

FCC SDOC Test Report

For

Audiocodes Ltd.

EUT Name: IP PHONE

Model No: C450HD

Brand Name: AudioCodes

Prepared By:

Electro Magnetic Test, Inc.

Date of Receipt: Sep. 27, 2018

Date of Test: Sep. 28~Oct. 04, 2018

Date of Issue: Oct. 05, 2018

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Verification of Compliance

Client Information:

Applicant:	Audiocodes Ltd.
Applicant add.:	1 Hayarden St. Airport City Lod 70151, Israel

EUT Information:

EUT Name: IP PHONE

Model No: C450HD

Brand Name: AudioCodes

Test procedure used: FCC Part 15 Subpart B

This device described above has been tested by Electro Magnetic Test, Inc. and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

Reviewed by:



Test director

Approved by:



Technical director

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2 Test Summary

Test	Test Requirement	Test Method	Criterion	Result
Mains Terminals Disturbance Voltage,	FCC Part 15 Subpart B: 2017	FCC Part 15 Subpart B ANSI C63.4: 2014 ICES-003 Issue 6: 2016	Limits	PASS
Radiated Emissions	FCC Part 15 Subpart B: 2017	FCC Part 15 Subpart B ANSI C63.4: 2014 ICES-003 Issue 6: 2016	Limits	PASS
Note: --				

2.1 Measurement Uncertainty

The report uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty Multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95% .

No.	Item	Frequency Range	U , Value
1	Power Line Conducted Emission	150KHz~30MHz	1.20 dB
3	Radiated Emission Test	30MHz~1GHz	3.30 dB
4	Radiated Emission Test	1GHz~6GHz	3.30 dB

3 GENERAL REPORT SUMMARY

This electromagnetic emission test report is generated by Electro Magnetic Test, Inc., which is an independent testing and consulting firm. The test report is based on testing performed Electro Magnetic Test, Inc. personnel according to the measurement procedure described in the test specification given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced in any form unless done so in full.

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Federal Government.

Electro Magnetic Test, Inc. is recognized by the following agencies for performing EMI/EMC testing:

COUNTRY	AGENCY	IDENTIFYING #
USA	Federal Communications Commission (FCC) (EMT's test site is recognized by the FCC)	Registration Number: 90576
USA, Canada, Taiwan, Australia/New Zealand, European Community	National Voluntary Lab Accreditation Program (NVLAP) (EMT is accredited by NVLAP. A copy of the NVLAP Scope Of Accreditation is available upon request.)	Lab Code: 200147-0
Canada	Industry Canada	File No.: IC 2804
Japan	Voluntary Control Council For Interference (VCCI)	A-0118
	Open Field Test Site "A"	-
	Mains Conducted Emissions Test Site "A"	-
	Telecom Conducted Emissions Test Site "A"	-
	3 Meter Semi-Anechoic Chamber Site "E"	-
	3 Meter Semi-Anechoic Chamber Site "E" (1GHz – 6GHz)	-
	Mains Conducted Emissions Test Site "E"	-
	Telecom Conducted Emissions Test Site "E"	-
Korea	Ministry of Information and Communication's Radio Research Laboratory (RRL) under the Asia Pacific Economic Cooperation (APEC) Mutual Recognition Arrangement (A copy of the Scope Of Accreditation is available upon request)	US0036
Taiwan	Bureau Of Standards, Metrology and Inspection (BSMI)	Reference Number: SL2-IN-E-1024
Australia / New Zealand	Australian Communications Authority (AUSTEL)	*

4 General Information

4.1 General Description of EUT

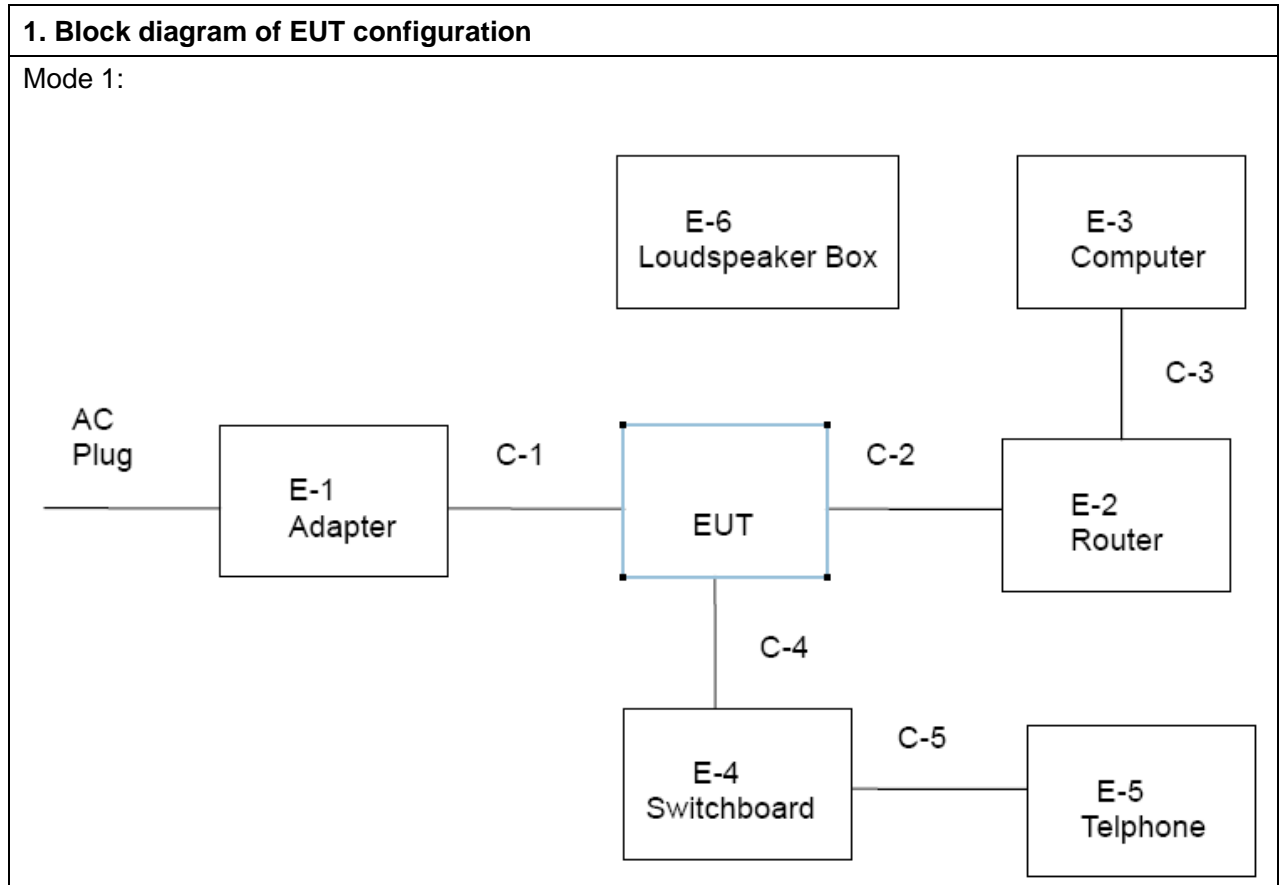
Manufacturer:	Audiocodes Ltd.			
Manufacturer Address:	1 Hayarden St. Airport City Lod 70151, Israel			
EUT Name:	IP PHONE			
Model No:	C450HD			
Brand Name:	AudioCodes			
Power Range:	120Vac/60Hz			
Test Supply:	120Vac/60Hz			
Power Cord:	N/A			
Signal Cable:	N/A			
Key component's information:				
No.	component name	Brand Name	Model No:	Serial No:
1	N/A	N/A	N/A	N/A

4.1.1 EUT Test Mode

Mode 1	WLAN Connecting Mode+ LAN Port Connecting
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4.2 Description of Test setup

EUT was tested in normal configuration (Please See following Block diagram)



4.3 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.
E-1	Adapter	N/A	RD1202000-C55-29MG
E-2	Router	Audio Codes	MP262DB
E-3	Computer	Lenovo	ENHANCED EXPERIENCE
E-4	Switchboard	D-Link	GDS-1100-08P
E-5	Telephone	Audio Codes	440HD
E-6	Loudspeaker Box	Jabra	PHS002W

Item	Shielded Type	Ferrite Core	Length
C-1	Unshielded	NO	100cm
C-2	Unshielded	NO	105cm
C-3	Unshielded	NO	115cm
C-4	Unshielded	NO	120cm
C-5	Unshielded	NO	125cm

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) —YESII means —shieldedII —with coreII; —NOII means —unshieldedII —without coreII.

