

TEST REPORT

Product Name : Magnetic wireless car charger
Brand Name : N/A
Model : MG16
Series Model : T233-F
FCC ID : 2AXTH-MG16
Applicant : **Shenzhen Caibo Technology Co.,Ltd.**
Address : F4, Building 30, Fifth Industrial Zone, Huaide Cuigang Industrial Park, Fu Yong, Bao'an District, Shenzhen China
Manufacturer : **Shenzhen Caibo Technology Co.,Ltd.**
Address : F4, Building 30, Fifth Industrial Zone, Huaide Cuigang Industrial Park, Fu Yong, Bao'an District, Shenzhen China
Standard(s) : FCC CFR Title 47 Part 15 Subpart C
Date of Receipt : Jan. 14, 2025
Date of Test : Jan. 14, 2025~ Jan. 18, 2025
Issued Date : Jan. 18, 2025

Issued By: **Guangdong Asia Hongke Test Technology Limited**
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Reviewed by: Leon Yi
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Note: This device has been tested and found to comply with the standard(s) listed, this test report merely corresponds to the test sample. It is not permitted to copy extracts of these test result without the written permission of the test laboratory. This report shall not be reproduced except in full, without the written approval of Guangdong Asia Hongke Test Technology Limited. If there is a need to alter or revise this document, the right belongs to Guangdong Asia Hongke Test Technology Limited, and it should give a prior written notice of the revision document. This test report must not be used by the client to claim product endorsement.



Report Revise Record

Report Version	Issued Date	Notes
M1	Jan. 18, 2025	Initial Release

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1 TEST SUMMARY

1.1 Test Standards

The tests were performed according to following standards:

[FCC Rules Part 15.207, 15.209, 15.215\(c\)](#)

[ANSI C63.10: 2013](#): American National Standard for Testing Unlicensed Wireless Devices

1.2 Test Summary

Test Item	Section in CFR 47	Test Result
Electric Field Radiated Emissions	FCC Part 15 C (Section15.209)	PASS
20dB Bandwidth/99% Bandwidth	FCC Part 15 C (Section15.215(c))	PASS
AC Power Line Conducted Emission	FCC Part 15 C (Section15.207)	PASS
Antenna Requirement	FCC Part 15 C (Section15.203)	PASS

1.3 Test Facility

Test Laboratory:

Guangdong Asia Hongke Test Technology Limited

B1/F, Building 11, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

The test facility is recognized, certified or accredited by the following organizations:

FCC-Registration No.: 251906 Designation Number: CN1376

Guangdong Asia Hongke Test Technology Limited has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

IC —Registration No.: 31737 CAB identifier: CN0165

The 3m Semi-anechoic chamber of Guangdong Asia Hongke Test Technology Limited has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 31737

A2LA-Lab Cert. No.: 7133.01

Guangdong Asia Hongke Test Technology Limited has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

1.4 Measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report according to CISPR 16 - 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the Guangdong Asia Hongke Test Technology Limited's quality system according to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Asia Hongke laboratory is reported:

Test	Measurement Uncertainty	Notes
Power Line Conducted Emission	9KHz~30MHz ± 1.20 dB	(1)
Radiated Emission	9KHz~30MHz ± 3.10 dB	(1)
Radiated Emission	30MHz~1GHz ± 3.75 dB	(1)
Radiated Emission	1GHz~18GHz ± 3.88 dB	(1)
Radiated Emission	18GHz~40GHz ± 3.88 dB	(1)
RF power, conducted	30MHz~6GHz ± 0.16 dB	(1)
RF power density, conducted	± 0.24 dB	(1)
Spurious emissions, conducted	± 0.21 dB	(1)
Temperature	$\pm 1^{\circ}\text{C}$	(1)
Humidity	$\pm 3\%$	(1)
DC and low frequency voltages	$\pm 1.5\%$	(1)
Time	$\pm 2\%$	(1)
Duty cycle	$\pm 2\%$	(1)

The report 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%.

2 GENGGENERAL INFORMATION

2.1 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature:	25°C
Relative Humidity:	55 %
Air Pressure:	101 kPa

2.2 General Description of EUT

Product Name:	Magnetic wireless car charger
Model/Type reference:	MG16
Serial Model:	T233-F
Power Supply:	Input: DC 5V 2A/ 9V 2.2A/ 12V 2A Wireless Output: 15W/10W/7.5W/5W
Hardware Version:	N/A
Software Version:	N/A
Sample(s) Status:	AiTSZ-250114012-1(Normal sample) AiTSZ-250114012-2(Engineer sample)
Wireless Charger:	
Operation frequency:	110KHz-205KHz, 360KHz
Modulation Technology:	ASK
Antenna Type:	Loop coil Antenna
Antenna gain:	0dBi
Remark: The above DUT's information was declared by manufacturer. For more detailed features description, please refer to the manufacturer's specifications or the User's Manual.	

2.3 Description of the test mode

Equipment under test was operated during the measurement under the following conditions:

☒ Charging and communication mode

Test Modes:		
Mode 1	AC/DC Adapter+ EUT + phone(Battery Status:< 1%)	Record
Mode 2	AC/DC Adapter+ EUT + phone(Battery Status:< 50%)	Pre-tested
Mode 3	AC/DC Adapter+ EUT + phone(Battery Status:< 99%)	Pre-tested
Mode 4	Stand-by mode.	Pre-tested
Note: All test modes were pre-tested, but we only recorded the worst case in this report.		

2.4 Special Accessories

Follow auxiliary equipment(s) test with EUT that provided by the manufacturer or laboratory is listed as follow:

Description	Manufacturer	Model	Serial No.	Provided by	Other
Adapter	HNT	HNT-QC530	/	Test lab	/
Phone	OSCAL	PILOT2	/	Test lab	/
Phone	Apple	IPhone 14	/	Test lab	/

