

FCC TEST REPORT

FCC ID:2A6IU-TX05-I3-QI2

Report No..... : ZHT-241111128W02

Product..... : 3 In 1 Magnetic Wireless

Trademark..... : /

Model(s)..... : TX05-I3-QI2
TX05-I3, TX05-i2, TX05-I3-Q, TX05-I2-Q

Model difference..... : TX05-I3-QI2 is tested model, other models are derivative models .The models are identical in circuit, only different on the model names. So the test data of TX05-I3-QI2 can represent the remaining models.

Applicant..... : Shenzhen Gaoyi Electronic Co.,Ltd

Address..... : Room 701 7th Floor, Building F, Huafeng Industrial Zone, Hangcheng Road Xixiang Town, Bao An District, Shenzhen, China

Manufacturer..... : Dongguan Gaoyi Electronic Co.,Ltd

Address..... : No.4, Changsheng Street, Tianmei Village, Huangjiang Town, DongguanCity, Guangdong Province, China

Prepared by..... : Guangdong Zhonghan Testing Technology Co., Ltd.

Address..... : Room 104, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Date of Receipt..... : Nov. 11, 2024

Date of Test(s)..... : Nov. 11, 2024 to Nov. 20, 2024

Date of Issue..... : Dec. 7, 2024

Test Standard(s)..... : FCC CFR Title 47 Part 15 Subpart C

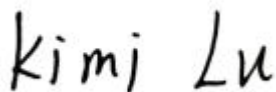
Test procedure..... : ANSI C63.10-2013

In the configuration tested, the EUT complied with the standards specified above.

Tested by:

Reviewed by:

Approved by:



Kimi Lu/ Engineer



Baret Wu/ Director



Levi Lee/ Manager

Note: The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report shall not be reproduced except in full, without prior written approval of ZHT. This document may be altered or revised by ZHT, personnel only, and shall be noted in the revision of the document.



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1. VERSION

Report No.	Version	Description	Approved
ZHT-24111128W02	Rev.01	Initial issue of report	Dec. 7, 2024

2. TEST SUMMARY

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
AC Power Line Conducted Emission	15.207	Pass
Spurious Emission	15.209(a)(f)	Pass
20dB Bandwidth	15.215	Pass

NOTE:

(1) "N/A" denotes test is not applicable in this Test Report

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

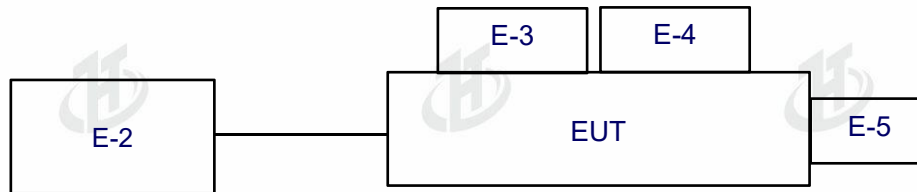
Product Name:	3 In 1 Magnetic Wireless
Test Model No:	TX05-I3-QI2
Hardware version:	V1.0
Software version:	V1.0
Operation Frequency:	iPhone coil: 128-360kHz AirPods coil: 115-205kHz Apple Watch coil: 320-330kHz
Modulation type:	FSK
Antenna Type:	Inductive loop coil Antenna
Antenna gain:	0dBi
Power supply:	Input: 5.0 V \Rightarrow 3.0 A / 9.0 V \Rightarrow 3.0 A / 12.0 V \Rightarrow 2.5 A Power: 22.5 W MAX(iPhone:15 W MAX) Apple Watch: 2.5 W AirPods: 5.0 W
Sample Number:	24111128YP-001
Remark:The antenna gain is provided by the customer, if the data provided by the customer is not accurate, Guangdong Zhonghan Testing Technology Co., Ltd. does not assume any responsibility.	

3.2 Test mode

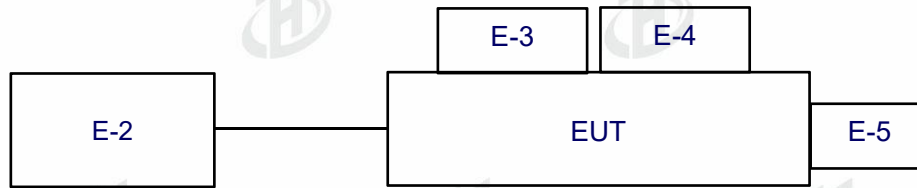
Test Modes:	
Mode 1	AC Adapter + iPhone Output(15W) + AirPods Output(5W) + Apple Watch(2.5 W)
Mode 2	AC Adapter + iPhone Output(10W) + AirPods Output(5W) + Apple Watch(2.5 W)
Mode 3	AC Adapter + iPhone Output(7.5W) + AirPods Output(5W) + Apple Watch(2.5 W)
Mode 4	AC Adapter + iPhone Output(5W) + AirPods Output(5W) + Apple Watch(2.5 W)
Mode 5	AC Adapter + iPhone Output(15W) + AirPods Output(5W)
Mode 6	AC Adapter + iPhone Output(10W) + AirPods Output(5W)
Mode 7	AC Adapter + iPhone Output(7.5W) + AirPods Output(5W)
Mode 8	AC Adapter + iPhone Output(5W) + AirPods Output(5W)
Mode 9	AC Adapter + iPhone Output(15W) + Apple Watch(2.5 W)
Mode 10	AC Adapter + iPhone Output(10W) + Apple Watch(2.5 W)
Mode 11	AC Adapter + iPhone Output(7.5W) + Apple Watch(2.5 W)
Mode 12	AC Adapter + iPhone Output(5W) + Apple Watch(2.5 W)
Mode 13	AC Adapter + iPhone Output(15W)
Mode 14	AC Adapter + iPhone Output(10W)
Mode 15	AC Adapter + iPhone Output(7.5W)
Mode 16	AC Adapter + iPhone Output(5W)
Mode 17	AC Adapter + AirPods Output(5W)
Mode 18	AC Adapter + Apple Watch(2.5 W)
Mode 19	Standby
Note: All modes were tested, only the worst-case was recorded in the report. Mode 1 is the worst mode.	

