

FCC RADIO TEST REPORT

FCC ID: QWHULG10

Product: Guitar Wireless System

Trade Name: Behringer

Model Name: AIRPLAY GUITAR ULG10

Serial Model: N/A

Report No.: UNIA19041914FR-01

Prepared for

MUSIC Tribe Manufacturing PH Ltd.

17A Brunswick Street Hamilton HM 10 Bermuda, Hamilton 999078, Bermuda

Prepared by

Shenzhen United Testing Technology Co., Ltd.

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TEST RESULT CERTIFICATION

Applicant's name : MUSIC Tribe Manufacturing PH Ltd.

Address..... : 17A Brunswick Street Hamilton HM 10 Bermuda, Hamilton
999078, Bermuda

Manufacture's Name : MUSIC Tribe Manufacturing PH Ltd.

Address..... : 17A Brunswick Street Hamilton HM 10 Bermuda, Hamilton
999078, Bermuda

Product description

Product name : Guitar Wireless System

Trade Mark..... : Behringer

Model and/or type reference : AIRPLAY GUITAR ULG10

Standards : FCC Rules and Regulations Part 15 Subpart C Section 15.247
ANSI C63.10: 2013

This device described above has been tested by Shenzhen United Testing Technology Co., Ltd., and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test :

Date (s) of performance of tests..... : Apr. 19, 2019 ~ Jun. 13, 2019

Date of Issue..... : Jun. 13, 2019

Test Result..... : Pass

Prepared by: _____

Kahn Yang

Kahn yang/Editor

Reviewer: _____


Sherwin Qian/Supervisor

Approved & Authorized Signer: _____

Liuze
Liuze/Manager

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1. TEST SUMMARY

1.1 TEST PROCEDURES AND RESULTS

DESCRIPTION OF TEST	RESULT	STANDARD
CONDUCTED EMISSIONS TEST	COMPLIANT	FCC Part 15.207
RADIATED EMISSION TEST	COMPLIANT	FCC Part 15.209(a)
BAND EDGE	COMPLIANT	FCC Part 15.247(d)
OCCUPIED BANDWIDTH MEASUREMENT	COMPLIANT	FCC Part 15.247(a)(2)
POWER SPECTRAL DENSITY	COMPLIANT	FCC Part 15.247(e)
PEAK OUTPUT POWER	COMPLIANT	FCC Part 15.247(b)
OUT OF BAND EMISSIONS	COMPLIANT	FCC Part 15.247(d)
ANTENNA REQUIREMENT	COMPLIANT	FCC Part 15.203

1.2 TEST FACILITY

Test Firm : Shenzhen United Testing Technology Co., Ltd.
Address : 2F, Annex Bldg, Jiahuangyuan Tech Park, #365 Baotian 1 Rd, Tiegang Community, Xixiang Str, Bao'an District, Shenzhen, China

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19. The testing quality system of our laboratory meets with ISO/IEC-17025 requirements, which is approved by CNAS. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:

CNAS-LAB Code: L6494

The EMC Laboratory has been assessed and in compliance with CNAS-CL01 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:2017 General Requirements) for the Competence of testing Laboratories.

Designation Number: CN1227

Test Firm Registration Number: 674885

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission. The acceptance letter from the FCC is maintained in our files.

1.3 MEASUREMENT UNCERTAINTY

Measurement Uncertainty

Conducted Emission Expanded Uncertainty	= 2.23dB, k=2
Radiated emission expanded uncertainty(9kHz-30MHz)	= 3.08dB, k=2
Radiated emission expanded uncertainty(30MHz-1000MHz)	= 4.42dB, k=2
Radiated emission expanded uncertainty(Above 1GHz)	= 4.06dB, k=2

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Guitar Wireless System
Trade Mark	Behringer
Model Name	AIRPLAY GUITAR ULG10
Serial No.	N/A
Model Difference	N/A
FCC ID	QWHULG10
Antenna Type	PCB Antenna
Antenna Gain	1dBi
Frequency Range	2405~2475MHz
Number of Channels	8CH
Modulation Type	GFSK
Battery	3.7V 750mAh
Power Source	DC 12V from adapter withAC 120(240)V/60Hz
Adapter Model	Input: AC 100-240V, 50/60Hz Output: DC 5V, 1.0A

Note: For more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.2 Carrier Frequency of Channels

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2405	5	2445
2	2415	6	2455
3	2425	7	2465
4	2435	8	2475

2.3 Operation of EUT during testing

Operating Mode

The mode is used: Transmitting mode

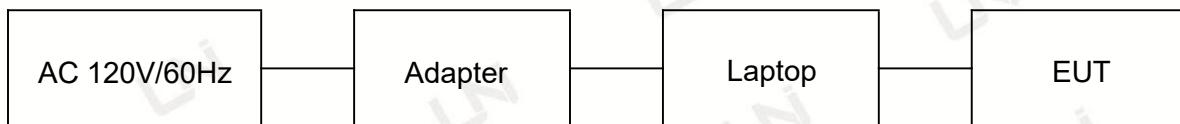
Low Channel: 2405MHz

Middle Channel: 2445MHz

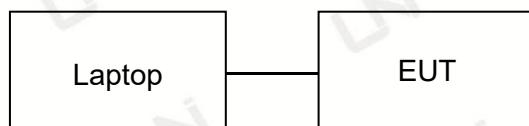
High Channel: 2475MHz

2.4 DESCRIPTION OF TEST SETUP

Operation of EUT during Conducted testing:



Operation of EUT during Radiation and Above1GHz Radiation testing:



Support Equipment

Equipment	Manufacturer	Model No.	Serial No.	Note
Adapter	MUSIC Tribe Manufacturing PH Ltd.	N/A	N/A	Input: 100-240V~1.7A 50-60Hz Output: 20V, 2.25A

