

Application for FCC Certificate

On Behalf of

Klipsch L.L.C.

RSB-14 SOUND BAR AND WIRELESS SUBWOOFER

Model Number: RSB-14

FCC ID:STI-RSB14

Prepared for : Klipsch L.L.C.

Address : 3502 Woodview Trace, Suite 200 Indianapolis, Indiana
46268, United States.

Prepared by : EST Technology Co., Ltd.

Address : San Tun Management Zone, Houjie District, Dongguan,
China

Tel: 86-769-83081888

Fax: 86-769-83081878

Report No. : ESTE-F1609008




Date of Report : September 08, 2016



TABLE OF CONTENTS

	Page
Test Report Declaration	
1. GENERAL PRODUCT INFORMATION	4
1.1. Product Function	4
1.2. Difference between Model Numbers	4
1.3. Independent Operation Modes	4
2. TEST SITES	5
2.1. Description of Standards and Results.....	5
2.2. Test Facilities	6
2.3. List of Test and Measurement Instruments	7
3. TEST SET-UP AND OPERATION MODES	8
3.1. Principle of Configuration Selection.....	8
3.2. Block Diagram of Test Set-up.....	8
3.3. Test Operation Mode and Test Software.....	9
3.4. Special Accessories and Auxiliary Equipment	9
3.5. Countermeasures to Achieve EMC Compliance.....	9
4. EMISSION TEST RESULTS	10
4.1. Conducted Emission at the Mains Terminals Test.....	10
4.2. Radiated Emission Test.....	13
5. PHOTOGRAPHS OF TEST SET-UP	19
5.1. Set-up for conducted emission at the mains terminals test.....	19
5.2. Set-up for radiated emission test (30-1000MHz)	20
5.3. Set-up for radiated emission test (Above 1GHz)	21
6. PHOTOGRAPHS OF THE EUT	22

EST Technology Co., Ltd.

Applicant:	Klipsch L.L.C.		
Address:	3502 Woodview Trace, Suite 200 Indianapolis, Indiana 46268, United States.		
Manufacturer:	Klipsch L.L.C.		
Address:	3502 Woodview Trace, Suite 200 Indianapolis, Indiana 46268, United States.		
Factory:	Zhao Yang Electronic (ShenZhen) Co., Ltd.		
Address:	Building 2, De Yong Jia Industrial Park, Guang Qiao Road, Yu Lv Community, Gong Ming Street, Guang Ming New District, Shenzhen, 518132, China		
E.U.T:	RSB-14 SOUND BAR AND WIRELESS SUBWOOFER		
Model Number:	RSB-14		
Power Supply:	DC 24V From Adapter Input AC 100-240V ~ 50/60Hz		
Test Voltage:	DC 24V From Adapter Input AC 120V/60Hz		
Trade Name:	Klipsch	Serial No.:	-----
Date of Receipt:	August 20, 2016	Date of Test:	August 20~ September 08, 2016
Test Specification:	FCC Rules and Regulations Part 15 Subpart B:2015 ANSI C63.4:2014		
Test Result:	<p>The device described above is tested by EST Technology Co., Ltd.. The measurement results were contained in this test report and EST Technology Co., Ltd. was assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliance with the FCC Rules and Regulations Part 15 Subpart B requirements. This report applies to above tested sample only and shall not be reproduced in part without written approval of EST Technology Co., Ltd.</p> <p style="text-align: right;">Issue Date: September 08, 2016</p>		
Prepared by:	Tested by:	Approved by:	
			
_____ Amy / Assistant	_____ Hale / Engineer	_____ Iceman Hu / Manager	
Other Aspects:	None.		
<i>Abbreviations: OK/P=passed fail/F=failed n.a/N=not applicable E.U.T=equipment under tested</i>			



1. GENERAL PRODUCT INFORMATION

1.1. Product Function

Refer to Technical Construction Form and User Manual.

1.2. Difference between Model Numbers

N/A

1.3. Independent Operation Modes

1.3.1. Conducted Modes

1	HDMI	Worst case
2	Wifi Mode	
3	Bluetooth Mode	
4	Network	
Note: The worst case will be recorded in this report.		

1.3.2. Radiated Modes

30MHz~1GHz		
1	HDMI	Worst case
2	Wifi Mode	
3	Bluetooth Mode	
4	Network	
Above 1GHz		
1	HDMI	
2	Wifi Mode	
3	Bluetooth Mode	Worst case
4	Network	
Note: The worst case will be recorded in this report.		

2. TEST SITES

2.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below

EMISSION			
Description of Test Item	Standard	Limits	Results
Conducted disturbance at mains terminals	FCC Rules and Regulations Part 15 Subpart B:2015 ANSI C63.4:2014	15.107(a) Class B	PASS
		Minimum passing margin is 22.24dB at 0.380MHz	
Radiated Emission Test	FCC Rules and Regulations Part 15 Subpart B:2015 ANSI C63.4:2014	15.109(a) Class B	PASS
		Minimum passing margin is 3.39dB at 239.52MHz for 30-1000MHz; Minimum passing margin is 13.91dB at 1375.00MHz for above 1GHZ;	

2.2. Test Facilities

EMC Lab	:	Certificated by CNAS, CHINA Registration No.: L5288 Date of registration: December 07, 2015 Certificated by FCC, USA Registration No.: 989591 Date of registration: November 20, 2013 Certificated by Industry Canada Registration No.: 9405A-1 Date of registration: December 30, 2015 Certificated by VCCI, Japan Registration No.: R-3663 & C-4103 Date of registration: July 25, 2014 Certificated by TUV Rheinland, Germany Registration No.: UA 50195514 0001 Date of registration: January 07, 2011 Certificated by TUV/PS, Shenzhen Registration No.: SCN1017 Date of registration: January 27, 2011 Certificated by Intertek ETL SEMKO Registration No.: 2011-RTL-L1-18 Date of registration: April 28, 2011 Certificated by Nemko, Hong Kong Registration No.: 175193 Date of registration: May 4, 2011
Name of Firm	:	EST Technology Co., Ltd.
Site Location	:	San Tun Management Zone, Houjie Town, Dongguan, Guangdong, China

2.3. List of Test and Measurement Instruments

2.3.1. For conducted emission at the mains terminals test (844 Room)

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde& Schwarz	ESVS30	832354	June 25,16	1 Year
Artificial Mains Network	Rohde& Schwarz	ENV216	101260	June 25,16	1 Year
Pulse Limiter	Rohde& Schwarz	ESH3-Z2	101100	June 25,16	1 Year

2.3.2. For radiated emission test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde& Schwarz	ESVS10	100004	June 25,16	1 Year
Spectrum Analyzer	Agilent	E4411B	MY50140697	June 25,16	1 Year
Bilog Antenna	Teseq	CBL 6111D	25872	June 28,15	3 Year
Signal Amplifier	Agilent	310N	187037	June 25,16	1 Year
Horn Antenna	SCHWARZBECK	BBHA9120D	8128-290	June 28,15	3 Year
Signal Amplifier	SCHWARZBECK	BBV9718	9718-212	June 25,16	1 Year
Spectrum Analyzer	Agilent	E4408B	MY44211139	June 25,16	1 Year

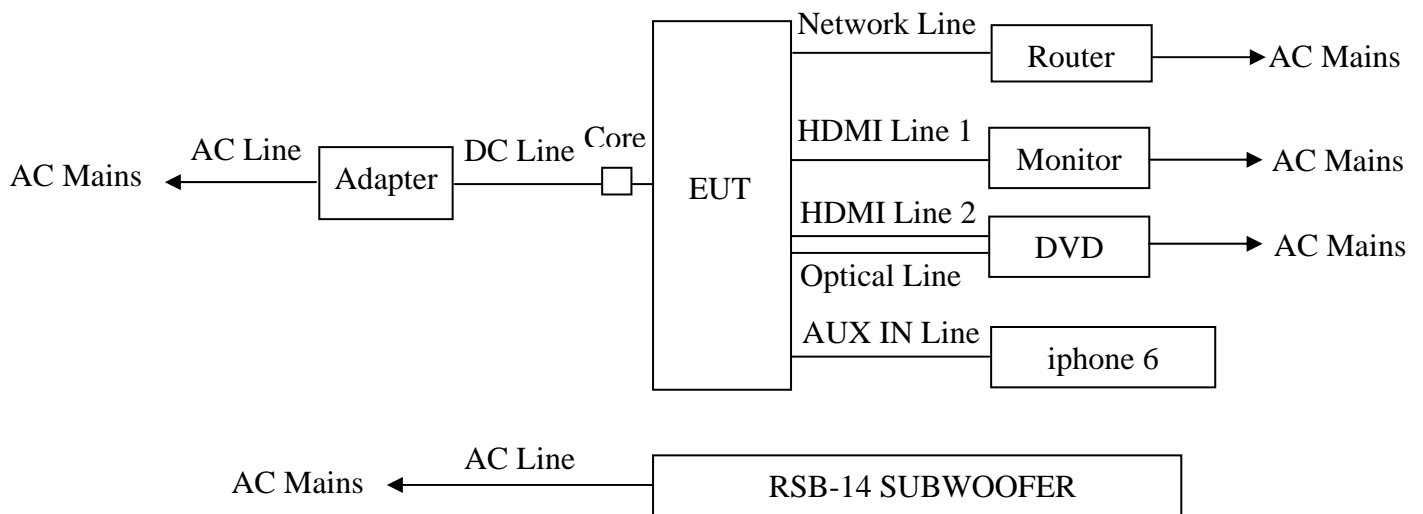
3. TEST SET-UP AND OPERATION MODES

3.1. Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.

3.2. Block Diagram of Test Set-up

System Diagram of Connections between EUT and Simulators



(EUT: RSB-14 SOUND BAR AND WIRELESS SUBWOOFER)

AC Line 1	:	Unshielded, Detachable 1.2m
AC Line 2	:	Unshielded, Detachable 1.5m
DC Line	:	Unshielded, Detachable 1.5m
Net work Line	:	Shielded, Detachable 0.8m
HDMI Line 1	:	Shielded, Detachable 0.8m
HDMI Line 2	:	Shielded, Detachable 0.8m
Optical Line	:	Shielded, Detachable 1.2m
AUX IN Line	:	Shielded, Detachable 0.8m

3.3. Test Operation Mode and Test Software

Refer to Test Setup in clause 4.

3.4. Special Accessories and Auxiliary Equipment

3.4.1. Monitor

M/N : V193HQV
S/N : ETLKR0D01404204CDC8501
Manufacturer : acer
Data Cable : Unshielded, Detachable, 1.5m

3.4.2. Router

M/N : RT-AC66U
S/N : G1ICGG000260
Manufacturer : ASUS
Ethernet Line : Shielded, Detachable 1.5m

3.4.3. iPhone 6

M/N : MG472CH/A
S/N : F1DNJLBYG5M
Manufacturer : Apple

3.4.4. DVD Player

M / N : DVDHDMI01
Manufacturer : SAMWIN
Data Cable : Shielded, Undetachable, 1.6m

3.4.5. Notebook

Manufacturer : DELL
M/N : Latitude E6420
Adapter : M/N: DA90PM111

3.4.6. Adapter

M/N : DYS902-240400W
Input : AC 100-240V~50/60Hz 1.5A Max
Output : DC 24V/4.0A

3.5. Countermeasures to Achieve EMC Compliance

None.

