



Test Report No.:
FCC2024-0031-RF1

TEST REPORT

FCC ID	:	2BG9T-TCLSMARTDM
Applicant	:	Shenzhen TCL Smart Home Technology Co., Ltd
Product Name	:	Smart Lock
Model No.	:	D1 Max,D11 Max,D12 Max,D13 Max,D14 Max,D15 Max,D16 Max,D17 Max,D18 Max,D19 Max

CVC Testing Technology Co., Ltd.

Applicant		Name: Shenzhen TCL Smart Home Technology Co., Ltd	
		Address: 7/F,TCL G1 Building. TCL International E City, No.1001 Zhongshan Yuan Road, Nanshan District,Shenzhen	
Manufacturer		Name: Shenzhen TCL Smart Home Technology Co., Ltd	
		Address: 7/F,TCL G1 Building. TCL International E City, No.1001 Zhongshan Yuan Road, Nanshan District,Shenzhen	
Equipment Under Test		Product Name : Smart Lock	
		Model No. : D1 Max	
		Trade mark : TCL	
		Serial no. : D1Max240800001	
		Sampling : 1-1	
Date of Receipt.	2024.7.4	Date of Testing	2024.8.19
Test Specification		Test Result	
FCC CFR47 Part 15C Radio Frequency Devices ANSI C63.10-2020/Cor1-2023 KDB 558074 D01 15.247 Meas Guidance v05r02		PASS	
Evaluation of Test Result		The equipment under test was found to comply with the requirements of the standards applied. Seal of CVC Issue Date: 2024-8-19	
Approved by: Chen Huawen 		Reviewed by: Xu Zhenfei 	Tested by: Lu Weiji 
Other Aspects: NONE.			
Abbreviations:OK, Pass= passed Fail = failed N/A= not applicable EUT= equipment, sample(s) under tested			
Note: This test report relates only to the EUT, and shall not be reproduced except in full, without written approval of CVC .			

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1. General Product Information

1.1 General information

Product Name	Smart Lock	
Model No.	D1 Max	
Additional model	D11 Max,D12 Max,D13 Max,D14 Max,D15 Max,D16 Max,D17 Max,D18 Max,D19 Max	
Power Supply	Rated voltage	DC 5.0V
	Battery voltage	DC 3.7V
Serial Number(SN)	D1Max240800001	
Hardware	V0.6	
Software	V1.0	
Bluetooth Version	5.0	
Specific power settings	Bluetooth(LE_1M): Default IEEE 802.11b: -60 IEEE 802.11g: -60 IEEE 802.11n(20MHz): -60	
Antenna Type	Internal antenna	
Antenna Gain	WIFI: 2.07 dBi (provided by client) Bluetooth: 0.3 dBi (provided by client)	
Beamforming gain	Unsupported (provided by client)	
Frequency Range	Bluetooth(LE_1M): 2402~2480MHz IEEE 802.11b/g/n(20MHz): 2412~2462MHz	
Channel Number	Bluetooth(LE_1M):40 Channels IEEE 802.11b/g/n(20MHz): 11 Channels	
Type of Modulation	Bluetooth(LE_1M):GFSK IEEE 802.11b: DSSS (CCK,DQPSK,DBPSK); IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK); IEEE 802.11n(HT20) : OFDM (64QAM, 16QAM,QPSK,BPSK);	
Max. Conducted Power	Bluetooth(LE_1M): 5.55 dBm WIFI2.4G:19.11dBm	
Operate Temp.Range	-20~70°C	

Note:

- The information of the EUT is declared by the manufacturer.
- The laboratory is not responsible for the product technical specification provided by the client.
- All the models are electrical identical including the same software parameter and hardware design (i.e., circuit design, PCB Layout, RF module/circuit, antenna type(s) and antenna location, components on PCB, etc.), same mechanical structure and design (including product enclosure, materials, etc.), the only difference is the model name, color, package.

No.	Model	Difference	Remarks
1	D1 Max	1. Only the appearance color difference is different. 2. Only the printing style on the surface of the package is different, the product inside the package is the same.	Inspection model
2	D11 Max		Coverage model
3	D12 Max		Coverage model
4	D13 Max		Coverage model
5	D14 Max		Coverage model
6	D15 Max		Coverage model

	7	D16 Max		Coverage model	
	8	D17 Max		Coverage model	
	9	D18 Max		Coverage model	
	10	D19 Max		Coverage model	

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)

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
IEEE 802.11b	1TX / 1RX	1,6,11
IEEE 802.11g	1TX / 1RX	1,6,11
IEEE 802.11n 20 SISO	1TX / 1RX	1,6,11

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	1	/
IEEE 802.11b	1	/	/
IEEE 802.11g	6	/	/
IEEE 802.11n 2.4GHz 20MHz	MCS 0	/	/

Note: The EUT has two Bluetooth modules, one located on the front lock and the other on the rear lock. The Bluetooth antenna of the front lock is labeled as antenna 1, and the Bluetooth antenna of the rear lock is labeled as antenna 2.

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

Note: The EUT has two Bluetooth modules, one located on the front lock and the other on the rear lock. The Bluetooth antenna of the front lock is labeled as antenna 1, and the Bluetooth antenna of the rear lock is labeled as antenna 2.

3.2 Duty cycle

TestMode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Limit	Verdict
11B	Ant1	2412	16.41	16.44	99.82	---	---
		2437	16.41	16.44	99.82	---	---
		2462	16.41	16.44	99.82	---	---
11G	Ant1	2412	2.73	2.76	98.91	---	---
		2437	2.73	2.76	98.91	---	---
		2462	2.73	2.77	98.56	---	---
11N20SISO	Ant1	2412	2.53	2.57	98.44	---	---
		2437	2.54	2.58	98.45	---	---
		2462	2.54	2.57	98.83	---	---
BLE_1M	Ant1	2402	20.00	20.00	100.00	---	---
		2440	20.00	20.00	100.00	---	---
		2480	20.00	20.00	100.00	---	---
	Ant2	2402	20.00	20.00	100.00	---	---
		2440	20.00	20.00	100.00	---	---
		2480	20.00	20.00	100.00	---	---

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(front), BLE_ diagram(rear)
Minimum 6 dB bandwidth	15.247(a)(2)	PASS	Appendix A of WIFI2.4G_ diagram and Appendix A of BLE_ diagram(front), BLE_ diagram(rear)
Occupied Channel Bandwidth	15.247(a)(2)	PASS	Appendix B of WIFI2.4G_ diagram and Appendix B of BLE_ diagram(front), BLE_ diagram(rear)
Band Edge Measurement	15.247(d)	PASS	Appendix E of WIFI2.4G_ diagram and Appendix E of BLE_ diagram(front), BLE_ diagram(rear)
Maximum Power spectral density	15.247(e)	PASS	Appendix D of WIFI2.4G_ diagram and Appendix D of BLE_ diagram(front), BLE_ diagram(rear)
Spurious RF Conducted Emissions	15.247(d)	PASS	Appendix F of WIFI2.4G_ diagram and Appendix F of BLE_ diagram(front), BLE_ diagram(rear)
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%	101.3kPa

Method of Measurement:

The EUT was setup according to ANSI C63.10-2020/Cor1-2023 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.

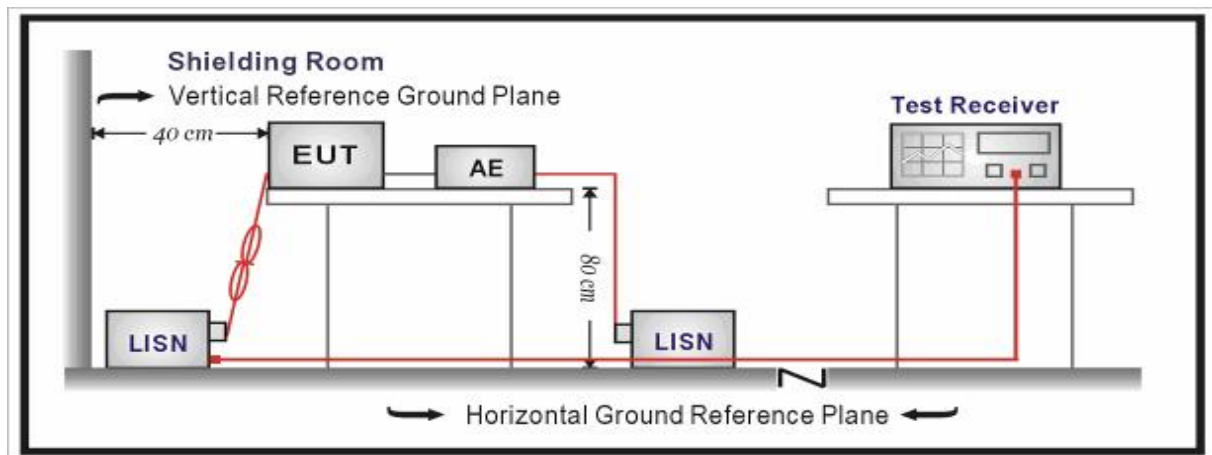
Limits:

