
FCC Test Report

Report No.: AGC08506190701FE01

PRODUCT DESIGNATION : WIRELESS HEADPHONE
BRAND NAME : CLEER
MODEL NAME : ENDURO 100
APPLICANT : Cleer Limited
DATE OF ISSUE : Aug. 08, 2019
STANDARD(S) : FCC Part 15 Subpart B
REPORT VERSION : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

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REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Aug. 08, 2019	Valid	Initial release



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1. VERIFICATION OF CONFORMITY

Applicant	Cleer Limited
Address	Units 3306-12, 33/F, Shui On Centre, Nos.6-8 Harbour Road, Wanchai, Hong Kong
Manufacturer	Cleer Limited
Address	Units 3306-12, 33/F, Shui On Centre, Nos.6-8 Harbour Road, Wanchai, Hong Kong
Factory	Cleer Limited
Address	Units 3306-12, 33/F, Shui On Centre, Nos.6-8 Harbour Road, Wanchai, Hong Kong
Product Designation	WIRELESS HEADPHONE
Brand Name	Cleer
Test Model	ENDURO 100
Measurement Procedure	ANSI C63.4: 2014
Date of test	Jul. 18, 2019 to Aug. 08, 2019
Deviation	None
Condition of Test Sample	Normal
Test Result	Pass
Report Template	AGCRT-US-IT/AC

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. for compliance with the requirements set forth in the FCC Rules and Regulations Part 15, the measurement procedure according to ANSI C63.4:2014. 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

NiNi

NiNi Guo(Guo Lili)

Aug. 08, 2019

Reviewed By

Max Zhang

Max Zhang(Zhang Yi)

Aug. 08, 2019

Approved By

Forrest Lei

Forrest Lei(Lei Yonggang)

Authorized Officer

Aug. 08, 2019

2. SYSTEM DESCRIPTION

TEST MODE DESCRIPTION		
NO.	TEST MODE DESCRIPTION	WORST
1	Data transferring by PC mode	V
2	Charging	

Note:1. V means EMI worst mode.

3. MEASUREMENT UNCERTAINTY

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in measurement" (GUM) published by CISPR and ANSI.

- Uncertainty of Conducted Emission, $U_c = \pm 3.2$ dB
- Uncertainty of Radiated Emission below 1GHz, $U_c = \pm 3.9$ dB
- Uncertainty of Radiated Emission above 1GHz, $U_c = \pm 4.8$ dB



4. PRODUCT INFORMATION

Housing Type	Plastic
Hardware Version	0.3dBi
Software Version	V0.3
Power Supply	DC 3.7V by battery or DC 5V by adapter
Highest operate frequency	2480MHz

I/O Port Information (Applicable Not Applicable)

I/O Port of EUT			
I/O Port Type	Number	Specific	Tested With
USB CHARGE	1	--	1

Note:

1. All the above "--" means that EUT has no cable.
2. All the cables were provided by AGC Lab.



5. SUPPORT EQUIPMENT

Item	Equipment	Model No.	ID or Specification	Remark
1	WIRELESS HEADPHONE	ENDURO 100	2ATS9-7128	EUT
2	PC Adapter	ADC6501TM	Input:100-240V, 50-60Hz, 1.7A Output:5V, 2A/ 12V, 2A/ 15V, 3A/ 9V, 2A/ 20V, 3.25A, 65W	AE
3	PC	16301-01	N/A	AE



6. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

TEST EQUIPMENT OF CONDUCTED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESPI	101206	Jun.12, 2019	Jun.11, 2020
LISN	R&S	ESH2-Z5	100086	Jun.12, 2019	Jun.11, 2020

TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	Jun.12, 2019	Jun.11, 2020
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec.07, 2018	Dec.08, 2019
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Sep. 21,2017	Sep. 20,2020
preamplifier	ChengYi	EMC184045SE	980508	May.17, 2019	May.18, 2020
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May. 26,2018	May. 25,2020
Broadband Preamplifier	ETS LINDGREN	3117PA	00225134	Oct. 25, 2018	Oct. 24, 2019
ANTENNA	SCHWARZBECK	VULB9168	D69250	Sep.28, 2017	Sep.27, 2019



7. TEST ITEMS AND THE RESULTS

Test item	Test Requirement	Test Method	Class/Severity	Result
CONDUCTED EMISSION	FCC Part 15 Rules	ANSI C63.4	Class B	Pass
RADIATED EMISSION	FCC Part 15 Rules	ANSI C63.4	Class B	Pass



8. LINE CONDUCTED EMISSION TEST

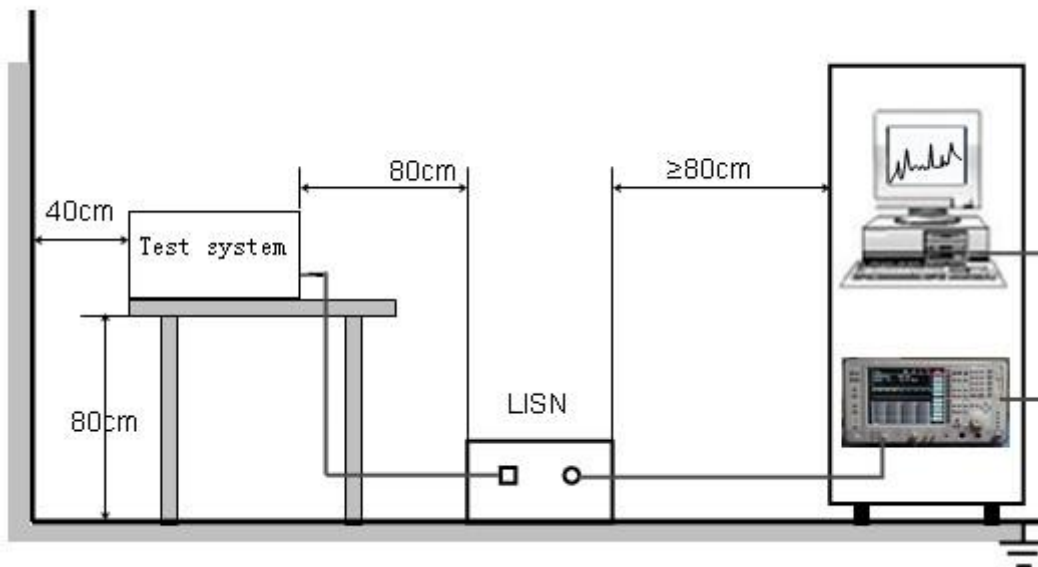
8.1. LIMITS OF LINE CONDUCTED EMISSION TEST

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 0.50MHz.