2.5 MEASUREMENT INSTRUMENTS LIST

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
CONDUCTED EMISSIONS TEST					
1	AMN	Schwarzbeck	NNLK8121	8121370	2019.9.9
2	AMN	ETS	3810/2	00020199	2019.9.9
3	EMI TEST RECEIVER	Rohde&Schwarz	ESCI	101210	2019.9.9
4	AAN	TESEQ	T8-Cat6	38888	2019.9.9
RADIATED EMISSION TEST					
1	Horn Antenna	Sunol	DRH-118	A101415	2019.9.29
2	BicoNILog Antenna	Sunol	JB1 Antenna	A090215	2019.9.29
3	PREAMP	HP	8449B	3008A00160	2019.9.9
4	PREAMP	HP	8447D	2944A07999	2019.9.9
5	EMI TEST RECEIVER	Rohde&Schwarz	ESR3	101891	2019.9.9
6	VECTOR Signal Generator	Rohde&Schwarz	SMU200A	101521	2019.9.28
7	Signal Generator	Agilent	E4421B	MY4335105	2019.9.28
8	MXA Signal Analyzer	Agilent	N9020A	MY50510140	2019.9.28
9	MXA Signal Analyzer	Agilent	N9020A	MY51110104	2019.9.9
10	ANT Tower&Turn table Controller	Champro	EM 1000	60764	2019.9.28
11	Anechoic Chamber	Taihe Maorui	9m*6m*6m	966A0001	2019.9.9
12	Shielding Room	Taihe Maorui	6.4m*4m*3m	643A0001	2019.9.9
13	RF Power sensor	DARE	RPR3006W	15I00041SNO88	2020.3.14
14	RF Power sensor	DARE	RPR3006W	15I00041SNO89	2020.3.14
15	RF power divider	Anritsu	K241B	992289	2019.9.28
16	Wideband radio communication tester	Rohde&Schwarz	CMW500	154987	2019.9.28
17	Biconical antenna	Schwarzbeck	VHA 9103	91032360	2019.9.8
18	Biconical antenna	Schwarzbeck	VHA 9103	91032361	2019.9.8
19	Broadband Hybrid Antennas	Schwarzbeck	VULB9163	VULB9163#958	2019.9.8
20	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1680	2020.1.12
21	Active Receive Loop Antenna	Schwarzbeck	FMZB 1919B	00023	2019.11.02
22	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170651	2020.03.14
23	Microwave Broadband Preamplifier	Schwarzbeck	BBV 9721	100472	2019.10.24
24	Active Loop Antenna	Com-Power	AL-130R	10160009	2020.05.10
25	Power Meter	KEYSIGHT	N1911A	MY50520168	2020.05.10

3. CONDUCTED EMISSIONS TEST

3.1 Conducted Power Line Emission Limit

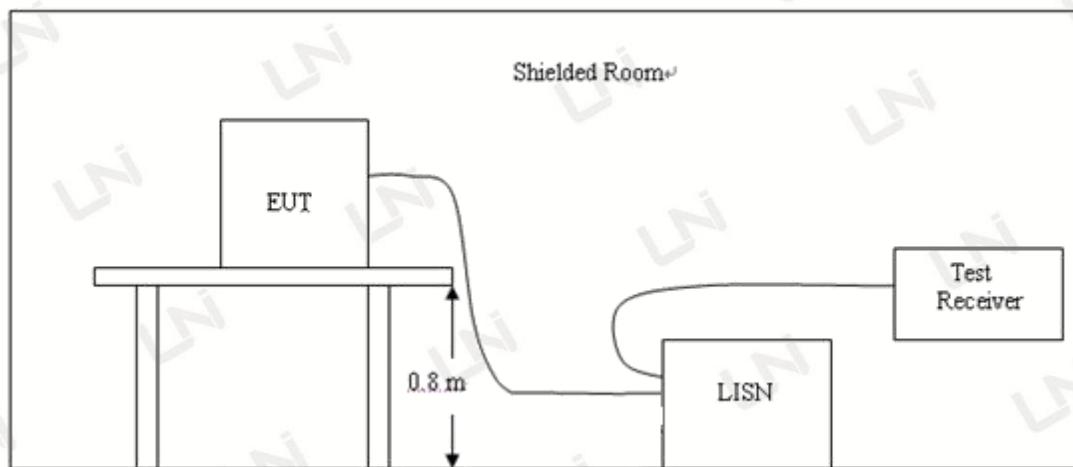
For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following

Frequency (MHz)	Maximum RF Line Voltage(dB μ V)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15~0.50	79	66	66~56*	56~46*
0.50~5.00	73	60	56	46
5.00~30.0	73	60	60	50

* Decreasing linearly with the logarithm of the frequency

For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

3.2 Test Setup



3.3 Test Procedure

- 1, The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. A wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10.
- 2, Support equipment, if needed, was placed as per ANSI C63.10.
- 3, All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
- 4, If a EUT received DC power from the USB Port of Notebook PC, the PC's adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5, All support equipments received AC power from a second LISN, if any.
- 6, The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7, Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.