2.5 Equipment List for the Test

No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	EMI Measuring Receiver	R&S	ESR	101160	2024.09.25	2025.09.24
2	Spectrum Analyzer	R&S	FSV40	101470	2024.09.23	2025.09.22
3	Low Noise Pre Amplifier	SCHWARZBECK	BBV 9745	00282	2024.09.25	2025.09.24
4	Low Noise Pre Amplifier	CESHENG	CSKJLNA23101 6A	CSKJLNA231016 A	2024.09.25	2025.09.24
5	Passive Loop	ETS	6512	00165355	2024.08.29	2027.08.28
6	TRILOG Super Broadband test Antenna	SCHWARZBECK	VULB9168	01434	2024.08.29	2027.08.28
7	Broadband Horn Antenna	Schwarzbeck	BBHA 9120D	452	2024.08.29	2027.08.28
8	Horn Antenna 15-40GHz	SCHWARZBECK	BBHA9170	BBHA9170367	2024.08.28	2027.08.27
9	6dB Attenuator	JFW	50FPE-006	4360846-949-1	2024.09.24	2025.09.23
10	EMI Test Receiver	R&S	ESPI	100771	2024.09.25	2025.09.24
11	LISN	R&S	NNLK 8129	8130179	2024.09.24	2025.09.23
12	LISN	R&S	ESH3-Z5	892785/016	2024.09.23	2025.09.22
13	Pulse Limiter	R&S	ESH3-Z2	102789	2024.09.24	2025.09.23
14	RF Automatic Test system	TST	TSTPASS	21033016	2024.09.25	2025.09.24
15	Vector Signal Generator	Agilent	N5182A	MY50143009	2024.09.25	2025.09.24

3 TEST CONDITIONS AND RESULTS

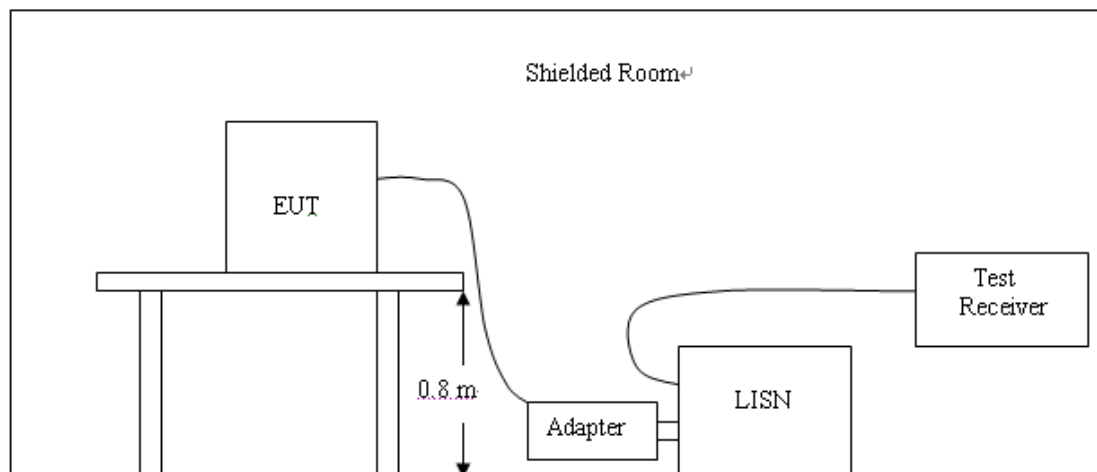
3.1 Conducted Emissions Test

LIMIT

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST CONFIGURATION



TEST PROCEDURE

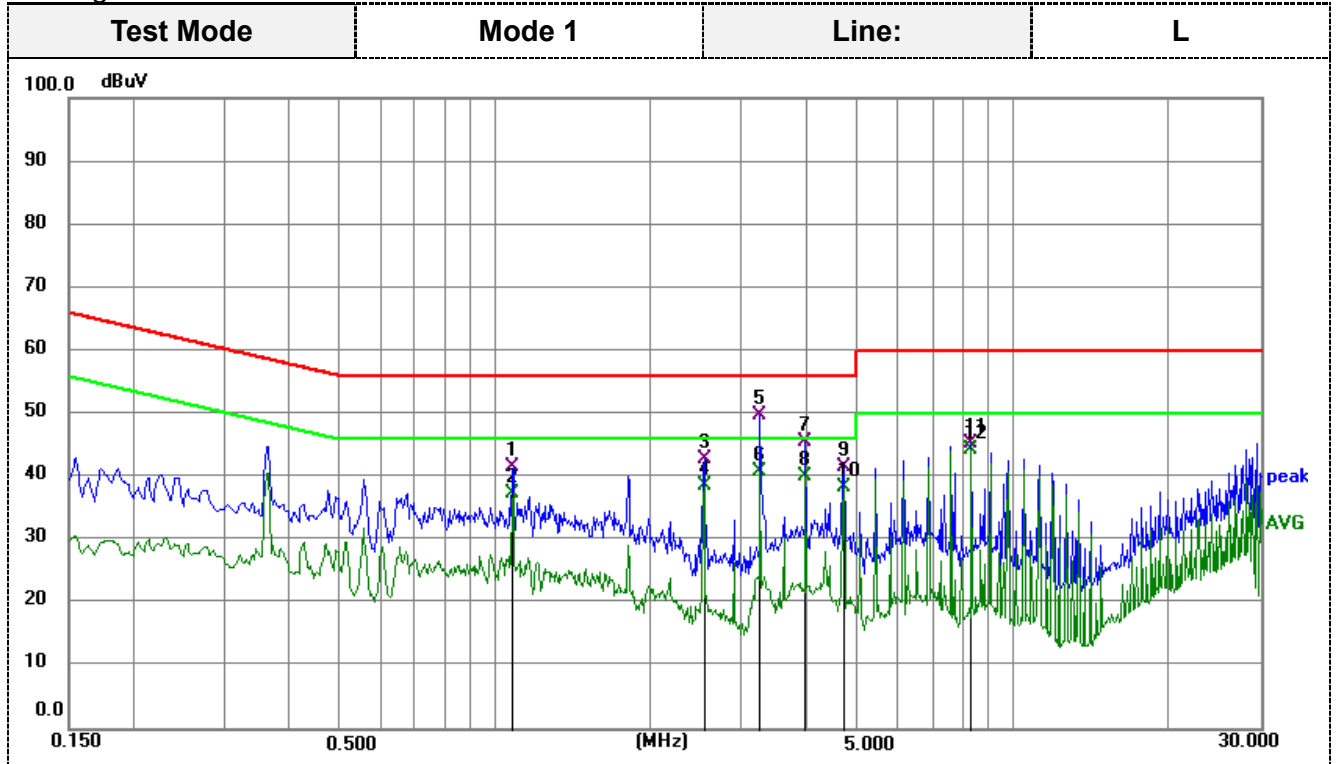
1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10:2013.
2. Support equipment, if needed, was placed as per ANSI C63.10:2013.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10:2013.
4. The adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5. All support equipments received AC power from a second LISN, if any.
6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.

