FCC REPORT

Applicant:	FLUENT AUDIO INC
Address of Applicant:	8362 TAMARACK VILLAGE SUITE# 119-252 WOODBURY, MINNESOTA 55125 USA
Manufacturer/Factory:	Shenzhen Alcors Technology Co.,Ltd
Address of Manufacturer/Factory:	4th Floor South, Bldg 23, LianChuang Sci& Tech Park, Bulan Road, LongGang District, Shenzhen, China

Equipment Under Test (EUT)

Product Name:	Hand Held Mic Transmitter
Model No.:	FA-WT900-HH, OEM-BT900-HH, OEM-ET900-HH, OEM-FT900-HH, OEM-KT900-HH, OEM-MT900-HH, OEM-ST900-HH, OEM-TT900-HH, OEM-WT900-HH, OEM-XT900-HH
Trade Mark:	N/A
FCC ID:	2APTAFA-WT900-HH
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.249
Date of sample receipt:	May 02, 2018
Date of Test:	May 02, 2018 - May 10, 2018
Date of report issued:	May 10, 2018
Test Result :	PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Robinson Lo
Laboratory Manager

This 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.

2 Version

Version No.	Date	Description
00	*May 10, 2018*	*Original*

Prepared By:		***Date:***	*May 10, 2018*
	Project Engineer		
Check By:		***Date:***	*May 10, 2018*
	Reviewer		

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
AC Power Line Conducted Emission	15.207	N/A
Field strength of the fundamental signal	15.249 (a)	Pass
Spurious emissions	15.249 (a) (d)/15.209	Pass
Band edge	15.249 (d)/15.205	Pass
20dB Occupied Bandwidth	15.215 (c)	Pass

Pass: The EUT complies with the essential requirements in the standard.

Remark: Test according to ANSI C63.10: 2013 and ANSI C63.4: 2014.

4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	9kHz ~ 30MHz	± 4.34dB	(1)
Radiated Emission	30MHz ~ 1000MHz	± 4.24dB	(1)
Radiated Emission	1GHz ~ 26.5GHz	± 4.68dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	± 3.45dB	(1)
Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.			

5 General Information

5.1 General Description of EUT

Product Name:	Hand Held Mic Transmitter
Model No.:	FA-WT900-HH, OEM-BT900-HH, OEM-ET900-HH, OEM-FT900-HH, OEM-KT900-HH, OEM-MT900-HH, OEM-ST900-HH, OEM-TT900-HH, OEM-WT900-HH, OEM-XT900-HH
Test Model No:	FA-WT900-HH
Remark: All above models are identical in the same PCB layout, interior structure and electrical circuits. The difference is model name for commercial purpose.	
Quantity of tested samples	1
Serial No.:	N/A
Test sample(s) ID:	N/A
Sample(s) Status	Engineer sample
Hardware:	N/A
Software:	N/A
Operation Frequency:	903~927MHz
Channel numbers:	25
Channel separation:	1MHz
Modulation type:	O-QPSK
Antenna Type:	Spring antenna
Antenna gain:	2 dBi(declare by Applicant)
Power supply:	DC 1.5V*2 From Battery

Operation Frequency each of channel			
Channel	Frequency	Channel	Frequency
1	903MHz	14	916MHz
2	904MHz	15	917MHz
….	….	….	….
12	914 MHz	24	926MHz
13	915 MHz	25	927MHz

5.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode.
Remark: During the test, the dutycycle >98%, New battery is used during all test. So the report just shows that condition's data.	

Per-test mode.

We have verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which was shown in this test report and defined as follows:

Axis	X	Y	Z
Field Strength(dBuV/m)	107.6	95.42	95.98

5.3 Description of Support Units

None

5.4 Test Facility

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

● **FCC —Registration No.: 381383**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fuly described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 381383, January 08, 2018.

● **Industry Canada (IC) —Registration No.: 9079A-2**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-2, August 15, 2016

5.5 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

Address: No. 301-309, 3/F., Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

Tel: 0755-27798480

Fax: 0755-27798960

5.6 Additional instructions

Software (Used for test) from client

Mode	/

Channel	Power level
Lowest	Default
Middle	Default
Highest	Default

6 Test Instruments list

Radiated Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	July 03 2015	July 02 2020
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	Spectrum Analyzer	Agilent	E4440A	GTS533	June 28 2017	June 27 2018
4	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June 28 2017	June 27 2018
5	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June 28 2017	June 27 2018
6	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	June 28 2017	June 27 2018
7	Horn Antenna	ETS-LINDGREN	3160	GTS217	June 28 2017	June 27 2018
8	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
9	Coaxial Cable	GTS	N/A	GTS213	June 28 2017	June 27 2018
10	Coaxial Cable	GTS	N/A	GTS211	June 28 2017	June 27 2018
11	Coaxial cable	GTS	N/A	GTS210	June 28 2017	June 27 2018
12	Coaxial Cable	GTS	N/A	GTS212	June 28 2017	June 27 2018
13	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June 28 2017	June 27 2018
14	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	June 28 2017	June 27 2018
15	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June 28 2017	June 27 2018
16	Band filter	Amindeon	82346	GTS219	June 28 2017	June 27 2018
17	Power Meter	Anritsu	ML2495A	GTS540	June 28 2017	June 27 2018
18	Power Sensor	Anritsu	MA2411B	GTS541	June 28 2017	June 27 2018

