

FCC PART 15.247

TEST REPORT

For

IMachine (Xiamen) Intelligent Devices Co.,Ltd.

Unit 1502-2, No.3 Jinzhong Road, Huli District, Xiamen, China

FCC ID: 2AUA5-IMACHINE-A1

Report Type: Original Report	Product Type: ALL IN ONE
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Simon Wang <i>Simon wang</i>	
Reviewed By: 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	

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	ALL IN ONE
Tested Model	A1
Multiple Model	B1, C1, D1, E1, F1, G1, H1, I1, J1
Frequency Range	Bluetooth LE: 2402~2480MHz Wi-Fi: 2412~2462MHz
Conducted Peak Power	Bluetooth LE: 1.69dBm Wi-Fi: 17.11dBm
Modulation Technique	Bluetooth LE: GFSK Wi-Fi: DSSS, OFDM
Antenna Specification	Internal Antenna Bluetooth/Wi-Fi: 3dBi@2.4GHz
Voltage Range	DC 24V from adapter
Date of Test	2019-10-15 to 2020-03-19
Sample serial number	RXM190926050-RF-S1(Assigned by BACL, Shenzhen)
Received date	2019-09-16
Sample/EUT Status	Good condition
Adapter information	Model: DJ-240250-SA Input: AC 100-240V, 50/60Hz, 0.15A Output: DC 24V, 2.5A

Notes: This series products model: B1, C1, D1, E1, F1, G1, H1, I1, J1 and A1 are electrically identical. Model A1 was selected for fully testing, the detailed information can be referred to the product similarity declaration letter.

Objective

This report is prepared on behalf of *IMachine (Xiamen) Intelligent Devices Co.,Ltd.* in accordance with Part 2-Subpart J, Part 15-Subparts A and C of the Federal Communication Commission's rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

Related Submittal(s)/Grant(s)

FCC Part 15.247 DSS and Part 15B JBC submissions with FCC ID: 2AUA5-IMACHINE-A1.

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 KDB 558074 D01 15.247 Meas Guidance v05r02.

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		±0.73dB
RF conducted test with spectrum		±1.6dB
AC Power Lines Conducted Emissions		±1.95dB
Emissions, Radiated	Below 1GHz	±4.75dB
	Above 1GHz	±4.88dB
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 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

For 802.11b, 802.11g and 802.11n-HT20 mode, 11 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	8	2447
2	2417	9	2452
3	2422	10	2457
4	2427	11	2462
5	2432	/	/
6	2437	/	/
7	2442	/	/

For 802.11b, 802.11g, 802.11n-HT20 mode, EUT was tested with Channel 1, 6 and 11

For 802.11n-HT40 mode, 7 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2422	6	2447
2	2427	7	2452
3	2432	/	/
4	2437	/	/
5	2442	/	/

EUT was tested with Channel 1, 4 and 7.

For BLE mode, 40 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	20	2442
1	2404	21	2444
2	2406	22	2446
3	2408	23	2448
4	2410	24	2450
5	2412	25	2452
6	2414	26	2454
7	2416	27	2456
8	2418	28	2458
9	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
19	2440	39	2480

EUT was tested with Channel 0, 19 and 39.

Equipment Modifications

No modification was made to the EUT tested.

EUT Exercise Software

“DRTU” exercise software was used.

The device was tested with the worst case was performed as below:

Mode	Data rate	Power level		
		Low channel	Middle channel	High channel
802.11b	1 Mbps	11.5	11.5	11.5
802.11g	6 Mbps	8.5	8.5	8.5
802.11n-HT20	MCS0	9	9	9
802.11n-HT40	MCS0	6	6	6
BLE	1 Mbps	Default	Default	Default

Pre-scan with all the data rates, the above data rate is the worst case for Wi-Fi test.

Support Equipment List and Details

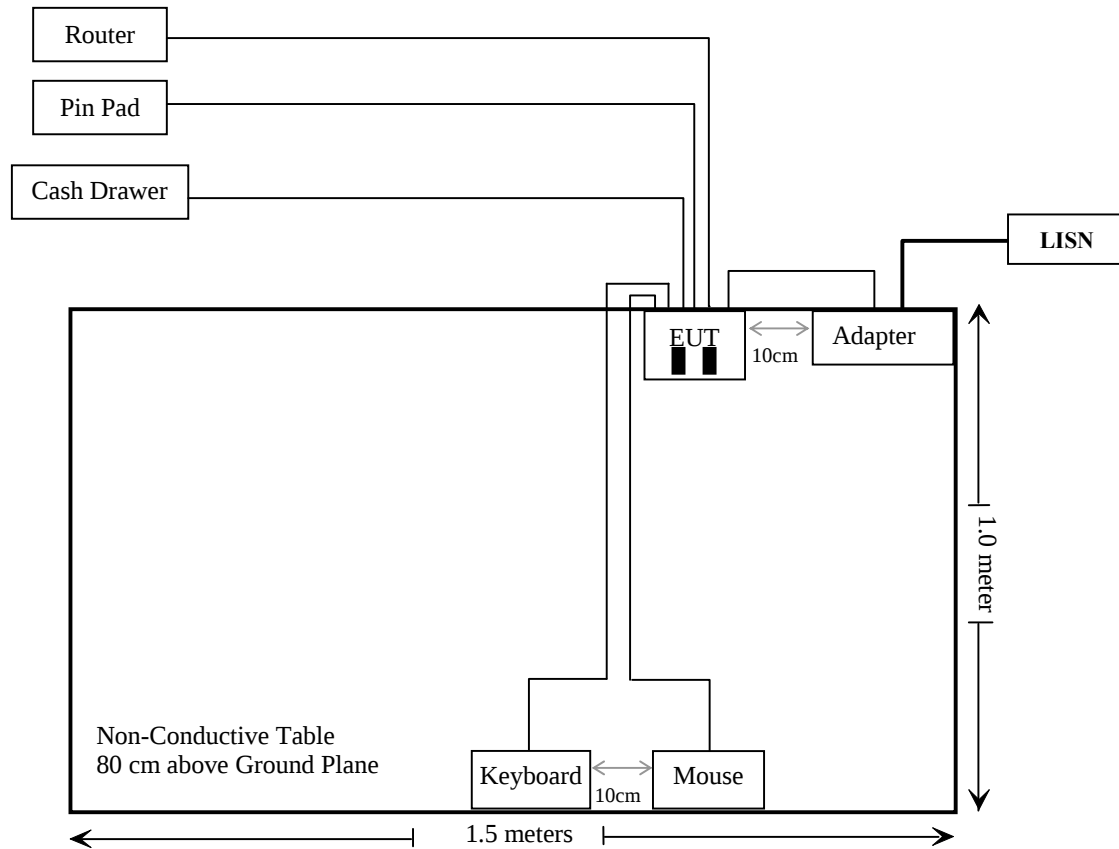
Manufacturer	Description	Model	Serial Number
Microsoft	Keyboard	1406	0200706128743
DELL	Mouse	MOC5UO	G1900NKD
TECLAST	U-disk	Unkown	Unkown
ADATA	U-disk	Unkown	Unkown
SAGEM	Router	SAGEM F@ST TM 2604 White	Unkown
MAKEN	Cash Drawer	MT-350T	Unkown
YD	PIN Pad	YD511DA-RJ	Unkown