5 Equipments List for All Test Items

<input checked="" type="checkbox"/> Radiation Test Equipment						
No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	EMI Measuring Receiver	R&S	ESR	101160	2017.12.01	2018.12.02
2	Low Noise Pre Amplifier	Tsj	MLA-10K01-B01-27	1205323	2017.12.15	2018.12.14
3	TRILOG Super Broadband test Antenna	SCHWARZBECK	VULB9160	9160-3206	2017.12.12	2018.12.11
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2018.09.25	2019.09.24
5	Spectrum Analyzer	ADVANTEST	R3182	150900201	2018.06.27	2019.06.26
6	Low Noise Pre Amplifier	Tsj	MLA-0120-A02-34	2648A04738	2017.12.05	2018.12.04
7	Broadband Horn Antenna	Schwarzbeck	BBHA 9120D	452	2017.12.12	2018.12.11

<input checked="" type="checkbox"/> Conduction Test equipment						
No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	Test Receiver	Rohde & Schwarz	ESPI	102090	2017-10-20	2018-10-20
2	LISN	Rohde & Schwarz	ESH3-Z5	100158	2017-10-19	2018-10-19
3	Test Cable	FARAD	BNC-N-NO.1	N/A	2017-10-19	2018-10-19
4	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100046	2017-10-19	2018-10-19

Note:

1. is not applicable in this Test Report. is applicable in this Test Report.

6 Emission Test Results

6.1 Mains Terminals Disturbance Voltage Measurement

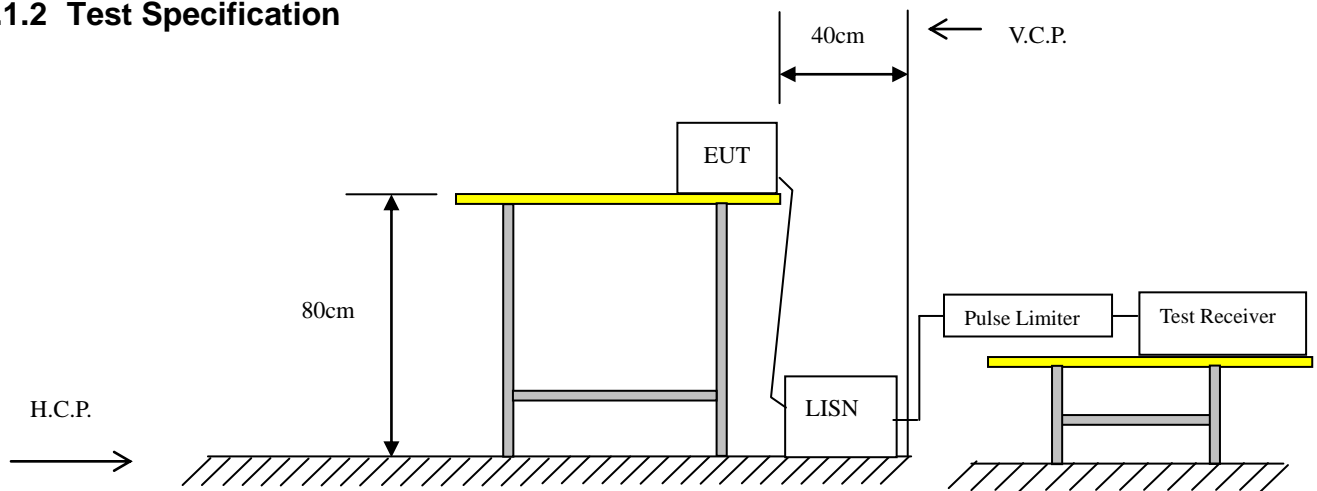
Frequency (MHz)	<input type="checkbox"/> Class A (dB μ V)		<input checked="" type="checkbox"/> Class B (dB μ V)	
	Q.P. (Quasi-Peak)	A.V. (Average)	Q.P. (Quasi-Peak)	A.V. (Average)
0.15 ~ 0.50	79	66	66 to 56	56 to 46
0.50 ~ 5.0	73	60	56	46
5.0 ~ 30	73	60	60	50

Detector: Peak for pre-scan (9kHz Resolution Bandwidth)
 Quasi-Peak & Average if maximized peak within 6dB of Average Limit

6.1.1 E.U.T. Operation

Temperature:	--	Humidity:	--	Atmospheric Pressure:	--	Kpa
Test Mode:	Mode 1		The Worst Mode:		Mode 1	

6.1.2 Test Specification



EUT was placed upon a wooden test table 0.8m above the horizontal metal reference plane and 0.4m from the vertical ground plane, and it was connected to an AMN. The closest distance between the boundary of the EUT and the surface of the AMN is 0.8m. All peripherals were connected to another AMN, and placed at a distance of 10cm from each other. A spectrum and receiver was connected to the RF output port of the AMN. Both average and quasi-peak value were detected.

6.1.3 Measurement Data

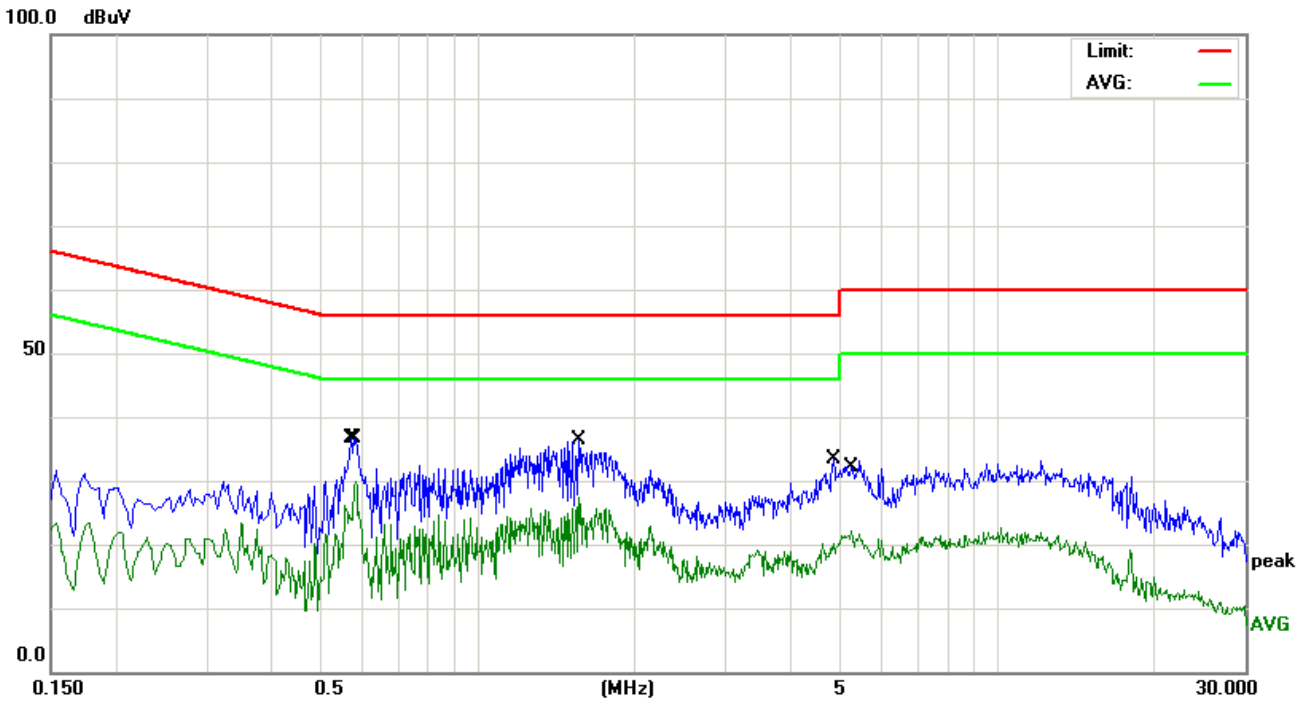
An initial pre-scan was performed on the live and neutral lines.

