ACCREDITED
TESTING LABORATORY
CERTIFICATE # 4821.01

BACL
Bay Area Compliance Labs Corp.

FCC PART 15.407

TEST REPORT

For

i.safe MOBILE GmbH

i_Park Tauberfranken 10 97922, Lauda-Koenigshofen, Germany

FCC ID: 2AACZ-IS5201

Report Type:	**Product Type:**
Original Report	TD-LTE Digital Mobile Phone

Report Number:	RSZ180411007-00F
Report Date:	2018-05-30
Reviewed By:	Rocky Kang RF Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

Note: This report must not be used by the customer to claim product certification, approval, or endorsement by A2LA* or any agency of the Federal Government. * This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk "*".

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *i.safe MOBILE GmbH's* product, model number: IS520.1 (FC*C ID: 2AACZ-IS5201)* or the "EUT" in this report was a *TD-LTE Digital Mobile Phone,* which was measured approximately: 15.4 cm (L) × 7.8 cm (W) ×2.4 cm (H), rated with input voltage: DC 3.8V battery or DC5.0V from Adapter..

Adapter Information:
Model: ICP12-050-2000B
Input: AC 100-240V, 50/60Hz, 0.3A
Output: DC 5.0V, 2000mA

**All measurement and test data in this report was gathered from production sample serial number: 1800508. (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2018-04-11.*

Objective

This type approval report is prepared on behalf of *i.safe MOBILE GmbH* in accordance with Part 2-Subpart J, Part 15-Subparts A and E of the Federal Communication Commissions rules.

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

Related Submittal(s)/Grant(s)

FCC Part 15.247 DSS&DTS, FCC Part 22H&24E&27 PCE, Part 15.225 DXX and Part 15B JBP submissions with FCC ID: 2AACZ-IS5201.

Test Methodology

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

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

Measurement Uncertainty

Parameter		uncertainty
Occupied Channel Bandwidth		±5%
RF Output Power with Power meter		±0.5dB
RF conducted test with spectrum		±1.5dB
AC Power Lines Conducted Emissions		±1.95dB
Emissions, Radiated	Below 1GHz	±4.75dB
	Above 1GHz	±4.88dB
Temperature		-30~60 ℃
Humidity		±6%
Supply voltages		±0.4%

Test Facility

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

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 342867,the FCC Designation No. : CN1221.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062B.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

The device support 802.11a/n20/ac20 modes.

For 5150-5250MHz Band, 4 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220
40	5200	48	5240

For 5470-5725MHz Band, 11 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	124	5620
104	5520	128	5640
108	5540	132	5660
112	5560	136	5680
116	5580	140	5700
120	5600	/	/

EUT Exercise Software

"RFtest tool" software was used. Test frequencies and power level were configured as below:

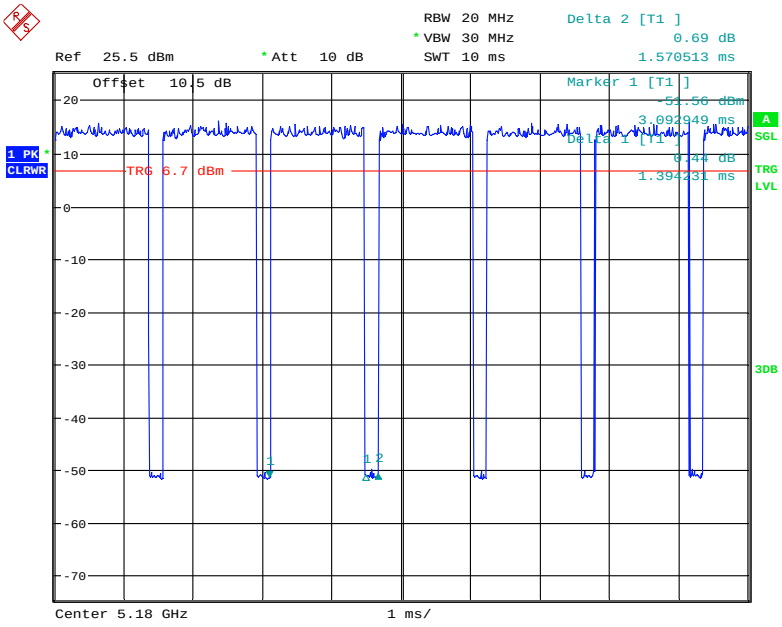
U-NII	Mode	Channel Number	Frequency (MHz)	Rate (Mbps)	Power Level
5150 – 5250MHz	802.11 a	CH36	5180	54	12
		CH40	5200	54	12
		CH48	5240	54	12
	802.11 n20	CH36	5180	MCS7	12
		CH40	5200	MCS7	12
		CH48	5240	MCS7	12
	802.11 ac20	CH36	5180	MCS7	12
		CH40	5200	MCS7	12
		CH48	5240	MCS7	12

U-NII	Mode	Channel Number	Frequency (MHz)	Rate (Mbps)	Power Level
5470 – 5725MHz	802.11 a	CH100	5500	54	12
		CH120	5600	54	12
		CH140	5700	54	12
	802.11 n20	CH100	5500	MCS7	12
		CH120	5600	MCS7	12
		CH140	5700	MCS7	12
	802.11 ac20	CH100	5500	MCS7	12
		CH120	5600	MCS7	12
		CH140	5700	MCS7	12

Duty cycle:

5150-5250 MHz

802.11a mode



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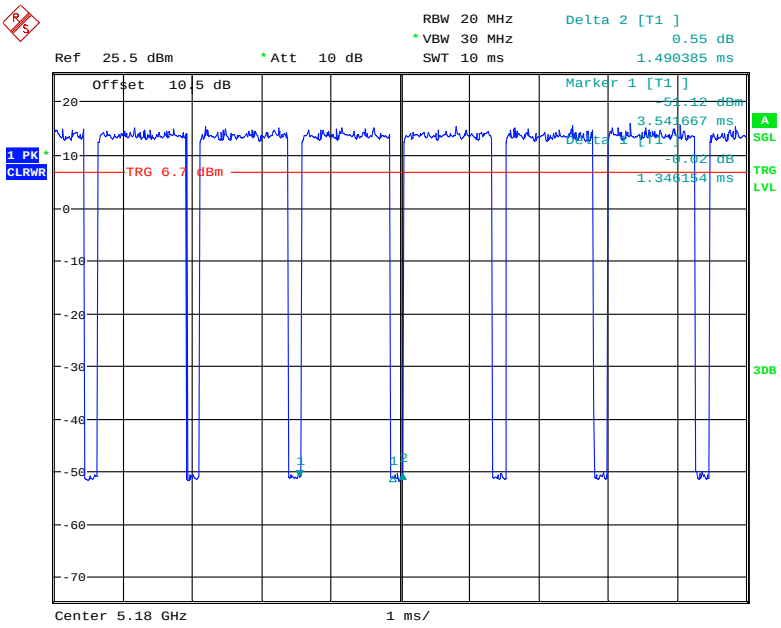
802.11n20 mode



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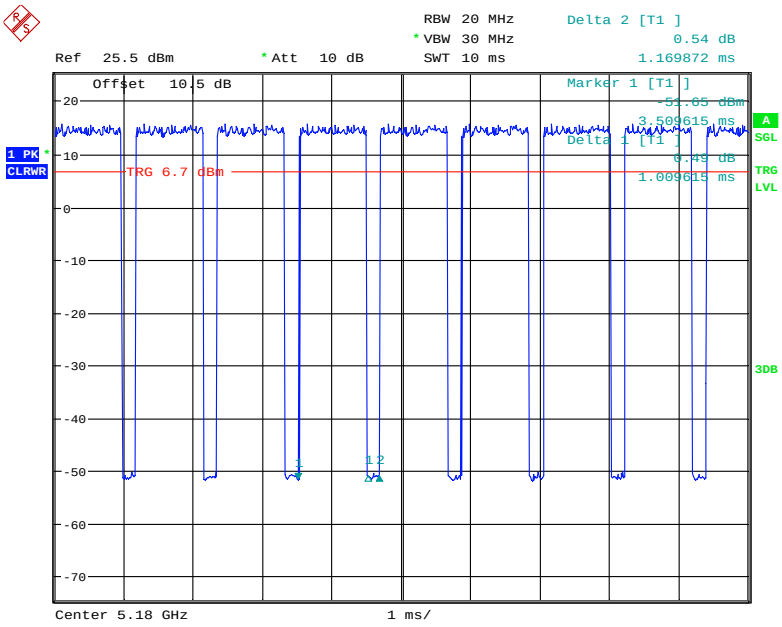
802.11ac20 Mode



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Band	Duty Cycle (%)	T(ms)	1/T(kHz)	VBW Setting	10log(1/dutycycle)
802.11a	89	1.394	0.72	1kHz	0.51
802.11n20	90	1.346	0.74	1kHz	0.46
802.11ac20	86	1.010	0.99	1kHz	0.66

Note: 5470 – 5725MHz band was used the same duty cycle to test for each mode.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

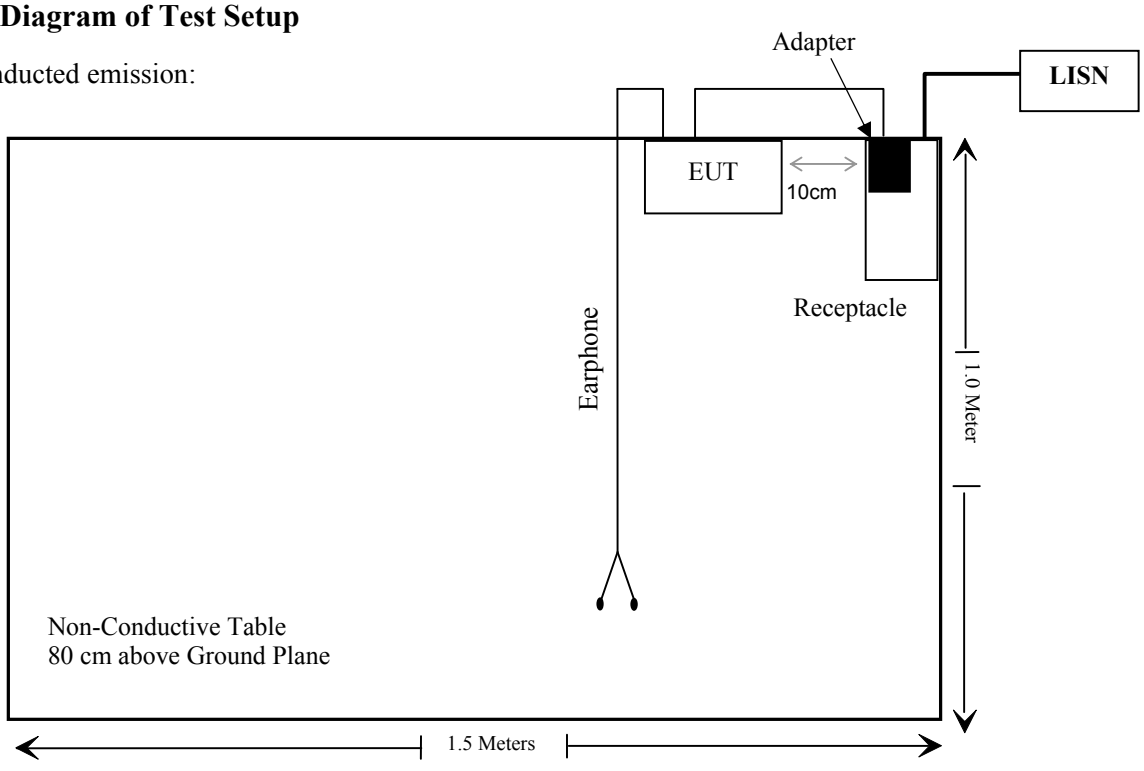
Manufacturer	Description	Model	Serial Number
/	/	/	/

External I/O Cable

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

Block Diagram of Test Setup

For conducted emission:



SUMMARY OF TEST RESULTS

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

DFS report please refer to RSZ180411009-00 issued by Bay Area Compliance Laboratories Corp. (Dongguan).

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
AC Line Conducted test					
Rohde & Schwarz	EMI Test Receiver	ESCS30	100176	2017-08-04	2018-08-04
Rohde & Schwarz	LISN	ENV216	3560.6650.12-101613-Yb	2017-12-21	2018-12-21
Rohde & Schwarz	Transient Limiter	ESH3Z2	DE25985	2017-11-19	2018-05-17
Rohde & Schwarz	CE Test software	EMC 32	V8.53.0	NCR	NCR
N/A	Conducted Emission Cable	N/A	UF A210B-1-0720-504504	2017-11-12	2018-05-12
Radiated Emission Test					
A.H.System	Horn Antenna	SAS-200/571	135	2015-08-18	2018-08-17
Rohde & Schwarz	Signal Analyzer	FSEM	845987/005	2018-04-24	2019-04-24
Agilent	Spectrum Analyzer	8564E	3943A01781	2018-01-04	2019-01-04
Sunol Sciences	Bi-log Antenna	JB1	A040904-2	2017-12-17	2020-12-16
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2018-05-21	2019-05-21
HP	Amplifier	HP8447E	1937A01046	2018-05-21	2018-11-19
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2018-01-11	2019-01-11
UTiFLEX MICRO-C0AX	RF Cable	UFA147A-2362-100100	MFR64639 231029-003	2018-04-01	2018-10-01
Ducommun technologies	RF Cable	104PEA	218124002	2018-05-21	2019-11-19
Ducommun technologies	RF Cable	RG-214	1	2018-05-21	2019-11-19
Ducommun technologies	RF Cable	RG-214	2	2017-11-22	2018-05-22
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-04	2017-12-29	2020-12-28
Ducommun Technologies	Horn Antenna	ARH-4823-02	1007726-04	2017-12-29	2020-12-28
Ducommun Technologies	Pre-amplifier	ALN-22093530-01	991373-01	2017-08-03	2018-08-03

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde & Schwarz	SPECTRUM ANALYZER	FSU26	200120	2017-12-05	2018-12-05
Agilent	Power Meter	N1912A	MY5000492	2017-11-18	2018-11-17
Agilent	Power Sensor	N1921A	MY54210024	2017-11-18	2018-11-17
Ducommun technologies	RF Cable	RG-214	3	2017-11-22	2018-05-22
WEINSCHEL	10dB Attenuator	5324	AU 3842	2017-11-22	2018-05-23

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

FCC§15.247 (i), §1.1307 (b) (1) & §2.1093 – RF EXPOSURE

Applicable Standard

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

Measurement Result

Please refer to SAR test report: RSZ180411007-20A.

FCC §15.203 – ANTENNA REQUIREMENT

Applicable Standard

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

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

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

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

Antenna Connector Construction

The EUT has one internal antenna arrangement, which was permanently attached and the antenna gain is -1.2 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

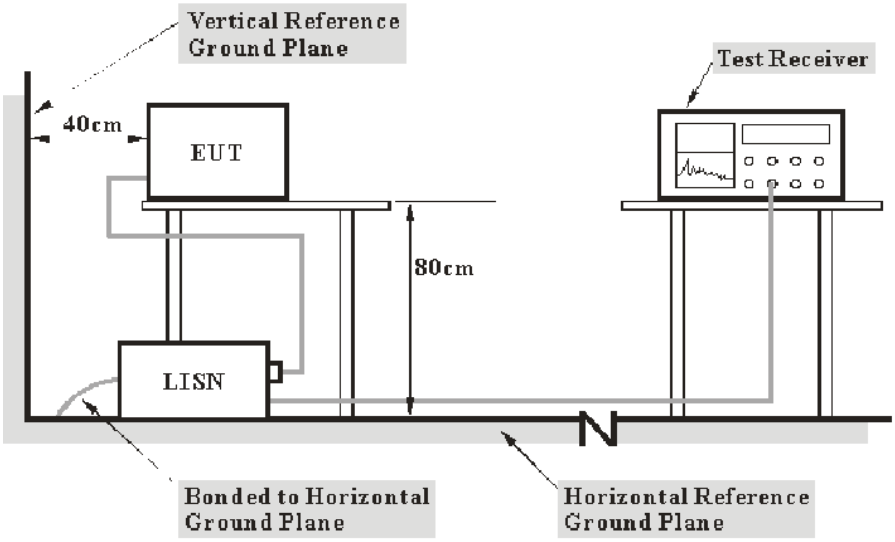
Result: Compliance.

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

Applicable Standard

FCC §15.207, §15.407(b) (6)

EUT Setup



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

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

The spacing between the peripherals was 10 cm.

The adapter was connected to a 120VAC/60 Hz power source.

EMI Test Receiver Setup

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

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

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

Test Procedure

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

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

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

Test Results Summary

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

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

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

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

Test Data

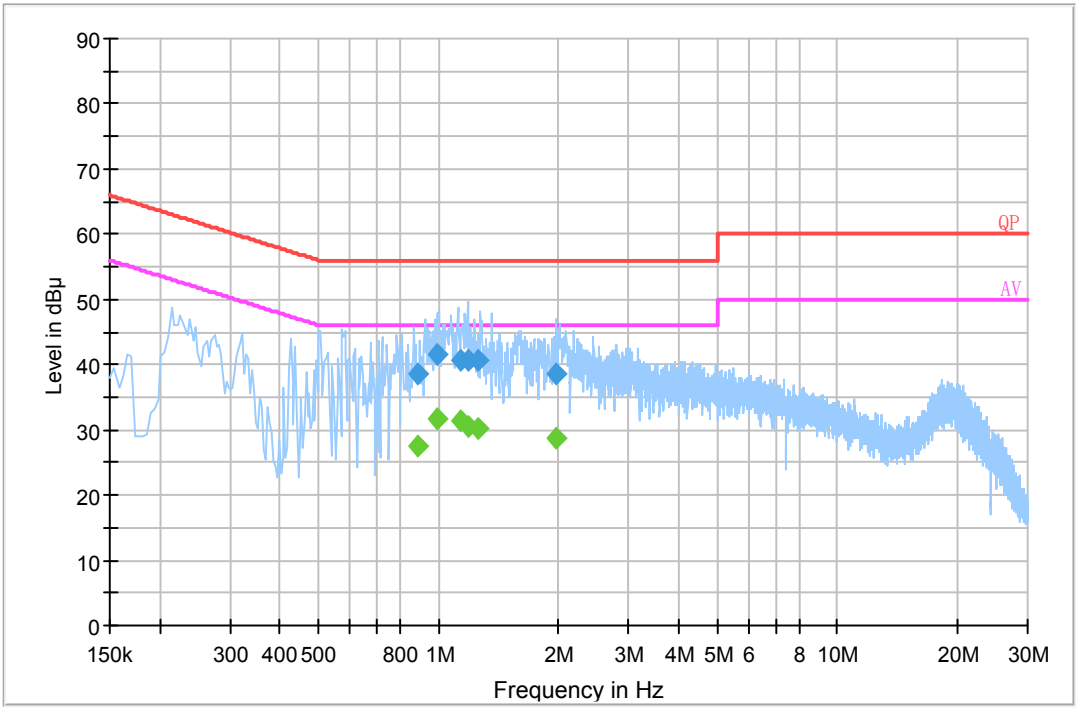
Environmental Conditions

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

The testing was performed by Simon Wang on 2018-05-03.

