TEST REPORT

Applicant Name :	Shenzhen Youmi Intelligent Technology Co., Ltd.
Address :	406-407 Jinqi Zhigu Building, 4/F, 1 Tangling Road, Nanshan District, Shenzhen City, China
Report Number :	SZ1210909-53551E-RF-00C
FCC ID:	2ATZ4-RP01X

Test Standard (s)

FCC PART 15.407

Sample Description

Product Type:	RP01
Model No.:	RP01
Multiple Model(s) No.:	RP03, RP04
Trade Mark:	UMIDIGI
Date Received:	2021/09/09
Date of Test:	2021/09/26~2021/11/11
Report Date:	2021/11/11

Test Result:	Pass*

* In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:

Ting Lü
EMC Engineer

Approved By:

Candy Li
EMC Engineer

Note: 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)

Product	RP01
Tested Model	RP01
Multiple Models	RP03, RP04
Model Differences	Refer to the DoS letter
Frequency Range	5G Wi-Fi: 5150-5250MHz; 5725-5850MHz
Mode	802.11a/n20/n40/ac20/ac40/ac80
Maximum Conducted Average Ouput Power	5150-5250 MHz: 12.88dBm 5725-5850 MHz: 9.72dBm
Modulation Technique	OFDM
Antenna Specification*	Antenna gain: 1.2 dBi (It is provided by the manufacturer)
Voltage Range	DC 3.87V from battery or DC 5V from adapter
Sample serial number	SZ1210909-53551E-RF-S1 for RF conducted SZ1210909-53551E-RF-S6 for CE&RE (Assigned by ATC)
Received date	2021-09-09
Sample/EUT Status	Good condition
Adapter information	Model: HJ-0502000W2-US Input: AC 100-240V, 50/60Hz, 0.3A Output: DC 5.0V, 2.0A

Objective

This test report is 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.

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. And KDB789033 D02 General U-NII Test Procedures New Rules v02r01.

All emissions measurement was performed at Shenzhen Accurate Technology Co., Ltd. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Each test item follows test standards and with no deviation.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		5%
RF Frequency		$0.082*10^{-7}$
RF output power, conducted		0.73dB
Unwanted Emission, conducted		1.6dB
AC Power Lines Conducted Emissions		2.72dB
Emissions, Radiated	9kHz - 30MHz	2.66dB
	30MHz - 1GHz	4.28dB
	1GHz - 18GHz	4.98dB
	18GHz - 26.5GHz	5.06dB
	26.5GHz - 40GHz	4.72dB
Temperature		1℃
Humidity		6%
Supply voltages		0.4%

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The test site used by Shenzhen Accurate Technology Co., Ltd. to collect test data is located on the 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. 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.: 708358, the FCC Designation No.: CN1189. Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 429 7.01.

Listed by Innovation, Science and Economic Development Canada (ISEDC), the Registration Number is 5077A.

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 5G Wi-Fi 802.11a/n20/n40/ac20/ac40/ac80 modes, which was declared by manufacturer.

For 5150-5250MHz Band, 7 channels are provided to testing:

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

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

For 5725-5850MHz Band, 8 channels are provided to testing:

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

For 802.11a/n20/ac20 mode: channel 149, 157, 165 were tested;
For 802.11n40/ac40 mode: channel 151, 159 were tested;
For 802.11ac80 mode, channel 155 was tested.

EUT Exercise Software

EUT was test in engineering mode. The software and power level was provided by the applicant.

The worst case was performed under:

U-NII	Mode	Frequency (MHz)	Data Rate	Power Level*
5150 – 5250MHz	802.11 a	5180	6Mbps	17
		5200	6Mbps	17
		5240	6Mbps	17
	802.11 n20	5180	MCS0	17
		5200	MCS0	17
		5240	MCS0	17
	802.11 n40	5190	MCS0	17
		5230	MCS0	17
	802.11 ac20	5180	MCS0	17
		5200	MCS0	17
		5240	MCS0	17
	802.11 ac40	5190	MCS0	17
		5230	MCS0	17
	802.11 ac80	5210	MCS0	17
5725 – 5850MHz	802.11 a	5745	6Mbps	17
		5785	6Mbps	17
		5825	6Mbps	17
	802.11 n20	5745	MCS0	17
		5785	MCS0	17
		5825	MCS0	17
	802.11 n40	5755	MCS0	17
		5795	MCS0	17
	802.11 ac20	5745	MCS0	17
		5785	MCS0	17
		5825	MCS0	17
	802.11 ac40	5755	MCS0	17
		5795	MCS0	17
	802.11 ac80	5775	MCS0	17

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

Duty cycle

Test Result: Pass. Please refer to the Appendix.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

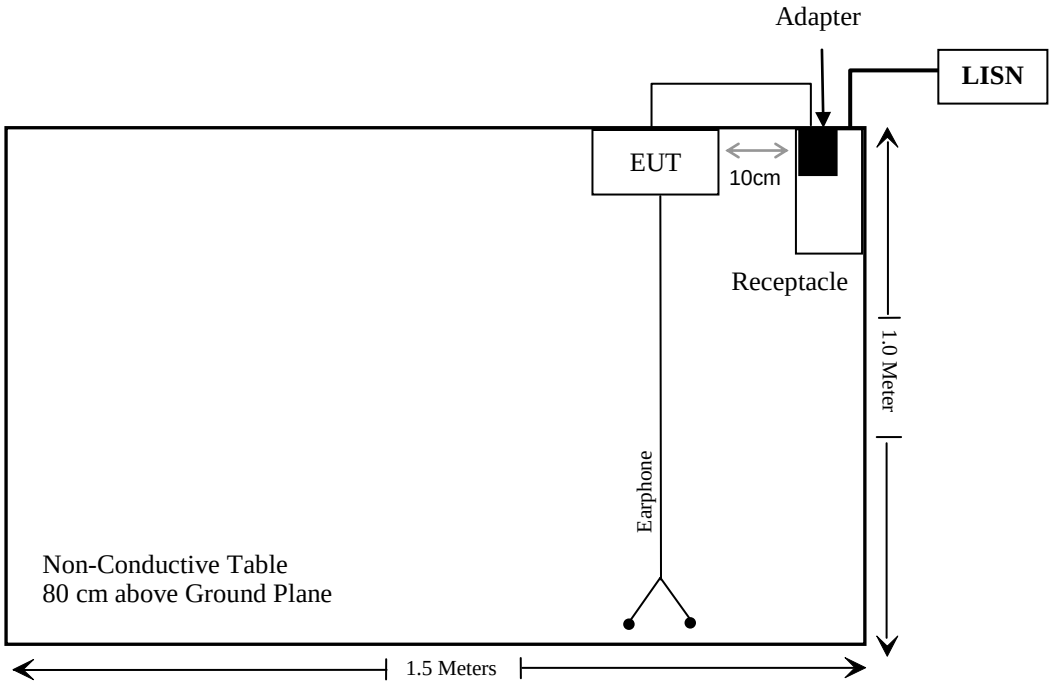
Manufacturer	Description	Model	Serial Number
Unknown	Earphone	Unknown	Unknown

External I/O Cable

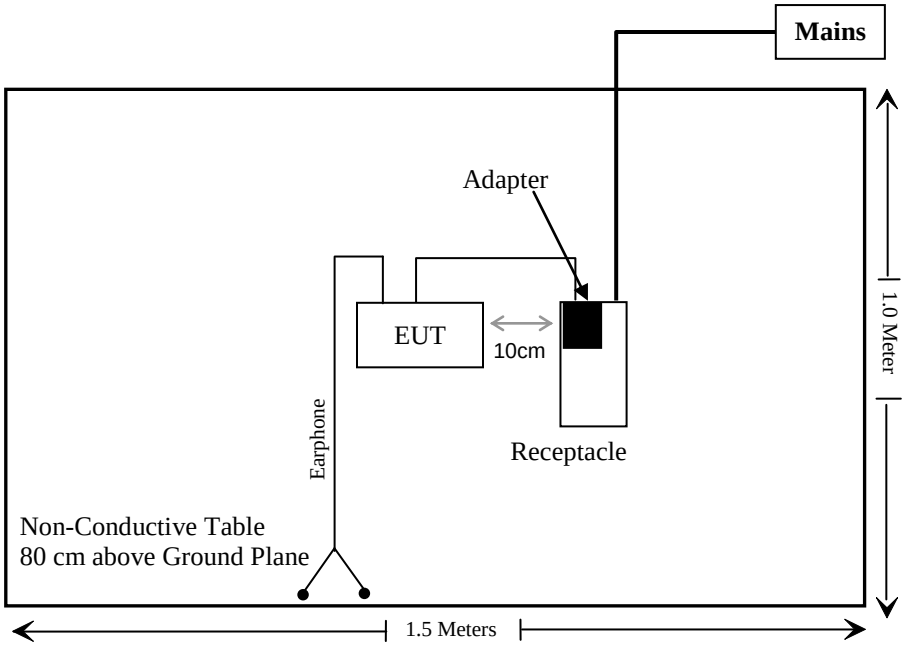
Cable Description	Length (m)	From Port	To
Un-shielding Detachable USB Cable	1.0	EUT	Adapter

Block Diagram of Test Setup

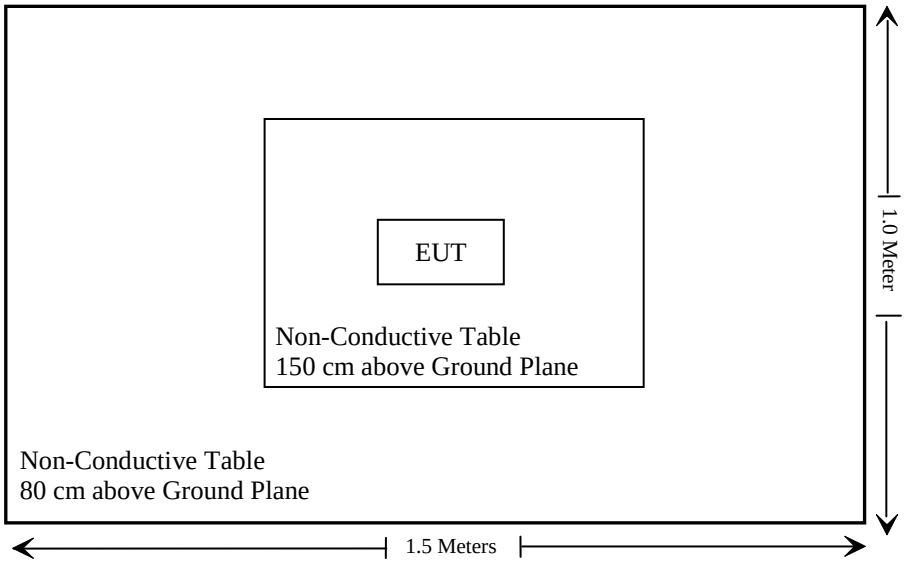
For conducted emission:



