TEST REPORT

Applicant:	Shenzhen Ruike Innovation Technology Co., Ltd
Address of Applicant:	Unit 1701, Rufeng Building, 573 Bulong Rd Bantian Maantang community, Longgang district, Shenzhen 518100, China
Manufacturer:	Shenzhen Ruike Innovation Technology Co., Ltd
Address of Manufacturer:	Unit 1701, Rufeng Building, 573 Bulong Rd Bantian Maantang community, Longgang district, Shenzhen 518100, China

Equipment Under Test (EUT)

Product Name:	FOLDING DRONE
Model No.:	See section 5.1
FCC ID:	2AXQL-RUKODRONE
Applicable standards:	FCC CFR Title 47 Part 15 Subpart E Section 15.407
Date of sample receipt:	March 07, 2022
Date of Test:	March 08, 2022-April 07, 2022
Date of report issue:	April 07, 2022
Test Result :	PASS *

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

Authorized Signature:

Robinson Luo
Laboratory Manager

2 Version

Version No.	Date	Description
00	*April 07, 2022*	*Original*

Prepared By: Tiger Chen ***Date:*** *April 07, 2022*

Project Engineer

Check By: ***Date:*** *April 07, 2022*

Reviewer

3 Contents

4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	FCC part 15.203	PASS
AC Power Line Conducted Emission	FCC part 15.207	N/A
99% Bandwidth	Report only	PASS
Emission Bandwidth	FCC part 15.407(a)	PASS
Peak Transmit Power	FCC part 15.407(a)(1)	PASS
Power Spectral Density	FCC part 15.407(a) (1)	PASS
Undesirable Emission	FCC part 15.407(b), 15.205/15.209	PASS
Radiated Emission	FCC part 15.205/15.209	PASS
Frequency Stability	FCC part 15.407(g)	PASS

Remark:

Pass: The EUT complies with the essential requirements in the standard.

N/A: The EUT stops work while charging

4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	9kHz-30MHz	3.1dB	(1)
Radiated Emission	30MHz-200MHz	3.8039dB	(1)
Radiated Emission	200MHz-1GHz	3.9679dB	(1)
Radiated Emission	1GHz-18GHz	4.29dB	(1)
Radiated Emission	18GHz-40GHz	3.30dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	3.44dB	(1)
Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.			

5 General Information

5.1 General Description of EUT

<table>
<tr><td>Product Name:</td><td>FOLDING DRONE</td></tr>
<tr><td>Model No.:</td><td>F11GIM2, R-f11gim2, F11GIM2-4DC, 45-LDCQ-J3NT, F11GIM2 3B, UK-F11GIM2, DE-F11GIM2, F11GIM, f11pro-gim, drone11gim, U11, U11S, U11 Drone, Drone11S, Udi 11, U11PRO, U11PRO 3B, u11pro 1b, UK-U11PRO, DE-U11PRO, U11 4K PRO, U11GIM, U11GIM2, U11GIM3, UK-U11GIM, DE-U11GIM, UK-U11GIM2, DE-U11GIM2, M11, M11PRO, M11 4K PRO, M11S, M11GIM, M11GIM2, M11GIM3, UK-M11GIM, DE-M11GIM, UK-M11GIM2, DE-M11GIM2, F11, f11, drone11, F11PRO, f11pro, drone11pro, F11 4K PRO, C11PRO, B11, B11PRO, B11 4K PRO, B11S, B11GIM, B11GIM2, B11GIM3, UK-B11GIM, DE-B11GIM, UK-B11GIM2, DE-B11GIM2, F15, F15 PRO, F15GIM, F15GIM2, F15GIM3, F15GIM2-3B, F15GIM2-4B, UK-F15GIM2, DE-F15GIM2, UK-F15-GIM, DE-F15GIM, F11MINI, F11MINI2, F11MINI3, F11MINI4, F11MINI5, F11MINI-3B, F11MINI-4B, UK-F11MINI, DE-F11MINI, UK-F11MINI2, DE-F11MIN2</td></tr>
<tr><td>Test Model No.:</td><td>F11GIM2</td></tr>
<tr><td colspan="2">Remark:All above models are identical in the same PCB layout, interior structure and electrical circuits. The differences are appearance color and model name for commercial purpose.</td></tr>
<tr><td>S/N:</td><td>20220301</td></tr>
<tr><td>Test sample(s) ID:</td><td>GTS202203000065-1</td></tr>
<tr><td>Sample(s) Status:</td><td>Engineer sample</td></tr>
<tr><td>Operation Frequency:</td><td>
<table>
<tr><th>Band</th><th>Mode</th><th>Frequency Range(MHz)</th><th>Number of channels</th></tr>
<tr><td rowspan="4">U-NII Band I</td><td>IEEE 802.11a</td><td>5180-5240</td><td>4</td></tr>
<tr><td>IEEE 802.11n/ac 20MHz</td><td>5180-5240</td><td>4</td></tr>
<tr><td>IEEE 802.11n/ac 40MHz</td><td>5190-5230</td><td>2</td></tr>
<tr><td>IEEE 802.11ac 80MHz</td><td>5210</td><td>1</td></tr>
</table>
</td></tr>
<tr><td>Modulation technology:</td><td>OFDM</td></tr>
<tr><td>Antenna Type:</td><td>ANT 1&2: Integral Antenna</td></tr>
<tr><td>Antenna gain:</td><td>ANT 1&2: 3dBi</td></tr>
<tr><td>Power supply:</td><td>DC 3.7V, 1500mAh, 5.55Wh for Rechargeable Li-ion battery
The battery is charged via USB DC5V</td></tr>
</table>

Channel list for 802.11a/n/ac(HT20)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180MHz	40	5200MHz	44	5220MHz	48	5240MHz

Channel list for 802.11n(HT40)/ac(HT40)			
Channel	Frequency	Channel	Frequency
38	5190MHz	46	5230MHz

Channel list for 802.11ac(HT80)	
Channel	Frequency
42	5210MHz

5.2 Test mode

Transmitting mode	Keep the EUT in transmitting with modulation..