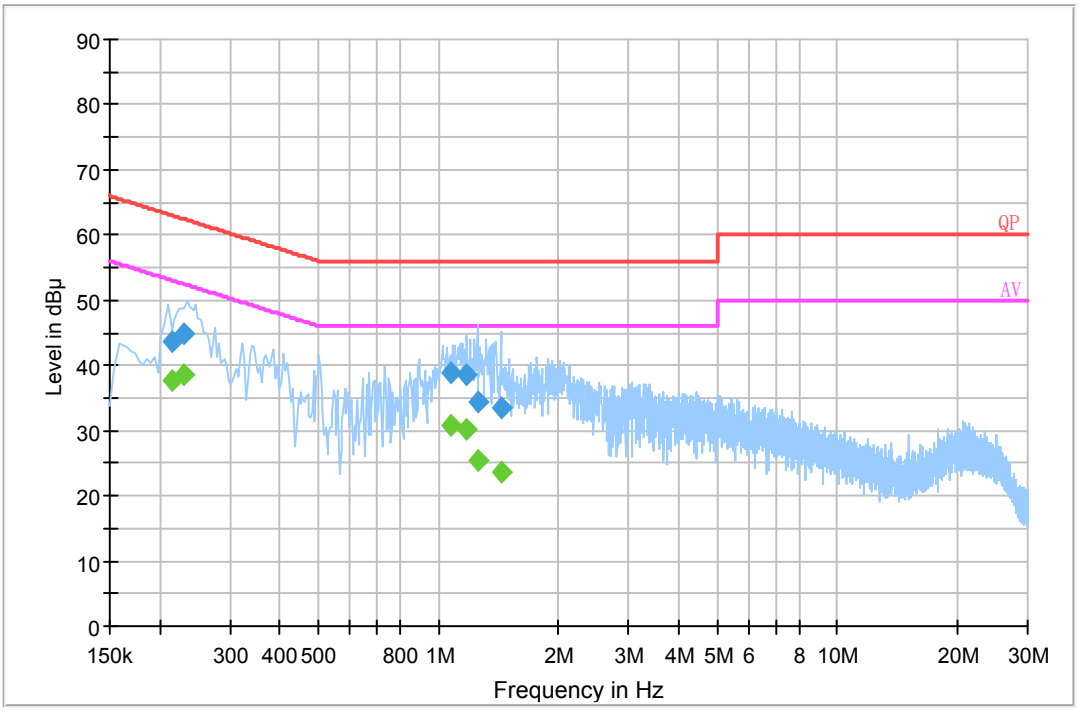
EUT operation mode: Transmitting (worst case)

AC 120 V/60 Hz, Line:



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/Ave./QP)
0.883050	38.7	20.0	56.0	17.3	QP
0.994970	41.4	20.0	56.0	14.6	QP
1.133230	40.7	20.0	56.0	15.3	QP
1.184270	40.7	20.0	56.0	15.3	QP
1.258830	40.8	20.0	56.0	15.2	QP
1.972330	38.6	20.0	56.0	17.4	QP
0.883050	27.6	20.0	46.0	18.4	Ave.
0.994970	31.7	20.0	46.0	14.3	Ave.
1.133230	31.4	20.0	46.0	14.6	Ave.
1.184270	30.5	20.0	46.0	15.5	Ave.
1.258830	30.3	20.0	46.0	15.7	Ave.
1.972330	28.7	20.0	46.0	17.3	Ave.

AC 120 V, 60 Hz, Neutral:



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/Ave./QP)
0.214501	43.6	20.1	63.0	19.4	QP
0.229500	45.0	20.1	62.5	17.5	QP
1.073710	39.0	20.0	56.0	17.0	QP
1.180330	38.6	20.0	56.0	17.4	QP
1.263190	34.5	20.0	56.0	21.5	QP
1.432490	33.4	20.0	56.0	22.6	QP
0.214501	37.8	20.1	53.0	15.2	Ave.
0.229500	38.7	20.1	52.5	13.8	Ave.
1.073710	30.7	20.0	46.0	15.3	Ave.
1.180330	30.1	20.0	46.0	15.9	Ave.
1.263190	25.4	20.0	46.0	20.6	Ave.
1.432490	23.6	20.0	46.0	22.4	Ave.

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

§15.205 & §15.209 & §15.407(B) (1), (3), (6),(7) – UNDESIRABLE EMISSION

Applicable Standard

FCC §15.407 (b) (1), (3), (6), (7); §15.209; §15.205;

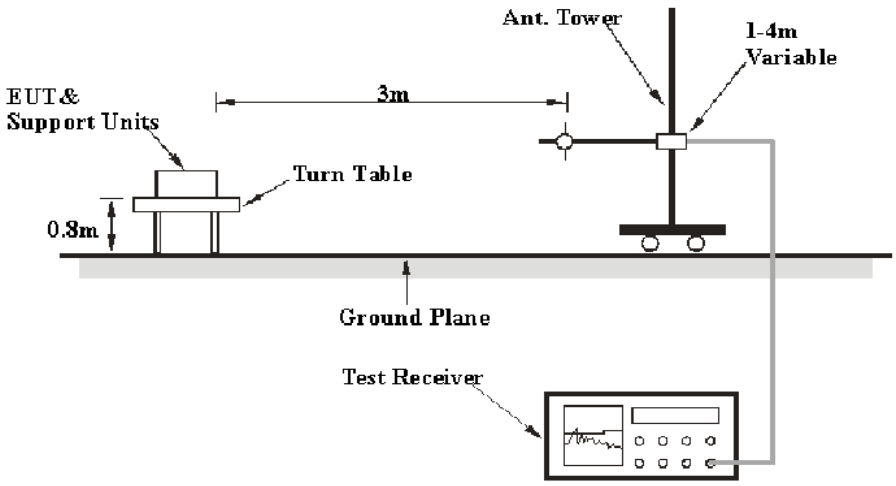
(b) Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:
(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.

KDB 789033 D02 General UNII Test Procedures New Rules v02r01, clause G),
E [dBμV/m] = EIRP [dBm] + 95.2, for d = 3 meters.

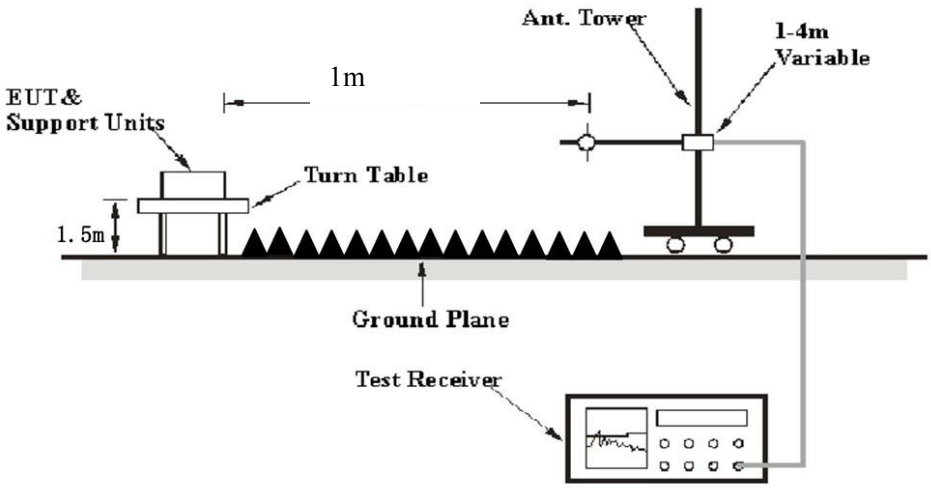
The general limit of -27 dBm EIRP (= 68.2 dBμV/m) is applied for unwanted emission of U-NII devices.
However, compliance with unwanted emissions in restricted bands may need to be considered, *e.g.*, some harmonics may land in the restricted bands below 5.15 GHz and above 5.35 GHz (refer
The general limit of -27 dBm EIRP (= 68.2 dBμV/m) is applied for unwanted emission of U-NII devices.
However, compliance with unwanted emissions in restricted bands may need to be considered, *e.g.*, some harmonics may land in the restricted bands below 5.15 GHz and above 5.35 GHz (refer to § 15.205 for restricted bands) that have average and peak limits specified in §§ 15.209 and 15.35(b), respectively.
Although the peak limit of 74 dBμV/m (20 dB above 54 dBμV/m) in the restricted band appears to be higher than 68.2 dBμV/m, the lower average limit of 54 dBμV/m in the restricted bands needs to be complied to

EUT Setup

Below 1 GHz:



Above 1 GHz:



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

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

The adapter was connected to a 120VAC/60 Hz power source,

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 40 GHz.

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

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

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

Test Procedure

Radiated Spurious Emission

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

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

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

According to ANSI C63.10-2013,9.4: For field strength measurements made at other than the distance at which the applicable limit is specified,extrapolate the measured field strength to the field strength at the distance specified by the limit using an inverse distance correction factor (20 dB/decade of distance). In some cases, a different distance correction factor may be required;

$$E_{\mathrm{SpecLimit}} = E_{\mathrm{Meas}} + 20\log\left(\frac{d_{\mathrm{Meas}}}{d_{\mathrm{SpecLimit}}}\right)$$

where

$E_{\mathrm{SpecLimit}}$	is the field strength of the emission at the distance specified by the limit, in dBμV/m
E_{Meas}	is the field strength of the emission at the measurement distance, in dBμV/m
d_{Meas}	is the measurement distance, in m
$d_{\mathrm{SpecLimit}}$	is the distance specified by the limit, in m

So the extrapolation factor of 1m is 20*log(1/3)= -9.5 dB

Corrected Amplitude & Margin Calculation

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

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

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

Margin = Limit – Corrected Amplitude

Test Results Summary

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

$$L_{\mathrm{m}} + U_{(L\mathrm{m})} \leq L_{\mathrm{lim}} + U_{\mathrm{cispr}}$$

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

Test Data

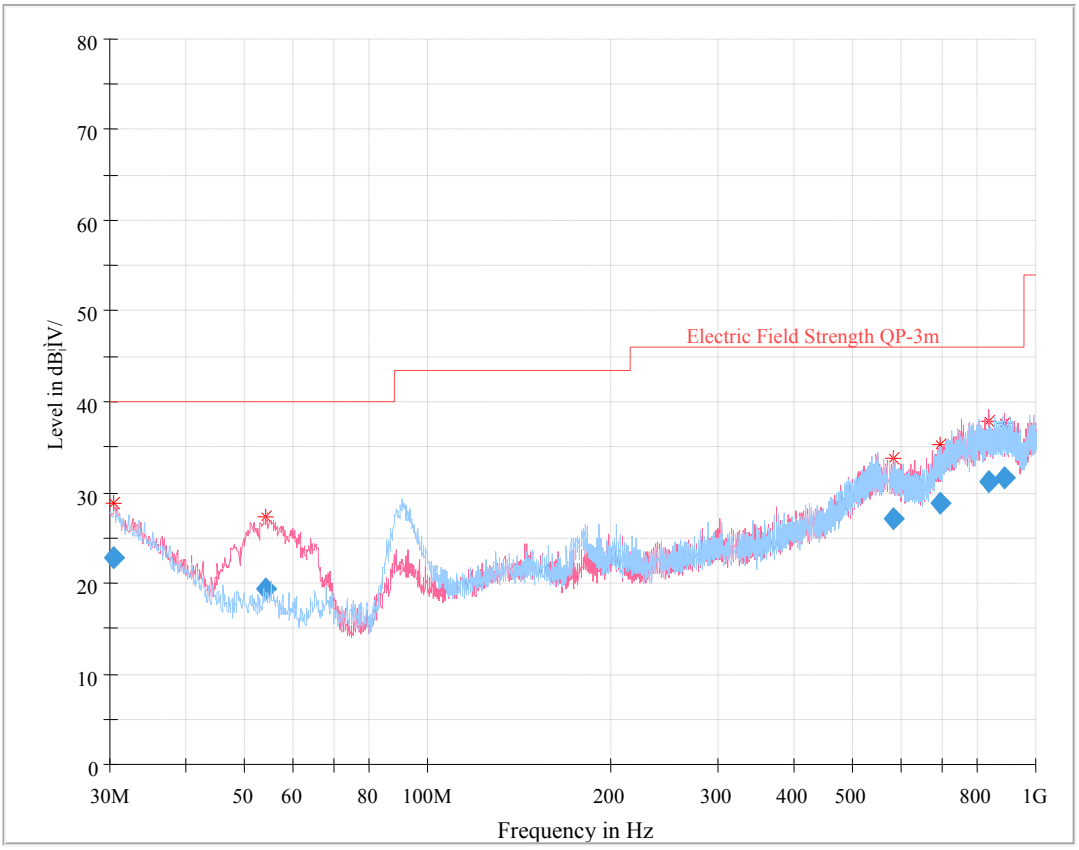
Environmental Conditions

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

The testing was performed by Simon Wang on 2018-05-30.

EUT operation mode: Transmitting

30 MHz – 1 GHz: *(worst case)*



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna height (cm)	Antenna Polarity	Turntable position (degree)	Correction Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
30.488625	22.69	283.0	V	138.0	0.4	40.00	17.31
53.992625	19.37	118.0	V	59.0	-11.0	40.00	20.63
581.912625	27.08	234.0	V	0.0	4.9	46.00	18.92
694.585750	28.86	143.0	H	307.0	6.6	46.00	17.14
839.548375	31.17	184.0	V	174.0	9.5	46.00	14.83
890.939125	31.64	340.0	V	190.0	10.1	46.00	14.36

30 MHz ~ 40 GHz:

5150-5250 MHz:

Frequency (MHz)	Receiver		Turntable	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m) @1m	Corrected Amplitude (dBμV/m) @3m	FCC Part 15.407/205/209	
	Reading (dBμV) @1m	PK/QP/Ave.	Degree	Height (m)	Polar (H / V)				Limit (dBμV/m)	Margin (dB)
802.11a										
5180MHz										
5180.00	65.42	PK	190	2.0	H	41.80	107.22	97.72	/	/
5180.00	54.29	Ave.	190	2.0	H	41.80	96.09	86.59	/	/
5180.00	72.73	PK	186	1.0	V	41.80	114.53	105.03	/	/
5180.00	60.89	Ave.	186	1.0	V	41.80	102.69	93.19	/	/
5128.15	28.24	PK	131	2.4	V	41.80	70.04	60.54	74	13.46
5128.15	13.58	Ave.	131	2.4	V	41.80	55.38	45.88	54	8.12
5360.52	27.13	PK	341	1.3	V	41.83	68.96	59.46	74	14.54
5360.52	13.74	Ave.	341	1.3	V	41.83	55.57	46.07	54	7.93
10360.00	42.06	PK	86	1.5	V	15.66	57.72	48.22	74	25.78
10360.00	26.93	Ave.	86	1.5	V	15.66	42.59	33.09	54	20.91
5200MHz										
5200.00	65.24	PK	139	1.5	H	41.80	107.04	97.54	/	/
5200.00	54.13	Ave.	139	1.5	H	41.80	95.93	86.43	/	/
5200.00	72.82	PK	211	1.5	V	41.80	114.62	105.12	/	/
5200.00	61.46	Ave.	211	1.5	V	41.80	103.26	93.76	/	/
10400.00	41.68	PK	266	1.2	V	15.66	57.34	47.84	74	26.16
10400.00	27.14	Ave.	266	1.2	V	15.66	42.80	33.3	54	20.7
5240MHz										
5240.00	65.50	PK	60	2.4	H	41.80	107.30	97.8	/	/
5240.00	54.27	Ave.	60	2.4	H	41.80	96.07	86.57	/	/
5240.00	73.29	PK	141	1.8	V	41.80	115.09	105.59	/	/
5240.00	61.71	Ave.	141	1.8	V	41.80	103.51	94.01	/	/
5111.14	27.47	PK	348	1.2	V	41.80	69.27	59.77	74	14.23
5111.14	13.56	Ave.	348	1.2	V	41.80	55.36	45.86	54	8.14
5394.38	28.13	PK	160	2.5	V	41.83	69.96	60.46	74	13.54
5394.38	14.14	Ave.	160	2.5	V	41.83	55.97	46.47	54	7.53
10480.00	42.10	PK	151	2.3	V	16.56	58.66	49.16	74	24.84
10480.00	27.06	Ave.	151	2.3	V	16.56	43.62	34.12	54	19.88

Frequency (MHz)	Receiver		Turntable	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m) @1m	Corrected Amplitude (dBμV/m) @3m	FCC Part 15.407/205/209	
	Reading (dBμV) @1m	PK/QP/Ave.	Degree	Height (m)	Polar (H / V)				Limit (dBμV/m)	Margin (dB)
802.11n20										
5180MHz										
5180.00	64.62	PK	37	1.4	H	41.80	106.42	96.92	/	/
5180.00	53.47	Ave.	37	1.4	H	41.80	95.27	85.77	/	/
5180.00	73.25	PK	202	1.4	V	41.80	115.05	105.55	/	/
5180.00	61.54	Ave.	202	1.4	V	41.80	103.34	93.84	/	/
5146.89	27.31	PK	152	1.9	V	41.80	69.11	59.61	74	14.39
5146.89	13.56	Ave.	152	1.9	V	41.80	55.36	45.86	54	8.14
5361.21	27.12	PK	272	1.2	V	41.83	68.95	59.45	74	14.55
5361.21	14.12	Ave.	272	1.2	V	41.83	55.95	46.45	54	7.55
10360.00	41.06	PK	98	2.2	V	15.66	56.72	47.22	74	26.78
10360.00	26.84	Ave.	98	2.2	V	15.66	42.50	33	54	21
5200MHz										
5200.00	65.33	PK	352	1.6	H	41.80	107.13	97.63	/	/
5200.00	54.15	Ave.	352	1.6	H	41.80	95.95	86.45	/	/
5200.00	73.25	PK	19	1.7	V	41.80	115.05	105.55	/	/
5200.00	62.05	Ave.	19	1.7	V	41.80	103.85	94.35	/	/
10400.00	42.06	PK	341	2.0	V	15.66	57.72	48.22	74	25.78
10400.00	27.11	Ave.	341	2.0	V	15.66	42.77	33.27	54	20.73
5240 MHz										
5240.00	65.33	PK	72	2.0	H	41.80	107.13	97.63	/	/
5240.00	54.15	Ave.	72	2.0	H	41.80	95.95	86.45	/	/
5240.00	73.25	PK	194	1.7	V	41.80	115.05	105.55	/	/
5240.00	62.05	Ave.	194	1.7	V	41.80	103.85	94.35	/	/
5128.45	27.68	PK	234	2.2	V	41.80	69.48	59.98	74	14.02
5128.45	13.57	Ave.	234	2.2	V	41.80	55.37	45.87	54	8.13
5374.11	27.19	PK	301	2.0	V	41.83	69.02	59.52	74	14.48
5374.11	14.20	Ave.	301	2.0	V	41.83	56.03	46.53	54	7.47
10480.00	41.89	PK	121	1.1	V	16.56	58.45	48.95	74	25.05
10480.00	27.06	Ave.	121	1.1	V	16.56	43.62	34.12	54	19.88