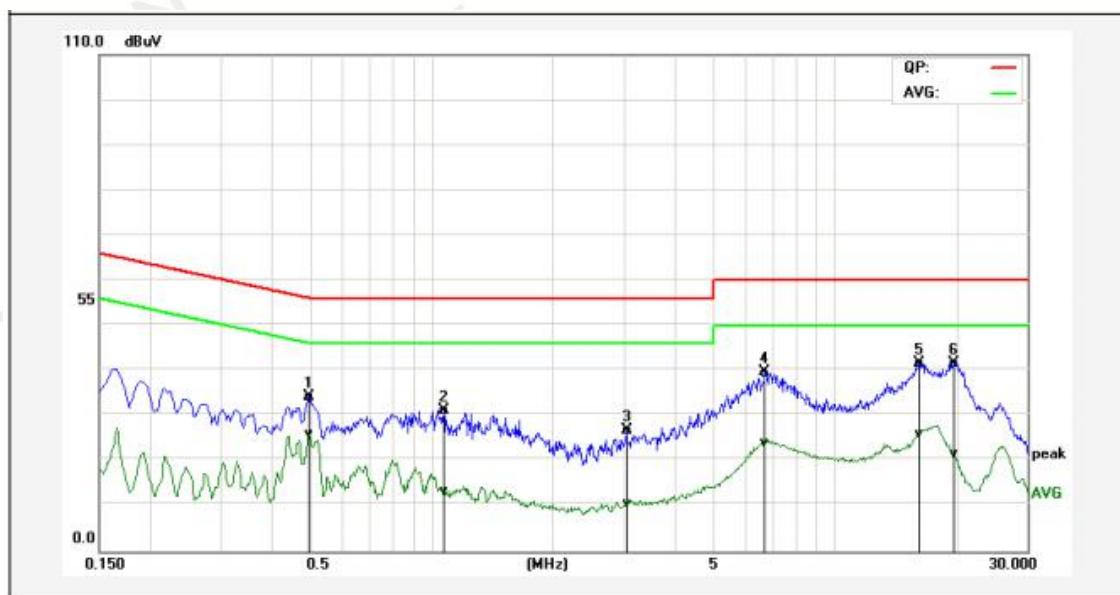
3.4 Test Result

Pass

Remark:

1. All modes were tested at AC 120V and 240V, only the worst result of AC 120V was reported.
2. All modes were tested at Low, Middle, and High channel, only the worst result of Low Channel was reported as below:

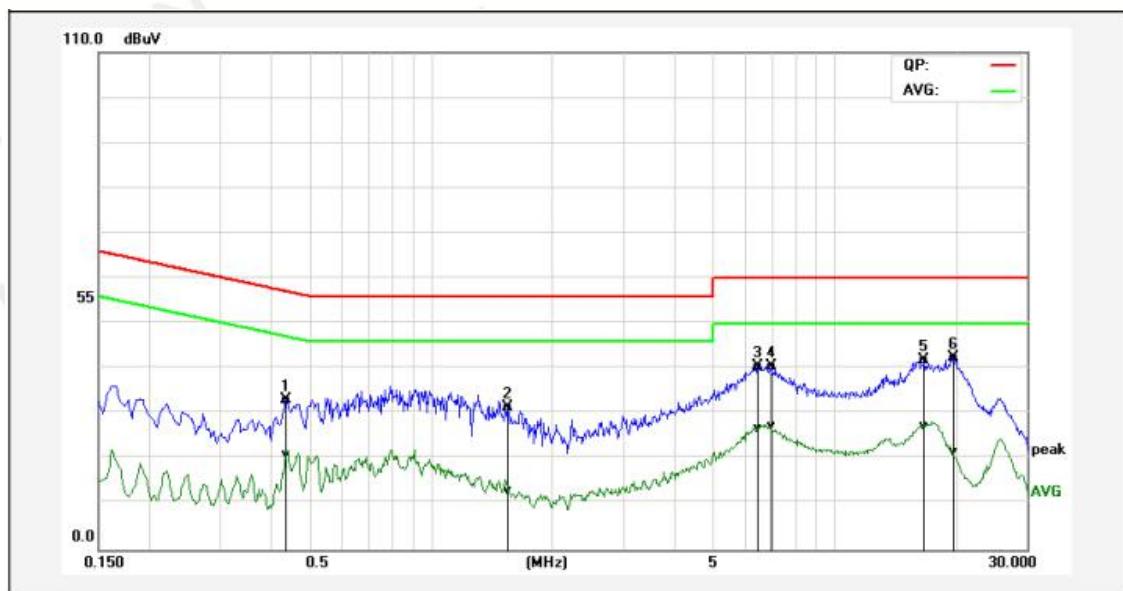
Temperature:	24°C	Relative Humidity:	45%
Test Date:	Apr. 29, 2019	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Phase:	Line
Test Mode:	Transmitting mode of GFSK 2405MHz		



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1P	0.4980	24.48	16.32	9.79	34.27	26.11	56.03	46.03	-21.76	-19.92	Pass
2P	1.0740	21.40	3.61	9.85	31.25	13.46	56.00	46.00	-24.75	-32.54	Pass
3P	3.0540	16.83	0.66	9.95	26.78	10.61	56.00	46.00	-29.22	-35.39	Pass
4P	6.7180	29.64	14.15	9.96	39.60	24.11	60.00	50.00	-20.40	-25.89	Pass
5P	16.2020	41.21	25.74	0.34	41.55	26.08	60.00	50.00	-18.45	-23.92	Pass
6*	19.6860	41.22	20.95	0.54	41.76	21.49	60.00	50.00	-18.24	-28.51	Pass

Remark: Factor = Insertion Loss + Cable Loss, Result = Reading + Factor, Margin = Result – Limit.

Temperature:	24°C	Relative Humidity:	45%
Test Date:	Apr. 29, 2019	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Phase:	Neutral
Test Mode:	Transmitting mode of GFSK 2405MHz		



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1P	0.4380	23.47	11.31	9.80	33.27	21.11	57.10	47.10	-23.83	-25.99	Pass
2P	1.5580	21.59	3.26	9.87	31.46	13.13	56.00	46.00	-24.54	-32.87	Pass
3P	6.4580	30.62	17.01	9.94	40.56	26.95	60.00	50.00	-19.44	-23.05	Pass
4P	6.9780	30.74	17.30	9.94	40.68	27.24	60.00	50.00	-19.32	-22.76	Pass
5P	16.6980	41.49	27.12	0.38	41.87	27.50	60.00	50.00	-18.13	-22.50	Pass
6*	19.6500	41.93	21.01	0.53	42.46	21.54	60.00	50.00	-17.54	-28.46	Pass

Remark: Factor = Insertion Loss + Cable Loss, Result = Reading + Factor, Margin = Result – Limit.

