

### FCC REPORT

**Applicant:** Shenzhen VVFLY Electronics Co., LTD.  
**Address of Applicant:** Room 1310, Changhong Building Nanshan Districts, Shenzhen, China  
**Manufacturer:** Shenzhen VVFLY Electronics Co., LTD.  
**Address of Manufacturer:** Room 1310, Changhong Building Nanshan Districts, Shenzhen, China  
**Factory:** DONGGUAN TOHEI E.M.C.CO.,LTD  
**Address of Factory:** Qingfeng Road, Jinlong Industrial District, Qingxi, Dongguan Guangdong, China

#### Equipment Under Test (EUT)

**Product Name:** Smart Electronic Muscle Stimulator  
**Model No.:** YA4100, YA4200, YA4300, YA4400, YA40, YA41, YA42, YA43, YA44, YA45  
**FCC ID:** 2ALXG-YA4100  
**Applicable standards:** FCC CFR Title 47 Part 15 Subpart C Section 15.249  
**Date of sample receipt:** December 14, 2018  
**Date of Test:** December 14-24, 2018  
**Date of report issued:** December 25, 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	December 25, 2018	Original

Prepared By:

*Bill. Yuan*

Date:

December 25, 2018

Project Engineer

Check By:

*Robinson*

Date:

December 25, 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	Pass
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

*Remarks:*

1. Pass: The EUT complies with the essential requirements in the standard.
2. Test according to ANSI C63.10:2013.

### 4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	9kHz ~ 30MHz	± 4.54dB	(1)
Radiated Emission	30MHz ~ 1000MHz	± 5.34dB	(1)
Radiated Emission	1GHz ~ 26.5GHz	± 5.34dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	± 3.44dB	(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:	Smart Electronic Muscle Stimulator
Model No.:	YA4100, YA4200, YA4300, YA4400, YA40, YA41, YA42, YA43, YA44, YA45
Test Model No:	YA4100
<i>Remark: All above models are identical in the same PCB layout, interior structure and electrical circuits. The differences model name for commercial purpose.</i>	
Serial No.:	6936154400066
Hardware version:	YA4100-V2.0
Software version:	V1.0
Test sample(s) ID:	GTS201812000125-1
Sample(s) Status	Engineered sample
Operation Frequency:	2402MHz~2480MHz
Channel numbers:	40
Channel separation:	2MHz
Modulation type:	GFSK
Antenna Type:	Chip Antenna
Antenna gain:	3.10dBi(Declared by applicant)
Power supply:	Rechargeable Battery: DC 3.7V, 80mAh, 0.296Wh

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2402MHz	11	2422MHz	21	2442MHz	31	2462MHz
2	2404MHz	12	2424MHz	22	2444MHz	32	2464MHz
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
9	2418MHz	19	2438MHz	29	2458MHz	39	2478MHz
10	2420MHz	20	2440MHz	30	2460MHz	40	2480MHz

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The lowest channel	2402MHz
The middle channel	2440MHz
The Highest channel	2480MHz

## 5.2 Test mode

Transmitting mode	Keep the EUT in charging and continuously transmitting mode.
<i>Remark: During the test, the duty cycle &gt;98%, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.</i>	

### 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. Only worse case is reported:

Axis	X	Y	Z
Field Strength(dBuV/m)	88.11	89.09	87.24

## 5.3 Description of Support Units

Manufacturer	Description	Model	Serial Number
AoHai Adapter	USB Charger	A9A-050100U-US1	N/A

## 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 fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 381383.

- **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.

- **NVLAP (LAB CODE:600179-0)**

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). LAB CODE:600179-0

- **CNAS (No. CNAS L5775)**

CNAS has accredited Global United Technology Services Co., Ltd., to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

## 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

## 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	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June. 27 2018	June. 26 2019
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 27 2018	June. 26 2019
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	June. 27 2018	June. 26 2019
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 27 2018	June. 26 2019
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 27 2018	June. 26 2019
9	Coaxial Cable	GTS	N/A	GTS211	June. 27 2018	June. 26 2019
10	Coaxial cable	GTS	N/A	GTS210	June. 27 2018	June. 26 2019
11	Coaxial Cable	GTS	N/A	GTS212	June. 27 2018	June. 26 2019
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 27 2018	June. 26 2019
13	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	June. 27 2018	June. 26 2019
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 27 2018	June. 26 2019
15	Band filter	Amindeon	82346	GTS219	June. 27 2018	June. 26 2019
16	Power Meter	Anritsu	ML2495A	GTS540	June. 27 2018	June. 26 2019
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 27 2018	June. 26 2019
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS588	June. 27 2018	June. 26 2019
19	Splitter	Agilent	11636B	GTS237	June. 27 2018	June. 26 2019
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 27 2018	June. 26 2019



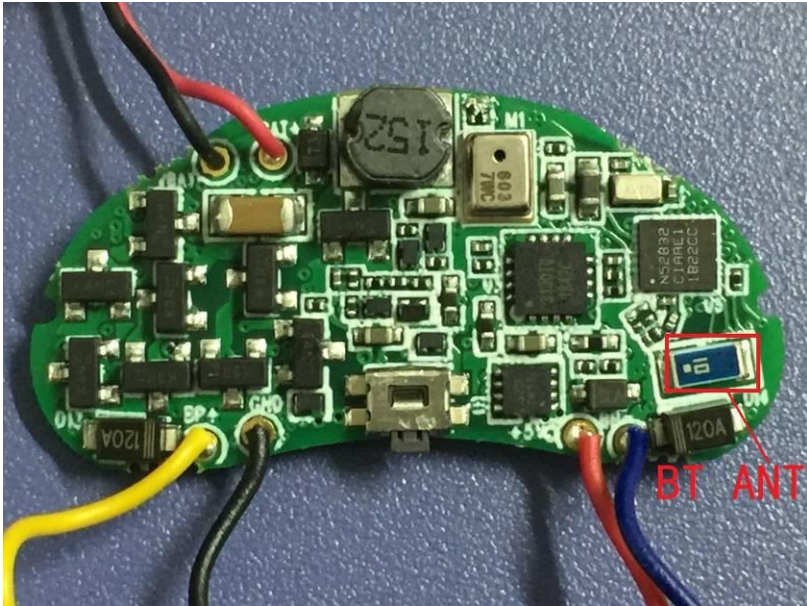
<b>RF Conducted:</b>						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	MXA Signal Analyzer	Agilent	N9020A	GTS566	June. 27 2018	June. 26 2019
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 27 2018	June. 26 2019
3	Spectrum Analyzer	Agilent	E4440A	GTS533	June. 27 2018	June. 26 2019
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	June. 27 2018	June. 26 2019
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	June. 27 2018	June. 26 2019
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	June. 27 2018	June. 26 2019
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	June. 27 2018	June. 26 2019
8	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 27 2018	June. 26 2019
9	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	June. 27 2018	June. 26 2019

<b>Conducted Emission</b>						
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. 27 2018	June. 26 2019
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 27 2018	June. 26 2019
4	Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	GTS226	June. 27 2018	June. 26 2019
5	Coaxial Cable	GTS	N/A	GTS227	June. 27 2018	June. 26 2019
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Thermo meter	KTJ	TA328	GTS233	June. 27 2018	June. 26 2019
8	Absorbing clamp	Elektronik-Feinmechanik	MDS21	GTS229	June. 27 2018	June. 26 2019

