TEST REPORT

FCC ID: 2AXYP-OTW-930-R

Product: True Wireless Earbuds

Model No.: OTW-930

Trade Mark: oraimo

Report No.: WSCT-A2LA-R&E240400020A-15B

Issued Date: 16 May 2024

Issued for:

ORAIMO TECHNOLOGY LIMITED
FLAT N 16/F BLOCK B UNIVERSAL INDUSTRIAL CENTRE 19-25 SHAN MEI STREET FOTAN NT HONGKONG

Issued By:

World Standardization Certification & Testing Group(Shenzhen) Co.,Ltd.
Building A-B, Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China
TEL: +86-755-26996192
FAX: +86-755-86376605

Note: *The results contained in this report pertain only to the tested sample. This report shall not be reproduced, except in full, without written approval of World Standardization Certification & Testing Group(Shenzhen) Co., Ltd. This report must not be used by the client to claim product certification, approval, or any agency of the U.S. Government.*

TABLE OF CONTENTS

1. Test Certification 3
2. GENERAL DESCRIPTION OF EUT 4
3. Test Result Summary 5
4. TEST METHODOLOGY 6
4.1. CONFIGURATION OF SYSTEM UNDER TEST 7
4.2. DESCRIPTION OF SUPPORT UNITS (CONDUCTED MODE) 8
5. MEASUREMENT INSTRUMENTS 9
6. Facilities and Accreditations 10
6.1. FACILITIES 10
6.2. ACCREDITATIONS 10
6.3. MEASUREMENT UNCERTAINTY 11
7. EMC EMISSION TEST 12
7.1. CONDUCTED EMISSION MEASUREMENT 12
7.2. RADIATED EMISSION MEASUREMENT 16

ACCREDITED Certificate #5768.01

For Question, Please Contact with WSCT www.wsct-cert.com

1. Test Certification

Product:	True Wireless Earbuds
Model No.:	OTW-930
Trade Mark:	oraimo
Applicant:	**ORAIMO TECHNOLOGY LIMITED**
Address:	FLAT N 16/F BLOCK B UNIVERSAL INDUSTRIAL CENTRE 19-25 SHAN MEI STREET FOTAN NT HONGKONG
Manufacturer:	**ORAIMO TECHNOLOGY LIMITED**
Address:	FLAT N 16/F BLOCK B UNIVERSAL INDUSTRIAL CENTRE 19-25 SHAN MEI STREET FOTAN NT HONGKONG
Date of Test:	25 April 2024 to 15 May 2024
Applicable Standards:	FCC CFR Title 47 Part 15 Subpart B

The above equipment has been tested by World Standardization Certification & Testing Group(Shenzhen) Co., Ltd. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By: Wang Xiang **(Wang Xiang)**

Checked By: Mo Peiyun **(Mo Peiyun)**

Approved By: Liu Fuxin **(Liu Fuxin)**

Date: 16 May 2024

2. GENERAL DESCRIPTION OF EUT

Equipment Type:	True Wireless Earbuds
Test Model:	OTW-930
Trade Mark	oraimo
Rechargeable Li-Polymer Battery:	Charging Box: Model : OTW-930 Input :5V⎓500mA Output : 5V⎓200mA Capacity : 520mAh 3.85V,2.002Wh Charging Box Battery: Li-ion Battery: 801444 Voltage: 3.85V Rated Capacity: 520mAh 2.002Wh Earphone Battery: Li-ion Battery : ZWD1054S3H Rated Voltage: 3.85V Rated Capacity: 50mAh 0.193Wh
Remark:	N/A.

3. Test Result Summary

Requirement	CFR 47 Section	Result
CONDUCTED EMISSION	§15.107	PASS
RADIATED EMISSION	§15.109	PASS

Note:

1. PASS: Test item meets the requirement.

2. Fail: Test item does not meet the requirement.

3. N/A: Test case does not apply to the test object.

4. The test result judgment is decided by the limit of test standard.

4. TEST METHODOLOGY

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.