Frequency (MHz)	Conducted Limits(dBμV)	
	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:

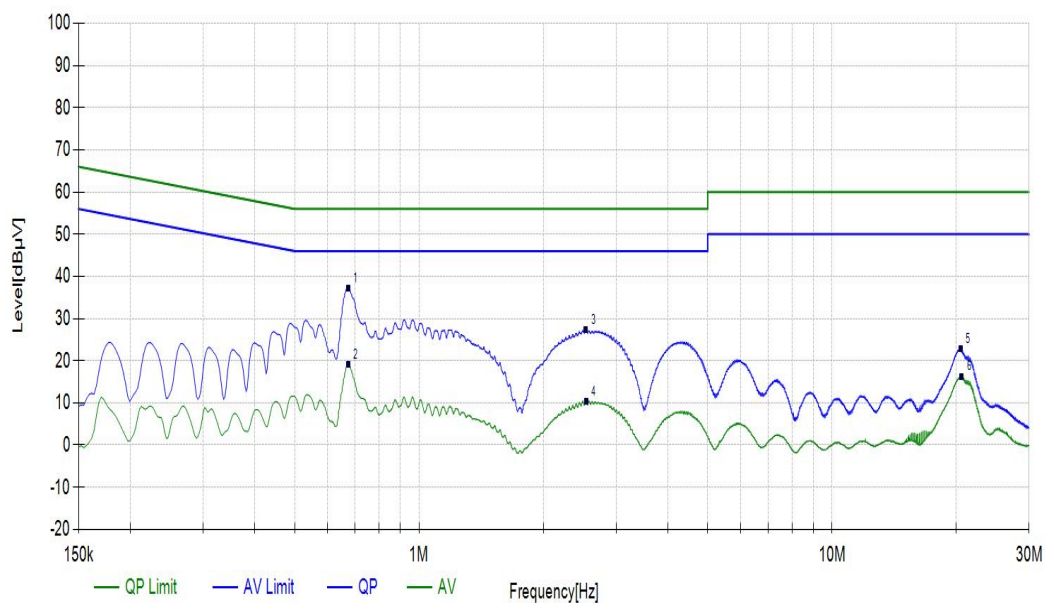
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$. $U = 3.12$ dB.

Test Results:

During the test, the Conducted Emission from 150kHz to 30MHz was performed in all modes with all channels, and all antennas. WIFI2.4G, 11N20, Channel 1, Antenna 1 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

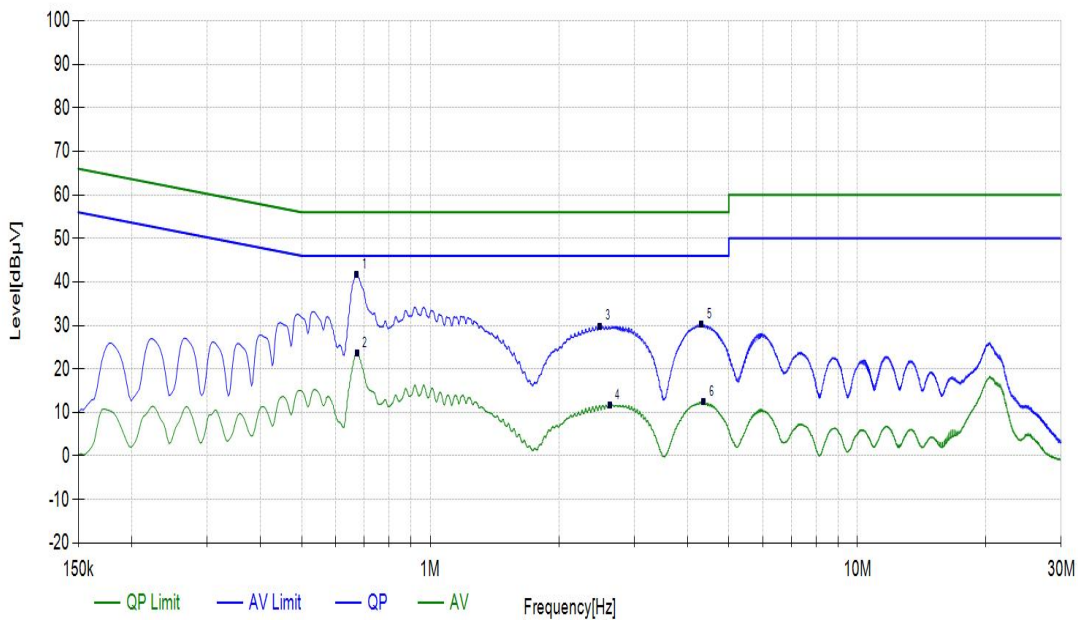
Power Line	L
Test channel	Worst-Case

NO.	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV]	Limit [dBμV]	Margin [dB]	Detector	Pass/Fail
1	0.6743	10.24	27.03	37.27	56.00	18.73	QP	PASS
3	2.5350	10.32	16.97	27.29	56.00	28.71	QP	PASS
5	20.4608	11.43	11.32	22.75	60.00	37.25	QP	PASS
2	0.6743	10.24	8.93	19.17	46.00	26.83	AV	PASS
4	2.5395	10.32	0.13	10.45	46.00	35.55	AV	PASS
6	20.5868	11.44	4.88	16.32	50.00	33.68	AV	PASS



Power Line	N
Test channel	Worst-Case

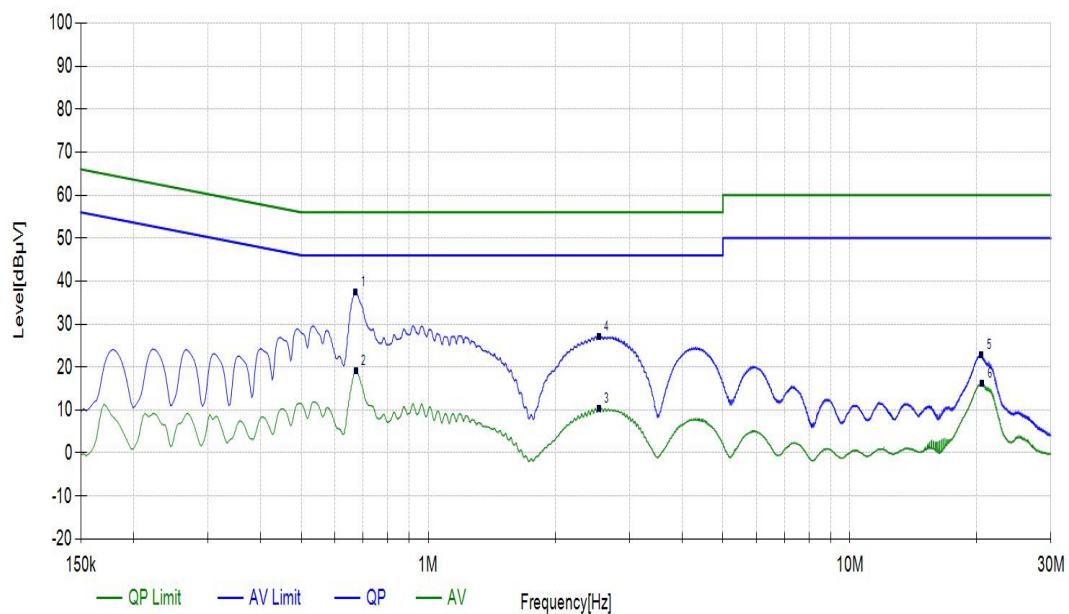
NO.	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV]	Limit [dBμV]	Margin [dB]	Detector	Pass/ Fail
1	0.6720	10.22	31.34	41.56	56.00	14.44	QP	PASS
3	2.4945	10.31	19.54	29.85	56.00	26.15	QP	PASS
5	4.3170	10.37	19.99	30.36	56.00	25.64	QP	PASS
2	0.6743	10.22	13.48	23.70	46.00	22.30	AV	PASS
4	2.6295	10.32	1.39	11.71	46.00	34.29	AV	PASS
6	4.3598	10.37	2.18	12.55	46.00	33.45	AV	PASS



During the test, the Conducted Emission from 150kHz to 30MHz was performed in all modes with all channels, and all antennas. Bluetooth(LE_1M), Channel 0, Antenna 1 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