4. EMISSION TEST RESULTS

4.1. Conducted Emission at the Mains Terminals Test

RESULT : **Pass**
Test Procedure : ANSI C63.4:2014
Frequency Range : 0.15 to 30MHz
Test Site : Shielded Room
Limits : FCC Part 15:2015 Class B

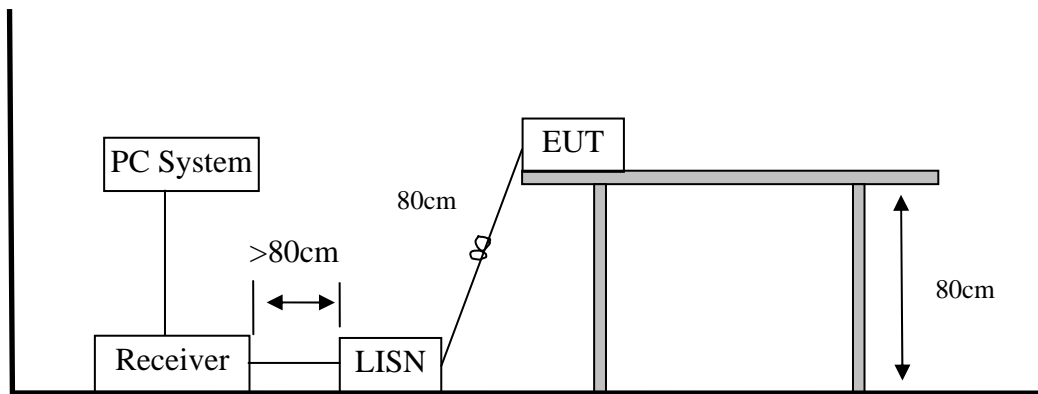
Test Setup

Date of Test : September 05, 2016
M/N : RSB-14
Input Voltage : DC 24V From Adapter Input AC 120V/60Hz
Operation Mode : HDMI

The frequency range from 150 kHz to 30 MHz was investigated.

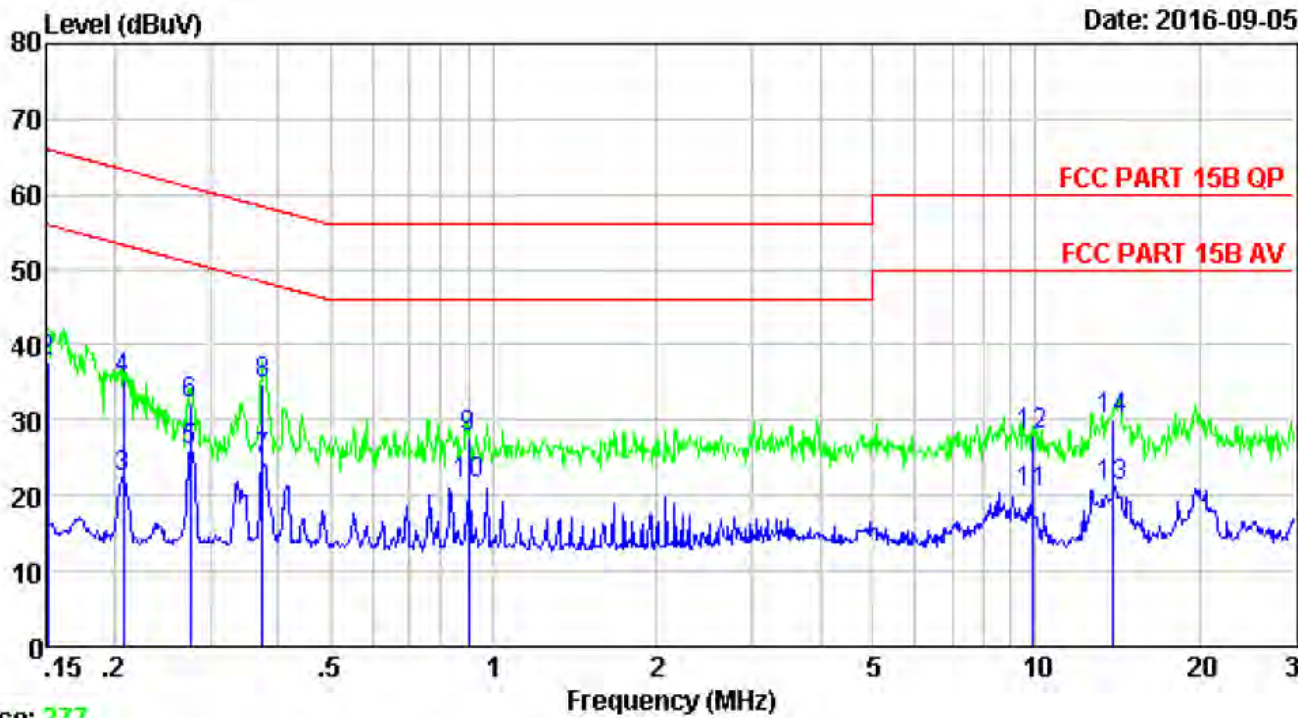
The bandwidth of the test receiver was set at 9 kHz.

The test data of the worst case condition(s) was reported on the following page.



Note: Measurement Uncertainty: ± 2.54 dB at a level of confidence of 95%.

Test Data

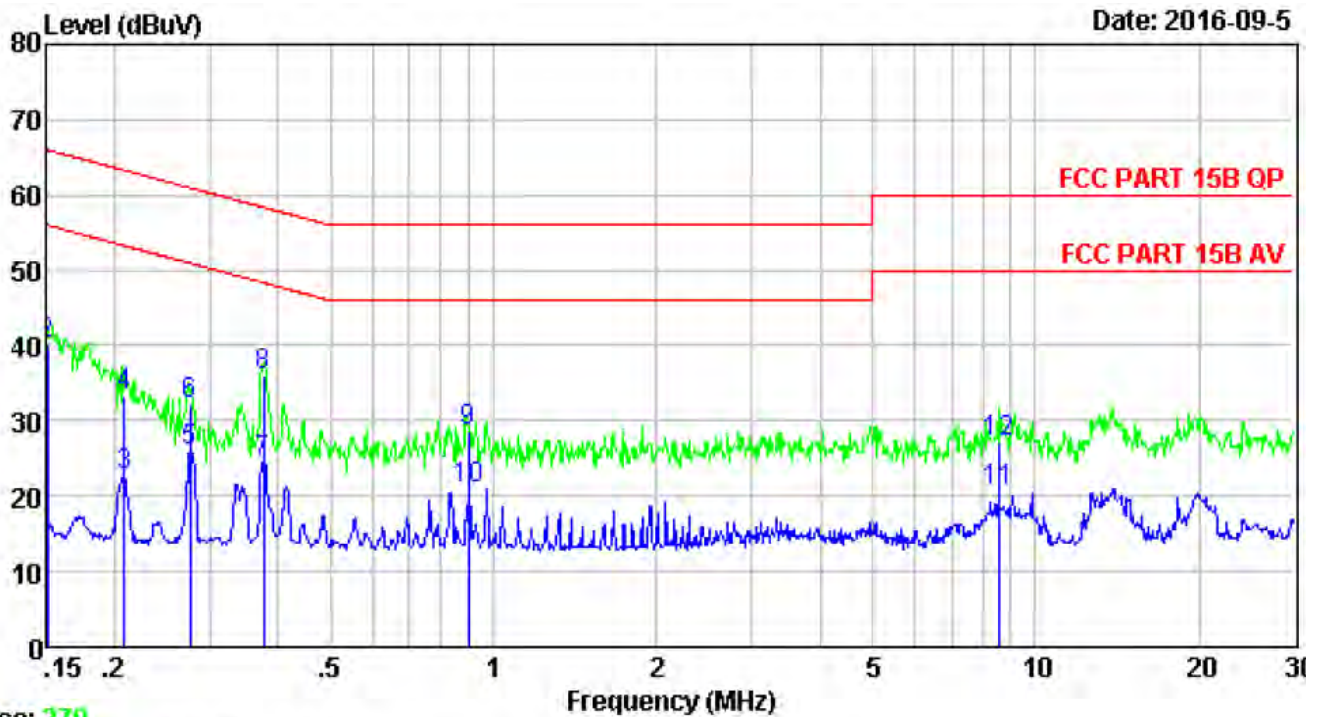


Trace: 277

Site no : 844 Shield Room
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa LINE
 Limit : FCC PART 15B QP
 Engineer : Hale
 EUT : RSB-14 SOUND BAR+WIRELESS SUBWOOFER
 Power : DC 12V From Adapter Input AC 120V/60Hz
 M/N : RSB-14
 Test Mode : HDMI

	Freq. (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBUV)	Emission Level (dBUV)	Limits (dBUV)	Margin (dB)	Remark
1	0.15	9.61	9.81	0.08	19.50	56.00	36.50	Average
2	0.15	9.61	9.81	18.28	37.70	66.00	28.30	QP
3	0.21	9.61	9.80	3.11	22.52	53.32	30.80	Average
4	0.21	9.61	9.80	15.99	35.40	63.32	27.92	QP
5	0.28	9.61	9.83	6.59	26.03	50.94	24.91	Average
6	0.28	9.61	9.83	12.66	32.10	60.94	28.84	QP
7	0.38	9.61	9.82	5.30	24.73	48.39	23.66	Average
8	0.38	9.61	9.82	15.27	34.70	58.39	23.69	QP
9	0.90	9.63	9.82	8.25	27.70	56.00	28.30	QP
10	0.90	9.63	9.82	2.18	21.63	46.00	24.37	Average
11	9.86	9.66	9.88	0.96	20.50	50.00	29.50	Average
12	9.86	9.66	9.88	8.36	27.90	60.00	32.10	QP
13	13.91	9.67	9.91	1.64	21.22	50.00	28.78	Average
14	13.91	9.67	9.91	10.42	30.00	60.00	30.00	QP





Trace: 279

Site no : 844 Shield Room
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa NEUTRAL
 Limit : FCC PART 15B QP
 Engineer : Hale
 EUT : RSB-14 SOUND BAR+WIRELESS SUBWOOFER
 Power : DC 12V From Adapter Input AC 120V/60Hz
 M/N : RSB-14
 Test Mode : HDMI

	Freq. (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuv)	Limits (dBuv)	Margin (dB)	Remark
1	0.15	9.46	9.81	0.55	19.82	56.00	36.18	Average
2	0.15	9.46	9.81	20.83	40.10	66.00	25.90	QP
3	0.21	9.60	9.80	3.24	22.64	53.27	30.63	Average
4	0.21	9.60	9.80	14.00	33.40	63.27	29.87	QP
5	0.28	9.60	9.83	6.50	25.93	50.94	25.01	Average
6	0.28	9.60	9.83	12.67	32.10	60.94	28.84	QP
7	0.38	9.59	9.82	5.09	24.50	48.34	23.84	Average
8	0.38	9.59	9.82	16.69	36.10	58.34	22.24	QP
9	0.90	9.62	9.82	9.16	28.60	56.00	27.40	QP
10	0.90	9.62	9.82	1.61	21.05	46.00	24.95	Average
11	8.55	9.68	9.88	1.15	20.71	50.00	29.29	Average
12	8.55	9.68	9.88	7.54	27.10	60.00	32.90	QP



4.2. Radiated Emission Test

RESULT : **Pass**
Test Procedure : ANSI C63.4:2014
Frequency Range : 30-1000 MHz;1-6 GHz
Test Site : 966 Chamber
Limits : FCC Part 15:2015 Class B

Test Setup

Date of Test : September 05, 2016
M/N : RSB-14
Input Voltage : DC 24V From Adapter Input AC 120V/60Hz
Operation Mode : HDMI/Bluetooth Mode

The EUT was placed on a turn table which was 0.8 m above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 m away from the receiving antenna which was mounted on an antenna tower. The measuring antenna moved up and down to find out the maximum emission level. It moved from 1 m to 4 m for both horizontal and vertical polarizations.

