TEST REPORT

Product Name	:	Magnetic Wireless Charger
Brand Name	:	N/A
Model	:	A18
Series Model	:	E6, E18, M18, W18
FCC ID	:	2AY5D-A18
Applicant	:	**Shenzhen USV Technology Co.,Ltd**
Address	:	4F, Building B20, Hengfeng Industrial City, Hangchen, Bao'an District, Shenzhen City, Guangdong Province, China
Manufacturer	:	**Shenzhen USV Technology Co.,Ltd**
Address	:	4F, Building B20, Hengfeng Industrial City, Hangchen, Bao'an District, Shenzhen City, Guangdong Province, China
Standard(s)	:	FCC CFR Title 47 Part 15 Subpart C
Date of Receipt	:	Nov. 07, 2024
Date of Test	:	Nov. 07, 2024 ~ Nov. 19, 2024
Issued Date	:	Nov. 20, 2024

Issued By: **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
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Approved by: Sean She
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Report Revise Record

Report Version	Issued Date	Notes
M1	Nov. 20, 2024	Initial Release

Contents

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	150KHz~30MHz ±1.20 dB	(1)
Radiated Emission	9KHz~30Hz ±3.10dB	(1)
Radiated Emission	9KHz~1GHz ±3.75dB	(1)
Radiated Emission	1GHz~18GHz ±3.88 dB	(1)
Radiated Emission	18GHz-40GHz ±3.88dB	(1)
RF power, conducted	30MHz~6GHz ±0.16dB	(1)
RF power density, conducted	±0.24dB	(1)
Spurious emissions, conducted	±0.21dB	(1)
Temperature	±1℃	(1)
Humidity	±3%	(1)
DC and low frequency voltages	±1.5%	(1)
Time	±2%	(1)
Duty cycle	±2%	(1)

The report uncertainty of measurement y ± U, where expended 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 GENGENERAL 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 Charger
Model/Type reference:	A18
Serial Model:	E6, E18, M18, W18
Power Supply:	Input: 5V/2A, 9V/3A Output: 15W/10W/7.5W/5W
Hardware version:	N/A
Software version:	N/A
Sample(s) Status:	AiTSZ-241107017-1(Normal sample) AiTSZ-241107017-2(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	CSKJLNA231016A	CSKJLNA231016A	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
16	Analog signal generator	Agilent	E8257	MY51554256	2024.09.25	2025.09.24
17	Spectrum Analyzer	Agilent	N9020A	MY51289843	2024.09.25	2025.09.24
18	Spectrum Analyzer	Agilent	N9020A	MY53421570	2024.09.25	2025.09.24
19	Power Sensor	Agilent	8481A	MY41097697	2024.09.25	2025.09.24
20	Wideband Radio communication tester	R&S	CMW500	1201.0002K50	2024.09.24	2025.09.23
21	DC power supply	ZHAOXIN	RXN-305D-2	28070002559	N/A	N/A
22	RE Software	EZ	EZ-EMC_RE	Ver.AIT-03A	N/A	N/A
23	CE Software	EZ	EZ-EMC_CE	Ver.AIT-03A	N/A	N/A
24	RF Software	TST	TSTPASS	Version 2.0	N/A	N/A
25	RF Software	cesheng	WCS-WCN	Version 2024.6.20	N/A	N/A
26	temporary antenna connector(Note)	NTS	R001	N/A	N/A	N/A
Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.						

3 TEST CONDITIONS AND RESULTS

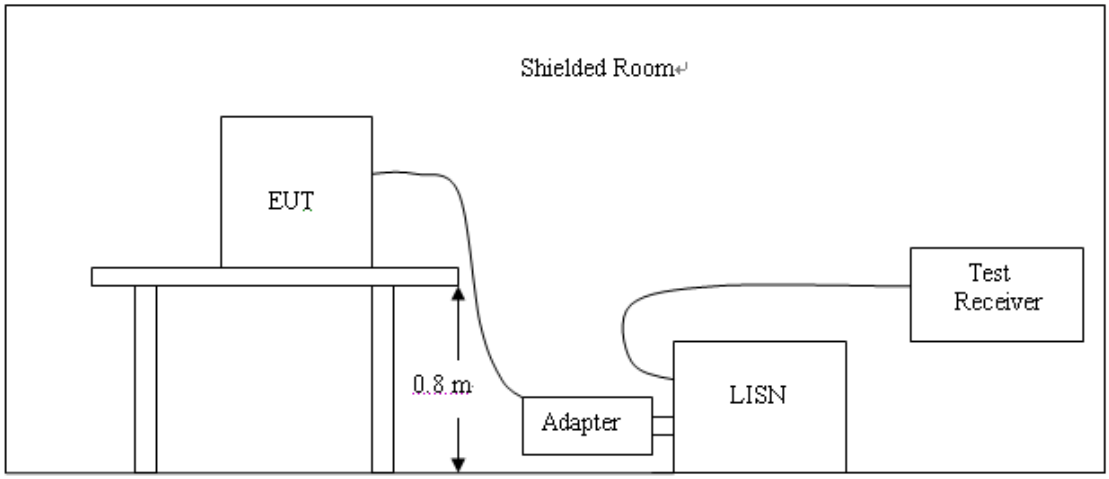
3.1 Conducted Emissions Test

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.

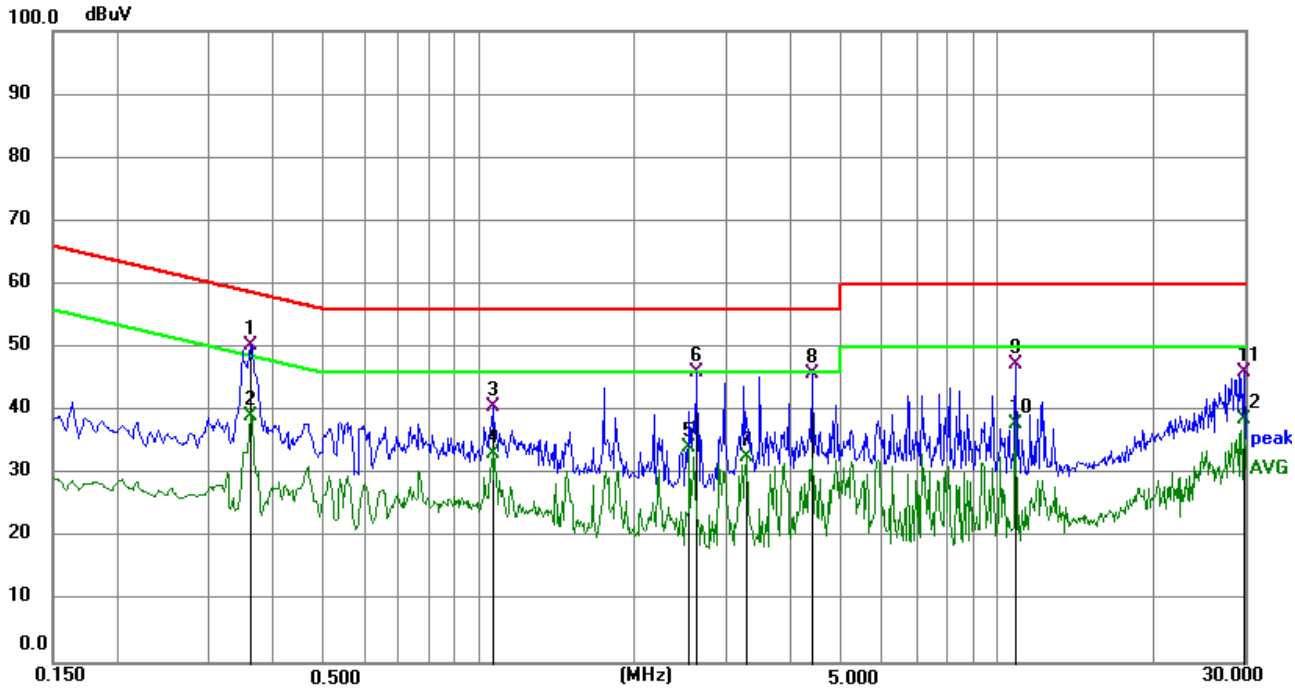
TEST RESULTS

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:

