



TEST REPORT

Report No.:	BCTC2407539968-1E
Applicant:	Ugreen Group Limited
Product Name:	2-in-1 Magnetic Wireless Charger
Test Model:	W709
Tested Date:	2024-07-15 to 2024-08-05
Issued Date:	2024-08-05
She	enzhen BCTC Testing Co., Ltd.
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FCC ID:2AQI5-W709

Product Name:	2-in-1 Magnetic Wireless Charger				
Trademark:	UGREEN				
Model/Type Reference:	W709				
Prepared For:	Ugreen Group Limited				
Address:	Ugreen Building, Longcheng Industrial Park, Longguanxi Road, Longhua, ShenZhen, China				
Manufacturer:	Ugreen Group Limited				
Address:	Ugreen Building, Longcheng Industrial Park, Longguanxi Road, Longhua, ShenZhen, China				
Prepared By:	Shenzhen BCTC Testing Co., Ltd.				
Address:	1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Zhancheng, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China				
Sample Received Date:	2024-07-15				
Sample Tested Date:	2024-07-15 to 2024-08-05				
Issue Date:	2024-08-05				
Report No.:	BCTC2407539968-1E				
Test Standards:	FCC Part15.209 ANSI C63.10-2013				
Test Results:	PASS				

Tested by:

kelsey Ton

Kelsey Tan/ Project Handler

Approved by:

Zero Zhou/Reviewer

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(Note: N/A Means Not Applicable)

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1. Version

Report No. Issue Date		Description	Approved	
BCTC2407539968-1E	2024-08-05	Original	Valid	





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2. Test Summary

The Product has been tested according to the following specifications:

No.	Test Parameter	Clause No.	Results
1	Conducted Emission	15.207	PASS
2	Radiated Emission	15.209	PASS
3	20dB Bandwidth	15.215	PASS
4	Antenna Requirement	15.203	PASS

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3. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

No.	Item	Uncertainty
1	3m chamber Radiated spurious emission(30MHz-1GHz)	U=4.3dB
2	Conducted Emission (150kHz-30MHz)	U=3.2dB
3	humidity uncertainty	U=5.3%
4	Temperature uncertainty	U=0.59°C

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4. Product Information And Test Setup

4.1 Product Information

Model/Type Reference:	W709
P/N code Differences:	All the P/N code and test models are the same circuit and RF module, except for the appearance color and sales platform.
Hardware Version:	V1.0
Software Version:	V1.0
Operation Frequency:	Airpods: 5W:112kHz-148.5kHz Phone:5W+7.5W:112kHz-148.5kHz 15W:360kHz
Modulation:	FSK
Antenna installation:	loop coil antenna
Ratings:	USB-C1(IN)Input: 5.0V3.0A/9.0V3.0A/12.0V2.5A Output: 20.0W Max (iPhone: 15.0W, AirPods: 5.0W) USB-C2 (0UT) Output: 5.0V1.0A 5.0W Max Total Output Power: 25.0W Max
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Remark:

- P/N code in the below table, for marketing purpose, will be marked on the marking plate.

35569	35569P	35569X	35569A	35569B	35569U	35569JP	35569ZD
45775	45775P	45775X	45775A	45775B	45775U	45775JP	45775ZD

4.2 Support Equipment

No.	Device Type	Brand	Model	Series No.	Note
E-1	2-in-1 Magnetic Wireless Charger	UGREEN	W709	N/A	EUT
E-2	Adapter	UGREEN	CD289	N/A	Auxiliary
E-3	Dummy load	N/A •••••	DL01	N/A	Auxiliary
E-4	Wireless earphone	N/A	ZA01	N/A	Auxiliary

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

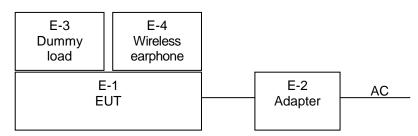
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.