8.2. BLOCK DIAGRAM OF TEST SETUP



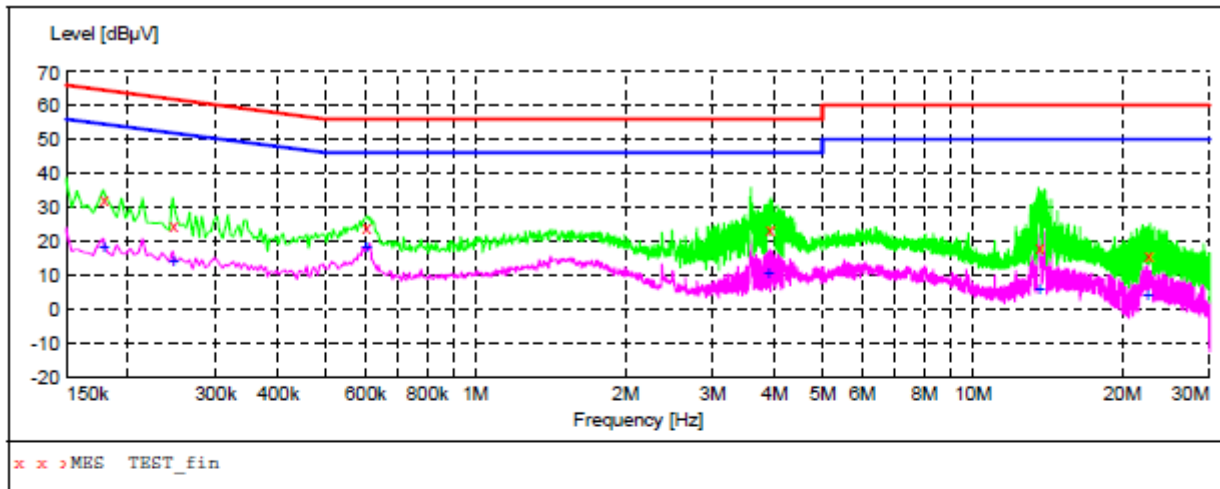
8.3. PROCEDURE OF LINE CONDUCTED EMISSION TEST

- (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 5V power from PC which received AC120V/60Hz power from 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.



8.4. TEST RESULT OF LINE CONDUCTED EMISSION TEST

Line Conducted Emission Test Line 1-L



MEASUREMENT RESULT: "TEST_fin"

8/08/2019 10:33AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.178000	32.50	10.9	65	32.1	QP	L1	FLO
0.246000	25.00	10.9	62	36.9	QP	L1	FLO
0.602000	24.30	10.7	56	31.7	QP	L1	FLO
3.898000	23.90	11.6	56	32.1	QP	L1	FLO
13.606000	18.20	12.1	60	41.8	QP	L1	FLO
22.534000	15.80	12.6	60	44.2	QP	L1	FLO

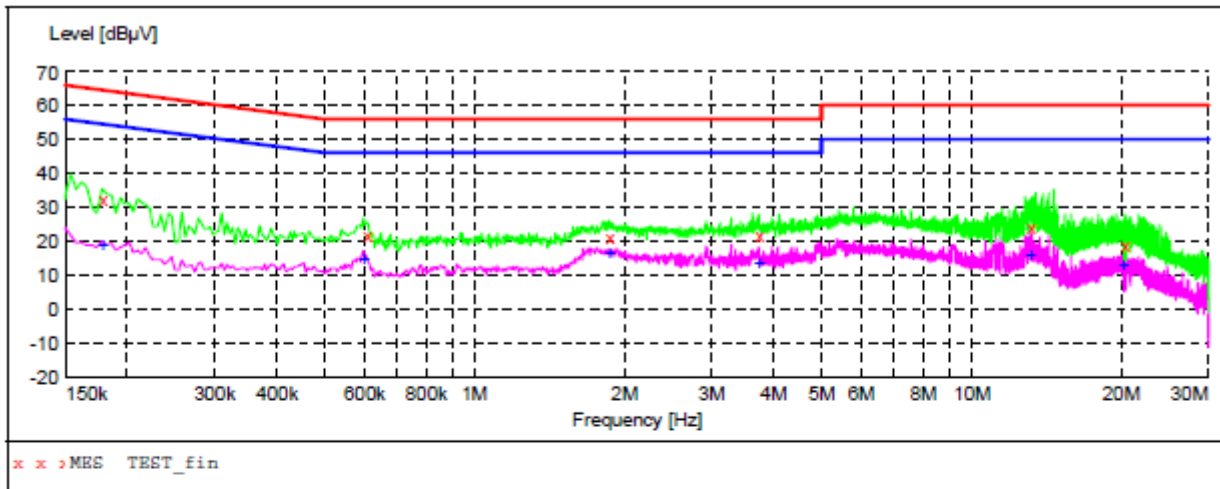
MEASUREMENT RESULT: "TEST_fin2"

