ACCREDITED
CERTIFICATE #5473.01

Test Report No.:
FCC2024-0050-RF

TEST REPORT

FCC ID	:	2BG9T-TCLSMARTDW
Applicant	:	Shenzhen TCL Smart Home Technology Co., Ltd
Product Name	:	Smart Lock
Model No.	:	D1,D10,D11,D12,D13,D14,D15,D16,D17,D18,D19
Classification Of Test:		**COMMISSION TEST**

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 **Trade mark :** TCL **Serial no.** : D1241000000001 **Sampling :** 1-1

Date of Receipt.	2024.11.4	Date of Testing	2024.12.4

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:** 2024-12-9

Approved by:	Reviewed by:	Tested by:
Chen Huawen	**Xu Zhenfei**	**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**.

TABLE OF CONTENTS

1. General Product Information

1.1 General information

Product Name	Smart Lock	
Model No.	D1	
Additional model	D10,D11,D12,D13,D14,D15,D16,D17,D18,D19	
Power Supply	Rated voltage	DC 6.0V
	Battery voltage	DC 6.0V
Serial Number(SN)	D1241000000001	
Hardware	SF300_FRONT_SW_V2.1、ST380-REARLOCK_V05	
Software	V1.20.28	
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: 1.01 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(front): 2.27 dBm Bluetooth(rear): 2.12 dBm WIFI2.4G:17.76dBm	
Operate Temp.Range	-20~70℃	

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 EUT has 2 Bluetooth modules here, one located on the front lock and one located on the rear lock.
4. 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	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	D10		Coverage model
3	D11		Coverage model

	4	D12		Coverage model
	5	D13		Coverage model
	6	D14		Coverage model
	7	D15		Coverage model
	8	D16		Coverage model
	9	D17		Coverage model
	10	D18		Coverage model
	11	D19		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	8.38	17.13	48.92	---	---
		2437	8.37	16.69	50.15	---	---
		2462	8.37	16.69	50.15	---	---
11G	Ant1	2412	2.02	4.04	50.00	---	---
		2437	2.03	4.05	50.12	---	---
		2462	2.02	4.04	50.00	---	---
11N20SISO	Ant1	2412	1.89	4.68	40.38	---	---
		2437	1.88	3.70	50.81	---	---
		2462	1.89	3.71	50.94	---	---
BLE_1M	Ant1	2402	100.00	100.00	100.00	---	---
		2440	100.00	100.00	100.00	---	---
		2480	100.00	100.00	100.00	---	---
	Ant2	2402	100.00	100.00	100.00	---	---
		2440	100.00	100.00	100.00	---	---
		2480	100.00	100.00	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

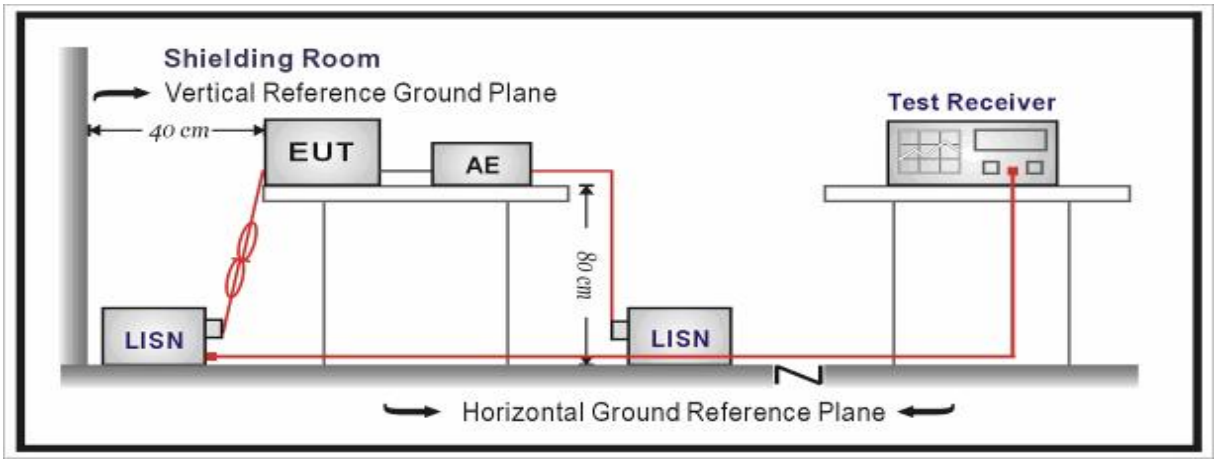
Method of Measurement:

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：

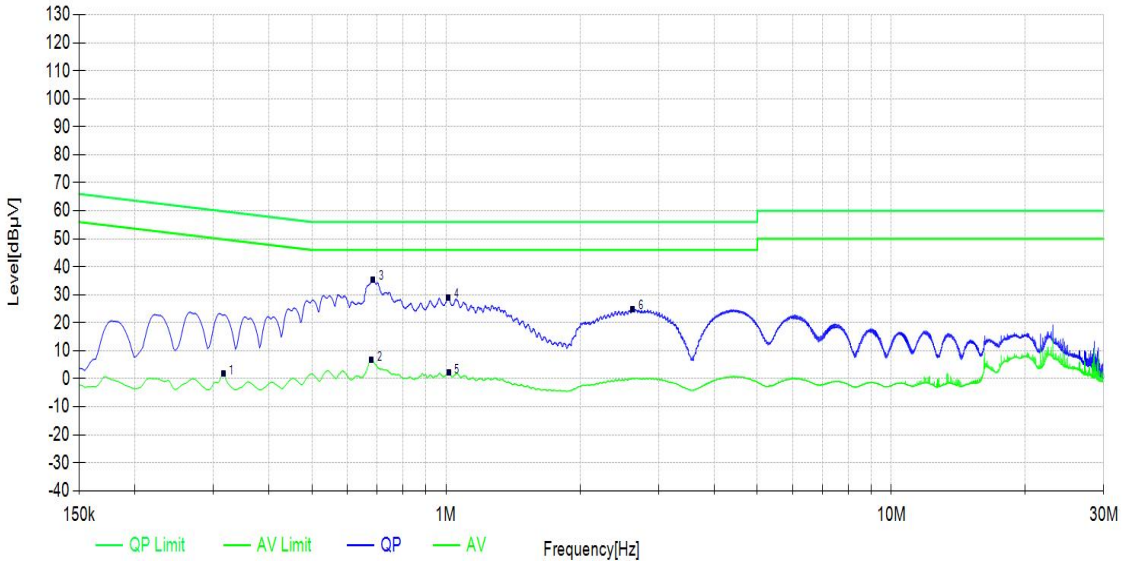
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 1.96. U= 3.12 dB.

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.