3.3 Block Diagram of EUT Configuration

Conducted Emission



Radiated Emission



3.4 Test Conditions

Temperature: 25.6℃

Relative Humidity: 54.3

3.5 Description Of Support Units (Conducted Mode)

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.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	3 In 1 Magnetic Wireless	Gaoyi Electronic	TX05-I3-QI2	/	EUT
E-2	AC ADAPTER	/	G301CU	/	AE
E-3	Wireless charging load	/	EESON	/	AE
E-4	AirPods	Apple	A2031	/	AE
E-5	Wireless charging load	/	YBZ	/	AE

Item	Shielded Type	Ferrite Core	Length	Note

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.



4. TEST FACILITY AND TEST INSTRUMENT USED

4.1 Test Facility

Guangdong Zhonghan Testing Technology Co., Ltd.

Add. : Room 104, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

FCC Registration Number:255941

Designation Number: CN0325

IC Registered No.: 29832

CAB identifier: CN0143

4.2 Instrument List For All Test Items

Radiation Test equipment

Item	Equipment	Manufacturer	Model	Last Cal.	Next Cal.
1	Receiver	R&S	ESCI	May 10, 2024	May 09, 2025
2	Loop antenna	EMCI	LAP600	May 10, 2024	May 09, 2025
3	Amplifier	Schwarzbeck	BBV 9743 B	May 10, 2024	May 09, 2025
4	Amplifier	Schwarzbeck	BBV 9718 B	May 10, 2024	May 09, 2025
5	Bilog Antenna	Schwarzbeck	VULB9162	May 28, 2024	May 27, 2025
6	Horn Antenna	Schwarzbeck	BBHA9120D	May 16, 2024	May 15, 2025
7	Horn Antenna	A.H.SYSTEMS	SAS574	May 10, 2024	May 09, 2025
8	Amplifier	AEROFLEX	100KHz-40GHz	May 10, 2024	May 09, 2025
9	Spectrum Analyzer	R&S	FSV40	May 10, 2024	May 09, 2025
10	966 Anechoic Chamber	EMToni	9m6m6m	May 10, 2024	May 09, 2025
11	Spectrum Analyzer	KEYSIGHT	N9020A	May 10, 2024	May 09, 2025
12	WIDBAND RADIO COMMUNICATION TESTER	R&S	CMW500	May 10, 2024	May 09, 2025
13	Single Generator	Agilent	N5182A	May 10, 2024	May 09, 2025
14	Power Sensor	MWRFTest	MW100-RFCB	May 10, 2024	May 09, 2025
15	Audio analyzer	R&S	UPL	May 10, 2024	May 09, 2025
16	Single Generator	R&S	SMB100A	May 10, 2024	May 09, 2025

Conduction Test equipment

Equipment	Manufacturer	Model	Last Cal.	Next Cal.
Receiver	R&S	ESCI	May 10, 2024	May 09, 2025
LISN	R&S	ENV216	May 10, 2024	May 09, 2025
ISN CAT 6	Schwarzbeck	NTFM 8158	May 10, 2024	May 09, 2025
ISN CAT 5	Schwarzbeck	CAT5 8158	May 10, 2024	May 09, 2025
Capacitive Voltage Probe	Schwarzbeck	CVP 9222 C	May 10, 2024	May 09, 2025
Current Transformer Clamp	Schwarzbeck	SW 9605	May 10, 2024	May 09, 2025

4.3 Testing software

Project	Software name	Edition
Conducted Emission	EZ-EMC	EMC-CON 3A1.1+
Radiated Emission	EZ-EMC	FA-03A2 RE+
RF Test	MTS 8310	2.0.0.0

4.4 Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 1.38\text{dB}$
2	RF conducted power	$\pm 0.16\text{dB}$
3	Conducted spurious emissions	$\pm 0.21\text{dB}$
4	All radiated emissions (9k-30MHz)	$\pm 4.68\text{dB}$
5	All radiated emissions (<1G)	$\pm 4.68\text{dB}$
6	All radiated emissions (>1G)	$\pm 4.89\text{dB}$
7	Temperature	$\pm 0.5^{\circ}\text{C}$
8	Humidity	$\pm 2\%$
9	Occupied Bandwidth	$\pm 4.96\text{dB}$

Decision Rule

- ☒ Uncertainty is not included
☐ Uncertainty is included

5. CONDUCTED EMISSION TEST

5.1 CONDUCTED EMISSION MEASUREMENT

Test Requirement:	FCC Part15 C Section 15.207
Test Method:	ANSI C63.10:2013
Test Frequency Range:	150KHz to 30MHz
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto

5.1.1 POWER LINE CONDUCTED EMISSION Limits

FREQUENCY (MHz)	Limit (dBuV)		Standard
	QP	AVG	
0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

(1) *Decreases with the logarithm of the frequency.