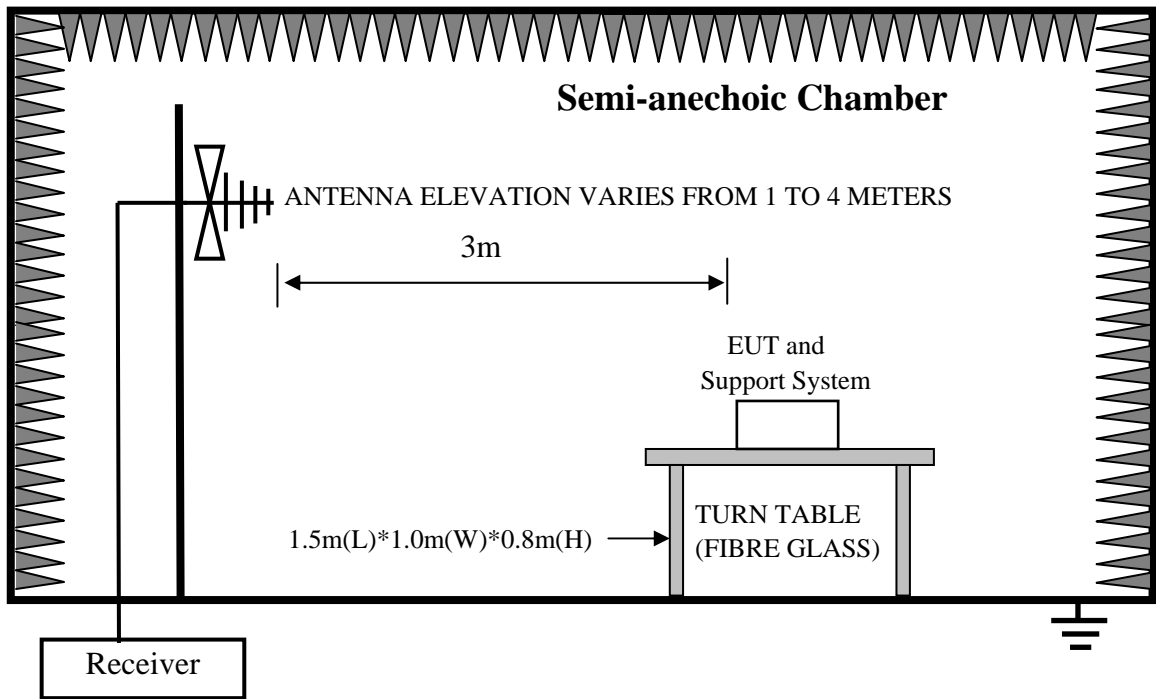
The EUT was tested in the Chamber Site. It was pre-scanned with a Peak detector from the spectrum, and all the final readings from the test receiver were measured with the Quasi-Peak detector.

The bandwidth setting on the test receiver was 120 kHz.

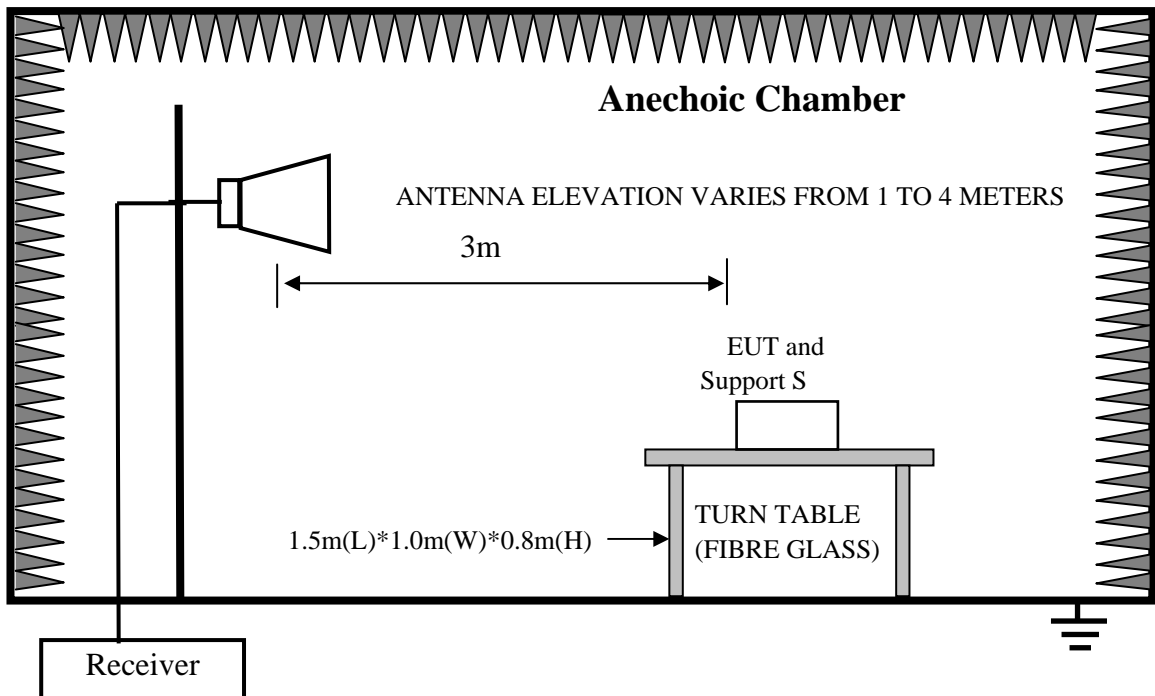
The bandwidth of the Spectrum's VBW is set at 3MHz and RBW is set at 1MHz for peak emissions measurement above 1GHz and 1MHz RBW, 10Hz VBW for average emissions measure above 1GHz

The test data of the worst case condition(s) was reported on the following page.

1、 In Semi-anechoic Chamber Test Setup Diagram for 30MHz~1000MHz



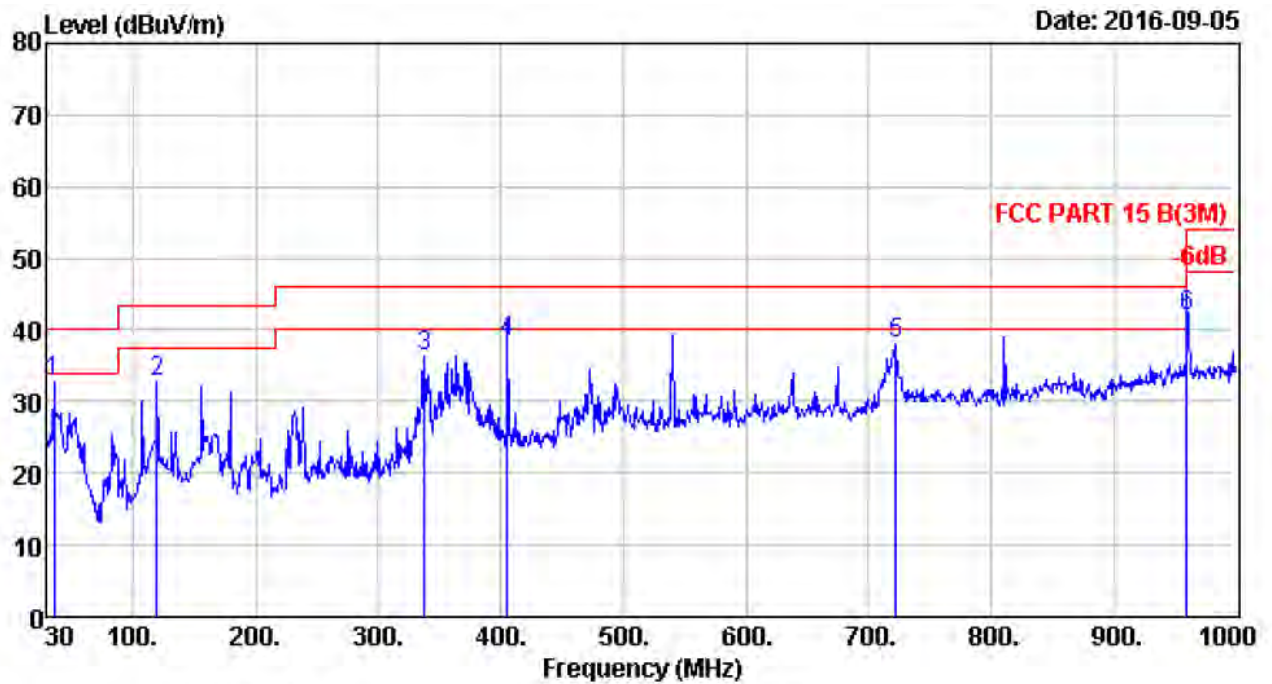
2、 In Anechoic Chamber Test Setup Diagram for 1-6GHz



Test uncertainty: $\pm 3.62\text{dB}$ at a level of confidence of 95%.

Test Data

30MHz-1GHz



Site no. : 2# 966 chamber Data no. : 162
 Dis. / Ant. : 3m 37062 Ant. pol. : VERTICAL
 Limit : FCC PART 15 B(3M)
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Hale
 EUT : RSB-14 SOUND BAR AND WIRELESS SUBWOOFER
 Power : DC 24V From Adapter Input AC 120V/60Hz
 M/N : RSB-14
 Test Mode : HDMI

	Freq. (MHz)	ANT Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	35.82	14.99	1.08	16.65	32.72	40.00	7.28	QP
2	119.24	11.09	1.37	20.23	32.69	43.50	10.81	QP
3	337.49	14.03	2.60	19.59	36.22	46.00	9.78	QP
4	405.39	16.11	2.65	19.53	38.29	46.00	7.71	QP
5	722.58	21.53	4.22	12.26	38.01	46.00	7.99	QP
6	960.23	25.05	5.00	11.84	41.89	54.00	12.11	QP

Above 1GHz

Site no. : 966 1# chamber Data no. : 386
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15(1-6G) PK
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Hale
 EUT : RSB-14 SOUND BAR AND WIRELESS SUBWOOFER
 Power : DC 24V From Adapter Input AC 120V/60Hz
 M/N : RSB-14
 Test Mode : Bluetooth Mode

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	1050.00	24.19	3.53	34.41	40.99	34.30	54.00	19.70	Average
2	1050.00	24.19	3.53	34.41	63.37	56.68	74.00	17.32	Peak
3	1375.00	25.09	4.11	34.44	41.64	36.40	54.00	17.60	Average
4	1375.00	25.09	4.11	34.44	63.92	58.68	74.00	15.32	Peak
5	1740.00	24.82	5.26	34.47	39.99	35.60	54.00	18.40	Average
6	1740.00	24.82	5.26	34.47	63.06	58.67	74.00	15.33	Peak
7	2025.00	26.09	6.21	34.50	36.90	34.70	54.00	19.30	Average
8	2025.00	26.09	6.21	34.50	61.09	58.89	74.00	15.11	Peak
9	2500.00	27.57	6.73	34.00	32.40	32.70	54.00	21.30	Average
10	2500.00	27.57	6.73	34.00	53.73	54.03	74.00	19.97	Peak
11	5970.00	32.74	12.11	32.26	27.01	39.60	54.00	14.40	Average
12	5970.00	32.74	12.11	32.26	46.69	59.28	74.00	14.72	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

Site no. : 966 1# chamber Data no. : 387
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15(1-6G) PK
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Hale
 EUT : RSB-14 SOUND BAR AND WIRELESS SUBWOOFER
 Power : DC 24V From Adapter Input AC 120V/60Hz
 M/N : RSB-14
 Test Mode : Bluetooth Mode

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	1045.00	24.20	3.53	34.40	42.47	35.80	54.00	18.20	Average
2	1045.00	24.20	3.53	34.40	63.00	56.33	74.00	17.67	Peak
3	1375.00	25.09	4.11	34.44	41.34	36.10	54.00	17.90	Average
4	1375.00	25.09	4.11	34.44	65.33	60.09	74.00	13.91	Peak
5	1840.00	25.09	5.57	34.48	37.62	33.80	54.00	20.20	Average
6	1840.00	25.09	5.57	34.48	62.19	58.37	74.00	15.63	Peak
7	2025.00	26.09	6.21	34.50	36.90	34.70	54.00	19.30	Average
8	2025.00	26.09	6.21	34.50	58.89	56.69	74.00	17.31	Peak
9	2500.00	27.57	6.73	34.00	36.30	36.60	54.00	17.40	Average
10	2500.00	27.57	6.73	34.00	56.26	56.56	74.00	17.44	Peak
11	5985.00	32.74	12.12	32.26	24.50	37.10	54.00	16.90	Average
12	5985.00	32.74	12.12	32.26	46.57	59.17	74.00	14.83	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