For radiated emission: Below 1GHz



For radiated emission: Above 1GHz



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1307 (b) (1) & §2.1093	RF Exposure	Compliant
§15.203	Antenna Requirement	Compliant
§15.407(b)(9)& §15.207(a)	Conducted Emissions	Compliant
§15.205& §15.209 & §15.407(b)	Undesirable Emission& Restricted Bands	Compliant
§15.407(a) (e)	26 dB Emission Bandwidth & 6dB Bandwidth	Compliant
§15.407(a)	Conducted Transmitter Output Power	Compliant
§15.407 (a)	Power Spectral Density	Compliant
§15.407 (h)	Transmit Power Control (TPC)	Not Applicable
§15.407 (h)	Dynamic Frequency Selection (DFS)	Not Applicable*

Not Applicable: the EUT has no TPC function which was declarded by the applicant.
Not Applicable*: the EUT not operating within frequency range of 5250-5350MHz&5470-5725MHz.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted emission test					
Rohde& Schwarz	Test Receiver	ESPI3	100396	2020/12/24	2021/12/23
R & S	L.I.S.N.	ENV216	101314	2020/12/25	2021/12/24
Anritsu Corp	50ΩCoaxial Switch	MP59B	6200506474	2020/12/25	2021/12/24
Unknown	RF Coaxial Cable	N-2m	No.2	2020/12/25	2021/12/24
Conducted Emission Test Software: ES-K1 V1.71					
Radiated emission test					
Rohde& Schwarz	Test Receiver	ESR	101817	2020/12/24	2021/12/23
Rohde&Schwarz	Spectrum Analyzer	FSV40	101495	2020/12/24	2021/12/23
SONOMA INSTRUMENT	Amplifier	310 N	186131	2020/12/25	2021/12/24
A.H. Systems, inc.	Preamplifier	PAM-0118P	531	2021/07/08	2022/07/07
Quinstar	Amplifier	QLW-18405536-J0	15964001002	2020/11/28	2021/11/27
Anritsu Corp	50 Coaxial Switch	MP59B	6100237248	2020/12/25	2021/12/24
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2020/01/05	2023/01/04
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-1067	2020/01/05	2023/01/04
Schwarzbeck	HORN ANTENNA	BBHA9170	9170-359	2020/01/05	2023/01/04
Unknown	RF Coaxial Cable	N-5m	No.3	2020/12/25	2021/12/24
Unknown	RF Coaxial Cable	N-5m	No.4	2020/12/25	2021/12/24
Unknown	RF Coaxial Cable	N-1m	No.5	2020/12/25	2021/12/24
Unknown	RF Coaxial Cable	N-1m	No.6	2020/12/25	2021/12/24
CD	Band Reject Filter	BRM-5.15/5.35g-45	075	2020/12/25	2021/12/24
CD	Band Reject Filter	BRM-5.725/5.875G-45	065	2020/12/25	2021/12/24
Radiated Emission Test Software: EZ_EMC V 1.1.4.2					
Radiated Emission Test Software: e3 19821G (V9)					

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF conducted test					
Rohde & Schwarz	Spectrum Analyzer	FSV-40	101495	2020/12/24	2021/12/23
Tonscend	RF Control Unit	JS0806-2	19G8060182	2021/07/06	2022/07/05

*** Statement of Traceability:** Shenzhen Accurate Technology Co., Ltd. attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC §1.1307(b) & §2.1093 - RF EXPOSURE INFORMATION

Applicable Standard

FCC§1.1310 and §2.1093.

Test Result

Compliant, please refer to the SAR report: SZ1210909-53551E-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 for 5G Wi-Fi which were permanently attached. Please refer to the EUT photos.

Type	Antenna Gain	Impedance	Frequency Range
PIFA	1.2dBi	50Ω	5150-5850MHz

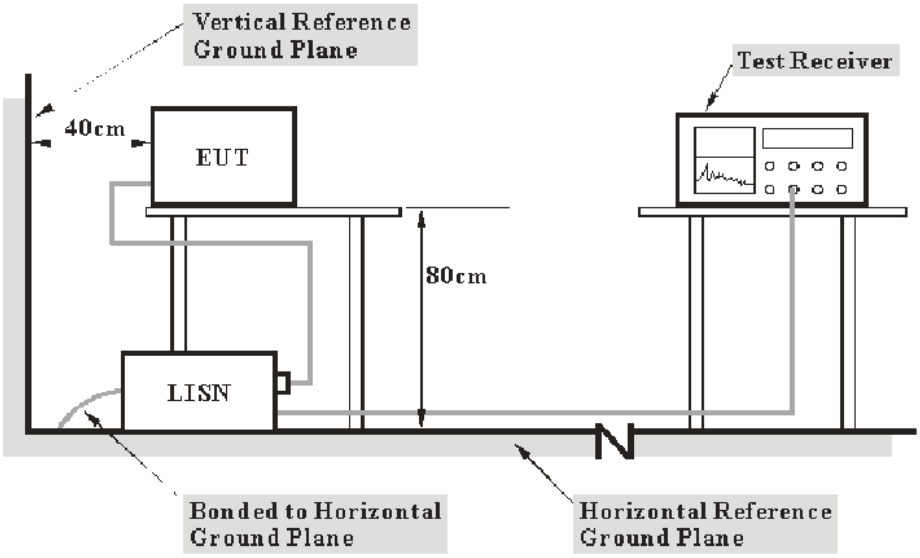
Result: Compliant.

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.

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 Data

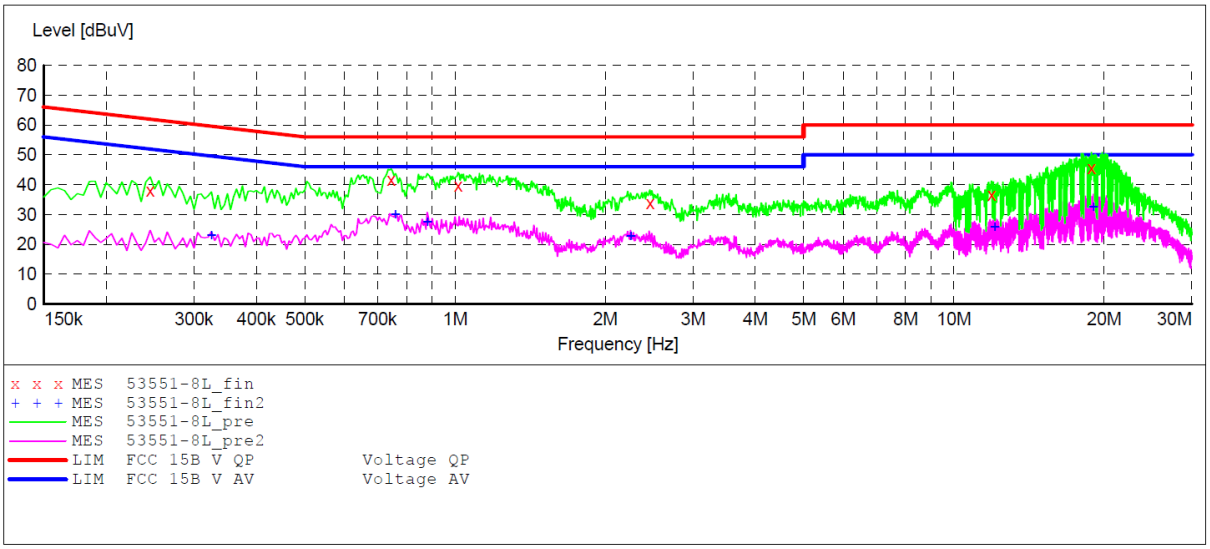
Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	65 %
ATM Pressure:	101.0 kPa

The testing was performed by Amy Cao on 2021-09-26.

EUT operation mode: Transmitting (worst case is 802.11ac40, 5230MHz)

AC 120V/60 Hz, Line:



MEASUREMENT RESULT: "53551-8L_fin"

2021-9-26 11:11

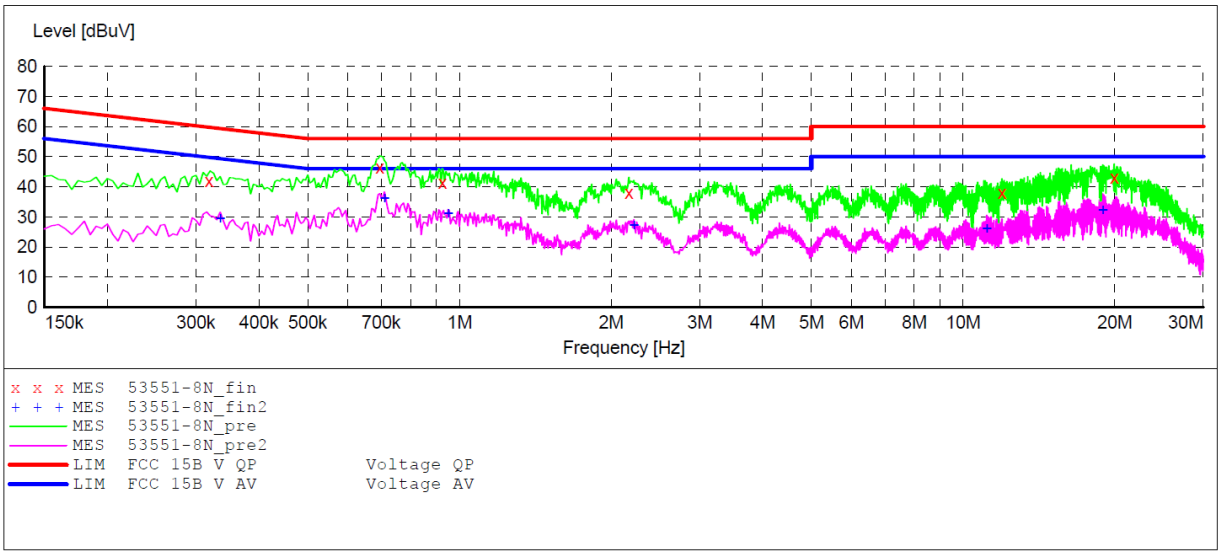
Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.245000	38.00	10.9	62	24.0	QP	L1	GND
0.745000	41.70	11.1	56	14.3	QP	L1	GND
1.015000	39.60	11.1	56	16.4	QP	L1	GND
2.460000	33.80	11.3	56	22.2	QP	L1	GND
11.900000	36.70	11.6	60	23.3	QP	L1	GND
18.875000	45.70	11.7	60	14.3	QP	L1	GND

