



Test Report No.:
FCC2025-0035-RF2

TEST REPORT

FCC ID : 2BQIW-PM220
Applicant : Zhongshan Polono Electronic Technology Co., Ltd.
Product Name : Label Maker
Model No. : PM220

CVC Testing Technology Co., Ltd.

Product Name	Label Maker	Trade Mark	---			
Type/Model	PM220	Sample Status	---			
Applicant	Zhongshan Polono Electronic Technology Co., Ltd.					
Applicant Address	No. 132, Tanlong North Road, Tanzhou Town, Zhongshan City, 4th and 5th floors, Building 2, 4th and 5th floors, Building 3					
Manufacturer	Zhongshan Polono Electronic Technology Co., Ltd.					
Manufacturer Address	No. 132, Tanlong North Road, Tanzhou Town, Zhongshan City, 4th and 5th floors, Building 2, 4th and 5th floors, Building 3					
Factory	Zhongshan Polono Electronic Technology Co., Ltd.					
Factory Address	No. 132, Tanlong North Road, Tanzhou Town, Zhongshan City, 4th and 5th floors, Building 2, 4th and 5th floors, Building 3					
Sample Identification	1-1	Test Item	See page 07			
Tested According To	FCC CFR47 Part 15C Radio Frequency Devices ANSI C63.10-2020+Cor1-2023 KDB 558074 D01 15.247 Meas Guidance v05r02					
Receiving Date	Jul.13,2025	Completing Date	Jul.16,2025~Aug.15,2025			
Test conclusion	<p>The equipment under test was found to comply with the requirements of the standards applied.</p> <p>Final Verdict: Pass.</p> <p>Seal of CVC</p> <p>Date of issue: Sep.05,2025</p>					
Abbreviations: / Pass= passed Fail = failed N/A= not applicable						
This test report relates only to the EUT, and shall not be reproduced except in full, without written approval of CVC.						

Approved by:

Chen Huawen



Reviewed by:

Xu Zhenfei



Tested by:

Li Yueao



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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
FCC2025-0035-RF2	Original release	Sep.05,2025

1. General Product Information

1.1 General information

Product Name	Label Maker
Model No.	PM220
Additional model	N/A
Power Supply	DC 5.0V
Software version	0.2.5
Hardware version	1.0.1
specific power settings	Bluetooth(DH5): Default
Antenna Type	PCB Antenna
Antenna Gain	Bluetooth: -0.93 dBi (provided by client)
Beamforming gain	Unsupported (provided by client)
Frequency Range	2402MHz~2480MHz
Channel Number	79
Type of Modulation	GFSK for BT-DH5
Hopping Channel Type:	Adaptive Frequency Hopping systems
Max. Conducted Power	0.19dBm
Operate Temp.Range	+5°C~+45°C

Note:

1. The information of the EUT is declared by the manufacturer.
2. The laboratory is not responsible for the product technical specification provided by the client.
3. The product models of this application are: PM220. All the tests carried out on model PM220.
4. EUT photo refer to report (Report NO.:FCC2025-0027-EUT).
5. The EUT have SISO function, provides 1 completed transmitter and 1 receiver.

2. Test Sites

2.1 Test Facilities

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

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

Telephone : +86-20-32293888

Fax : +86-20-32293889

FCC(Test firm designation number: CN1282)

IC(Test firm CAB identifier number: CN0103)

CNAS(Test firm designation number: L0095)

2.2 Description of Non-standard Method and Deviations

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

2.3 List of Test and Measurement Instruments

Refer to **Appendix X**.

3. Test Configuration

3.1 Test Mode

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

Test Mode	Antenna Delivery	Test Channel
DH1/DH3/DH5	1TX / 1RX	0,39,78,hop

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 configuration for confirming worst case. Data rate and channel below means worst-case rate of each test item.

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

Test Items	Test Modes	Test Channels
Conducted Emissions	DH5	0
Radiated Emissions	DH5	0
Peak Power Output -Conducted	DH5	0,39,78
20dB Emission Bandwidth	DH5	0,39,78
Occupied Channel Bandwidth	DH5	0,39,78
Frequency Separation	DH5	hop
Time of Occupancy (Dwell Time)	DH1/DH3/DH5	hop
Band Edge Compliance	DH5	0,78
Number of Hopping Frequency	DH5	hop
Spurious RF Conducted Emissions	DH5	0,39,78