Frequency (MHz)	Receiver		Turntable	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m) @1m	Corrected Amplitude (dBμV/m) @3m	FCC Part 15.407/205/209	
	Reading (dBμV) @1m	PK/QP/Ave.	Degree	Height (m)	Polar (H / V)				Limit (dBμV/m)	Margin (dB)
802.11ac20										
5180MHz										
5180.00	63.72	PK	98	1.0	H	41.80	105.52	96.02	/	/
5180.00	52.01	Ave.	98	1.0	H	41.80	93.81	84.31	/	/
5180.00	72.39	PK	284	2.0	V	41.80	114.19	104.69	/	/
5180.00	61.15	Ave.	284	2.0	V	41.80	102.95	93.45	/	/
5102.3	27.44	PK	258	1.6	V	41.80	69.24	59.74	74	14.26
5102.3	13.58	Ave.	258	1.6	V	41.80	55.38	45.88	54	8.12
5389.91	28.37	PK	177	1.5	V	41.83	70.20	60.7	74	13.3
5389.91	14.21	Ave.	177	1.5	V	41.83	56.04	46.54	54	7.46
10360.00	41.09	PK	21	1.3	V	15.66	56.75	47.25	74	26.75
10360.00	26.92	Ave.	21	1.3	V	15.66	42.58	33.08	54	20.92
5200MHz										
5200.00	63.95	PK	172	1.1	H	41.80	105.75	96.25	/	/
5200.00	52.74	Ave.	172	1.1	H	41.80	94.54	85.04	/	/
5200.00	73.15	PK	318	2.4	V	41.80	114.95	105.45	/	/
5200.00	61.48	Ave.	318	2.4	V	41.80	103.28	93.78	/	/
10400.00	42.16	PK	312	2.3	V	15.66	57.82	48.32	74	25.68
10400.00	27.11	Ave.	312	2.3	V	15.66	42.77	33.27	54	20.73
5240MHz										
5240.00	63.15	PK	291	1.8	H	41.80	104.95	95.45	/	/
5240.00	52.08	Ave.	291	1.8	H	41.80	93.88	84.38	/	/
5240.00	72.78	PK	266	1.0	V	41.80	114.58	105.08	/	/
5240.00	61.64	Ave.	266	1.0	V	41.80	103.44	93.94	/	/
5108.71	28.07	PK	324	2.0	V	41.80	69.87	60.37	74	13.63
5108.71	13.51	Ave.	324	2.0	V	41.80	55.31	45.81	54	8.19
5374.35	27.61	PK	193	1.0	V	41.83	69.44	59.94	74	14.06
5374.35	14.14	Ave.	193	1.0	V	41.83	55.97	46.47	54	7.53
10480.00	41.22	PK	8	2.4	V	16.56	57.78	48.28	74	25.72
10480.00	26.37	Ave.	8	2.4	V	16.56	42.93	33.43	54	20.57

5470-5725 MHz:

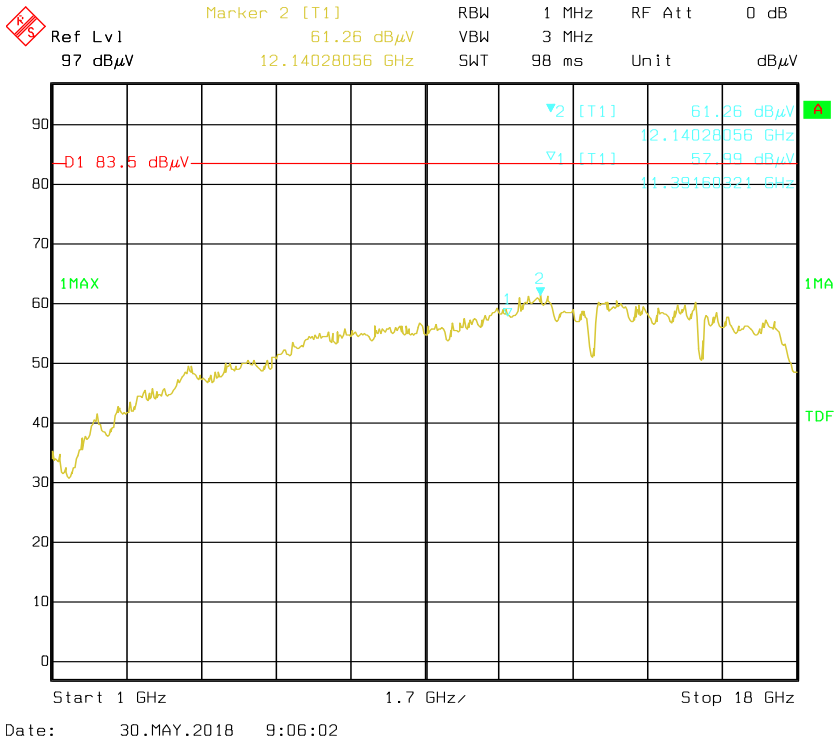
Frequency (MHz)	Receiver		Turntable	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m) @1m	Corrected Amplitude (dBμV/m) @3m	FCC Part 15.407/205/209	
	Reading (dBμV) @1m	PK/QP/Ave.	Degree	Height (m)	Polar (H / V)				Limit (dBμV/m)	Margin (dB)
802.11a										
5500 MHz										
5500.00	60.15	PK	180	1.5	H	42.01	102.16	92.66	/	/
5500.00	49.11	Ave.	180	1.5	H	42.01	91.12	81.62	/	/
5500.00	70.36	PK	180	2.2	V	42.01	112.37	102.87	/	/
5500.00	59.33	Ave.	180	2.2	V	42.01	101.34	91.84	/	/
5423.14	28.76	PK	322	1.9	V	41.83	70.59	61.09	74	13.84
5423.14	14.12	PK	322	1.9	V	41.83	55.95	46.45	54	8.18
5734.02	27.42	PK	250	1.9	V	42.15	69.57	60.07	74	13.39
5734.02	14.20	PK	250	1.9	V	42.15	56.35	46.85	54	7.5
11000.00	39.57	PK	69	2.0	V	19.07	58.64	49.14	74	26.84
11000.00	25.59	Ave.	69	2.0	V	19.07	44.66	35.16	54	20.98
5600MHz										
5600.00	62.35	PK	121	1.4	H	42.07	104.42	94.92	/	/
5600.00	50.33	Ave.	121	1.4	H	42.07	92.40	82.9	/	/
5600.00	71.68	PK	354	2.3	V	42.07	113.75	104.25	/	/
5600.00	60.27	Ave.	354	2.3	V	42.07	102.34	92.84	/	/
11200.00	42.32	PK	189	2.4	V	20.10	62.42	52.92	74	21.08
11200.00	27.65	Ave.	189	2.4	V	20.10	47.75	38.25	54	15.75
5700MHz										
5700.00	60.15	PK	61	2.1	H	42.15	102.30	92.8	/	/
5700.00	49.11	Ave.	61	2.1	H	42.15	91.26	81.76	/	/
5700.00	69.44	PK	247	1.8	V	42.15	111.59	102.09	/	/
5700.00	58.21	Ave.	247	1.8	V	42.15	100.36	90.86	/	/
5423.14	28.27	PK	248	2.1	V	41.83	70.10	60.6	74	13.4
5423.14	14.13	PK	248	2.1	V	41.83	55.96	46.46	54	7.54
5733.81	28.15	PK	229	1.6	V	42.15	70.30	60.8	74	13.2
5733.81	14.19	PK	229	1.6	V	42.15	56.34	46.84	54	7.16
11400.00	42.45	PK	3	2.0	V	19.02	61.47	51.97	74	22.03
11400.00	28.87	Ave.	3	2.0	V	19.02	47.89	38.39	54	15.61

Frequency (MHz)	Receiver		Turntable	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m) @1m	Corrected Amplitude (dBμV/m) @3m	FCC Part 15.407/205/209	
	Reading (dBμV) @1m	PK/QP/Ave.	Degree	Height (m)	Polar (H / V)				Limit (dBμV/m)	Margin (dB)
802.11n20										
5500 MHz										
5500.00	59.98	PK	21	1.7	H	42.01	101.99	92.49	/	/
5500.00	48.84	Ave.	21	1.7	H	42.01	90.85	81.35	/	/
5500.00	70.86	PK	319	2.2	V	42.01	112.87	103.37	/	/
5500.00	59.27	Ave.	319	2.2	V	42.01	101.28	91.78	/	/
5460.38	27.84	PK	312	2.1	V	42.01	69.85	60.35	74	13.65
5460.38	14.28	PK	312	2.1	V	42.01	56.29	46.79	54	7.21
5743.86	27.59	PK	251	1.2	V	42.15	69.74	60.24	74	13.76
5743.86	14.19	PK	251	1.2	V	42.15	56.34	46.84	54	7.16
11000.00	40.58	PK	9	1.6	V	19.07	59.65	50.15	74	23.85
11000.00	26.45	Ave.	9	1.6	V	19.07	45.52	36.02	54	17.98
5600MHz										
5600.00	60.34	PK	178	1.8	H	42.07	102.41	92.91	/	/
5600.00	49.12	Ave.	178	1.8	H	42.07	91.19	81.69	/	/
5600.00	70.65	PK	231	2.4	V	42.07	112.72	103.22	/	/
5600.00	59.42	Ave.	231	2.4	V	42.07	101.49	91.99	/	/
11200.00	42.62	PK	41	2.1	V	20.10	62.72	53.22	74	20.78
11200.00	27.35	Ave.	41	2.1	V	20.10	47.45	37.95	54	16.05
5700MHz										
5700.00	59.22	PK	85	1.9	H	42.15	101.37	91.87	/	/
5700.00	48.17	Ave.	85	1.9	H	42.15	90.32	80.82	/	/
5700.00	70.71	PK	91	1.3	V	42.15	112.86	103.36	/	/
5700.00	59.66	Ave.	91	1.3	V	42.15	101.81	92.31	/	/
5436.77	27.68	PK	100	1.0	V	41.83	69.51	60.01	74	13.99
5436.77	14.17	PK	100	1.0	V	41.83	56.00	46.5	54	7.5
5746.64	28.23	PK	152	1.9	V	42.15	70.38	60.88	74	13.12
5746.64	14.19	PK	152	1.9	V	42.15	56.34	46.84	54	7.16
11400.00	42.21	PK	33	1.1	V	19.02	61.23	51.73	74	22.27
11400.00	27.68	Ave.	33	1.1	V	19.02	46.70	37.2	54	16.8

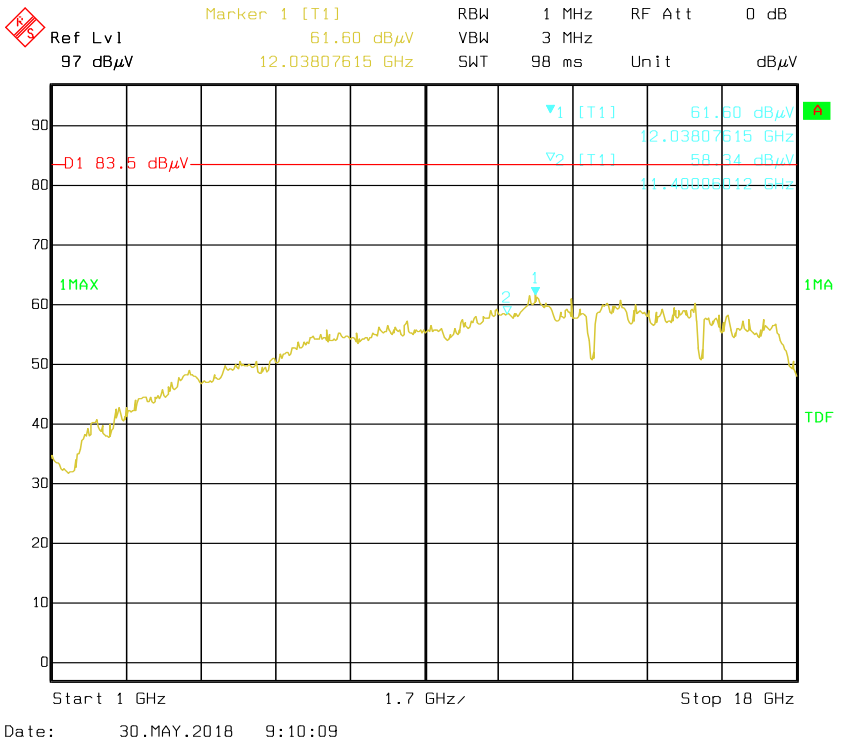
Frequency (MHz)	Receiver		Turntable	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m) @1m	Corrected Amplitude (dBμV/m) @3m	FCC Part 15.407/205/209	
	Reading (dBμV) @1m	PK/QP/Ave.	Degree	Height (m)	Polar (H / V)				Limit (dBμV/m)	Margin (dB)
802.11ac20										
5500 MHz										
5500.00	59.73	PK	180	1.8	H	42.01	101.74	92.24	/	/
5500.00	48.55	Ave.	180	1.8	H	42.01	90.56	81.06	/	/
5500.00	70.53	PK	5	1.3	V	42.01	112.54	103.04	/	/
5500.00	59.14	Ave.	5	1.3	V	42.01	101.15	91.65	/	/
5460.02	28.26	PK	190	2.5	V	42.01	70.27	60.77	74	13.23
5460.02	14.22	PK	190	2.5	V	42.01	56.23	46.73	54	7.27
5744.28	28.31	PK	61	2.0	V	42.15	70.46	60.96	74	13.04
5744.28	14.16	PK	61	2.0	V	42.15	56.31	46.81	54	7.19
11000.00	41.02	PK	203	1.6	V	19.07	60.09	50.59	74	23.41
11000.00	26.45	Ave.	203	1.6	V	19.07	45.52	36.02	54	17.98
5600MHz										
5600.00	60.25	PK	204	1.8	H	42.07	102.32	92.82	/	/
5600.00	49.10	Ave.	204	1.8	H	42.07	91.17	81.67	/	/
5600.00	70.48	PK	360	2.2	V	42.07	112.55	103.05	/	/
5600.00	59.28	Ave.	360	2.2	V	42.07	101.35	91.85	/	/
11200.00	42.11	PK	60	1.4	V	20.10	62.21	52.71	74	21.29
11200.00	27.10	Ave.	60	1.4	V	20.10	47.20	37.7	54	16.3
5700 MHz										
5700.00	58.84	PK	80	1.8	H	42.15	100.99	91.49	/	/
5700.00	47.34	Ave.	80	1.8	H	42.15	89.49	79.99	/	/
5700.00	69.27	PK	275	1.3	V	42.15	111.42	101.92	/	/
5700.00	58.14	Ave.	275	1.3	V	42.15	100.29	90.79	/	/
5412.16	27.42	PK	263	1.9	V	41.83	69.25	59.75	74	14.25
5412.16	14.16	PK	263	1.9	V	41.83	55.99	46.49	54	7.51
5739.37	28.37	PK	288	2.4	V	42.15	70.52	61.02	74	12.98
5739.37	14.21	PK	288	2.4	V	42.15	56.36	46.86	54	7.14
11400.00	42.35	PK	235	1.2	V	19.02	61.37	51.87	74	22.13
11400.00	27.56	Ave.	235	1.2	V	19.02	46.58	37.08	54	16.92

Note:
Corrected Amplitude = Corrected Factor + Reading
Corrected Factor=Antenna factor (RX) + Cable Loss – Amplifier Factor
Margin = Limit- Corr. Amplitude
All other spurious emissions are 20 dB below the limit or are on the system noise floor level.

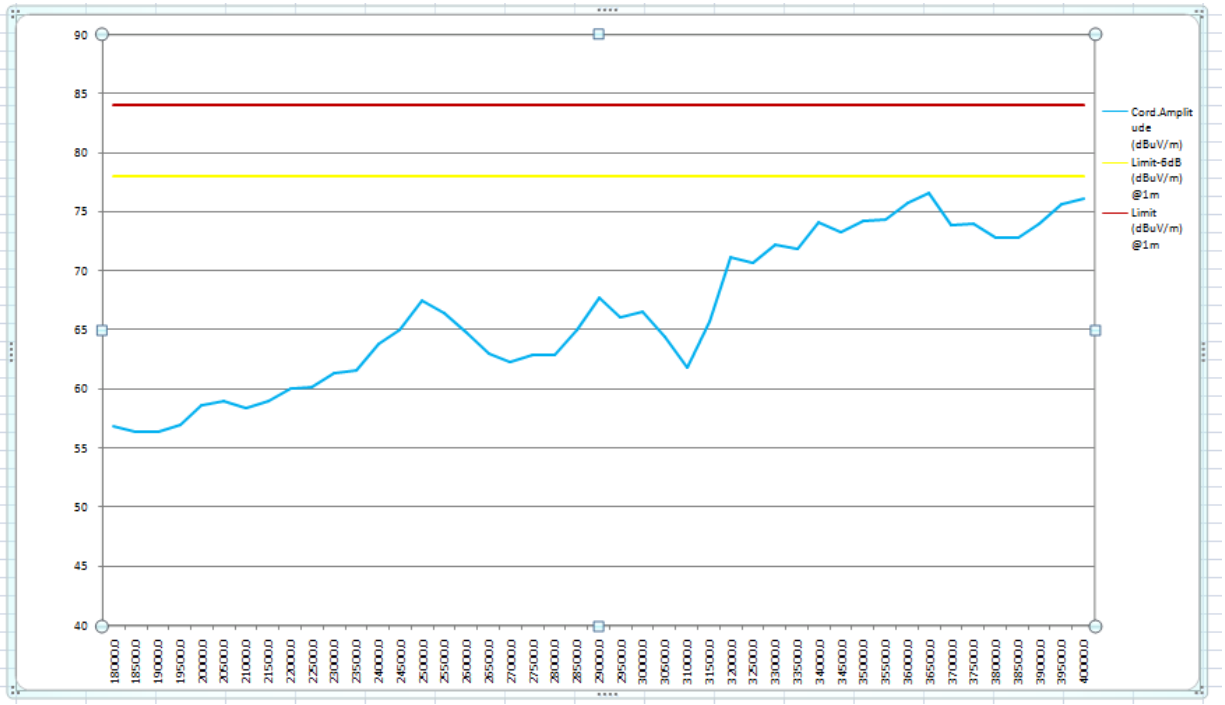
Pre-scan with 802.11a 5700MHz, for Peak
Horizontal, 1~18 GHz



