FCC Test Report

Report No.: AGC05198160101FE04

FCC ID	:	NMCAMP
PRODUCT DESIGNATION	:	Bluetooth headset
BRAND NAME	:	UCLEAR-DIGITAL
MODEL NAME	:	See Page 3
CLIENT	:	BITwave Private Limited
DATE OF ISSUE	:	Feb.23,2016
STANDARD(S)	:	FCC Part 15 Rules
REPORT VERSION	:	V1.0

Attestation of Global Compliance Co., Ltd.

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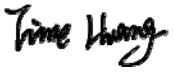
1. VERIFICATION OF COMPLIANCE

Applicant:	BITwave Private Limited
	11, Serangoon North Ave 5 , #05-03 Singapore 554809
Manufacturer:	BITwave Private Limited
	11, Serangoon North Ave 5 , #05-03 Singapore 554809
Product Designation:	Bluetooth headset
Brand name:	UCLEAR-DIGITAL
Model Name:	AMP
Series Model	AMP PLUS, AMP PRO
Different Description	All the same except for the appearance and Headset The collocation of line and headsets AMP---Boost Plus Speaker; AMP PLUS-----Boost Pro Speaker; AMP PRO----Pulse Pro Speaker
Measurement Procedure:	ANSI C63.4: 2003
Date of test:	Jan.16,2016 to Jan.18,2016
Deviation:	None
Condition of Test Sample:	Normal

The above equipment was tested by Dongguan Precise Testing Service Co., Ltd. for compliance with the requirements set forth in the FCC Rules and Regulations Part 15, the measurement procedure according to ANSI C63.4:2009. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment are within the compliance requirements.

The test results of this report relate only to the tested sample identified in this report.

Tested By 

Time Huang(Huang Nanhui) Feb.23,2016

Reviewed By 

Forrest Lei(Lei Yonggang) Feb.23,2016

Approved By 

Solger Zhang(Zhang Hongyi) Feb.23,2016
Authorized Officer

2. PRODUCT INFORMATION

Housing Type: Plastic

EUT Rating Voltage: DC 3.7V by battery

I/O Port Information (☒Applicable ☐Not Applicable)

I/O Port of EUT			
I/O Port Type	**Q'TY**	**Cable**	**Tested with**
USB PORT	1	N/A	--

3. TEST FACILITY

Facility Dongguan Precise Testing Service Co., Ltd.

Location: Building D,Baoding Technology Park,Guangming Road2,Dongcheng District, Dongguan, Guangdong, China,

Description: The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.4:2009.

Site Filing: The FCC Registration Number is 371540

Instrument Tolerance: All measuring equipment is in accord with ANSI C63.4 requirements that meet industry regulatory agency and accreditation agency requirement.

4. SUPPORT EQUIPMENT LIST

Item	Equipment	Mfr/Brand	Model/Type No.	Remark
1	Bluetooth headset	UCLEAR-DIGITAL	AMP	EUT
2	PC	SONY	E1412AYCW	A.E
3	Control box	N/A	N/A	A.E

**Note: All the above equipment/cables were placed in worse case positions to maximize emission signals during emission test.

5. SYSTEM DESCRIPTION

EUT test procedure:

1. Connect EUT and PC (if need).
2. Power on the EUT, the EUT begins to work.
3. Make sure the EUT operates normally during the test.

Test Mode

1. USB (connection for date transferring)

6 SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§15.107	Conduction Emission	Compliant
§15.109	Radiated Emission	Compliant

Measurement uncertainty:

Conducted measurement: +/- 2.75dB
Radiated measurement: +/- 3.2dB

7. FCC LINE CONDUCTED EMISSION TEST

7.1. TEST EQUIPMENT OF LINE CONDUCTED EMISSION TEST

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	N/A	06/27/2015	06/26/2016
LISN	R&S	ESH3-Z5	N/A	06/27/2015	06/26/2016
AMN	R&S	ESH2-Z5	862060/020	06/27/2015	06/26/2016