8/08/2019 10:33AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.178000	18.50	10.9	55	36.1	AV	L1	FLO
0.246000	14.20	10.9	52	37.7	AV	L1	FLO
0.602000	18.10	10.7	46	27.9	AV	L1	FLO
3.882000	10.80	11.6	46	35.2	AV	L1	FLO
13.606000	5.80	12.1	50	44.2	AV	L1	FLO
22.534000	4.30	12.6	50	45.7	AV	L1	FLO



Line Conducted Emission Test Line 2-N



MEASUREMENT RESULT: "TEST_fin"

8/08/2019 11:20AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.178000	32.50	10.9	65	32.1	QP	N	FLO
0.606000	21.60	10.7	56	34.4	QP	N	FLO
1.866000	21.10	11.5	56	34.9	QP	N	FLO
3.734000	21.90	11.6	56	34.1	QP	N	FLO
13.158000	24.30	12.1	60	35.7	QP	N	FLO
20.350000	19.10	12.5	60	40.9	QP	N	FLO

MEASUREMENT RESULT: "TEST_fin2"

8/08/2019 11:20AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.178000	19.20	10.9	55	35.4	AV	N	FLO
0.598000	14.60	10.7	46	31.4	AV	N	FLO
1.866000	16.30	11.5	46	29.7	AV	N	FLO
3.734000	13.90	11.6	46	32.1	AV	N	FLO
13.158000	15.80	12.1	50	34.2	AV	N	FLO
20.174000	12.80	12.5	50	37.2	AV	N	FLO

RESULT: PASS



9. RADIATED EMISSION TEST

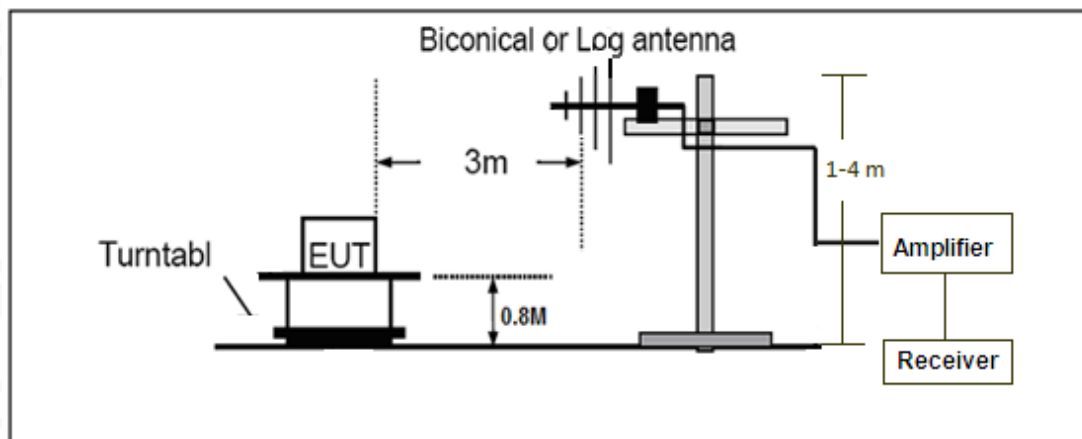
9.1. LIMITS OF RADIATED EMISSION TEST

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.

9.2. BLOCK DIAGRAM OF TEST SETUP

System Diagram of Connections between EUT and Simulators



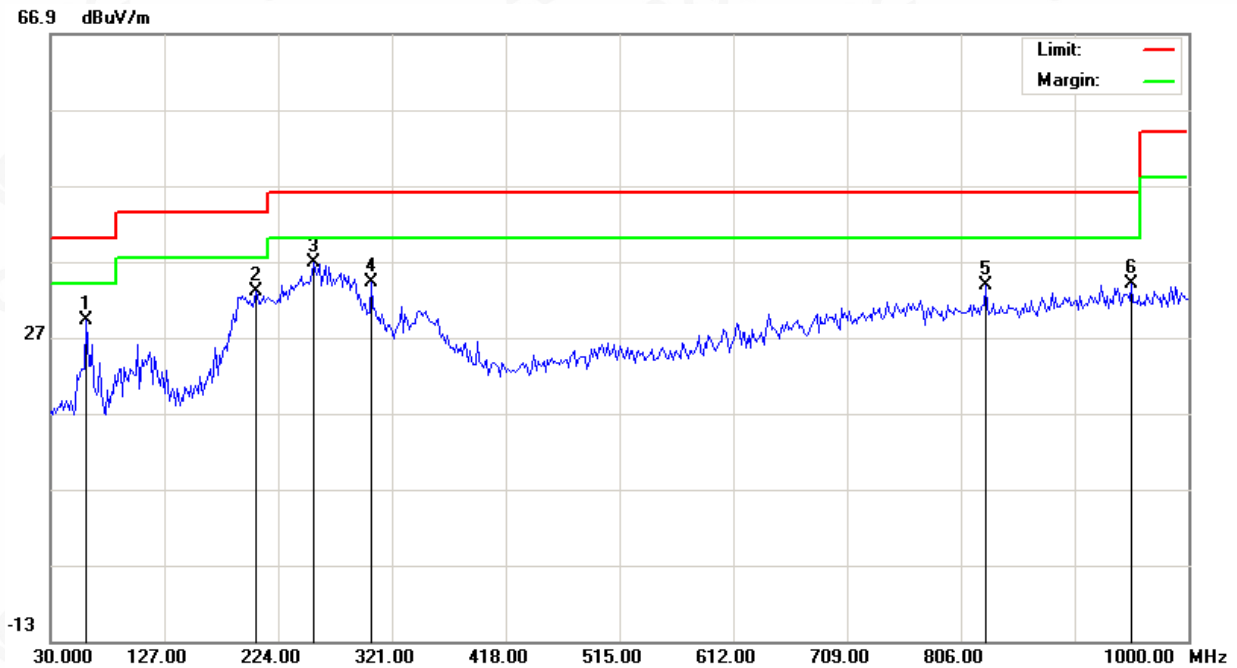
9.3. PROCEDURE OF RADIATED EMISSION TEST

- (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 was connected to PC for charging. All support equipments received AC120V/60Hz power from socket under the turntable, if any.
- (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.