3.2 Duty cycle

Appendix I of BT_ diagram

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	/
Peak Power Output -Conducted	15.247(b)(1)	PASS	Appendix C of BT_diagram
20dB Emission Bandwidth	15.247(a)(1)	PASS	Appendix A of BT_diagram
Occupied Channel Bandwidth	15.247(a)(1)	PASS	Appendix B of BT_diagram
Frequency Separation	15.247(a)(1)	PASS	Appendix D of BT_diagram
Time of Occupancy (Dwell Time)	15.247(a)(1)(iii)	PASS	Appendix E of BT_diagram
Band Edge Compliance	15.247(d)	PASS	Appendix G of BT_diagram
Number of Hopping Frequency	15.247(a)(1)(iii)	PASS	Appendix F of BT_diagram
Spurious RF Conducted Emissions	15.247(d)	PASS	Appendix H of BT_diagram
Antenna Requirement	15.203	PASS	See note 1

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

5. Measurement procedure

5.1 Conducted Emission

Ambient condition:

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

Method of Measurement:

The EUT was setup according to ANSI C63.10-2020+Cor1-2023 for compliance to FCC 47CFR 15.207 requirements. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs) Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.

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

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

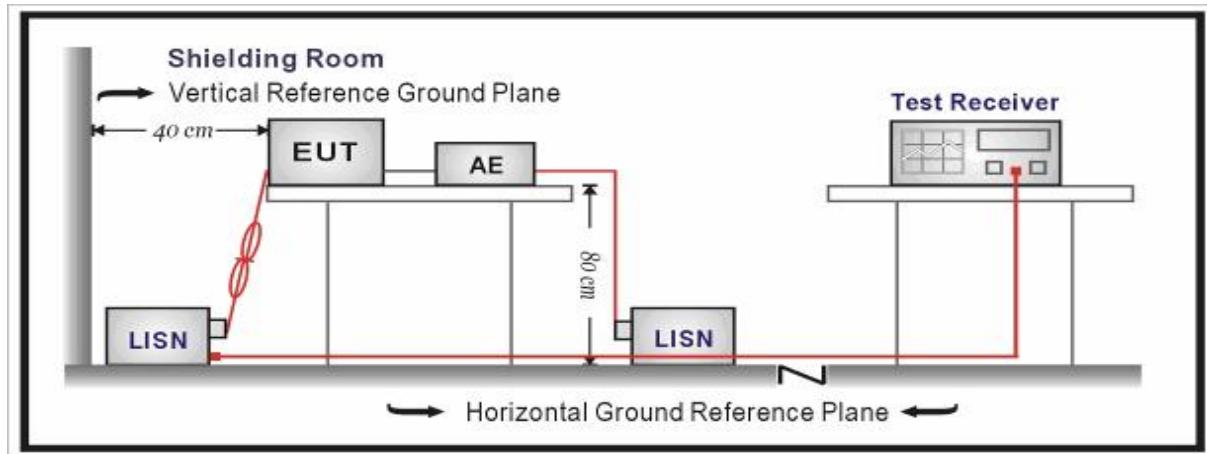
Limits:

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

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

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

Test Setup:



Measurement Data

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

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

Notes:

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

Measurement Uncertainty:

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

Test Results:

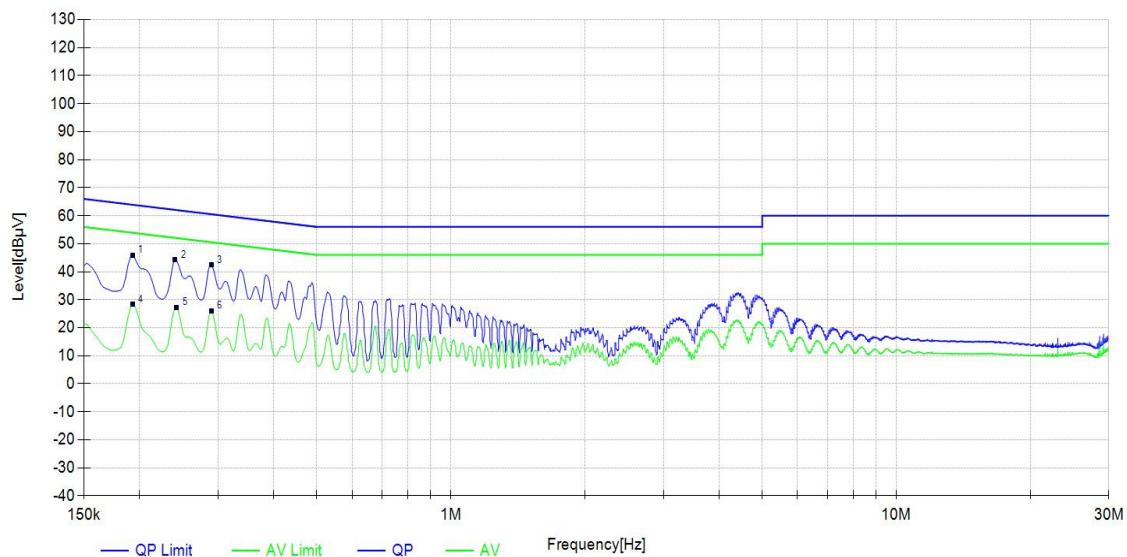
During the test, the Conducted Emission from 150kHz to 30MHz was performed in all modes with all channels, and all antennas.BT GFSK Channel 0, antenna 1 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