Vertical, 1~18 GHz

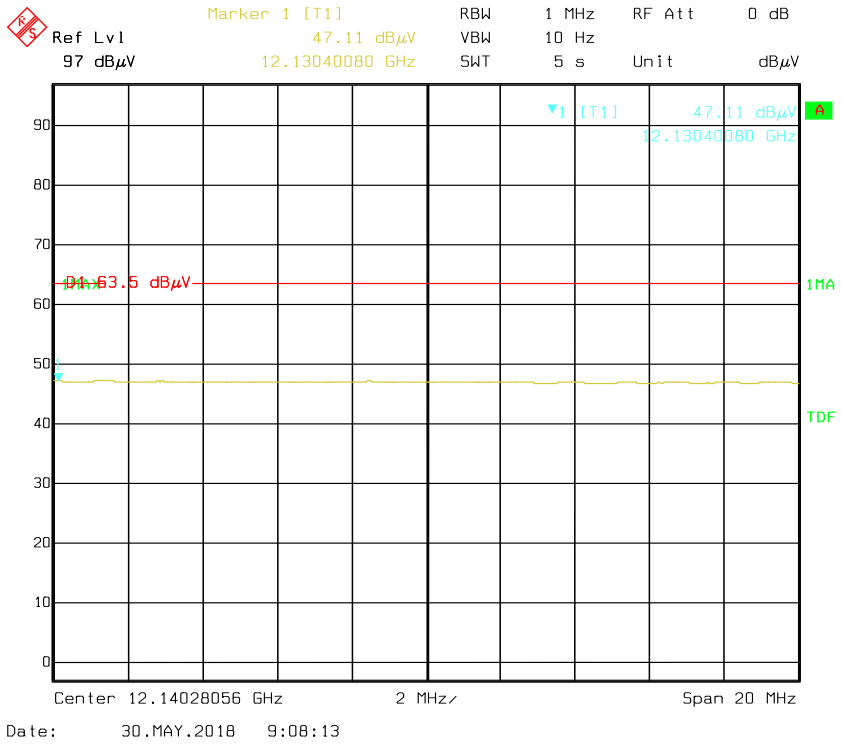


Above 18 GHz

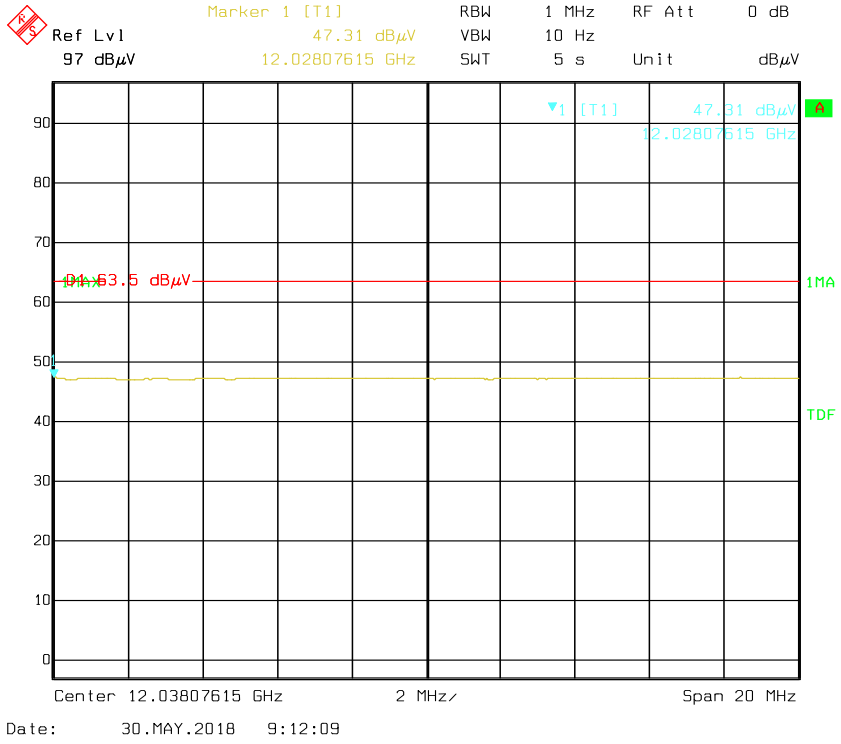


For **Average**

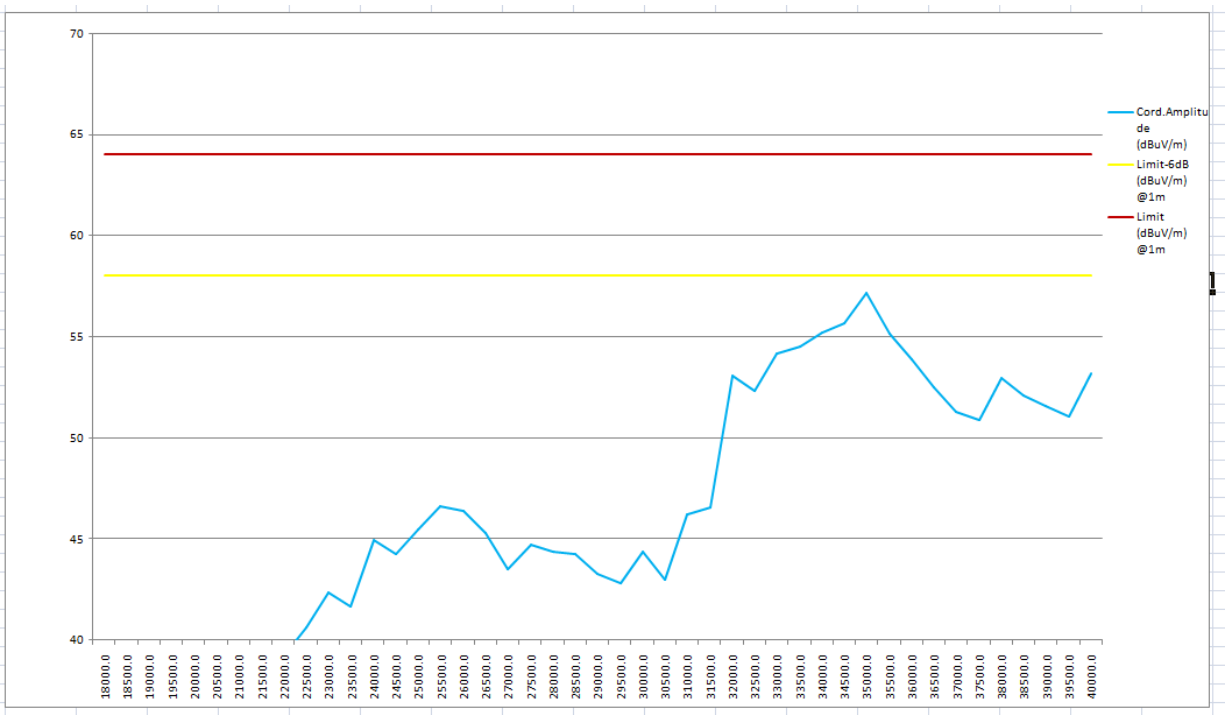
Horizontal, 1~18 GHz



Vertical, 1~18 GHz



Above 18 GHz



§15.407(B) (1), (3) –OUT OF BAND EMISSION

Applicable Standard

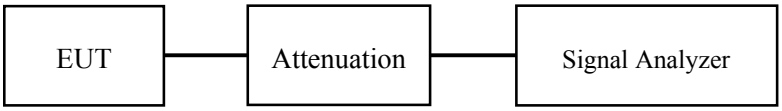
FCC §15.407 (b) (1), (3);

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

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

Test Procedure

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



Test Data

Environmental Conditions

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

The testing was performed by Simon Wang on 2018-05-14.

EUT operation mode: Transmitting, please refer to the below table and plots.

5150 – 5250 MHz:

802.11a

Frequency (MHz)	Reading(dBm)	Antenna Gain(dBi)	Emission(dBm)	Limit(dBm)
Left	-44.14	-1.2	-43.18	-27
Right	-49.83	-1.2	-49.65	-27

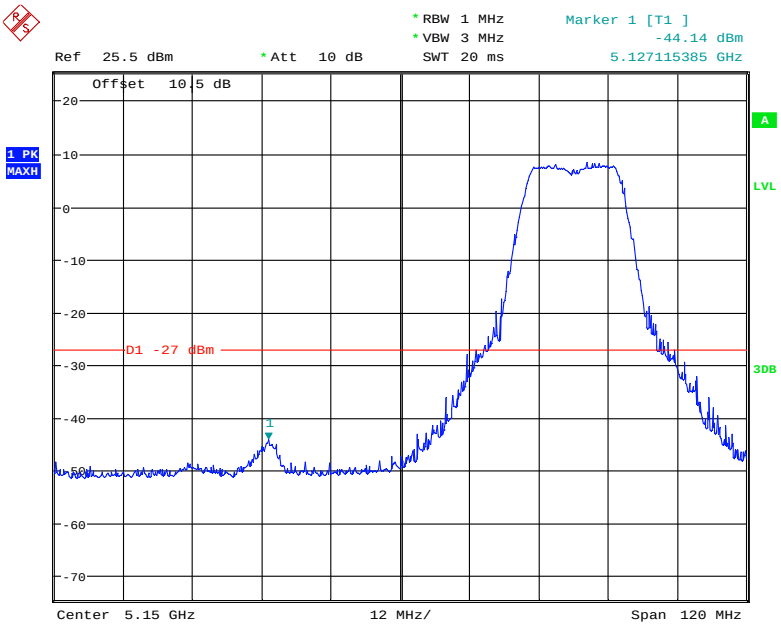
802.11n20

Frequency (MHz)	Reading(dBm)	Antenna Gain(dBi)	Emission(dBm)	Limit(dBm)
Left	-43.46	-1.2	-44.66	-27
Right	-49.91	-1.2	-51.11	-27

802.11ac20

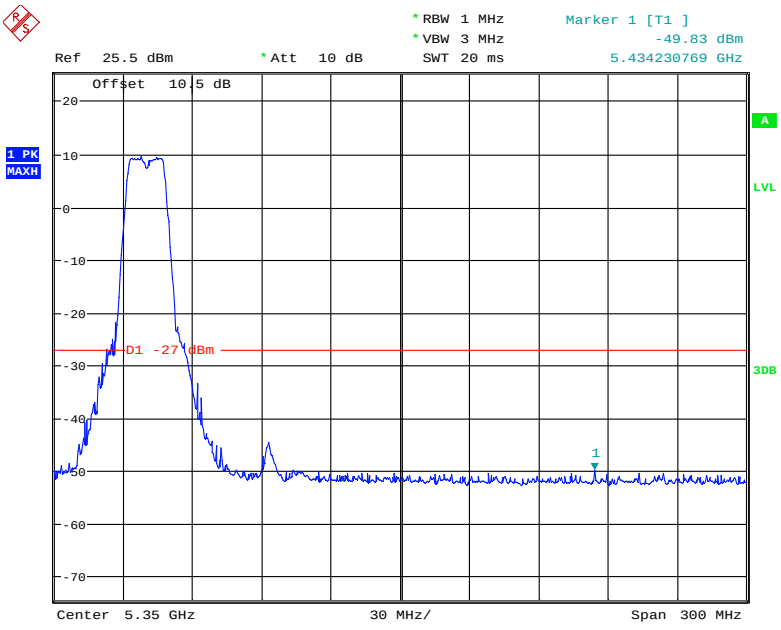
Frequency (MHz)	Reading(dBm)	Antenna Gain(dBi)	Emission(dBm)	Limit(dBm)
Left	-43.46	-1.2	-44.66	-27
Right	-49.91	-1.2	-51.11	-27

802.11a mode, Band Edge, Left Side



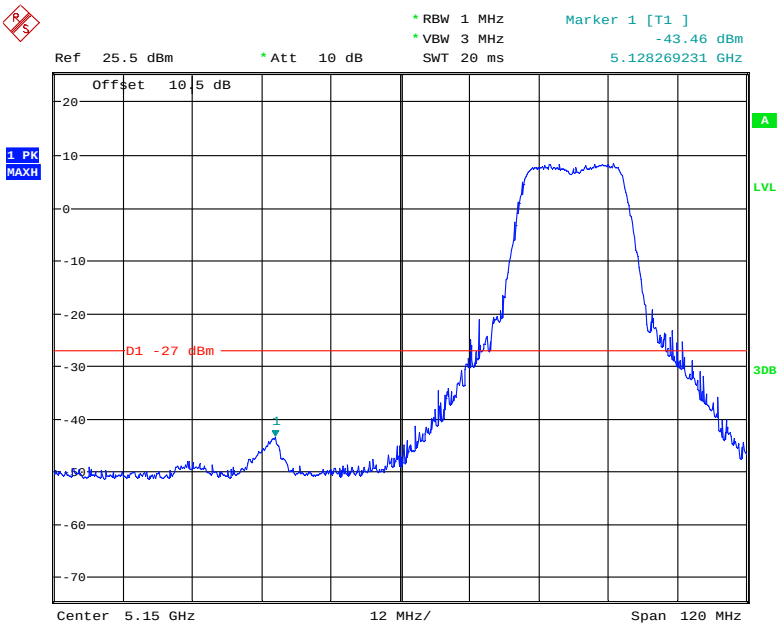
Date: 14.MAY.2018 05:39:55

802.11a mode, Band Edge, Right Side



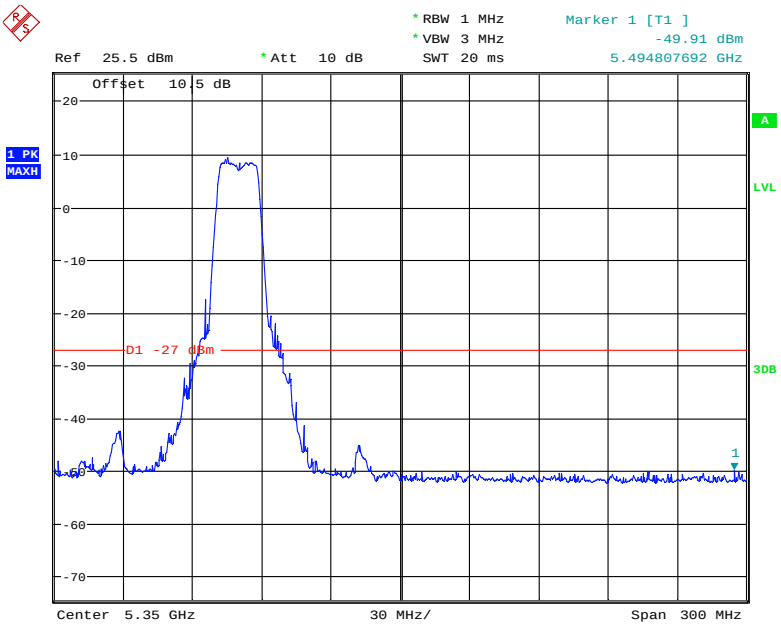
Date: 14.MAY.2018 05:44:02

802.11n20 mode, Band Edge, Left Side



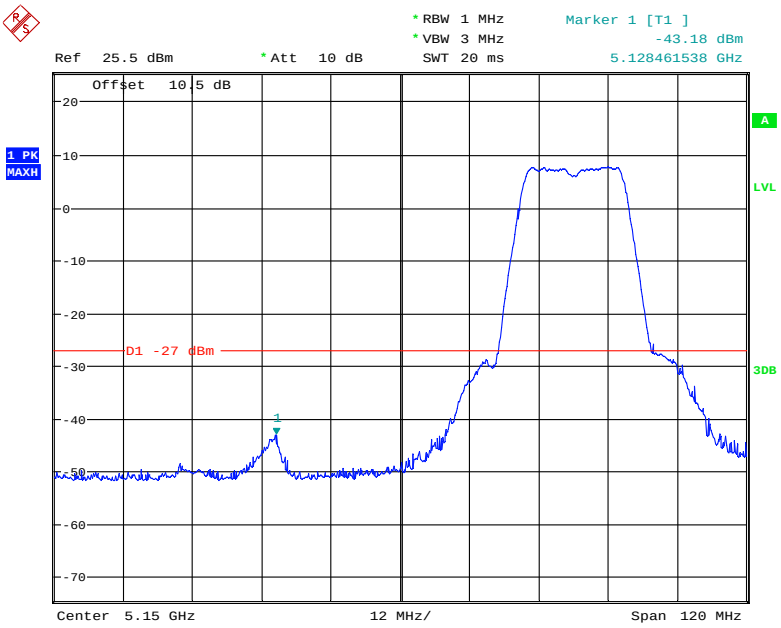
Date: 14.MAY.2018 05:56:19

802.11n20 mode, Band Edge, Right Side



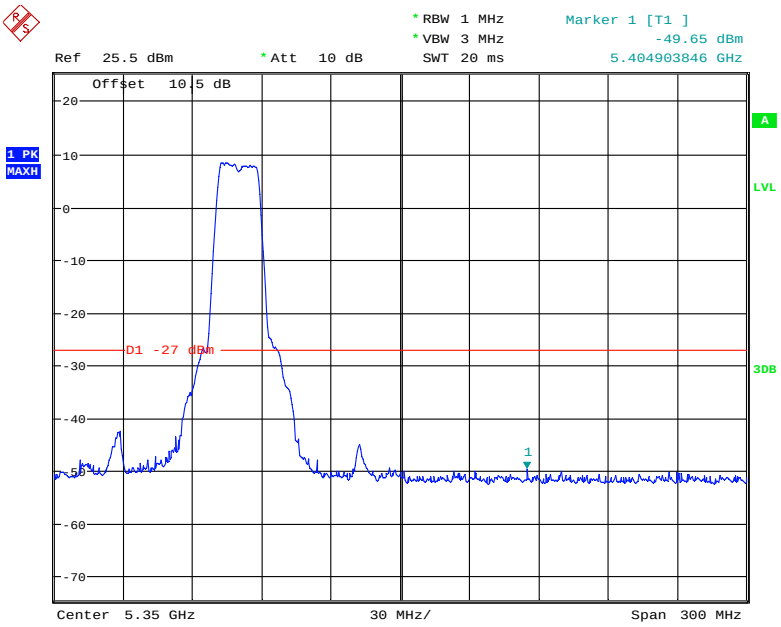
Date: 14.MAY.2018 05:58:08

802.11ac20 mode, Band Edge, Left Side



Date: 14.MAY.2018 05:59:45

802.11ac20 mode, Band Edge, Right Side



Date: 14.MAY.2018 05:59:07

5470 – 5725 MHz:

802.11a

Frequency (MHz)	Reading(dBm)	Antenna Gain(dBi)	Emission(dBm)	Limit(dBm)
Left	-47.31	-1.2	-48.51	-27
Right	-46.76	-1.2	-47.96	-27

