

FCC REPORT

Applicant: Zylux Acoustic Corporation
Address of Applicant: 3F, 22, Lane 35, Jihu Road, NeiHu Technology Park, Taipei
11492, Taiwan
Equipment Under Test (EUT)
Product Name: E sound bar(2.1) Audio/Optical System (WOOFER)
Model No.: SB4021E-A0 (SUB)
FCC ID: XN6-SB4021ESUB
Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247: 2010
Date of sample receipt: Aug. 02, 2012
Date of Test: November 09-13, 2012
Date of report issued: November 14, 2012
Test Result : PASS *

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

Authorized Signature:



Robinson Lo
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the GTS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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2 Version

Version No.	Date	Description
00	November 14, 2012	Original

Prepared By:

Hank. Yan.

Date:

November 14, 2012

Project Engineer

Check By:

Hans. Hu

Date:

November 14, 2012

Reviewer

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203/15.247 (c)	Pass
AC Power Line Conducted Emission	15.207	Pass
Conducted Peak Output Power	15.247 (b)(3)	Pass
Channel Bandwidth	15.247 (a)(2)	Pass
Power Spectral Density	15.247 (e)	Pass
Band Edge	15.247(d)	Pass
Spurious Emission	15.205/15.209	Pass

Pass: The EUT complies with the essential requirements in the standard.

5 General Information

5.1 Client Information

Applicant:	Zylux Acoustic Corporation
Address of Applicant:	3F, 22, Lane 35, Jihu Road, NeiHu Technology Park, Taipei 11492, Taiwan
Manufacturer:	ZHAO YANG ELEC.(SHENZHEN) CO., LTD
Address of Manufacturer:	Section A, 4 th Floor, Building 1 & Building 2, De Yong Jia Industrial Park, Guang Qiao Road, Yu Lv Community, Gong Ming Street, Guang Ming New District, Shenzhen

5.2 General Description of E.U.T.

Product Name:	E sound bar(2.1) Audio/Optical System (WOOFER)
Model No.:	SB4021E-A0 (SUB)
Operation Frequency:	2405.376 MHz - 2466.816 MHz.
Channel numbers:	8
Modulation technology:	DSSS
Antenna Type:	PIFA
Antenna gain:	2.0dBi (declare by Applicant)
Power supply:	AC 120V/60Hz

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2405.376MHz z	4	2433.024MHz z	7	2460.672MHz z		
2	2414.592MHz z	5	2442.240MHz z	8	2466.816MHz z		
3	2423.808MHz z	6	2451.456MHz z				

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The lowest channel	2405.376MHz
The middle channel	2442.240MHz
The Highest channel	2466.816MHz

5.3 Test mode

Operation mode	Keep the EUT in operation mode.
Transmitting mode	Keep the EUT in transmitting mode

5.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC —Registration No.: 600491**

Global United Technology Services 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 600491, July 20, 2010.

- **Industry Canada (IC)**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. Has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-1.

5.5 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

Address: 2nd Floor, Block No.2, Laodong Industrial Zone, Xixiang Road Baoan District, Shenzhen, China

Tel: 0755-27798480

Fax: 0755-27798960

5.6 Other Information Requested by the Customer

None.

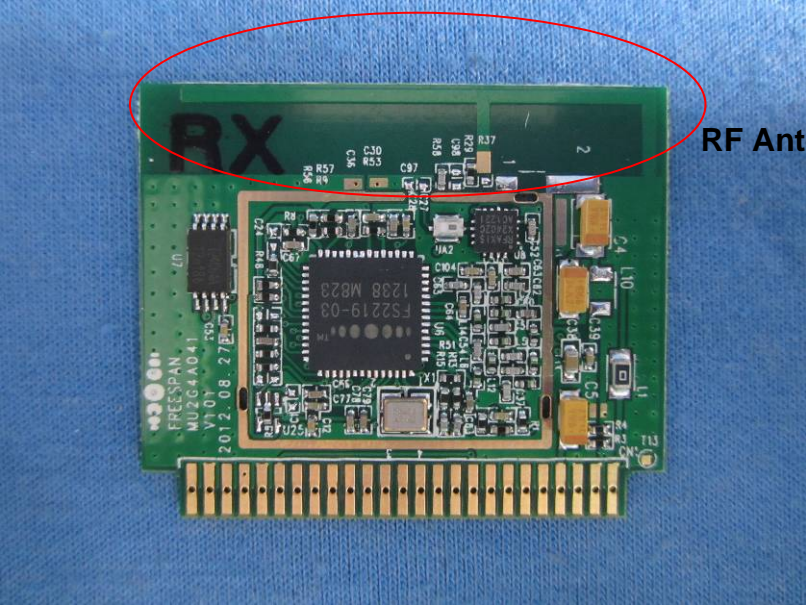
5.7 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	Mar. 30 2011	Mar. 29 2013
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	Jul. 03 2012	Jul. 02 2013
4	BiConiLog Antenna	SCHWARZBECK MESS- ELEKTRONIK	VULB9163	GTS214	Feb. 25 2012	Feb. 24 2013
5	Double -ridged waveguide horn	SCHWARZBECK MESS- ELEKTRONIK	9120D-829	GTS208	June 29 2012	June 28 2013
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	Mar. 30 2011	Mar. 29 2013
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	Mar. 31 2012	Mar. 30 2013
9	Coaxial Cable	GTS	N/A	GTS211	Mar. 31 2012	Mar. 30 2013
10	Coaxial cable	GTS	N/A	GTS210	Mar. 31 2012	Mar. 30 2013
11	Coaxial Cable	GTS	N/A	GTS212	Mar. 31 2012	Mar. 30 2013
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	Jul. 03 2012	Jul. 02 2013
13	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	Jul. 03 2012	Jul. 02 2013
14	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June 29 2012	June 28 2013
15	Band filter	Amindeon	82346	GTS219	Mar. 31 2012	Mar. 30 2013
16	Universal radio communication tester	Rohde & Schwarz	CMU200	GTS235	May 11 2012	May 10 2013
17	Signal Generator	Rohde & Schwarz	SML03	GTS236	May 11 2012	May 10 2013
18	Temp. Humidity/Barometer	Oregon Scientific	BA-888	GTS248	May 11 2012	May 10 2013
19	D.C. Power Supply	Instek	PS-3030	GTS232	NA	NA
20	Splitter	Agilent	11636B	GTS237	May 11 2012	May 10 2013