<b>General used equipment:</b>						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Humidity/ Temperature Indicator	Shanghai	ZJ1-2B	GTS243	June. 27 2018	June. 26 2019
2	Barometer	ChangChun	DYM3	GTS255	June. 27 2018	June. 26 2019

## 7 Test results and Measurement Data

### 7.1 Antenna requirement

<b>Standard requirement:</b>	FCC Part15 C Section 15.203
<p><b>15.203 requirement:</b></p> <p>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.</p>	
<p><b>EUT Antenna:</b></p>	
<p><i>The antenna is chip antenna, the best case gain of the is 3.10dBi</i></p> 	

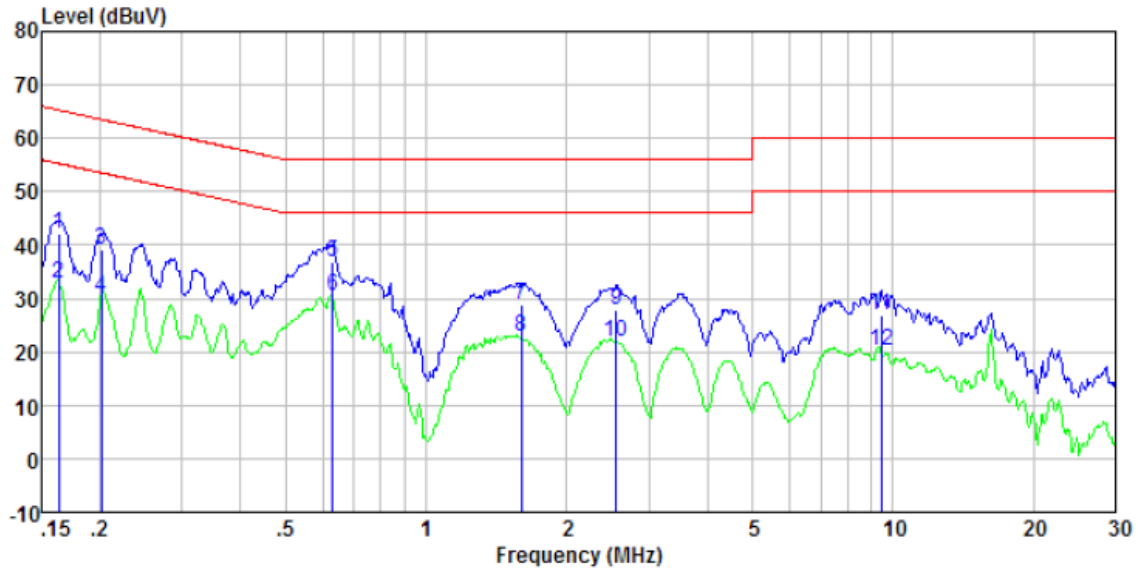
## 7.2 Conducted Emissions

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:	<p><i>Remark:</i>  E.U.T: Equipment Under Test  LISN: Line Impedance Stabilization Network  Test table height=0.8m</p>					
Test procedure:	<ol style="list-style-type: none"> <li>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.</li> <li>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).</li> <li>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.</li> </ol>					
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar
Test voltage:	AC 120V, 60Hz					
Test results:	Pass					

Remark: Both high and low voltages have been tested to show only the worst low voltage test data.

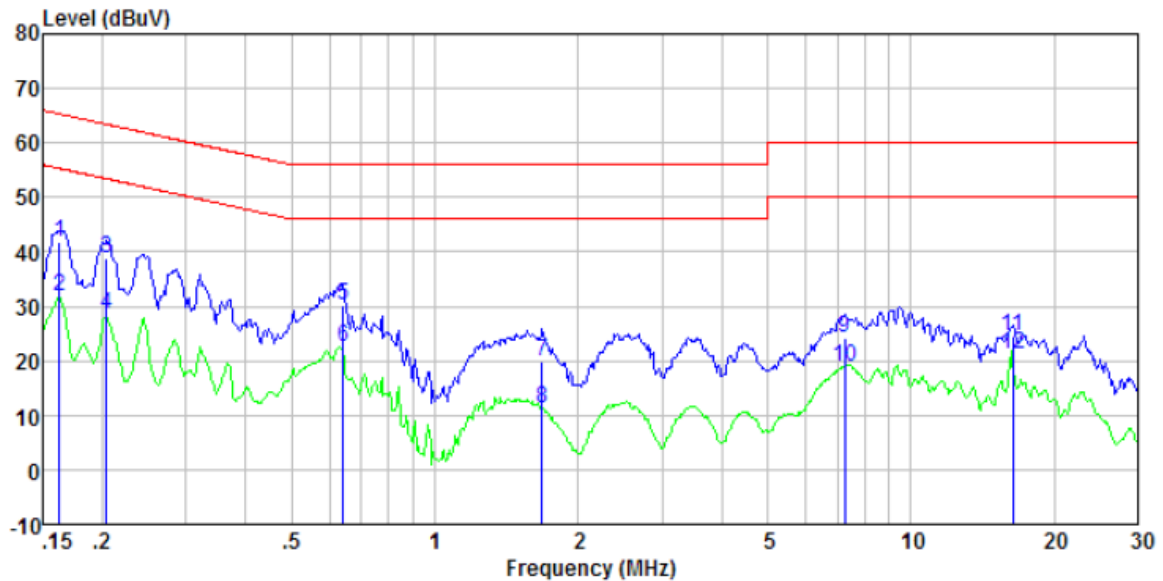
**Measurement data**

Line:



Freq MHz	Reading level dBuV	LISN/ISN factor dB/m	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.16	41.65	0.40	0.08	42.13	65.30	-23.17	QP
0.16	32.23	0.40	0.08	32.71	55.30	-22.59	Average
0.20	38.55	0.40	0.11	39.06	63.54	-24.48	QP
0.20	29.75	0.40	0.11	30.26	53.54	-23.28	Average
0.63	36.49	0.28	0.12	36.89	56.00	-19.11	QP
0.63	30.10	0.28	0.12	30.50	46.00	-15.50	Average
1.60	28.33	0.20	0.17	28.70	56.00	-27.30	QP
1.60	22.52	0.20	0.17	22.89	46.00	-23.11	Average
2.55	27.59	0.20	0.18	27.97	56.00	-28.03	QP
2.55	21.60	0.20	0.18	21.98	46.00	-24.02	Average
9.45	26.59	0.20	0.20	26.99	60.00	-33.01	QP
9.45	19.76	0.20	0.20	20.16	50.00	-29.84	Average