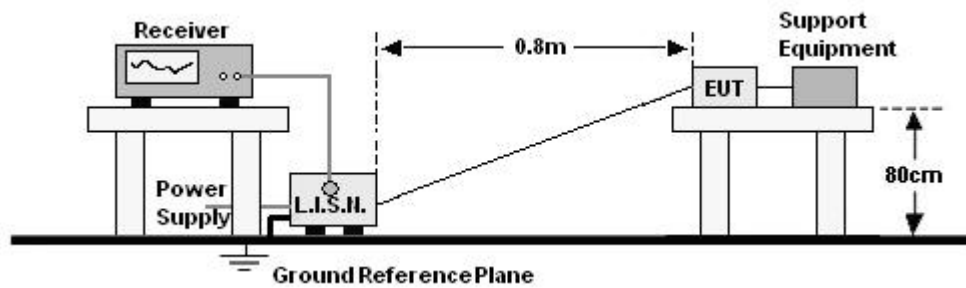
5.1.2 TEST PROCEDURE

- The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

5.1.3 DEVIATION FROM TEST STANDARD

No deviation

5.1.4 TEST SETUP

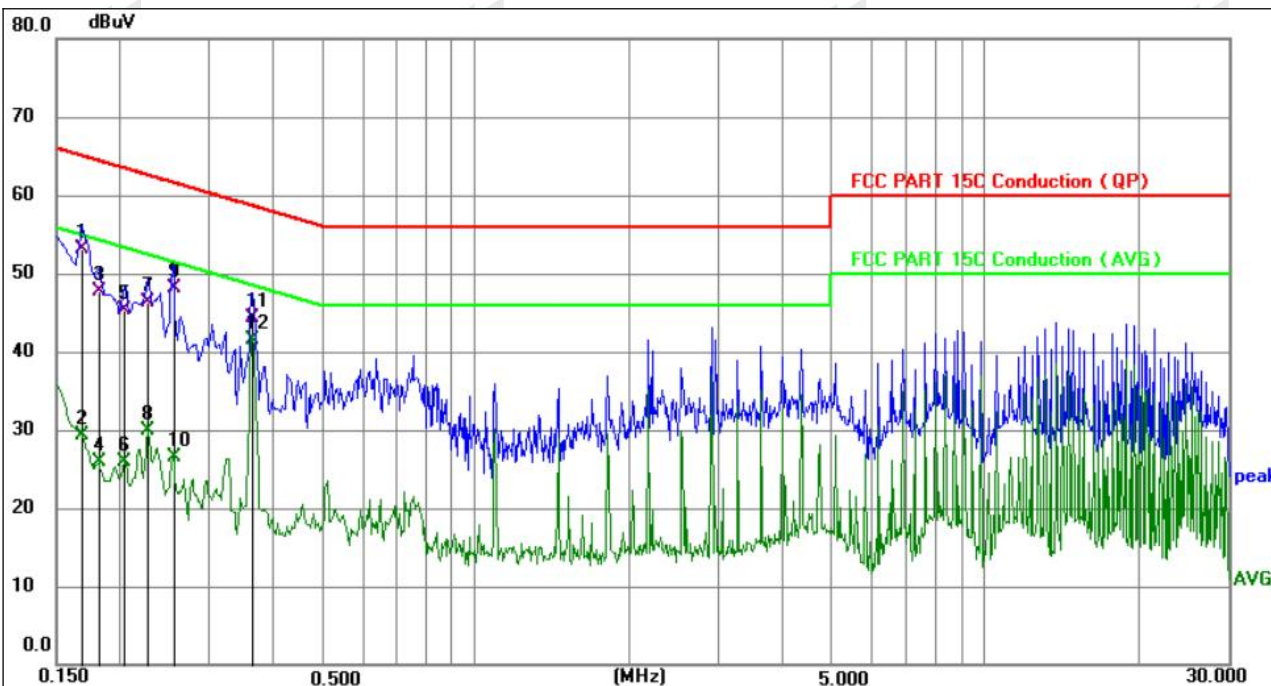


5.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

5.1.6 Test Result

Temperature:	24.2°C	Relative Humidity:	54.6%
Pressure:	101kPa	Phase :	L
Test Voltage:	AC 120V/60Hz	Test Mode:	Mode 1