Quasi-peak or average measurements were performed at the frequency which maximum peak emissions were detected.

Please refer to the attached quasi-peak & average measurement data for reference.

Test Data – Conducted Emission

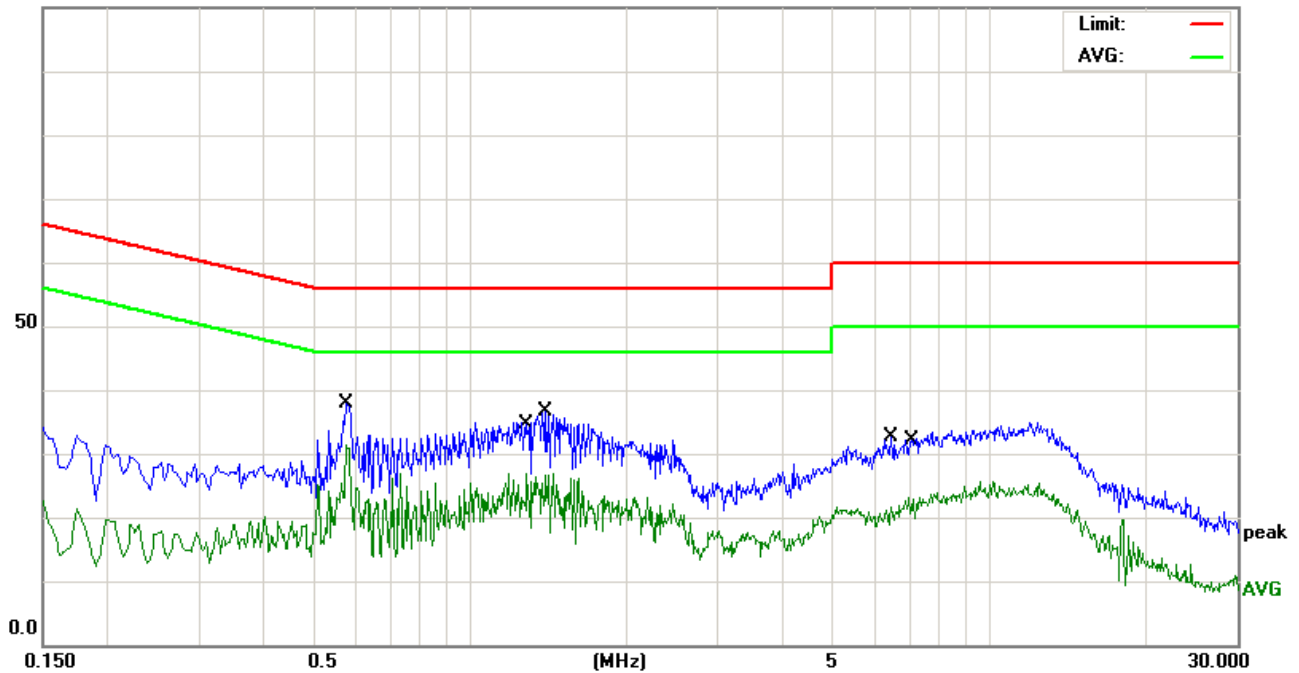
Mode 1: (L)



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		0.5700	26.64	9.97	36.61	56.00	-19.39	QP
2	*	0.5820	19.83	9.97	29.80	46.00	-16.20	AVG
3		1.5620	26.45	9.93	36.38	56.00	-19.62	QP
4		1.5620	17.37	9.93	27.30	46.00	-18.70	AVG
5		4.8340	23.31	10.04	33.35	56.00	-22.65	QP
6		5.2460	12.00	10.05	22.05	50.00	-27.95	AVG

Mode 1: (N)

100.0 dBuV



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		0.5780	27.95	9.97	37.92	56.00	-18.08	QP
2	*	0.5780	21.49	9.97	31.46	46.00	-14.54	AVG
3		1.2860	16.97	9.92	26.89	46.00	-19.11	AVG
4		1.3980	26.76	9.93	36.69	56.00	-19.31	QP
5		6.4860	22.55	10.09	32.64	60.00	-27.36	QP
6		6.9940	12.92	10.11	23.03	50.00	-26.97	AVG

6.1.4 Test Setup Photograph

6.2 Radiated Emission Measurement

Limits of Radiated Emission Measurement

Frequency (MHz)	<input type="checkbox"/> Class A (10m)	<input checked="" type="checkbox"/> Class B (3m)
	Quasi-Peak dB(μ V/m)	Quasi-Peak dB(μ V/m)
30 ~ 88	39.0	40.0
88 ~ 216	43.5	43.5
216 ~ 960	46.5	46.0
Above 960	49.5	54.0

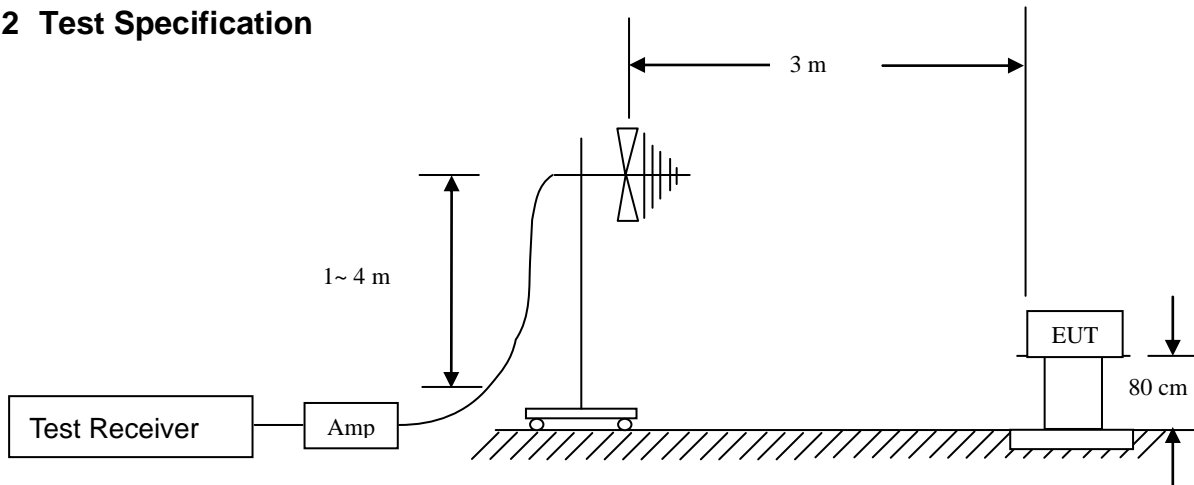
<input checked="" type="checkbox"/> Class B (3m)		
Frequency of emission (GHz)	Average limit dB(μ V/m)	Peak limit dB(μ V/m)
Above 1000	54	74

Detector: Peak for pre-scan (120kHz resolution bandwidth)
 Quasi-Peak if maximum peak within 6dB of limit

6.2.1 E.U.T. Operation

Temperature:	25°C	Humidity:	50% RH	Atmospheric Pressure:	101	Kpa
Test Mode:	Mode 1		The Worst Mode:		Mode 1	

6.2.2 Test Specification



EUT was placed upon a wooden test table which was placed on the turn table 0.8m above the horizontal metal ground plane, and operating in the mode as mentioned above. A receiving antenna was placed 3m away from the EUT. During testing, turn around the turn table and move the antenna from 1m to 4m to find the maximum field-strength reading. All peripherals were placed at a distance of 10cm between each other. Both horizontal and vertical antenna polarities were tested.