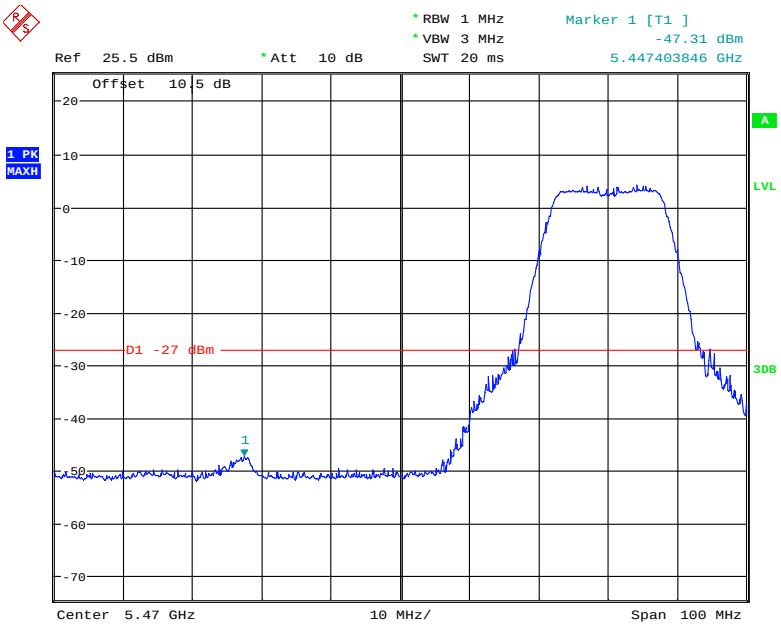
802.11n20

Frequency (MHz)	Reading(dBm)	Antenna Gain(dBi)	Emission(dBm)	Limit(dBm)
Left	-46.34	-1.2	-47.54	-27
Right	-45.96	-1.2	-47.16	-27

802.11ac20

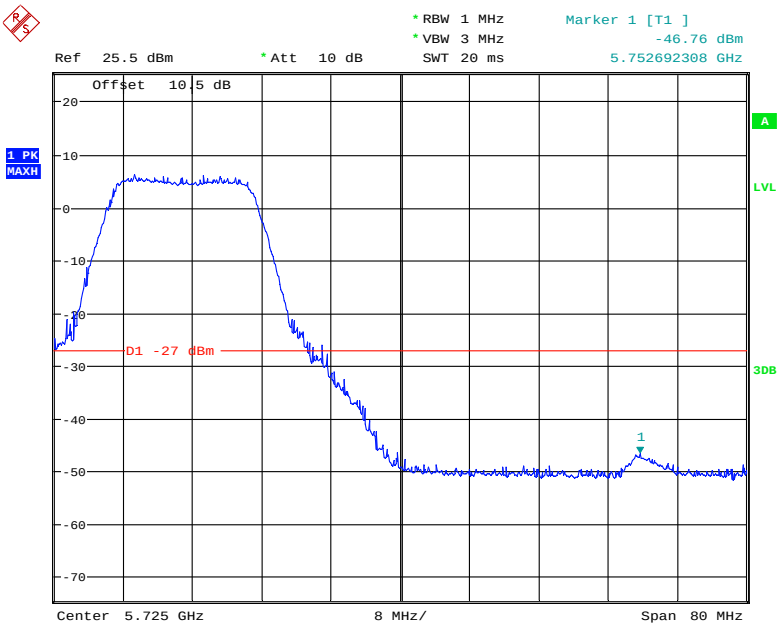
Frequency (MHz)	Reading(dBm)	Antenna Gain(dBi)	Emission(dBm)	Limit(dBm)
Left	-46.33	-1.2	-47.53	-27
Right	-46.08	-1.2	-47.28	-27

802.11a mode, Band Edge, Left Side



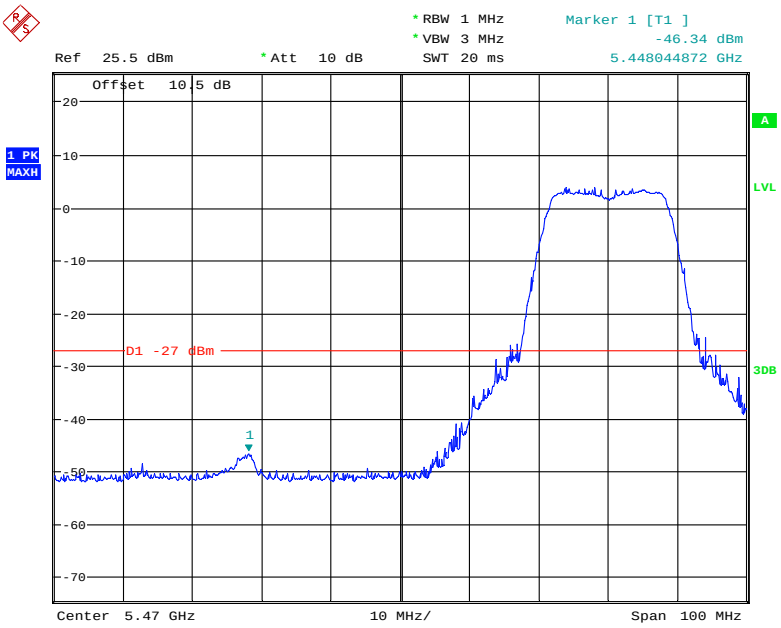
Date: 14.MAY.2018 06:09:53

802.11a mode, Band Edge, Right Side



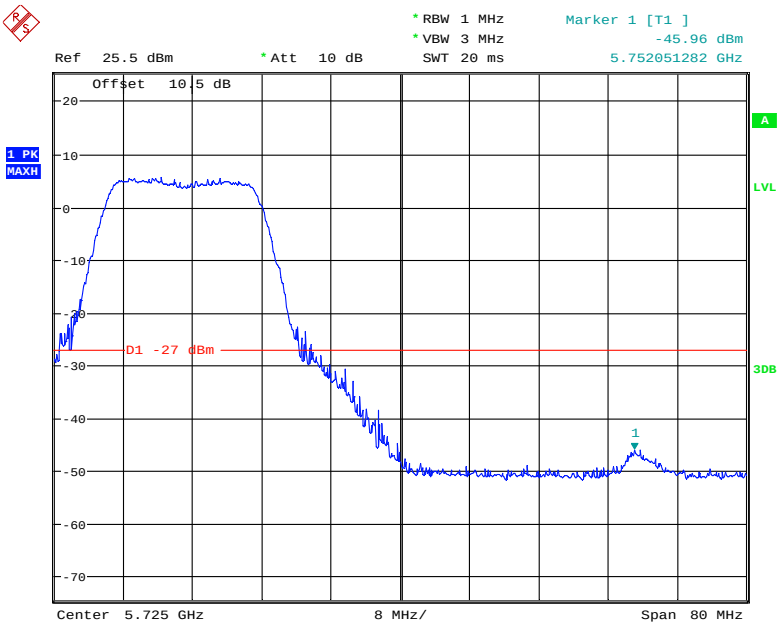
Date: 14.MAY.2018 06:12:19

802.11n20 mode, Band Edge, Left Side



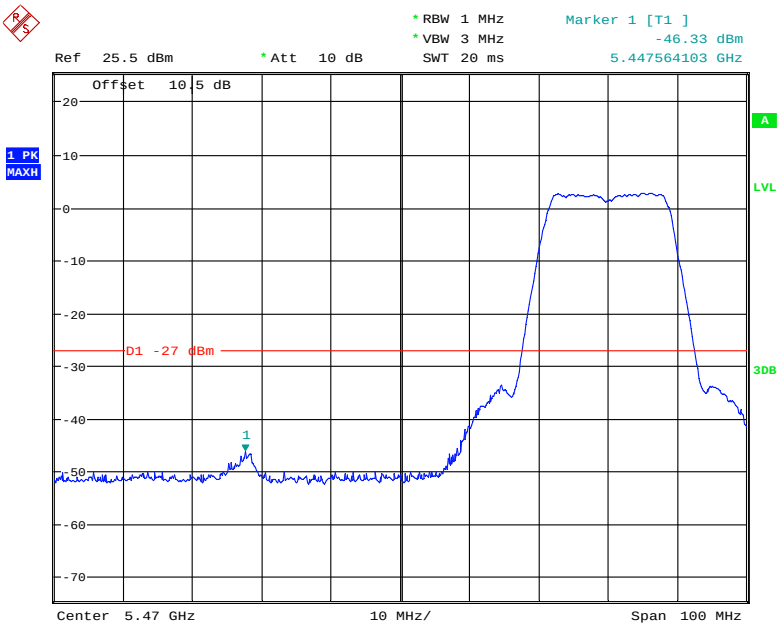
Date: 14.MAY.2018 06:08:02

802.11n20 mode, Band Edge, Right Side



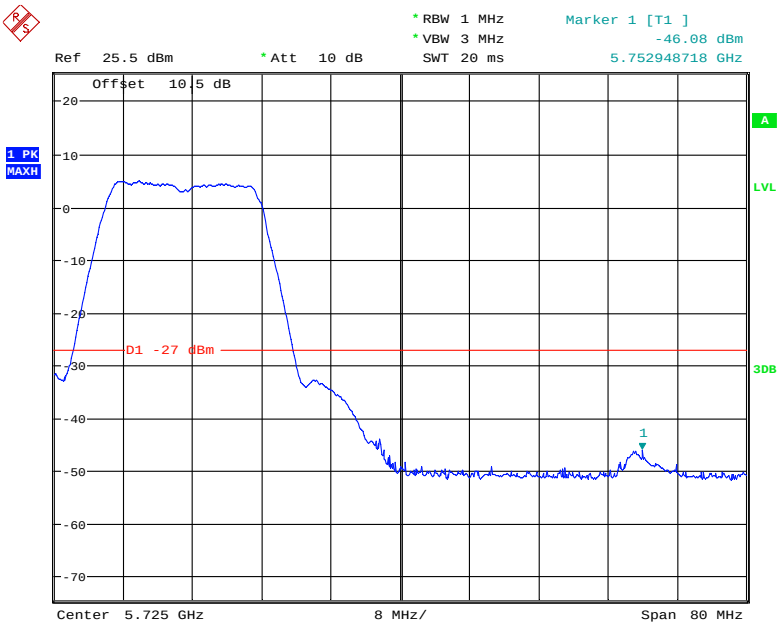
Date: 14.MAY.2018 06:06:22

802.11ac20 mode, Band Edge, Left Side



Date: 14.MAY.2018 06:03:19

802.11ac20 mode, Band Edge, Right Side



Date: 14.MAY.2018 06:04:52

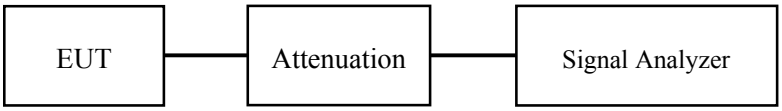
FCC §15.407(a) (1) (5) – 26 dB EMISSION BANDWIDTH

Applicable Standard

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

Test Procedure

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



Test Data

Environmental Conditions

Temperature:	23.5~25 ℃
Relative Humidity:	49~56 %
ATM Pressure:	109.0~101.0 kPa

The testing was performed by Simon Wang from 2018-04-19 to 2018-05-21.

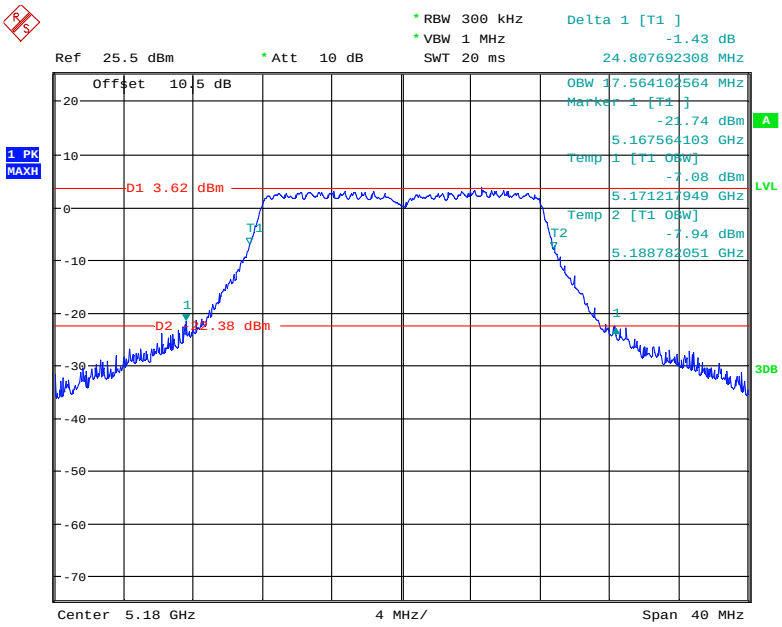
EUT operation mode: Transmitting

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

5120 MHz - 5250 MHz:

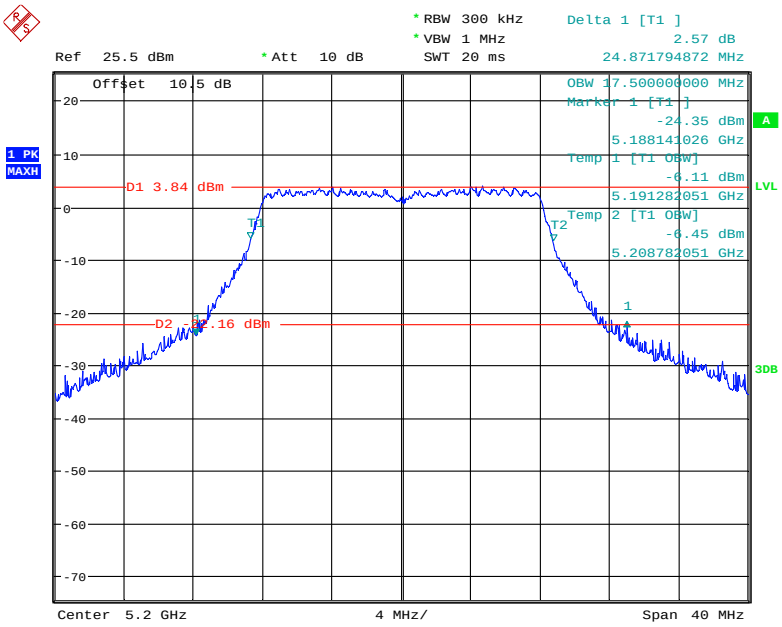
Frequency (MHz)	26dB bandwidth (MHz)	99% Bandwidth (MHz)	Remark
802.11a			No transmitted signal in the 99% bandwidth extends into the U-NII-2A band
5180	24.81	17.56	
5200	24.87	17.50	
5240	24.36	17.56	
802.11n20			
5180	26.99	18.46	
5200	26.35	18.40	
5240	27.31	18.59	
802.11ac20			
5180	24.36	18.40	
5200	24.29	18.40	
5240	25.13	18.40	