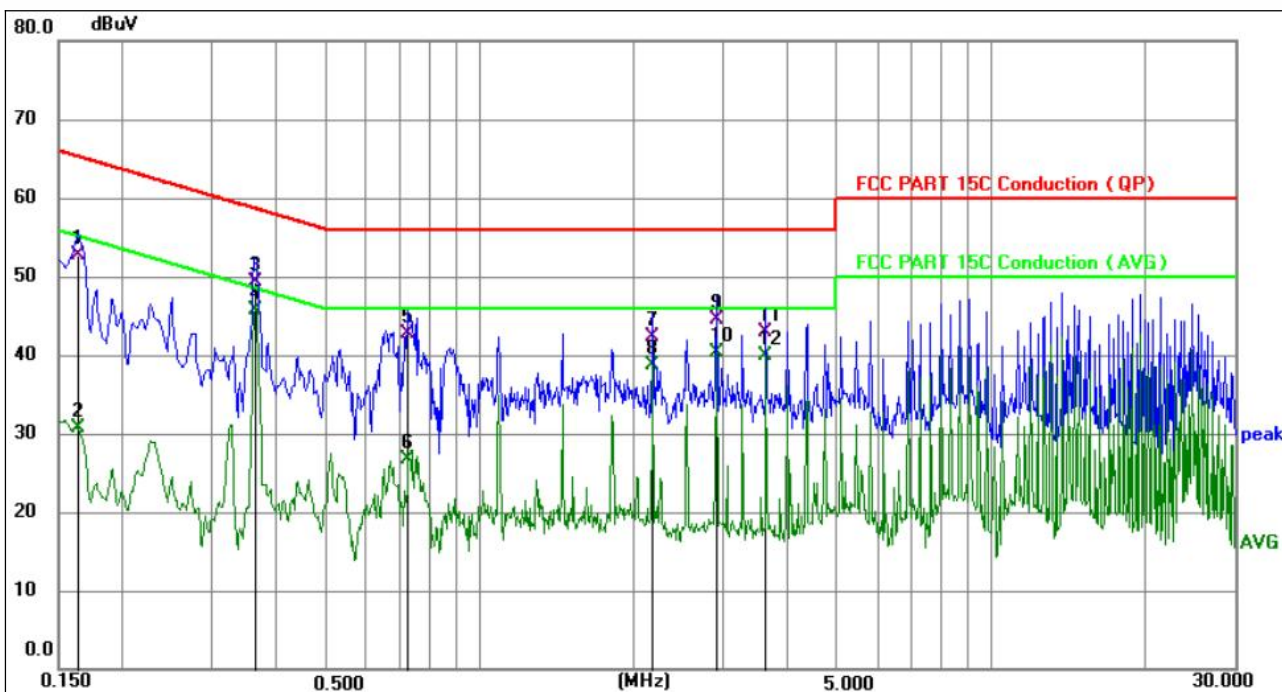
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1680	43.13	9.90	53.03	65.06	-12.03	QP	P
2	0.1680	19.50	9.90	29.40	55.06	-25.66	AVG	P
3	0.1814	37.73	9.90	47.63	64.42	-16.79	QP	P
4	0.1814	16.04	9.90	25.94	54.42	-28.48	AVG	P
5	0.2040	35.42	9.91	45.33	63.45	-18.12	QP	P
6	0.2040	15.92	9.91	25.83	53.45	-27.62	AVG	P
7	0.2265	36.37	9.92	46.29	62.58	-16.29	QP	P
8	0.2265	19.90	9.92	29.82	52.58	-22.76	AVG	P
9	0.2535	38.17	9.93	48.10	61.64	-13.54	QP	P
10	0.2535	16.57	9.93	26.50	51.64	-25.14	AVG	P
11	0.3614	34.24	9.97	44.21	58.70	-14.49	QP	P
12 *	0.3614	31.63	9.97	41.60	48.70	-7.10	AVG	P

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Measurement Level = Reading level + Correct Factor



Temperature:	24.2°C	Relative Humidity:	54.6%
Pressure:	101kPa	Phase :	N
Test Voltage:	AC 120V/60Hz	Test Mode:	Mode 1



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1641	42.73	9.90	52.63	65.25	-12.62	QP	P
2	0.1641	20.89	9.90	30.79	55.25	-24.46	AVG	P
3	0.3634	39.36	9.97	49.33	58.65	-9.32	QP	P
4 *	0.3634	35.67	9.97	45.64	48.65	-3.01	AVG	P
5	0.7236	32.70	10.04	42.74	56.00	-13.26	QP	P
6	0.7236	16.74	10.04	26.78	46.00	-19.22	AVG	P
7	2.1783	32.31	10.07	42.38	56.00	-13.62	QP	P
8	2.1783	28.55	10.07	38.62	46.00	-7.38	AVG	P
9	2.8998	34.46	10.07	44.53	56.00	-11.47	QP	P
10	2.8998	30.19	10.07	40.26	46.00	-5.74	AVG	P
11	3.6225	32.83	10.09	42.92	56.00	-13.08	QP	P
12	3.6225	29.74	10.09	39.83	46.00	-6.17	AVG	P

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Measurement Level = Reading level + Correct Factor

**6. RADIATED EMISSION MEASUREMENT**

Test Requirement:	FCC Part15 C Section 15.209				
Test Method:	ANSI C63.10:2013				
Test Frequency Range:	9kHz to 1GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Value
	9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
	150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz	Average

6.1 Radiated Emission Limits**Limits for frequency below 30MHz**

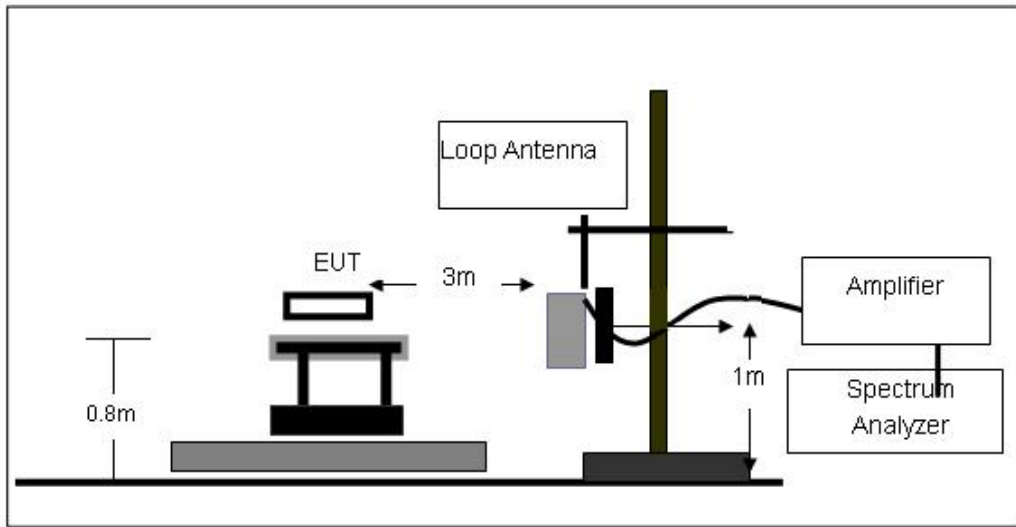
Frequency	Limit (uV/m)	Measurement Distance(m)	Remark
0.009-0.490	2400/F(kHz)	300	Peak Value
0.490-1.705	24000/F(kHz)	30	Quasi-peak Value
1.705-30	30	30	Quasi-peak Value

