ACCREDITED
CERTIFICATE #5473.01

Test Report No.:
FCC2024-0032-RF1

TEST REPORT

FCC ID	:	2BG9T-TCLSMARTDP
Applicant	:	Shenzhen TCL Smart Home Technology Co., Ltd
Product Name	:	Smart Lock
Model No.	:	D1 Pro,D10 Pro,D11 Pro,D12 Pro,D13 Pro,D14 Pro,D15 Pro,D16 Pro,D17 Pro,D18 Pro,D19 Pro
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 Pro **Trade mark :** TCL **Serial no.** : D1Pro240800001 **Sampling :** 1-1

Date of Receipt.	2024.7.4	Date of Testing	2024.8.1

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:** 2024-8-16

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**.

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1. General Product Information

1.1 General information

Product Name	Smart Lock	
Model No.	D1 Pro	
Additional model	D10 Pro,D11 Pro,D12 Pro,D13 Pro,D14 Pro,D15 Pro,D16 Pro,D17 Pro,D18 Pro,D19 Pro	
Power Supply	Rated voltage	DC 5.0V
	Battery voltage	DC 3.7V
Serial Number(SN)	D1Pro240800001	
Hardware	Front motherboard:S300-FRONT-V03; Rear motherboard:S300-REARLOCK_V03; Touch Pad：S300_TOUCH_V02	
Software	V2007019	
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): 5.67 dBm Bluetooth(rear): 5.33 dBm WIFI2.4G:16.91dBm	
Operate Temp.Range	-20~85℃	

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 Pro	1. Only the appearance color difference is different. 2. Only the printing style on the surface of the	Inspection model
2	D10 Pro		Coverage model

	3	D11 Pro	package is different, the product inside the package is the same.	Coverage model
	4	D12 Pro		Coverage model
	5	D13 Pro		Coverage model
	6	D14 Pro		Coverage model
	7	D15 Pro		Coverage model
	8	D16 Pro		Coverage model
	9	D17 Pro		Coverage model
	10	D18 Pro		Coverage model
	11	D19 Pro		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	8.37	16.69	50.15	---	---
		2437	8.37	16.68	50.18	---	---
		2462	8.37	16.69	50.15	---	---
11G	Ant1	2412	2.03	4.82	42.12	---	---
		2437	2.02	4.04	50.00	---	---
		2462	2.02	4.04	50.00	---	---
11N20SISO	Ant1	2412	1.88	3.70	50.81	---	---
		2437	1.88	3.70	50.81	---	---
		2462	1.89	3.71	50.94	---	---
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

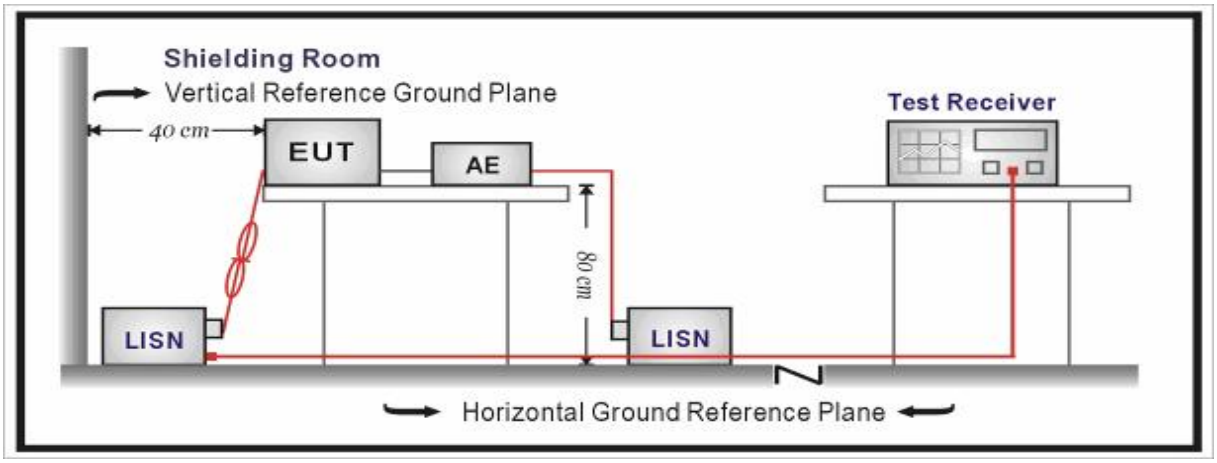
Method of Measurement:

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：

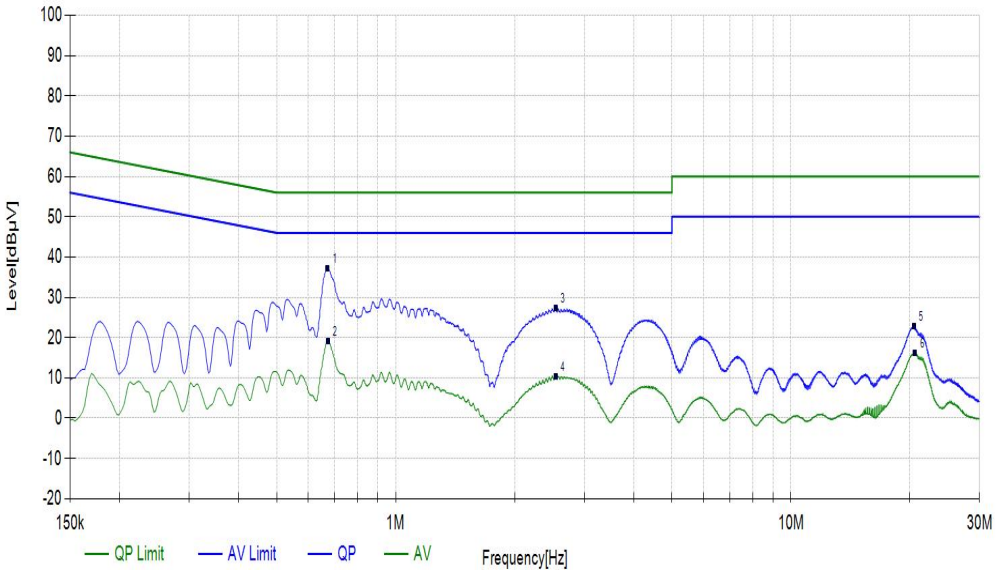
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 1.96. U= 3.12 dB.

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.