Radiates Emission	150k~30MHz						
Power Line	L						
Test channel	Worst-Case						
Suspected List							
Freq. [MHz]	Factor [dB]	Reading [dB μ V]	Level [dB μ V]	Limit [dB μ V]	Margin [dB]	Detector	Pass/Fail
0.19275	10.17	35.52	45.69	63.92	18.23	QP	PASS
0.24	10.18	33.74	43.92	62.10	18.18	QP	PASS
0.2895	10.19	31.97	42.16	60.54	18.38	QP	PASS
0.19275	10.17	18.61	28.78	53.92	25.14	AV	PASS
0.24225	10.18	17.89	28.07	52.02	23.95	AV	PASS
0.2895	10.19	16.49	26.68	50.54	23.86	AV	PASS

Radiates Emission	150k~30MHz
Power Line	N
Test channel	Worst-Case

Suspected List

Freq. [MHz]	Factor [dB]	Reading [dB μ V]	Level [dB μ V]	Limit [dB μ V]	Margin [dB]	Detector	Pass/Fail
0.19275	10.17	35.64	45.81	63.92	18.11	QP	PASS
0.24	10.18	34.04	44.22	62.10	17.88	QP	PASS
0.2895	10.19	32.19	42.38	60.54	18.16	QP	PASS
0.19275	10.17	18.18	28.35	53.92	25.57	AV	PASS
0.24225	10.18	17.13	27.31	52.02	24.71	AV	PASS
0.2895	10.19	15.88	26.07	50.54	24.47	AV	PASS



5.2 Radiated Emission

Ambient condition:

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

Method of Measurement:

The EUT was setup and tested according to ANSI C63.10-2020+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 (μ V/m)	Limit (dB μ V/m @3m)	Remark
0.009MHz-0.490MHz	2400/F(kHz)@300m	20lg(24000000/F(kHz))	Quasi-peak Level
0.490MHz~1.705MHz	24000/F(kHz)@30m	20lg(2400000/F(kHz))	Quasi-peak Level
1.705MHz~30.0MHz	30@30m	69.54	Quasi-peak Level
30MHz-88MHz	100@3m	40.0	Quasi-peak Level
88MHz-216MHz	150@3m	43.5	Quasi-peak Level
216MHz-960MHz	200@3m	46.0	Quasi-peak Level
960MHz-1GHz	500@3m	54.0	Quasi-peak Level

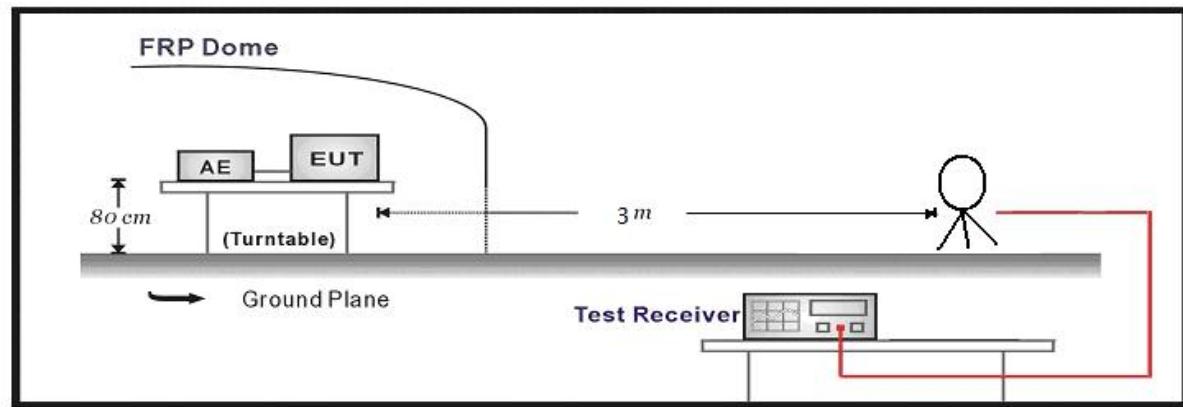
Above 1GHz	500@3m	54.0	Average Level
	5000@3m	74.0	Peak Level

