TEST REPORT

Reference No......	:	WTH24D07173317W001
FCC ID	:	2BHYX-XQ003
Applicant.....	:	XQ Innovation (DongGuan) Health Technology Co.,Ltd
Address.....	:	Room 701, No. 1, Road 3 Sukeng Industrial Park, Changping Town, Dongguan City, Guangdong Province, China
Manufacturer	:	XQ Innovation (DongGuan) Health Technology Co.,Ltd
Address.....	:	Room 701, No. 1, Road 3 Sukeng Industrial Park, Changping Town, Dongguan City, Guangdong Province, China
Product.....	:	XQ-003
Model(s).	:	XQ-003, XQ-004, XQ-005, XQ-006, XQ-007, XQ-013, XQ-015, XQ-019, XQ-020, XQ-021, XQ-026, XQ-027
Standards	:	FCC CFR47 Part 15 Section 15.249
Date of Receipt sample	:	2024-07-25
Date of Test	:	2024-07-25 to 2024-07-29
Date of Issue.....	:	2024-08-09
Test Result.....	:	**Pass**

Remarks:
The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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3 Revision History

Test Report No.	Date of Receipt Sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTH24D07173317W001	2024-07-25	2024-07-25 to 2024-07-29	2024-07-29	Original	-	Valid

4 General Information

4.1 General Description of E.U.T

Product:	XQ-003
Model(s):	XQ-003, XQ-004, XQ-005, XQ-006, XQ-007, XQ-013, XQ-015, XQ-019, XQ-020, XQ-021, XQ-026, XQ-027
Model Description:	Only the model names are different. The test sample model was XQ-003.
Test Sample No.:	1-1/1

4.2 Details of E.U.T.

Frequency Range:	2402MHz
Type of Modulation:	GFSK
Antenna installation:	Internal Antenna
Antenna Gain:	0dBi

Note:
#: The antenna gain is provided by the applicant, and the applicant should be responsible for its authenticity, WALTEK lab has not verified the authenticity of its information.

Ratings:	Input: DC 3V by CR2032 lithium battery

4.3 Channel List

Channel No.	Frequency (MHz)
1	2402

4.4 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

Test mode	Channel No.
Transmitting	2402MHz

5 Equipment Used during Test

5.1 Equipments List

3m Semi-anechoic Chamber for Radiation Emissions						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1	Spectrum Analyzer	R&S	FSP30	100091	2024-04-22	2025-04-21
2	Broad-band Horn Antenna(1-18GHz)	SCHWARZBECK	BBHA 9120 D	667	2024-01-23	2025-01-22
3	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	2024-07-18	2025-07-17
4	Coaxial Cable (above 1GHz)	Top	1GHz-18GHz	N/A	2024-04-22	2025-04-21
3m Semi-anechoic Chamber for Radiation Emissions						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No**	**Last Calibration Date**	**Calibration Due Date**
1	Test Receiver	R&S	ESCI	101296	2024-04-22	2025-04-21
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	2023-11-04	2024-11-03
3	Active Loop Antenna	Com-Power Corp.	AL-130R	10160007	2024-04-27	2025-04-26
4	Amplifier	ANRITSU	MH648A	M43381	2024-04-22	2025-04-21
5	Cable	HUBER+SUHNER	CBL2	525178	2024-04-22	2025-04-21
RF Conducted Testing						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	Spectrum Analyzer	R&S	FSL6	100959	2024-04-22	2025-04-21
2	Coaxial Cable	Top	10Hz-30GHz	-	2024-04-22	2025-04-21
3	Antenna Connector*	Realacc	45RSm	-	2024-04-22	2025-04-21
4	DC Block	Gwave	GDCB-3G-N-SMA	140307001	2024-04-22	2025-04-21

Test Software:

Test Item	Software name	Software version
Radiated Emission(3m)	EZ-EMC	EZ-EMC(RA-03A1-1)

5.2 Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	± 1 x 10^{-6}
RF Power	± 1.0 dB
RF Power Density	± 2.2 dB
Radiated Spurious Emissions test	± 5.03 dB (Bilog antenna 30M~1000MHz)
	± 5.47 dB (Horn antenna 1000M~25000MHz)

5.3 Test Facility

The test facility has a test site registered with the following organizations:

ISED CAB identifier: CN0013. Test Firm Registration No.: 7760A.

Waltek Testing Group Co., Ltd. Has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration number 7760A, October 15, 2016.

FCC Designation No.: CN1201. Test Firm Registration No.: 523476.

Waltek Testing Group Co., Ltd. EMC Laboratory `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. Registration number 523476, September 10, 2019.

5.4 Test Equipment Calibration

All the test equipments used are valid and calibrated by GUANG ZHOU GRG METROLOGY & TEST CO., L TD. address is No.163, Pingyun Rd. West of Huangpu Ave,Tianhe District, Guangzhou, Guangdong, China.