9.4. TEST RESULT OF RADIATED EMISSION TEST

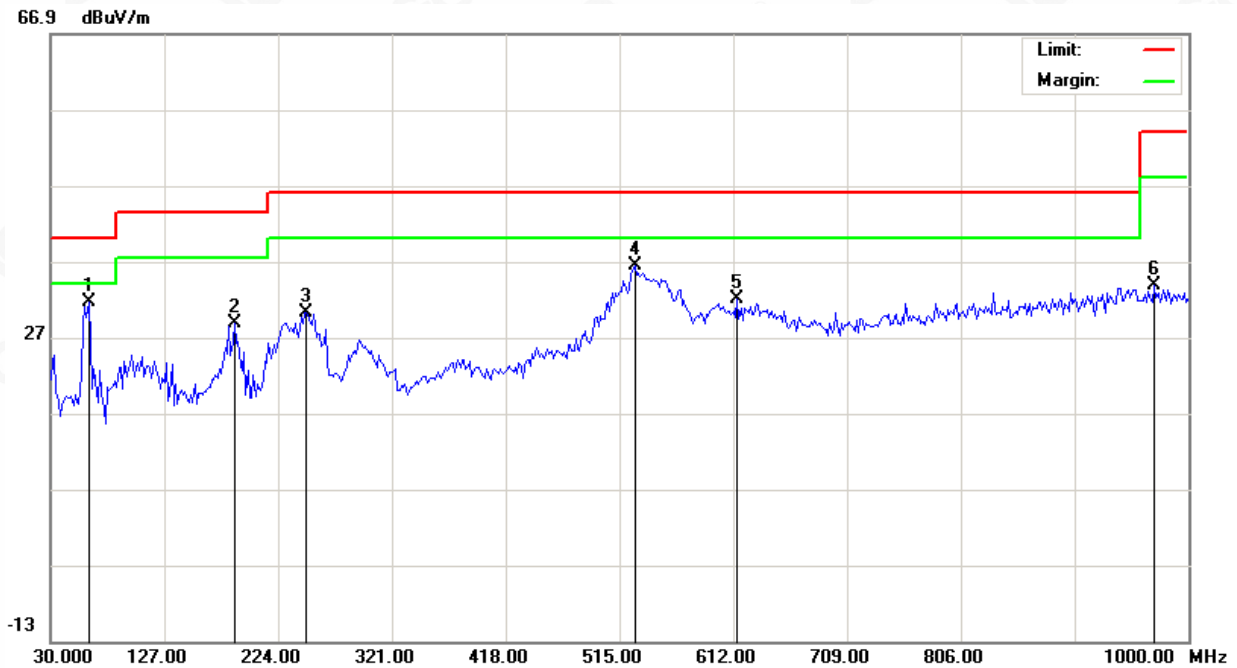
Radiated Emission below 1GHz Test at 3m Distance-Horizontal



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		60.7167	10.49	18.74	29.23	40.00	-10.77	peak			
2		204.6000	16.69	16.33	33.02	43.50	-10.48	peak			
3	*	254.7167	18.47	18.40	36.87	46.00	-9.13	peak			
4		303.2167	14.62	19.58	34.20	46.00	-11.80	peak			
5		827.0167	2.97	30.76	33.73	46.00	-12.27	peak			
6		951.5000	1.81	32.14	33.95	46.00	-12.05	peak			



Radiated Emission below 1GHz Test at 3m Distance-Vertical



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna	Table	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		Height	Degree	
									cm	degree	
1	*	62.3333	13.19	18.46	31.65	40.00	-8.35	peak			
2		186.8167	11.96	16.77	28.73	43.50	-14.77	peak			
3		248.2500	11.70	18.52	30.22	46.00	-15.78	peak			
4		527.9333	10.88	25.54	36.42	46.00	-9.58	peak			
5		615.2333	4.90	27.13	32.03	46.00	-13.97	peak			
6		970.9000	1.41	32.31	33.72	54.00	-20.28	peak			