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

Pre-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.

Mode	Data rate	Mode	Data rate
802.11a/n/ac(HT20)	6/6.5 Mbps	802.11ac(HT80)	29.3 Mbps
802.11n/ac(HT40)	13.5 Mbps		

5.3 Test Facility

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

● **FCC —Registration No.: 381383**

Designation Number: CN5029

Global United Technology Services Co., Ltd., Shenzhen 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 files.

● **IC —Registration No.: 9079A**

CAB identifier: CN0091

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing .

● **NVLAP (LAB CODE:600179-0)**

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

5.4 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

Address: No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

Tel: 0755-27798480

Fax: 0755-27798960

5.5 Description of Support Units

Manufacturer	Description	Model	Serial Number/FCC ID
Apple	USB Charger	A1399	N/A
Lenovo	Notebook PC	E40-80	N/A

5.6 Deviation from Standards

None.

5.7 Additional Instructions

Test Software	Special test software provided by manufacturer
Power level setup	Default

6 Test Instruments list

Radiated Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	July. 02 2020	July. 01 2025
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June. 24 2021	June. 23 2022
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 24 2021	June. 23 2022
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June. 24 2021	June. 23 2022
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 24 2021	June. 23 2022
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 24 2021	June. 23 2022
9	Coaxial Cable	GTS	N/A	GTS211	June. 24 2021	June. 23 2022
10	Coaxial cable	GTS	N/A	GTS210	June. 24 2021	June. 23 2022
11	Coaxial Cable	GTS	N/A	GTS212	June. 24 2021	June. 23 2022
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 24 2021	June. 23 2022
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	June. 24 2021	June. 23 2022
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 24 2021	June. 23 2022
15	Band filter	Amindeon	82346	GTS219	June. 24 2021	June. 23 2022
16	Power Meter	Anritsu	ML2495A	GTS540	June. 24 2021	June. 23 2022
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 24 2021	June. 23 2022
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	June. 24 2021	June. 23 2022
19	Splitter	Agilent	11636B	GTS237	June. 24 2021	June. 23 2022
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 24 2021	June. 23 2022
21	Breitband hornantenne	SCHWARZBECK	BBHA 9170	GTS579	Oct. 17 2021	Oct. 16 2022
22	Amplifier	TDK	PA-02-02	GTS574	Oct. 17 2021	Oct. 16 2022
23	Amplifier	TDK	PA-02-03	GTS576	Oct. 17 2021	Oct. 16 2022
24	PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	GTS578	June. 24 2021	June. 23 2022

RF Conducted Test:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	MXA Signal Analyzer	Agilent	N9020A	GTS566	June. 24 2021	June. 23 2022
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 24 2021	June. 23 2022
3	Spectrum Analyzer	Agilent	E4440A	GTS533	June. 24 2021	June. 23 2022
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	June. 24 2021	June. 23 2022
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	June. 24 2021	June. 23 2022
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	June. 24 2021	June. 23 2022
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	June. 24 2021	June. 23 2022
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	June. 24 2021	June. 23 2022

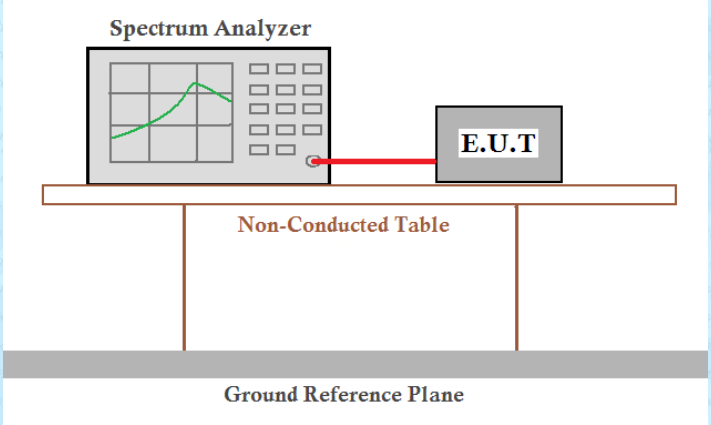
General used equipment:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	June. 24 2021	June. 23 2022
2	Barometer	ChangChun	DYM3	GTS255	June. 24 2021	June. 23 2022

7 Test results and Measurement Data

7.1 Antenna requirement:

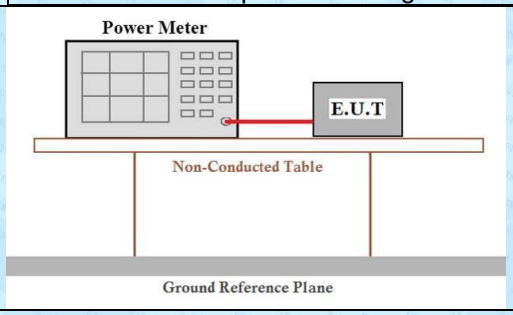
Standard requirement:	FCC Part15 C Section 15.203
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.	
E.U.T Antenna:	
The antenna is integral antenna, reference to the appendix II for details	