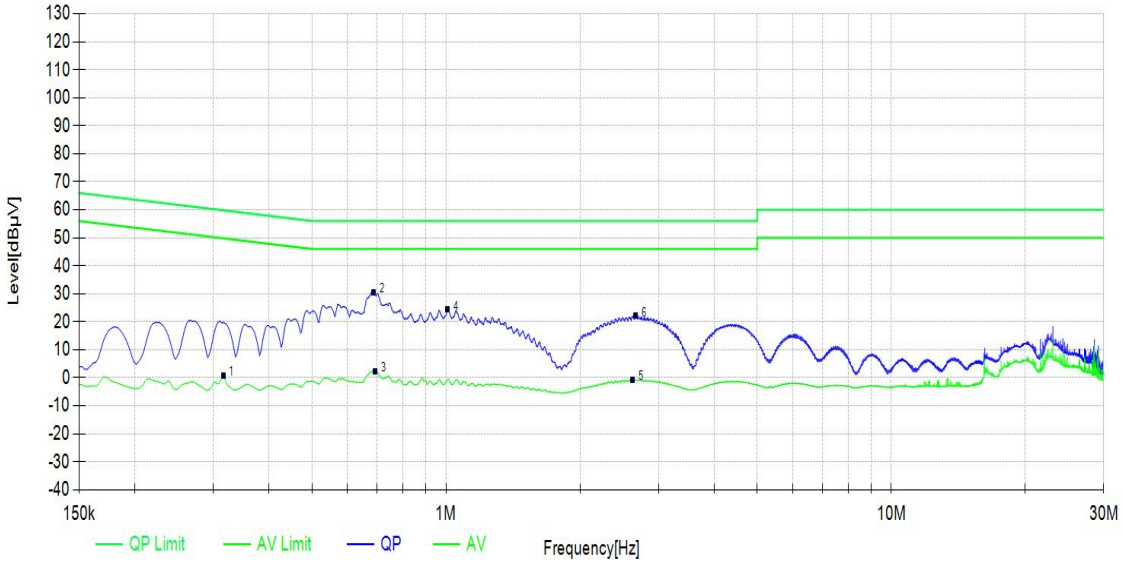
Power Line	L
Test channel	Worst-Case

NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV]	Limit [dBµV]	Margin [dB]	Detector	Pass/ Fail
6	2.6250	10.33	14.50	24.83	56.00	31.17	QP	PASS
4	1.0118	10.25	18.71	28.96	56.00	27.04	QP	PASS
3	0.6855	10.24	25.14	35.38	56.00	20.62	QP	PASS
2	0.6810	10.24	-3.55	6.69	46.00	39.31	AV	PASS
5	1.0140	10.25	-8.15	2.10	46.00	43.90	AV	PASS
1	0.3165	10.21	-8.40	1.81	49.80	47.99	AV	PASS



Power Line	N
Test channel	Worst-Case

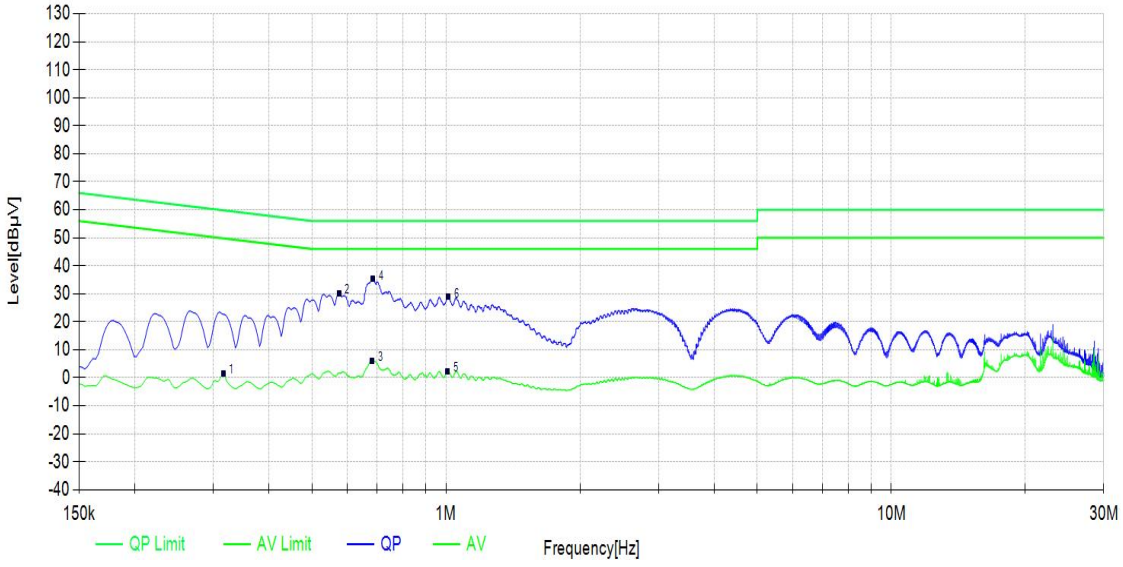
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV]	Limit [dBµV]	Margin [dB]	Detector	Pass/ Fail
6	2.6700	10.32	11.78	22.10	56.00	33.90	QP	PASS
2	0.6878	10.23	20.33	30.56	56.00	25.44	QP	PASS
4	1.0095	10.25	14.06	24.31	56.00	31.69	QP	PASS
3	0.6945	10.23	-7.91	2.32	46.00	43.68	AV	PASS
5	2.6250	10.32	-11.05	-0.73	46.00	46.73	AV	PASS
1	0.3165	10.20	-9.48	0.72	49.80	49.08	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.

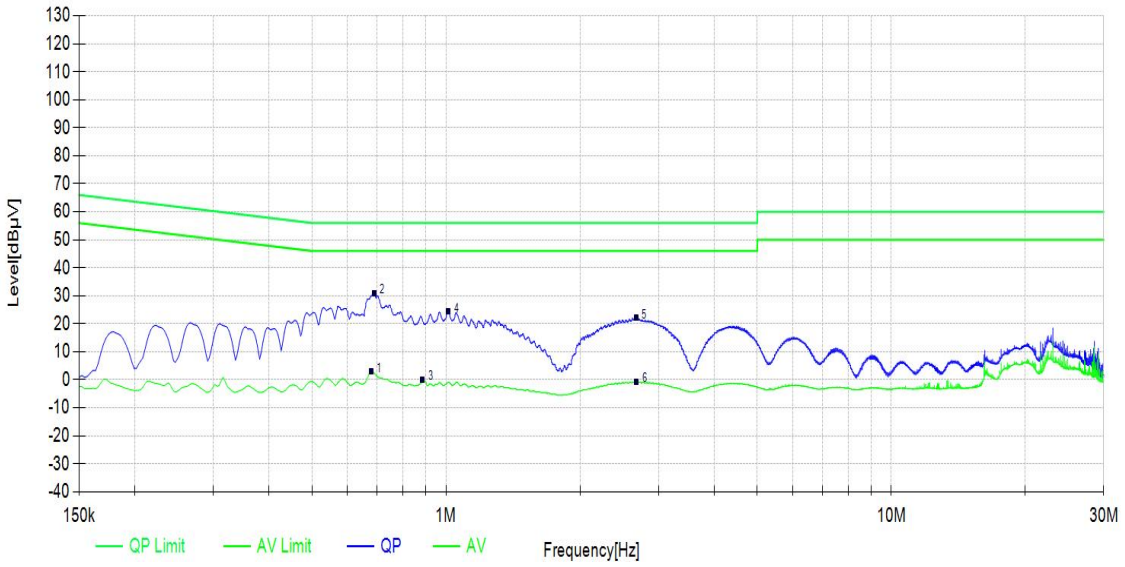
Power Line	L
Test channel	Worst-Case

NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV]	Limit [dBµV]	Margin [dB]	Detector	Pass/ Fail
6	1.0118	10.25	18.67	28.92	56.00	27.08	QP	PASS
2	0.5753	10.23	19.88	30.11	56.00	25.89	QP	PASS
4	0.6855	10.24	24.99	35.23	56.00	20.77	QP	PASS
3	0.6833	10.24	-4.15	6.09	46.00	39.91	AV	PASS
5	1.0095	10.25	-7.83	2.42	46.00	43.58	AV	PASS
1	0.3165	10.21	-8.66	1.55	49.80	48.25	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
2	0.6900	10.23	20.67	30.90	56.00	25.10	QP	PASS
4	1.0118	10.25	14.16	24.41	56.00	31.59	QP	PASS
5	2.6745	10.32	11.74	22.06	56.00	33.94	QP	PASS
3	0.8858	10.24	-10.17	0.07	46.00	45.93	AV	PASS
6	2.6768	10.32	-11.04	-0.72	46.00	46.72	AV	PASS
1	0.6788	10.23	-7.37	2.86	46.00	43.14	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)).