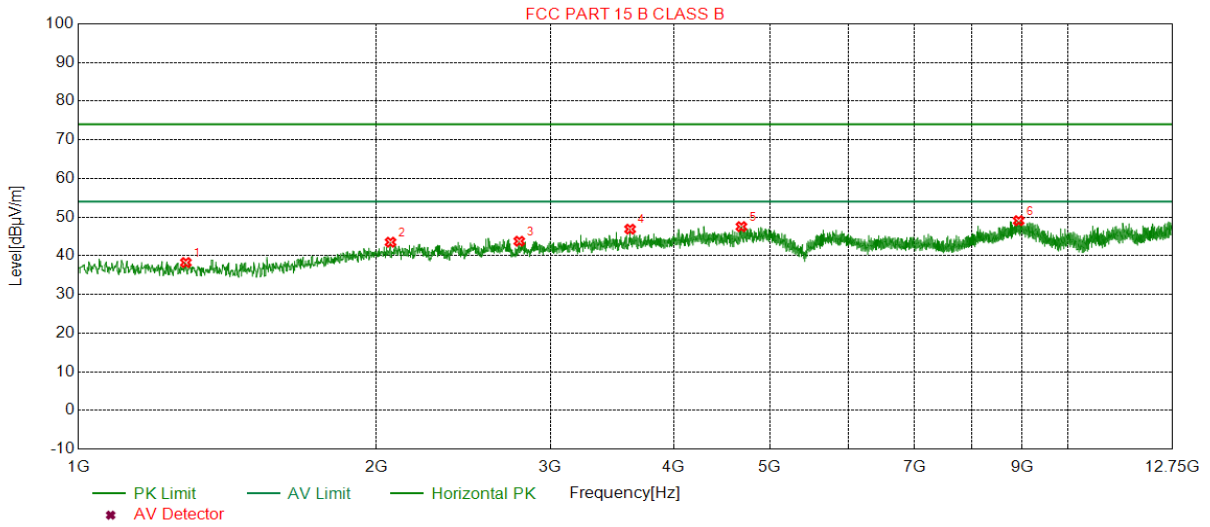
RESULT: PASS



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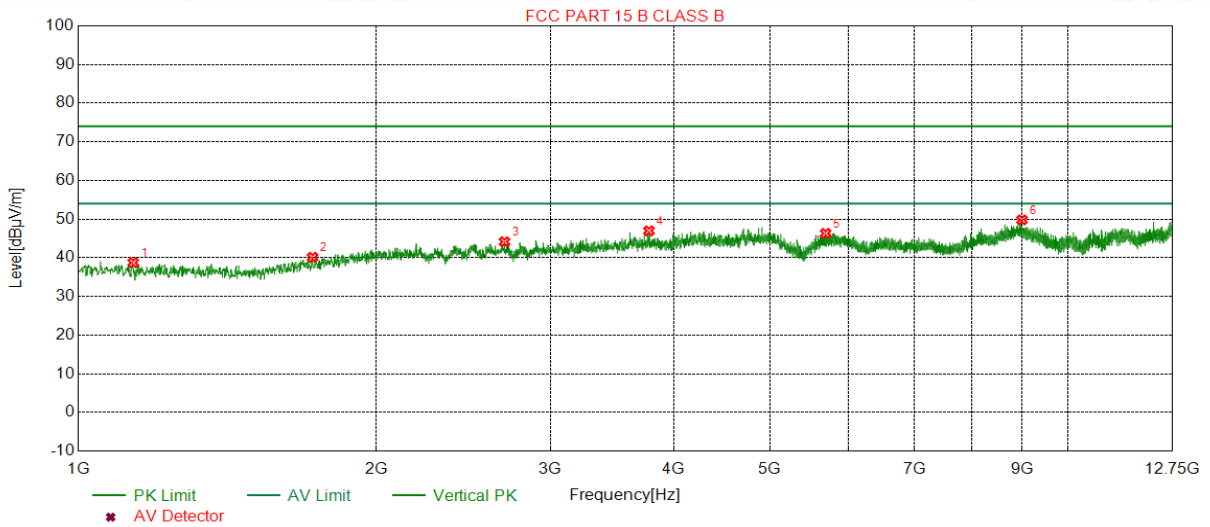
Radiated Emission above 1GHz Test at 3m Distance-Horizontal



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1284.3784	38.24	-16.92	74.00	35.76	150	151	Horizontal
2	2068.1818	43.50	-11.53	74.00	30.50	150	353	Horizontal
3	2790.8791	43.76	-9.49	74.00	30.24	150	0	Horizontal
4	3612.2862	46.88	-7.35	74.00	27.12	150	137	Horizontal
5	4680.4680	47.53	-5.03	74.00	26.47	150	277	Horizontal
6	8924.9925	49.07	1.09	74.00	24.93	150	0	Horizontal



Radiated Emission above 1GHz Test at 3m Distance-Vertical



NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1136.3136	38.72	-16.77	74.00	35.28	150	306	Vertical
2	1725.0475	40.12	-14.74	74.00	33.88	150	360	Vertical
3	2696.8697	44.13	-9.57	74.00	29.87	150	346	Vertical
4	3774.4524	46.97	-7.00	74.00	27.03	150	153	Vertical
5	5694.5945	46.31	-4.67	74.00	27.69	150	7	Vertical
6	8994.3244	49.80	1.59	74.00	24.20	150	236	Vertical

RESULT: PASS

Note:

$$\text{Level(dBuV/m)} = \text{Reading(dBuV)} + \text{Factor(dB/m)}$$

$$\text{Factor(dB/m)} = \text{Antenna Factor(dB/m)} + \text{Cable loss(dB)} + \text{Attenuation(dB) for Attenuator}$$

$$\text{Margin} = \text{Level} - \text{Limit}$$



Attestation of Global Compliance

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APPENDIX A: PHOTOGRAPHS OF TEST SETUP