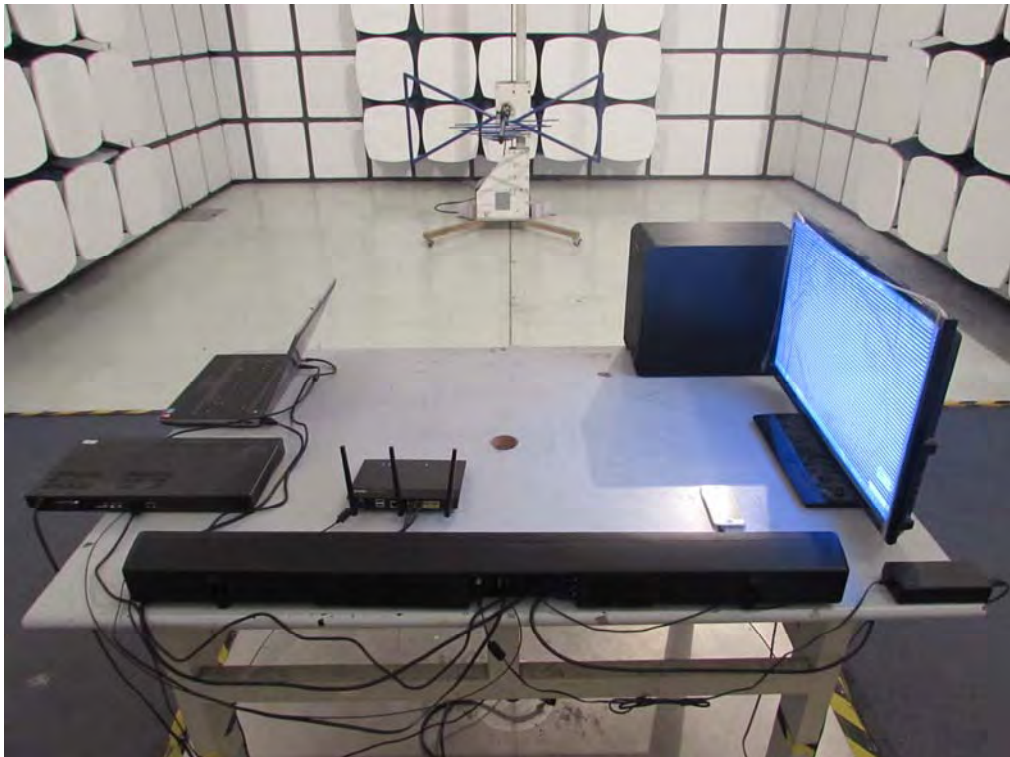
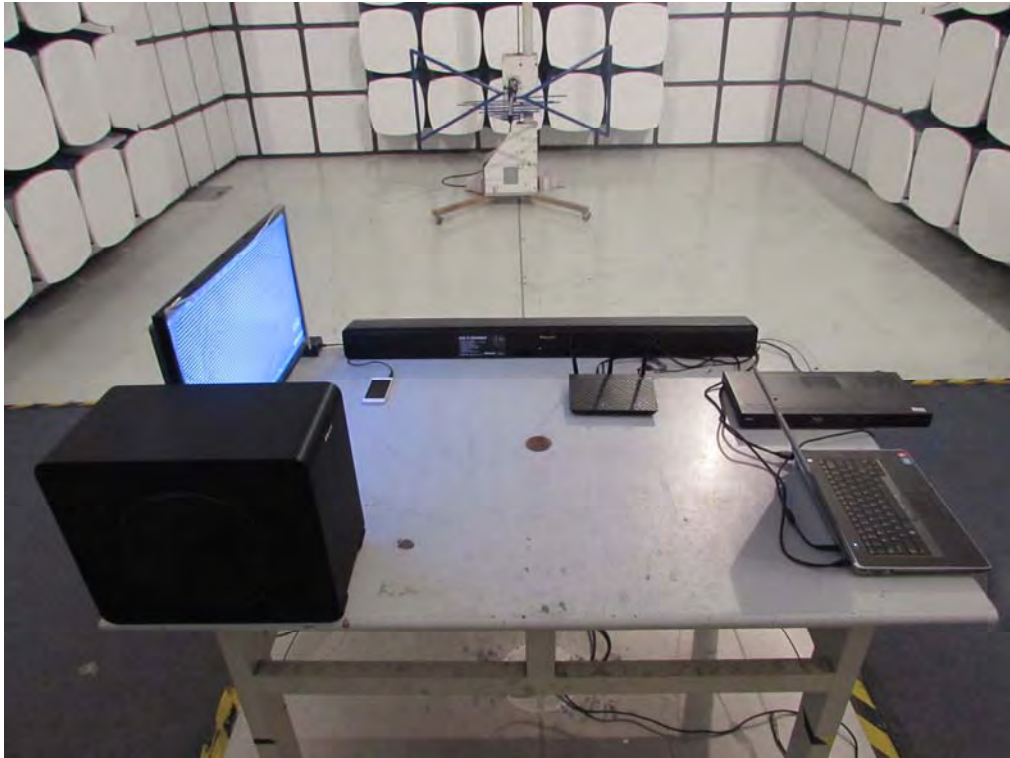


5. PHOTOGRAPHS OF TEST SET-UP

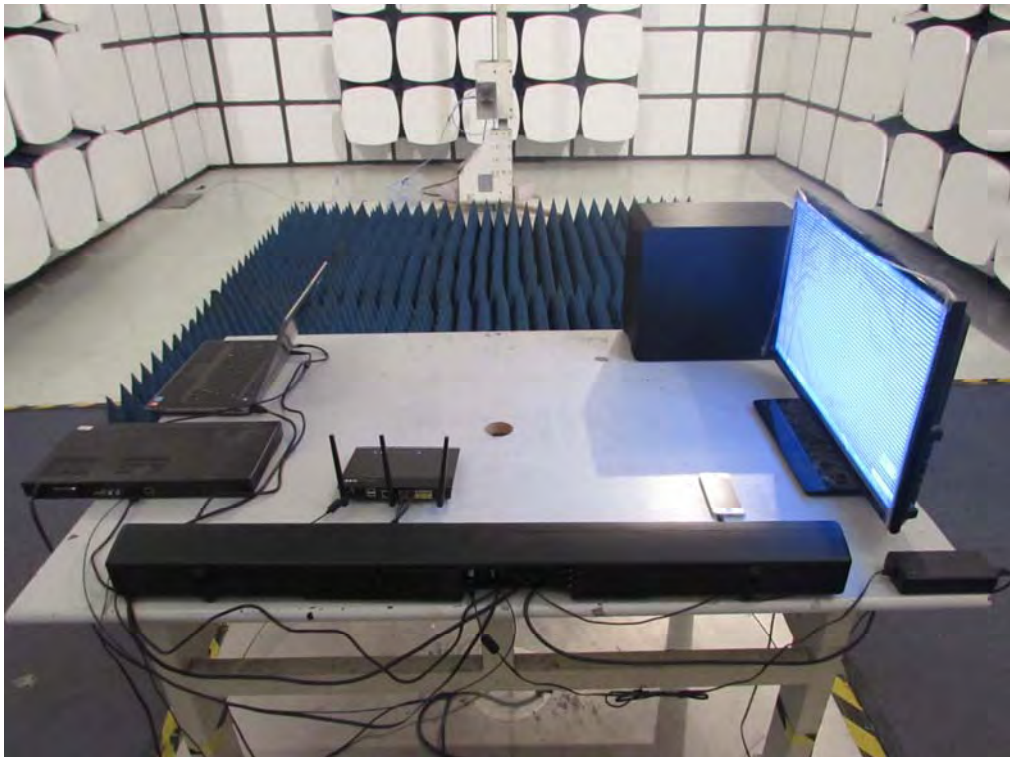
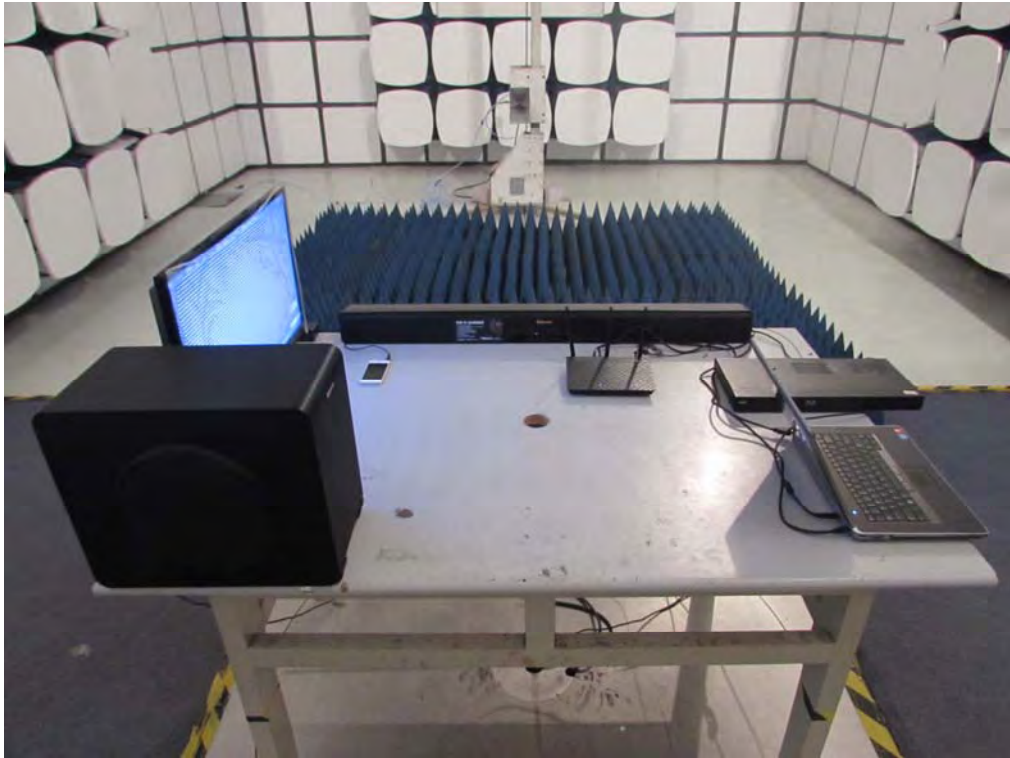
5.1. Set-up for conducted emission at the mains terminals test



5.2. Set-up for radiated emission test (30-1000MHz)

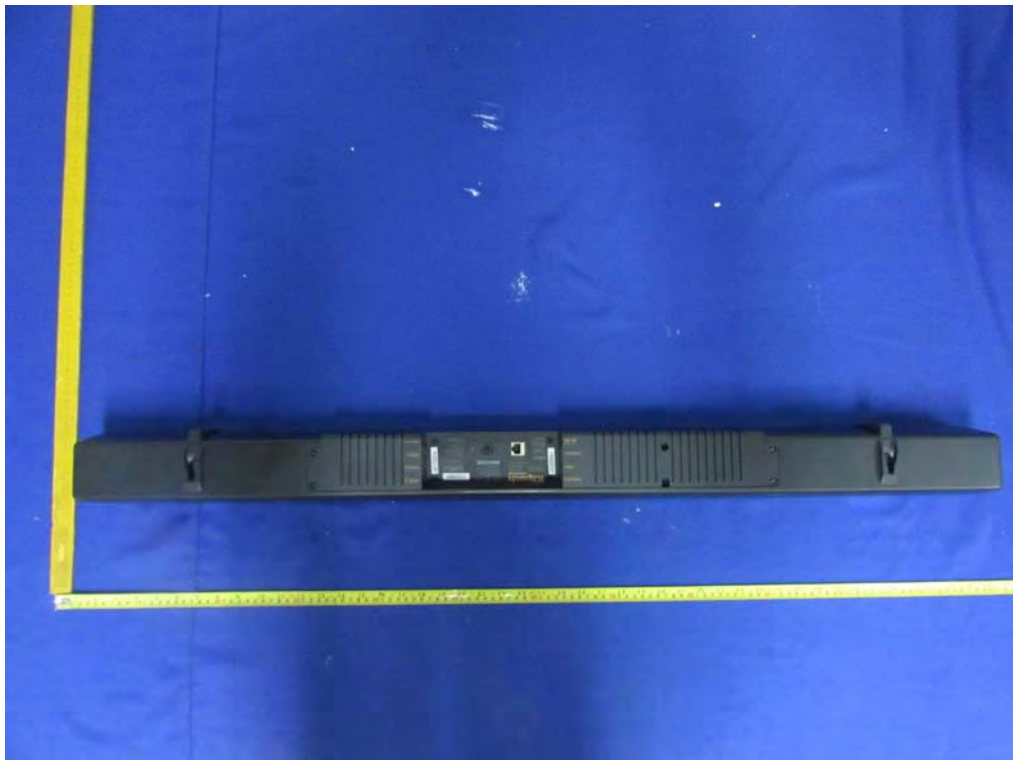
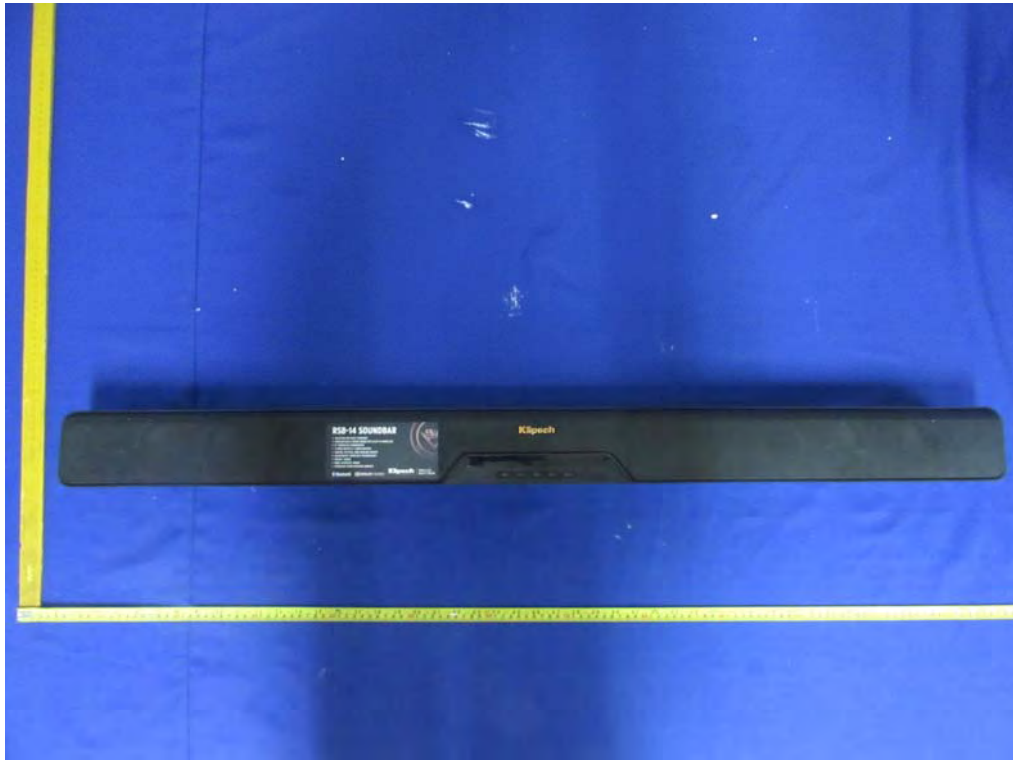