MEASUREMENT RESULT: "53551-8L_fin2"

2021-9-26 11:11

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.325000	22.90	10.9	50	27.1	AV	L1	GND
0.760000	30.00	11.1	46	16.0	AV	L1	GND
0.880000	27.40	11.1	46	18.6	AV	L1	GND
2.250000	22.70	11.3	46	23.3	AV	L1	GND
12.075000	25.70	11.6	50	24.3	AV	L1	GND
19.050000	32.40	11.7	50	17.6	AV	L1	GND

AC 120V/60 Hz, Neutral:



MEASUREMENT RESULT: "53551-8N_fin"

2021-9-26 11:12

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.320000	42.40	10.9	60	17.6	QP	N	GND
0.695000	46.50	11.1	56	9.5	QP	N	GND
0.925000	41.30	11.1	56	14.7	QP	N	GND
2.170000	38.00	11.3	56	18.0	QP	N	GND
11.950000	37.90	11.6	60	22.1	QP	N	GND
19.975000	43.10	11.7	60	16.9	QP	N	GND

MEASUREMENT RESULT: "53551-8N_fin2"

2021-9-26 11:12

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.335000	29.40	10.9	49	19.6	AV	N	GND
0.710000	36.10	11.1	46	9.9	AV	N	GND
0.950000	31.10	11.1	46	14.9	AV	N	GND
2.220000	27.00	11.3	46	19.0	AV	N	GND
11.150000	25.90	11.6	50	24.1	AV	N	GND
18.950000	32.30	11.7	50	17.7	AV	N	GND

§15.205 & §15.209 & §15.407(B)– UNDESIRABLE EMISSION

Applicable Standard

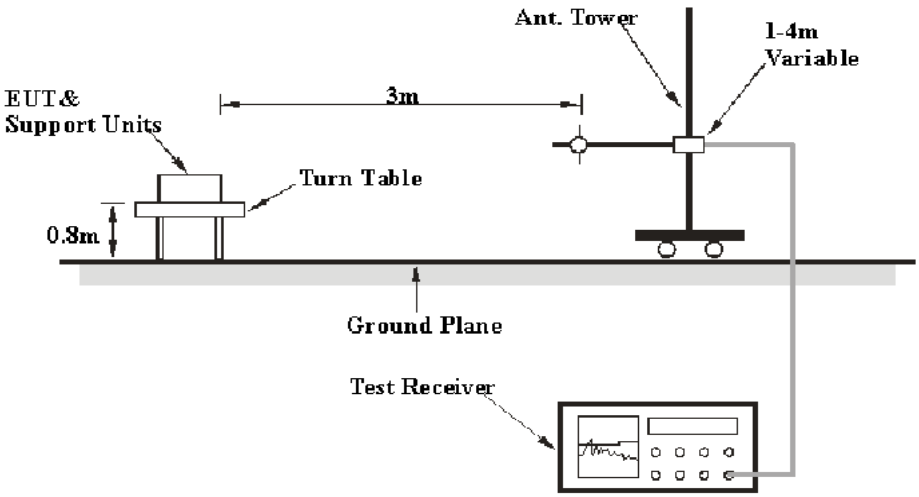
FCC §15.407 (b); §15.209; §15.205;

(b) Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:
(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(4) For transmitters operating in the 5.725-5.85 GHz band:
(i) All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

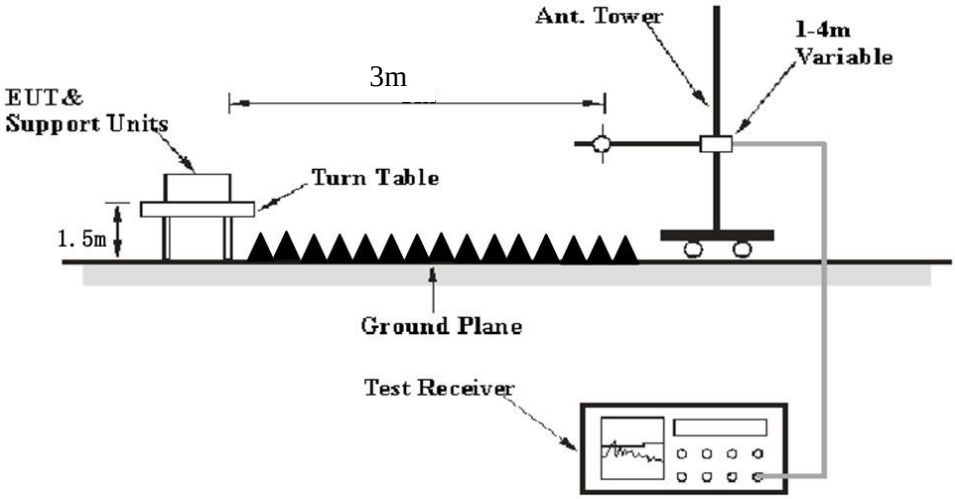
Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.

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.

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	Measurement
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.

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 = Corrected Amplitude - Limit

Test Data

Environmental Conditions

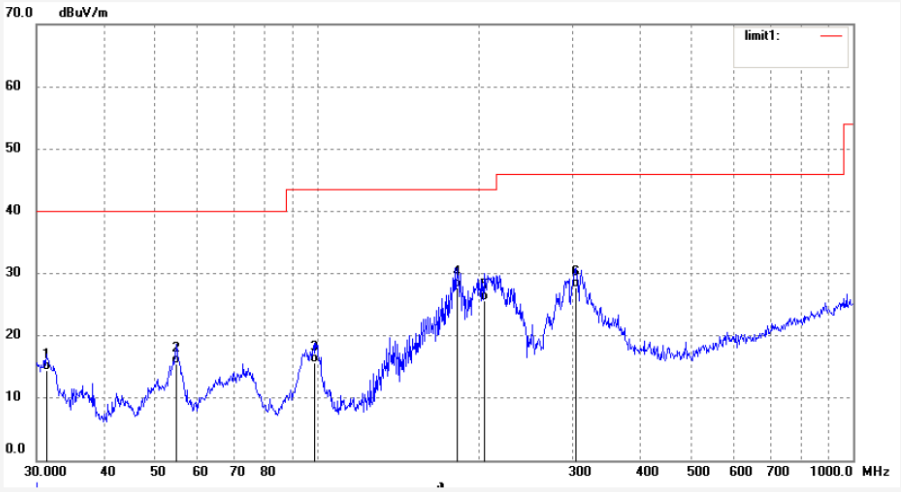
Temperature:	23~25 ℃
Relative Humidity:	48~50 %
ATM Pressure:	101.0 kPa

The testing was performed by Caro Hu on 2021-09-28 for below 1GHz and by Chao Mo on 2021-11-05 for above 1GHz.

EUT operation mode: Transmitting(Scan with X-AXIS, Y-AXIS, Z-AXIS, the worst case was recorded)

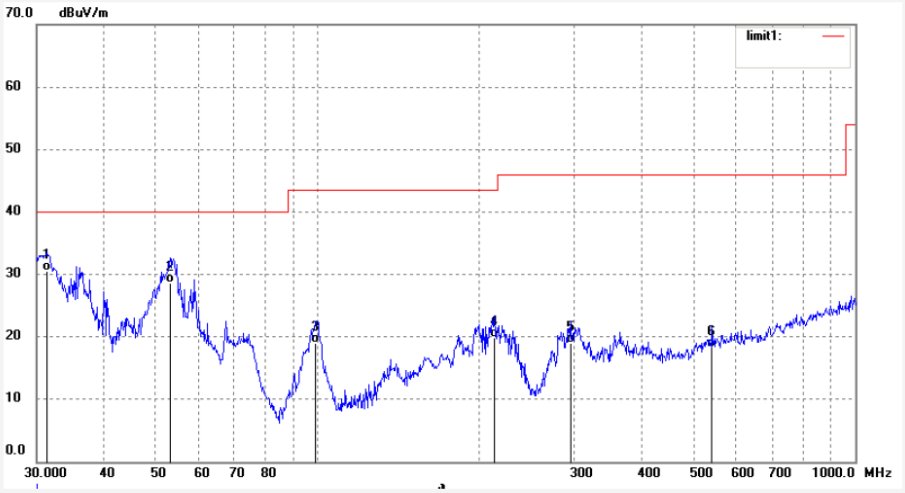
30 MHz – 1 GHz: *(worst case is 802.11ac40, 5230MHz)*

Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	31.2893	34.62	-20.11	14.51	40.00	-25.49	QP			
2	54.6429	32.84	-17.37	15.47	40.00	-24.53	QP			
3	98.8326	34.21	-18.49	15.72	43.50	-27.78	QP			
4	182.5592	45.88	-18.17	27.71	43.50	-15.79	QP			
5	204.9551	43.19	-17.53	25.66	43.50	-17.84	QP			
6	303.5437	42.32	-14.50	27.82	46.00	-18.18	QP			

Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	31.3992	44.51	-13.97	30.54	40.00	-9.46	QP			
2	53.1313	46.23	-17.53	28.70	40.00	-11.30	QP			
3	98.8326	37.54	-18.49	19.05	43.50	-24.45	QP			
4	213.0151	37.21	-17.31	19.90	43.50	-23.60	QP			
5	295.1469	33.67	-14.65	19.02	46.00	-26.98	QP			
6	541.3725	27.69	-9.33	18.36	46.00	-27.64	QP			

