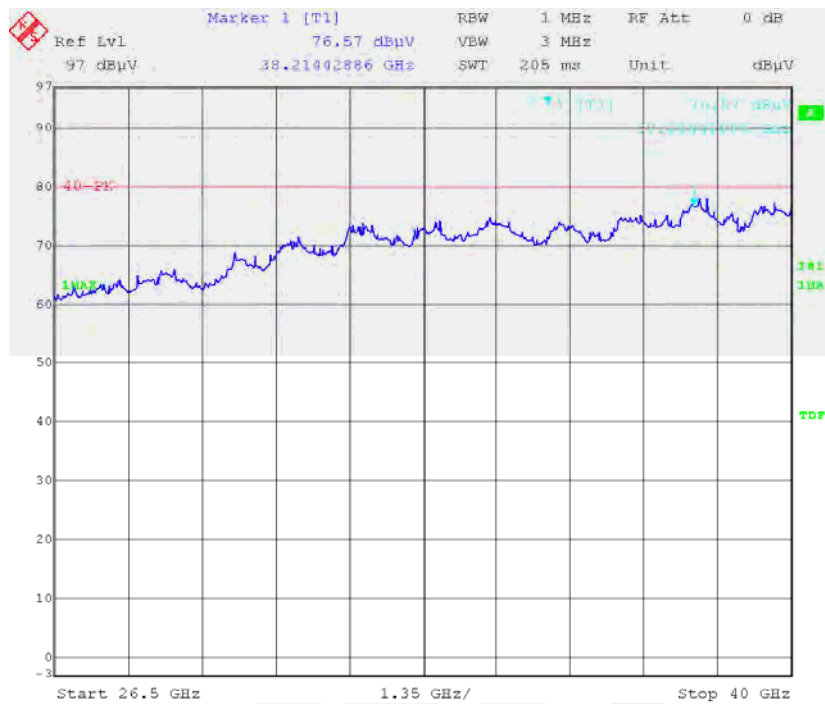
802.11a Mode: Low Channel_Horizontal_1GHz-18GHz



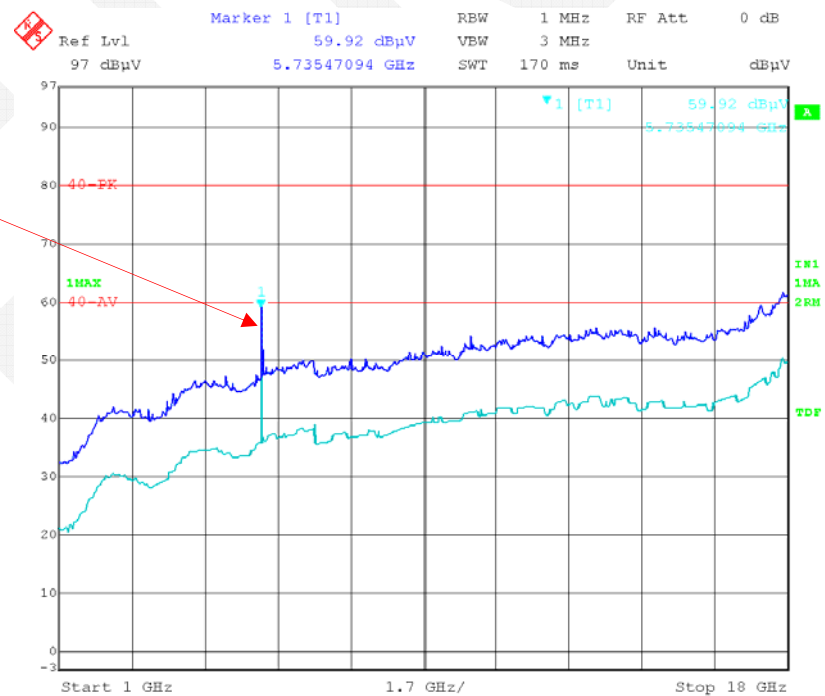
802.11a Mode: Low Channel_Horizontal_18GHz-26.5GHz



802.11a Mode: Low Channel_Horizontal_26.5GHz-40GHz

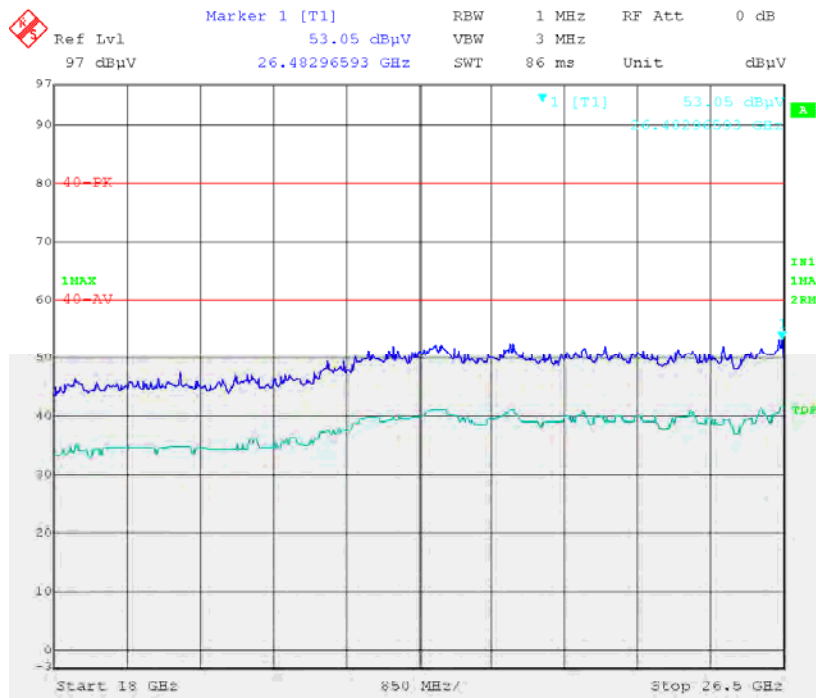


802.11a Mode: Low Channel_Vertical_1GHz-18GHz

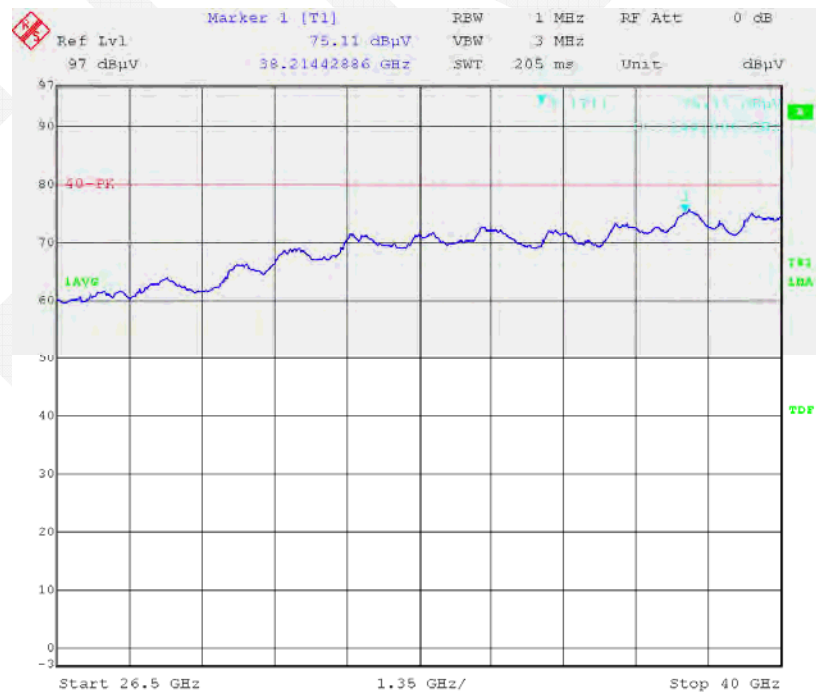


Fundamental with
Reject Band Filter

802.11a Mode: Low Channel_Vertical_18GHz-26.5GHz



802.11a Mode: Low Channel_Vertical_26.5GHz-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:	25 °C
Relative Humidity:	65 %
ATM Pressure:	95.2 kPa

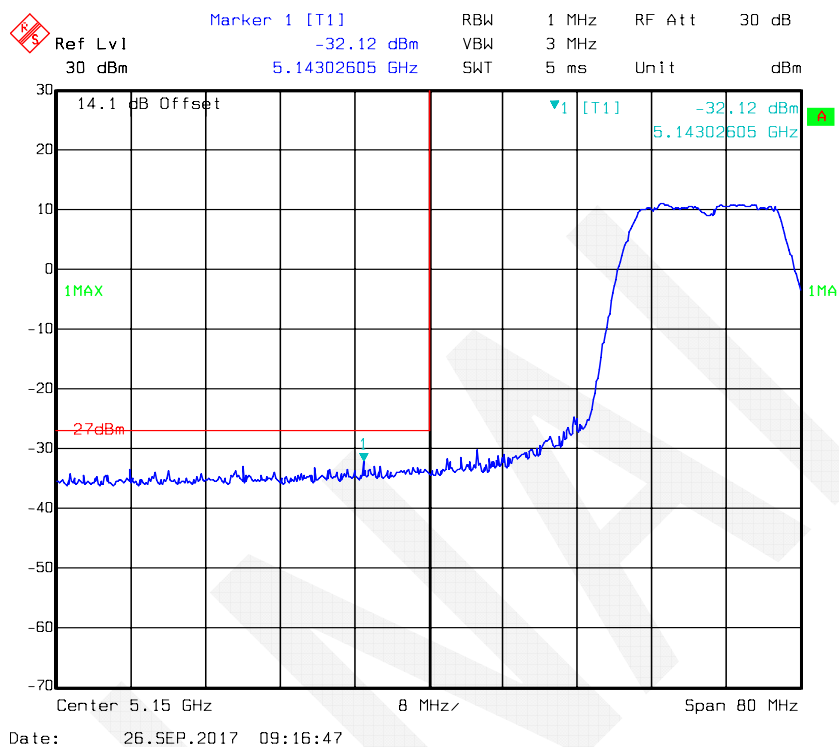
* The testing was performed by Tom Tang on 2017-09-26.

Test mode: Transmitting

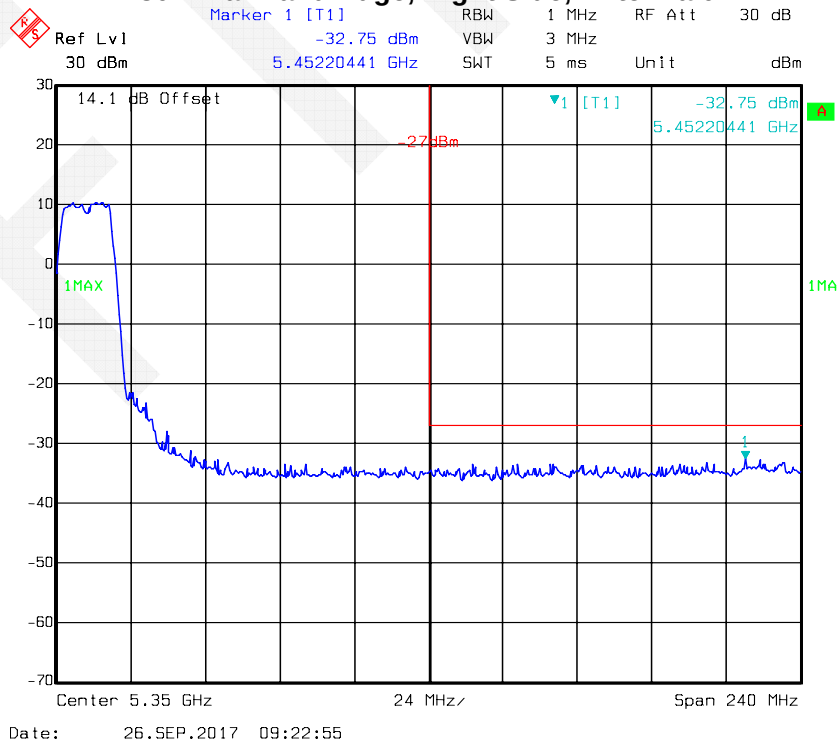
Test Result: Compliance. Please refer to following table and plots.

For 5150-5250 MHz (Note: The antenna gain was offset in the offset, all emissions under limit more than 3dBc, so MIMO mode also comply the requirement.)

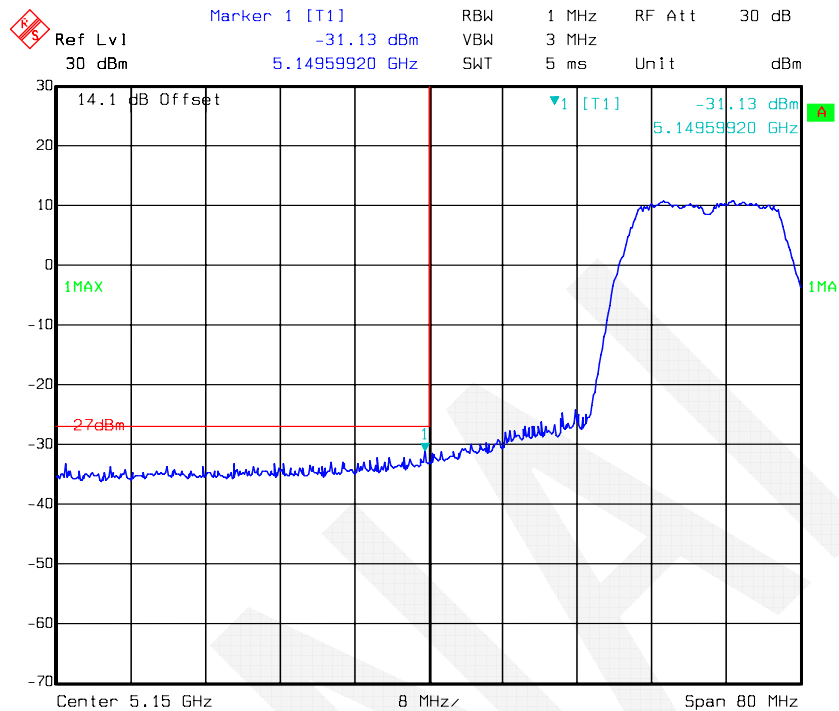
802.11a: Band Edge, Left Side, Antenna 0