5.3. Set-up for radiated emission test (Above 1GHz)

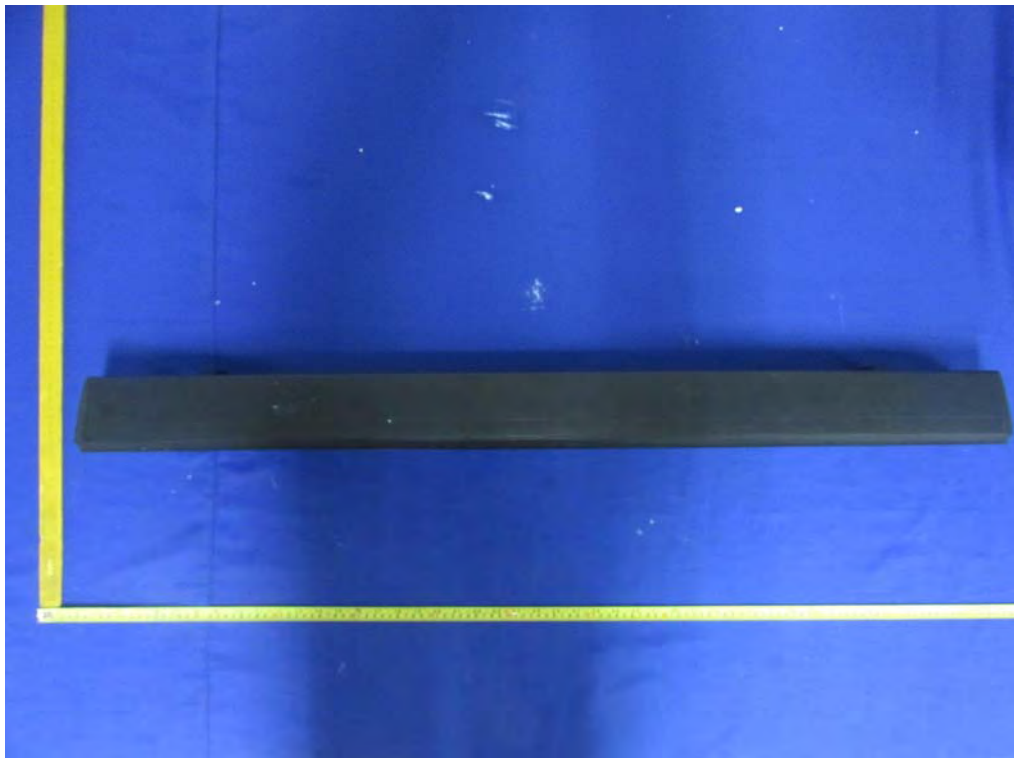
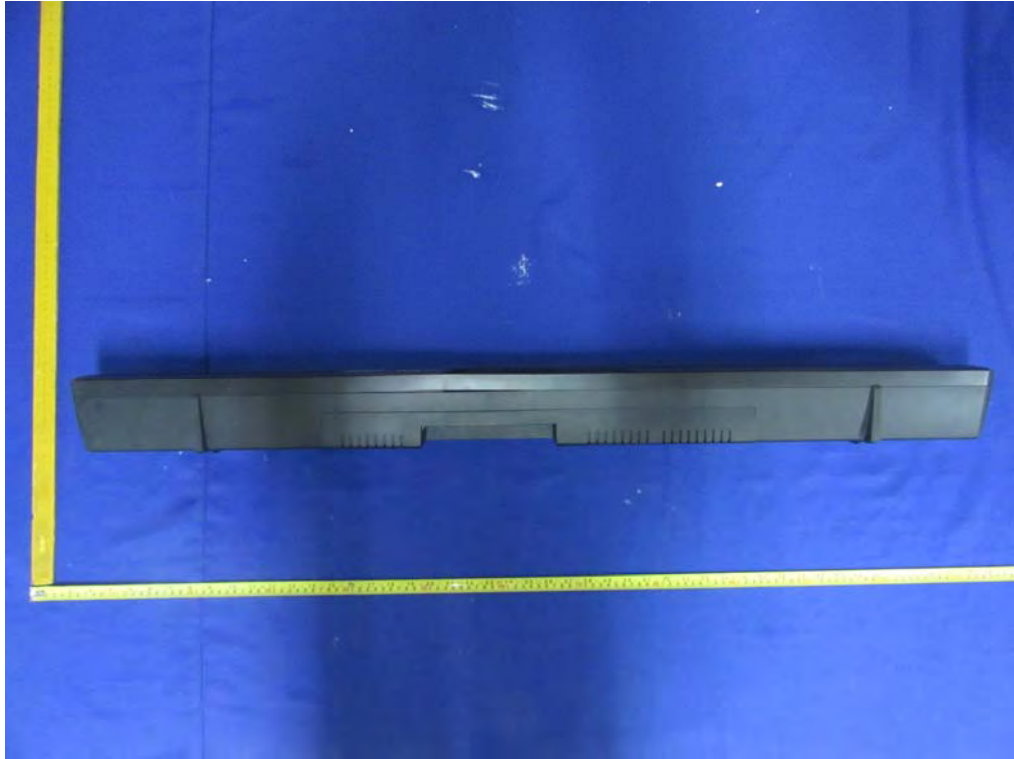