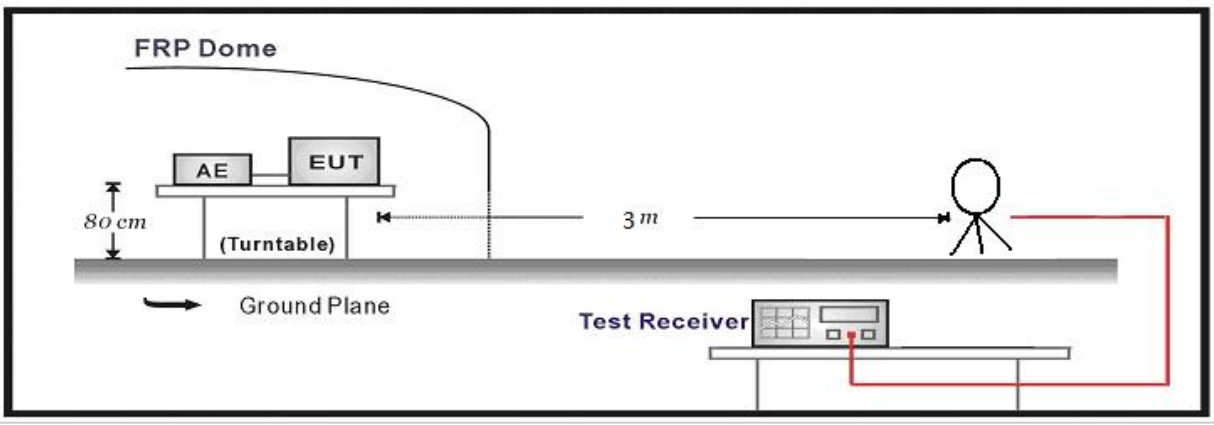
Frequency	Limit (μV/m)	Limit (dBμV/m @3m)	Remark
0.009MHz-0.490MHz	2400/F(kHz)@300m	20lg(24000000/F(kHz))	Quasi-peak Level
0.490MHz~1.705MHz	24000/F(kHz)@30m	20lg(2400000/F(kHz))	Quasi-peak Level
1.705MHz~30.0MHz	30@30m	69.54	Quasi-peak Level
30MHz-88MHz	100@3m	40.0	Quasi-peak Level
88MHz-216MHz	150@3m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

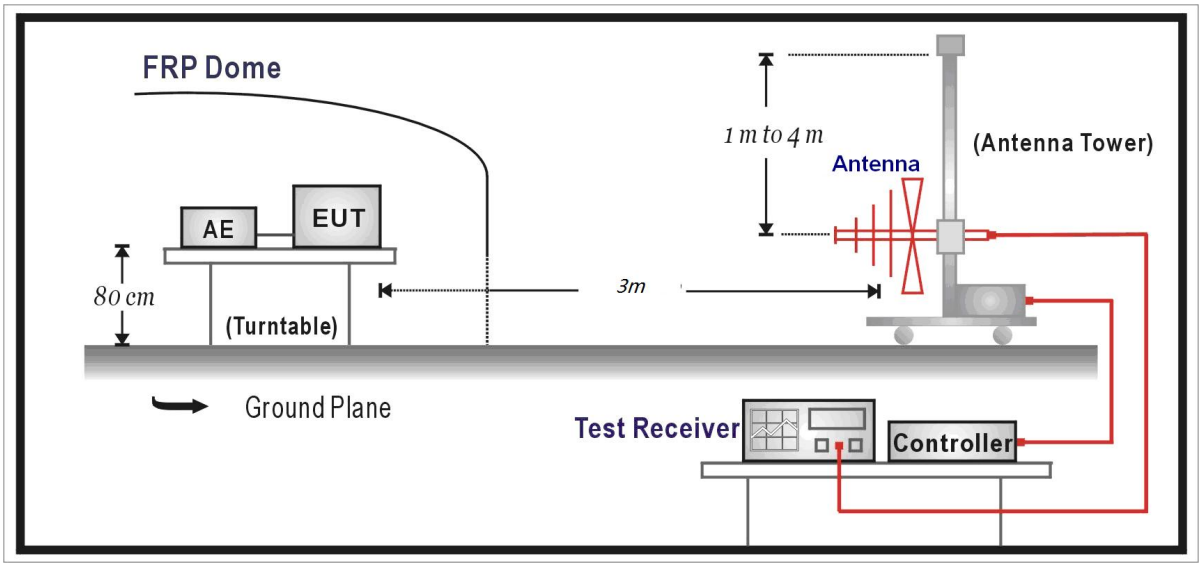
MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218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

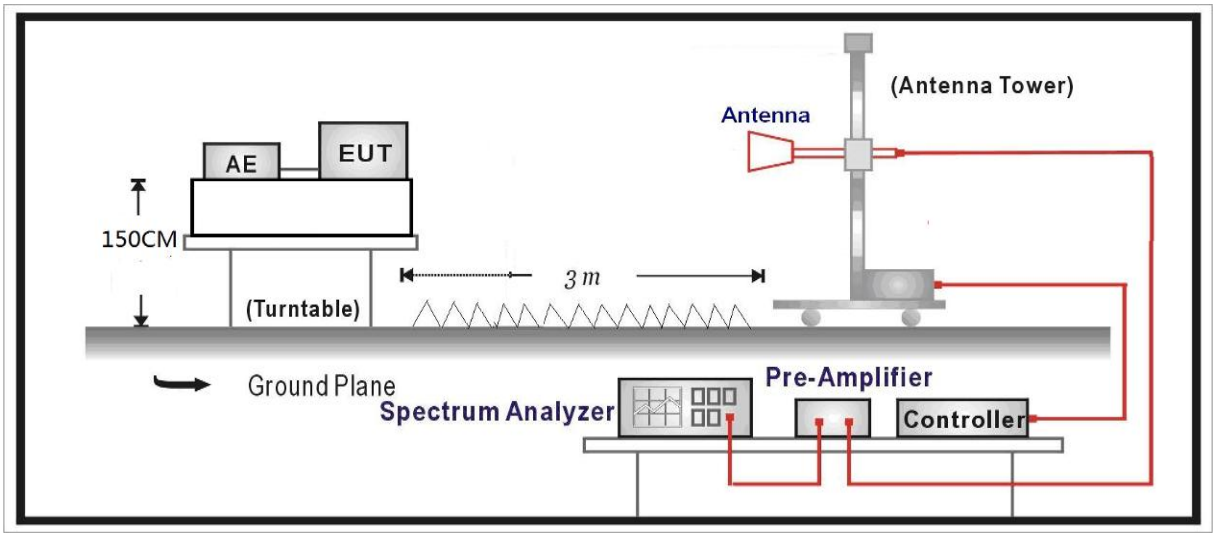
Below 30MHz Test Setup:



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

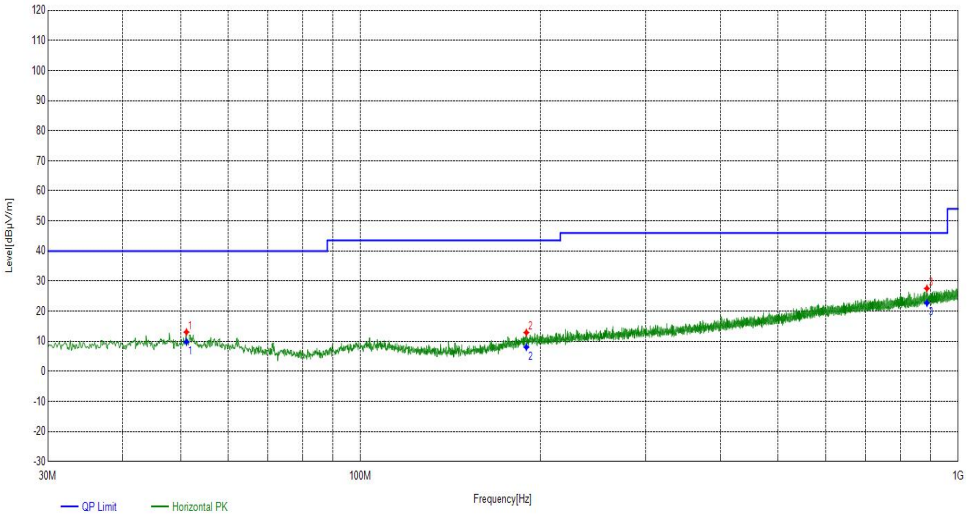
Suspected List

Frequency [MHz]	Polarity	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/Fail
51.1481	Horizontal	13.00	0.04	13.04	---	---	PK	100	34	---
189.4839	Horizontal	12.71	0.19	12.90	---	---	PK	100	82	---
886.5957	Horizontal	25.54	2.00	27.54	---	---	PK	100	210	---

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
51.1481	Horizontal	13.00	9.79	40.00	30.21	121	34	PASS
189.4839	Horizontal	12.71	8.05	43.50	35.45	171	82	PASS
886.5957	Horizontal	25.54	22.69	46.00	23.31	190	210	PASS