6 Test Summary

Test Items	Test Requirement	Result
Conducted Emissions	15.207	N/A
Radiated Emission	15.249(a) 15.209 15.205(a)	PASS
Periodic Operation	15.35(c)	N/A
Outside Restricted band	15.249 15.205 15.209	PASS
20dB Bandwidth	15:215(c)	PASS
Antenna Requirement	15.203	PASS

7 Radiation Emission Test

Test Requirement: FCC Part15 Paragraph 15.249&15.209&15.205

Test Method: ANSI 63.10: 2013

Measurement Distance: 3m

Test Result: PASS

15.249(a)Limit:

Fundamental frequency	Field strength of fundamental		Field strength of harmonics	
	mV/m	dBuV/m	uV/m	dBuV/m
902-928 MHz	50	94	500	54
2400-2483.5 MHz	50	94	500	54
5725-5875 MHz	50	94	500	54
24.0-24.25 GHz	250	108	2500	68

15.209 Limit:

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

Note: RF Voltage(dBuV)=20 $\log_{10}$ RF Voltage(uV)

7.1 EUT Operation

Operating Environment **:**

Temperature: 25.4 °C

Humidity: 55.7% RH

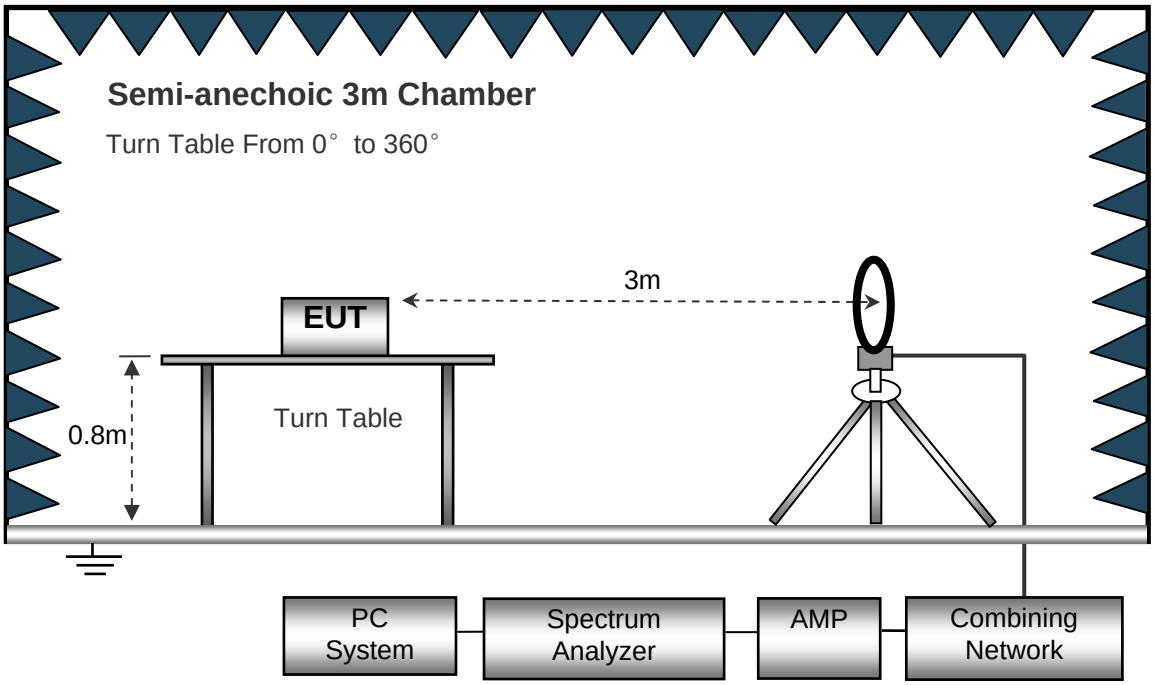
Atmospheric Pressure: 101.3kPa

EUT Operation **:**

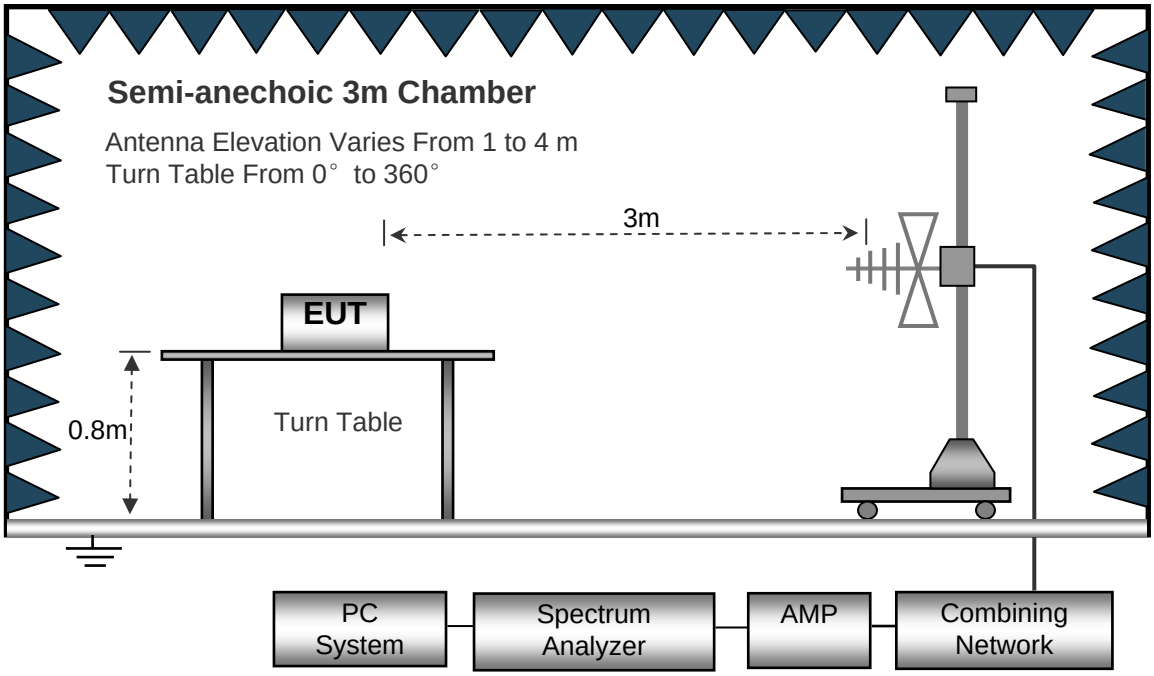
The test was performed in transmitting mode, the test data were shown in the report.

7.2 Test Setup

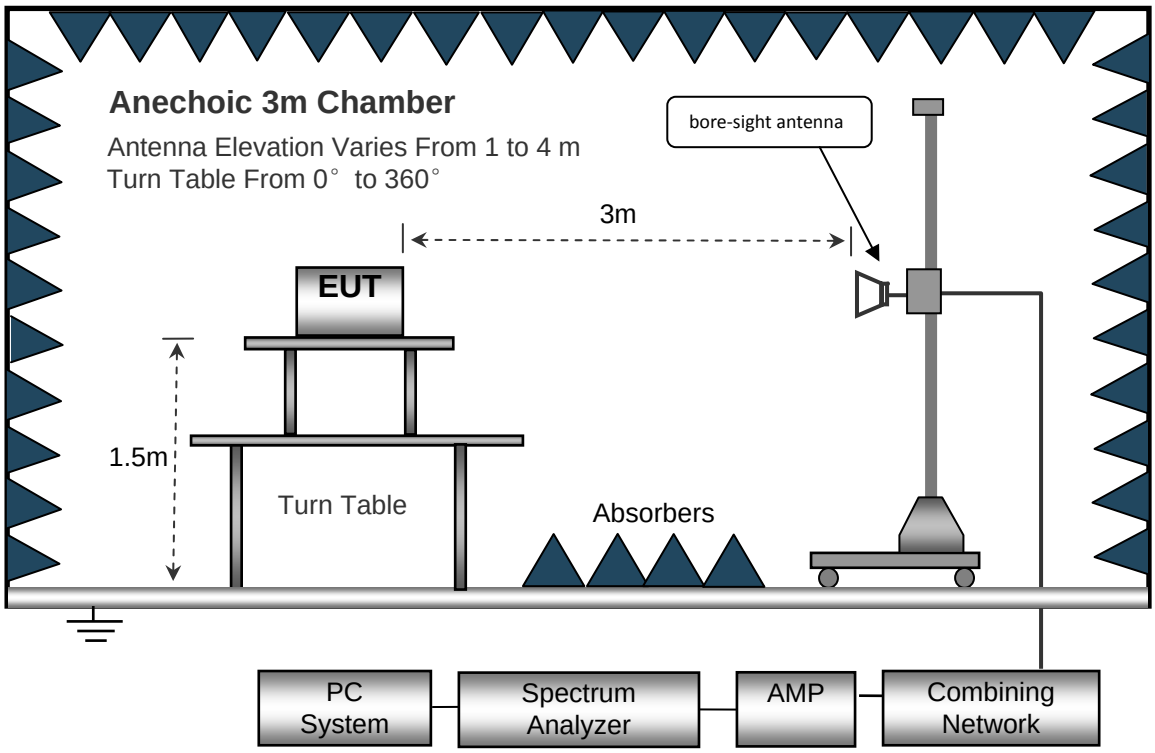
The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.10.
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30MHz to 1GHz.



The test setup for emission measurement above 1 GHz.



