



Test Report No.:
FCC2025-0008-RF1

TEST REPORT

FCC ID : 2BOP508182020
Applicant : Open Launch LLC
Product Name : Nova
Model No. : Nova

CVC Testing Technology Co., Ltd.

Product Name	Nova					
Type/Model	Nova	Trade Mark	NOVA			
Applicant	Open Launch LLC					
Applicant Address	103 Forrest St Lafayette LA 70501					
Manufacturer	Huizhou Boshijie Technology Co., Ltd					
Manufacturer Address	Boshijie Industrial Park, No. 1 Hufeng West Third Road, Zhongkai High-tech Zone, Huizhou City, Guangdong, China. 516006					
Factory	Huizhou Boshijie Technology Co., Ltd					
Factory Address	Boshijie Industrial Park, No. 1 Hufeng West Third Road, Zhongkai High-tech Zone, Huizhou City, Guangdong, China. 516006					
Sample Identification	1-1	Test Item	See page 9			
Tested According To	FCC CFR47 Part 15C Radio Frequency Devices ANSI C63.10-2020 KDB 558074 D01 15.247 Meas Guidance v05r02 KDB 662911 D01 Multiple Transmitter Output v02r01					
Receiving Date	2025-02-19	Completing Date	2025-04-26			
Test conclusion	<p>The equipment under test was found to comply with the requirements of the standards applied.</p> <p>Final Verdict: Pass.</p>					
	Seal of CVC					
	Date of issue: 2025-06-06					
Abbreviations: / Pass= passed Fail = failed N/A= not applicable						
This test report relates only to the EUT, and shall not be reproduced except in full, without written approval of CVC.						

Approved by:

Chen Huawen



Reviewed by:

Xu Zhenfei



Tested by:

Lu Weiji



TABLE OF CONTENTS

RELEASE CONTROL RECORD	4
1. GENERAL PRODUCT INFORMATION	5
1.1 GENERAL INFORMATION	5
2. TEST SITES	6
2.1 TEST FACILITIES	6
2.2 DESCRIPTION OF NON-STANDARD METHOD AND DEVIATIONS	6
2.3 LIST OF TEST AND MEASUREMENT INSTRUMENTS	6
3. TEST CONFIGURATION	7
3.1 TEST MODE	7
3.2 DUTY CYCLE	9
4. SUMMARY OF MEASUREMENT RESULTS	10
5. MEASUREMENT PROCEDURE	11
5.1 CONDUCTED EMISSION	11
5.2 RADIATED EMISSION	17
5.3 MAXIMUM CONDUCTED OUTPUT POWER	35
5.4 MINIMUM 6 DB BANDWIDTH	38
5.5 OCCUPIED CHANNEL BANDWIDTH	40
5.6 BAND EDGE MEASUREMENT	42
5.7 MAXIMUM POWER SPECTRAL DENSITY	44
5.8 SPURIOUS RF CONDUCTED EMISSIONS	46
6. APPENDIX X	49

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
FCC2025-0008-RF1	Original release	June.06,2025

1. General Product Information

1.1 General information

Product Name	Nova
Model No.	Nova
Additional model	/
Power Supply	DC 12.0V --- 5.0A From Adapter
Serial Number(SN)	B110C460
Bluetooth Version	5.1
Software version	2024-Dec-05
Hardware version	REV-F
specific power settings	Bluetooth(LE_1M, LE_2M): 6 IEEE 802.11b: 14 IEEE 802.11g: 16 IEEE 802.11n(HT20&HT40): 16
Antenna Type	Internal antenna
Antenna Gain	WIFI: Ant1:2.50 dBi, Ant2:2.50 dBi (provided by client) Bluetooth: 2.50 dBi (provided by client)
Beamforming gain	Unsupported (provided by client)
Frequency Range	Bluetooth(LE_1M, LE_2M): 2402~2480MHz IEEE 802.11b/g/n(HT20): 2412~2462MHz IEEE 802.11n(HT40): 2422~2452MHz
Channel Number	Bluetooth(LE_1M, LE_2M):40 Channels IEEE 802.11b/g/n (HT20): 11 Channels IEEE 802.11n (HT40): 7 Channels
Type of Modulation	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM GFSK for BT-LE
Max. Conducted Power	Bluetooth(LE): 6.12 dBm WIFI2.4G:24.78dBm
Operate Temp.Range	-15°C~+45°C

Note:

1. The information of the EUT is declared by the manufacturer.
2. The laboratory is not responsible for the product technical specification provided by the client.
3. The product models of this application are: Nova. All the tests carried out on model Nova.
4. EUT photo refer to report (Report NO.:FCC2025-0008-EUT).
5. There are two power supplies, from different manufacturers.

Power supply information		
No.	Manufacturer	MODEL
1	MOSO Power	MS-Z5000R120-060B0-Q
2	Yingyuan	CGSW65C-120-5000II

6. The EUT have MIMO function, provides 2 completed transmitter and 2 receiver.

2. Test Sites

2.1 Test Facilities

The tests and measurements refer to this report were performed by RF testing Lab. of CVC Testing Technology Co., Ltd.

Add.: No.3, Tiantaiyi Road, Kaitai Avenue, Science City, Guangzhou, Guangdong, 510663, People's Republic of China

Telephone : +86-20-32293888

Fax : +86-20-32293889

FCC(Test firm designation number: CN1282)

IC(Test firm CAB identifier number: CN0103)

CNAS(Test firm designation number: L0095)

2.2 Description of Non-standard Method and Deviations

The testing and measurement methods used in this report are applied by all standard methods. Not any non-standard method or deviation from the used standards was used.

2.3 List of Test and Measurement Instruments

Refer to **Appendix X**.

3. Test Configuration

3.1 Test Mode

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

Test Mode	Antenna Delivery	Test Channel
Bluetooth(LE_1M)	1TX / 1RX	0,19,39
Bluetooth(LE_2M)	1TX / 1RX	0,19,39
IEEE 802.11b	1TX / 1RX	1,6,11
IEEE 802.11g	1TX / 1RX	1,6,11
IEEE 802.11n 20 MIMO	2TX / 2RX	1,6,11
IEEE 802.11n 40 MIMO	2TX / 2RX	3,6,9

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in lie-down position (X axis) and the worst case was recorded.

In order to find the worst case condition, Pre-tests are needed at the presence of different data rate and different channels. Preliminary tests have been done on all the configurations for confirming worst case. Data rate below means worst-case rate of each test item.

Worst-case data rates and channels are shown as following table.

Test Mode	Data Rate		
	Antenna 1	Antenna 2	MIMO
Bluetooth(LE_1M)	1	/	/
Bluetooth(LE_2M)	2	/	/
IEEE 802.11b	1	1	/
IEEE 802.11g	6	6	/
IEEE 802.11n 2.4GHz 20MHz	MCS 0	MCS 0	MCS 8
IEEE 802.11n 2.4GHz 40MHz	MCS 0	MCS 0	MCS 8

Test Items	Test Antennas	Test Modes	Test Channels
Radiated Emissions	Antenna 1, Antenna 2	IEEE 802.11n 20 Bluetooth(LE_2M)	1/ 0
Radiated Emissions (Band Edge)	Antenna 1, Antenna 2	IEEE 802.11n 20 Bluetooth(LE_2M)	1,6,11/ 0,19,39
Maximum conducted output power	Antenna 1, Antenna 2	Bluetooth(LE_1M)/ Bluetooth(LE_2M)/ IEEE 802.11b/ IEEE 802.11g/ IEEE 802.11n 20/ IEEE 802.11n 40	0,19,39/ 0,19,39/ 1,6,11/ 1,6,11/ 1,6,11/ 3,6,9
Minimum 6 dB bandwidth	Antenna 1, Antenna 2	Bluetooth(LE_1M)/ Bluetooth(LE_2M)/ IEEE 802.11b/ IEEE 802.11g/ IEEE 802.11n 20/ IEEE 802.11n 40	0,19,39/ 0,19,39/ 1,6,11/ 1,6,11/ 1,6,11/ 3,6,9
Occupied Channel Bandwidth	Antenna 1, Antenna 2	Bluetooth(LE_1M)/ Bluetooth(LE_2M)/ IEEE 802.11b/ IEEE 802.11g/ IEEE 802.11n 20/ IEEE 802.11n 40	0,19,39/ 0,19,39/ 1,6,11/ 1,6,11/ 1,6,11/ 3,6,9
Band Edge Measurement	Antenna 1, Antenna 2	Bluetooth(LE_1M)/ Bluetooth(LE_2M)/ IEEE 802.11b/ IEEE 802.11g/ IEEE 802.11n 20/ IEEE 802.11n 40	0,39/ 0,39/ 1,11/ 1,11/ 1,11/ 3,9
Maximum Power spectral density	Antenna 1, Antenna 2	Bluetooth(LE_1M)/ Bluetooth(LE_2M)/ IEEE 802.11b/ IEEE 802.11g/ IEEE 802.11n 20/ IEEE 802.11n 40	0,19,39/ 0,19,39/ 1,6,11/ 1,6,11/ 1,6,11/ 3,6,9
Spurious RF Conducted Emissions	Antenna 1, Antenna 2	Bluetooth(LE_1M)/ Bluetooth(LE_2M)/ IEEE 802.11b/ IEEE 802.11g/ IEEE 802.11n 20/ IEEE 802.11n 40	0,19,39/ 0,19,39/ 1,6,11/ 1,6,11/ 1,6,11/ 3,6,9

3.2 Duty cycle

TestMode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Limit	Verdict
11B	Ant1	2412	100.00	100.00	100.00	---	---
	Ant2	2412	100.00	100.00	100.00	---	---
	Ant1	2437	100.00	100.00	100.00	---	---
	Ant2	2437	100.00	100.00	100.00	---	---
	Ant1	2462	100.00	100.00	100.00	---	---
	Ant2	2462	100.00	100.00	100.00	---	---
11G	Ant1	2412	100.00	100.00	100.00	---	---
	Ant2	2412	100.00	100.00	100.00	---	---
	Ant1	2437	100.00	100.00	100.00	---	---
	Ant2	2437	100.00	100.00	100.00	---	---
	Ant1	2462	100.00	100.00	100.00	---	---
	Ant2	2462	100.00	100.00	100.00	---	---
11N20MIMO	Ant1	2412	100.00	100.00	100.00	---	---
	Ant2	2412	100.00	100.00	100.00	---	---
	Ant1	2437	100.00	100.00	100.00	---	---
	Ant2	2437	100.00	100.00	100.00	---	---
	Ant1	2462	100.00	100.00	100.00	---	---
	Ant2	2462	100.00	100.00	100.00	---	---
11N40MIMO	Ant1	2422	100.00	100.00	100.00	---	---
	Ant2	2422	100.00	100.00	100.00	---	---
	Ant1	2437	100.00	100.00	100.00	---	---
	Ant2	2437	100.00	100.00	100.00	---	---
	Ant1	2452	100.00	100.00	100.00	---	---
	Ant2	2452	100.00	100.00	100.00	---	---
BLE_1M	Ant1	2402	2.13	2.50	85.20	---	---
		2440	2.13	2.50	85.20	---	---
		2480	2.13	2.50	85.20	---	---
BLE_2M	Ant1	2402	1.07	1.88	56.91	---	---
		2440	1.07	1.88	56.91	---	---
		2480	1.07	1.87	57.22	---	---

