Shenzhen Huaxia Testing Technology Co., Ltd

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Report Template Version: V04
Report Template Revision Date: 2018-07-06

TEST REPORT

Report No. :	CQASZ20190901002E-02
Applicant:	Avantree Technology Co., Ltd.
Address of Applicant:	The 4th Floor, Yuepeng Building, No.1019 Jiabin Rd, Luohu District,Shenzhen, China
Equipment Under Test (EUT):	
EUT Name:	Wireless Stereo Headphones
All Model No.:	BTHS-AS90, BTHS-AS90B, BTHS-AS90C, BTHS-AS90M, BTHS-ANC033, BTHS-035
Test Model No.:	BTHS-AS90
Brand Name:	Avantree
FCC ID:	2AITF-BTHS-AS90
Standards:	47 CFR Part 15, Subpart C
Date of Receipt:	2019-12-13
Date of Test:	2019-12-13 to 2019-12-24
Date of Issue:	2019-12-24
Test Result :	**PASS***

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

Tested By: Tom Chen.

(Tom Chen)

Reviewed By: Aaron Ma

(Aaron Ma)

Approved By:

(Jack Ai)

1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20190901002E-02	Rev.01	Initial report	2019-12-24

2 Contents

3 Test Summary

Test Item	FCC Test Requirement	Test Method	Result
Antenna Requirement	47 CFR Part 15, Subpart C Section 15.203	ANSI C63.10 2013	Pass
Conducted Emission (150KHz to 30MHz)	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10 2013	Pass
Electric Field Strength of Fundamental and Outside the Allocated bands	47 CFR Part 15, Subpart C Section 15.225(a)/(b)/(c)	ANSI C63.10 2013	Pass
Radiated Emission	47 CFR Part 15, Subpart C Section 15.225(d)/15.209	ANSI C63.10 2013	Pass
Frequency Tolerance	47 CFR Part 15, Subpart C Section 15.225(e)	ANSI C63.10 2013	Pass
20dB Occupied Bandwidth	47 CFR Part 15, Subpart C Section 15.215	ANSI C63.10 2013	Pass

4 General Information

4.1 Client Information

Applicant:	Avantree Technology Co., Ltd.
Address of Applicant:	The 4th Floor, Yuepeng Building, No.1019 Jiabin Rd, Luohu District,Shenzhen, China
Manufacturer:	Avantree Technology Co., Ltd.
Address of Manufacturer:	The 4th Floor, Yuepeng Building, No.1019 Jiabin Rd, Luohu District,Shenzhen, China

4.2 General Description of E.U.T.

Product Name:	Wireless Stereo Headphones
All Model No.:	BTHS-AS90, BTHS-AS90B, BTHS-AS90C, BTHS-AS90M, BTHS-ANC033, BTHS-035
Test Model No.:	BTHS-AS90
Trade Mark:	Avantree
Hardware Version:	Rer 2.7
Software Version:	BT5.0
Operation Frequency:	13.56MHz
Modulation Type:	ASK
Product Type:	☐ Mobile ☒ Portable ☐ Fix Location
Antenna Type:	Induction coil
Antenna Gain:	0dBi
USB Cable:	98cm(Unshielded)
AUX Cable:	148cm(Unshielded)
Power Supply:	lithium battery:DC3.7V, Charge by DC5V

4.3 Test Environment & Test Mode

Operating Environment:	
Radiated Emissions:	
Temperature:	24.6 °C
Humidity:	55 % RH
Atmospheric Pressure:	1015mbar
Conducted Emissions:	
Temperature:	24.2 °C
Humidity:	53 % RH
Atmospheric Pressure:	1015mbar
Radio conducted item test (RF Conducted test room):	
Temperature:	24 °C
Humidity:	46 % RH
Atmospheric Pressure:	1015mbar
Test Mode:	
Test mode:	Keep EUT working in continuous transmitting mode with 100% duty cycle.

4.4 Description of Support Units

The EUT has been tested with associated equipment below.

1）Support equipment

Description	Manufacturer	Model No.	Certification	Supplied by
Adapter	Samsung	EP-TA50CBC	FCC	CQA

4.5 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate.

The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities.

The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the **Shenzhen Huaxia Testing Technology Co., Ltd.** quality system acc. to DIN EN ISO/IEC 17025.

Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CQA laboratory is reported:

No.	Item	Uncertainty	Notes
1	Radiated Emission (Below 1GHz)	5.12dB	(1)
2	Radiated Emission (Above 1GHz)	4.60dB	(1)
3	Conducted Disturbance (0.15~30MHz)	3.34dB	(1)
4	Radio Frequency	3×10^{-8}	(1)
5	Duty cycle	0.6 %.	(1)
6	Occupied Bandwidth	1.1%	(1)
7	RF conducted power	0.86dB	(1)
8	RF power density	0.74	(1)
9	Conducted Spurious emissions	0.86dB	(1)
10	Temperature test	0.8℃	(1)
11	Humidity test	2.0%	(1)
12	Supply voltages	0.5 %.	(1)
13	Frequency Error	5.5 Hz	(1)

(1)This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

4.6 Test Location

Shenzhen Huaxia Testing Technology Co., Ltd,

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

4.7 Test Facility

- **A2LA (Certificate No. 4742.01)**
  Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4742.01.
- **FCC Registration No.: 522263**
  Shenzhen Huaxia Testing Technology 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 our files. Registration No.:522263

4.8 Equipment List

Test Equipment	Manufacturer	Model No.	Instrument No.	Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESR7	CQA-005	2019/10/25	2020/10/24
Spectrum analyzer	R&S	FSU26	CQA-038	2019/10/25	2020/10/24
Preamplifier	MITEQ	AMF-6D-02001800-29-20P	CQA-036	2019/10/25	2020/10/24
Loop antenna	Schwarzbeck	FMZB1516	CQA-060	2019/10/21	2020/10/20
Bilog Antenna	R&S	HL562	CQA-011	2019/9/26	2020/9/25
Coaxial Cable (Below 1GHz)	CQA	N/A	C013	2019/9/26	2020/9/25
high-low temperature chamber	Auchno	OJN-9606	CQA-S003	2019/9/25	2020/9/24
LISN	R&S	ENV216	CQA-003	2019/10/23	2020/10/22
Coaxial cable	CQA	N/A	CQA-C009	2019/9/26	2020/9/25

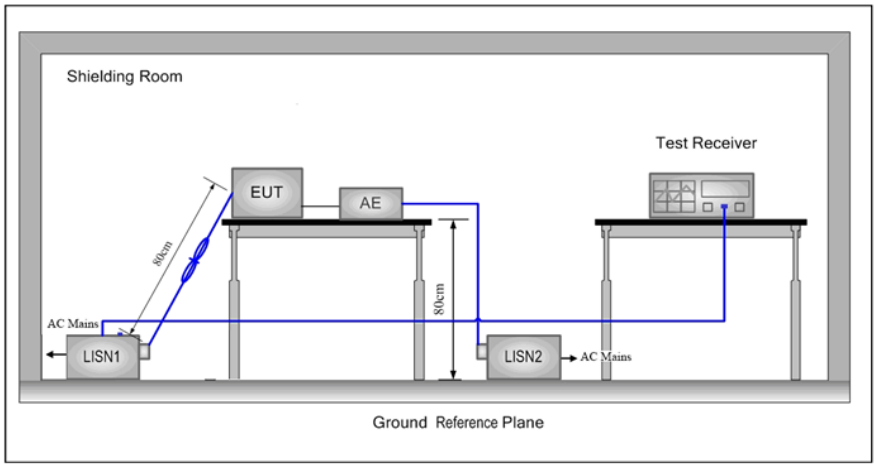
5 Test Result and Measurement Data

5.1 Antenna Requirment

Standard requirement:	47 CFR 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:	Please see EUT internal photos.
The antenna is Induction coil.	