7.3 Spectrum Analyzer Setup

Below 30MHz

Sweep Speed ..... Auto
IF Bandwidth..... 10kHz
Video Bandwidth 10kHz

Resolution Bandwidth 10kHz

30MHz ~ 1GHz

Sweep Speed ..... Auto
Detector ..... PK
Resolution Bandwidth..... 100kHz
Video Bandwidth 300kHz

Above 1GHz

Sweep Speed ..... Auto
Detector ..... PK
Resolution Bandwidth..... 1MHz
Video Bandwidth 3MHz
Detector ..... Ave.
Resolution Bandwidth..... 1MHz
Video Bandwidth 10Hz

7.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane for below 1GHz and 1.5m above 1GHz.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions. The spectrum was investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.

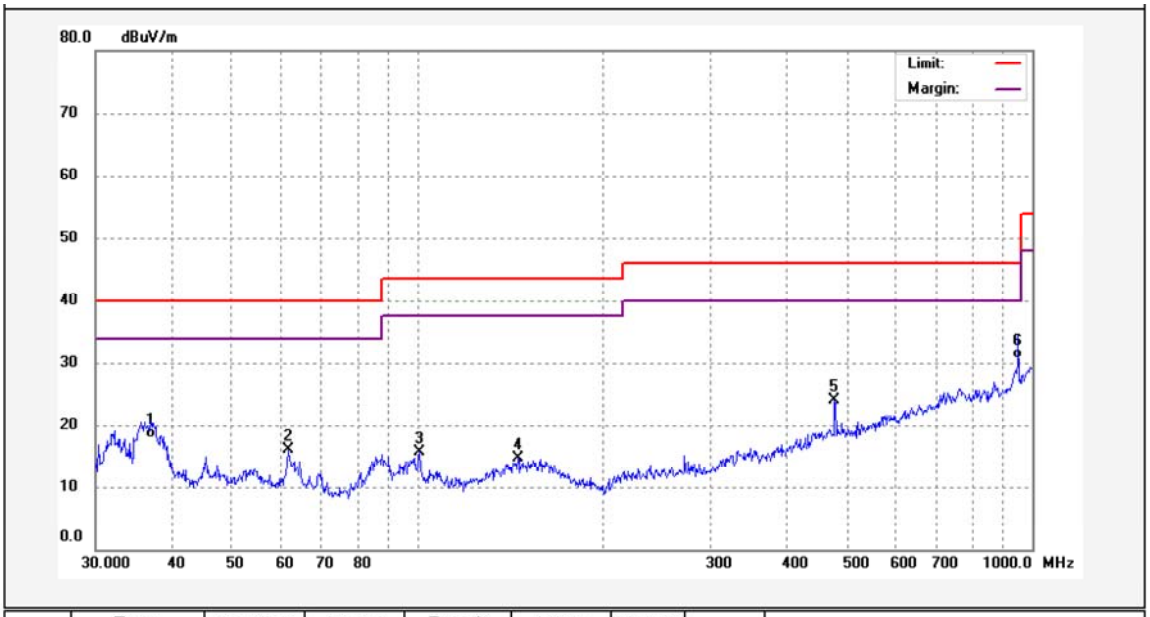
7.5 Test Result

Test Frequency : 9kHz~ 30MHz

The measurements were more than 20 dB below the limit and not reported.