4. Summary of measurement results

Summary of measurements of results	Clause in FCC rules	Verdict	Note
Conducted Emissions	15.207	PASS	/
Radiated Emissions	15.247(d),15.205,15.209	PASS	/
Maximum conducted output power	15.247(b)(3)	PASS	Appendix C of WIFI2.4G_diagram and Appendix C of BLE_diagram
Minimum 6 dB bandwidth	15.247(a)(2)	PASS	Appendix A of WIFI2.4G_diagram and Appendix A of BLE_diagram
Occupied Channel Bandwidth	15.247(a)(2)	PASS	Appendix B of WIFI2.4G_diagram and Appendix B of BLE_diagram
Band Edge Measurement	15.247(d)	PASS	Appendix E of WIFI2.4G_diagram and Appendix E of BLE_diagram
Maximum Power spectral density	15.247(e)	PASS	Appendix D of WIFI2.4G_diagram and Appendix D of BLE_diagram
Spurious RF Conducted Emissions	15.247(d)	PASS	Appendix F of WIFI2.4G_diagram and Appendix F of BLE_diagram
Antenna Requirement	15.203	PASS	See note 1

Note 1: According to 15.203, it is considered sufficient to comply with the provisions of this section.

5. Measurement procedure

5.1 Conducted Emission

Ambient condition:

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.2kPa

Method of Measurement:

The EUT was setup according to ANSI C63.10-2020 for compliance to FCC 47CFR 15.247 requirements. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs) Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.

The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.

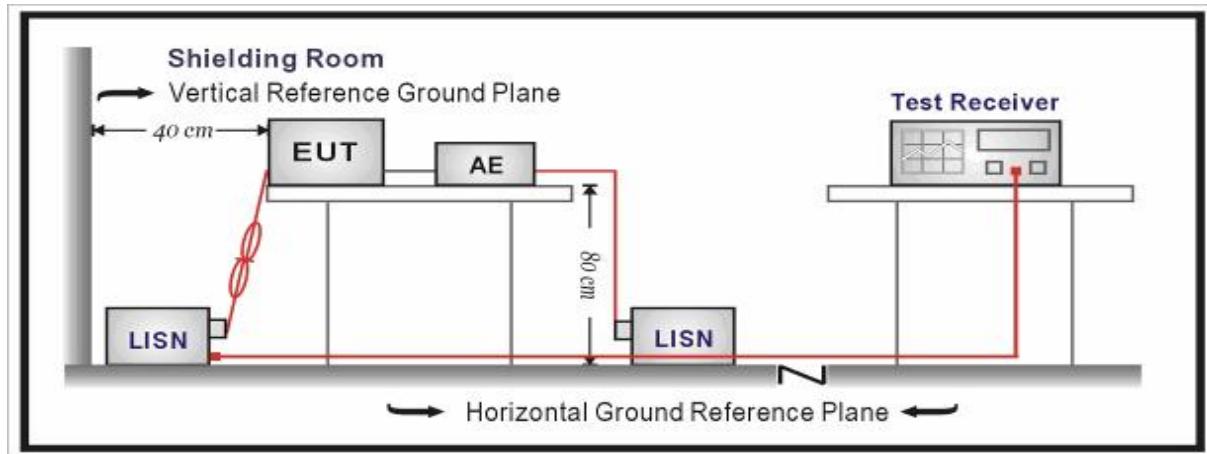
Limits:

Frequency (MHz)	Conducted Limits(dB μ V)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46*
0.5 - 5	56	46
5 - 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

Test Setup:



Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Notes:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Level =Reading + Factor.

Measurement Uncertainty:

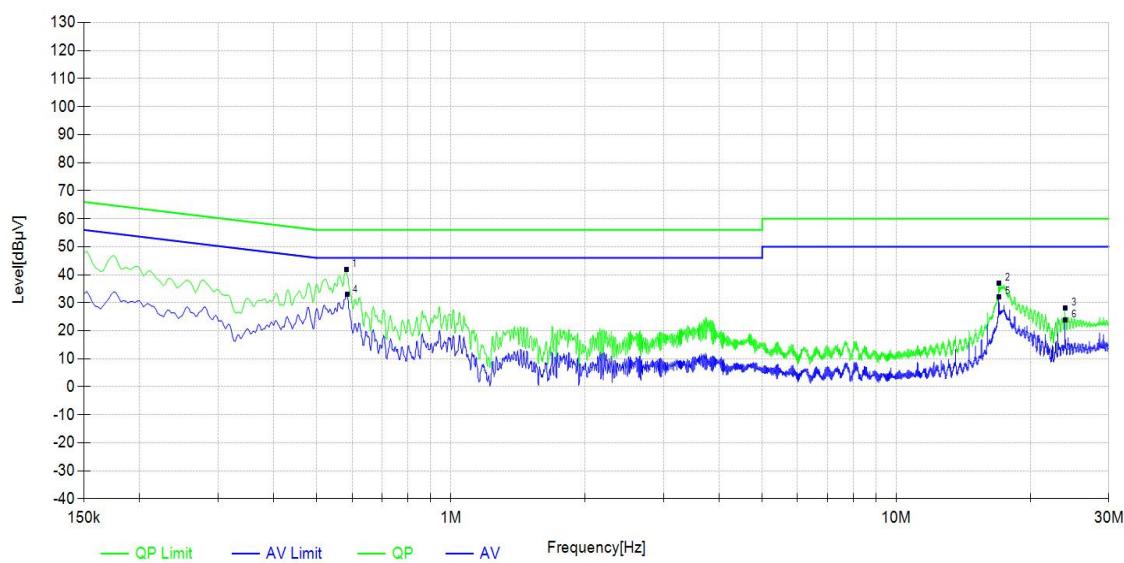
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$. $U = 3.12$ dB.

Test Results:

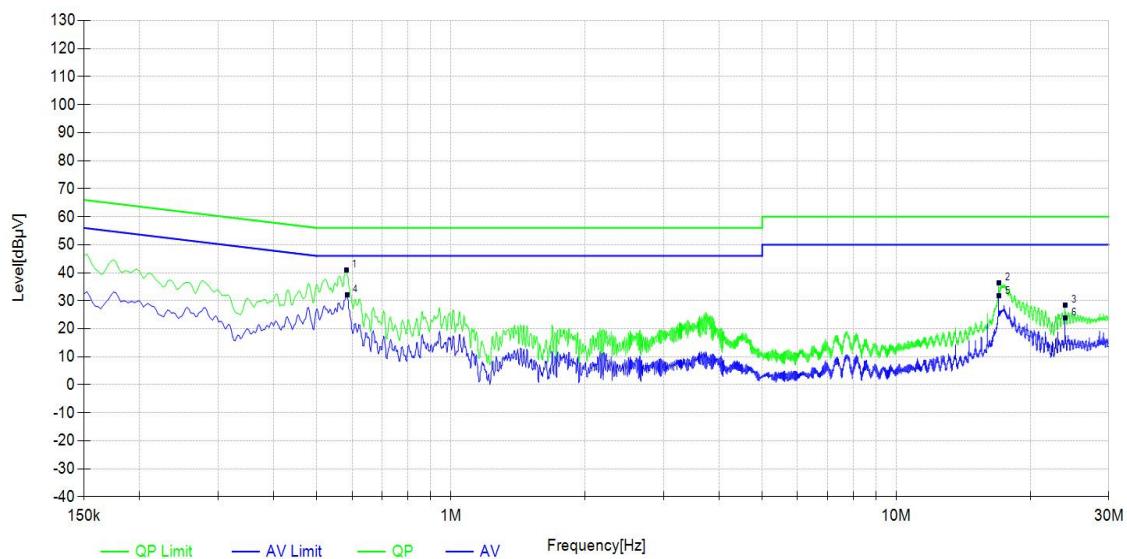
WIFI:

During the test, the Conducted Emission from 150kHz to 30MHz was carried out in 2 power modes, in all modes of WIFI, on all channels and all antennas. Power supply 1#, 802.11n20, Channel 1, MIMO are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

Radiates Emission		150k~30MHz						
Power Line		L						
Test channel		Worst-Case						
Suspected List								
Freq. [MHz]	Factor [dB]	Reading [dB μ V]	Level [dB μ V]	Limit [dB μ V]	Margin [dB]	Detector	Type	Pass/Fail
0.582	10.23	31.62	41.85	56.00	14.15	QP	L	PASS
17.02275	11.64	25.46	37.10	60.00	22.90	QP	L	PASS
24.000	11.69	16.49	28.18	60.00	31.82	QP	L	PASS
0.58425	10.23	22.62	32.85	46.00	13.15	AV	L	PASS
17.025	11.64	20.51	32.15	50.00	17.85	AV	L	PASS
24.000	11.69	12.28	23.97	50.00	26.03	AV	L	PASS



Radiates Emission	150k~30MHz							
Power Line	N							
Test channel	Worst-Case							
Suspected List								
Freq. [MHz]	Factor [dB]	Reading [dB μ V]	Level [dB μ V]	Limit [dB μ V]	Margin [dB]	Detector	Type	Pass/Fail
0.582	10.21	30.85	41.06	56.00	14.94	QP	N	PASS
17.01825	11.60	24.89	36.49	60.00	23.51	QP	N	PASS
24.000	11.58	16.95	28.53	60.00	31.47	QP	N	PASS
0.58425	10.21	21.84	32.05	46.00	13.95	AV	N	PASS
17.01825	11.60	20.09	31.69	50.00	18.31	AV	N	PASS
24.000	11.58	12.24	23.82	50.00	26.18	AV	N	PASS