Conducted Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongYu Electron	7.0(L)x3.0(W)x3.0(H)	GTS252	Jul. 03 2012	Jul. 02 2013
2	EMI Test Receiver	Rohde & Schwarz	ESCS30	GTS223	Jul. 03 2012	Jul. 02 2013
3	10dB Pulse Limita	Rohde & Schwarz	N/A	GTS224	Jul. 03 2012	Jul. 02 2013
4	LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	GTS226	Jul. 03 2012	Jul. 02 2013
5	Coaxial Cable	GTS	N/A	GTS227	Mar. 31 2012	Mar. 30 2013
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A

6 Test results and Measurement Data

6.1 Antenna requirement:

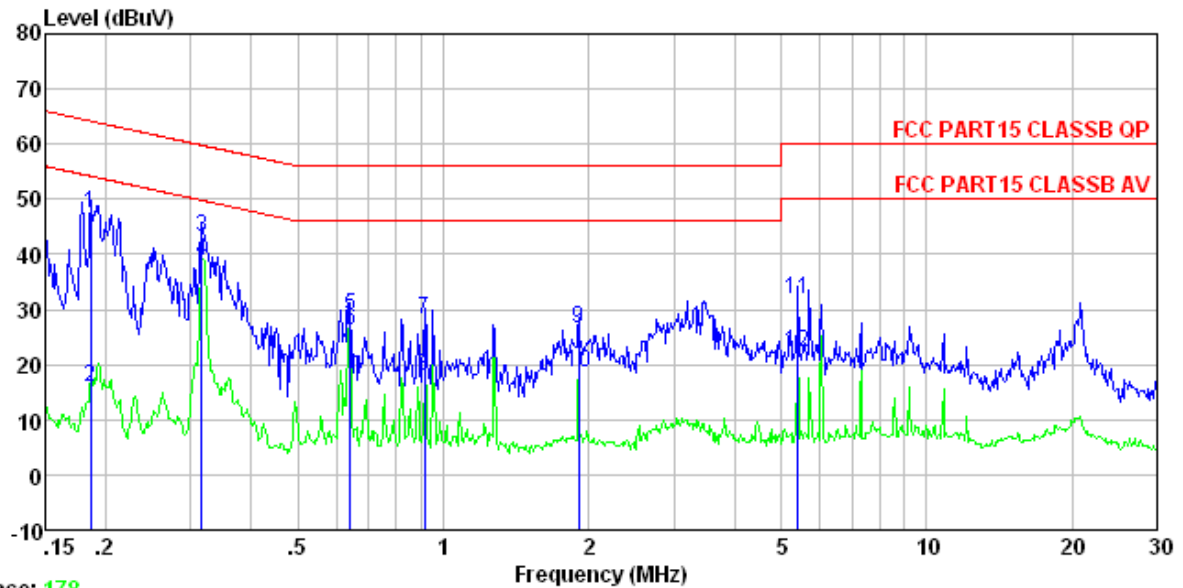
Standard requirement:	FCC Part15 C Section 15.203 /247(c)
<p>15.203 requirement:</p> <p>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that 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.</p> <p>15.247(c) (1)(i) requirement:</p> <p>(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.</p>	
E.U.T Antenna:	
<p><i>The antenna is PIFA antenna. The best case gain of the antenna is 2dBi.</i></p> <div style="text-align: center;">  </div>	

6.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207														
Test Method:	ANSI C63.4:2003														
Test Frequency Range:	150KHz to 30MHz														
Class / Severity:	Class B														
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto														
Limit:	<table border="1"> <thead> <tr> <th rowspan="2">Frequency range (MHz)</th> <th colspan="2">Limit (dBuV)</th> </tr> <tr> <th>Quasi-peak</th> <th>Average</th> </tr> </thead> <tbody> <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> </tbody> </table> <p>* Decreases with the logarithm of the frequency.</p>	Frequency range (MHz)	Limit (dBuV)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	5-30	60	50
Frequency range (MHz)	Limit (dBuV)														
	Quasi-peak	Average													
0.15-0.5	66 to 56*	56 to 46*													
0.5-5	56	46													
5-30	60	50													
Test setup:	<p><i>Remark</i> E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p>														
Test procedure:	<ol style="list-style-type: none"> 1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2003 on conducted measurement. 														
Test Instruments:	Refer to section 5.7 for details														
Test mode:	Refer to section 5.3 for details														
Test results:	Pass														

Measurement data:

Line:

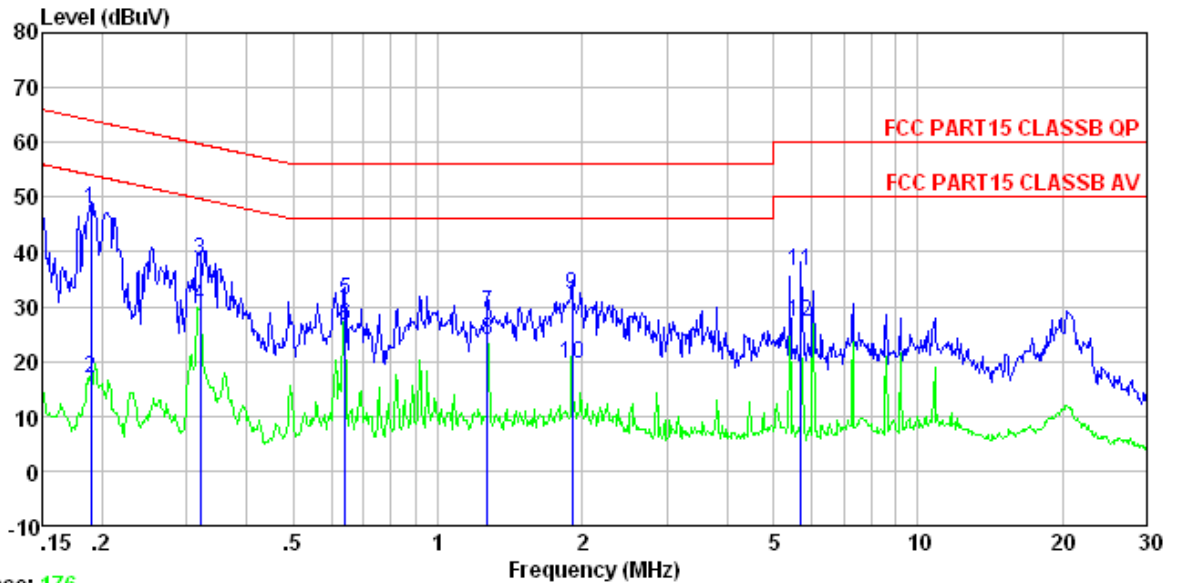


Trace: 178

Condition : FCC PART15 CLASSB QP LISN-2012 LINE
 Job No. : 1318RF
 Test Mode : Operation mode
 Test Engineer: Edward

