ACCREDITED
CERTIFICATE #5473.01

Test Report No.:
FCC2023-0046-RF1

TEST REPORT

FCC ID	:	2AWMK-BTP-T6P2A
Applicant	:	Guangzhou Pinzhong Electronic Technology Co.,Ltd.
Product Name	:	BEITONG ZEUS PRO ELITE GAMEPAD
Mode No.	:	BTP-T6P2A

CVC Testing Technology Co., Ltd.

Applicant	**Name:** Guangzhou Pinzhong Electronic Technology Co.,Ltd. **Address:** Room 611-612, Greenland Center of Financial city, No.662, Huangpu Avenue Middle Road, Tianhe District, Guangzhou City.
Manufacturer	**Name:** Guangzhou Pinzhong Electronic Technology Co.,Ltd. **Address:** Room 611-612, Greenland Center of Financial city, No.662, Huangpu Avenue Middle Road, Tianhe District, Guangzhou City.
Equipment Under Test	**Product Name :** BEITONG ZEUS PRO ELITE GAMEPAD **Model No. :** BTP-T6P2A **Trade mark :** BEITONG **Serial no. :** JC23F05T6P000066 **Sampling :** 1-1

Date of Receipt.	2023.07.19	**Date of Testing**	2023.08.05

Test Specification	**Test Result**
FCC CFR47 Part 15C (2020) Radio Frequency Devices ANSI C63.10 (2013) KDB 558074 D01 DTS Meas Guidance v05 KDB 662911 D01 Multiple Transmitter Output v02r01	PASS

Evaluation of Test Result	The equipment under test was found to comply with the requirements of the standards applied. **Seal of CVC** **Date of issue: 2023.08.10**

Approved by:	Reviewed by:	Tested by:
Chen HuaWen	**Xu Zhenfei**	**Lu Weiji**

Other Aspects: NONE.

Abbreviations: 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	BEITONG ZEUS PRO ELITE GAMEPAD	
Model No.	BTP-T6P2A	
Additional model	N/A	
Power Supply	Rated voltage	DC 5.0V
	Battery voltage	DC 3.7V
Serial Number(SN)	JC23F05T6P000066	
firmware	V1.0	
software	V1.0	
specific power settings	Bluetooth(LE_1M): 0 2.4G Customization: -0.3	
Antenna Type	Internal Antenna	
Antenna Connector	A permanently attached antenna	
Antenna Gain	Bluetooth(LE_1M): 0.21 dBi (provided by client) 2.4G Customization: 1.00 dBi (provided by client)	
Beamforming gain	Unsupported (provided by client)	
Frequency Range	Bluetooth(LE_1M): 2402~2480MHz 2.4G Customization: 2402~2480MHz	
Channel Number	Bluetooth(LE_1M): 40 Channels 2.4G Customization: 40 Channels	
Type of Modulation	Bluetooth(LE_1M): GFSK 2.4G Customization: GFSK	
Max. Conducted Power	Bluetooth(LE_1M): -0.66 dBm 2.4G Customization: -1.89 dBm	
Operate Temp.Range	-20~60℃	

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.

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
2.4G Customization	1TX / 1RX	0,19,39

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)	1Mbps	/	/
2.4G Customization	1Mbps	/	/

Test Items	Test Antennas	Test Modes	Test Channels
Conducted Emissions	Antenna 1	Bluetooth(LE_1M), 2.4G Customization	0, 0
Radiated Emissions	Antenna 1	Bluetooth(LE_1M), 2.4G Customization	0, 39
Radiated Emissions (Band Edge)	Antenna 1	Bluetooth(LE_1M), 2.4G Customization	0,39, 0,39
Maximum conducted output power	Antenna 1	Bluetooth(LE_1M), 2.4G Customization	0,19,39, 0,19,39
Minimum 6 dB bandwidth	Antenna 1	Bluetooth(LE_1M), 2.4G Customization	0,19,39, 0,19,39
Occupied Channel Bandwidth	Antenna 1	Bluetooth(LE_1M), 2.4G Customization	0,19,39, 0,19,39
Band Edge Measurement	Antenna 1	Bluetooth(LE_1M), 2.4G Customization	0,39, 0,39
Maximum Power spectral density	Antenna 1	Bluetooth(LE_1M), 2.4G Customization	0,19,39, 0,19,39
Spurious RF Conducted Emissions	Antenna 1	Bluetooth(LE_1M), 2.4G Customization	0,19,39, 0,19,39

3.2 Duty cycle

TestMode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Limit	Verdict
BLE_1M	Ant1	2402	20.00	20.00	100	---	---
		2440	20.00	20.00	100	---	---
		2480	20.00	20.00	100	---	---
2.4G Customization	Ant1	2402	20.00	20.00	100	---	---
		2440	20.00	20.00	100	---	---
		2480	20.00	20.00	100	---	---

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 BLE_ diagram and Appendix C of 2.4G_ diagram
Minimum 6 dB bandwidth	15.247(a)(2)	PASS	Appendix A of BLE_ diagram and Appendix A of 2.4G_ diagram
Occupied Channel Bandwidth	15.247(a)(2)	PASS	Appendix B of BLE_ diagram and Appendix B of 2.4G_ diagram
Band Edge Measurement	15.247(d)	PASS	Appendix E of BLE_ diagram and Appendix E of 2.4G_ diagram
Maximum Power spectral density	15.247(e)	PASS	Appendix D of BLE_ diagram and Appendix D of 2.4G_ diagram
Spurious RF Conducted Emissions	15.247(d)	PASS	Appendix F of BLE_ diagram and Appendix F of 2.4G_ diagram
Antenna Requirement	15.203	PASS	See note 1

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

5. Measurement procedure

5.1 Conducted Emission

Ambient condition:

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

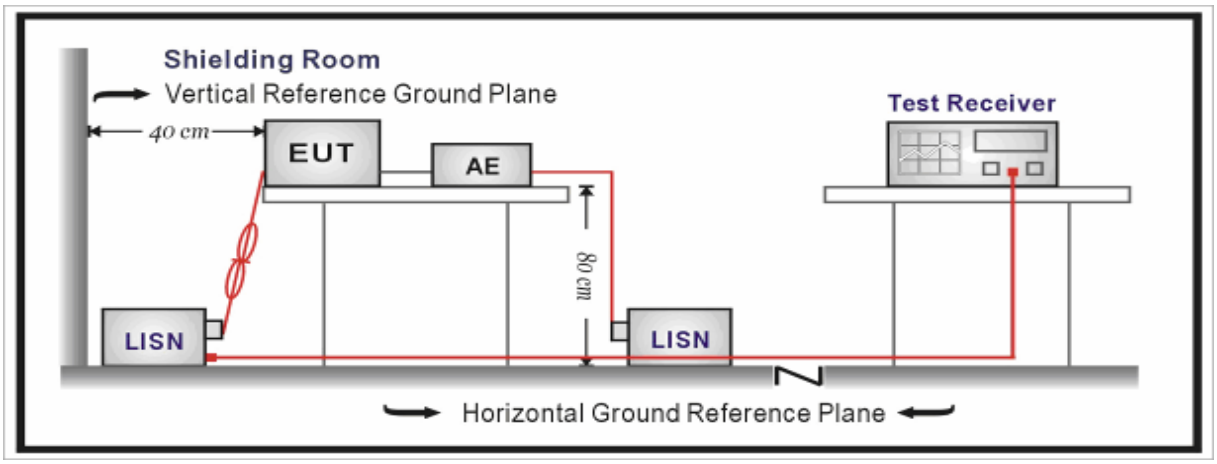
Method of Measurement:

The EUT was setup according to ANSI C63.10, 2013 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：

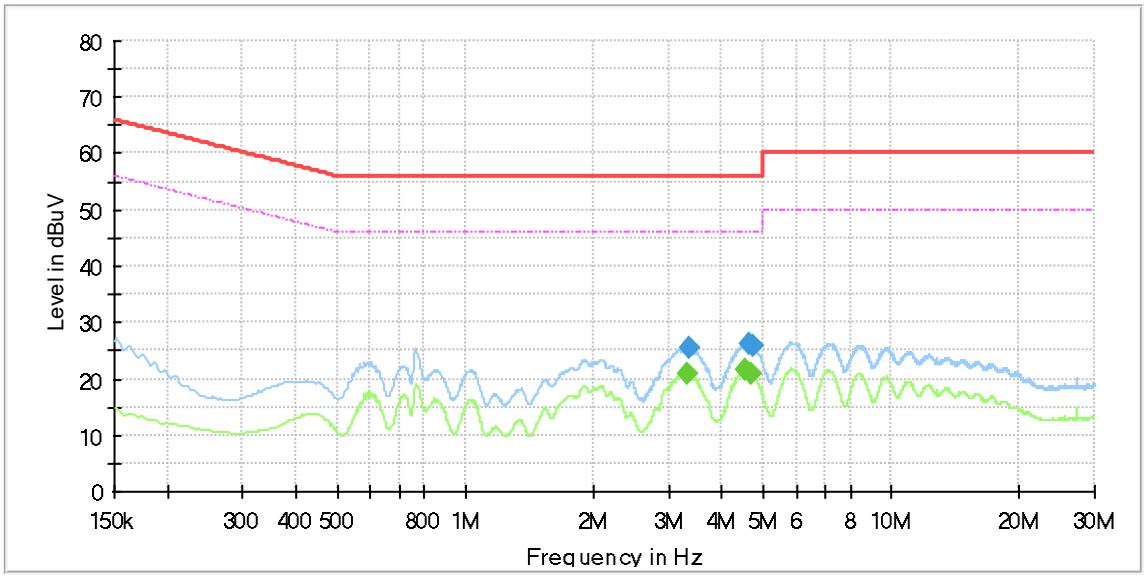
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 1.96. U= 3.12 dB.

Test Results:

During the test, the Conducted Emission from 150kHz to 30MHz was performed in all modes with all channels, and all antennas. 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.

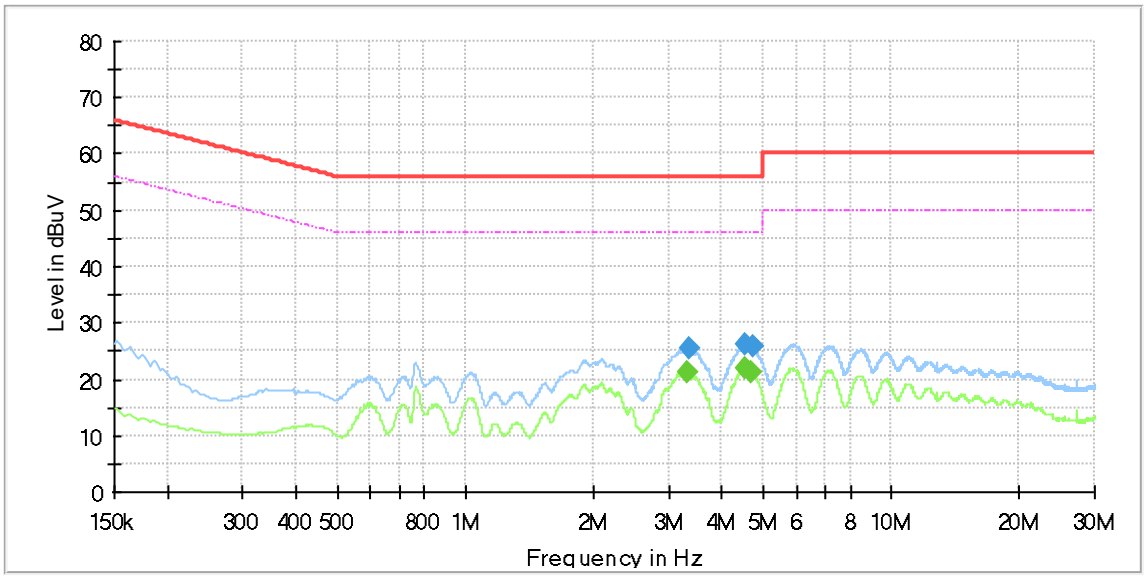
Power Line	L
Test channel	Worst-Case

Suspected List							
Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV]	Limit [dBµV]	Margin [dB]	Detector	Pass/Fail
3.352	20.7	4.7	25.4	56.0	30.6	QP	PASS
4.630	20.7	5.6	26.3	56.0	29.7	QP	PASS
4.745	20.6	5.3	25.9	56.0	30.1	QP	PASS
3.327	20.7	0.1	20.8	46.0	25.2	AV	PASS
4.515	20.7	0.9	21.6	46.0	24.4	AV	PASS
4.697	20.6	0.4	21.0	46.0	25.0	AV	PASS