Radiates Emission	9k~1G
Test channel	Worst-Case

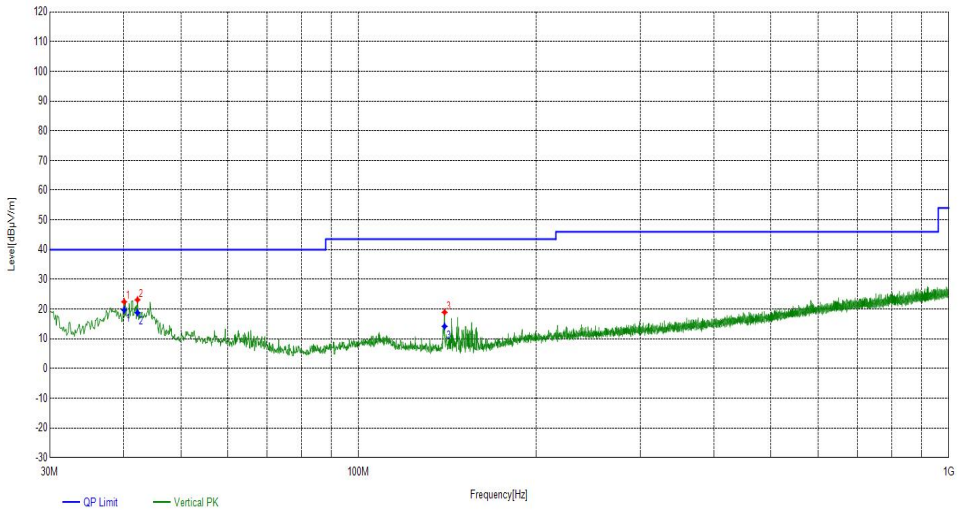
Suspected List

Frequency [MHz]	Polarity	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/Fail
40.089	Vertical	12.12	10.32	22.44	---	---	PK	100	359	---
42.2232	Vertical	12.33	10.78	23.11	---	---	PK	100	359	---
139.912	Vertical	9.47	9.46	18.93	---	---	PK	100	352	---

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
40.089	Vertical	12.12	19.71	40.00	20.29	192	359	PASS
42.2232	Vertical	12.33	18.78	40.00	21.22	184	359	PASS
139.912	Vertical	9.47	14.19	43.50	29.31	188	352	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]	Detector	Height [cm]	Angle deg	Pass/Fail
4947.19472	1.86	40.15	42.01	74.00	31.99	PK	150	20	PASS
6675.367537	7.26	35.31	42.57	74.00	31.43	PK	150	100	PASS
8832.583258	10.18	34.89	45.07	74.00	28.93	PK	150	210	PASS
4944.194419	1.85	28.10	29.95	54.00	24.05	AV	150	350	PASS
6696.369637	7.38	24.11	31.49	54.00	22.51	AV	150	300	PASS
9447.644765	12.11	22.80	34.91	54.00	19.09	AV	150	310	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]	Detector	Height [cm]	Angle deg	Pass/Fail
4942.694269	1.85	39.90	41.75	74.00	32.25	PK	150	300	PASS
6576.357636	6.70	35.30	42.00	74.00	32.00	PK	150	50	PASS
9209.120912	11.10	34.01	45.11	74.00	28.89	PK	150	340	PASS
4951.69517	1.88	28.80	30.68	54.00	23.32	AV	150	30	PASS
6826.882688	8.08	23.89	31.97	54.00	22.03	AV	150	10	PASS
8598.559856	10.11	25.50	35.61	54.00	18.39	AV	150	220	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]	Detector	Height [cm]	Angle deg	Pass/Fail
5995.79958	5.67	36.74	42.41	74.00	31.59	PK	150	60	PASS
7098.409841	8.97	35.40	44.37	74.00	29.63	PK	150	150	PASS
9350.135014	11.70	33.36	45.06	74.00	28.94	PK	150	220	PASS
5998.79988	5.69	25.18	30.87	54.00	23.13	AV	150	220	PASS
7021.90219	8.95	25.13	34.08	54.00	19.92	AV	150	150	PASS
9285.628563	11.43	23.58	35.01	54.00	18.99	AV	150	180	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]	Detector	Height [cm]	Angle deg	Pass/Fail
5412.241224	3.24	37.06	40.30	74.00	33.70	PK	150	30	PASS
7044.40444	8.96	34.87	43.83	74.00	30.17	PK	150	290	PASS
9329.132913	11.61	34.73	46.34	74.00	27.66	PK	150	190	PASS
5548.754876	3.67	26.18	29.85	54.00	24.15	AV	150	110	PASS
7797.479748	9.23	25.54	34.77	54.00	19.23	AV	150	70	PASS
9302.130213	11.49	23.29	34.78	54.00	19.22	AV	150	60	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]	Detector	Height [cm]	Angle deg	Pass/Fail
6604.860486	6.88	35.76	42.64	74.00	31.36	PK	150	260	PASS
7797.479748	9.23	35.57	44.80	74.00	29.20	PK	150	150	PASS
11286.828683	12.34	34.28	46.62	74.00	27.38	PK	150	30	PASS
6690.369037	7.34	24.68	32.02	54.00	21.98	AV	150	350	PASS
7645.964597	9.12	24.97	34.09	54.00	19.91	AV	150	340	PASS
11360.336034	12.12	24.85	36.97	54.00	17.03	AV	150	350	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]	Detector	Height [cm]	Angle deg	Pass/Fail
5998.79988	5.69	35.53	41.22	74.00	32.78	PK	150	310	PASS
8490.549055	9.98	34.94	44.92	74.00	29.08	PK	150	220	PASS
11199.819982	12.59	34.07	46.66	74.00	27.34	PK	150	190	PASS
6019.80198	5.72	25.63	31.35	54.00	22.65	AV	150	10	PASS
8271.527153	9.64	24.84	34.48	54.00	19.52	AV	150	10	PASS
11058.805881	12.57	24.13	36.70	54.00	17.30	AV	150	10	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), front and rear, channel 0, 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:

Radiates Emission	9k~1G
Test channel	Worst-Case

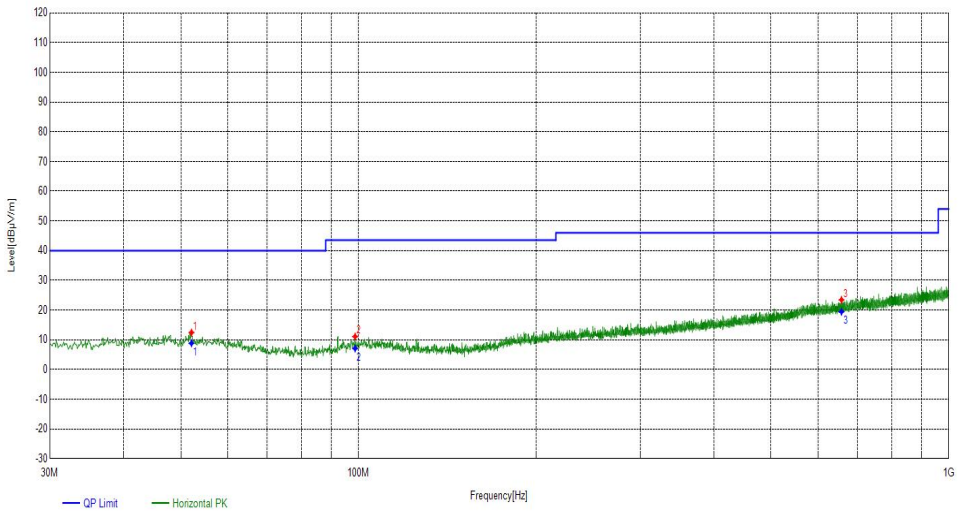
Suspected List

Frequency [MHz]	Polarity	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/Fail
52.1182	Horizontal	12.91	-0.47	12.44	---	---	PK	100	220	---
98.6829	Horizontal	11.59	-0.50	11.09	---	---	PK	100	39	---
658.0408	Horizontal	22.77	0.67	23.44	---	---	PK	100	178	---