6. PHOTOGRAPHS OF THE EUT

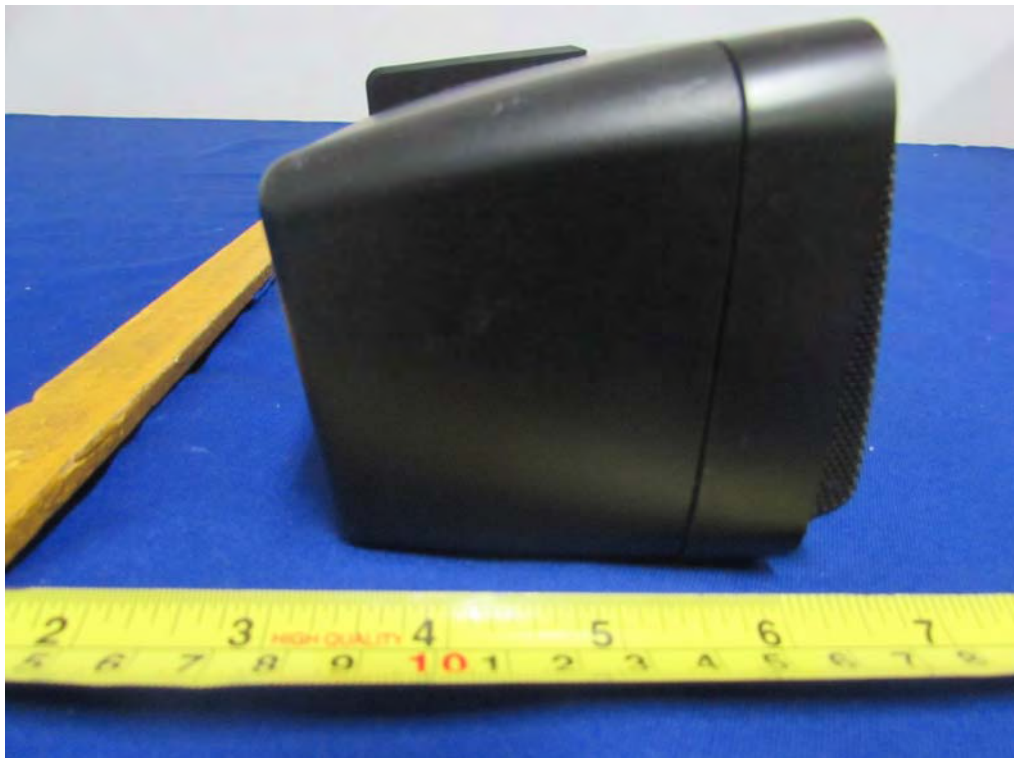
External Photos
M/N: RSB-14



External Photos
M/N: RSB-14



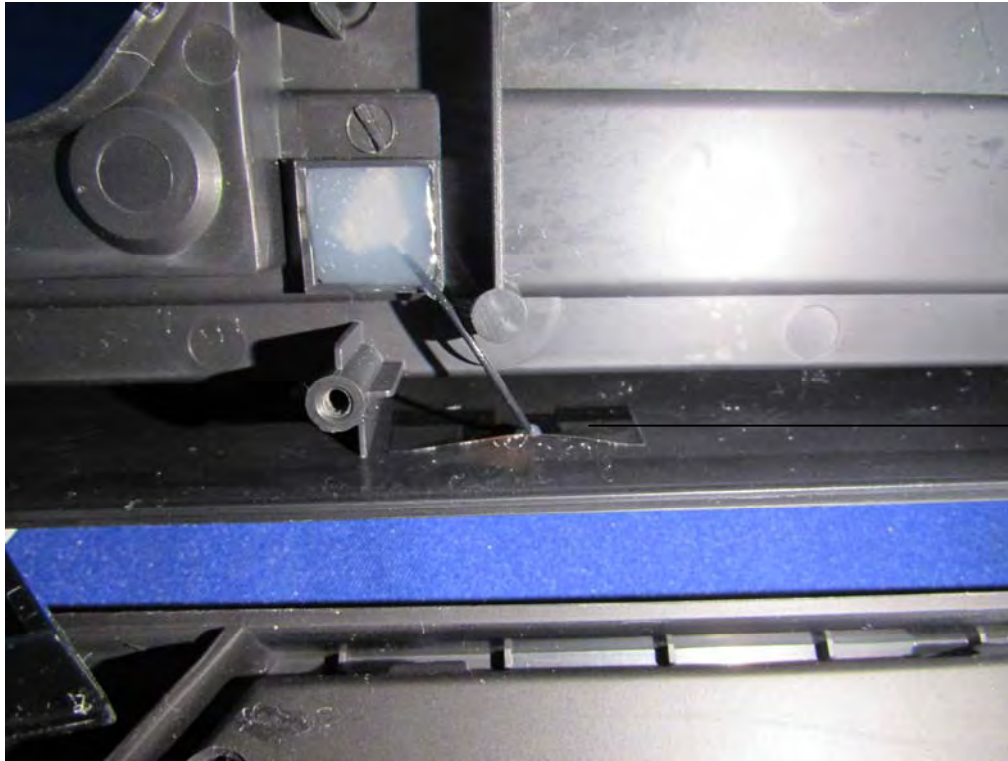
External Photos
M/N: RSB-14



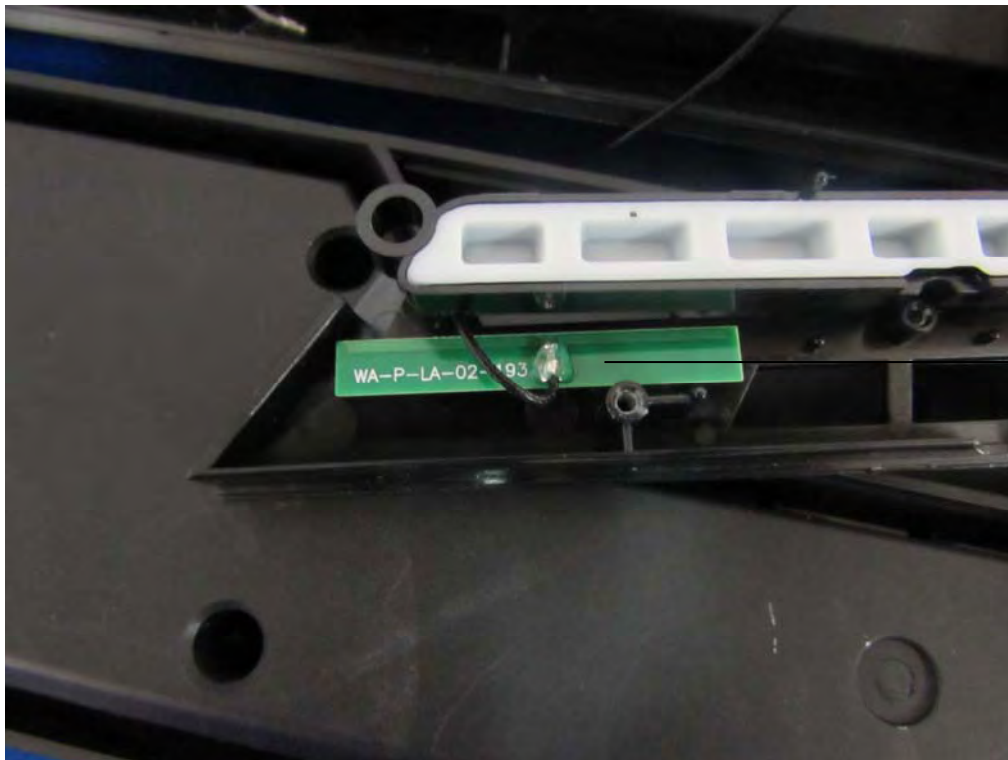
Internal Photos
M/N: RSB-14



Internal Photos
M/N: RSB-14

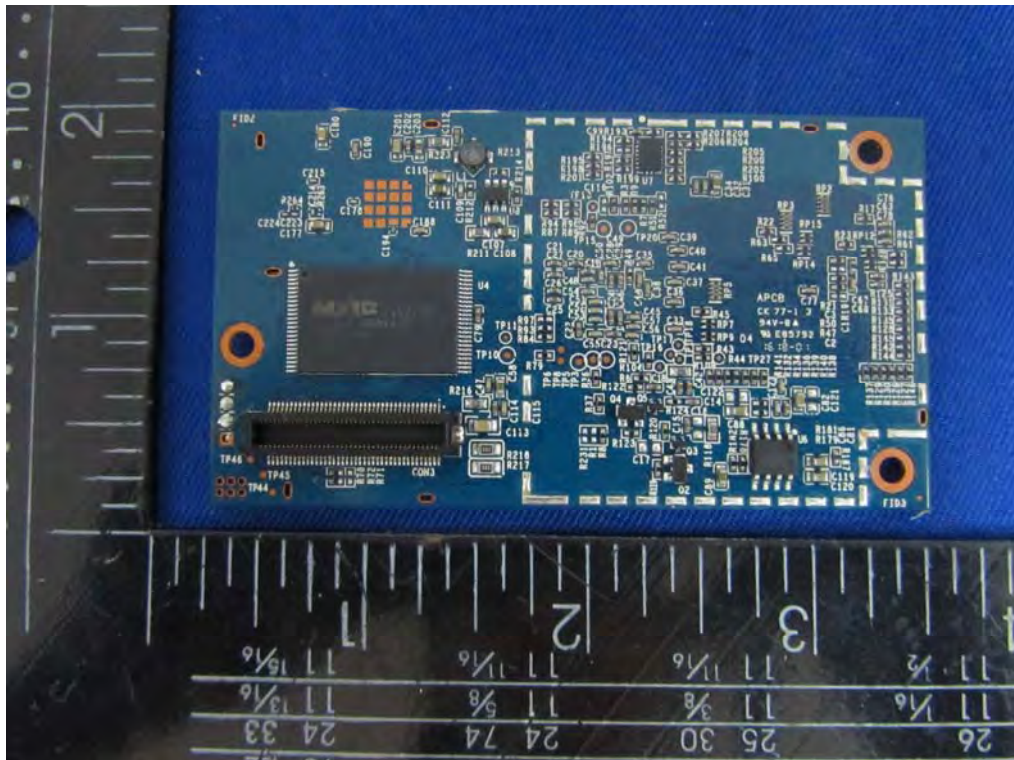


Wi-Fi
Antenna J4

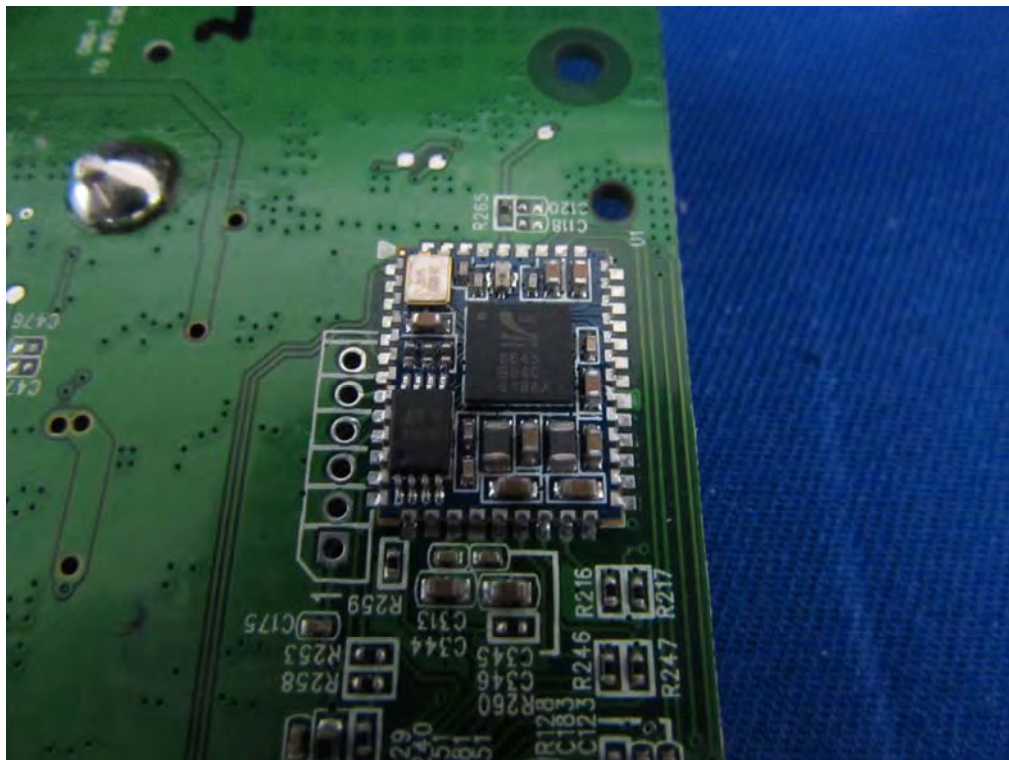
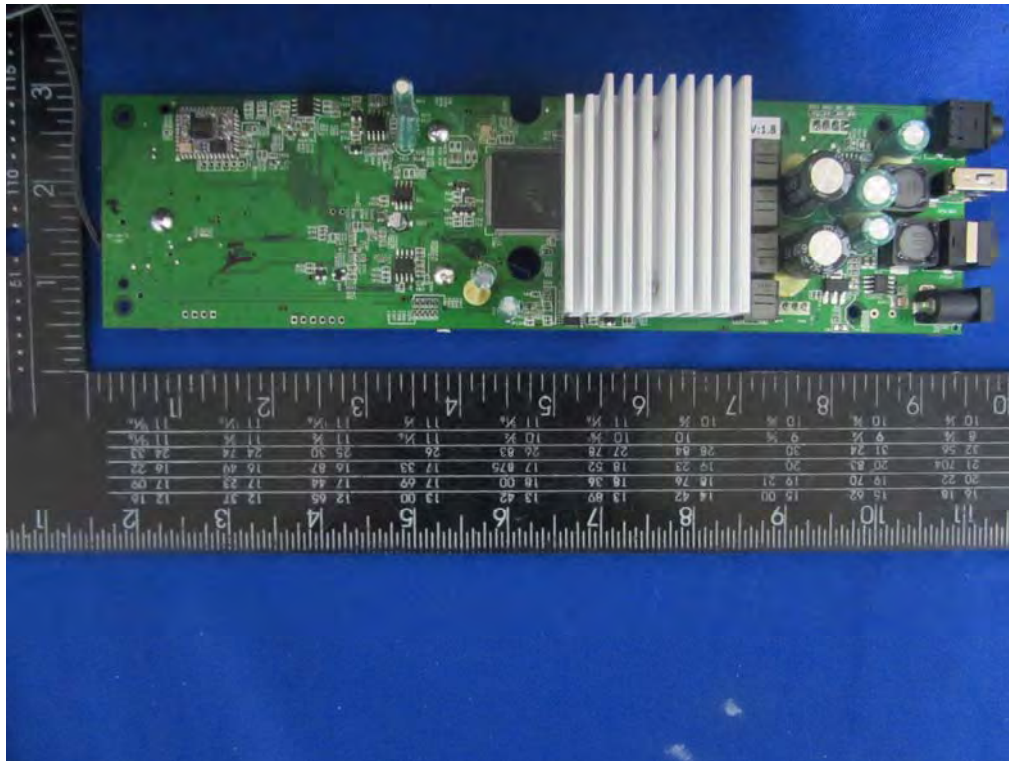