802.11a: Band Edge, Right Side, Antenna 0

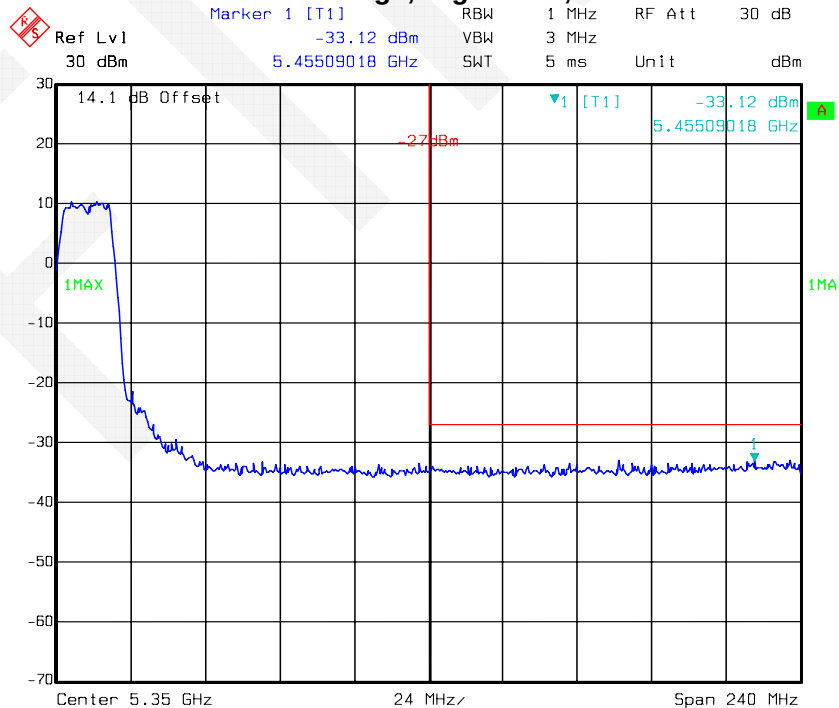


802.11a: Band Edge, Left Side, Antenna 1



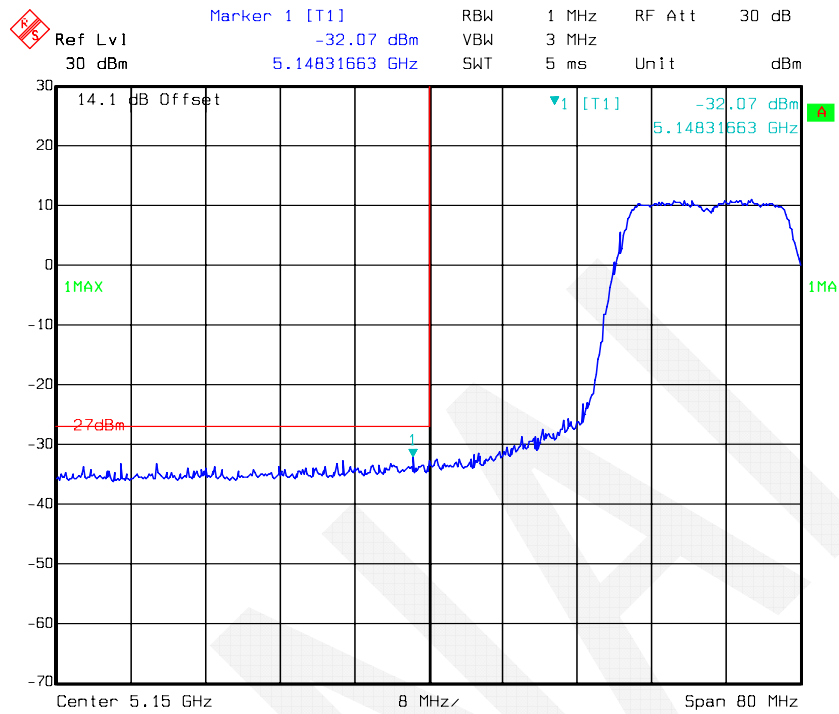
Date: 26.SEP.2017 10:19:45

802.11a: Band Edge, Right Side, Antenna 1



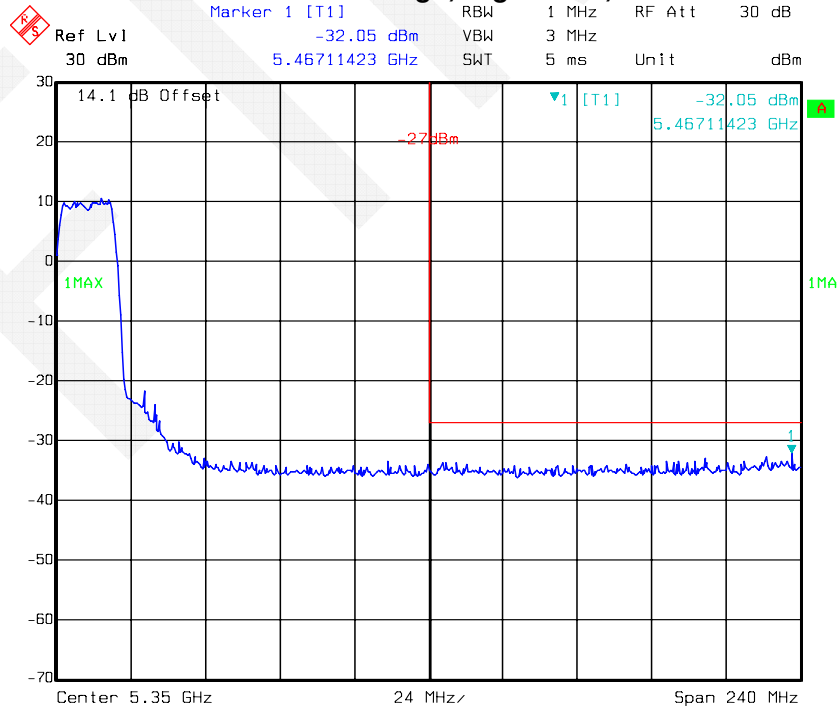
Date: 26.SEP.2017 10:22:40

802.11n-HT20: Band Edge, Left Side, Antenna 0



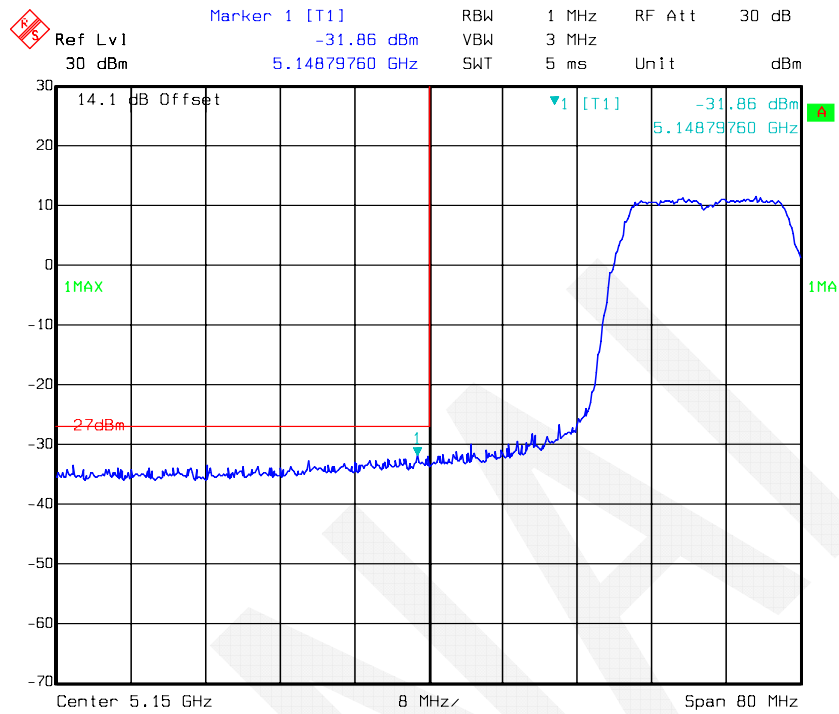
Date: 26.SEP.2017 09:25:10

802.11n-HT20: Band Edge, Right Side, Antenna 0



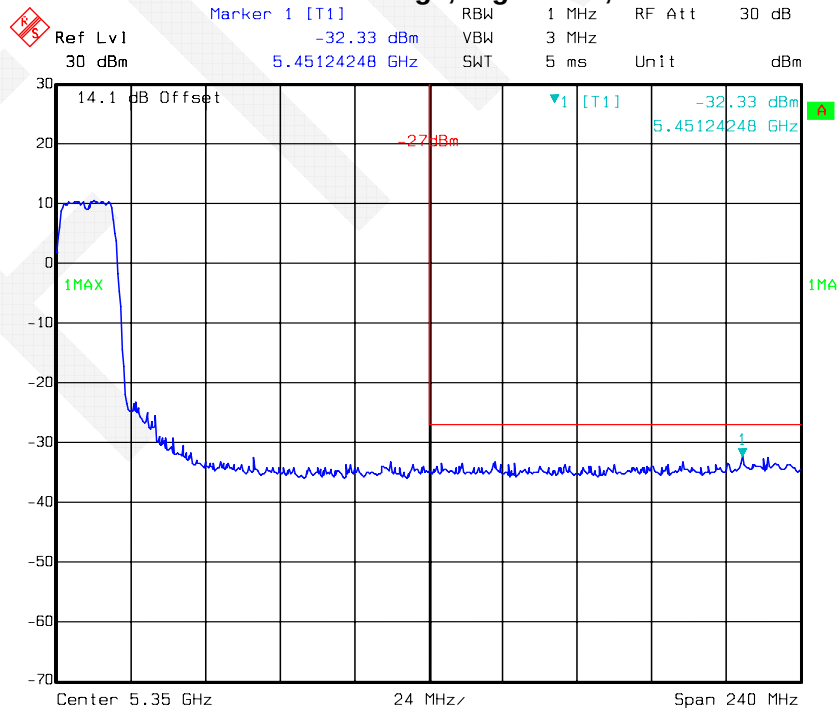
Date: 26.SEP.2017 09:28:33

802.11n-HT20: Band Edge, Left Side, Antenna 1



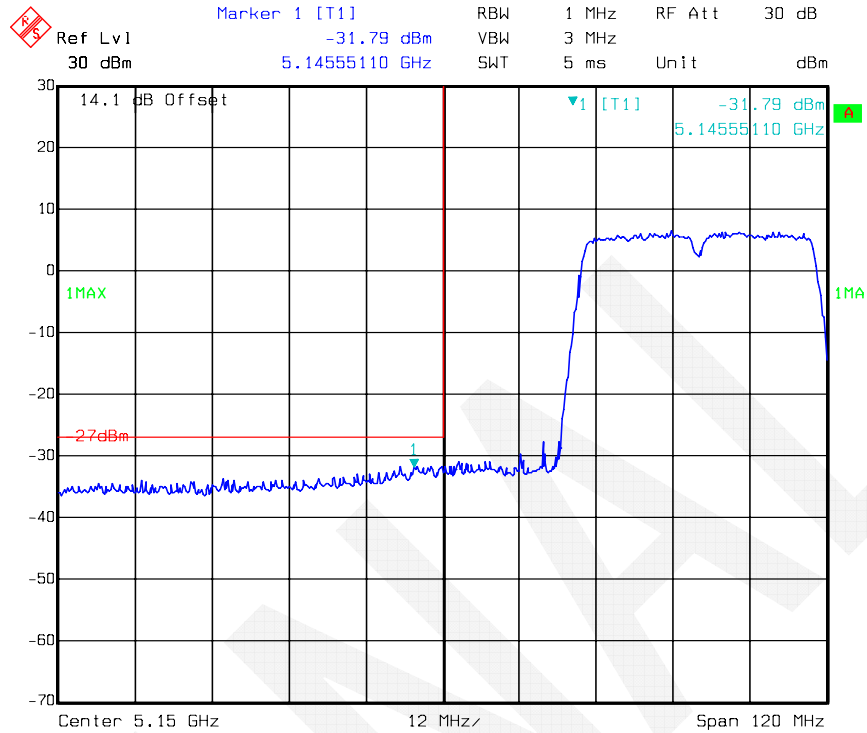
Date: 26.SEP.2017 10:36:53

802.11n-HT20: Band Edge, Right Side, Antenna 1



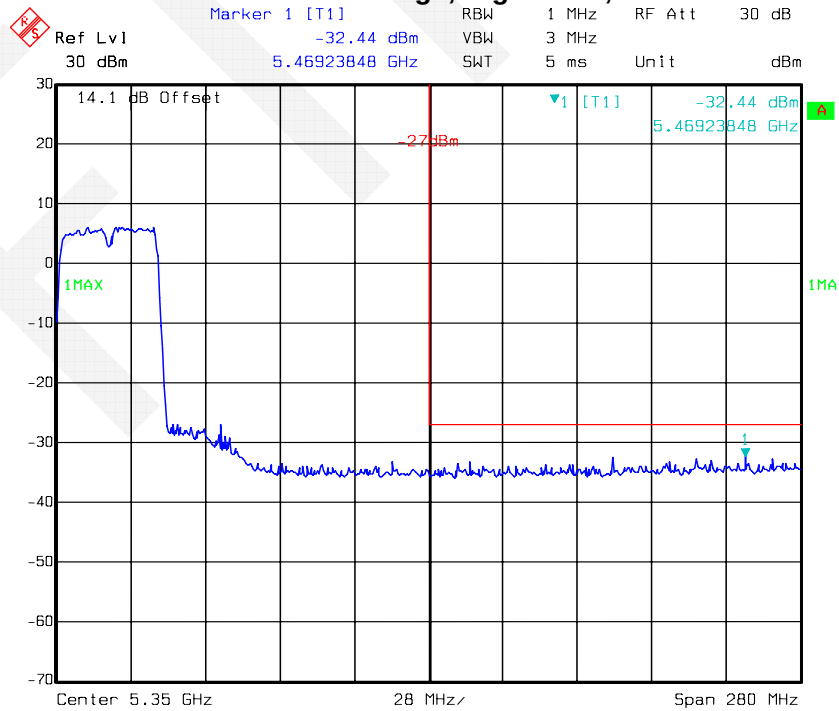
Date: 26.SEP.2017 10:41:42

802.11n-HT40: Band Edge, Left Side, Antenna 0



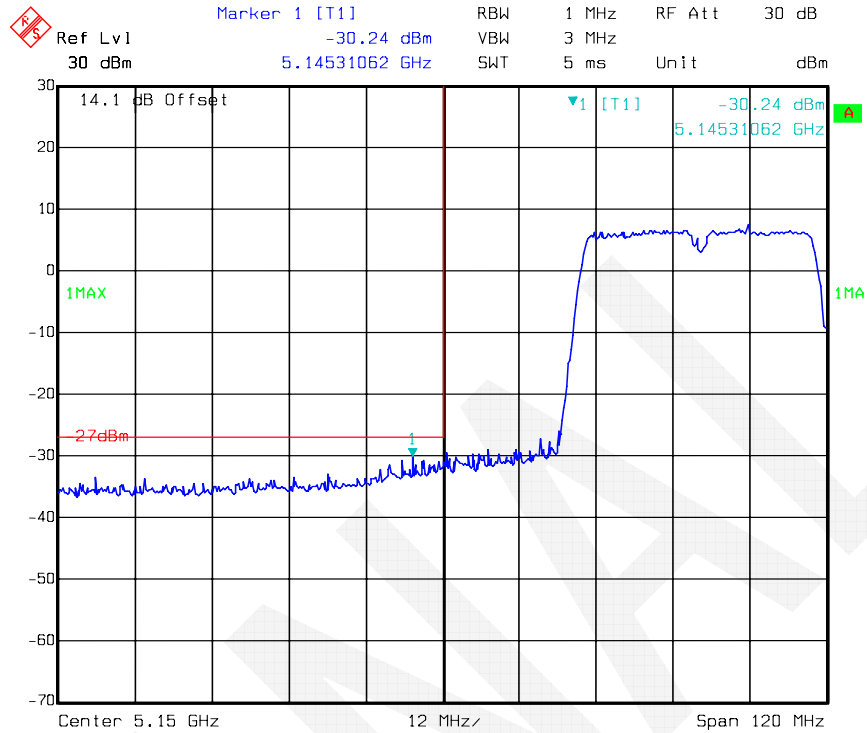
Date: 26.SEP.2017 09:42:53

802.11n-HT40: Band Edge, Right Side, Antenna 0

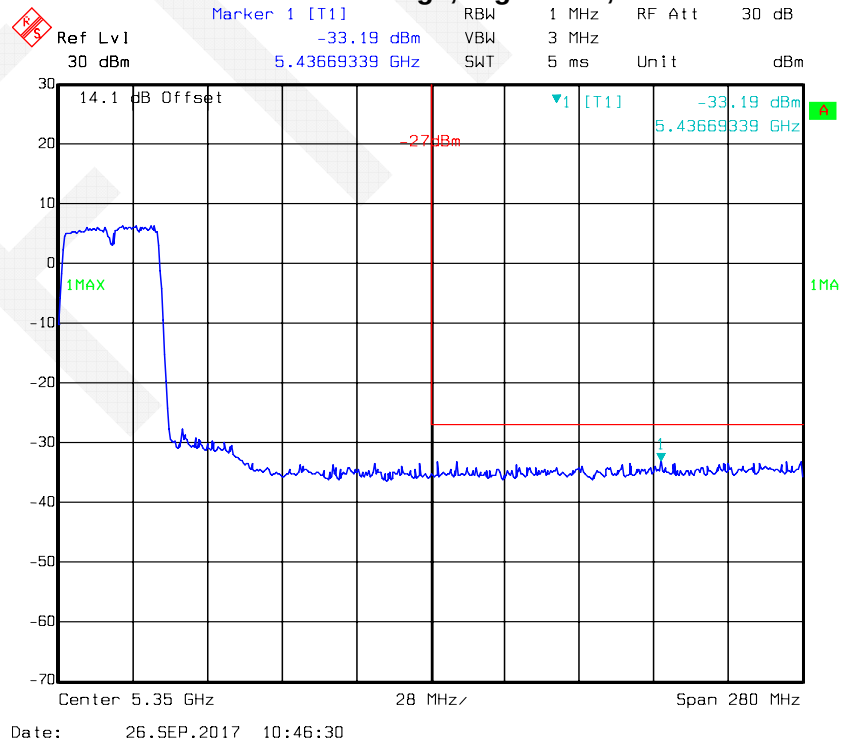


Date: 26.SEP.2017 09:44:36

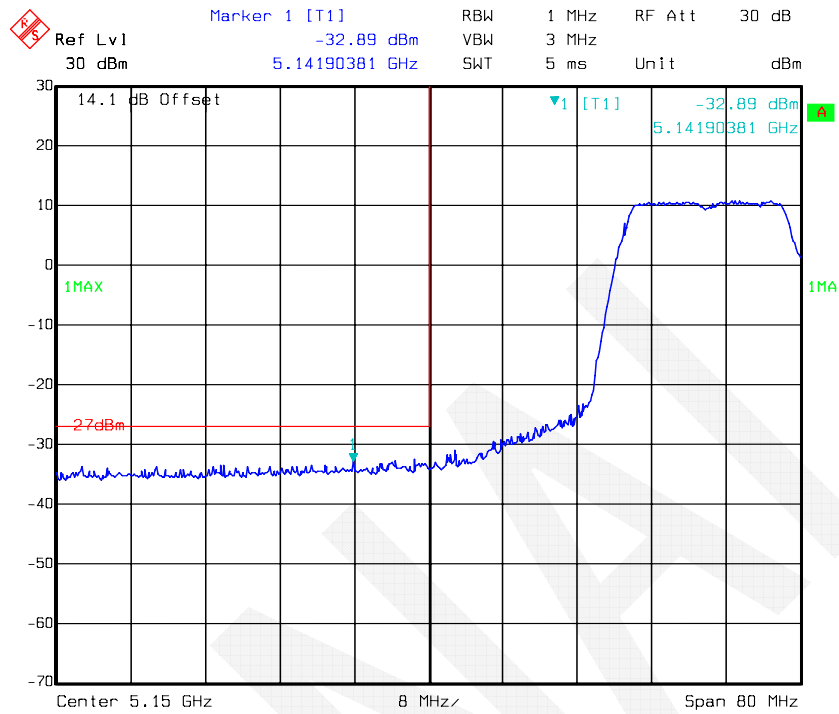
802.11n-HT40: Band Edge, Left Side, Antenna 1