7.2 Emission Bandwidth

Test Requirement :	FCC Part15 E Section 15.407
Test Method :	ANSI C63.10:2013 & KDB 789033 D02 v02r01
Limit:	N/A
Test setup:	
Test procedure:	According to KDB 789033 D02 General U-NII Test Procedures New Rules v02r01.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

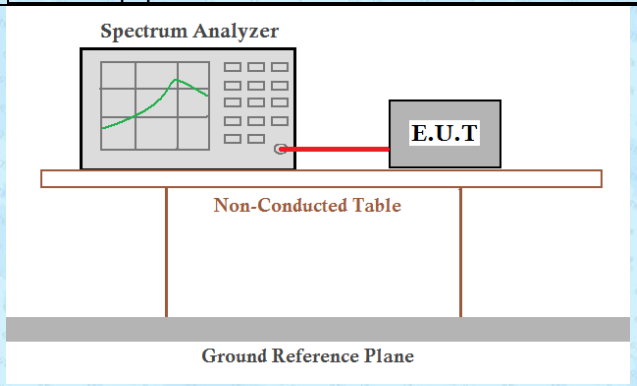
Measurement Data: The detailed test data see Appendix for WIFI 5G.

7.3 Peak Transmit Power

<table>
<tr><td>Test Requirement</td><td>FCC Part15 E Section 15.407</td></tr>
<tr><td>Test Method :</td><td>ANSI C63.10:2013 & KDB 789033 D02 v02r01</td></tr>
<tr><td>FCC Limit:</td><td>
<table>
<tr><td>Frequency band (MHz)</td><td>Limit</td></tr>
<tr><td rowspan="2">5150-5250</td><td>≤1W(30dBm) for master device</td></tr>
<tr><td>≤250Mw(23.98dBm) for client device</td></tr>
<tr><td>5250-5350</td><td>≤250Mw(23.98dBm) for client device or 11dBm+10logB*</td></tr>
<tr><td>5470-5725</td><td>≤250Mw(23.98dBm) for client device or 11dBm+10logB*</td></tr>
<tr><td colspan="2">Remark: *Where B is the 26Db emission bandwidth in MHz.
The maximum conducted output power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.</td></tr>
</table>
</td></tr>
<tr><td>Test setup:</td><td> 
</td></tr>
<tr><td>Test procedure:</td><td>Measurement using an RF average power meter
(i) Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied
a) The EUT is configured to transmit continuously or to transmit with a constant duty cycle.
b) At all times when the EUT is transmitting, it must be transmitting at its maximum power control level.
c) The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.
(ii) If the transmitter does not transmit continuously, measure the duty cycle, x, of the transmitter output signal as described in section B).
(iii) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
(iv) Adjust the measurement in dBm by adding 10 log(1/x) where x is the duty cycle (e.g., 10log(1/0.25) if the duty cycle is 25 percent).</td></tr>
<tr><td>Test Instruments:</td><td>Refer to section 6.0 for details</td></tr>
<tr><td>Test mode:</td><td>Refer to section 5.2 for details</td></tr>
<tr><td>Test results:</td><td>Pass</td></tr>
</table>

Measurement Data: The detailed test data see Appendix for WIFI 5G.

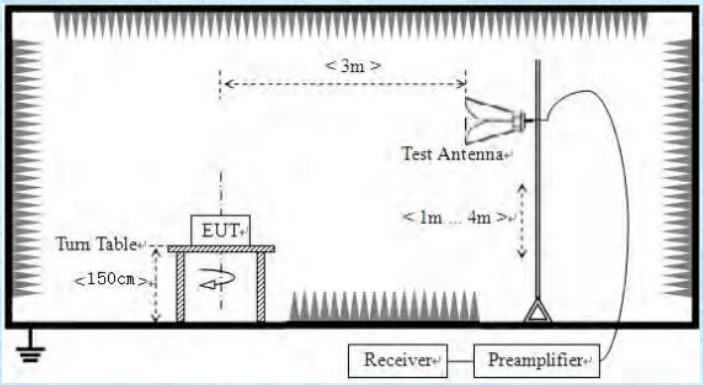
7.4 Power Spectral Density

Test Requirement:	FCC Part15 E Section 15.407
Test Method :	ANSI C63.10:2013 & KDB 789033 D02 v02r01
FCC Limit:	<table><tr><td>Frequency band (MHz)</td><td>Limit</td></tr><tr><td rowspan="2">5150-5250</td><td>≤17dBm in 1MHz for master device</td></tr><tr><td>≤11dBm in 1MHz for client device</td></tr><tr><td>5250-5350</td><td>≤11dBm in 1MHz for client device</td></tr><tr><td>5470-5725</td><td>≤11dBm in 1MHz for client device</td></tr><tr><td colspan="2">Remark: The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test.</td></tr></table>
Test setup:	
Test procedure:	1) Create an average power spectrum for the EUT operating mode being tested by following the instructions in section E)2) for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, “Compute power…”. 2) Use the peak search function on the instrument to find the peak of the spectrum. 3) Make the following adjustments to the peak value of the spectrum, if applicable: a) If Method SA-2 or SA-2 Alternative was used, add 10 log(1/x), where x is the duty cycle, to the peak of the spectrum. b) If Method SA-3 Alternative was used and the linear mode was used in step E)2)g)(viii), add 1 dB to the final result to compensate for the difference between linear averaging and power averaging. 4) The result is the PSD.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data: The detailed test data see Appendix for WIFI 5G.