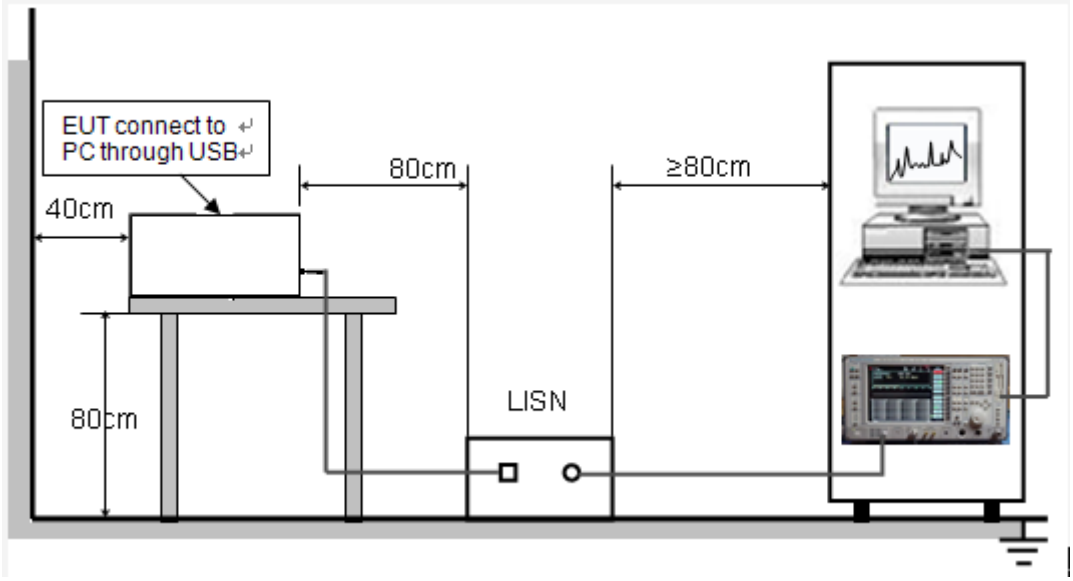
7.2 .LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
150kHz~500kHz	66-56	56-46
500kHz~5MHz	56	46
5MHz~30MHz	60	50

**Note: 1. The lower limit shall apply at the transition frequency.

2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz

7.3. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



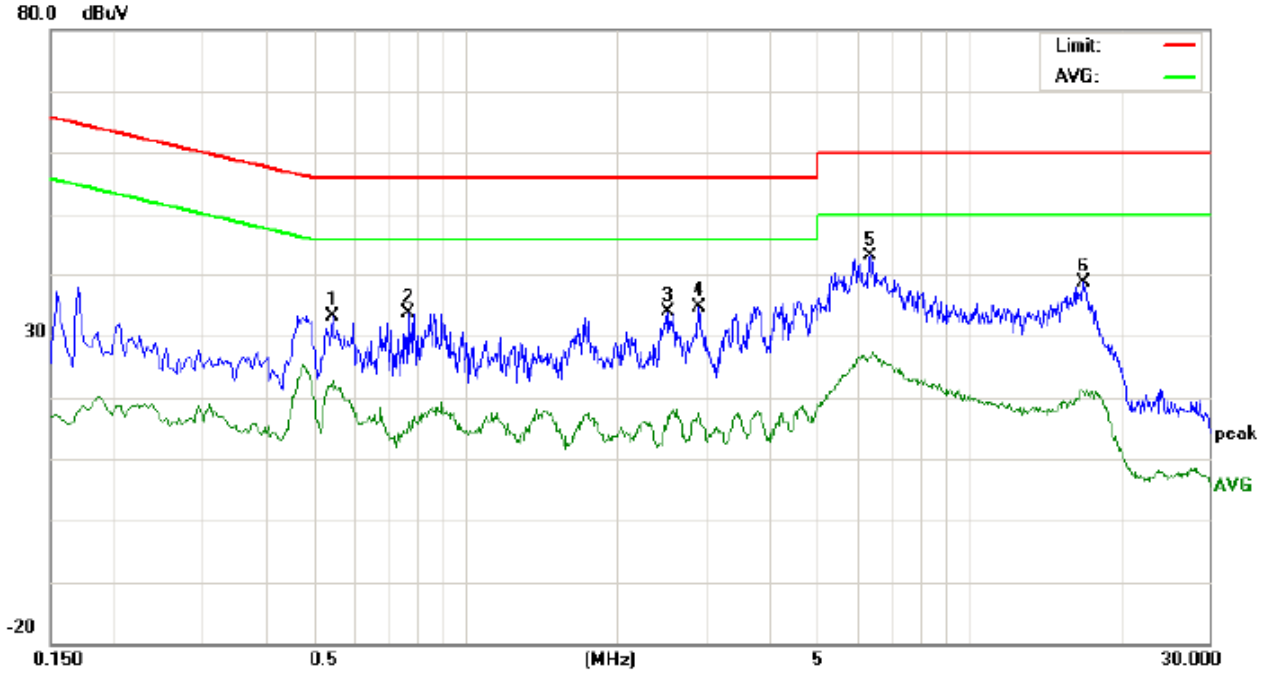
7.4. PROCEDURE OF LINE CONDUCTED EMISSION TEST

1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2) Support equipment, if needed, was placed as per ANSI C63.4.
3) All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
4) The EUT received DC charging voltage by adapter which received 120V/60Hzpower by a LISN.
5) The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
6) Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
7) During the above scans, the emissions were maximized by cable manipulation.
8) A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions.
9) Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.