Above 1GHz:

5150-5250 MHz:

Frequency (MHz)	Receiver		Turn-Table	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part 15.407	
	Reading (dBμV)	PK/QP/Ave.	Angle Degree	Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11a									
5180 MHz									
4500	58.68	PK	245	1.4	H	1.89	60.57	74	-13.43
4500	44.72	Ave.	245	1.4	H	1.89	46.61	54	-7.39
4500	57.55	PK	297	2.5	V	1.89	59.44	74	-14.56
4500	43.89	Ave.	297	2.5	V	1.89	45.78	54	-8.22
5150	59.28	PK	185	2.4	H	3.37	62.65	74	-11.35
5150	44.92	Ave.	185	2.4	H	3.37	48.29	54	-5.71
5150	58.14	PK	205	1.4	V	3.37	61.51	74	-12.49
5150	44.15	Ave.	205	1.4	V	3.37	47.52	54	-6.48
10360	47.37	PK	81	1.6	H	14.41	61.78	68.2	-6.42
10360	46.53	PK	118	1.1	V	14.41	60.94	68.2	-7.26
5200 MHz									
10400	46.82	PK	292	1.6	H	14.46	61.28	68.2	-6.92
10400	45.73	PK	217	1.2	V	14.46	60.19	68.2	-8.01
5240 MHz									
5350	58.98	PK	153	1.3	H	3.33	62.31	74	-11.69
5350	44.60	Ave.	153	1.3	H	3.33	47.93	54	-6.07
5350	58.49	PK	132	2.3	V	3.33	61.82	74	-12.18
5350	43.38	Ave.	132	2.3	V	3.33	46.71	54	-7.29
5460	57.56	PK	64	2	H	3.31	60.87	74	-13.13
5460	43.62	Ave.	64	2	H	3.31	46.93	54	-7.07
5460	56.36	PK	7	2.4	V	3.31	59.67	74	-14.33
5460	42.77	Ave.	7	2.4	V	3.31	46.08	54	-7.92
10480	46.13	PK	184	1.6	H	14.53	60.66	68.2	-7.54
10480	45.56	PK	184	1.6	V	14.53	60.09	68.2	-8.11

Frequency (MHz)	Receiver		Turn-Table	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part15.407	
	Reading (dBμV)	PK/QP/Ave.	Angle Degree	Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11n20									
5180 MHz									
4500	59.35	PK	141	1.7	H	1.89	61.24	74	-12.76
4500	45.63	Ave.	141	1.7	H	1.89	47.52	54	-6.48
4500	58.49	PK	269	2	V	1.89	60.38	74	-13.62
4500	44.52	Ave.	269	2	V	1.89	46.41	54	-7.59
5150	59.08	PK	326	2.5	H	3.37	62.45	74	-11.55
5150	44.49	Ave.	326	2.5	H	3.37	47.86	54	-6.14
5150	57.82	PK	150	1.8	V	3.37	61.19	74	-12.81
5150	43.30	Ave.	150	1.8	V	3.37	46.67	54	-7.33
10360	49.50	PK	300	1.6	H	14.41	63.91	68.2	-4.29
10360	48.17	PK	35	2.1	V	14.41	62.58	68.2	-5.62
5200 MHz									
10400	48.79	PK	276	2.1	H	14.46	63.25	68.2	-4.95
10400	47.52	PK	290	1.8	V	14.46	61.98	68.2	-6.22
5240 MHz									
5350	58.65	PK	94	2.2	H	3.33	61.98	74	-12.02
5350	44.72	Ave.	94	2.2	H	3.33	48.05	54	-5.95
5350	56.75	PK	313	1.1	V	3.33	60.08	74	-13.92
5350	44.34	Ave.	313	1.1	V	3.33	47.67	54	-6.33
5460	57.54	PK	202	1.7	H	3.31	60.85	74	-13.15
5460	43.67	Ave.	202	1.7	H	3.31	46.98	54	-7.02
5460	55.77	PK	291	1	V	3.31	59.08	74	-14.92
5460	42.44	Ave.	291	1	V	3.31	45.75	54	-8.25
10480	48.09	PK	335	2	H	14.53	62.62	68.2	-5.58
10480	46.75	PK	335	2	V	14.53	61.28	68.2	-6.92

Frequency (MHz)	Receiver		Turn-Table	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part15.407	
	Reading (dBμV)	PK/QP/Ave.	Angle Degree	Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11n40									
5190 MHz									
4500	60.40	PK	349	1.5	H	1.89	62.29	74	-11.71
4500	46.17	Ave.	349	1.5	H	1.89	48.06	54	-5.94
4500	58.93	PK	60	1.6	V	1.89	60.82	74	-13.18
4500	45.19	Ave.	60	1.6	V	1.89	47.08	54	-6.92
5150	61.50	PK	186	1.3	H	3.37	64.87	74	-9.13
5150	47.25	Ave.	186	1.3	H	3.37	50.62	54	-3.38
5150	60.37	PK	42	2	V	3.37	63.74	74	-10.26
5150	46.12	Ave.	42	2	V	3.37	49.49	54	-4.51
10380	46.09	PK	87	1.7	H	14.43	60.52	68.2	-7.68
10380	45.44	PK	100	1.3	V	14.43	59.87	68.2	-8.33
5230 MHz									
5350	58.60	PK	32	1.1	H	3.33	61.93	74	-12.07
5350	44.71	Ave.	32	1.1	H	3.33	48.04	54	-5.96
5350	56.84	PK	220	1.8	V	3.33	60.17	74	-13.83
5350	44.09	Ave.	220	1.8	V	3.33	47.42	54	-6.58
5460	57.43	PK	63	2.4	H	3.31	60.74	74	-13.26
5460	43.64	Ave.	63	2.4	H	3.31	46.95	54	-7.05
5460	56.07	PK	161	2.1	V	3.31	59.38	74	-14.62
5460	42.23	Ave.	161	2.1	V	3.31	45.54	54	-8.46
10460	45.38	PK	192	2.4	H	14.51	59.89	68.2	-8.31
10460	44.47	PK	192	2.4	V	14.51	58.98	68.2	-9.22

Frequency (MHz)	Receiver		Turn-Table	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part15.407	
	Reading (dBμV)	PK/QP/Ave.	Angle Degree	Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11ac20									
5180 MHz									
4500	58.70	PK	51	2	H	1.89	60.59	74	-13.41
4500	45.64	Ave.	51	2	H	1.89	47.53	54	-6.47
4500	58.19	PK	130	1.3	V	1.89	60.08	74	-13.92
4500	45.28	Ave.	130	1.3	V	1.89	47.17	54	-6.83
5150	58.58	PK	197	1.4	H	3.37	61.95	74	-12.05
5150	44.57	Ave.	197	1.4	H	3.37	47.94	54	-6.06
5150	57.01	PK	333	1.7	V	3.37	60.38	74	-13.62
5150	43.45	Ave.	333	1.7	V	3.37	46.82	54	-7.18
10360	50.42	PK	226	1.2	H	14.41	64.83	68.2	-3.37
10360	49.51	PK	94	1.5	V	14.41	63.92	68.2	-4.28
5200 MHz									
10400	49.46	PK	161	2.1	H	14.46	63.92	68.2	-4.28
10400	48.48	PK	280	2.1	V	14.46	62.94	68.2	-5.26
5240 MHz									
5350	58.95	PK	122	1.2	H	3.33	62.28	74	-11.72
5350	44.65	Ave.	122	1.2	H	3.33	47.98	54	-6.02
5350	57.86	PK	343	1.2	V	3.33	61.19	74	-12.81
5350	43.41	Ave.	343	1.2	V	3.33	46.74	54	-7.26
5460	57.01	PK	143	2.1	H	3.31	60.32	74	-13.68
5460	43.48	Ave.	143	2.1	H	3.31	46.79	54	-7.21
5460	55.87	PK	254	1.1	V	3.31	59.18	74	-14.82
5460	42.36	Ave.	254	1.1	V	3.31	45.67	54	-8.33
10480	49.35	PK	177	2.4	H	14.53	63.88	68.2	-4.32
10480	47.74	PK	177	2.4	V	14.53	62.27	68.2	-5.93

Frequency (MHz)	Receiver		Turn-Table	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part15.407	
	Reading (dBμV)	Detector (PK/QP/AV)	Angle Degree	Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11ac40									
5190 MHz									
4500	60.53	PK	256	1.1	H	1.89	62.42	74	-11.58
4500	46.14	Ave.	256	1.1	H	1.89	48.03	54	-5.97
4500	59.23	PK	109	1.7	V	1.89	61.12	74	-12.88
4500	45.78	Ave.	109	1.7	V	1.89	47.67	54	-6.33
5150	61.60	PK	145	1.2	H	3.37	64.97	74	-9.03
5150	47.07	Ave.	145	1.2	H	3.37	50.44	54	-3.56
5150	60.05	PK	217	2.3	V	3.37	63.42	74	-10.58
5150	46.00	Ave.	217	2.3	V	3.37	49.37	54	-4.63
10380	47.32	PK	37	1.4	H	14.43	61.75	68.2	-6.45
10380	45.96	PK	210	1.3	V	14.43	60.39	68.2	-7.81
5230 MHz									
5350	59.04	PK	256	1.7	H	3.33	62.37	74	-11.63
5350	44.63	Ave.	256	1.7	H	3.33	47.96	54	-6.04
5350	57.56	PK	51	1.9	V	3.33	60.89	74	-13.11
5350	43.65	Ave.	51	1.9	V	3.33	46.98	54	-7.02
5460	57.27	PK	187	2.2	H	3.31	60.58	74	-13.42
5460	43.56	Ave.	187	2.2	H	3.31	46.87	54	-7.13
5460	55.88	PK	306	1.9	V	3.31	59.19	74	-14.81
5460	42.17	Ave.	306	1.9	V	3.31	45.48	54	-8.52
10460	46.50	PK	261	2.1	H	14.51	61.01	68.2	-7.19
10460	45.31	PK	261	2.1	V	14.51	59.82	68.2	-8.38