External I/O Cable

Cable Description	Length (m)	From/Port	To
Un-Shielding Detachable USB Cable	1.5	EUT	Mouse
Shielding Detachable K/B Cable With Magnet Ring	1.5	EUT	Keyboard
Un-Shielding Detachable AC Cable	1.2	LISN	Adapter
Un-Shielding Detachable DC Cable	1.2	EUT	Adapter
Un-Shielding Detachable RJ45 Cable	10	EUT	Router
Un-Shielding Detachable RJ11 Cable	10	EUT	Cash Drawer
Un-Shielding Detachable RJ9 to RS232 Cable	10	EUT	PIN Pad

Block Diagram of Test Setup

For conducted emission:



Note: ■ mark U-disk

SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §2.1091	Maximum Permissible Exposure(MPE)	Compliance
§15.203	Antenna Requirement	Compliance
§15.207 (a)	AC Line Conducted Emissions	Compliance
§15.205, §15.209, §15.247(d)	Spurious Emissions	Compliance
§15.247 (a)(2)	6 dB Emission Bandwidth	Compliance*
§15.247(b)(3)	Maximum Conducted Output Power	Compliance*
§15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliance*
§15.247(e)	Power Spectral Density	Compliance*

Compliance*: The EUT's Wifi module is identical with the product which the Model named iMachine P1 and FCC ID is 2AUA5-P1. So these test items please referred to FCC ID: 2AUA5-P1 that has been certified on 2019-12-04, report No.: RXM190916056-00C, which was tested by Bay Area Compliance Laboratories Corp. (Shenzhen).

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
AC Line Conducted Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2019/7/9	2020/7/8
Rohde & Schwarz	LISN	ENV216	101613	2019/1/25	2020/1/24
Rohde & Schwarz	Transient Limitor	ESH3Z2	DE25985	2018/11/29	2019/11/29
/	CE Cable	CE Cable	UF A210B-1-0720-504504	2018/11/29	2019/11/29
Rohde & Schwarz	CE Test software	EMC 32	V8.53.0	NCR	NCR
Radiated Emission Test					
R&S	EMI Test Receiver	ESR3	102455	2019/7/9	2020/7/8
Sonoma instrument	Pre-amplifier	310 N	186238	2019/4/20	2020/4/20
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2017/12/22	2020/12/21
/	Cable 2	RF Cable 2	/	2019/11/29	2020/11/28
/	Cable	Chamber Cable 1	/	2019/11/29	2020/11/28
/	Cable	Chamber Cable 4	EC-007	2019/11/29	2020/11/28
Rohde & Schwarz	Auto test software	EMC 32	V9.10	NCR	NCR
Rohde & Schwarz	Spectrum Analyzer	FSV40-N	102259	2019/7/22	2020/07/21
COM-POWER	Pre-amplifier	PA-122	181919	2018/11/29	2019/11/29
COM-POWER	Amplifier	QLW-18405536-J0	15964001002	2018/11/29	2019/11/29
Sunol Sciences	Horn Antenna	DRH-118	A052604	2017/12/22	2020/12/21
the electro-Mechanics Co	Horn Antenna	3116	9510-2270	2019/10/13	2022/10/12
Insulted Wire Inc.	RF Cable	SPS-2503-3150	02222010	2018/11/29	2019/11/29
/	RF Cable	W1101-EQ1 OUT	/	2018/11/29	2019/11/29
/	Signal Cable	RG-214	2	2018/11/29	2019/11/29
SNSD	Band Reject filter	BSF2402-2480MN-0898-001	2.4G filter	2019/4/20	2020/4/20

* **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) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.247 (i) and subpart 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure

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

f = frequency in MHz

* = Plane-wave equivalent power density

Result

Calculated Formulary:

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

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

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

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

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

Frequency (MHz)	Antenna Gain		Max Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
	(dBi)	(numeric)	(dBm)	(mW)			
2412-2462(Wifi)	3.0	2.0	17.5	56.23	20	0.0224	1.0
2402-2480(BLE)	3.0	2.0	2.0	1.58	20	0.0006	1.0

Note: Bluetooth and Wifi can not transmitting simultaneously.

To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 20cm from nearby persons.

Result: compliance.

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 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT has an internal antenna arrangement, which was permanently attached and the antenna gain is 3 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

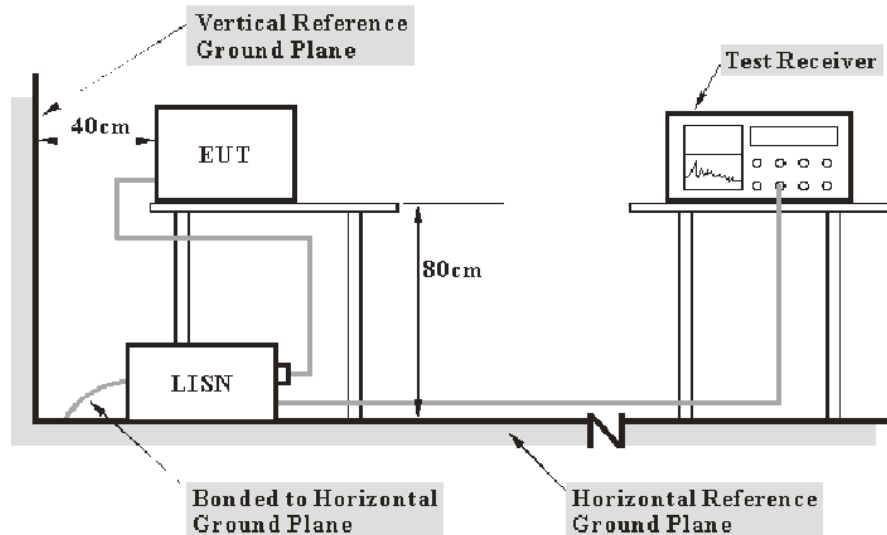
Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207

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 outlet of the LISN.

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

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

Corrected Factor & Margin Calculation

The Corrected factor is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

$$\text{Correction Factor} = \text{LISN VDF} + \text{Cable Loss} + \text{Transient Limiter Attenuation}$$