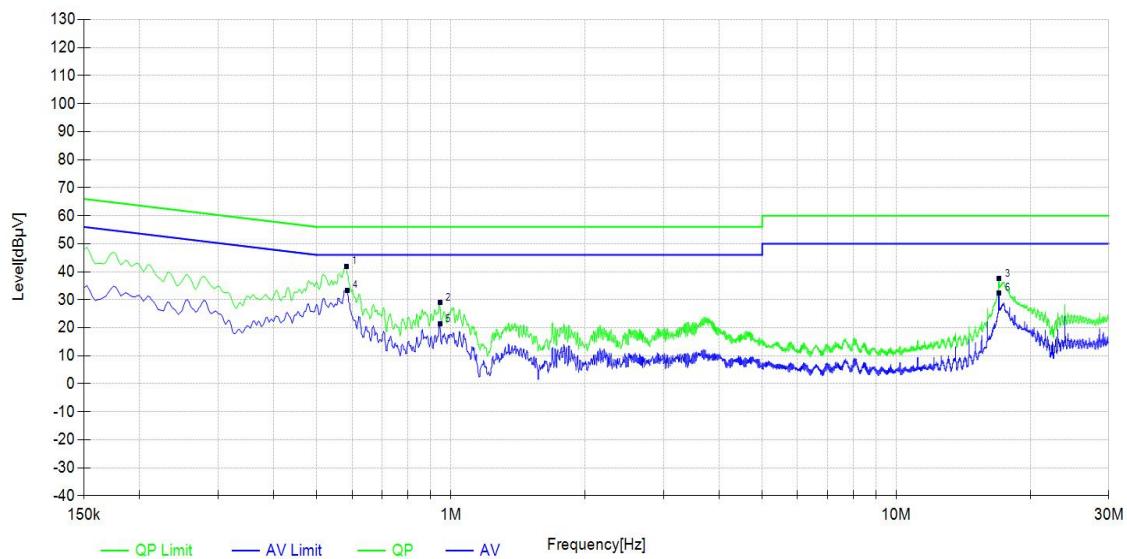


Test Results:

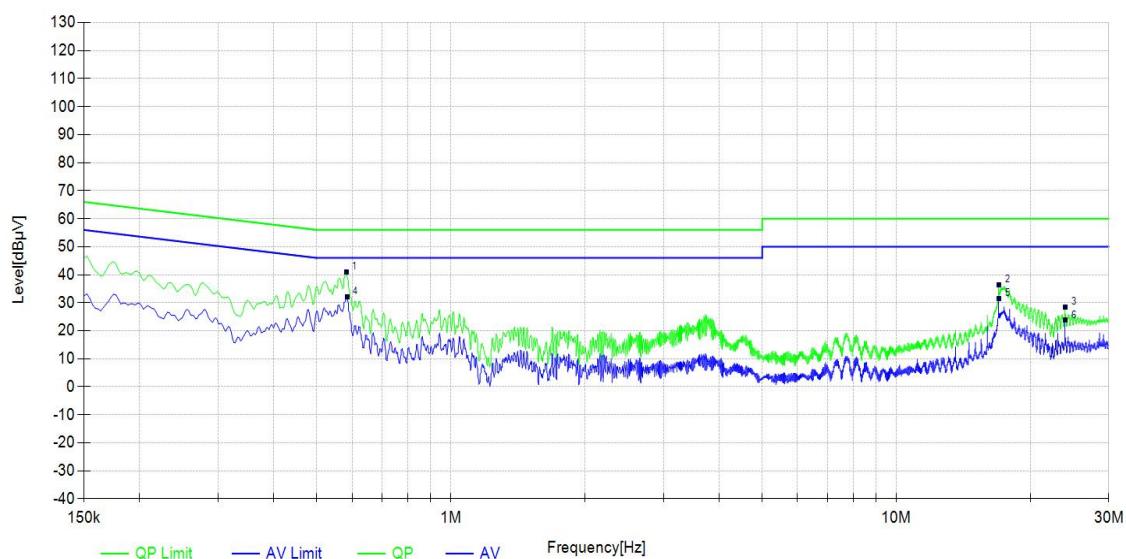
Bluetooth(Low Energy):

During the test, the Conducted Emission from 150kHz to 30MHz was carried out in 2 power modes, in all modes of WIFI, on all channels and all antennas. Power supply 1#,BLE(2Mbps), channel 0, antenna 1 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

Radiates Emission	150k~30MHz							
Power Line	L							
Test channel	Worst-Case							
Suspected List								
Freq. [MHz]	Factor [dB]	Reading [dB μ V]	Level [dB μ V]	Limit [dB μ V]	Margin [dB]	Detector	Type	Pass/Fail
0.582	10.23	31.75	41.98	56.00	14.02	QP	L	PASS
0.94425	10.25	18.65	28.90	56.00	27.10	QP	L	PASS
17.03175	11.64	25.88	37.52	60.00	22.48	QP	L	PASS
0.58425	10.23	23.15	33.38	46.00	12.62	AV	L	PASS
0.94425	10.25	11.08	21.33	46.00	24.67	AV	L	PASS
17.034	11.64	20.73	32.37	50.00	17.63	AV	L	PASS



Radiates Emission		150k~30MHz						
Power Line		N						
Test channel		Worst-Case						
Suspected List								
Freq. [MHz]	Factor [dB]	Reading [dB μ V]	Level [dB μ V]	Limit [dB μ V]	Margin [dB]	Detector	Type	Pass/Fail
0.582	10.21	30.88	41.09	56.00	14.91	QP	N	PASS
17.016	11.60	24.85	36.45	60.00	23.55	QP	N	PASS
24	11.58	16.96	28.54	60.00	31.46	QP	N	PASS
0.58425	10.21	21.86	32.07	46.00	13.93	AV	N	PASS
17.016	11.60	20.00	31.60	50.00	18.40	AV	N	PASS
24	11.58	12.18	23.76	50.00	26.24	AV	N	PASS



5.2 Radiated Emission

Ambient condition:

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.2kPa

Method of Measurement:

The EUT was setup and tested according to ANSI C63.10-2020.

The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from Antenna to the EUT was 3 meters.

The Antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the Antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10-2020 on radiated measurement.

The resolution bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz.

The frequency range from 30MHz to 10th harmonic is checked.

Note: When doing emission measurement above 1GHz, the horn Antenna will be bended down a little (as horn Antenna has the narrow beamwidth) in order to keeping the Antenna in the “cone of radiation” of EUT.

The 3dB beamwidth is 10~60 degrees for H-plane and 10~90 degrees for E-plane.

Limits:

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) of FCC part 15, must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

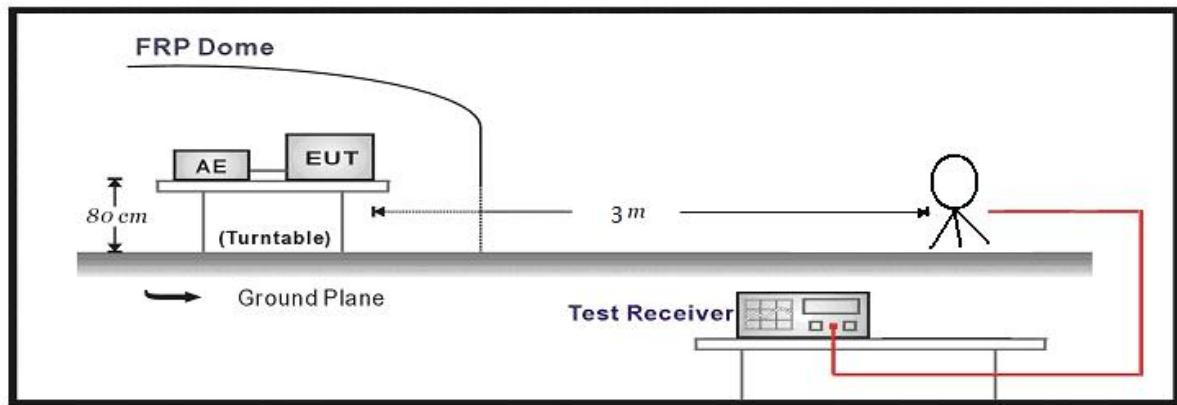
Frequency	Limit (μ V/m)	Limit (dB μ V/m @3m)	Remark
0.009MHz-0.490MHz	2400/F(kHz)@300m	20lg(24000000/F(kHz))	Quasi-peak Level
0.490MHz~1.705MHz	24000/F(kHz)@30m	20lg(2400000/F(kHz))	Quasi-peak Level
1.705MHz~30.0MHz	30@30m	69.54	Quasi-peak Level
30MHz-88MHz	100@3m	40.0	Quasi-peak Level
88MHz-216MHz	150@3m	43.5	Quasi-peak Level
216MHz-960MHz	200@3m	46.0	Quasi-peak Level
960MHz-1GHz	500@3m	54.0	Quasi-peak Level
Above 1GHz	500@3m	54.0	Average Level
	5000@3m	74.0	Peak Level

Spurious Radiated Emissions are permitted in any of the frequency bands listed below:

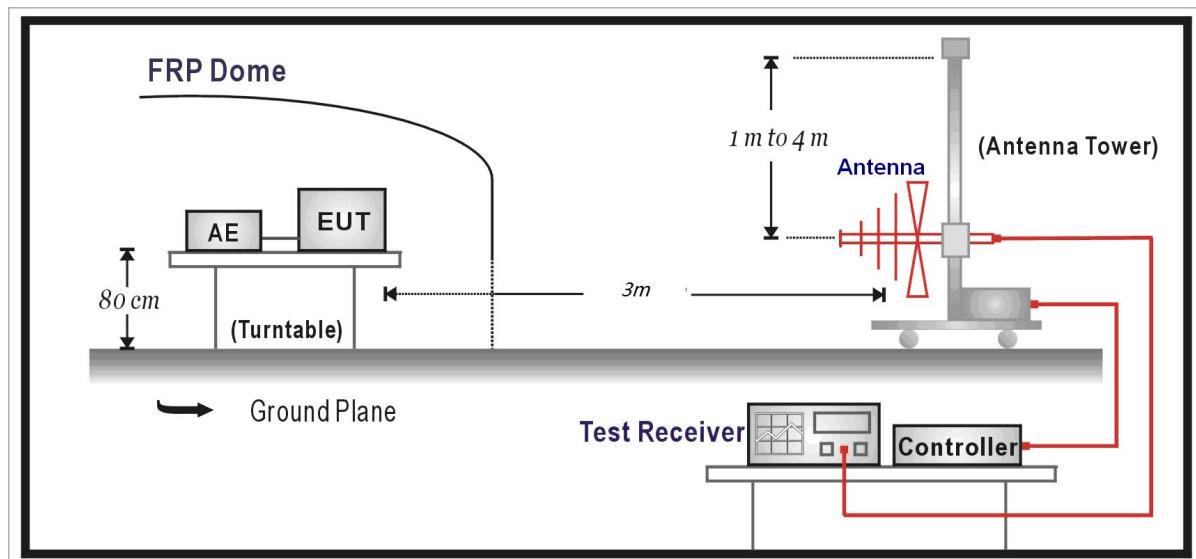
MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.
12.57675-12.57725	322-335.4	3600-4400	/
13.36-13.41	/	/	/

Test Setup:

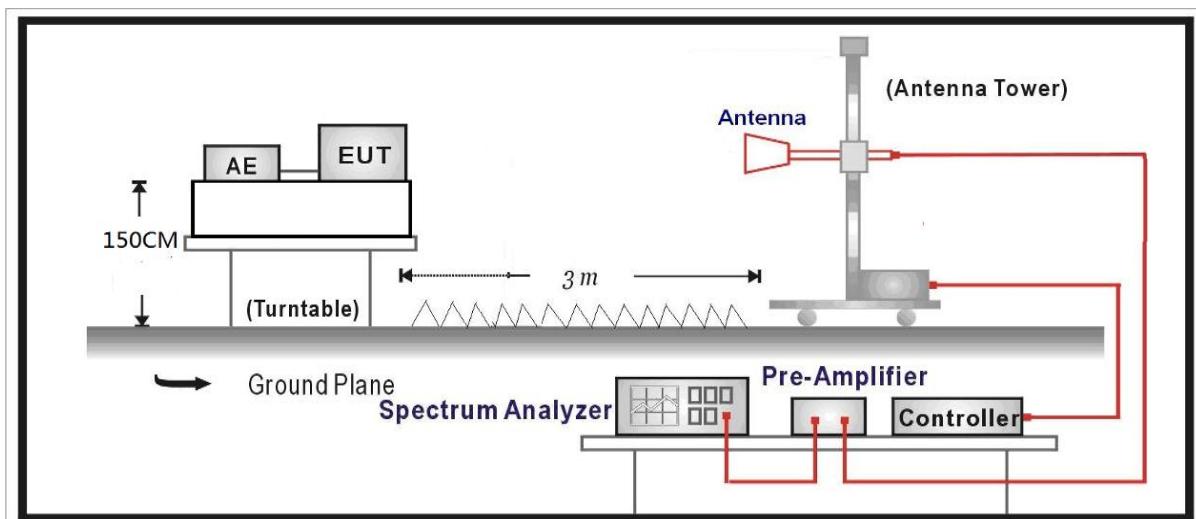
Below 30MHz Test Setup:



Below 1GHz Test Setup:



Above 1GHz Test Setup:



Measurement Data:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Level =Reading - Factor

Factor = Preamplifier Factor – Antenna Factor–Cable Loss

Measurement Uncertainty:

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

Frequency	Uncertainty
9KHz-30MHz	3.55 dB
30MHz-200MHz	4.19 dB
200MHz-1GHz	3.63 dB
Above 1GHz	3.68 dB

Test Results:

SPURIOUS EMISSIONS:

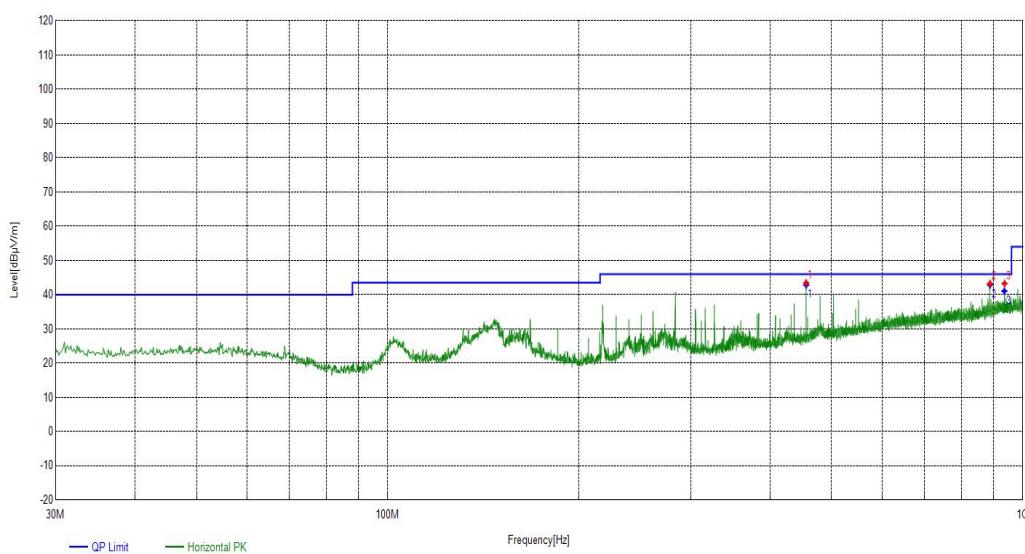
WIFI:

During the test, radiation emission from 9kHz to 1GHz was carried out in 2 power modes, in all modes of WIFI, on all channels and all antennas. Power supply 1#, 802.11n20, Channel 1, MIMO are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

Radiates Emission		9k~1G								
Test channel		Worst-Case								
Suspected List										
Frequency [MHz]	Polarity	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/Fail
455.9512	Horizontal	25.29	18.15	43.44	46.00	2.56	PK	100	50	PASS
887.965	Horizontal	32.74	10.51	43.25	46.00	2.75	PK	100	114	PASS
935.98	Horizontal	33.46	9.78	43.24	46.00	2.76	PK	100	127	PASS

Note: 9kHz~30MHz have been test and test data more than 20dB margin.

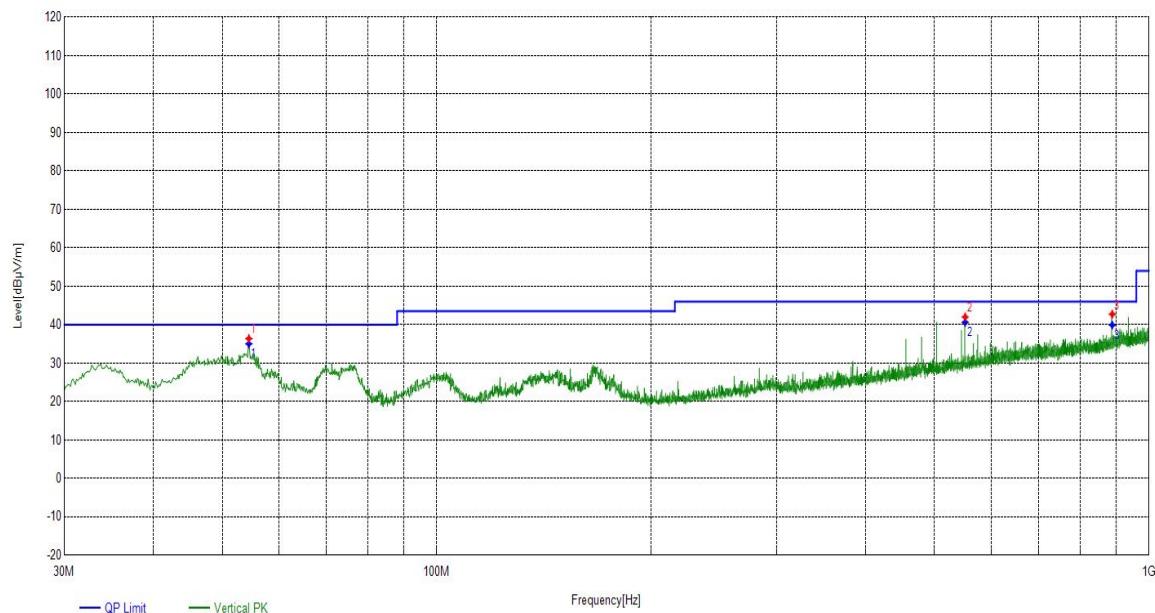
Final Data List								
Frequency [MHz]	Polarity	Factor [dB]	QP Value [dB μ V/m]	QP Limit [dB μ V/m]	QP Margin [dB]	Height [cm]	Angle [°]	Pass/Fail
455.9694	Horizontal	25.29	42.81	46.00	3.19	190	46.9	PASS
887.9828	Horizontal	32.74	42.84	46.00	3.16	260	112.2	PASS
935.3248	Horizontal	33.46	41.06	46.00	4.94	170	125.2	PASS



Radiates Emission	9k~1G									
Test channel	Worst-Case									
Suspected List										
Frequency [MHz]	Polarity	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/Fail
54.4925	Vertical	20.32	16.05	36.37	40.00	3.63	PK	100	258	PASS
551.9812	Vertical	27.69	14.31	42.00	46.00	4.00	PK	100	199	PASS
888.0862	Vertical	32.74	9.99	42.73	46.00	3.27	PK	100	220	PASS

Note: 9kHz~30MHz have been test and test data more than 20dB margin.

Final Data List								
Frequency [MHz]	Polarity	Factor [dB]	QP Value [dB μ V/m]	QP Limit [dB μ V/m]	QP Margin [dB]	Height [cm]	Angle [°]	Pass/Fail
54.4925	Vertical	20.32	35.01	40.00	4.99	190	258	PASS
551.9812	Vertical	27.69	40.64	46.00	5.36	150	199	PASS
888.0862	Vertical	32.74	39.91	46.00	6.09	220	220	PASS



During the test, the Radiates Emission from 1GHz to 40GHz was carried out in 2 power modes, in all modes of WIFI, on all channels and all antennas. Power supply 1#, 802.11n20, Highest, medium, lowest channels, MIMO are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

Radiates Emission	Above 1G								
Test channel	Lowest								
polarization	Horizontal								
Suspected List									
Frequency [MHz]	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
4083.108311	0.50	38.94	39.44	74.00	34.56	PK	150	22	PASS
7233.423342	9.01	49.84	58.85	74.00	15.15	PK	150	134	PASS
14425.142514	18.07	33.44	51.51	74.00	22.49	PK	150	225	PASS
4092.109211	0.50	27.66	28.16	54.00	25.84	AV	150	359	PASS
7234.923492	9.01	29.69	38.70	54.00	15.30	AV	150	121	PASS
14458.145815	18.21	21.65	39.86	54.00	14.14	AV	150	359	PASS
Radiates Emission	Above 1G								
Test channel	Lowest								
polarization	Vertical								
Suspected List									
Frequency [MHz]	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
4120.612061	0.48	38.47	38.95	74.00	35.05	PK	150	261	PASS
7309.930993	9.00	37.89	46.89	74.00	27.11	PK	150	143	PASS
10902.790279	12.66	34.18	46.84	74.00	27.16	PK	150	261	PASS
4117.611761	0.48	27.54	28.02	54.00	25.98	AV	150	1	PASS
7321.932193	8.99	23.87	32.86	54.00	21.14	AV	150	59	PASS
11201.320132	12.59	22.72	35.31	54.00	18.69	AV	150	114	PASS

Note: The emission levels of other frequencies were greater than 20dB margin.