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
52.1182	Horizontal	12.91	8.84	40.00	31.16	125	220	PASS
98.6829	Horizontal	11.59	7.09	43.50	36.41	132	39	PASS
658.0408	Horizontal	22.77	19.44	46.00	26.56	190	178	PASS



Radiates Emission	9k~1G
Test channel	Worst-Case

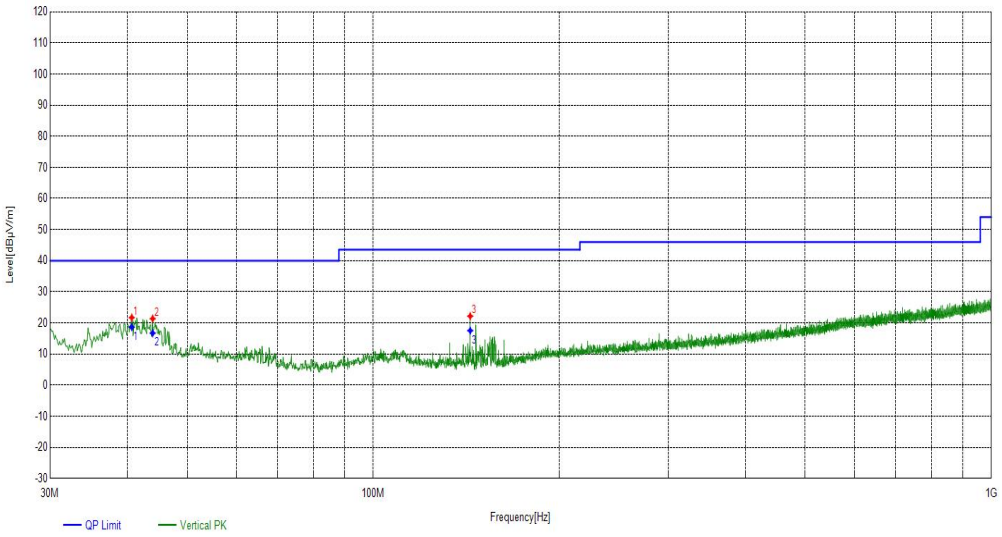
Suspected List

Frequency [MHz]	Polarity	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/Fail
40.6711	Vertical	12.18	9.53	21.71	---	---	PK	100	5	---
43.9694	Vertical	12.51	8.86	21.37	---	---	PK	100	1	---
143.5014	Vertical	9.49	12.69	22.18	---	---	PK	100	301	---

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
40.6711	Vertical	12.18	18.67	40.00	21.33	126	5	PASS
43.9694	Vertical	12.51	16.72	40.00	23.28	174	1	PASS
143.5014	Vertical	9.49	17.53	43.50	25.97	130	301	PASS



BLE(rear) Antenna2:

Radiates Emission	9k~1G
Test channel	Worst-Case

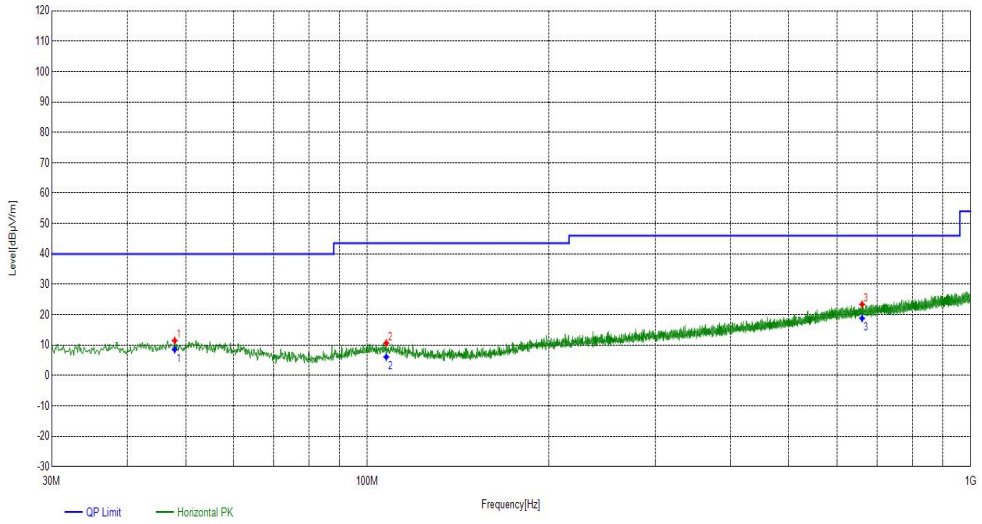
Suspected List

Frequency [MHz]	Polarity	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/Fail
47.9468	Horizontal	12.90	-1.40	11.50	---	---	PK	100	63	---
107.5108	Horizontal	11.67	-1.00	10.67	---	---	PK	100	311	---
660.8541	Horizontal	22.81	0.58	23.39	---	---	PK	100	197	---

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
47.9468	Horizontal	12.90	8.52	40.00	31.48	129	63	PASS
107.5108	Horizontal	11.67	6.09	43.50	37.41	175	311	PASS
660.8541	Horizontal	22.81	18.81	46.00	27.19	400	197	PASS



Radiates Emission	9k~1G
Test channel	Worst-Case

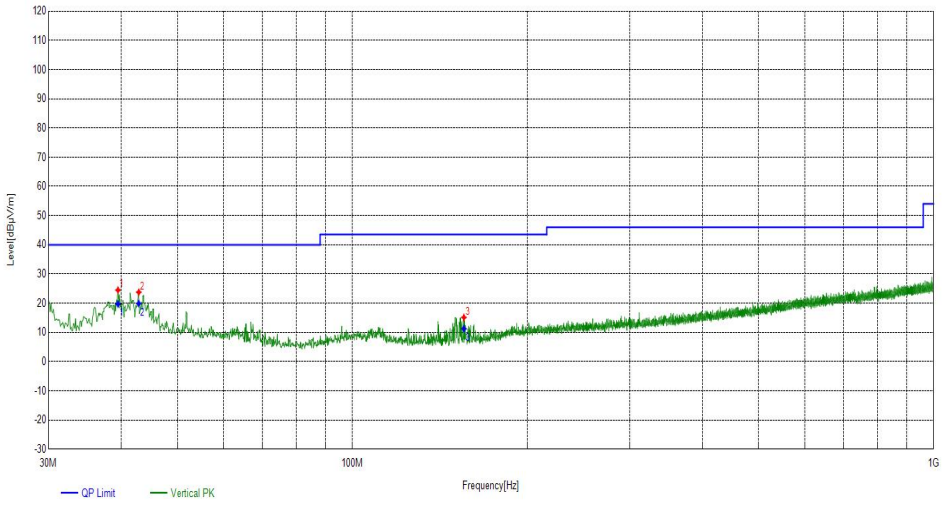
Suspected List

Frequency [MHz]	Polarity	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/Fail
39.507	Vertical	12.02	12.47	24.49	---	---	PK	100	359	---
42.9023	Vertical	12.40	11.35	23.75	---	---	PK	100	359	---
155.5306	Vertical	9.80	5.32	15.12	---	---	PK	100	57	---