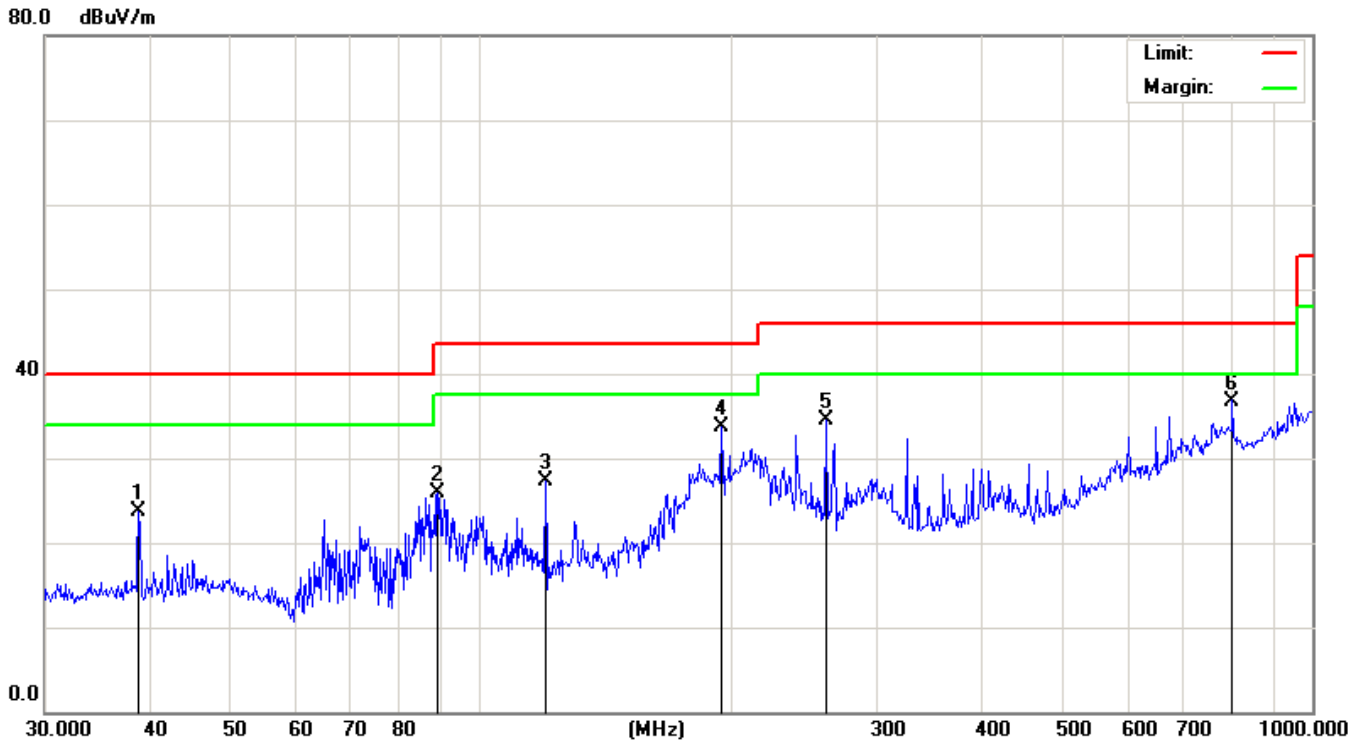
6.2.3 Measurement Data

An initial pre-scan was performed in the 3m chamber using the spectrum analyzers in peak detection mode. The EUT was measured by Biology antenna with 2 orthogonal polarities and peak emissions from the EUT were detected within 6dB of the class B limit line.

The following quasi-peak measurements were performed on the EUT.

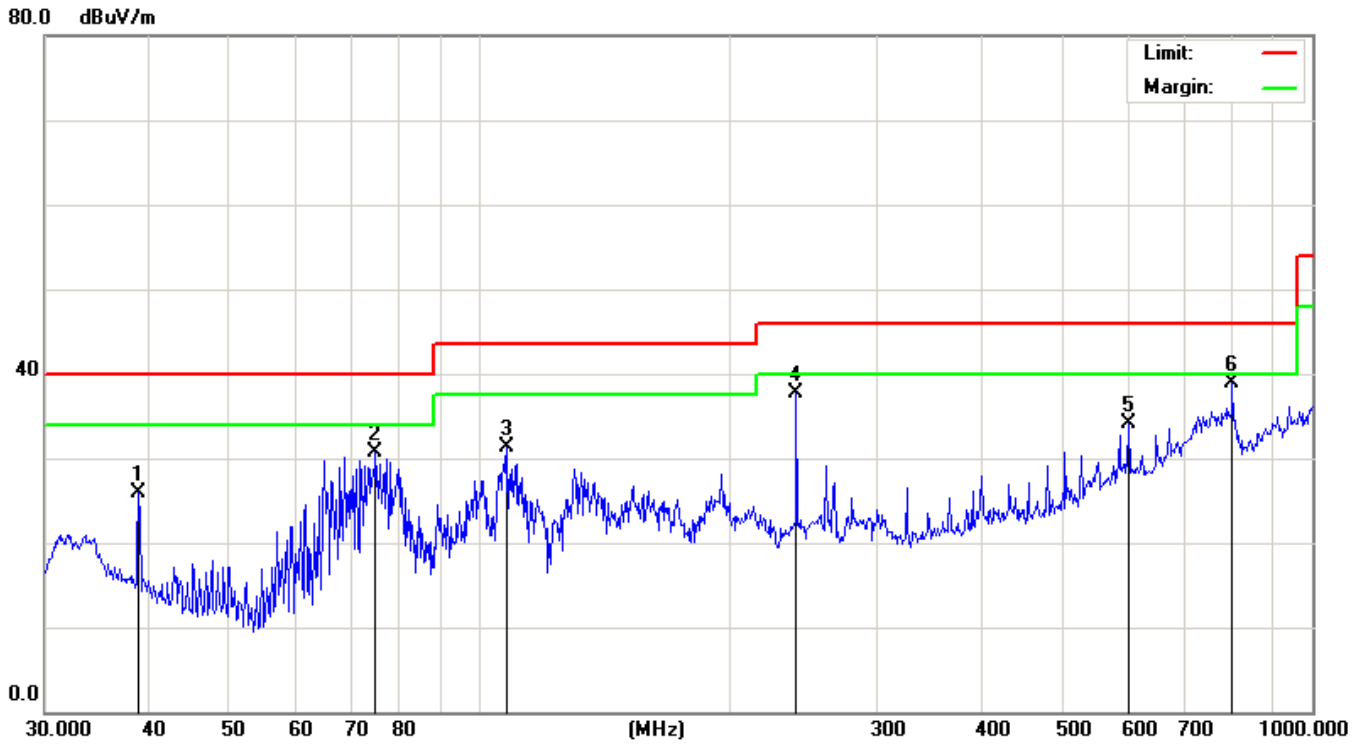
Test Data – Radiated Emission-Below 1GHz

Mode 1: (Vertical)