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

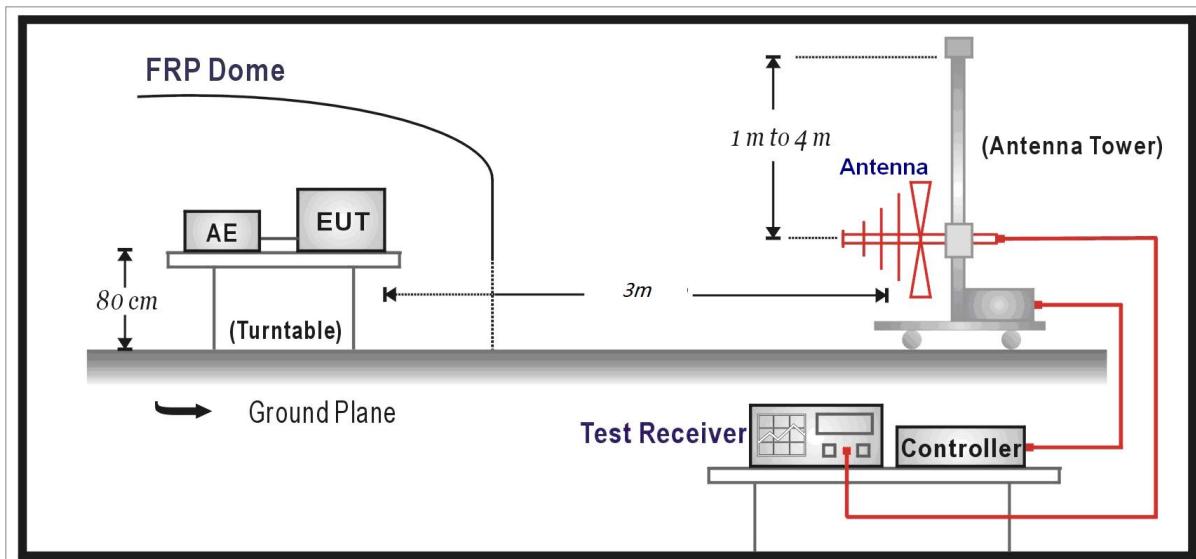
MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218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

Test Setup:

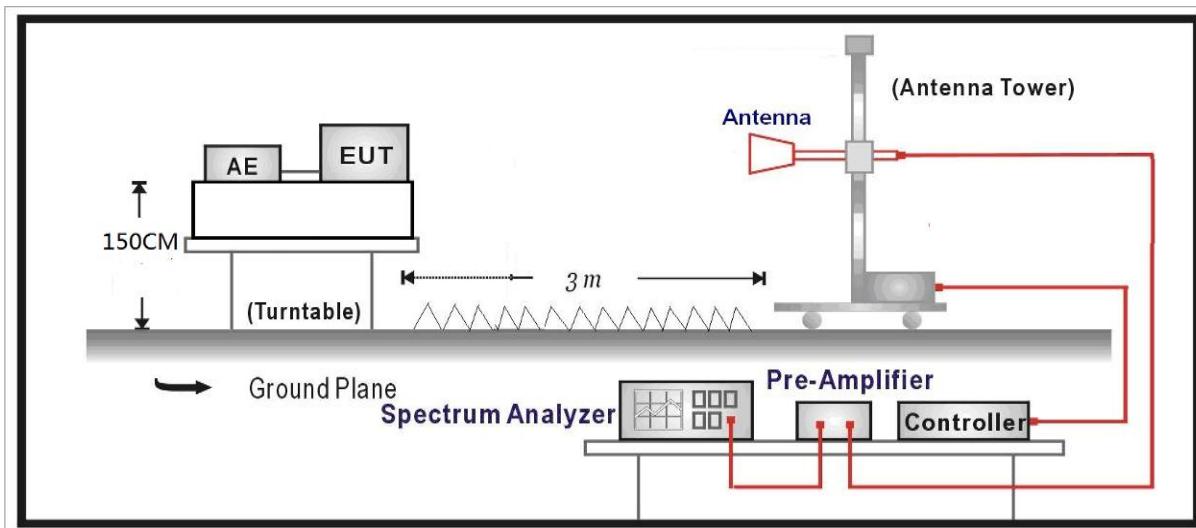
Below 30MHz Test Setup:



Below 1GHz Test Setup:



Above 1GHz Test Setup:



Measurement Data:

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

Final Level =Reading - Factor

Factor = Preamplifier Factor – Antenna Factor–Cable Loss

Measurement Uncertainty:

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

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

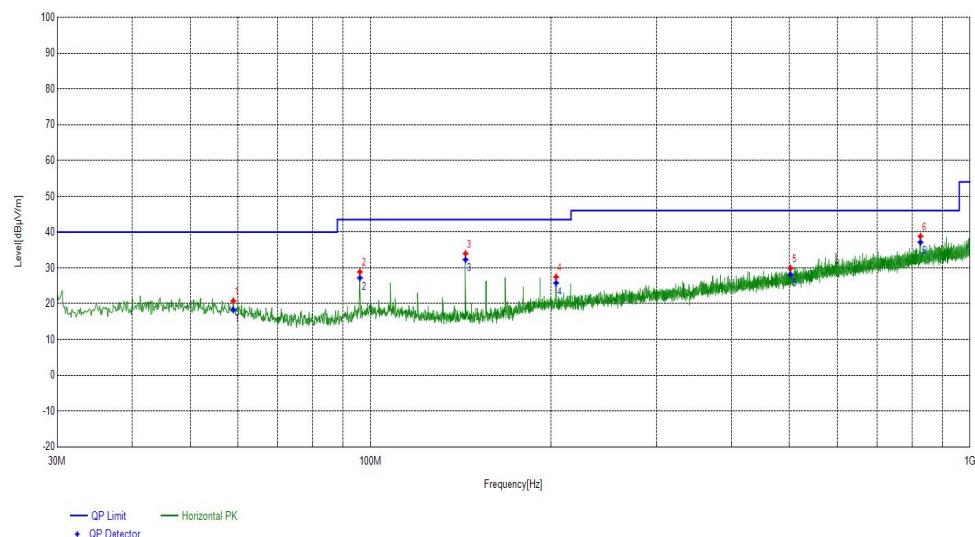
Test Results:

During the test, the Radiates Emission from 9kHz to 1GHz was performed in all modes with all channels and all antennas. BT GFSK Channel 0, antenna 1 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

Radiates Emission	9k~1G								
Test channel	Worst-Case								
Polarity	Horizontal								
Suspected List									
Frequency [MHz]	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/Fail
59.01	12.27	8.46	20.73	40.00	19.27	PK	100	240	PASS
95.97	11.06	17.81	28.87	43.50	14.63	PK	100	0	PASS
143.99	9.50	24.50	34.00	43.50	9.50	PK	100	280	PASS
203.94	13.00	14.46	27.46	43.50	16.04	PK	100	320	PASS
501.76	19.76	10.08	29.84	46.00	16.16	PK	100	270	PASS
826.74	24.92	13.90	38.82	46.00	7.18	PK	100	170	PASS

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

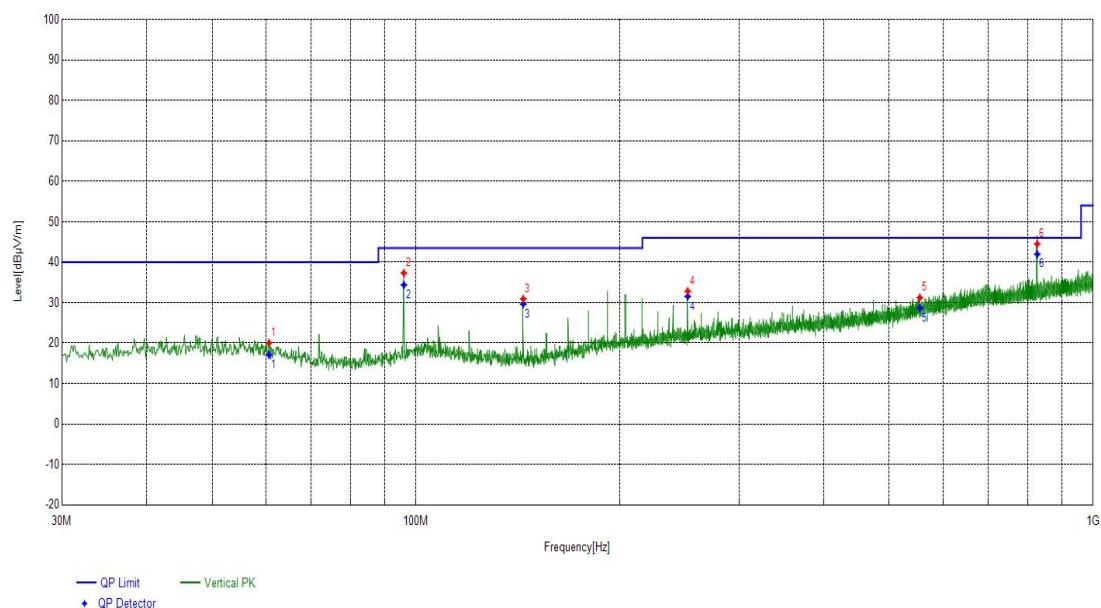
Final Data List							
Frequency [MHz]	Factor [dB]	QP Value [dB μ V/m]	QP Limit [dB μ V/m]	QP Margin [dB]	Height [cm]	Angle [°]	Pass/Fail
59.005901	12.27	18.34	40.00	21.66	339	351	PASS
95.966597	11.06	27.20	43.50	16.30	285	317	PASS
143.986399	9.50	32.33	43.50	11.17	319	180	PASS
203.938394	13.00	25.79	43.50	17.71	98	15	PASS
501.758176	19.76	28.17	46.00	17.83	312	230	PASS
826.740674	24.92	37.15	46.00	8.85	121	270	PASS