4 RADIATED EMISSION TEST

4.1 Radiation Limit

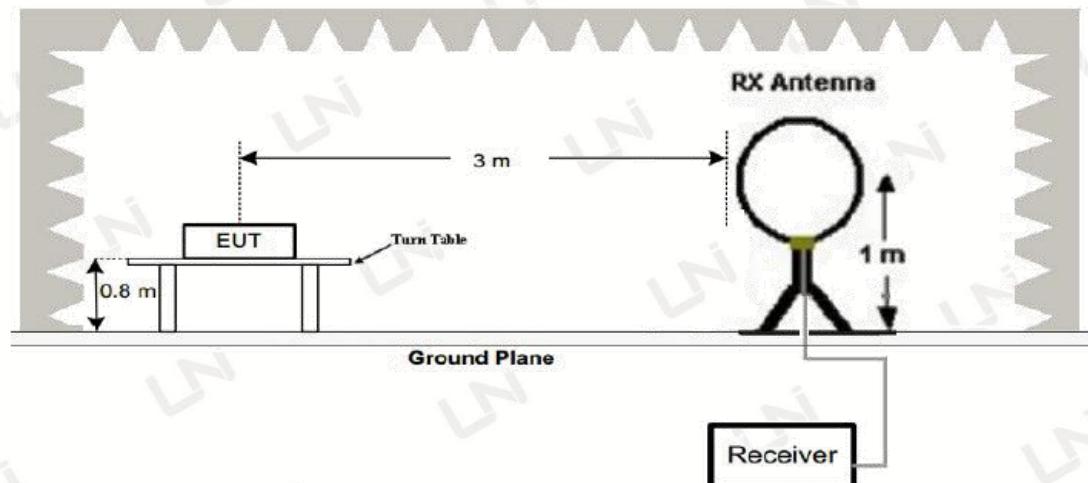
For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Distance (Meters)	Radiated (dB μ V/m)	Radiated (μ V/m)
30-88	3	40	100
88-216	3	43.5	150
216-960	3	46	200
Above 960	3	54	500

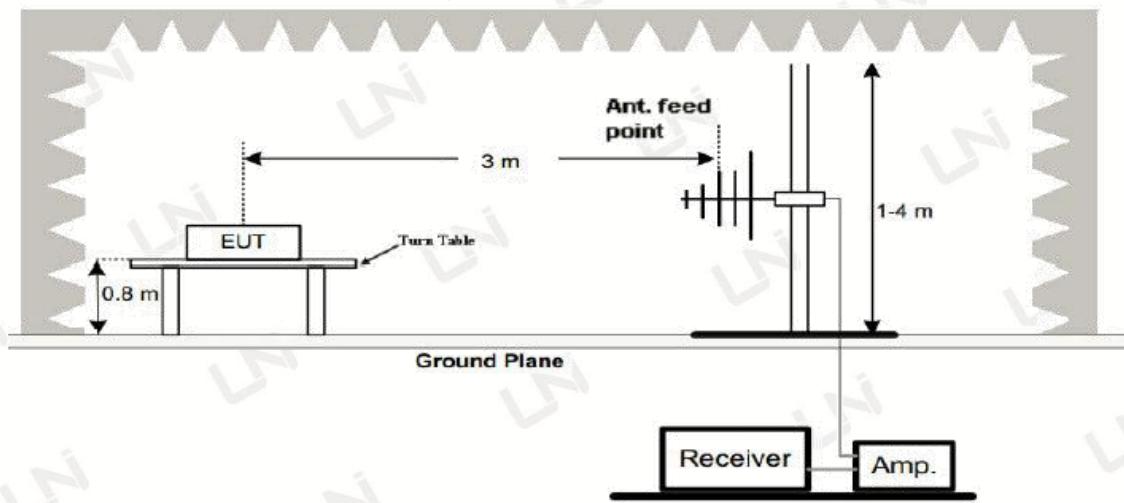
For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

4.2 Test Setup

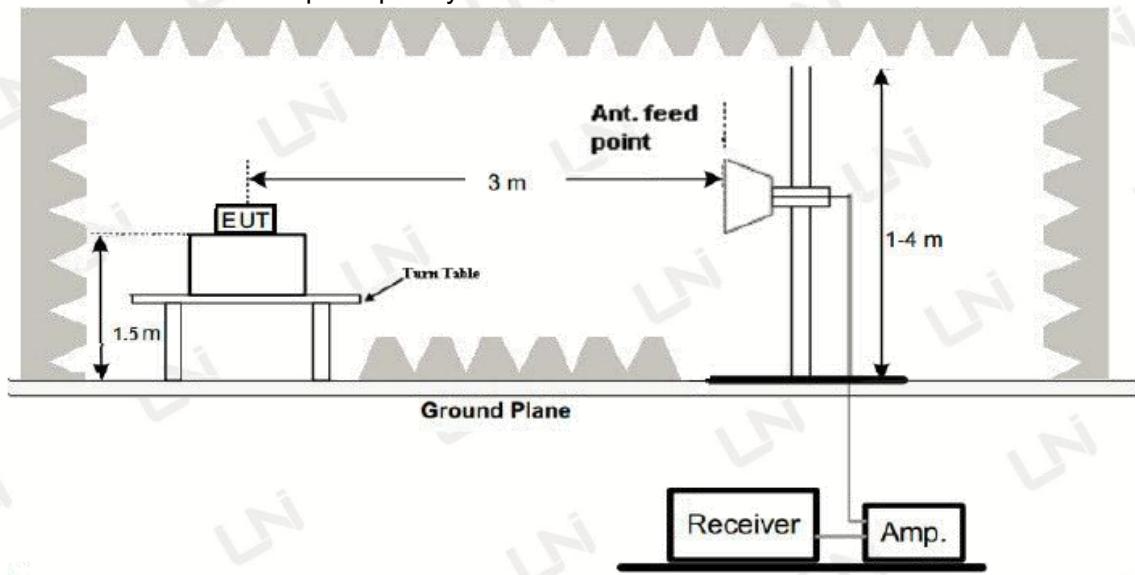
1. Radiated Emission Test-Up Frequency Below 30MHz



2. Radiated Emission Test-Up Frequency 30MHz~1GHz



3. Radiated Emission Test-Up Frequency Above 1GHz



4.3 Test Procedure

1. Below 1GHz measurement the EUT is placed on turntable which is 0.8m above ground plane. And above 1GHz measurement EUT was placed on low permittivity and low tangent turn table which is 1.5m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The test frequency range from 9KHz to 25GHz per FCC PART 15.33(a).