7.5 Band Edge

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 E Section 15.407 and 5.205</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2013</td></tr>
<tr><td>Test site:</td><td>Measurement Distance: 3m (Semi-Anechoic Chamber)</td></tr>
<tr><td>Receiver setup:</td><td>
<table>
<tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>120KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>AV</td><td>1MHz</td><td>3MHz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><td>Frequency</td><td>Limit (dBuV/m @3m)</td><td>Remark</td></tr>
<tr><td>30MHz-88MHz</td><td>40.0</td><td>Quasi-peak Value</td></tr>
<tr><td>88MHz-216MHz</td><td>43.5</td><td>Quasi-peak Value</td></tr>
<tr><td>216MHz-960MHz</td><td>46.0</td><td>Quasi-peak Value</td></tr>
<tr><td>960MHz-1GHz</td><td>54.0</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>54.0</td><td>Average Value</td></tr>
<tr><td>68.2</td><td>Peak Value</td></tr>
</table>
Undesirable emission 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 EIRP 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 EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.
(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 EIRP of −27 dBm/MHz.
</td></tr>
<tr><td>Test Procedure:</td><td>
a. The EUT was placed on the top of a rotating table 1.5 m above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not
</td></tr>
</table>

	have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
Test setup:	For radiated emissions above 1GHz 
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Remarks:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
3. *The pre-test were performed on lowest, middle and highest frequencies, only the worst case's (lowest and highest frequencies) data was showed.*
4. *all were test, only the ANT 1 test result recorded in the report.*
5. *According to KDB 789033 D02 v02r01 section G) 1) (d), for For measurements above 1000 MHz @ 3m distance, the limit of field strength is computed as follows:*
   E[dBuV/m] = EIRP[dBm] + 95.2;
   For example, if EIRP = -27dBm
   E[dBuV/m] = -27 + 95.2 = 68.2dBuV/m.

Measurement Data:

802.11ac(HT20)					Test Frequency: 5180MHz			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
5150	39.98	31.56	4.95	37.58	38.91	68.2	-29.29	Vertical
5150	44.2	31.56	4.95	37.58	43.13	68.2	-25.07	Horizontal
5150	31.23	31.56	4.95	37.58	30.16	54	-23.84	Vertical
5150	34.22	31.56	4.95	37.58	33.15	54	-20.85	Horizontal

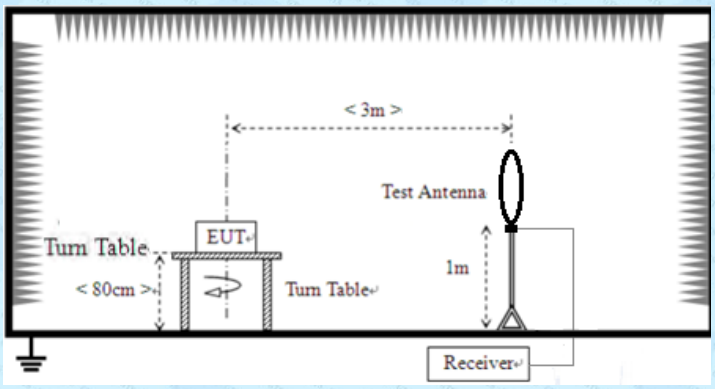
802.11ac(HT40)					Test Frequency: 5190MHz			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
5150	44.49	31.56	4.95	37.58	43.42	68.2	-24.78	Vertical
5150	39.56	31.56	4.95	37.58	38.49	68.2	-29.71	Horizontal
5150	32.5	31.56	4.95	37.58	31.43	54	-22.57	Vertical
5150	33.03	31.56	4.95	37.58	31.96	54	-22.04	Horizontal

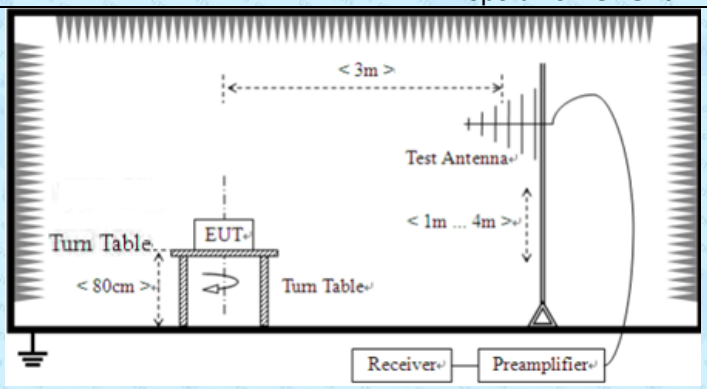
802.11ac(HT80)					Test Frequency: 5210MHz			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
5150	44.21	31.56	4.95	37.58	43.14	68.2	-25.06	Vertical
5150	42.88	31.56	4.95	37.58	41.81	68.2	-26.39	Horizontal
5150	31.43	31.56	4.95	37.58	30.36	54	-23.64	Vertical
5150	30.65	31.56	4.95	37.58	29.58	54	-24.42	Horizontal