The test data of the worst case condition (mode 1) was reported on the Summary Data page.

7.5 TEST RESULT OF LINE CONDUCTED EMISSION TEST

LINE CONDUCTED EMISSION - L



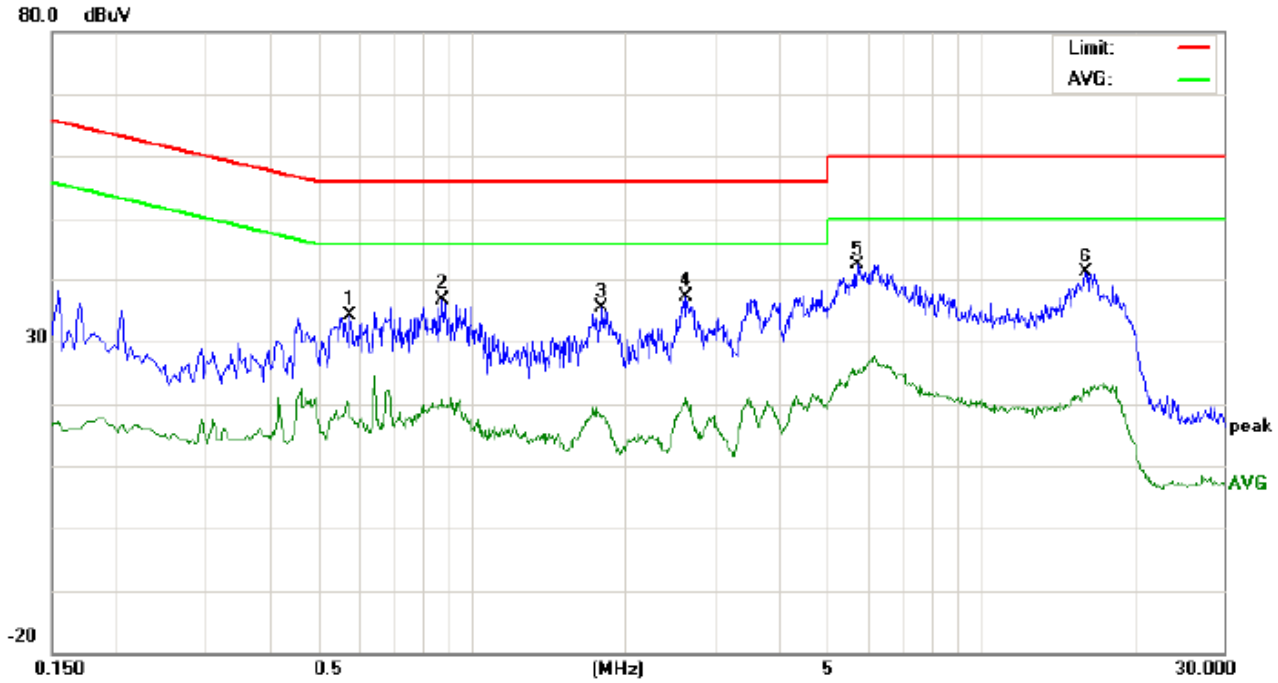
Site: Conduction
Limit: FCC Class B Conduction(QP)
EUT: Bluetooth Headset
M/N: AMP
Mode: USB
Note:

Phase: *L1*
Power:

Temperature: 23.5
Humidity: 54.5 %

No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.5460	22.81		12.32	10.36	33.17		22.68	56.00	46.00	-22.83	-23.32	P	
2	0.7700	23.35		5.47	10.30	33.65		15.77	56.00	46.00	-22.35	-30.23	P	
3	2.5300	23.43		6.43	10.44	33.87		16.87	56.00	46.00	-22.13	-29.13	P	
4	2.9100	24.16		6.76	10.53	34.69		17.29	56.00	46.00	-21.31	-28.71	P	
5	6.3820	32.92		16.32	10.30	43.22		26.62	60.00	50.00	-16.78	-23.38	P	
6	16.9220	28.52		10.78	10.13	38.65		20.91	60.00	50.00	-21.35	-29.09	P	

LINE CONDUCTED EMISSION – N



Site: Conduction
Limit: FCC Class B Conduction(QP)
EUT: Bluetooth Headset
M/N: AMP
Mode: USB
Note:

Phase: *N*
Power:

Temperature: 23.5
Humidity: 54.5 %

No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.5780	23.84		7.62	10.33	34.17		17.95	56.00	46.00	-21.83	-28.05	P	
2	0.8740	26.24		9.28	10.38	36.62		19.66	56.00	46.00	-19.38	-26.34	P	
3	1.8020	25.05		7.80	10.28	35.33		18.08	56.00	46.00	-20.67	-27.92	P	
4	2.6460	26.58		10.32	10.46	37.04		20.78	56.00	46.00	-18.96	-25.22	P	
5	5.7180	31.99		15.24	10.26	42.25		25.50	60.00	50.00	-17.75	-24.50	P	
6	16.1380	30.89		11.65	10.11	41.00		21.76	60.00	50.00	-19.00	-28.24	P	