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
39.507	Vertical	12.02	19.73	40.00	20.27	159	359	PASS
42.9023	Vertical	12.40	19.89	40.00	20.11	230	359	PASS
155.5306	Vertical	9.80	11.26	43.50	32.24	150	57	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]	Detector	Height [cm]	Angle deg	Pass/Fail
4330.633063	1.92	46.39	48.31	74.00	25.69	PK	150	140	PASS
5847.284729	9.00	41.81	50.81	74.00	23.19	PK	150	330	PASS
9792.679268	12.37	35.06	47.43	74.00	26.57	PK	150	50	PASS
4098.109811	1.92	39.06	40.98	54.00	13.02	AV	150	240	PASS
5490.249025	9.01	34.50	43.51	54.00	10.49	AV	150	220	PASS
9792.679268	12.38	25.64	38.02	54.00	15.98	AV	150	120	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]	Detector	Height [cm]	Angle deg	Pass/Fail
4902.190219	1.68	38.25	39.93	74.00	34.07	PK	150	130	PASS
5997.29973	5.68	35.86	41.54	74.00	32.46	PK	150	250	PASS
8571.557156	10.07	35.18	45.25	74.00	28.75	PK	150	200	PASS
4947.19472	1.86	27.08	28.94	54.00	25.06	AV	150	40	PASS
5994.29943	5.66	24.89	30.55	54.00	23.45	AV	150	10	PASS
8231.023102	9.57	24.95	34.52	54.00	19.48	AV	150	20	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]	Detector	Height [cm]	Angle deg	Pass/Fail
4879.687969	1.58	42.38	43.96	74.00	30.04	PK	150	280	PASS
9761.176118	12.40	36.24	48.64	74.00	25.36	PK	150	320	PASS
11559.855986	11.90	35.66	47.56	74.00	26.44	PK	150	300	PASS
4881.188119	1.59	36.94	38.53	54.00	15.47	AV	150	80	PASS
9761.176118	12.40	25.82	38.22	54.00	15.78	AV	150	20	PASS
11190.819082	12.59	25.70	38.29	54.00	15.71	AV	150	10	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]	Detector	Height [cm]	Angle deg	Pass/Fail
5272.727273	2.96	36.78	39.74	74.00	34.26	PK	150	330	PASS
6700.870087	7.40	37.32	44.72	74.00	29.28	PK	150	330	PASS
9530.153015	12.35	33.19	45.54	74.00	28.46	PK	150	270	PASS
5274.227423	2.96	26.93	29.89	54.00	24.11	AV	150	220	PASS
6645.364537	7.10	24.95	32.05	54.00	21.95	AV	150	160	PASS
9359.135914	11.73	23.43	35.16	54.00	18.84	AV	150	210	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]	Detector	Height [cm]	Angle deg	Pass/Fail
4218.121812	0.40	38.35	38.75	74.00	35.25	PK	150	10	PASS
5377.737774	3.15	37.00	40.15	74.00	33.85	PK	150	90	PASS
9845.184519	12.39	33.23	45.62	74.00	28.38	PK	150	260	PASS
4297.629763	0.25	29.32	29.57	54.00	24.43	AV	150	120	PASS
5211.221122	2.83	26.26	29.09	54.00	24.91	AV	150	200	PASS
10284.728473	12.72	23.15	35.87	54.00	18.13	AV	150	190	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]	Detector	Height [cm]	Angle deg	Pass/Fail
4938.193819	1.83	37.98	39.81	74.00	34.19	PK	150	250	PASS
5991.29913	5.65	36.69	42.34	74.00	31.66	PK	150	250	PASS
9909.690969	12.38	33.33	45.71	74.00	28.29	PK	150	270	PASS
4944.194419	1.85	27.70	29.55	54.00	24.45	AV	150	120	PASS
6100.810081	5.82	24.91	30.73	54.00	23.27	AV	150	220	PASS
9384.638464	11.84	23.32	35.16	54.00	18.84	AV	150	230	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]	Detector	Height [cm]	Angle deg	Pass/Fail
4768.676868	1.10	38.72	39.82	74.00	34.18	PK	150	10	PASS
6139.813981	5.87	35.11	40.98	74.00	33.02	PK	150	130	PASS
9476.147615	12.23	33.27	45.50	74.00	28.50	PK	150	290	PASS
4839.183918	1.41	27.46	28.87	54.00	25.13	AV	150	350	PASS
6003.30033	5.69	24.82	30.51	54.00	23.49	AV	150	340	PASS
9330.633063	11.61	23.71	35.32	54.00	18.68	AV	150	320	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]	Detector	Height [cm]	Angle deg	Pass/Fail
4647.164717	0.57	38.59	39.16	74.00	34.84	PK	150	30	PASS
7006.90069	8.94	35.20	44.14	74.00	29.86	PK	150	230	PASS
9785.178518	12.40	33.44	45.84	74.00	28.16	PK	150	210	PASS
4821.182118	1.32	27.43	28.75	54.00	25.25	AV	150	60	PASS
7068.406841	8.97	24.64	33.61	54.00	20.39	AV	150	120	PASS
9672.667267	12.39	23.45	35.84	54.00	18.16	AV	150	90	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]	Detector	Height [cm]	Angle deg	Pass/Fail
4878.187819	1.58	38.97	40.55	74.00	33.45	PK	150	200	PASS
6999.39994	8.94	34.38	43.32	74.00	30.68	PK	150	70	PASS
10266.726673	12.69	33.49	46.18	74.00	27.82	PK	150	250	PASS
4942.694269	1.85	27.43	29.28	54.00	24.72	AV	150	350	PASS
7080.408041	8.97	25.22	34.19	54.00	19.81	AV	150	320	PASS
10265.226523	12.69	23.05	35.74	54.00	18.26	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]	Detector	Height [cm]	Angle deg	Pass/Fail
4791.179118	1.21	38.43	39.64	74.00	34.36	PK	150	310	PASS
6696.369637	7.38	34.52	41.90	74.00	32.10	PK	150	220	PASS
11372.337234	12.08	34.61	46.69	74.00	27.31	PK	150	360	PASS
4740.174017	0.97	27.89	28.86	54.00	25.14	AV	150	120	PASS
6627.362736	7.01	24.11	31.12	54.00	22.88	AV	150	90	PASS
10877.287729	12.68	23.34	36.02	54.00	17.98	AV	150	70	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]	Detector	Height [cm]	Angle deg	Pass/Fail
4242.124212	0.36	38.60	38.96	74.00	35.04	PK	150	70	PASS
6025.80258	5.72	35.92	41.64	74.00	32.36	PK	150	120	PASS
8573.057306	10.07	35.22	45.29	74.00	28.71	PK	150	50	PASS
4108.610861	0.50	28.86	29.36	54.00	24.64	AV	150	300	PASS
5998.79988	5.69	25.62	31.31	54.00	22.69	AV	150	320	PASS
8729.072907	10.13	25.04	35.17	54.00	18.83	AV	150	350	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]	Detector	Height [cm]	Angle deg	Pass/Fail
4773.177318	1.11	37.39	38.50	74.00	35.50	PK	150	360	PASS
7123.912391	8.98	35.36	44.34	74.00	29.66	PK	150	300	PASS
9321.632163	11.57	33.54	45.11	74.00	28.89	PK	150	40	PASS
4929.192919	1.79	27.05	28.84	54.00	25.16	AV	150	50	PASS
7125.412541	8.98	24.58	33.56	54.00	20.44	AV	150	90	PASS
9249.624963	11.27	23.18	34.45	54.00	19.55	AV	150	120	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]	Detector	Height [cm]	Angle deg	Pass/ Fail
2375.9375	-5.09	40.20	35.11	74.00	38.89	PK	150	150	PASS
2390.1390	-5.04	60.35	55.31	74.00	18.69	PK	150	60	PASS
2419.1419	-4.96	84.49	79.53	---	---	PK	150	180	---
2375.9375	-5.09	27.97	22.88	54.00	31.12	AV	150	150	PASS
2390.1390	-5.04	35.46	30.42	54.00	23.58	AV	150	340	PASS
2419.5419	-4.96	74.07	69.11	---	---	AV	150	40	---

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]	Detector	Height [cm]	Angle deg	Pass/ Fail
2387.7387	-5.05	53.14	48.09	74.00	25.91	PK	150	270	PASS
2390.1390	-5.04	55.77	50.73	74.00	23.27	PK	150	280	PASS
2415.7415	-4.97	81.64	76.67	---	---	PK	150	310	---
2387.7387	-5.05	35.63	30.58	54.00	23.42	AV	150	10	PASS
2390.1390	-5.04	40.24	35.20	54.00	18.80	AV	150	10	PASS
2415.7415	-4.97	66.95	61.98	---	---	AV	150	50	---