Radiates Emission	9k~1G								
Test channel	Worst-Case								
Polarity	Vertical								
Suspected List									
Frequency [MHz]	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/Fail
60.66	12.01	8.01	20.02	40.00	19.98	PK	100	60	PASS
95.97	11.06	26.25	37.31	43.50	6.19	PK	100	150	PASS
143.99	9.50	21.41	30.91	43.50	12.59	PK	100	130	PASS
251.96	14.26	18.54	32.80	46.00	13.20	PK	100	310	PASS
554.73	21.03	10.17	31.20	46.00	14.80	PK	100	50	PASS
826.93	24.92	19.58	44.50	46.00	1.50	PK	100	30	PASS

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

Final Data List							
Frequency [MHz]	Factor [dB]	QP Value [dB μ V/m]	QP Limit [dB μ V/m]	QP Margin [dB]	Height [cm]	Angle [°]	Pass/Fail
60.655066	12.01	17.08	40.00	22.92	275	292	PASS
95.966597	11.06	34.37	43.50	9.13	359	267	PASS
143.986399	9.50	29.64	43.50	13.86	127	171	PASS
251.958196	14.26	31.53	46.00	14.47	238	218	PASS
554.725473	21.03	28.65	46.00	17.35	95	125	PASS
826.934694	24.92	41.95	46.00	4.05	316	239	PASS



During the test, the Radiates Emission from 1GHz to 40GHz was performed in all modes with all channels and all antennas. BT GFSK , Highest, medium, lowest channels, antenna 1 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

Radiates Emission		Above 1G							
Test channel		Lowest							
polarization		Horizontal							
Suspected List									
Frequency [MHz]	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/ Fail
3306.06	-1.51	54.79	53.28	74.00	20.72	PK	150	287	PASS
7993.00	7.49	34.92	42.41	74.00	31.59	PK	150	250	PASS
14334.77	16.65	33.64	50.29	74.00	23.71	PK	150	72	PASS
3307.56	-1.50	47.22	45.72	54.00	8.28	AV	150	293	PASS
8164.03	7.74	23.05	30.79	54.00	23.21	AV	150	355	PASS
14682.84	16.57	21.64	38.21	54.00	15.79	AV	150	42	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 [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/ Fail
3202.54	-1.70	58.47	56.77	74.00	17.23	PK	150	290	PASS
7004.30	6.72	34.11	40.83	74.00	33.17	PK	150	24	PASS
11722.74	9.62	34.00	43.62	74.00	30.38	PK	150	198	PASS
3204.04	-1.70	54.01	52.31	54.00	1.69	AV	150	290	PASS
6867.77	6.36	21.89	28.25	54.00	25.75	AV	150	24	PASS
11644.73	9.65	22.84	32.49	54.00	21.51	AV	150	284	PASS

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

Radiates Emission	Above 1G								
Test channel	Medium								
polarization	Horizontal								

Suspected List

Frequency [MHz]	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/ Fail
3306.06	-1.51	54.95	53.44	74.00	20.56	PK	150	284	PASS
7991.50	7.49	34.31	41.80	74.00	32.20	PK	150	266	PASS
14375.28	16.76	33.26	50.02	74.00	23.98	PK	150	144	PASS
3307.56	-1.50	47.27	45.77	54.00	8.23	AV	150	290	PASS
7863.97	7.39	23.13	30.52	54.00	23.48	AV	150	284	PASS
14384.28	16.78	22.30	39.08	54.00	14.92	AV	150	235	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 [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/ Fail
4132.73	-0.69	47.42	46.73	74.00	27.27	PK	150	246	PASS
6201.64	4.95	34.35	39.30	74.00	34.70	PK	150	61	PASS
10465.49	10.50	32.59	43.09	74.00	30.91	PK	150	5	PASS
4134.23	-0.69	38.99	38.30	54.00	15.70	AV	150	85	PASS
6138.63	4.88	22.99	27.87	54.00	26.13	AV	150	48	PASS
10108.42	10.28	21.32	31.60	54.00	22.40	AV	150	110	PASS

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

Radiates Emission	Above 1G								
Test channel	Highest								
polarization	Horizontal								