Frequency (MHz)	Receiver		Turn-Table	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part15.407	
	Reading (dBμV)	Detector (PK/QP/AV)	Angle Degree	Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11ac80									
5210MHz									
4500	59.93	PK	33	2.1	H	1.89	61.82	74	-12.18
4500	46.85	Ave.	33	2.1	H	1.89	48.74	54	-5.26
4500	58.60	PK	65	2.1	V	1.89	60.49	74	-13.51
4500	45.18	Ave.	65	2.1	V	1.89	47.07	54	-6.93
5150	60.06	PK	229	1.3	H	3.37	63.43	74	-10.57
5150	46.93	Ave.	229	1.3	H	3.37	50.30	54	-3.70
5150	58.94	PK	290	2.1	V	3.37	62.31	74	-11.69
5150	46.51	Ave.	290	2.1	V	3.37	49.88	54	-4.12
5350	57.42	PK	47	1.3	H	3.33	60.75	74	-13.25
5350	42.46	Ave.	47	1.3	H	3.33	45.79	54	-8.21
5350	56.16	PK	156	1.5	V	3.33	59.49	74	-14.51
5350	41.01	Ave.	156	1.5	V	3.33	44.34	54	-9.66
5460	59.19	PK	278	2.3	H	3.31	62.50	74	-11.50
5460	44.74	Ave.	278	2.3	H	3.31	48.05	54	-5.95
5460	58.43	PK	200	1.7	V	3.31	61.74	74	-12.26
5460	43.87	Ave.	200	1.7	V	3.31	47.18	54	-6.82
10420	42.10	PK	70	2.4	H	14.48	56.58	68.2	-11.62
10420	40.84	PK	70	2.4	V	14.48	55.32	68.2	-12.88

5725-5850 MHz:

Frequency (MHz)	Receiver		Turn-Table	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part15.407	
	Reading (dBμV)	Detector (PK/QP/AV)	Angle Degree	Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11a									
5745 MHz									
5725	64.46	PK	62	1.1	H	3.97	68.43	122.2	-53.77
5725	63.97	PK	62	1.1	V	3.97	67.94	122.2	-54.26
5720	61.62	PK	243	1.1	H	3.95	65.57	110.8	-45.23
5720	60.67	PK	243	1.1	V	3.95	64.62	110.8	-46.18
5700	77.54	PK	248	1	H	3.89	81.43	105.2	-23.77
5700	76.75	PK	111	2.1	V	3.89	80.64	105.2	-24.56
5650	59.10	PK	50	1.2	H	3.75	62.85	68.2	-5.35
5650	57.62	PK	314	2	V	3.75	61.37	68.2	-6.83
11490	37.58	PK	239	1.7	H	14.77	52.35	74	-21.65
11490	36.85	PK	90	1.3	V	14.77	51.62	74	-22.38
5785 MHz									
11570	37.23	PK	334	1.7	H	14.64	51.87	74	-22.13
11570	36.11	PK	264	1.3	V	14.64	50.75	74	-23.25
5825 MHz									
5850	64.22	PK	105	2.1	H	4.33	68.55	122.2	-53.65
5850	63.66	PK	105	2.1	V	4.33	67.99	122.2	-54.21
5855	63.48	PK	210	1.7	H	4.35	67.83	110.8	-42.97
5855	62.27	PK	210	1.7	V	4.35	66.62	110.8	-44.18
5875	87.39	PK	44	1	H	4.41	91.80	105.2	-13.40
5875	86.53	PK	44	1	V	4.41	90.94	105.2	-14.26
5925	59.90	PK	151	2.2	H	4.55	64.45	68.2	-3.75
5925	58.82	PK	151	2.2	V	4.55	63.37	68.2	-4.83
11650	36.98	PK	131	1.3	H	14.51	51.49	74	-22.51
11650	35.87	PK	131	1.3	V	14.51	50.38	74	-23.62

Frequency (MHz)	Receiver		Turn-Table	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part15.407	
	Reading (dBμV)	Detector (PK/QP/AV)	Angle Degree	Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11n20									
5745 MHz									
5725	67.08	PK	41	1.1	H	3.97	71.05	122.2	-51.15
5725	65.91	PK	41	1.1	V	3.97	69.88	122.2	-52.32
5720	60.40	PK	212	2.1	H	3.95	64.35	110.8	-46.45
5720	59.57	PK	212	2.1	V	3.95	63.52	110.8	-47.28
5700	63.06	PK	204	2.5	H	3.89	66.95	105.2	-38.25
5700	62.19	PK	93	1.2	V	3.89	66.08	105.2	-39.12
5650	59.63	PK	73	1.1	H	3.75	63.38	68.2	-4.82
5650	58.33	PK	298	2.4	V	3.75	62.08	68.2	-6.12
11490	37.06	PK	115	1.9	H	14.77	51.83	74	-22.17
11490	36.40	PK	272	1.1	V	14.77	51.17	74	-22.83
5785 MHz									
11570	37.56	PK	307	1.2	H	14.64	52.20	74	-21.80
11570	36.82	PK	125	1.5	V	14.64	51.46	74	-22.54
5825 MHz									
5850	62.65	PK	82	1.6	H	4.33	66.98	122.2	-55.22
5850	61.60	PK	82	1.6	V	4.33	65.93	122.2	-56.27
5855	62.65	PK	290	1.3	H	4.35	67.00	110.8	-43.80
5855	62.24	PK	290	1.3	V	4.35	66.59	110.8	-44.21
5875	65.01	PK	266	1.4	H	4.41	69.42	105.2	-35.78
5875	64.51	PK	266	1.4	V	4.41	68.92	105.2	-36.28
5925	59.22	PK	317	1.4	H	4.55	63.77	68.2	-4.43
5925	58.46	PK	317	1.4	V	4.55	63.01	68.2	-5.19
11650	35.96	PK	360	2.4	H	14.51	50.47	74	-23.53
11650	34.87	PK	360	2.4	V	14.51	49.38	74	-24.62

Frequency (MHz)	Receiver		Turn-Table	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part15.407	
	Reading (dBμV)	Detector (PK/QP/AV)	Angle Degree	Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11n40									
5755 MHz									
5725	76.67	PK	36	2.3	H	3.97	80.64	122.2	-41.56
5725	75.88	PK	36	2.3	V	3.97	79.85	122.2	-42.35
5720	70.94	PK	330	1.1	H	3.95	74.89	110.8	-35.91
5720	70.00	PK	330	1.1	V	3.95	73.95	110.8	-36.85
5700	60.37	PK	158	1.2	H	3.89	64.26	105.2	-40.94
5700	59.16	PK	262	2	V	3.89	63.05	105.2	-42.15
5650	59.23	PK	116	2.5	H	3.75	62.98	68.2	-5.22
5650	58.08	PK	245	1.4	V	3.75	61.83	68.2	-6.37
11510	36.66	PK	325	1.6	H	14.75	51.41	74	-22.59
11510	35.64	PK	80	1.8	V	14.75	50.39	74	-23.61
5795 MHz									
5850	64.30	PK	275	1.8	H	4.33	68.63	122.2	-53.57
5850	63.61	PK	275	1.8	V	4.33	67.94	122.2	-54.26
5855	62.16	PK	87	1.1	H	4.35	66.51	110.8	-44.29
5855	60.49	PK	87	1.1	V	4.35	64.84	110.8	-45.96
5875	70.37	PK	37	1.1	H	4.41	74.78	105.2	-30.42
5875	67.52	PK	37	1.1	V	4.41	71.93	105.2	-33.27
5925	59.78	PK	254	1	H	4.55	64.33	68.2	-3.87
5925	59.39	PK	254	1	V	4.55	63.94	68.2	-4.26
11590	37.53	PK	90	1.1	H	14.60	52.13	74	-21.87
11590	36.83	PK	90	1.1	V	14.60	51.43	74	-22.57

Frequency (MHz)	Receiver		Turn-Table	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part15.407	
	Reading (dBμV)	Detector (PK/QP/AV)	Angle Degree	Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11ac20									
5745 MHz									
5725	68.25	PK	241	1.5	H	3.97	72.22	122.2	-49.98
5725	67.90	PK	241	1.5	V	3.97	71.87	122.2	-50.33
5720	60.45	PK	65	2	H	3.95	64.40	110.8	-46.40
5720	59.59	PK	65	2	V	3.95	63.54	110.8	-47.26
5700	67.99	PK	235	1.6	H	3.89	71.88	105.2	-33.32
5700	66.13	PK	40	2.3	V	3.89	70.02	105.2	-35.18
5650	59.79	PK	80	2.4	H	3.75	63.54	68.2	-4.66
5650	59.16	PK	43	1	V	3.75	62.91	68.2	-5.29
11490	37.59	PK	320	1.4	H	14.77	52.36	74	-21.64
11490	36.40	PK	172	1.6	V	14.77	51.17	74	-22.83
5785 MHz									
11570	37.60	PK	125	1.5	H	14.64	52.24	74	-21.76
11570	36.67	PK	194	2.2	V	14.64	51.31	74	-22.69
5825 MHz									
5850	62.34	PK	348	1.1	H	4.33	66.67	122.2	-55.53
5850	61.58	PK	348	1.1	V	4.33	65.91	122.2	-56.29
5855	64.55	PK	36	1.2	H	4.35	68.90	110.8	-41.90
5855	64.27	PK	36	1.2	V	4.35	68.62	110.8	-42.18
5875	76.83	PK	196	1.5	H	4.41	81.24	105.2	-23.96
5875	76.22	PK	196	1.5	V	4.41	80.63	105.2	-24.57
5925	59.36	PK	45	1.2	H	4.55	63.91	68.2	-4.29
5925	58.22	PK	45	1.2	V	4.55	62.77	68.2	-5.43
11650	36.95	PK	221	1.5	H	14.51	51.46	74	-22.54
11650	35.62	PK	221	1.5	V	14.51	50.13	74	-23.87