**Neutral:**

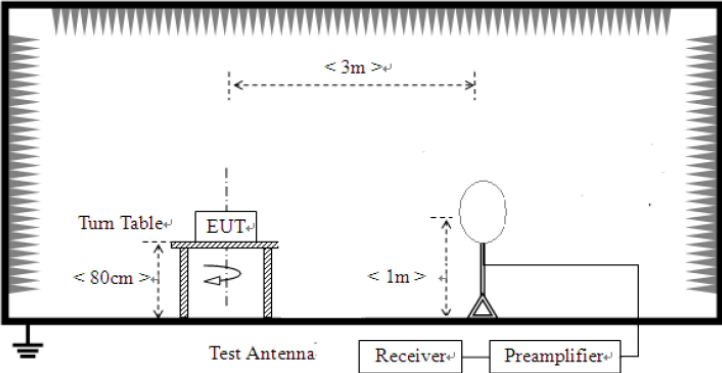


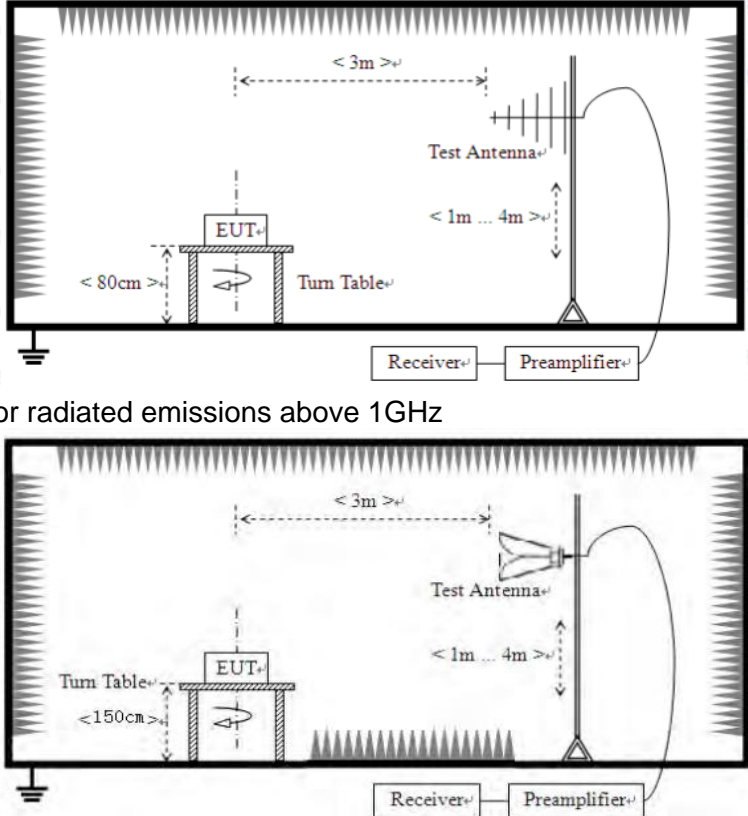
Freq MHz	Reading level dBuV	LISN/ISN factor dB/m	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.16	41.28	0.40	0.08	41.76	65.34	-23.58	QP
0.16	31.48	0.40	0.08	31.96	55.34	-23.38	Average
0.20	38.31	0.40	0.11	38.82	63.45	-24.63	QP
0.20	27.98	0.40	0.11	28.49	53.45	-24.96	Average
0.64	29.66	0.27	0.12	30.05	56.00	-25.95	QP
0.64	22.15	0.27	0.12	22.54	46.00	-23.46	Average
1.68	19.43	0.20	0.17	19.80	56.00	-36.20	QP
1.68	11.04	0.20	0.17	11.41	46.00	-34.59	Average
7.25	23.84	0.20	0.19	24.23	60.00	-35.77	QP
7.25	18.41	0.20	0.19	18.80	50.00	-31.20	Average
16.40	24.04	0.23	0.22	24.49	60.00	-35.51	QP
16.40	20.68	0.23	0.22	21.13	50.00	-28.87	Average

**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:	9kHz to 25GHz																						
Test site:	Measurement Distance: 3m																						
Receiver setup:	<table border="1"> <thead> <tr> <th>Frequency</th> <th>Detector</th> <th>RBW</th> <th>VBW</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td>30MHz-1GHz</td> <td>Quasi-peak</td> <td>120KHz</td> <td>300KHz</td> <td>Quasi-peak Value</td> </tr> <tr> <td rowspan="2">Above 1GHz</td> <td>Peak</td> <td>1MHz</td> <td>3MHz</td> <td>Peak Value</td> </tr> <tr> <td>Peak</td> <td>1MHz</td> <td>10Hz</td> <td>Average Value</td> </tr> </tbody> </table>			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	
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)	<table border="1"> <thead> <tr> <th>Frequency</th> <th>Limit (dBuV/m @3m)</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td rowspan="2">2400MHz-2483.5MHz</td> <td>94.00</td> <td>Average Value</td> </tr> <tr> <td>114.00</td> <td>Peak Value</td> </tr> </tbody> </table>	Frequency	Limit (dBuV/m @3m)	Remark	2400MHz-2483.5MHz	94.00	Average Value	114.00	Peak Value														
Frequency	Limit (dBuV/m @3m)	Remark																					
2400MHz-2483.5MHz	94.00	Average Value																					
	114.00	Peak Value																					
Limit: (Spurious Emissions)	<table border="1"> <thead> <tr> <th>Frequency</th> <th>Limit (uV/m)</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td>30MHz-88MHz</td> <td>100 @3m</td> <td>Quasi-peak Value</td> </tr> <tr> <td>88MHz-216MHz</td> <td>150 @3m</td> <td>Quasi-peak Value</td> </tr> <tr> <td>216MHz-960MHz</td> <td>200 @3m</td> <td>Quasi-peak Value</td> </tr> <tr> <td>960MHz-1GHz</td> <td>500 @3m</td> <td>Quasi-peak Value</td> </tr> <tr> <td rowspan="2">Above 1GHz</td> <td>500 @3m</td> <td>Average Value</td> </tr> <tr> <td>5000 @3m</td> <td>Peak Value</td> </tr> </tbody> </table>			Frequency	Limit (uV/m)	Remark	30MHz-88MHz	100 @3m	Quasi-peak Value	88MHz-216MHz	150 @3m	Quasi-peak Value	216MHz-960MHz	200 @3m	Quasi-peak Value	960MHz-1GHz	500 @3m	Quasi-peak Value	Above 1GHz	500 @3m	Average Value	5000 @3m	Peak Value
Frequency	Limit (uV/m)	Remark																					
30MHz-88MHz	100 @3m	Quasi-peak Value																					
88MHz-216MHz	150 @3m	Quasi-peak Value																					
216MHz-960MHz	200 @3m	Quasi-peak Value																					
960MHz-1GHz	500 @3m	Quasi-peak Value																					
Above 1GHz	500 @3m	Average Value																					
	5000 @3m	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:	<p>For radiated emissions from 9kHz to 30MHz</p>  <p>For radiated emissions from 30MHz to 1GHz</p>																						

	 <p>For radiated emissions above 1GHz</p>						
<p>Test Procedure:</p>	<ol style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>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.</li> </ol>						
<p>Test Instruments:</p>	<p>Refer to section 6.0 for details</p>						
<p>Test mode:</p>	<p>Refer to section 5.2 for details</p>						
<p>Test environment:</p>	<table border="1"> <tr> <td>Temp.:</td> <td>25 °C</td> <td>Humid.:</td> <td>52%</td> <td>Press.:</td> <td>1012mbar</td> </tr> </table>	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar
Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar		
<p>Test voltage:</p>	<p>AC 120V, 60Hz</p>						
<p>Test results:</p>	<p>Pass</p>						

**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)	Over Limit (dB)	polarization
2402.00	85.35	27.58	5.39	30.18	88.14	114.00	-25.86	Vertical
2402.00	83.92	27.58	5.39	30.18	86.71	114.00	-27.29	Horizontal
2440.00	84.28	27.55	5.43	30.06	87.20	114.00	-26.80	Vertical
2440.00	83.07	27.55	5.43	30.06	85.99	114.00	-28.01	Horizontal
2480.00	86.03	27.52	5.47	29.93	89.09	114.00	-24.91	Vertical
2480.00	83.78	27.52	5.47	29.93	86.84	114.00	-27.16	Horizontal