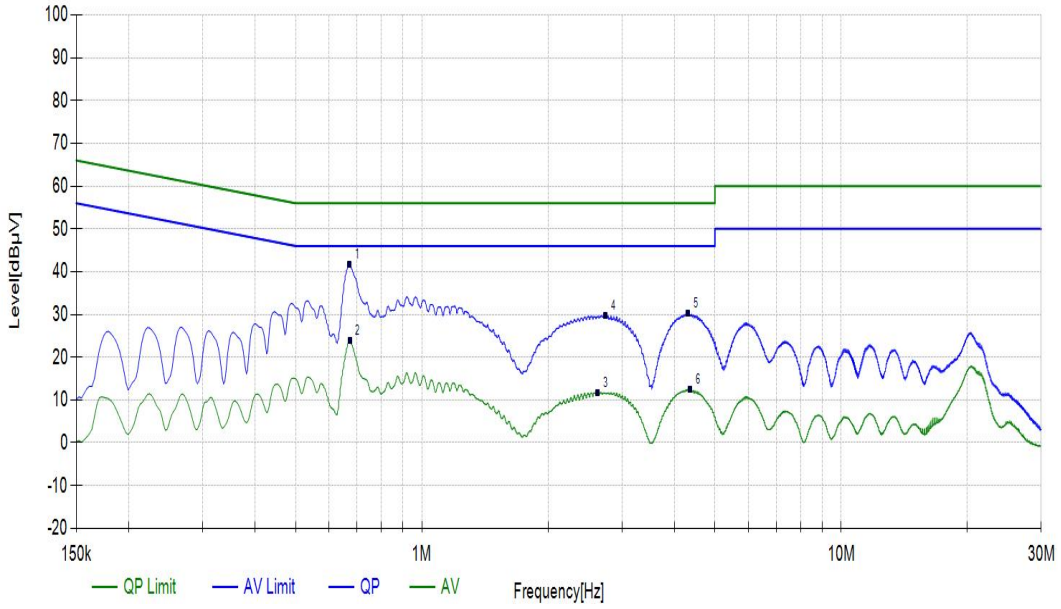
Power Line	L
Test channel	Worst-Case

NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV]	Limit [dBµV]	Margin [dB]	Detector	Pass/ Fail
1	0.6720	10.24	26.94	37.18	56.00	18.82	QP	PASS
3	2.5373	10.32	16.98	27.30	56.00	28.70	QP	PASS
5	20.4653	11.43	11.36	22.79	60.00	37.21	QP	PASS
2	0.6743	10.24	8.97	19.21	46.00	26.79	AV	PASS
4	2.5395	10.32	0.13	10.45	46.00	35.55	AV	PASS
6	20.5868	11.44	4.86	16.30	50.00	33.70	AV	PASS



Power Line	N
Test channel	Worst-Case

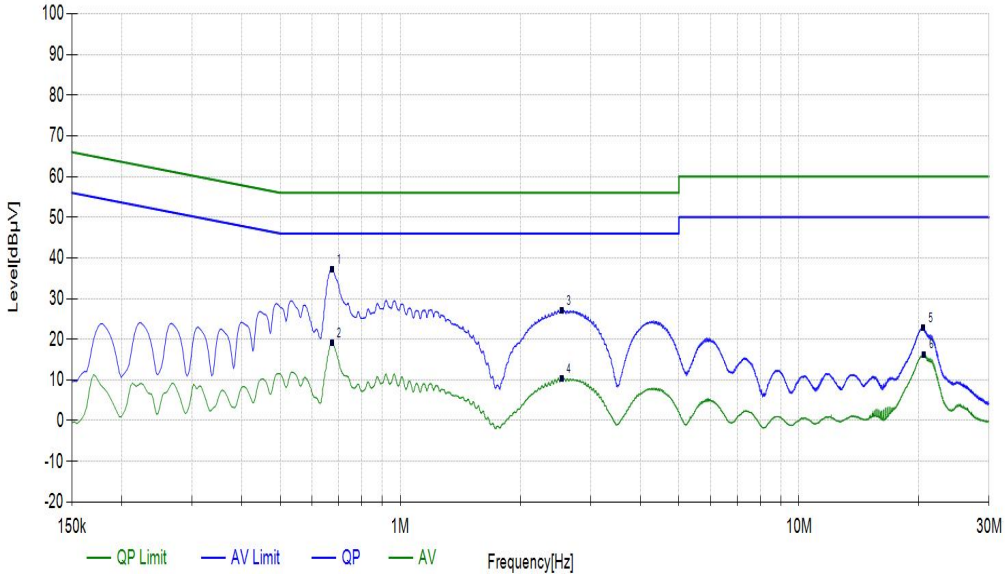
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV]	Limit [dBµV]	Margin [dB]	Detector	Pass/ Fail
1	0.6720	10.22	31.38	41.60	56.00	14.40	QP	PASS
3	2.7420	10.32	19.32	29.64	56.00	26.36	QP	PASS
5	4.3148	10.37	19.87	30.24	56.00	25.76	QP	PASS
2	0.6743	10.22	13.62	23.84	46.00	22.16	AV	PASS
4	4.3620	10.37	2.20	12.57	46.00	33.43	AV	PASS
6	2.6250	10.32	1.44	11.76	46.00	34.24	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.

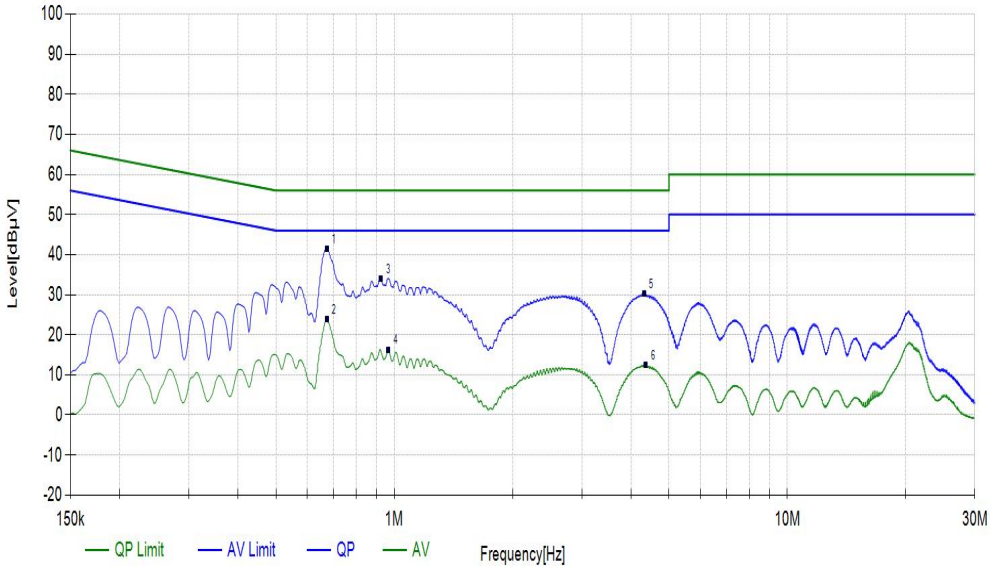
Power Line	L
Test channel	Worst-Case

NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV]	Limit [dBµV]	Margin [dB]	Detector	Pass/ Fail
1	0.6743	10.24	27.04	37.28	56.00	18.72	QP	PASS
3	2.5373	10.32	16.84	27.16	56.00	28.84	QP	PASS
5	20.5035	11.44	11.45	22.89	60.00	37.11	QP	PASS
2	0.6743	10.24	8.94	19.18	46.00	26.82	AV	PASS
4	2.5395	10.32	0.10	10.42	46.00	35.58	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	0.6743	10.22	31.30	41.52	56.00	14.48	QP	PASS
3	0.9240	10.24	23.85	34.09	56.00	21.91	QP	PASS
5	4.3193	10.37	19.79	30.16	56.00	25.84	QP	PASS
2	0.6743	10.22	13.57	23.79	46.00	22.21	AV	PASS
4	0.9668	10.25	6.07	16.32	46.00	29.68	AV	PASS
6	4.3643	10.37	2.18	12.55	46.00	33.45	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)).