Note:

For battery operated equipment, the equipment tests shall be performed using a new battery.

4.4 Test Result

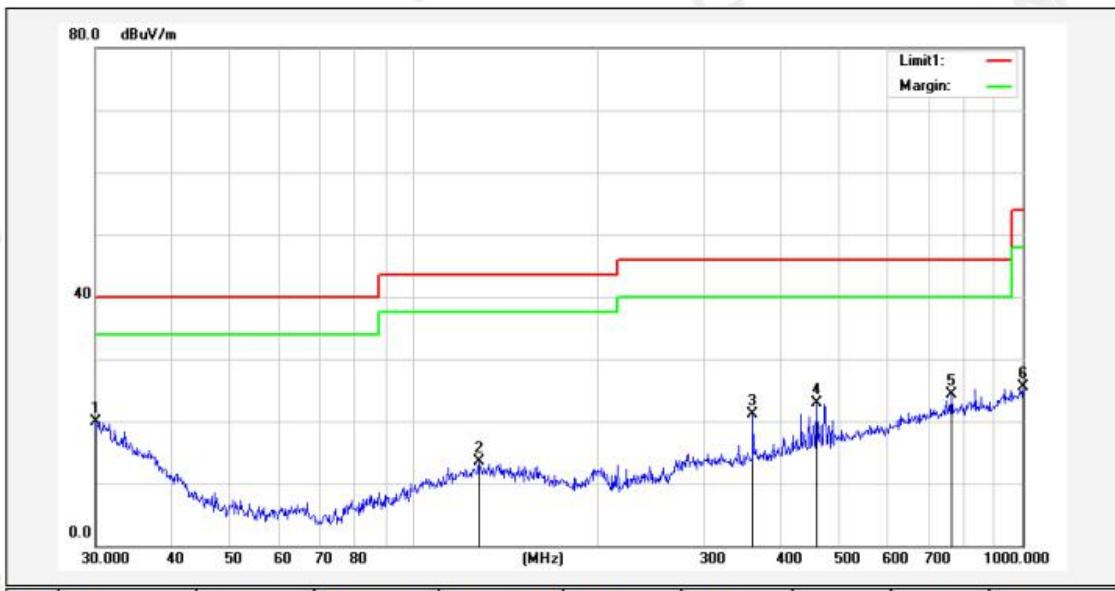
PASS

Remark:

1. All modes were test at Low, Middle, and High channel, only the worst result of Low Channel was reported for below 1GHz test.
2. By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that "Z axis" position was the worst, and test data recorded in this report.

Below 1GHz Test Results:

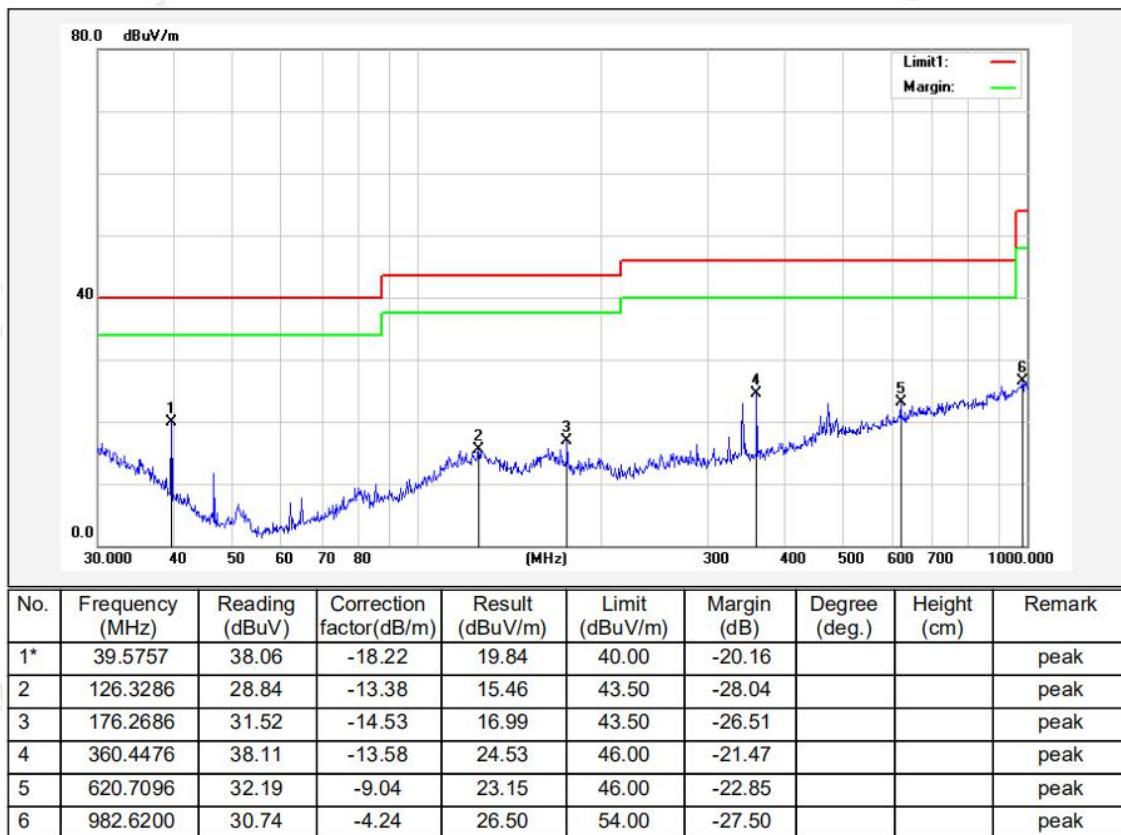
Temperature:	24°C	Relative Humidity:	45%
Test Date:	Apr. 29, 2019	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Polarization:	Horizontal
Test Mode:	Transmitting mode of GFSK2405MHz		