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

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

Test Results Summary

According to the EUT complied with the FCC Part 15.207,

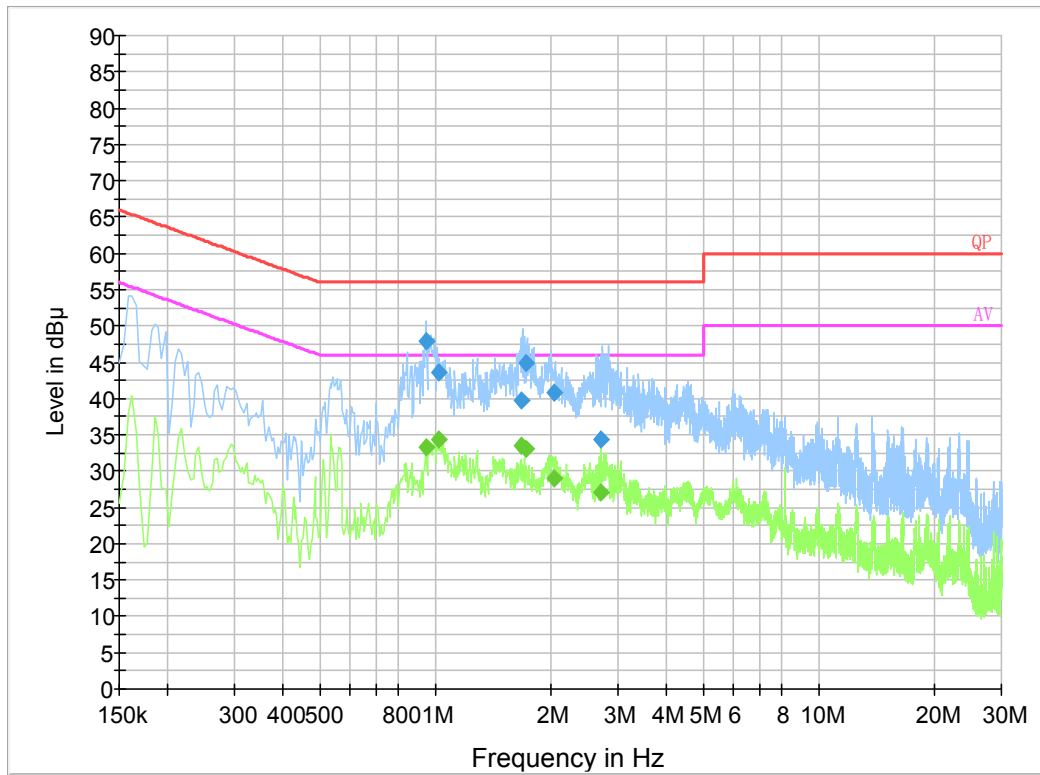
Test Data

Environmental Conditions

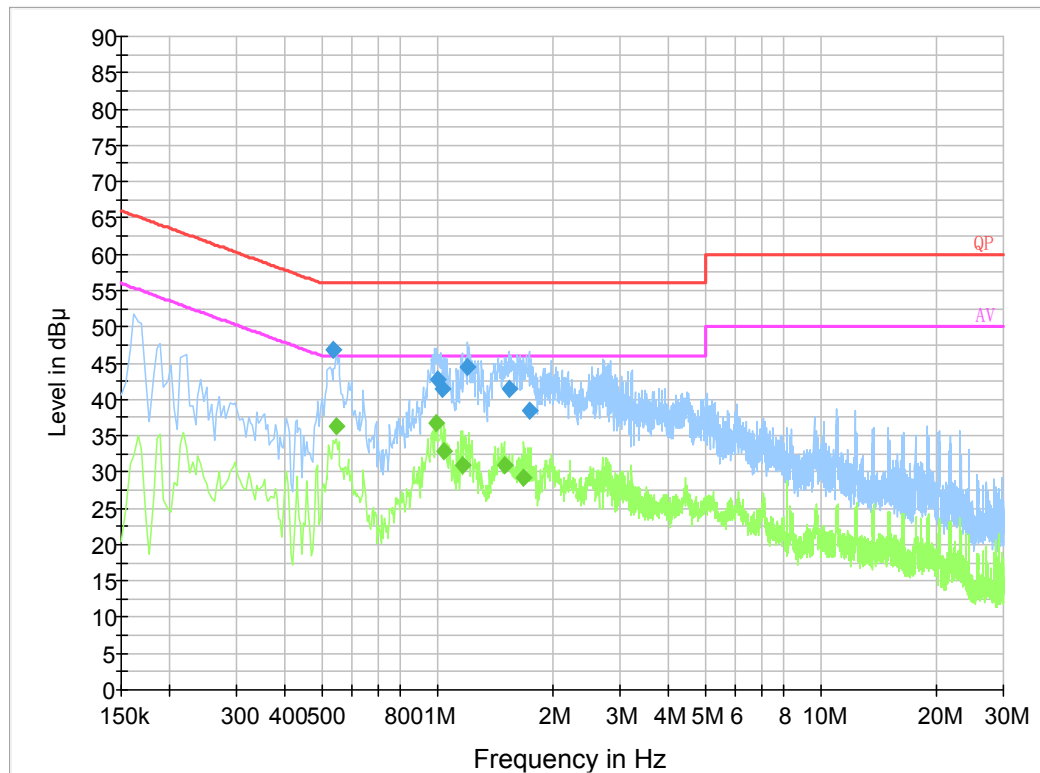
Temperature:	25 °C
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Kiki Geng on 2019-10-15.

EUT operation mode: Transmitting (the worst case)

Wi-Fi Mode:**AC 120 V/60 Hz, Line:**

Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/Ave./QP)
0.947810	47.9	19.8	56.0	8.1	QP
1.018790	43.6	19.9	56.0	12.4	QP
1.672650	39.8	19.9	56.0	16.2	QP
1.723930	44.8	19.9	56.0	11.2	QP
2.035790	40.8	19.9	56.0	15.2	QP
2.708870	34.3	19.9	56.0	21.7	QP
0.947810	33.3	19.8	46.0	12.7	Ave.
1.018790	34.5	19.9	46.0	11.5	Ave.
1.672650	33.5	19.9	46.0	12.5	Ave.
1.723930	33.1	19.9	46.0	12.9	Ave.
2.035790	29.0	19.9	46.0	17.0	Ave.
2.708870	27.1	19.9	46.0	18.9	Ave.

AC 120V/ 60 Hz, Neutral:

Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/Ave./QP)
0.537810	46.8	19.8	56.0	9.2	QP
0.999030	42.9	19.8	56.0	13.1	QP
1.030670	41.4	19.8	56.0	14.6	QP
1.203970	44.4	19.8	56.0	11.6	QP
1.546930	41.4	19.8	56.0	14.6	QP
1.739930	38.5	19.8	56.0	17.5	QP
0.546000	36.3	19.8	46.0	9.7	Ave.
0.998000	36.8	19.8	46.0	9.2	Ave.
1.038000	32.8	19.8	46.0	13.2	Ave.
1.162000	31.0	19.8	46.0	15.0	Ave.
1.494000	30.9	19.8	46.0	15.1	Ave.
1.686000	29.2	19.8	46.0	16.8	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

FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS**Applicable Standard**

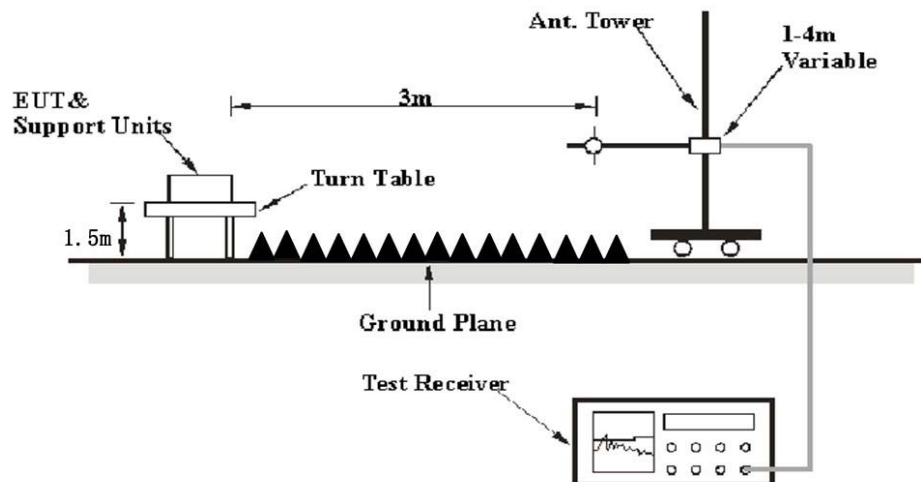
FCC §15.247 (d); §15.209; §15.205;