Test Mode	Mode 1	Line:	L

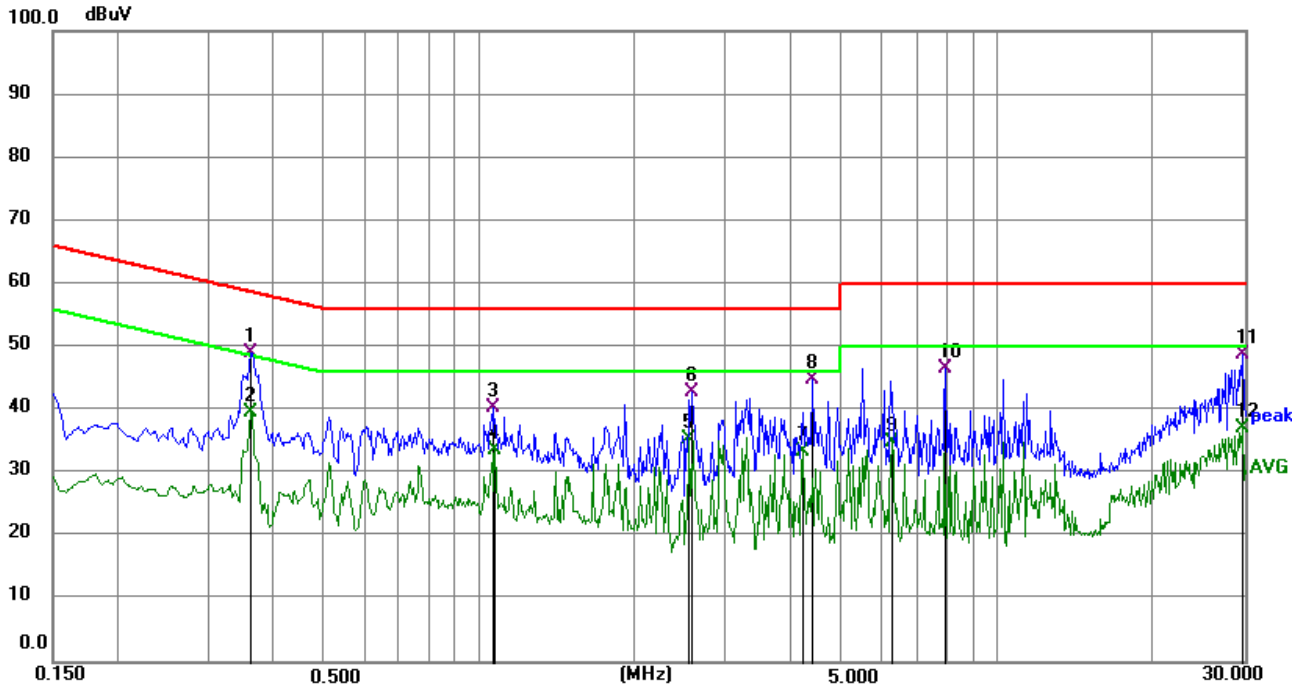


Remark: Correct Factor = Insertion loss of LISN + Cable loss + Insertion loss of Pulse Limiter;
Measurement Result = Reading Level +Correct Factor;

Margin = Measurement Result- Limit

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.3613	39.60	10.69	50.29	58.70	-8.41	QP
2	0.3613	28.34	10.69	39.03	48.70	-9.67	AVG
3	1.0633	29.90	10.66	40.56	56.00	-15.44	QP
4	1.0633	22.40	10.66	33.06	46.00	-12.94	AVG
5	2.5530	23.42	10.79	34.21	46.00	-11.79	AVG
6	2.6295	35.27	10.79	46.06	56.00	-9.94	QP
7	3.2865	21.72	10.87	32.59	46.00	-13.41	AVG
8	4.4024	34.74	11.01	45.75	56.00	-10.25	QP
9	10.8643	36.08	11.16	47.24	60.00	-12.76	QP
10	10.8643	26.73	11.16	37.89	50.00	-12.11	AVG
11	29.9130	34.34	11.75	46.09	60.00	-13.91	QP
12	29.9130	26.77	11.75	38.52	50.00	-11.48	AVG

Test Mode	Mode 1	Line:	N



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	38.27	10.68	48.95	58.70	-9.75	QP
2	0.3613	28.99	10.68	39.67	48.70	-9.03	AVG
3	1.0633	29.61	10.65	40.26	56.00	-15.74	QP
4	1.0725	22.98	10.65	33.63	46.00	-12.37	AVG
5	2.5530	24.64	10.79	35.43	46.00	-10.57	AVG
6	2.5754	31.98	10.79	42.77	56.00	-13.23	QP
7	4.2225	22.39	11.00	33.39	46.00	-12.61	AVG
8	4.4024	33.84	11.00	44.84	56.00	-11.16	QP
9	6.2655	23.96	11.01	34.97	50.00	-15.03	AVG
10	7.9485	35.45	11.04	46.49	60.00	-13.51	QP
11	29.7870	37.05	11.62	48.67	60.00	-11.33	QP
12	29.7870	25.38	11.62	37.00	50.00	-13.00	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.

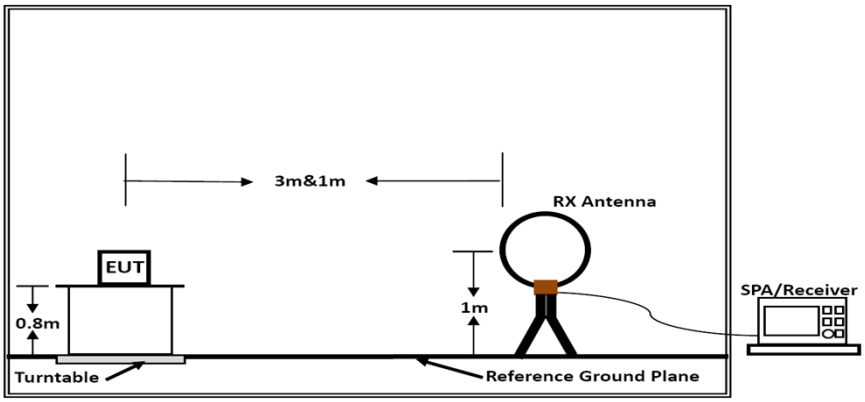
In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

Radiated emission limits

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
0.009-0.49	3	20log(2400/F(KHz))+40log(300/3)	2400/F(KHz)
0.49-1.705	3	20log(24000/F(KHz))+ 40log(30/3)	24000/F(KHz)
1.705-30	3	20log(30)+ 40log(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