802.11n-HT40: Band Edge, Right Side, Antenna 1

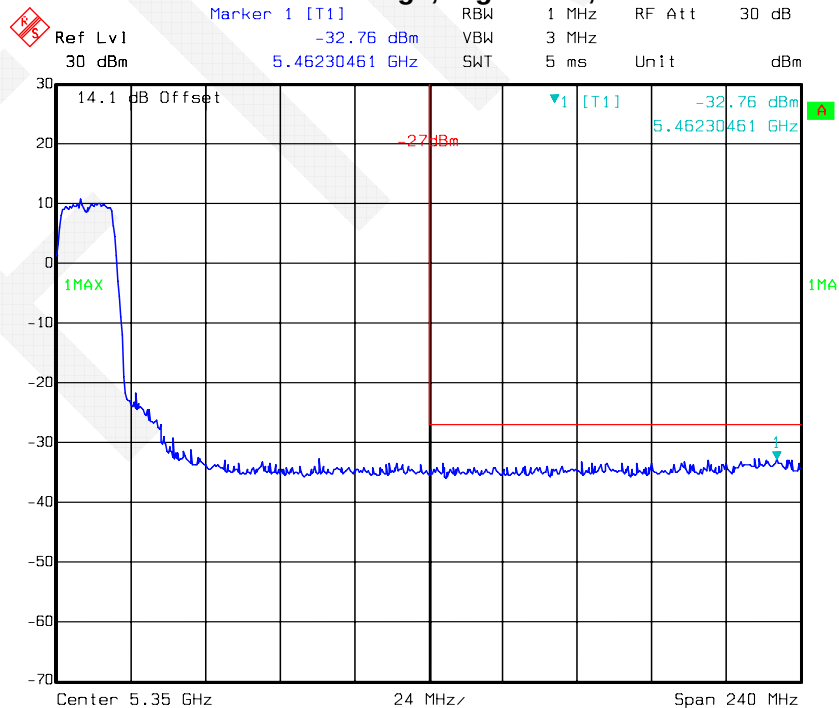


802.11ac20: Band Edge, Left Side, Antenna 0



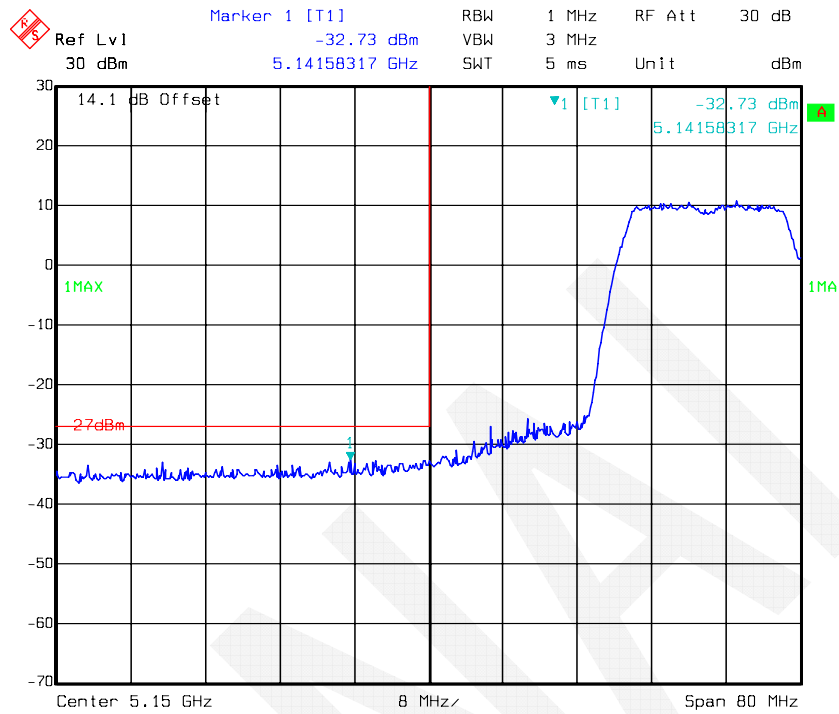
Date: 26.SEP.2017 09:30:22

802.11ac20: Band Edge, Right Side, Antenna 0



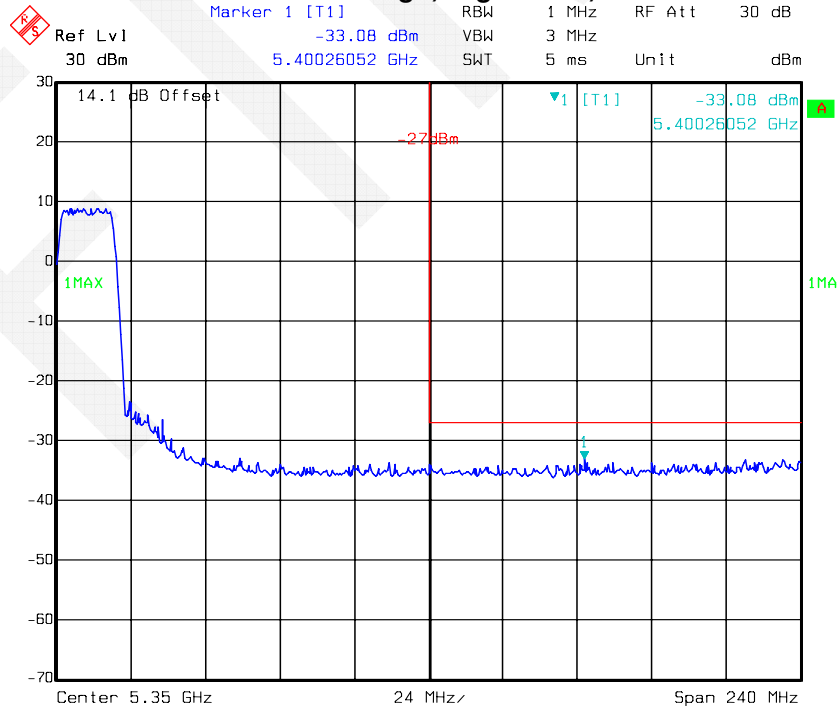
Date: 26.SEP.2017 09:33:22

802.11ac20: Band Edge, Left Side, Antenna 1



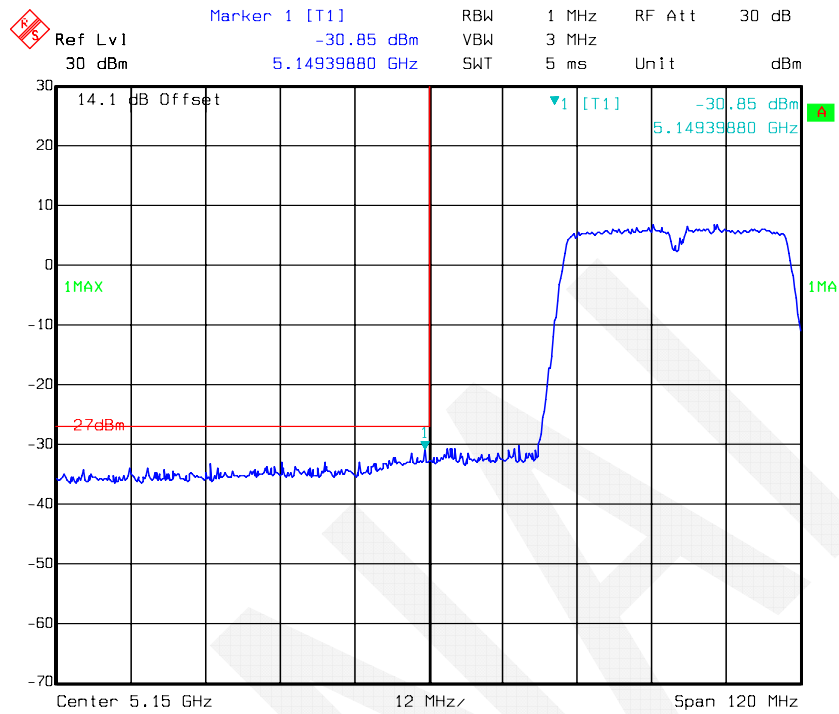
Date: 26.SEP.2017 10:25:04

802.11ac20: Band Edge, Right Side, Antenna 1



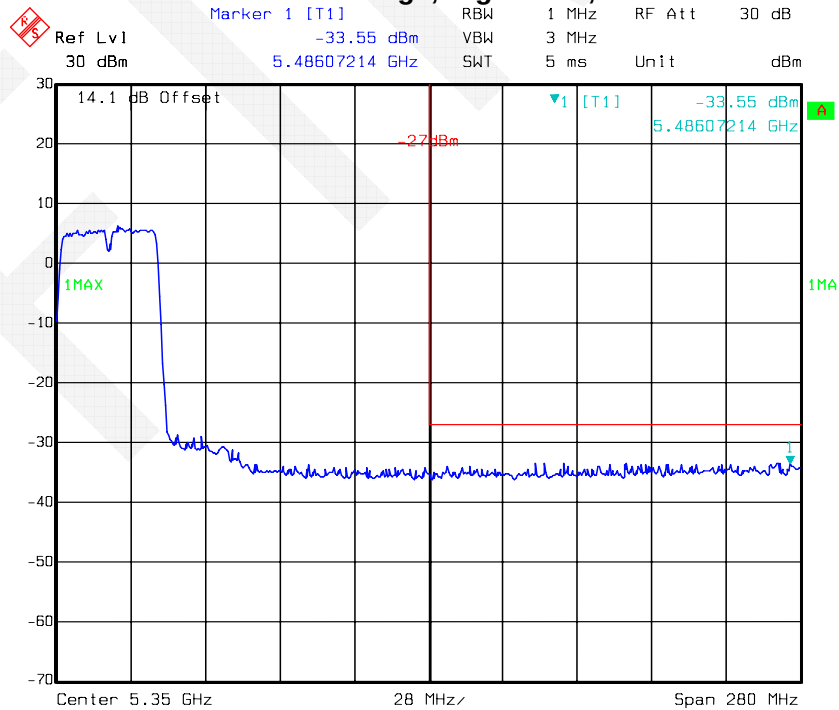
Date: 26.SEP.2017 10:27:36

802.11ac40: Band Edge, Left Side, Antenna 0



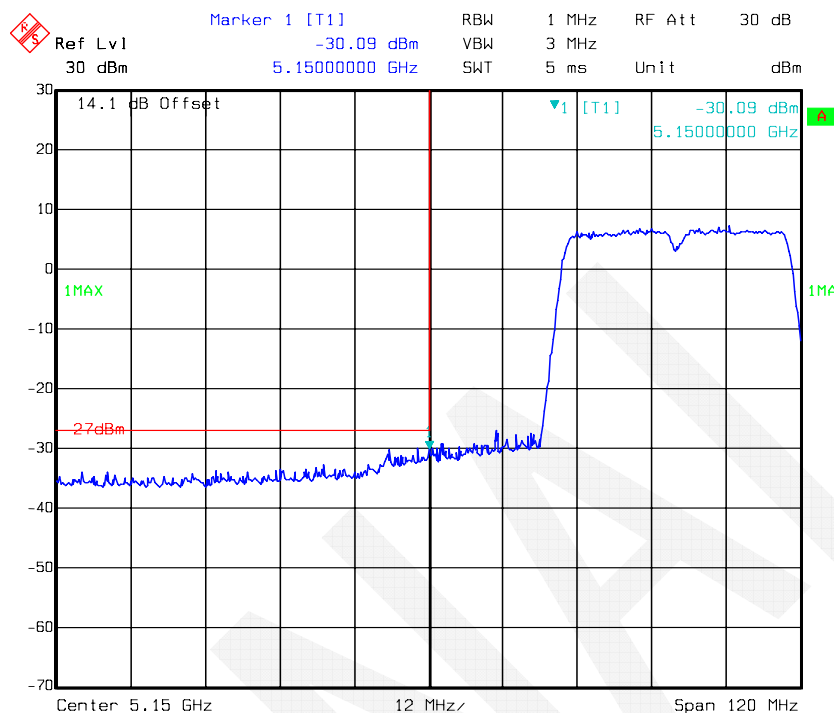
Date: 26.SEP.2017 09:39:10

802.11ac40: Band Edge, Right Side, Antenna 0

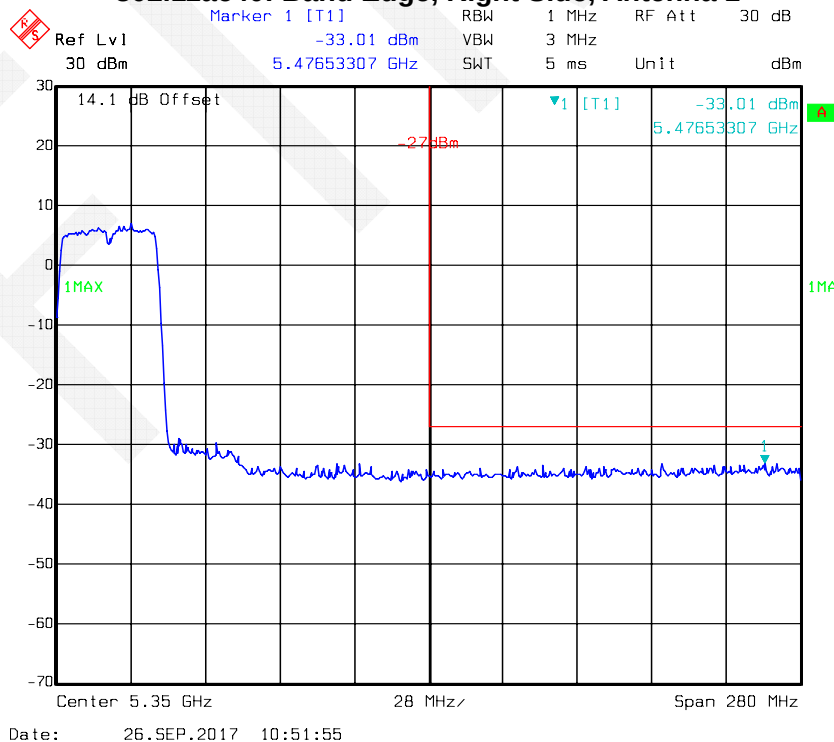


Date: 26.SEP.2017 09:40:56

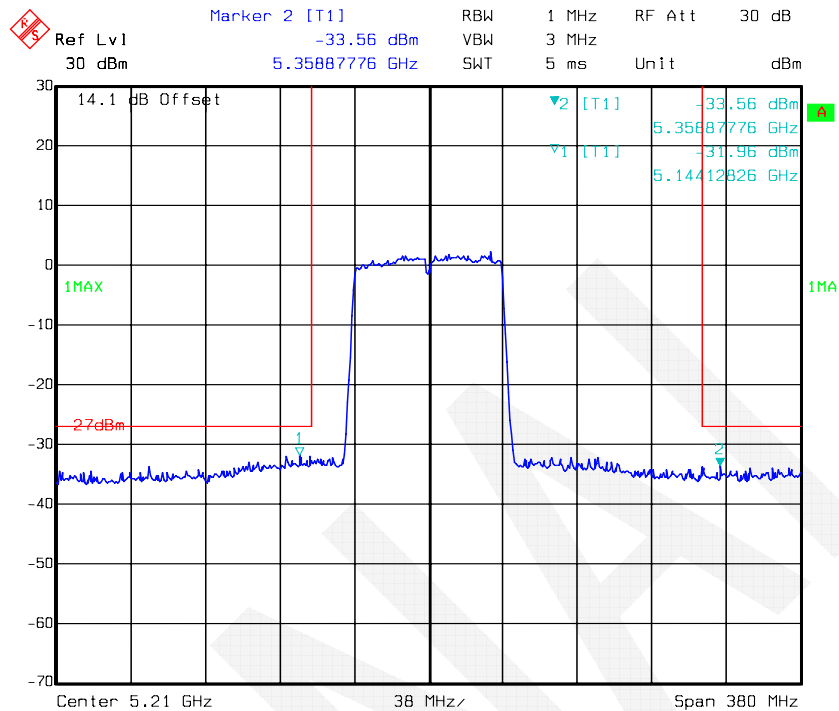
802.11ac40: Band Edge, Left Side, Antenna 1



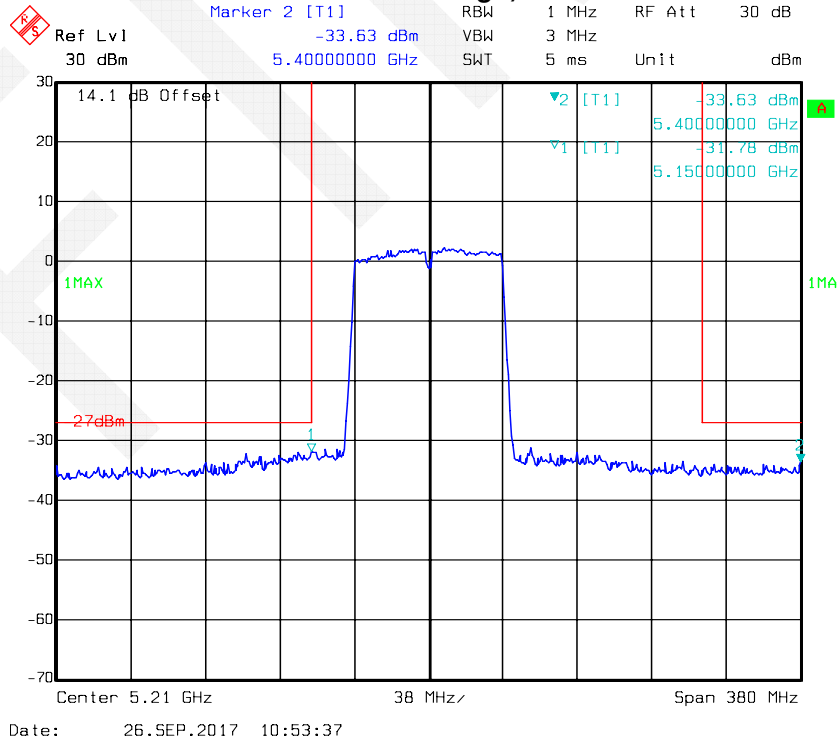
802.11ac40: Band Edge, Right Side, Antenna 1



802.11ac80: Band Edge, Antenna 0

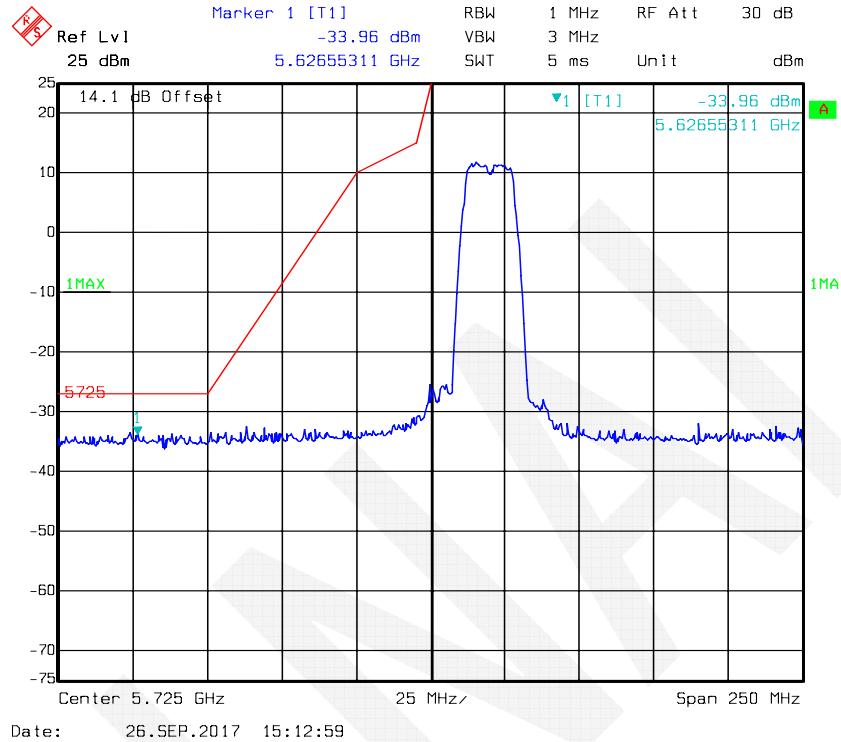


802.11ac80: Band Edge, Antenna 1

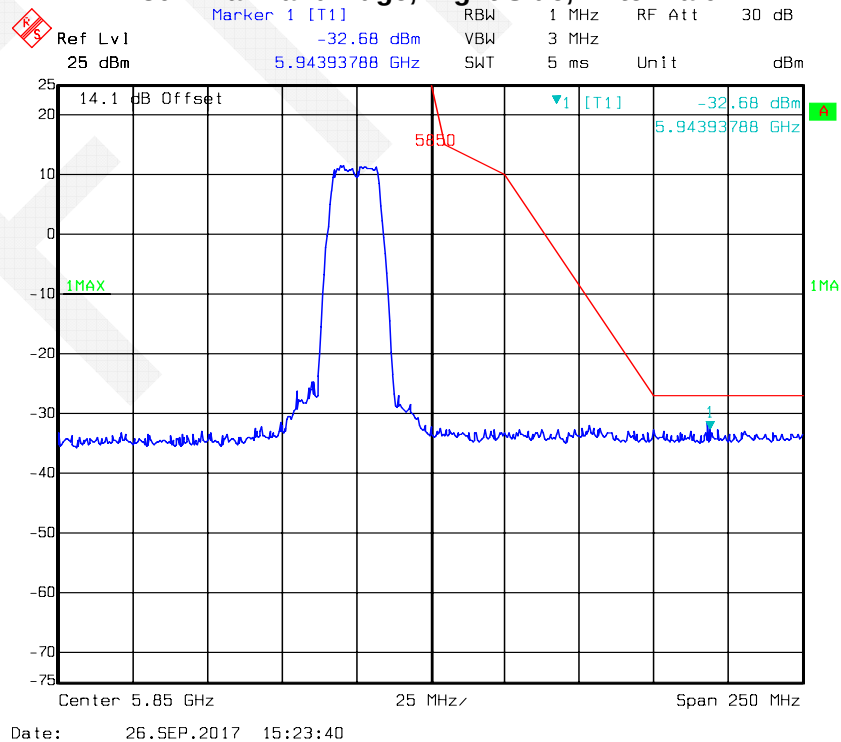


For 5725-5850 MHz: (Note: The antenna gain was offset in the offset, all emissions under limit more than 3dBc, so MIMO mode also comply the requirement.)