TEST RESULTS

Remark:

1. Both 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz power supply have been tested, only the worst result of 120 VAC, 60 Hz was reported as below:

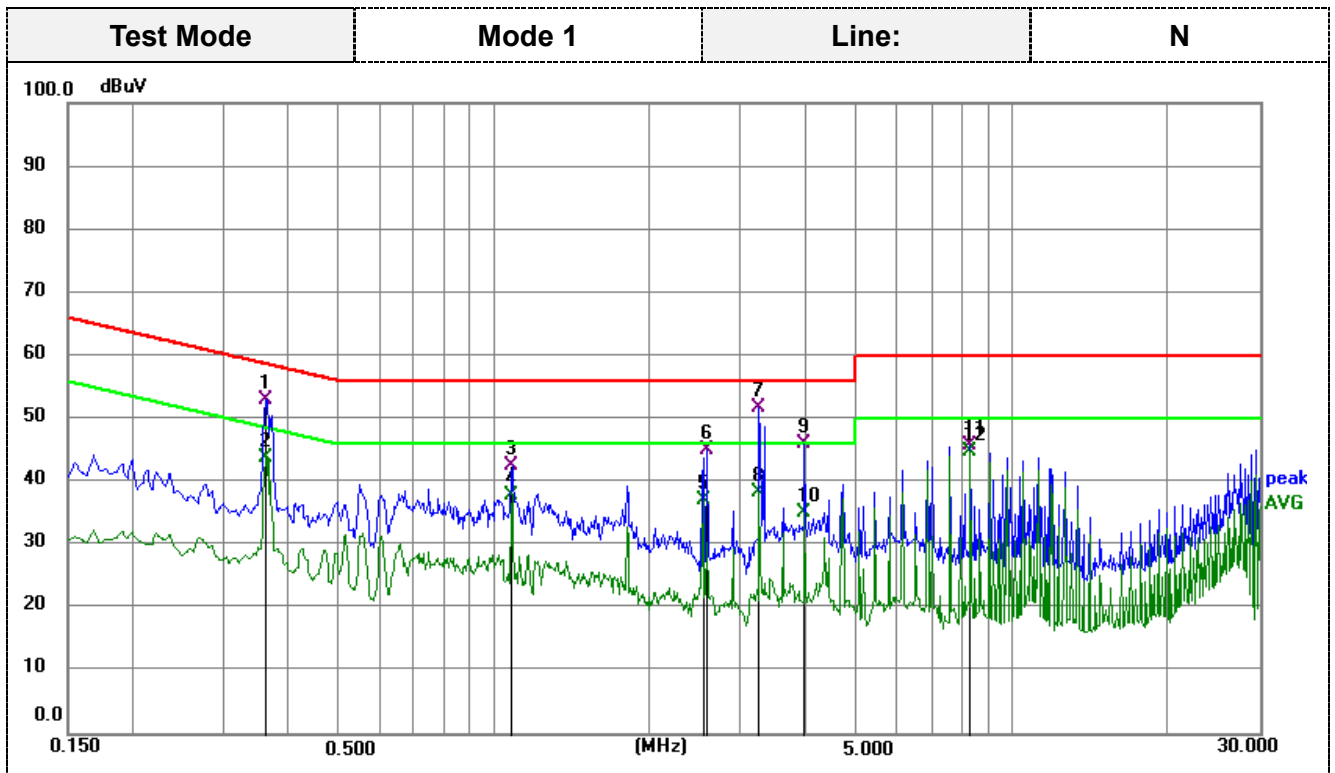
2. Test phone coil can be working on EPP and MPP mode, only the worst result with phone coil working at EPP mode recorded as below:



Remark: Correct Factor = Insertion loss of LISN + Cable loss + Insertion loss of Pulse Limiter;
Measurement Result = Reading Level + Correct Factor;

Margin = Measurement Result - Limit

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	1.0859	30.91	10.66	41.57	56.00	-14.43	QP
2	1.0859	26.70	10.66	37.36	46.00	-8.64	AVG
3	2.5304	32.11	10.79	42.90	56.00	-13.10	QP
4	2.5304	27.86	10.79	38.65	46.00	-7.35	AVG
5	3.2505	38.88	10.84	49.72	56.00	-6.28	QP
6	3.2505	29.90	10.84	40.74	46.00	-5.26	AVG
7	3.9750	34.55	11.00	45.55	56.00	-10.45	QP
8	3.9750	29.03	11.00	40.03	46.00	-5.97	AVG
9	4.6993	30.59	11.01	41.60	56.00	-14.40	QP
10	4.6993	27.37	11.01	38.38	46.00	-7.62	AVG
11	8.3129	34.17	11.06	45.23	60.00	-14.77	QP
12	8.3129	33.21	11.06	44.27	50.00	-5.73	AVG



Remark: Correct Factor = Insertion loss of LISN + Cable loss + Insertion loss of Pulse Limiter;
Measurement Result = Reading Level +Correct Factor;
Margin = Measurement Result- Limit

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.3613	42.31	10.68	52.99	58.70	-5.71	QP
2	0.3613	33.21	10.68	43.89	48.70	-4.81	AVG
3	1.0859	31.79	10.65	42.44	56.00	-13.56	QP
4	1.0859	27.10	10.65	37.75	46.00	-8.25	AVG
5	2.5304	26.29	10.78	37.07	46.00	-8.93	AVG
6	2.5754	34.29	10.79	45.08	56.00	-10.92	QP
7	3.2550	40.80	10.84	51.64	56.00	-4.36	QP
8	3.2550	27.38	10.84	38.22	46.00	-7.78	AVG
9	3.9750	35.06	10.99	46.05	56.00	-9.95	QP
10	3.9750	24.23	10.99	35.22	46.00	-10.78	AVG
11	8.3175	34.76	11.04	45.80	60.00	-14.20	QP
12	8.3175	33.87	11.04	44.91	50.00	-5.09	AVG

3.2 Radiated Emissions

Limit

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emission out of authorized band shall not exceed the following table at a 3 meters measurement distance.