**Average value:**

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
2402.00	73.82	27.58	5.39	30.18	76.61	94.00	-17.39	Vertical
2402.00	72.52	27.58	5.39	30.18	75.31	94.00	-18.69	Horizontal
2440.00	72.62	27.55	5.43	30.06	75.54	94.00	-18.46	Vertical
2440.00	70.08	27.55	5.43	30.06	73.00	94.00	-21.00	Horizontal
2480.00	74.13	27.52	5.47	29.93	77.19	94.00	-16.81	Vertical
2480.00	72.31	27.52	5.47	29.93	75.37	94.00	-18.63	Horizontal

Note: RBW 3MHz VBW 3MHz Peak detector is for PK value , RMS detector is for AV value



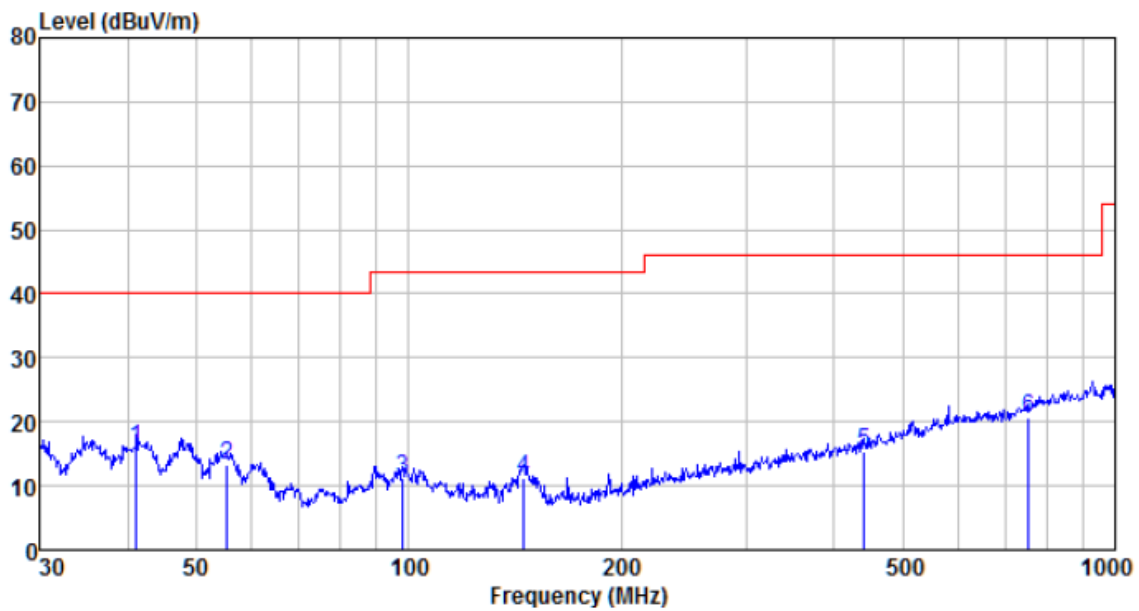
### 7.3.2 Spurious emissions

■ Below 30MHz

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o), the test result no need to reported.

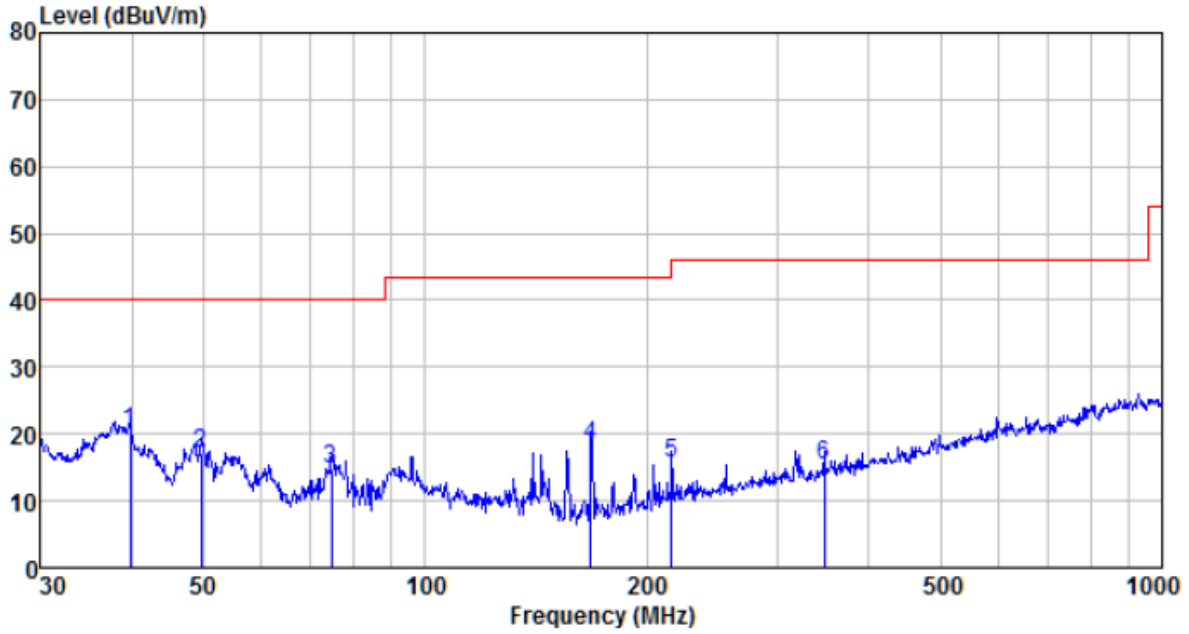
■ Below 1GHz

Horizontal:



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
41.132	38.71	12.21	0.67	35.73	15.86	40.00	-24.14	QP
55.221	36.94	11.78	0.82	36.26	13.28	40.00	-26.72	QP
98.142	34.73	11.93	1.18	36.71	11.13	43.50	-32.37	QP
145.351	39.24	7.51	1.54	37.05	11.24	43.50	-32.26	QP
441.743	33.71	16.20	3.06	37.52	15.45	46.00	-30.55	QP
755.387	33.26	20.66	4.29	37.62	20.59	46.00	-25.41	QP

Vertical:



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
39.715	43.22	12.17	0.66	35.65	20.40	40.00	-19.60	QP
49.707	40.25	12.30	0.77	36.17	17.15	40.00	-22.85	QP
74.657	42.79	7.45	0.98	36.49	14.73	40.00	-25.27	QP
167.824	45.48	8.46	1.67	37.18	18.43	43.50	-25.07	QP
216.024	39.94	11.02	1.93	37.35	15.54	46.00	-30.46	QP
348.027	35.80	14.48	2.61	37.47	15.42	46.00	-30.58	QP

■ Above 1GHz

Test channel:	Lowest channel
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**Peak value:**

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4804.00	35.64	31.78	8.60	32.09	43.93	74.00	-30.07	Vertical
7206.00	30.73	36.15	11.65	32.00	46.53	74.00	-27.47	Vertical
9608.00	30.49	37.95	14.14	31.62	50.96	74.00	-23.04	Vertical
12010.00	*					74.00		Vertical
14412.00	*					74.00		Vertical
4804.00	39.59	31.78	8.60	32.09	47.88	74.00	-26.12	Horizontal
7206.00	32.33	36.15	11.65	32.00	48.13	74.00	-25.87	Horizontal
9608.00	29.75	37.95	14.14	31.62	50.22	74.00	-23.78	Horizontal
12010.00	*					74.00		Horizontal
14412.00	*					74.00		Horizontal

**Average value:**

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4804.00	24.77	31.78	8.60	32.09	33.06	54.00	-20.94	Vertical
7206.00	19.60	36.15	11.65	32.00	35.40	54.00	-18.60	Vertical
9608.00	18.78	37.95	14.14	31.62	39.25	54.00	-14.75	Vertical
12010.00	*					54.00		Vertical
14412.00	*					54.00		Vertical
4804.00	28.81	31.78	8.60	32.09	37.10	54.00	-16.90	Horizontal
7206.00	21.66	36.15	11.65	32.00	37.46	54.00	-16.54	Horizontal
9608.00	18.37	37.95	14.14	31.62	38.84	54.00	-15.16	Horizontal
12010.00	*					54.00		Horizontal
14412.00	*					54.00		Horizontal

**Remarks:**

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.