EUT Setup

Below 1 GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.247 limits.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 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	1MHz	3 MHz	/	PK
	1MHz	10 Hz ^{Note 1}	/	PK
	1MHz	> 1/T ^{Note 2}	/	PK

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

Note 2: when duty cycle is less than 98%

Test Procedure

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

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

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:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

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:

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

Test Results Summary

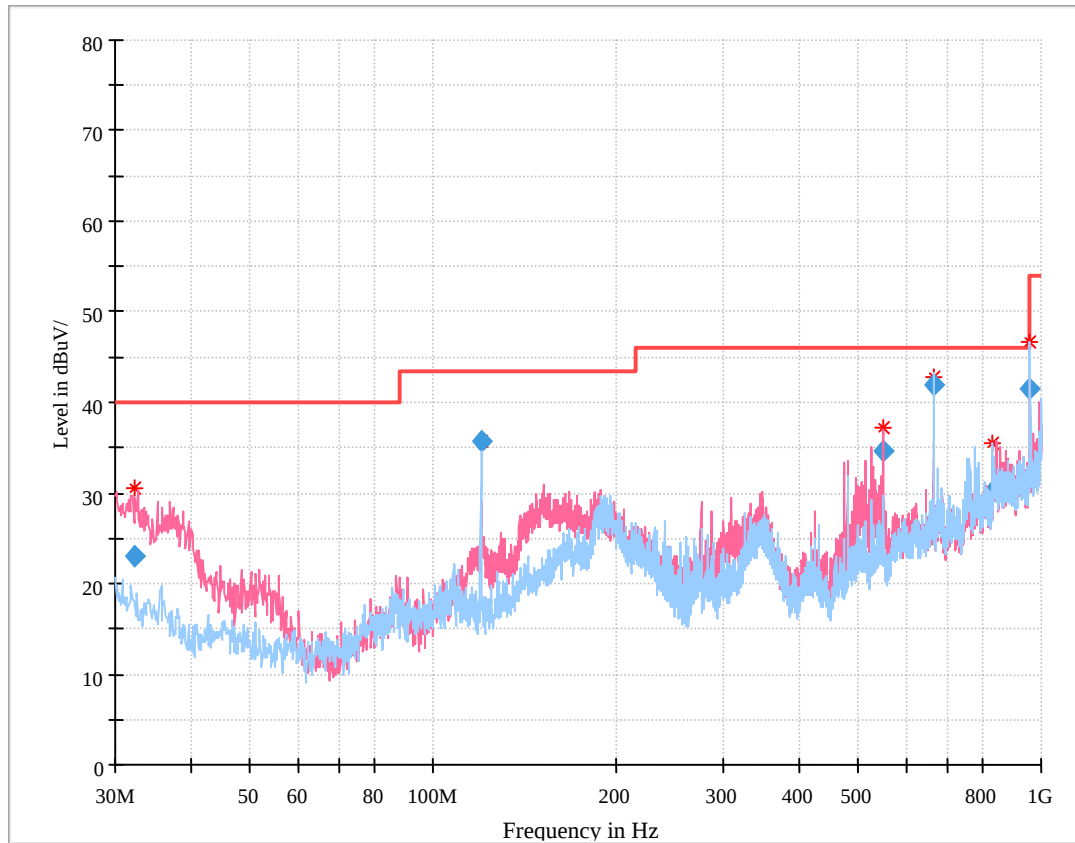
According to the EUT complied with the FCC Title 47, Part 15, Subpart C, section 15.205, 15.209 and 15.247.

Test Data**Environmental Conditions**

Temperature:	23 °C
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

The testing was performed by Zero Yan on 2020-03-19 for below 1G and Curry Xiang on 2019-10-19 for above 1G.

EUT operation mode: Transmitting(worst case)

Wi-Fi Mode: *(the worst case)***30 MHz~1 GHz:**

Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna height (cm)	Antenna Polarity	Turntable position (degree)	Correction Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
32.404375	22.98	117.0	V	29.0	-9.1	40.00	17.02
120.010750	35.64	285.0	H	168.0	-14.3	43.50	7.86
550.006125	34.54	109.0	V	355.0	-4.1	46.00	11.46
666.721500	41.85	114.0	H	319.0	-1.5	46.00	4.15
832.152125	30.20	253.0	H	150.0	2.6	46.00	15.80
960.017250	41.46	207.0	H	198.0	5.3	54.00	12.54

1 GHz-25 GHz (Wi-Fi):**For Antenna 1:****802.11b Mode:**

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/QP/Ave.		Height (m)	Polar (H/V)				
Low Channel (2412 MHz)									
2386.01	28.82	PK	231	1.4	H	31.87	60.69	74	13.31
2386.01	17.60	Ave.	79	1.1	H	31.87	49.47	54	4.53
2483.70	28.61	PK	130	1.3	H	32.13	60.74	74	13.26
2483.70	14.52	Ave.	130	1.3	H	32.13	46.65	54	7.35
1578.00	60.03	PK	311	1.6	H	-2.50	57.53	74	16.47
1578.00	34.49	Ave.	311	1.6	H	-2.50	31.99	54	22.01
4824.00	43.14	PK	105	2.1	H	5.40	48.54	74	25.46
4824.00	28.54	Ave.	105	2.1	H	5.40	33.94	54	20.06
Middle Channel (2437MHz)									
4874.00	43.19	PK	217	1.5	H	6.43	49.62	74	24.38
4874.00	28.34	Ave.	217	1.5	H	6.43	34.77	54	19.23
High Channel (2462 MHz)									
2328.12	28.30	PK	207	1.2	H	31.64	59.94	74	14.06
2328.12	14.41	Ave.	207	1.2	H	31.64	46.05	54	7.95
2489.62	28.94	PK	217	2.2	H	32.13	61.07	74	12.93
2489.62	15.67	Ave.	217	2.2	H	32.13	47.80	54	6.20
4924.00	43.88	PK	225	1.9	H	6.43	50.31	74	23.69
4924.00	28.35	Ave.	225	1.9	H	6.43	34.78	54	19.22