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
2473.1473	-4.81	81.98	77.17	---	---	PK	150	50	---
2483.5483	-4.79	62.86	58.07	74.00	15.93	PK	150	200	PASS
2501.1501	-4.73	44.64	39.91	74.00	34.09	PK	150	40	PASS
2470.7470	-4.82	72.63	67.81	---	---	AV	150	10	---
2483.5483	-4.79	48.45	43.66	54.00	10.34	AV	150	30	PASS
2501.1501	-4.73	29.36	24.63	54.00	29.37	AV	150	20	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
2471.7471	-4.82	79.58	74.76	---	---	PK	150	160	---
2483.5483	-4.79	62.34	57.55	74.00	16.45	PK	150	220	PASS
2494.9494	-4.75	49.69	44.94	74.00	29.06	PK	150	190	PASS
2471.7471	-4.82	65.29	60.47	---	---	AV	150	130	---
2483.5483	-4.79	47.05	42.26	54.00	11.74	AV	150	20	PASS
2494.9494	-4.75	32.54	27.79	54.00	26.21	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]	Detector	Height [cm]	Angle deg	Pass/ Fail
2377.9377	-5.08	39.90	34.82	74.00	39.18	PK	150	360	PASS
2390.1390	-5.04	39.22	34.18	74.00	39.82	PK	150	340	PASS
2402.3402	-5.00	86.21	81.21	---	---	PK	150	110	---
2377.9377	-5.08	30.34	25.26	54.00	28.74	AV	150	10	PASS
2390.1390	-5.04	28.88	23.84	54.00	30.16	AV	150	10	PASS
2402.3402	-5.00	85.56	80.56	---	---	AV	150	300	---

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]	Detector	Height [cm]	Angle deg	Pass/ Fail
2378.7378	-5.08	39.14	34.06	74.00	39.94	PK	150	100	PASS
2390.1390	-5.04	38.93	33.89	74.00	40.11	PK	150	300	PASS
2402.3402	-5.00	78.19	73.19	---	---	PK	150	120	---
2378.7378	-5.08	29.93	24.85	54.00	29.15	AV	150	50	PASS
2390.1390	-5.04	28.98	23.94	54.00	30.06	AV	150	20	PASS
2402.3402	-5.00	77.57	72.57	---	---	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]	Detector	Height [cm]	Angle deg	Pass/ Fail
2480.3480	-4.80	90.28	85.48	---	---	PK	150	190	---
2483.5483	-4.79	54.26	49.47	74.00	24.53	PK	150	90	PASS
2489.1489	-4.77	49.87	45.10	74.00	28.90	PK	150	330	PASS
2480.1480	-4.80	89.68	84.88	---	---	AV	150	350	---
2483.5483	-4.79	44.87	40.08	54.00	13.92	AV	150	330	PASS
2489.1489	-4.77	39.53	34.76	54.00	19.24	AV	150	140	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]	Detector	Height [cm]	Angle deg	Pass/ Fail
2480.3480	-4.80	85.27	80.47	---	---	PK	150	250	---
2483.5483	-4.79	50.32	45.53	74.00	23.47	PK	150	260	PASS
2503.9503	-4.72	43.64	38.92	74.00	35.08	PK	150	160	PASS
2480.3480	-4.80	84.68	79.88	---	---	AV	150	350	---
2483.5483	-4.79	39.53	34.74	54.00	19.26	AV	150	200	PASS
2503.9503	-4.72	38.16	33.44	54.00	20.56	AV	150	10	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]	Detector	Height [cm]	Angle deg	Pass/ Fail
2378.9378	-5.08	39.22	34.14	74.00	39.86	PK	150	40	PASS
2390.1390	-5.04	39.38	34.34	74.00	39.66	PK	150	350	PASS
2402.3402	-5.00	88.20	83.20	---	---	PK	150	340	---
2378.9378	-5.08	28.80	23.72	54.00	30.28	AV	150	280	PASS
2390.1390	-5.04	28.90	23.86	54.00	30.14	AV	150	10	PASS
2402.3402	-5.00	87.54	82.54	---	---	AV	150	350	---

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]	Detector	Height [cm]	Angle deg	Pass/ Fail
2378.7378	-5.08	39.10	34.02	74.00	39.98	PK	150	80	PASS
2390.1390	-5.04	38.94	33.90	74.00	40.10	PK	150	170	PASS
2402.3402	-5.00	78.00	73.00	---	---	PK	150	120	---
2378.7378	-5.08	29.99	24.80	54.00	29.20	AV	150	210	PASS
2390.1390	-5.04	28.81	23.77	54.00	30.23	AV	150	10	PASS
2402.3402	-5.00	77.34	72.34	---	---	AV	150	360	---

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]	Detector	Height [cm]	Angle deg	Pass/ Fail
2480.3480	-4.80	90.27	85.47	---	---	PK	150	350	---
2483.5483	-4.79	54.58	49.79	74.00	24.21	PK	150	40	PASS
2504.7504	-4.71	43.20	38.49	74.00	35.51	PK	150	130	PASS
2480.3480	-4.80	89.75	84.95	---	---	AV	150	350	---
2483.5483	-4.79	44.65	39.86	54.00	14.14	AV	150	350	PASS
2504.7504	-4.71	37.04	32.33	54.00	21.67	AV	150	300	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]	Detector	Height [cm]	Angle deg	Pass/ Fail
2480.3480	-4.80	88.17	83.37	---	---	PK	150	80	---
2483.5483	-4.79	54.21	49.42	74.00	24.58	PK	150	170	PASS
2489.1489	-4.77	48.94	44.17	74.00	29.83	PK	150	120	PASS
2480.3480	-4.80	87.59	82.79	---	---	AV	150	210	---
2483.5483	-4.79	42.75	37.96	54.00	16.04	AV	150	10	PASS
2489.1489	-4.77	39.41	34.64	54.00	19.36	AV	150	360	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.

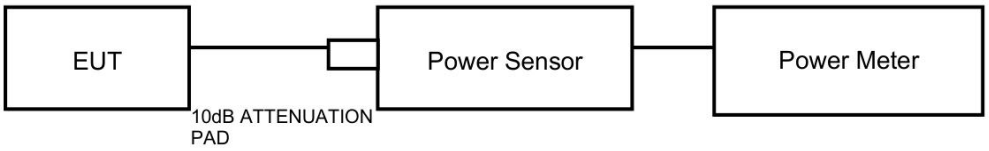
Limits:

Average Output Power	≤ 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.

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	16.83	≤30	PASS
	Ant1	2437	15.46	≤30	PASS
	Ant1	2462	15.69	≤30	PASS
11G	Ant1	2412	16.95	≤30	PASS
	Ant1	2437	16.00	≤30	PASS
	Ant1	2462	15.94	≤30	PASS
11N20SISO	Ant1	2412	17.76	≤30	PASS
	Ant1	2437	16.66	≤30	PASS
	Ant1	2462	16.73	≤30	PASS
BLE_1M	Ant1	2402	2.21	≤30	PASS
		2440	1.65	≤30	PASS
		2480	2.27	≤30	PASS
	Ant2	2402	2.12	≤30	PASS
		2440	1.58	≤30	PASS
		2480	1.95	≤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:

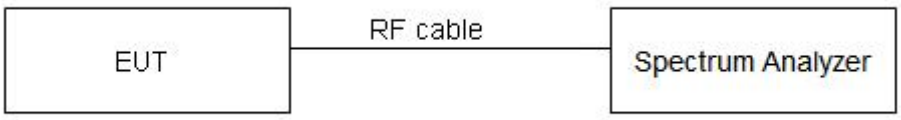
The EUT was connected to the spectrum analyzer through an external attenuator (20dB) and a known loss cable. Set RBW = shall be in the range of 1% to 5% of the OBW but not less than 100 kHz; VBW is set to greater than 3 times RBW on spectrum analyzer.
Detector=Peak, Trace mode=Max hold.