Test channel:	Middle
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**Peak value:**

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4880.00	35.74	31.85	8.67	32.12	44.14	74.00	-29.86	Vertical
7320.00	30.79	36.37	11.72	31.89	46.99	74.00	-27.01	Vertical
9760.00	30.55	38.35	14.25	31.62	51.53	74.00	-22.47	Vertical
12200.00	*					74.00		Vertical
14640.00	*					74.00		Vertical
4880.00	39.71	31.85	8.67	32.12	48.11	74.00	-25.89	Horizontal
7320.00	32.41	36.37	11.72	31.89	48.61	74.00	-25.39	Horizontal
9760.00	29.82	38.35	14.25	31.62	50.80	74.00	-23.20	Horizontal
12200.00	*					74.00		Horizontal
14640.00	*					74.00		Horizontal

**Average value:**

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4880.00	24.86	31.85	8.67	32.12	33.26	54.00	-20.74	Vertical
7320.00	19.66	36.37	11.72	31.89	35.86	54.00	-18.14	Vertical
9760.00	18.84	38.35	14.25	31.62	39.82	54.00	-14.18	Vertical
12200.00	*					54.00		Vertical
14640.00	*					54.00		Vertical
4880.00	28.91	31.85	8.67	32.12	37.31	54.00	-16.69	Horizontal
7320.00	21.73	36.37	11.72	31.89	37.93	54.00	-16.07	Horizontal
9760.00	18.44	38.35	14.25	31.62	39.42	54.00	-14.58	Horizontal
12200.00	*					54.00		Horizontal
14640.00	*					54.00		Horizontal

**Remarks:**

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.*

Test channel:	Highest
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**Peak value:**

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4960.00	35.67	31.93	8.73	32.16	44.17	74.00	-29.83	Vertical
7440.00	30.75	36.59	11.79	31.78	47.35	74.00	-26.65	Vertical
9920.00	30.50	38.81	14.38	31.88	51.81	74.00	-22.19	Vertical
12400.00	*					74.00		Vertical
14880.00	*					74.00		Vertical
4960.00	39.62	31.93	8.73	32.16	48.12	74.00	-25.88	Horizontal
7440.00	32.36	36.59	11.79	31.78	48.96	74.00	-25.04	Horizontal
9920.00	29.77	38.81	14.38	31.88	51.08	74.00	-22.92	Horizontal
12400.00	*					74.00		Horizontal
14880.00	*					74.00		Horizontal

**Average value:**

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4960.00	24.83	31.93	8.73	32.16	33.33	54.00	-20.67	Vertical
7440.00	19.64	36.59	11.79	31.78	36.24	54.00	-17.76	Vertical
9920.00	18.82	38.81	14.38	31.88	40.13	54.00	-13.87	Vertical
12400.00	*					54.00		Vertical
14880.00	*					54.00		Vertical
4960.00	28.88	31.93	8.73	32.16	37.38	54.00	-16.62	Horizontal
7440.00	21.71	36.59	11.79	31.78	38.31	54.00	-15.69	Horizontal
9920.00	18.42	38.81	14.38	31.88	39.73	54.00	-14.27	Horizontal
12400.00	*					54.00		Horizontal
14880.00	*					54.00		Horizontal

**Remarks:**

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Pre-amplifier 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
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	37.37	27.59	5.38	30.18	40.16	74.00	-33.84	Horizontal
2400.00	53.37	27.58	5.39	30.18	56.16	74.00	-17.84	Horizontal
2390.00	37.40	27.59	5.38	30.18	40.19	74.00	-33.81	Vertical
2400.00	54.82	27.58	5.39	30.18	57.61	74.00	-16.39	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	29.17	27.59	5.38	30.18	31.96	54.00	-22.04	Horizontal
2400.00	40.08	27.58	5.39	30.18	42.87	54.00	-11.13	Horizontal
2390.00	28.72	27.59	5.38	30.18	31.51	54.00	-22.49	Vertical
2400.00	41.20	27.58	5.39	30.18	43.99	54.00	-10.01	Vertical

Test channel:	Highest channel
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	38.82	27.53	5.47	29.93	41.89	74.00	-32.11	Horizontal
2500.00	39.04	27.55	5.49	29.93	42.15	74.00	-31.85	Horizontal
2483.50	38.74	27.53	5.47	29.93	41.81	74.00	-32.19	Vertical
2500.00	39.51	27.55	5.49	29.93	42.62	74.00	-31.38	Vertical

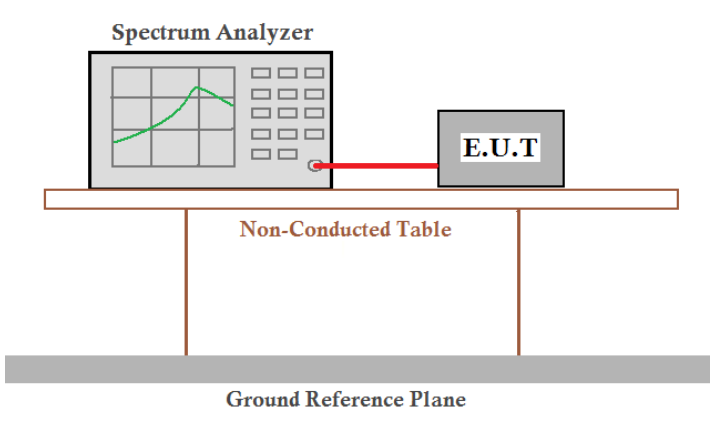
Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	31.93	27.53	5.47	29.93	35.00	54.00	-19.00	Horizontal
2500.00	30.72	27.55	5.49	29.93	33.83	54.00	-20.17	Horizontal
2483.50	32.68	27.53	5.47	29.93	35.75	54.00	-18.25	Vertical
2500.00	30.18	27.55	5.49	29.93	33.29	54.00	-20.71	Vertical

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Pre-amplifier Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