Power Line	N
Test channel	Worst-Case

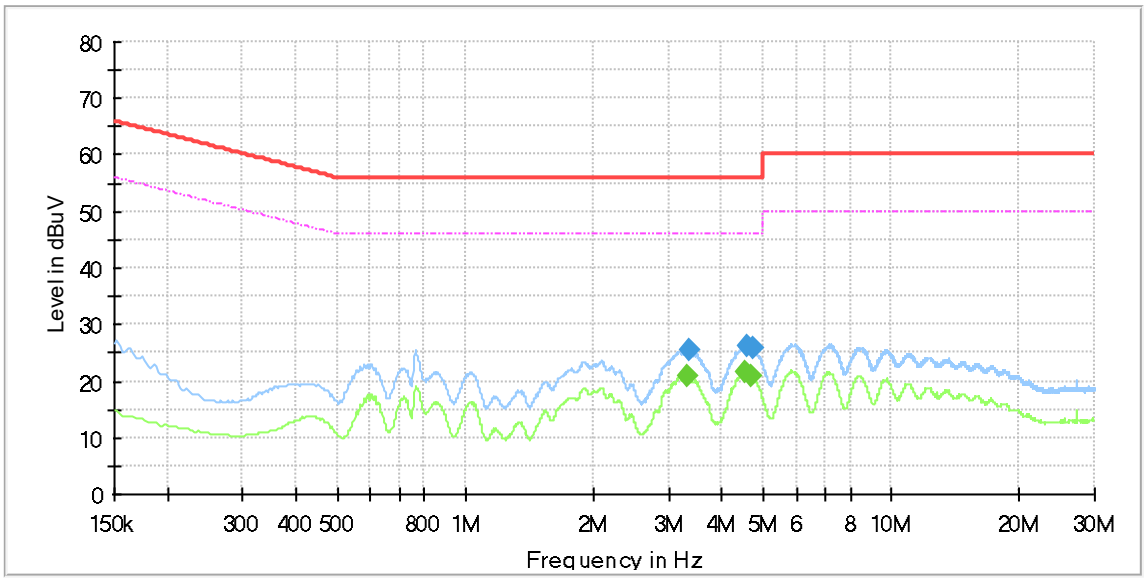
Suspected List							
Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV]	Limit [dBµV]	Margin [dB]	Detector	Pass/Fail
3.359	20.7	4.7	25.4	56.0	30.6	QP	PASS
4.531	20.6	5.5	26.1	56.0	29.9	QP	PASS
4.760	20.6	5.2	25.8	56.0	30.2	QP	PASS
3.336	20.7	0.5	21.2	46.0	24.8	AV	PASS
4.526	20.6	1.3	21.9	46.0	24.1	AV	PASS
4.702	20.6	0.7	21.3	46.0	24.7	AV	PASS



During the test, the Conducted Emission from 150kHz to 30MHz was performed in all modes with all channels, and all antennas. 2.4G Customization, Channel 0, Antenna 1 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

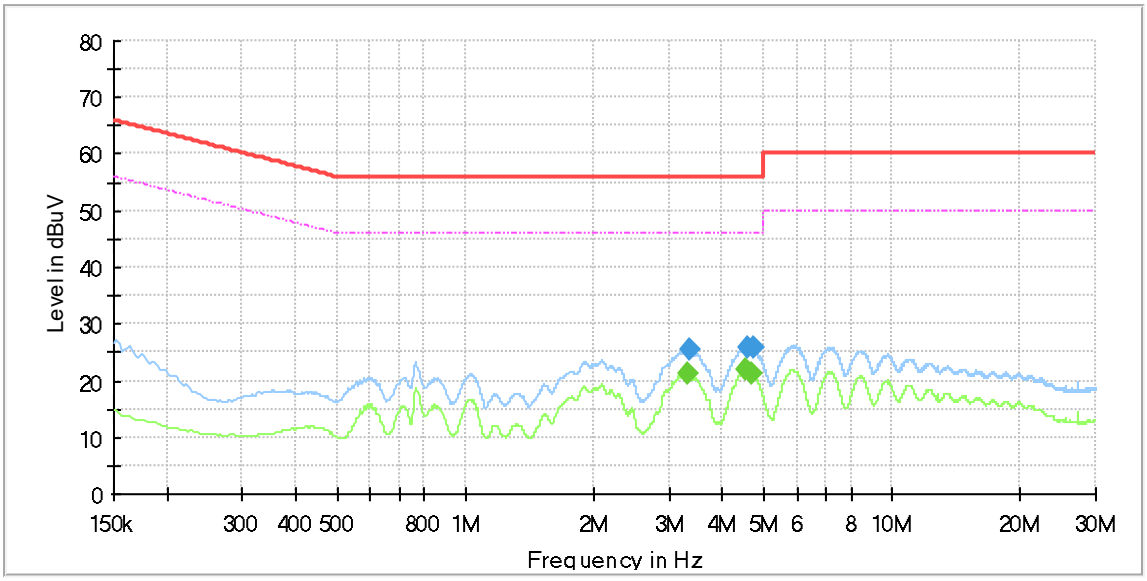
Power Line	L
Test channel	Worst-Case

Suspected List							
Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV]	Limit [dBµV]	Margin [dB]	Detector	Pass/Fail
3.356	20.7	4.8	25.5	56.0	30.5	QP	PASS
4.576	20.7	5.6	26.3	56.0	29.7	QP	PASS
4.756	20.6	5.3	25.9	56.0	30.1	QP	PASS
3.316	20.7	0.1	20.8	46.0	25.2	AV	PASS
4.515	20.7	0.9	21.6	46.0	24.4	AV	PASS
4.700	20.6	0.4	21.0	46.0	25.0	AV	PASS



Power Line	N
Test channel	Worst-Case

Suspected List							
Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV]	Limit [dBµV]	Margin [dB]	Detector	Pass/Fail
3.350	20.7	4.7	25.4	56.0	30.6	QP	PASS
4.587	20.6	5.4	26.0	56.0	30.0	QP	PASS
4.760	20.6	5.2	25.8	56.0	30.2	QP	PASS
3.327	20.7	0.5	21.2	46.0	24.8	AV	PASS
4.526	20.6	1.3	21.9	46.0	24.1	AV	PASS
4.697	20.6	0.7	21.3	46.0	24.7	AV	PASS



5.2 Radiated Emission

Ambient condition:

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement:

The EUT was setup and tested according to ANSI C63.10, 2013.
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 C63.10:2013 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)).

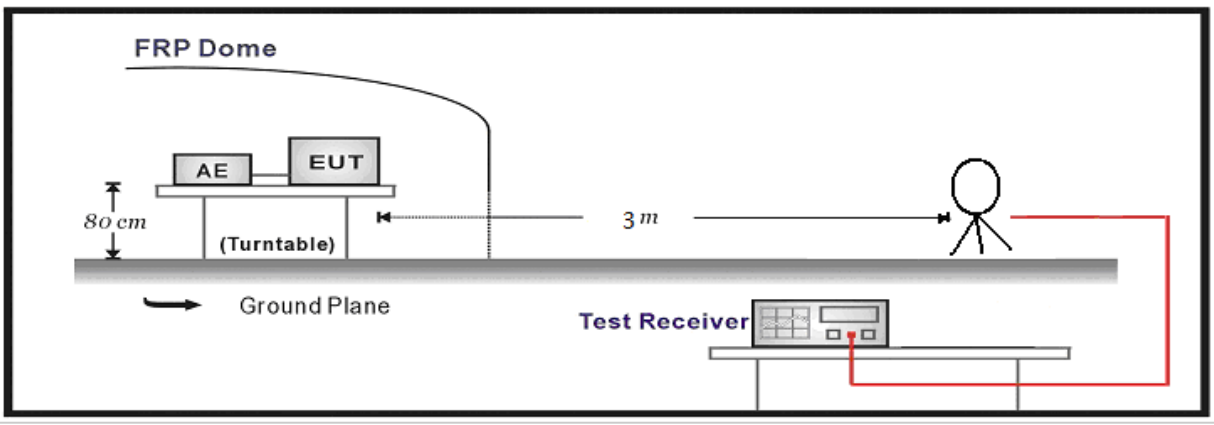
Frequency	Limit (μV/m)	Limit (dBμV/m @3m)	Remark
0.009MHz-0.490MHz	2400/F(kHz)@300m	20lg(240000/F(kHz))	Quasi-peak Level
0.490MHz~1.705MHz	24000/F(kHz)@30m	20lg(240000/F(kHz))	Quasi-peak Level
1.705MHz~30.0MHz	30@30m	49.54	Quasi-peak Level
30MHz-88MHz	100@3m	40.0	Quasi-peak Level
88MHz-216MHz	150@3m	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:

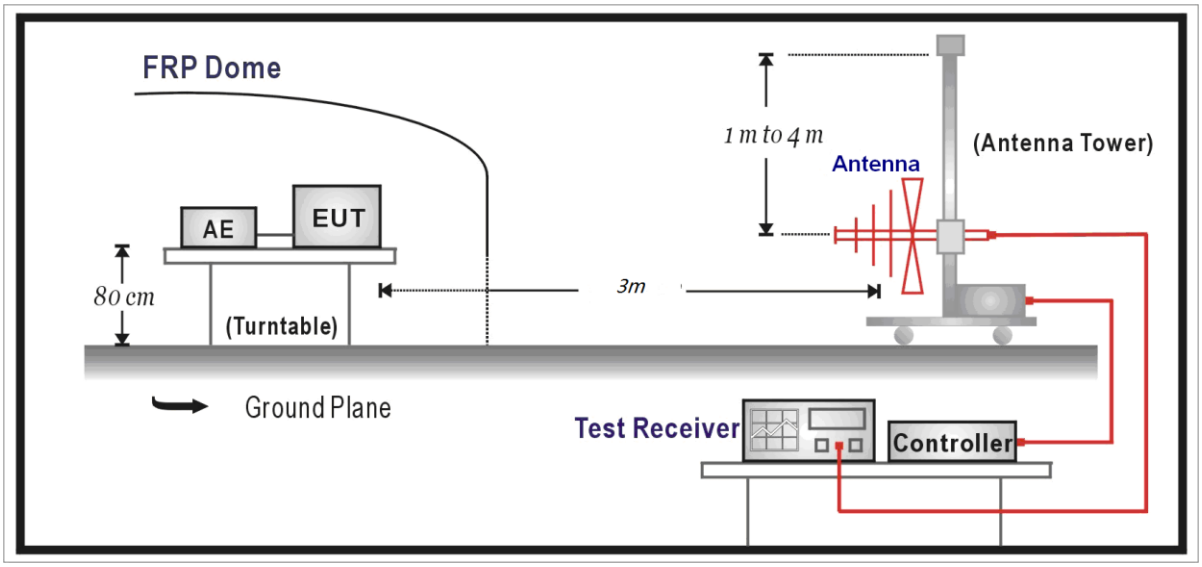
MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218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

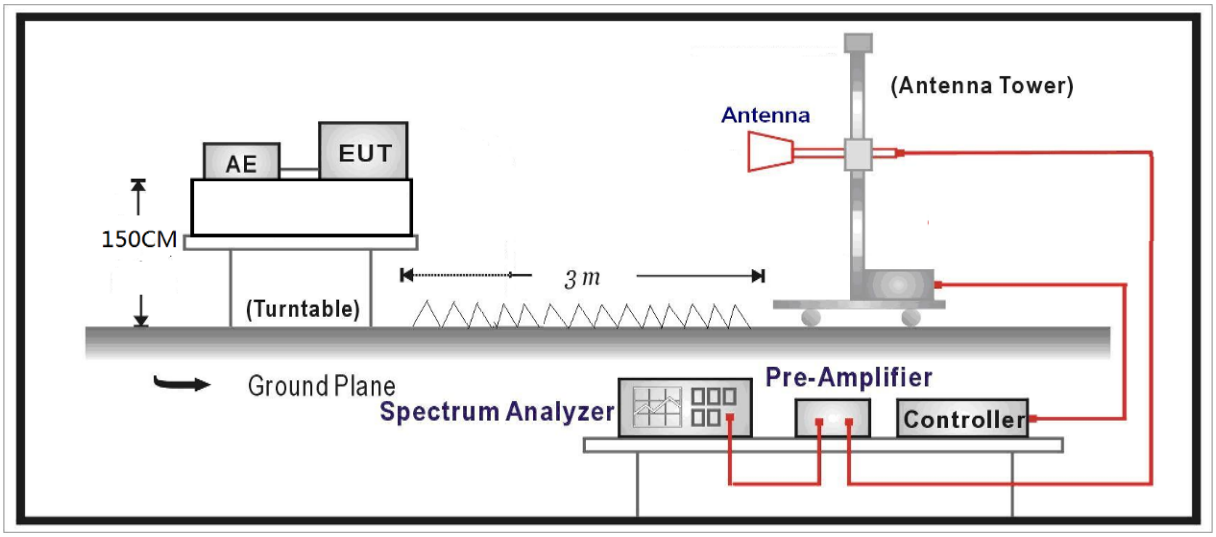
Below 30MHz Test Setup:



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：

Bluetooth(Low Energy):

During the test, the Radiates Emission from 9kHz to 40GHz was performed in Bluetooth (LE_1M) 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.