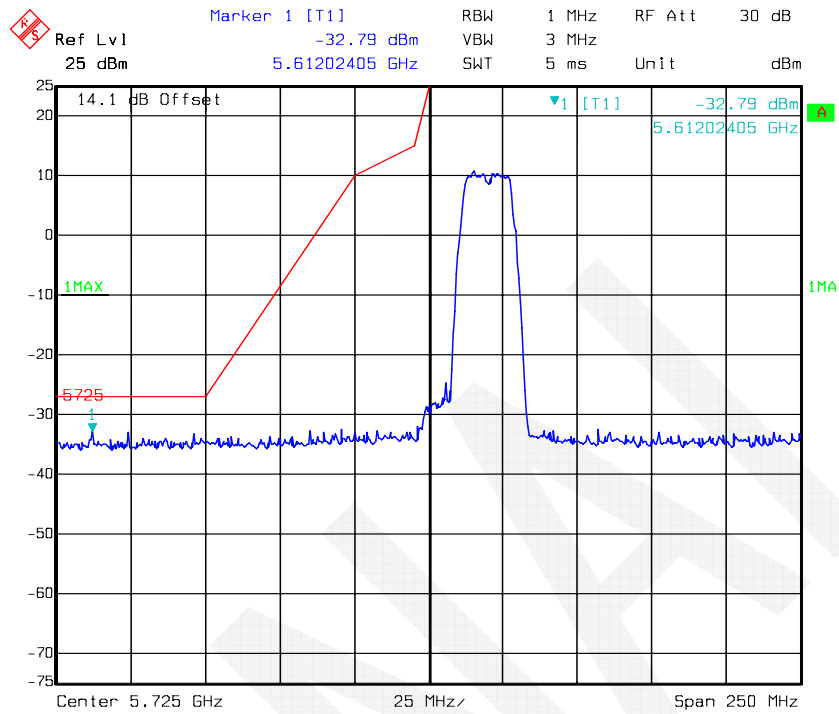
802.11a: Band Edge, Left Side, Antenna 0



802.11a: Band Edge, Right Side, Antenna 0

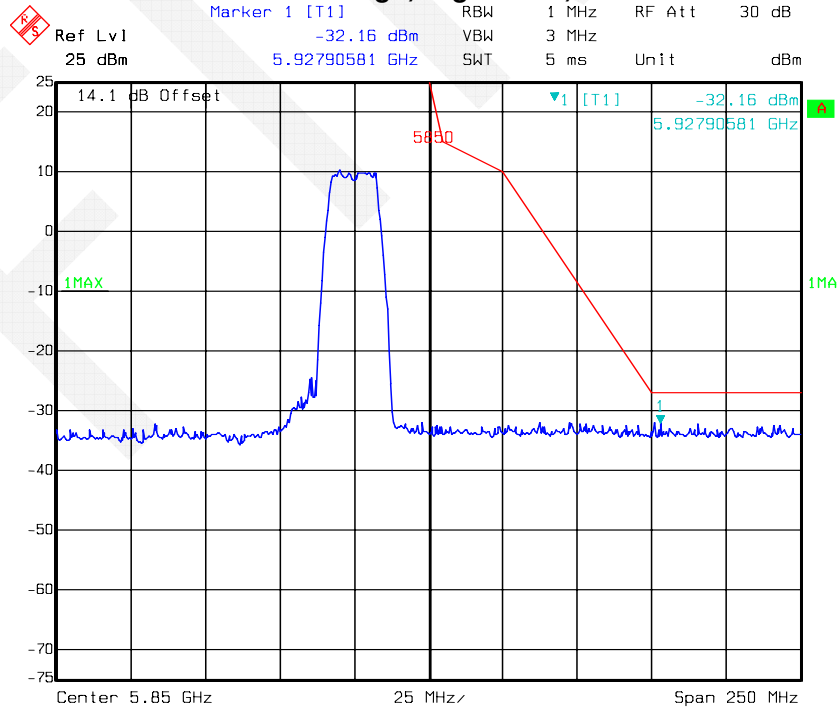


802.11a: Band Edge, Left Side, Antenna 1



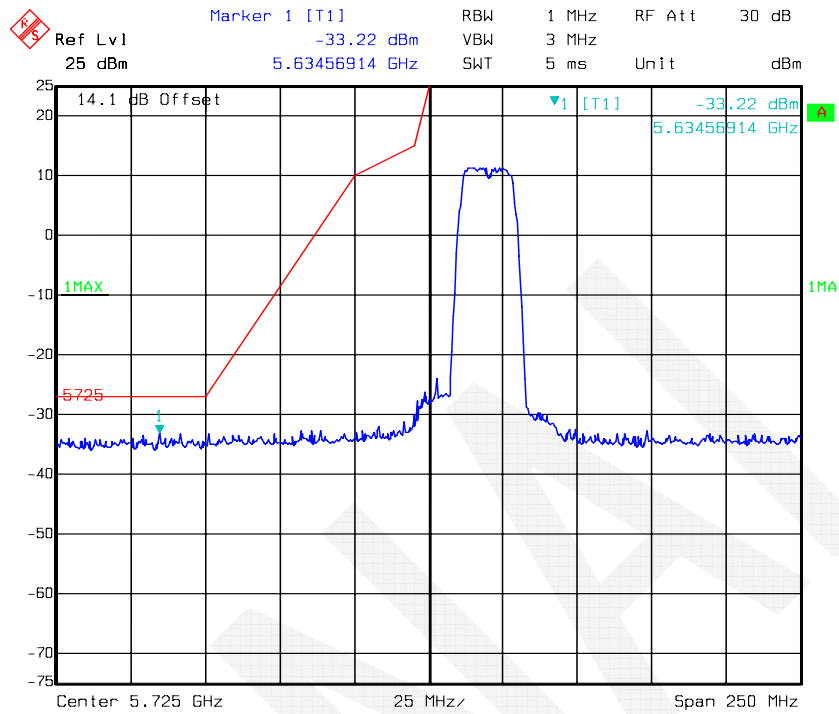
Date: 26.SEP.2017 15:38:04

802.11a: Band Edge, Right Side, Antenna 1

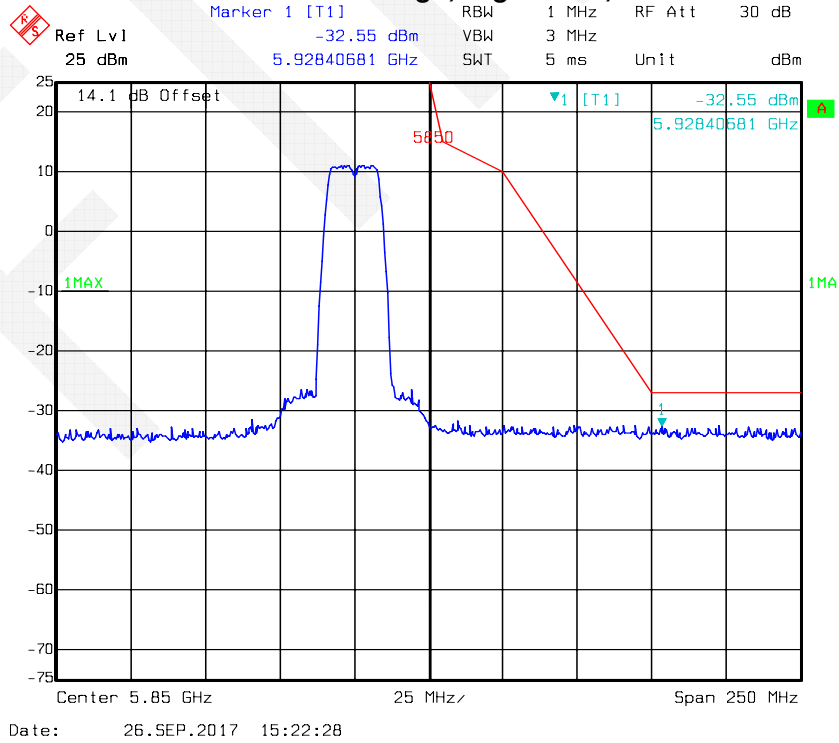


Date: 26.SEP.2017 15:28:31

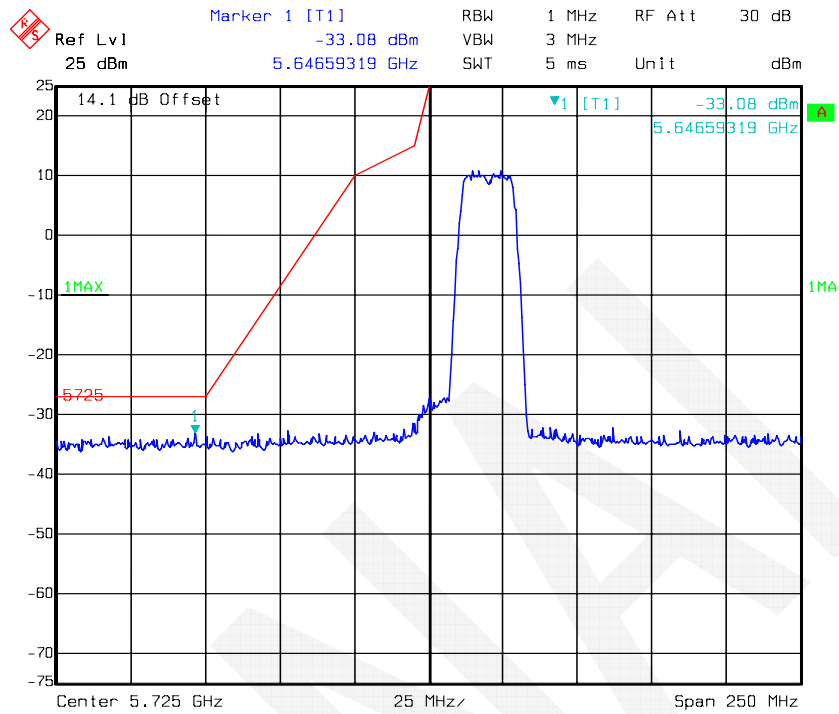
802.11n-HT20: Band Edge, Left Side, Antenna 0



802.11n-HT20: Band Edge, Right Side, Antenna 0

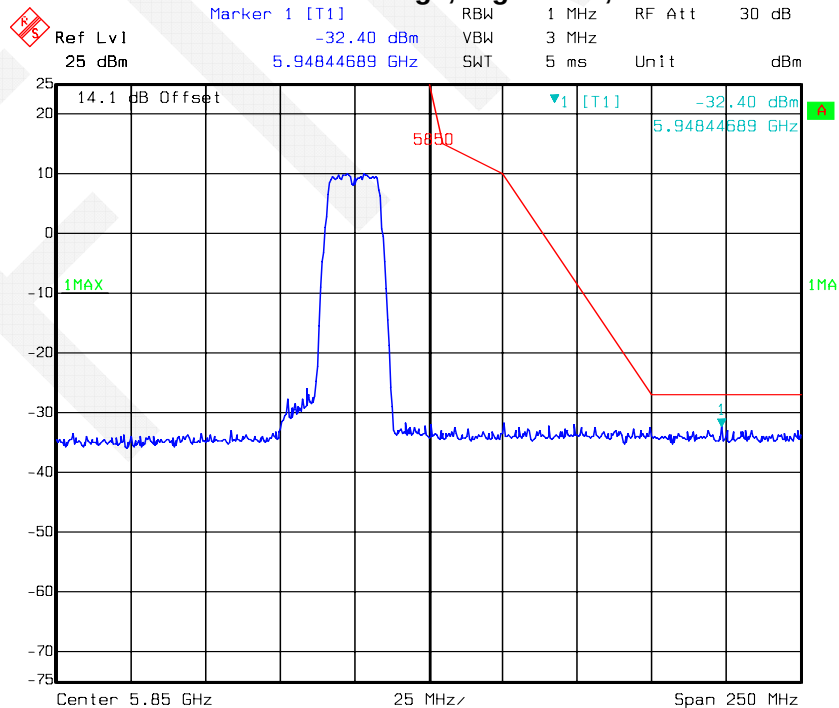


802.11n-HT20: Band Edge, Left Side, Antenna 1



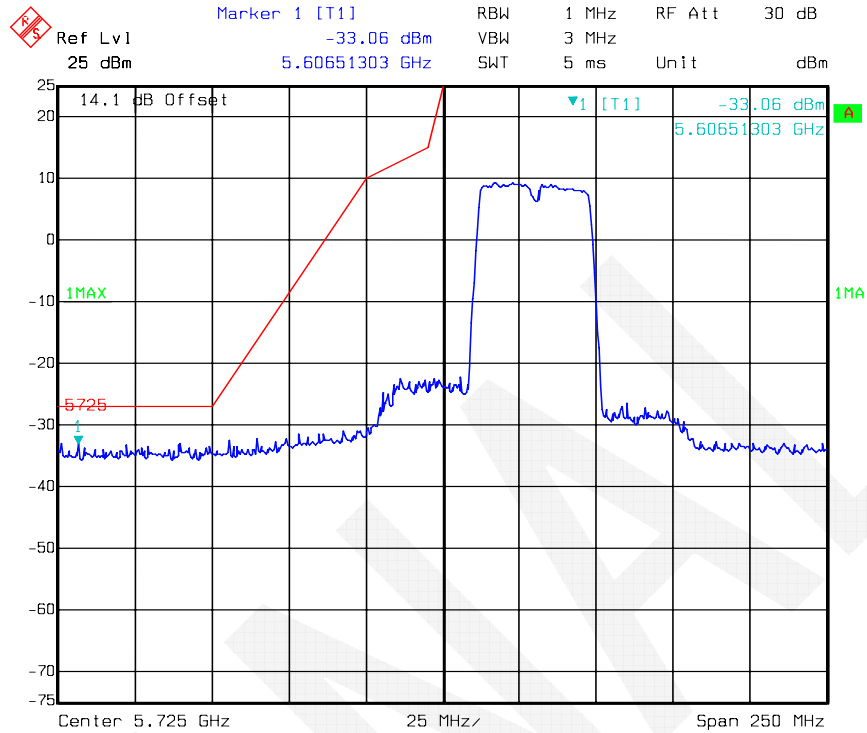
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802.11n-HT20: Band Edge, Right Side, Antenna 1



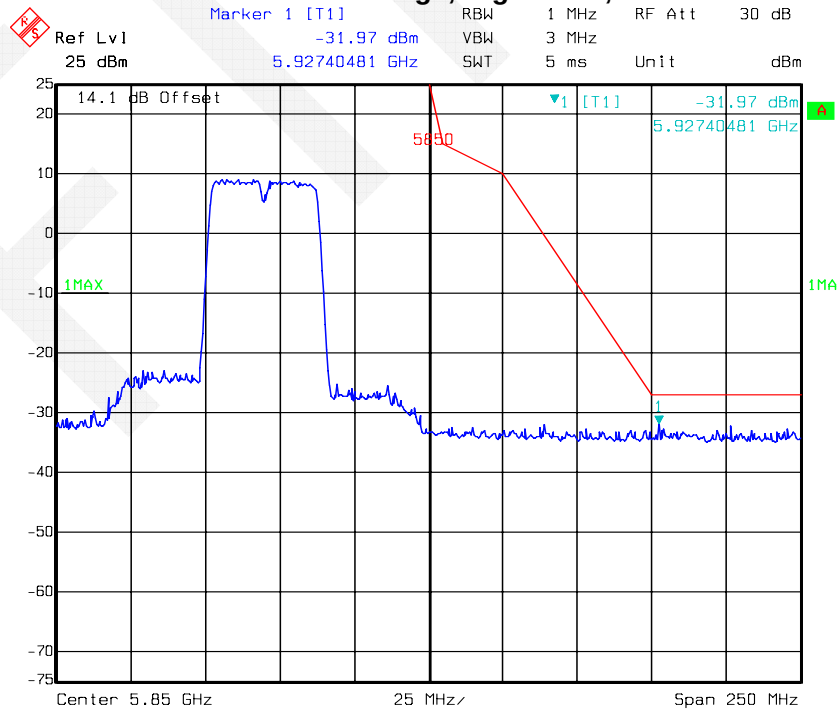
Date: 26.SEP.2017 15:29:29

802.11n-HT40: Band Edge, Left Side, Antenna 0



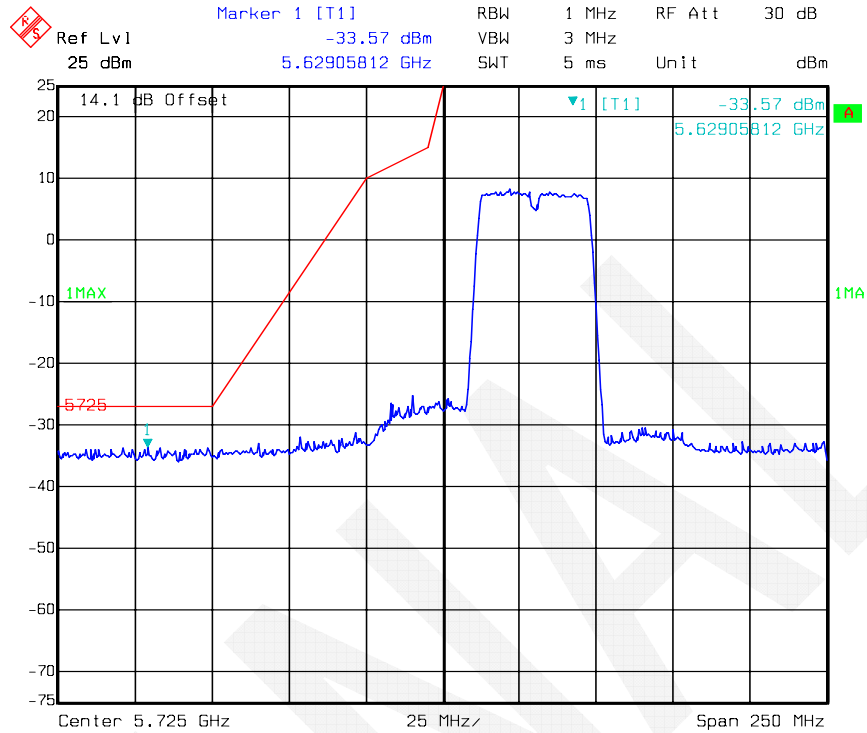
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802.11n-HT40: Band Edge, Right Side, Antenna 0