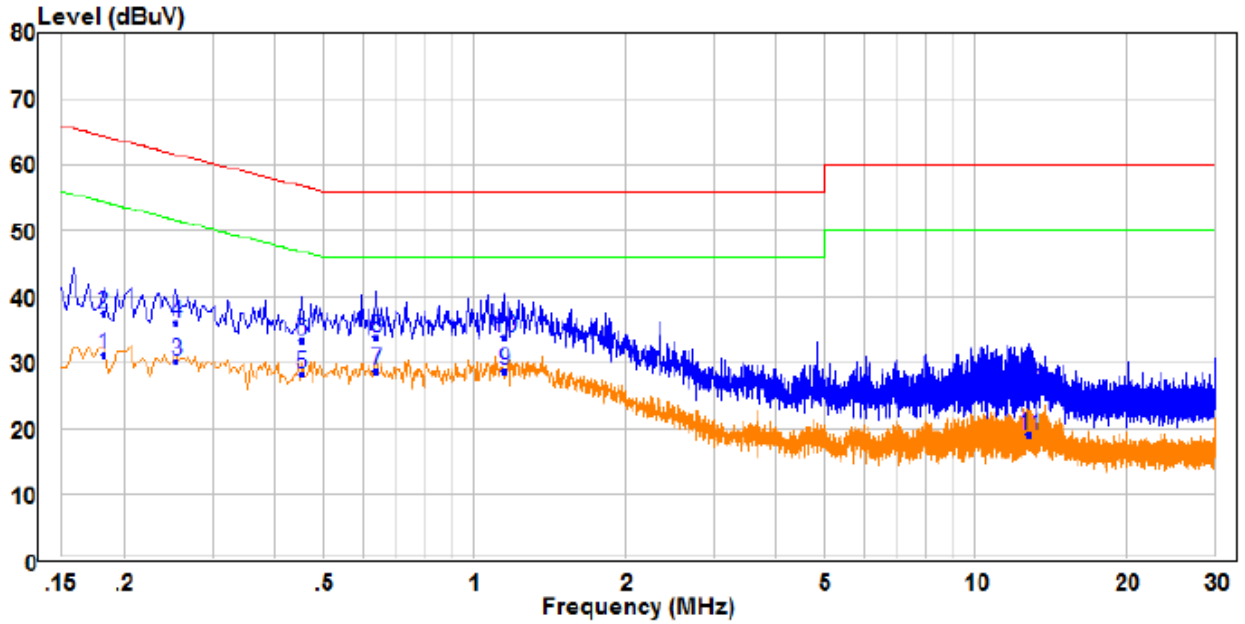
5.2 Conducted Emissions

<table>
<tr><td>Test Requirement:</td><td>47 CFR Part 15C Section 15.207</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10: 2013</td></tr>
<tr><td>Test Frequency Range:</td><td>150kHz to 30MHz</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><th rowspan="2">Frequency range (MHz)</th><th colspan="2">Limit (dBuV)</th></tr>
<tr><th>Quasi-peak</th><th>Average</th></tr>
<tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr>
<tr><td>0.5-5</td><td>56</td><td>46</td></tr>
<tr><td>5-30</td><td>60</td><td>50</td></tr>
</table>
* Decreases with the logarithm of the frequency.</td></tr>
<tr><td>Test Procedure:</td><td>1) The mains terminal disturbance voltage test was conducted in a shielded room.
2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
5) 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.</td></tr>
</table>

Test Setup:	
Test Mode:	Charging + NFC
Test Voltage:	AC 120V/60Hz
Test Results:	Pass

Measurement Data

Live line:



		Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.182	21.70	9.49	31.19	54.39	-23.20	Average	Line
2		0.182	27.96	9.49	37.45	64.39	-26.94	QP	Line
3		0.254	20.76	9.49	30.25	51.63	-21.38	Average	Line
4		0.254	26.46	9.49	35.95	61.63	-25.68	QP	Line
5		0.454	18.81	9.51	28.32	46.80	-18.48	Average	Line
6		0.454	23.92	9.51	33.43	56.80	-23.37	QP	Line
7	PP	0.638	19.02	9.77	28.79	46.00	-17.21	Average	Line
8		0.638	23.93	9.77	33.70	56.00	-22.30	QP	Line
9		1.150	19.22	9.53	28.75	46.00	-17.25	Average	Line
10	QP	1.150	24.36	9.53	33.89	56.00	-22.11	QP	Line
11		12.837	9.11	9.86	18.97	50.00	-31.03	Average	Line
12		12.837	15.77	9.86	25.63	60.00	-34.37	QP	Line

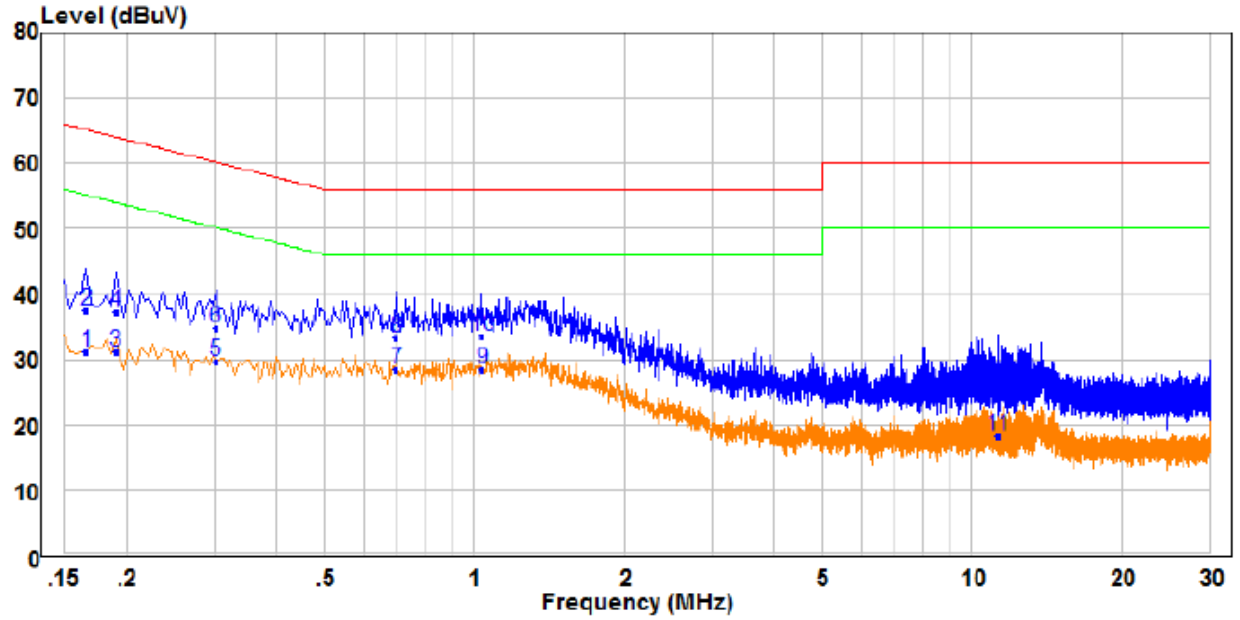
Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:

2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.

3. If the Peak value under Average limit, the Average value is not recorded in the report.

Neutral line:



		Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.166	21.77	9.48	31.25	55.16	-23.91	Average	Neutral
2		0.166	28.00	9.48	37.48	65.16	-27.68	QP	Neutral
3		0.190	21.70	9.48	31.18	54.04	-22.86	Average	Neutral
4		0.190	27.67	9.48	37.15	64.04	-26.89	QP	Neutral
5		0.302	20.29	9.48	29.77	50.19	-20.42	Average	Neutral
6		0.302	25.40	9.48	34.88	60.19	-25.31	QP	Neutral
7		0.698	18.60	9.83	28.43	46.00	-17.57	Average	Neutral
8		0.698	23.52	9.83	33.35	56.00	-22.65	QP	Neutral
9	PP	1.038	18.77	9.72	28.49	46.00	-17.51	Average	Neutral
10	QP	1.038	23.90	9.72	33.62	56.00	-22.38	QP	Neutral
11		11.281	8.40	9.94	18.34	50.00	-31.66	Average	Neutral
12		11.281	14.04	9.94	23.98	60.00	-36.02	QP	Neutral

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:

2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.