	Read Freq	Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.186	47.59	-0.23	0.10	47.46	64.20	-16.74	QP
2	0.186	15.97	-0.23	0.10	15.84	54.20	-38.36	Average
3	0.317	43.29	-0.22	0.10	43.17	59.80	-16.63	QP
4	0.317	38.82	-0.22	0.10	38.70	49.80	-11.10	Average
5	0.641	28.94	-0.20	0.10	28.84	56.00	-27.16	QP
6	0.641	26.44	-0.20	0.10	26.34	46.00	-19.66	Average
7	0.914	28.46	-0.21	0.10	28.35	56.00	-27.65	QP
8	0.914	18.15	-0.21	0.10	18.04	46.00	-27.96	Average
9	1.908	26.57	-0.24	0.10	26.43	56.00	-29.57	QP
10	1.908	18.59	-0.24	0.10	18.45	46.00	-27.55	Average
11	5.419	32.16	-0.31	0.11	31.96	60.00	-28.04	QP
12	5.419	22.38	-0.31	0.11	22.18	50.00	-27.82	Average

Neutral:



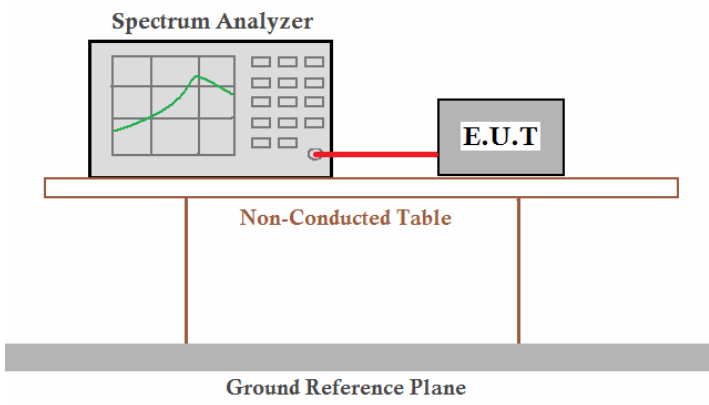
Trace: 176
 Condition : FCC PART15 CLASSB QP LISN-2012 NEUTRAL
 Job No. : 1318RF
 Test Mode : Operation mode
 Test Engineer: Edward

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.189	47.67	-0.09	0.10	47.68	64.06	-16.38	QP
2	0.189	17.03	-0.09	0.10	17.04	54.06	-37.02	Average
3	0.320	38.57	-0.09	0.10	38.58	59.71	-21.13	QP
4	0.320	30.11	-0.09	0.10	30.12	49.71	-19.59	Average
5	0.641	31.26	-0.08	0.10	31.28	56.00	-24.72	QP
6	0.641	26.47	-0.08	0.10	26.49	46.00	-19.51	Average
7	1.269	28.93	-0.09	0.10	28.94	56.00	-27.06	QP
8	1.269	23.78	-0.09	0.10	23.79	46.00	-22.21	Average
9	1.908	32.18	-0.11	0.10	32.17	56.00	-23.83	QP
10	1.908	19.60	-0.11	0.10	19.59	46.00	-26.41	Average
11	5.713	36.54	-0.17	0.11	36.48	60.00	-23.52	QP
12	5.713	27.15	-0.17	0.11	27.09	50.00	-22.91	Average

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss

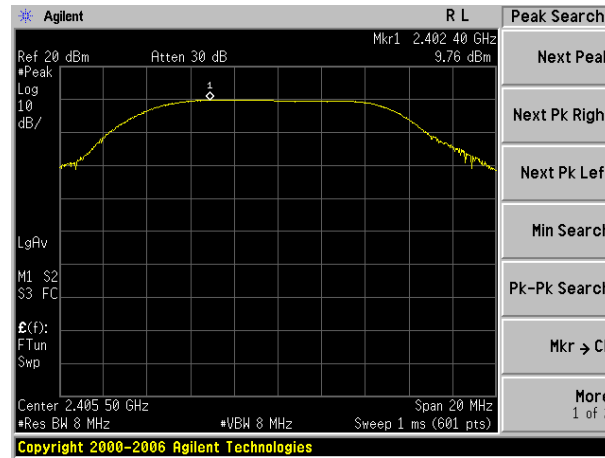
6.3 Conducted Peak Output Power

Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	ANSI C63.4:2003 and KDB558074 D01 Meas Guidance
Limit:	30dBm
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both are placed on a Non-Conducted Table, which is supported by a Ground Reference Plane.</p>
Test Instruments:	Refer to section 5.7 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

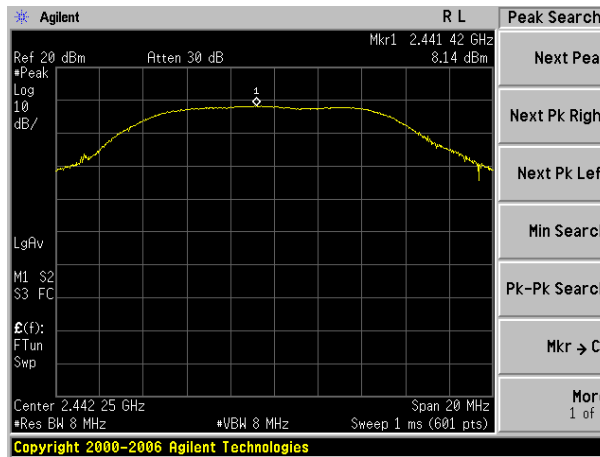
Measurement Data

Test CH	Peak Output Power (dBm)	Limit(dBm)	Result
Lowest	9.76	30.00	Pass
Middle	8.14		
Highest	10.15		