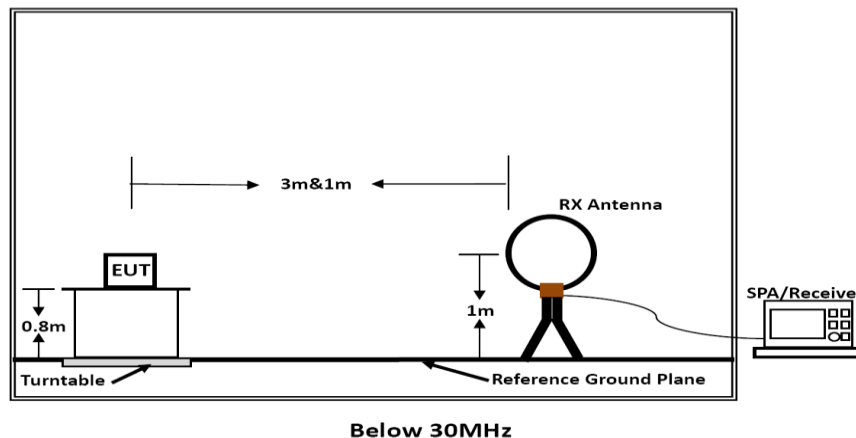
In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

Radiated emission limits

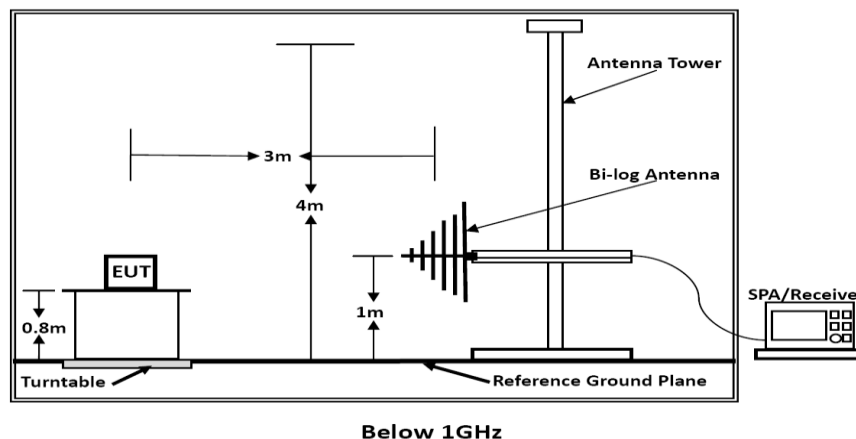
Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
0.009-0.49	3	$20\log(2400/F(\text{KHz}))+40\log(300/3)$	$2400/F(\text{KHz})$
0.49-1.705	3	$20\log(24000/F(\text{KHz}))+40\log(30/3)$	$24000/F(\text{KHz})$
1.705-30	3	$20\log(30)+40\log(30/3)$	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

TEST CONFIGURATION

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



(B) Radiated Emission Test Set-Up, Frequency below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



Test Procedure

- Below 1GHz measurement the EUT is placed on a turntable which is 0.8m above ground plane, and above 1GHz measurement EUT was placed on a low permittivity and low loss tangent turn table which is 1.5m above ground plane.
- Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0°C to 360°C to acquire the highest emissions from EUT
- And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- Repeat above procedures until all frequency measurements have been completed.
- Radiated emission test frequency band from 9KHz to 1000MHz.
- The distance between test antenna and EUT as following table states:

Test Frequency range	Test Antenna Type	Test Distance
9KHz-30MHz	Active Loop Antenna	3
30MHz-1GHz	Bilog Antenna	3

- Setting test receiver/spectrum as following table states:

Test Frequency range	Test Receiver/Spectrum Setting	Detector
9KHz-150KHz	RBW=200Hz/VBW=3KHz, Sweep time=Auto	QP
150KHz-30MHz	RBW=9KHz/VBW=100KHz, Sweep time=Auto	QP
30MHz-1GHz	RBW=120KHz/VBW=1000KHz, Sweep time=Auto	QP

TEST RESULTS

Remark:

- All test modes described in section 2.3 has been tested, only the worst result of Mode 1 is recorded as below:
- Test result for 30MHz -1GHz only show the worst case of phone coil working on EPP mode.

For 9KHz-150KHz

(Phone Frequency:110-205KHz)



Remark:

Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	0.0160	34.37	21.05	55.42	123.52	-68.10	QP
2	0.0235	34.86	21.01	55.87	120.18	-64.31	QP
3	0.0420	29.06	22.12	51.18	115.14	-63.96	QP
4	0.0601	28.90	22.63	51.53	112.03	-60.50	QP
5	0.0800	25.86	22.70	48.56	109.54	-60.98	QP
6	0.1245	53.73	22.15	75.88	105.70	-29.82	QP

For 150KHz-30MHz

(Phone Frequency:110-205KHz)



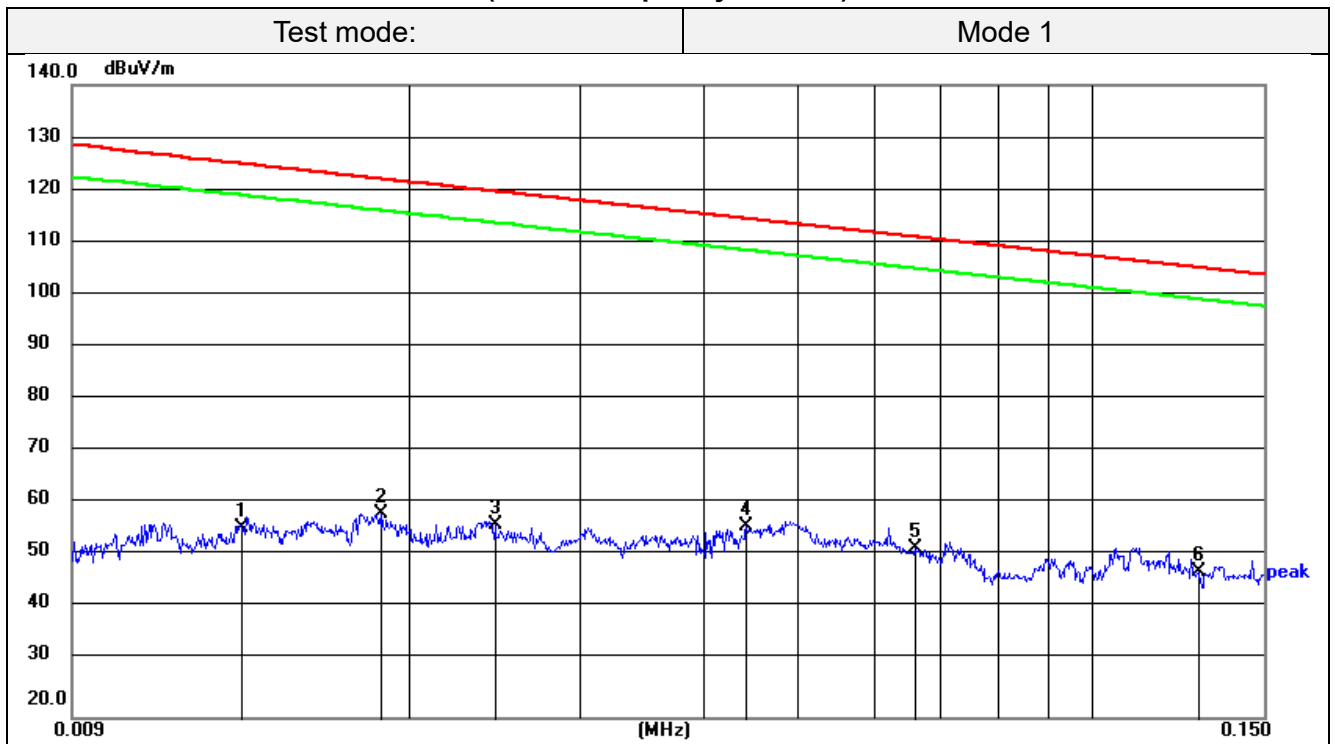
Remark:

Emission Level = Reading + Factor;
Factor = Antenna Factor + Cable Loss;
Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	0.1882	28.10	21.71	49.81	102.11	-52.30	QP
2	0.4304	25.99	21.69	47.68	94.93	-47.25	QP
3	0.9082	23.37	22.56	45.93	68.44	-22.51	QP
4	1.6104	24.32	22.48	46.80	63.47	-16.67	QP
5	3.7395	19.76	22.82	42.58	69.54	-26.96	QP
6	11.9961	22.42	23.00	45.42	69.54	-24.12	QP

For 9KHz-150KHz

(Phone Frequency:360KHz)



Remark:

Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	0.0134	34.79	21.21	56.00	125.06	-69.06	QP
2	0.0187	37.89	20.88	58.77	122.17	-63.40	QP
3	0.0244	35.52	21.06	56.58	119.86	-63.28	QP
4	0.0442	34.12	22.25	56.37	114.70	-58.33	QP
5	0.0656	29.45	22.65	52.10	111.27	-59.17	QP
6	0.1282	25.68	22.12	47.80	105.45	-57.65	QP

For 150KHz-30MHz

(Phone Frequency:360KHz)

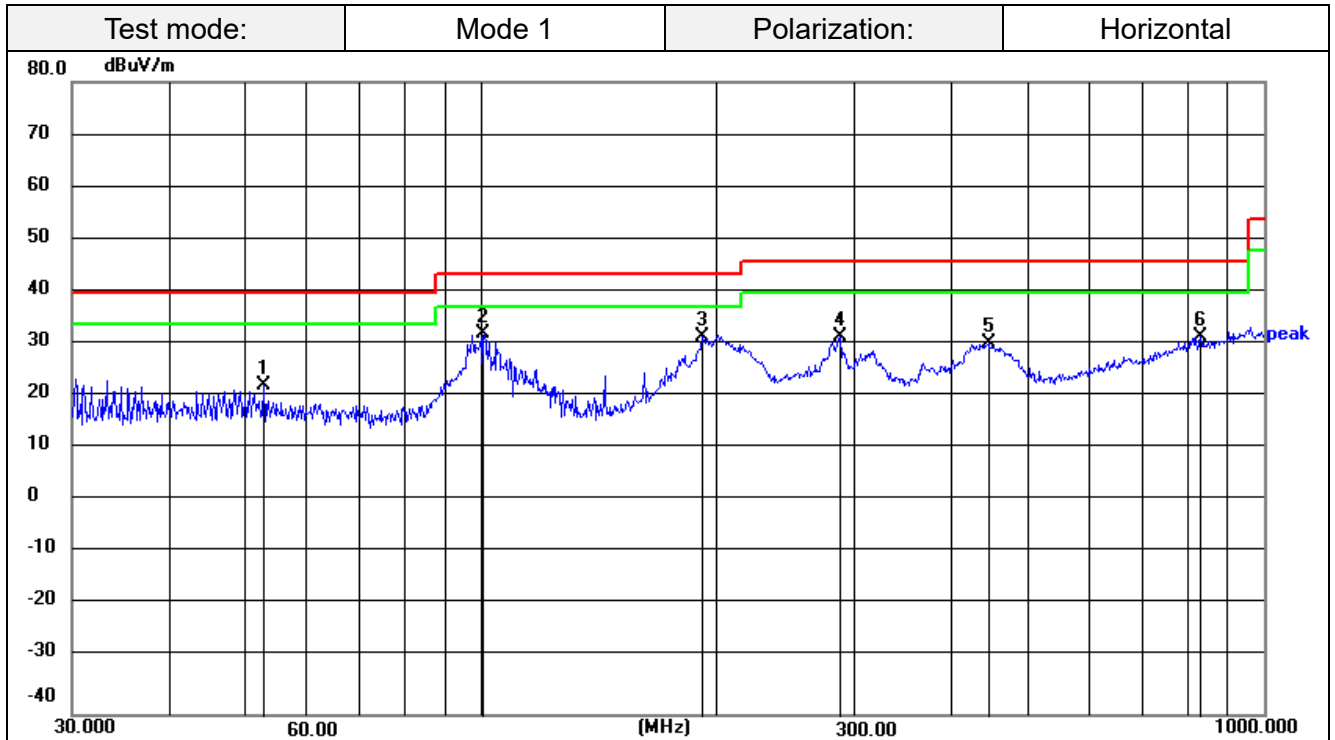


Remark:

Emission Level = Reading + Factor;
Factor = Antenna Factor + Cable Loss;
Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	0.3600	52.21	21.58	73.79	96.43	-22.64	QP
2	0.7084	23.08	22.38	45.46	70.60	-25.14	QP
3	2.0440	19.84	22.41	42.25	69.54	-27.29	QP
4	2.7355	19.40	22.55	41.95	69.54	-27.59	QP
5	7.5255	19.58	22.95	42.53	69.54	-27.01	QP
6	16.0545	20.53	23.56	44.09	69.54	-25.45	QP