802.11g Mode:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/QP/Ave.		Height (m)	Polar (H/V)				
Low Channel (2412 MHz)									
2389.59	34.48	PK	297	2.2	H	31.87	66.35	74	7.65
2389.59	18.98	Ave.	297	2.2	H	31.87	50.85	54	3.15
2490.41	28.34	PK	183	2.1	H	32.13	60.47	74	13.53
2490.41	14.56	Ave.	183	2.1	H	32.13	46.69	54	7.31
4824.00	43.19	PK	13	1.5	H	5.40	48.59	74	25.41
4824.00	28.43	Ave.	13	1.5	H	5.40	33.83	54	20.17
Middle Channel (2437MHz)									
4874.00	43.21	PK	349	1.2	H	6.43	49.64	74	24.36
4874.00	28.39	Ave.	349	1.2	H	6.43	34.82	54	19.18
High Channel (2462 MHz)									
2323.37	29.25	PK	180	1.4	H	31.64	60.89	74	13.11
2323.37	14.93	Ave.	180	1.4	H	31.64	46.57	54	7.43
2486.47	29.88	PK	5	1.5	H	32.13	62.01	74	11.99
2486.47	15.63	Ave.	5	1.5	H	32.13	47.76	54	6.24
4924.00	43.26	PK	252	2.2	H	6.43	49.69	74	24.31
4924.00	28.22	Ave.	252	2.2	H	6.43	34.65	54	19.35

802.11n-HT20 Mode:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/QP/Ave.		Height (m)	Polar (H/V)				
Low Channel (2412 MHz)									
2389.59	35.45	PK	301	1.6	H	31.87	67.32	74	6.68
2389.59	19.12	Ave.	301	1.6	H	31.87	50.99	54	3.01
2485.27	29.40	PK	25	1.2	H	32.13	61.53	74	12.47
2485.27	15.57	Ave.	25	1.2	H	32.13	47.70	54	6.30
4824.00	43.38	PK	115	2.0	H	5.40	48.78	74	25.22
4824.00	28.18	Ave.	115	2.0	H	5.40	33.58	54	20.42
Middle Channel (2437MHz)									
4874.00	43.45	PK	62	1.3	H	6.43	49.88	74	24.12
4874.00	28.62	Ave.	62	1.3	H	6.43	35.05	54	18.95
High Channel (2462 MHz)									
2382.88	28.38	PK	137	2.3	H	31.87	60.25	74	13.75
2382.88	14.51	Ave.	137	2.3	H	31.87	46.38	54	7.62
2488.57	30.36	PK	258	1.3	H	32.13	62.49	74	11.51
2488.57	15.68	Ave.	258	1.3	H	32.13	47.81	54	6.19
4924.00	43.04	PK	350	1.2	H	6.43	49.47	74	24.53
4924.00	28.11	Ave.	350	1.2	H	6.43	34.54	54	19.46

802.11n-HT40 Mode:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/QP/Ave.		Height (m)	Polar (H/V)				
Low Channel (2422 MHz)									
2388.55	33.69	PK	134	1.1	H	31.87	65.56	74	8.44
2388.55	19.03	Ave.	134	1.1	H	31.87	50.90	54	3.10
2484.36	29.13	PK	136	2.2	H	32.13	61.26	74	12.74
2484.36	15.02	Ave.	136	2.2	H	32.13	47.15	54	6.85
4844.00	43.70	PK	78	1.1	H	5.40	49.10	74	24.90
4844.00	29.03	Ave.	78	1.1	H	5.40	34.43	54	19.57
Middle Channel (2437MHz)									
4874.00	43.74	PK	178	1.2	H	6.43	50.17	74	23.83
4874.00	28.89	Ave.	178	1.2	H	6.43	35.32	54	18.68
High Channel (2452 MHz)									
2312.49	28.42	PK	195	2.3	H	31.64	60.06	74	13.94
2312.49	14.66	Ave.	195	2.3	H	31.64	46.30	54	7.70
2485.69	29.32	PK	13	1.0	H	32.13	61.45	74	12.55
2485.69	15.17	Ave.	13	1.0	H	32.13	47.30	54	6.70
4904.00	43.44	PK	91	1.5	H	6.43	49.87	74	24.13
4904.00	28.71	Ave.	91	1.5	H	6.43	35.14	54	18.86

For Antenna 2:**802.11b Mode:**

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/QP/Ave.		Height (m)	Polar (H/V)				
Low Channel (2412 MHz)									
2348.49	28.60	PK	123	1.4	H	31.64	60.24	74	13.76
2348.49	14.79	Ave.	123	1.4	H	31.64	46.43	54	7.57
2487.21	28.87	PK	296	1.8	H	32.13	61.00	74	13.00
2487.21	14.93	Ave.	296	1.8	H	32.13	47.06	54	6.94
4824.00	47.77	PK	110	1.8	H	5.40	53.17	74	20.83
4824.00	40.12	Ave.	110	1.8	H	5.40	45.52	54	8.48
Middle Channel (2437MHz)-									
4874.00	46.57	PK	305	1.4	H	6.43	53.00	74	21.00
4874.00	37.52	Ave.	305	1.4	H	6.43	43.95	54	10.05
High Channel (2462 MHz)									
2320.94	28.17	PK	46	1.7	H	31.64	59.81	74	14.19
2320.94	14.23	Ave.	46	1.7	H	31.64	45.87	54	8.13
2484.68	29.19	PK	315	1.0	H	32.13	61.32	74	12.68
2484.68	15.90	Ave.	315	1.0	H	32.13	48.03	54	5.97
4924.00	44.12	PK	273	1.7	H	6.43	50.55	74	23.45
4924.00	30.78	Ave.	273	1.7	H	6.43	37.21	54	16.79

802.11g Mode:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/QP/Ave.		Height (m)	Polar (H/V)				
Low Channel (2412 MHz)									
2389.25	29.39	PK	87	1.2	H	31.87	61.26	74	12.74
2389.25	15.11	Ave.	87	1.2	H	31.87	46.98	54	7.02
2484.75	28.36	PK	108	2.1	H	32.13	60.49	74	13.51
2484.75	14.30	Ave.	108	2.1	H	32.13	46.43	54	7.57
4824.00	43.23	PK	189	1.9	H	5.40	48.63	74	25.37
4824.00	28.57	Ave.	189	1.9	H	5.40	33.97	54	20.03
Middle Channel (2437MHz)									
4874.00	44.67	PK	11	1.4	H	6.43	51.10	74	22.90
4874.00	29.90	Ave.	11	1.4	H	6.43	36.33	54	17.67
High Channel (2462 MHz)									
2375.82	27.65	PK	241	1.8	H	31.87	59.52	74	14.48
2375.82	13.88	Ave.	241	1.8	H	31.87	45.75	54	8.25
2483.58	36.54	PK	93	1.8	H	32.13	68.67	74	5.33
2483.58	18.78	Ave.	93	1.8	H	32.13	50.91	54	3.09
4924.00	43.80	PK	220	1.2	H	6.43	50.23	74	23.77
4924.00	28.59	Ave.	220	1.2	H	6.43	35.02	54	18.98