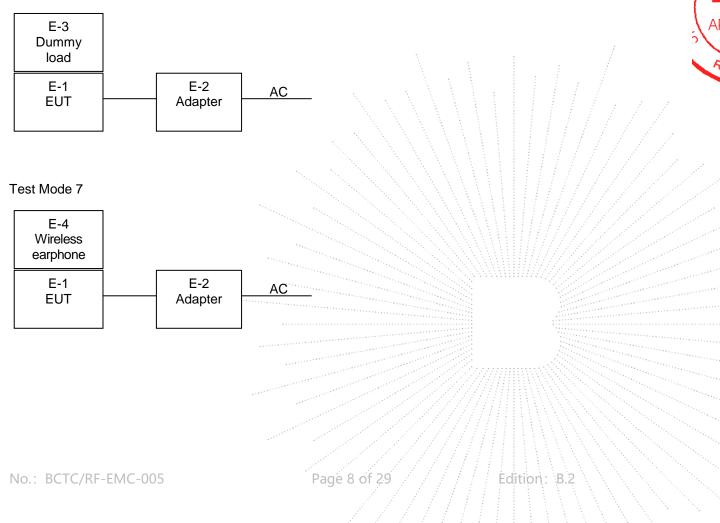
4.3 Test Setup Configuration

See test photographs attached in *EUT TEST SETUP PHOTOGRAPHS* for the actual connections between Product and support equipment.

Conducted Emission & Radiated Spurious Emission: Test Mode 1-3



Test Mode 4-6





4.4 Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

	Mode 1	iPhone:15W+ AirPods:5W
	Mode 2	iPhone:7.5W+ AirPods:5W
	Mode 3	iPhone:5W+ AirPods:5W
AC Mode	Mode 4	iPhone:15W
	Mode 5	iPhone:7.5W
	Mode 6	iPhone:5W
	Mode 7	AirPods:5W

Note: All test mode were tested and passed, only shows the worst case mode which were recorded in this report.



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5. Test Facility And Test Instrument Used

5.1 Test Facility

All measurement facilities used to collect the measurement data are located at Shenzhen BCTC Testing Co., Ltd. Address:1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Zhancheng, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards. FCC Test Firm Registration Number: 712850

A2LA certificate registration number is: CN1212

ISED Registered No.: 23583

ISED CAB identifier: CN0017

5.2 Test Instrument Used

Conducted Emissions Test						
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.	
Receiver	R&S	ESR3	102075	May 16, 2024	May 15, 2025	
LISN	R&S	ENV216	101375	May 16, 2024	May 15, 2025	
Software	Frad	EZ-EMC	EMC-CON 3A1	١	١	
Pulse limiter	Schwarzbeck	VTSD9561-F	01323	May 16, 2024	May 15, 2025	

RF Conducted Test						
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.	
Power Meter	Keysight	E4419	<i>I</i>	May 16, 2024	May 15, 2025	
Power Sensor (AV)	Keysight	E9300A		May 16, 2024	May 15, 2025	
Signal Analyzer 20kHz-26.5G Hz	Keysight	N9020A	MY49100060	May 16, 2024	May 15, 2025	
Spectrum Analyzer 9kHz-40GHz	R&S	FSP 40	· · · · · · · · · · · · · · · · · · ·	May 16, 2024	May 15, 2025	



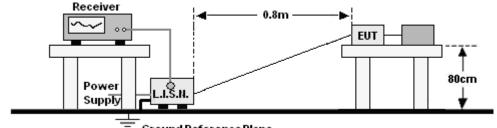
Radiated Emissions Test (966 Chamber01)						
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.	
966 chamber	ChengYu	966 Room	966	May 16, 2024	May 15, 2025	
Receiver	R&S	ESR3	102075	May 16, 2024	May 15, 2025	
Receiver	R&S	ESRP	101154	May 16, 2024	May 15, 2025	
Amplifier	Schwarzbeck	BBV9744	9744-0037	May 16, 2024	May 15, 2025	
TRILOG Broadband Antenna	Schwarzbeck	VULB9163	942	May 21, 2024	May 20, 2025	
Loop Antenna(9KHz -30MHz)	Schwarzbeck	FMZB1519B	00014	May 21, 2024	May 20, 2025	
Amplifier	SKET	LAPA_01G1 8G-45dB	SK202104090 1	May 16, 2024	May 15, 2025	
Horn Antenna	Schwarzbeck	BBHA9120D	1541	May 21, 2024	May 20, 2025	
Amplifier(18G Hz-40GHz)	MITEQ	TTA1840-35- HG	2034381	May 16, 2024	May 15, 2025	
Horn Antenn(18GH z-40GHz)	Schwarzbeck	BBHA9170	00822	May 21, 2024	May 20, 2025	
Spectrum Analyzer9kHz- 40GHz	R&S	FSP40	100363	May 16, 2024	May 15, 2025	
Software	Frad	EZ-EMC	FA-03A2 RE	\	\	