Pretest Mode	Description
Mode 1	Bluetooth
Model 2	Idle

4.1. CONFIGURATION OF SYSTEM UNDER TEST

Mode 1&2

EUT

(EUT: True Wireless Earbuds)

I/O Port of EUT			
I/O Port Type	**Q'TY**	**Cable**	**Tested with**
Power	1	1m USB cable, unshielded	1

4.2. 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
1	/	/	/	/	/

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.

5. MEASUREMENT INSTRUMENTS

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibrated	Calibrated until
Test software	--	EZ-EMC	CON-03A	--	--
ESCI Test Receiver	R&S	ESCI	100005	11/05/2023	11/04/2024
LISN	AFJ	LS16	16010222119	11/05/2023	11/04/2024
LISN(EUT)	Mestec	AN3016	04/10040	11/05/2023	11/04/2024
pre-amplifier	CDSI	PAP-1G18-38	--	11/05/2023	11/04/2024
System Controller	CT	SC100	-	11/05/2023	11/04/2024
Bi-log Antenna	Chase	CBL6111C	2576	11/05/2023	11/04/2024
Spectrum analyzer	R&S	FSU26	200409	11/05/2023	11/04/2024
Horn Antenna	SCHWARZBECK	9120D	1141	11/05/2023	11/04/2024
Bi-log Antenna	SCHWAREBECK	VULB9163	9163/340	11/05/2023	11/04/2024
Pre Amplifier	H.P.	HP8447E	2945A02715	11/05/2023	11/04/2024
9*6*6 Anechoic	--	--	--	11/05/2023	11/04/2024

6. Facilities and Accreditations

6.1. Facilities

All measurement facilities used to collect the measurement data are located at **Building A-B, Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China of the World Standardization Certification & Testing Group(Shenzhen) CO., LTD**

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 32. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

6.2. ACCREDITATIONS

CNAS - Registration Number: L3732

China National Accreditation Service for Conformity Assessment, The test firm Registration Number: L3732

FCC - Designation Number: CN1303

World Standardization Certification & Testing Group(Shenzhen) CO., LTD. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Designation Number: CN1303.

A2LA - Certificate Number: 5768.01

The EMC Laboratory has been accredited by the American Association for Laboratory Accreditation (A2LA).Certification Number: 5768.01

6.3. Measurement Uncertainty

The reported 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 %.

No.	Item	MU
1	Conducted Emission Test	±3.2dB
2	RF power, conducted	±0.16dB
3	Spurious emissions, conducted	±0.21dB
4	All emissions, radiated(<1GHz)	±4.7dB
5	All emissions, radiated(>1GHz)	±4.7dB
6	Temperature	±0.5°C
7	Humidity	±2.0%

7. EMC EMISSION TEST

7.1. CONDUCTED EMISSION MEASUREMENT

7.1.1. POWER LINE CONDUCTED EMISSION LIMITS

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

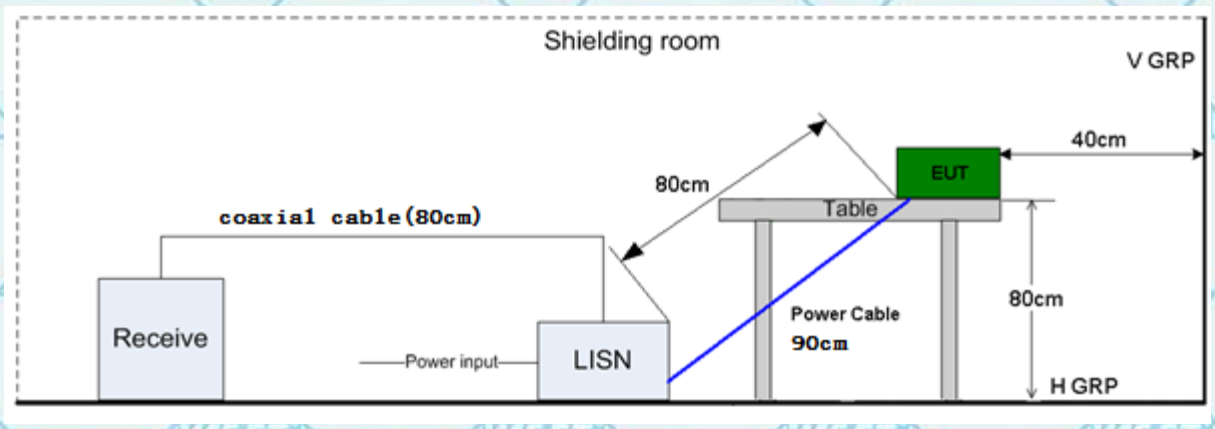
Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