3. If the Peak value under Average limit, the Average value is not recorded in the report.

5.3 Electric Field Strength of Fundamental and Outside the Allocated bands

Test Requirement: 47 CFR Part 15, Subpart C Section 15.225(a)/(b)/(c)

Test Method: ANSI C63.10: 2013

Test Site: 3m (Semi-Anechoic Chamber)

Receiver Setup:

Frequency	Detector	RBW	VBW	Remark
0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak

Limit:

Frequency Range(MHz)	E-field Strength Limit @ 30 m (μV/m)	E-field Strength Limit @ 3 m (dBμV/m)
13.560 ± 0.007	15848	124
13.410 to 13.553 13.567 to 13.710	334	90
13.110 to 13.410 13.710 to 14.010	106	81

Note: Where the limits have been defined at one distance, and a signal level measured at another, the limits have been extrapolated using the following formula:

Extrapolation(dB)=40log$_{10}$(Measurement Distance/Specification Distance)

Test Setup:

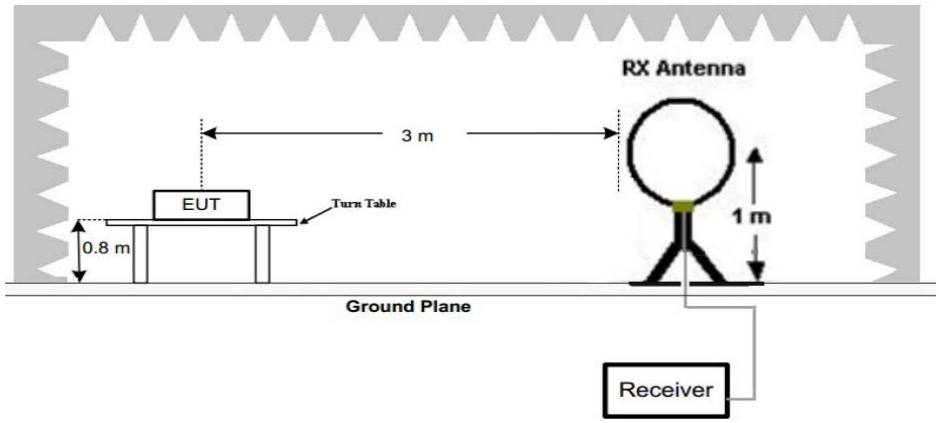


Figure 1. Below 30MHz

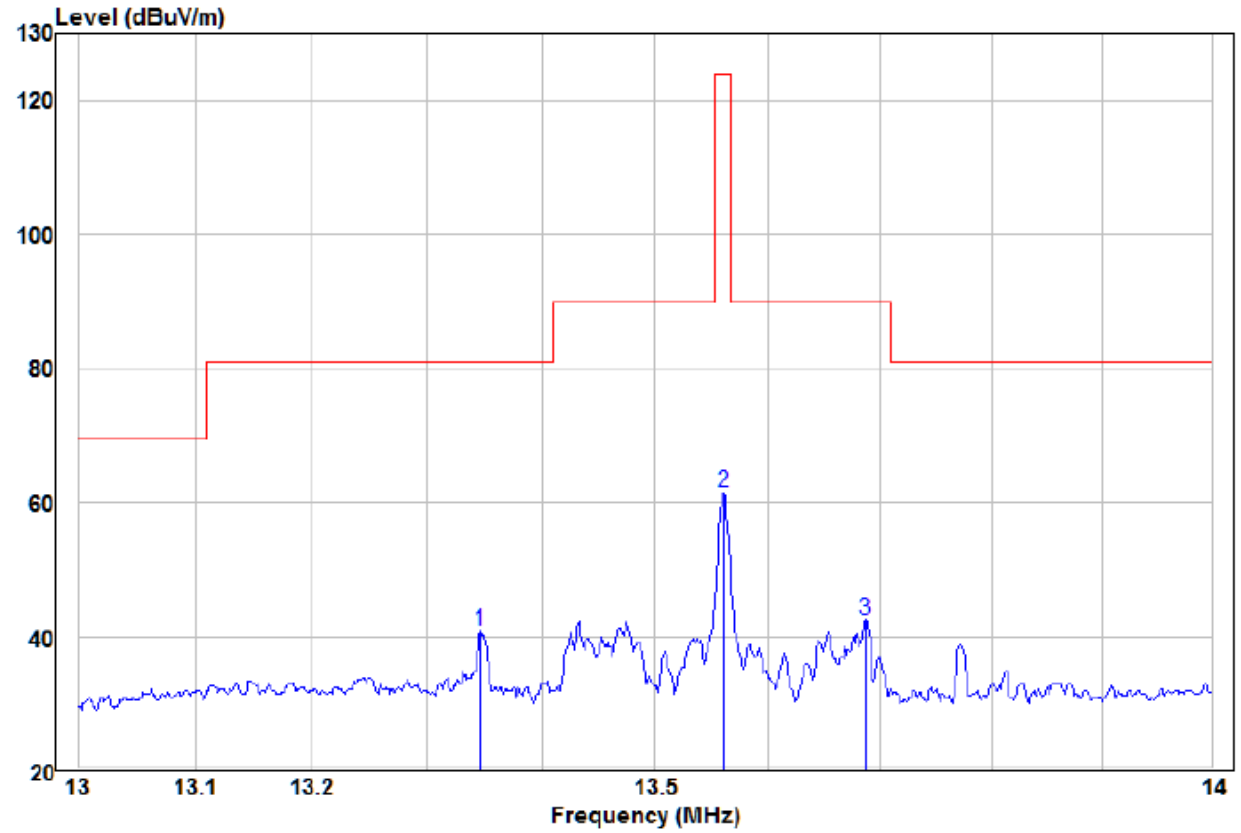
Test Procedure:

1. 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.
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 (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. 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. 7. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.
Test Mode:	Transmitting with ASK modulation.
Test Result:	Pass

Measurement Data

X axis positioning



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1 pp	13.35	20.93	19.93	40.86	81.00	-40.14	Peak	HORIZONTAL
2	13.56	41.59	19.92	61.51	124.00	-62.49	Peak	HORIZONTAL
3	13.69	22.53	19.92	42.45	90.00	-47.55	Peak	HORIZONTAL

Remark:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Factor= Antenna Factor + Cable Factor – Preamplifier Factor,

Level = Read Level + Factor,

Over Limit=Level-Limit Line.

5.4 Radiated Emissions

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.225(d),
Test Method:	ANSI C63.10: 2013
Test Site:	3m (Semi-Anechoic Chamber)

Receiver Setup:

Frequency	Detector	RBW	VBW	Remark
0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
30MHz-1GHz	Peak	100 kHz	300kHz	Peak

Limit:

Frequency	Field strength (microvolt/meter)	Limit (dBuV/m) @ 3 m	Remark
0.009MHz-0.490MHz	2400/F(kHz) @300m	128.5-93.8	Quasi-peak
0.490MHz-1.705MHz	24000/F(kHz) @30m	73.8-63	Quasi-peak
1.705MHz-30MHz	30 @30m	70	Quasi-peak
30MHz-88MHz	100 @3m	40.0	Quasi-peak
88MHz-216MHz	150 @3m	43.5	Quasi-peak
216MHz-960MHz	200 @3m	46.0	Quasi-peak
960MHz-1GHz	500 @3m	54.0	Quasi-peak

Note: Where the limits have been defined at one distance, and a signal level measured at another, the limits have been extrapolated using the following formula:

Extrapolation(dB)=40log$_{10}$(Measurement Distance/Specification Distance)

Test Setup:

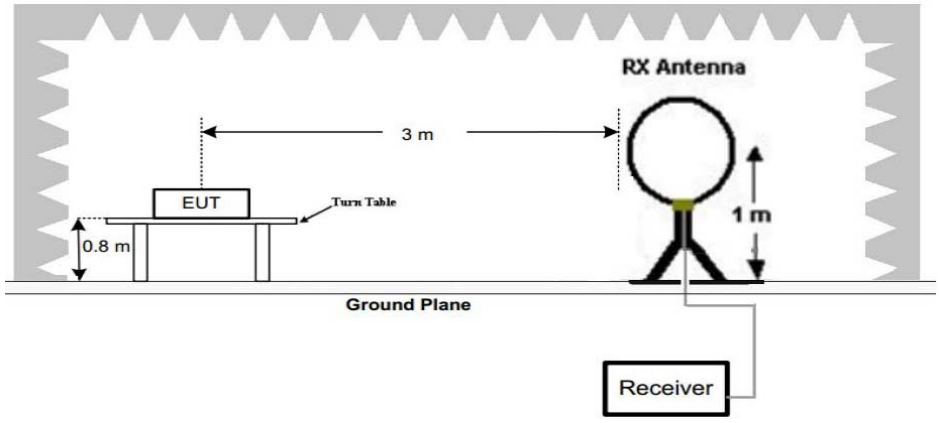


Figure 1. Below 30MHz

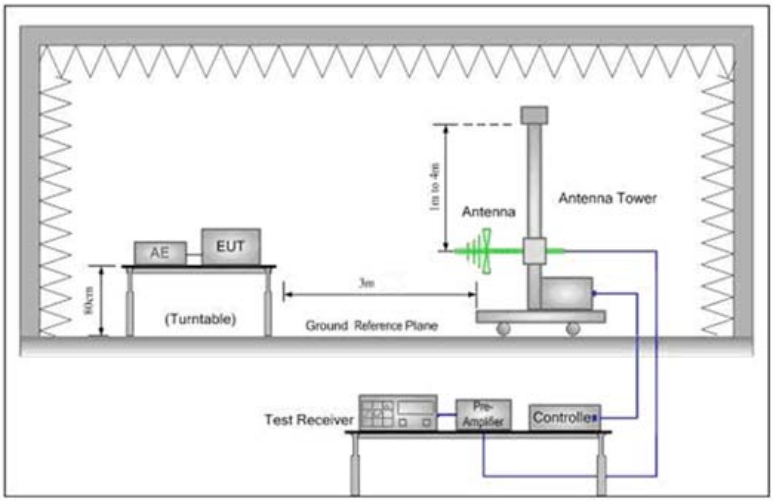


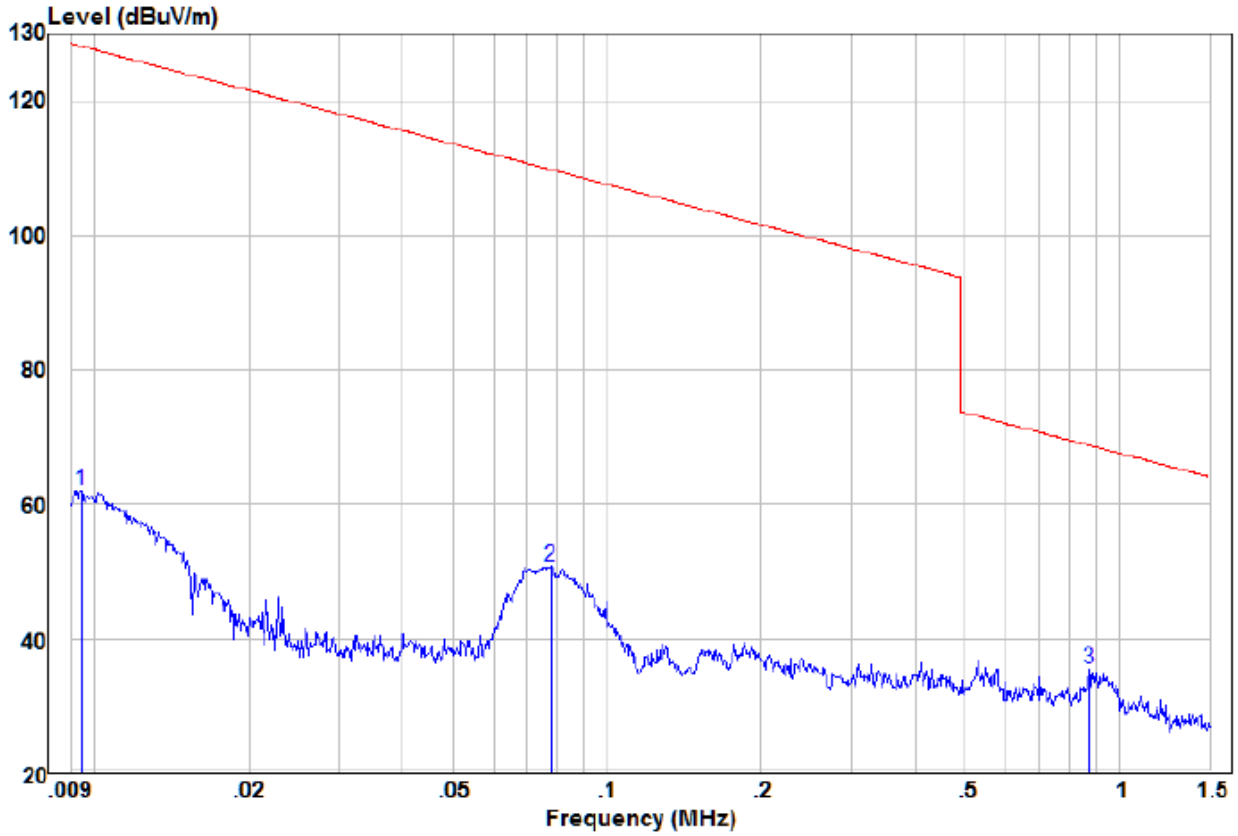
Figure 2. 30MHz to 1GHz

Test Procedure:	5. 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. 6. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 7. 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. 8. 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. 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. 7. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.
Test Mode:	Transmitting with ASK modulation.
Test Result:	Pass

Measurement Data

X axis positioning

9kHz – 150KHz:



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1	0.01	42.36	19.69	62.05	128.10	-66.05	Peak	HORIZONTAL
2	0.08	31.14	19.69	50.83	109.76	-58.93	Peak	HORIZONTAL
3 pp	0.88	15.73	19.85	35.58	68.76	-33.18	Peak	HORIZONTAL

Remark:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

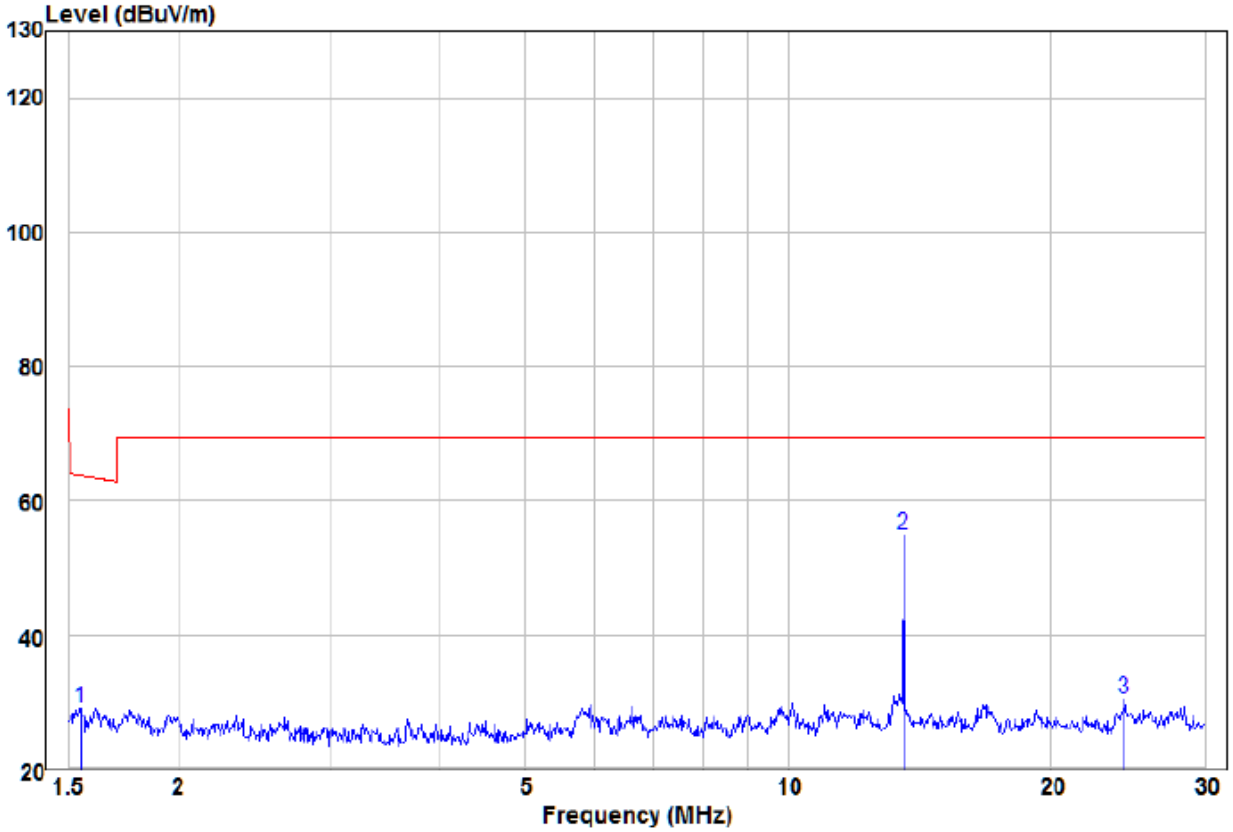
Factor= Antenna Factor + Cable Factor – Preamplifier Factor,

Level = Read Level + Factor,

Over Limit=Level-Limit Line.