7.6 Radiated Emission

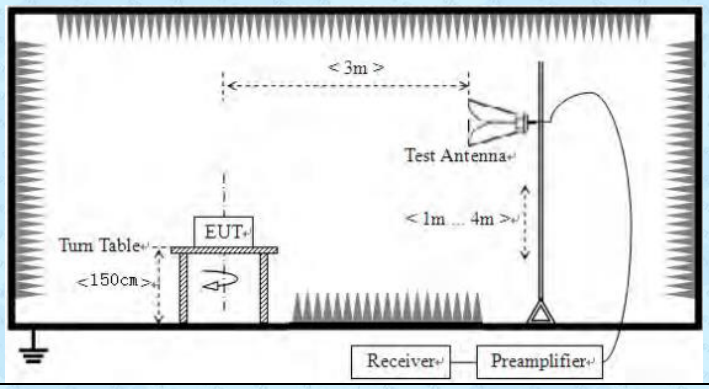
<table>
<tr><td>Test Requirement :</td><td>FCC Part15 C Section 15.209 and 15.205</td></tr>
<tr><td>Test Method :</td><td>ANSI C63.10: 2013</td></tr>
<tr><td>Test Frequency Range:</td><td>9kHz to 40GHz</td></tr>
<tr><td>Test site:</td><td>Measurement Distance: 3m (Semi-Anechoic Chamber)</td></tr>
<tr><td>Receiver setup:</td><td>
<table>
<tr><th>Frequency</th><th>Detector</th><th>RBW</th><th>VBW</th><th>Value</th></tr>
<tr><td>9kHz-150KHz</td><td>Quasi-peak</td><td>200Hz</td><td>1kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>150kHz-30MHz</td><td>Quasi-peak</td><td>9kHz</td><td>30kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>120KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>AV</td><td>1MHz</td><td>3MHz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>FCC Limit:</td><td>
<table>
<tr><th>Frequency (MHz)</th><th>Field strength (microvolts/meter)</th><th>Measurement distance (meters)</th></tr>
<tr><td>0.009-0.490</td><td>2400/F(kHz)</td><td>300</td></tr>
<tr><td>0.490-1.705</td><td>24000/F(kHz)</td><td>30</td></tr>
<tr><td>1.705-30.0</td><td>30</td><td>30</td></tr>
<tr><td>30-88</td><td>100**</td><td>3</td></tr>
<tr><td>88-216</td><td>150**</td><td>3</td></tr>
<tr><td>216-960</td><td>200**</td><td>3</td></tr>
<tr><td>Above 960</td><td>500</td><td>3</td></tr>
</table>

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.
</td></tr>
<tr><td>Test Procedure:</td><td>Substitution method was performed to determine the actual ERP emission levels of the EUT.
The following test procedure as below:
1>.Below 1GHz test procedure:
1. The EUT was placed on the top of a rotating table (0.8m for below 1GHz and 1.5 meters for above 1GHz) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotable table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.</td></tr>
</table>

	2>.Above 1GHz test procedure: 1. On the test site as test setup graph above,the EUT shall be placed at the 0.8m support on the turntable and in the position closest to normal use as declared by the provider. 2. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter.The output of the test antenna shall be connected to the measuring receiver. 3. The transmitter shall be switched on, if possible, without modulation and the measuring receiver shall be tuned to the frequency of the transmitter under test. 4. The test antenna shall be raised and lowered from 1m to 4m until a maximum signal level is detected by the measuring receiver. Then the turntable should be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver. 5. Repeat step 4 for test frequency with the test antenna polarized horizontally. 6. Remove the transmitter and replace it with a substitution antenna 7. Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a nonradiating cable. With the antennas at both ends vertically polarized, and with the signal generator tuned to a particular test frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output. 8. Repeat step 7 with both antennas horizontally polarized for each test frequency. 9. Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps 7 and 8 by the power loss in the cable between the generator and the antenna, and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna by the following formula: EIRP(dBm) = Pg(dBm) – cable loss (dB) + antenna gain (dBi) where: Pg is the generator output power into the substitution antenna.
Test setup:	For radiated emissions from 9kHz to 30MHz  For radiated emissions from 30MHz to1GHz



For radiated emissions above 1GHz



Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar
Test results:	Pass					

Remarks:

1. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.

Measurement Data:

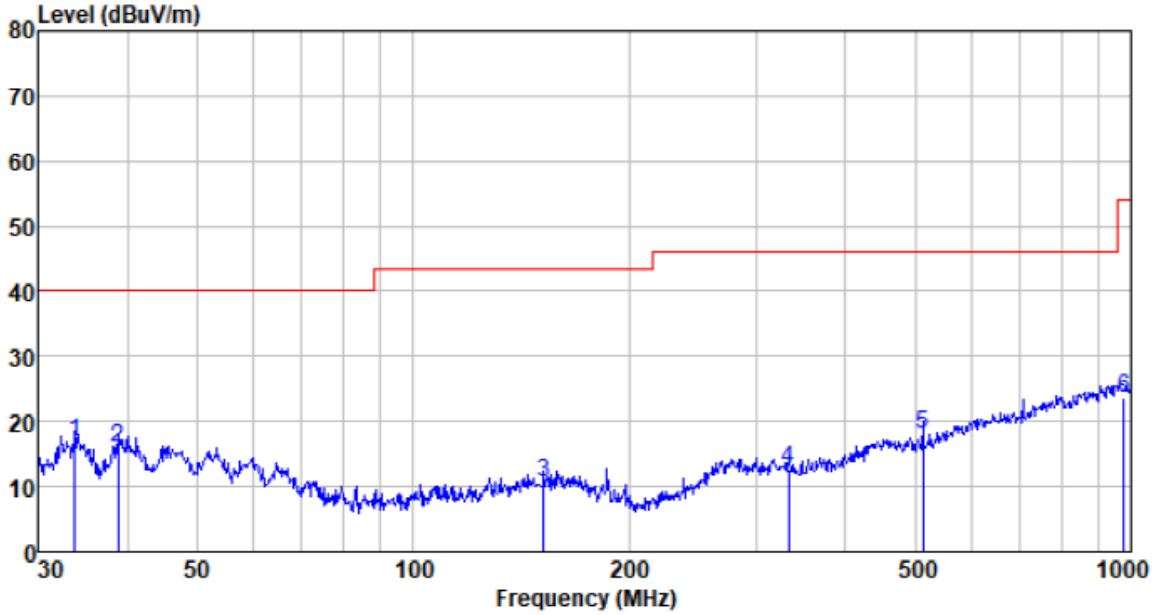
9 kHz ~ 30 MHz

The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

30MHz~ 1GHz

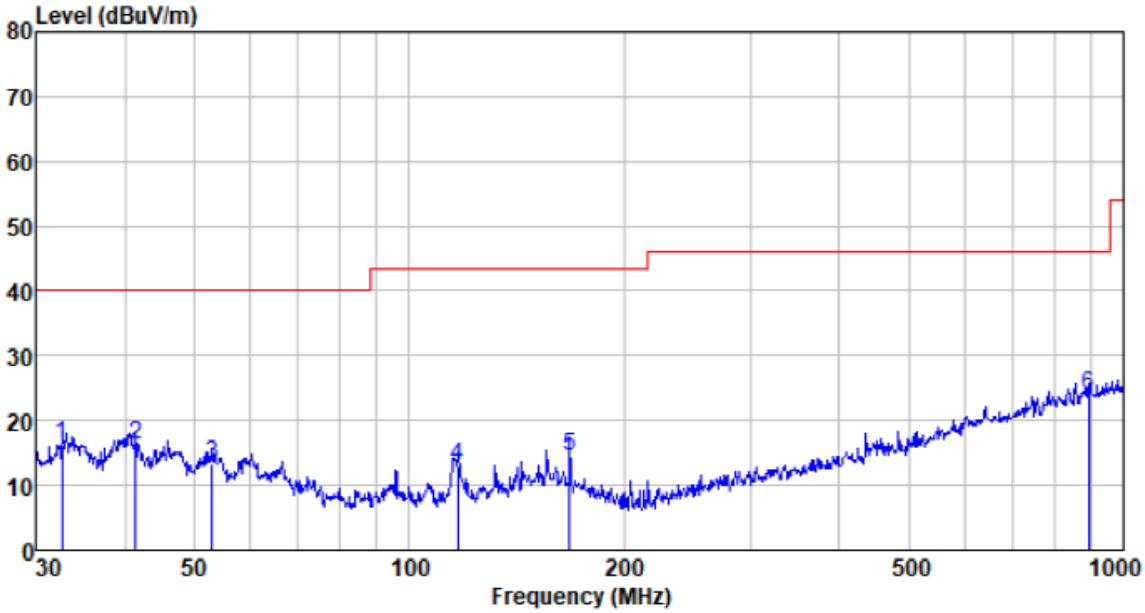
Pre-scan all test modes, found worst case at 802.11ac(HT20) 5200MHz, and so only show the test result of 802.11ac(HT20) 5200MHz,

Horizontal:



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
33.799	39.01	12.42	0.59	35.28	16.74	40.00	-23.26	QP
38.752	37.78	13.07	0.65	35.59	15.91	40.00	-24.09	QP
152.130	33.22	12.80	1.58	37.09	10.51	43.50	-32.99	QP
333.687	34.46	13.26	2.54	37.46	12.80	46.00	-33.20	QP
513.633	35.22	16.94	3.36	37.51	18.01	46.00	-27.99	QP
975.753	32.07	23.99	5.14	37.53	23.67	54.00	-30.33	QP

Vertical:



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
32.634	38.56	12.34	0.58	35.19	16.29	40.00	-23.71	QP
41.422	38.06	13.17	0.68	35.75	16.16	40.00	-23.84	QP
52.945	36.02	12.75	0.80	36.22	13.35	40.00	-26.65	QP
116.950	37.82	10.68	1.34	36.86	12.98	43.50	-30.52	QP
167.824	37.48	12.52	1.67	37.18	14.49	43.50	-29.01	QP
893.857	33.64	22.91	4.83	37.60	23.78	46.00	-22.22	QP

Above 1GHz:

802.11a					Test Frequency: 5180MHz			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360	33.85	38.96	8.27	35.64	45.44	68.2	-22.76	Vertical
15540	34.21	38.4	10.57	35.35	47.83	68.2	-20.37	Vertical
10360	31.26	38.96	8.27	35.64	42.85	68.2	-25.35	Horizontal
15540	31.95	38.4	10.57	35.35	45.57	68.2	-22.63	Horizontal
10360	27.25	38.96	8.27	35.64	38.84	54	-15.16	Vertical
15540	26.87	38.4	10.57	35.35	40.49	54	-13.51	Vertical
10360	25.44	38.96	8.27	35.64	37.03	54	-16.97	Horizontal
15540	23.77	38.4	10.57	35.35	37.39	54	-16.61	Horizontal

802.11a					Test Frequency: 5200MHz			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400	35.72	39.01	8.29	35.67	47.35	68.2	-20.85	Vertical
15600	31.1	38.3	10.62	35.36	44.66	68.2	-23.54	Vertical
10400	32.98	39.01	8.29	35.67	44.61	68.2	-23.59	Horizontal
15600	32.38	38.3	10.62	35.36	45.94	68.2	-22.26	Horizontal
10400	26.04	39.01	8.29	35.67	37.67	54	-16.33	Vertical
15600	27.55	38.3	10.62	35.36	41.11	54	-12.89	Vertical
10400	27.21	39.01	8.29	35.67	38.84	54	-15.16	Horizontal
15600	23.88	38.3	10.62	35.36	37.44	54	-16.56	Horizontal