Limits for frequency Above 30MHz

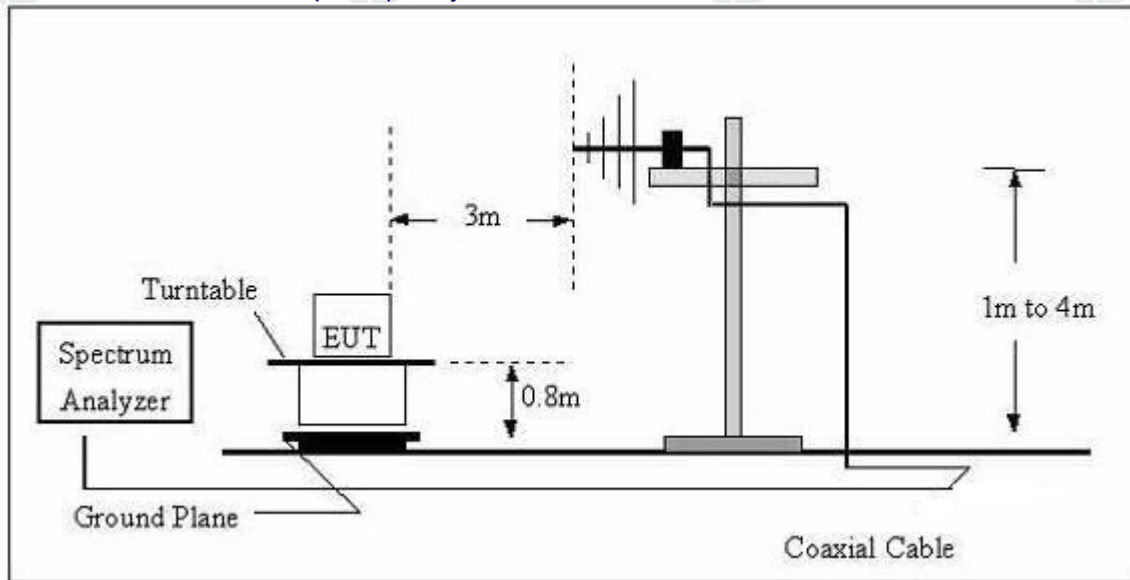
Frequency	Limit (dBuV/m @3m)	Remark
30MHz-88MHz	40.00	Quasi-peak Value
88MHz-216MHz	43.50	Quasi-peak Value
216MHz-960MHz	46.00	Quasi-peak Value
960MHz-1GHz	54.00	Quasi-peak Value
Above 1GHz	54.00	Average Value
	74.00	Peak Value

6.2 Anechoic Chamber Test Setup Diagram

(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209 and FCC 15.205 limits.

6.3 Test Procedure

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna (calibrated by dipole antenna) are used as a receiving antenna. Both horizontal and vertical polarization of the antenna are set on measurement.

6.4 DEVIATION FROM TEST STANDARD

No deviation



6.5 Test Result

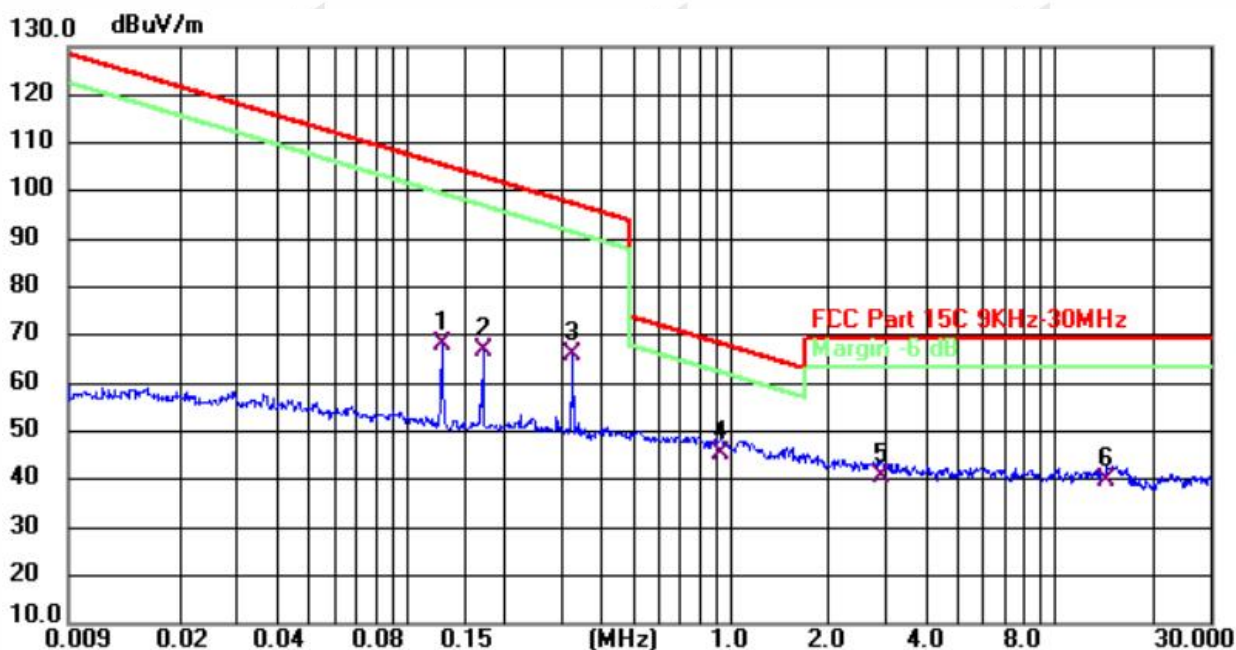
Measurement data:

Note: Limit dBuV/m @3m = Limit dBuV/m @300m+ 80

Limit dBuV/m @3m = Limit dBuV/m @30m + 40

9 kHz~30 MHz

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	coaxial
Test Voltage:	AC 120V/60Hz	Test Modes:	Mode 1



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	0.128	68.02	0.16	68.18	105.46	-37.28	Peak
2	0.170	66.78	0.15	66.93	102.94	-36.01	Peak
3	0.324	65.16	0.77	65.93	97.39	-31.46	Peak
4 *	0.931	43.25	1.97	45.22	68.23	-23.01	QP
5	2.901	34.85	6.00	40.85	69.54	-28.69	QP
6	14.340	37.78	2.21	39.99	69.54	-29.55	QP

Note:

Pre-scan in the all of mode, the worst case in of was recorded.

Factor = antenna factor + cable loss – pre-amplifier.

Emission Level = Meter Reading - Factor

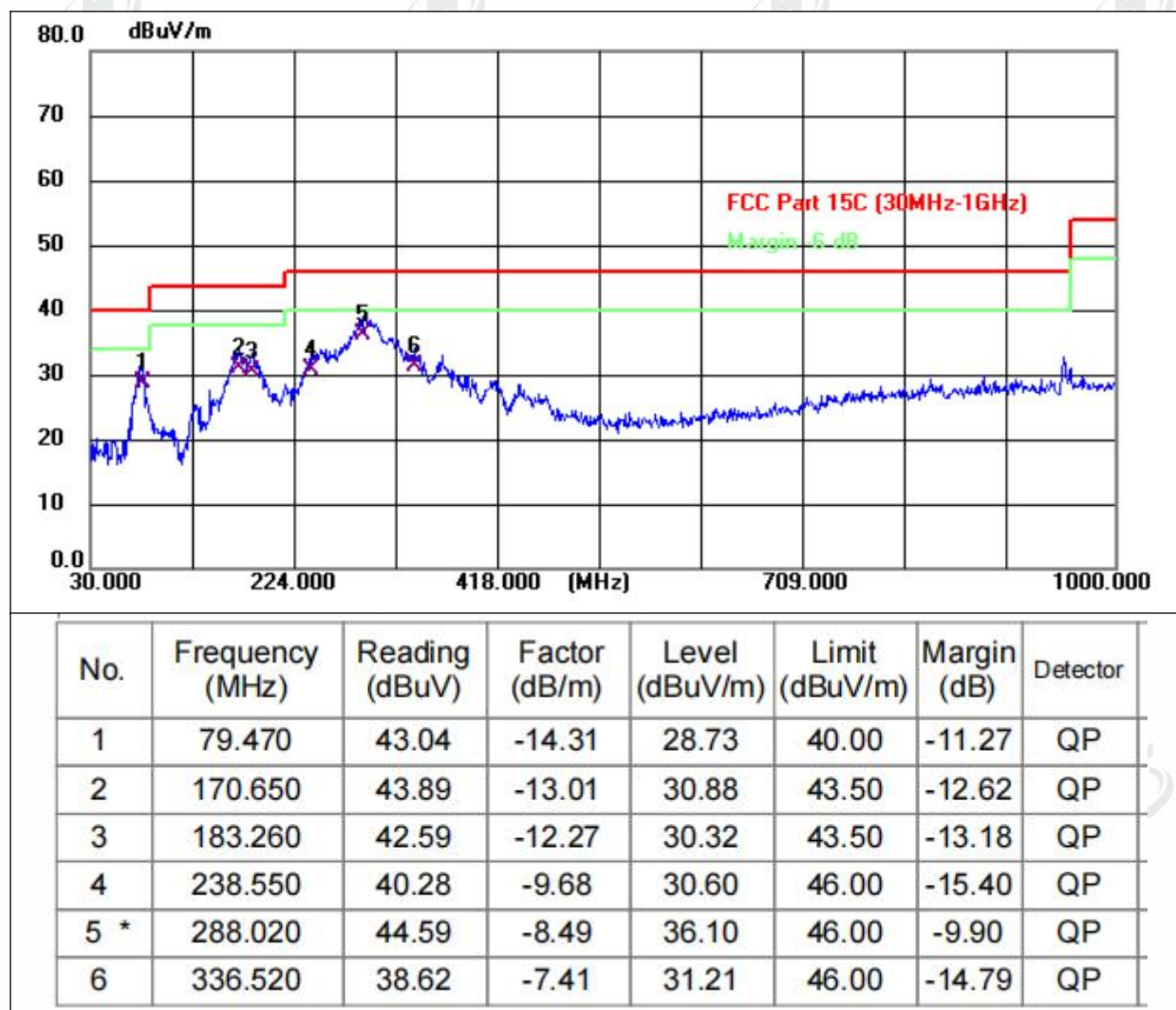
Margin = Emission Level- Limit.

The amplitude of emissions which are attenuated by more than 20db below the permissible value has no need to be reported.