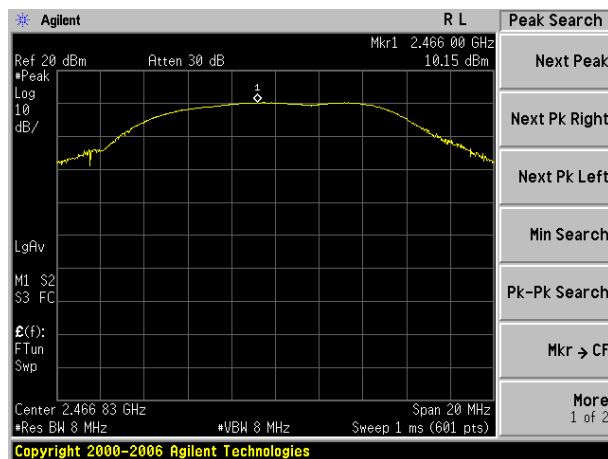
Test plot as follows:



Lowest channel

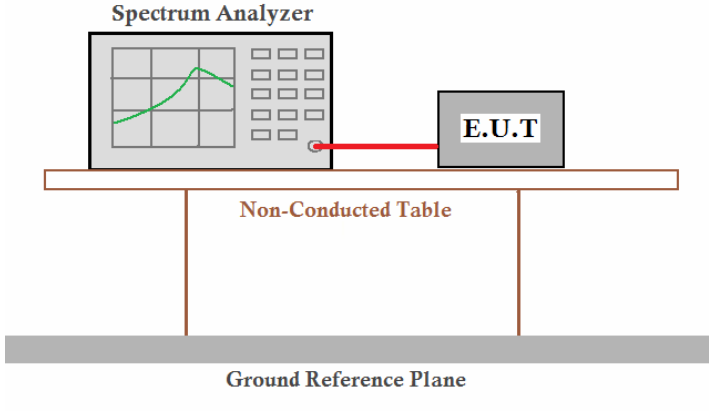


Middle channel



Highest channel

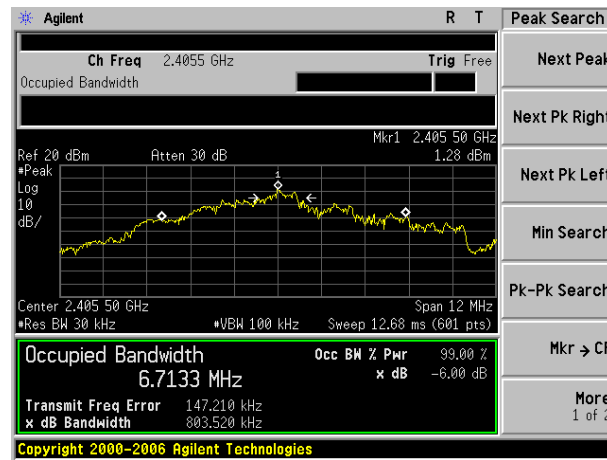
6.4 Channel Bandwidth

Test Requirement:	FCC Part15 C Section 15.247 (a)(2)
Test Method:	ANSI C63.4:2003 and KDB558074 D01 Meas Guidance
Limit:	>500KHz
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both are placed on a Non-Conducted Table, which is supported by a Ground Reference Plane.</p>
Test Instruments:	Refer to section 5.7 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement Data

Test CH	Emission Bandwidth (MHz)	Limit(KMHz)	Result
Lowest	0.804	>500	Pass
Middle	0.735		
Highest	0.805		

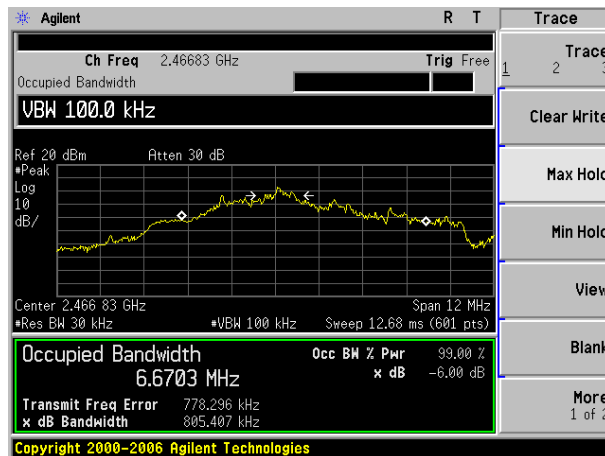
Test plot as follows:



Lowest channel

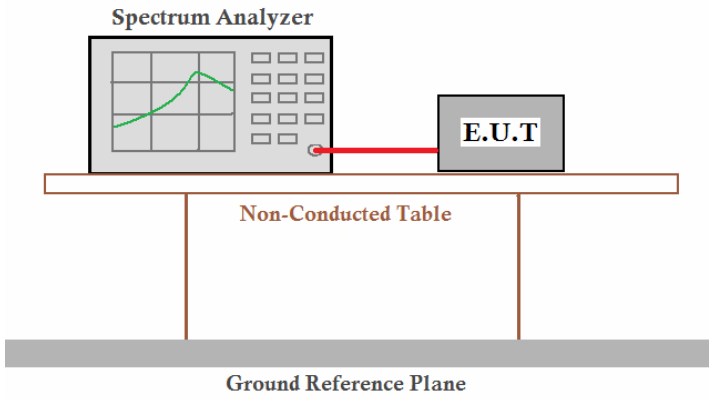


Middle channel



Highest channel

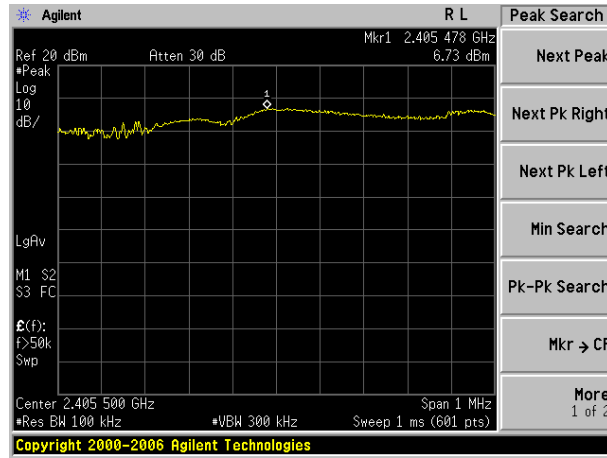
6.5 Power Spectral Density

Test Requirement:	FCC Part15 C Section 15.247 (e)
Test Method:	ANSI C63.4:2003 and KDB558074 D01 Meas Guidance
Limit:	8dBm
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.</p>
Test Instruments:	Refer to section 5.7 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