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		38.8878	38.31	-14.51	23.80	40.00	-16.20	QP
2		88.9639	42.85	-17.01	25.84	43.50	-17.66	QP
3		119.8556	42.17	-14.90	27.27	43.50	-16.23	QP
4		195.1365	49.48	-15.76	33.72	43.50	-9.78	QP
5		260.1444	47.26	-12.82	34.44	46.00	-11.56	QP
6	*	801.7863	36.14	0.66	36.80	46.00	-9.20	QP

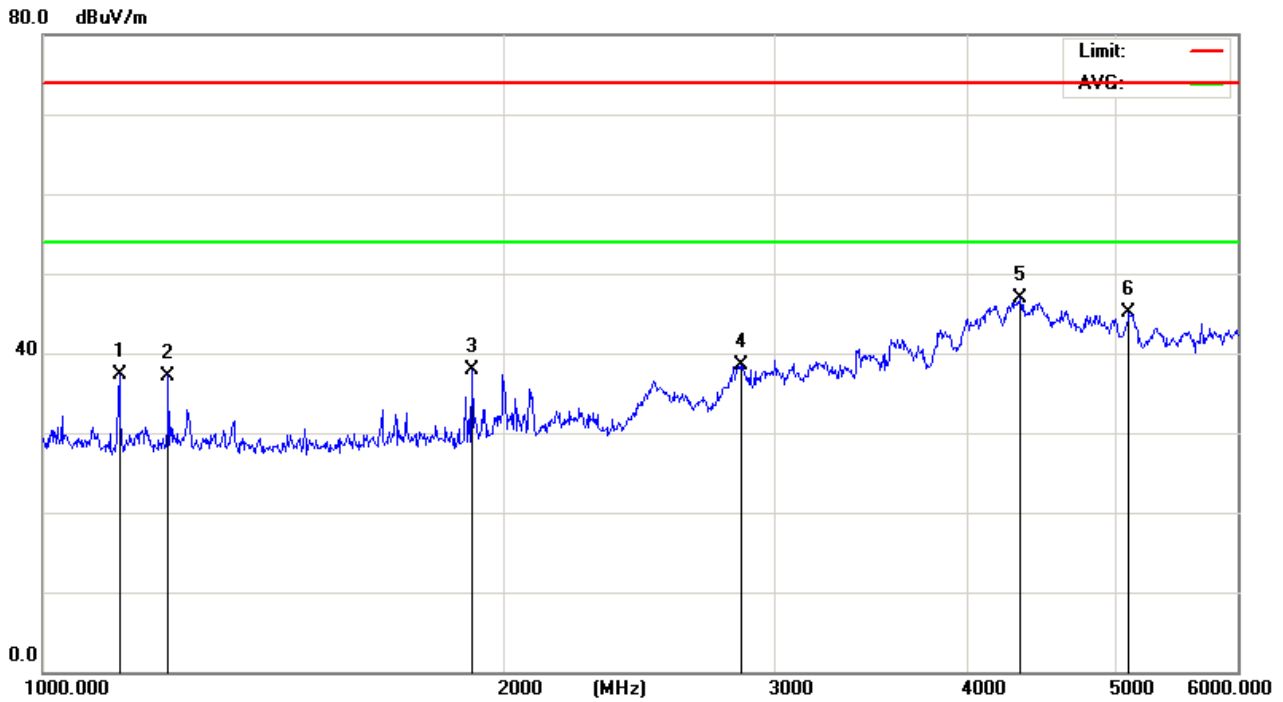
Mode 1: (Horizontal)



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		38.8878	42.54	-16.64	25.90	40.00	-14.10	QP
2		74.9191	49.88	-19.19	30.69	40.00	-9.31	QP
3		107.8877	44.83	-13.46	31.37	43.50	-12.13	QP
4		239.9874	51.85	-14.07	37.78	46.00	-8.22	QP
5		601.4265	35.03	-0.89	34.14	46.00	-11.86	QP
6	*	801.7863	35.63	3.30	38.93	46.00	-7.07	QP

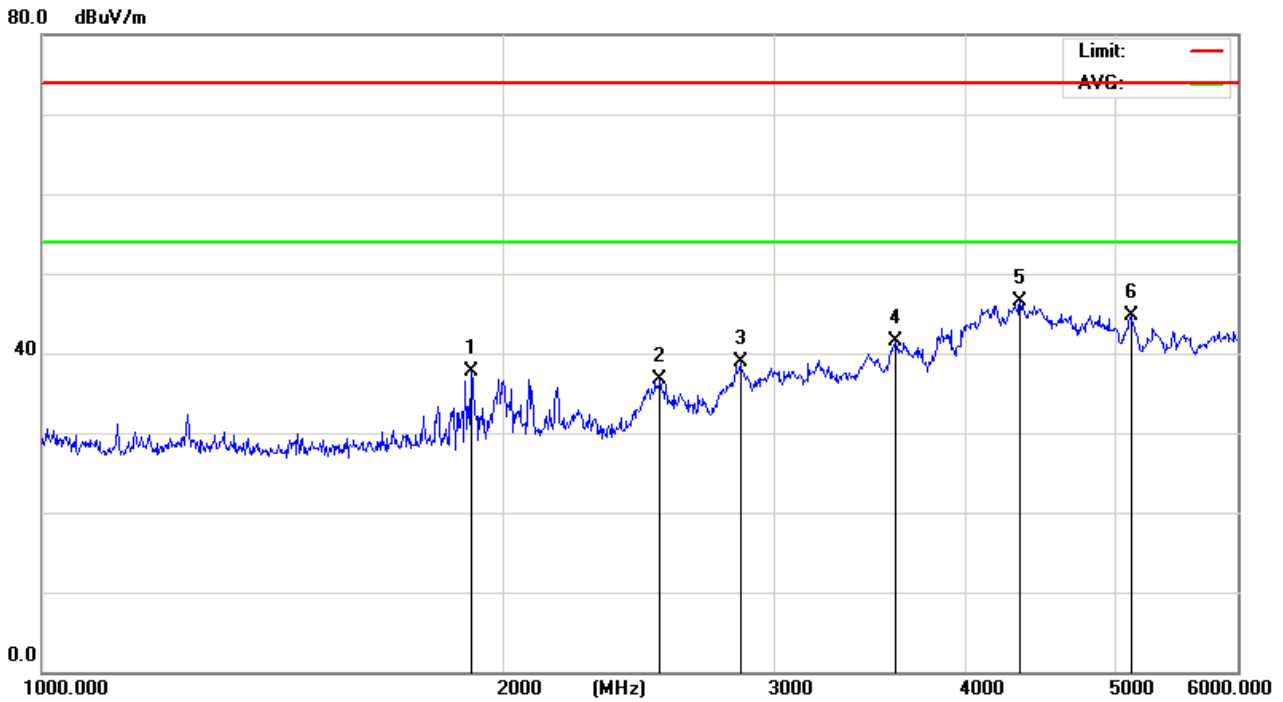
Test Data – Radiated Emission-Above 1GHz

Mode 1: (Vertical)



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		1121.506	48.09	-10.77	37.32	74.00	-36.68	peak
2		1206.996	47.79	-10.59	37.20	74.00	-36.80	peak
3		1902.639	47.37	-9.51	37.86	74.00	-36.14	peak
4		2847.347	41.10	-2.63	38.47	74.00	-35.53	peak
5	*	4330.397	42.45	4.39	46.84	74.00	-27.16	peak
6		5097.292	40.20	4.95	45.15	74.00	-28.85	peak