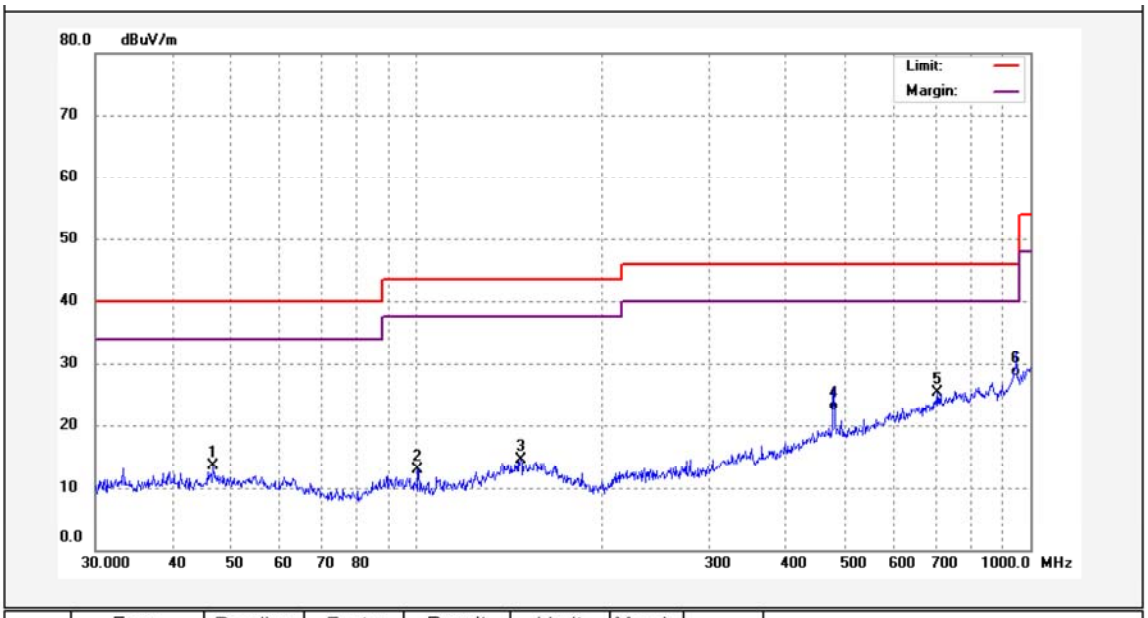
Test Frequency: 30MHz ~ 1GHz

Antenna Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	36.8952	35.04	-16.43	18.61	40.00	-21.39	QP	
2	61.7779	32.59	-16.46	16.13	40.00	-23.87	peak	
3	100.9338	33.57	-17.78	15.79	43.50	-27.71	peak	
4	145.8610	28.85	-14.10	14.75	43.50	-28.75	peak	
5	477.1693	33.81	-9.75	24.06	46.00	-21.94	peak	
6	948.7608	31.60	-0.12	31.48	46.00	-14.52	QP	

Antenna Polarization: Horizontal

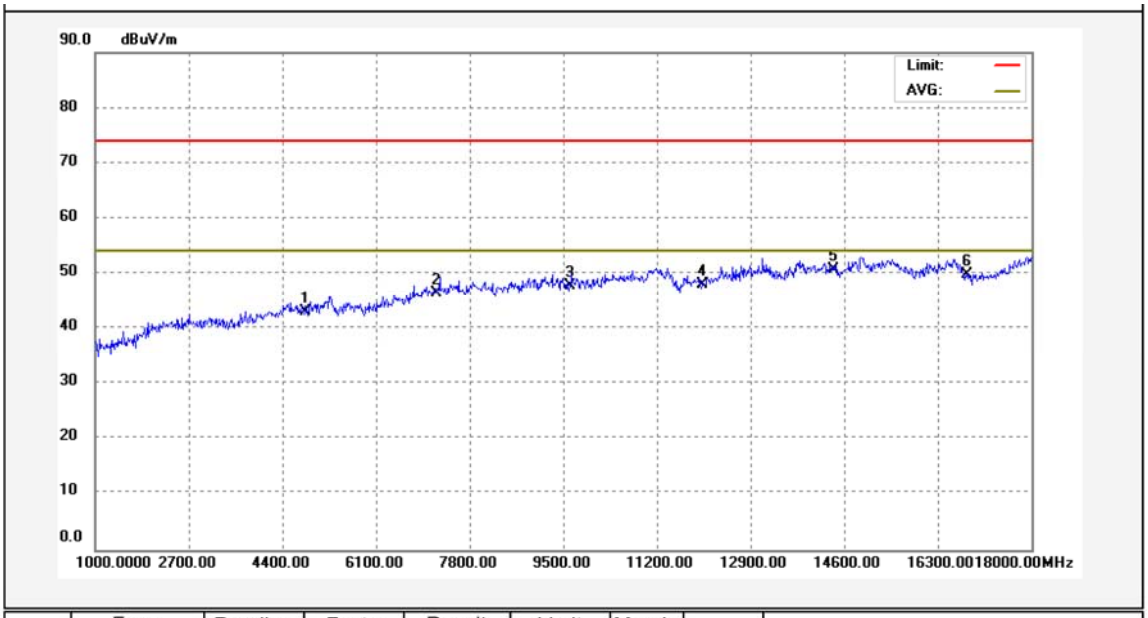


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	46.6663	29.38	-15.88	13.50	40.00	-26.50	peak	
2	100.5806	30.63	-17.82	12.81	43.50	-30.69	peak	
3	147.9214	28.60	-14.04	14.56	43.50	-28.94	peak	
4	478.8455	32.85	-9.75	23.10	46.00	-22.90	QP	
5	706.6998	30.45	-5.06	25.39	46.00	-20.61	peak	
6	948.7609	28.92	-0.12	28.80	46.00	-17.20	QP	