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6. Conducted Emissions

6.1 Block Diagram Of Test Setup



Ground Reference Plane

6.2 Limit

	Limit	(dBuV)
Frequency (MHz)	Quas-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Notes:

1. *Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

6.3 Test procedure

Receiver Parameters	Setting		
Attenuation	10 dB		
Start Frequency	0.15 MHz		
Stop Frequency	30 MHz		
IF Bandwidth	9 kHz		

a. The Product was placed on a nonconductive table 0.8 m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).

b. The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.

c. For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

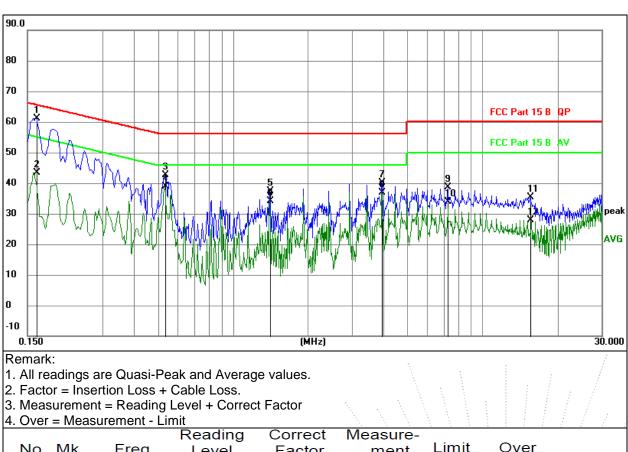
6.4 EUT operating Conditions

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.



6.5 Test Result

Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	L
Test Mode:	Mode 2(The worst mode)	Test Voltage:	AC 120V/60Hz



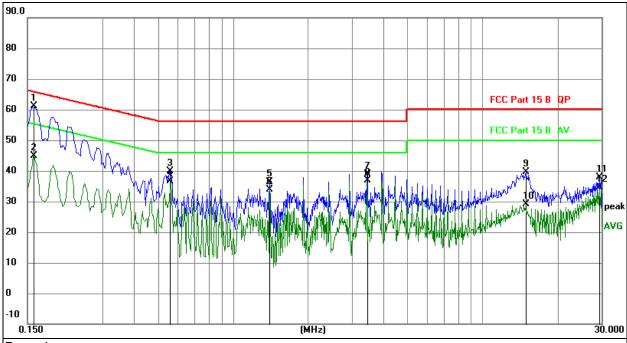
No. M	k. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	MHz	20101	dB	dBuV	dBuV	dB	Detector
1 *	0.1635	41.12	20.07	61.19	65.28	-4.09	QP
· · · ·	0.1055	41.12	20.07	01.15	05.20	-4.03	
2	0.1635	23.35	20.07	43.42	55.28	-11.86	AVG
3	0.5369	22.53	20.08	42.61	56.00	-13.39	QP
4	0.5369	18.70	20.08	38.78	46.00	-7.22	AVG
5	1.4053	17.35	20.09	37.44	56.00	-18.56	QP
6	1.4053	14.02	20.09	34.11	46.00	-11.89	AVG
7	3.9615	19.96	20.14	40.10	56.00	-15.90	QP
8	3.9615	16.76	20.14	36.90	46.00	-9.10	AVG
9	7.2869	18.40	20.16	38.56	60.00	-21.44	QP
10	7.2869	13.79	20.16	33.95	50.00	-16.05	AVG
11	15.5984	14.95	20.31	35.26	60.00	-24.74	QP
12	15.5984	7.47	20.31	27.78	50.00	-22.22	AVG

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Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	N
Test Mode:	Mode 2(The worst mode)	Test Voltage:	AC 120V/60Hz



Remark:

1. All readings are Quasi-Peak and Average values.

2. Factor = Insertion Loss + Cable Loss.

3. Measurement = Reading Level + Correct Factor 4. Over = Measurement - Limit

4. Over	= Measu	rement - Lir	nit			8		
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1	*	0.1582	41.11	20.07	61.18	65.56	-4.38	QP
2		0.1582	24.83	20.07	44.90	55.56	-10.66	AVG
3		0.5581	19.76	20.08	39.84	56.00	-16.16	QP
4		0.5581	16.50	20.08	36.58	46.00	-9.42	AVG
5		1.4032	16.30	20.09	36.39	56.00	-19.61	QP
6		1.4032	13.90	20.09	33.99	46.00	-12.01	AVG
7		3.4356	18.69	20.13	38.82	56.00	-17.18	QP
8		3.4356	16.71	20.13	36.84	46.00	-9.16	AVG
9		14.9068	19.41	20.31	39.72	60.00	-20.28	QP
10		14.9068	8.78	20.31	29.09	50.00	-20.91	AVG
11		29.3709	17.53	20.27	37.80	60.00	-22.20	QP
12		29.3709	14.26	20.27	34.53	50.00	-15.47	AVG
						1980 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 -	승규는 아파 운영 가지?	

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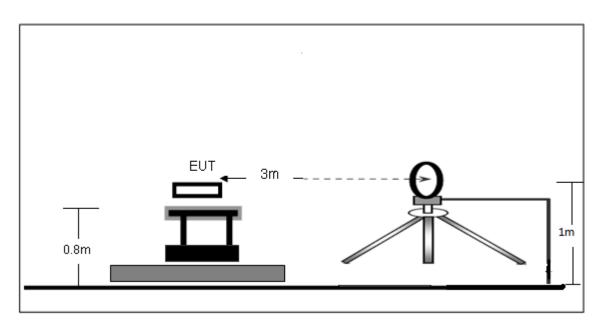
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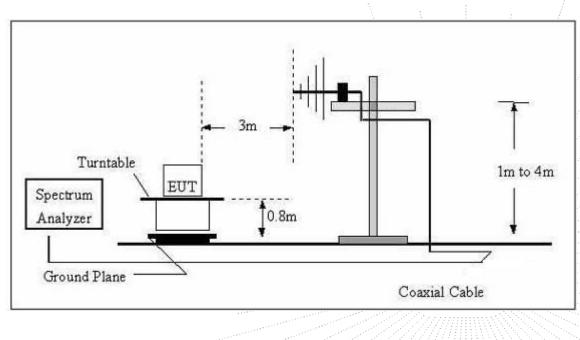
7. Radiated Emissions

7.1 Block Diagram Of Test Setup

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



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







7.2 Limit

FCC §15.209; §15.205.

Test Standard	FCC Part15 C Section 15.209 and 15.205						
	Frequency (MHz)	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)		
	0.009MHz~0.490MHz	2400/F(kHz)	-	-	300		
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30		
	1.705MHz-30MHz	30	-	-	30		
Test Limit	30MHz~88MHz	100	40.0	Quasi-peak	3		
	88MHz~216MHz	150	43.5	Quasi-peak	3		
	216MHz~960MHz	200	46.0	Quasi-peak	3		
	960MHz~1000MHz	500	54.0	Quasi-peak	3		
	Above 1000MHz	500	54.0	Average	3		
	Above 1000MHz	-	74.0	Peak	3		

7.3 Test procedure

Receiver Parameter	Setting
Attenuation	Auto
9kHz~150kHz	RBW 200Hz for QP
150kHz~30MHz	RBW 9kHz for QP
30MHz~1000MHz	RBW 120kHz for QP

Below 1GHz test procedure as below:

a.The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.

b.The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d.For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e.The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

g.Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 1.5 metre(Above 18GHz the distance is 1 meter and table is 1.5 metre).

h.Test the EUT in the lowest channel ,the middle channel ,the Highest channel.