Radiates Emission	9kHz~1GHz
Test channel	Worst-Case
Polarity	Horizontal

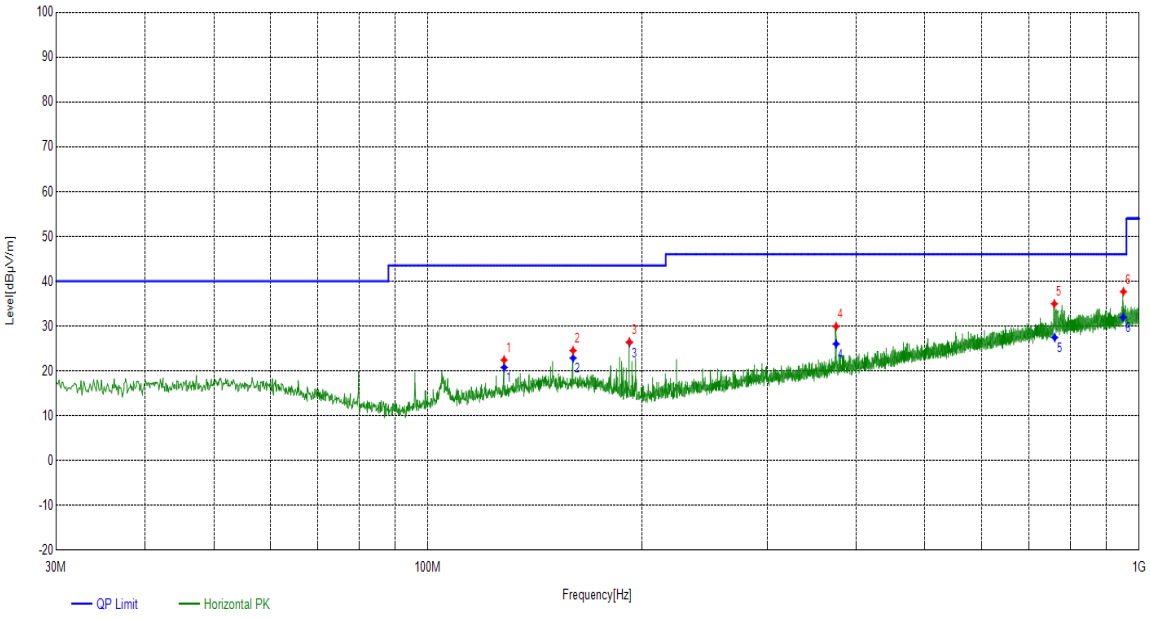
Suspected List

Frequency [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/Fail
127.9798	19.03	3.40	22.43	---	---	PK	100	20	---
159.993	20.87	3.66	24.53	---	---	PK	100	33	---
192.0062	17.75	8.68	26.43	---	---	PK	100	138	---
374.9665	23.31	6.62	29.93	---	---	PK	100	92	---
760.095	31.46	3.51	34.97	---	---	PK	100	79	---
950.6221	33.60	4.08	37.68	---	---	PK	100	295	---

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

Final Data List

Frequency [MHz]	Factor [dB]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Pass/Fail
128.002	19.03	20.78	43.51	22.73	110	20	PASS
160.0022	20.87	22.87	43.51	20.64	280	33	PASS
192.009	17.75	26.36	43.50	17.14	180	138	PASS
375.0099	23.31	26.02	46.01	19.99	130	92	PASS
760.9415	31.46	27.45	46.00	18.55	120	79	PASS
949.742	33.60	31.95	46.00	14.05	350	295	PASS


100
90
80
70
60
50
40
30
20
10
0
-10
-20
Level[dBµV/m]
30M
100M
1G
Frequency[Hz]
QP Limit
Horizontal PK

Radiates Emission	9kHz~1GHz
Test channel	Worst-Case
Polarity	Vertical

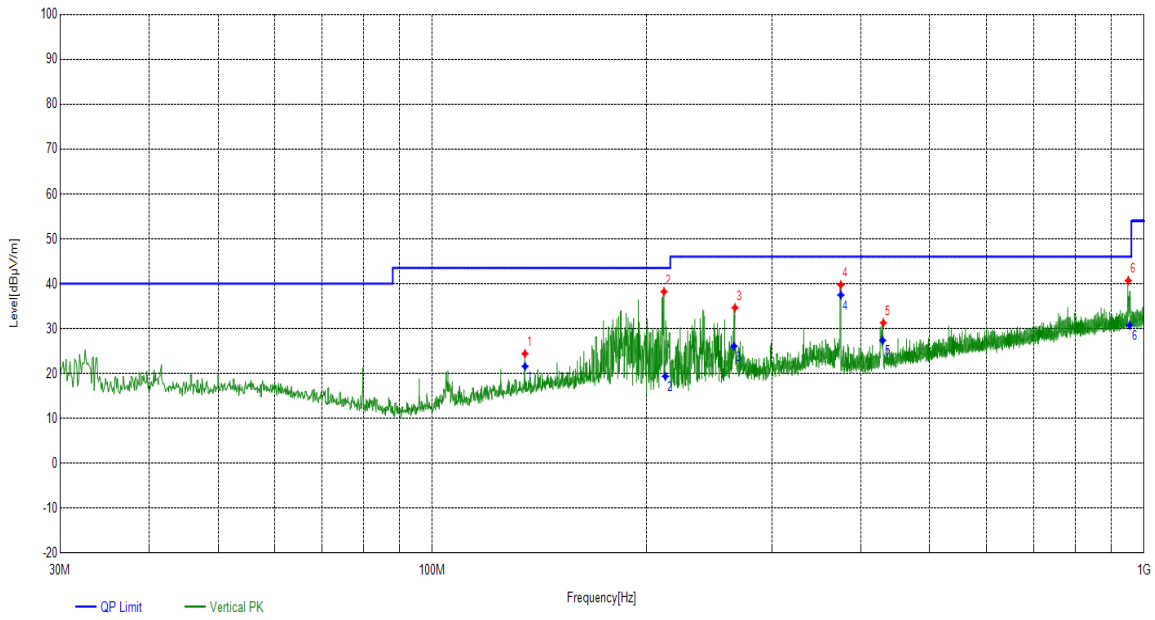
Suspected List

Frequency [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/Fail
134.9645	19.63	4.79	24.42	---	---	PK	100	93	---
211.6022	17.81	20.42	38.23	---	---	PK	100	160	---
266.2186	20.04	14.61	34.65	---	---	PK	100	120	---
374.9665	23.31	16.45	39.76	---	---	PK	100	74	---
430.262	24.76	6.53	31.29	---	---	PK	100	60	---
950.331	33.59	7.10	40.69	---	---	PK	100	74	---

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

Final Data List

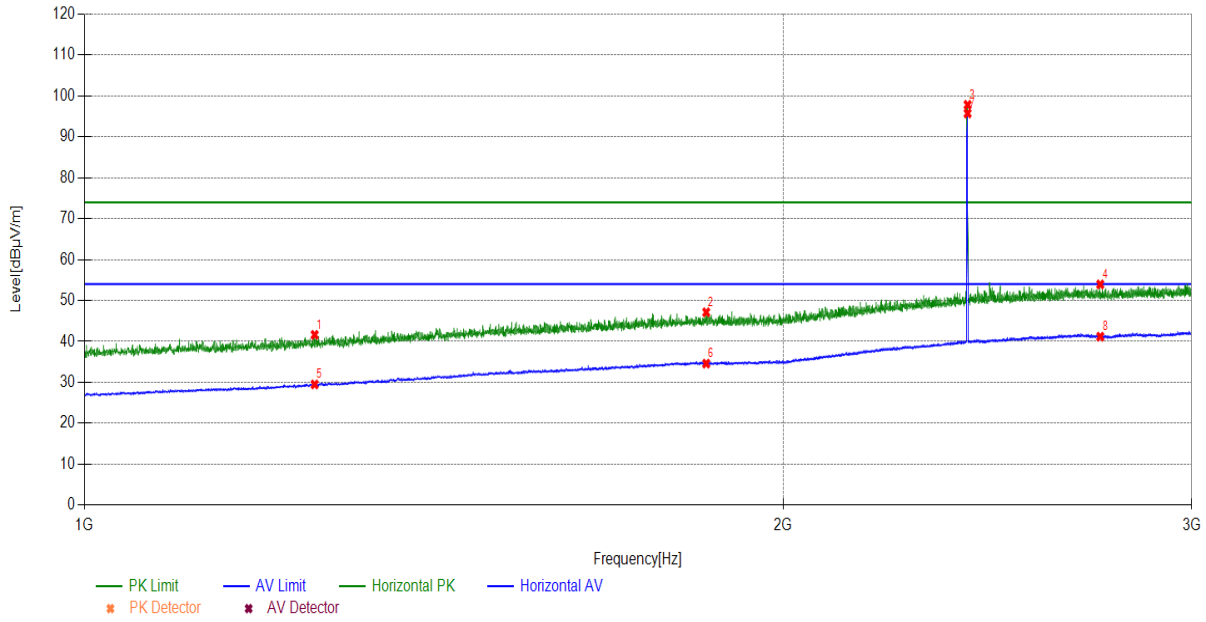
Frequency [MHz]	Factor [dB]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Pass/Fail
134.9938	19.63	21.59	43.51	21.92	170	93	PASS
212.5148	17.81	19.37	43.50	24.13	340	160	PASS
265.4327	20.04	26.09	46.02	19.93	290	120	PASS
374.9882	23.31	37.49	46.01	8.52	310	74	PASS
429.4027	24.76	27.37	46.01	18.64	160	60	PASS
954.4433	33.59	30.74	46.00	15.26	160	74	PASS



Radiates Emission	1G~3G
Test channel	Worst-Case
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
1256.6257	28.45	13.18	41.63	74.00	32.37	PK	150	216	PASS
1853.2853	33.05	14.09	47.14	74.00	26.86	PK	150	302	PASS
2401.9402	37.34	60.47	97.81	74.00	-23.81	PK	150	73	---
2739.974	38.61	15.34	53.95	74.00	20.05	PK	150	4	PASS
1256.6257	28.45	1.06	29.51	54.00	24.49	AV	150	216	PASS
1853.2853	33.05	1.55	34.60	54.00	19.40	AV	150	174	PASS
2401.9402	37.34	58.37	95.71	54.00	-41.71	AV	150	59	---
2739.974	38.61	2.58	41.19	54.00	12.81	AV	150	130	PASS

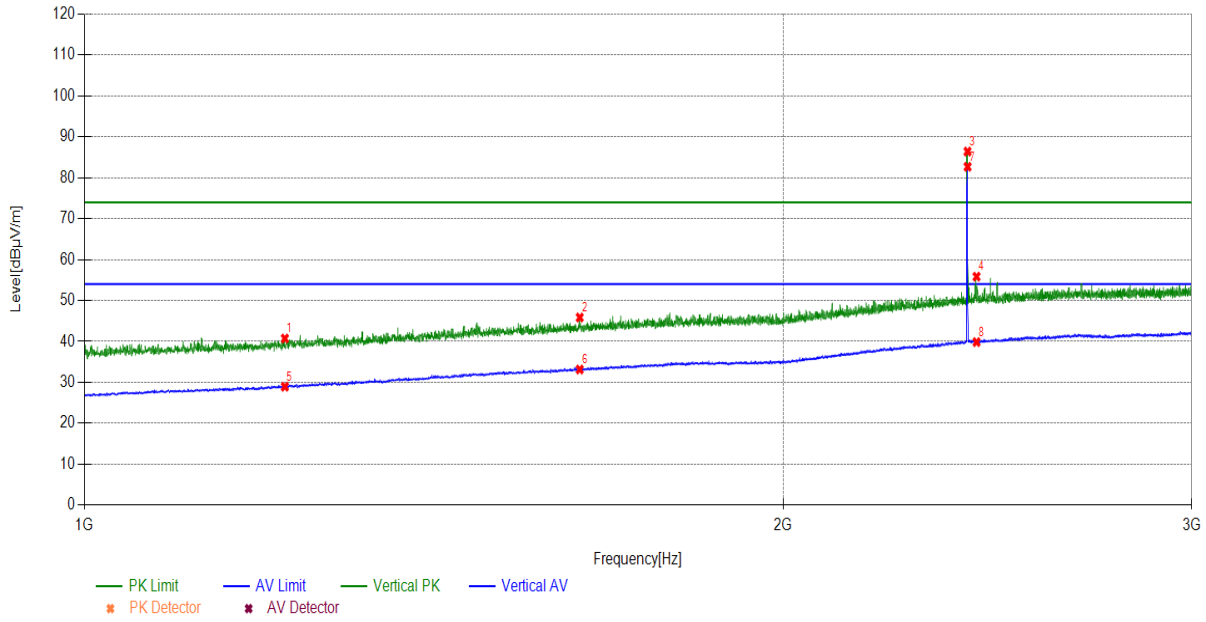


Note: The signal beyond the limit is carrier

Radiates Emission	1G~3G
Test channel	Worst-Case
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
1220.022	28.10	12.62	40.72	74.00	33.28	PK	150	9	PASS
1634.6635	31.76	14.10	45.86	74.00	28.14	PK	150	51	PASS
2401.7402	37.34	49.06	86.40	74.00	-12.40	PK	150	65	---
2423.3423	37.44	18.40	55.84	74.00	18.16	PK	150	322	PASS
1220.022	28.10	0.86	28.96	54.00	25.04	AV	150	9	PASS
1634.6635	31.76	1.39	33.15	54.00	20.85	AV	150	193	PASS
2401.9402	37.34	45.34	82.68	54.00	-28.68	AV	150	65	---
2423.3423	37.44	2.42	39.86	54.00	14.14	AV	150	251	PASS