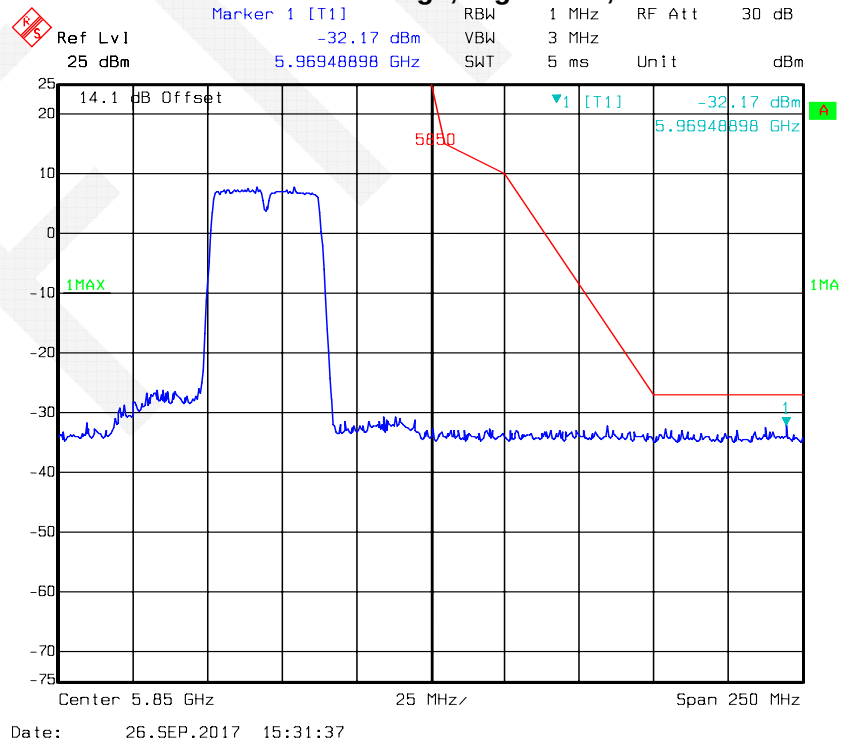


Date: 26.SEP.2017 15:20:55

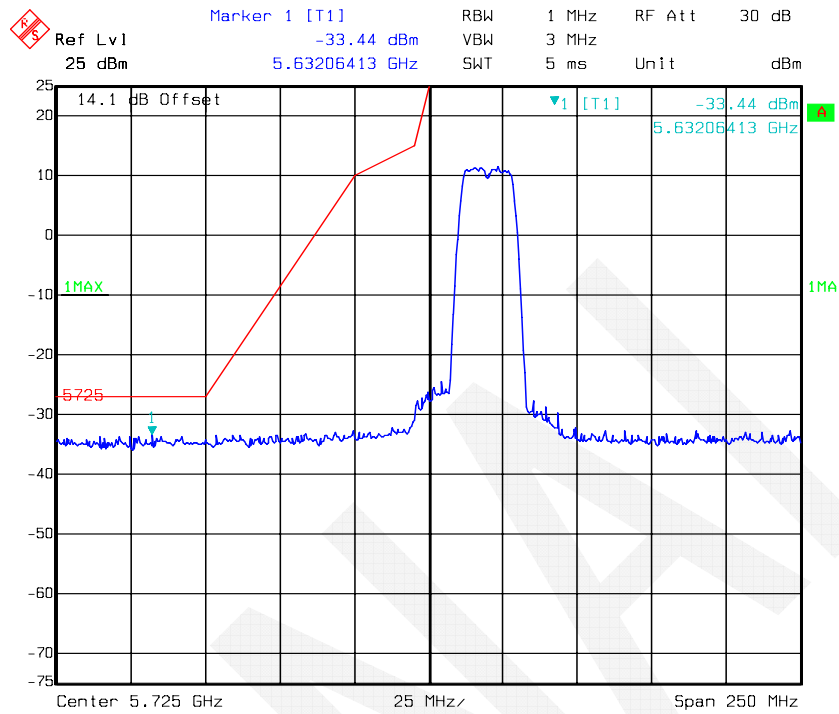
802.11n-HT40: Band Edge, Left Side, Antenna 1