For Question,
Please Contact with WSCT
www.wsct-cert.com

TEST PROCEDURE

a. The EUT was placed 0.4 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.
b. 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.
c. 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.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

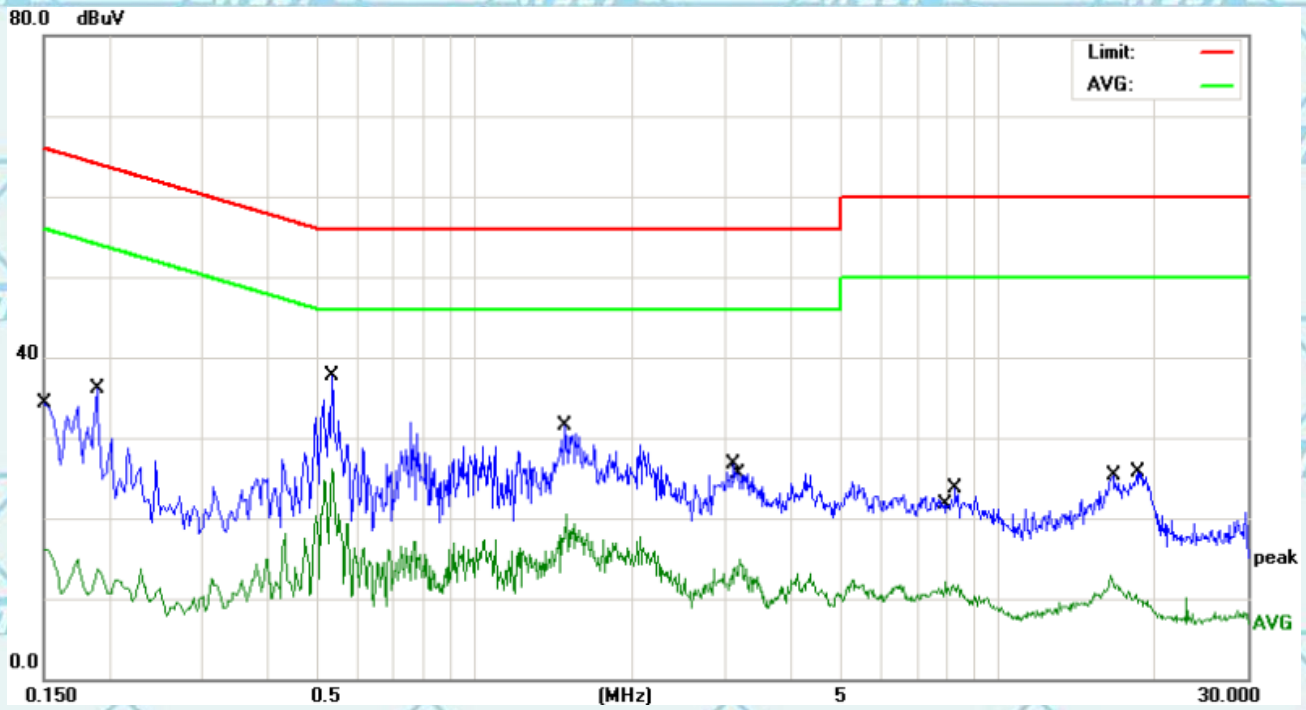
TEST SETUP



7.1.2. Test Results

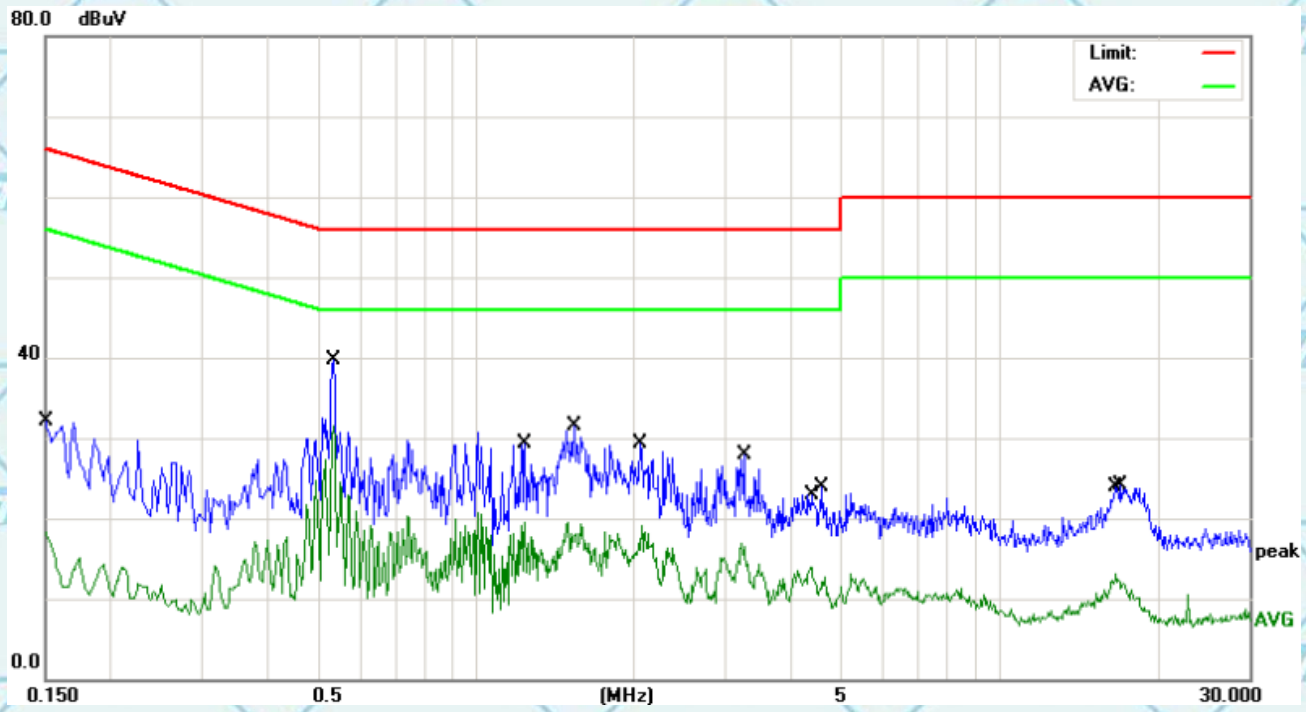
Temperature	20 ℃	Relative Humidity	48%
Pressure	1010 hPa	Test Mode	Mode 1(the worst case)

Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1500	5.74	10.45	16.19	55.99	-39.80	AVG
2		0.1900	25.56	10.45	36.01	64.03	-28.02	QP
3	*	0.5340	27.24	10.52	37.76	56.00	-18.24	QP
4		0.5340	15.55	10.52	26.07	46.00	-19.93	AVG
5		1.4900	20.81	10.63	31.44	56.00	-24.56	QP
6		1.4980	9.82	10.63	20.45	46.00	-25.55	AVG
7		3.1300	15.94	10.72	26.66	56.00	-29.34	QP
8		3.2100	4.12	10.72	14.84	46.00	-31.16	AVG
9		7.9420	1.27	10.79	12.06	50.00	-37.94	AVG
10		8.3100	12.88	10.80	23.68	60.00	-36.32	QP
11		16.4380	1.69	11.16	12.85	50.00	-37.15	AVG
12		18.4900	14.56	11.10	25.66	60.00	-34.34	QP

Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1500	21.68	10.45	32.13	65.99	-33.86	QP
2		0.1500	7.86	10.45	18.31	55.99	-37.68	AVG
3		0.5340	29.12	10.52	39.64	56.00	-16.36	QP
4	*	0.5340	20.99	10.52	31.51	46.00	-14.49	AVG
5		1.2380	8.91	10.59	19.50	46.00	-26.50	AVG
6		1.5420	20.86	10.64	31.50	56.00	-24.50	QP
7		2.0700	8.40	10.71	19.11	46.00	-26.89	AVG
8		3.2540	17.14	10.72	27.86	56.00	-28.14	QP
9		4.3460	3.22	10.73	13.95	46.00	-32.05	AVG
10		4.5860	13.11	10.74	23.85	56.00	-32.15	QP
11		16.6740	1.87	11.15	13.02	50.00	-36.98	AVG
12		17.1060	12.99	11.14	24.13	60.00	-35.87	QP

Note1:

Freq. = Emission frequency in MHz

Reading level (dBμV) = Receiver reading

Corr. Factor (dB) = Antenna factor + Cable loss

Measurement (dBμV) = Reading level (dBμV) + Corr. Factor (dB)

Limit (dBμV) = Limit stated in standard

Margin (dB) = Measurement (dBμV) – Limits (dBμV)

Q.P. =Quasi-Peak AVG =average

** is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.*

7.2.RADIATED EMISSION MEASUREMENT

7.2.1. Radiated Emission Limits

The field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Limit (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

(1) The limit for radiated test was performed according to FCC PART 15B.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 1Hz for Average

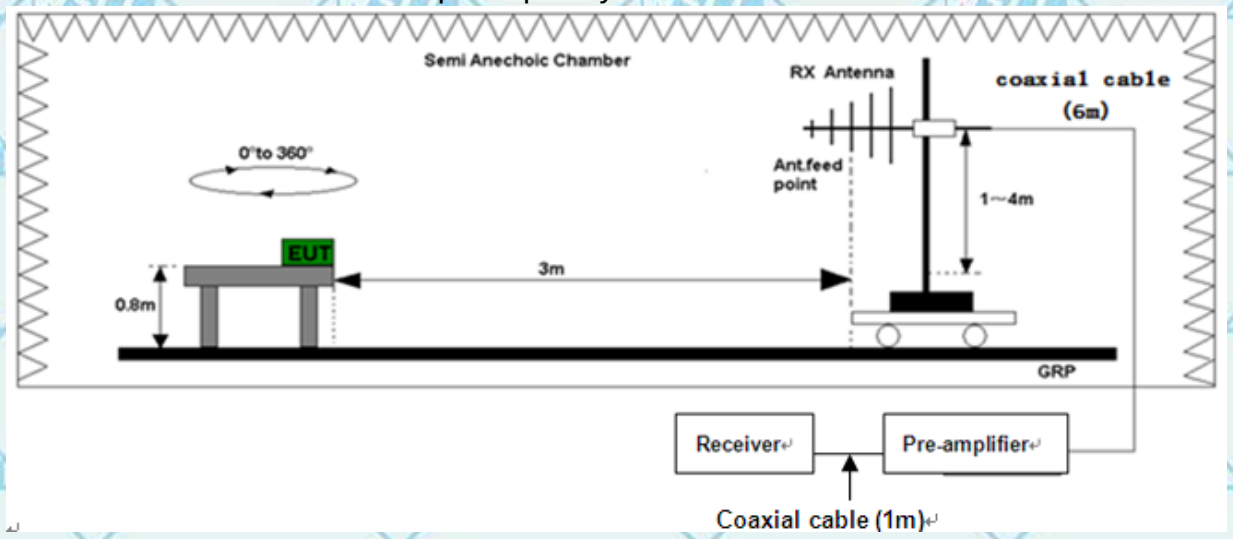
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