X axis positioning

150KHz-30MHz:



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1	1.55	9.13	19.96	29.09	63.85	-34.76	Peak	HORIZONTAL
2 pp	13.56	35.13	19.92	55.05	69.50	-14.45	Peak	HORIZONTAL
3	24.32	10.52	20.16	30.68	69.50	-38.82	Peak	HORIZONTAL

Remark:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

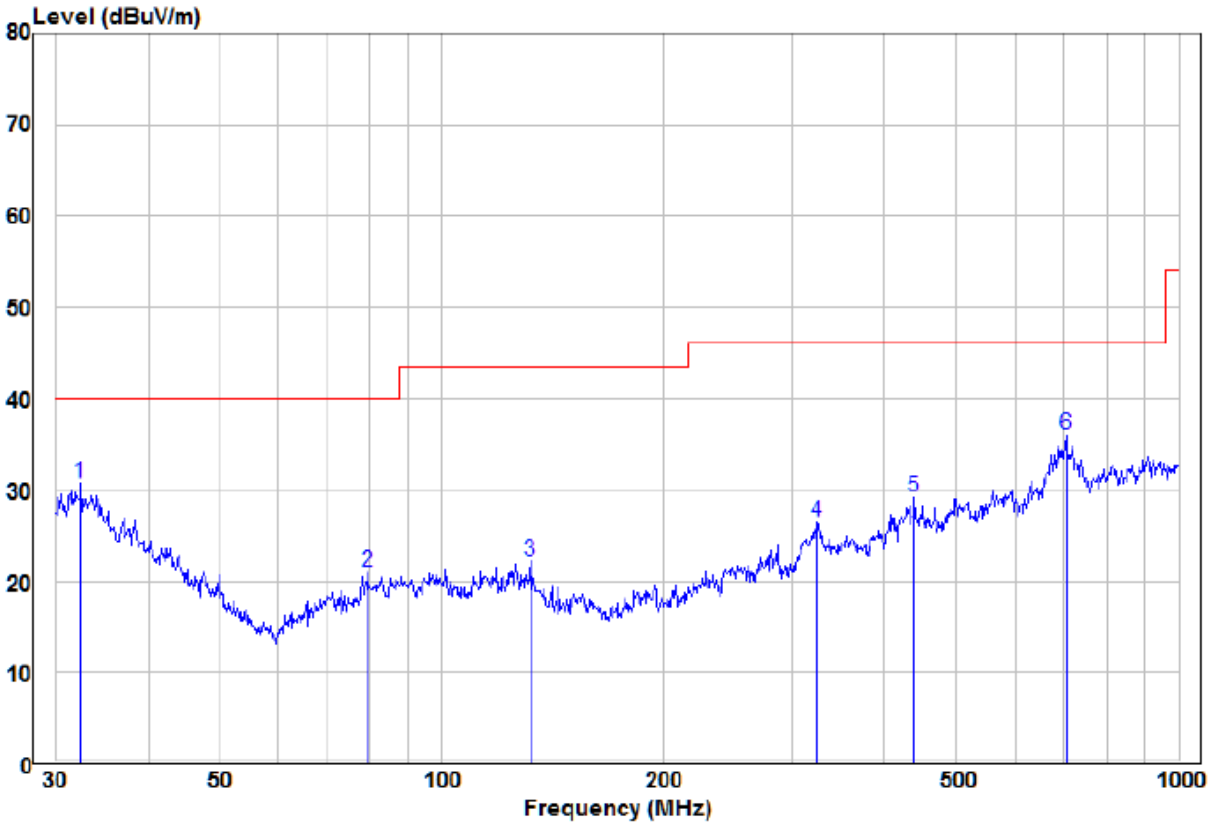
Factor= Antenna Factor + Cable Factor – Preamplifier Factor,

Level = Read Level + Factor,

Over Limit=Level-Limit Line.

30MHz-1GHz

Horizontal



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1 pp	32.41	13.15	17.54	30.69	40.00	-9.31	Peak	HORIZONTAL
2	79.52	11.22	9.70	20.92	40.00	-19.08	Peak	HORIZONTAL
3	132.22	12.29	9.82	22.11	43.50	-21.39	Peak	HORIZONTAL
4	324.46	14.12	12.32	26.44	46.00	-19.56	Peak	HORIZONTAL
5	438.66	13.82	15.37	29.19	46.00	-16.81	Peak	HORIZONTAL
6	704.23	15.80	20.12	35.92	46.00	-10.08	Peak	HORIZONTAL

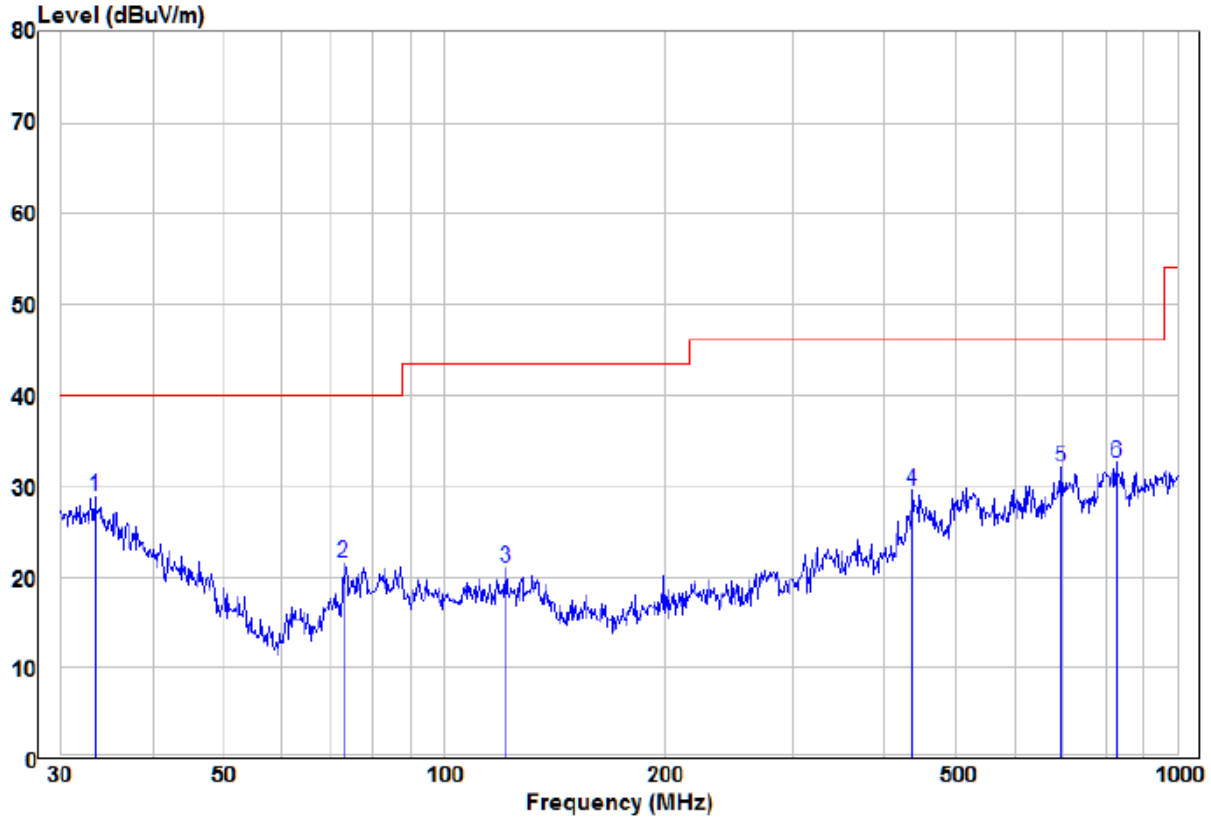
Remark:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Factor= Antenna Factor + Cable Factor – Preamplifier Factor,

Level = Read Level + Factor,
Over Limit=Level-Limit Line.