Note: Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

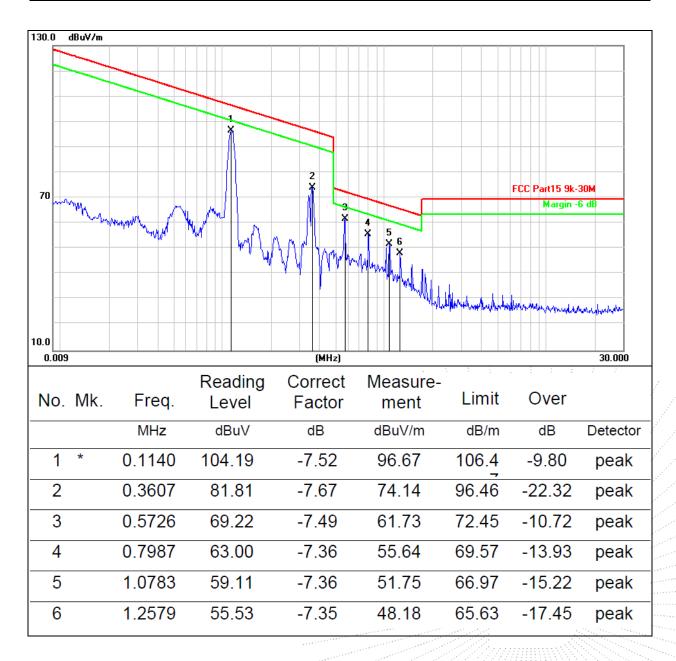
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7.4 Test Result

9kHz-30MHz

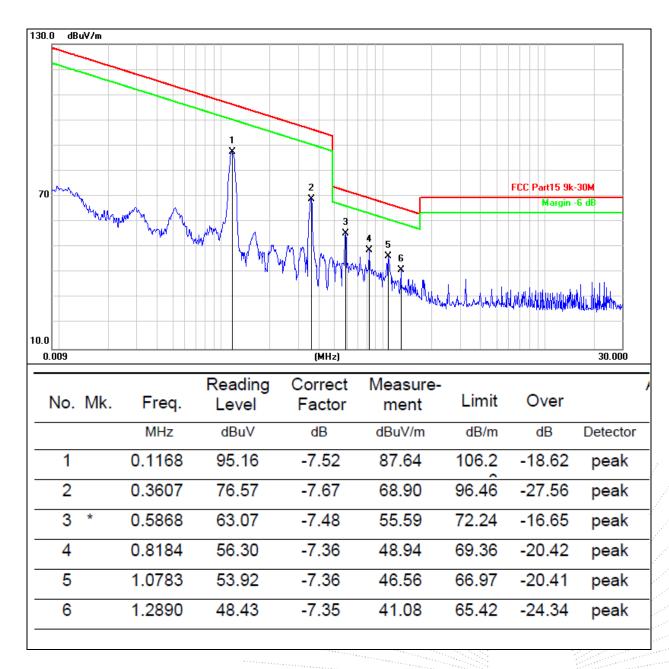
Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101 kPa	Test Voltage:	AC 120V/60Hz
Test Mode:	Mode 1(The worst mode)	Polarization:	Coaxial(Worst)







Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101 kPa	Test Voltage:	AC 120V/60Hz
Test Mode:	Mode 1(The worst mode)	Polarization:	Coplanar (Worst)

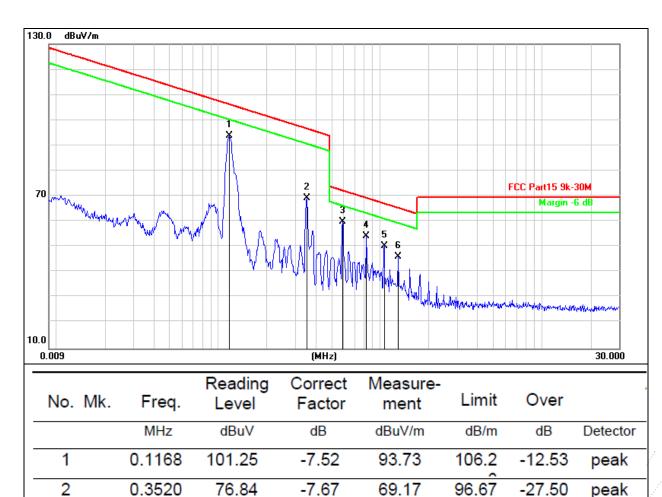


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Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101 kPa	Test Voltage:	AC 120V/60Hz
Test Mode:	Mode 2(The worst mode)	Polarization:	Coaxial(Worst)