Radiates Emission		Above 1G							
Test channel		Medium							
polarization		Horizontal							
Suspected List									
Frequency [MHz]	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/Fail
3598.559856	-0.21	39.00	38.79	74.00	35.21	PK	150	58	PASS
7380.438044	8.99	44.67	53.66	74.00	20.34	PK	150	162	PASS
9948.69487	12.37	33.96	46.33	74.00	27.67	PK	150	182	PASS
3934.593459	0.42	26.67	27.09	54.00	26.91	AV	150	50	PASS
7387.938794	8.99	27.39	36.38	54.00	17.62	AV	150	189	PASS
10778.277828	12.75	22.02	34.77	54.00	19.23	AV	150	1	PASS
Radiates Emission		Above 1G							
Test channel		Medium							
polarization		Vertical							
Suspected List									
Frequency [MHz]	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/Fail
4105.610561	0.49	39.41	39.90	74.00	34.10	PK	150	165	PASS
7227.422742	9.01	37.53	46.54	74.00	27.46	PK	150	269	PASS
12567.956796	12.99	34.64	47.63	74.00	26.37	PK	150	171	PASS
4032.10321	0.53	27.87	28.40	54.00	25.60	AV	150	359	PASS
7233.423342	9.01	24.59	33.60	54.00	20.40	AV	150	359	PASS
12527.452745	12.87	22.94	35.81	54.00	18.19	AV	150	312	PASS

Note: The emission levels of other frequencies were greater than 20dB margin.

Radiates Emission	Above 1G							
Test channel	Highest							
polarization	Horizontal							

Suspected List

Frequency [MHz]	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
4111.611161	0.49	39.31	39.80	74.00	34.20	PK	150	269	PASS
7311.431143	9.00	39.23	48.23	74.00	25.77	PK	150	165	PASS
11640.864086	11.83	35.16	46.99	74.00	27.01	PK	150	140	PASS
4105.610561	0.49	27.89	28.38	54.00	25.62	AV	150	359	PASS
7317.431743	8.99	24.92	33.91	54.00	20.09	AV	150	127	PASS
10971.79718	12.59	23.01	35.60	54.00	18.40	AV	150	359	PASS

Radiates Emission	Above 1G							
Test channel	Highest							
polarization	Vertical							

Suspected List

Frequency [MHz]	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
4926.192619	1.78	38.76	40.54	74.00	33.46	PK	150	188	PASS
7384.938494	8.99	41.04	50.03	74.00	23.97	PK	150	65	PASS
11237.323732	12.49	34.01	46.50	74.00	27.50	PK	150	149	PASS
5293.729373	2.99	25.23	28.22	54.00	25.78	AV	150	64	PASS
7393.939394	8.99	25.82	34.81	54.00	19.19	AV	150	1	PASS
11198.319832	12.60	22.74	35.34	54.00	18.66	AV	150	124	PASS

Note: The emission levels of other frequencies were greater than 20dB margin.

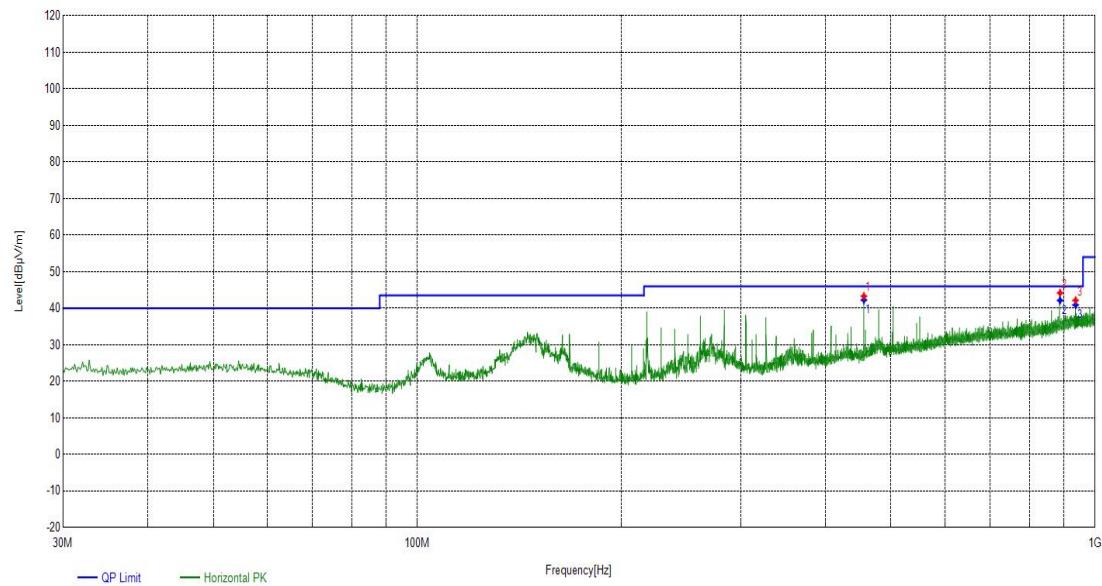
Bluetooth(Low Energy):

During the test, the Radiates Emission from 9kHz to 40GHz was carried out in 2 power modes, in all modes of WIFI, on all channels and all antennas. Power supply 1#, BLE(2Mbps), channel 0, antenna 1 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

Radiates Emission		9k~1G									
Test channel		Worst-Case									
Suspected List											
Frequency [MHz]	Polarity	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/Fail	
455.9512	Horizontal	25.29	18.01	43.30	46.00	2.70	PK	100	46	PASS	
887.965	Horizontal	32.74	11.46	44.20	46.00	1.80	PK	100	262	PASS	
935.98	Horizontal	33.46	8.70	42.16	46.00	3.84	PK	100	107	PASS	

Note: 9kHz~30MHz have been test and test data more than 20dB margin.

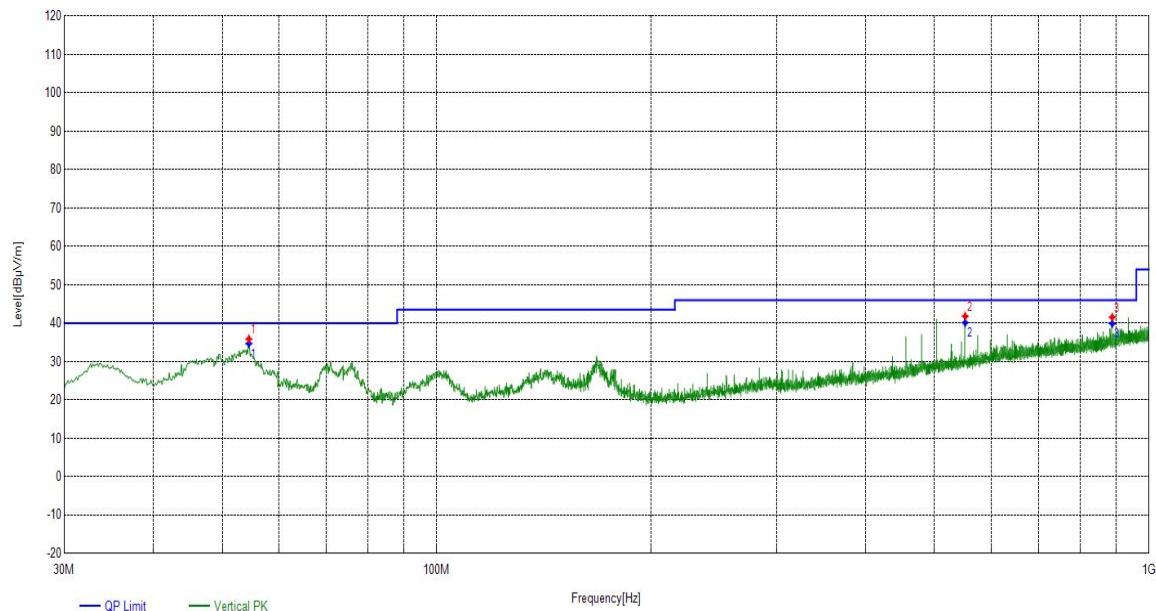
Final Data List								
Frequency [MHz]	Polarity	Factor [dB]	QP Value [dB μ V/m]	QP Limit [dB μ V/m]	QP Margin [dB]	Height [cm]	Angle [°]	Pass/Fail
455.9512	Horizontal	25.29	42.25	46.00	3.75	210	46	PASS
887.965	Horizontal	32.74	42.15	46.00	3.85	160	262	PASS
935.98	Horizontal	33.46	40.90	46.00	5.10	170	107	PASS



Radiates Emission	9k~1G									
Test channel	Worst-Case									
Suspected List										
Frequency [MHz]	Polarity	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/Fail
54.4925	Vertical	20.32	15.55	35.87	40.00	4.13	PK	100	273	PASS
551.9812	Vertical	27.69	14.10	41.79	46.00	4.21	PK	100	209	PASS
888.0862	Vertical	32.74	8.81	41.55	46.00	4.45	PK	100	213	PASS

Note: 9kHz~30MHz have been test and test data more than 20dB margin.

Final Data List								
Frequency [MHz]	Polarity	Factor [dB]	QP Value [dB μ V/m]	QP Limit [dB μ V/m]	QP Margin [dB]	Height [cm]	Angle [°]	Pass/Fail
54.4925	Vertical	20.32	34.67	40.00	5.33	100	273	PASS
551.9812	Vertical	27.69	40.13	46.00	5.87	100	209	PASS
888.0862	Vertical	32.74	39.89	46.00	6.11	100	213	PASS



During the test, the Radiates Emission from 1GHz to 40GHz was carried out in 2 power modes, in all modes of WIFI, on all channels and all antennas. Power supply 1#, BLE(2Mbps), Highest, medium, lowest channels, antenna 1 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

Radiates Emission	Above 1G								
Test channel	Lowest								
polarization	Horizontal								

Suspected List

Frequency [MHz]	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
4863.186319	1.51	37.25	38.76	74.00	35.24	PK	150	231	PASS
7039.90399	8.95	33.66	42.61	74.00	31.39	PK	150	289	PASS
8616.561656	10.11	34.03	44.14	74.00	29.86	PK	150	224	PASS
4863.186319	1.51	26.59	28.10	54.00	25.90	AV	150	359	PASS
7113.411341	8.98	22.98	31.96	54.00	22.04	AV	150	359	PASS
8498.049805	9.99	23.27	33.26	54.00	20.74	AV	150	359	PASS

Radiates Emission	Above 1G								
Test channel	Lowest								
polarization	Vertical								

Suspected List

Frequency [MHz]	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
4624.662466	0.47	38.20	38.67	74.00	35.33	PK	150	36	PASS
7005.40054	8.94	33.06	42.00	74.00	32.00	PK	150	75	PASS
7888.988899	9.24	34.66	43.90	74.00	30.10	PK	150	88	PASS
4755.175518	1.03	26.43	27.46	54.00	26.54	AV	150	359	PASS
6898.889889	8.44	21.76	30.20	54.00	23.80	AV	150	354	PASS
8070.507051	9.34	23.18	32.52	54.00	21.48	AV	150	359	PASS

Note: The emission levels of other frequencies were greater than 20dB margin.