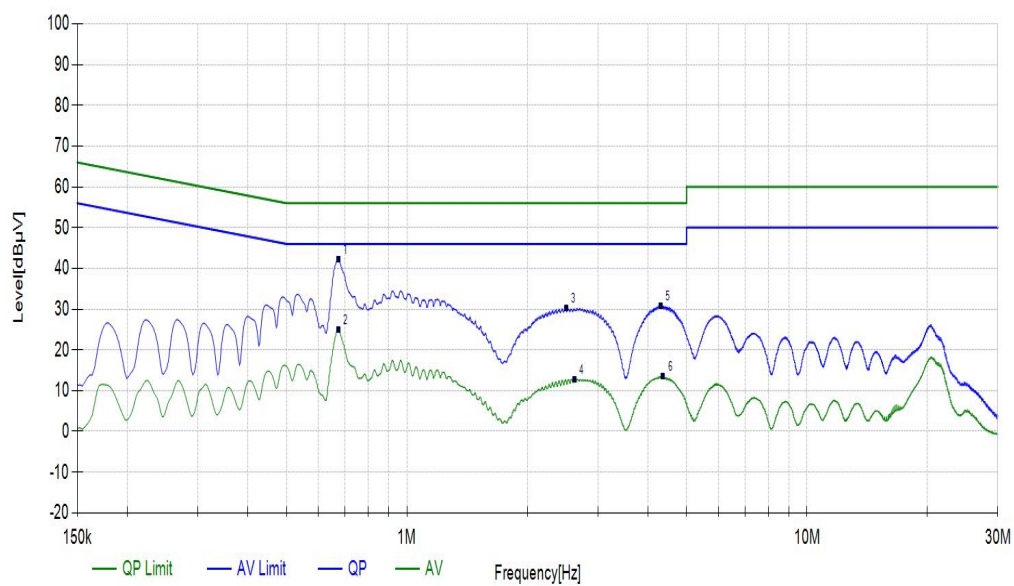
Power Line	L
Test channel	Worst-Case

NO.	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV]	Limit [dBμV]	Margin [dB]	Detector	Pass/Fail
1	0.6720	10.24	27.09	37.33	56.00	18.67	QP	PASS
3	2.5373	10.32	16.86	27.18	56.00	28.82	QP	PASS
5	20.4945	11.44	11.40	22.84	60.00	37.16	QP	PASS
2	0.6743	10.24	8.88	19.12	46.00	26.88	AV	PASS
4	20.5868	11.44	4.82	16.26	50.00	33.74	AV	PASS
6	2.5373	10.32	0.07	10.39	46.00	35.61	AV	PASS



Power Line	N
Test channel	Worst-Case

NO.	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV]	Limit [dBμV]	Margin [dB]	Detector	Pass/Fail
1	0.6743	10.22	31.91	42.13	56.00	13.87	QP	PASS
3	2.5013	10.31	19.84	30.15	56.00	25.85	QP	PASS
5	4.3058	10.37	20.44	30.81	56.00	25.19	QP	PASS
2	0.6743	10.22	14.74	24.96	46.00	21.04	AV	PASS
4	2.6228	10.31	2.52	12.83	46.00	33.17	AV	PASS
6	4.3598	10.37	3.21	13.58	46.00	32.42	AV	PASS



5.2 Radiated Emission

Ambient condition:

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.3kPa

Method of Measurement:

The EUT was setup and tested according to ANSI C63.10-2020/Cor1-2023.

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/Cor1-2023 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)).

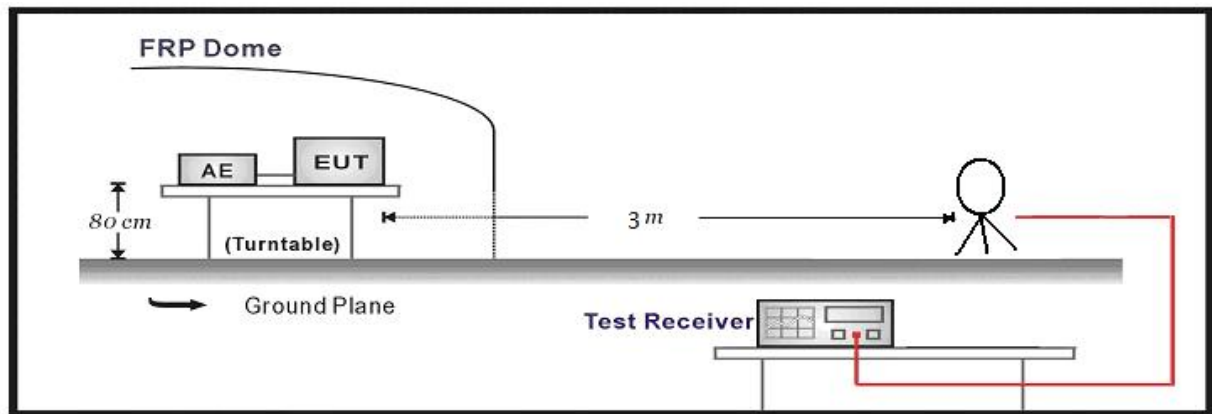
Frequency	Limit (μV/m)	Limit (dBμV/m @3m)	Remark
0.009MHz-0.490MHz	2400/F(kHz)@300m	20lg(24000000/F(kHz))	Quasi-peak Level
0.490MHz~1.705MHz	24000/F(kHz)@30m	20lg(2400000/F(kHz))	Quasi-peak Level
1.705MHz~30.0MHz	30@30m	69.54	Quasi-peak Level
30MHz-88MHz	100@3m	40.0	Quasi-peak Level
88MHz-216MHz	150@3m	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:

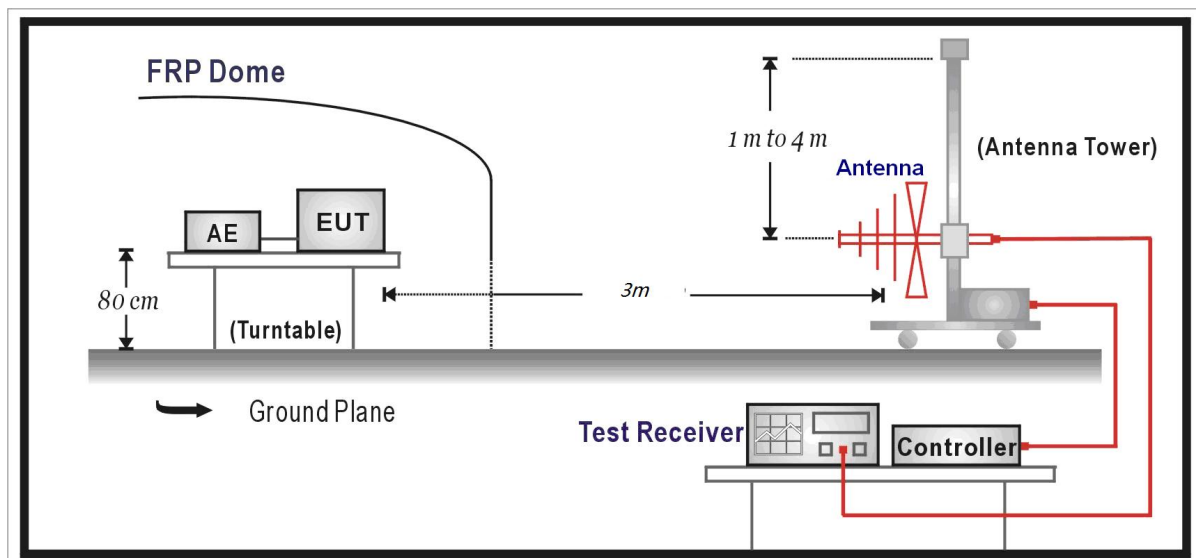
MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	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:

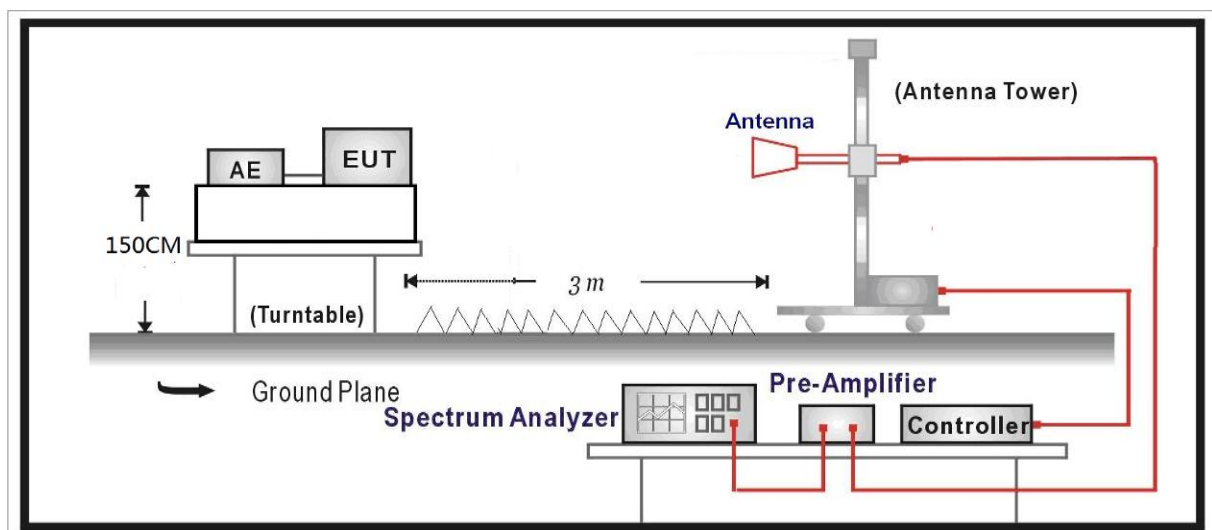
Below 30MHz Test Setup:



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:

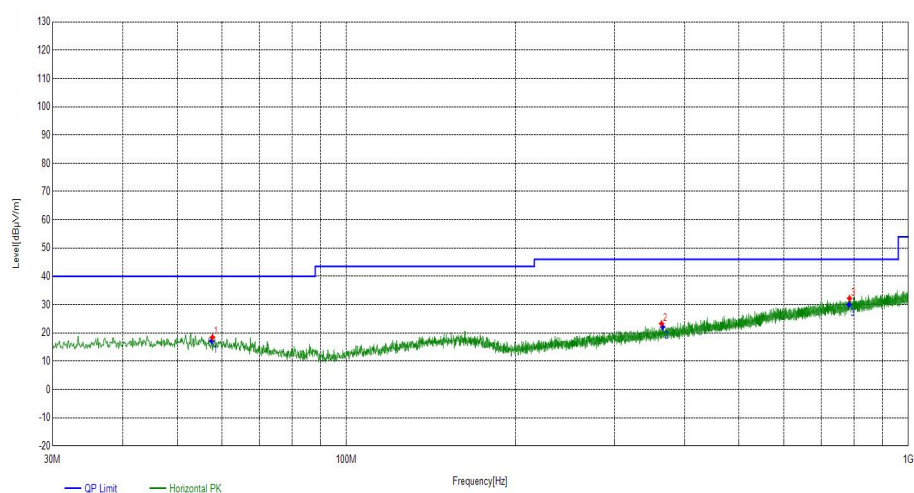
WIFI:

During the test, the Radiates Emission from 9kHz to 1GHz was performed in WIFI all modes with all channels and all antennas. 802.11n20, Channel 1, Ant1 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 [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/Fail
57.7448	Horizontal	20.10	-1.65	18.45	---	---	PK	100	170	---
363.8104	Horizontal	23.15	0.12	23.27	---	---	PK	100	120	---
785.9966	Horizontal	31.90	0.31	32.21	---	---	PK	100	220	---

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

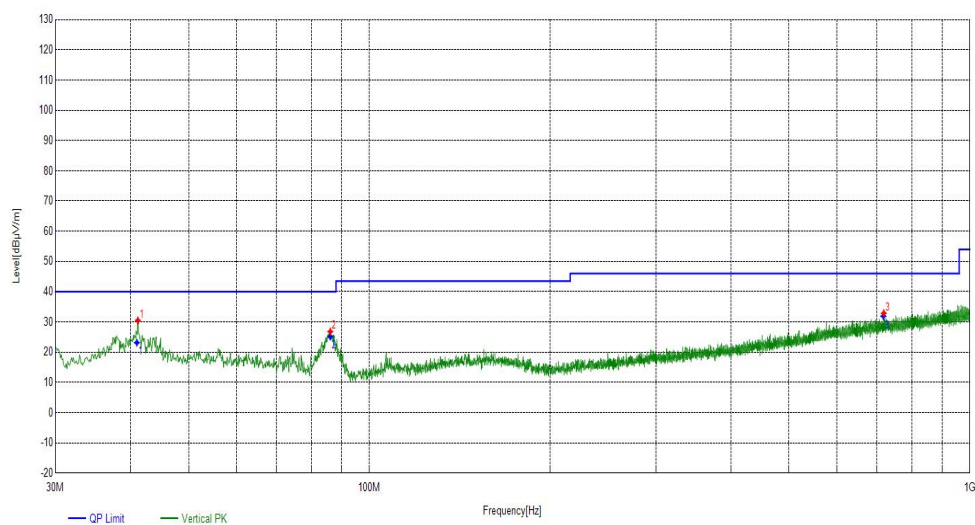
Final Data List									
Frequency [MHz]	Polarity	Factor [dB]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Pass/Fail	
57.5506	Horizontal	20.10	17.11	40.00	22.89	100	170	PASS	
365.5029	Horizontal	23.15	22.10	46.00	23.90	150	120	PASS	
784.4018	Horizontal	31.90	29.99	46.00	16.01	110	220	PASS	



Radiates Emission			9k~1G							
Test channel			Worst-Case							
Suspected List										
Frequency [MHz]	Polarity	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/Fail
41.1561	Vertical	20.09	10.42	30.51	---	---	PK	100	60	---
86.0716	Vertical	15.12	11.69	26.81	---	---	PK	100	20	---
718.7689	Vertical	30.86	2.01	32.87	---	---	PK	100	80	---

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	
41.0006	Vertical	20.09	23.15	40.00	16.85	300	65	PASS	
86.0442	Vertical	15.12	25.22	40.00	14.78	330	25	PASS	
717.5311	Vertical	30.86	31.90	46.00	14.10	350	85	PASS	



During the test, the Radiates Emission from Above 1G was performed in WIFI all modes with all channels and all antennas. 802.11n20, Highest, medium, lowest channels, Ant1 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 [dBμV/ m]	Level [dBμV/ m]	Limit [dBμV/ m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
4398.139814	0.04	38.19	38.23	74.00	35.77	PK	150	40	PASS
7722.472247	9.18	36.15	45.33	74.00	28.67	PK	150	130	PASS
10725.772577	12.73	33.67	46.40	74.00	27.60	PK	150	240	PASS
4602.160216	0.37	28.29	28.66	54.00	25.34	AV	150	210	PASS
7597.959796	9.09	25.97	35.06	54.00	18.94	AV	150	110	PASS
10874.287429	12.69	24.67	37.36	54.00	16.64	AV	150	210	PASS

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

Radiates Emission		Above 1G							
Test channel		Lowest							
polarization		Vertical							
Suspected List									
Frequency [MHz]	Factor [dB]	Reading [dBμV/ m]	Level [dBμV/ m]	Limit [dBμV/ m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
5596.759676	3.88	36.64	40.52	74.00	33.48	PK	150	100	PASS
7449.444945	9.01	35.98	44.99	74.00	29.01	PK	150	150	PASS
10745.274528	12.74	34.31	47.05	74.00	26.95	PK	150	50	PASS
5599.759976	3.89	26.19	30.08	54.00	23.92	AV	150	310	PASS
7623.462346	9.11	25.78	34.89	54.00	19.11	AV	150	360	PASS
10802.280228	12.77	23.97	36.74	54.00	17.26	AV	150	17	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 [dBμV/ m]	Level [dBμV/ m]	Limit [dBμV/ m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
7126.912691	8.98	37.14	46.12	74.00	27.88	PK	150	240	PASS
11055.805581	12.57	34.52	47.09	74.00	26.91	PK	150	140	PASS
13412.541254	14.37	35.11	49.48	74.00	24.52	PK	150	60	PASS
7075.907591	8.97	25.44	34.41	54.00	19.59	AV	150	350	PASS
11163.816382	12.58	25.17	37.75	54.00	16.25	AV	150	150	PASS
12993.9994	14.07	25.58	39.65	54.00	14.35	AV	150	150	PASS

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

Radiates Emission	Above 1G								
Test channel	Medium								
polarization	Vertical								
Suspected List									
Frequency [MHz]	Factor [dB]	Reading [dBμV/ m]	Level [dBμV/ m]	Limit [dBμV/ m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
7600.960096	9.09	36.97	46.06	74.00	27.94	PK	150	260	PASS
10256.225623	12.68	34.65	47.33	74.00	26.67	PK	150	130	PASS
13006.0006	14.08	34.78	48.86	74.00	25.14	PK	150	190	PASS
7776.477648	9.21	25.59	34.80	54.00	19.20	AV	150	100	PASS
10439.243924	12.87	23.87	36.74	54.00	17.26	AV	150	150	PASS
12966.9967	13.99	23.77	37.76	54.00	16.24	AV	150	50	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 [dBμV/ m]	Level [dBμV/ m]	Limit [dBμV/ m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
4437.143714	0.00	38.95	38.95	74.00	35.05	PK	150	270	PASS
6174.317432	5.92	36.03	41.95	74.00	32.05	PK	150	40	PASS
8636.063606	10.11	35.19	45.30	74.00	28.70	PK	150	10	PASS
4435.643564	0.00	28.66	28.66	54.00	25.34	AV	150	180	PASS
6024.30243	5.72	25.55	31.27	54.00	22.73	AV	150	100	PASS
8579.057906	10.08	24.60	34.68	54.00	19.32	AV	150	210	PASS