-7.48

-7.36

-7.36

-7.35

60.10

54.21

50.38

46.14

72.24

69.29

67.11

65.42

-12.14

-15.08

-16.73

-19.28

peak

peak

peak

peak

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5

6

0.5868

0.8251

1.0610

1.2890

67.58

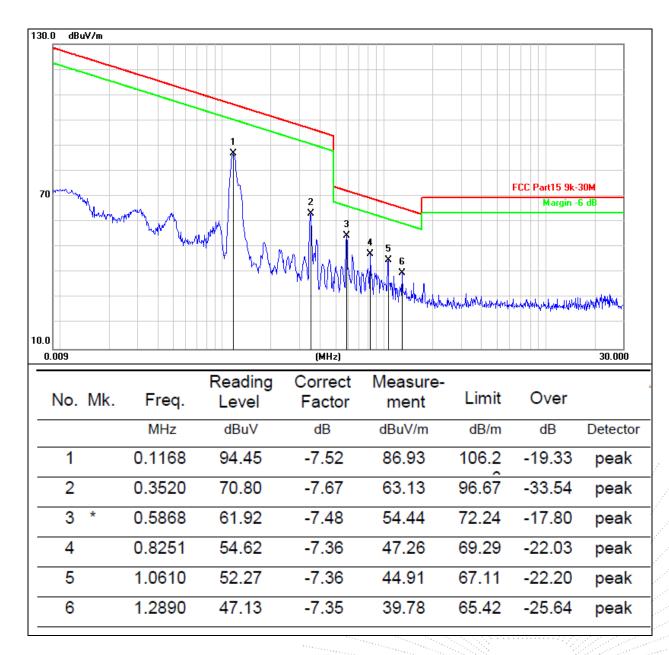
61.57

57.74

53.49



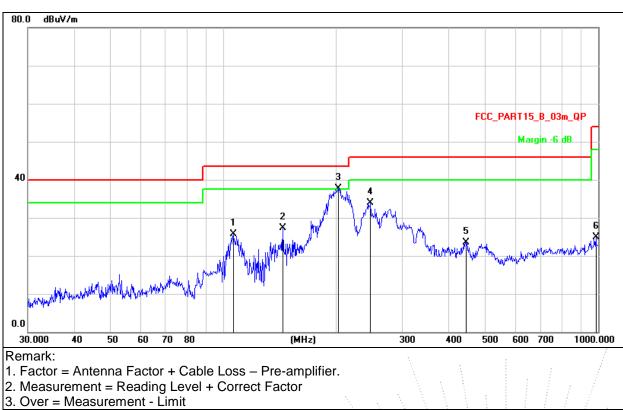
Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101 kPa	Test Voltage:	AC 120V/60Hz
Test Mode:	Mode 2(The worst mode)	Polarization:	Coplanar (Worst)





Between 30MHz - 1GHz

Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	Horizontal
Test Mode:	Mode 1(The worst mode)	Test Voltage:	AC 120V/60Hz

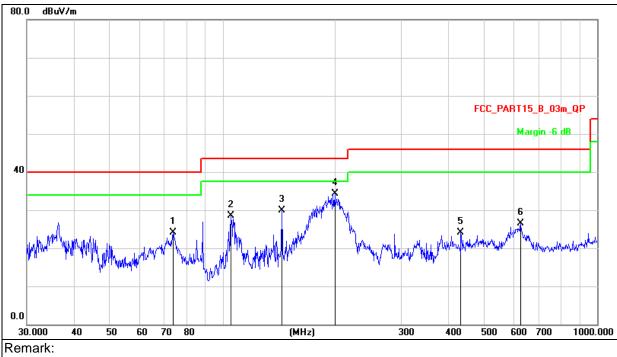


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		106.0126	42.01	-16.35	25.66	43.50	-17.84	QP
2		143.8293	46.24	-19.00	27.24	43.50	-16.26	QP
3	*	202.8103	53.30	-15.64	37.66	43.50	-5.84	QP
4		246.8147	48.30	-14.38	33.92	46.00	-12.08	QP
5		443.2943	33.55	-9.99	23.56	46.00	-22.44	QP
6		986.0715	27.36	-2.52	24.84	54.00	-29.16	QP





Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	Vertical
Test Mode:	Mode 1(The worst mode)	Test Voltage:	AC 120V/60Hz



1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Measurement = Reading Level + Correct Factor
Over = Measurement - Limit

No.	Mk.	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		73.6170	42.73	-18.63	24.10	40.00	-15.90	QP
2		105.2718	44.79	-16.30	28.49	43.50	-15.01	QP
3		143.8295	48.82	-19.00	29.82	43.50	-13.68	QP
4	*	199.2855	50.14	-15.77	34.37	43.50	-9.13	QP
5		432.5457	34.21	-10.20	24.01	46.00	-21.99	QP
6		625.0780	33.15	-6.59	26.56	46.00	-19.44	QP

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8. Bandwidth Test

8.1 Test Procedure

- 1. Set RBW = 1%~5% OBW.
- 2. Set the video bandwidth (VBW) \ge 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.