Frequency (MHz)	Receiver		Turn-Table	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part15.407	
	Reading (dBμV)	Detector (PK/QP/AV)	Angle Degree	Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11ac40									
5755 MHz									
5725	68.51	PK	51	2.2	H	3.97	72.48	122.2	-49.72
5725	67.40	PK	51	2.2	V	3.97	71.37	122.2	-50.83
5720	67.66	PK	24	1.6	H	3.95	71.61	110.8	-39.19
5720	65.59	PK	24	1.6	V	3.95	69.54	110.8	-41.26
5700	62.25	PK	184	1.3	H	3.89	66.14	105.2	-39.06
5700	60.54	PK	176	2.4	V	3.89	64.43	105.2	-40.77
5650	59.12	PK	265	1.8	H	3.75	62.87	68.2	-5.33
5650	58.18	PK	19	1.8	V	3.75	61.93	68.2	-6.27
11510	36.51	PK	99	1.1	H	14.75	51.26	74	-22.74
11510	35.33	PK	35	2.5	V	14.75	50.08	74	-23.92
5795 MHz									
5850	71.33	PK	311	1.8	H	4.33	75.66	122.2	-46.54
5850	70.59	PK	311	1.8	V	4.33	74.92	122.2	-47.28
5855	64.39	PK	260	1.6	H	4.35	68.74	110.8	-42.06
5855	63.17	PK	260	1.6	V	4.35	67.52	110.8	-43.28
5875	65.55	PK	162	2.1	H	4.41	69.96	105.2	-35.24
5875	63.61	PK	162	2.1	V	4.41	68.02	105.2	-37.18
5925	59.67	PK	241	1.9	H	4.55	64.22	68.2	-3.98
5925	58.54	PK	241	1.9	V	4.55	63.09	68.2	-5.11
11590	37.16	PK	184	1.1	H	14.60	51.76	74	-22.24
11590	35.94	PK	184	1.1	V	14.60	50.54	74	-23.46

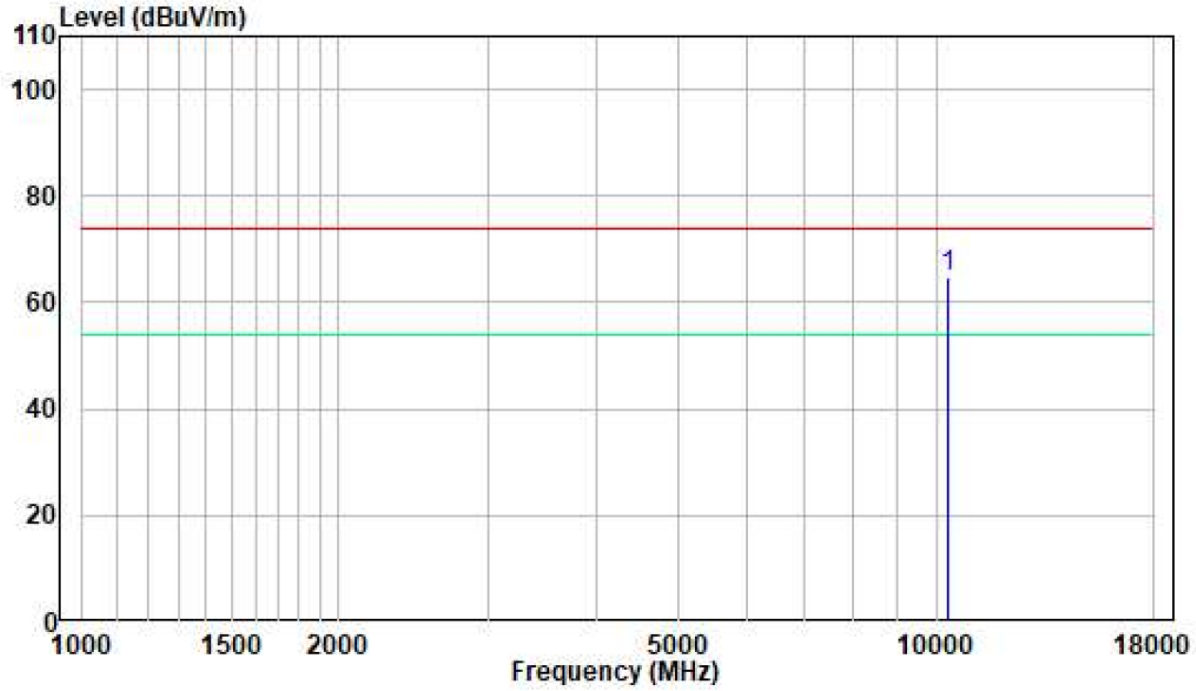
Frequency (MHz)	Receiver		Turn-Table	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part15.407	
	Reading (dBμV)	Detector (PK/QP/AV)	Angle Degree	Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11ac80									
5775 MHz									
5725	76.66	PK	107	2.4	H	3.97	80.63	122.2	-41.57
5725	75.60	PK	107	2.4	V	3.97	79.57	122.2	-42.63
5720	66.73	PK	203	1	H	3.95	70.68	110.8	-40.12
5720	64.69	PK	203	1	V	3.95	68.64	110.8	-42.16
5700	72.19	PK	77	2.4	H	3.89	76.08	105.2	-29.12
5700	71.06	PK	294	2.3	V	3.89	74.95	105.2	-30.25
5650	59.69	PK	355	1.5	H	3.75	63.44	68.2	-4.76
5650	58.12	PK	252	2.2	V	3.75	61.87	68.2	-6.33
5850	64.61	PK	336	1.8	H	4.33	68.94	122.2	-53.26
5850	63.69	PK	336	1.8	V	4.33	68.02	122.2	-54.18
5855	65.51	PK	1	1.9	H	4.35	69.86	110.8	-40.94
5855	65.19	PK	1	1.9	V	4.35	69.54	110.8	-41.26
5875	61.49	PK	115	1.7	H	4.41	65.90	105.2	-39.30
5875	60.51	PK	115	1.7	V	4.41	64.92	105.2	-40.28
5925	59.56	PK	179	1.7	H	4.55	64.11	68.2	-4.09
5925	58.37	PK	179	1.7	V	4.55	62.92	68.2	-5.28
11550	35.78	PK	240	2	H	14.60	50.38	74	-23.62
11550	34.29	PK	240	2	V	14.60	48.89	74	-25.11

Note:
Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin = Corrected. Amplitude - Limit
The other spurious emission which is in the noise floor level was not recorded.
The test result of peak was less than the limit of average, so just peak values were recorded.

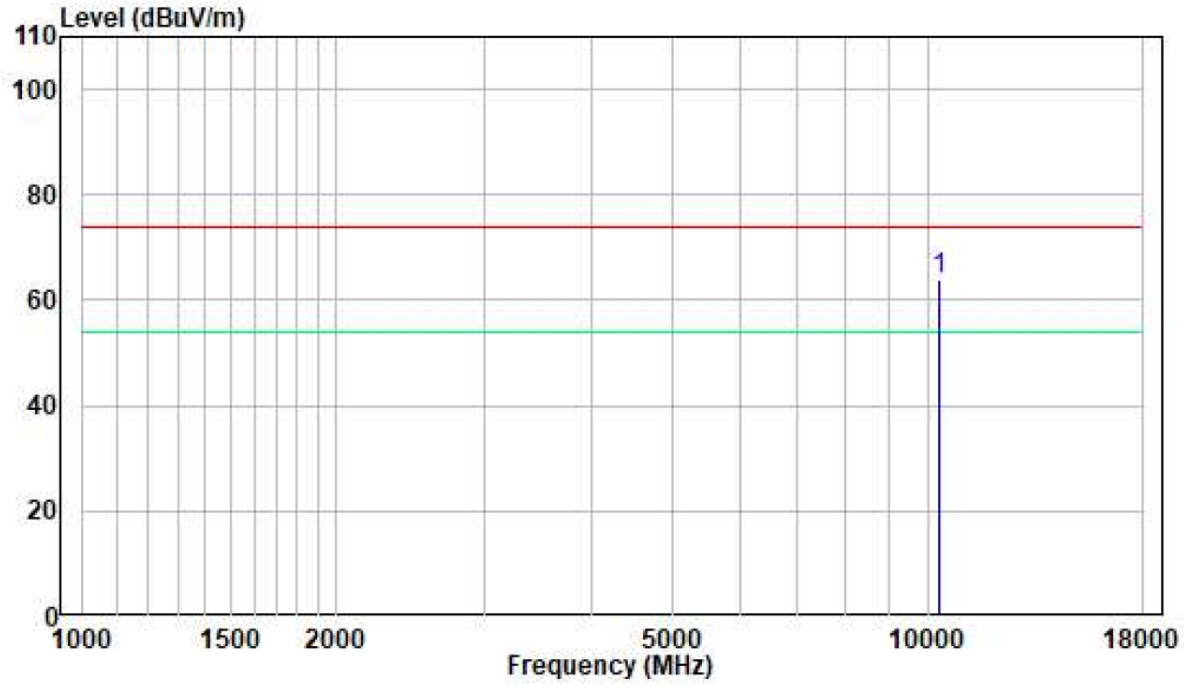
1 GHz - 18 GHz: (Pre-Scan plots)