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1*	30.0000	26.55	-6.65	19.90	40.00	-20.10			peak
2	128.1130	27.86	-14.30	13.56	43.50	-29.94			peak
3	360.4477	32.90	-11.75	21.15	46.00	-24.85			peak
4	459.1144	33.17	-10.28	22.89	46.00	-23.11			peak
5	763.3757	29.25	-5.04	24.21	46.00	-21.79			peak
6	1000.0000	26.88	-1.41	25.47	54.00	-28.53			peak

Remark: Absolute Level = Reading Level + Factor, Margin = Absolute Level – Limit
Factor = Ant. Factor + Cable Loss – Pre-amplifier

Temperature:	24°C	Relative Humidity:	45%
Test Date:	Apr. 29, 2019	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Polarization:	Vertical
Test Mode:	Transmitting mode of GFSK2405MHz		



Remark: Absolute Level = Reading Level + Factor, Margin = Absolute Level – Limit
 Factor = Ant. Factor + Cable Loss – Pre-amplifier

Remark:

- (1) Measuring frequencies from 9 kHz to the 1 GHz, radiated emission test from 9KHz to 30MHz was verified, and no any emission was found except system noise floor.
- (2) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (3) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1MHz for measuring above 1 GHz, below 30MHz was 10KHz.

Above 1 GHz Test Results:

Channel: 2405MHz

Horizontal:

Frequency (MHz)	Reading Result (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
4810	71.3	-3.74	67.6	74	-6.40	peak
4810	50.0	-3.74	46.3	54	-7.70	AVG
7215	60.0	-0.98	59.0	74	-15.00	peak
7215	50.3	-0.98	49.3	54	-4.70	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit

Vertical:

Frequency (MHz)	Reading Result (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
4810	57.9	-3.74	54.2	74	-19.80	peak
4810	50.1	-3.74	46.4	54	-7.60	AVG
7215	58.5	-0.98	57.5	74	-16.50	peak
7215	47.5	-0.98	46.5	54	-7.50	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit

Middle Channel: 2445MHz

Horizontal:

Frequency (MHz)	Reading Result (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
4890	60.1	-3.61	56.5	74	-17.50	peak
4890	48.2	-3.61	44.6	54	-9.40	AVG
7335	60.6	-0.91	59.7	74	-14.30	peak
7335	49.7	-0.91	48.8	54	-5.20	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit

Vertical:

Frequency (MHz)	Reading Result (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
4890	58.3	-3.61	54.7	74	-19.30	peak
4890	47.9	-3.61	44.3	54	-9.70	AVG
7335	59.3	-0.91	58.4	74	-15.60	peak
7335	48.0	-0.91	47.1	54	-6.90	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit

High Channel: 2475MHz

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB μ V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)	
4950	60.35	-3.43	56.92	74	-17.08	peak
4950	50.26	-3.43	46.83	54	-7.17	AVG
7425	54.99	-0.75	54.24	74	-19.76	peak
7425	47.06	-0.75	46.31	54	-7.69	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB μ V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)	
4950	61.84	-3.43	58.41	74	-15.59	peak
4950	51.21	-3.43	47.78	54	-6.22	AVG
7425	56.35	-0.75	55.60	74	-18.40	peak
7425	46.06	-0.75	45.31	54	-8.69	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit

Remark:

- (1) Measuring frequencies from 1 GHz to the 25 GHz.
- (2) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
- (3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (4) Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.
- (6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dB μ V/m (PK Value) <93.98(AV Limit), at harmonic 53.20 dB μ V/m (PK Value) <54 dB μ V/m (AV Limit), the Average Detected not need to completed.

5 BAND EDGE

5.1 Limits

FCC PART 15.247 Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

5.2 Test Procedure

The band edge compliance of RF radiated emission should be measured by following the guidance in ANSI C63.10 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW 1MHz VBW 3MHz PK detector is for PK value , RMS detector is for AV value.

5.3 Test Result

PASS

Operation Mode: Low Channel: 2405MHz

Horizontal:

Frequency (MHz)	Reading Result (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
2310	56.21	-5.81	50.4	74	-23.6	peak
2310	/	-5.81	/	54	/	AVG
2390	61.34	-5.84	55.5	74	-18.5	peak
2390	49.04	-5.84	43.2	54	-10.8	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency (MHz)	Reading Result (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
2310	56.11	-5.81	50.3	74	-23.7	peak
2310	/	-5.81	/	54	/	AVG
2390	64.04	-5.84	58.2	74	-15.8	peak
2390	54.34	-5.84	48.5	54	-5.5	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Operation Mode: High Channel: 2475MHz

Horizontal:

Frequency (MHz)	Reading Result (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
2483.5	57.13	-5.65	51.48	74	-22.52	peak
2483.5	/	-5.65	/	54	/	AVG
2500	56.35	-5.72	50.63	74	-23.37	peak
2500	/	-5.72	/	54	/	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency (MHz)	Reading Result (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
2483.5	56.35	-5.65	50.7	74	-23.3	peak
2483.5	/	-5.65	/	54	/	AVG
2500	57.23	-5.72	51.51	74	-22.49	peak
2500	/	-5.72	/	54	/	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

6 OCCUPIED BANDWIDTH MEASUREMENT

6.1 Test Limit

FCC Part15(15.247), Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2)	Bandwidth	>= 500KHz (6dB bandwidth)	2400-2483.5	PASS

6.2 Test Procedure

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Set EUT as normal operation.
3. Based on FCC Part15 C Section 15.247: RBW=100KHz, VBW=300KHz.
4. The useful radiated emission from the EUT was detected by the spectrum analyzer with peak detector.