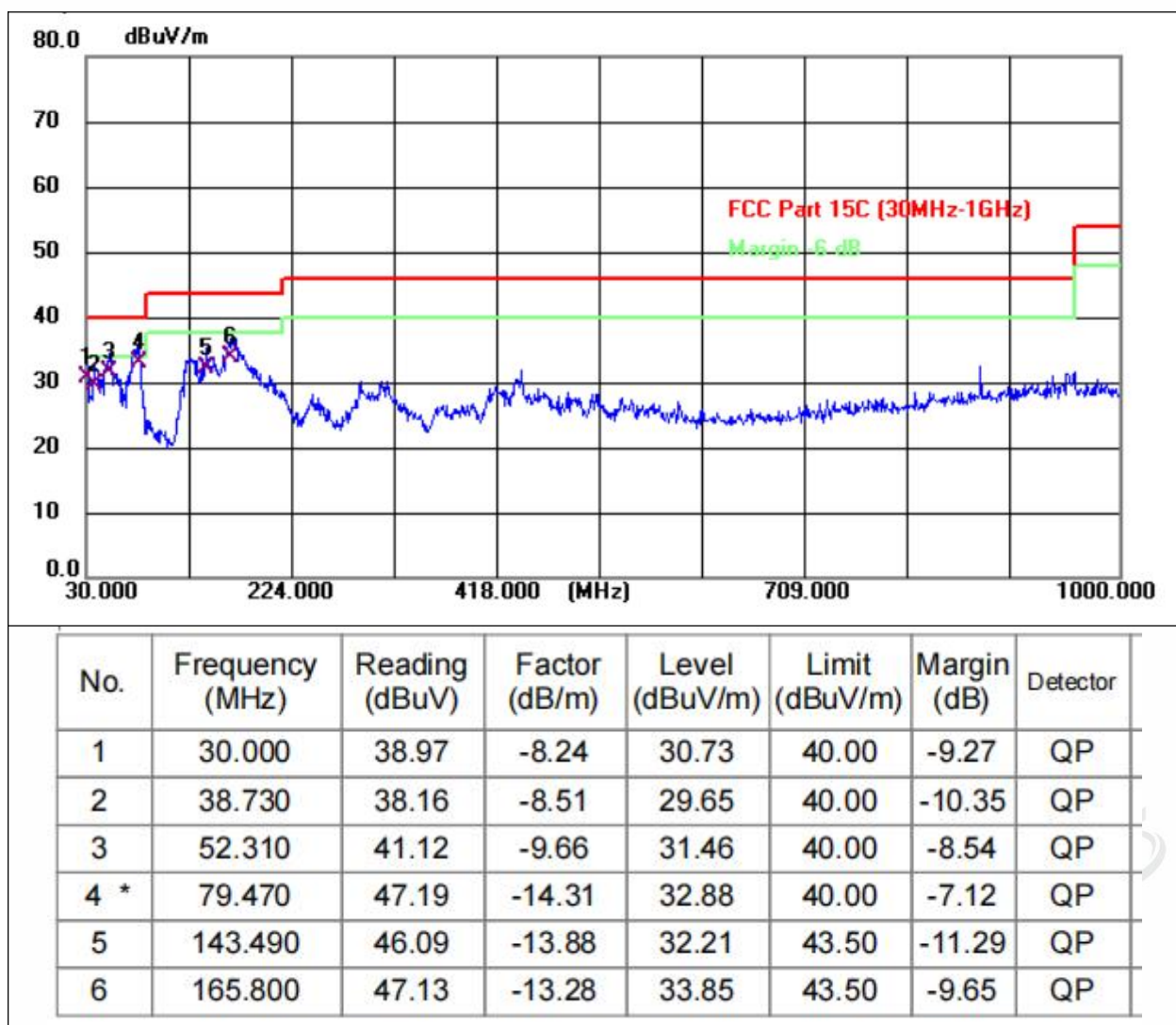
30MHz-1GHz

Temperature:	26°C	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	Horizontal
Test Voltage:	AC 120V/60Hz	Test Modes:	Mode 1





Temperature:	26°C	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	Vertical
Test Voltage:	AC 120V/60Hz	Test Modes:	Mode 1



Remarks:

1. Factor = Antenna Factor + Cable Loss – Preamplifier Factor
2. Level = Reading + Factor
3. Margin = Emission Level- Limit.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.