TEST PROCEDURE

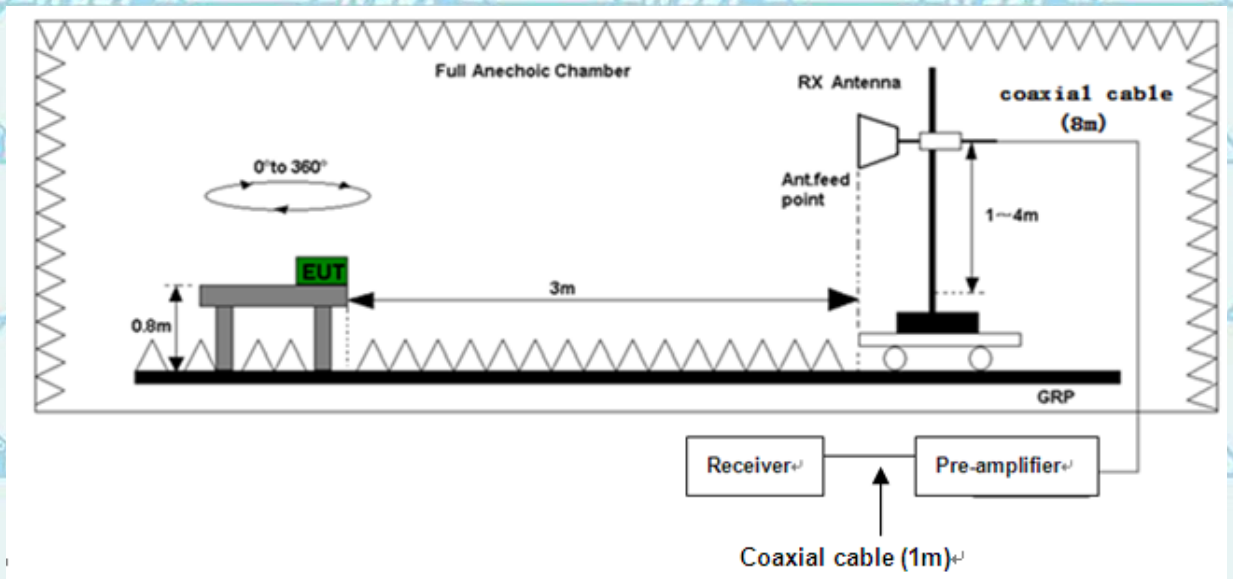
a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