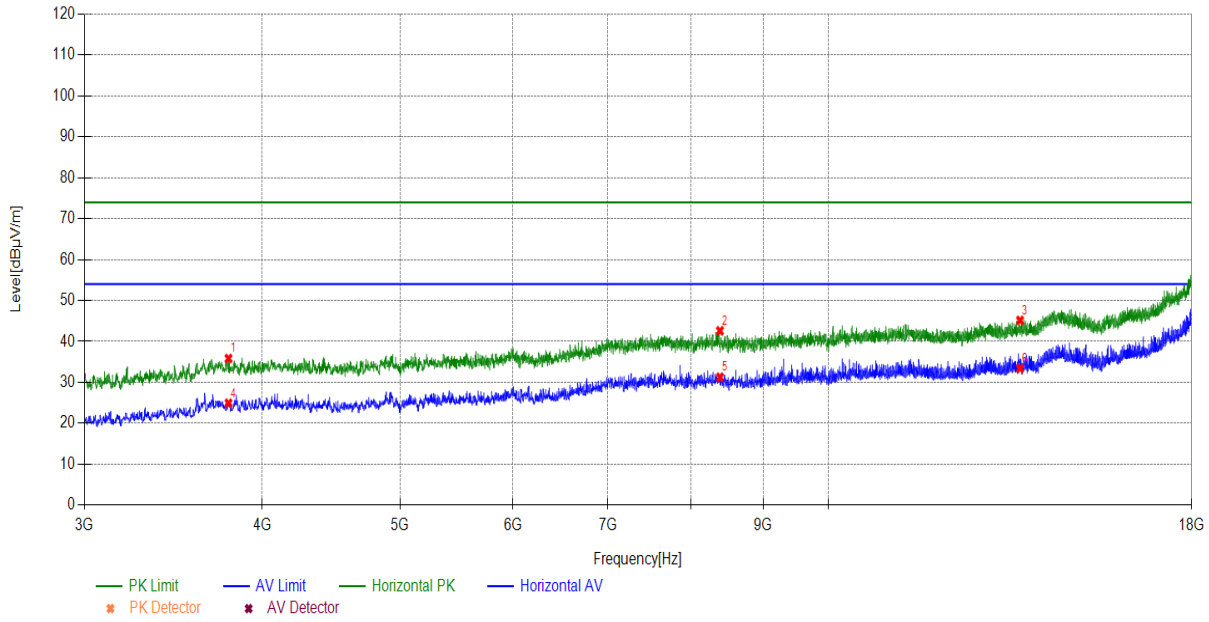


Note: The signal beyond the limit is carrier

Radiates Emission	3G~18G
Test channel	Worst-Case
polarization	Horizontal

Suspected List

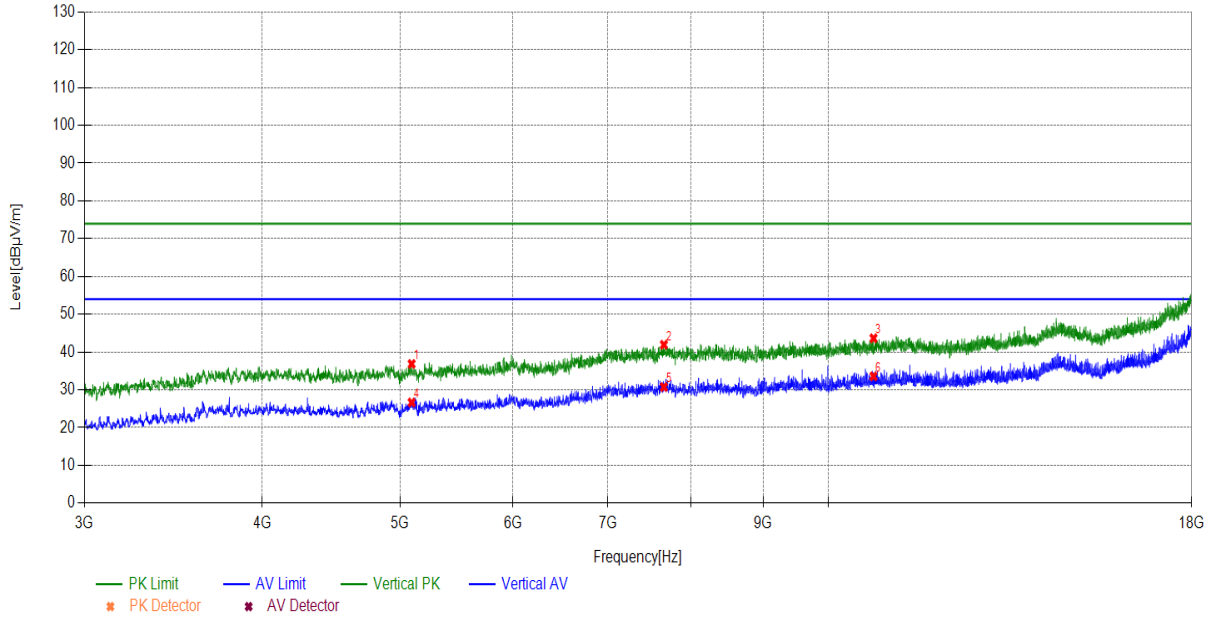
Frequency[MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/Fail
3787.5788	-0.56	36.41	35.85	74.00	38.15	PK	150	40	PASS
8390.039	9.01	33.58	42.59	74.00	31.41	PK	150	190	PASS
13634.5635	13.80	31.35	45.15	74.00	28.85	PK	150	240	PASS
3787.5788	-0.56	25.48	24.92	54.00	29.08	AV	150	50	PASS
8390.039	9.01	22.25	31.26	54.00	22.74	AV	150	60	PASS
13634.5635	13.80	19.61	33.41	54.00	20.59	AV	150	80	PASS



Radiates Emission	3G~18G
Test channel	Worst-Case
polarization	Vertical

Suspected List

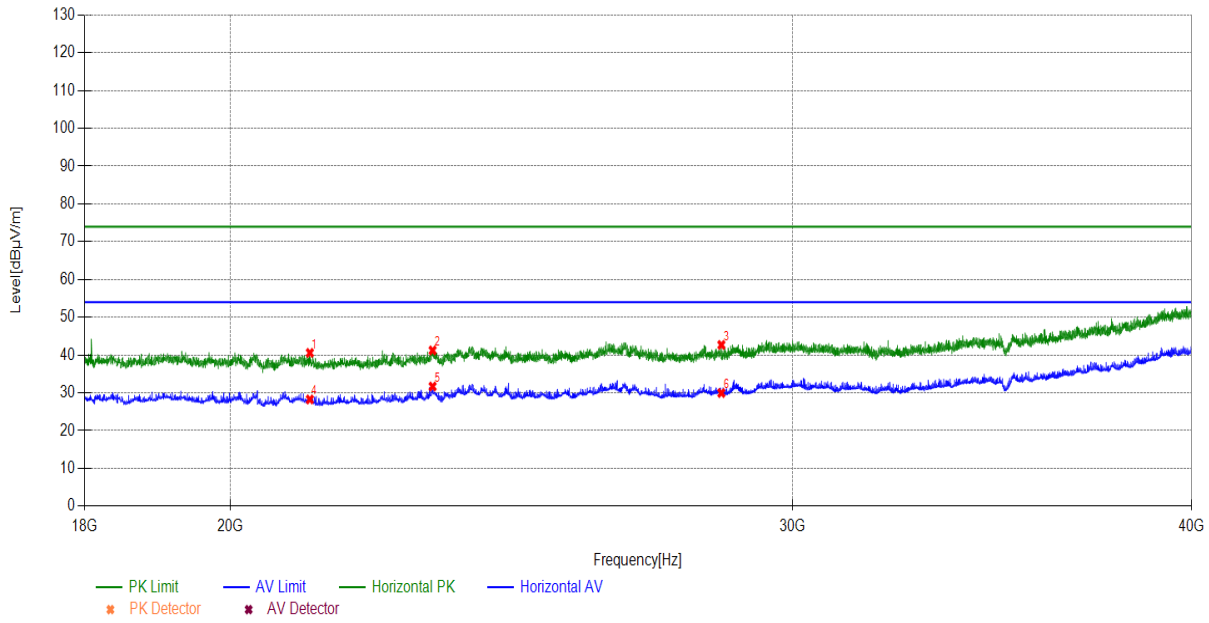
Frequency[MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/Fail
5094.2094	1.76	35.10	36.86	74.00	37.14	PK	150	100	PASS
7662.4662	8.37	33.57	41.94	74.00	32.06	PK	150	330	PASS
10755.7756	11.82	31.83	43.65	74.00	30.35	PK	150	300	PASS
5094.2094	1.76	24.91	26.67	54.00	27.33	AV	150	10	PASS
7662.4662	8.37	22.38	30.75	54.00	23.25	AV	150	80	PASS
10755.7756	11.82	21.77	33.59	54.00	20.41	AV	150	10	PASS



Radiates Emission	18G~40G
Test channel	Worst-Case
polarization	Horizontal

Suspected List

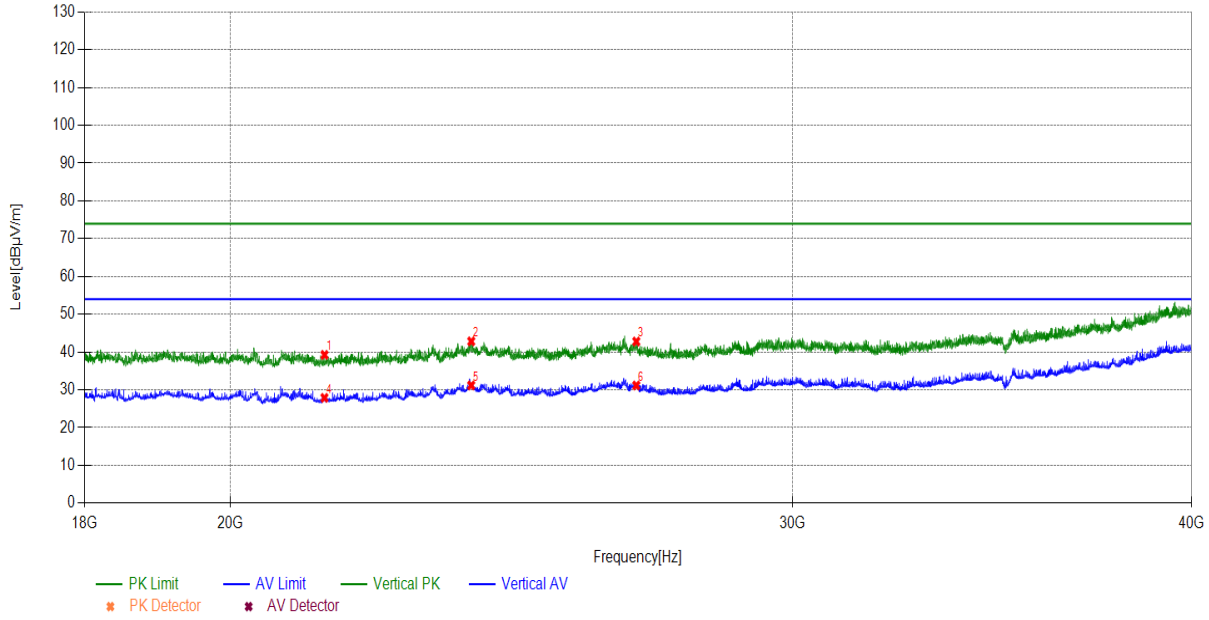
Frequency[MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/Fail
21177.1177	1.69	38.89	40.58	74.00	33.42	PK	150	80	PASS
23137.5138	3.01	38.22	41.23	74.00	32.77	PK	150	270	PASS
28495.0495	5.70	36.99	42.69	74.00	31.31	PK	150	200	PASS
21177.1177	1.69	26.57	28.26	54.00	25.74	AV	150	210	PASS
23137.5138	3.01	28.68	31.69	54.00	22.31	AV	150	10	PASS
28495.0495	5.70	24.26	29.96	54.00	24.04	AV	150	170	PASS



Radiates Emission	18G~40G
Test channel	Worst-Case
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
21401.5402	1.75	37.51	39.26	74.00	34.74	PK	150	40	PASS
23790.9791	3.53	39.32	42.85	74.00	31.15	PK	150	200	PASS
26798.6799	4.82	37.97	42.79	74.00	31.21	PK	150	220	PASS
21401.5402	1.75	26.14	27.89	54.00	26.11	AV	150	10	PASS
23790.9791	3.53	27.66	31.19	54.00	22.81	AV	150	10	PASS
26798.6799	4.82	26.34	31.16	54.00	22.84	AV	150	10	PASS



2.4G Customization:

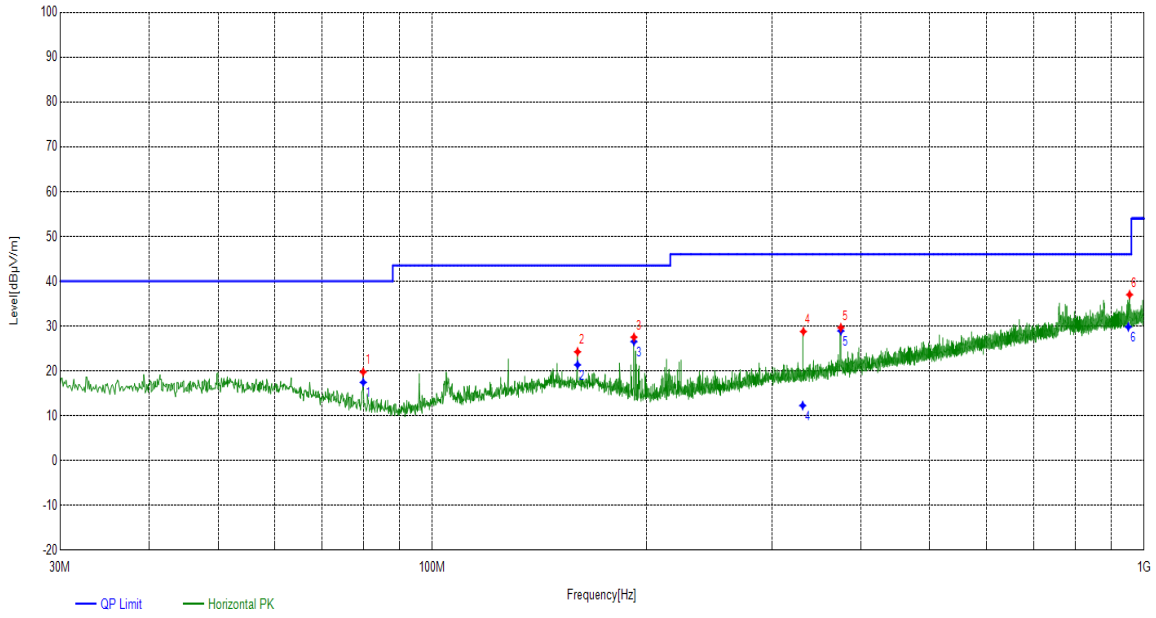
During the test, the Radiates Emission from 9kHz to 40GHz was performed in 2.4G Customization all modes with all channels and all antennas. 2.4G Customization, channel 39, antenna 1 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

Radiates Emission	9kHz~1GHz
Test channel	Worst-Case
Polarity	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
79.96	16.15	3.61	19.76	---	---	PK	100	106	---
159.993	20.87	3.39	24.26	---	---	PK	100	158	---
192.0062	17.75	9.77	27.52	---	---	PK	100	145	---
332.1852	22.23	6.56	28.79	---	---	PK	100	86	---
374.9665	23.31	6.35	29.66	---	---	PK	100	60	---
954.3084	33.64	3.37	37.01	---	---	PK	100	126	---

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

Final Data List							
Frequency [MHz]	Factor [dB]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Pass/Fail
79.9831	16.15	17.45	40.00	22.55	240	106	PASS
159.9906	20.87	21.35	43.51	22.16	200	158	PASS
192.0007	17.75	26.55	43.50	16.95	350	145	PASS
331.4209	22.23	12.28	46.01	33.73	180	86	PASS
375.0208	23.31	28.93	46.01	17.08	400	60	PASS
950.3999	33.64	29.82	46.00	16.18	400	126	PASS


100
90
80
70
60
50
40
30
20
10
0
-10
-20
Level[dBµV/m]
30M
100M
1G
Frequency[Hz]
QP Limit
Horizontal PK

Radiates Emission	9kHz~1GHz
Test channel	Worst-Case
Polarity	Vertical

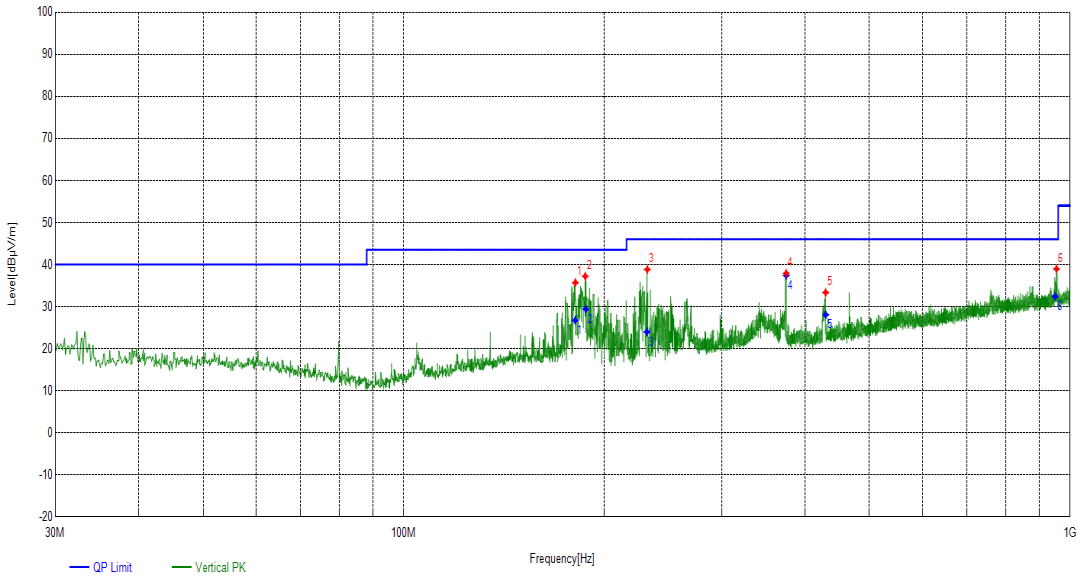
Suspected List

Frequency [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/Fail
180.9471	19.18	16.52	35.70	---	16.24	PK	100	138	---
187.2527	18.26	18.95	37.21	---	22.11	PK	100	164	---
232.0712	18.65	20.18	38.83	---	23.18	PK	100	99	---
374.9665	23.31	14.61	37.92	---	21.32	PK	100	53	---
429.777	24.75	8.60	33.35	---	16.81	PK	100	66	---
954.2114	33.64	5.31	38.95	---	12.01	PK	100	79	---

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

Final Data List

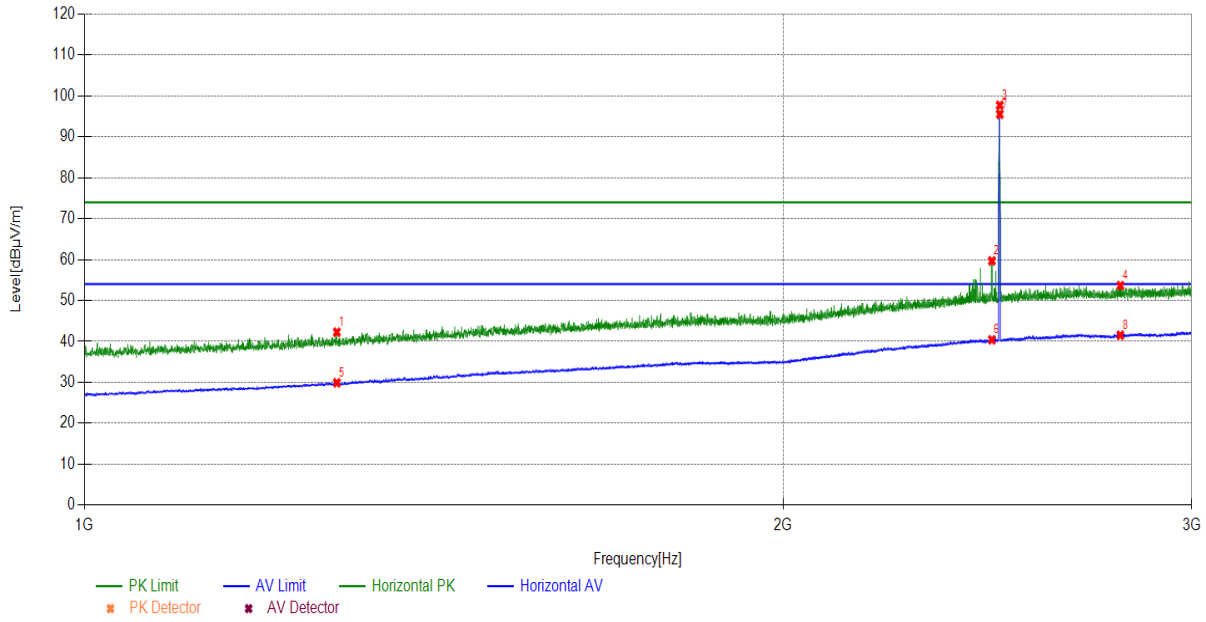
Frequency [MHz]	Factor [dB]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Pass/Fail
180.8817	19.18	26.74	43.50	16.76	160	138	PASS
187.586	18.26	29.39	43.50	14.11	120	164	PASS
231.7487	18.65	23.99	46.02	22.03	190	99	PASS
374.9991	23.31	37.41	46.01	8.60	400	53	PASS
429.9449	24.75	28.07	46.01	17.94	340	66	PASS
949.5853	33.64	32.43	46.00	13.57	370	79	PASS



Radiates Emission	1G~3G
Test channel	Worst-Case
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
1284.6285	28.72	13.56	42.28	74.00	31.72	PK	150	357	PASS
2460.5461	37.61	22.09	59.70	74.00	14.30	PK	150	232	PASS
2479.748	37.70	60.01	97.71	74.00	-23.71	PK	150	16	---
2795.1795	38.78	14.87	53.65	74.00	20.35	PK	150	318	PASS
1284.6285	28.72	1.19	29.91	54.00	24.09	AV	150	218	PASS
2460.5461	37.61	2.80	40.41	54.00	13.59	AV	150	232	PASS
2479.948	37.70	57.82	95.52	54.00	-41.52	AV	150	360	---
2795.1795	38.78	2.76	41.54	54.00	12.46	AV	150	174	PASS

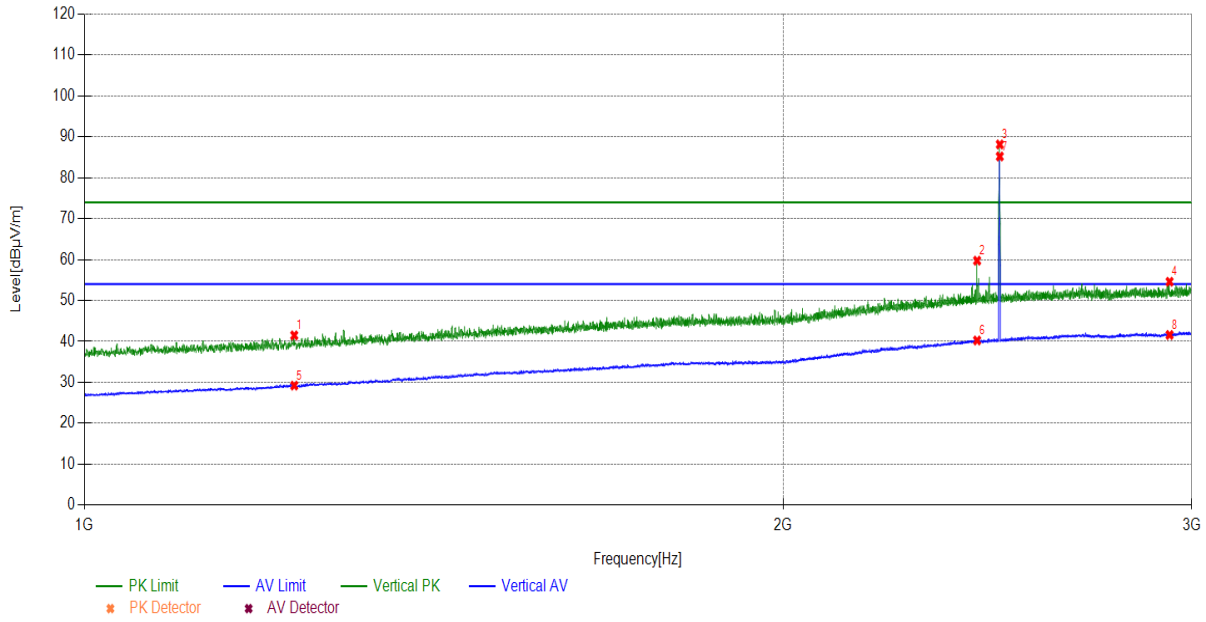


Note: The signal beyond the limit is carrier

Radiates Emission	1G~3G
Test channel	Worst-Case
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
1231.4231	28.21	13.29	41.50	74.00	32.50	PK	150	7	PASS
2424.7425	37.45	22.30	59.75	74.00	14.25	PK	150	290	PASS
2479.948	37.70	50.44	88.14	74.00	-14.14	PK	150	332	---
2934.9935	39.23	15.37	54.60	74.00	19.40	PK	150	275	PASS
1231.4231	28.21	1.02	29.23	54.00	24.77	AV	150	77	PASS
2424.7425	37.45	2.80	40.25	54.00	13.75	AV	150	219	PASS
2479.948	37.70	47.50	85.20	54.00	-31.20	AV	150	332	---
2934.9935	39.23	2.37	41.60	54.00	12.40	AV	150	219	PASS