802.11n-HT40: Band Edge, Right Side, Antenna 1

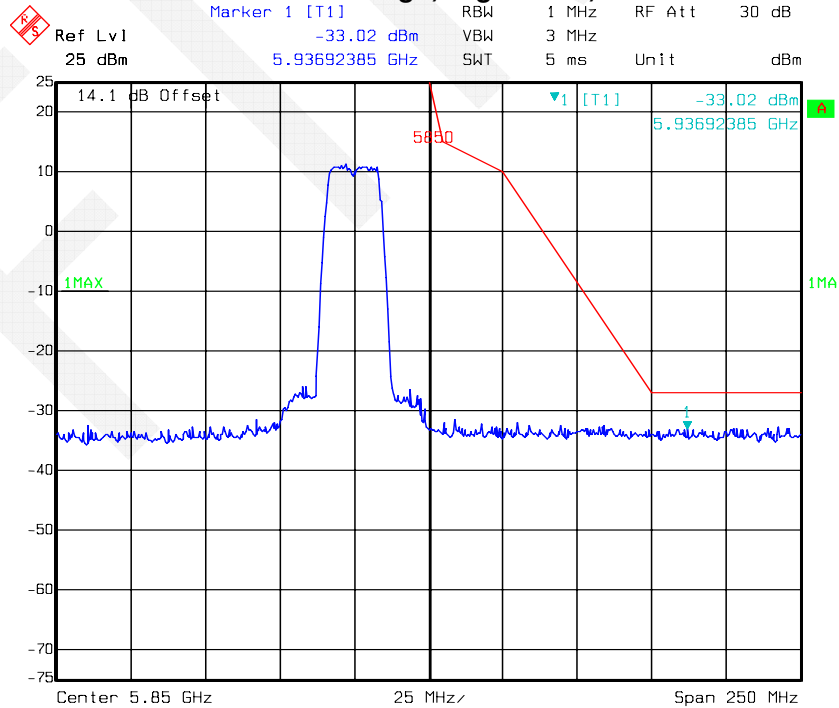


802.11ac20: Band Edge, Left Side, Antenna 0



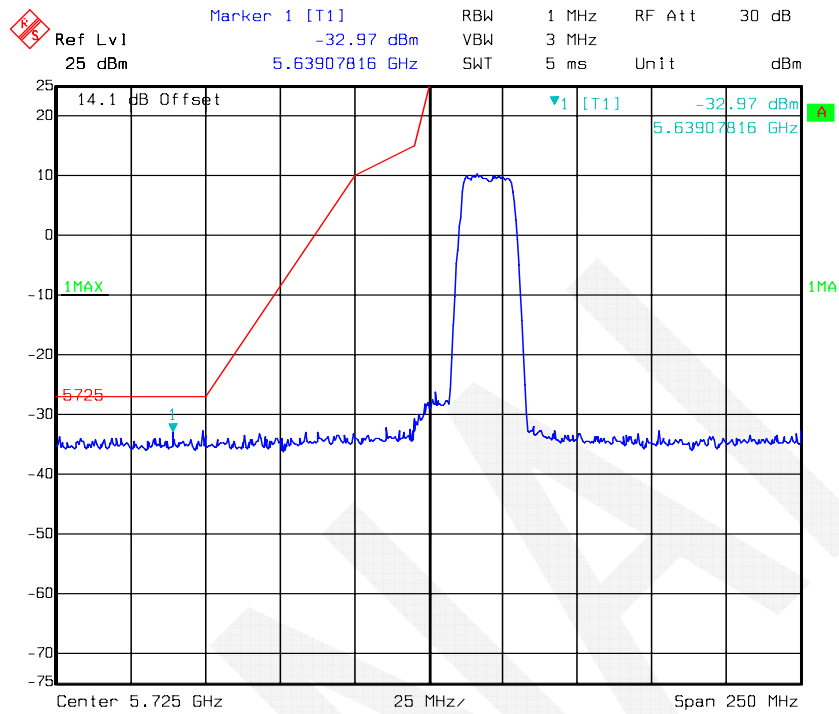
Date: 26.SEP.2017 15:14:16

802.11ac20: Band Edge, Right Side, Antenna 0



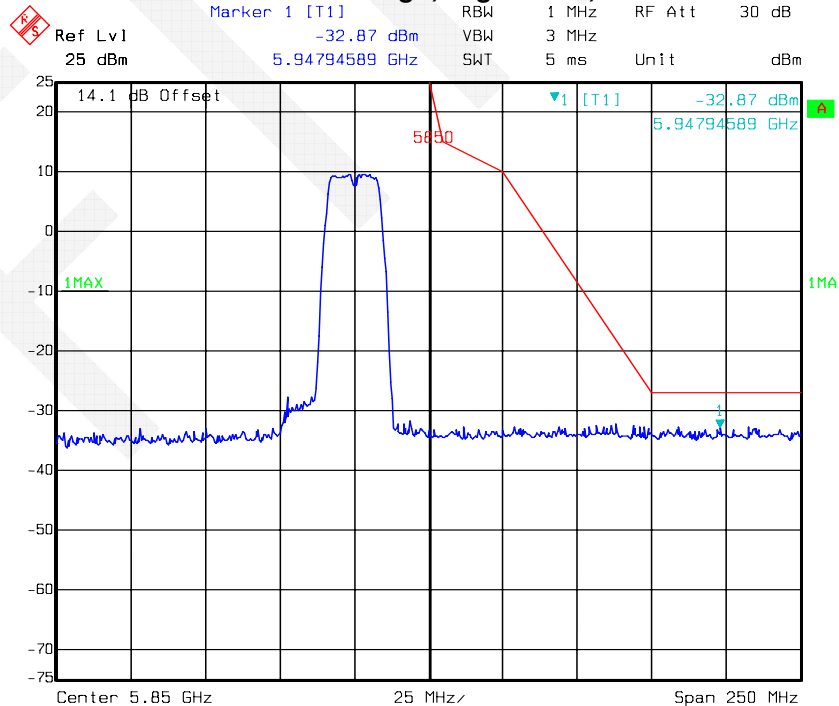
Date: 26.SEP.2017 15:24:49

802.11ac20: Band Edge, Left Side, Antenna 1



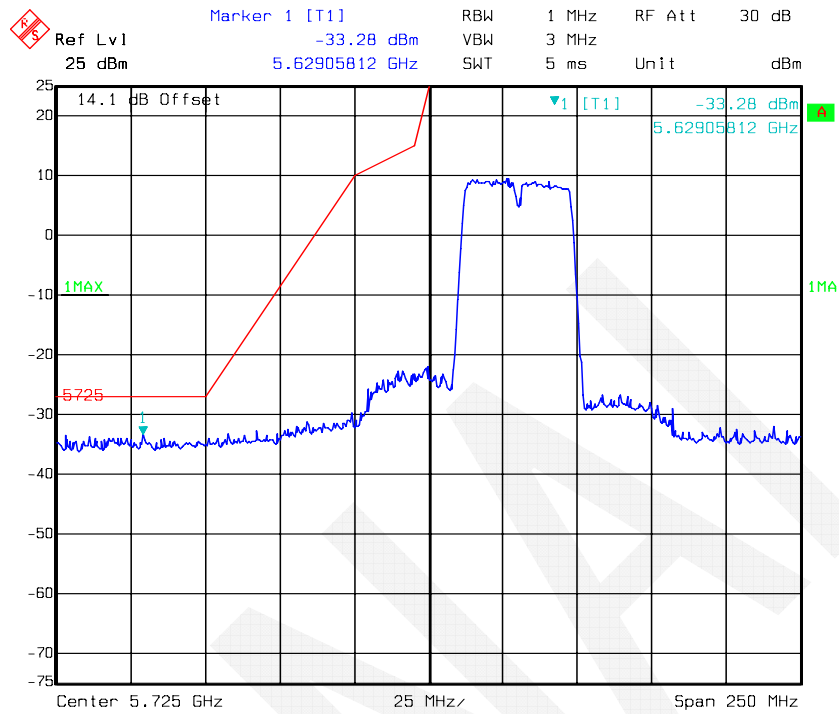
Date: 26.SEP.2017 15:37:05

802.11ac20: Band Edge, Right Side, Antenna 1



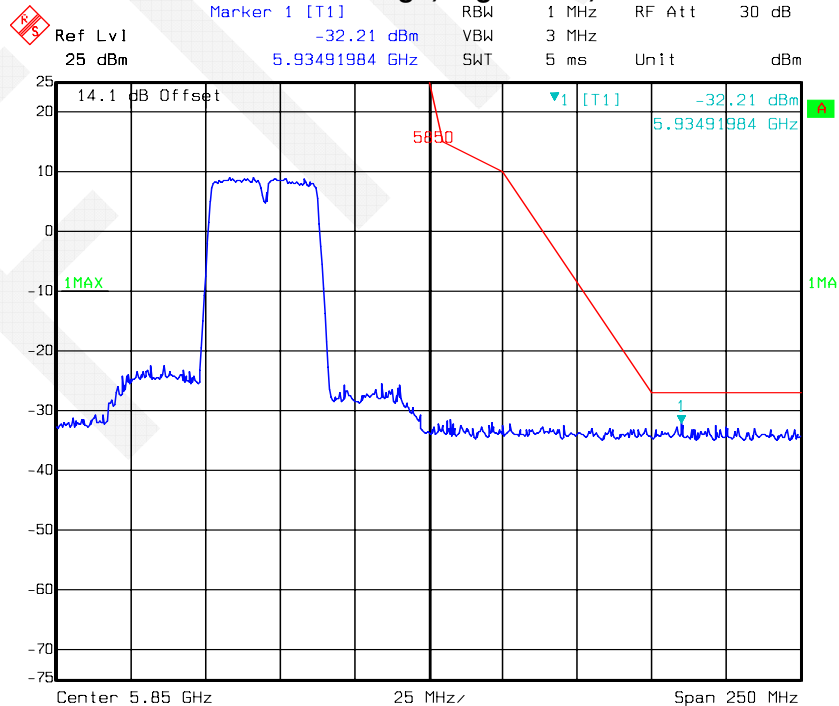
Date: 26.SEP.2017 15:27:09

802.11ac40: Band Edge, Left Side, Antenna 0



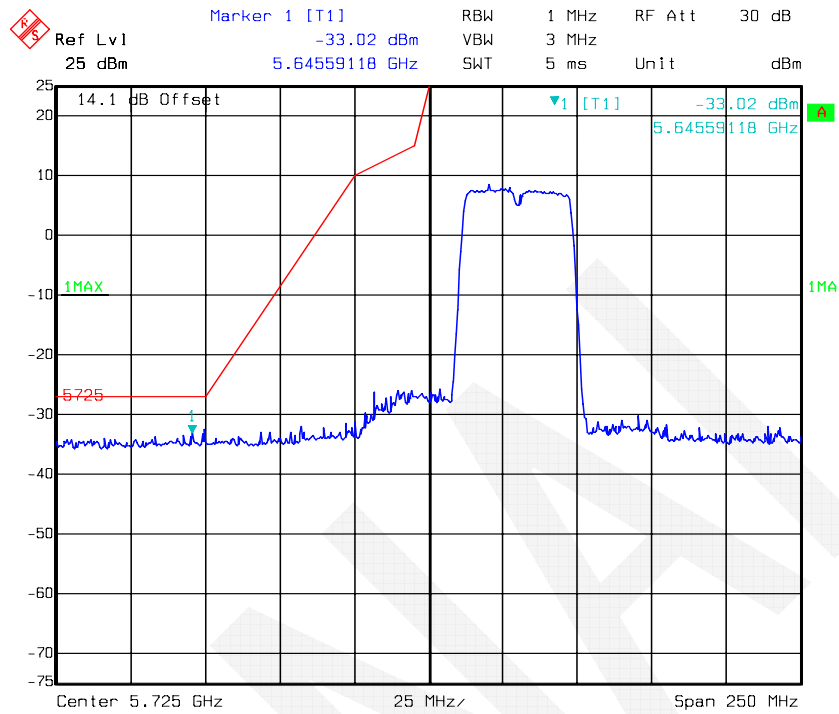
Date: 26.SEP.2017 15:17:34

802.11ac40: Band Edge, Right Side, Antenna 0



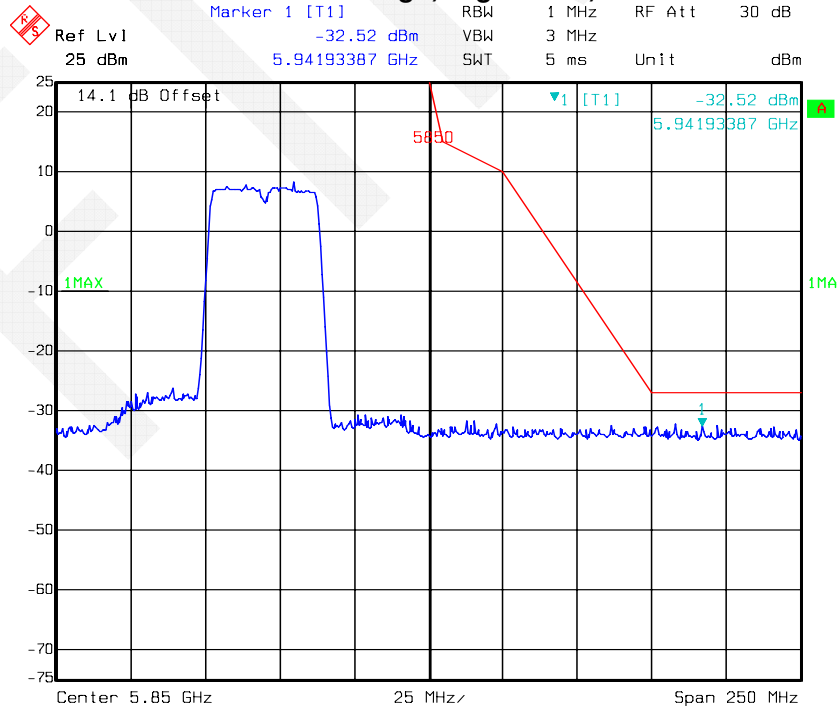
Date: 26.SEP.2017 15:19:39

802.11ac40: Band Edge, Left Side, Antenna 1



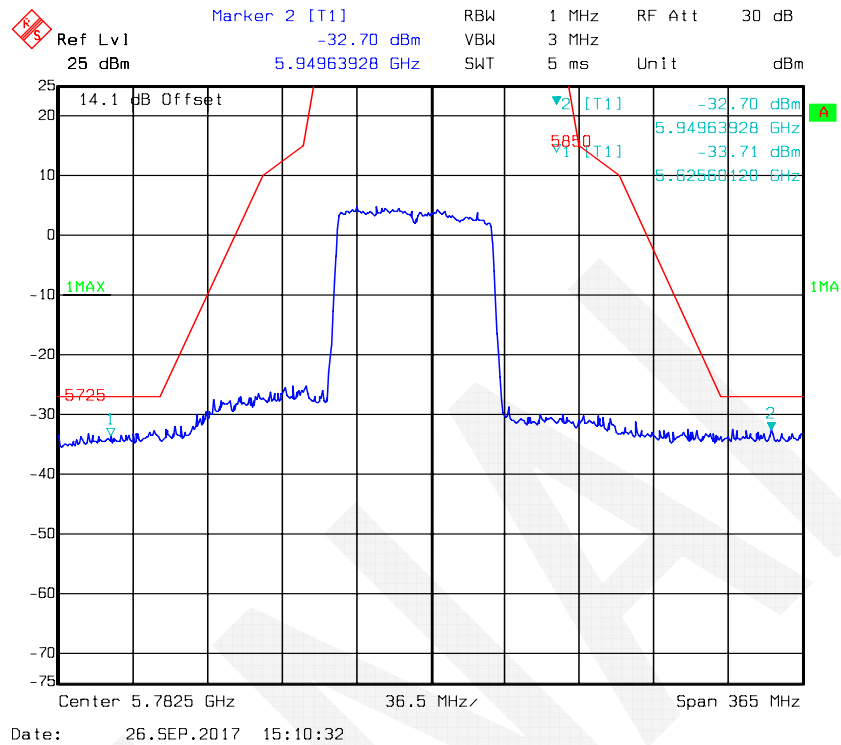
Date: 26.SEP.2017 15:35:54

802.11ac40: Band Edge, Right Side, Antenna 1

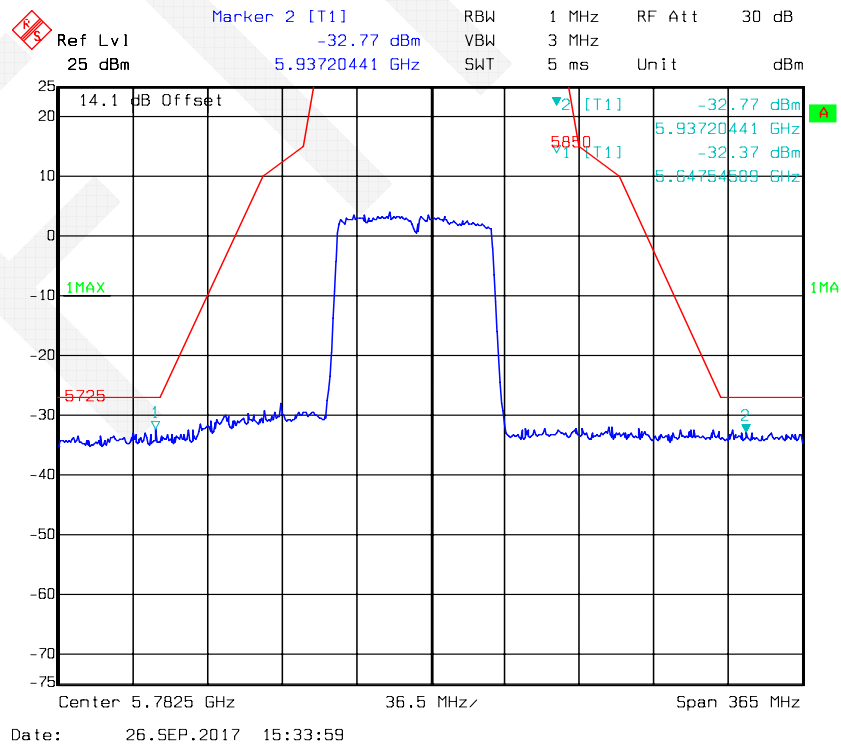


Date: 26.SEP.2017 15:30:31

802.11ac80: Band Edge, Antenna 0



802.11ac80: Band Edge, Antenna 1



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:	25 °C
Relative Humidity:	65 %
ATM Pressure:	95.2 kPa

* The testing was performed by Tom Tang on 2017-09-26.

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

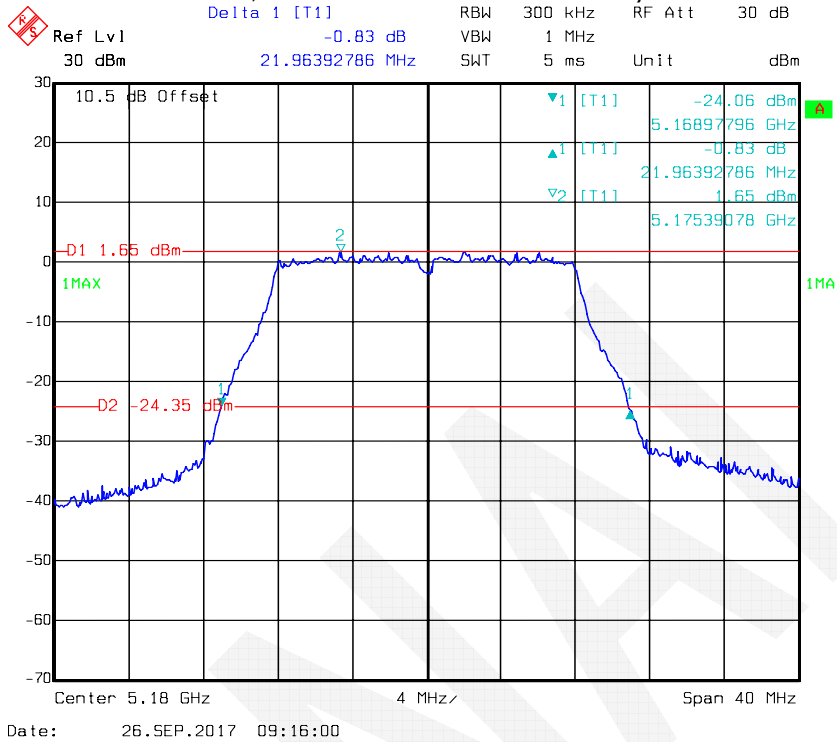
Test mode: Transmitting

For 5150-5250 MHz:

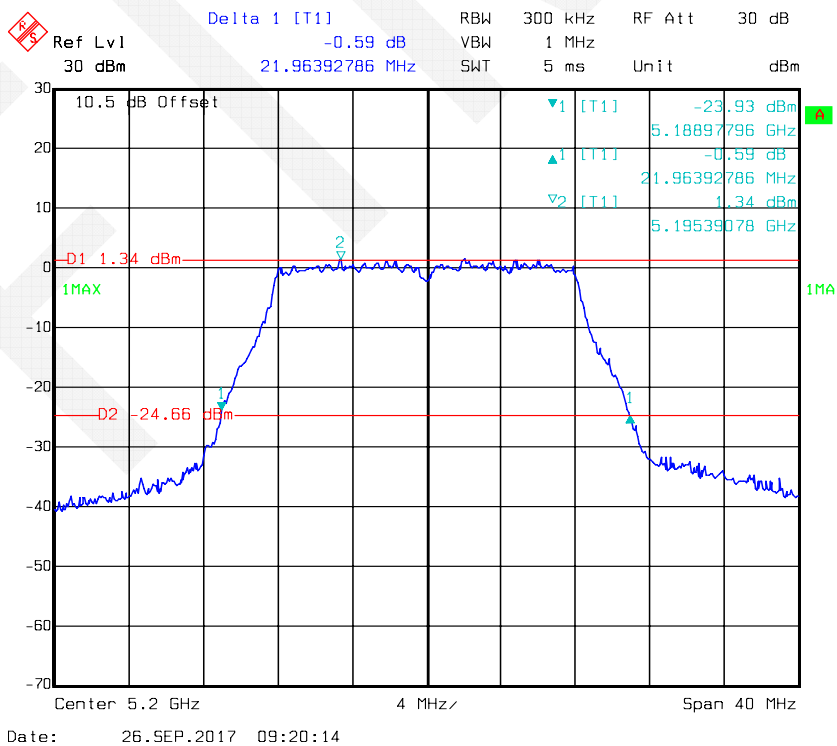
Mode	Channel	Frequency (MHz)	26dB Bandwidth (MHz)		99% Occupied Bandwidth (MHz)	
			Antenna 0	Antenna 1	Antenna 0	Antenna 1
802.11a	Low	5180	21.96	21.96	17.31	17.23
	Middle	5200	21.96	21.80	17.31	17.31
	High	5240	22.12	21.96	17.31	17.31
802.11n-HT20	Low	5180	22.12	22.12	18.28	18.36
	Middle	5200	22.20	22.20	18.36	18.36
	High	5240	22.12	22.04	18.28	18.36
802.11n-HT40	Low	5190	40.24	40.40	36.87	36.87
	High	5230	40.24	40.24	36.87	36.87
802.11ac20	Low	5180	22.20	22.12	18.28	18.28
	Middle	5200	22.28	22.20	18.44	18.36
	High	5240	22.28	22.12	18.28	18.36
802.11ac40	Low	5190	40.24	40.40	36.87	36.87
	High	5230	40.24	40.24	36.87	36.87
802.11ac80	-	5210	82.73	83.05	76.31	76.31

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

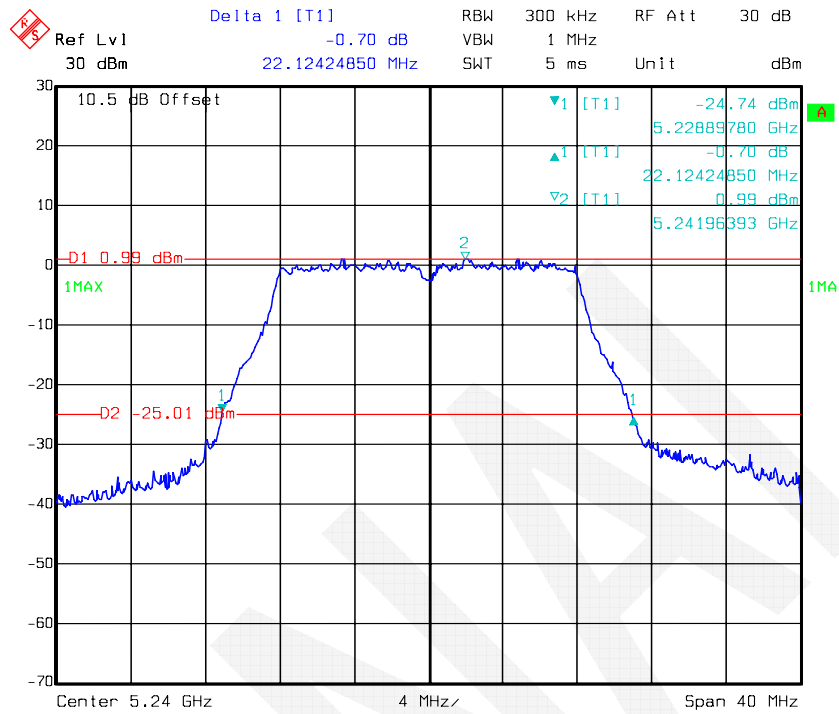
802.11a mode, 26 dB Bandwidth-5180 MHz, Antenna 0