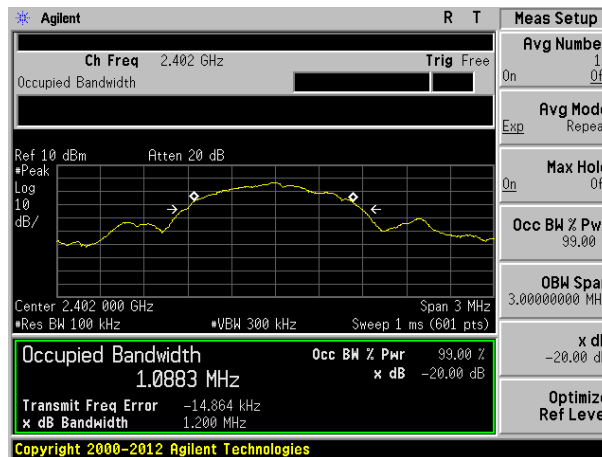
## 7.4 20dB Occupy Bandwidth

Test Requirement:	FCC Part15 C Section 15.249/15.215
Test Method:	ANSI C63.10:2013
Limit:	Operation Frequency range 2400MHz~2483.5MHz
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both are placed on a Non-Conducted Table, which is supported by two legs. Below the table is a Ground Reference Plane.</p>
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

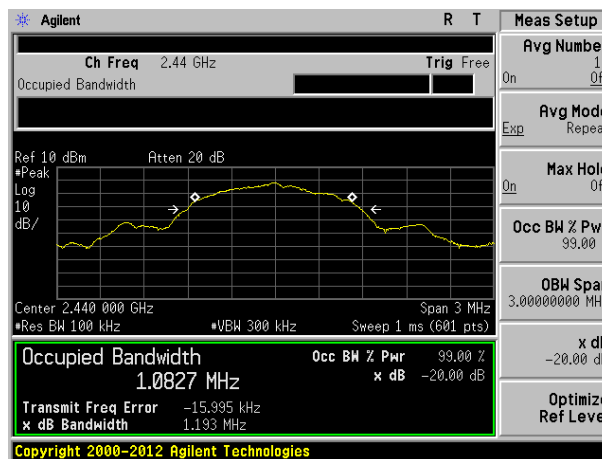
### Measurement Data

Test channel	20dB bandwidth(MHz)	Result
Lowest	1.200	Pass
Middle	1.193	Pass
Highest	1.195	Pass

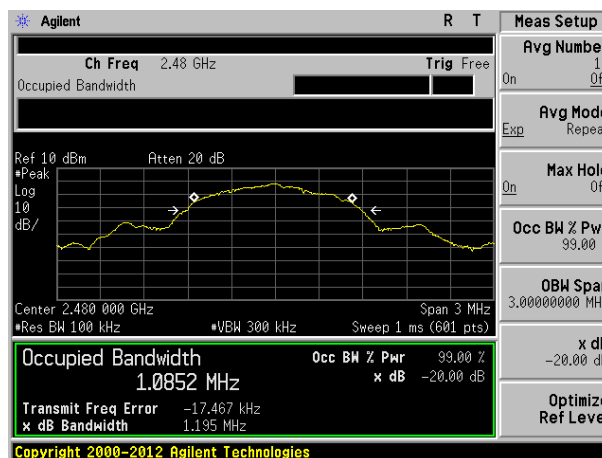
Test plot as follows:



Lowest channel



Middle channel

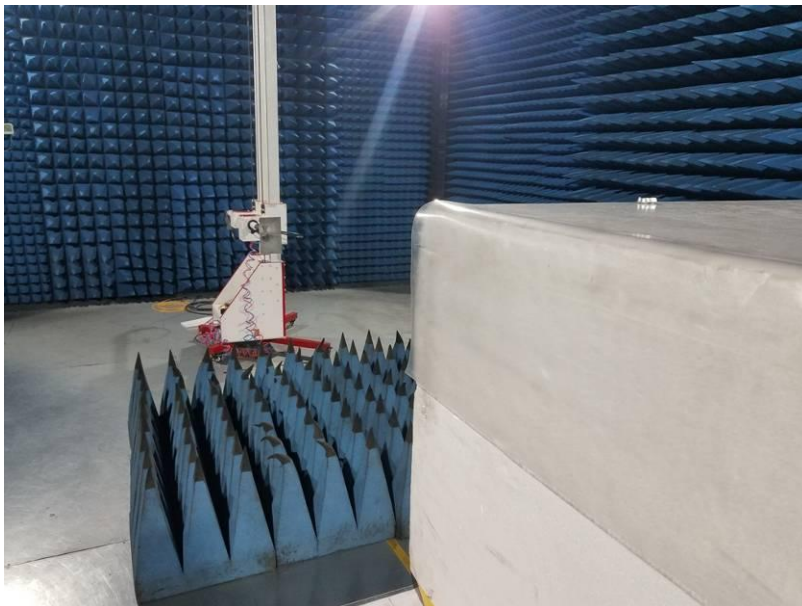
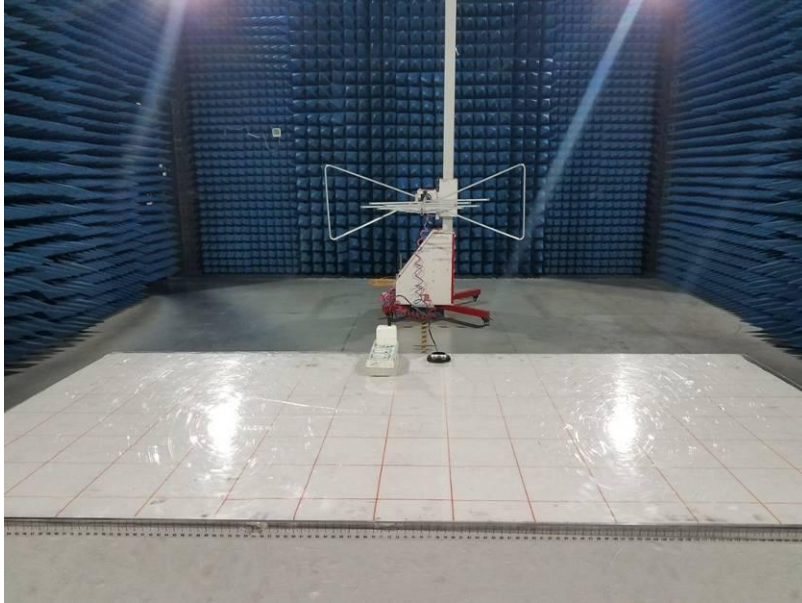