802.11a					Test Frequency: 5240MHz			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480	36.61	39.15	8.32	35.78	48.3	68.2	-19.9	Vertical
15720	33.04	38	10.72	35.37	46.39	68.2	-21.81	Vertical
10480	33.79	39.15	8.32	35.78	45.48	68.2	-22.72	Horizontal
15720	33.15	38	10.72	35.37	46.5	68.2	-21.7	Horizontal
10480	25.71	39.15	8.32	35.78	37.4	54	-16.6	Vertical
15720	28.22	38	10.72	35.37	41.57	54	-12.43	Vertical
10480	23.73	39.15	8.32	35.78	35.42	54	-18.58	Horizontal
15720	25.8	38	10.72	35.37	39.15	54	-14.85	Horizontal

802.11n(HT20)				Test Frequency: 5180MHz				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360	33.16	38.96	8.27	35.64	44.75	68.2	-23.45	Vertical
15540	31.19	38.4	10.57	35.35	44.81	68.2	-23.39	Vertical
10360	33.57	38.96	8.27	35.64	45.16	68.2	-23.04	Horizontal
15540	31.36	38.4	10.57	35.35	44.98	68.2	-23.22	Horizontal
10360	28.46	38.96	8.27	35.64	40.05	54	-13.95	Vertical
15540	27.65	38.4	10.57	35.35	41.27	54	-12.73	Vertical
10360	25.01	38.96	8.27	35.64	36.6	54	-17.4	Horizontal
15540	22.61	38.4	10.57	35.35	36.23	54	-17.77	Horizontal

802.11n(HT20)				Test Frequency: 5200MHz				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400	35.45	39.01	8.29	35.67	47.08	68.2	-21.12	Vertical
15600	31.7	38.3	10.62	35.36	45.26	68.2	-22.94	Vertical
10400	31.53	39.01	8.29	35.67	43.16	68.2	-25.04	Horizontal
15600	32.85	38.3	10.62	35.36	46.41	68.2	-21.79	Horizontal
10400	29.57	39.01	8.29	35.67	41.2	54	-12.8	Vertical
15600	24.33	38.3	10.62	35.36	37.89	54	-16.11	Vertical
10400	24.22	39.01	8.29	35.67	35.85	54	-18.15	Horizontal
15600	24.55	38.3	10.62	35.36	38.11	54	-15.89	Horizontal

802.11n(HT20)				Test Frequency: 5240MHz				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480	36.78	39.15	8.32	35.78	48.47	68.2	-19.73	Vertical
15720	31.82	38	10.72	35.37	45.17	68.2	-23.03	Vertical
10480	35.64	39.15	8.32	35.78	47.33	68.2	-20.87	Horizontal
15720	29.71	38	10.72	35.37	43.06	68.2	-25.14	Horizontal
10480	28.84	39.15	8.32	35.78	40.53	54	-13.47	Vertical
15720	27.74	38	10.72	35.37	41.09	54	-12.91	Vertical
10480	25.6	39.15	8.32	35.78	37.29	54	-16.71	Horizontal
15720	23.33	38	10.72	35.37	36.68	54	-17.32	Horizontal

802.11n(HT40)					Test Frequency: 5190MHz			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10380	33.42	39.01	8.28	35.67	45.04	68.2	-23.16	Vertical
15570	32.85	38.3	10.6	35.36	46.39	68.2	-21.81	Vertical
10380	31.49	39.01	8.28	35.67	43.11	68.2	-25.09	Horizontal
15570	33.05	38.3	10.6	35.36	46.59	68.2	-21.61	Horizontal
10380	29.14	39.01	8.28	35.67	40.76	54	-13.24	Vertical
15570	25.89	38.3	10.6	35.36	39.43	54	-14.57	Vertical
10380	23.33	39.01	8.28	35.67	34.95	54	-19.05	Horizontal
15570	24.3	38.3	10.6	35.36	37.84	54	-16.16	Horizontal

802.11n(HT40)					Test Frequency: 5230MHz			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10460	33.2	39.11	8.31	35.75	44.87	68.2	-23.33	Vertical
15690	33.43	38.1	10.7	35.37	46.86	68.2	-21.34	Vertical
10460	35.06	39.11	8.31	35.75	46.73	68.2	-21.47	Horizontal
15690	31.31	38.1	10.7	35.37	44.74	68.2	-23.46	Horizontal
10460	29.13	39.11	8.31	35.75	40.8	54	-13.2	Vertical
15690	28.33	38.1	10.7	35.37	41.76	54	-12.24	Vertical
10460	27.84	39.11	8.31	35.75	39.51	54	-14.49	Horizontal
15690	24.5	38.1	10.7	35.37	37.93	54	-16.07	Horizontal

802.11ac(HT20)					Test Frequency: 5180MHz			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360	35.24	38.96	8.27	35.64	46.83	68.2	-21.37	Vertical
15540	34.71	38.4	10.57	35.35	48.33	68.2	-19.87	Vertical
10360	34.97	38.96	8.27	35.64	46.56	68.2	-21.64	Horizontal
15540	31.26	38.4	10.57	35.35	44.88	68.2	-23.32	Horizontal
10360	27.27	38.96	8.27	35.64	38.86	54	-15.14	Vertical
15540	26.61	38.4	10.57	35.35	40.23	54	-13.77	Vertical
10360	25.36	38.96	8.27	35.64	36.95	54	-17.05	Horizontal
15540	24.07	38.4	10.57	35.35	37.69	54	-16.31	Horizontal

802.11ac(HT20)					Test Frequency: 5200MHz			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400	32.02	39.01	8.29	35.67	43.65	68.2	-24.55	Vertical
15600	34.67	38.3	10.62	35.36	48.23	68.2	-19.97	Vertical
10400	34.21	39.01	8.29	35.67	45.84	68.2	-22.36	Horizontal
15600	29.92	38.3	10.62	35.36	43.48	68.2	-24.72	Horizontal
10400	27.09	39.01	8.29	35.67	38.72	54	-15.28	Vertical
15600	28.12	38.3	10.62	35.36	41.68	54	-12.32	Vertical
10400	24.18	39.01	8.29	35.67	35.81	54	-18.19	Horizontal
15600	25.95	38.3	10.62	35.36	39.51	54	-14.49	Horizontal