Bluetooth
Antenna

Internal Photos
M/N: RSB-14



Internal Photos
M/N: RSB-14

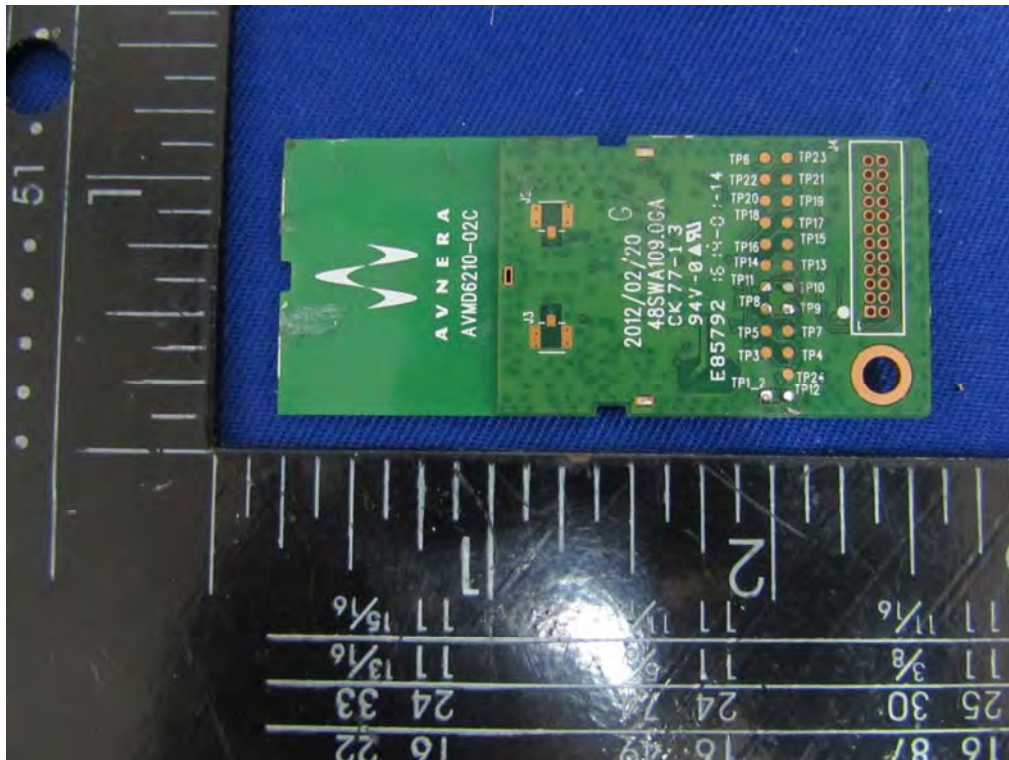


Internal Photos
M/N: RSB-14

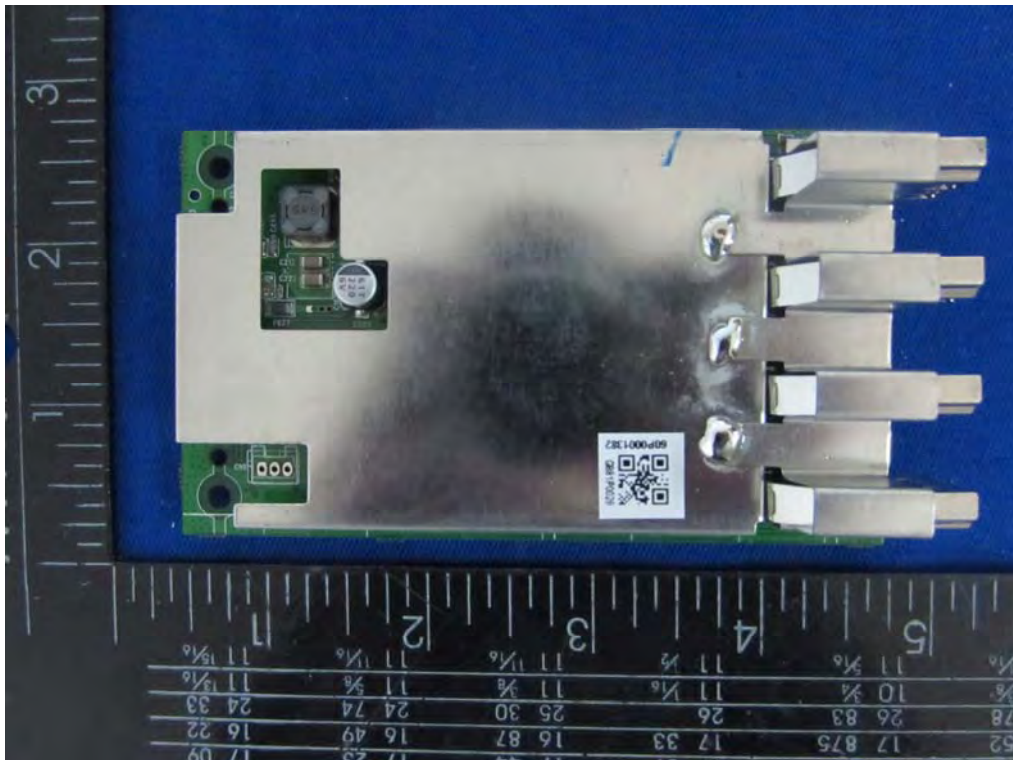
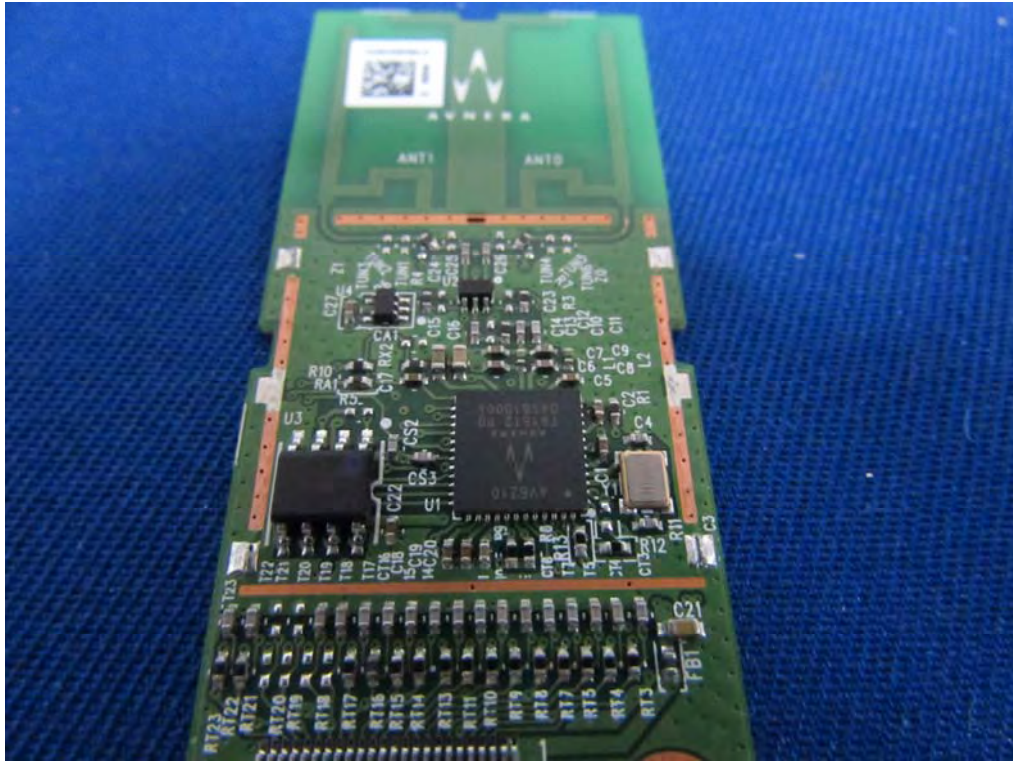


2.4G
Wireless
Antenna 1

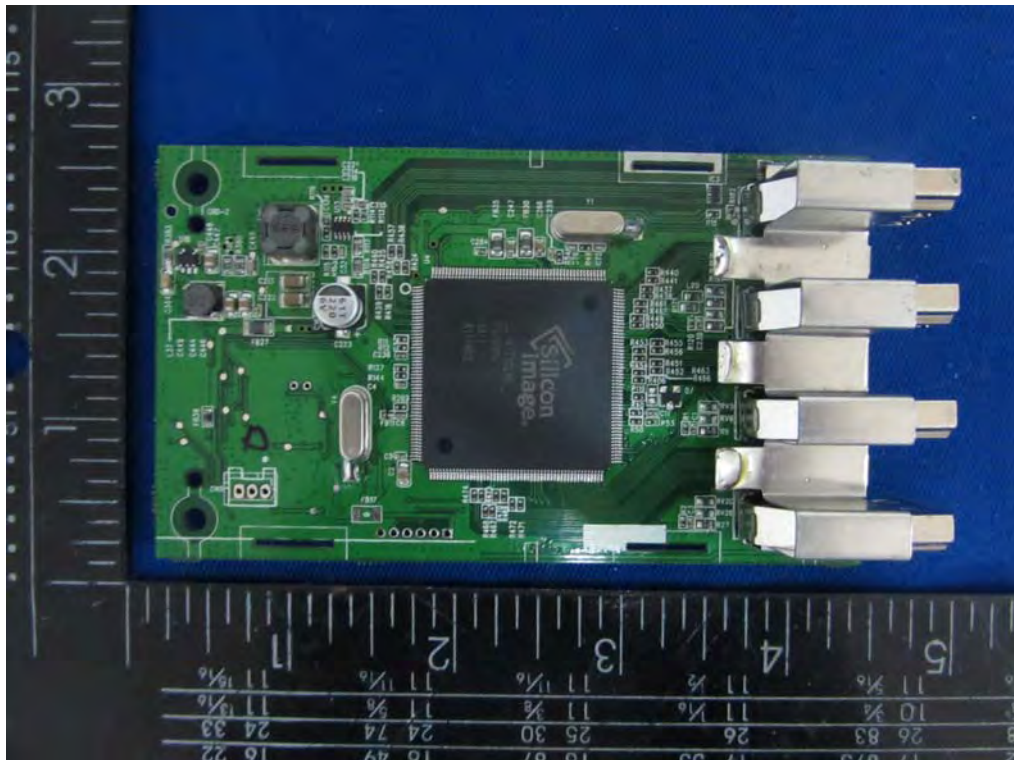
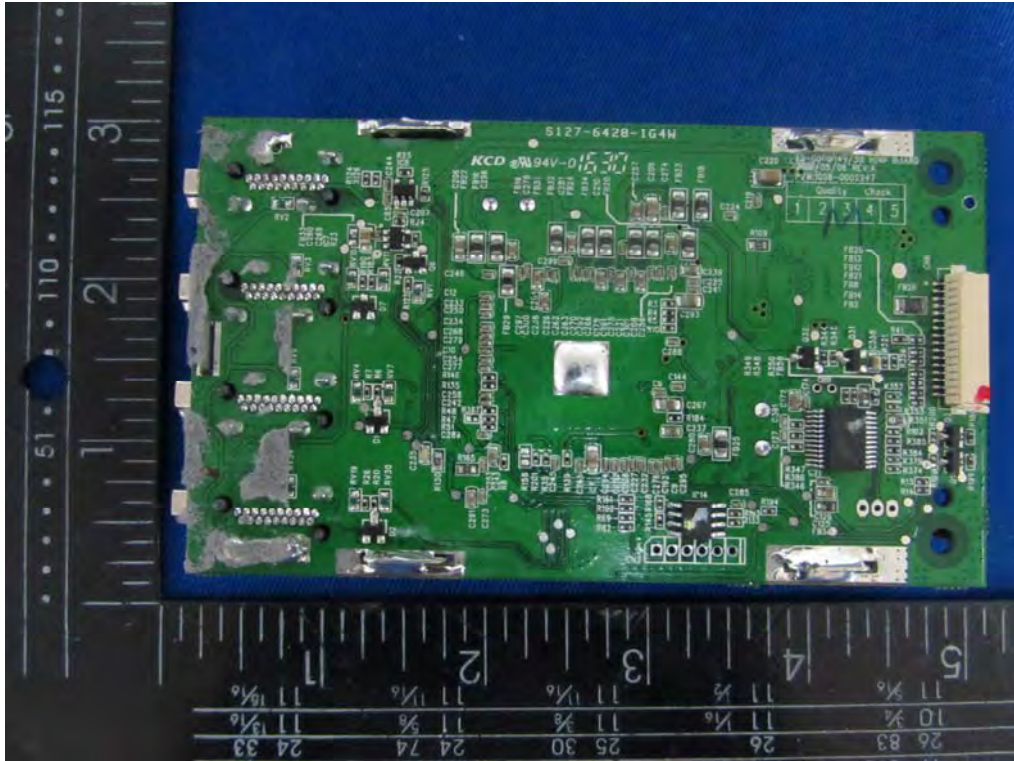
2.4G
Wireless
Antenna 0