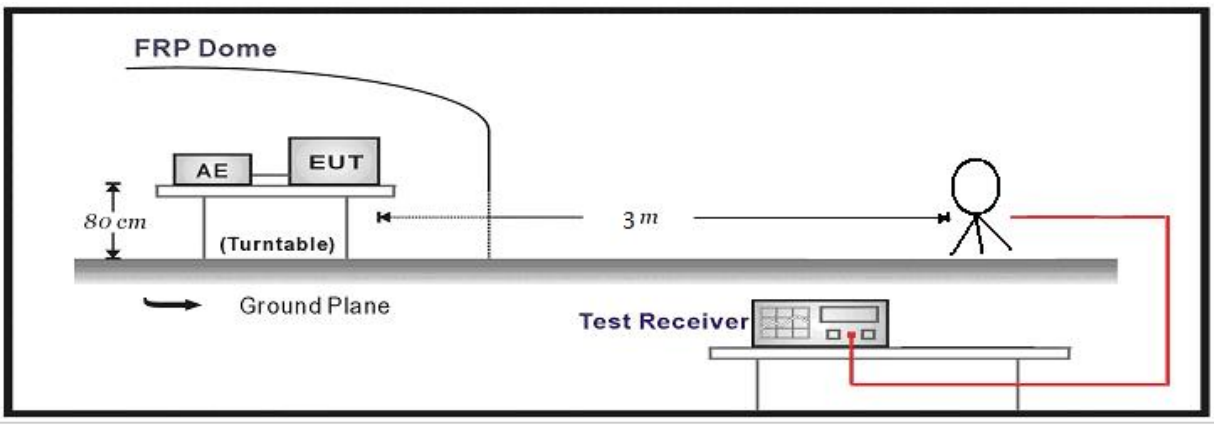
Frequency	Limit (μV/m)	Limit (dBμV/m @3m)	Remark
0.009MHz-0.490MHz	2400/F(kHz)@300m	20lg(24000000/F(kHz))	Quasi-peak Level
0.490MHz~1.705MHz	24000/F(kHz)@30m	20lg(2400000/F(kHz))	Quasi-peak Level
1.705MHz~30.0MHz	30@30m	69.54	Quasi-peak Level
30MHz-88MHz	100@3m	40.0	Quasi-peak Level
88MHz-216MHz	150@3m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

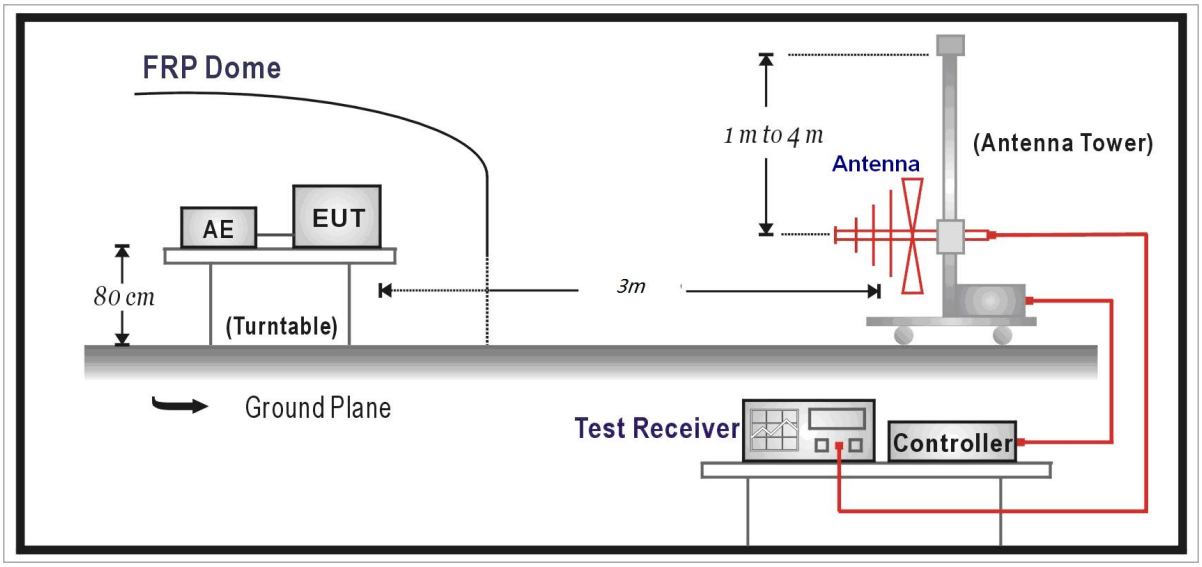
MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218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

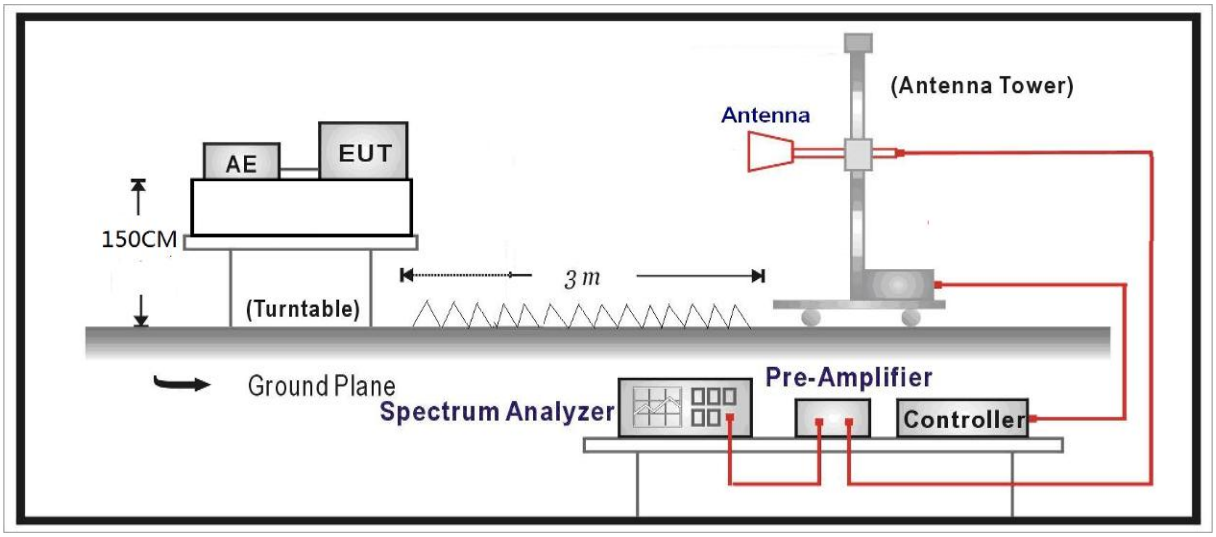
Below 30MHz Test Setup:



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

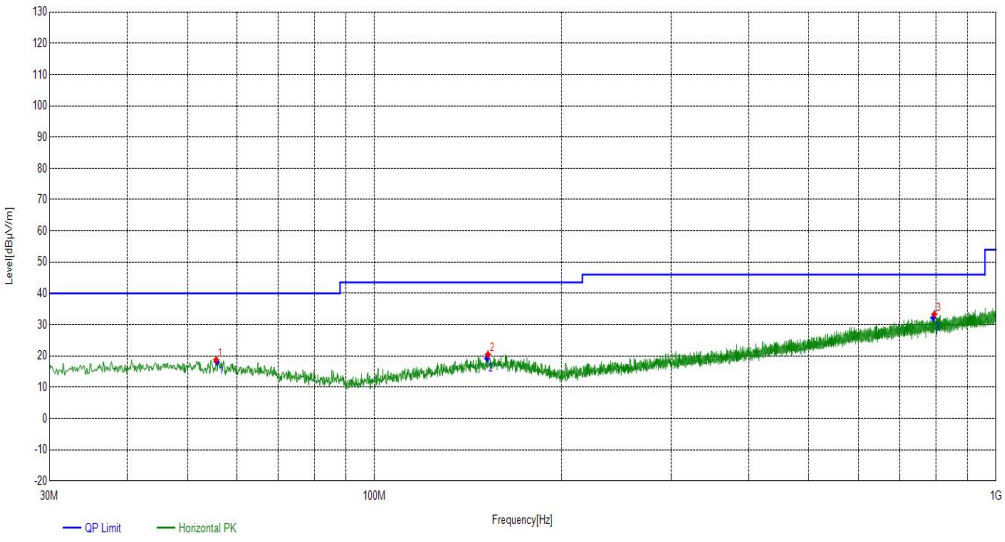
Suspected List

Frequency [MHz]	Polarity	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/Fail
55.6106	Horizontal	20.27	-1.48	18.79	---	---	PK	100	0	---
152.2322	Horizontal	20.81	-0.30	20.51	---	---	PK	100	260	---
795.6976	Horizontal	32.04	1.36	33.40	---	---	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
55.7547	Horizontal	20.27	18.09	40.00	21.91	330	20	PASS
151.7805	Horizontal	20.81	19.20	43.50	24.30	380	265	PASS
792.3121	Horizontal	32.04	32.21	46.00	13.79	170	215	PASS