Test Frequency: 1GHz ~ 18GHz

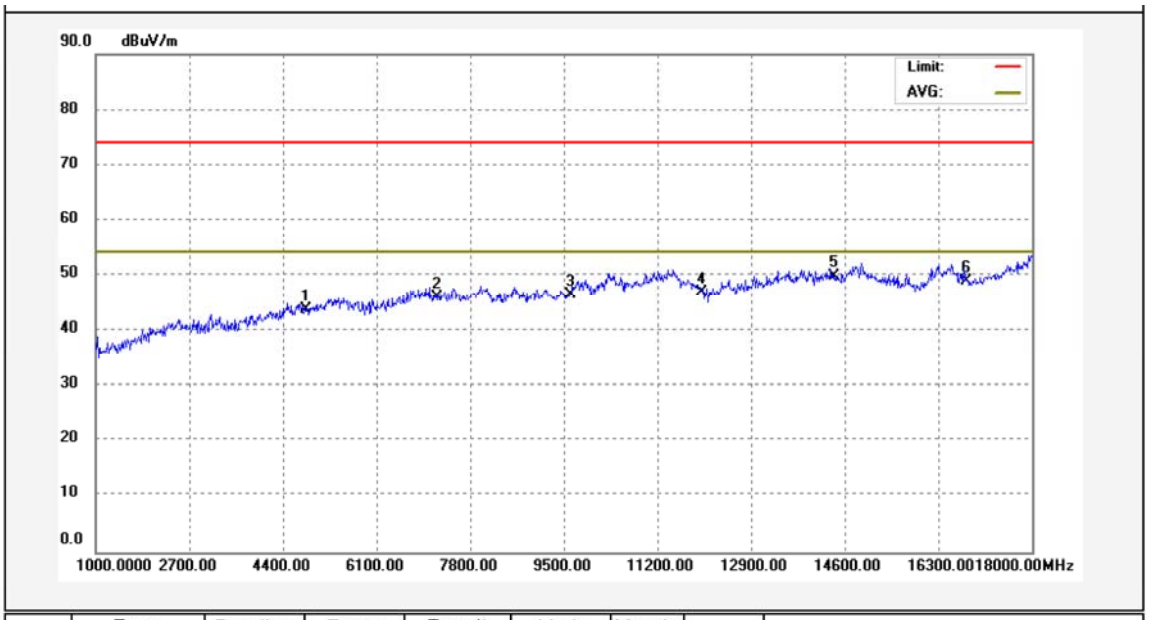
The measurements were more than 20 dB below the limit , so the AV value was not reported.

Antenna Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	4804.000	48.50	-5.51	42.99	74.00	-31.01	peak	
2	7206.000	45.36	1.15	46.51	74.00	-27.49	peak	
3	9608.000	43.86	3.86	47.72	74.00	-26.28	peak	
4	12010.000	43.37	4.70	48.07	74.00	-25.93	peak	
5	14412.000	41.30	9.47	50.77	74.00	-23.23	peak	
6	16814.000	38.73	11.20	49.93	74.00	-24.07	peak	

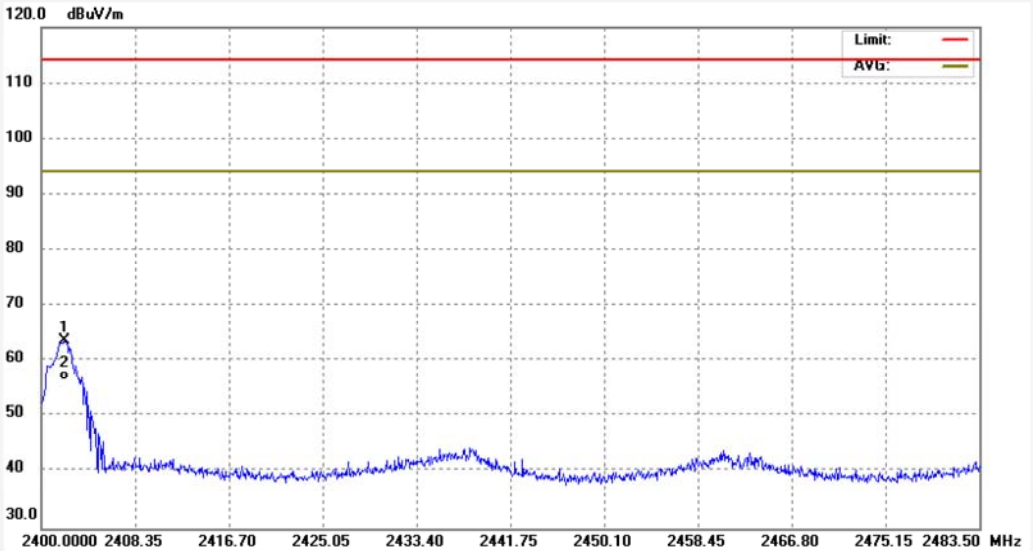
Antenna Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	4804.000	49.27	-5.51	43.76	74.00	-30.24	peak	
2	7206.000	44.86	1.15	46.01	74.00	-27.99	peak	
3	9608.000	42.68	3.86	46.54	74.00	-27.46	peak	
4	12010.000	42.31	4.70	47.01	74.00	-26.99	peak	
5	14412.000	40.29	9.47	49.76	74.00	-24.24	peak	
6	16814.000	37.68	11.20	48.88	74.00	-25.12	peak	