For 30MHz-1GHz



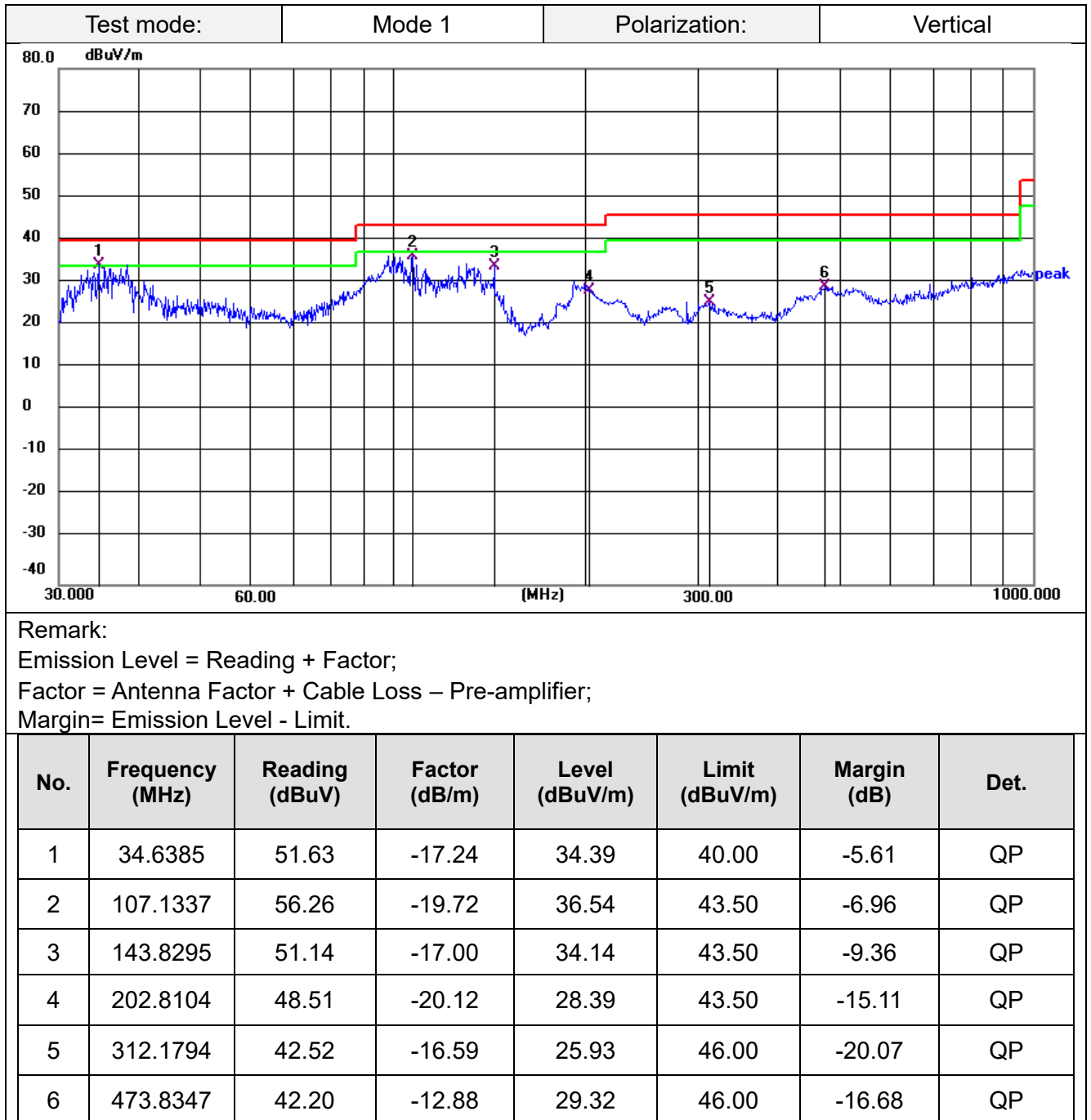
Remark:

Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	52.7600	39.29	-16.85	22.44	40.00	-17.56	QP
2	100.9339	52.53	-20.24	32.29	43.50	-11.21	QP
3	191.7450	51.34	-19.55	31.79	43.50	-11.71	QP
4	287.9904	49.03	-17.28	31.75	46.00	-14.25	QP
5	444.8514	43.88	-13.35	30.53	46.00	-15.47	QP
6	830.4002	37.49	-5.64	31.85	46.00	-14.15	QP



3.3 20dB Bandwidth

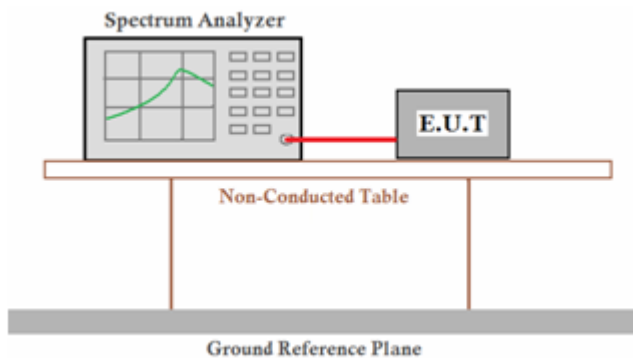
Limit

The 20dB bandwidth shall be less than 80% of the permitted frequency band.

Test Procedure

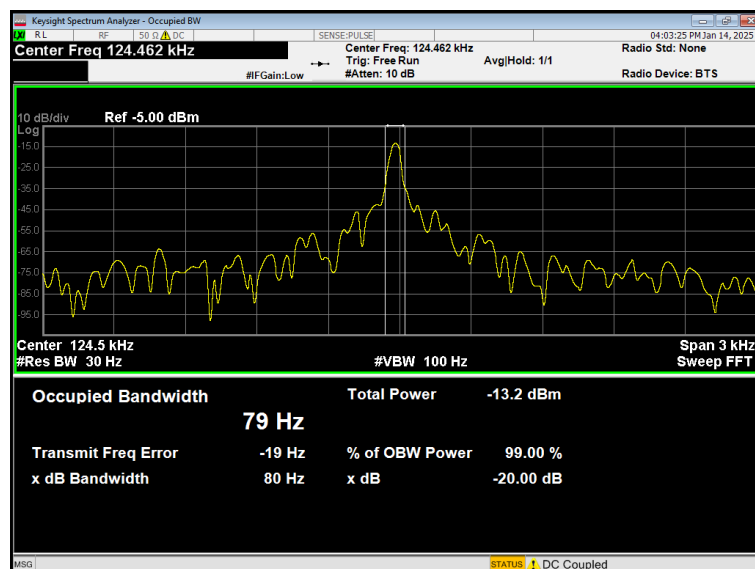
1. Set RBW = 30Hz.
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