8. FCC RADIATED EMISSION TEST

8.1. TEST EQUIPMENT OF RADIATED EMISSION

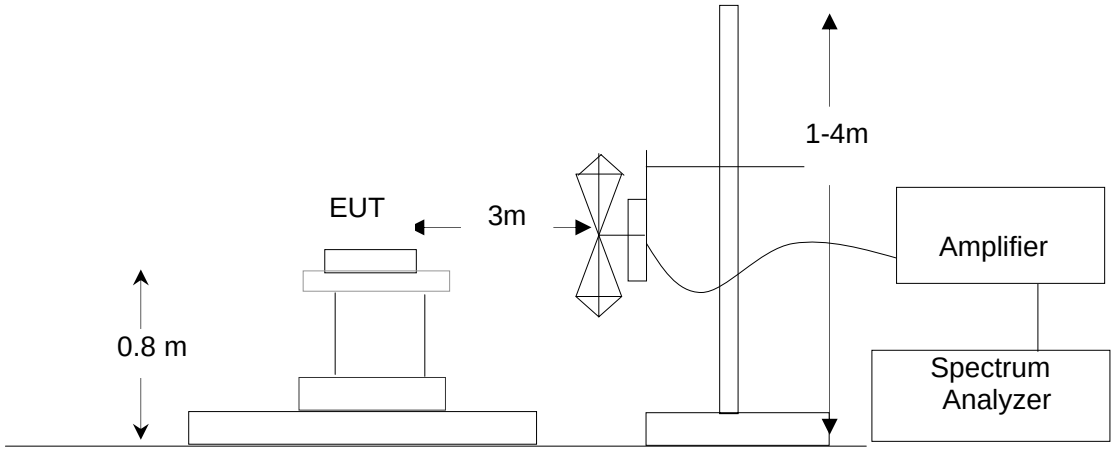
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
PSA SERIES SPECTRUM ANALYZER	AGILENT	E4440A	US41421290	06/27/2015	06/26/2016
ANTENNA	A.H.	SAS-521-4	128	06/27/2015	06/26/2016
HORN ANTENNA	EM	EM-AH-10180	N/A	06/27/2015	06/26/2016
AMPLIFIER	EM	EM30180	0607030	06/27/2015	06/26/2016
POSITIONING CONTROLLER	MF	MF-7802	MF780208147	06/27/2015	06/26/2016

8.2. LIMITS OF RADIATED EMISSION TEST

Frequency (MHz)	Distance (m)	Maximum Field Strength Limit (dBuV/m/ Q.P.)
30~88	3	40.0
88~216	3	43.5
216~960	3	46.0
Above 960	3	54.0