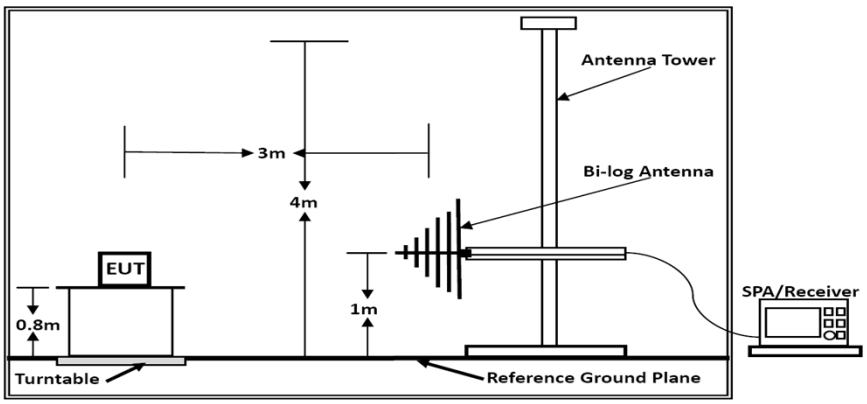
TEST CONFIGURATION

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



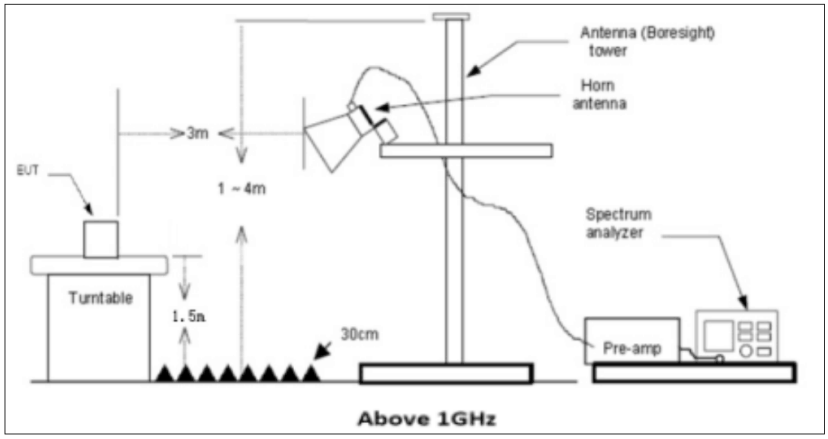
Below 30MHz

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



Below 1GHz

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



Test Procedure

1. 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.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0℃ to 360℃ to acquire the highest emissions from EUT
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.
5. Radiated emission test frequency band from 9KHz to 1000MHz.
6. 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

7. 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

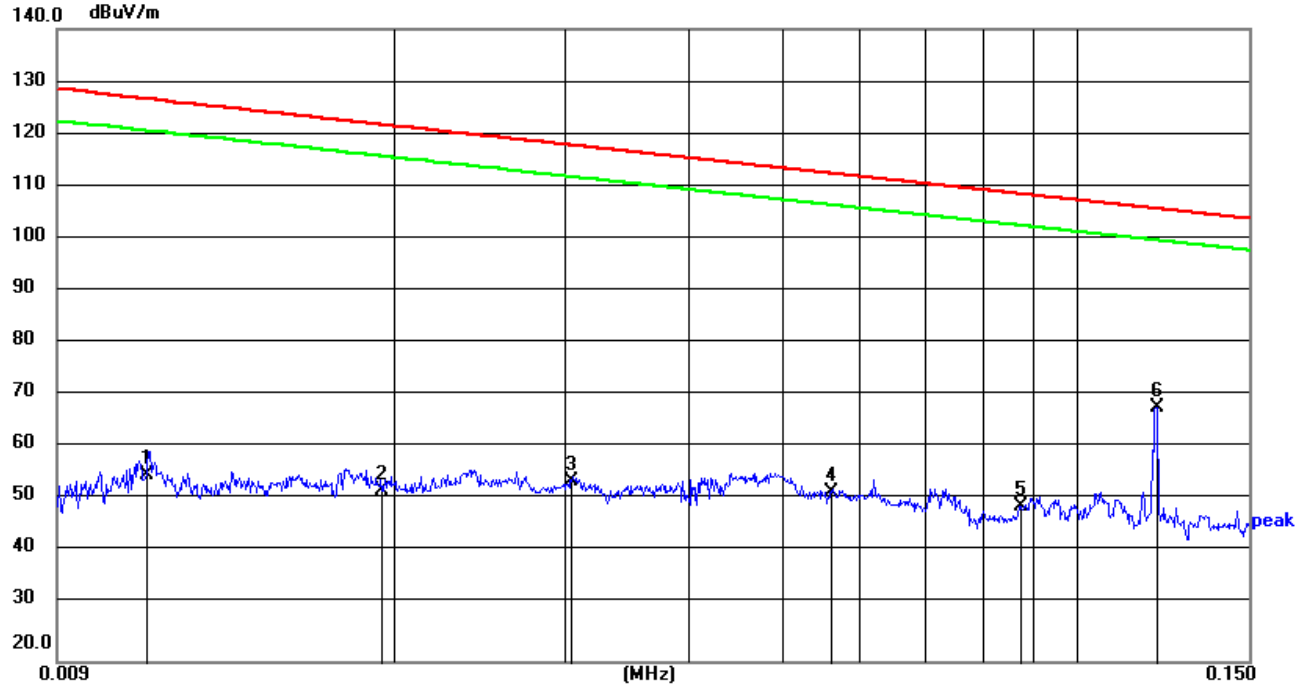
TEST RESULTS

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

For 9KHz-150KHz

(Phone Frequency:110-205KHz)

Test mode:	Mode 1



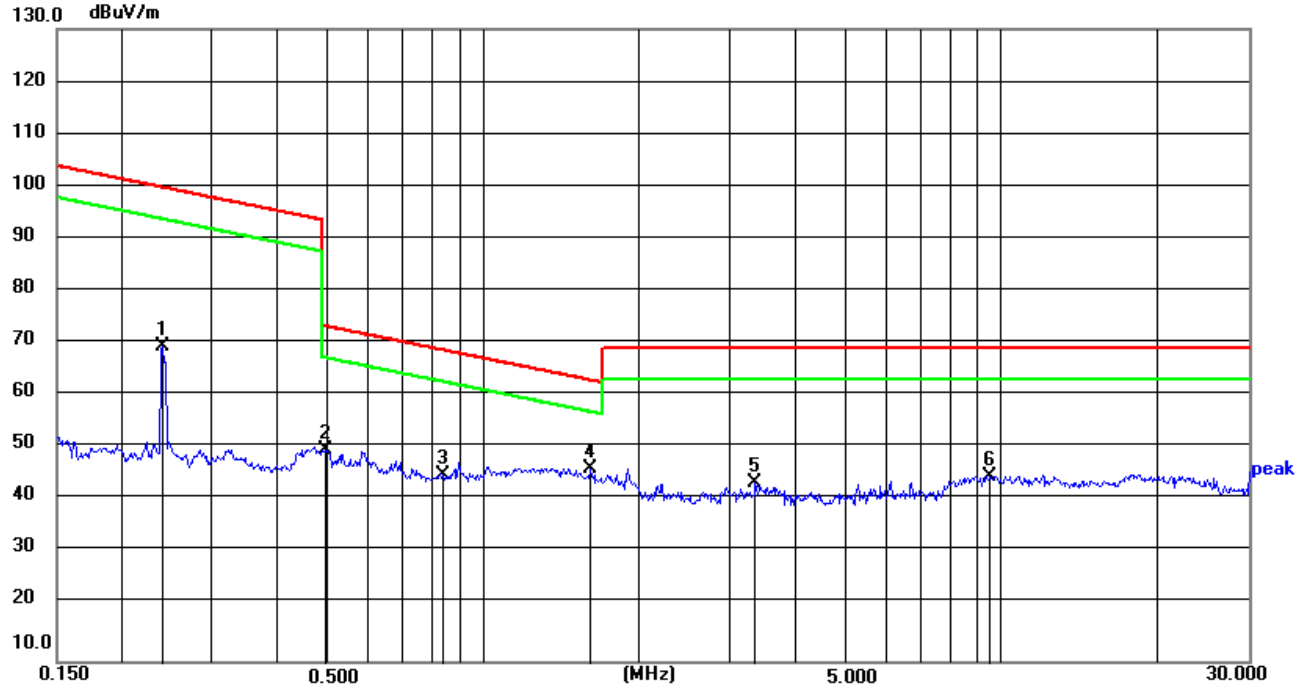
Remark:
Emission Level = Reading + Factor;
Factor = Antenna Factor + Cable Loss;
Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	0.0111	34.25	21.36	55.61	126.70	-71.09	QP
2	0.0194	31.82	20.84	52.66	121.85	-69.19	QP
3	0.0303	32.81	21.42	54.23	117.98	-63.75	QP
4	0.0560	29.74	22.62	52.36	112.64	-60.28	QP
5	0.0874	26.89	22.59	49.48	108.77	-59.29	QP
6	0.1207	46.08	22.19	68.27	105.97	-37.70	QP