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

Radiates Emission	Above 1G								
Test channel	Highest								
polarization	Vertical								
Suspected List									
Frequency [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/Fail
7002.40024	8.94	35.80	44.74	74.00	29.26	PK	150	180	PASS
9536.153615	12.35	33.87	46.22	74.00	27.78	PK	150	100	PASS
13207.020702	14.11	33.85	47.96	74.00	26.04	PK	150	210	PASS
6972.39724	8.81	25.97	34.78	54.00	19.22	AV	150	40	PASS
9791.179118	12.41	23.87	36.28	54.00	17.72	AV	150	130	PASS
13681.068107	14.75	23.39	38.14	54.00	15.86	AV	150	240	PASS

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

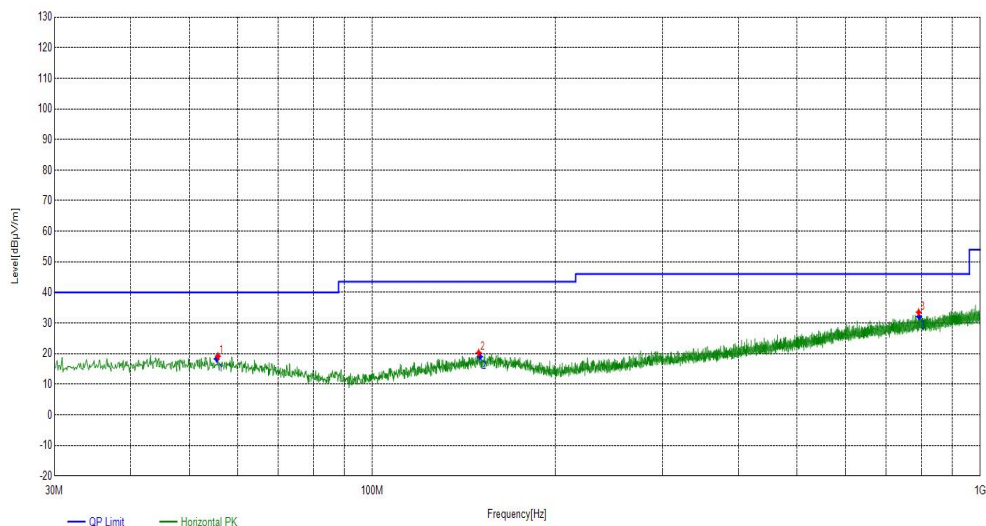
Bluetooth(Low Energy):

During the test, the Radiates Emission from 9kHz to 1GHz was performed in Bluetooth(Low Energy) all modes with all channels and all antennas. BLE(1Mbps),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 [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
55.7076	Horizontal	20.26	-1.08	19.18	---	---	PK	100	160	---
149.613	Horizontal	20.74	-0.49	20.25	---	---	PK	100	190	---
792.1082	Horizontal	31.99	1.52	33.51	---	---	PK	100	100	---

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

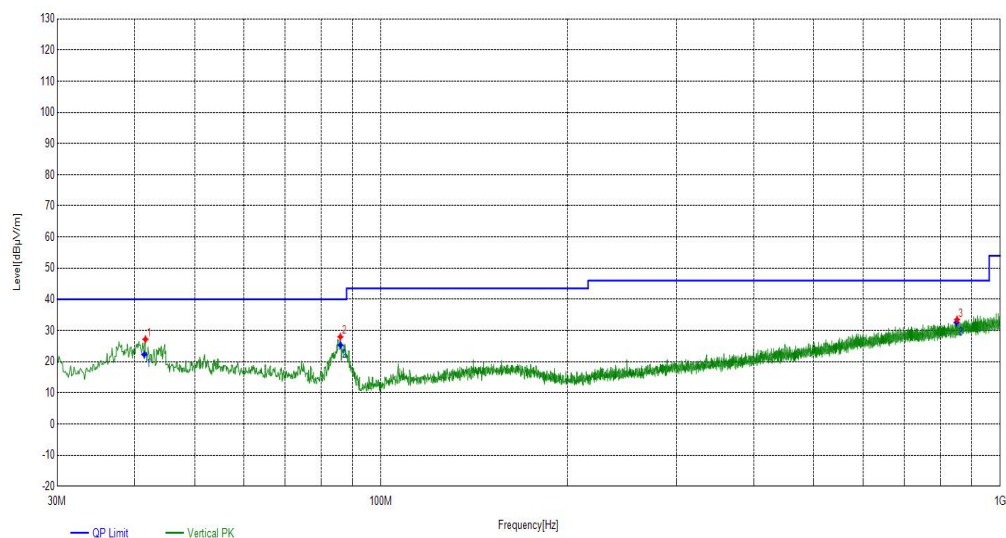
Final Data List									
Frequency [MHz]	Polarity	Factor [dB]	QP Value [dB μ V/m]	QP Limit [dB μ V/m]	QP Margin [dB]	Height [cm]	Angle [°]	Pass/Fail	
55.4319	Horizontal	20.26	18.30	40.00	21.70	200	165	PASS	
150.3318	Horizontal	20.74	19.01	43.50	24.49	370	195	PASS	
792.7047	Horizontal	31.99	32.10	46.00	13.90	260	105	PASS	



Radiates Emission			9k~1G							
Test channel			Worst-Case							
Suspected List										
Frequency [MHz]	Polarity	Factor [dB]	Readin g [dBμV/ m]	Level [dBμV/ m]	Limit [dBμV/ m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
41.6412	Vertical	20.13	7.05	27.18	---	---	PK	100	290	---
85.9746	Vertical	15.13	12.83	27.96	---	---	PK	100	250	---
851.7692	Vertical	32.34	1.17	33.51	---	---	PK	100	190	---

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	
41.4658	Vertical	20.13	22.29	40.00	17.71	130	295	PASS	
86.0368	Vertical	15.13	25.31	40.00	14.69	380	255	PASS	
850.2164	Vertical	32.34	32.56	46.00	13.44	320	195	PASS	



During the test, the Radiates Emission from Above 1G was performed in Bluetooth(Low Energy) all modes with all channels and all antennas. BLE(1Mbps), , front and rear, Highest, medium, lowest channels, antenna 1 and antenna 2 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

BLE(front)Antenna1:

Radiates Emission		Above 1G							
Test channel		Lowest							
polarization		Horizontal							
Suspected List									
Frequency [MHz]	Factor [dB]	Reading [dBμV/ m]	Level [dBμV/ m]	Limit [dBμV/ m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
4804.680468	1.25	40.14	41.39	74.00	32.61	PK	150	321	PASS
7204.920492	9.01	40.98	49.99	74.00	24.01	PK	150	13	PASS
11219.321932	12.53	35.71	48.24	74.00	25.76	PK	150	20	PASS
4804.680468	1.25	29.16	30.41	54.00	23.59	AV	150	1	PASS
7207.920792	9.00	33.42	42.42	54.00	11.58	AV	150	20	PASS
11309.330933	12.27	23.98	36.25	54.00	17.75	AV	150	1	PASS

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

Radiates Emission		Above 1G							
Test channel		Lowest							
polarization		Vertical							
Suspected List									
Frequency [MHz]	Factor [dB]	Reading [dBμV/ m]	Level [dBμV/ m]	Limit [dBμV/ m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
4804.680468	1.25	41.71	42.96	74.00	31.04	PK	150	355	PASS
7206.420642	9.01	39.63	48.64	74.00	25.36	PK	150	105	PASS
11004.80048	12.57	35.94	48.51	74.00	25.49	PK	150	4	PASS
4804.680468	1.25	34.22	35.47	54.00	18.53	AV	150	348	PASS
7207.920792	9.00	26.81	35.81	54.00	18.19	AV	150	65	PASS
10755.775578	12.75	23.26	36.01	54.00	17.99	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 [dBμV/ m]	Level [dBμV/ m]	Limit [dBμV/ m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
4881.188119	1.59	50.18	51.77	74.00	22.23	PK	150	290	PASS
7320.432043	8.99	43.88	52.87	74.00	21.13	PK	150	335	PASS
9761.176118	12.40	35.90	48.30	74.00	25.70	PK	150	322	PASS
4881.188119	1.59	41.58	43.17	54.00	10.83	AV	150	263	PASS
7323.432343	8.99	24.63	33.62	54.00	20.38	AV	150	309	PASS
9761.176118	12.40	25.79	38.19	54.00	15.81	AV	150	322	PASS