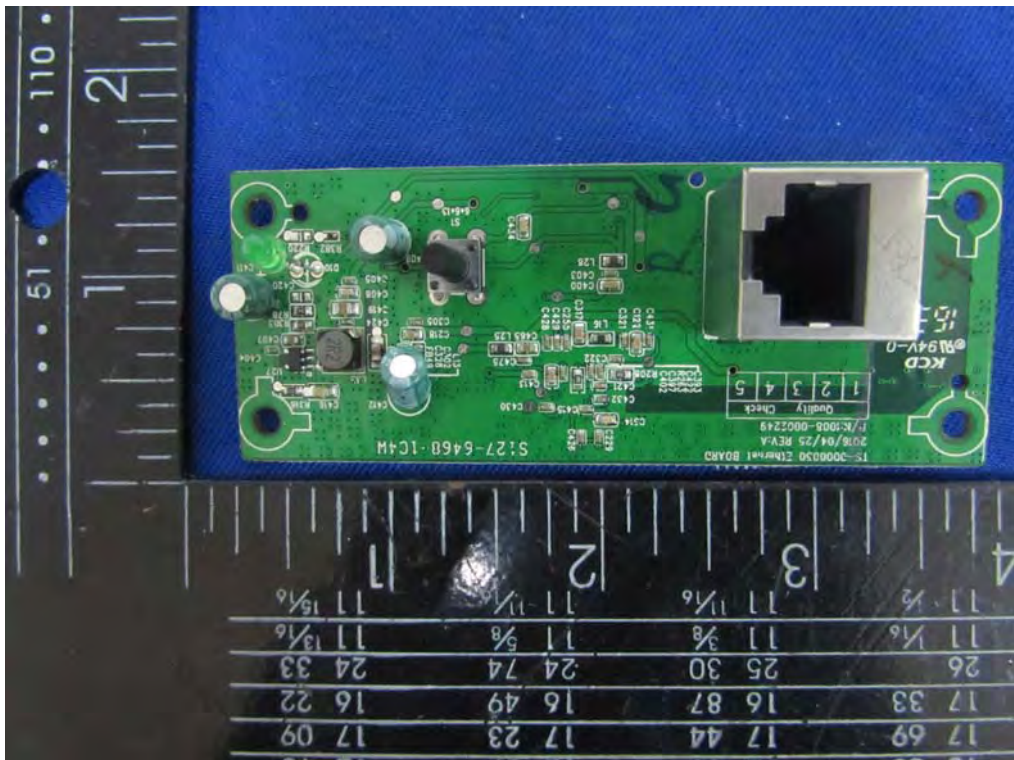
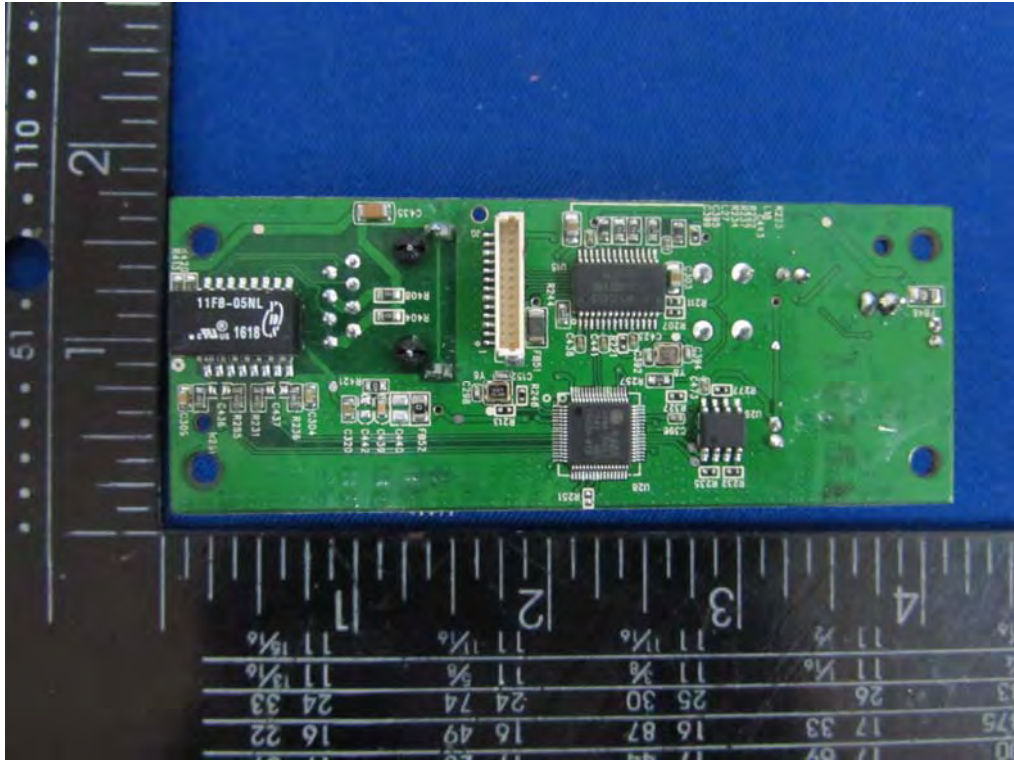
Internal Photos
M/N: RSB-14



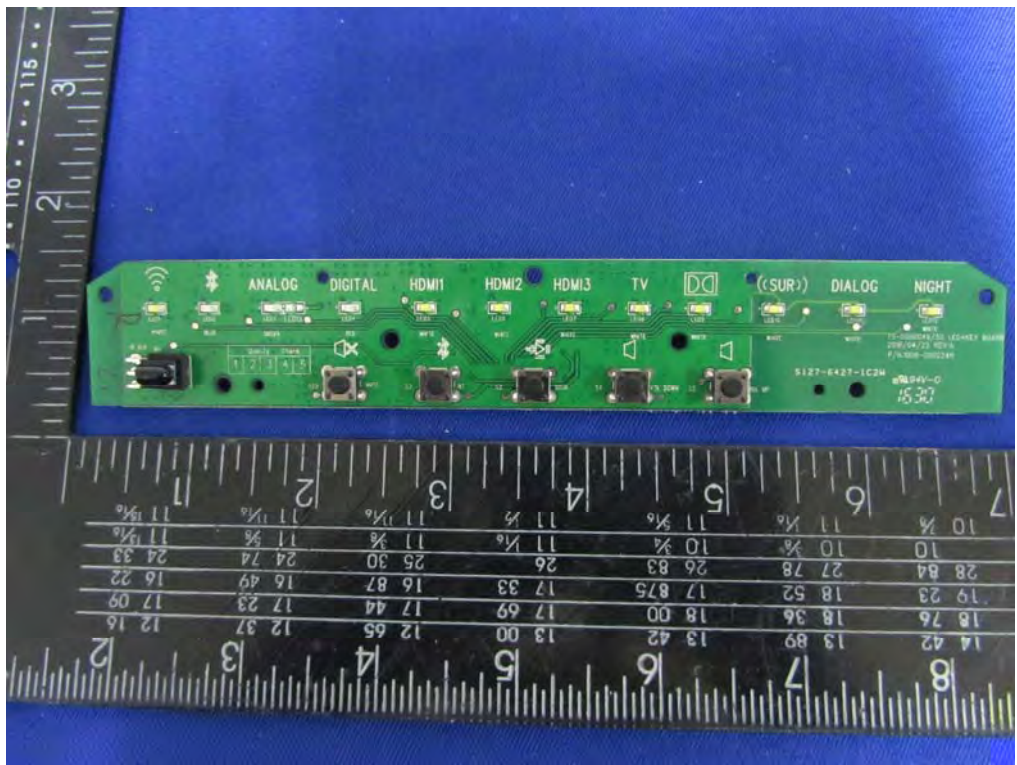
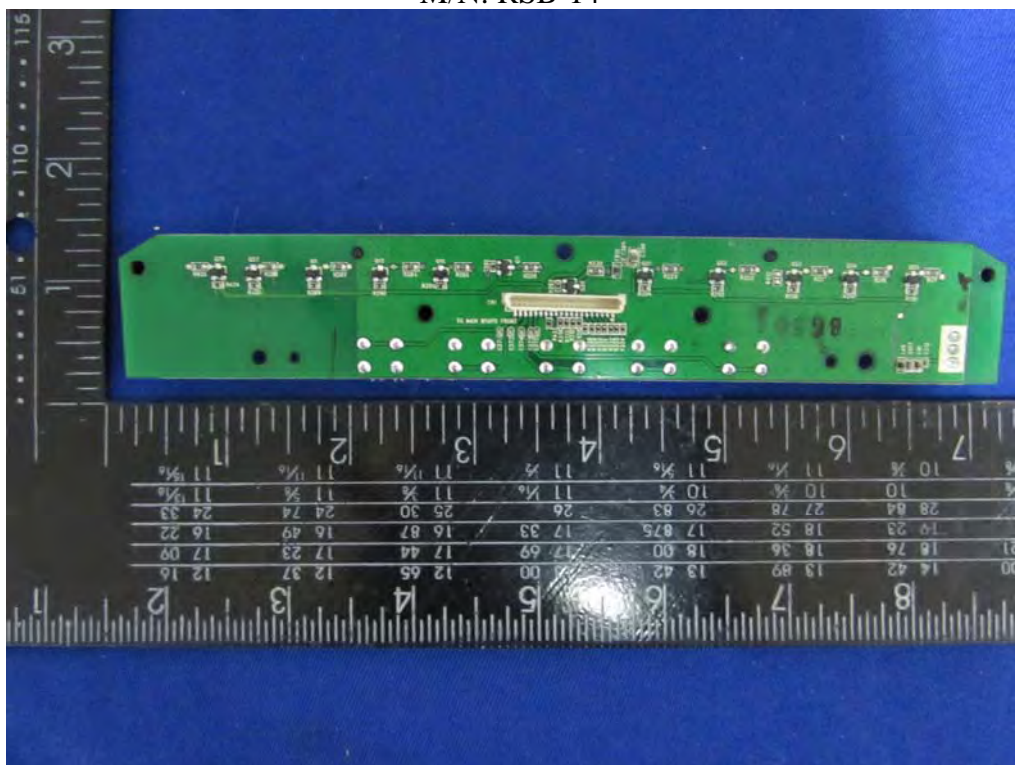
Internal Photos
M/N: RSB-14



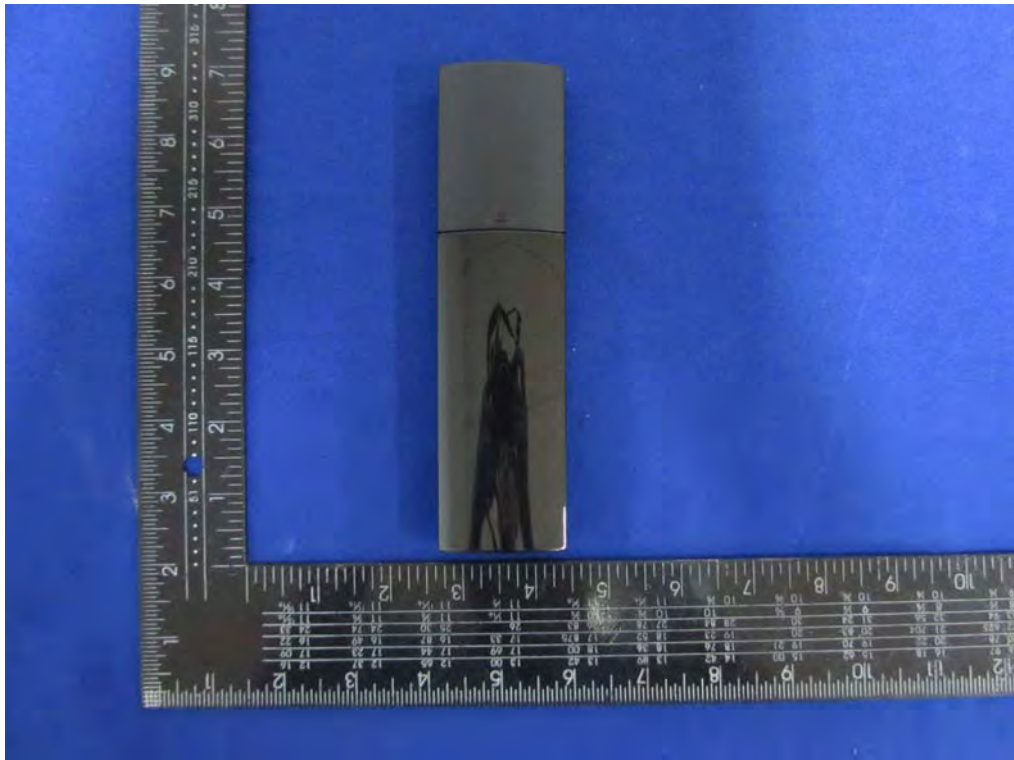
Internal Photos
M/N: RSB-14



Internal Photos
M/N: RSB-14



Remote Photos



Adapter Photos