802.11ac(HT20)					Test Frequency: 5240MHz			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480	33.53	39.15	8.32	35.78	45.22	68.2	-22.98	Vertical
15720	34.62	38	10.72	35.37	47.97	68.2	-20.23	Vertical
10480	31.31	39.15	8.32	35.78	43	68.2	-25.2	Horizontal
15720	33.87	38	10.72	35.37	47.22	68.2	-20.98	Horizontal
10480	25.51	39.15	8.32	35.78	37.2	54	-16.8	Vertical
15720	26.77	38	10.72	35.37	40.12	54	-13.88	Vertical
10480	23.88	39.15	8.32	35.78	35.57	54	-18.43	Horizontal
15720	24.19	38	10.72	35.37	37.54	54	-16.46	Horizontal

802.11ac(HT40)					Test Frequency: 5190MHz			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10380	32.8	39.01	8.28	35.67	44.42	68.2	-23.78	Vertical
15570	33.35	38.3	10.6	35.36	46.89	68.2	-21.31	Vertical
10380	35.94	39.01	8.28	35.67	47.56	68.2	-20.64	Horizontal
15570	29.94	38.3	10.6	35.36	43.48	68.2	-24.72	Horizontal
10380	25.02	39.01	8.28	35.67	36.64	54	-17.36	Vertical
15570	28.18	38.3	10.6	35.36	41.72	54	-12.28	Vertical
10380	25.27	39.01	8.28	35.67	36.89	54	-17.11	Horizontal
15570	26.74	38.3	10.6	35.36	40.28	54	-13.72	Horizontal

802.11ac(HT40)					Test Frequency: 5230MHz			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10460	36.79	39.11	8.31	35.75	48.46	68.2	-19.74	Vertical
15690	34.28	38.1	10.7	35.37	47.71	68.2	-20.49	Vertical
10460	34.72	39.11	8.31	35.75	46.39	68.2	-21.81	Horizontal
15690	33.24	38.1	10.7	35.37	46.67	68.2	-21.53	Horizontal
10460	29.68	39.11	8.31	35.75	41.35	54	-12.65	Vertical
15690	25.38	38.1	10.7	35.37	38.81	54	-15.19	Vertical
10460	25.39	39.11	8.31	35.75	37.06	54	-16.94	Horizontal
15690	26.91	38.1	10.7	35.37	40.34	54	-13.66	Horizontal

802.11ac(HT80)					Test Frequency: 5210MHz			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10420	34.06	39.06	8.29	35.71	45.7	68.2	-22.5	Vertical
15630	33.18	38.2	10.65	35.36	46.67	68.2	-21.53	Vertical
10420	35.83	39.06	8.29	35.71	47.47	68.2	-20.73	Horizontal
15630	30.37	38.2	10.65	35.36	43.86	68.2	-24.34	Horizontal
10420	28.41	39.06	8.29	35.71	40.05	54	-13.95	Vertical
15630	25.13	38.2	10.65	35.36	38.62	54	-15.38	Vertical
10420	26.95	39.06	8.29	35.71	38.59	54	-15.41	Horizontal
15630	22.99	38.2	10.65	35.36	36.48	54	-17.52	Horizontal

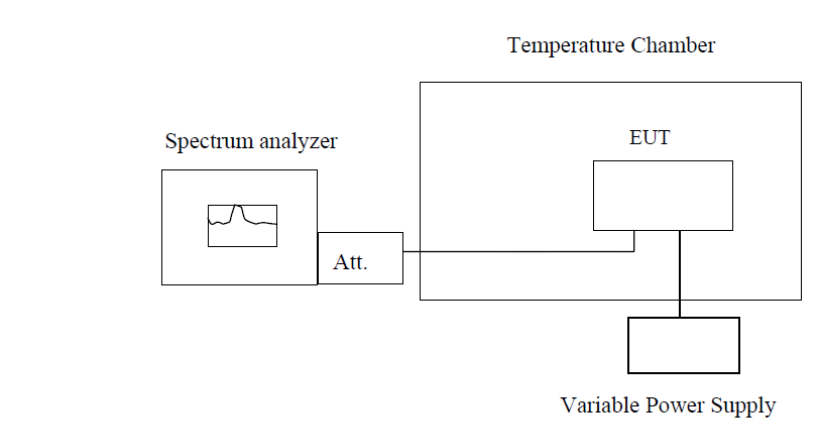
Notes:

1. Level = Read Level + Antenna Factor+ Cable loss- Preamp Factor.

2. The test trace is same as the ambient noise (the test frequency range: 18GHz~40GHz), therefore no data appear in the report.

3. all were test, only the ANT 1 test result recorded in the report.

7.7 Frequency stability

Test Requirement:	FCC Part15 C Section 15.407(g)
Test Method:	ANSI C63.10:2013, FCC Part 2.1055,
Limit:	Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified
Test Procedure:	The EUT was setup to ANSI C63.4, 2003; tested to 2.1055 for compliance to FCC Part 15.407(g) requirements.
Test setup:	 **Note :** Measurement setup for testing on Antenna connector
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data: The detailed test data see Appendix for WIFI 5G.

8 Test Setup Photo

Reference to the **appendix I** for details.

9 EUT Constructional Details

Reference to the **appendix II** for details.

---END---