802.11a mode, 26 dB Bandwidth-5200 MHz, Antenna 0

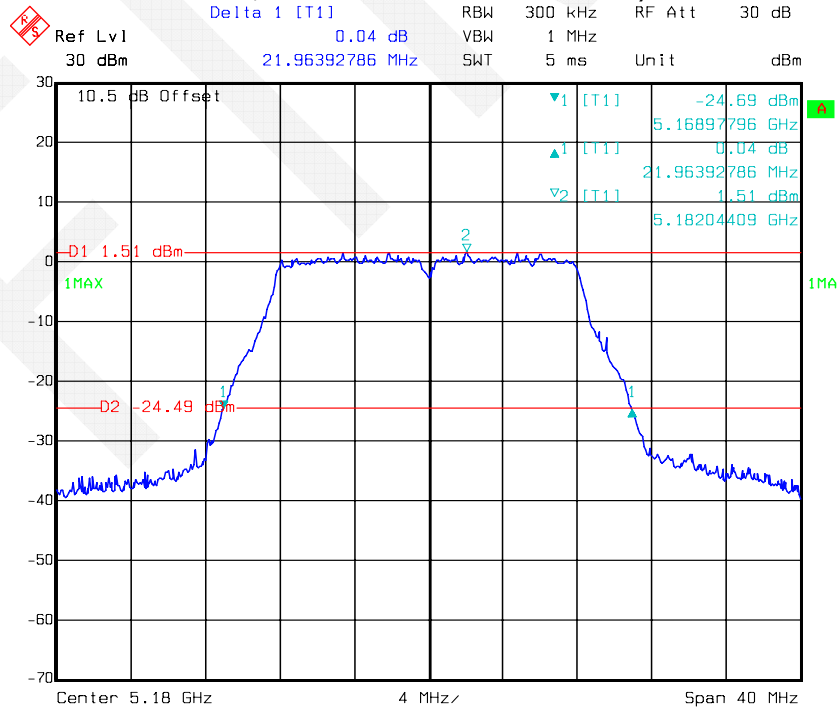


802.11a mode, 26 dB Bandwidth-5240 MHz, Antenna 0



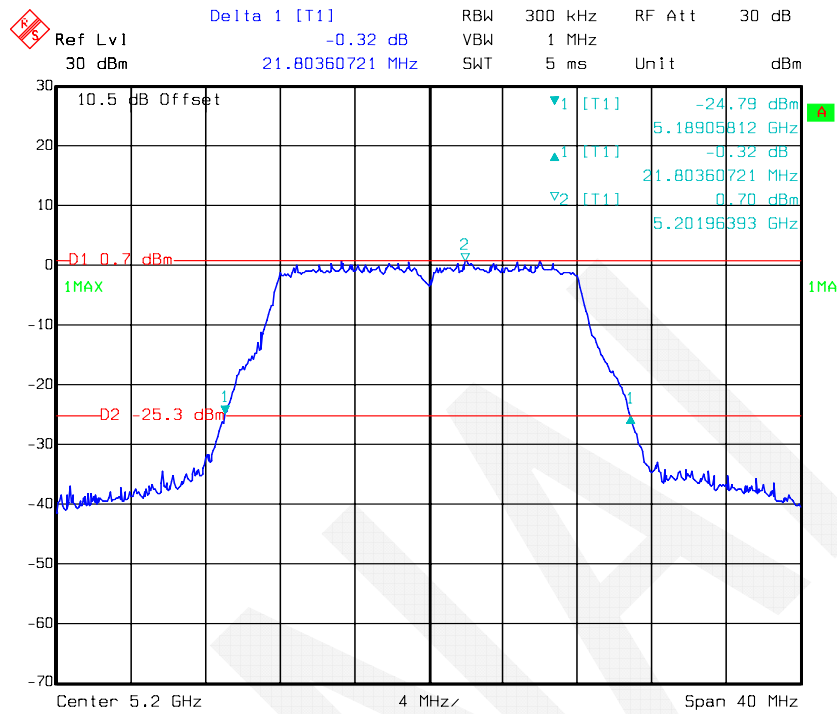
Date: 26.SEP.2017 09:22:08

802.11a mode, 26 dB Bandwidth-5180 MHz, Antenna 1



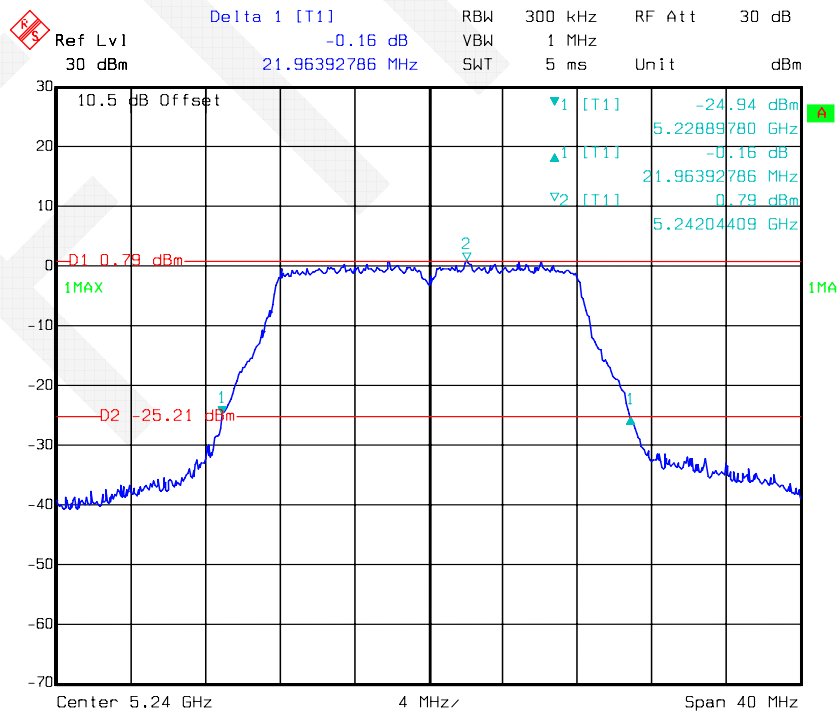
Date: 26.SEP.2017 10:18:52

802.11a mode, 26 dB Bandwidth-5200 MHz, Antenna 1



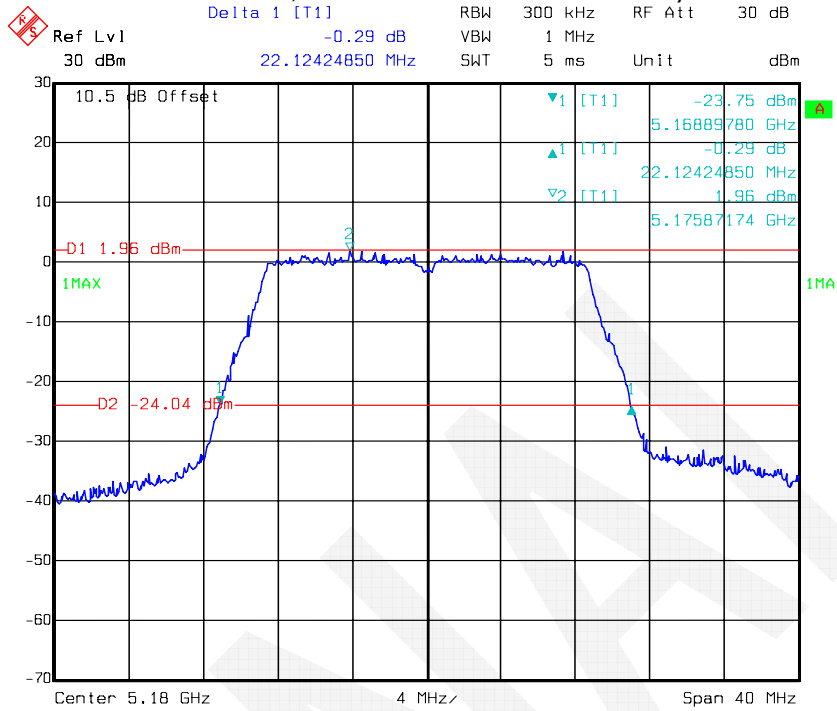
Date: 26.SEP.2017 10:20:27

802.11a mode, 26 dB Bandwidth-5240 MHz, Antenna 1



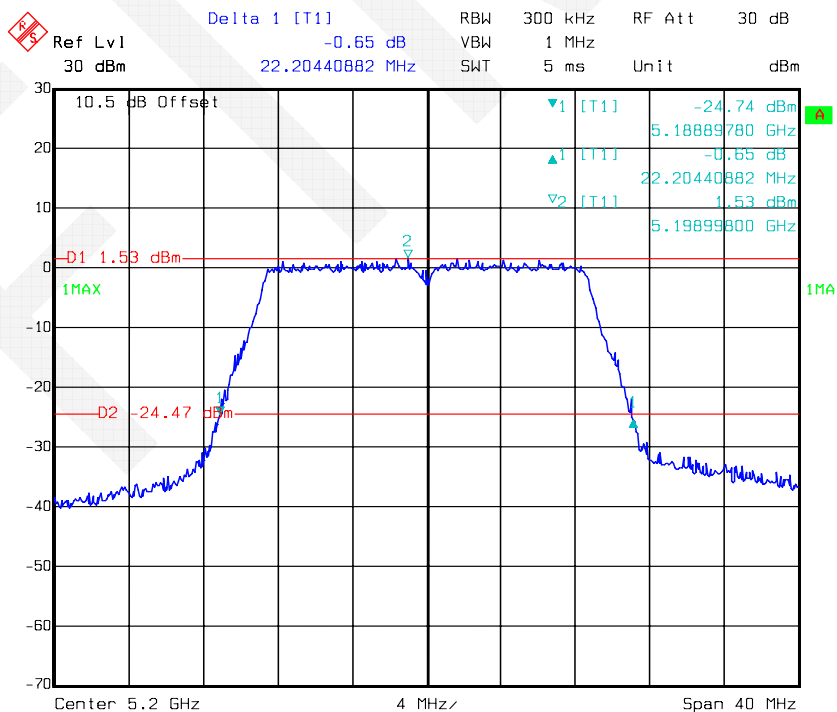
Date: 26.SEP.2017 10:21:41

802.11n-HT20 mode, 26 dB Bandwidth-5180 MHz, Antenna 0



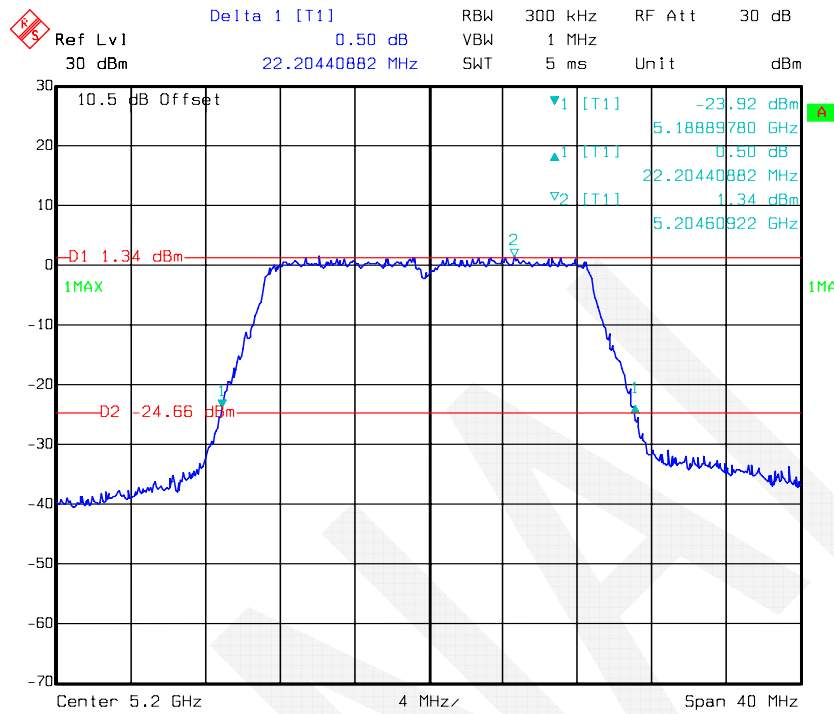
Date: 26.SEP.2017 09:24:24

802.11n-HT20 mode, 26 dB Bandwidth-5200 MHz, Antenna 0

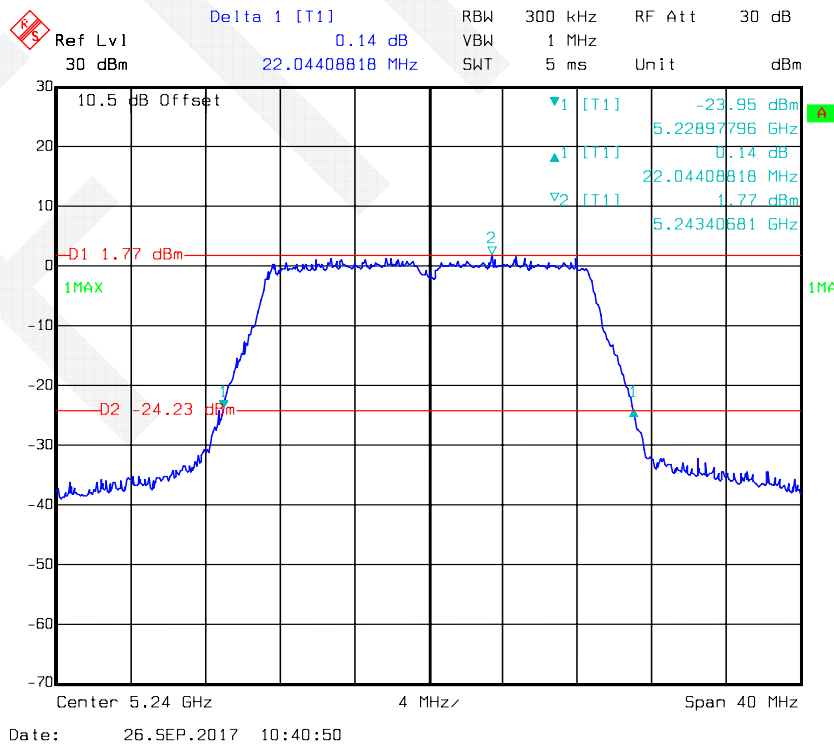


Date: 26.SEP.2017 09:26:22

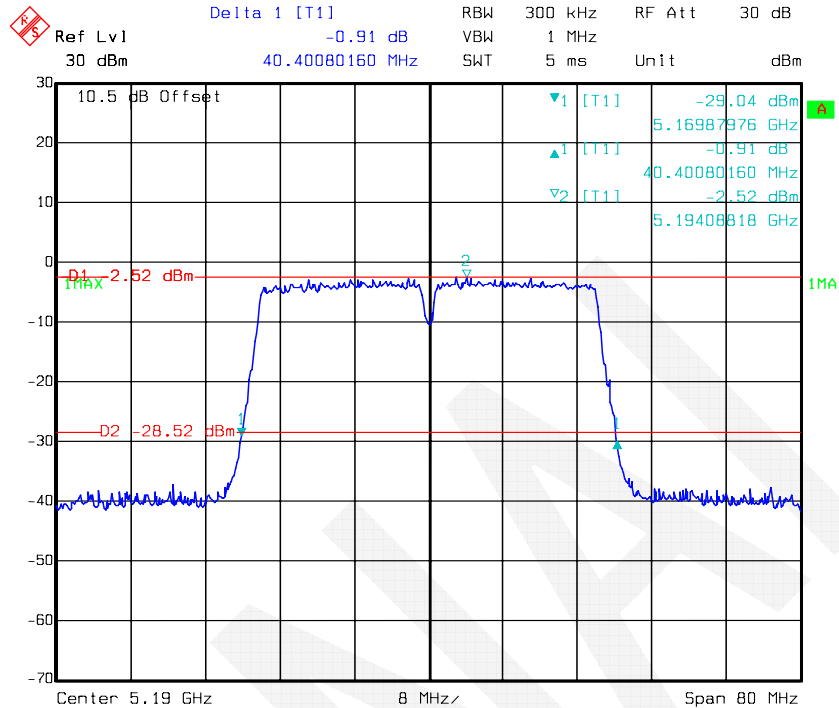
802.11n-HT20 mode, 26 dB Bandwidth-5200 MHz, Antenna 1



802.11n-HT20 mode, 26 dB Bandwidth-5240 MHz, Antenna 1

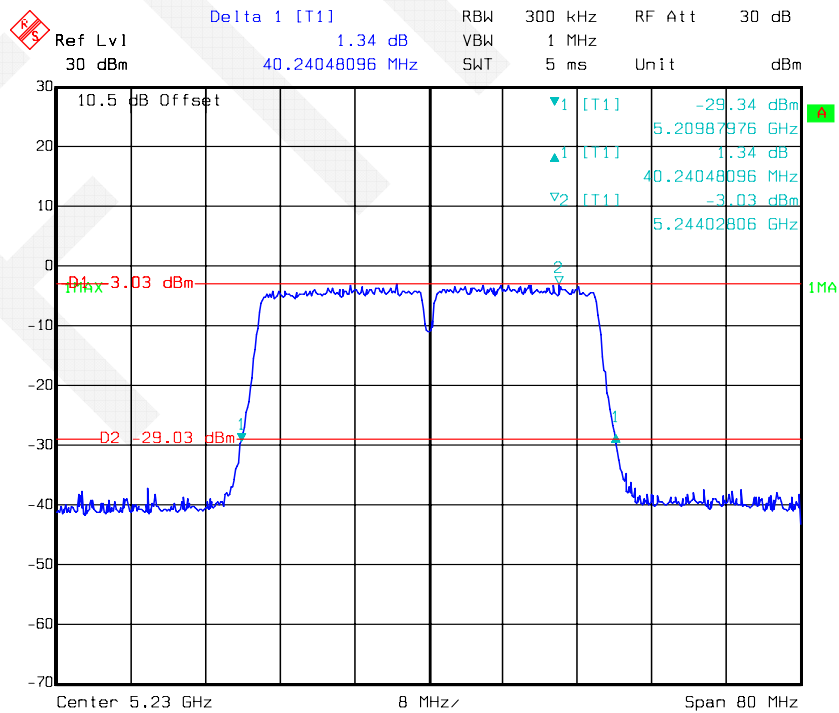


802.11n-HT40 mode, 26 dB Bandwidth-5190 MHz, Antenna 1



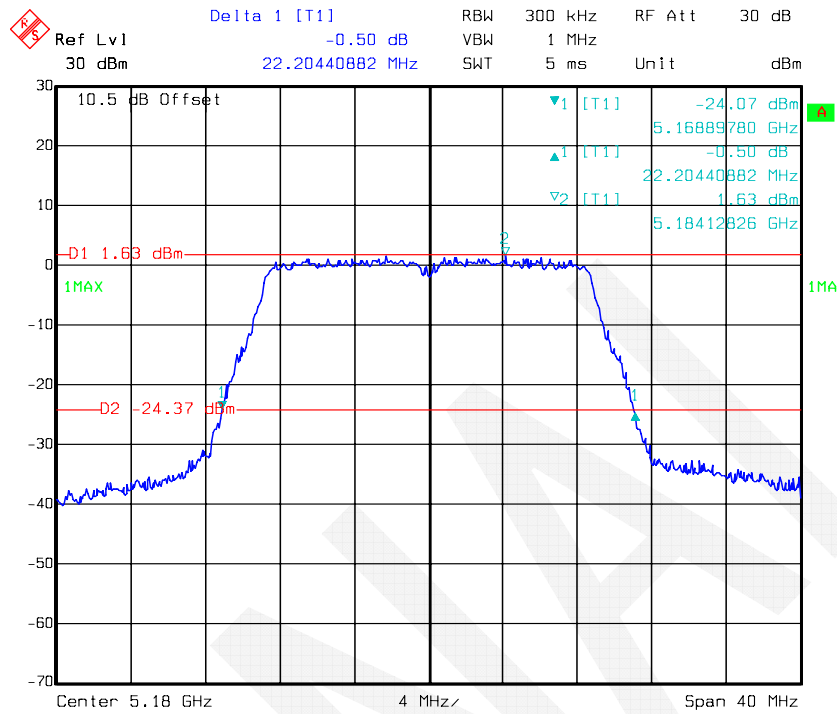
Date: 26.SEP.2017 10:42:42

802.11n-HT40 mode, 26 dB Bandwidth-5230 MHz, Antenna 1

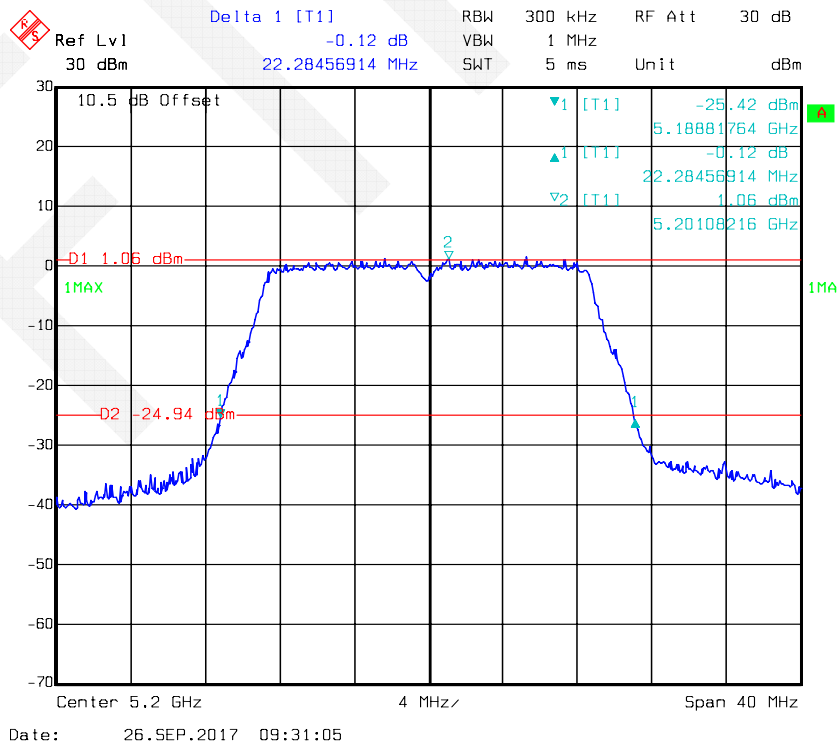


Date: 26.SEP.2017 10:45:44

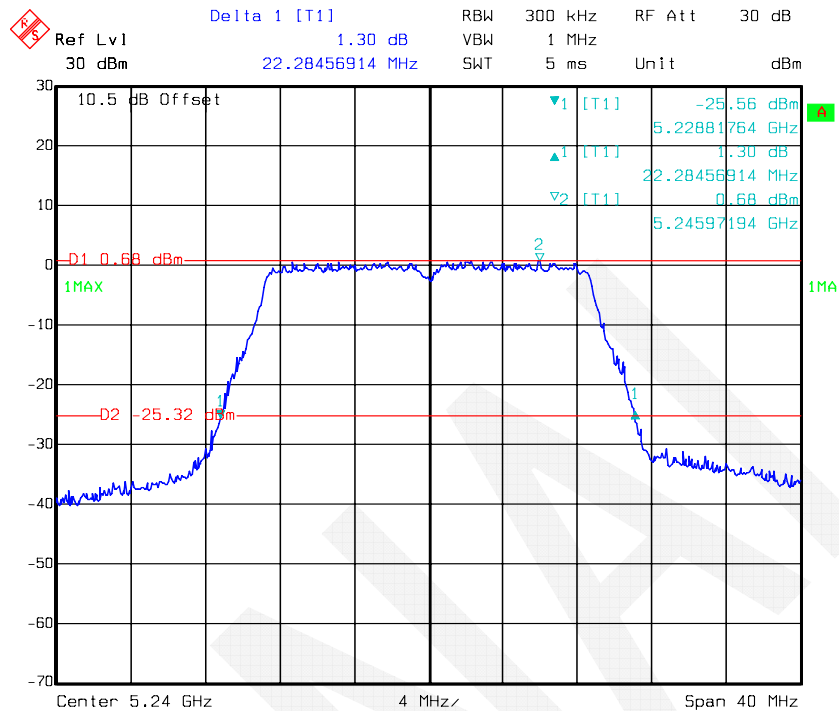
802.11ac20 mode, 26 dB Bandwidth-5180 MHz, Antenna 0



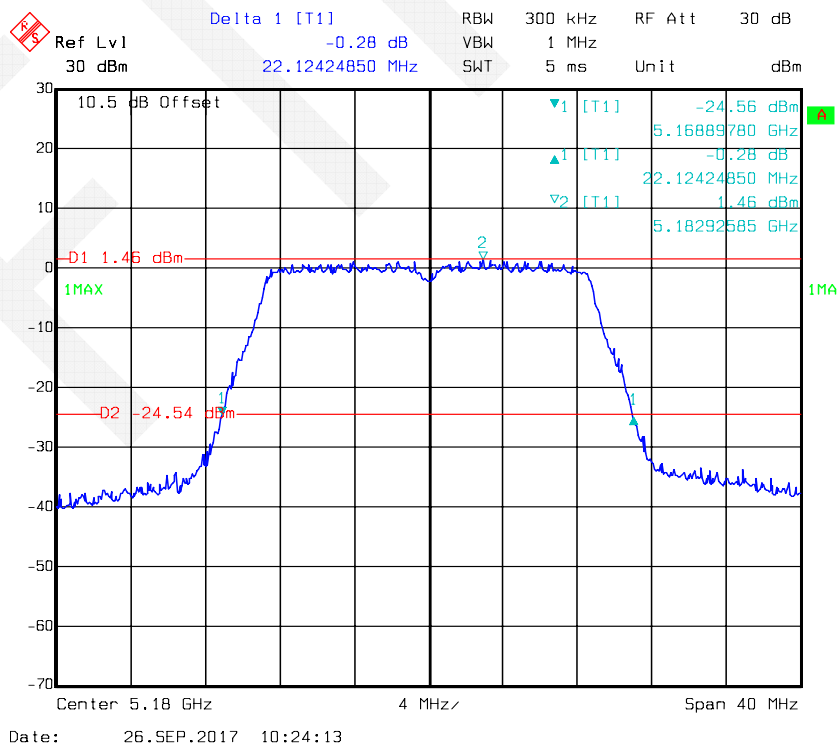
802.11ac20 mode, 26 dB Bandwidth-5200 MHz, Antenna 0