Radiates Emission	Above 1G								
Test channel	Medium								
polarization	Horizontal								

Suspected List

Frequency [MHz]	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
4290.129013	0.25	39.04	39.29	74.00	34.71	PK	150	84	PASS
5859.285929	5.01	35.04	40.05	74.00	33.95	PK	150	306	PASS
8933.093309	10.31	34.32	44.63	74.00	29.37	PK	150	357	PASS
4191.119112	0.44	26.83	27.27	54.00	26.73	AV	150	40	PASS
6028.80288	5.73	23.12	28.85	54.00	25.15	AV	150	150	PASS
8700.570057	10.12	22.74	32.86	54.00	21.14	AV	150	136	PASS

Radiates Emission	Above 1G								
Test channel	Medium								
polarization	Vertical								

Suspected List

Frequency [MHz]	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
4855.685569	1.48	37.53	39.01	74.00	34.99	PK	150	318	PASS
6108.310831	5.83	35.05	40.88	74.00	33.12	PK	150	311	PASS
7653.465347	9.13	34.50	43.63	74.00	30.37	PK	150	259	PASS
4864.686469	1.51	26.47	27.98	54.00	26.02	AV	150	112	PASS
6069.306931	5.78	23.14	28.92	54.00	25.08	AV	150	156	PASS
7641.464146	9.12	22.84	31.96	54.00	22.04	AV	150	40	PASS

Note: The emission levels of other frequencies were greater than 20dB margin.

Radiates Emission	Above 1G								
Test channel	Highest								
polarization	Horizontal								

Suspected List

Frequency [MHz]	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
3418.541854	-0.63	50.39	49.76	74.00	24.24	PK	150	310	PASS
5197.719772	2.81	41.79	44.60	74.00	29.40	PK	150	80	PASS
5790.279028	4.68	41.17	45.85	74.00	28.15	PK	150	280	PASS
3420.042004	-0.63	30.36	29.73	54.00	24.27	AV	150	310	PASS
5203.720372	2.82	31.33	34.15	54.00	19.85	AV	150	350	PASS
6022.80228	5.72	24.19	29.91	54.00	24.09	AV	150	360	PASS

Radiates Emission	Above 1G								
Test channel	Highest								
polarization	Vertical								

Suspected List

Frequency [MHz]	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
5196.219622	2.81	42.40	45.21	74.00	28.79	PK	150	350	PASS
5788.778878	4.67	41.83	46.50	74.00	27.50	PK	150	300	PASS
7719.471947	9.18	34.20	43.38	74.00	30.62	PK	150	260	PASS
5287.728773	2.99	25.96	28.95	54.00	25.05	AV	150	160	PASS
6046.804681	5.75	24.64	30.39	54.00	23.61	AV	150	150	PASS
8048.004801	9.32	24.53	33.85	54.00	20.15	AV	150	10	PASS

Note: The emission levels of other frequencies were greater than 20dB margin.

Band Edge:

During the test, the Band Edge was performed in WIFI all modes with all channels and all antennas. Power supply 1#, 802.11n20, MIMO are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

Test mode	802.11n20								
Test channel	Lowest channel								
polarization	Horizontal								

Suspected List

Frequency [MHz]	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
2384.1384	-5.07	68.89	63.82	74.00	10.18	PK	150	263	PASS
2390.1390	-5.04	68.84	63.80	74.00	10.20	PK	150	231	PASS
2412.7412	-4.98	108.87	103.89	---	---	PK	150	282	---
2384.1384	-5.07	50.97	45.90	54.00	8.10	AV	150	224	PASS
2390.1390	-5.04	55.40	50.36	54.00	3.64	AV	150	224	PASS
2413.1413	-4.98	97.75	92.77	---	---	AV	150	257	---

Test mode	802.11n20								
Test channel	Lowest channel								
polarization	Vertical								

Suspected List

Frequency [MHz]	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
2379.1379	-5.08	58.86	53.78	74.00	20.22	PK	150	123	PASS
2390.1390	-5.04	67.80	62.76	74.00	11.24	PK	150	78	PASS
2413.3413	-4.98	108.11	103.13	---	---	PK	150	26	---
2379.1379	-5.08	48.17	43.09	54.00	10.91	AV	150	84	PASS
2390.1390	-5.04	56.02	50.98	54.00	3.02	AV	150	123	PASS
2412.7412	-4.98	99.20	94.22	---	---	AV	150	320	---

Test mode	802.11n20
Test channel	Highest channel
polarization	Horizontal

Suspected List

Frequency [MHz]	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/Fail
2464.1464	-4.84	106.30	101.46	---	---	PK	150	282	---
2483.5485	-4.79	62.28	57.49	74.00	16.51	PK	150	275	PASS
2490.7490	-4.76	53.87	49.11	74.00	24.89	PK	150	307	PASS
2463.3463	-4.84	94.66	89.82	---	---	AV	150	300	---
2483.5483	-4.79	43.61	38.82	54.00	15.18	AV	150	294	PASS
2490.7490	-4.76	42.25	37.49	54.00	16.51	AV	150	288	PASS

Test mode	802.11n20
Test channel	Highest channel
polarization	Vertical

Suspected List

Frequency [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/Fail
2463.7463	-4.84	105.75	100.91	---	---	PK	150	15	---
2483.5483	-4.79	56.97	52.18	74.00	21.82	PK	150	237	PASS
2497.3497	-4.75	54.15	49.40	74.00	24.60	PK	150	335	PASS
2462.9462	-4.84	96.68	91.84	---	---	AV	150	359	---
2483.5483	-4.79	44.23	39.44	54.00	14.56	AV	150	359	PASS
2497.3497	-4.75	41.86	37.11	54.00	16.89	AV	150	9	PASS

During the test, the Band Edge was performed in BLE all modes with all channels and all antennas. Power supply 1#,BLE(2Mbps), Antenna 1 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

Test mode	BLE(2Mbps)								
Test channel	Lowest channel								
polarization	Horizontal								

Suspected List

Frequency [MHz]	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
2373.1373	-5.09	53.83	48.74	74.00	25.26	PK	150	12	PASS
2390.1390	-5.04	52.52	47.48	74.00	26.52	PK	150	249	PASS
2401.7401	-5.01	96.89	91.88	---	---	PK	150	195	---
2373.1373	-5.09	40.80	35.71	54.00	18.29	AV	150	202	PASS
2390.1390	-5.04	40.90	35.86	54.00	18.14	AV	150	18	PASS
2402.1402	-5.00	87.03	82.03	---	---	AV	150	222	---

Test mode	BLE(2Mbps)								
Test channel	Lowest channel								
polarization	Vertical								

Suspected List

Frequency [MHz]	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
2377.9377	-5.08	50.87	45.79	74.00	28.21	PK	150	350	PASS
2390.1390	-5.04	52.08	47.04	74.00	26.96	PK	150	350	PASS
2402.3402	-5.00	94.56	89.56	---	---	PK	150	350	---
2377.9377	-5.08	40.78	35.70	54.00	18.30	AV	150	130	PASS
2390.1390	-5.04	41.83	36.79	54.00	17.21	AV	150	20	PASS
2402.1402	-5.00	80.77	75.77	---	---	AV	150	350	---

Test mode	BLE(2Mbps)								
Test channel	Highest channel								
polarization	Horizontal								

Suspected List

Frequency [MHz]	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
2479.7479	-4.80	96.46	91.66	74.00	-17.66	PK	150	208	PASS
2483.5483	-4.79	53.26	48.47	74.00	25.53	PK	150	359	PASS
2495.9495	-4.75	52.64	47.89	74.00	26.11	PK	150	334	PASS
2480.1480	-4.80	85.06	80.26	54.00	-26.26	AV	150	135	PASS
2483.5483	-4.79	41.18	36.39	54.00	17.61	AV	150	321	PASS
2495.9495	-4.75	41.38	36.63	54.00	17.37	AV	150	359	PASS

Test mode	BLE(2Mbps)								
Test channel	Highest channel								
polarization	Vertical								

Suspected List

Frequency [MHz]	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
2479.34793	-4.80	94.56	89.76	---	---	PK	150	360	---
2483.54835	-4.79	51.65	46.86	74.00	27.14	PK	150	360	PASS
2493.14931	-4.76	53.97	49.21	74.00	24.79	PK	150	360	PASS
2480.14801	-4.80	80.99	76.19	---	---	AV	150	350	PASS
2483.54835	-4.79	41.20	36.41	54.00	17.59	AV	150	10	---
2493.14931	-4.76	41.06	36.30	54.00	17.70	AV	150	60	PASS

5.3 Maximum conducted output power

Ambient condition:

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.2kPa

Method of Measurement:

a. A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor and set the detector to PEAK. Record the power level.

Limits:

Average Output Power	≤ 1W (30dBm)
----------------------	--------------

Note: the conducted output power limit specified above is based on the use the antennas with directional gains that do not exceed 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated Levels above, as appropriate, by the amount in dB that the directional gain of antenna exceeds 6 dBi.

Systems operating in the 2400-2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

Frequency(MHz)	Antenna Gain(dBi)		Directional gain	Limit(dBm)
	Antenna 1	Antenna 2		
2412-2462	2.50	2.50	5.51	30.00

WiFi Antenna:

ANT1:Internal antenna with gain 2.50dBi

ANT2:Internal antenna with gain 2.50dBi

BLE Antenna:

Internal antenna with gain 2.50dBi

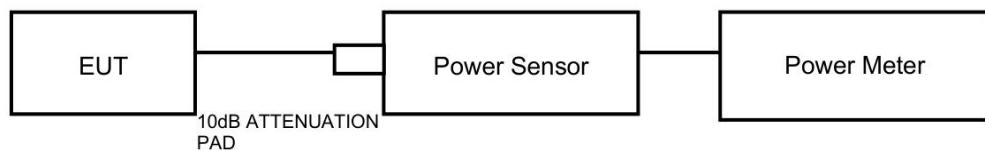
The maximum peak gain of the transmit antenna less than 6dBi

Directional gain is to be computed as follows:

transmit signals are correlated, then

Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{ANT}]$ dBi [Note the "20"s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

Test Setup:



Measurement Uncertainty:

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 0.44$ dB.