Suspected List

Frequency [MHz]	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/ Fail
3202.54	-1.70	55.47	53.77	74.00	20.23	PK	150	284	PASS
4003.70	-0.57	50.09	49.52	74.00	24.48	PK	150	67	PASS
9745.35	10.09	32.03	42.12	74.00	31.88	PK	150	67	PASS
3204.04	-1.70	50.57	48.87	54.00	5.13	AV	150	284	PASS
4005.20	-0.57	44.54	43.97	54.00	10.03	AV	150	85	PASS
9640.33	10.06	21.46	31.52	54.00	22.48	AV	150	110	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 [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/ Fail
3202.54	-1.70	53.66	51.96	74.00	22.04	PK	150	50	PASS
5604.52	3.11	39.10	42.21	74.00	31.79	PK	150	310	PASS
10723.54	10.36	32.07	42.43	74.00	31.57	PK	150	120	PASS
3204.04	-1.70	48.89	47.19	54.00	6.81	AV	150	80	PASS
5606.02	3.12	32.29	35.41	54.00	18.59	AV	150	210	PASS
10746.05	10.35	21.46	31.81	54.00	22.19	AV	150	100	PASS

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

Band Edge:

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

BT GFSK , Highest and lowest channels, antenna 1 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

Test mode	GFSK								
Test channel	Lowest								
polarization	Horizontal								

Suspected List

Frequency [MHz]	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
2261.93	29.51	10.48	39.99	74.00	34.01	PK	150	12	PASS
2390.14	29.91	9.18	39.09	74.00	34.91	PK	150	172	PASS
2401.94	29.93	43.51	73.44	---	---	PK	150	165	---
2288.13	29.60	2.15	31.75	54.00	22.25	AV	150	293	PASS
2390.14	29.91	1.95	31.86	54.00	22.14	AV	150	162	PASS
2401.94	29.93	43.08	73.01	---	---	AV	150	175	---

Test mode	GFSK								
Test channel	Lowest								
polarization	Vertical								

Suspected List

Frequency [MHz]	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
2157.92	29.32	12.66	41.98	74.00	32.02	PK	150	210	PASS
2390.14	29.91	7.89	37.80	74.00	36.20	PK	150	190	PASS
2402.14	29.93	40.33	70.26	---	---	PK	150	230	---
2190.92	29.32	0.60	29.92	54.00	24.08	AV	150	60	PASS
2390.14	29.91	0.93	30.84	54.00	23.16	AV	150	190	PASS
2402.14	29.93	39.91	69.84	---	---	AV	150	110	---

Test mode	GFSK								
Test channel	Highest								
polarization	Horizontal								

Suspected List

Frequency [MHz]	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
2480.15	29.75	53.09	82.84	---	---	PK	150	346	---
2483.55	29.74	9.56	39.30	74.00	34.70	PK	150	179	PASS
2659.37	29.70	14.64	44.34	74.00	29.66	PK	150	346	PASS
2480.15	29.75	52.79	82.54	---	---	AV	150	346	---
2483.55	29.74	2.36	32.10	54.00	21.90	AV	150	329	PASS
2655.97	29.69	6.79	36.48	54.00	17.52	AV	150	296	PASS

Test mode	GFSK								
Test channel	Highest								
polarization	Vertical								

Suspected List

Frequency [MHz]	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detect or	Height [cm]	Angle deg	Pass/ Fail
2480.15	29.75	49.24	78.99	---	---	PK	150	269	---
2483.55	29.74	8.83	38.57	74.00	35.43	PK	150	262	PASS
2569.36	29.53	11.91	41.44	74.00	32.56	PK	150	122	PASS
2480.15	29.75	48.83	78.58	---	---	AV	150	280	---
2483.55	29.74	2.55	32.29	54.00	21.71	AV	150	262	PASS
2554.76	29.57	4.22	33.79	54.00	20.21	AV	150	94	PASS

5.3 Peak Power Output -Conducted

Ambient condition:

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

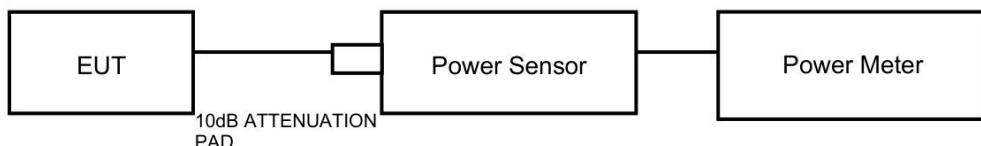
Method of Measurement:

During the process of the testing, The EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss. The EUT is controlled by the Bluetooth test set to ensure max power transmission with proper modulation. The peak detector is used.

Limits:

Rule Part 15.247 (b) (1) specifies that " For frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts."

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.

5.4 20dB Emission Bandwidth

Ambient condition:

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

Method of Measurement:

The EUT was connected to the spectrum analyzer through an external attenuator (20dB) and a known loss cable. RBW is set to 20 kHz; VBW is set to 100 kHz on spectrum analyzer.

Detector=Peak, Trace mode=Max hold.

Limits:

No specific occupied bandwidth requirements in part 15.247(a) (1).