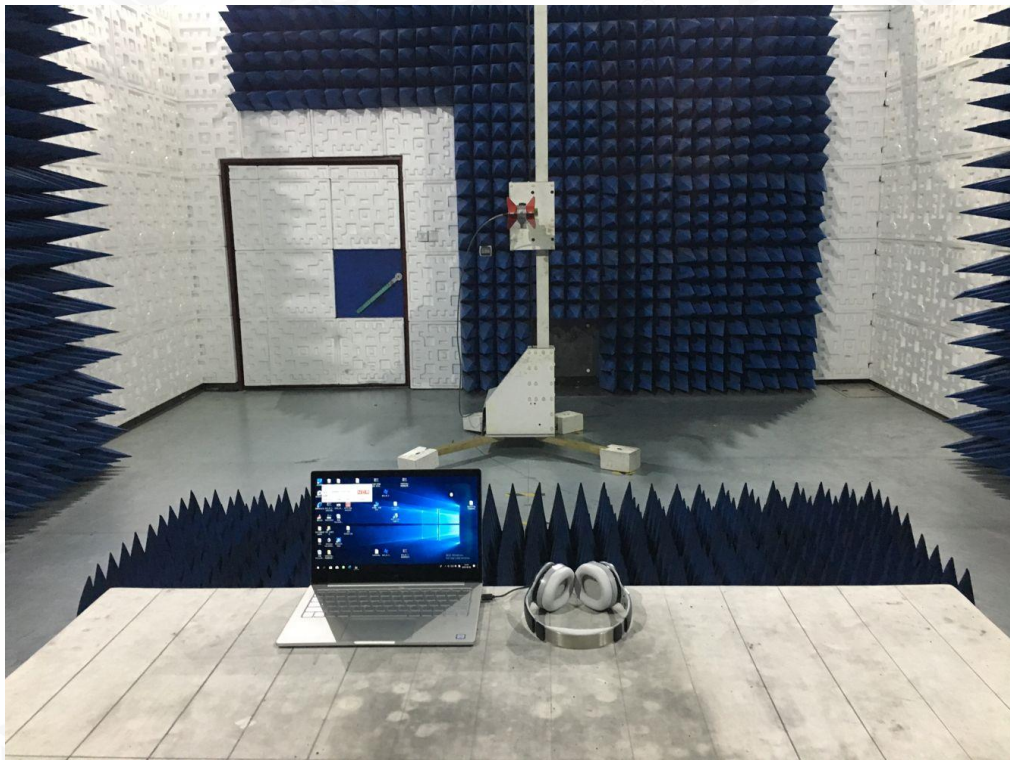
FCC LINE CONDUCTED EMISSION TEST SETUP



FCC RADIATED EMISSION TEST SETUP BELOW 1GHZ



FCC RADIATED EMISSION TEST SETUP ABOVE 1GHZ



APPENDIX B: PHOTOGRAPHS OF EUT

ALL VIEW OF EUT



TOP VIEW OF EUT