Vertical



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1 pp	33.44	11.65	17.17	28.82	40.00	-11.18	Peak	VERTICAL
2	72.85	12.88	8.62	21.50	40.00	-18.50	Peak	VERTICAL
3	121.55	10.28	10.64	20.92	43.50	-22.58	Peak	VERTICAL
4	435.59	14.22	15.27	29.49	46.00	-16.51	Peak	VERTICAL
5	696.86	11.97	20.04	32.01	46.00	-13.99	Peak	VERTICAL
6	827.49	11.95	20.68	32.63	46.00	-13.37	Peak	VERTICAL

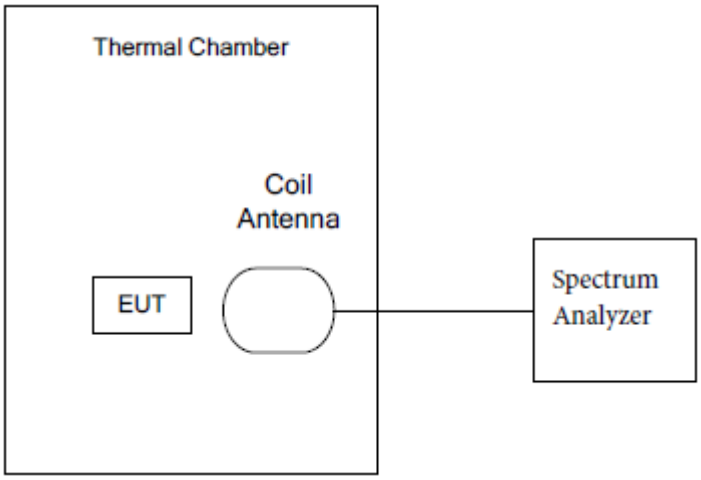
Remark:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Factor= Antenna Factor + Cable Factor – Preamplifier Factor,

Level = Read Level + Factor,
Over Limit=Level-Limit Line.

5.5 Frequency Stability

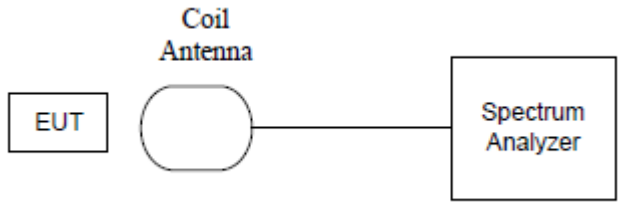
Test Requirement:	47 CFR Part 15 C Section 15.225(e)
Test Method:	ANSI C63.10: 2013
Test Setup:	
Frequency Range:	Operation within the band 13.110-14.010 MHz
Requirements:	The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of –20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.
Method of Measurement:	The EUT was placed in an environmental test chamber and powered such that control element received normal voltage and the transmitter provided maximum RF output.
Test Result:	The unit does meet the FCC Part 15 C Section 15.225(e) requirements.

Test Frequency: 13.56MHz				Temperature:20℃
Supply Voltage （V）DC	Test Result (MHz)	Deviation (kHz)	Limit ±0.01% (kHz)	Result
3.7	13.55973	-0.27	1.3560	Pass
4.2	13.55971	-0.29	1.3560	Pass
3.4	13.55972	-0.28	1.3560	Pass

Test Frequency: 13.56MHz				Normal Voltage:3.7Vdc
Temperature （℃）	Test Result (MHz)	Deviation (kHz)	Limit ±0.01% (kHz)	Result
-20	13.55984	-0.16	1.3560	Pass
-10	13.55979	-0.21	1.3560	
0	13.55978	-0.22	1.3560	
10	13.55977	-0.23	1.3560	
20	13.55978	-0.22	1.3560	
30	13.55981	-0.19	1.3560	
40	13.55976	-0.24	1.3560	
50	13.55979	-0.21	1.3560	

Note: Deviation (KHz) = (Test Result-13.56MHz)*1000

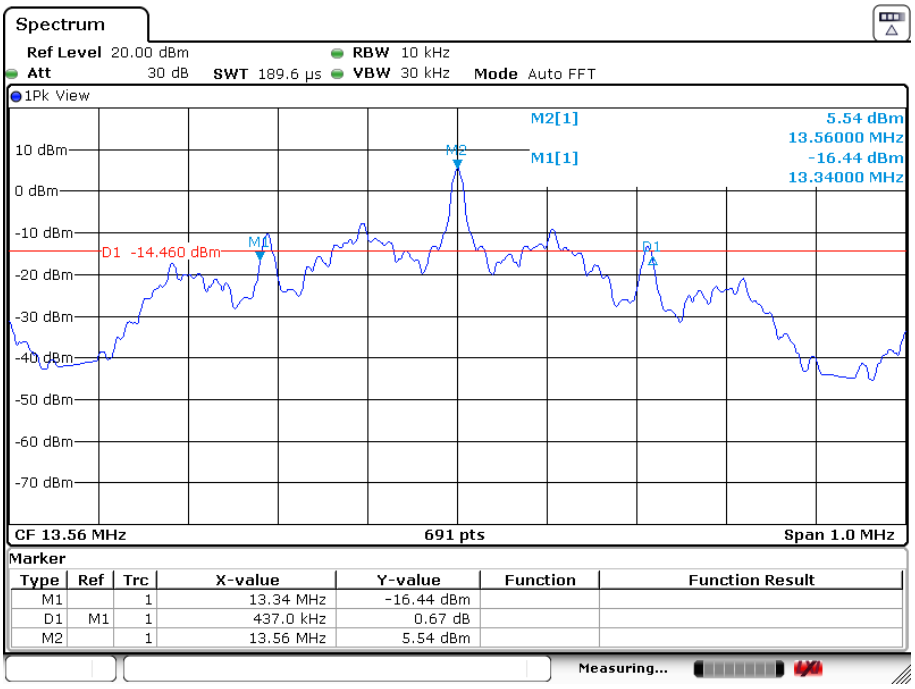
5.6 20dB Occupied Bandwidth

Test Requirement:	47 CFR Part 15 C Section 15.215 (C)
Test Method:	ANSI C63.10: 2013
Test Setup:	
Frequency Range:	Operation within the band 13.110 – 14.010 MHz
Requirements:	Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §15.217 through §15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the 20 dB bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.
Limit:	For 13.56 MHz the permitted frequency band is 14kHz, so the limit is 11.2 kHz.

Test Data:

20dB bandwidth (MHz)	FL (MHz)	FH (MHz)	Limit(MHz)	Result
0.437	**13.340**	**13.777**	**13.110 – 14.010**	**Pass**

Test plot as follows:



6 Photographs - EUT Test Setup

6.1 Radiated Emission

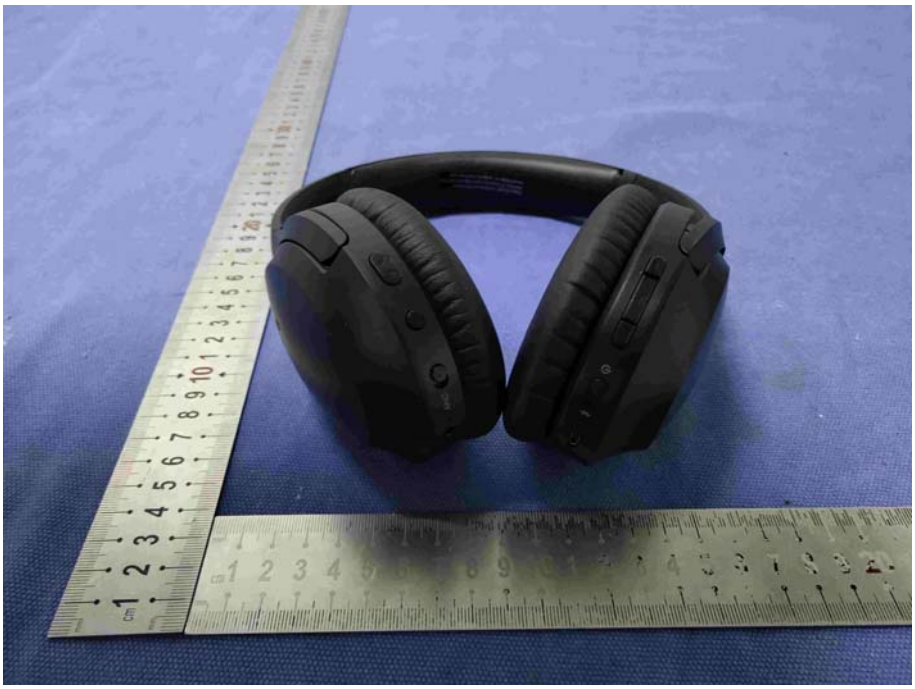
9KHz~30MHz:

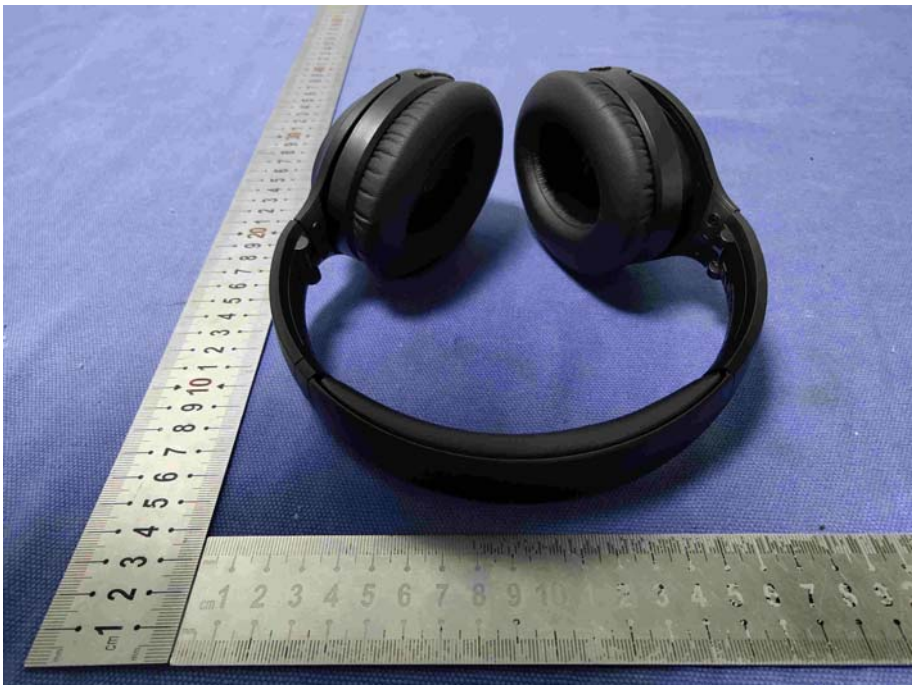
30MHz~1GHz:

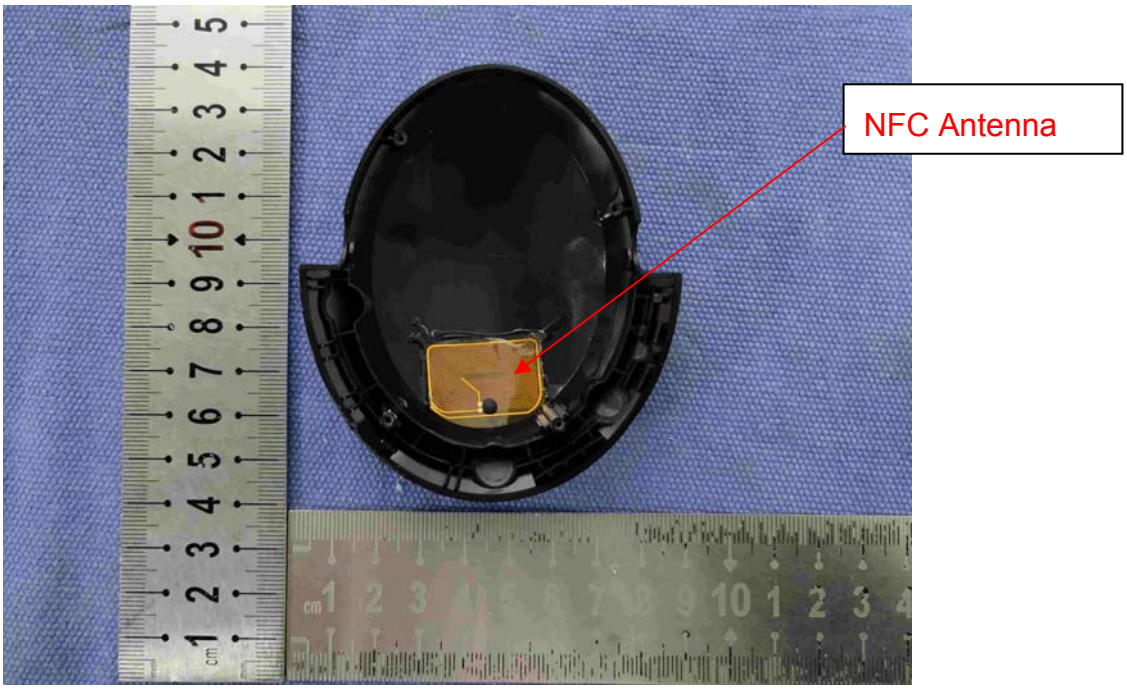
6.2 Conducted Emission

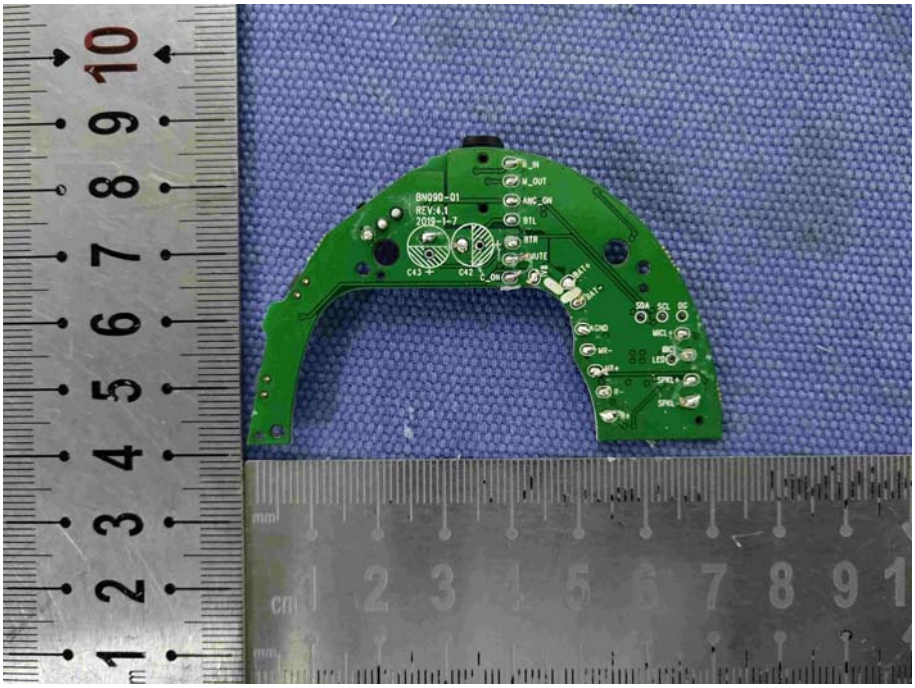
7 Photographs - EUT Construction Details