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

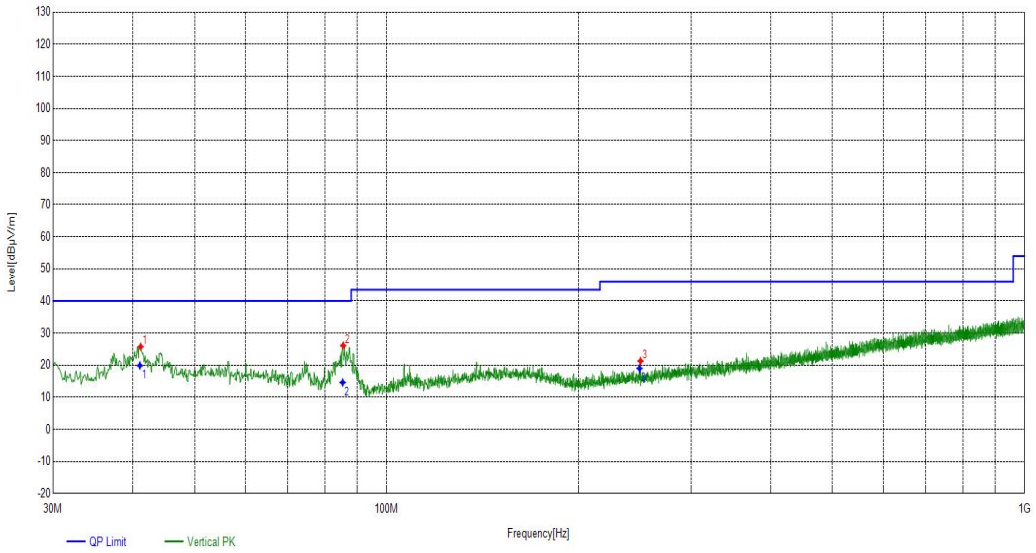
Suspected List

Frequency [MHz]	Polarity	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/Fail
41.1561	Vertical	20.09	5.66	25.75	---	---	PK	100	90	---
85.4895	Vertical	15.15	10.96	26.11	---	---	PK	100	250	---
250.018	Vertical	19.46	1.84	21.30	---	---	PK	100	350	---

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
41.0376	Vertical	20.09	19.89	40.00	20.11	390	95	PASS
85.3275	Vertical	15.15	14.61	40.00	25.39	250	255	PASS
249.1171	Vertical	19.46	18.99	46.00	27.01	180	355	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
4273.627363	0.29	38.58	38.87	74.00	35.13	PK	150	170	PASS
7647.464747	9.12	36.30	45.42	74.00	28.58	PK	150	220	PASS
10871.287129	12.69	34.74	47.43	74.00	26.57	PK	150	260	PASS
4212.121212	0.43	28.33	28.76	54.00	25.24	AV	150	110	PASS
7750.975098	9.20	25.32	34.52	54.00	19.48	AV	150	40	PASS
11319.831983	12.23	24.47	36.70	54.00	17.30	AV	150	230	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
7638.463846	9.12	36.50	45.62	74.00	28.38	PK	150	224	PASS
9381.638164	11.83	35.34	47.17	74.00	26.83	PK	150	109	PASS
12348.934894	12.37	34.28	46.65	74.00	27.35	PK	150	185	PASS
7635.463546	9.11	24.86	33.97	54.00	20.03	AV	150	30	PASS
9249.624963	11.27	23.04	34.31	54.00	19.69	AV	150	350	PASS
12024.90249	11.58	23.39	34.97	54.00	19.03	AV	150	270	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
4884.188419	8.98	37.14	46.12	74.00	27.88	PK	150	240	PASS
8225.022502	12.57	34.52	47.09	74.00	26.91	PK	150	140	PASS
12798.979898	14.37	35.11	49.48	74.00	24.52	PK	150	60	PASS
4824.182418	8.97	25.44	34.41	54.00	19.59	AV	150	350	PASS
8622.562256	12.58	25.17	37.75	54.00	16.25	AV	150	150	PASS
12740.474047	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]	Detector	Height [cm]	Angle deg	Pass/Fail
7012.90129	1.60	37.80	39.40	74.00	34.60	PK	150	190	PASS
9017.10171	9.56	35.77	45.33	74.00	28.67	PK	150	240	PASS
12935.493549	13.53	34.43	47.96	74.00	26.04	PK	150	70	PASS
7098.409841	1.34	27.79	29.13	54.00	24.87	AV	150	60	PASS
8610.561056	10.11	24.51	34.62	54.00	19.38	AV	150	210	PASS
12996.9997	13.40	23.55	36.95	54.00	17.05	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]	Detector	Height [cm]	Angle deg	Pass/Fail
6030.30303	5.73	38.45	44.18	74.00	29.82	PK	150	50	PASS
9848.184819	12.40	34.58	46.98	74.00	27.02	PK	150	330	PASS
11295.829583	12.31	35.09	47.40	74.00	26.60	PK	150	310	PASS
6031.80318	5.73	29.46	35.19	54.00	18.81	AV	150	200	PASS
10160.216022	12.55	24.00	36.55	54.00	17.45	AV	150	220	PASS
11204.320432	12.58	24.79	37.37	54.00	16.63	AV	150	150	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
6970.89709	8.80	34.96	43.76	74.00	30.24	PK	150	10	PASS
9305.130513	11.51	33.78	45.29	74.00	28.71	PK	150	280	PASS
11285.328533	12.35	34.44	46.79	74.00	27.21	PK	150	240	PASS
7102.910291	8.97	25.31	34.28	54.00	19.72	AV	150	40	PASS
9606.660666	12.38	23.97	36.35	54.00	17.65	AV	150	350	PASS
11226.822682	12.52	24.71	37.23	54.00	16.77	AV	150	320	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

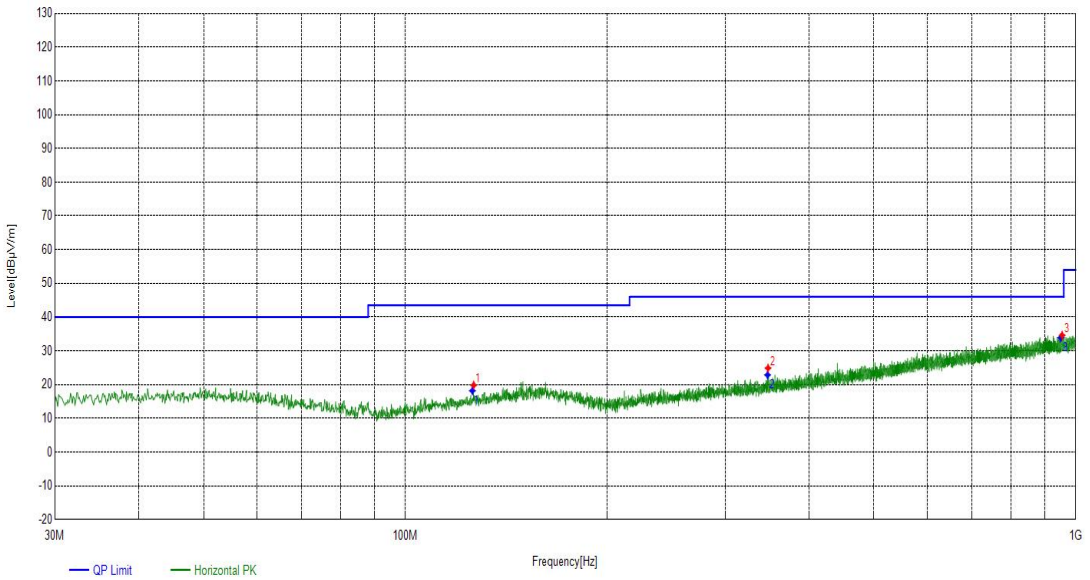
Suspected List

Frequency [MHz]	Polarity	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/Fail
126.4276	Horizontal	18.98	0.85	19.83	---	---	PK	100	180	---
347.5128	Horizontal	22.72	2.16	24.88	---	---	PK	100	240	---
954.4054	Horizontal	34.03	0.59	34.62	---	---	PK	100	280	---