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

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	9.32	2407.32	2416.64	≥0.5	PASS
	Ant1	2437	9.28	2432.36	2441.64	≥0.5	PASS
	Ant1	2462	9.28	2457.36	2466.64	≥0.5	PASS
11G	Ant1	2412	16.56	2403.68	2420.24	≥0.5	PASS
	Ant1	2437	16.64	2428.68	2445.32	≥0.5	PASS
	Ant1	2462	16.56	2453.76	2470.32	≥0.5	PASS
11N20SISO	Ant1	2412	17.64	2403.16	2420.80	≥0.5	PASS
	Ant1	2437	17.56	2428.24	2445.80	≥0.5	PASS
	Ant1	2462	17.92	2453.04	2470.96	≥0.5	PASS
BLE_1M	Ant1	2402	0.66	2401.80	2402.46	≥0.5	PASS
		2440	0.69	2439.77	2440.46	≥0.5	PASS
		2480	0.67	2479.79	2480.46	≥0.5	PASS
	Ant2	2402	0.64	2401.80	2402.44	≥0.5	PASS
		2440	0.70	2439.75	2440.46	≥0.5	PASS
		2480	0.67	2479.79	2480.46	≥0.5	PASS

5.5 Occupied Channel Bandwidth

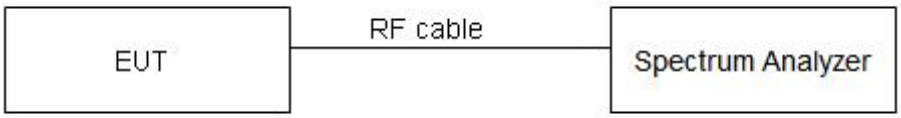
Ambient condition:

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	13.227	---	---
	Ant1	2412	13.227	---	---
	Ant1	2437	13.227	---	---
11G	Ant1	2437	17.782	---	---
	Ant1	2462	17.782	---	---
	Ant1	2462	17.822	---	---
11N20SISO	Ant1	2402	19.66	---	---
	Ant1	2440	19.74	---	---
	Ant1	2480	19.74	---	---
BLE_1M	Ant1	2402	1.039	---	---
		2440	1.075	---	---
		2480	1.051	---	---
	Ant2	2402	1.051	---	---
		2440	1.059	---	---
		2480	1.099	---	---

5.6 Band Edge Measurement

Ambient condition:

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

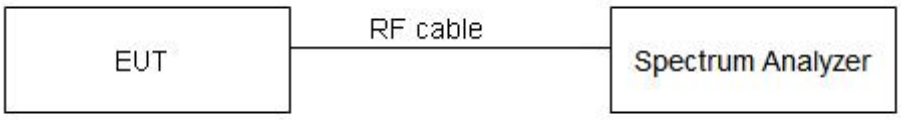
Method of Measurement:

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 Hz, 2 GHz-3 GHz = 1.407 dB.

Test Results:

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	4.84	-32.5	≤-15.16	PASS
	Ant1	Low	2462	3.62	-47.67	≤-16.38	PASS
11G	Ant1	High	2412	-1.95	-26.61	≤-21.95	PASS
	Ant1	High	2462	-2.95	-39.88	≤-22.95	PASS
11N20SISO	Ant1	Low	2412	-0.03	-24.71	≤-20.03	PASS
	Ant1	High	2462	-1.40	-34.97	≤-21.4	PASS
BLE_1M	Ant1	Low	2402	1.29	-41.29	≤-18.71	PASS
		High	2480	0.99	-41.67	≤-19.01	PASS
	Ant2	Low	2402	0.99	-42.83	≤-19.01	PASS
		High	2480	1.14	-42.8	≤-18.86	PASS

5.7 Maximum Power Spectral Density

Ambient condition:

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

Method of Measurement:

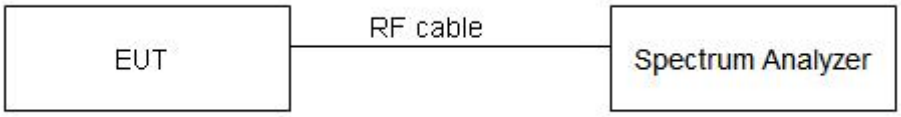
During the process of the testing, The EUT was connected to Spectrum Analyzer with a known loss. The EUT is max power transmission with proper modulation. The Average detector is used. We use Method AVGPSD-2 in KDB 558074 D01 for this test.

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	≤ 8 dBm / 3kHz

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= 0.75dB.

Test Results:

TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-7.40	≤8	PASS
	Ant1	2437	-8.41	≤8	PASS
	Ant1	2462	-8.40	≤8	PASS
11G	Ant1	2412	-15.84	≤8	PASS
	Ant1	2437	-16.60	≤8	PASS
	Ant1	2462	-16.48	≤8	PASS
11N20SISO	Ant1	2412	-15.08	≤8	PASS
	Ant1	2437	-16.23	≤8	PASS
	Ant1	2462	-15.96	≤8	PASS
BLE_1M	Ant1	2402	-11.69	≤8	PASS
		2440	-12.19	≤8	PASS
		2480	-11.53	≤8	PASS
	Ant2	2402	-11.76	≤8	PASS
		2440	-12.32	≤8	PASS
		2480	-12.00	≤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 to100kHz 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	3.84	3.84	---	PASS
			30~1000	3.84	-59.7	≤-16.16	PASS
			1000~26500	3.84	-47.96	≤-16.16	PASS
		2437	Reference	0.98	0.98	---	PASS
			30~1000	0.98	-59.97	≤-19.02	PASS
			1000~26500	0.98	-49.09	≤-19.02	PASS
		2462	Reference	1.30	1.30	---	PASS
			30~1000	1.30	-59.66	≤-18.7	PASS
			1000~26500	1.30	-48.66	≤-18.7	PASS
11G	Ant1	2412	Reference	-4.61	-4.61	---	PASS
			30~1000	-4.61	-59.91	≤-24.61	PASS
			1000~26500	-4.61	-47.99	≤-24.61	PASS
		2437	Reference	-5.99	-5.99	---	PASS
			30~1000	-5.99	-60.16	≤-25.99	PASS
			1000~26500	-5.99	-48.76	≤-25.99	PASS
		2462	Reference	-6.67	-6.67	---	PASS
			30~1000	-6.67	-59.06	≤-26.67	PASS
			1000~26500	-6.67	-48.43	≤-26.67	PASS
11N20SISO	Ant1	2412	Reference	-4.72	-4.72	---	PASS
			30~1000	-4.72	-59.56	≤-24.72	PASS
			1000~26500	-4.72	-47.54	≤-24.72	PASS
		2437	Reference	-6.45	-6.45	---	PASS
			30~1000	-6.45	-59.63	≤-26.45	PASS
			1000~26500	-6.45	-48.1	≤-26.45	PASS
		2462	Reference	-6.58	-6.58	---	PASS
			30~1000	-6.58	-59.53	≤-26.58	PASS
			1000~26500	-6.58	-47.52	≤-26.58	PASS

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	0.70	0.70	---	PASS
			30~1000	0.70	-58.03	≤-19.3	PASS
			1000~26500	0.70	-36.01	≤-19.3	PASS
		2440	Reference	-0.15	-0.15	---	PASS
			30~1000	-0.15	-58.14	≤-20.15	PASS
			1000~26500	-0.15	-35.41	≤-20.15	PASS
		2480	Reference	0.59	0.59	---	PASS
			30~1000	0.59	-59.07	≤-19.41	PASS
			1000~26500	0.59	-33.62	≤-19.41	PASS
	Ant2	2402	Reference	0.06	0.06	---	PASS
			30~1000	0.06	-59.07	≤-19.94	PASS
			1000~26500	0.06	-37.21	≤-19.94	PASS
		2440	Reference	-0.10	-0.10	---	PASS
			30~1000	-0.10	-58.65	≤-20.1	PASS
			1000~26500	-0.10	-34.2	≤-20.1	PASS
		2480	Reference	-0.39	-0.39	---	PASS
			30~1000	-0.39	-59.22	≤-20.39	PASS
			1000~26500	-0.39	-35.82	≤-20.39	PASS

6. Appendix X

Test Equipment	Type/Mode	SERIAL NO.	Equipment No.	Manufacturer	Cal. Due
Communication Shielded Room 2	4m*3m*3m	CRTDSWKSR44301	/	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	2027/02/01
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	SCHWARZBECK	2025/06/09
Waveguide Horn Antenna	HF906	360306/008	EM-000093	R&S	2025/01/13
Waveguide Horn Antenna	BBHA9170	00949	DZ-000209-2	SCHWARZBECK	2025/08/03
Preamplifier	BBV 9721	9721-050	DZ-000209-1	SCHWARZBECK	2025/06/02
Bandstop Filters	SW-BSF-2400-100-7-A1	/	EM-000495	/	2025/05/30
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
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

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