6.3 Measurement Equipment Used

Same as Radiated Emission Measurement

6.4 Test Result

PASS

TX 802.11b Mode			
Frequency	6dB Bandwidth (MHz)	Channel Separation (MHz)	Result
2405 MHz	1.323	>=500KHz	PASS
2445 MHz	1.447	>=500KHz	PASS
2475 MHz	1.376	>=500KHz	PASS

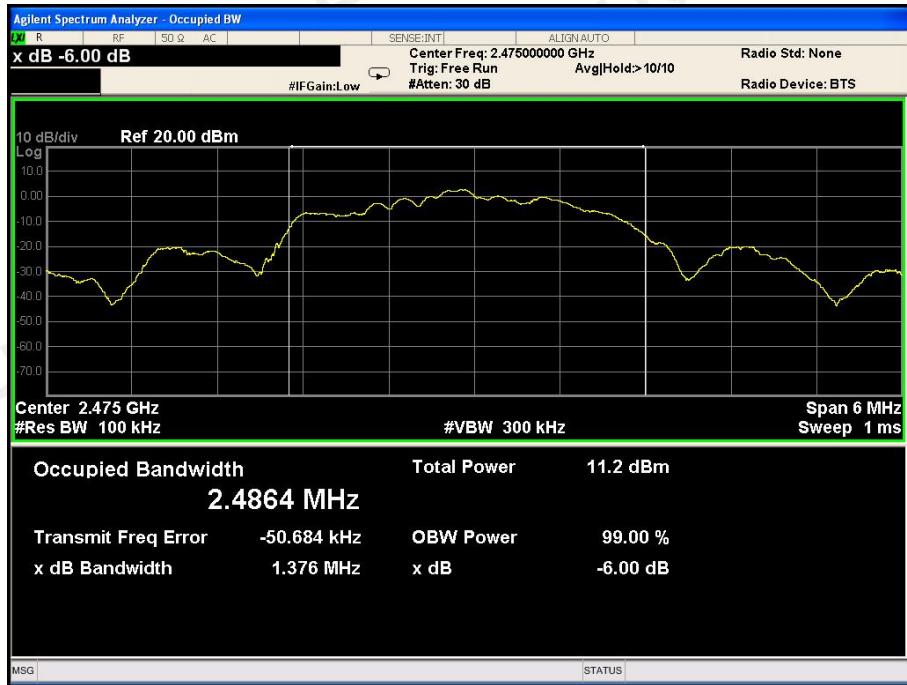
CH: 2405MHz



CH: 2445MHz



CH: 2475MHz



7 POWER SPECTRAL DENSITY TEST

7.1 Test Limit

FCC Part15(15.247), Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247	Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	PASS

7.2 Test Procedure

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Set EUT as normal operation.
3. Based on FCC Part15 C Section 15.247: RBW=3KHz, VBW \geq 3RBW.
4. The useful radiated emission from the EUT was detected by the spectrum analyzer with peak detector.