802.11n-HT20 Mode:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/QP/Ave.		Height (m)	Polar (H/V)				
Low Channel (2412 MHz)									
2350.00	29.11	PK	176	1.8	H	31.77	60.88	74	13.12
2350.00	15.69	Ave.	176	1.8	H	31.77	47.46	54	6.54
2499.98	28.90	PK	156	2.3	H	32.13	61.03	74	12.97
2499.98	15.21	Ave.	156	2.3	H	32.13	47.34	54	6.66
4824.00	43.37	PK	70	2.3	H	5.40	48.77	74	25.23
4824.00	28.58	Ave.	70	2.3	H	5.40	33.98	54	20.02
Middle Channel (2437MHz)									
4874.00	44.78	PK	140	2.4	H	6.43	51.21	74	22.79
4874.00	30.22	Ave.	140	2.4	H	6.43	36.65	54	17.35
High Channel (2462 MHz)									
2323.26	27.90	PK	331	1.4	H	31.64	59.54	74	14.46
2323.26	14.07	Ave.	331	1.4	H	31.64	45.71	54	8.29
2483.82	35.13	PK	16	1.7	H	32.13	67.26	74	6.74
2483.82	18.12	Ave.	16	1.7	H	32.13	50.25	54	3.75
4924.00	43.36	PK	36	2.0	H	6.43	49.79	74	24.21
4924.00	28.27	Ave.	36	2.0	H	6.43	34.70	54	19.30

802.11n-HT40 Mode:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/QP/Ave.		Height (m)	Polar (H/V)				
Low Channel (2422 MHz)									
2386.71	29.16	PK	211	2.4	H	31.87	61.03	74	12.97
2386.71	15.33	Ave.	211	2.4	H	31.87	47.20	54	6.80
2493.99	28.01	PK	105	1.0	H	32.13	60.14	74	13.86
2493.99	14.16	Ave.	105	1.0	H	32.13	46.29	54	7.71
4844.00	43.38	PK	164	2.0	H	5.40	48.78	74	25.22
4844.00	28.45	Ave.	164	2.0	H	5.40	33.85	54	20.15
Middle Channel (2437MHz)									
4874.00	43.71	PK	140	2.3	H	6.43	50.14	74	23.86
4874.00	28.63	Ave.	140	2.3	H	6.43	35.06	54	18.94
High Channel (2452 MHz)									
2338.31	28.56	PK	40	2.1	H	31.64	60.20	74	13.80
2338.31	14.77	Ave.	40	2.1	H	31.64	46.41	54	7.59
2484.84	31.25	PK	52	2.0	H	32.13	63.38	74	10.62
2484.84	16.18	Ave.	52	2.0	H	32.13	48.31	54	5.69
4904.00	43.19	PK	103	1.2	H	6.43	49.62	74	24.38
4904.00	28.31	Ave.	103	1.2	H	6.43	34.74	54	19.26

1 GHz-25 GHz(BLE):

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/QP/Ave.		Height (m)	Polar (H/V)				
Low Channel (2402 MHz)									
2341.19	28.34	PK	219	1.5	V	31.64	59.98	74	14.02
2341.19	15.47	Ave.	219	1.5	V	31.64	47.11	54	6.89
2495.78	28.16	PK	202	2.0	V	32.13	60.29	74	13.71
2495.78	15.85	Ave.	202	2.0	V	32.13	47.98	54	6.02
1625.71	61.17	PK	157	1.7	V	-2.40	58.77	74	15.23
1625.71	38.22	Ave.	157	1.7	V	-2.40	35.82	54	18.18
4804.00	44.07	PK	51	1.6	V	5.40	49.47	74	24.53
4804.00	30.92	Ave.	51	1.6	V	5.40	36.32	54	17.68
Middle Channel (2440 MHz)									
1625.71	62.28	PK	27	1.7	V	-2.40	59.88	74	14.12
1625.71	39.45	Ave.	27	1.7	V	-2.40	37.05	54	16.95
4880.00	43.84	PK	146	2.2	V	6.43	50.27	74	23.73
4880.00	30.17	Ave.	146	2.2	V	6.43	36.60	54	17.40
High Channel (2480 MHz)									
2318.97	28.51	PK	12	1.7	V	31.64	60.15	74	13.85
2318.97	15.47	Ave.	12	1.7	V	31.64	47.11	54	6.89
2493.30	28.65	PK	12	2.4	V	32.13	60.78	74	13.22
2493.30	15.15	Ave.	12	2.4	V	32.13	47.28	54	6.72
1625.71	61.47	PK	137	2.1	V	-2.40	59.07	74	14.93
1625.71	38.55	Ave.	137	2.1	V	-2.40	36.15	54	17.85
4960.00	43.50	PK	189	1.7	V	6.95	50.45	74	23.55
4960.00	30.02	Ave.	189	1.7	V	6.95	36.97	54	17.03

Note:

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

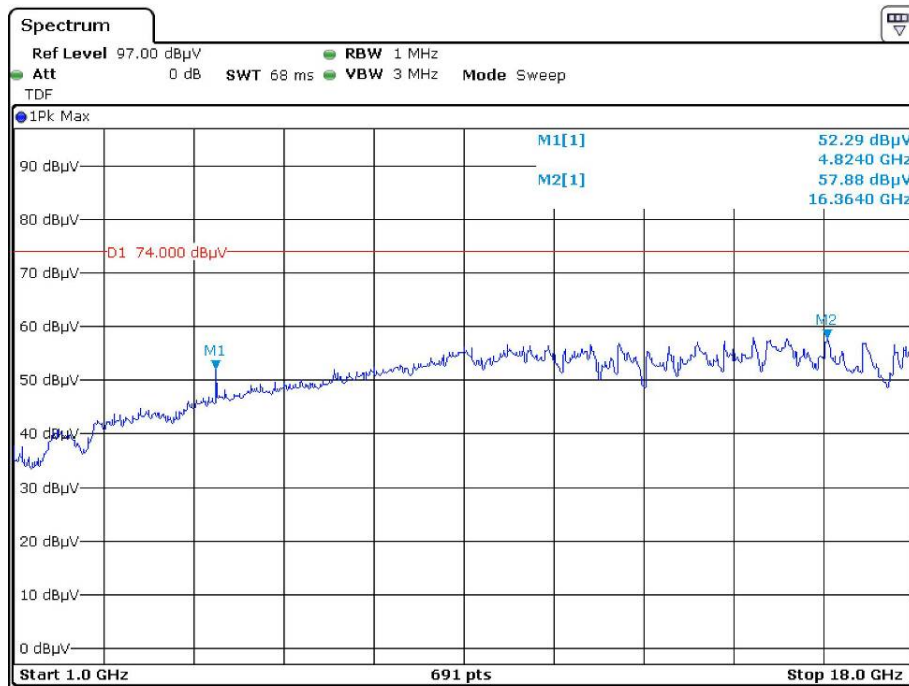
Corrected Amplitude = Corrected Factor + Reading