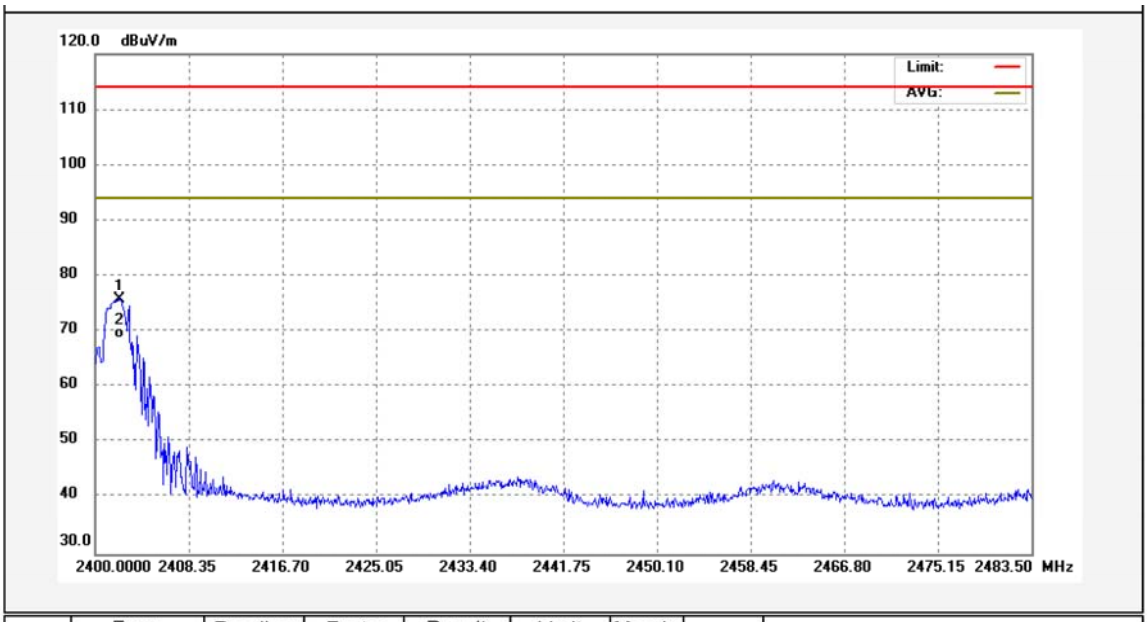
Fundamental:

Antenna Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2402.004	72.13	-8.45	63.68	114.00	-50.32	peak	
2	2402.004	65.87	-8.45	57.42	94.00	-36.58	AVG	

Antenna Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2402.171	84.27	-8.45	75.82	114.00	-38.18	peak	
2	2402.171	78.11	-8.45	69.66	94.00	-24.34	AVG	

Test Frequency: 18GHz ~ 25GHz

The measurements were more than 20 dB below the limit and not reported.

8 Restricted band

Test Requirement: FCC Part15 Paragraph 15.205

Test Method: ANSI C63.10: 2013

Test Result: N/A

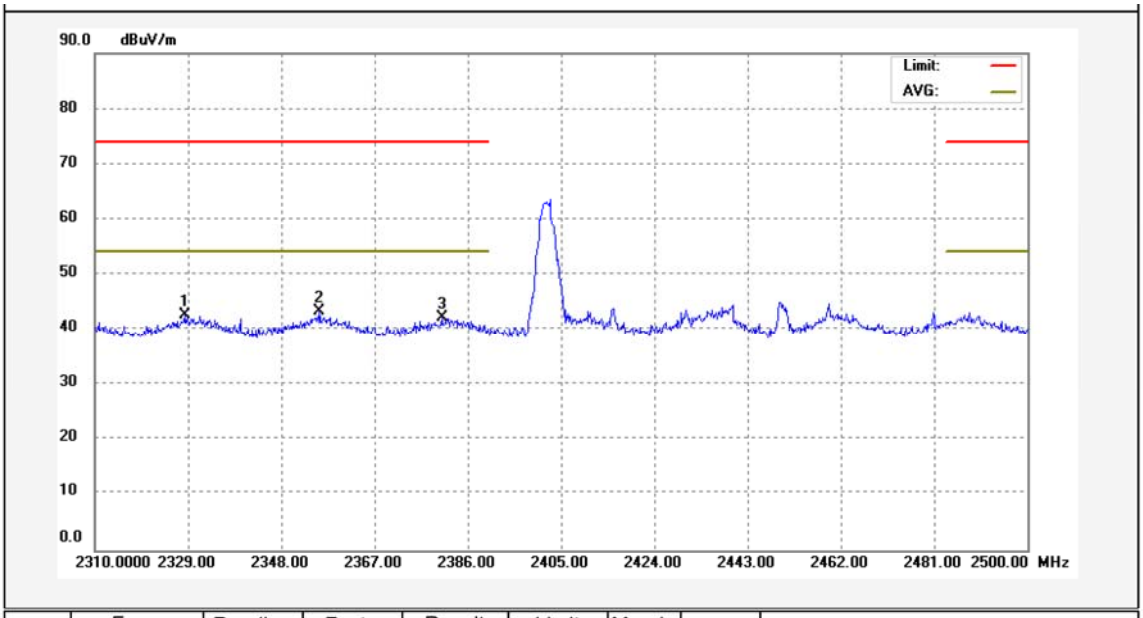
8.1 Requiments

emissions that fall in the restricted bands(15.205).Above 1000MHz, compliance with the emissions limits in section 15.209 shall be demonstrated based on the average value of the measured emissions,The provisions in section 15.35apply to these measurements.