802.11 ac20, 5180MHz

Horizontal



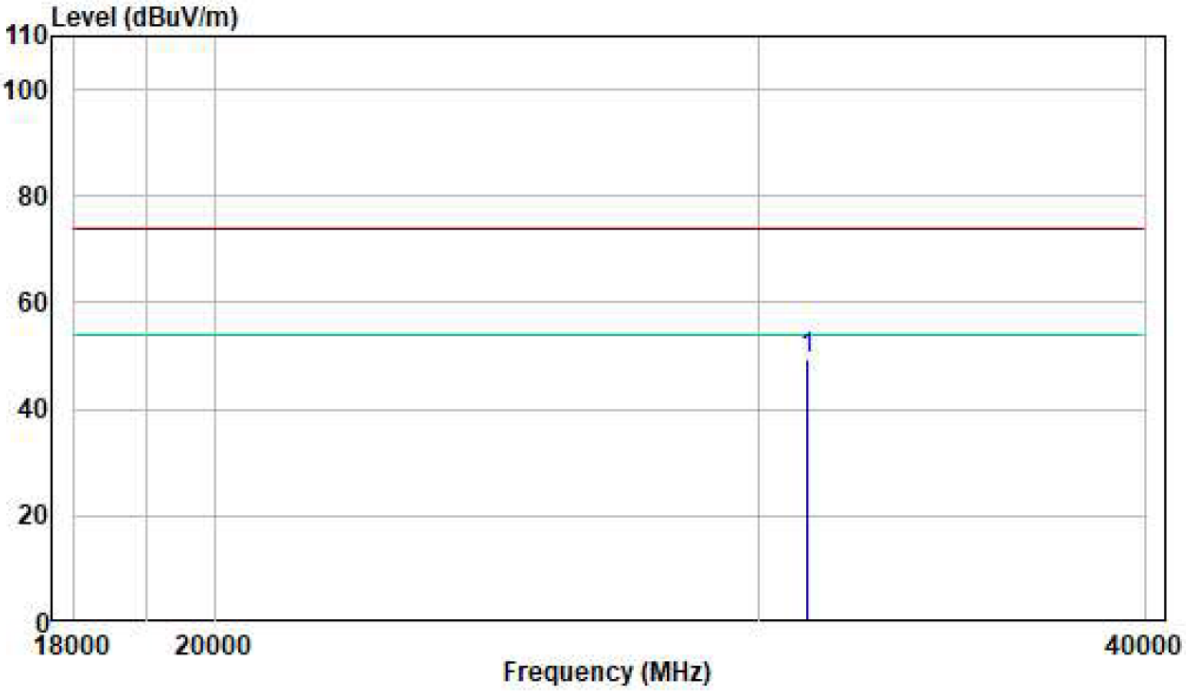
Vertical



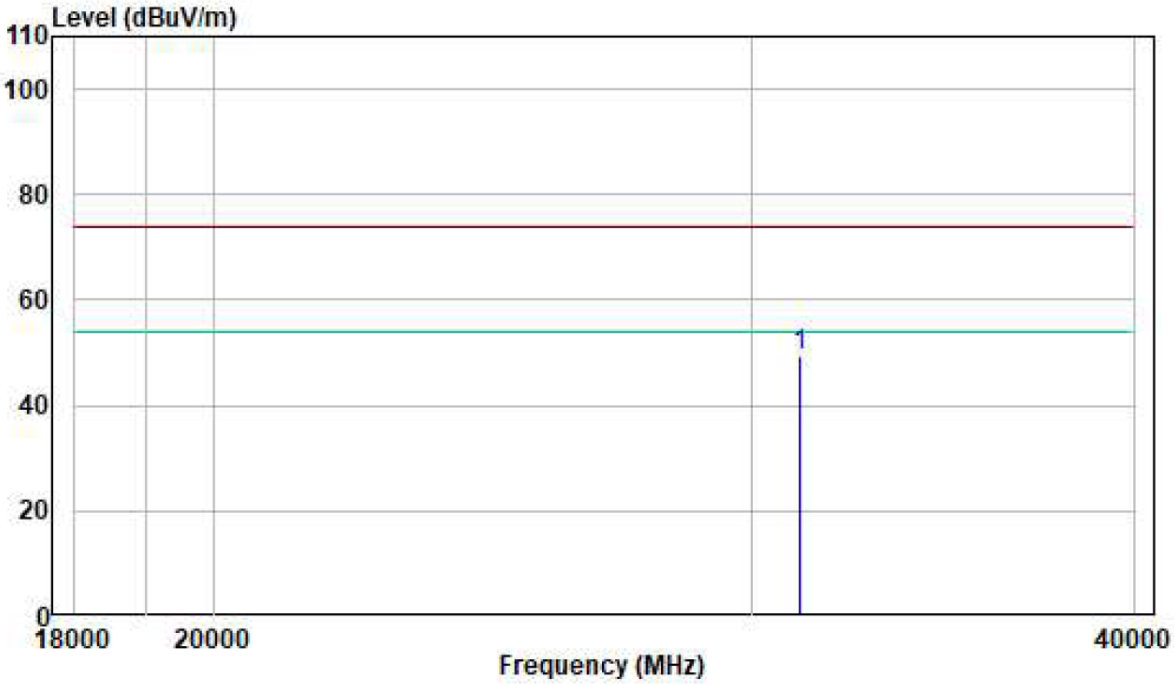
18-40GHz: (Pre-Scan plots)

802.11 ac20, 5180MHz

Horizontal



Vertical



FCC §15.407(a),(e) – 26 dB & 6dB 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.

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

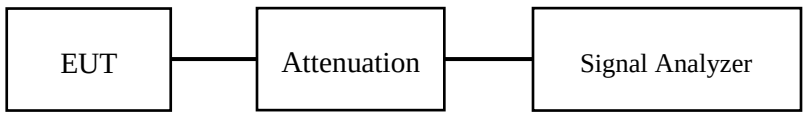
Test Procedure

1. Emission Bandwidth (EBW)

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

2. **Minimum Emission Bandwidth for the band 5.725-5.85 GHz**

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.725-5.85 GHz. The following procedure shall be used for measuring this bandwidth:
a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3 × RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.



Test Data

Environmental Conditions

Temperature:	27 ℃
Relative Humidity:	57 %
ATM Pressure:	101.0 kPa

The testing was performed by Paul liu from 2021-10-26 to 2021-11-11.

EUT operation mode: Transmitting

Test Result: Pass

Please refer to the Appendix.

FCC §15.407(a) – 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.

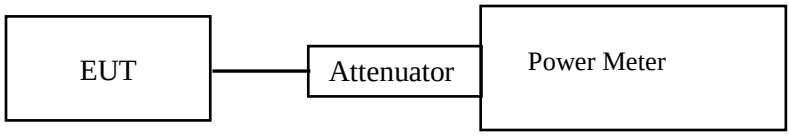
For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum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

Test Procedure

c. Place the EUT on a bench and set it in transmitting mode.

d. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to one test equipment.

e. Add a correction factor to the display.



Test Data

Environmental Conditions

Temperature:	27 ℃
Relative Humidity:	57 %
ATM Pressure:	101.0 kPa

The testing was performed by Paul liu on 2021-10-26.

EUT operation mode: Transmitting

Test Result: Pass

Please refer to the Appendix.

FCC §15.407(a) - POWER SPECTRAL DENSITY

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.

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

Test Procedure

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:	27 ℃
Relative Humidity:	57 %
ATM Pressure:	101.0 kPa

The testing was performed by Paul liu from 2021-10-26.

EUT operation mode: Transmitting

Test Result: Pass

Please refer to the Appendix.

APPENDIX

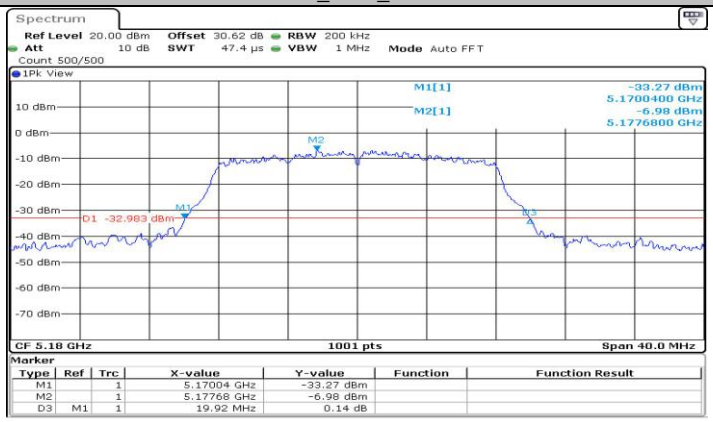
Appendix A1: Emission Bandwidth

Test Result

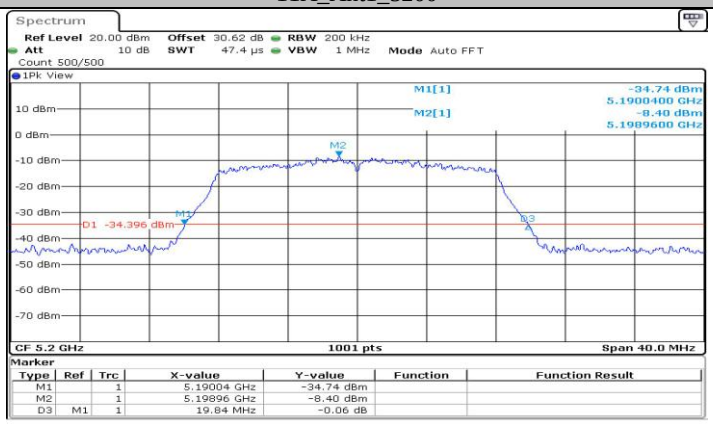
Test Mode	Antenna	Channel	26db EBW [MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	19.920	---	PASS
		5200	19.840	---	PASS
		5240	19.640	---	PASS
11N20SISO	Ant1	5180	20.120	---	PASS
		5200	20.240	---	PASS
		5240	20.200	---	PASS
11N40SISO	Ant1	5190	41.920	---	PASS
		5230	40.960	---	PASS
11AC20SISO	Ant1	5180	20.280	---	PASS
		5200	20.400	---	PASS
		5240	21.840	---	PASS
11AC40SISO	Ant1	5190	40.800	---	PASS
		5230	40.880	---	PASS
11AC80SISO	Ant1	5210	83.680	---	PASS