Highest channel



## 8 Test Setup Photo

Radiated Emission



## Conducted Emission

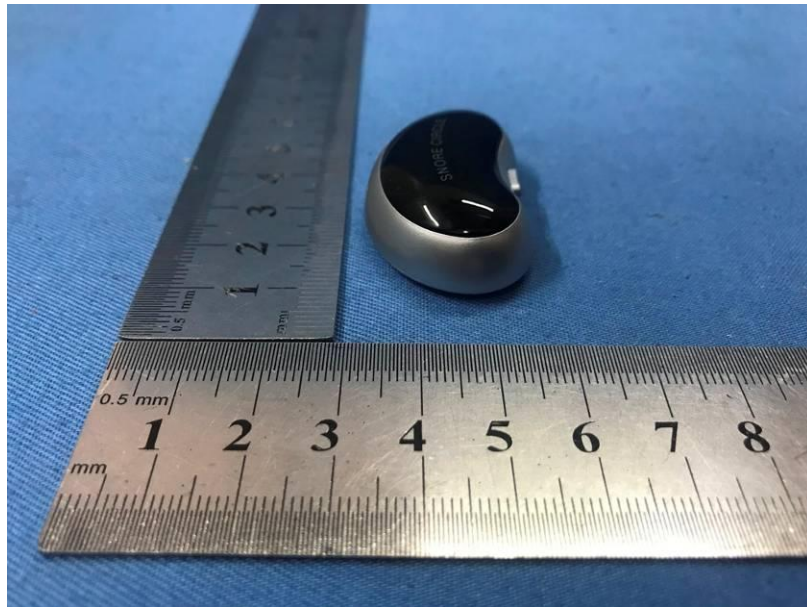
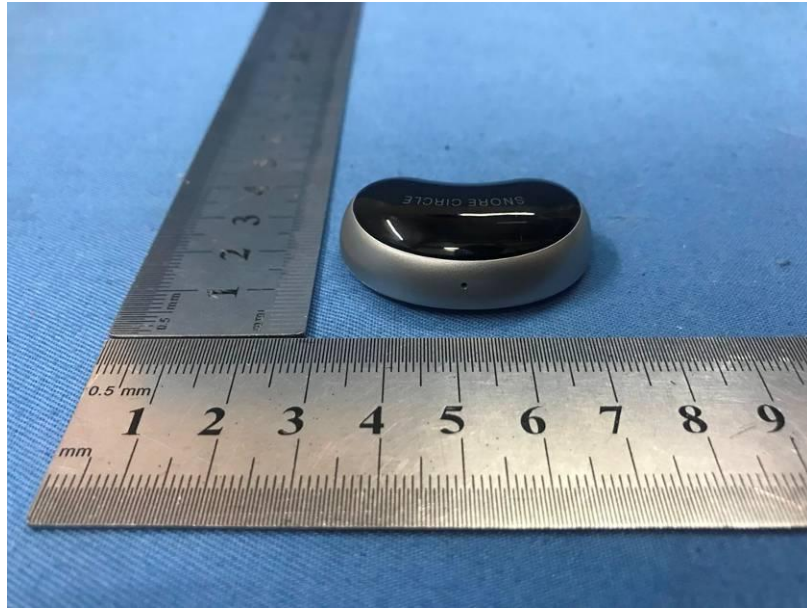


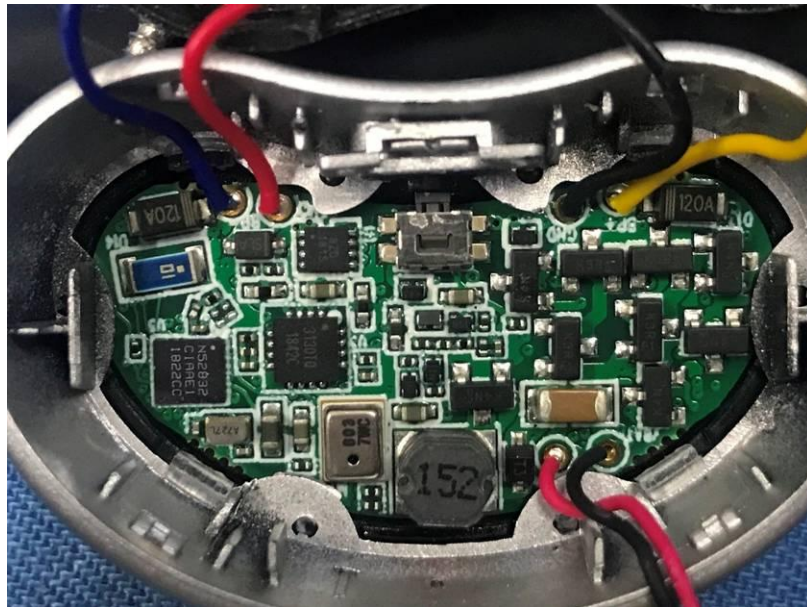
## 9 EUT Constructional Details

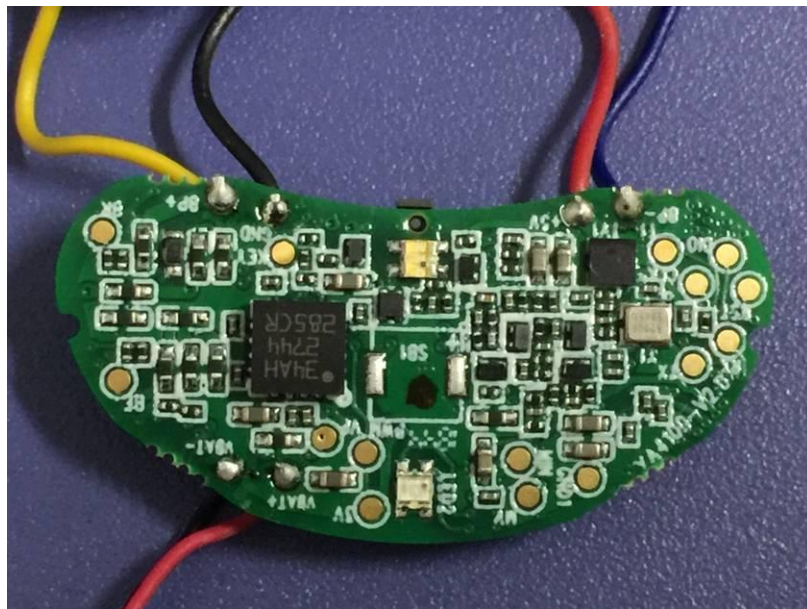
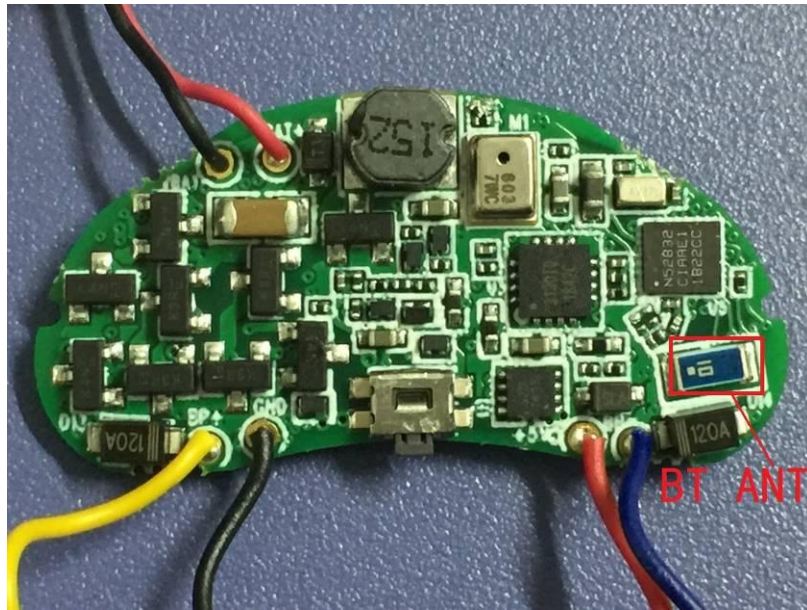