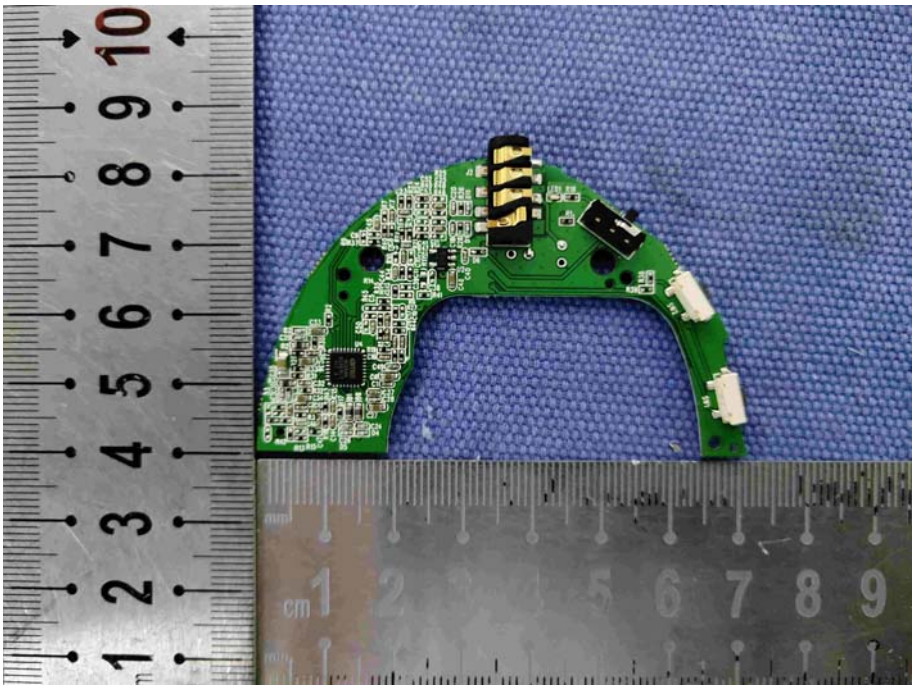
Test mode No.: BTHS-AS90

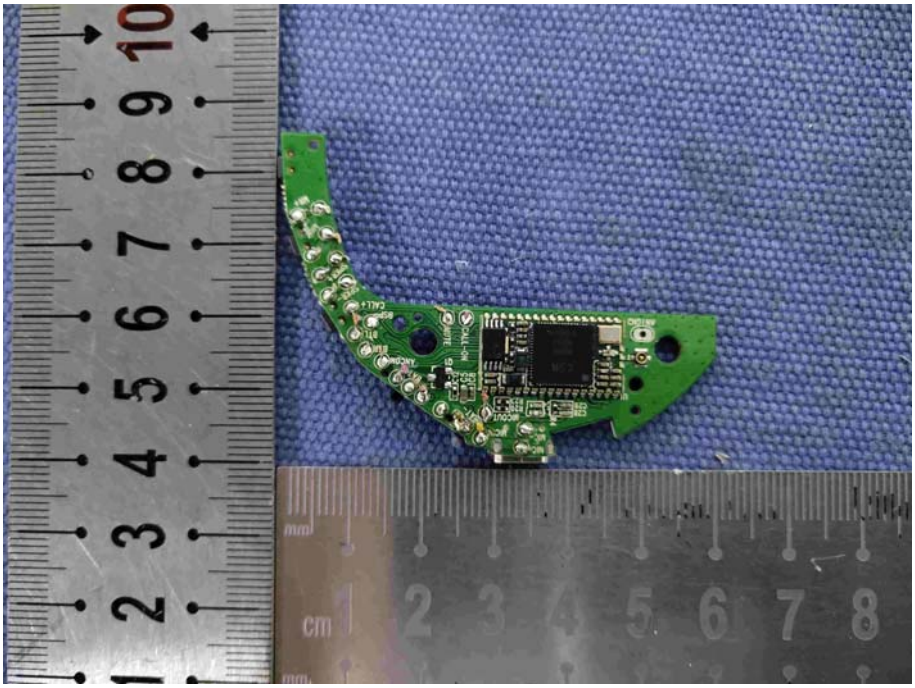


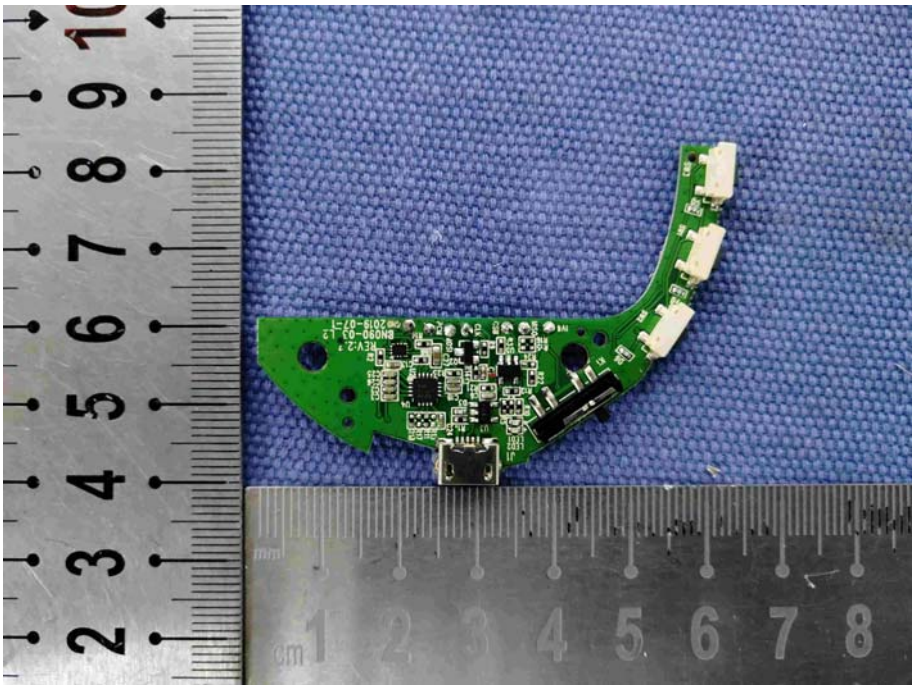


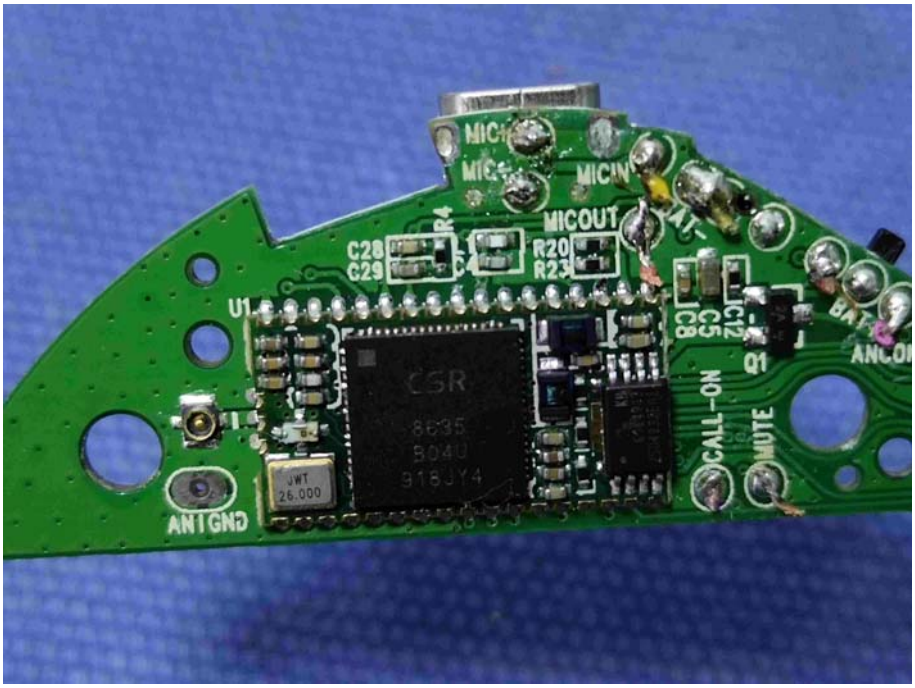

NFC Antenna

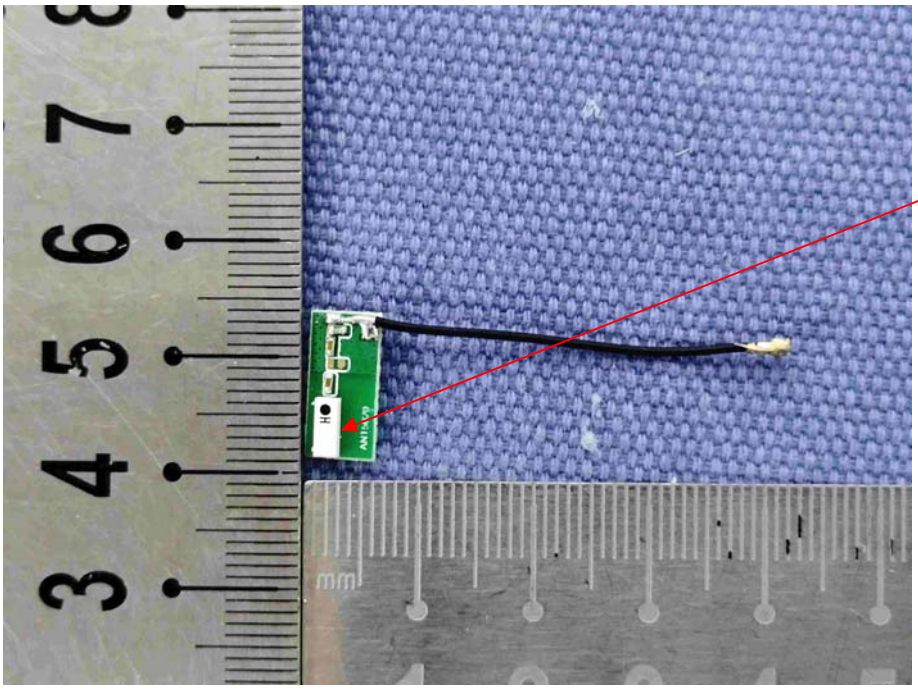









MIC1
MIC2
MICIN
MICOUT
C28
C29
R20
R23
U1
C5
C8
C12
Q1
CSR
8635
B04U
918JY4
JWT
26.000
ANTGND
CALL-ON
MUTE


BT Antenna
mm

The End