For 150KHz-30MHz

(Phone Frequency:110-205KHz)

Test mode:	Mode 1



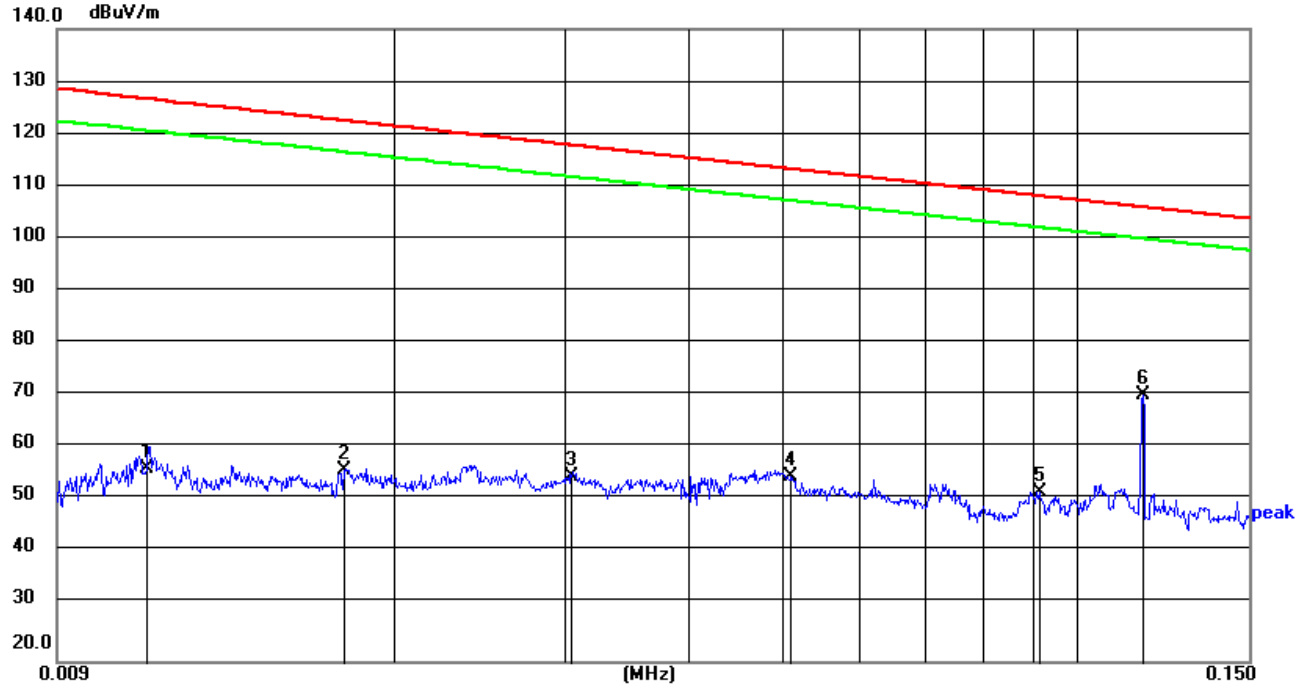
Remark:
Emission Level = Reading + Factor;
Factor = Antenna Factor + Cable Loss;
Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	0.2403	48.29	21.45	69.74	99.99	-30.25	QP
2	0.4964	28.42	21.79	50.21	73.69	-23.48	QP
3	0.8346	23.09	22.53	45.62	69.17	-23.55	QP
4	1.6104	24.32	22.48	46.80	63.47	-16.67	QP
5	3.3456	21.17	22.70	43.87	69.54	-25.67	QP
6	9.5014	22.67	22.67	45.34	69.54	-24.20	QP

For 9KHz-150KHz

(Phone Frequency:360KHz)

Test mode:	Mode 1



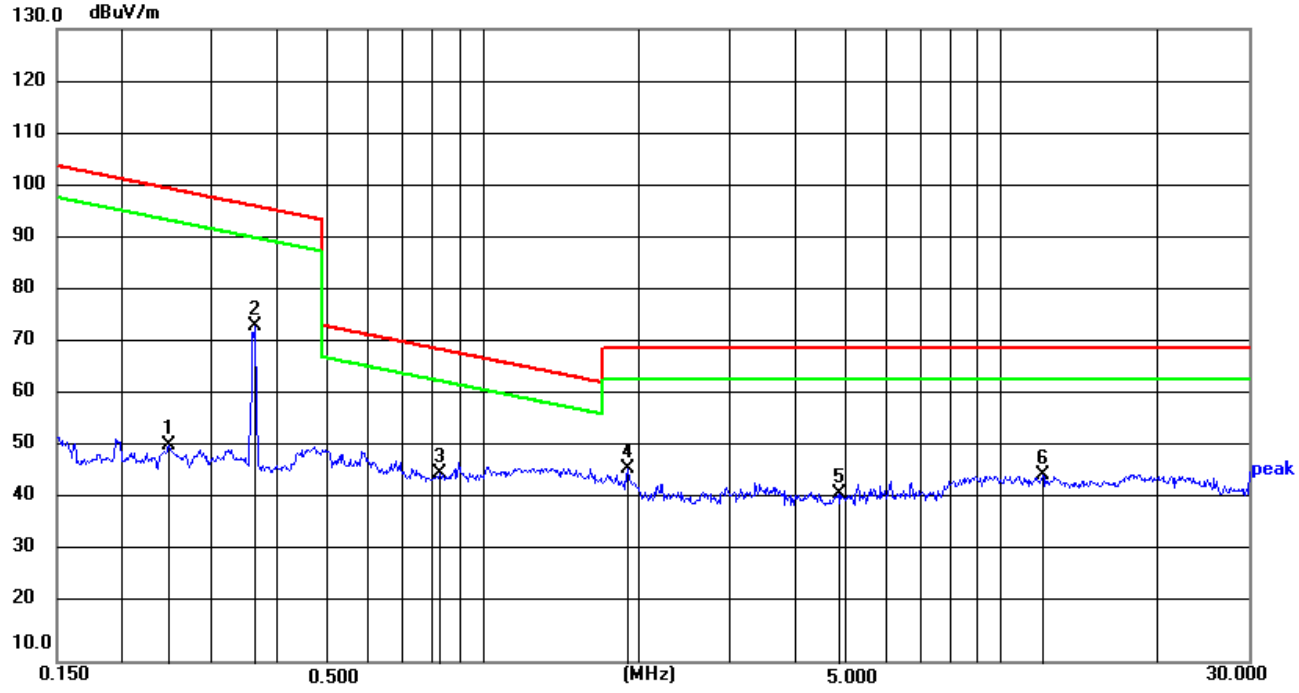
Remark:
Emission Level = Reading + Factor;
Factor = Antenna Factor + Cable Loss;
Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	0.0111	35.25	21.36	56.61	126.70	-70.09	QP
2	0.0177	35.39	20.94	56.33	122.65	-66.32	QP
3	0.0303	33.81	21.42	55.23	117.98	-62.75	QP
4	0.0510	32.71	22.60	55.31	113.45	-58.14	QP
5	0.0913	29.70	22.53	52.23	108.39	-56.16	QP
6	0.1165	48.49	22.23	70.72	106.28	-35.56	QP