**Note: The lower limit shall apply at the transition frequency.

8.3 BLOCK DIAGRAM OF RADIATED EMISSION TEST



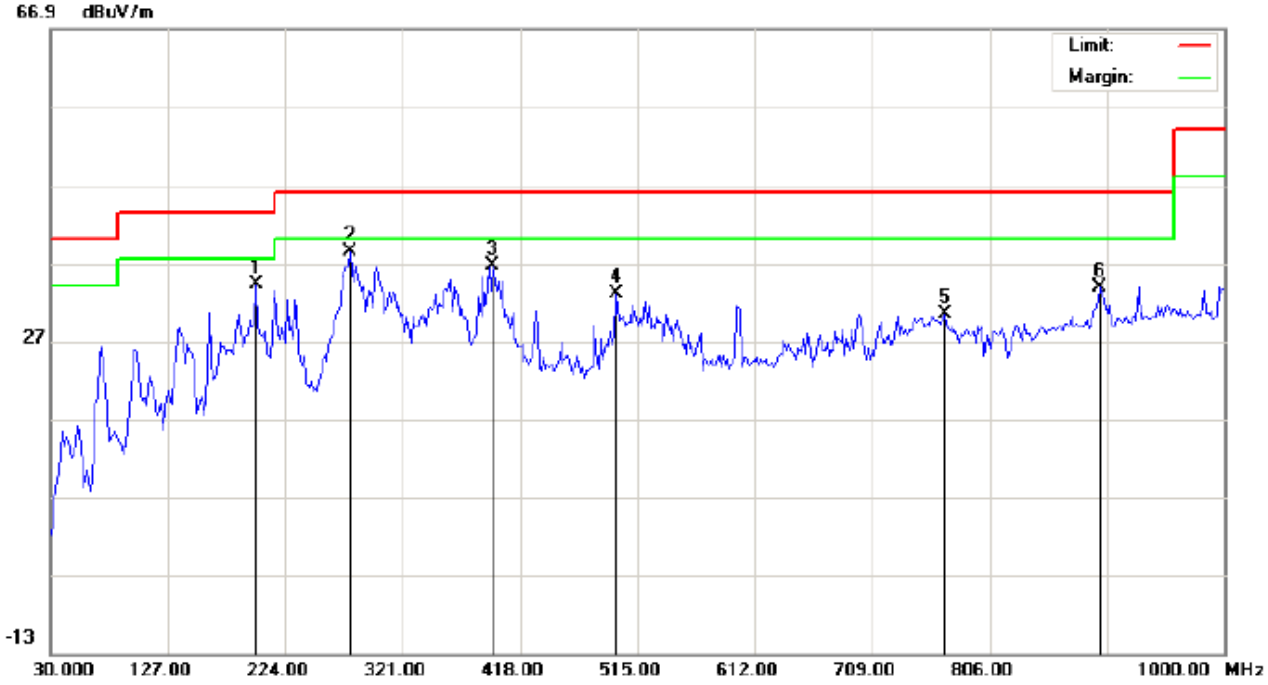
8.4 PROCEDURE OF RADIATED EMISSION TEST

1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2) Support equipment, if needed, was placed as per ANSI C63.4.
3) All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
4) The EUT received DC 5V power from PC with receive 120V/60Hz power from socket under the turntable through a LISN.
5) The antenna was placed at 3 meter away from the EUT as stated in FCC Part 15. The antenna connected to the Analyzer via a cable and at times a pre-amplifier would be used.
6) The Analyzer / Receiver quickly scanned from 30MHz to 1000MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
7) The test mode(s) were scanned during the test:
8) Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and Q.P./Peak reading is presented.

The test data of the worst case condition (mode 1) was reported on the Summary Data page.

8.5 TEST RESULT OF RADIATED EMISSION TEST

Radiated Emission Test –Horizontal -3m



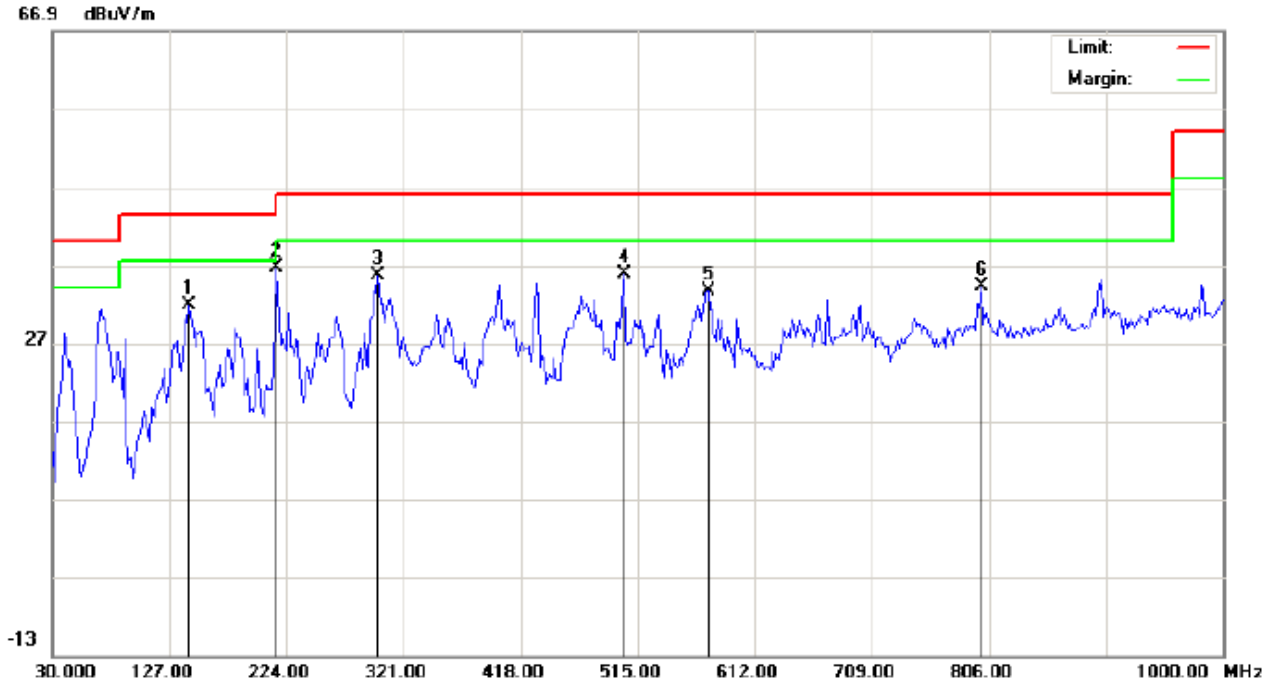
Site: site #1
Limit: FCC Class B 3M Radiation
EUT: Bluetooth Headset
M/N: AMP
Mode: USB
Note:

Polarization: *Horizontal*
Power:
Distance:

Temperature: 23.5
Humidity: 54.5 %

No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		199.7500	22.23	11.99	34.22	43.50	-9.28	peak			
2	*	277.3500	26.89	11.55	38.44	46.00	-7.56	peak			
3		395.3667	17.54	19.04	36.58	46.00	-9.42	peak			
4		497.2167	11.92	21.10	33.02	46.00	-12.98	peak			
5		768.8167	3.49	26.89	30.38	46.00	-15.62	peak			
6		896.5333	5.20	28.52	33.72	46.00	-12.28	peak			

Radiated Emission Test –Vertical -3m



Site: site #1
Limit: FCC Class B 3M Radiation
EUT: Bluetooth Headset
M/N: AMP
Mode: USB
Note:

Polarization: *Vertical*
Power:
Distance:

Temperature: 23.5
Humidity: 54.5 %

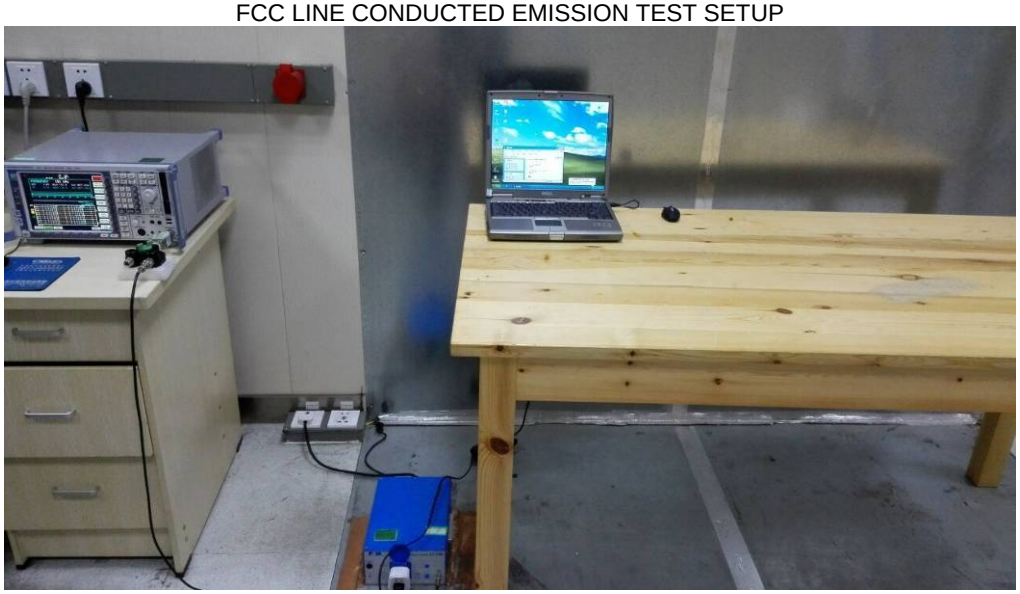
No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		143.1667	16.65	15.22	31.87	43.50	-11.63	peak			
2	*	215.9167	26.10	10.56	36.66	43.50	-6.84	peak			
3		299.9833	20.14	15.41	35.55	46.00	-10.45	peak			
4		503.6833	14.50	21.23	35.73	46.00	-10.27	peak			
5		573.2000	11.07	22.60	33.67	46.00	-12.33	peak			
6		799.5333	6.89	27.31	34.20	46.00	-11.80	peak			

Note: *above 1GHz have more than 20db margin, no recording in the report*

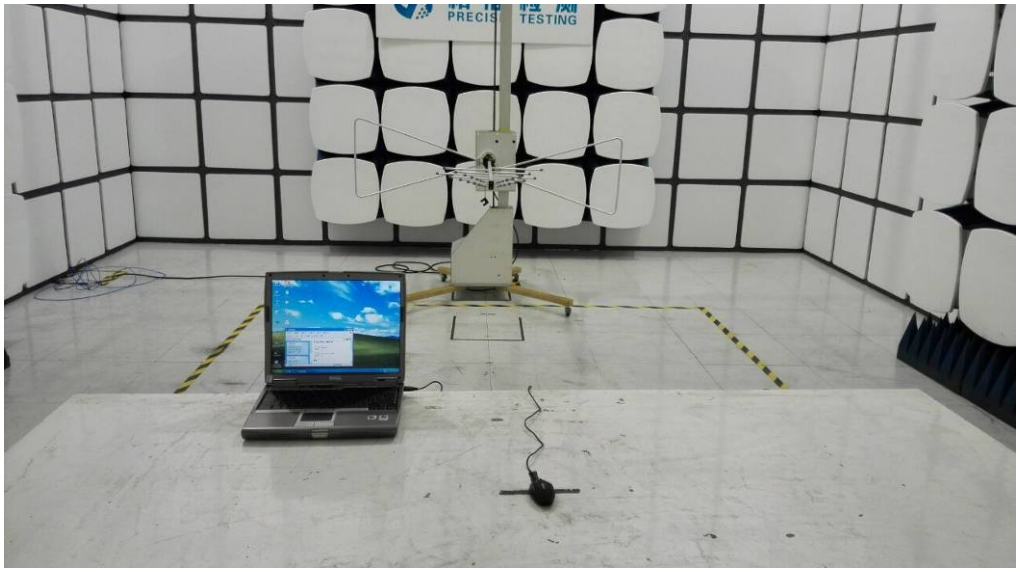
Measurement = Reading + Factor, Over = Measurement – Limit.