Test Results:

TestMode	Antenna	Channel	Peak Powert[dBm]	Conducted Limit[dBm]	Verdict
11B	Ant1	2412	18.11	≤30.00	PASS
	Ant2	2412	18.34	≤30.00	PASS
	Ant1	2437	19.04	≤30.00	PASS
	Ant2	2437	18.71	≤30.00	PASS
	Ant1	2462	17.48	≤30.00	PASS
	Ant2	2462	18.90	≤30.00	PASS
11G	Ant1	2412	21.34	≤30.00	PASS
	Ant2	2412	22.94	≤30.00	PASS
	Ant1	2437	21.30	≤30.00	PASS
	Ant2	2437	22.99	≤30.00	PASS
	Ant1	2462	21.84	≤30.00	PASS
	Ant2	2462	23.40	≤30.00	PASS
11N20MIMO	Ant1	2412	19.92	≤30.00	PASS
	Ant2	2412	21.87	≤30.00	PASS
	total	2412	24.01	≤30.00	PASS
	Ant1	2437	20.25	≤30.00	PASS
	Ant2	2437	22.12	≤30.00	PASS
	total	2437	24.30	≤30.00	PASS
	Ant1	2462	20.78	≤30.00	PASS
	Ant2	2462	22.51	≤30.00	PASS
	total	2462	24.74	≤30.00	PASS
	Ant1	2422	20.21	≤30.00	PASS
11N40MIMO	Ant2	2422	22.34	≤30.00	PASS
	total	2422	24.41	≤30.00	PASS
	Ant1	2437	20.33	≤30.00	PASS
	Ant2	2437	22.35	≤30.00	PASS
	total	2437	24.47	≤30.00	PASS
	Ant1	2452	20.64	≤30.00	PASS
	Ant2	2452	22.67	≤30.00	PASS
	total	2452	24.78	≤30.00	PASS
	BLE_1M	2402	5.84	≤30.00	PASS
		2440	6.01	≤30.00	PASS
		2480	6.04	≤30.00	PASS
BLE_2M	Ant1	2402	5.92	≤30.00	PASS
		2440	6.04	≤30.00	PASS
		2480	6.12	≤30.00	PASS

Note: WIFI has MIMO function, Directional gain needs to be considered.

5.4 Minimum 6 dB Bandwidth

Ambient condition:

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.2kPa

Method of Measurement:

The EUT was connected to the spectrum analyzer through an external attenuator (20dB) and a known loss cable. Set RBW = shall be in the range of 1% to 5% of the OBW but not less than 100 kHz; VBW is set to greater than 3 times RBW on spectrum analyzer.

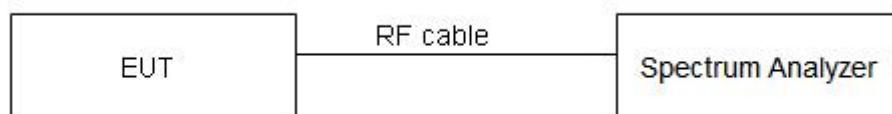
Detector=Peak, Trace mode=Max hold.

Limits:

Rule Part 15.247 (a) (2) specifies that "Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz."

Minimum 6dB Bandwidth	≥ 500 kHz
-----------------------	----------------

Test Setup:



Measurement Uncertainty:

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 936$ Hz.

Test Results:

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	9.24	2407.36	2416.60	≥ 0.5	PASS
	Ant2	2412	9.28	2407.32	2416.60	≥ 0.5	PASS
	Ant1	2437	9.28	2432.32	2441.60	≥ 0.5	PASS
	Ant2	2437	9.28	2432.32	2441.60	≥ 0.5	PASS
	Ant1	2462	9.28	2457.32	2466.60	≥ 0.5	PASS
	Ant2	2462	9.28	2457.32	2466.60	≥ 0.5	PASS
11G	Ant1	2412	16.16	2403.88	2420.04	≥ 0.5	PASS
	Ant2	2412	16.16	2403.88	2420.04	≥ 0.5	PASS
	Ant1	2437	16.08	2428.92	2445.00	≥ 0.5	PASS
	Ant2	2437	16.04	2428.88	2444.92	≥ 0.5	PASS
	Ant1	2462	16.20	2453.80	2470.00	≥ 0.5	PASS
	Ant2	2462	16.08	2453.92	2470.00	≥ 0.5	PASS
11N20MIMO	Ant1	2412	17.12	2403.32	2420.44	≥ 0.5	PASS
	Ant2	2412	17.24	2403.28	2420.52	≥ 0.5	PASS
	Ant1	2437	17.44	2428.28	2445.72	≥ 0.5	PASS
	Ant2	2437	17.00	2428.60	2445.60	≥ 0.5	PASS
	Ant1	2462	17.36	2453.32	2470.68	≥ 0.5	PASS
	Ant2	2462	17.04	2453.64	2470.68	≥ 0.5	PASS
11N40MIMO	Ant1	2422	35.28	2404.40	2439.68	≥ 0.5	PASS
	Ant2	2422	35.44	2404.32	2439.76	≥ 0.5	PASS
	Ant1	2437	34.88	2419.56	2454.44	≥ 0.5	PASS
	Ant2	2437	35.04	2419.72	2454.76	≥ 0.5	PASS
	Ant1	2452	35.52	2434.32	2469.84	≥ 0.5	PASS
	Ant2	2452	35.36	2434.24	2469.60	≥ 0.5	PASS
BLE_1M	Ant1	2402	0.692	2401.612	2402.304	≥ 0.5	PASS
		2440	0.732	2439.580	2440.312	≥ 0.5	PASS
		2480	0.688	2479.604	2480.292	≥ 0.5	PASS
BLE_2M	Ant1	2402	1.364	2401.268	2402.632	≥ 0.5	PASS
		2440	1.132	2439.396	2440.528	≥ 0.5	PASS
		2480	1.136	2479.400	2480.536	≥ 0.5	PASS

5.5 Occupied Channel Bandwidth

Ambient condition:

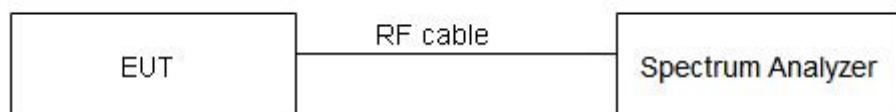
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.2kPa

Method of Measurement:

The EUT was connected to the spectrum analyzer through an external attenuator (20dB) and a known loss cable. RBW is set to 1% to 5% of the OBW; video bandwidth (VBW) shall be at least three times RBW on spectrum analyzer.

Detector=Peak, Trace mode=Max hold.

Test Setup:



Measurement Uncertainty:

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 936$ Hz.

Test Results:

TestMode	Antenna	Channel	OCB [MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	13.506	---	---
	Ant2	2412	13.546	---	---
	Ant1	2437	13.427	---	---
	Ant2	2437	13.586	---	---
	Ant1	2462	13.586	---	---
	Ant2	2462	13.546	---	---
11G	Ant1	2412	17.143	---	---
	Ant2	2412	17.103	---	---
	Ant1	2437	17.023	---	---
	Ant2	2437	17.063	---	---
	Ant1	2462	17.103	---	---
	Ant2	2462	17.023	---	---
11N20MIMO	Ant1	2412	18.022	---	---
	Ant2	2412	17.822	---	---
	Ant1	2437	18.022	---	---
	Ant2	2437	17.822	---	---
	Ant1	2462	17.982	---	---
	Ant2	2462	17.782	---	---
11N40MIMO	Ant1	2422	36.284	---	---
	Ant2	2422	36.284	---	---
	Ant1	2437	36.204	---	---
	Ant2	2437	36.284	---	---
	Ant1	2452	36.204	---	---
	Ant2	2452	36.284	---	---
BLE_1M	Ant1	2402	1.0407	---	---
		2440	1.0433	---	---
		2480	1.0412	---	---
BLE_2M	Ant1	2402	2.0623	---	---
		2440	2.0623	---	---
		2480	2.0812	---	---

5.6 Band Edge Measurement

Ambient condition:

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.2kPa

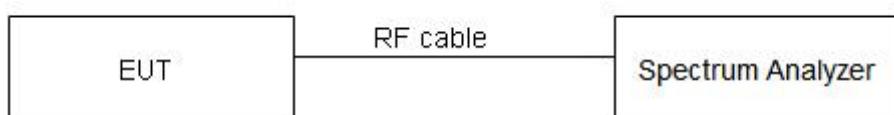
Method of Measurement:

The EUT was connected to the spectrum analyzer through an external attenuator (20dB) and a known loss cable the band edge of the lowest and highest channels were measured. The peak detector is used and RBW is set to 100 kHz and VBW is set to 300 kHz on spectrum analyzer.

Limits:

Rule Part 15.247(d) specifies that “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.

Test Setup:



Measurement Uncertainty:

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$, $U = 936$ Hz, $2 \text{ GHz} - 3 \text{ GHz} = 1.407 \text{ dB}$.

Test Results:

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	6.85	-35.46	≤-13.15	PASS
	Ant2	Low	2412	7.37	-35.35	≤-12.63	PASS
	Ant1	High	2462	6.39	-36.17	≤-13.61	PASS
	Ant2	High	2462	7.66	-35.88	≤-12.34	PASS
11G	Ant1	Low	2412	0.20	-34.06	≤-19.8	PASS
	Ant2	Low	2412	2.18	-36.65	≤-17.82	PASS
	Ant1	High	2462	1.30	-36.04	≤-18.7	PASS
	Ant2	High	2462	2.62	-36.17	≤-17.38	PASS
11N20MIMO	Ant1	Low	2412	-0.98	-34.9	≤-20.98	PASS
	Ant2	Low	2412	0.21	-36.17	≤-19.79	PASS
	Ant1	High	2462	-0.02	-35.85	≤-20.02	PASS
	Ant2	High	2462	1.40	-35.52	≤-18.6	PASS
11N40MIMO	Ant1	Low	2422	-3.99	-36.41	≤-23.99	PASS
	Ant2	Low	2422	-1.87	-37.01	≤-21.87	PASS
	Ant1	High	2452	-3.76	-35.33	≤-23.76	PASS
	Ant2	High	2452	-0.96	-35.61	≤-20.96	PASS
BLE_1M	Ant1	Low	2402	5.42	-48.03	≤-14.59	PASS
		High	2480	4.99	-30.28	≤-15.01	PASS
BLE_2M	Ant1	Low	2402	4.44	-29.13	≤-15.56	PASS
		High	2480	4.11	-47.79	≤-15.89	PASS

5.7 Maximum Power Spectral Density

Ambient condition:

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.2kPa

Method of Measurement:

During the process of the testing, The EUT was connected to Spectrum Analyzer with a known loss. The EUT is max power transmission with proper modulation. The Peak detector is used. The conducted Power is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically.

Limits:

Rule Part 15.247(e) specifies that" For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

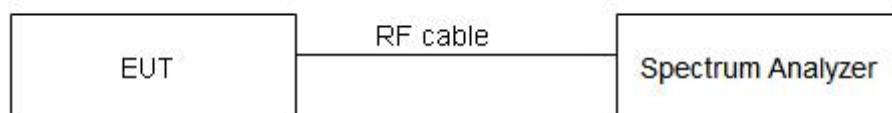
Maximum Power Spectral Density	≤ 8 dBm / 3kHz
--------------------------------	----------------

Frequency(MHz)	Antenna Gain(dBi)		Directional gain	Limit(dBm)
	Antenna 1	Antenna 2		
2412-2462	2.50	2.50	5.51	8.00

Directional gain is to be computed as follows:
 transmit signals are correlated, then

$$\text{Directional gain} = 10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{\text{ANT}}] \text{ dBi}$$
 [Note the "20"s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

Test Setup:



Measurement Uncertainty:

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 0.75\text{dB}$.