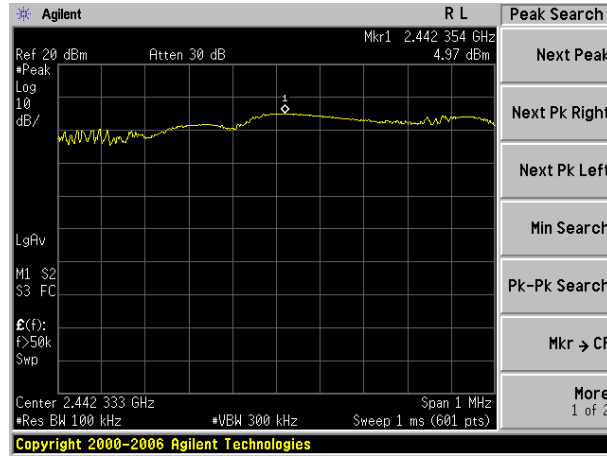
Measurement Data

Test CH	Power Spectral Density (dBm/100KHz)	Limit (dBm/3KHz)	Result
Lowest	6.73	8.00	Pass
Middle	4.97		
Highest	7.17		

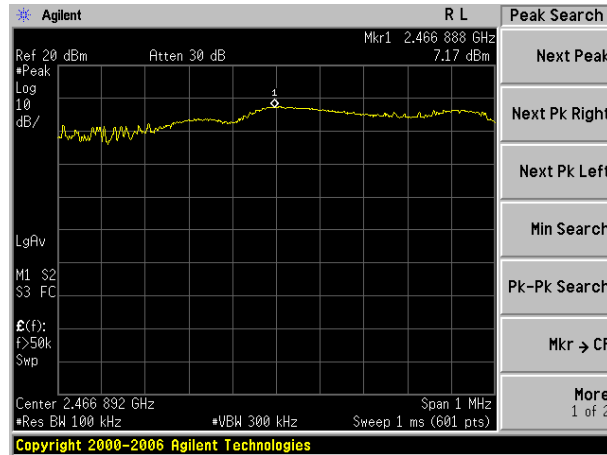
Test plot as follows:



Lowest channel



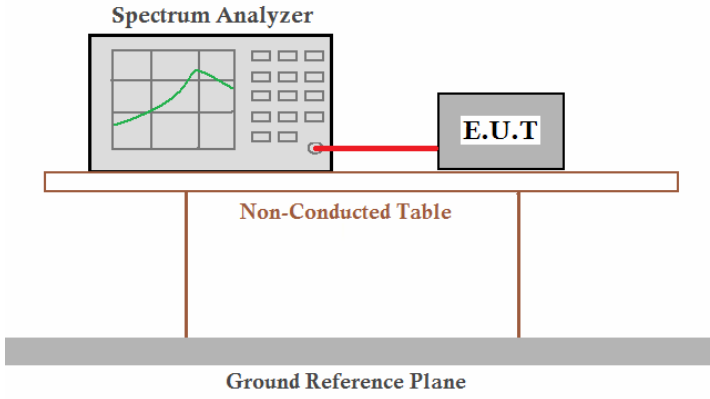
Middle channel



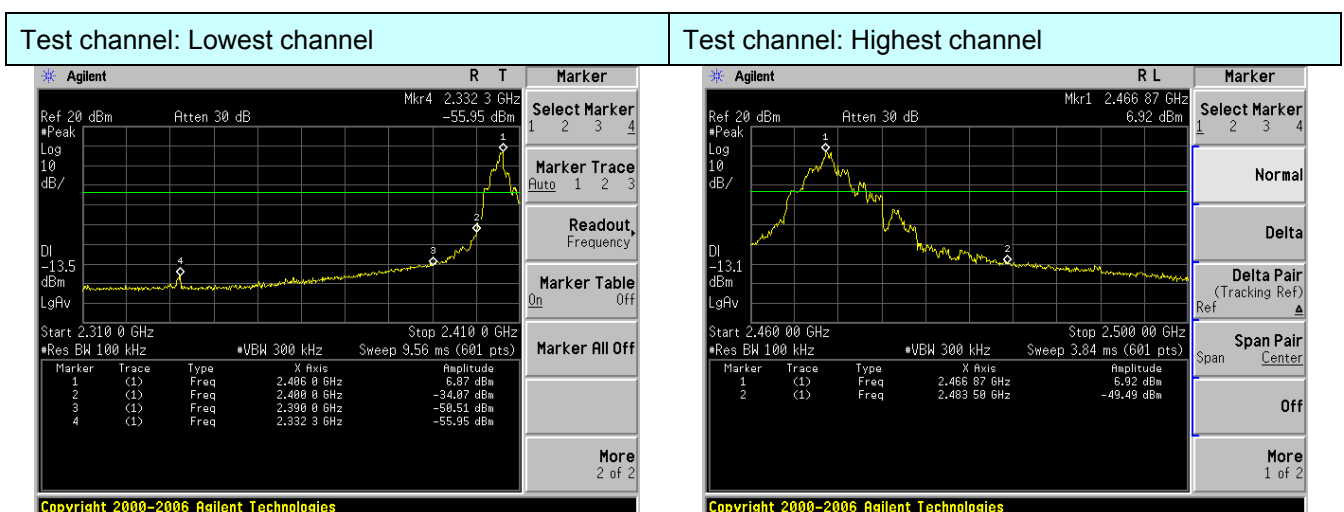
Highest channel

6.6 Band edges

6.6.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.4:2003 and KDB558074 D01 Meas Guidance
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	
Test Instruments:	Refer to section 5.7 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Test plot as follows:



6.6.2 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209 and 15.205				
Test Method:	ANSI C63.4: 2003				
Test Frequency Range:	30MHz to 25GHz, only worse case is reported				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		AV	1MHz	10Hz	Average Value
Limit:	Frequency		Limit (dBuV/m @3m)		Remark
	Above 1GHz		54.00		Average Value
			74.00		Peak Value
Test setup:					
Test Procedure:	<ol style="list-style-type: none"> 1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter 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 and the rota 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. 				
Test Instruments:	Refer to section 5.7 for details				
Test mode:	Refer to section 5.3 for details				
Test results:	Pass				

Remark:

Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.