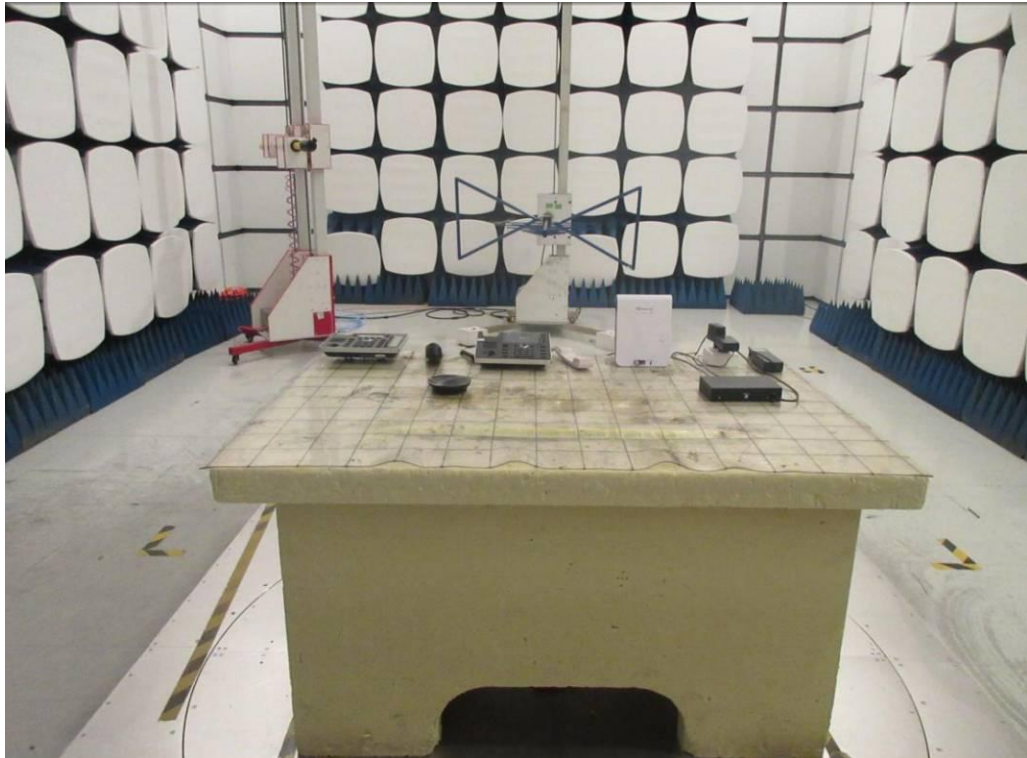
Mode 1: (Horizontal)



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		1902.639	47.19	-9.51	37.68	74.00	-36.32	peak
2		2525.249	41.35	-4.66	36.69	74.00	-37.31	peak
3		2847.347	41.54	-2.63	38.91	74.00	-35.09	peak
4		3594.181	40.98	0.43	41.41	74.00	-32.59	peak
5	*	4330.397	42.16	4.39	46.55	74.00	-27.45	peak
6		5115.591	39.80	4.89	44.69	74.00	-29.31	peak