Test setup



Test Results

Mode	Frequency (KHz)	20dB Bandwidth (KHz)	99% OBW (KHz)	Conclusion
Tx Mode	124.50	0.080	-	Pass
	360.00	0.163		Pass





3.4 Antenna Requirement

Standard Applicable

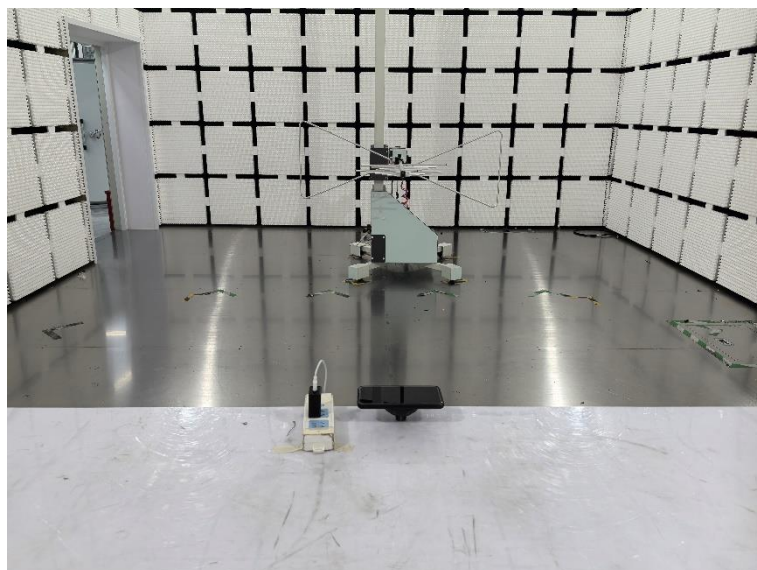
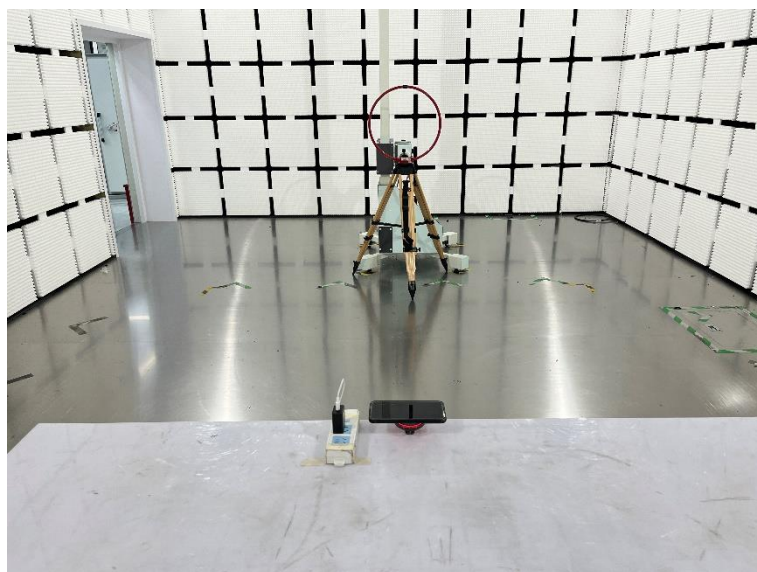
For intentional device, according to FCC 47 CFR Section 15.203:

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

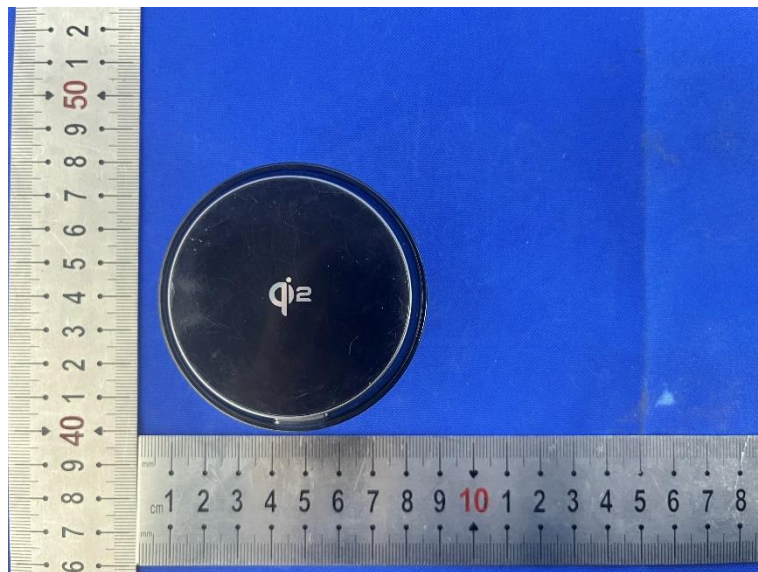
Confirmation

The EUT's antenna is an Inductive Loop coil Antenna, the best case gain of the antenna is 0dBi.