Measurement data:

Test channel:	Lowest
---------------	--------

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	33.46	27.59	5.38	0.00	66.43	74.00	-7.57	Horizontal
2400.00	36.75	27.58	5.39	0.00	69.72	74.00	-4.28	Horizontal
2390.00	32.16	27.59	5.38	0.00	65.13	74.00	-8.87	Vertical
2400.00	36.06	27.58	5.39	0.00	69.03	74.00	-4.97	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	13.68	27.59	5.38	0.00	46.65	54.00	-7.35	Horizontal
2400.00	14.56	27.58	5.39	0.00	47.53	54.00	-6.47	Horizontal
2390.00	13.60	27.59	5.38	0.00	46.57	54.00	-7.43	Vertical
2400.00	14.17	27.58	5.39	0.00	47.14	54.00	-6.86	Vertical

Test channel:	Highest
---------------	---------

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	33.49	27.53	5.47	0.00	66.49	74.00	-7.51	Horizontal
2500.00	27.22	27.55	5.49	0.00	60.26	74.00	-13.74	Horizontal
2483.50	37.46	27.53	5.47	0.00	70.46	74.00	-3.54	Vertical
2500.00	30.27	27.55	5.49	0.00	63.31	74.00	-10.69	Vertical

Average value:

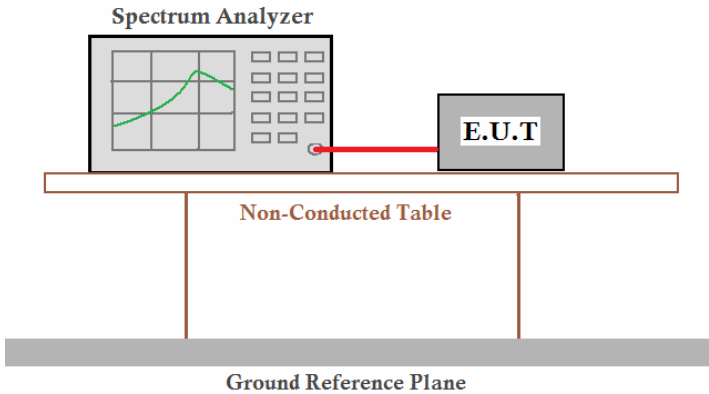
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	13.88	27.53	5.47	0.00	46.88	54.00	-7.12	Horizontal
2500.00	13.87	27.55	5.49	0.00	46.91	54.00	-7.09	Horizontal
2483.50	14.01	27.53	5.47	0.00	47.01	54.00	-6.99	Vertical
2500.00	13.87	27.55	5.49	0.00	46.91	54.00	-7.09	Vertical

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Pre-amplifier Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

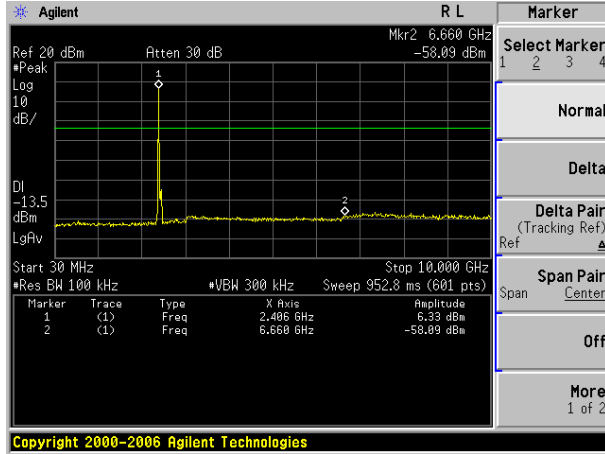
6.7 Spurious Emission

6.7.1 Conducted Emission Method

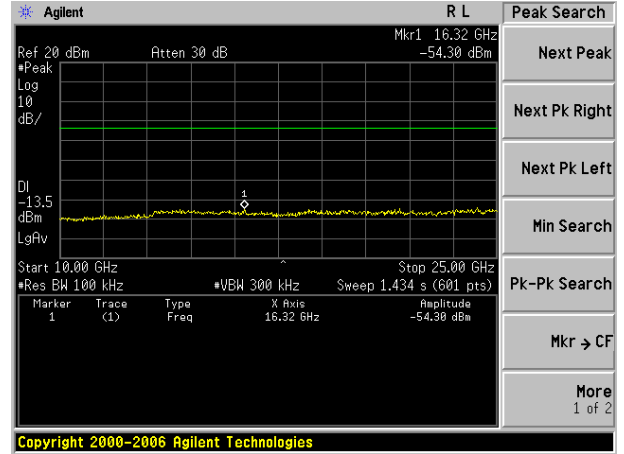
Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.4:2003 and KDB558074 D01 Meas Guidance
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both are placed on a Non-Conducted Table, which is supported by two vertical legs. Below the table is a Ground Reference Plane.</p>
Test Instruments:	Refer to section 5.7 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Test plot as follows:

Test channel: Lowest channel

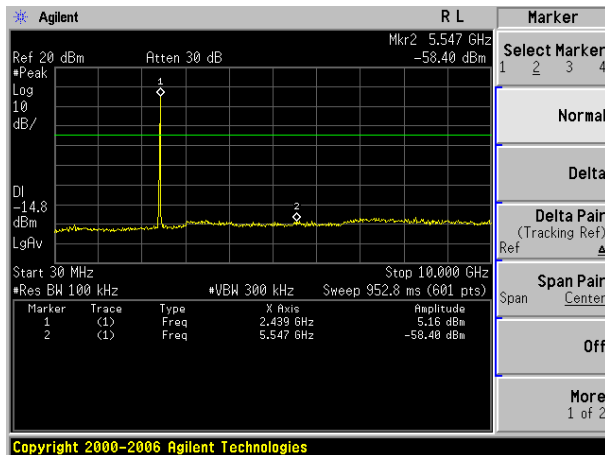


30MHz~10GHz

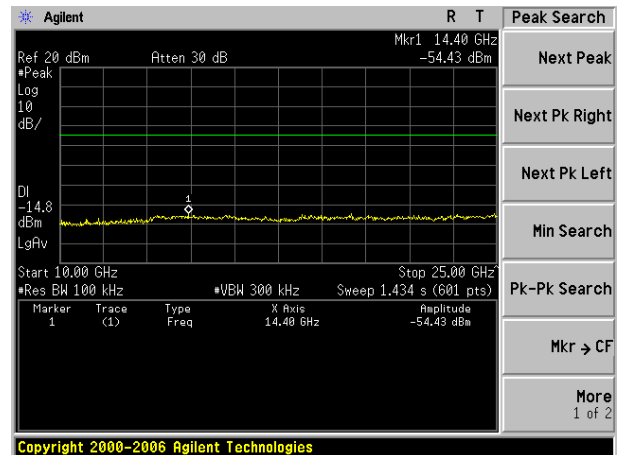


10GHz~25GHz

Test channel: Middle channel

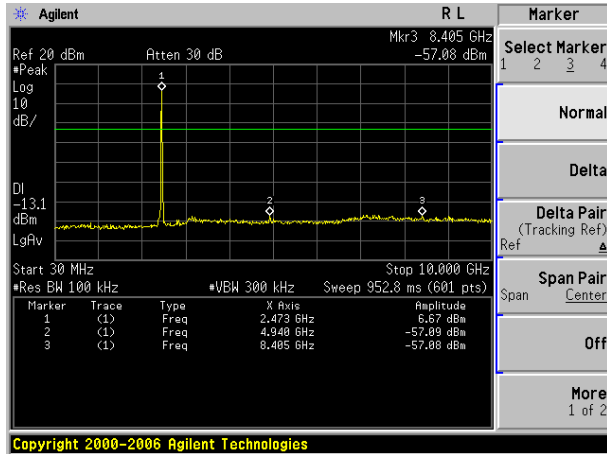


30MHz~10GHz

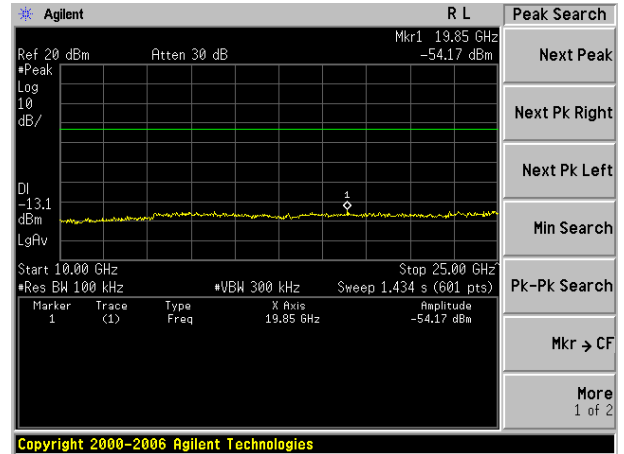


10GHz~25GHz

Test channel: Highest channel



30MHz~10GHz



10GHz~25GHz

6.7.2 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209				
Test Method:	ANSI C63.4: 2003				
Test Frequency Range:	30MHz to 25GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
AV		1MHz	10Hz	Average Value	
Limit:	Frequency	Limit (dBuV/m @3m)		Remark	
	30MHz-88MHz	40.0		Quasi-peak Value	
	88MHz-216MHz	43.5		Quasi-peak Value	
	216MHz-960MHz	46.0		Quasi-peak Value	
	960MHz-1GHz	54.0		Quasi-peak Value	
	Above 1GHz	54.0		Average Value	
74.0		Peak Value			
Test setup:	Below 1GHz				
Test setup:	Above 1GHz				

Test Procedure:	<ol style="list-style-type: none"> 1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter 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 and the rota 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.
Test Instruments:	Refer to section 5.7 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Remark:

Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.

■ Below 1GHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
34.16	42.42	15.79	0.60	32.06	26.75	40.00	-13.25	Vertical
65.11	39.97	14.33	0.90	31.91	23.29	40.00	-16.71	Vertical
107.13	40.62	15.05	1.25	31.80	25.12	43.50	-18.38	Vertical
307.83	40.47	16.18	2.40	32.15	26.90	46.00	-19.10	Vertical
677.58	39.81	21.50	4.00	31.16	34.15	46.00	-11.85	Vertical
922.52	38.74	24.01	4.93	31.19	36.49	46.00	-9.51	Vertical
39.99	38.36	16.58	0.66	32.06	23.54	40.00	-16.46	Horizontal
53.51	38.29	16.18	0.80	31.95	23.32	40.00	-16.68	Horizontal
107.89	39.78	14.95	1.26	31.80	24.19	43.50	-19.31	Horizontal
224.52	43.72	14.46	1.99	32.15	28.02	46.00	-17.98	Horizontal
262.90	45.75	15.22	2.19	32.17	30.99	46.00	-15.01	Horizontal
790.62	37.79	22.96	4.42	31.31	33.86	46.00	-12.14	Horizontal

■ Above 1GHz

Test channel:	Lowest
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4810.76	30.51	31.78	8.60	24.17	46.72	74.00	-27.28	Vertical
7216.14	30.43	36.19	11.66	26.46	51.82	74.00	-22.18	Vertical
9621.52	29.35	38.01	14.14	25.45	56.05	74.00	-17.95	Vertical
12026.90	*					74.00		Vertical
14432.28	*					74.00		Vertical
4810.76	35.22	31.78	8.60	24.17	51.43	74.00	-22.57	Horizontal
7216.14	30.66	36.19	11.66	26.46	52.05	74.00	-21.95	Horizontal
9621.52	28.77	38.01	14.14	25.45	55.47	74.00	-18.53	Horizontal
12026.90	*					74.00		Horizontal
14432.28	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4810.76	19.47	31.78	8.60	24.17	35.68	54.00	-18.32	Vertical
7216.14	18.43	36.19	11.66	26.46	39.82	54.00	-14.18	Vertical
9621.52	15.44	38.01	14.14	25.45	42.14	54.00	-11.86	Vertical
12026.90	*					54		Vertical
14432.28	*					54		Vertical
4810.76	18.98	31.78	8.60	24.17	35.19	54.00	-18.81	Horizontal
7216.14	19.37	36.19	11.66	26.46	40.76	54.00	-13.24	Horizontal
9621.52	16.04	38.01	14.14	25.45	42.74	54.00	-11.26	Horizontal
12026.90	*					54		Horizontal
14432.28	*					54		Horizontal

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Pre-amplifier Factor
2. “*”, means this data is too weak instrument of signal is unable to test.
3. The emission levels of other frequencies are very lower than the limit and not show in test report.