For 150KHz-30MHz

(Phone Frequency:360KHz)

Test mode:	Mode 1

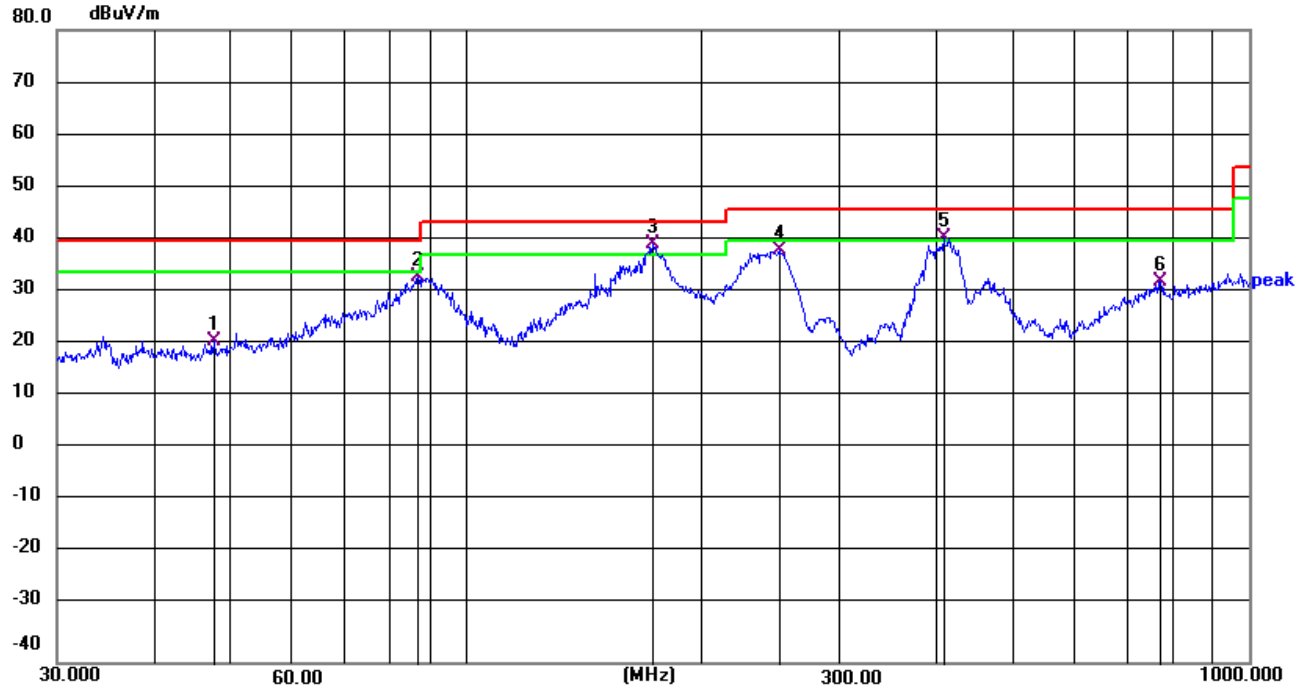


Remark:
Emission Level = Reading + Factor;
Factor = Antenna Factor + Cable Loss;
Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	0.2467	29.79	21.42	51.21	99.76	-48.55	QP
2	0.3613	52.00	21.58	73.58	96.45	-22.87	QP
3	0.8215	23.13	22.53	45.66	69.31	-23.65	QP
4	1.8980	24.18	22.42	46.60	69.54	-22.94	QP
5	4.8480	18.57	23.24	41.81	69.54	-27.73	QP
6	11.9961	22.42	23.00	45.42	69.54	-24.12	QP

For 30MHz-1GHz

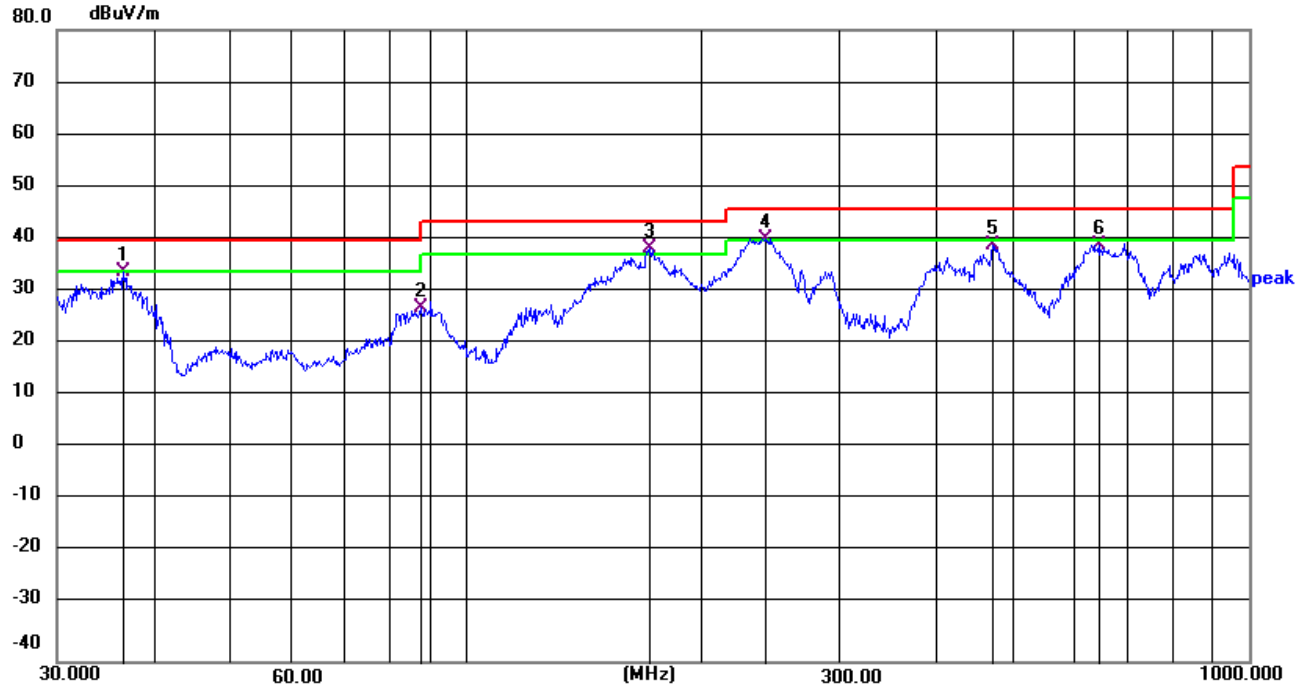
Test mode:	Mode 1	Polarization:	Horizontal



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	47.6584	37.73	-16.64	21.09	40.00	-18.91	QP
2	86.8067	54.13	-20.97	33.16	40.00	-6.84	QP
3	173.2050	56.79	-17.31	39.48	43.50	-4.02	QP
4	251.1804	56.73	-18.53	38.20	46.00	-7.80	QP
5	407.5144	54.95	-14.37	40.58	46.00	-5.42	QP
6	771.4485	38.89	-6.49	32.40	46.00	-13.60	QP

Test mode:	Mode 1	Polarization:	Vertical



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	36.5092	50.97	-16.98	33.99	40.00	-6.01	QP
2	87.4176	48.27	-20.98	27.29	40.00	-12.71	QP
3	171.3925	55.60	-17.04	38.56	43.50	-4.94	QP
4	241.6763	59.31	-18.82	40.49	46.00	-5.51	QP
5	470.5232	51.95	-12.93	39.02	46.00	-6.98	QP
6	642.8612	48.20	-8.95	39.25	46.00	-6.75	QP