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
125.8568	Horizontal	18.98	18.17	43.50	25.33	150	185	PASS
346.9143	Horizontal	22.72	22.85	46.00	23.15	300	245	PASS
949.9024	Horizontal	34.03	33.88	46.00	12.12	340	285	PASS



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

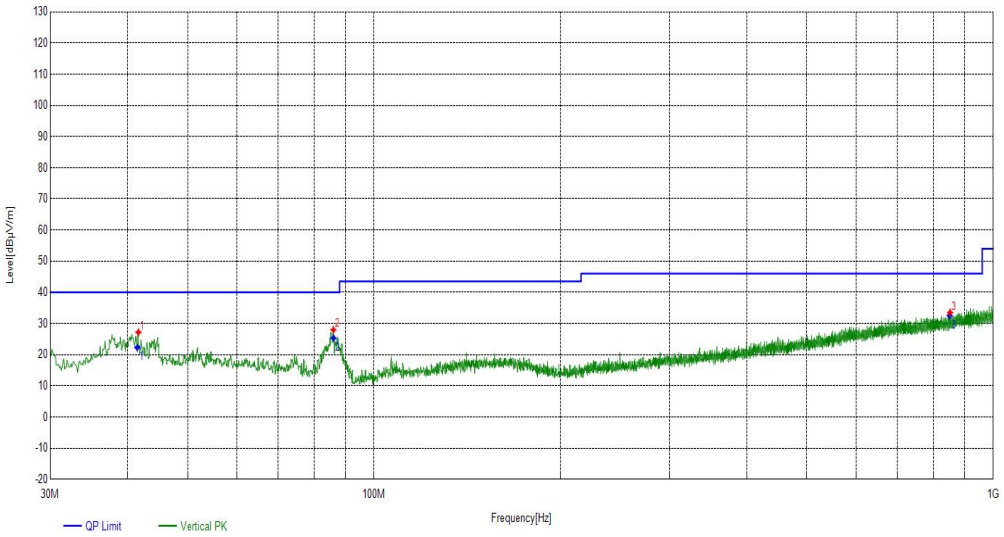
Suspected List

Frequency [MHz]	Polarity	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/Fail
41.6412	Vertical	20.13	6.68	26.81	---	---	PK	100	100	---
86.1686	Vertical	15.11	13.00	28.11	---	---	PK	100	230	---
874.6635	Vertical	32.90	1.57	34.47	---	---	PK	100	140	---

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
41.7123	Vertical	20.13	19.91	40.00	20.09	400	105	PASS
86.3432	Vertical	15.11	14.42	40.00	25.58	120	235	PASS
874.1062	Vertical	32.90	33.49	46.00	12.51	380	145	PASS



BLE(rear) Antenna2:

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

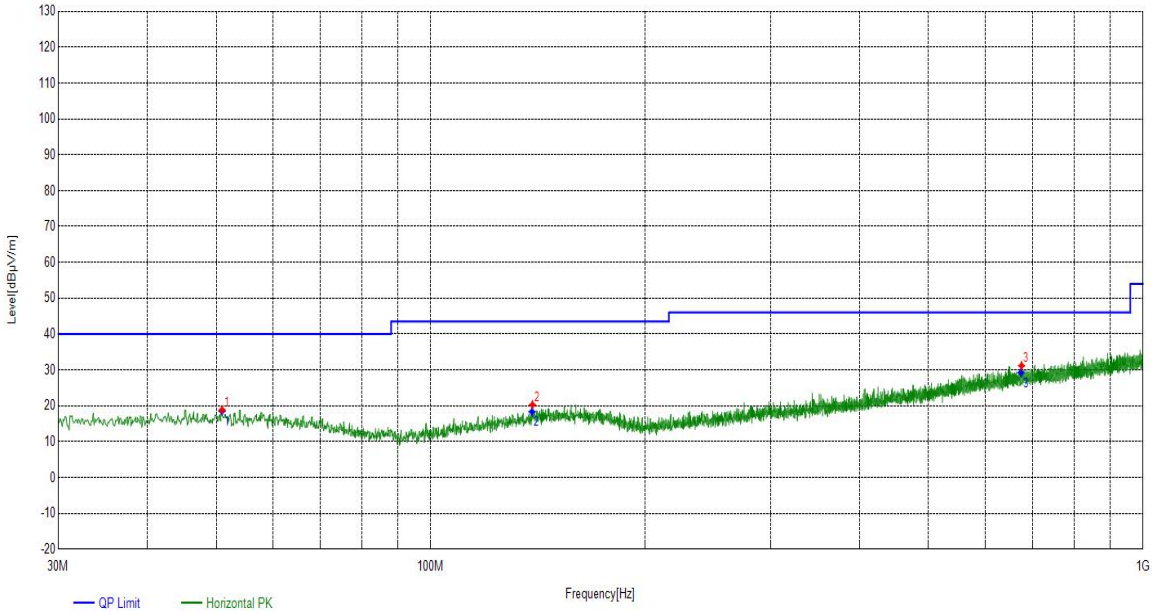
Suspected List

Frequency [MHz]	Polarity	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/Fail
50.9541	Horizontal	20.47	-1.59	18.88	---	---	PK	100	220	---
138.9419	Horizontal	20.08	0.20	20.28	---	---	PK	100	280	---
675.4055	Horizontal	30.22	0.96	31.18	---	---	PK	100	230	---

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
50.9416	Horizontal	20.47	18.51	40.00	21.49	230	225	PASS
138.767	Horizontal	20.08	18.36	43.50	25.14	250	285	PASS
673.8319	Horizontal	30.22	29.25	46.00	16.75	290	235	PASS



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

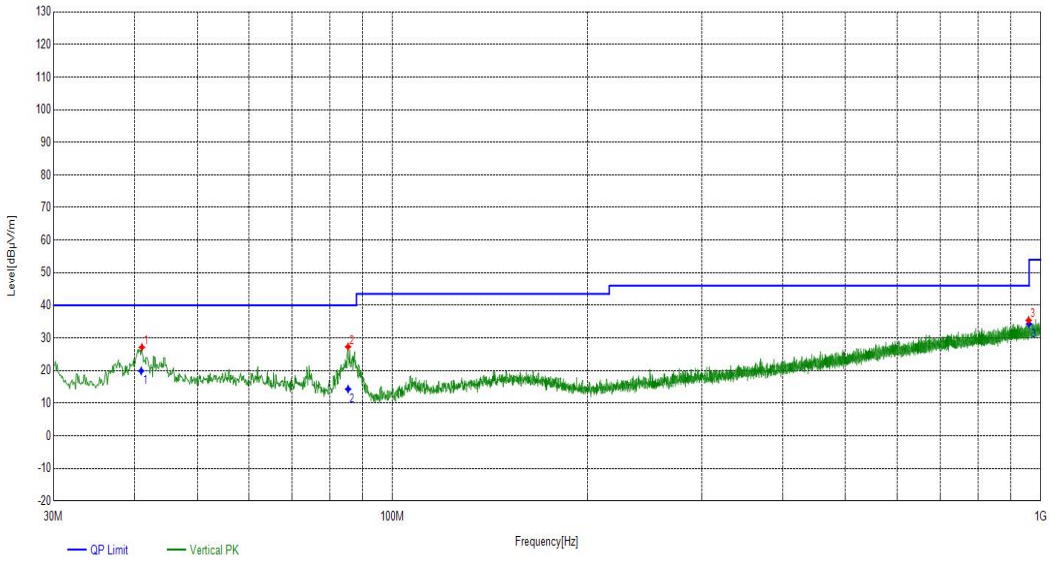
Suspected List

Frequency [MHz]	Polarity	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/Fail
41.0591	Vertical	20.08	7.04	27.12	---	---	PK	100	170	---
85.3925	Vertical	15.16	12.11	27.27	---	---	PK	100	250	---
958.0918	Vertical	34.07	1.34	35.41	---	---	PK	100	150	---