Test Graphs

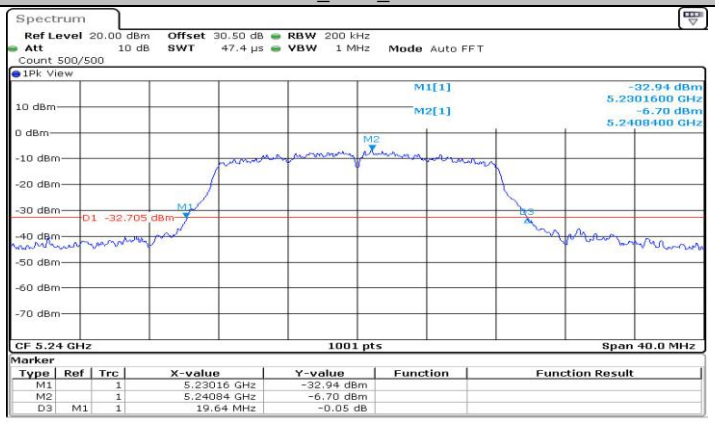
11A_Ant1_5180



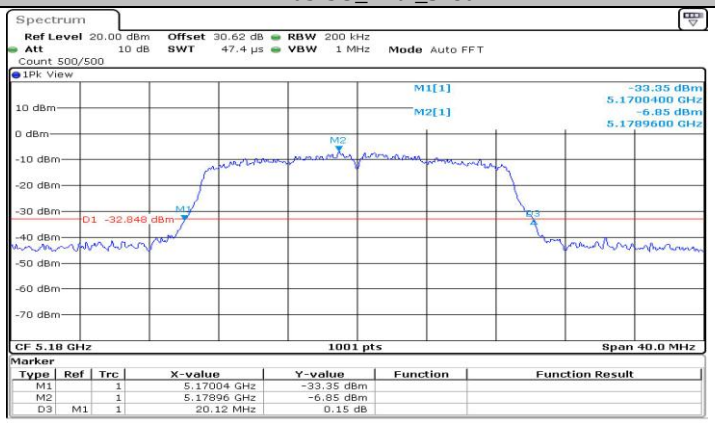
11A_Ant1_5200



11A_Ant1_5240



11N20SISO_Ant1_5180



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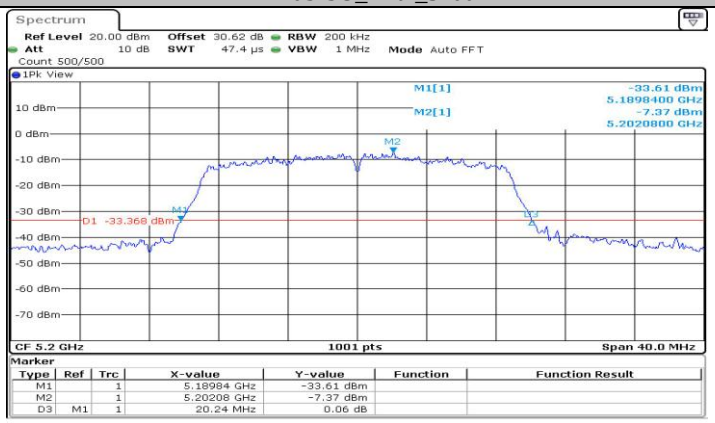
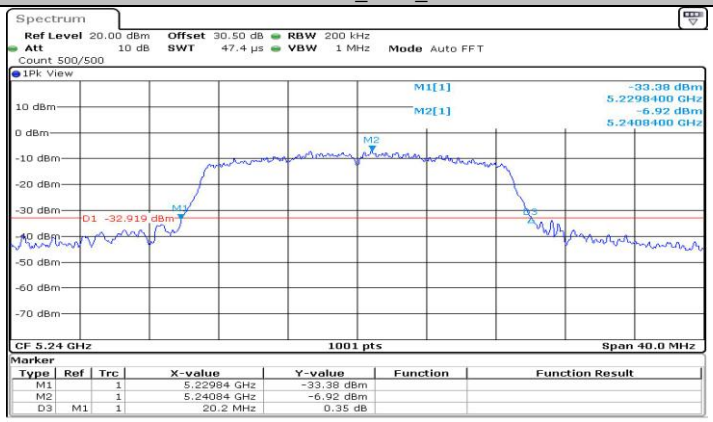
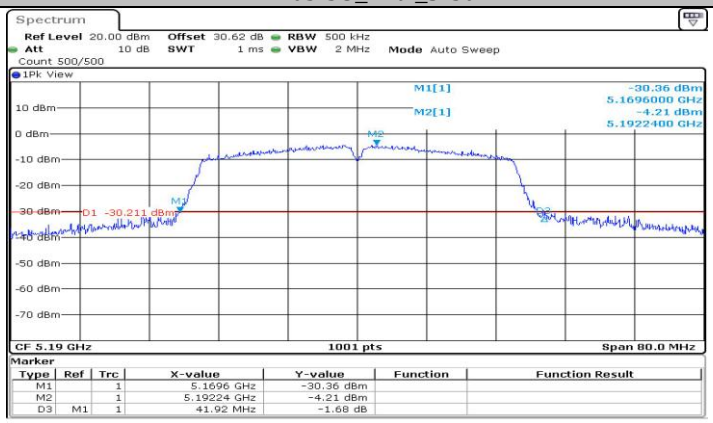


11N20SISO_Ant1_5240



11N40SISO_Ant1_5190



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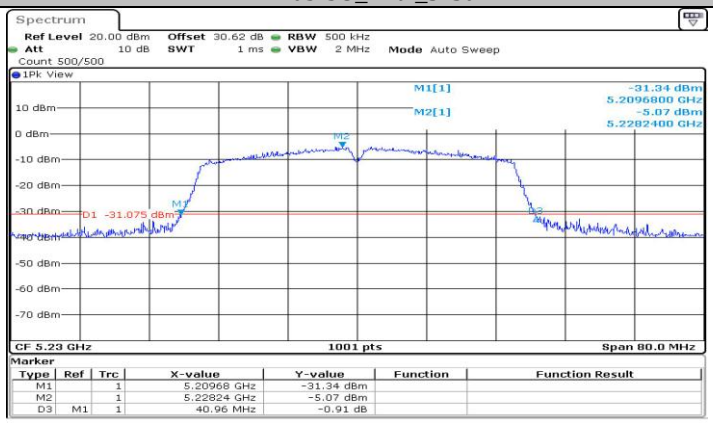
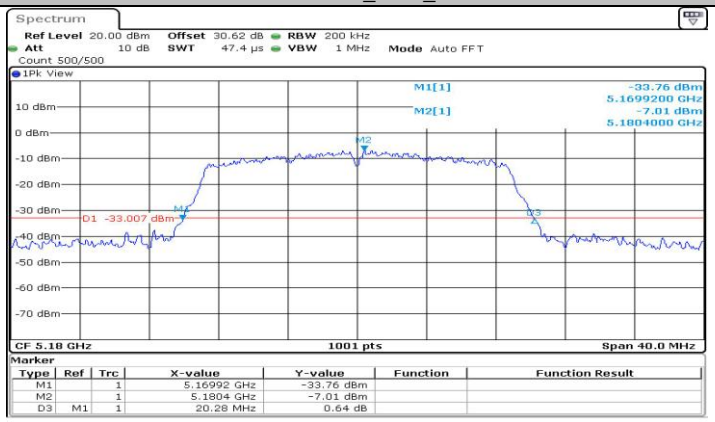


11AC20SISO_Ant1_5180



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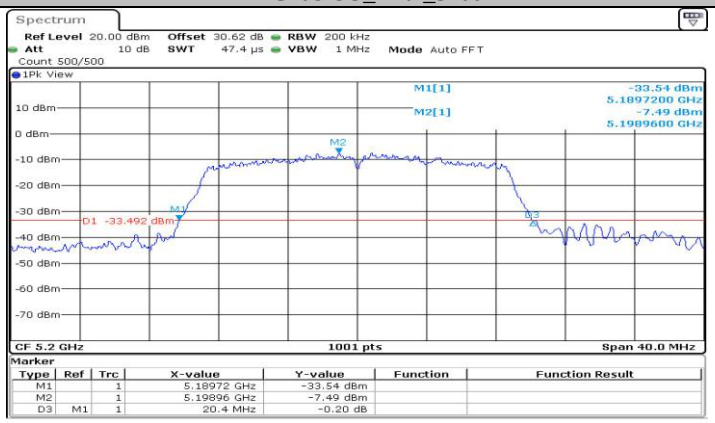

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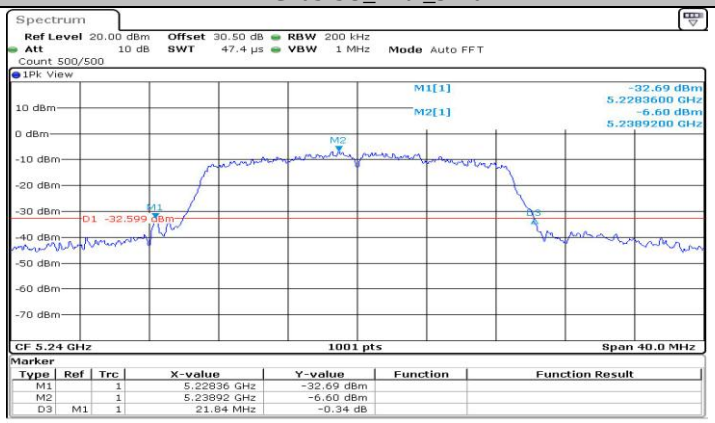
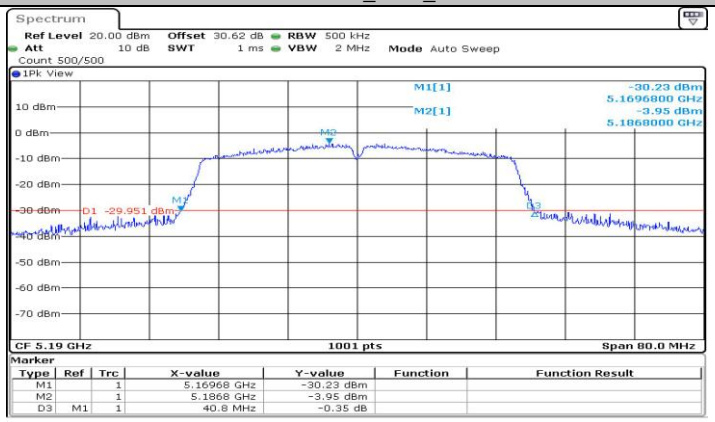
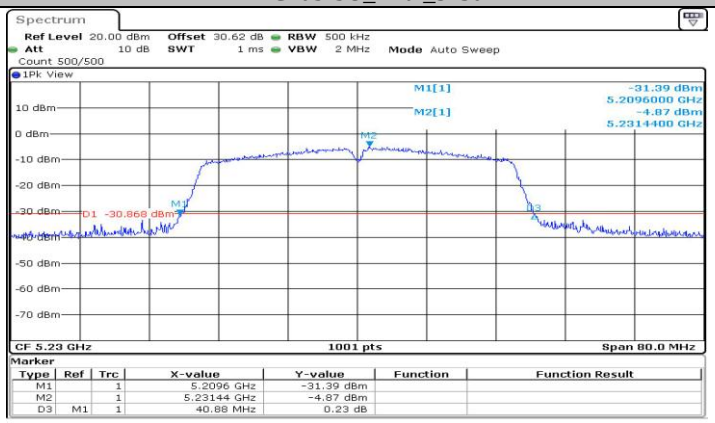


11AC40SISO_Ant1_5190



11AC40SISO_Ant1_5230



11AC80SISO_Ant1_5210