3.3 20dB Bandwidth

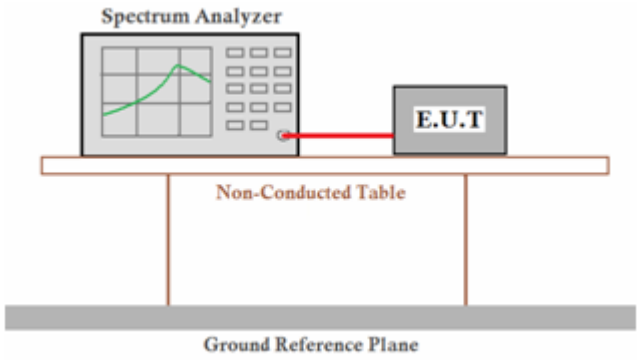
Limit

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

Test Procedure

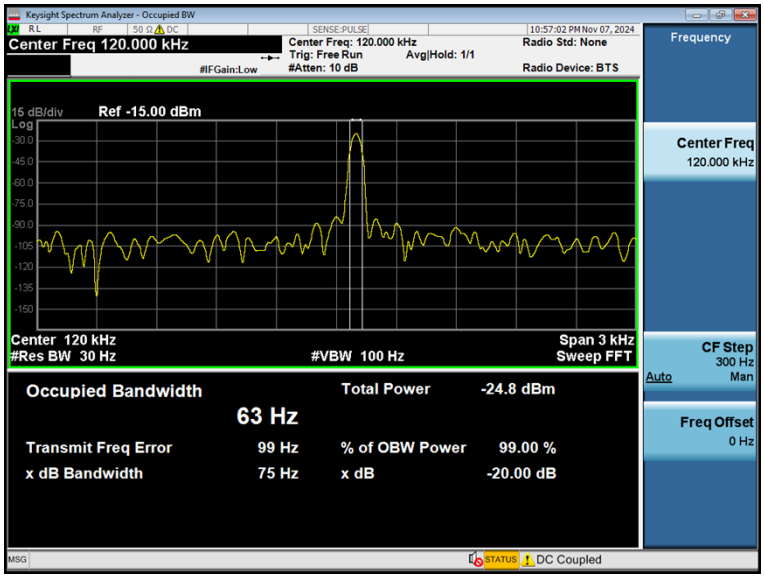
1. Set RBW = 30Hz.
2. Set the video bandwidth (VBW) ≥ 3 x RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points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

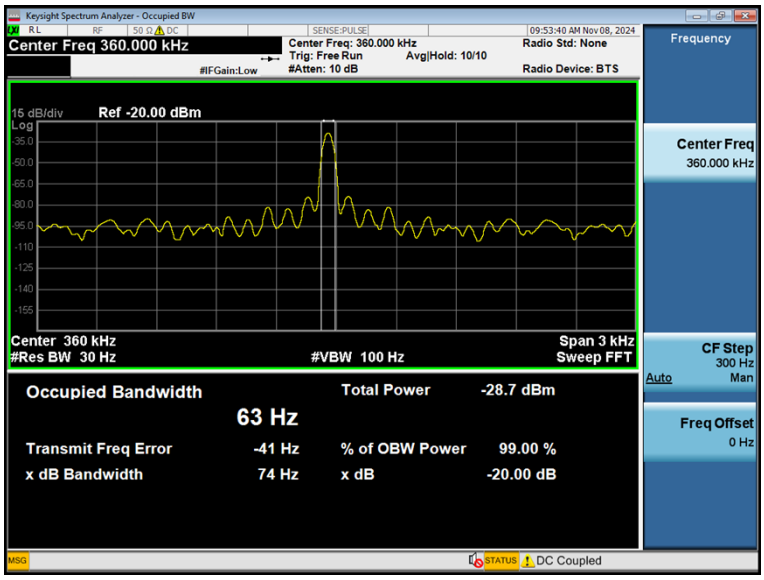
Test setup



Test Results

Mode	Frequency (KHz)	20dB Bandwidth (KHz)	99% OBW (KHz)	Conclusion
Tx Mode	120.0	0.075	-	Pass
	360.0	0.074		Pass




Keysight Spectrum Analyzer - Occupied BW
Center Freq 360.000 kHz
Center Freq: 360.000 kHz
Trig: Free Run
Avg|Hold: 10/10
#Atten: 10 dB
Radio Std: None
Radio Device: BTS
09:53:40 AM Nov 08, 2024
Frequency
Ref -20.00 dBm
Center 360 kHz
#Res BW 30 Hz
#VBW 100 Hz
Span 3 kHz
Sweep FFT
Occupied Bandwidth
63 Hz
Total Power -28.7 dBm
Transmit Freq Error -41 Hz
% of OBW Power 99.00 %
x dB Bandwidth 74 Hz
x dB -20.00 dB
Center Freq
360.000 kHz
CF Step
300 Hz
Auto Man
Freq Offset
0 Hz
DC Coupled

3.4 Antenna Requirement

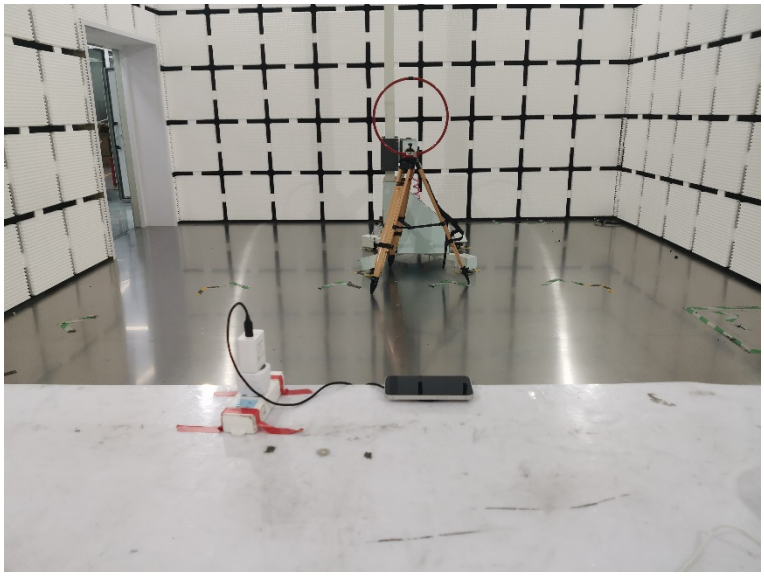
Standard Applicable

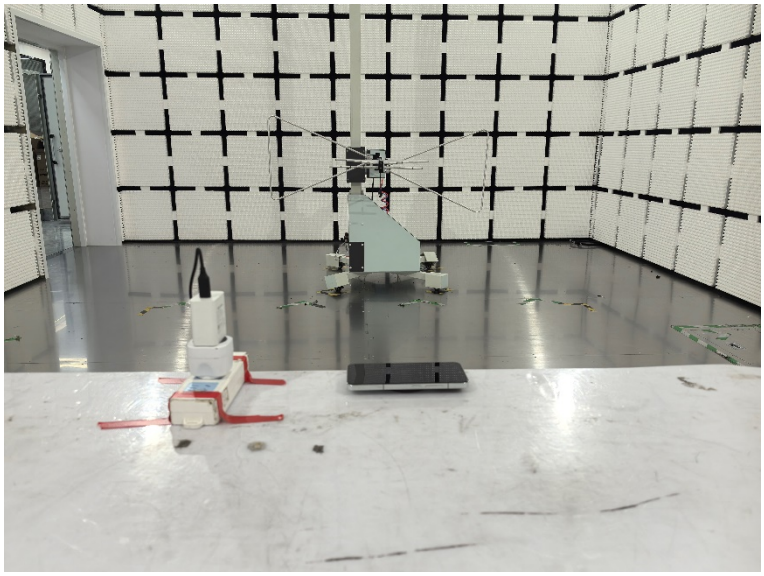
For intentional device, according to FCC 47 CFR Section 15.203:
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling 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