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
40.9527	Vertical	20.08	19.89	40.00	20.11	400	175	PASS
85.4036	Vertical	15.16	14.31	40.00	25.69	290	255	PASS
959.6863	Vertical	34.07	34.27	46.00	11.73	330	155	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
4960.69607	1.92	46.39	48.31	74.00	25.69	PK	150	240	PASS
7440.444044	9.00	41.81	50.81	74.00	23.19	PK	150	270	PASS
9920.192019	12.37	35.06	47.43	74.00	26.57	PK	150	40	PASS
4960.69607	1.92	39.06	40.98	54.00	13.02	AV	150	290	PASS
7441.944194	9.01	34.50	43.51	54.00	10.49	AV	150	20	PASS
9921.692169	12.38	25.64	38.02	54.00	15.98	AV	150	170	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
4804.680468	1.25	40.35	41.60	74.00	32.40	PK	150	170	PASS
7636.963696	9.11	37.35	46.46	74.00	27.54	PK	150	260	PASS
11637.863786	11.83	36.40	48.23	74.00	25.77	PK	150	270	PASS
4806.180618	1.27	31.29	32.56	54.00	21.44	AV	150	10	PASS
7896.489649	9.24	25.65	34.89	54.00	19.11	AV	150	20	PASS
11253.825383	12.44	24.67	37.11	54.00	16.89	AV	150	50	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
4879.687969	1.58	44.44	46.02	74.00	27.98	PK	150	270	PASS
7318.931893	8.99	41.03	50.02	74.00	23.98	PK	150	20	PASS
9758.175818	12.40	34.38	46.78	74.00	27.22	PK	150	140	PASS
4881.188119	1.59	39.37	40.96	54.00	13.04	AV	150	70	PASS
7321.932193	8.99	33.78	42.77	54.00	11.23	AV	150	160	PASS
9761.176118	12.40	25.22	37.62	54.00	16.38	AV	150	170	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
4804.680468	1.25	38.18	39.43	74.00	34.57	PK	150	130	PASS
8540.054005	10.04	35.67	45.71	74.00	28.29	PK	150	270	PASS
11481.848185	11.94	34.78	46.72	74.00	27.28	PK	150	360	PASS
4804.680468	1.25	29.00	30.25	54.00	23.75	AV	150	120	PASS
8604.560456	10.11	25.48	35.59	54.00	18.41	AV	150	40	PASS
11076.807681	12.57	24.37	36.94	54.00	17.06	AV	150	30	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
4959.19592	1.92	46.88	48.80	74.00	25.20	PK	150	260	PASS
7440.444044	9.00	45.74	54.74	74.00	19.26	PK	150	360	PASS
14567.656766	18.14	33.35	51.49	74.00	22.51	PK	150	20	PASS
4960.69607	1.92	40.18	42.10	54.00	11.90	AV	150	60	PASS
7441.944194	9.01	39.01	48.02	54.00	5.98	AV	150	150	PASS
14557.155716	18.17	23.08	41.25	54.00	12.75	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]	Detector	Height [cm]	Angle deg	Pass/Fail
4959.19592	1.92	46.27	48.19	74.00	25.81	PK	150	140	PASS
7440.444044	9.00	41.91	50.91	74.00	23.09	PK	150	50	PASS
9921.692169	12.38	35.36	47.74	74.00	26.26	PK	150	150	PASS
4960.69607	1.92	40.09	42.01	54.00	11.99	AV	150	20	PASS
7441.944194	9.01	34.35	43.36	54.00	10.64	AV	150	20	PASS
9921.692169	12.38	25.50	37.88	54.00	16.12	AV	150	230	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
4960.69607	1.92	46.72	48.64	74.00	25.36	PK	150	10	PASS
7440.444044	9.00	44.70	53.70	74.00	20.30	PK	150	170	PASS
14563.156316	18.15	33.04	51.19	74.00	22.81	PK	150	210	PASS
4960.69607	1.92	40.29	42.21	54.00	11.79	AV	150	270	PASS
7441.944194	9.01	38.48	47.49	54.00	6.51	AV	150	120	PASS
14551.155116	18.20	22.21	40.41	54.00	13.59	AV	150	70	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	42.83	44.41	74.00	29.59	PK	150	300	PASS
6621.362136	6.98	36.90	43.88	74.00	30.12	PK	150	140	PASS
9758.175818	12.40	34.79	47.19	74.00	26.81	PK	150	320	PASS
4881.188119	1.59	36.83	38.42	54.00	15.58	AV	150	70	PASS
6700.870087	7.40	25.86	33.26	54.00	20.74	AV	150	40	PASS
9761.176118	12.40	25.88	38.28	54.00	15.72	AV	150	220	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
4879.687969	1.58	44.13	45.71	74.00	28.29	PK	150	340	PASS
7320.432043	8.99	40.51	49.50	74.00	24.50	PK	150	100	PASS
14588.658866	18.07	33.43	51.50	74.00	22.50	PK	150	20	PASS
4881.188119	1.59	40.04	41.63	54.00	12.37	AV	150	330	PASS
7321.932193	8.99	33.50	42.49	54.00	11.51	AV	150	210	PASS
14548.154816	18.21	22.87	41.08	54.00	12.92	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]	Detector	Height [cm]	Angle deg	Pass/Fail
4804.680468	1.25	39.52	40.77	74.00	33.23	PK	150	290	PASS
8700.570057	10.12	35.64	45.76	74.00	28.24	PK	150	290	PASS
12372.937294	12.44	34.82	47.26	74.00	26.74	PK	150	330	PASS
4804.680468	1.25	28.91	30.16	54.00	23.84	AV	150	80	PASS
8591.059106	10.10	24.61	34.71	54.00	19.29	AV	150	110	PASS
12338.433843	12.34	23.97	36.31	54.00	17.69	AV	150	30	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
4804.680468	1.25	41.50	42.75	74.00	31.25	PK	150	12	PASS
7206.420642	9.01	39.68	48.69	74.00	25.31	PK	150	309	PASS
14494.149415	18.34	33.44	51.78	74.00	22.22	PK	150	38	PASS
4804.680468	1.25	31.67	32.92	54.00	21.08	AV	150	1	PASS
7207.920792	9.00	27.65	36.65	54.00	17.35	AV	150	77	PASS
14587.158716	18.07	22.29	40.36	54.00	13.64	AV	150	50	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
2345.1345	-5.18	52.42	47.24	74.00	26.76	PK	150	330	PASS
2390.1390	-5.04	50.97	45.93	74.00	28.07	PK	150	200	PASS
2419.7419	-4.96	79.92	74.96	---	---	PK	150	240	---
2345.1345	-5.18	41.06	35.88	54.00	18.12	AV	150	40	PASS
2390.1390	-5.04	40.96	35.92	54.00	18.08	AV	150	120	PASS
2420.1420	-4.96	67.30	62.34	---	---	AV	150	180	---

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
2364.9364	-5.11	51.86	46.75	74.00	27.25	PK	150	170	PASS
2390.1390	-5.04	52.24	47.20	74.00	26.80	PK	150	140	PASS
2419.9419	-4.96	93.47	88.51	---	---	PK	150	120	---
2364.9364	-5.11	40.91	35.80	54.00	18.20	AV	150	310	PASS
2390.1390	-5.04	41.40	36.36	54.00	17.64	AV	150	60	PASS
2419.7419	-4.96	84.75	79.79	---	---	AV	150	10	---