APPENDIX 1: PHOTOGRAPHS OF TEST SETUP

FCC LINE CONDUCTED EMISSION TEST SETUP



FCC RADIATED EMISSION TEST SETUP



APPENDIX 2: PHOTOGRAPHS OF EUT

All VIEW OF EUT

TOP VIEW OF EUT

BOTTOM VIEW OF EUT

FRONT VIEW OF EUT

BACK VIEW OF EUT

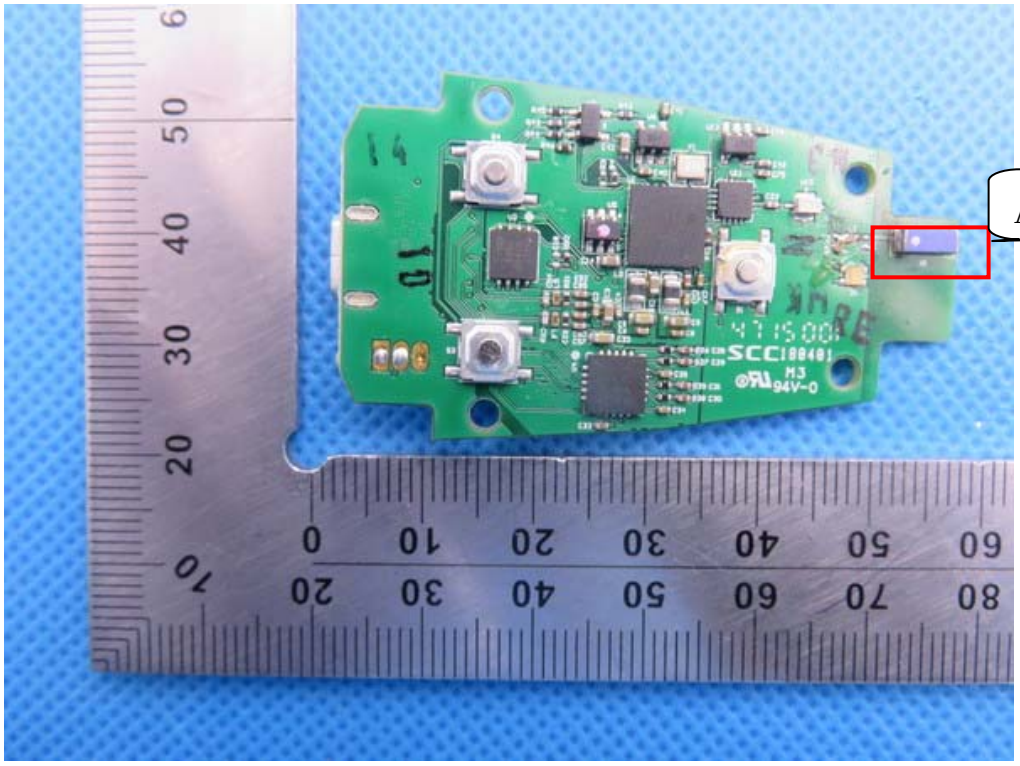