BOTTOM VIEW OF EUT



FRONT VIEW OF EUT



BACK VIEW OF EUT



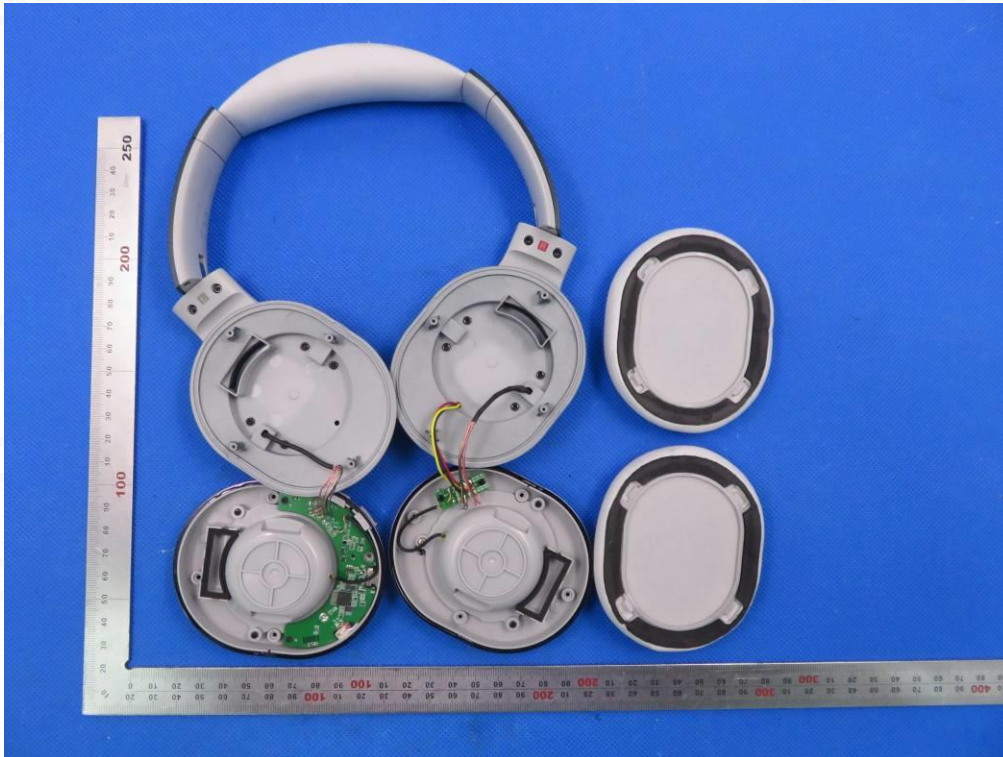
LEFT VIEW OF EUT



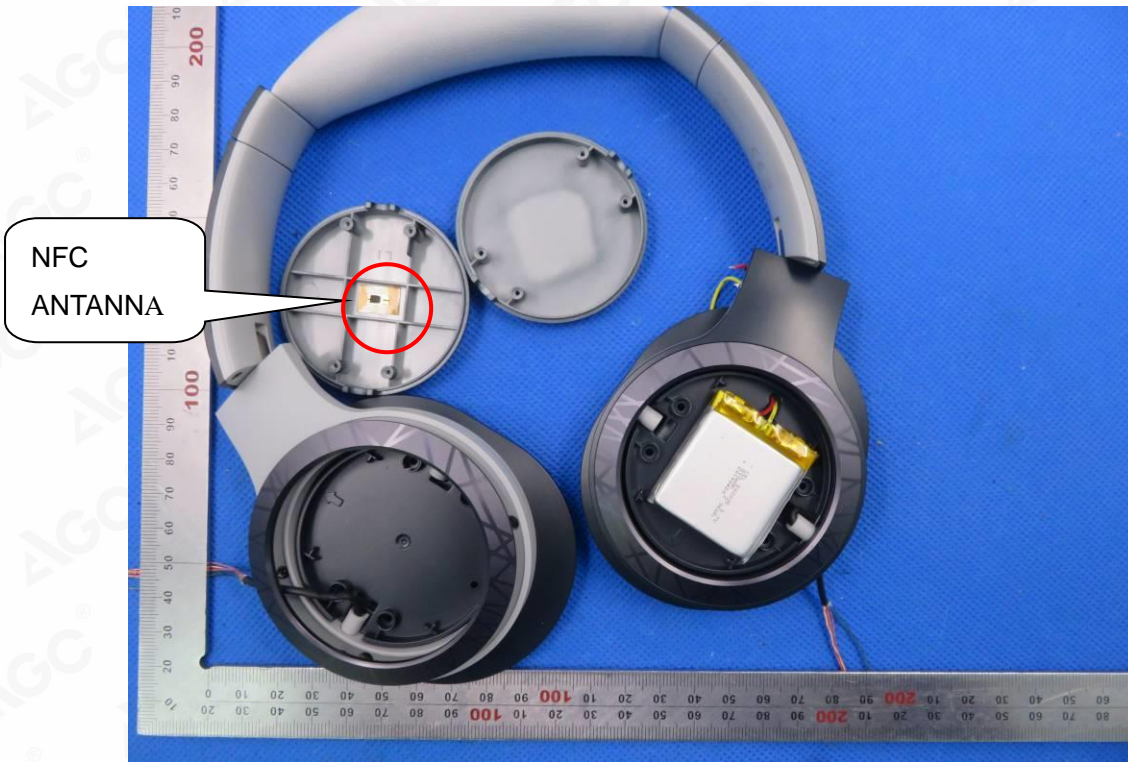
RIGHT VIEW OF EUT



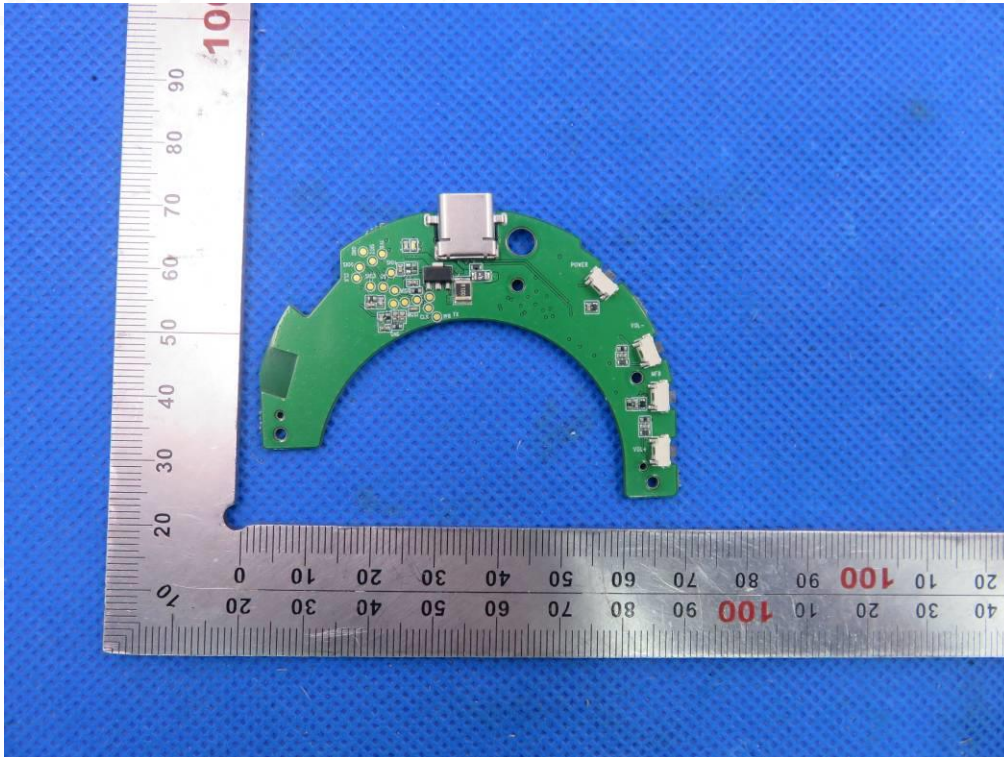
OPEN VIEW OF EUT-1