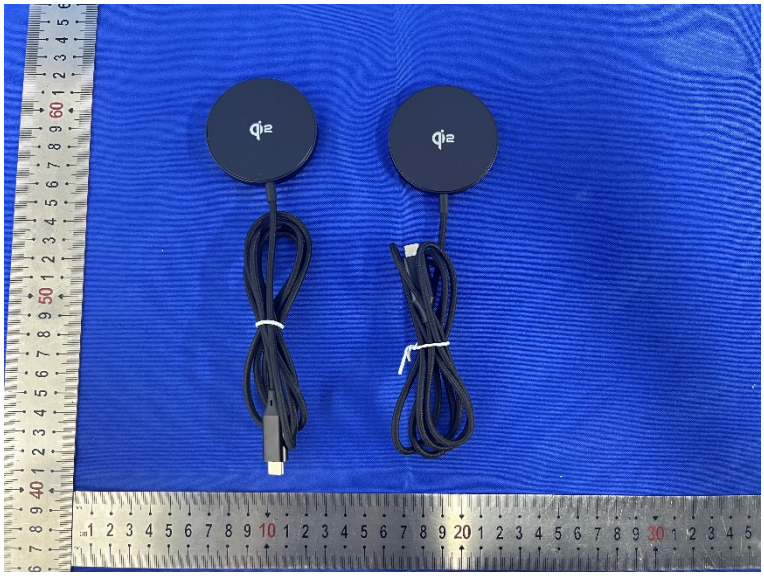
The EUT's antenna is an Inductive Loop coil Antenna, the best case gain of the antenna is 0dBi.