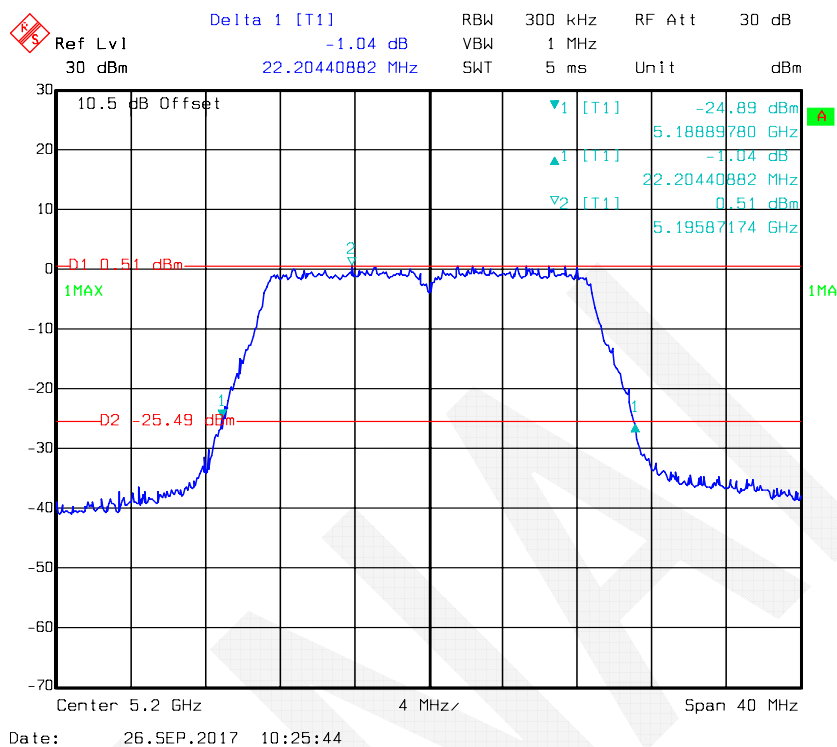
802.11ac20 mode, 26 dB Bandwidth-5240 MHz, Antenna 0



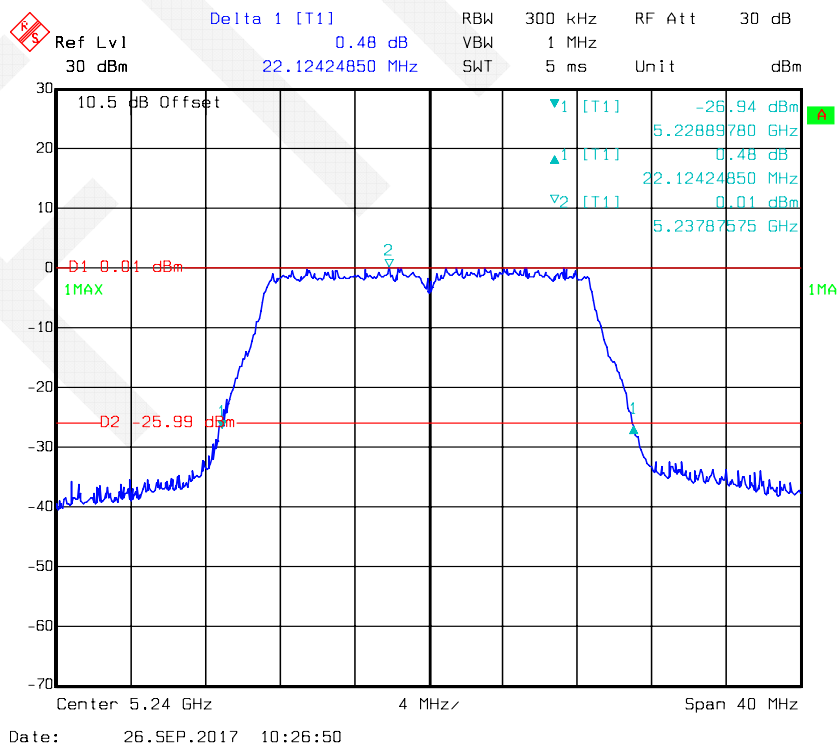
802.11ac20 mode, 26 dB Bandwidth-5180 MHz, Antenna 1



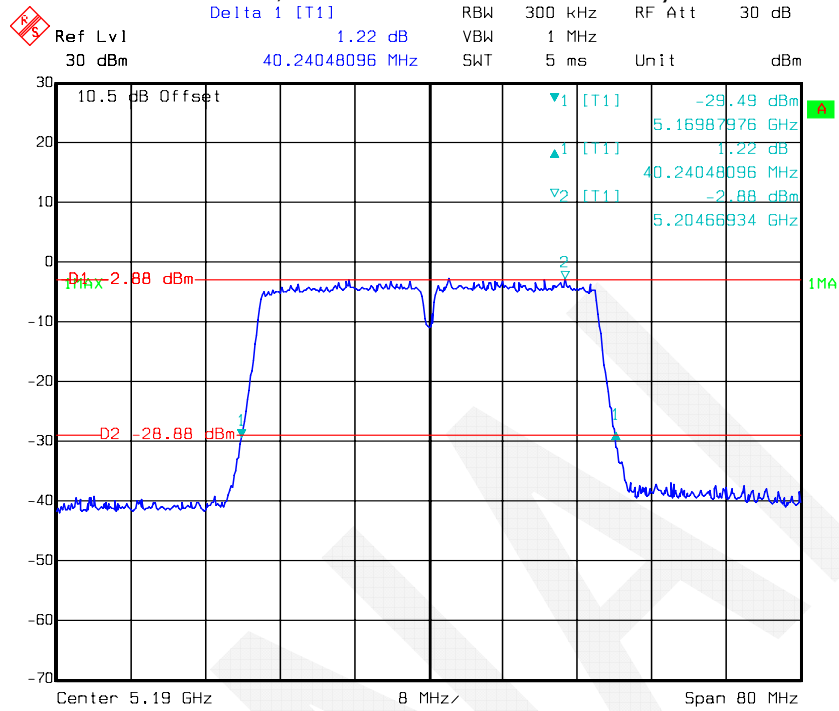
802.11ac20 mode, 26 dB Bandwidth-5200 MHz, Antenna 1



802.11ac20 mode, 26 dB Bandwidth-5240 MHz, Antenna 1

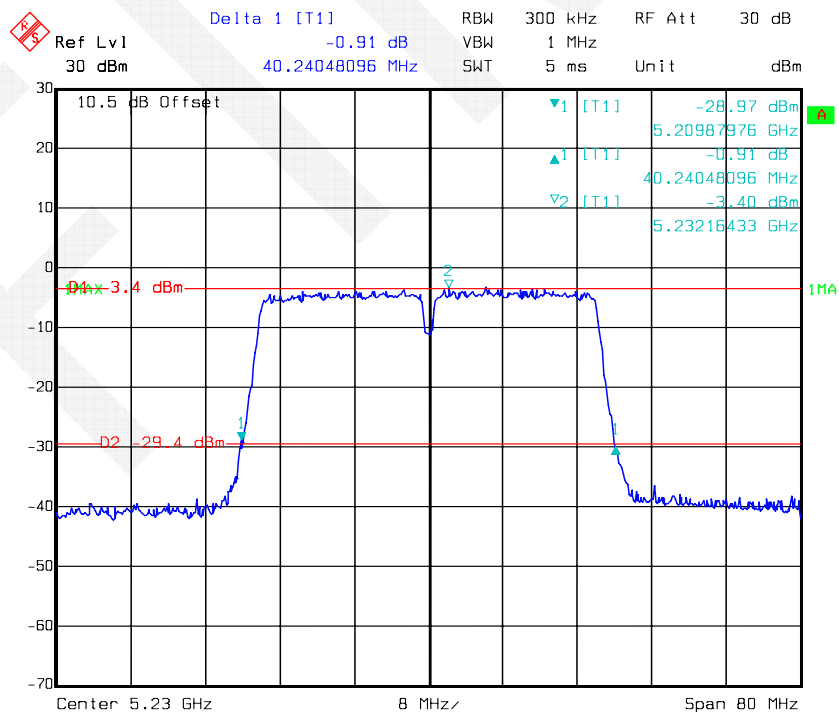


802.11ac40 mode, 26 dB Bandwidth-5190 MHz, Antenna 0



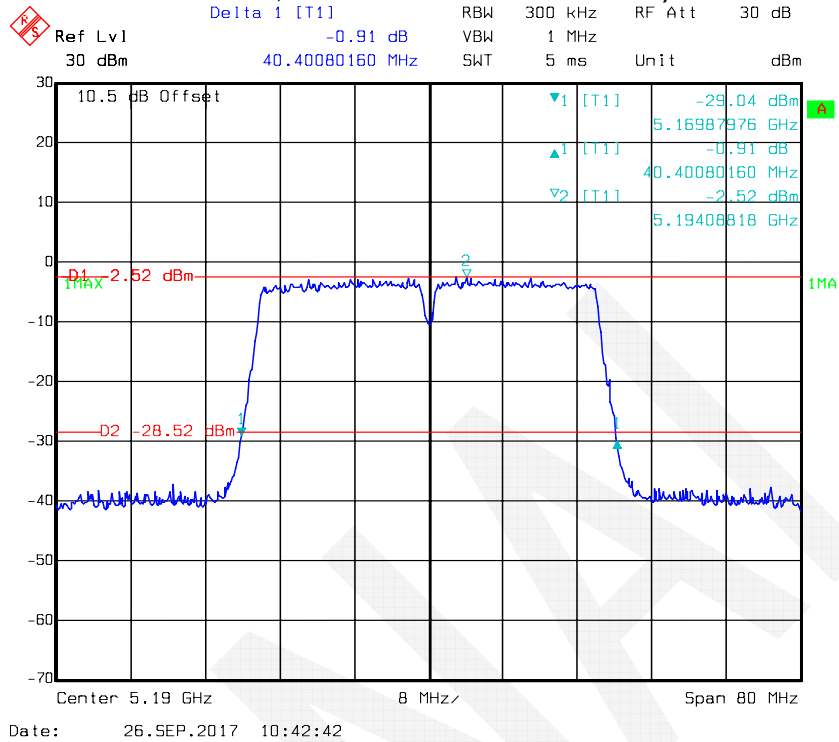
Date: 26.SEP.2017 09:38:23

802.11ac40 mode, 26 dB Bandwidth-5230 MHz, Antenna 0

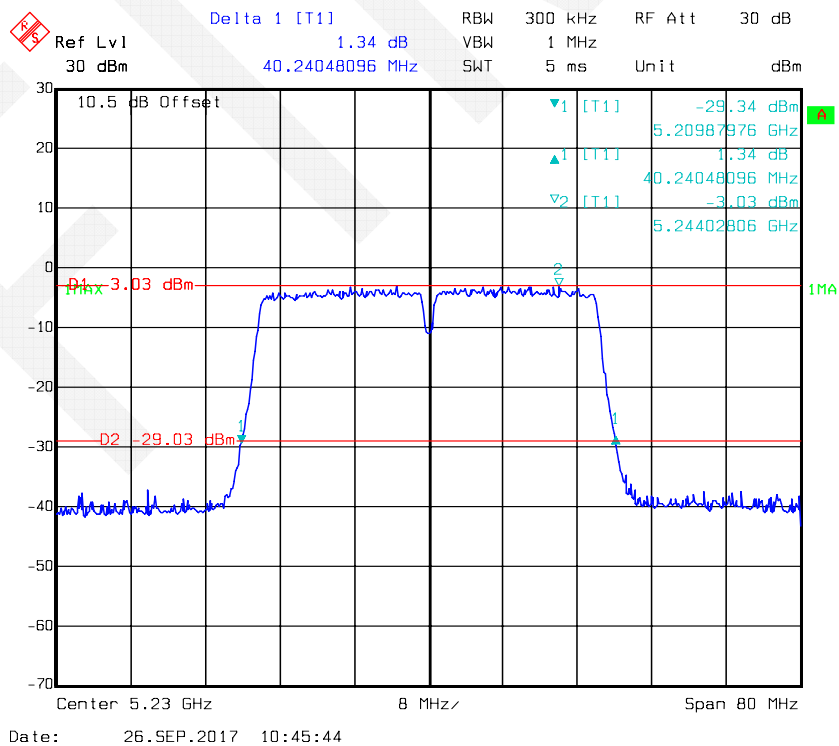


Date: 26.SEP.2017 09:40:11

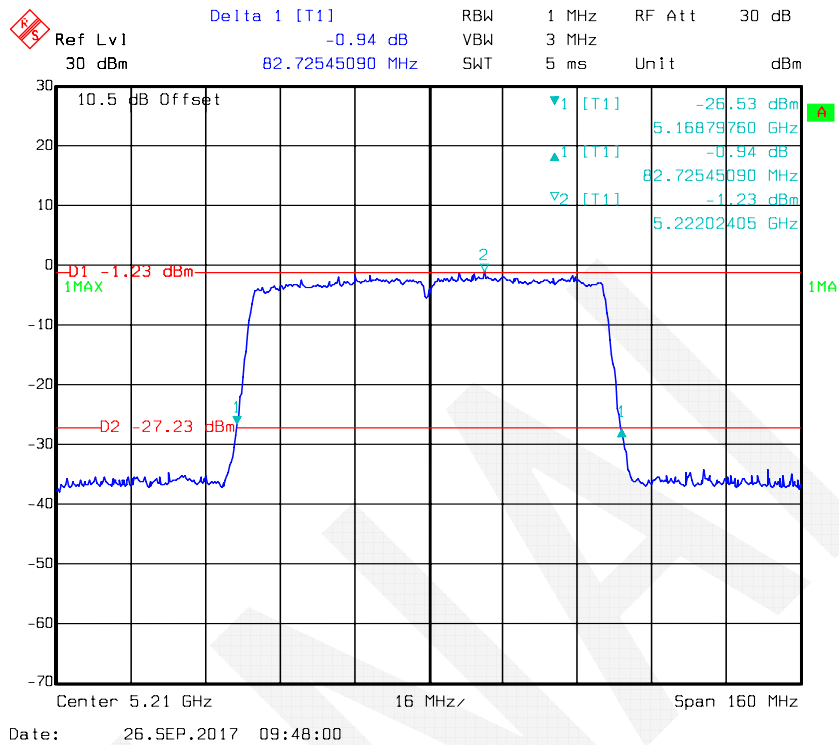
802.11ac40 mode, 26 dB Bandwidth-5190 MHz, Antenna 1



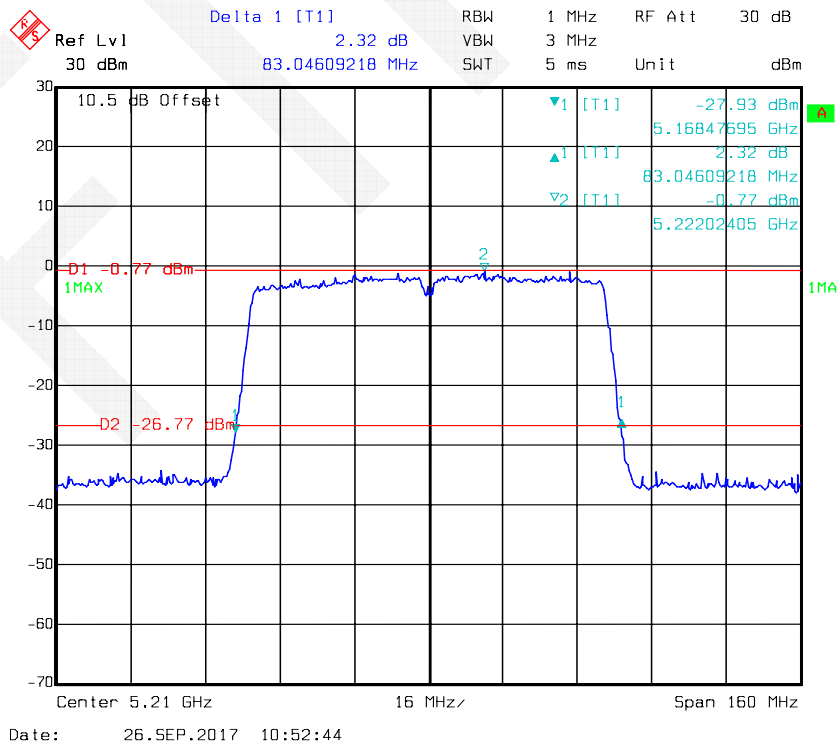
802.11ac40 mode, 26 dB Bandwidth-5230 MHz, Antenna 1



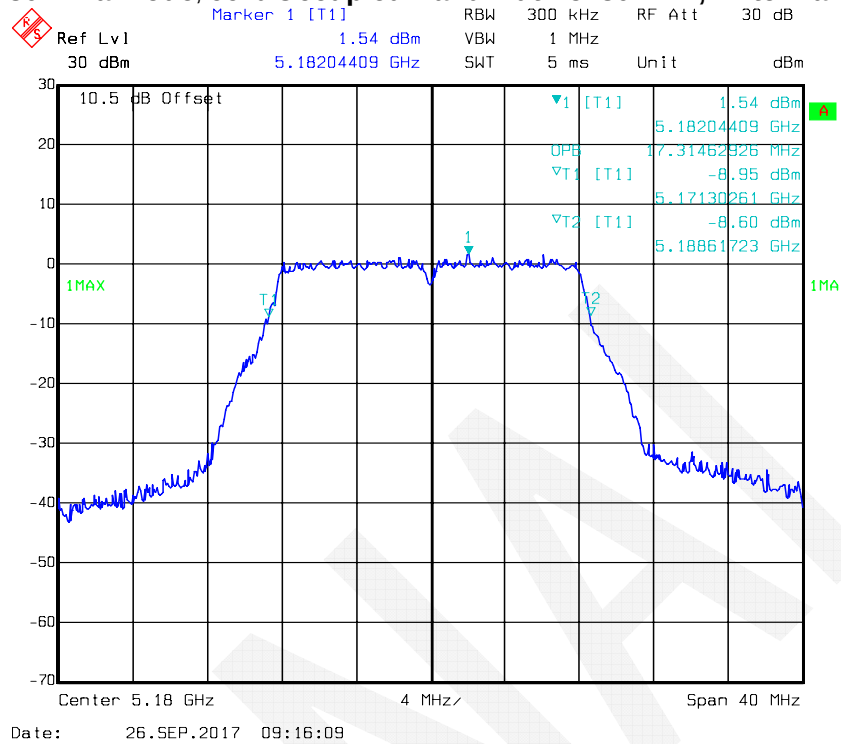
802.11ac80 mode, 26 dB Bandwidth-5210 MHz, Antenna 0



802.11ac80 mode, 26 dB Bandwidth-5210 MHz, Antenna 1



802.11a mode, 99% Occupied Bandwidth-5180 MHz, Antenna 0



802.11a mode, 99% Occupied Bandwidth -5200 MHz, Antenna 0