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

Radiates Emission	Above 1G								
Test channel	medium								
polarization	Vertical								
Suspected List									
Frequency [MHz]	Factor [dB]	Reading [dBμV/ m]	Level [dBμV/ m]	Limit [dBμV/ m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
4881.188119	1.59	54.84	56.43	74.00	17.57	PK	150	347	PASS
7320.432043	8.99	42.83	51.82	74.00	22.18	PK	150	359	PASS
9761.176118	12.40	33.99	46.39	74.00	27.61	PK	150	360	PASS
4881.188119	1.59	49.24	50.83	54.00	3.17	AV	150	1	PASS
7321.932193	8.99	35.88	44.87	54.00	9.13	AV	150	1	PASS
9761.176118	12.40	25.22	37.62	54.00	16.38	AV	150	6	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 [dBμV/ m]	Level [dBμV/ m]	Limit [dBμV/ m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
4960.69607	1.92	52.82	54.74	74.00	19.26	PK	150	262	PASS
7440.444044	9.00	46.02	55.02	74.00	18.98	PK	150	249	PASS
9920.192019	12.37	34.66	47.03	74.00	26.97	PK	150	321	PASS
4960.69607	1.92	42.43	44.35	54.00	9.65	AV	150	255	PASS
7441.944194	9.01	35.01	44.02	54.00	9.98	AV	150	321	PASS
9920.192019	12.37	25.09	37.46	54.00	16.54	AV	150	359	PASS

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

Radiates Emission	Above 1G								
Test channel	Highest								
polarization	Vertical								
Suspected List									
Frequency [MHz]	Factor [dB]	Reading [dBμV/ m]	Level [dBμV/ m]	Limit [dBμV/ m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
4959.19592	1.92	51.78	53.70	74.00	20.30	PK	150	351	PASS
7440.444044	9.00	46.55	55.55	74.00	18.45	PK	150	357	PASS
9920.192019	12.37	35.38	47.75	74.00	26.25	PK	150	338	PASS
4962.19622	1.92	43.45	45.37	54.00	8.63	AV	150	21	PASS
7441.944194	9.01	38.98	47.99	54.00	6.01	AV	150	12	PASS
9921.692169	12.38	23.69	36.07	54.00	17.93	AV	150	10	PASS

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

BLE(rear)Antenna 2:

Radiates Emission		Above 1G							
Test channel		Lowest							
polarization		Horizontal							
Suspected List									
Frequency [MHz]	Factor [dB]	Reading [dBμV/ m]	Level [dBμV/ m]	Limit [dBμV/ m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
3957.0957	-0.22	31.74	31.52	74.00	42.48	PK	150	320	PASS
5013.2013	1.50	30.57	32.07	74.00	41.93	PK	150	190	PASS
5985.2985	4.90	29.21	34.11	74.00	39.89	PK	150	110	PASS
3957.0957	-0.22	20.73	20.51	54.00	33.49	AV	150	10	PASS
5013.2013	1.50	20.40	21.90	54.00	32.10	AV	150	40	PASS
6000.3001	4.96	23.33	28.29	54.00	25.71	AV	150	130	PASS

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

Radiates Emission		Above 1G							
Test channel		Lowest							
polarization		Vertical							
Suspected List									
Frequency [MHz]	Factor [dB]	Reading [dBμV/ m]	Level [dBμV/ m]	Limit [dBμV/ m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
3964.5965	-0.20	31.96	31.76	74.00	42.24	PK	150	200	PASS
5704.7705	3.67	29.18	32.85	74.00	41.15	PK	150	140	PASS
6852.3852	7.24	28.30	35.54	74.00	38.46	PK	150	130	PASS
3961.5962	-0.21	24.32	24.11	54.00	29.89	AV	150	240	PASS
5703.2703	3.67	21.99	25.66	54.00	28.34	AV	150	140	PASS
6784.8785	6.90	22.05	28.95	54.00	25.05	AV	150	10	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 [dBμV/ m]	Level [dBμV/ m]	Limit [dBμV/ m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
4735.6736	0.34	30.09	30.43	74.00	43.57	PK	150	200	PASS
6703.8704	6.51	28.73	35.24	74.00	38.76	PK	150	310	PASS
8657.0657	9.24	28.44	37.68	74.00	36.32	PK	150	20	PASS
4728.1728	0.31	25.51	25.82	54.00	28.18	AV	150	40	PASS
6703.8704	6.51	22.68	29.19	54.00	24.81	AV	150	200	PASS
8660.066	9.24	24.25	33.49	54.00	20.51	AV	150	310	PASS

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

Radiates Emission		Above 1G							
Test channel		medium							
polarization		Vertical							
Suspected List									
Frequency [MHz]	Factor [dB]	Reading [dBμV/ m]	Level [dBμV/ m]	Limit [dBμV/ m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
4080.108	-0.22	31.39	31.17	74.00	42.83	PK	150	10	PASS
4776.1776	0.50	29.74	30.24	74.00	43.76	PK	150	130	PASS
6762.3762	6.79	28.33	35.12	74.00	38.88	PK	150	320	PASS
4080.108	-0.22	25.61	25.39	54.00	28.61	AV	150	60	PASS
4854.1854	0.83	23.17	24.00	54.00	30.00	AV	150	170	PASS
6730.8731	6.64	22.23	28.87	54.00	25.13	AV	150	30	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 [dBμV/ m]	Level [dBμV/ m]	Limit [dBμV/ m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
3598.5599	-0.84	36.71	35.87	74.00	38.13	PK	150	130	PASS
4876.6877	0.93	30.67	31.60	74.00	42.40	PK	150	70	PASS
6642.3642	6.21	29.35	35.56	74.00	38.44	PK	150	90	PASS
3547.5548	-0.95	31.06	30.11	54.00	23.89	AV	150	20	PASS
4876.6877	0.93	23.95	24.88	54.00	29.12	AV	150	190	PASS
6658.8659	6.29	22.36	28.65	54.00	25.35	AV	150	310	PASS

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

Radiates Emission		Above 1G							
Test channel		Highest							
polarization		Vertical							
Suspected List									
Frequency [MHz]	Factor [dB]	Reading [dBμV/ m]	Level [dBμV/ m]	Limit [dBμV/ m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
4182.1182	-0.34	31.94	31.60	74.00	42.40	PK	150	110	PASS
6013.8014	4.97	29.06	34.03	74.00	39.97	PK	150	310	PASS
7846.9847	8.43	29.43	37.86	74.00	36.14	PK	150	90	PASS
4170.117	-0.32	25.18	24.86	54.00	29.14	AV	150	140	PASS
6003.3003	4.96	22.23	27.19	54.00	26.81	AV	150	230	PASS
7860.486	8.44	21.25	29.69	54.00	24.31	AV	150	330	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.

802.11n20, Highest and lowest channels, Ant1 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 [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
2367.1367	-5.11	52.84	47.73	74.00	26.27	PK	150	250	PASS
2390.1390	-5.04	56.52	51.48	74.00	22.52	PK	150	40	PASS
2409.9409	-4.99	98.06	93.07	---	---	PK	150	320	---
2366.7366	-5.11	42.24	37.13	54.00	16.87	AV	150	10	PASS
2390.1390	-5.04	44.84	39.80	54.00	14.20	AV	150	20	PASS
2419.1419	-4.96	88.12	83.16	---	---	AV	150	350	---
Test mode			802.11n20						
Test channel			Lowest channel						
polarization			Vertical						
Suspected List									
Frequency [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
2385.9385	-5.05	54.60	49.55	74.00	24.45	PK	150	180	PASS
2390.1390	-5.04	56.51	51.47	74.00	22.53	PK	150	170	PASS
2417.7417	-4.97	97.45	92.48	---	---	PK	150	120	---
2385.9385	-5.05	44.09	39.04	54.00	14.96	AV	150	50	PASS
2390.1390	-5.04	44.15	39.11	54.00	14.89	AV	150	10	PASS
2406.9406	-4.99	88.54	83.55	---	---	AV	150	20	---

The signal beyond the limit is carrier.

Test mode			802.11n20						
Test channel			Highest channel						
polarization			Horizontal						
Suspected List									
Frequency [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/ Fail
2460.7460	-4.84	96.22	91.38	---	---	PK	150	320	---
2483.5483	-4.79	54.24	49.45	74.00	24.55	PK	150	190	PASS
2491.1491	-4.76	54.68	49.92	74.00	24.08	PK	150	320	PASS
2463.7463	-4.84	87.09	82.25	---	---	AV	150	20	---
2483.5483	-4.79	44.31	39.52	54.00	14.48	AV	150	10	PASS
2491.1491	-4.76	43.62	38.86	54.00	15.14	AV	150	10	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
2461.7461	-4.84	94.33	89.49	---	---	PK	150	360	---
2483.5483	-4.79	53.65	48.86	74.00	25.14	PK	150	240	PASS
2544.3544	-4.57	54.68	50.11	74.00	23.89	PK	150	160	PASS
2459.7459	-4.85	87.54	82.69	---	---	AV	150	10	---
2483.5483	-4.79	43.02	38.23	54.00	15.77	AV	150	40	PASS
2544.3544	-4.57	42.25	37.68	54.00	16.32	AV	150	10	PASS

The signal beyond the limit is carrier.

During the test, the Band Edge was performed in BLE all modes with all channels and all antennas.