Test Results:

TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-6.20	≤8.00	PASS
	Ant2	2412	-5.97	≤8.00	PASS
	Ant1	2437	-5.23	≤8.00	PASS
	Ant2	2437	-5.59	≤8.00	PASS
	Ant1	2462	-6.81	≤8.00	PASS
	Ant2	2462	-5.38	≤8.00	PASS
11G	Ant1	2412	-9.79	≤8.00	PASS
	Ant2	2412	-8.35	≤8.00	PASS
	Ant1	2437	-10.35	≤8.00	PASS
	Ant2	2437	-8.32	≤8.00	PASS
	Ant1	2462	-9.67	≤8.00	PASS
	Ant2	2462	-8.10	≤8.00	PASS
11N20MIMO	Ant1	2412	-11.67	≤8.00	PASS
	Ant2	2412	-9.19	≤8.00	PASS
	total	2412	-7.25	≤8.00	PASS
	Ant1	2437	-10.14	≤8.00	PASS
	Ant2	2437	-8.94	≤8.00	PASS
	total	2437	-6.49	≤8.00	PASS
	Ant1	2462	-10.34	≤8.00	PASS
	Ant2	2462	-9.45	≤8.00	PASS
	total	2462	-6.86	≤8.00	PASS
11N40MIMO	Ant1	2422	-14.96	≤8.00	PASS
	Ant2	2422	-12.06	≤8.00	PASS
	total	2422	-10.26	≤8.00	PASS
	Ant1	2437	-13.37	≤8.00	PASS
	Ant2	2437	-12.86	≤8.00	PASS
	total	2437	-10.10	≤8.00	PASS
	Ant1	2452	-12.70	≤8.00	PASS
	Ant2	2452	-12.50	≤8.00	PASS
	total	2452	-9.59	≤8.00	PASS
BLE_1M	Ant1	2402	-11.18	≤8.00	PASS
		2440	-10.74	≤8.00	PASS
		2480	-10.91	≤8.00	PASS
BLE_2M	Ant1	2402	-13.19	≤8.00	PASS
		2440	-12.96	≤8.00	PASS
		2480	-12.88	≤8.00	PASS

5.8 Spurious RF Conducted Emissions

Ambient condition:

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.2kPa

Method of Measurement:

The EUT was connected to the spectrum analyzer with a known loss. The spectrum analyzer scans from 30MHz to the 10th harmonic of the carrier. The peak detector is used. Set RBW to 100kHz and VBW to 300 kHz, Sweep is set to AUTO .The test is in transmitting mode.

Limits:

Rule Part 15.247(d) pacifies that “In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.

Test Setup:



Measurement Uncertainty:

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

Frequency	Uncertainty
100kHz-2GHz	0.684 dB
2GHz-26GHz	1.407 dB

Test Results:

TestMode	Antenna	Channel	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	7.07	7.07	---	PASS
			30~1000	7.07	-48.23	≤-12.93	PASS
			1000~26500	7.07	-36.94	≤-12.93	PASS
	Ant2	2412	Reference	7.41	7.41	---	PASS
			30~1000	7.41	-48.18	≤-12.59	PASS
			1000~26500	7.41	-36.62	≤-12.59	PASS
	Ant1	2437	Reference	8.00	8.00	---	PASS
			30~1000	8.00	-48.27	≤-12	PASS
			1000~26500	8.00	-36.95	≤-12	PASS
	Ant2	2437	Reference	7.44	7.44	---	PASS
			30~1000	7.44	-48.14	≤-12.56	PASS
			1000~26500	7.44	-36.83	≤-12.56	PASS
11G	Ant1	2462	Reference	6.54	6.54	---	PASS
			30~1000	6.54	-48.51	≤-13.46	PASS
			1000~26500	6.54	-37.15	≤-13.46	PASS
	Ant2	2462	Reference	7.81	7.81	---	PASS
			30~1000	7.81	-47.73	≤-12.19	PASS
			1000~26500	7.81	-36.3	≤-12.19	PASS
	Ant1	2412	Reference	0.14	0.14	---	PASS
			30~1000	0.14	-47.8	≤-19.86	PASS
			1000~26500	0.14	-36.83	≤-19.86	PASS
	Ant2	2412	Reference	2.47	2.47	---	PASS
			30~1000	2.47	-47.93	≤-17.53	PASS
			1000~26500	2.47	-36.84	≤-17.53	PASS
11N20MIMO	Ant1	2437	Reference	0.71	0.71	---	PASS
			30~1000	0.71	-47.7	≤-19.29	PASS
			1000~26500	0.71	-37.24	≤-19.29	PASS
	Ant2	2437	Reference	2.07	2.07	---	PASS
			30~1000	2.07	-47.79	≤-17.93	PASS
			1000~26500	2.07	-36.46	≤-17.93	PASS
	Ant1	2462	Reference	0.70	0.70	---	PASS
			30~1000	0.70	-48	≤-19.3	PASS
			1000~26500	0.70	-37.1	≤-19.3	PASS
	Ant2	2462	Reference	2.45	2.45	---	PASS
			30~1000	2.45	-48.07	≤-17.55	PASS
			1000~26500	2.45	-37.09	≤-17.55	PASS

TestMode	Antenna	Channel	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11N40MIMO	Ant1	2462	Reference	-0.52	-0.52	---	PASS
			30~1000	-0.52	-47.47	≤-20.52	PASS
			1000~26500	-0.52	-36.96	≤-20.52	PASS
	Ant2	2462	Reference	1.78	1.78	---	PASS
			30~1000	1.78	-47.85	≤-18.22	PASS
			1000~26500	1.78	-37.17	≤-18.22	PASS
BLE_1M	Ant1	2422	Reference	-3.80	-3.80	---	PASS
			30~1000	-3.80	-47.51	≤-23.8	PASS
			1000~26500	-3.80	-37.12	≤-23.8	PASS
	Ant2	2422	Reference	-1.97	-1.97	---	PASS
			30~1000	-1.97	-47.12	≤-21.97	PASS
			1000~26500	-1.97	-36.74	≤-21.97	PASS
	Ant1	2437	Reference	-3.57	-3.57	---	PASS
			30~1000	-3.57	-47.75	≤-23.57	PASS
			1000~26500	-3.57	-36.72	≤-23.57	PASS
	Ant2	2437	Reference	-1.65	-1.65	---	PASS
			30~1000	-1.65	-48.47	≤-21.65	PASS
			1000~26500	-1.65	-36.87	≤-21.65	PASS
BLE_2M	Ant1	2452	Reference	-3.64	-3.64	---	PASS
			30~1000	-3.64	-47.62	≤-23.64	PASS
			1000~26500	-3.64	-36.74	≤-23.64	PASS
	Ant2	2452	Reference	-1.46	-1.46	---	PASS
			30~1000	-1.46	-47.46	≤-21.46	PASS
			1000~26500	-1.46	-37.01	≤-21.46	PASS
BLE_2M	Ant1	2402	Reference	4.67	4.67	---	PASS
			30~1000	4.67	-59.91	≤-15.33	PASS
			1000~26500	4.67	-46.87	≤-15.33	PASS
	2440		Reference	4.24	4.24	---	PASS
			30~1000	4.24	-45.18	≤-15.76	PASS
			1000~26500	4.24	-46.68	≤-15.76	PASS
	2480		Reference	4.70	4.70	---	PASS
			30~1000	4.70	-59.41	≤-15.3	PASS
			1000~26500	4.70	-47.36	≤-15.3	PASS
	Ant1	2402	Reference	1.63	1.63	---	PASS
			30~1000	1.63	-59.16	≤-18.37	PASS
			1000~26500	1.63	-46.91	≤-18.37	PASS
		2440	Reference	4.54	4.54	---	PASS
			30~1000	4.54	-51.84	≤-15.46	PASS
			1000~26500	4.54	-46.79	≤-15.46	PASS
	2480		Reference	3.33	3.33	---	PASS
			30~1000	3.33	-59.06	≤-16.67	PASS
			1000~26500	3.33	-47.08	≤-16.67	PASS

6. Appendix X

Test Equipment	Type/Mode	SERIAL NO.	Equipment No.	Manufacturer	Cal. Due
Communication Shielded Room 2	4m*3m*3m	CRTDSWKS44301	/	CRT	2027/04/22
Spectrum Analyzer	FSV40	101580	DZ-000238-3	R&S	2026/03/27
UXA signal analyzer	N9040B	US57212256	DZ-000466	KEYSIGHT	2025/12/17
Power Meter	JS0806-2	19H9080187	DZ-000241	Tonscend	2026/03/27
Programmable DC Power Supply	E3644A	MY58036222	DZ-000178	KEYSIGHT	2026/04/10
5m Semi-Anechoic Chamber	SAC-5	SAC-5-2.0	EM-000557	COMTEST	2027/02/01
Spectrum Analyzer	N9010B	MY57470323	DZ-000174	KEYSIGHT	2026/01/01
EMI Test Receiver	N9038A-508	MY532290079	EM-000397	Agilent	2025/12/26
EMI Test Receiver	ESR7	102235	EM-000574	R&S	2026/01/05
loop antenna	HLA 6121	540046	EM-000546	TESEQ	2026/06/03
Broadband Antenna	VULB 9163	9163-530	EM-000342	SCHWARZ BECK	2025/06/09
Waveguide Horn Antenna	HF906	360306/008	EM-000093	R&S	2025/12/26
Waveguide Horn Antenna	BBHA9170	00949	DZ-000209-2	SCHWARZ BECK	2025/08/03
Bandstop Filters	SW-BSF-2400-100-7-A1	/	EM-000495	/	2025/08/29
5.8GHz band resistance	ZBSF6-C5725-5850-1627	1232740	DZ-000399-2	Tonscend	2026/05/29
Preamplifier	BBV 9721	9721-050	DZ-000209-1	SCHWARZ BECK	2026/06/02
Temperature and humidity meter	MHO-C201	/	DZ-000249-2	Seconds test	2025/07/28
Temperature and humidity meter	MHO-C201	/	DZ-000249-5	Seconds test	2025/07/28

Dynacomm	Software Release	Software Developer
TS1120-3 Test System(Conduction test)	3.3.38	Tonscend
TS+ (5m,Radiation test)	JS32-RE 5.0.0	Tonscend

————— No Body Text Below —————

Important

1. The test report is invalid without the official stamp of CVC;
2. Any part photocopies of the test report are forbidden without the written permission from CVC;
3. The test report is invalid without the signatures of Author and Reviewer;
4. The test report is invalid if altered;
5. Objections to the test report must be submitted to CVC within 15 days;
6. Generally, commission test is responsible for the tested samples only;
7. As for the test result, “—” or “N/A” means “not applicable”, “/” means “not testing”, “P” means “pass” and “F” means “fail”.

Address: No.3,Tiantaiyi Road, Kaitai Avenue, Science City, Guangzhou, China (Test location)

Post Code: 510663 Tel: 020-32293888

FAX: 020 32293889 E-mail: office@cvc.org.cn