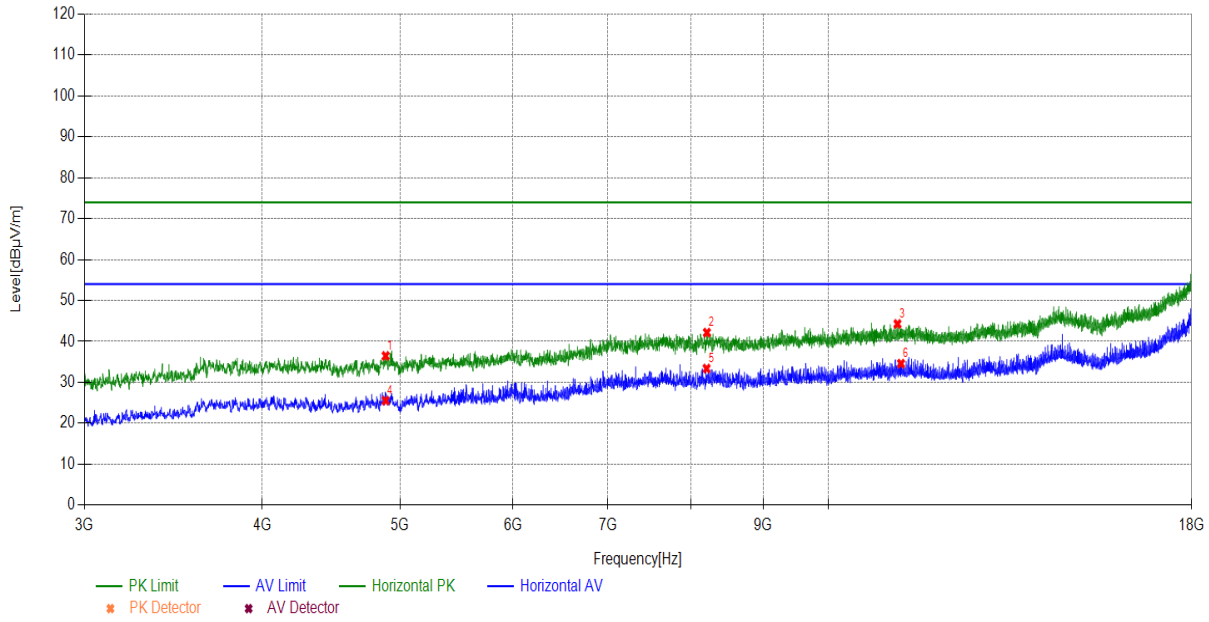


Note: The signal beyond the limit is carrier

Radiates Emission	3G~18G
Test channel	Worst-Case
polarization	Horizontal

Suspected List

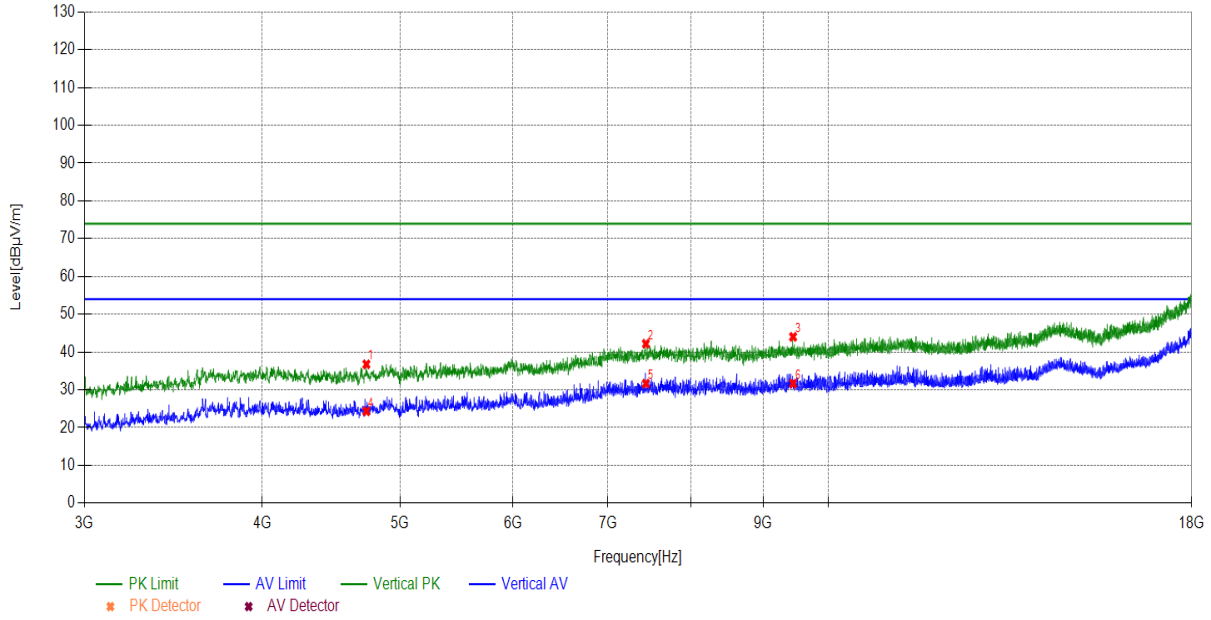
Frequency [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/Fail
4884.1884	0.96	35.52	36.48	74.00	37.52	PK	150	290	PASS
8214.5215	8.78	33.40	42.18	74.00	31.82	PK	150	40	PASS
11181.8182	11.54	32.75	44.29	74.00	29.71	PK	150	130	PASS
4884.1884	0.96	24.59	25.55	54.00	28.45	AV	150	20	PASS
8210.021	8.78	24.61	33.39	54.00	20.61	AV	150	10	PASS
11246.3246	11.48	23.11	34.59	54.00	19.41	AV	150	10	PASS



Radiates Emission	3G~18G
Test channel	Worst-Case
polarization	Vertical

Suspected List

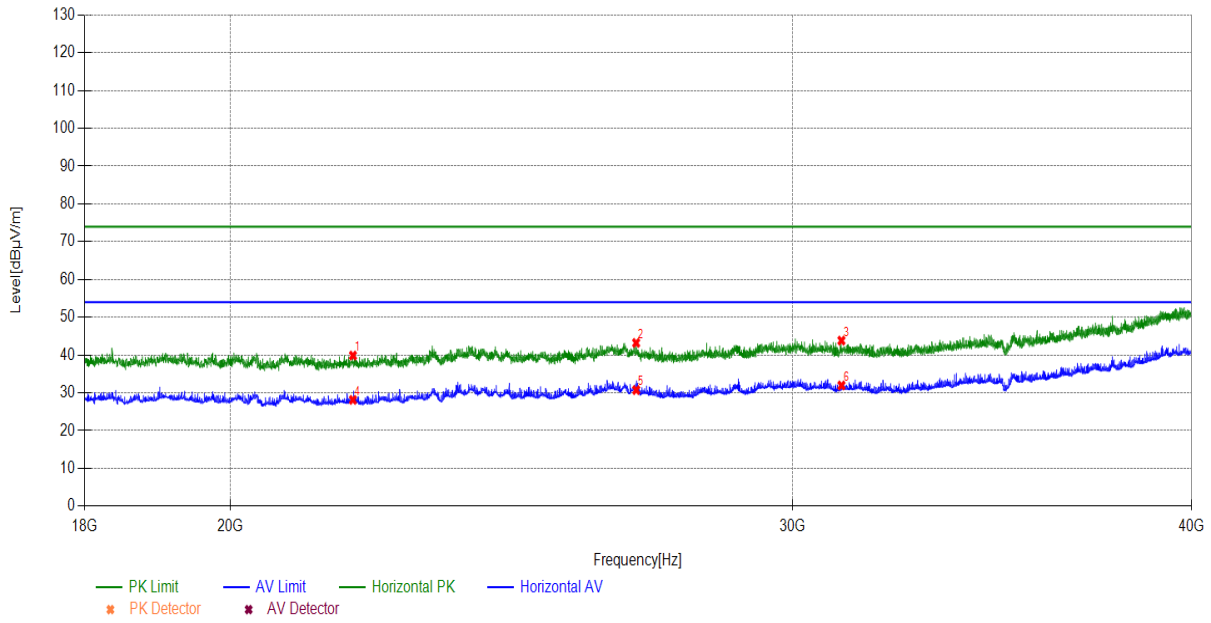
Frequency [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/Fail
4734.1734	0.33	36.44	36.77	74.00	37.23	PK	150	280	PASS
7441.9442	8.28	33.93	42.21	74.00	31.79	PK	150	280	PASS
9443.1443	11.21	32.83	44.04	74.00	29.96	PK	150	160	PASS
4734.1734	0.33	24.00	24.33	54.00	29.67	AV	150	140	PASS
7441.9442	8.28	23.38	31.66	54.00	22.34	AV	150	10	PASS
9443.1443	11.21	20.47	31.68	54.00	22.32	AV	150	10	PASS



Radiates Emission	18G~40G
Test channel	Worst-Case
polarization	Horizontal

Suspected List

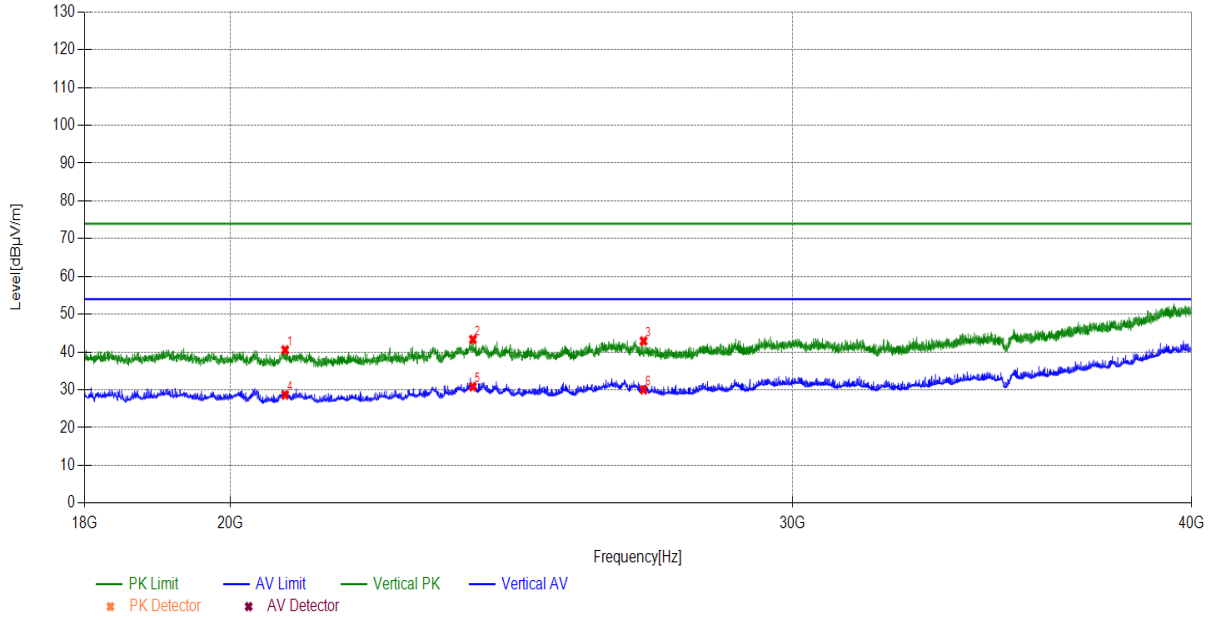
Frequency [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/Fail
21845.9846	1.86	38.02	39.88	74.00	34.12	PK	150	150	PASS
26796.4796	4.82	38.40	43.22	74.00	30.78	PK	150	250	PASS
31071.5072	6.22	37.62	43.84	74.00	30.16	PK	150	190	PASS
21845.9846	1.86	26.28	28.14	54.00	25.86	AV	150	180	PASS
26796.4796	4.82	25.93	30.75	54.00	23.25	AV	150	240	PASS
31071.5072	6.22	25.75	31.97	54.00	22.03	AV	150	10	PASS



Radiates Emission	18G~40G
Test channel	Worst-Case
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
20803.0803	1.58	38.99	40.57	74.00	33.43	PK	150	180	PASS
23819.582	3.56	39.77	43.33	74.00	30.67	PK	150	310	PASS
26939.4939	4.88	38.05	42.93	74.00	31.07	PK	150	80	PASS
20803.0803	1.58	27.07	28.65	54.00	25.35	AV	150	30	PASS
23819.582	3.56	27.28	30.84	54.00	23.16	AV	150	150	PASS
26939.4939	4.88	25.16	30.04	54.00	23.96	AV	150	110	PASS



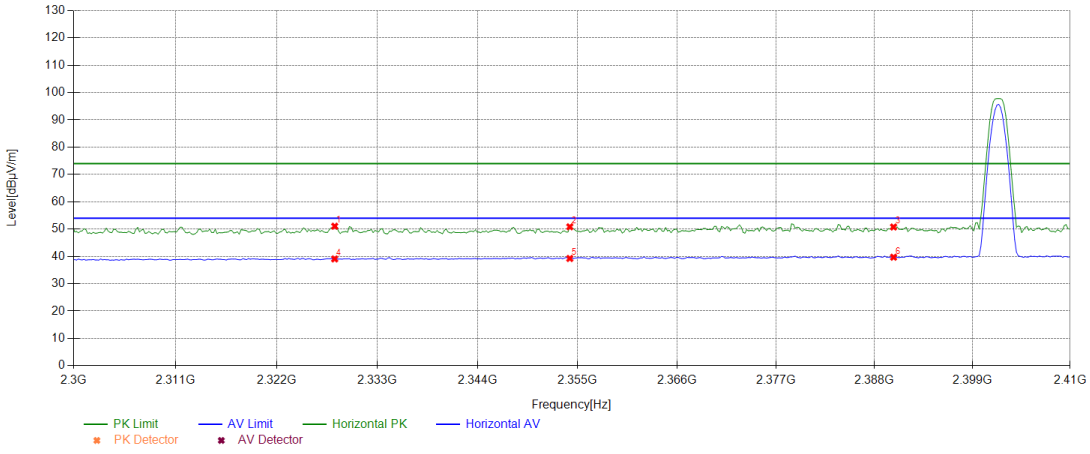
Band Edge： Bluetooth(LE_1M)