TEST SETUP

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



（B）Radiated Emission Test-Up Frequency Above 1GHz



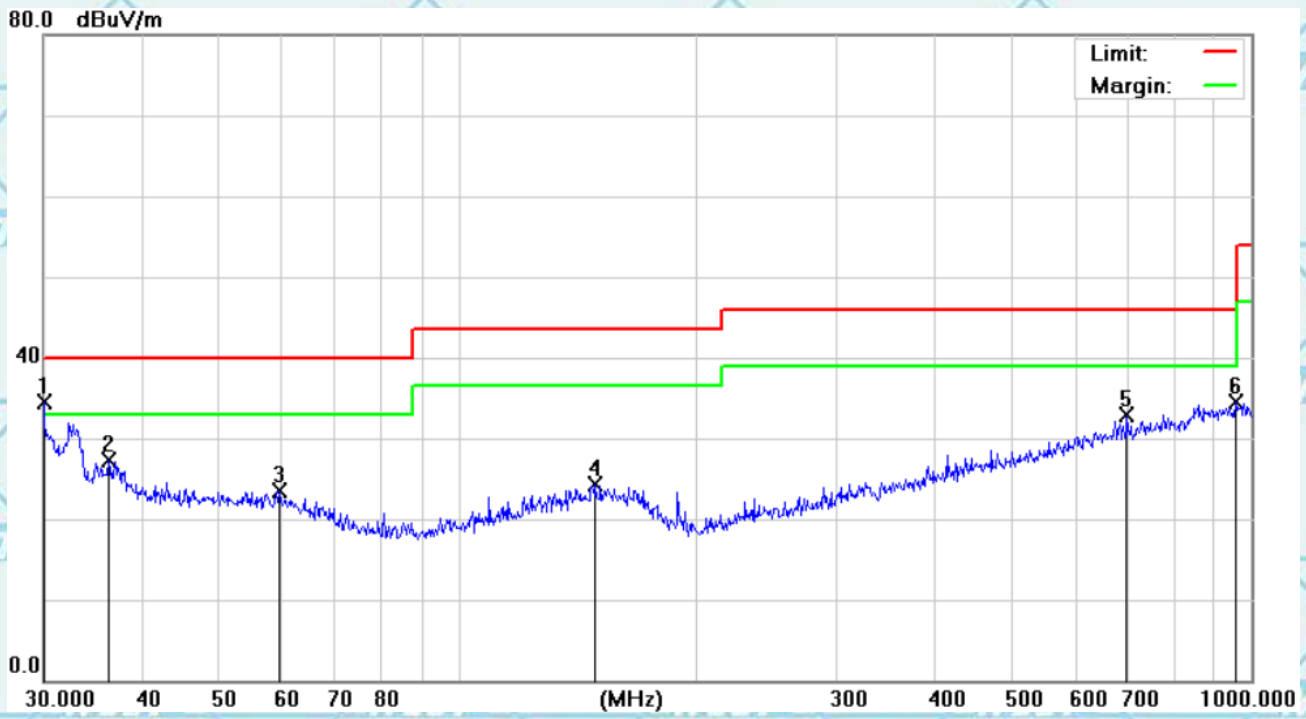
7.2.2. Test Results

Temperature	20 ℃	Relative Humidity	48%
Pressure	1010 hPa	Test Mode	Mode 1(the worst case)