Conducted Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	May.16 2014	May.15 2019
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June 28 2017	June 27 2018
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June 28 2017	June 27 2018
4	Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	GTS226	June 28 2017	June 27 2018
5	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Thermo meter	KTJ	TA328	GTS233	June 28 2017	June 27 2018

General used equipment:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Barometer	ChangChun	DYM3	GTS257	June 28 2017	June 27 2018

7 Test results and Measurement Data

7.1 Antenna requirement

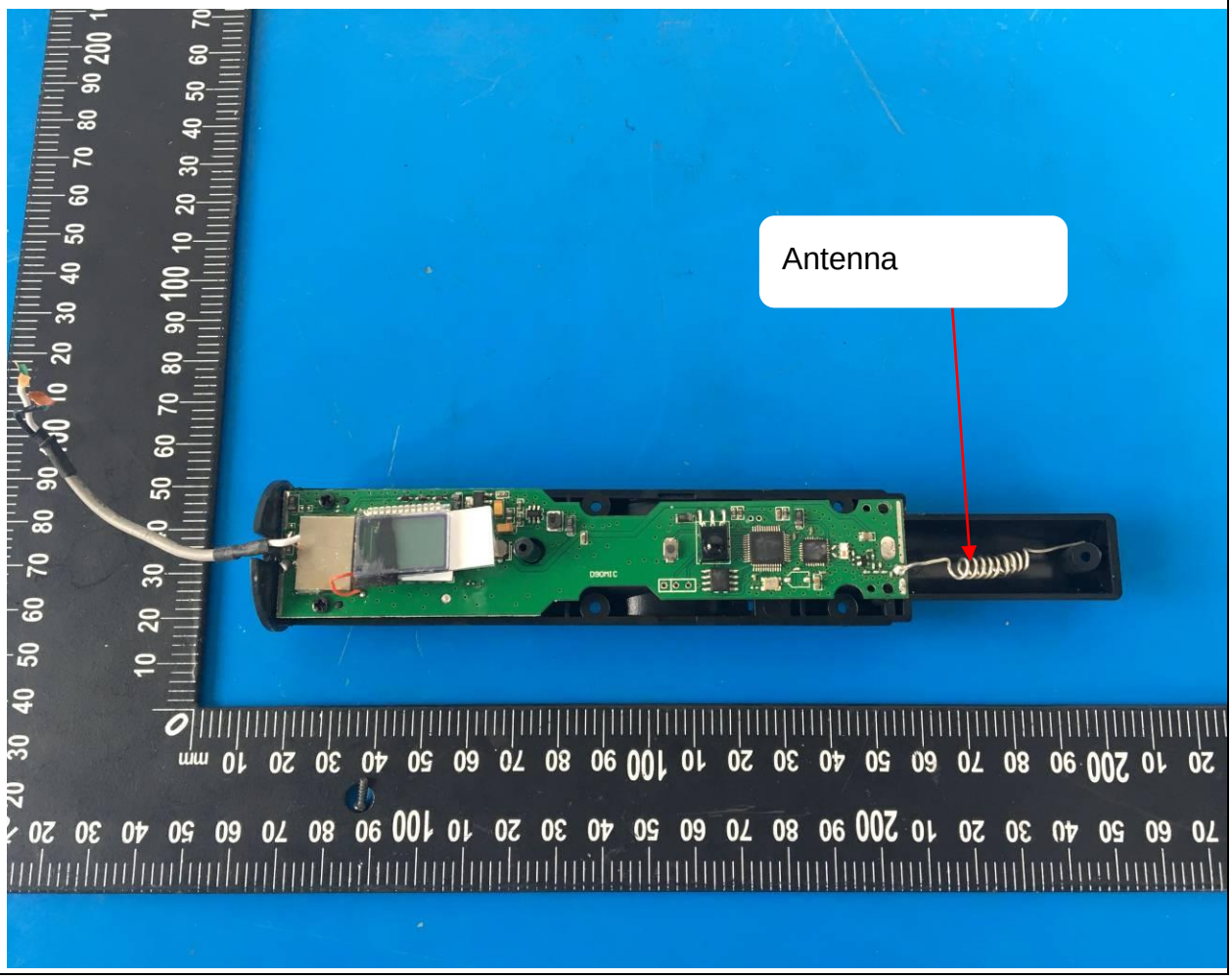
Standard requirement:	FCC Part15 C Section 15.203

15.203 requirement:

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.