8.2 Test Result

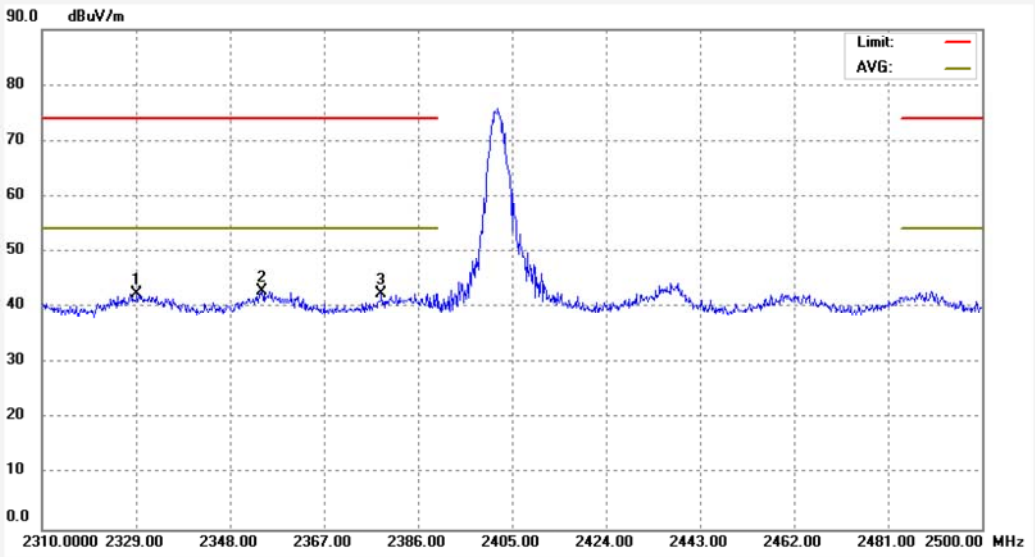
Mode: Continuously Transmitting

Antenna Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2328.240	51.27	-8.70	42.57	74.00	-31.43	peak	
2	2355.790	51.95	-8.61	43.34	74.00	-30.66	peak	
3	2380.680	50.79	-8.53	42.26	74.00	-31.74	peak	

Antenna Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2329.190	51.00	-8.69	42.31	74.00	-31.69	peak	
2	2354.460	51.49	-8.61	42.88	74.00	-31.12	peak	
3	2378.590	50.95	-8.54	42.41	74.00	-31.59	peak	

9 20 dB Bandwidth Measurement

Test Requirement: FCC CFR47 Part 15 Section 15.215(c)

Test Method: ANSI C63.10:2013

Test Mode: Transmitting

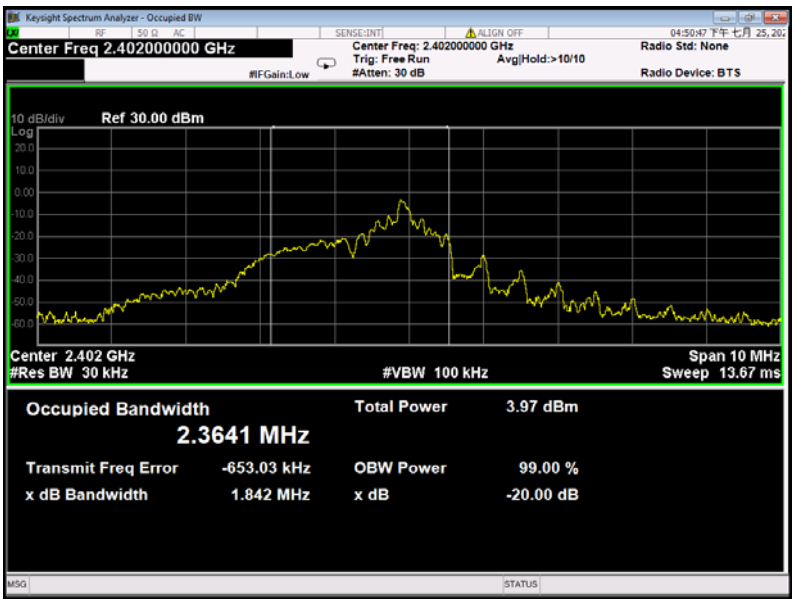
9.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 1%-5% OBW, VBW = 3RBW

9.2 Test Result

Frequency (MHz)	Bandwidth Emission (MHz)
2402	1.842

Low channel Test plots



10 Antenna Requirement

According to the FCC Part 15 Paragraph 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. This product has a Internal Antenna , fulfil the requirement of this section.

11 RF Exposure

Remark: Please refer to MPE test report: WTH24D07173317W002

12 Photographs - Constructional Details

Note: Please refer to appendix: Appendix-XQ-003-Photos.

======End of Report======