6.2.4 Test Setup photograph

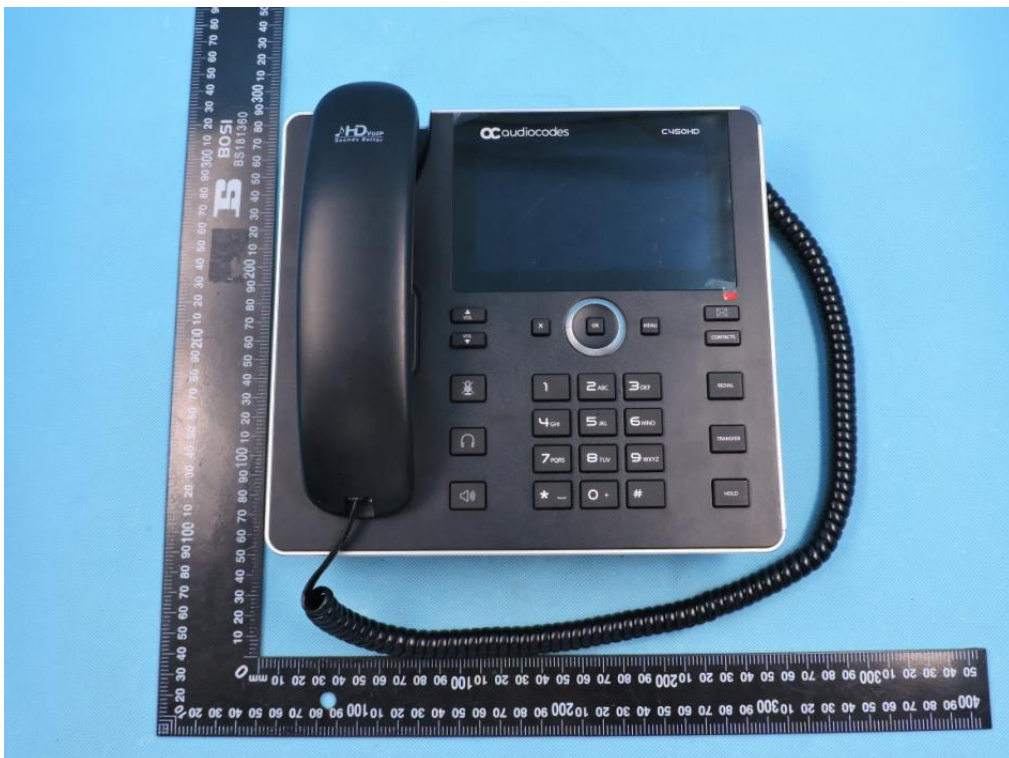
30MHz-1GHz



1GHz-6GHz



7 APPENDIX-Photographs of EUT Constructional Details

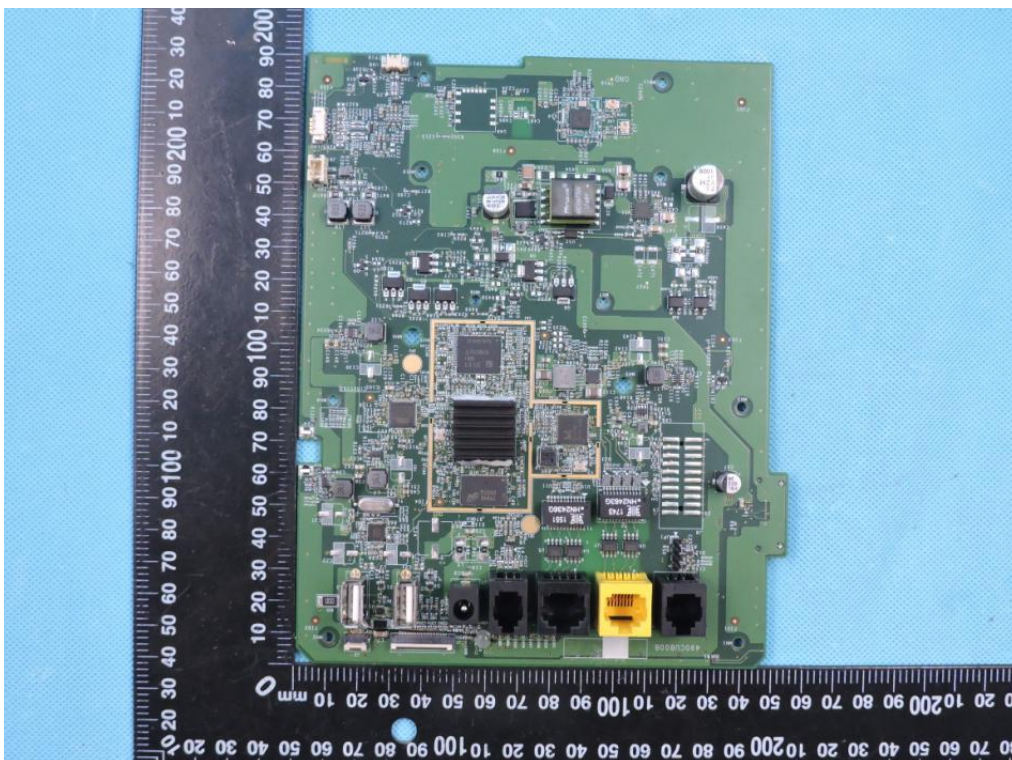
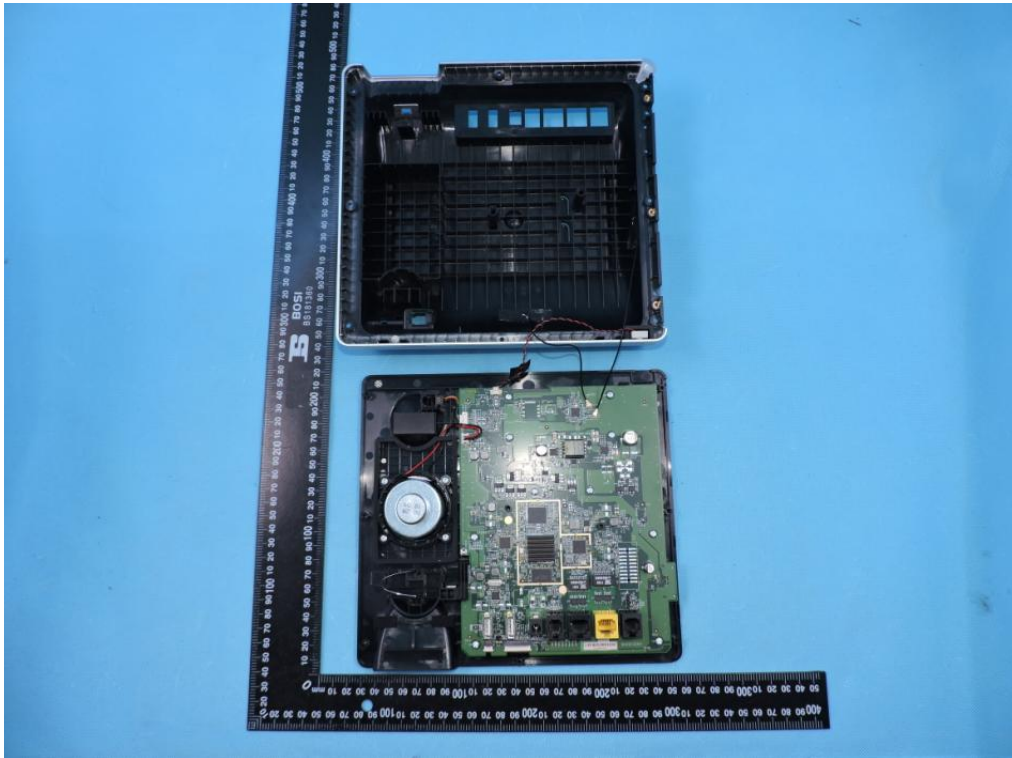


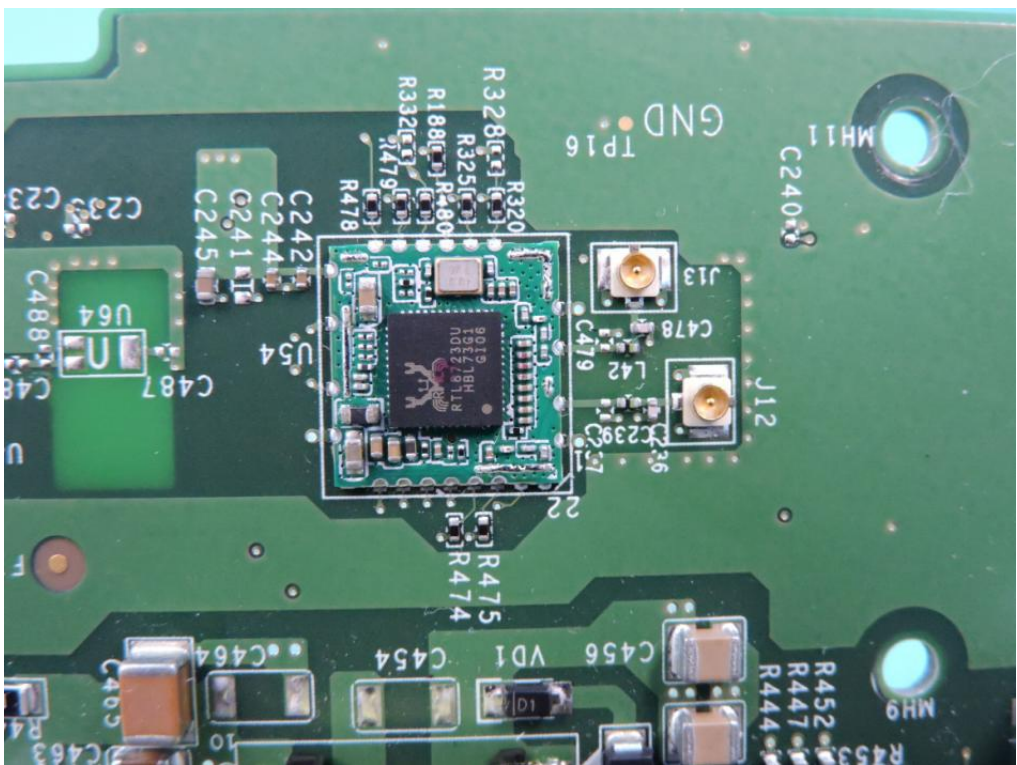
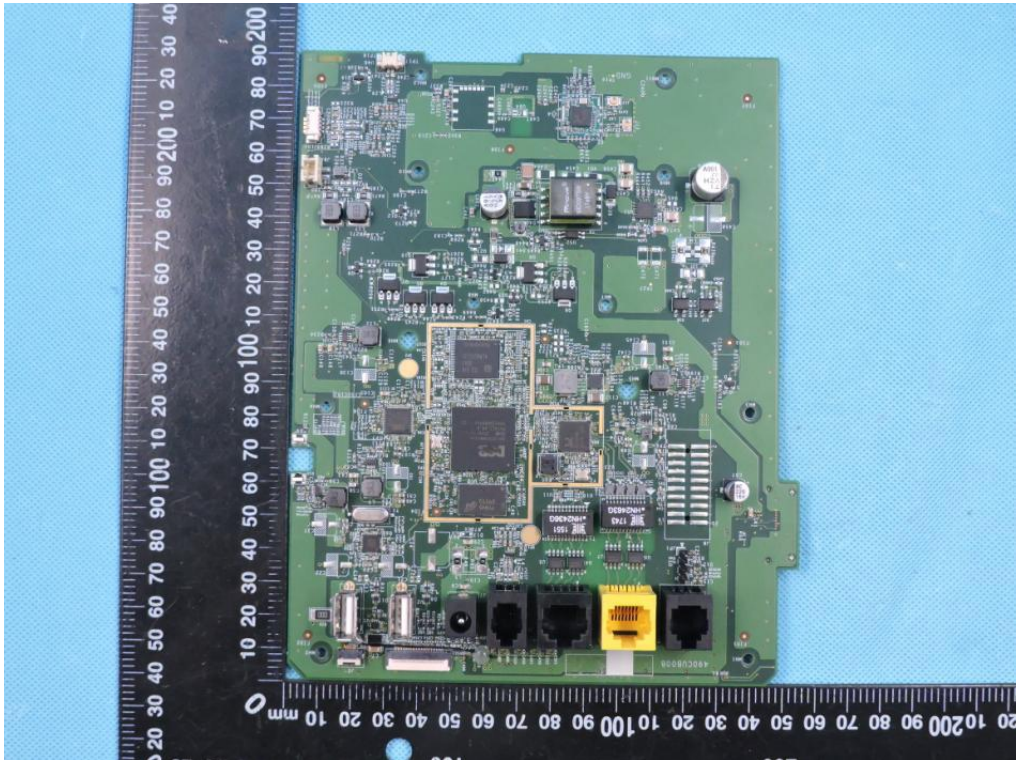