802.11a mode, 26 dB Emissions & 99% Occupied Bandwidth, 5180 MHz



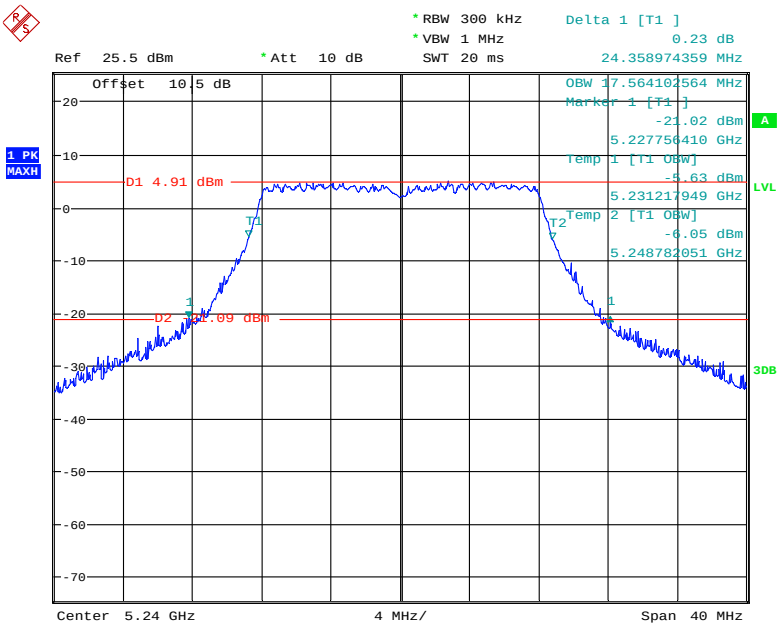
Date: 21.MAY.2018 16:03:14

802.11a mode, 26 dB Emissions & 99% Occupied Bandwidth, 5200 MHz



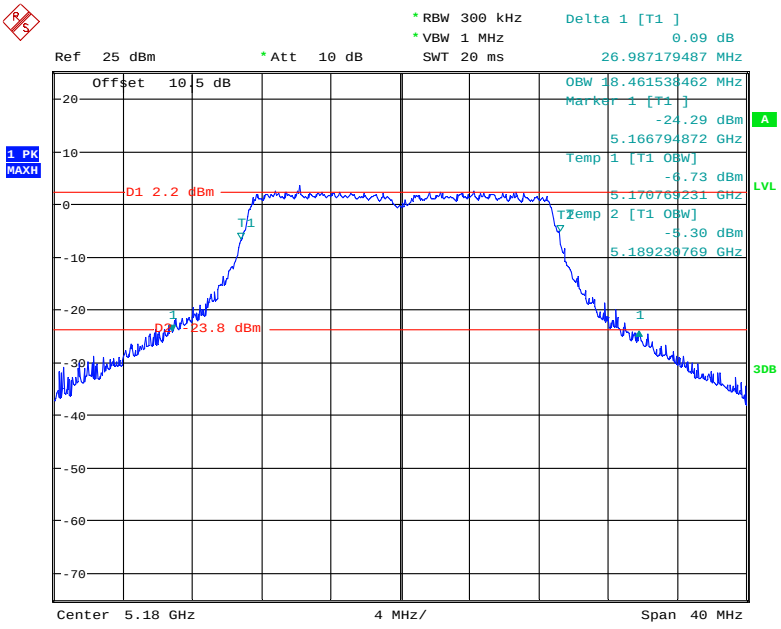
Date: 21.MAY.2018 16:11:59

802.11a mode, 26 dB Emissions & 99% Occupied Bandwidth, 5240 MHz



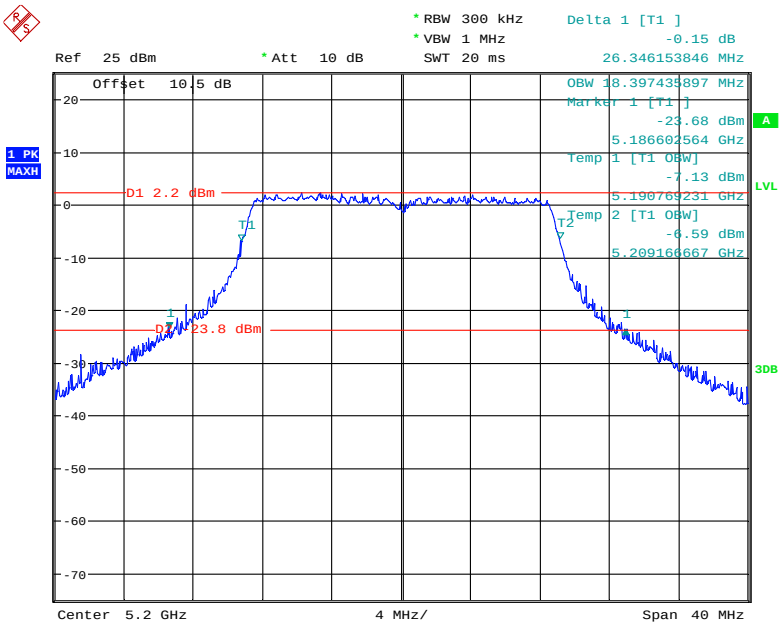
Date: 21.MAY.2018 16:15:10

802.11n20 mode, 26 dB Emissions & 99% Occupied Bandwidth, 5180 MHz



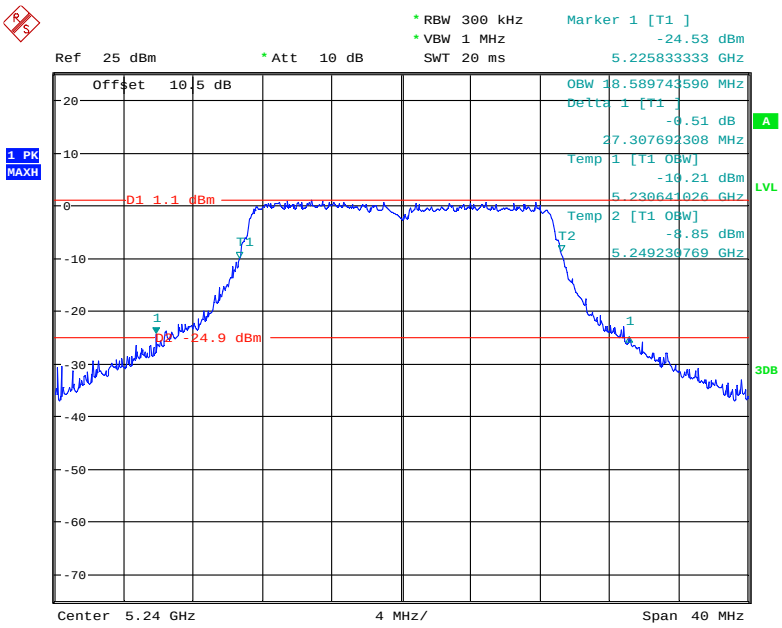
Date: 19.APR.2018 16:02:08

802.11n20 mode, 26 dB Emissions & 99% Occupied Bandwidth, 5200 MHz



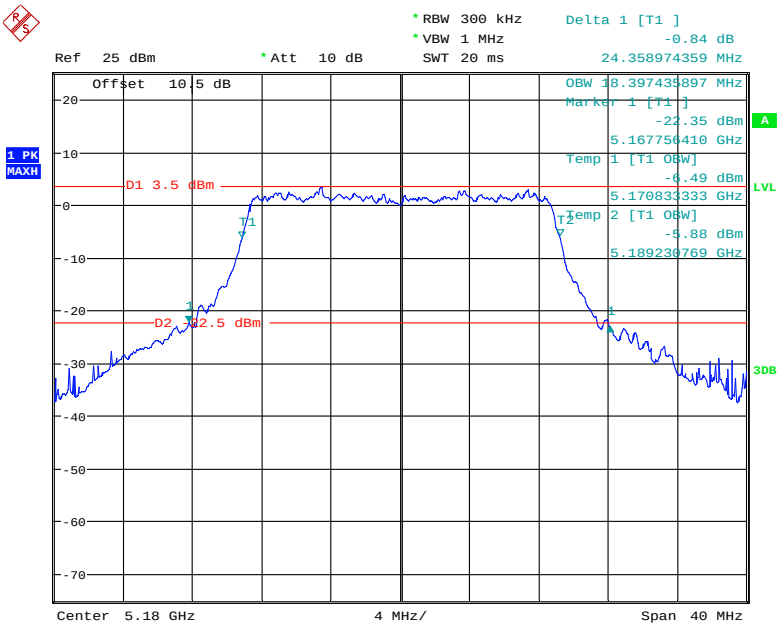
Date: 19.APR.2018 15:58:33

802.11n20 mode, 26 dB Emissions & 99% Occupied Bandwidth, 5240 MHz



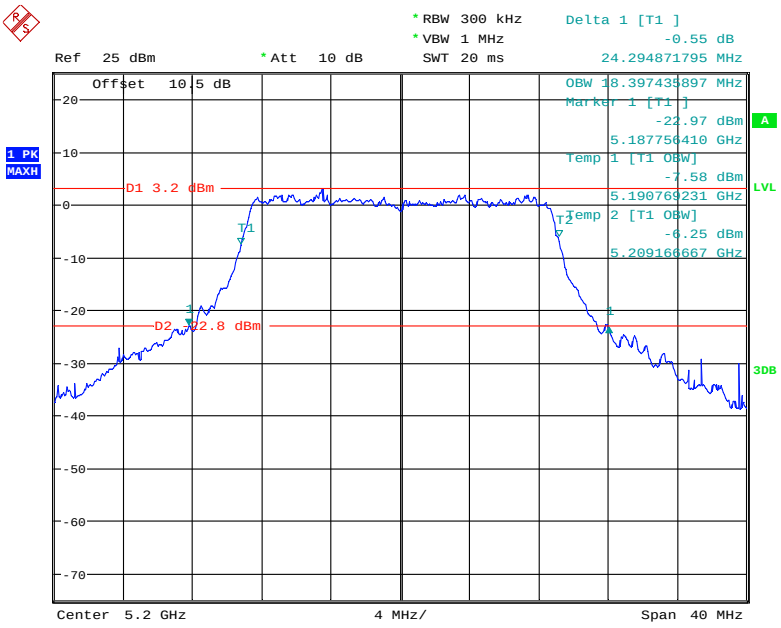
Date: 19.APR.2018 16:05:56

802.11ac20 mode, 26 dB Emissions & 99% Occupied Bandwidth, 5180 MHz



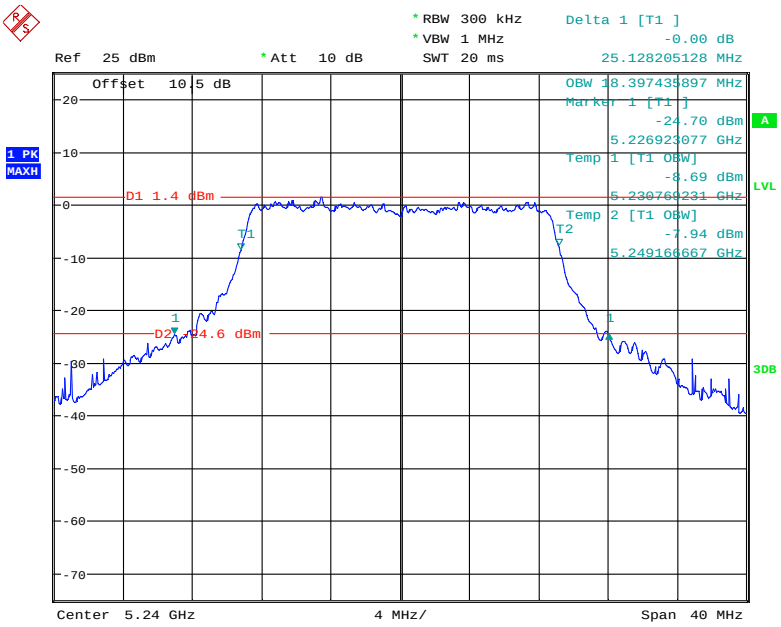
Date: 19.APR.2018 16:19:51

802.11ac20 mode, 26 dB Emissions & 99% Occupied Bandwidth, 5200 MHz



Date: 19.APR.2018 16:21:22

802.11ac20 mode, 26 dB Emissions & 99% Occupied Bandwidth, 5240 MHz

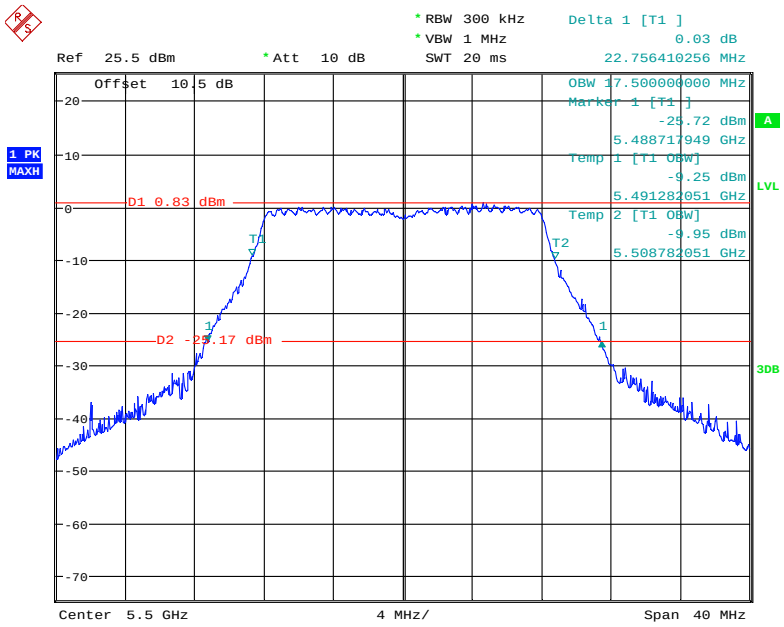


Date: 19.APR.2018 16:22:50

5470 MHz – 5725 MHz:

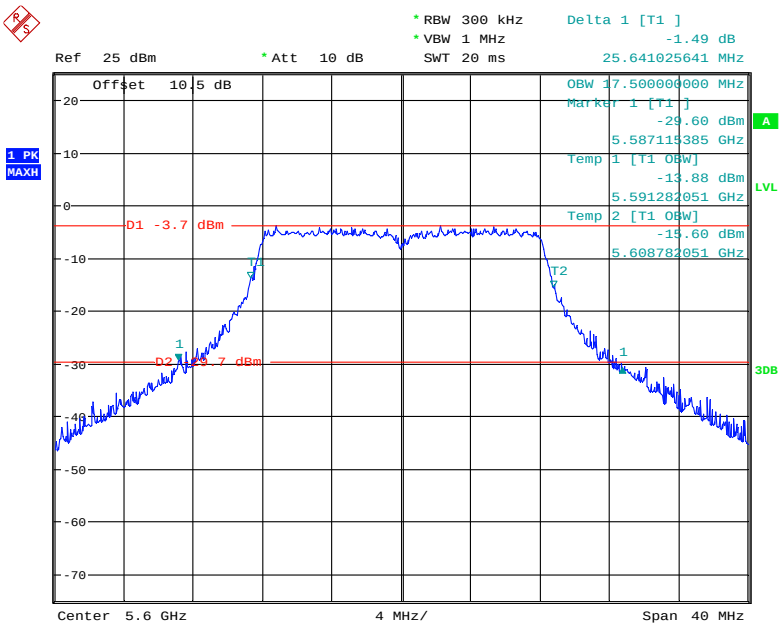
Frequency (MHz)	26dB bandwidth (MHz)	99% Bandwidth (MHz)
802.11a		
5500	22.76	17.50
5600	25.64	17.50
5700	25.83	17.65
802.11n20		
5500	25.96	18.53
5600	23.01	18.27
5700	26.69	18.53
802.11ac20		
5500	25.19	18.40
5600	24.04	18.40
5700	24.87	18.46