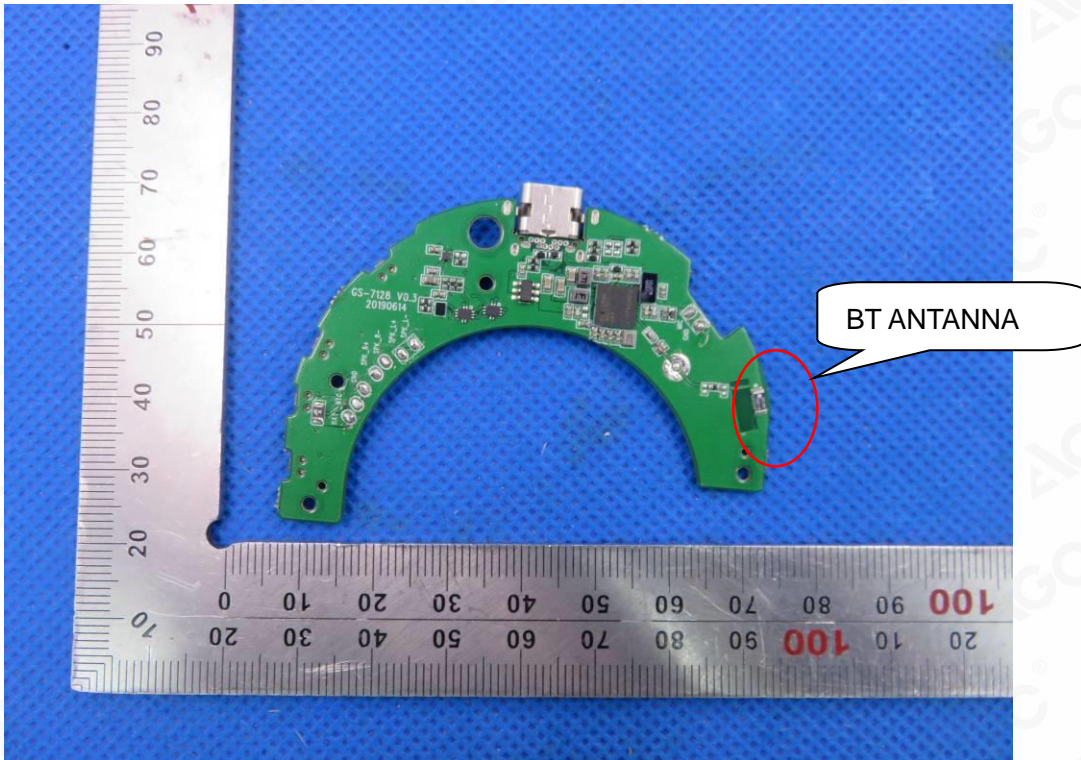
OPEN VIEW OF EUT-2



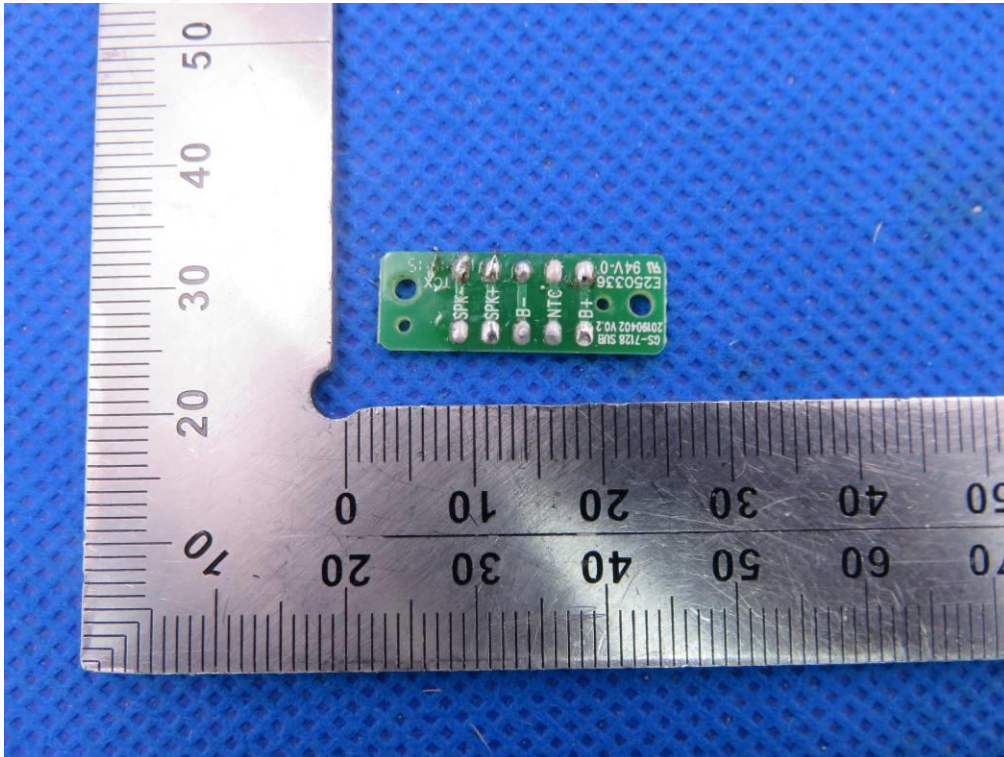
INTERNAL VIEW OF EUT-1



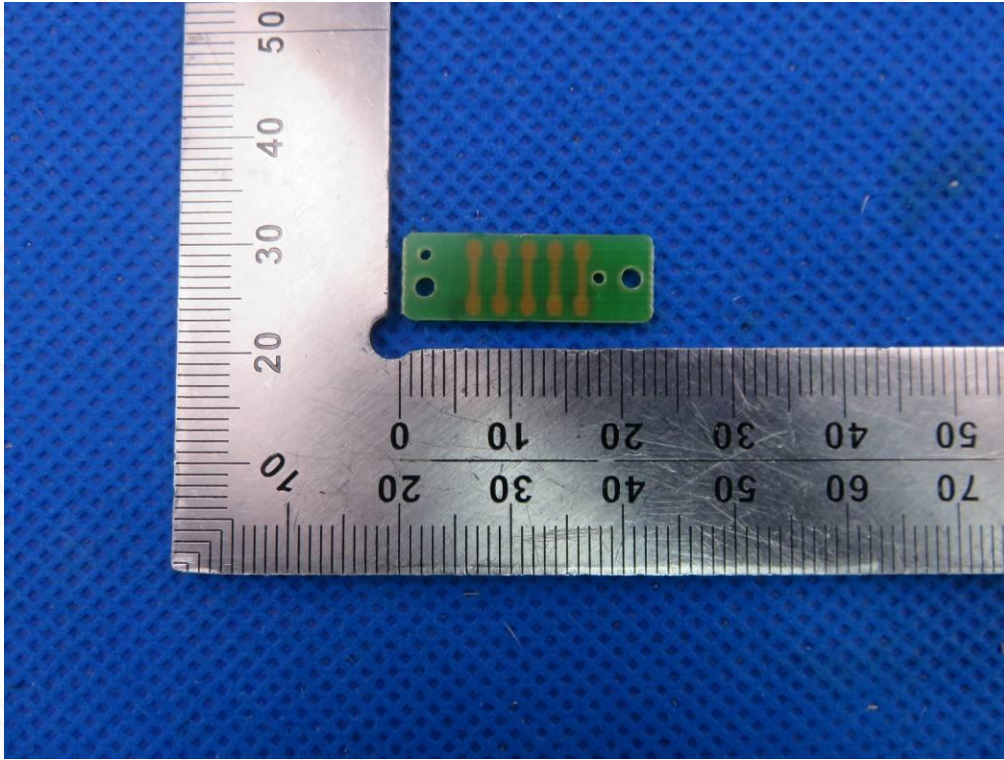
INTERNAL VIEW OF EUT-2



INTERNAL VIEW OF EUT-3



INTERNAL VIEW OF EUT-4



----END OF REPORT----