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.

5.5 Occupied Channel Bandwidth

Ambient condition:

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

Method of Measurement:

The EUT was connected to the spectrum analyzer through an external attenuator (20dB) and a known loss cable. RBW is set to 20 kHz; VBW is set to 100 kHz on spectrum analyzer.

Detector=Peak, Trace mode=Max hold.

Limits:

No specific occupied bandwidth requirements in part 15.247(a) (1).

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.

5.6 Frequency Separation

Ambient condition:

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

Method of Measurement:

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

Limits:

Rule Part 15.247(a)(1) specifies that "Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW."

Note: The value of two-thirds of 20 dB bandwidth is always greater than 25 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

5.7 Time of Occupancy (Dwell Time)

Ambient condition:

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

Method of Measurement:

The EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss. RBW is set to 1MHz and VBW is set to 3MHz on spectrum analyzer. The dwell time is calculated by:
Dwell time = time slot length * hop rate * 0.4s with:

The selected EUT Packet type uses a slot type of 5-Tx&1-Rx and a hopping rate of 1600(ch*hop/s) for all channels. So the final hopping rate for all channel is $1600/6=266.67$ (ch*hop/s)

Limits:

Rule Part15.247(a) specifies that " Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed."

Dwell time	$\leq 400\text{ms}$
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Test Setup:



Measurement Uncertainty:

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

Requirements	Uncertainty					
	Dwell Time	DH5	U=0.70ms	2DH5	U=0.70ms	3DH5

5.8 Band Edge Measurement

Ambient condition:

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

Method of Measurement:

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

Limits:

Rule Part 15.247(d) specifies that “In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

Test Setup:



Measurement Uncertainty:

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

5.9 Number of hopping Frequency

Ambient condition:

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

Method of Measurement:

The EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss. RBW is set to 100KHz and VBW is set to 300KHz on spectrum analyzer. Set EUT on Hopping on mode.

Limits:

Rule Part 15.247(a) (1) (iii) specifies that" Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels."

Limits	≥ 15 channels

Test Setup:



Measurement Uncertainty:

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

5.10 Spurious RF Conducted Emissions

Ambient condition:

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

Method of Measurement:

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

Limits:

Rule Part 15.247(d) pacifies that “In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

Test Setup:



Measurement Uncertainty:

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

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

6. Appendix X

Test Equipment	Type/Mode	SERIAL NO.	Equipment No.	Manufacturer	Cal. Due
Communication Shielded Room 2	4m*3m*3m	CRTDSWKS4 4301	DZ-000244-2	CRT	2027/04/22
Spectrum Analyzer	FSV40	101580	DZ-000238-3	R&S	2026/03/27
RF Radio Frequency Switch	JS0806-2	19H9080187	DZ-000241	Tonscend	2026/03/27
Programmable DC Power Supply	E3644A	MY58036222	DZ-000178	KEYSIGHT	2026/04/10
5m Semi-Anechoic Chamber	SAC-5	SAC-5-2.0	EM-000557	COMTEST	2027/02/01
Spectrum Analyzer	N9010B	MY57470323	DZ-000174	KEYSIGHT	2026/01/01
EMI Test Receiver	N9038A-508	MY532290079	EM-000397	Agilent	2025/12/26
EMI Test Receiver	ESR7	102235	EM-000574	R&S	2026/01/05
loop antenna	HLA 6121	540046	EM-000546	TESEQ	2026/06/02
Broadband Antenna	VULB 9163	9163-530	EM-000342	SCHWARZBECK	2026/06/02
Waveguide Horn Antenna	HF906	360306/008	EM-000093	R&S	2025/12/26
Waveguide Horn Antenna	BBHA9170	00949	DZ-000209-2	SCHWARZBECK	2026/08/02
Preamplifier	BBV 9721	9721-050	DZ-000209-1	SCHWARZBECK	2026/06/02
2.4GHz band stop	ZBSF6-C2400-2483.5-543	1232723	DZ-000399-1	Tonscend	2026/06/10
5G Bandstop Filters	WRCJV12-4900-5100-5900-6100-50EE	1	DZ-000186	WI	2025/12/02
Temperature and humidity meter	UT330THC	C231446122	DZ-000249-2	UNI-T	2026/07/24
Temperature and humidity meter	UT330THC	C231446087	DZ-000249-5	UNI-T	2026/07/24

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

Description Of Support Units				
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.				
Description	Brand	Model No.	Serial Number	Supplied by
laptop	DELL	G5 5500	379P463	Lab
SWITCHING ADAPTER	HUIZHOU FUJIA APPLIANCE	FJ-SW2050501000U	/	Lab

————— No Body Text Below —————

Important

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

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

Post Code: 510663 Tel: 020-32293888

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