EUT Antenna:

The antenna is Spring antenna, the best case gain of the antenna is 2dBi



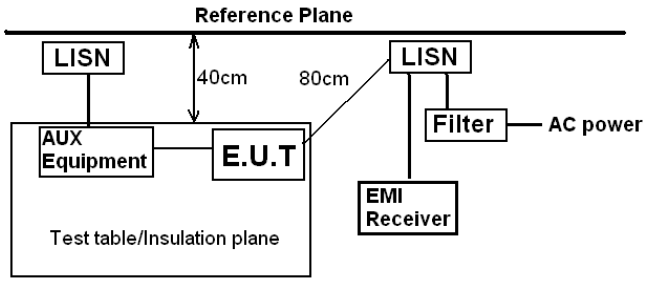
7.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207
Test Method:	ANSI C63.10:2013
Test Frequency Range:	150KHz to 30MHz
Class / Severity:	Class B
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto
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 setup:



Remark:
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m

Test procedure:

1. The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.
2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).
3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.

Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	N/A(The EUT is supplied by battery)

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level =Receiver Read level + LISN Factor + Cable Loss
4. *If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.*

7.3 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209
Test Method:	ANSI C63.10:2013
Test Frequency Range:	30MHz to 18GHz
Test site:	Measurement Distance: 3m
Receiver setup:	

Frequency	Detector	RBW	VBW	Remark
30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value
Above 1GHz	Peak	1MHz	3MHz	Peak Value
	Peak	1MHz	10Hz	Average Value

Limit:
(Field strength of the fundamental signal)

Frequency	Limit (dBuV/m @3m)	Remark
Carrier frequency	94.00	Average Value

Limit:
(Spurious Emissions)

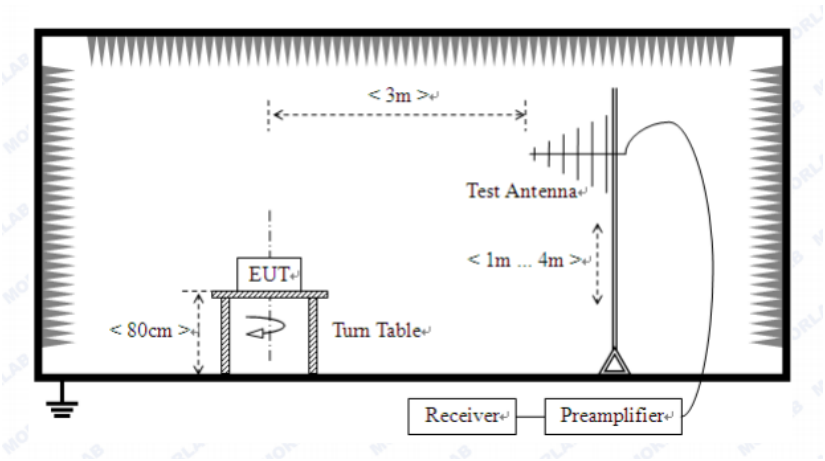
Frequency	Limit (dBuV/m @3m)	Remark
30MHz-88MHz	40.00	Quasi-peak Value
88MHz-216MHz	43.50	Quasi-peak Value
216MHz-960MHz	46.00	Quasi-peak Value
960MHz-1GHz	54.00	Quasi-peak Value
Above 1GHz	54.00	Average Value
	74.00	Peak Value

Limit:
(band edge)

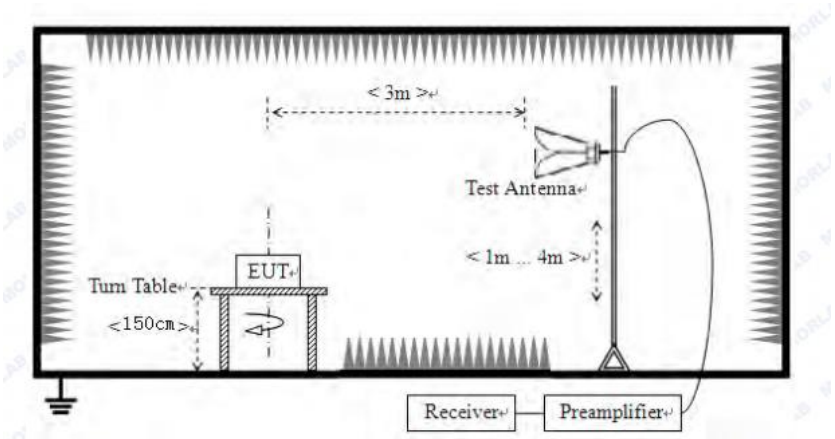
Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Test setup:

Below 1GHz



Above 1GHz

	
Test Procedure:	1. The EUT was placed on the top of a rotating table (0.8m for below 1GHz and 1.5 meters for above 1GHz) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. 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. 4. 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 and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. 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.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement data:

7.3.1 Field Strength of The Fundamental Signal

Peak value:

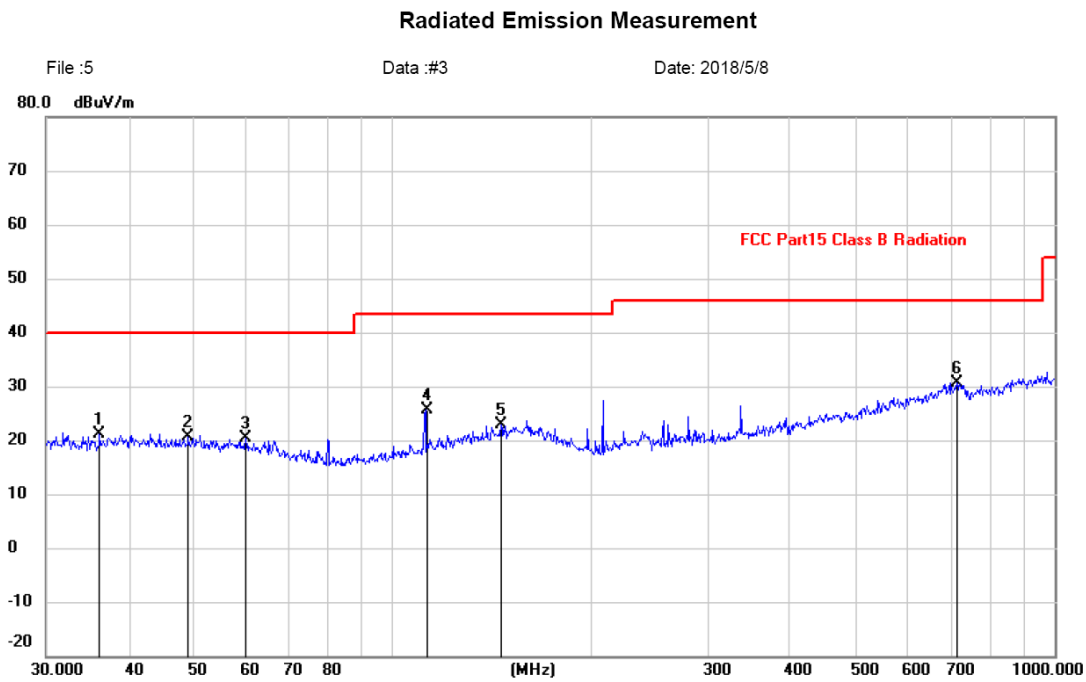
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	polarization
903.00	96.95	22.37	4.93	37.58	86.67	94.00	Vertical
903.00	95.62	22.37	4.93	37.58	85.34	94.00	Horizontal
915.00	98.30	22.39	4.93	37.58	88.04	94.00	Vertical
915.00	98.26	22.39	4.93	37.58	88.00	94.00	Horizontal
927.00	98.61	22.41	4.95	37.58	88.39	94.00	Vertical
927.00	97.10	22.41	4.95	37.58	86.88	94.00	Horizontal

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss-Preamp Factor*

7.3.2 Spurious emissions

- Below 1GHz

Horizontal:

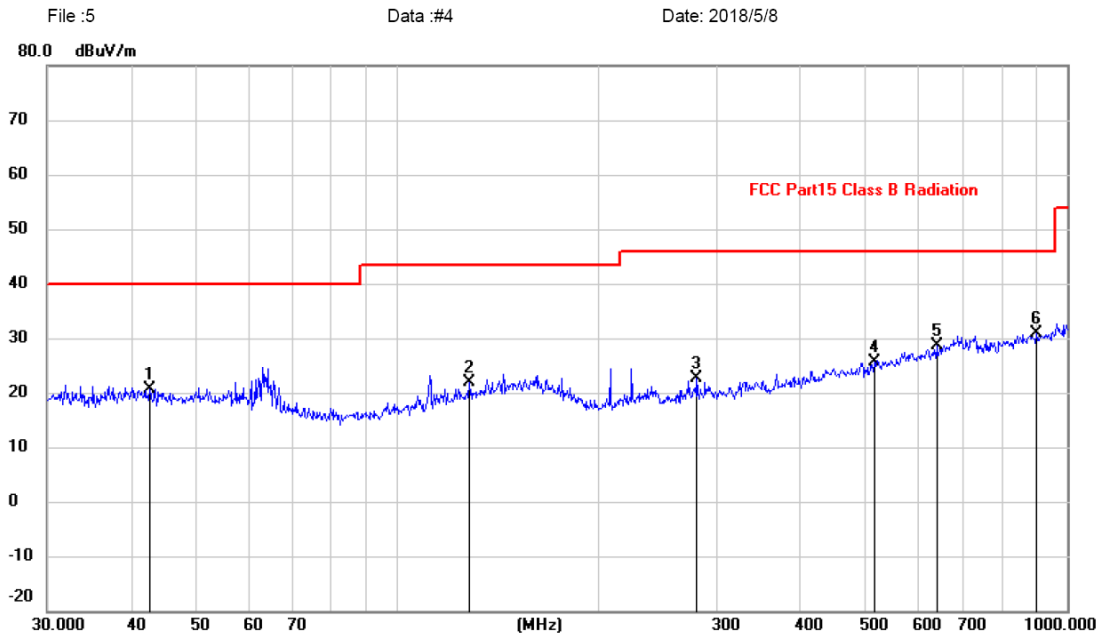


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		36.2540	7.42	13.59	21.01	40.00	-18.99	peak			
2		49.1865	7.03	13.65	20.68	40.00	-19.32	peak			
3		60.0691	7.37	12.96	20.33	40.00	-19.67	peak			
4		112.5243	13.81	11.78	25.59	43.50	-17.91	peak			
5		145.8611	8.58	14.25	22.83	43.50	-20.67	peak			
6	*	711.6734	9.87	20.72	30.59	46.00	-15.41	peak			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Vertical:

Radiated Emission Measurement



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		42.7494	6.77	13.97	20.74	40.00	-19.26	peak			
2		128.5629	8.84	13.14	21.98	43.50	-21.52	peak			
3		280.0237	9.69	12.97	22.66	46.00	-23.34	peak			
4		517.2478	7.96	17.74	25.70	46.00	-20.30	peak			
5		638.3686	8.65	20.01	28.66	46.00	-17.34	peak			
6	*	900.1473	7.91	22.95	30.86	46.00	-15.14	peak			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

■ Above 1GHz

Test channel:	Lowest channel

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	PK Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1288.00	37.00	25.61	4.54	35.99	31.16	74.00	-42.84	Vertical
2503.00	33.67	27.55	5.49	36.94	29.77	74.00	-44.23	Vertical
3709.00	30.56	29.25	7.34	37.37	29.78	74.00	-44.22	Vertical
5500.00	28.38	31.98	9.51	37.07	32.80	74.00	-41.20	Vertical
7561.00	26.22	36.75	11.86	35.52	39.31	74.00	-34.69	Vertical
8704.00	27.00	36.87	13.23	34.74	42.36	74.00	-31.64	Horizontal
1369.00	36.13	25.66	4.59	36.06	30.32	74.00	-43.68	Horizontal
2440.00	33.93	27.48	5.43	36.89	29.95	74.00	-44.05	Horizontal
3736.00	30.77	29.29	7.4	37.38	30.08	74.00	-43.92	Horizontal
5428.00	28.44	31.86	9.4	37.18	32.52	74.00	-41.48	Horizontal

Test channel:	Middle channel

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	PK Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1342.00	36.63	25.7	4.57	36.04	30.86	74.00	-43.14	Vertical
2467.00	34.17	27.49	5.45	36.91	30.20	74.00	-43.80	Vertical
3772.00	31.72	29.33	7.46	37.38	31.13	74.00	-42.87	Vertical
5473.00	28.57	31.95	9.47	37.11	32.88	74.00	-41.12	Vertical
7534.00	27.77	36.72	11.85	35.53	40.81	74.00	-33.19	Vertical
8677.00	26.53	36.84	13.19	34.76	41.80	74.00	-32.20	Horizontal
1324.00	36.73	25.67	4.56	36.02	30.94	74.00	-43.06	Horizontal
2530.00	35.64	27.58	5.52	36.96	31.78	74.00	-42.22	Horizontal
3754.00	32.98	29.3	7.44	37.38	32.34	74.00	-41.66	Horizontal
5455.00	28.36	31.89	9.45	37.13	32.57	74.00	-41.43	Horizontal

Test channel:	Highest channel

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	PK Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1216.00	37.85	25.42	4.48	35.93	31.82	74.00	-42.18	Vertical
2566.00	34.35	27.68	5.55	36.99	30.59	74.00	-43.41	Vertical
3655.00	30.21	29.19	7.25	37.37	29.28	74.00	-44.72	Vertical
5617.00	29.32	32.27	9.67	36.91	34.35	74.00	-39.65	Vertical
7318.00	28.20	36.37	11.72	35.6	40.69	74.00	-33.31	Vertical
8551.00	26.80	36.63	12.97	34.9	41.50	74.00	-32.50	Horizontal
1234.00	36.10	25.48	4.49	35.94	30.13	74.00	-43.87	Horizontal
2620.00	35.34	27.86	5.6	37.03	31.77	74.00	-42.23	Horizontal
3907.00	29.87	29.52	7.69	37.39	29.69	74.00	-44.31	Horizontal
5563.00	28.58	32.13	9.61	36.98	33.34	74.00	-40.66	Horizontal

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
3. *"*", means this data is the too weak instrument of signal is unable to test.*

7.3.3 Bandedge emissions

Test channel:	Lowest channel

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)		Polarization
902.00	35.30	22.3	4.87	37.6	24.87	46		Horizontal
902.00	39.51	22.3	4.87	37.6	29.08	46		Vertical
928.00	40.95	22.3	4.87	37.6	30.52	46		Horizontal
928.00	35.88	22.3	4.87	37.6	25.45	46		Vertical