7. BANDWIDTH TEST

1. Set RBW = 10 Hz for 1%-5%OBW.
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

TEST SETUP

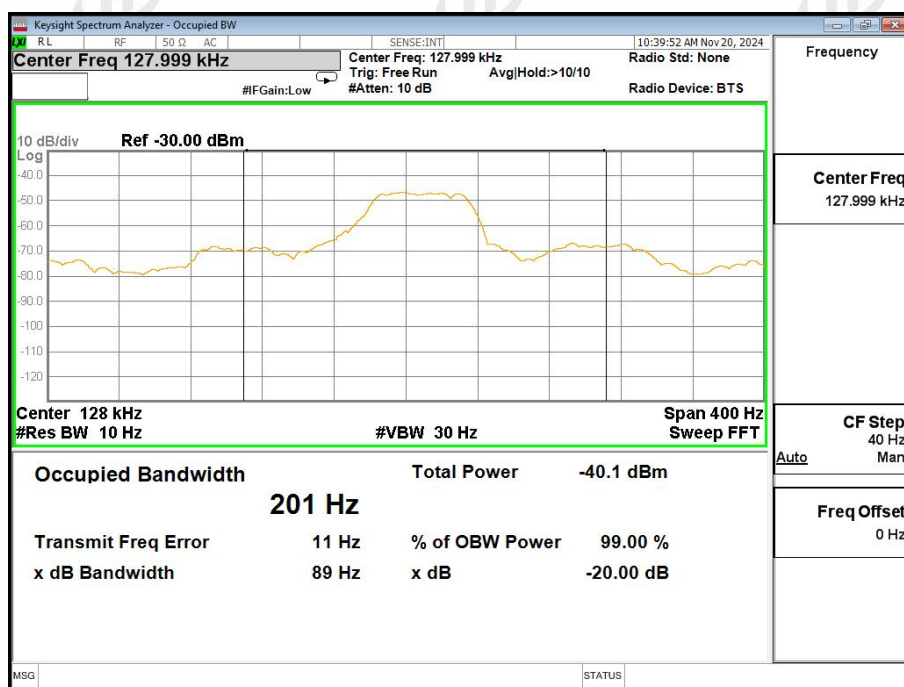




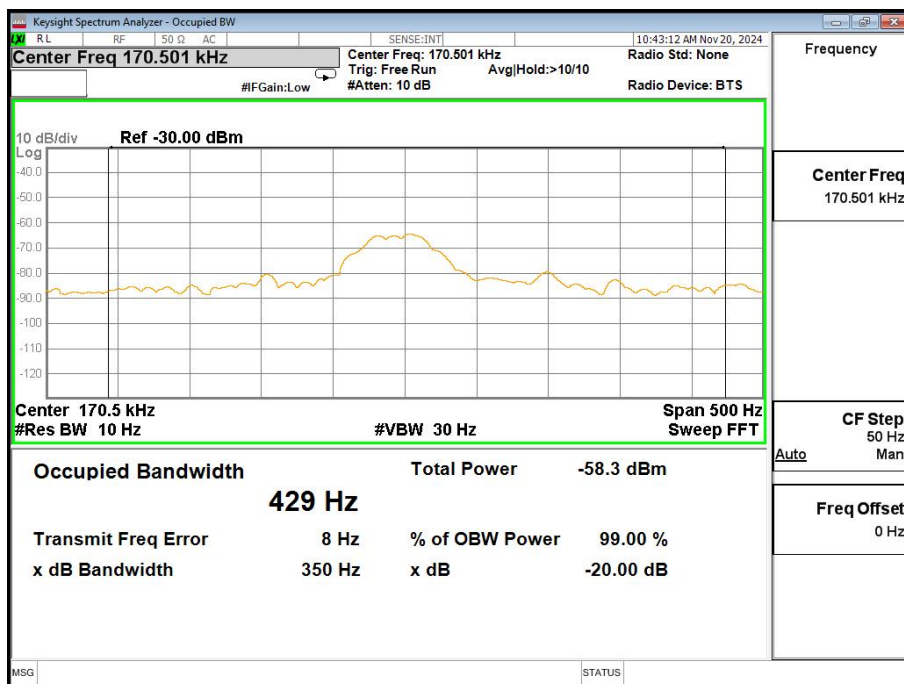
Temperature:	25.7 °C	Relative Humidity:	55%
Pressure:	101kPa		

	Frequency (KHz)	20dB bandwidth (KHz)	Result
iPhone coil	128.0	0.089	Pass
AirPods coil	170.5	0.350	Pass
Apple Watch coil	324.2	0.572	Pass

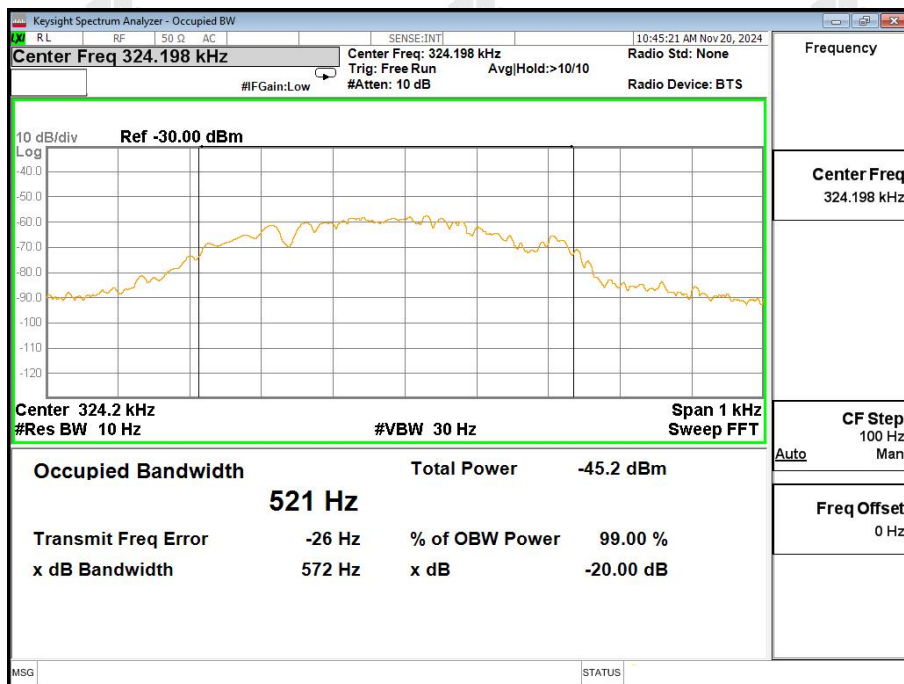
iPhone coil



AirPods coil



Apple Watch coil



8. ANTENNA REQUIREMENT

Standard requirement:	FCC Part15 C Section 15.203
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.	
EUT Antenna:	
The antenna is Coil Antenna, the best case gain of the antennas is 0dBi, reference to the appendix II for details	

9. TEST SETUP PHOTO

Reference to the appendix I for details.

10. EUT CONSTRUCTIONAL DETAILS

Reference to the appendix II for details.

***** END OF REPORT *****