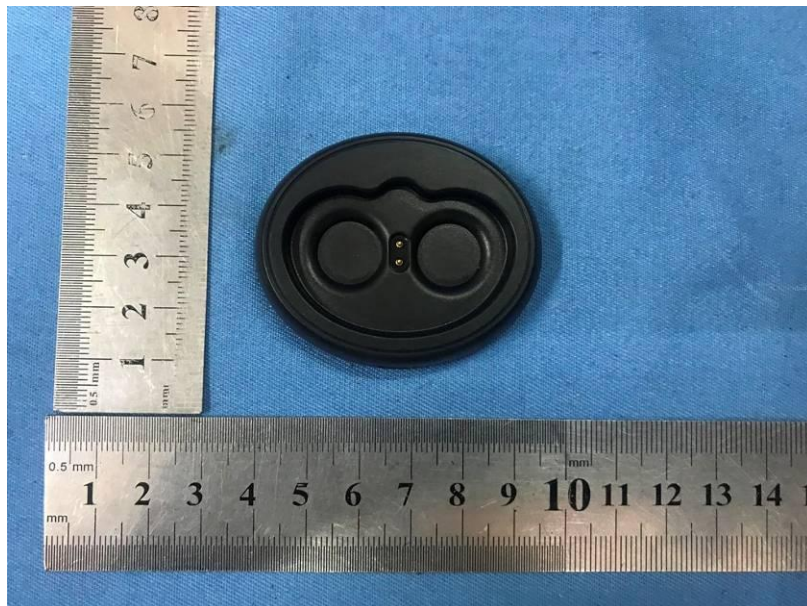




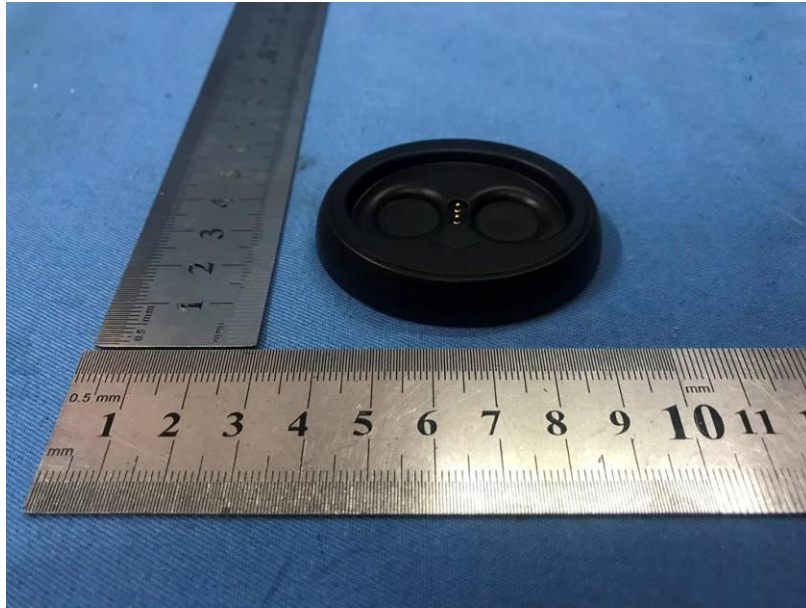




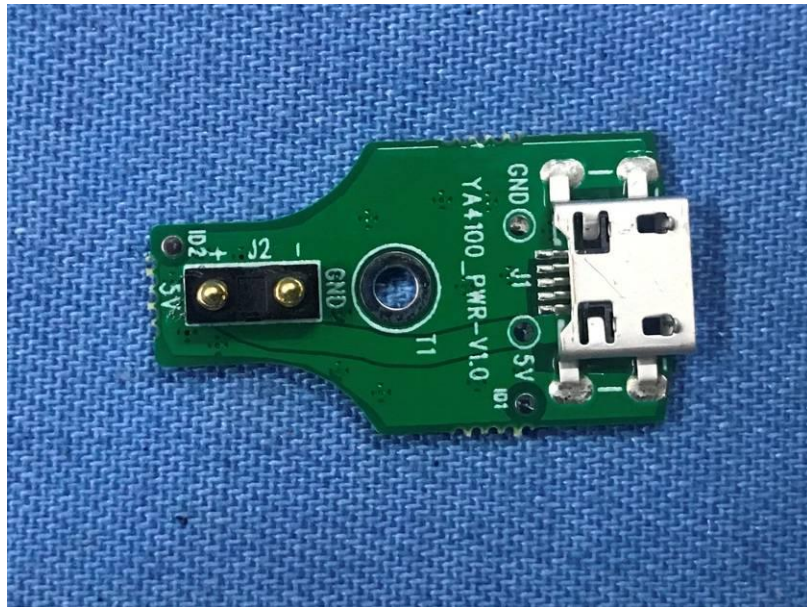
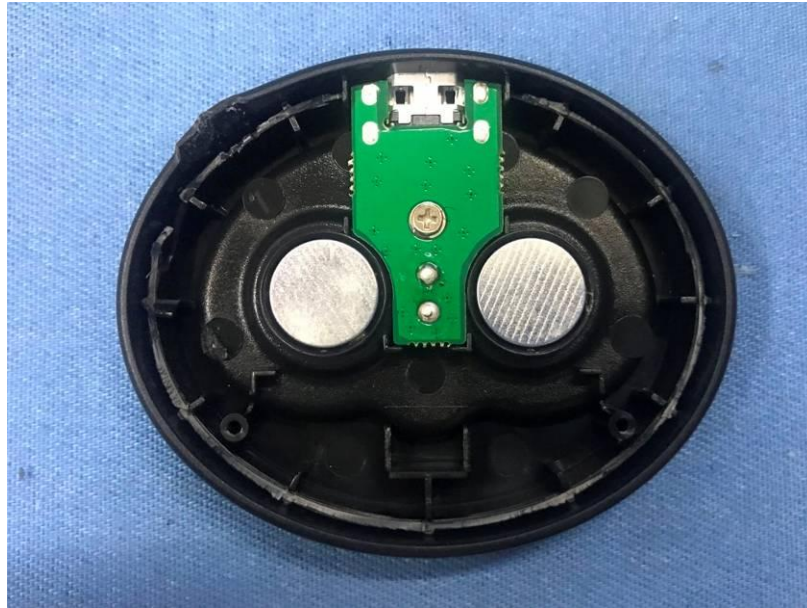


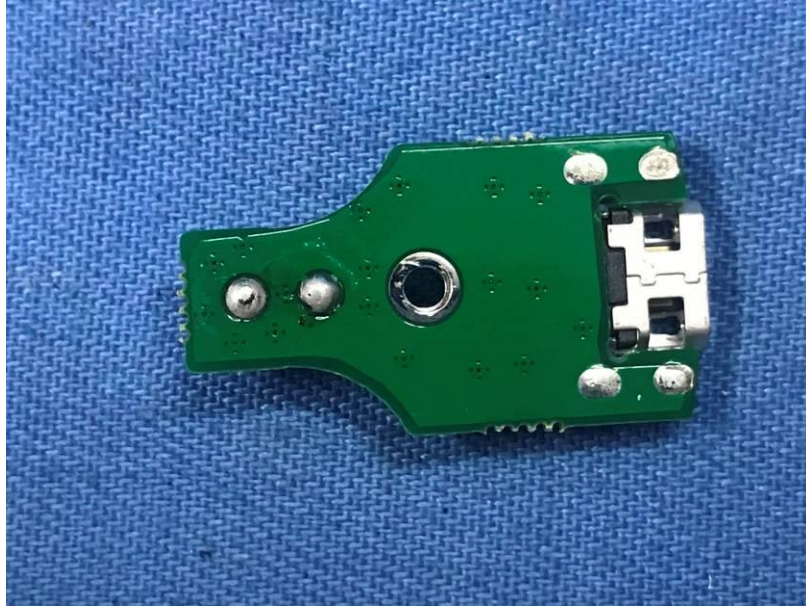












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