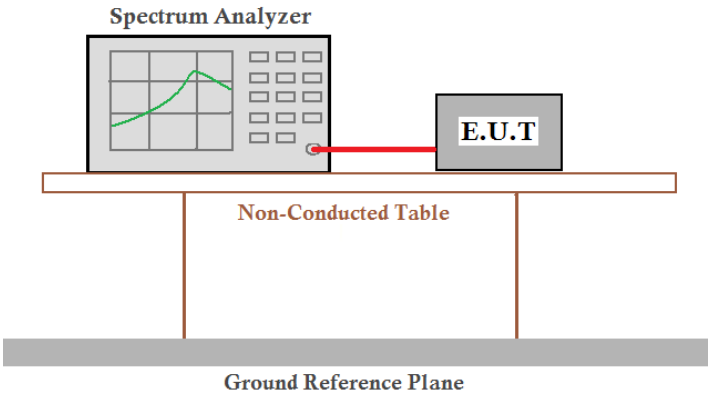
Test channel:	Highest channel

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)		Polarization
902.00	34.65	22.3	4.87	37.6	24.22	46		Horizontal
902.00	38.63	22.3	4.87	37.6	28.20	46		Vertical
928.00	25.02	22.3	4.87	37.6	14.59	46		Horizontal
928.00	26.38	22.3	4.87	37.6	15.95	46		Vertical

Remark:
Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamp Factor

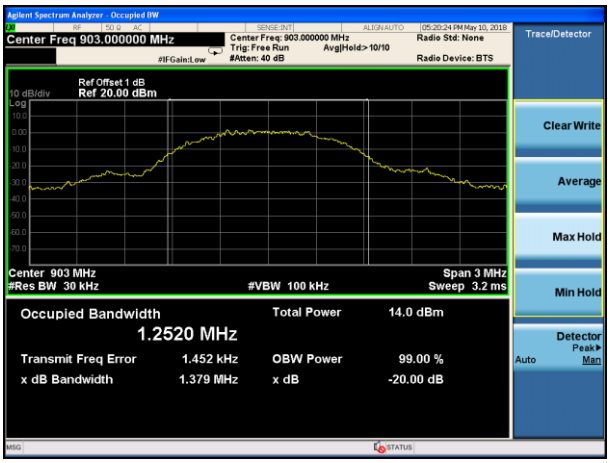
7.4 20dB Occupy Bandwidth

Test Requirement:	FCC Part15 C Section 15.249/15.215
Test Method:	ANSI C63.10:2013
Limit:	Operation Frequency range 902MHz~928MHz
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

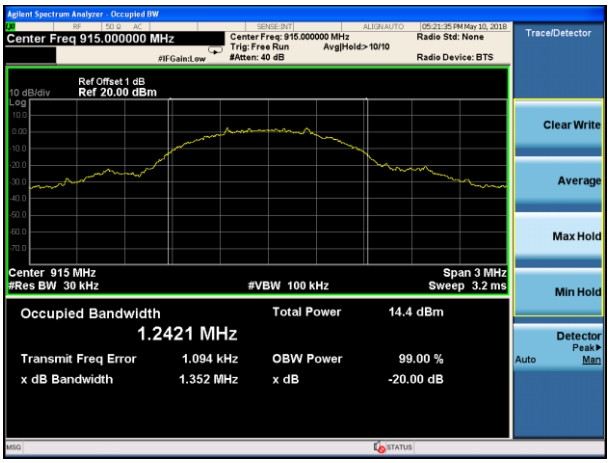
Measurement Data

Test channel	20dB bandwidth(MHz)	Result
903MHz	1.379	Pass
915MHz	1.352	Pass
927MHz	1.319	Pass

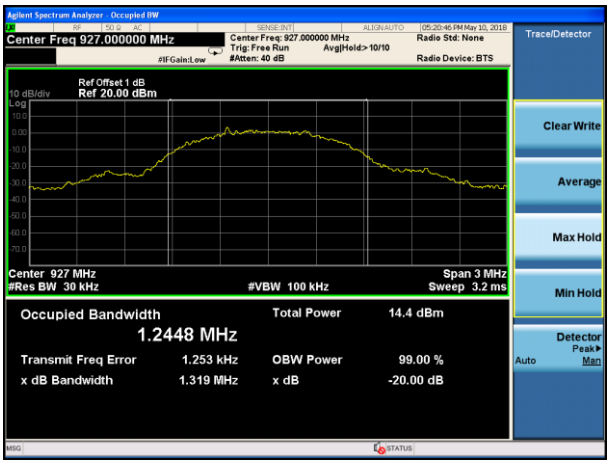
Test plot as follows:



Lowest : 903MHz



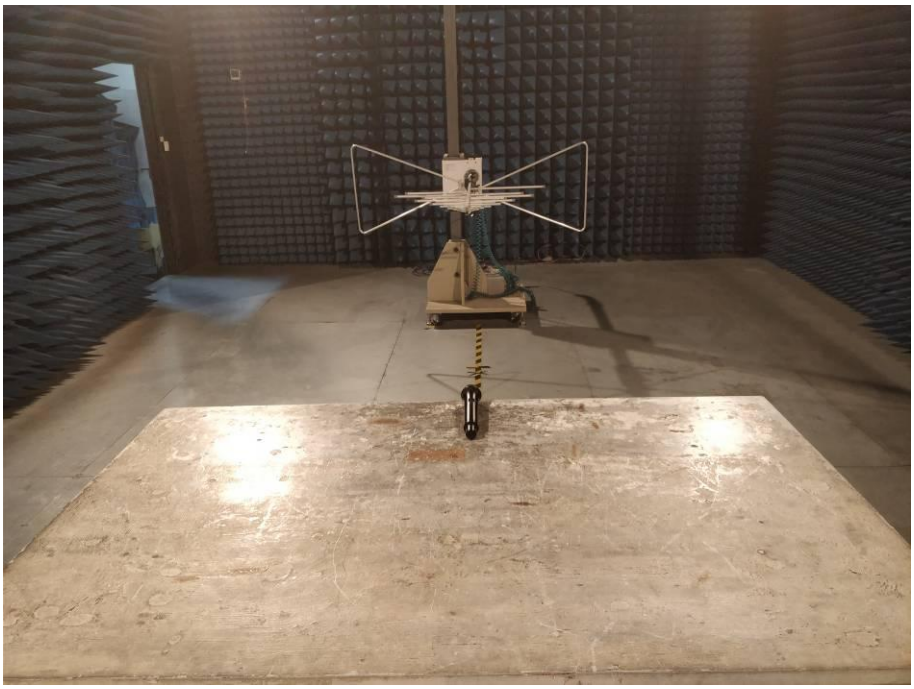
Middle: 915MHz



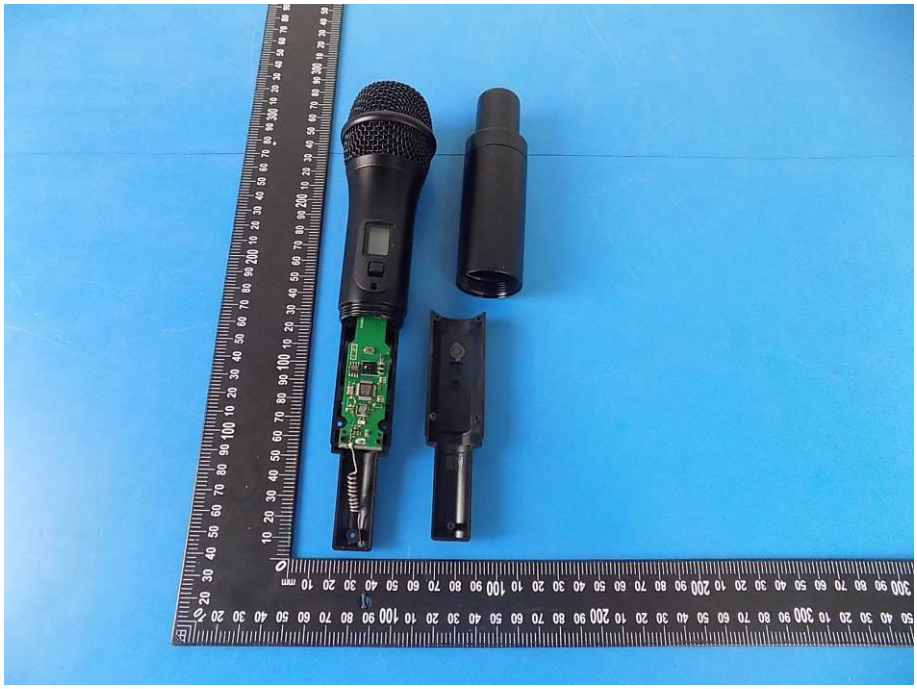
Highest: 927MHz

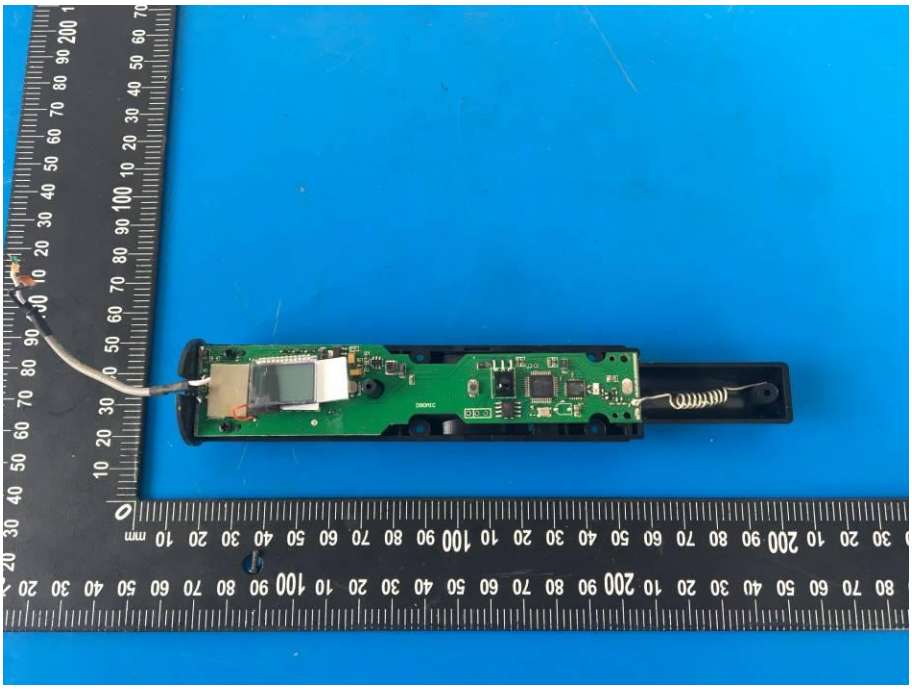