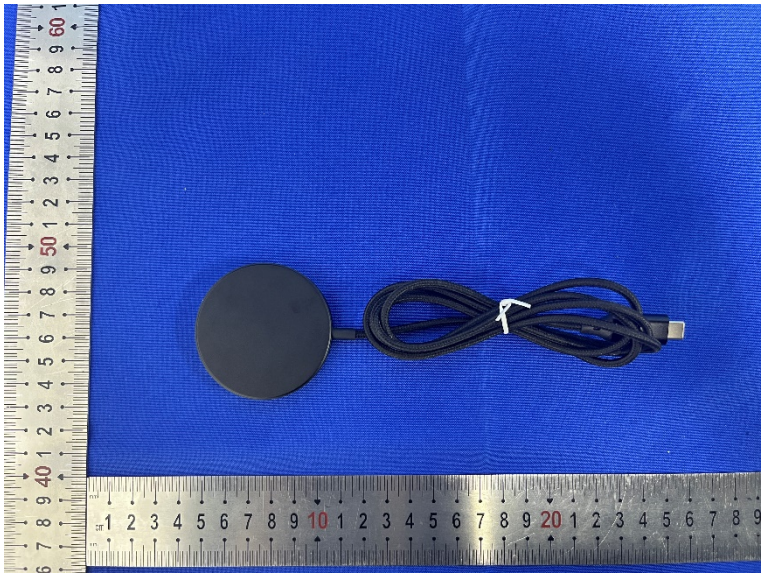
4 Test Setup Photographs of EUT

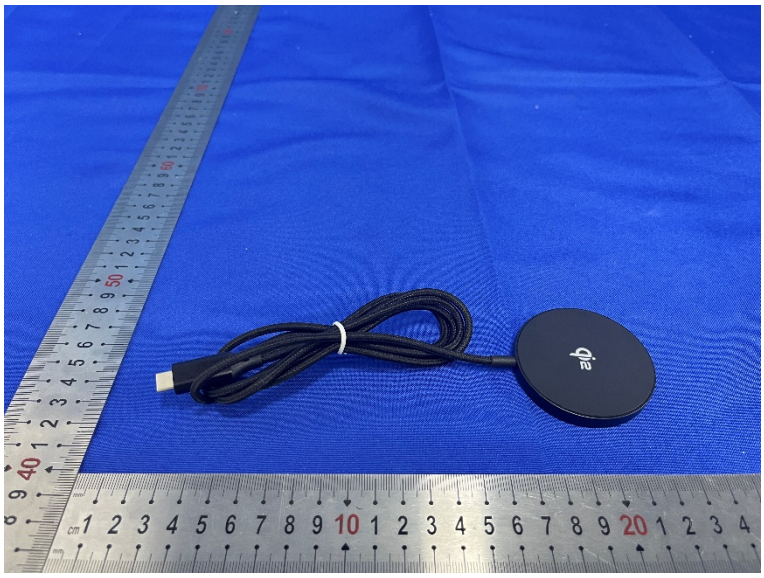


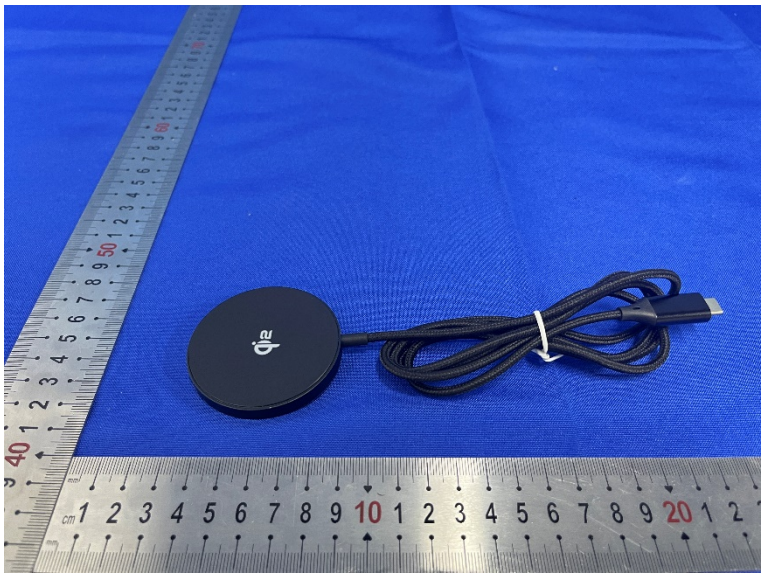


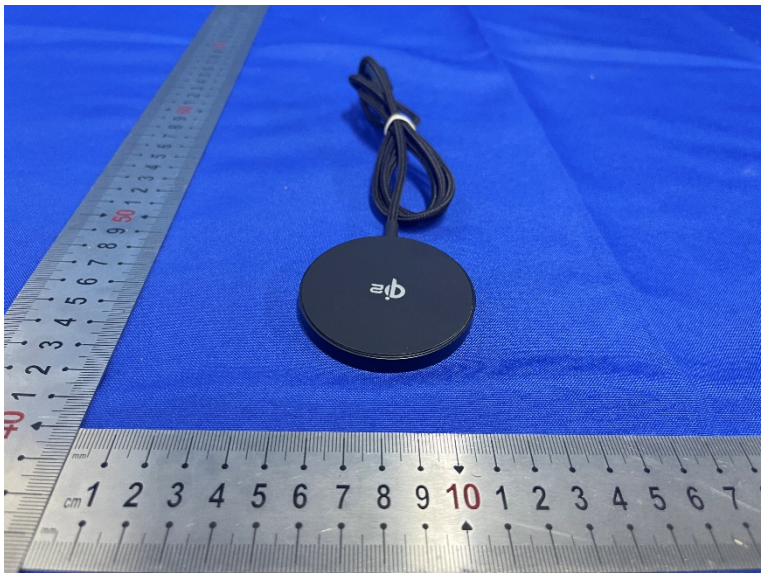
5 External Photographs of EUT

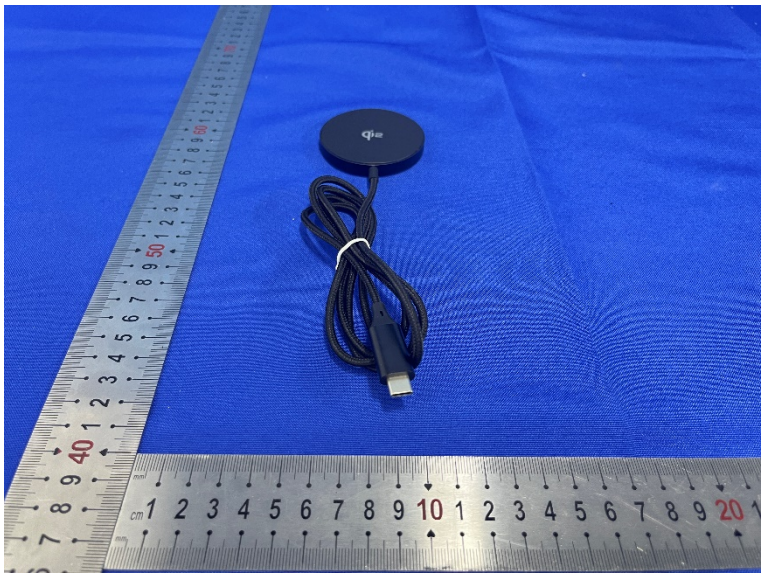




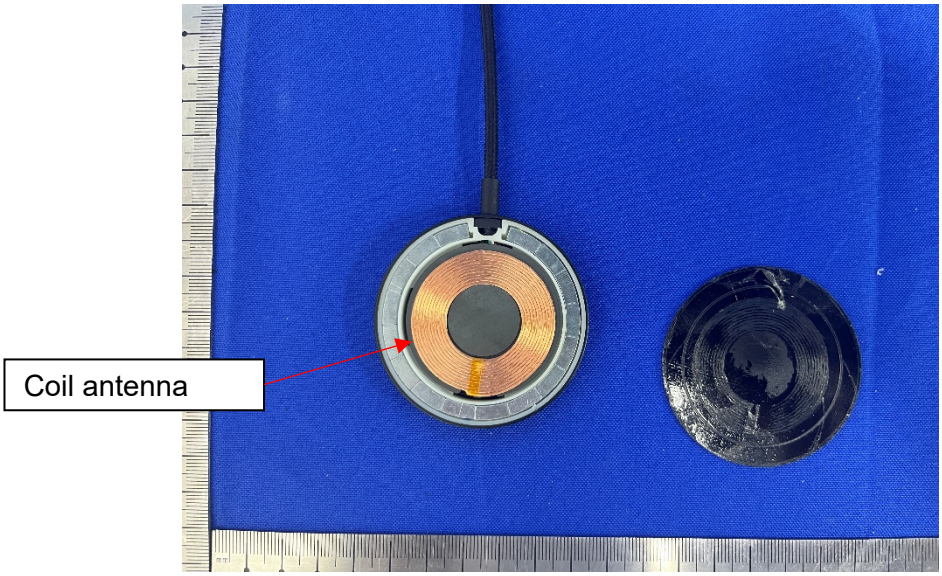


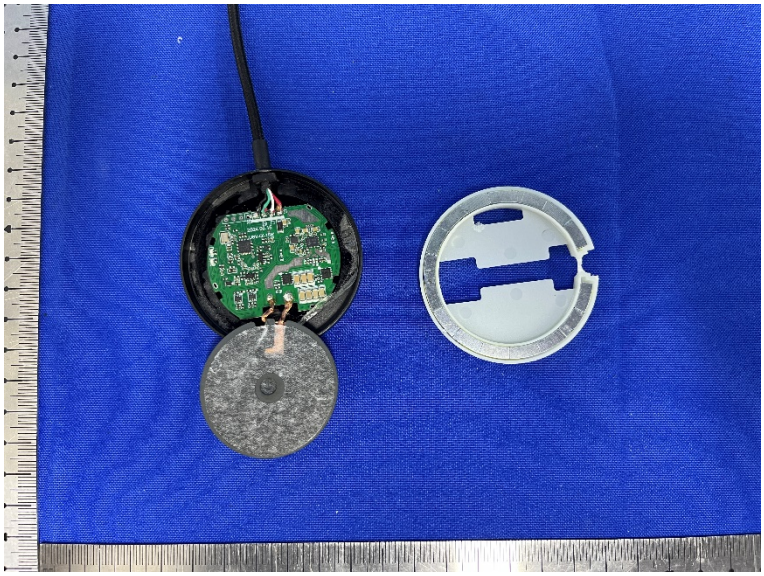


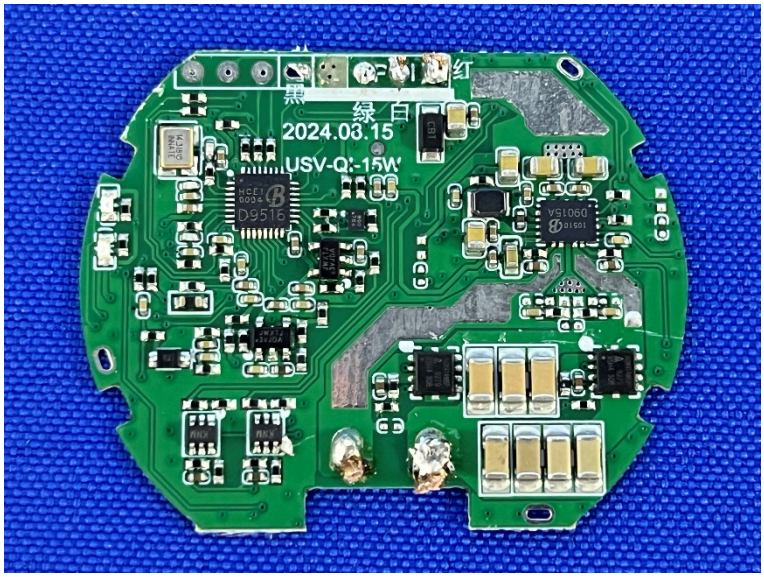


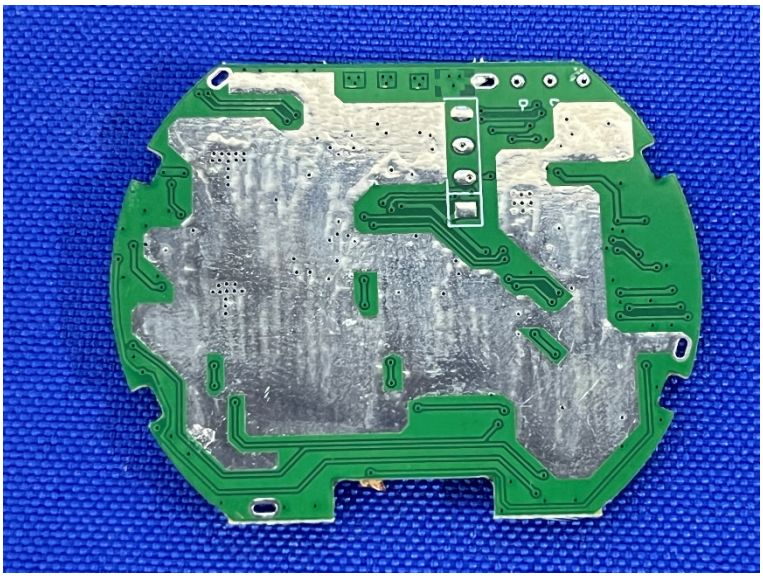


6 Internal Photographs of EUT









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