Please refer to following diagram for individual

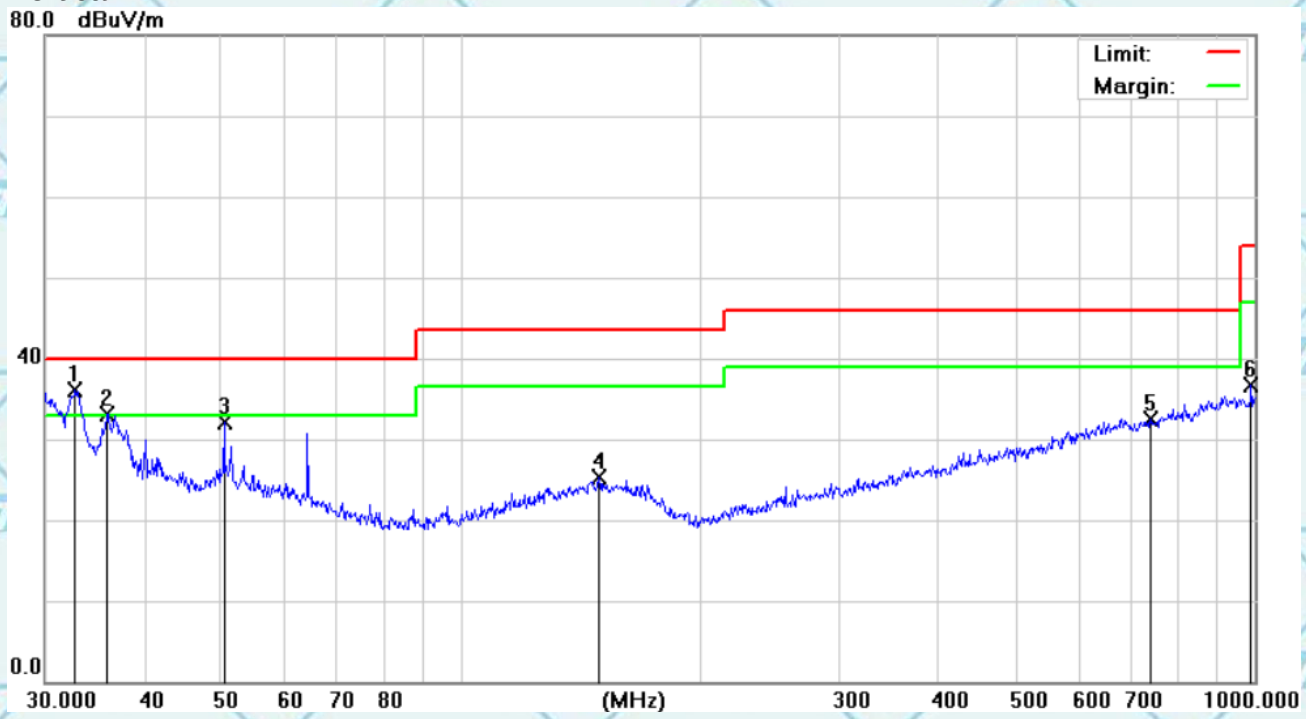
Below 1GHz

Horizontal:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	*	30.0000	37.17	-2.60	34.57	40.00	-5.43	QP
2		36.2541	29.24	-1.99	27.25	40.00	-12.75	QP
3		59.4405	26.28	-2.77	23.51	40.00	-16.49	QP
4		148.9625	26.04	-1.72	24.32	43.50	-19.18	QP
5		696.8567	27.78	5.07	32.85	46.00	-13.15	QP
6		955.4381	26.46	8.12	34.58	46.00	-11.42	QP

Vertical:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	*	32.7486	38.59	-2.52	36.07	40.00	-3.93	QP
2	!	35.8746	35.19	-2.07	33.12	40.00	-6.88	QP
3		50.4089	34.31	-2.14	32.17	40.00	-7.83	QP
4		149.4857	27.03	-1.72	25.31	43.50	-18.19	QP
5		739.6604	26.96	5.48	32.44	46.00	-13.56	QP
6		989.5355	28.16	8.47	36.63	54.00	-17.37	QP

Note:
Freq. = Emission frequency in MHz
Reading level (dBμV) = Receiver reading
Corr. Factor (dB) = Antenna factor + Cable loss - Amplifier factor.
Measurement (dBμV) = Reading level (dBμV) + Corr. Factor (dB)
Limit (dBμV) = Limit stated in standard
Margin (dB) = Measurement (dBμV) – Limits (dBμV)

TEST RESULTS

Above 1GHz(1~26GHz) :(Mode 1—worst case)

Freq. (MHz)	Ant. Pol.	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
1752.49	V	58.11	41.73	74	54	-15.89	-12.27
2583.44	V	59.20	40.99	74	54	-14.80	-13.01
1692.33	H	59.14	39.64	74	54	-14.86	-14.36
2374.95	H	58.69	39.69	74	54	-15.31	-14.31

Remark:
All emissions not reported were more than 20dB below the specified limit or in the noise floor.
Freq. = Emission frequency in MHz
Factor = Antenna Factor + Cable Loss – Pre-amplifier.
Over= Emission Level - Limit.
All the x/y/z orientation has been investigated, and only worst case is presented in this report.

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