During the test, the Band Edge was performed in Bluetooth(LE_1M) all modes with all channels and all antennas. Bluetooth(LE_1M), Antenna 1 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

Test mode	Bluetooth(LE_1M)
Test channel	Lowest channel
polarization	Horizontal

Suspected List

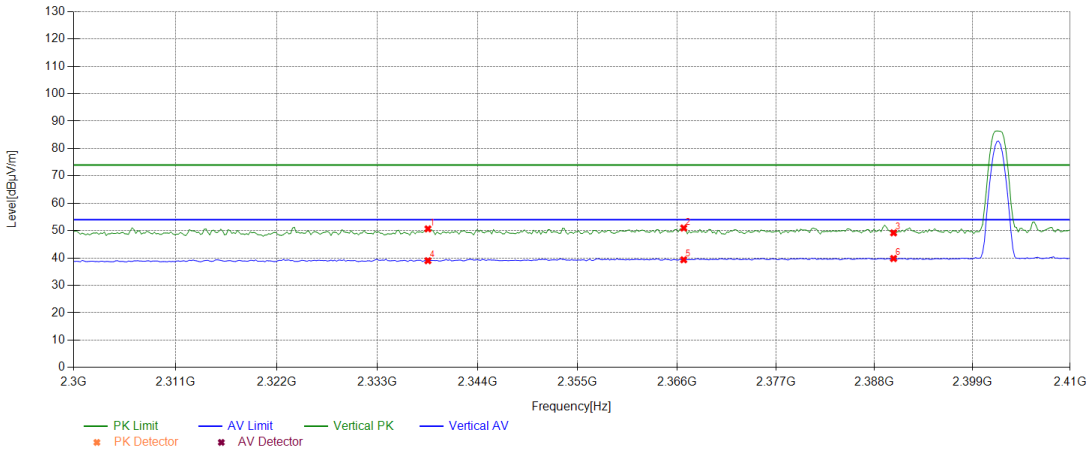
Frequency [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/ Fail
2328.3328	36.69	14.38	51.07	74.00	22.93	PK	150	260	PASS
2354.1354	36.92	13.92	50.84	74.00	23.16	PK	150	159	PASS
2390.139	37.24	13.53	50.77	74.00	23.23	PK	150	356	PASS
2328.3328	36.69	2.40	39.09	54.00	14.91	AV	150	88	PASS
2354.1354	36.92	2.35	39.27	54.00	14.73	AV	150	330	PASS
2390.139	37.24	2.49	39.73	54.00	14.27	AV	150	145	PASS



Test mode	Bluetooth(LE_1M)
Test channel	Lowest channel
polarization	Vertical

Suspected List

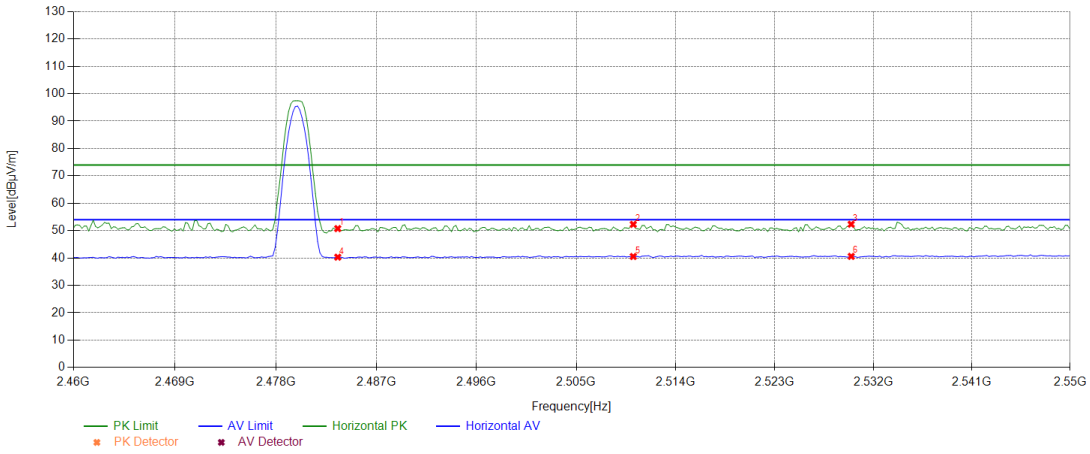
Frequency [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/ Fail
2338.5339	36.78	13.88	50.66	74.00	23.34	PK	150	94	PASS
2366.7367	37.03	13.93	50.96	74.00	23.04	PK	150	1	PASS
2390.139	37.24	11.95	49.19	74.00	24.81	PK	150	336	PASS
2338.5339	36.78	2.25	39.03	54.00	14.97	AV	150	123	PASS
2366.7367	37.03	2.34	39.37	54.00	14.63	AV	150	179	PASS
2390.139	37.24	2.57	39.81	54.00	14.19	AV	150	236	PASS



Test mode	Bluetooth(LE_1M)
Test channel	Highest channel
polarization	Horizontal

Suspected List

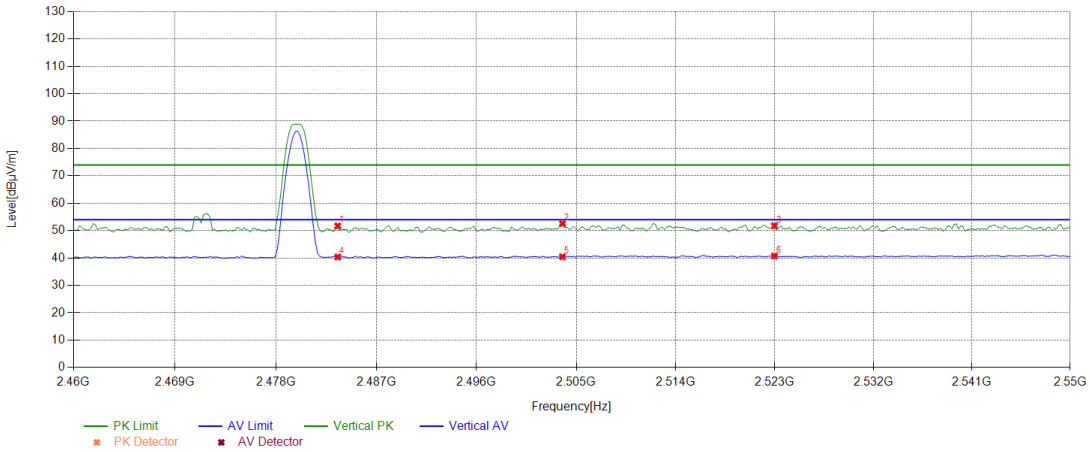
Frequency [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/ Fail
2483.5484	37.72	13.03	50.75	74.00	23.25	PK	150	336	PASS
2510.151	37.84	14.45	52.29	74.00	21.71	PK	150	149	PASS
2529.953	37.91	14.42	52.33	74.00	21.67	PK	150	1	PASS
2483.5484	37.72	2.59	40.31	54.00	13.69	AV	150	35	PASS
2510.151	37.84	2.71	40.55	54.00	13.45	AV	150	193	PASS
2529.953	37.91	2.70	40.61	54.00	13.39	AV	150	359	PASS



Test mode	Bluetooth(LE_1M)
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
2483.5484	37.72	14.02	51.74	74.00	22.26	PK	150	356	PASS
2503.7504	37.81	14.77	52.58	74.00	21.42	PK	150	29	PASS
2522.9523	37.89	13.89	51.78	74.00	22.22	PK	150	129	PASS
2483.5484	37.72	2.67	40.39	54.00	13.61	AV	150	172	PASS
2503.7504	37.81	2.65	40.46	54.00	13.54	AV	150	187	PASS
2522.9523	37.89	2.85	40.74	54.00	13.26	AV	150	187	PASS



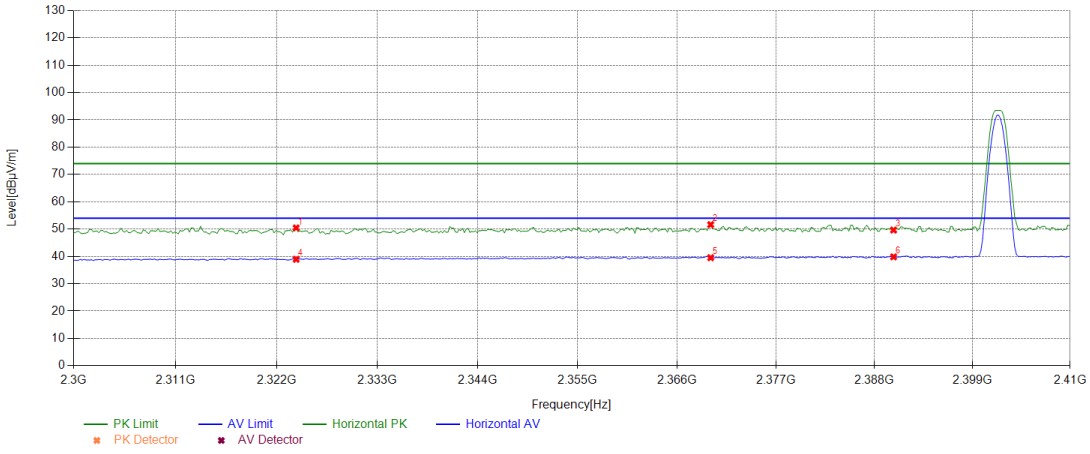
Band Edge： 2.4G Customization

During the test, the Band Edge was performed in 2.4G Customization all modes with all channels and all antennas. 2.4G Customization, Antenna 1 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

Test mode	2.4G Customization
Test channel	Lowest channel
polarization	Horizontal

Suspected List

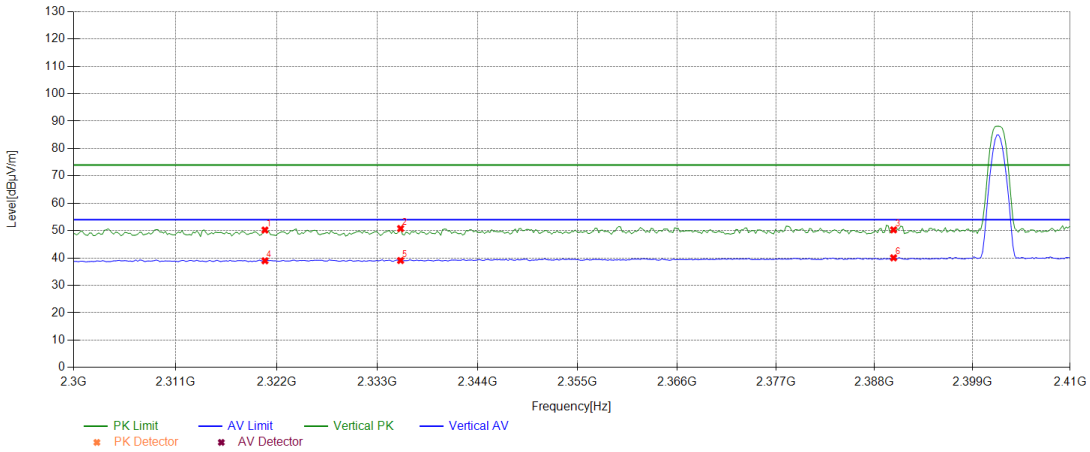
Frequency [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/ Fail
2324.1324	36.65	13.80	50.45	74.00	23.55	PK	150	87	PASS
2369.737	37.06	14.57	51.63	74.00	22.37	PK	150	216	PASS
2390.139	37.24	12.43	49.67	74.00	24.33	PK	150	230	PASS
2324.1324	36.65	2.32	38.97	54.00	15.03	AV	150	356	PASS
2369.737	37.06	2.48	39.54	54.00	14.46	AV	150	216	PASS
2390.139	37.24	2.60	39.84	54.00	14.16	AV	150	73	PASS



Test mode	2.4G Customization
Test channel	Lowest channel
polarization	Vertical

Suspected List

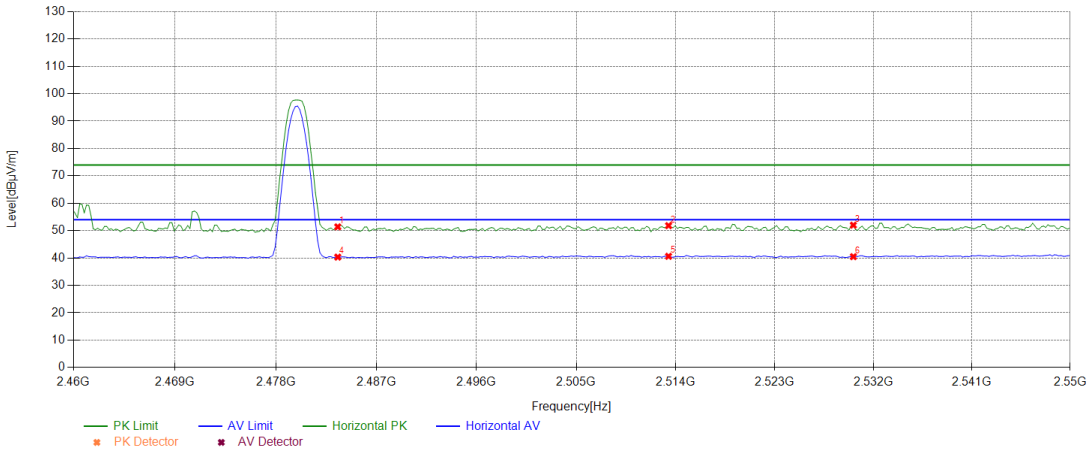
Frequency [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/ Fail
2320.7321	36.62	13.61	50.23	74.00	23.77	PK	150	131	PASS
2335.5336	36.76	14.02	50.78	74.00	23.22	PK	150	74	PASS
2390.139	37.24	13.05	50.29	74.00	23.71	PK	150	4	PASS
2320.7321	36.62	2.37	38.99	54.00	15.01	AV	150	360	PASS
2335.5336	36.76	2.34	39.10	54.00	14.90	AV	150	146	PASS
2390.139	37.24	2.83	40.07	54.00	13.93	AV	150	360	PASS