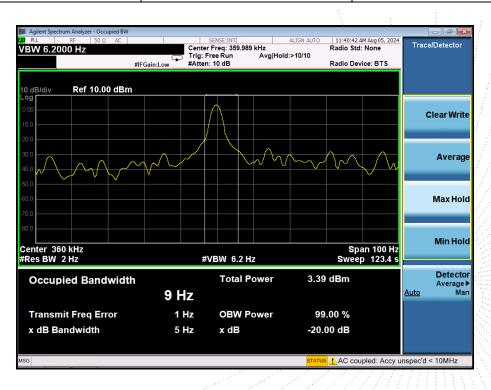
8.2 Test Setup



8.3 Test Result

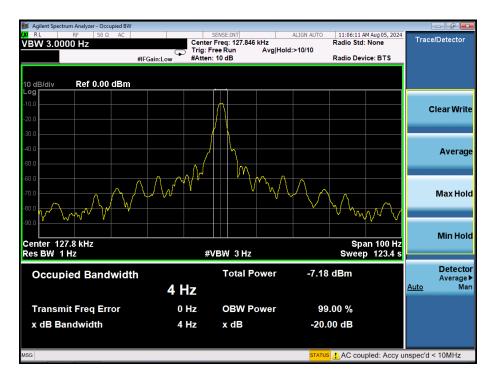
Phone

Frequency (kHz)	20dB bandwidth (kHz)	Result	
360	0.005	Pass	



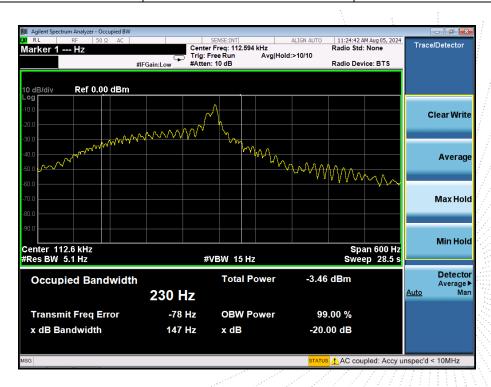


Frequency (kHz)	20dB bandwidth (kHz)	Result
127.8	0.004	Pass



Airpods

Frequency (kHz)	20dB bandwidth (kHz)	Result	
112.6	0.147	Pass	





9. Antenna Requirements

9.1 Limit

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 shall be considered sufficient to comply with the provisions of this section. 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.

9.2 Test Result

The antenna used for this product is Inductive loop coil antenna.

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10. EUT Photographs

EUT Photo



NOTE: Appendix-Photographs Of EUT Constructional Details

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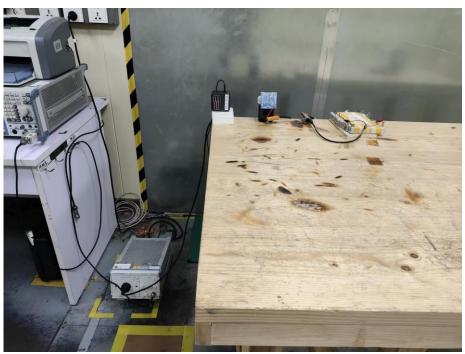
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11. EUT Test Setup Photographs

Conducted emissions



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Radiated Measurement Photos

9kHz-30MHz



30MHz-1GHz



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STATEMENT

1. The equipment lists are traceable to the national reference standards.

2. The test report can not be partially copied unless prior written approval is issued from our lab.

3. The test report is invalid without the "special seal for inspection and testing".

4. The test report is invalid without the signature of the approver.

5. The test process and test result is only related to the Unit Under Test.

6. Sample information is provided by the client and the laboratory is not responsible for its authenticity.

7. The quality system of our laboratory is in accordance with ISO/IEC17025.

8. If there is any objection to this test report, the client should inform issuing laboratory within 15 days from the date of receiving test report.

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***** END *****

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