7.3 Measurement Equipment Used

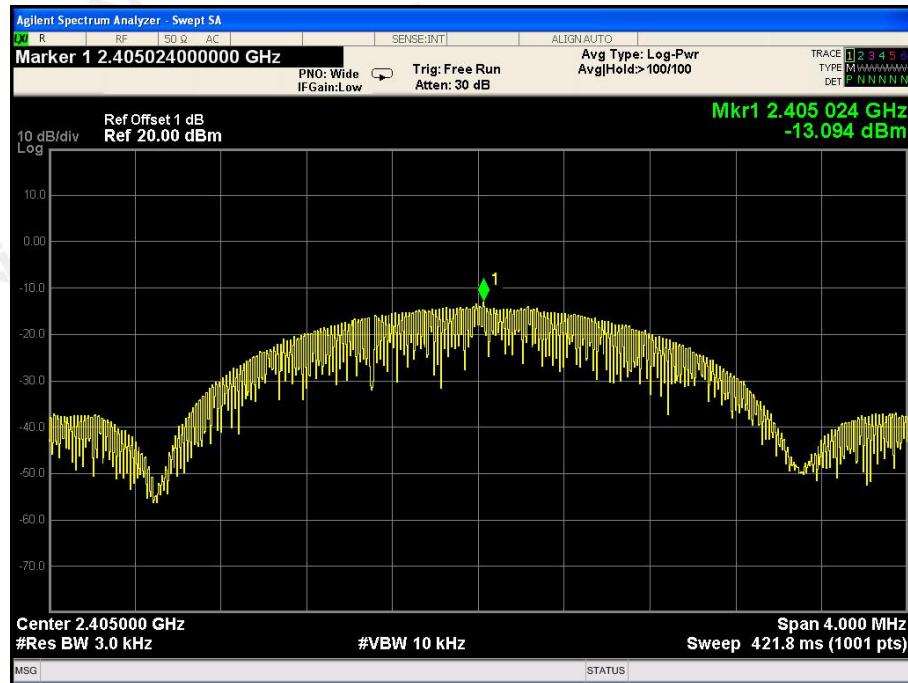
Same as Radiated Emission Measurement

7.4 Test Result

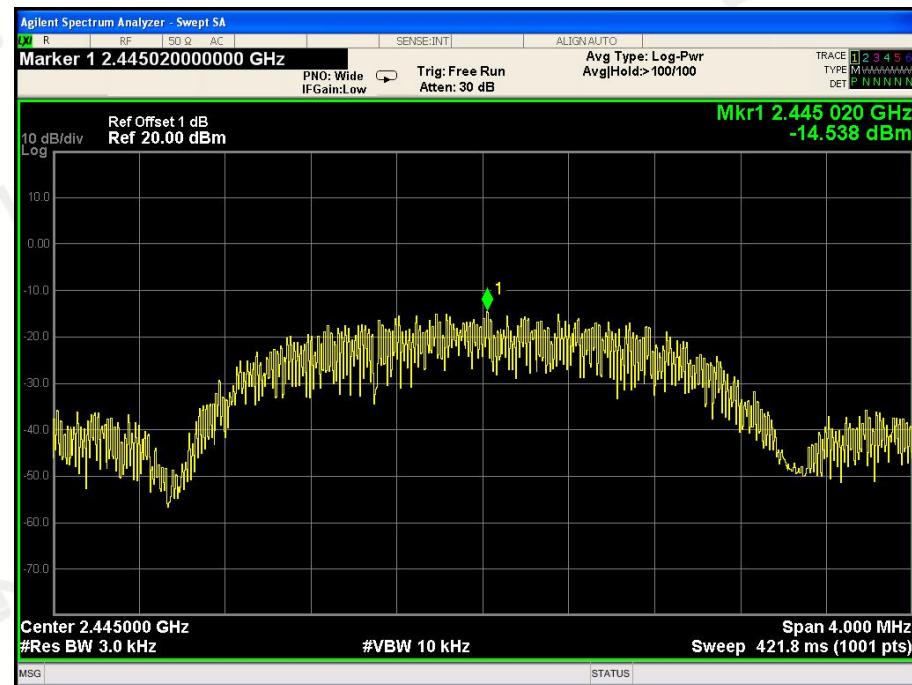
PASS

TX Mode			
Frequency	Power Density (dBm/3KHz)	Limit (dBm/3KHz)	Result
2405 MHz	-13.094	8	PASS
2445 MHz	-14.538	8	PASS
2475 MHz	-11.684	8	PASS

CH: 2405MHz



CH: 2445MHz



CH: 2475MHz



8 PEAK OUTPUT POWER TEST

8.1 Test Limit

FCC Part15(15.247), Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)	Peak Output Power	1 watt or 30dBm	2400-2483.5	PASS

8.2 Test Procedure

1. The EUT was placed on a table which is 0.8m above ground plane.
2. The EUT was directly connected to the Power meter.

8.3 Measurement Equipment Used

Same as Radiated Emission Measurement

8.4 Test Result

PASS

All the test modes completed for test.

TX Mode				
Test	Frequency	Maximum Peak Conducted Output Power	LIMIT	
Channel	(MHz)	(dBm)	(dBm)	
CH1	2405	8.684	30	
CH9	2445	7.698	30	
CH16	2475	7.985	30	

9 OUT OF BAND EMISSIONS TEST

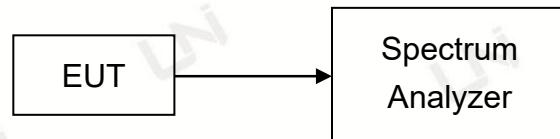
9.1 Test Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

9.2 Test Procedure

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Set EUT as TX operation and connect directly to the spectrum analyzer.
3. Based on FCC Part15 C Section 15.247: RBW=100KHz, VBW=300KHz.
4. Set detected by the spectrum analyzer with peak detector.

9.3 Test Setup



9.4 Test Result

PASS

Reference (Test Channel: 2405MHz)



TX Mode
CH: 2405MHz



Reference (Test Channel: 2475MHz)



TX Mode CH:
2475MHz



10 ANTENNA REQUIREMENT

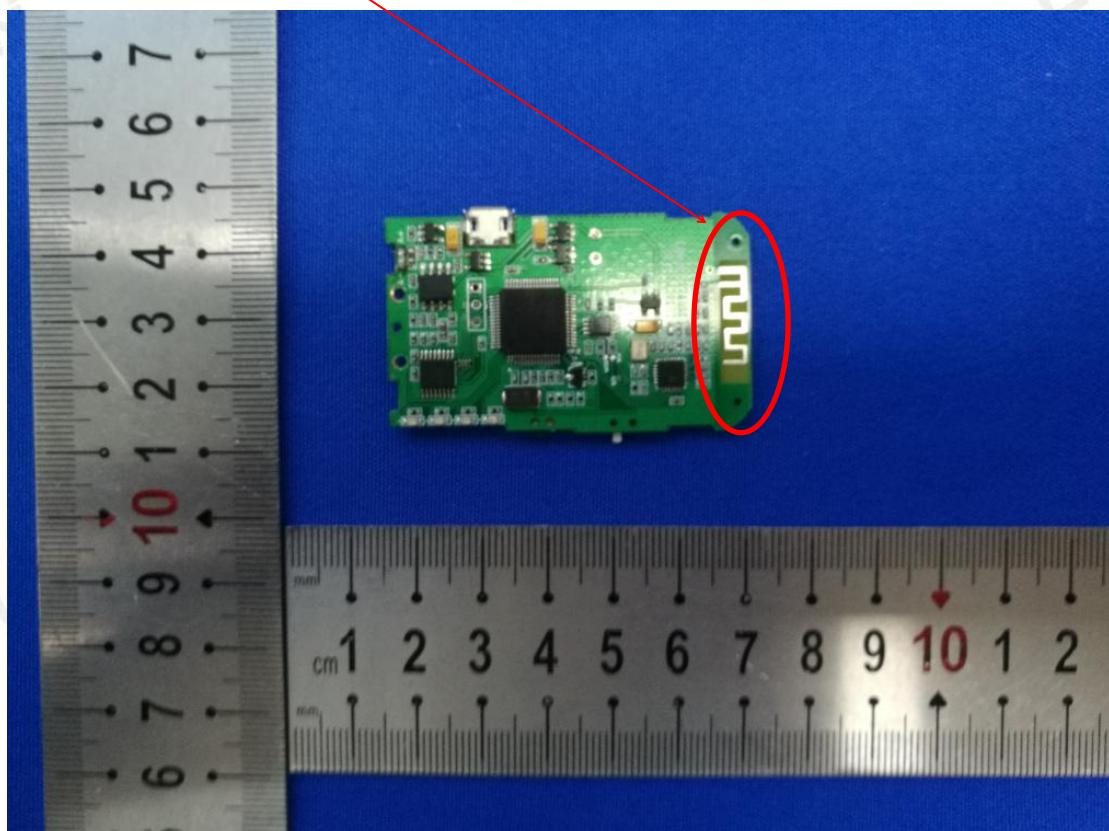
Standard Applicable:

For intentional device, according to FCC 47 CFR Section 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.

Antenna Connected Construction

The antenna used in this product is an PCB Antenna, the directional gains of antenna used for transmitting is 1dBi.

WIFI ANTENNA



11 PHOTOGRAPH OF TEST

11.1 Radiated Emission



11.2 Conducted Emission



End of Report