802.11a mode, 26 dB Emissions & 99% Occupied Bandwidth, 5500 MHz



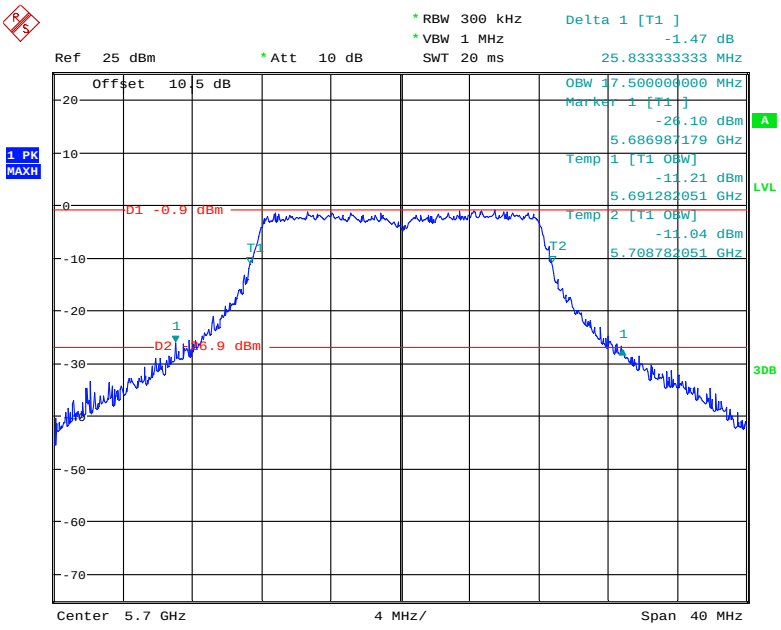
Date: 21.MAY.2018 16:21:19

802.11a mode, 26 dB Emissions & 99% Occupied Bandwidth, 5600 MHz



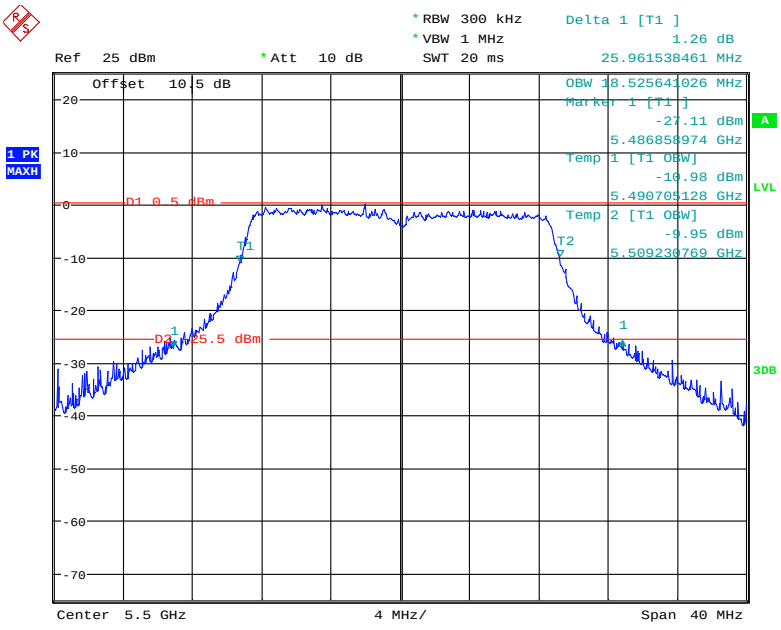
Date: 19.APR.2018 15:48:26

802.11a mode, 26 dB Emissions & 99% Occupied Bandwidth, 5700 MHz



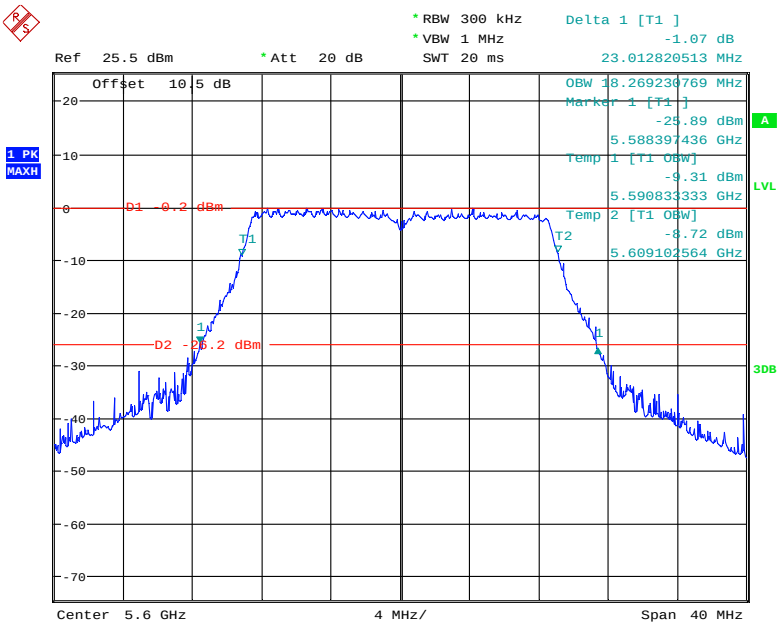
Date: 19.APR.2018 15:50:12

802.11n20 mode, 26 dB Emissions & 99% Occupied Bandwidth, 5500 MHz



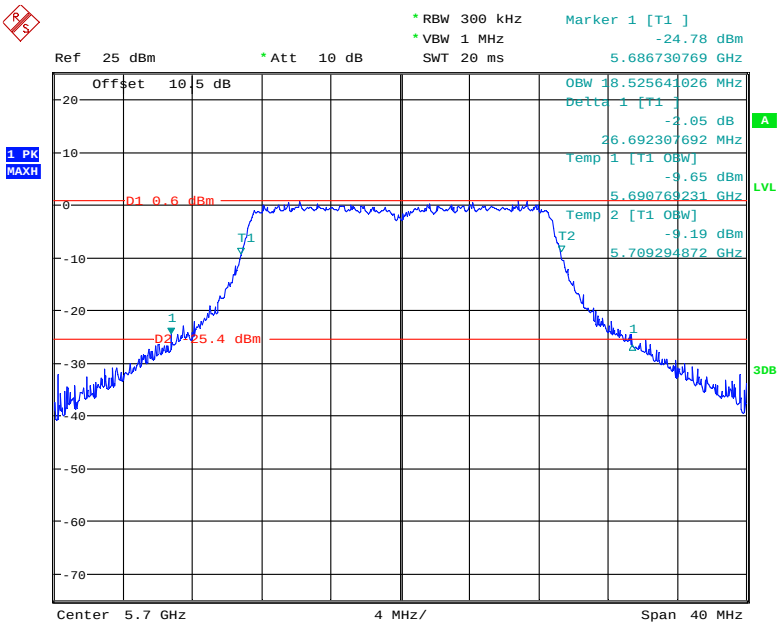
Date: 19.APR.2018 16:07:58

802.11n20 mode, 26 dB Emissions & 99% Occupied Bandwidth, 5600 MHz



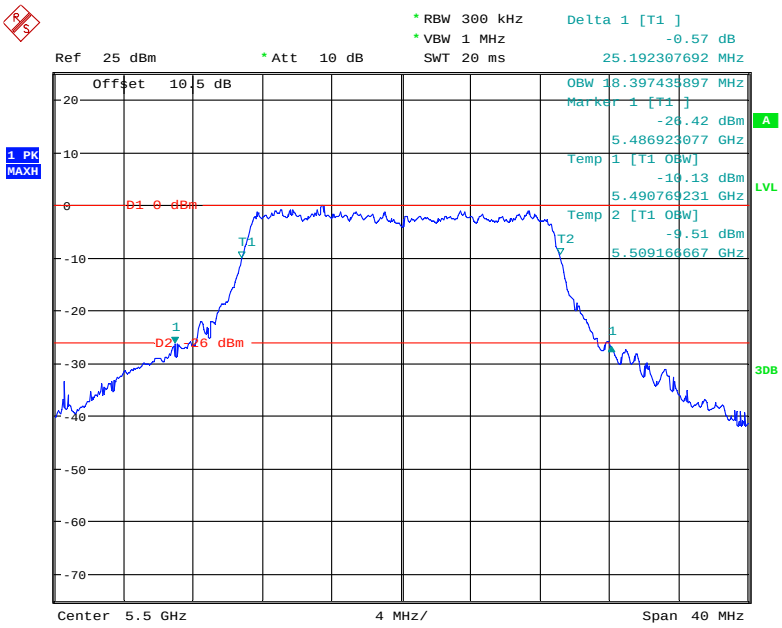
Date: 3.MAY.2018 14:32:58

802.11n20 mode, 26 dB Emissions & 99% Occupied Bandwidth, 5700 MHz



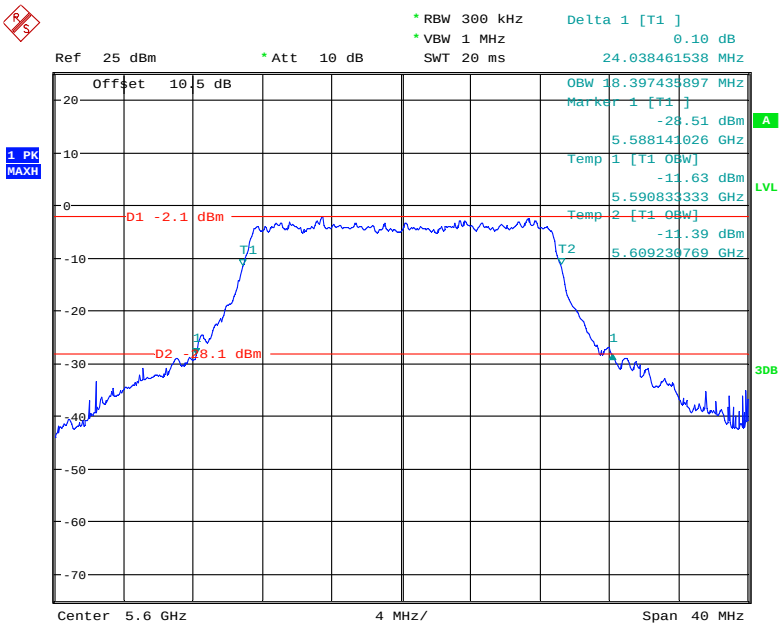
Date: 19.APR.2018 16:14:35

802.11ac20 mode, 26 dB Emissions & 99% Occupied Bandwidth, 5500 MHz



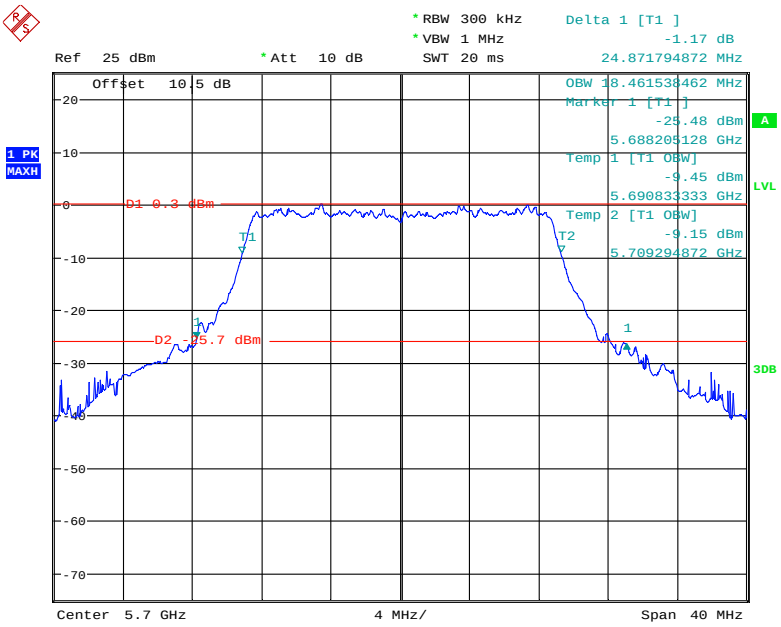
Date: 19.APR.2018 16:24:04

802.11ac20 mode, 26 dB Emissions & 99% Occupied Bandwidth, 5600 MHz



Date: 19.APR.2018 16:25:40

802.11ac20 mode, 26 dB Emissions & 99% Occupied Bandwidth, 5700 MHz



Date: 19.APR.2018 16:27:06

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

Applicable Standard

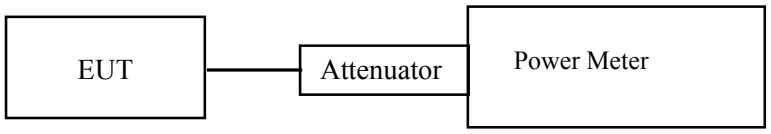
For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz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

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

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

Test Procedure

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



Test Data

Environmental Conditions

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

The testing was performed by Simon Wang on 2018-04-25.

EUT operation mode: Transmitting

Test Result: Pass

Please refer to the following tables.

5150 MHz – 5250 MHz(this is a client device)

Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
802.11a		
5180	10.52	24
5200	11.66	
5240	10.63	
802.11n20		
5180	11.92	24
5200	11.12	
5240	10.54	
802.11ac20		
5180	11.96	24
5200	11.55	
5240	10.27	

5470 MHz – 5725 MHz:

Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
802.11a		
5500	10.31	24
5600	10.08	
5700	11.09	
802.11n20		
5500	10.55	24
5600	10.25	
5700	11.06	
802.11ac20		
5500	10.44	24
5600	10.43	
5700	11.08	

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

Applicable Standard

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

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

Test Procedure

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

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

Test Data

Environmental Conditions

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

The testing was performed by Simon Wang on 2018-04-19.

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EUT operation mode: Transmitting

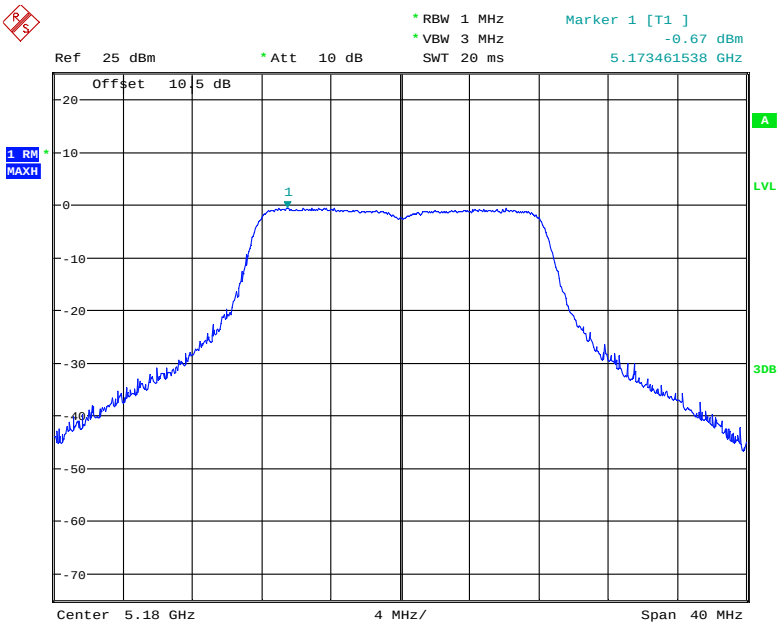
Test Result: Pass

Please refer to the following tables and plots.

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

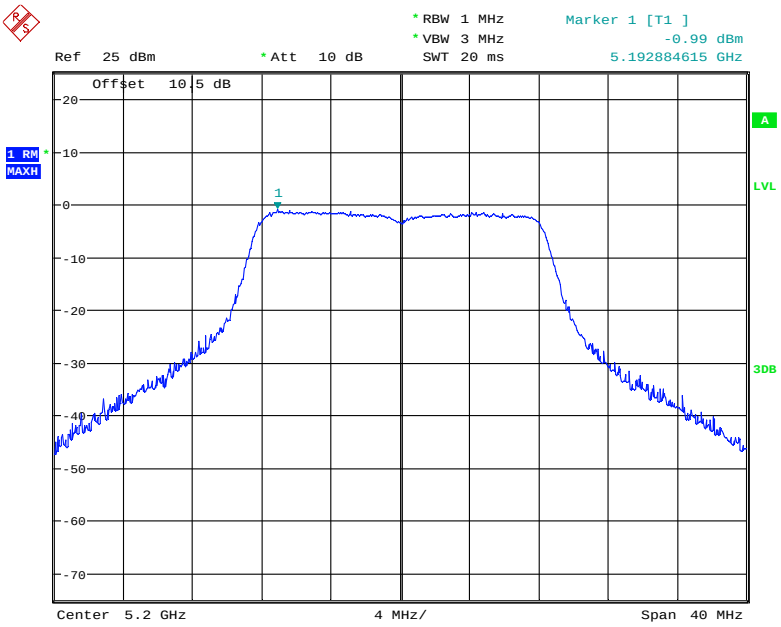
Frequency (MHz)	Power Spectral Density (dBm/MHz)	Duty cycle factor (dB)	Power Spectral Density (dBm/MHz)	Limit (dBm/MHz)
802.11a				
5180	-0.67	0.51	-0.16	11
5200	-0.99	0.51	-0.48	
5240	-1.86	0.51	-1.35	
802.11n20				
5180	-0.02	0.46	0.44	11
5200	-0.11	0.46	0.35	
5240	-1.85	0.46	-1.39	
802. 11ac20				
5180	0.46	0.66	1.12	11
5200	0.09	0.66	0.75	
5240	-1.87	0.66	-1.21	