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
2457.9457	-4.85	82.91	78.06	---	---	PK	150	210	---
2483.5483	-4.79	53.28	48.49	74.00	25.51	PK	150	250	PASS
2520.3520	-4.66	54.98	50.32	74.00	23.68	PK	150	240	PASS
2459.7459	-4.85	72.11	67.26	---	---	AV	150	20	---
2483.5483	-4.79	42.09	37.30	54.00	16.70	AV	150	250	PASS
2520.3520	-4.66	41.54	36.88	54.00	17.12	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
2455.1455	-4.86	86.68	81.82	---	---	PK	150	50	---
2483.5483	-4.79	52.27	47.48	74.00	26.52	PK	150	260	PASS
2518.9518	-4.66	52.08	47.42	74.00	26.58	PK	150	300	PASS
2454.9454	-4.86	75.38	70.52	---	---	AV	150	50	---
2483.5483	-4.79	42.41	37.62	54.00	16.38	AV	150	10	PASS
2518.9518	-4.66	41.63	36.97	54.00	17.03	AV	150	240	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
2353.9353	-5.16	52.75	47.59	74.00	26.41	PK	150	180	PASS
2390.1390	-5.04	52.07	47.03	74.00	26.97	PK	150	270	PASS
2401.7401	-5.01	90.98	85.97	---	---	PK	150	130	---
2353.9353	-5.16	42.19	37.03	54.00	16.97	AV	150	30	PASS
2390.1390	-5.04	41.82	36.78	54.00	17.22	AV	150	60	PASS
2402.1402	-5.00	90.45	85.45	---	---	AV	150	10	---

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
2342.7342	-5.19	51.82	46.63	74.00	27.37	PK	150	30	PASS
2390.1390	-5.04	54.48	49.44	74.00	24.56	PK	150	270	PASS
2401.7401	-5.01	91.89	86.88	---	---	PK	150	270	---
2342.7342	-5.19	42.22	37.03	54.00	16.97	AV	150	10	PASS
2390.1390	-5.04	42.40	37.36	54.00	16.64	AV	150	30	PASS
2402.1402	-5.00	91.27	86.27	---	---	AV	150	20	---

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	78.45	73.65	---	---	PK	150	310	---
2483.5483	-4.79	53.17	48.38	74.00	25.62	PK	150	320	PASS
2498.3498	-4.74	55.44	50.70	74.00	23.30	PK	150	310	PASS
2480.1480	-4.80	77.59	72.79	---	---	AV	150	350	---
2483.5483	-4.79	42.81	38.02	54.00	15.98	AV	150	80	PASS
2498.3498	-4.74	42.01	37.27	54.00	16.73	AV	150	30	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
2480.1480	-4.80	79.02	74.22	---	---	PK	150	179	---
2483.5483	-4.79	52.86	48.07	74.00	25.93	PK	150	166	PASS
2500.7500	-4.73	52.93	48.20	74.00	25.80	PK	150	211	PASS
2480.1480	-4.80	78.37	73.57	---	---	AV	150	354	---
2483.5483	-4.79	42.52	37.73	54.00	16.27	AV	150	348	PASS
2500.7500	-4.73	41.96	37.23	54.00	16.77	AV	150	134	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
2378.1378	-5.08	54.53	49.45	74.00	24.55	PK	150	40	PASS
2390.1390	-5.04	52.52	47.48	74.00	26.52	PK	150	270	PASS
2401.7401	-5.01	91.04	86.03	---	---	PK	150	70	---
2378.1378	-5.08	43.29	38.21	54.00	15.79	AV	150	210	PASS
2390.1390	-5.04	42.47	37.43	54.00	16.57	AV	150	10	PASS
2402.1402	-5.00	90.40	85.40	---	---	AV	150	10	---

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
2377.3377	-5.08	54.96	49.88	74.00	24.12	PK	150	350	PASS
2390.1390	-5.04	53.26	48.22	74.00	25.78	PK	150	100	PASS
2401.7401	-5.01	91.88	86.87	---	---	PK	150	170	---
2377.3377	-5.08	41.84	36.76	54.00	17.24	AV	150	100	PASS
2390.1390	-5.04	42.73	37.69	54.00	16.31	AV	150	10	PASS
2402.1402	-5.00	91.30	86.30	---	---	AV	150	20	---

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
2480.1480	-4.80	78.45	73.65	---	---	PK	150	280	---
2483.5483	-4.79	53.19	48.40	74.00	25.60	PK	150	110	PASS
2515.3515	-4.67	54.51	49.84	74.00	24.16	PK	150	70	PASS
2480.1480	-4.80	77.63	72.83	---	---	AV	150	30	---
2483.5483	-4.79	42.88	38.09	54.00	15.91	AV	150	20	PASS
2515.3515	-4.67	41.74	37.07	54.00	16.93	AV	150	160	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
2480.1480	-4.80	79.21	74.41	---	---	PK	150	60	---
2483.5483	-4.79	52.93	48.14	74.00	25.86	PK	150	170	PASS
2497.1497	-4.75	52.70	47.95	74.00	26.05	PK	150	250	PASS
2480.1480	-4.80	78.29	73.49	---	---	AV	150	60	---
2483.5483	-4.79	42.82	38.03	54.00	15.97	AV	150	360	PASS
2497.1497	-4.75	42.45	37.70	54.00	16.30	AV	150	20	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.

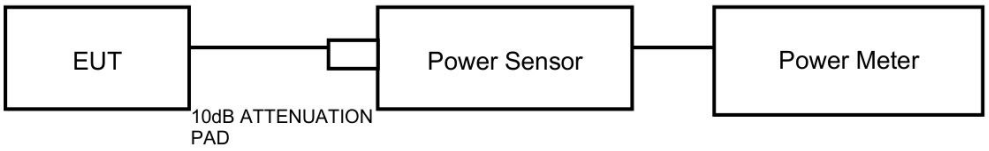
Limits:

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	16.91	≤30	PASS
	Ant1	2437	16.01	≤30	PASS
	Ant1	2462	15.38	≤30	PASS
11G	Ant1	2412	16.50	≤30	PASS
	Ant1	2437	16.41	≤30	PASS
	Ant1	2462	16.18	≤30	PASS
11N20SISO	Ant1	2412	16.82	≤30	PASS
	Ant1	2437	16.34	≤30	PASS
	Ant1	2462	15.80	≤30	PASS
BLE_1M	Ant1	2402	5.67	≤30	PASS
		2440	5.24	≤30	PASS
		2480	5.55	≤30	PASS
	Ant2	2402	5.33	≤30	PASS
		2440	4.95	≤30	PASS
		2480	5.03	≤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:

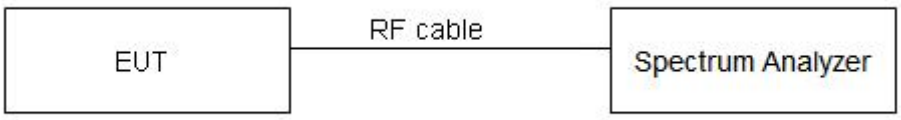
The EUT was connected to the spectrum analyzer through an external attenuator (20dB) and a known loss cable. Set RBW = shall be in the range of 1% to 5% of the OBW but not less than 100 kHz; VBW is set to greater than 3 times RBW on spectrum analyzer.
Detector=Peak, Trace mode=Max hold.