Margin = Limit - Corrected. Amplitude

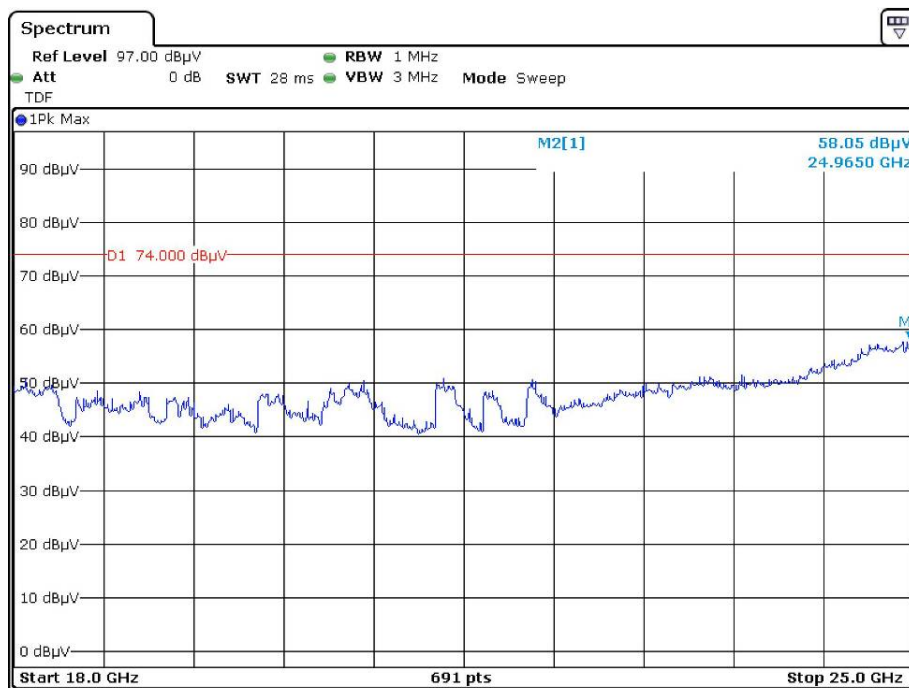
The other spurious emission which is 20dB to the limit was not recorded.

And for the pre-scan is performed with the 2400-2483.5MHz band filter.