802.11a mode, Power Spectral Density, 5180 MHz



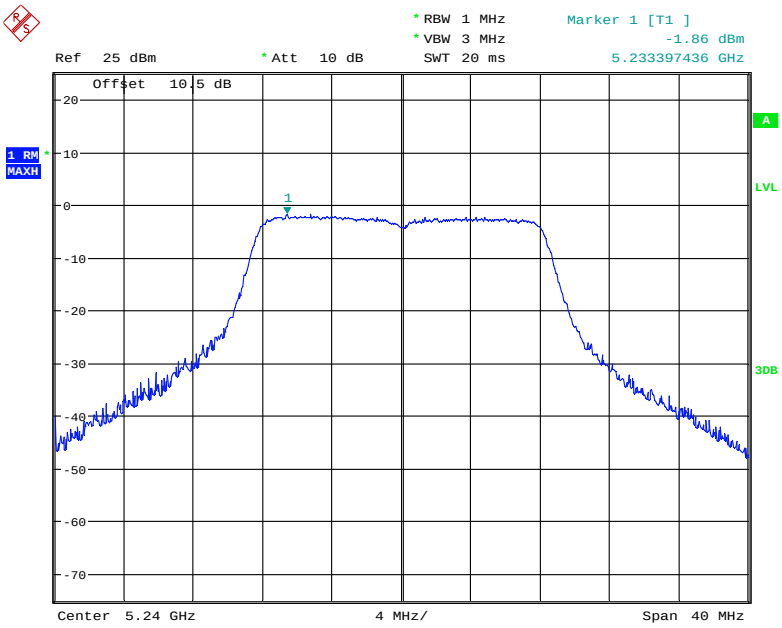
Date: 19.APR.2018 16:46:53

802.11a mode, Power Spectral Density, 5200 MHz



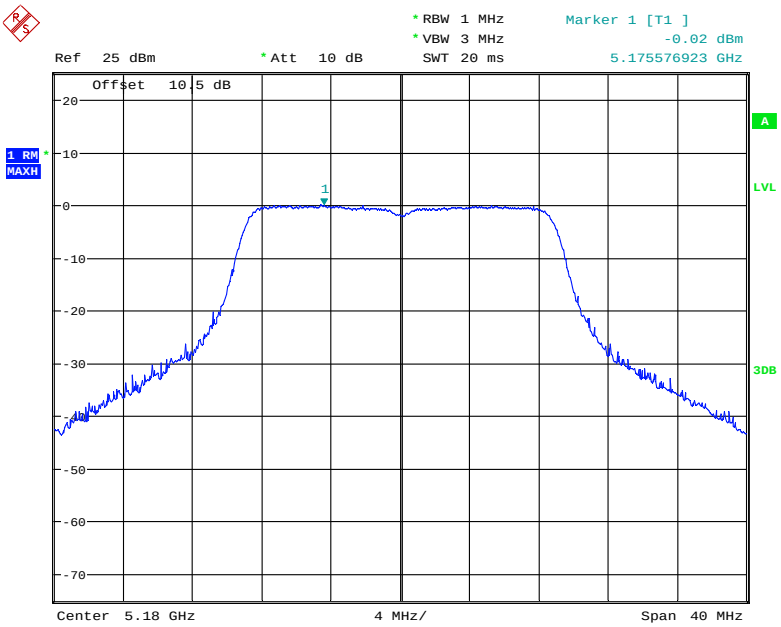
Date: 19.APR.2018 16:46:19

802.11a mode, Power Spectral Density, 5240 MHz



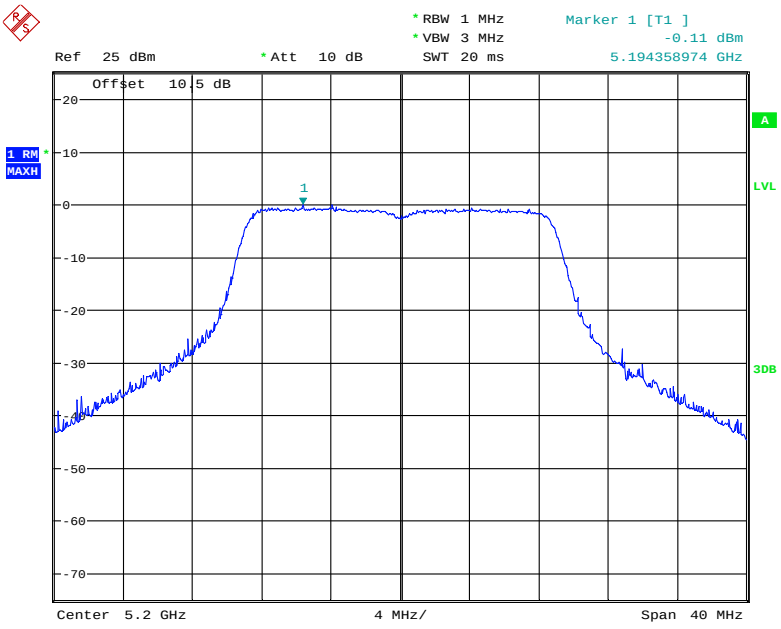
Date: 19.APR.2018 16:45:28

802.11n20 mode, Power Spectral Density, 5180 MHz



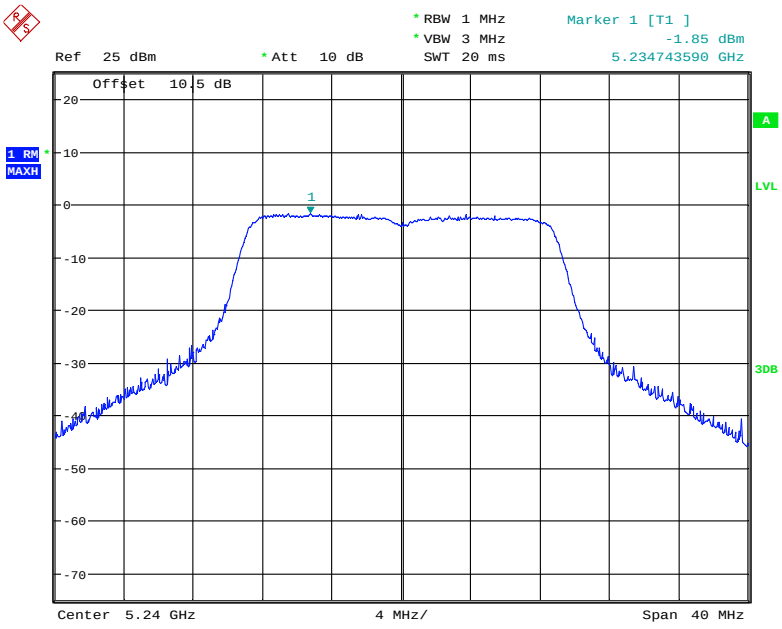
Date: 19.APR.2018 16:38:52

802.11n20 mode, Power Spectral Density, 5200 MHz



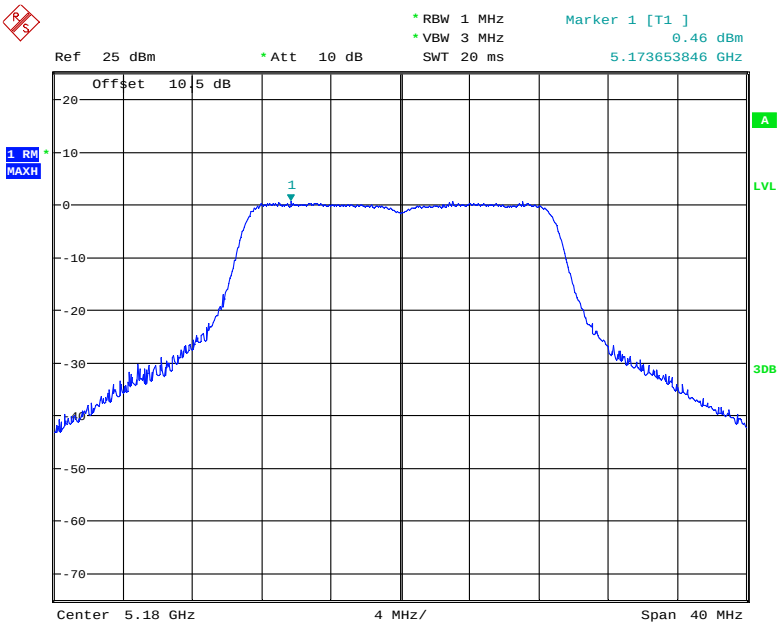
Date: 19.APR.2018 16:39:51

802.11n20 mode, Power Spectral Density, 5240 MHz

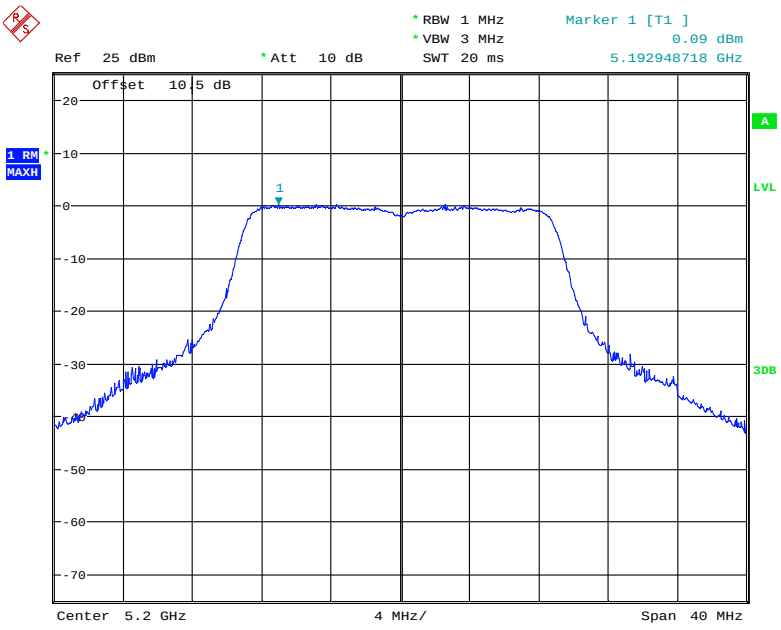


Date: 19.APR.2018 16:40:24

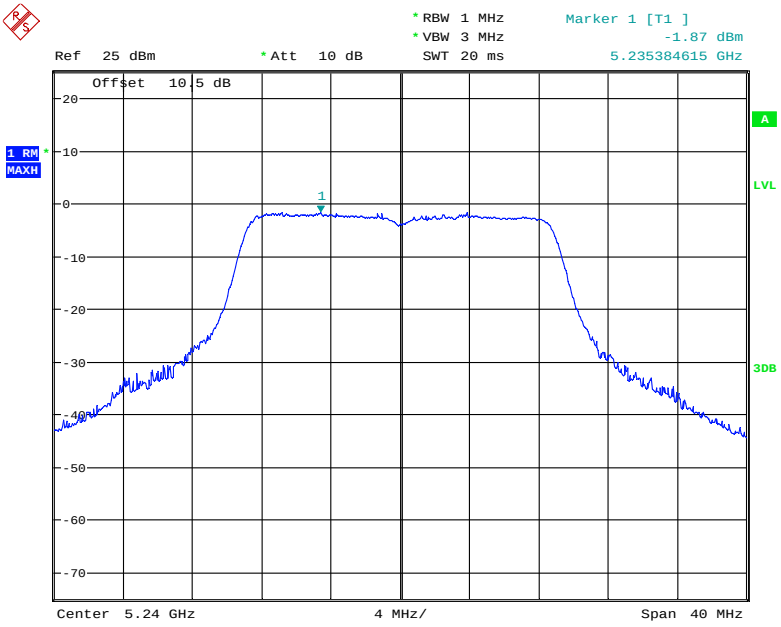
802.11ac20 mode, Power Spectral Density, 5180 MHz



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



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

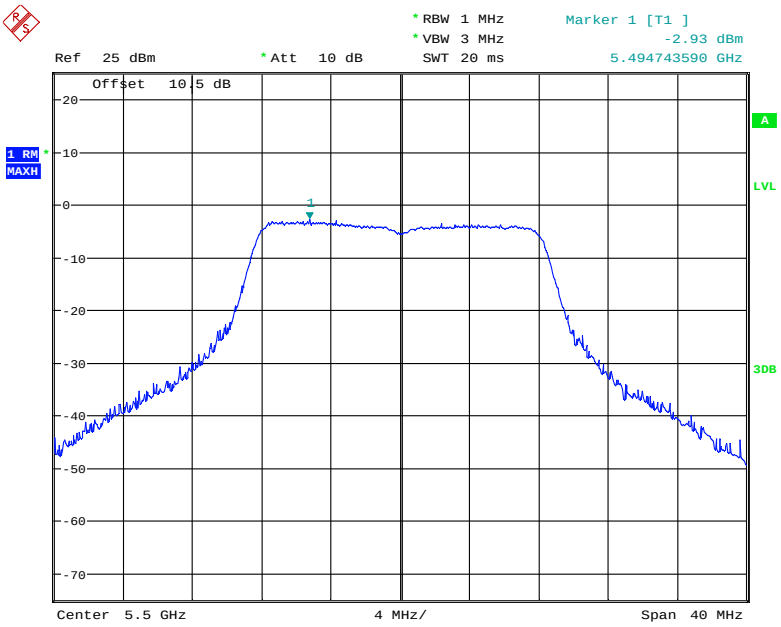


Date: 19.APR.2018 16:35:29

5470 MHz – 5725 MHz:

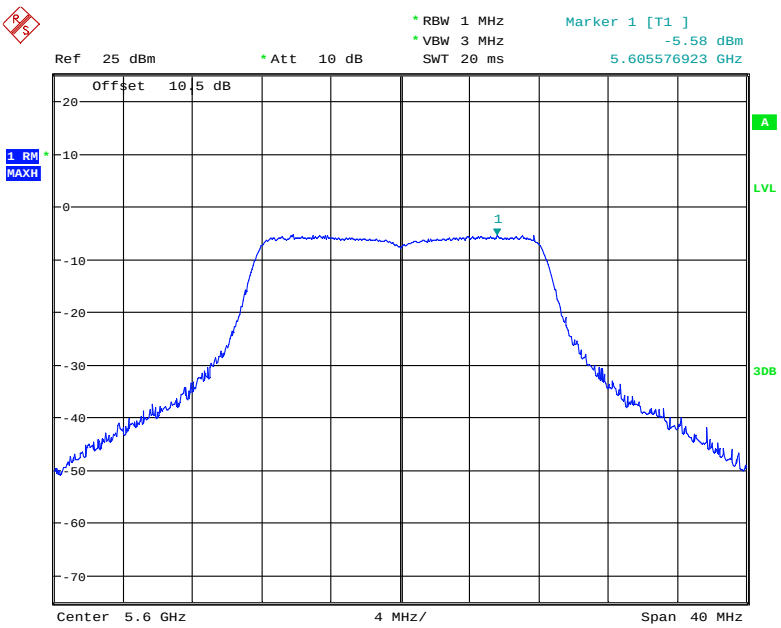
Frequency (MHz)	Power Spectral Density (dBm/MHz)	Duty cycle factor (dB)	Power Spectral Density (dBm/MHz)	Limit (dBm/MHz)
802.11a				
5500	-2.93	0.57	-2.36	11
5600	-5.58	0.57	-5.01	
5700	-2.74	0.57	-2.17	
802.11n20				
5500	-3.03	0.46	-2.57	11
5600	-5.55	0.46	-5.09	
5700	-2.92	0.46	-2.46	
802. 11ac20				
5500	-4.38	0.66	-3.72	11
5600	-5.88	0.66	-5.22	
5700	-2.39	0.66	-1.73	

802.11a mode, Power Spectral Density, 5500 MHz



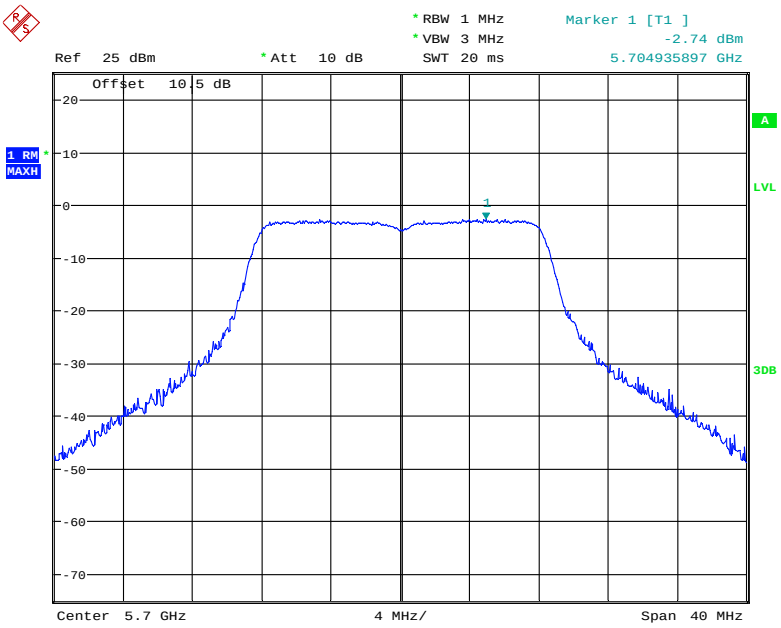
Date: 19.APR.2018 16:44:44

802.11a mode, Power Spectral Density, 5600 MHz



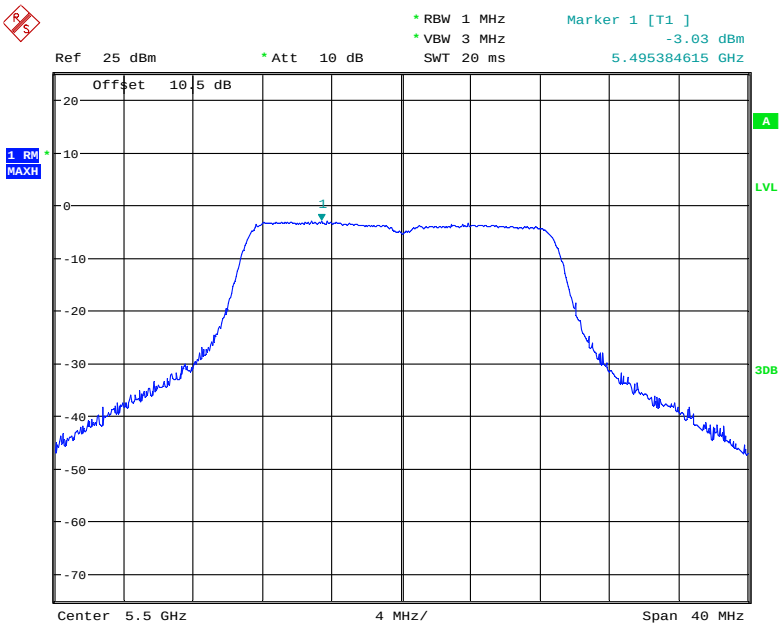
Date: 19.APR.2018 16:44:00

802.11a mode, Power Spectral Density, 5700 MHz



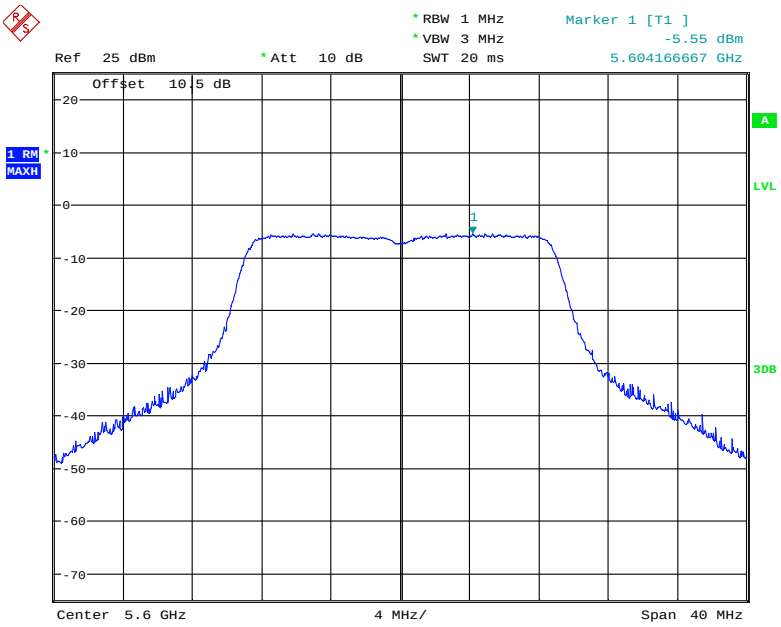
Date: 19.APR.2018 16:43:27

802.11n20 mode, Power Spectral Density, 5500 MHz



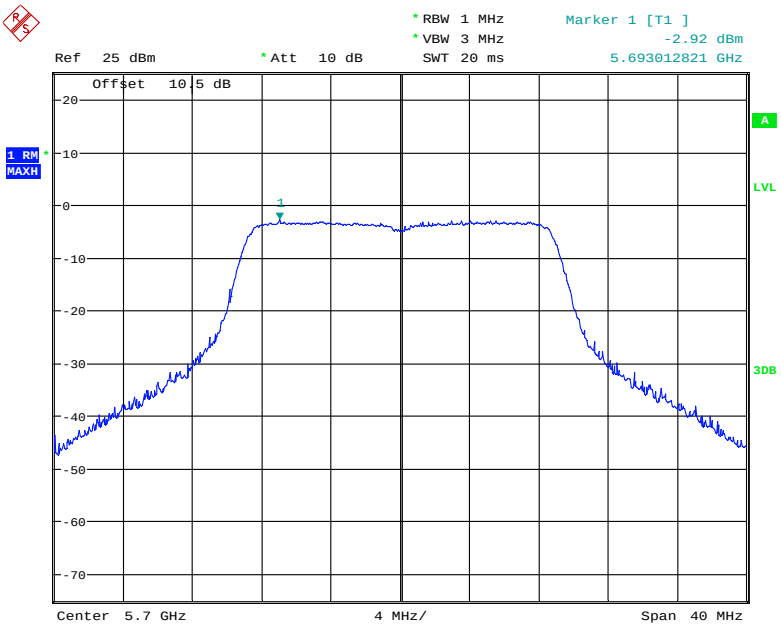
Date: 19.APR.2018 16:41:04

802.11n20 mode, Power Spectral Density, 5600 MHz



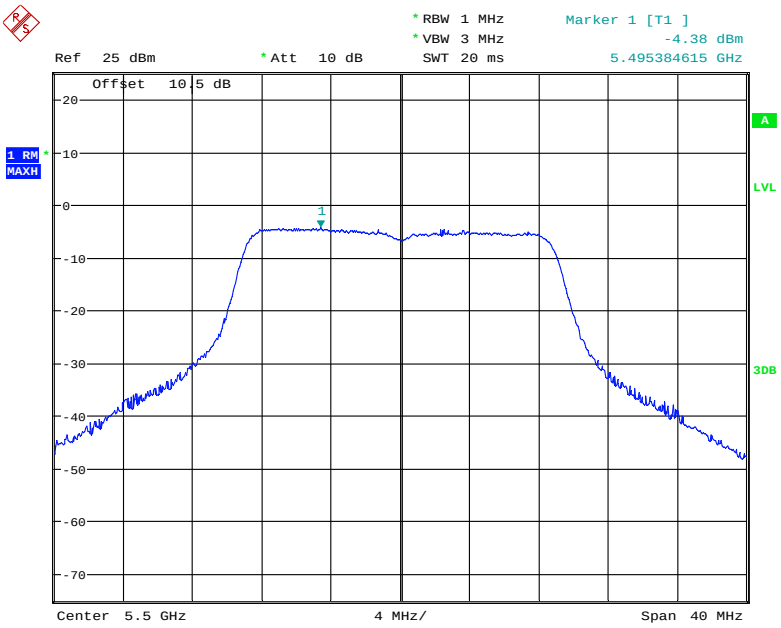
Date: 19.APR.2018 16:42:09

802.11n20 mode, Power Spectral Density, 5700 MHz



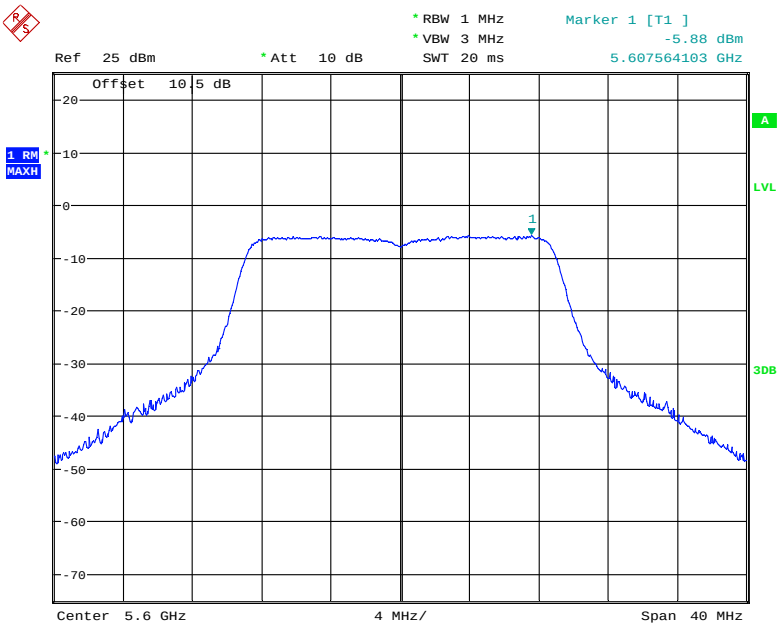
Date: 19.APR.2018 16:42:47

802.11ac20 mode, Power Spectral Density, 5500 MHz



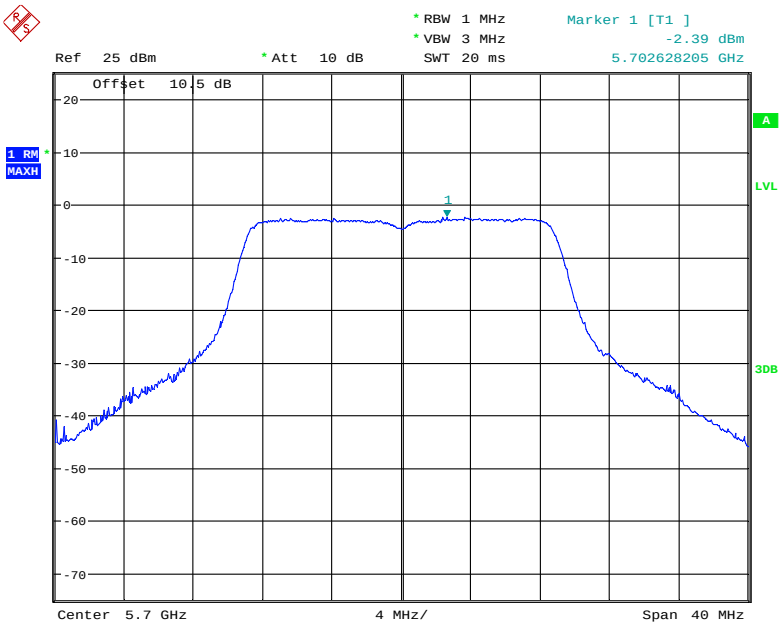
Date: 19.APR.2018 16:31:37

802. 11ac20 mode, Power Spectral Density, 5600 MHz



Date: 19.APR.2018 16:30:53

802. 11ac20 mode, Power Spectral Density, 5700 MHz



Date: 19.APR.2018 16:29:47

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