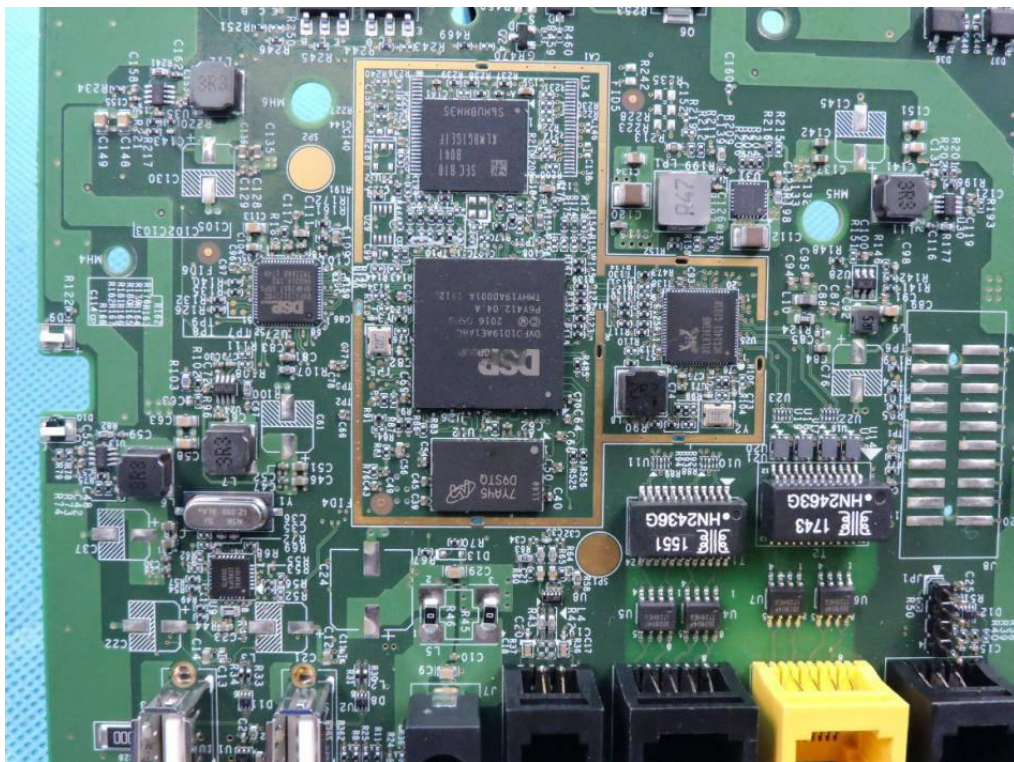
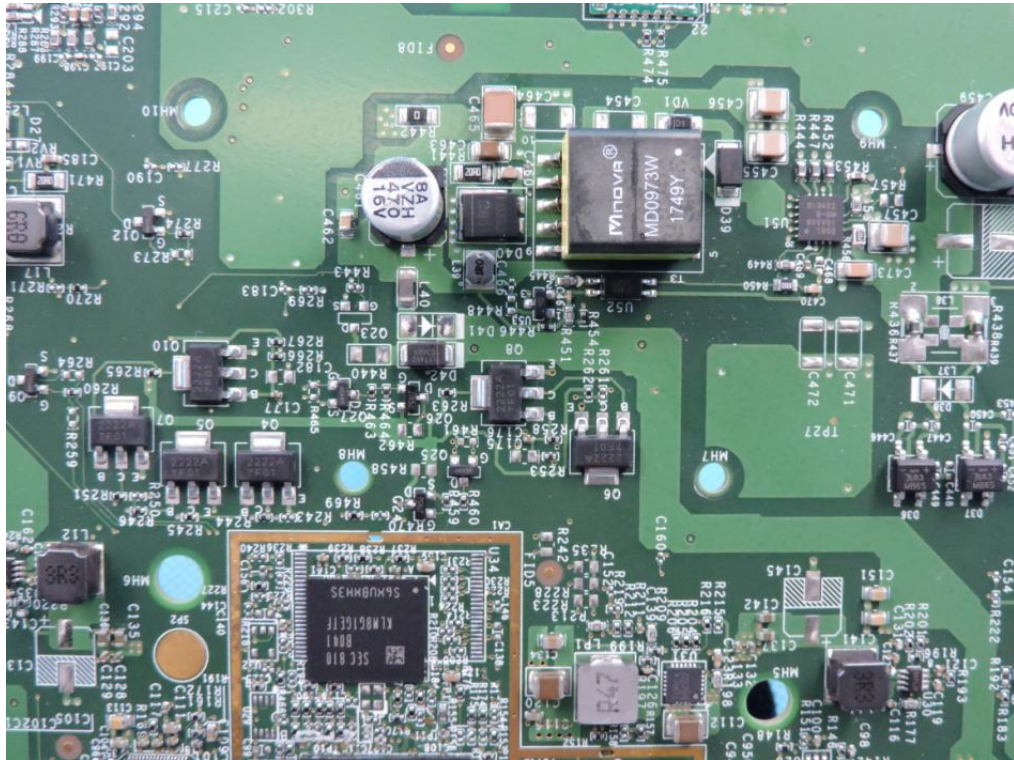


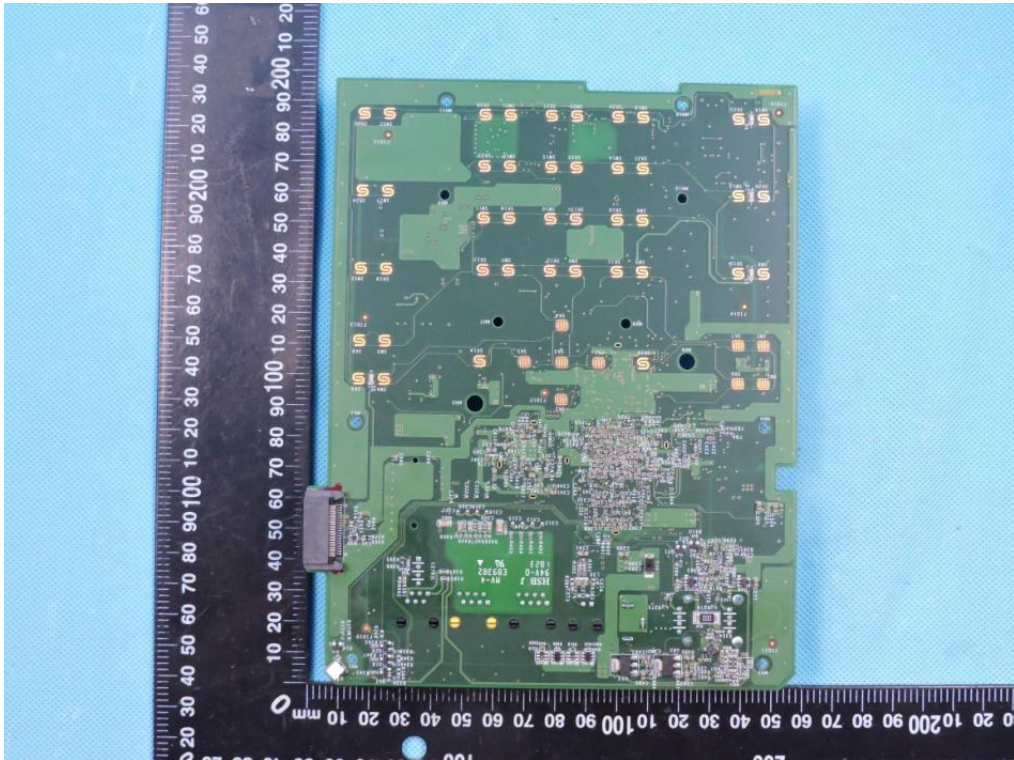












-----End of report-----