BLE(1Mbps), front and rear, Highest and lowest channels, Antenna 1 and antenna 2 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

BLE(front)Antenna 1:

Test mode			BLE(1Mbps)						
Test channel			Lowest channel						
polarization			Horizontal						
Suspected List									
Frequency [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
2378.1378	-5.08	53.98	48.90	74.00	25.10	PK	150	290	PASS
2390.1390	-5.04	51.82	46.78	74.00	27.22	PK	150	10	PASS
2401.9401	-5.01	88.98	83.97	---	---	PK	150	90	---
2378.1378	-5.08	42.96	37.88	54.00	16.12	AV	150	10	PASS
2390.1390	-5.04	41.22	36.18	54.00	17.82	AV	150	340	PASS
2402.1402	-5.00	88.34	83.34	---	---	AV	150	330	---
Test mode			BLE(1Mbps)						
Test channel			Lowest channel						
polarization			Vertical						
Suspected List									
Frequency [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
2378.1378	-5.08	55.78	50.70	74.00	23.30	PK	150	280	PASS
2390.1390	-5.04	54.94	49.90	74.00	24.10	PK	150	150	PASS
2401.9401	-5.01	94.99	89.98	---	---	PK	150	180	---
2378.1378	-5.08	48.06	42.98	54.00	11.02	AV	150	100	PASS
2390.1390	-5.04	44.00	38.96	54.00	15.04	AV	150	10	PASS
2402.1402	-5.00	94.51	89.51	---	---	AV	150	10	---

The signal beyond the limit is carrier.

Test mode		BLE(1Mbps)							
Test channel		Highest channel							
polarization		Horizontal							
Suspected List									
Frequency [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
2480.1480	-4.80	84.42	79.62	---	---	PK	150	273	---
2483.5483	-4.79	53.50	48.71	74.00	25.29	PK	150	228	PASS
2498.1498	-4.74	53.09	48.35	74.00	25.65	PK	150	65	PASS
2480.1480	-4.80	83.90	79.10	---	---	AV	150	332	---
2483.5483	-4.79	42.47	37.68	54.00	16.32	AV	150	26	PASS
2500.3500	-4.73	41.98	37.25	54.00	16.75	AV	150	254	PASS
Test mode		BLE(1Mbps)							
Test channel		Highest channel							
polarization		Vertical							
Suspected List									
Frequency [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
2480.1480	-4.80	85.82	81.02	---	---	PK	150	354	---
2483.5483	-4.79	53.25	48.46	74.00	25.54	PK	150	132	PASS
2489.1489	-4.77	53.76	48.99	74.00	25.01	PK	150	341	PASS
2480.1480	-4.80	84.93	80.13	---	---	AV	150	354	---
2483.5483	-4.79	43.08	38.29	54.00	15.71	AV	150	347	PASS
2489.9489	-4.76	42.47	37.71	54.00	16.29	AV	150	359	PASS

The signal beyond the limit is carrier.

BLE(rear)Antenna 2:

Test mode			BLE(1Mbps)						
Test channel			Lowest channel						
polarization			Horizontal						
Suspected List									
Frequency [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
2335.7336	-5.06	62.87	57.81	74.00	16.19	PK	150	227	PASS
2390.139	-5.04	58.90	53.86	74.00	20.14	PK	150	313	PASS
2401.9401	-5.01	89.12	84.11	---	---	PK	150	354	---
2324.3324	-5.06	44.43	39.37	54.00	14.63	AV	150	313	PASS
2335.7336	-5.04	44.09	39.05	54.00	14.95	AV	150	157	PASS
2402.1402	-5.00	89.78	84.78	---	---	AV	150	242	---

Test mode			BLE(1Mbps)						
Test channel			Lowest channel						
polarization			Vertical						
Suspected List									
Frequency [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
2347.3347	-5.11	54.84	49.73	74.00	24.27	PK	150	237	PASS
2390.139	-5.04	54.88	49.84	74.00	24.16	PK	150	53	PASS
2401.9401	-5.01	93.02	88.01	---	---	PK	150	95	---
2347.3347	-5.11	44.50	39.39	54.00	14.61	AV	150	237	PASS
2390.139	-5.04	44.42	39.38	54.00	14.62	AV	150	2	PASS
2402.1402	-5.00	92.43	87.43	---	---	AV	150	110	---

The signal beyond the limit is carrier.

Test mode			BLE(1Mbps)						
Test channel			Highest channel						
polarization			Horizontal						
Suspected List									
Frequency [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
2480.1480	-4.80	82.91	78.11	---	---	PK	150	202	---
2483.5484	-4.79	59.85	55.06	74.00	18.94	PK	150	355	PASS
2500.35	-4.91	57.40	52.49	74.00	21.51	PK	150	102	PASS
2480.1480	-4.80	82.79	77.99	---	---	AV	150	343	---
2483.5484	-4.79	45.54	40.75	54.00	13.25	AV	150	188	PASS
2500.35	-4.91	45.08	40.17	54.00	13.83	AV	150	272	PASS
Test mode			BLE(1Mbps)						
Test channel			Highest channel						
polarization			Vertical						
Suspected List									
Frequency [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
2480.1480	-4.80	87.98	83.18	---	---	PK	150	10	---
2483.5484	-4.79	55.45	50.66	74.00	23.34	PK	150	72	PASS
2509.751	-4.98	56.97	51.99	74.00	22.01	PK	150	4	PASS
2480.1480	-4.80	86.02	81.22	---	---	AV	150	20	---
2483.5484	-4.79	44.99	40.20	54.00	13.80	AV	150	157	PASS
2509.751	-4.98	45.04	40.06	54.00	13.94	AV	150	4	PASS

The signal beyond the limit is carrier.

5.3 Maximum conducted output power

Ambient condition:

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.3kPa

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.

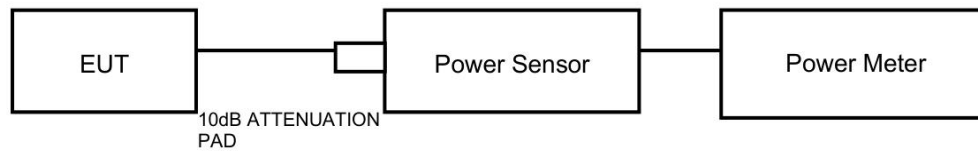
Limits:

Average Output Power	$\leq 1W$ (30dBm)
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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.

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	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	2412	18.35	≤ 30	PASS
	Ant1	2437	18.39	≤ 30	PASS
	Ant1	2462	18.27	≤ 30	PASS
11G	Ant1	2412	19.11	≤ 30	PASS
	Ant1	2437	18.79	≤ 30	PASS
	Ant1	2462	18.69	≤ 30	PASS
11N20SISO	Ant1	2412	18.00	≤ 30	PASS
	Ant1	2437	18.15	≤ 30	PASS
	Ant1	2462	18.05	≤ 30	PASS
BLE_1M	Ant1	2402	5.55	≤ 30	PASS
		2440	5.07	≤ 30	PASS
		2480	5.38	≤ 30	PASS
	Ant2	2402	5.32	≤ 30	PASS
		2440	5.17	≤ 30	PASS
		2480	4.74	≤ 30	PASS

5.4 Minimum 6 dB Bandwidth

Ambient condition:

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.3kPa

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.

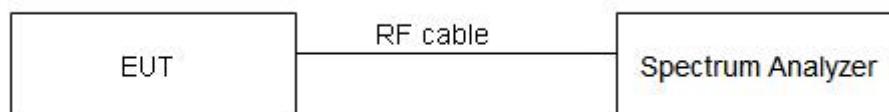
Detector=Peak, Trace mode=Max hold.