4 Test Setup Photographs of EUT

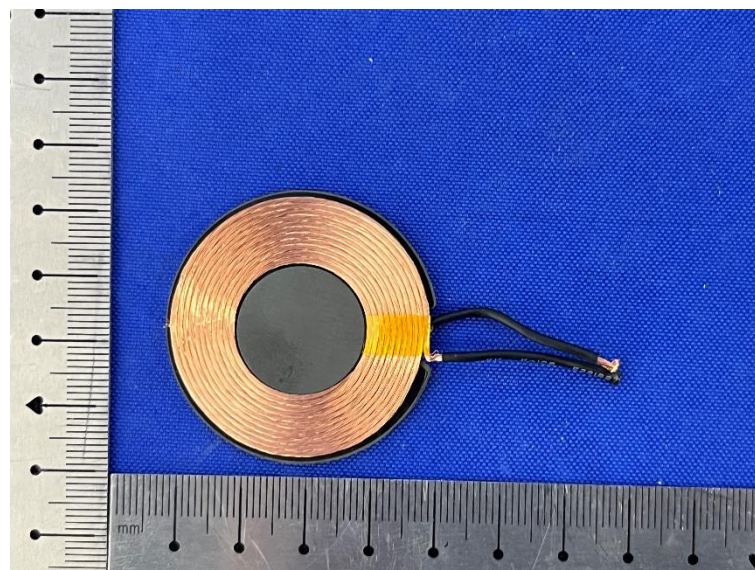
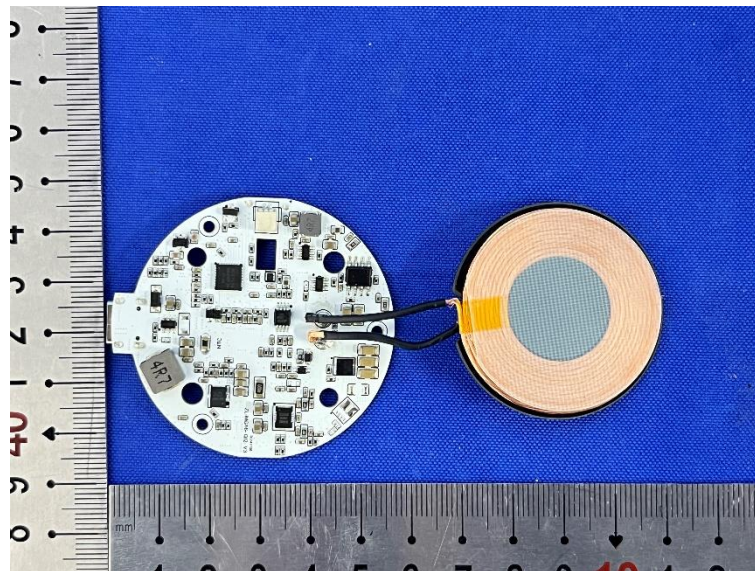
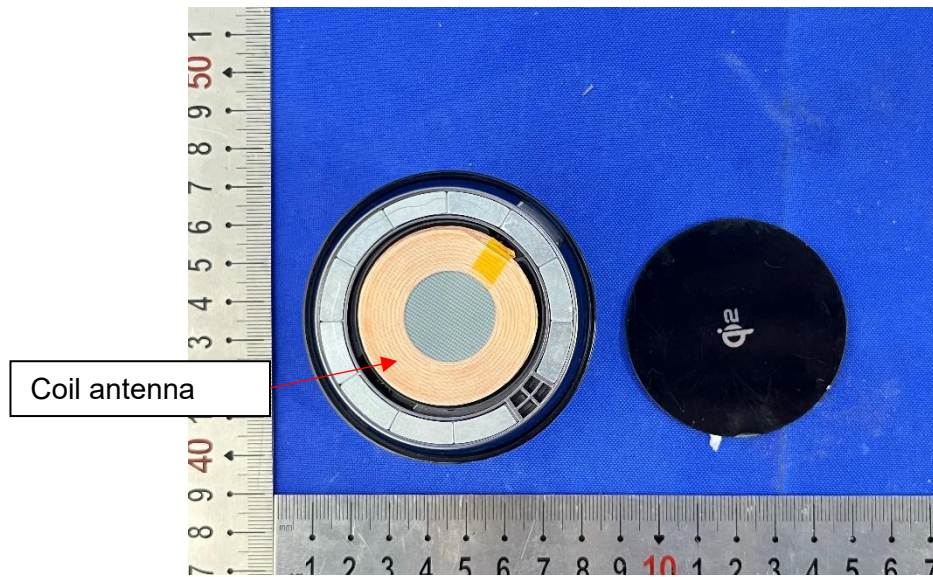


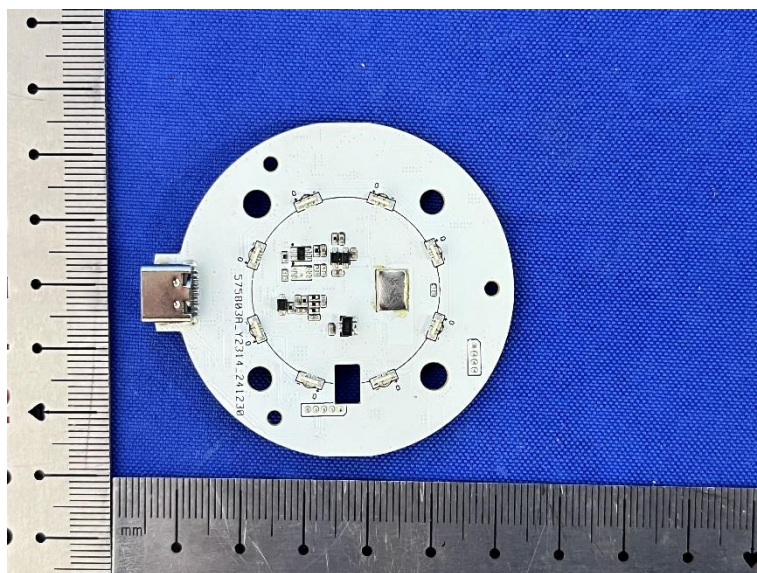
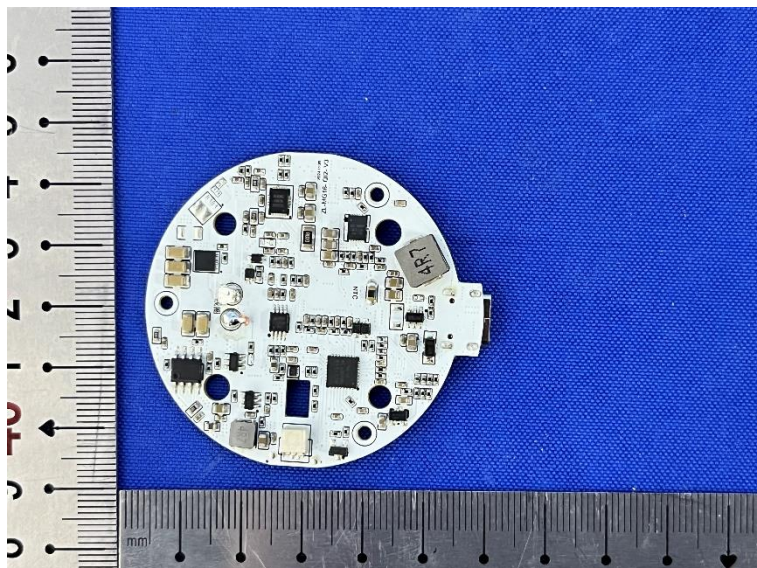
5 External Photographs of EUT





6 Internal Photographs of EUT





***** End of Report *****