8 Test Setup Photo

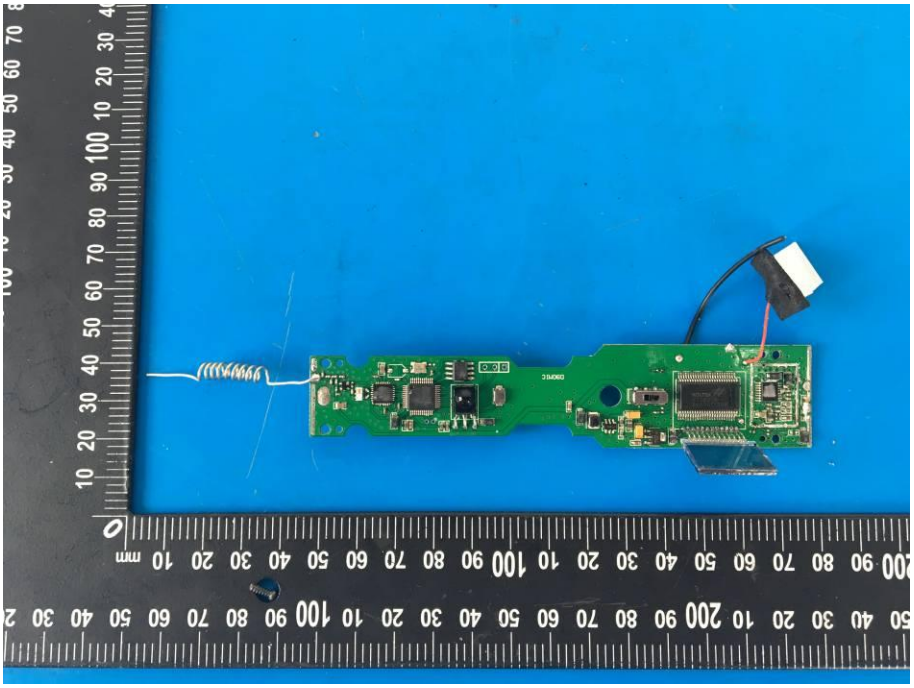
Radiated Emission

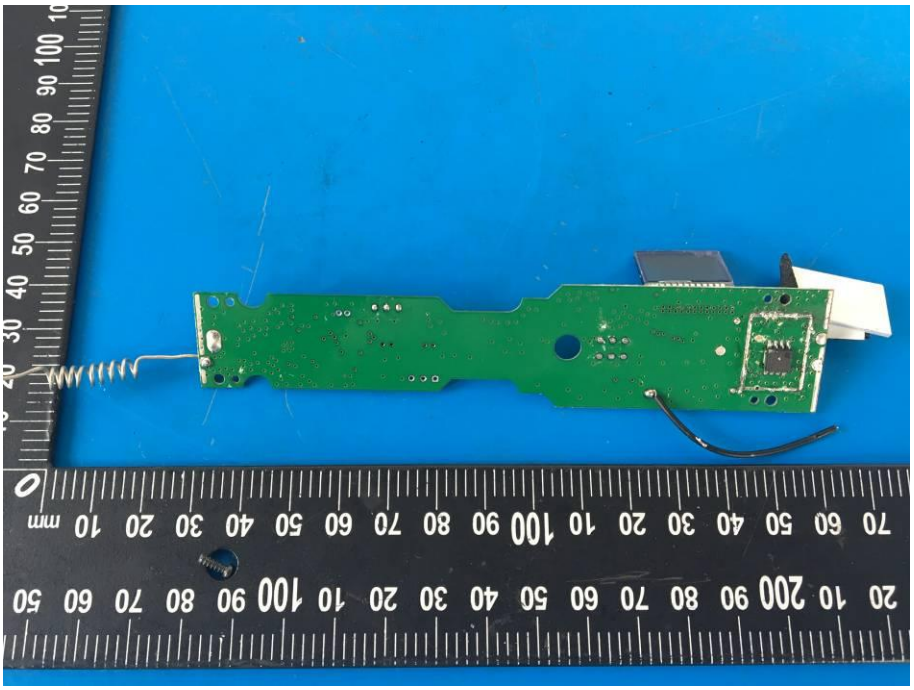


9 EUT Constructional Details









------End------