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	10.08	2406.96	2417.04	≥0.5	PASS
	Ant1	2437	9.64	2432.40	2442.04	≥0.5	PASS
	Ant1	2462	10.12	2456.92	2467.04	≥0.5	PASS
11G	Ant1	2412	16.44	2403.76	2420.20	≥0.5	PASS
	Ant1	2437	16.40	2428.80	2445.20	≥0.5	PASS
	Ant1	2462	16.48	2453.72	2470.20	≥0.5	PASS
11N20SISO	Ant1	2412	17.56	2403.24	2420.80	≥0.5	PASS
	Ant1	2437	17.60	2428.16	2445.76	≥0.5	PASS
	Ant1	2462	17.44	2453.32	2470.76	≥0.5	PASS
BLE_1M	Ant1	2402	0.65	2401.68	2402.33	≥0.5	PASS
		2440	0.68	2439.66	2440.34	≥0.5	PASS
		2480	0.69	2479.64	2480.33	≥0.5	PASS
	Ant2	2402	0.67	2401.78	2402.45	≥0.5	PASS
		2440	0.64	2439.79	2440.44	≥0.5	PASS
		2480	0.64	2479.79	2480.42	≥0.5	PASS

5.5 Occupied Channel Bandwidth

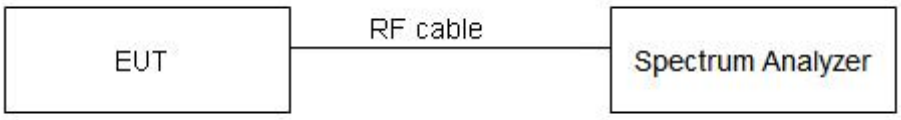
Ambient condition:

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	15.824	---	---
	Ant1	2412	15.824	---	---
	Ant1	2437	15.664	---	---
11G	Ant1	2437	17.183	---	---
	Ant1	2462	17.303	---	---
	Ant1	2462	17.303	---	---
11N20SISO	Ant1	2402	18.222	---	---
	Ant1	2440	18.422	---	---
	Ant1	2480	18.462	---	---
BLE_1M	Ant1	2402	1.067	---	---
		2440	1.087	---	---
		2480	1.091	---	---
	Ant2	2402	1.075	---	---
		2440	1.079	---	---
		2480	1.083	---	---

5.6 Band Edge Measurement

Ambient condition:

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

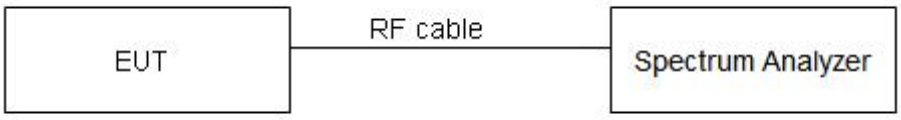
Method of Measurement:

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	4.87	-22.59	≤-15.13	PASS
	Ant1	Low	2462	3.57	-46.43	≤-16.43	PASS
11G	Ant1	High	2412	-2.83	-31.51	≤-22.83	PASS
	Ant1	High	2462	-2.38	-43.75	≤-22.38	PASS
11N20SISO	Ant1	Low	2412	-1.98	-28.43	≤-21.98	PASS
	Ant1	High	2462	-3.06	-41.4	≤-23.06	PASS
BLE_1M	Ant1	Low	2402	4.86	-39.84	≤-15.14	PASS
		High	2480	4.29	-40.15	≤-15.71	PASS
	Ant2	Low	2402	4.30	-38.52	≤-15.7	PASS
		High	2480	4.10	-40.24	≤-15.9	PASS

5.7 Maximum Power Spectral Density

Ambient condition:

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

Method of Measurement:

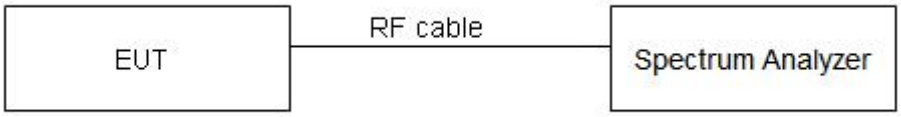
During the process of the testing, The EUT was connected to Spectrum Analyzer with a known loss. The EUT is max power transmission with proper modulation. The Average detector is used. We use Method AVGPSD-2 in KDB 558074 D01 for this test.

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	-8.67	≤8	PASS
	Ant1	2437	-9.34	≤8	PASS
	Ant1	2462	-9.98	≤8	PASS
11G	Ant1	2412	-15.59	≤8	PASS
	Ant1	2437	-15.59	≤8	PASS
	Ant1	2462	-16.16	≤8	PASS
11N20SISO	Ant1	2412	-15.91	≤8	PASS
	Ant1	2437	-16.41	≤8	PASS
	Ant1	2462	-16.78	≤8	PASS
BLE_1M	Ant1	2402	-8.24	≤8	PASS
		2440	-8.71	≤8	PASS
		2480	-8.29	≤8	PASS
	Ant2	2402	-8.66	≤8	PASS
		2440	-8.95	≤8	PASS
		2480	-8.82	≤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	1.41	1.41	---	PASS
			30~1000	1.41	-53.03	≤-18.59	PASS
			1000~26500	1.41	-37.01	≤-18.59	PASS
		2437	Reference	1.11	1.11	---	PASS
			30~1000	1.11	-59.7	≤-18.89	PASS
			1000~26500	1.11	-46.78	≤-18.89	PASS
		2462	Reference	0.59	0.59	---	PASS
			30~1000	0.59	-60.03	≤-19.41	PASS
			1000~26500	0.59	-45.5	≤-19.41	PASS
11G	Ant1	2412	Reference	-6.08	-6.08	---	PASS
			30~1000	-6.08	-59.06	≤-26.08	PASS
			1000~26500	-6.08	-48.7	≤-26.08	PASS
		2437	Reference	-5.88	-5.88	---	PASS
			30~1000	-5.88	-60.47	≤-25.88	PASS
			1000~26500	-5.88	-35.37	≤-25.88	PASS
		2462	Reference	-6.56	-6.56	---	PASS
			30~1000	-6.56	-57.63	≤-26.56	PASS
			1000~26500	-6.56	-49.05	≤-26.56	PASS
11N20SISO	Ant1	2412	Reference	-6.08	-6.08	---	PASS
			30~1000	-6.08	-59.14	≤-26.08	PASS
			1000~26500	-6.08	-48.3	≤-26.08	PASS
		2437	Reference	-6.11	-6.11	---	PASS
			30~1000	-6.11	-59.58	≤-26.11	PASS
			1000~26500	-6.11	-48.73	≤-26.11	PASS
		2462	Reference	-2.71	-2.71	---	PASS
			30~1000	-2.71	-60.49	≤-22.71	PASS
			1000~26500	-2.71	-49.25	≤-22.71	PASS

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	2.99	2.99	---	PASS
			30~1000	2.99	-59.78	≤-17.01	PASS
			1000~26500	2.99	-27.52	≤-17.01	PASS
		2440	Reference	3.34	3.34	---	PASS
			30~1000	3.34	-60.41	≤-16.66	PASS
			1000~26500	3.34	-29.41	≤-16.66	PASS
		2480	Reference	3.05	3.05	---	PASS
			30~1000	3.05	-60.7	≤-16.95	PASS
			1000~26500	3.05	-27.57	≤-16.95	PASS
	Ant2	2402	Reference	3.45	3.45	---	PASS
			30~1000	3.45	-60.4	≤-16.55	PASS
			1000~26500	3.45	-30.07	≤-16.55	PASS
		2440	Reference	2.86	2.86	---	PASS
			30~1000	2.86	-60.27	≤-17.14	PASS
			1000~26500	2.86	-30.88	≤-17.14	PASS
		2480	Reference	3.40	3.40	---	PASS
			30~1000	3.40	-60.71	≤-16.6	PASS
			1000~26500	3.40	-29.57	≤-16.6	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	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	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	2025/08/04
Preamplifier	BBV 9721	9721-050	DZ-000209-1	SCHWARZBECK	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".

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