**Pre-scan with 802.11B Mode, Antenna 2, High channel
Horizontal**

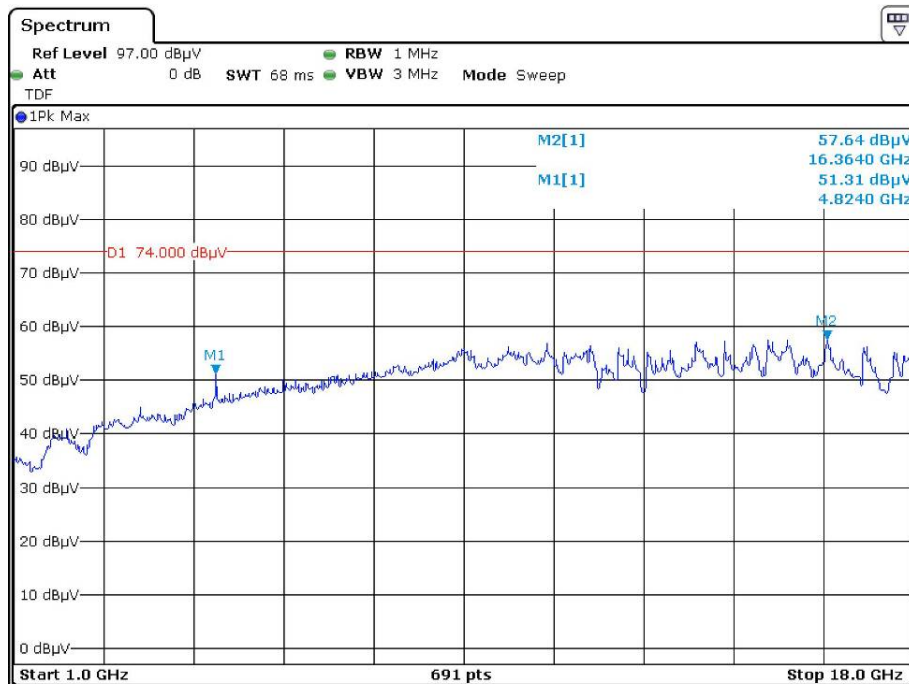


Date: 19.OCT.2019 21:02:21

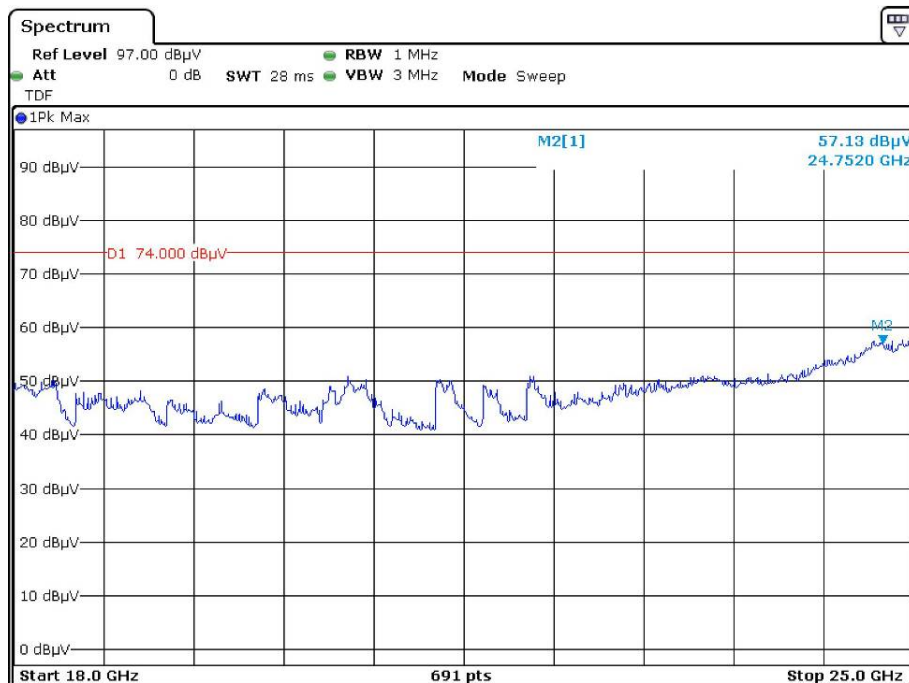


Date: 19.OCT.2019 21:46:25

Vertical

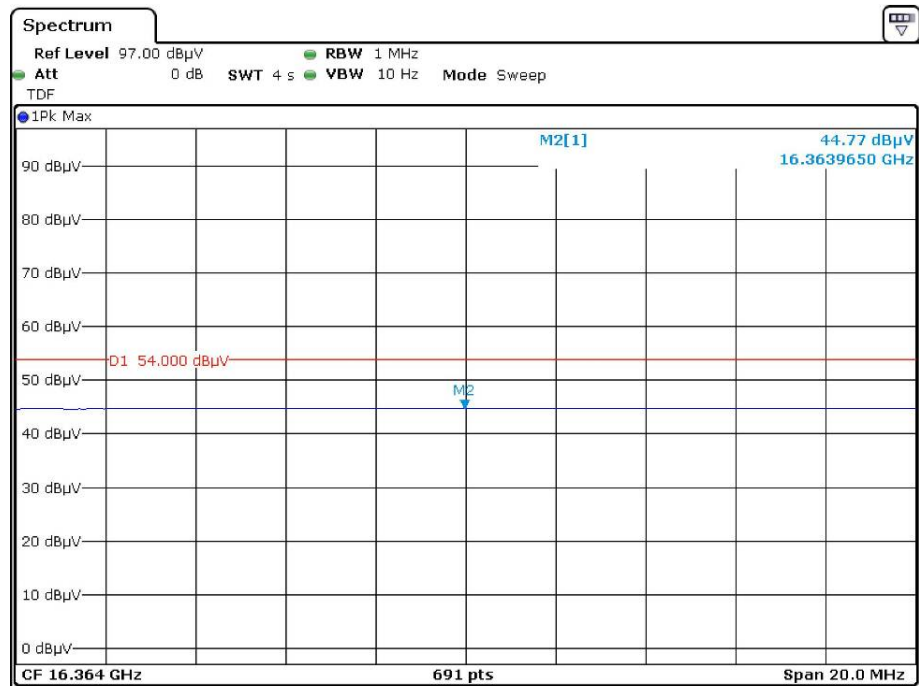


Date: 19.OCT.2019 21:07:54

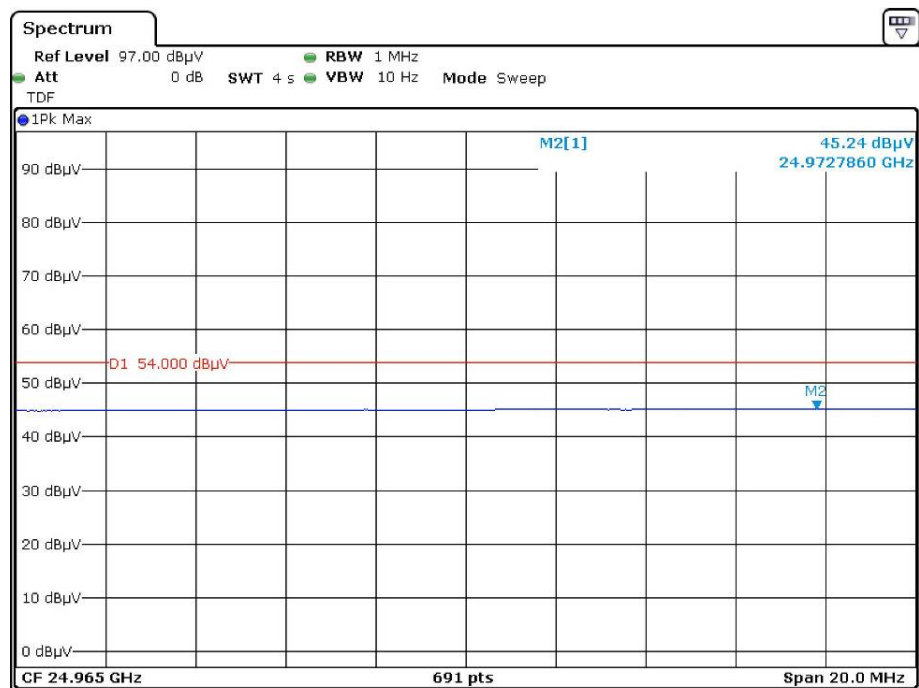


Date: 19.OCT.2019 21:53:40

Pre-scan for Average Horizontal

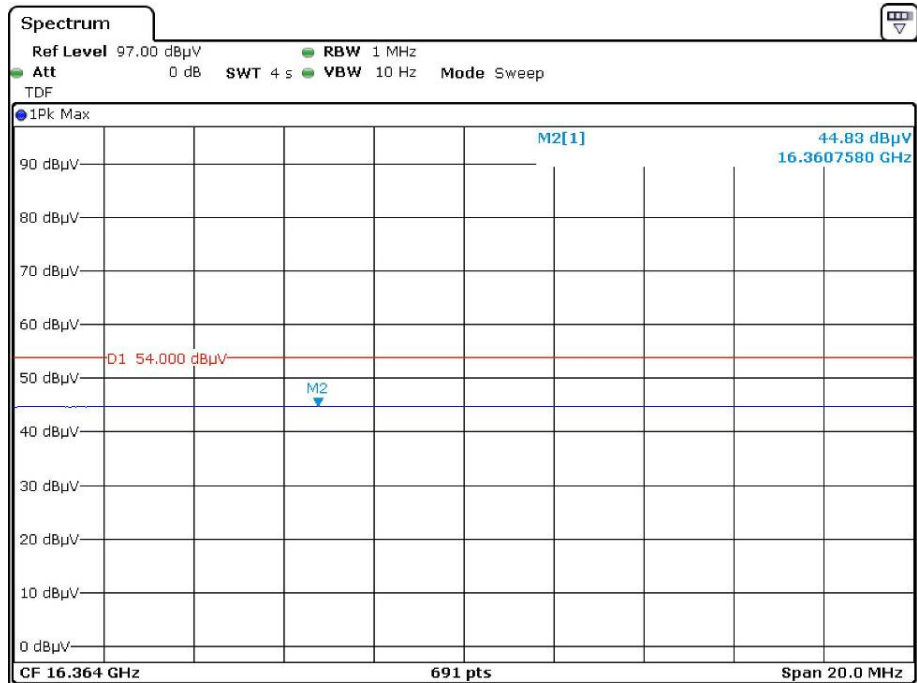


Date: 19.OCT.2019 21:04:43

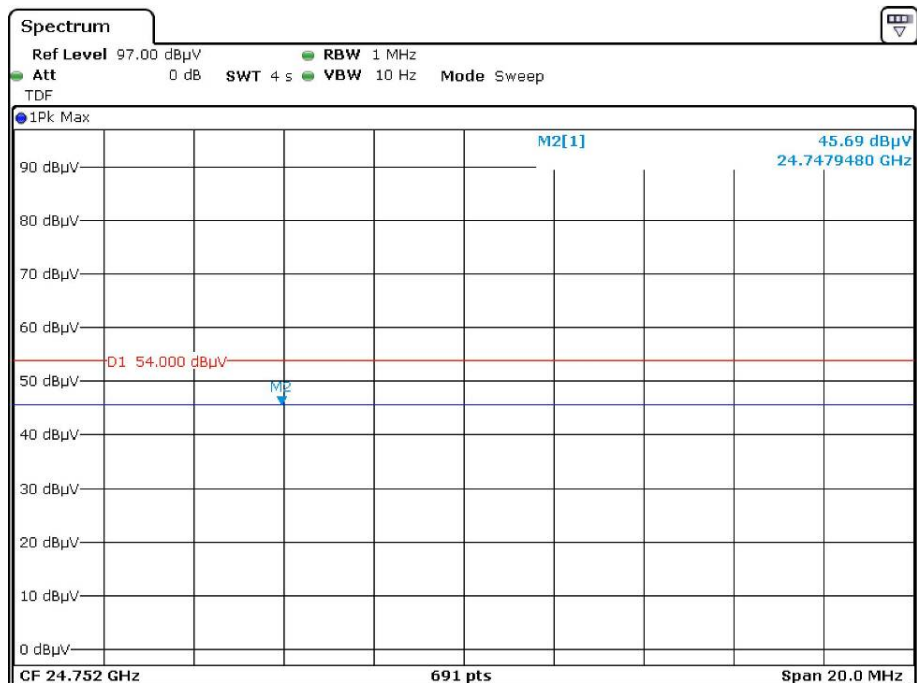


Date: 19.OCT.2019 21:49:58

Vertical



Date: 19.OCT.2019 21:11:28



Date: 19.OCT.2019 21:57:20

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