Test mode	2.4G Customization
Test channel	Highest channel
polarization	Horizontal

Suspected List

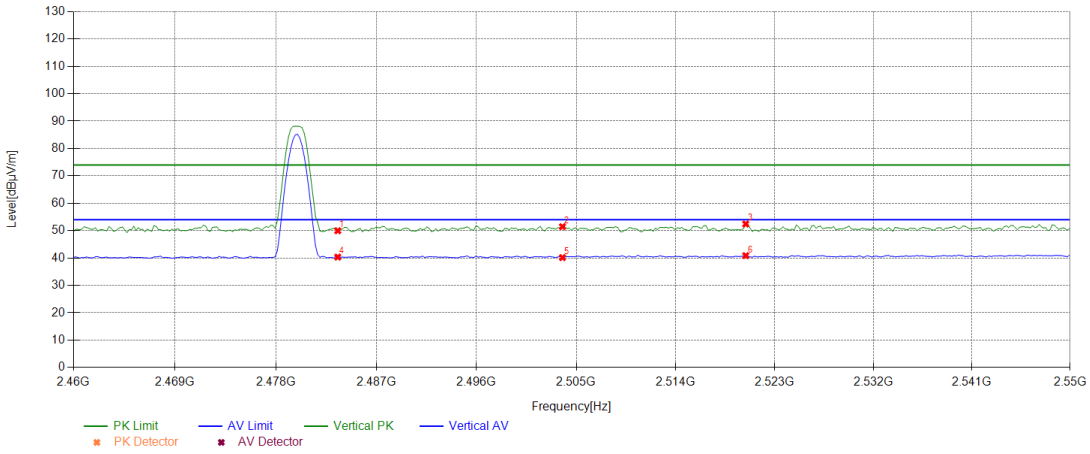
Frequency [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/ Fail
2483.5484	37.72	13.68	51.40	74.00	22.60	PK	150	204	PASS
2513.3513	37.85	13.98	51.83	74.00	22.17	PK	150	275	PASS
2530.153	37.91	14.09	52.00	74.00	22.00	PK	150	132	PASS
2483.5484	37.72	2.61	40.33	54.00	13.67	AV	150	103	PASS
2513.3513	37.85	2.79	40.64	54.00	13.36	AV	150	289	PASS
2530.153	37.91	2.59	40.50	54.00	13.50	AV	150	174	PASS



Test mode	2.4G Customization
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
2483.5484	37.72	12.25	49.97	74.00	24.03	PK	150	106	PASS
2503.7504	37.81	13.63	51.44	74.00	22.56	PK	150	162	PASS
2520.352	37.88	14.54	52.42	74.00	21.58	PK	150	106	PASS
2483.5484	37.72	2.63	40.35	54.00	13.65	AV	150	20	PASS
2503.7504	37.81	2.34	40.15	54.00	13.85	AV	150	162	PASS
2520.352	37.88	2.98	40.86	54.00	13.14	AV	150	176	PASS



5.3 Maximum conducted output power

Ambient condition:

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement:

The EUT was tested according to DTS test procedure of ANSI C63.10 for compliance to FCC 47CFR 15.247 requirements. The maximum conducted output power using ANSI C63.10 section 11.9.2.3 AVGPM Average power meter method.

1. Power meter and sensor's minimum video bandwidth is 50MHz, larger than 802.11n(40MHz) bandwidth;
2. Fast responding diode sensors respond immediately to changes in power level to reduce total test time.
3. Use average detector to test.

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 Maximum Average Conducted Output Power Level Method AVGSA-2 in KDB 558074 D01 /KDB662911 D01 for this test.

The conducted Power is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically.

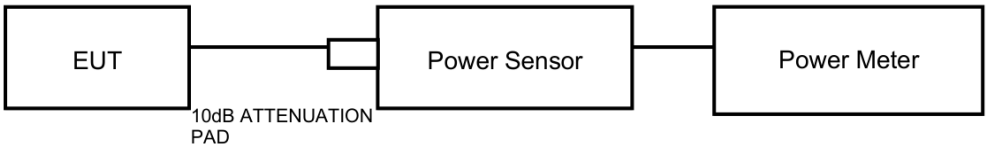
Limits:

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
BLE_1M	Ant1	2402	-0.66	≤30	PASS
	Ant1	2440	-1.02	≤30	PASS
	Ant1	2480	-1.69	≤30	PASS
2.4G Customization	Ant1	2402	-2.20	≤30	PASS
	Ant1	2440	-1.95	≤30	PASS
	Ant1	2480	-1.89	≤30	PASS

5.4 Minimum 6 dB Bandwidth

Ambient condition:

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement:

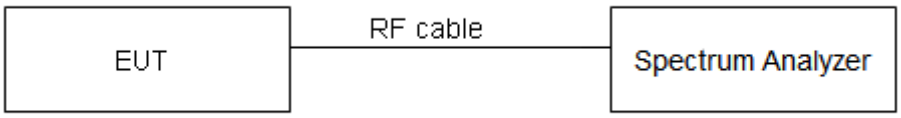
The EUT was connected to the spectrum analyzer through an external attenuator (20dB) and a known loss cable. RBW is set to 100 kHz; VBW is set to 300 kHz on spectrum analyzer.
Detector=Peak, Trace mode=Max hold.

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
BLE_1M	Ant1	2402	0.66	2401.70	2402.36	≥0.5	PASS
		2440	0.66	2439.70	2440.36	≥0.5	PASS
		2480	0.66	2479.70	2480.36	≥0.5	PASS
2.4G Customization	Ant1	2402	0.67	2401.70	2402.36	≥0.5	PASS
		2440	0.67	2439.70	2440.37	≥0.5	PASS
		2480	0.66	2479.70	2480.36	≥0.5	PASS

5.5 Occupied Channel Bandwidth

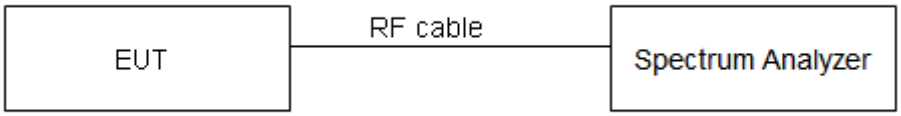
Ambient condition:

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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 50 kHz; VBW is set to 200 kHz 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]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.015	2401.521	2402.536	---	---
		2440	1.019	2439.517	2440.536	---	---
		2480	1.019	2479.517	2480.536	---	---
2.4G Customization	Ant1	2402	1.019	2401.521	2402.540	---	---
		2440	1.019	2439.521	2440.540	---	---
		2480	1.011	2479.529	2480.540	---	---

5.6 Band Edge Measurement

Ambient condition:

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

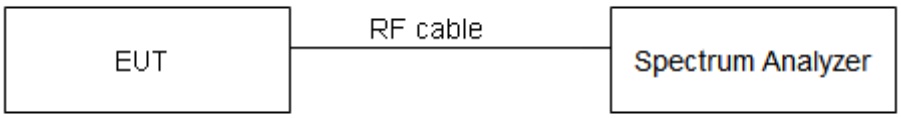
Method of Measurement:

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
BLE_1M	Ant1	Low	2402	-0.99	-49.67	≤-20.99	PASS
		High	2480	-1.90	-48.98	≤-21.9	PASS
2.4G Customization	Ant1	Low	2402	-2.46	-49.82	≤-22.46	PASS
		High	2480	-2.12	-48.48	≤-22.12	PASS

5.7 Maximum Power Spectral Density

Ambient condition:

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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.

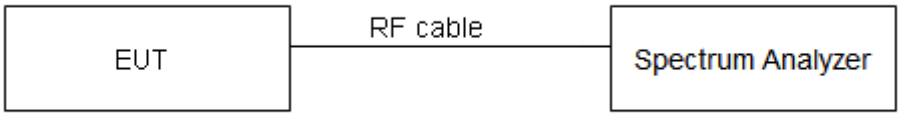
The conducted Power is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically.

Limits:

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

Maximum Power Spectral Density	≤ 8 dBm / 3kHz

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/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-9.29	≤8	PASS
		2440	-9.67	≤8	PASS
		2480	-10.71	≤8	PASS
2.4G Customization	Ant1	2402	-12.09	≤8	PASS
		2440	-11.42	≤8	PASS
		2480	-11.23	≤8	PASS

5.8 Spurious RF Conducted Emissions

Ambient condition:

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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
BLE_1M	Ant1	2402	Reference	-0.80	-0.80	---	PASS
			30~1000	-0.80	-61.08	≤-20.8	PASS
			1000~26500	-0.80	-49.63	≤-20.8	PASS
		2440	Reference	-1.38	-1.38	---	PASS
			30~1000	-1.38	-60.79	≤-21.38	PASS
			1000~26500	-1.38	-50.19	≤-21.38	PASS
		2480	Reference	-1.85	-1.85	---	PASS
			30~1000	-1.85	-60.24	≤-21.85	PASS
			1000~26500	-1.85	-49.96	≤-21.85	PASS
2.4G Customization	Ant1	2402	Reference	-2.35	-2.35	---	PASS
			30~1000	-2.35	-61.3	≤-22.35	PASS
			1000~26500	-2.35	-45.05	≤-22.35	PASS
		2440	Reference	-2.17	-2.17	---	PASS
			30~1000	-2.17	-60.58	≤-22.17	PASS
			1000~26500	-2.17	-38.13	≤-22.17	PASS
		2480	Reference	-2.07	-2.07	---	PASS
			30~1000	-2.07	-60.77	≤-22.07	PASS
			1000~26500	-2.07	-41.88	≤-22.07	PASS

6. Appendix X

Test Equipment	Type/Mode	SERIAL NO.	Equipment No.	Manufacturer	Cal. Due
Spectrum Analyzer	FSV40	101580	DZ-000238-3	R&S	2024/04/22
Comprehensive Test Instrument	CMW270	100304	DZ-000240-1	R&S	2023/12/06
Analog Signal Generator	SMB100A	181858	DZ-000238-2	R&S	2024/05/29
Vector Signal Generator	SGT100A	111661	DZ-000238-1	R&S	2024/05/29
RF Radio Frequency Switch	JS0806-2	19H9080187	DZ-000241	Tonscend	2024/05/29
Programmable DC Power Supply	E3644A	MY58036222	DZ-000178	KEYSIGHT	2024/04/12
3m Semi-Anechoic Chamber	FACT-4	ST08035	WKNA-0024	ETS	2024/12/12
5m Semi-Anechoic Chamber	SAC-5	SAC-5-2.0	EM-000557	COMTEST	2024/11/02
Spectrum Analyzer	N9010B	MY57470323	DZ-000174	KEYSIGHT	2024/02/22
EMI Test Receiver	N9038A-508	MY532290079	EM-000397	Agilent	2024/02/22
EMI Test Receiver	ESR7	102235	VGDY-0956	R&S	2024/02/22
loop antenna	HLA 6121	540046	EM-000546	TESEQ	2024/06/05
Broadband Antenna	VULB 9168	01537	EM-000736-1	SCHWARZBECK	2024/04/24
Broadband Antenna	VULB 9163	9163-530	EM-000342	SCHWARZBECK	2024/06/10
Waveguide Horn Antenna	HF906	360306/008	EM-000093	R&S	2024/02/24
Waveguide Horn Antenna	BBHA9170	00949	EM-000383	SCHWARZBECK	2023/08/26
Bandstop Filters	SW-BSF-2400-100-7-A1	/	EM-000495	/	2023/08/30
5G Bandstop Filters	WRCJV12-4900-5100-5900-6100-50EE	1	DZ-000186	WI	2023/12/06
Preamplifier	BBV 9721	9721-050	DZ-000209-1	SCHWARZBECK	2024/06/04
EMI Test Receiver	ESR3	102394	VGDY-0705	R&S	2024/04/22
LISN	NSLK 8127	8127644	VGDY-0150	SCHWARZBECK	2023/09/03
Plus Limiter（#2）	VTSD 9561	9561-F017	VGDY-0152	SCHWARZBECK	2024/09/03
Shielding Room(#2)	GP1A	001	WKNF-0006	LEINING	2024/08/07
Temperature and humidity meter	MHO-C201	/	DZ-000249-2	Seconds test	2023/09/23

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".

The test data and test results given in this test report should only be used for purposes of scientific research, teaching and internal quality control when the CMA symbol is not presented.

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