LEFT VIEW OF EUT

RIGHT VIEW OF EUT

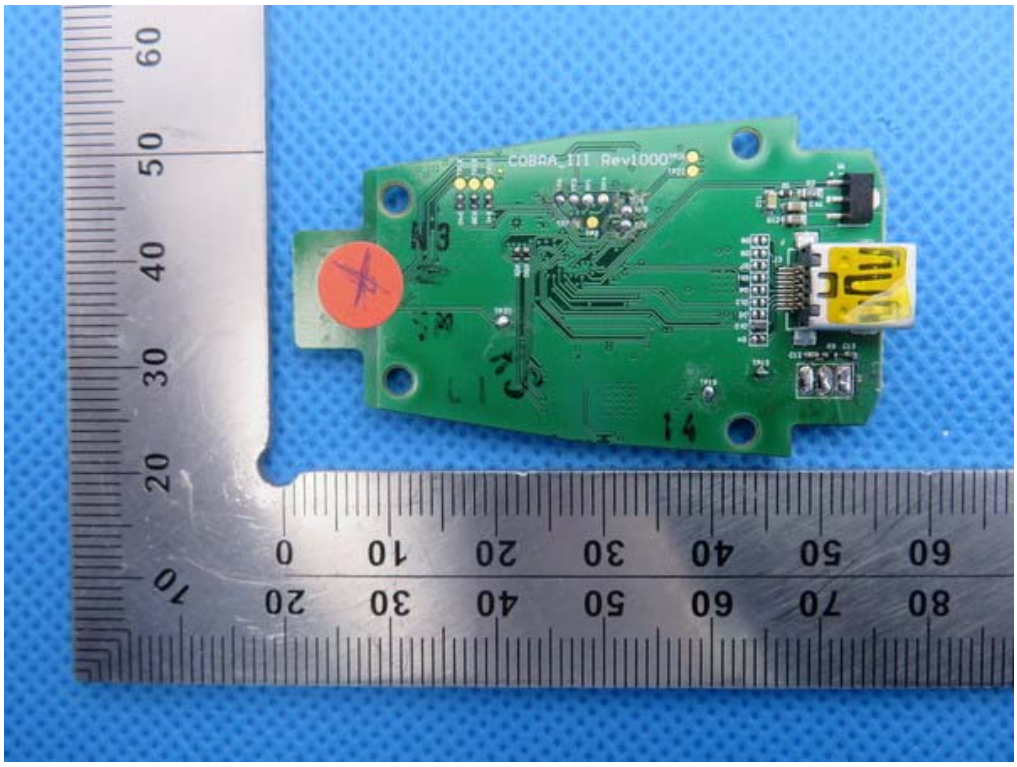
OPEN VIEW OF EUT

VIEW OF EUT (PORT)

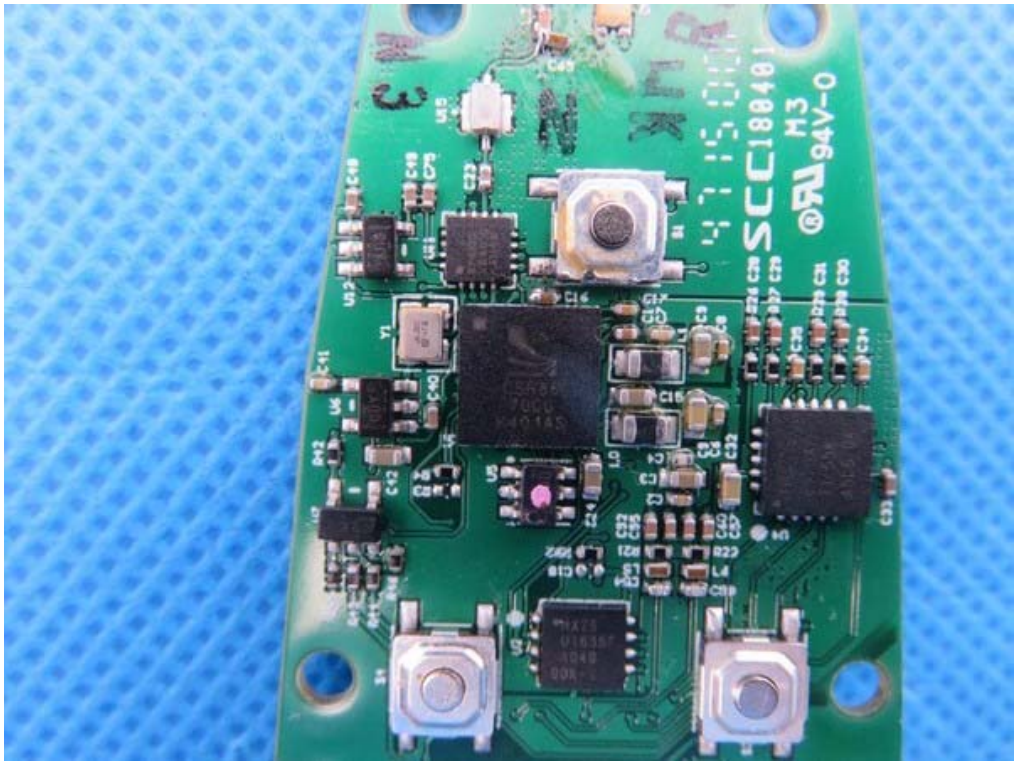
INTERNAL VIEW OF EUT-1



INTERNAL VIEW OF EUT-2



INTERNAL VIEW OF EUT-3



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