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
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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	9.60	2407.20	2416.80	≥0.5	PASS
	Ant1	2437	9.56	2432.20	2441.76	≥0.5	PASS
	Ant1	2462	9.56	2457.20	2466.76	≥0.5	PASS
11G	Ant1	2412	16.48	2403.80	2420.28	≥0.5	PASS
	Ant1	2437	16.48	2428.76	2445.24	≥0.5	PASS
	Ant1	2462	16.68	2453.64	2470.32	≥0.5	PASS
11N20SISO	Ant1	2412	17.68	2403.20	2420.88	≥0.5	PASS
	Ant1	2437	17.76	2428.08	2445.84	≥0.5	PASS
	Ant1	2462	17.60	2453.16	2470.76	≥0.5	PASS
BLE_1M	Ant1	2402	0.73	2401.71	2402.44	≥0.5	PASS
		2440	0.65	2439.79	2440.44	≥0.5	PASS
		2480	0.69	2479.74	2480.43	≥0.5	PASS
	Ant2	2402	0.70	2401.60	2402.30	≥0.5	PASS
		2440	0.69	2439.63	2440.32	≥0.5	PASS
		2480	0.70	2479.60	2480.30	≥0.5	PASS

5.5 Occupied Channel Bandwidth

Ambient condition:

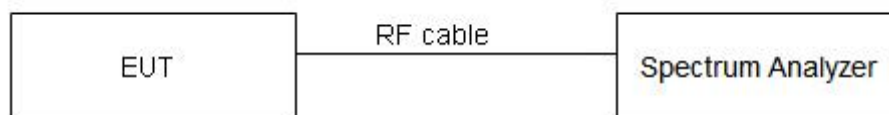
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.3kPa

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	11.269	---	---
	Ant1	2412	11.189	---	---
	Ant1	2437	11.149	---	---
11G	Ant1	2437	16.863	---	---
	Ant1	2462	16.823	---	---
	Ant1	2462	16.903	---	---
11N20SISO	Ant1	2402	17.862	---	---
	Ant1	2440	17.862	---	---
	Ant1	2480	17.862	---	---
BLE_1M	Ant1	2402	1.115	---	---
		2440	1.191	---	---
		2480	1.147	---	---
	Ant2	2402	1.059	---	---
		2440	1.043	---	---
		2480	1.059	---	---

5.6 Band Edge Measurement

Ambient condition:

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.3kPa

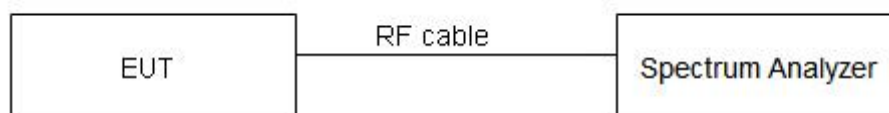
Method of Measurement:

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 $k = 1.96$, $U = 936 \text{ Hz}$, $2 \text{ GHz}-3 \text{ GHz} = 1.407 \text{ dB}$.

Test Results:

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	6.31	-37.92	≤-13.69	PASS
	Ant1	Low	2462	6.62	-46.18	≤-13.38	PASS
11G	Ant1	High	2412	-0.28	-37.53	≤-20.28	PASS
	Ant1	High	2462	-1.29	-47.1	≤-21.29	PASS
11N20SISO	Ant1	Low	2412	-1.16	-40.37	≤-21.16	PASS
	Ant1	High	2462	-2.31	-47.25	≤-22.31	PASS
BLE_1M	Ant1	Low	2402	3.80	-38.35	≤-16.2	PASS
		High	2480	4.55	-37.76	≤-15.45	PASS
	Ant2	Low	2402	5.14	-45.19	≤-14.86	PASS
		High	2480	3.57	-48.48	≤-16.43	PASS

5.7 Maximum Power Spectral Density

Ambient condition:

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.3kPa

Method of Measurement:

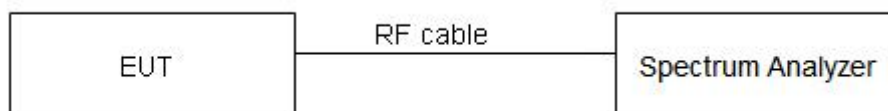
During the process of the testing, The EUT was connected to Spectrum Analyzer with a known loss. The EUT is max power transmission with proper modulation. The Average detector is used. We use Method AVGPS-2 in KDB 558074 D01 for this test.

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	$\leq 8 \text{ dBm} / 3\text{kHz}$
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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	-7.40	≤8	PASS
	Ant1	2437	-7.36	≤8	PASS
	Ant1	2462	-7.39	≤8	PASS
11G	Ant1	2412	-11.51	≤8	PASS
	Ant1	2437	-12.72	≤8	PASS
	Ant1	2462	-12.65	≤8	PASS
11N20SISO	Ant1	2412	-14.08	≤8	PASS
	Ant1	2437	-12.33	≤8	PASS
	Ant1	2462	-14.32	≤8	PASS
BLE_1M	Ant1	2402	-8.31	≤8	PASS
		2440	-8.80	≤8	PASS
		2480	-8.41	≤8	PASS
	Ant2	2402	-9.25	≤8	PASS
		2440	-9.37	≤8	PASS
		2480	-10.43	≤8	PASS

5.8 Spurious RF Conducted Emissions

Ambient condition:

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.3kPa

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) specifies 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	4.08	4.08	---	PASS
			30~1000	4.08	-59.78	≤-15.92	PASS
			1000~26500	4.08	-47.71	≤-15.92	PASS
		2437	Reference	4.62	4.62	---	PASS
			30~1000	4.62	-52.83	≤-15.38	PASS
			1000~26500	4.62	-47.68	≤-15.38	PASS
		2462	Reference	3.49	3.49	---	PASS
			30~1000	3.49	-60.13	≤-16.51	PASS
			1000~26500	3.49	-48.24	≤-16.51	PASS
11G	Ant1	2412	Reference	-2.41	-2.41	---	PASS
			30~1000	-2.41	-59.36	≤-22.41	PASS
			1000~26500	-2.41	-48.75	≤-22.41	PASS
		2437	Reference	-2.25	-2.25	---	PASS
			30~1000	-2.25	-60.26	≤-22.25	PASS
			1000~26500	-2.25	-49.37	≤-22.25	PASS
		2462	Reference	-3.57	-3.57	---	PASS
			30~1000	-3.57	-60.68	≤-23.57	PASS
			1000~26500	-3.57	-48.35	≤-23.57	PASS
11N20SISO	Ant1	2412	Reference	-5.17	-5.17	---	PASS
			30~1000	-5.17	-59.57	≤-25.17	PASS
			1000~26500	-5.17	-48.61	≤-25.17	PASS
		2437	Reference	-4.21	-4.21	---	PASS
			30~1000	-4.21	-59.65	≤-24.21	PASS
			1000~26500	-4.21	-49.21	≤-24.21	PASS
		2462	Reference	-4.79	-4.79	---	PASS
			30~1000	-4.79	-60.7	≤-24.79	PASS
			1000~26500	-4.79	-48.84	≤-24.79	PASS

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	3.82	3.82	---	PASS
			30~1000	3.82	-59.87	≤-16.18	PASS
			1000~26500	3.82	-28.27	≤-16.18	PASS
		2440	Reference	3.29	3.29	---	PASS
			30~1000	3.29	-60.28	≤-16.71	PASS
			1000~26500	3.29	-27.45	≤-16.71	PASS
		2480	Reference	3.55	3.55	---	PASS
			30~1000	3.55	-59.69	≤-16.45	PASS
			1000~26500	3.55	-29.99	≤-16.45	PASS
	Ant2	2402	Reference	3.22	3.22	---	PASS
			30~1000	3.22	-59.69	≤-16.78	PASS
			1000~26500	3.22	-48.66	≤-16.78	PASS
		2440	Reference	2.46	2.46	---	PASS
			30~1000	2.46	-60.45	≤-17.54	PASS
			1000~26500	2.46	-49.42	≤-17.54	PASS
		2480	Reference	3.05	3.05	---	PASS
			30~1000	3.05	-58.74	≤-16.95	PASS
			1000~26500	3.05	-48.54	≤-16.95	PASS

6. Appendix X

Test Equipment	Type/Mode	SERIAL NO.	Equipment No.	Manufacturer	Cal. Due
Communication Shielded Room 2	4m*3m*3m	CRTDSWKS4 4301	/	CRT	2027/04/22
Spectrum Analyzer	FSV40	101580	DZ-000238-3	R&S	2025/04/22
Power Meter	JS0806-2	19H9080187	DZ-000241	Tonscend	2025/04/27
5m Semi-Anechoic Chamber	SAC-5	SAC-5-2.0	EM-000557	COMTEST	2024/11/02
Spectrum Analyzer	N9010B	MY57470323	DZ-000174	KEYSIGHT	2025/01/02
EMI Test Receiver	N9038A-508	MY532290079	EM-000397	Agilent	2025/01/13
EMI Test Receiver	ESR7	102235	EM-000574	R&S	2025/01/13
loop antenna	HLA 6121	540046	EM-000546	TESEQ	2025/06/04
Broadband Antenna	VULB 9163	9163-530	EM-000342	SCHWAR ZBECK	2025/06/09
Waveguide Horn Antenna	HF906	360306/008	EM-000093	R&S	2025/01/13
Waveguide Horn Antenna	BBHA9170	00949	DZ-000209-2	SCHWAR ZBECK	2024/08/05
Preamplifier	BBV 9721	9721-050	DZ-000209-1	SCHWAR ZBECK	2025/06/03
Bandstop Filters	SW-BSF-2400-100-7-A1	/	EM-000495	/	2024/08/30
5G Bandstop Filters	WRCJV12-4900-5100-5900-6100-50EE	1	DZ-000186	WI	2024/12/03
Temperature and humidity meter	MHO-C201	/	DZ-000249-2	Seconds test	2024/08/30
Temperature and humidity meter	MHO-C201	/	DZ-000249-5	Seconds test	2024/08/30
SuperCharge	HW-100400C01	/	/	HUAWEI	/

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

The End

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)

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