Test channel:	Middle
---------------	--------

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4884.50	29.19	31.85	8.66	24.10	45.60	74.00	-28.40	Vertical
7326.75	30.66	36.37	11.72	26.78	51.97	74.00	-22.03	Vertical
9769.00	27.54	38.35	14.27	25.35	54.81	74.00	-19.19	Vertical
12211.25	*					74.00		Vertical
14653.50	*					74.00		Vertical
4884.50	29.37	31.85	8.66	24.10	45.78	74.00	-28.22	Horizontal
7326.75	30.51	36.37	11.72	26.78	51.82	74.00	-22.18	Horizontal
9769.00	27.53	38.35	14.27	25.35	54.80	74.00	-19.20	Horizontal
12211.25	*					74.00		Horizontal
14653.50	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4884.50	18.77	31.85	8.66	24.10	35.18	54.00	-18.82	Vertical
7326.75	20.75	36.37	11.72	26.78	42.06	54.00	-11.94	Vertical
9769.00	17.38	38.35	14.27	25.35	44.65	54.00	-9.35	Vertical
12211.25	*					54		Vertical
14653.50	*					54		Vertical
4884.50	19.38	31.85	8.66	24.10	35.79	54.00	-18.21	Horizontal
7326.75	21.02	36.37	11.72	26.78	42.33	54.00	-11.67	Horizontal
9769.00	15.62	38.35	14.27	25.35	42.89	54.00	-11.11	Horizontal
12211.25	*					54		Horizontal
14653.50	*					54		Horizontal

Remark:

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *“*”*, means this data is the too weak instrument of signal is unable to test.
3. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Test channel:	Highest
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4933.64	30.46	31.90	8.70	24.05	47.01	74.00	-26.99	Vertical
7400.46	29.88	36.52	11.76	26.90	51.26	74.00	-22.74	Vertical
9867.28	27.03	38.72	14.33	25.29	54.79	74.00	-19.21	Vertical
12334.10	*					74.00		Vertical
14800.92	*					74.00		Vertical
4933.64	33.48	31.90	8.70	24.05	50.03	74.00	-23.97	Horizontal
7400.46	30.96	36.52	11.76	26.90	52.34	74.00	-21.66	Horizontal
9867.28	28.05	38.72	14.33	25.29	55.81	74.00	-18.19	Horizontal
12334.10	*					74.00		Horizontal
14800.92	*					74.00		Horizontal

Average value:

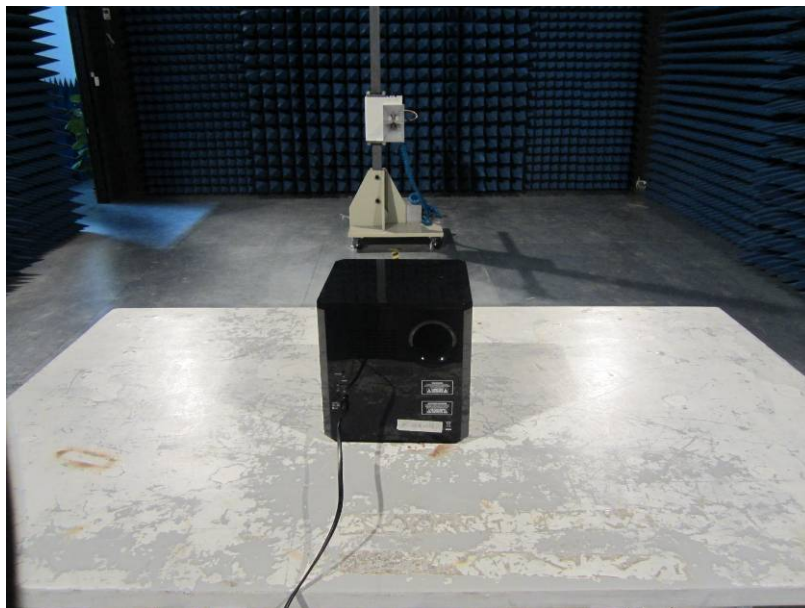
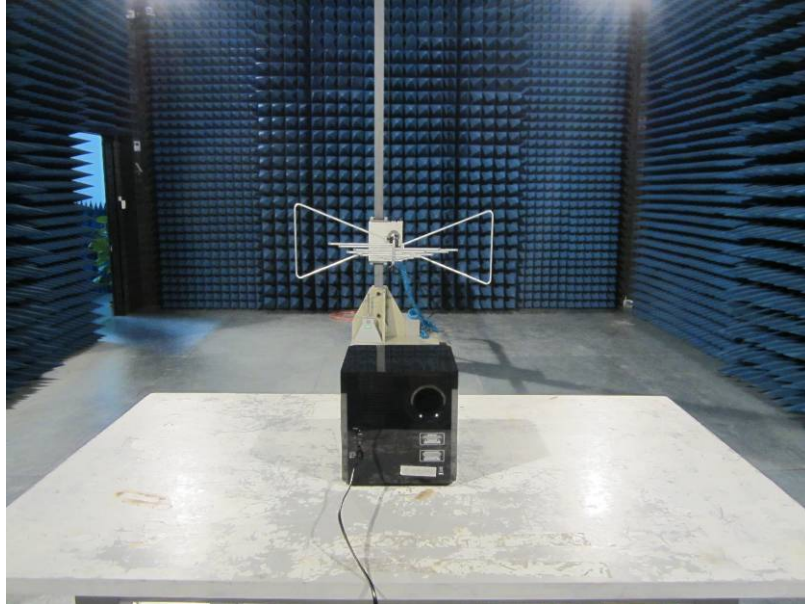
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4933.64	18.78	31.90	8.70	24.05	35.33	54.00	-18.67	Vertical
7400.46	18.69	36.52	11.76	26.90	40.07	54.00	-13.93	Vertical
9867.28	16.11	38.72	14.33	25.29	43.87	54.00	-10.13	Vertical
12334.10	*					54		Vertical
14800.92	*					54		Vertical
4933.64	19.21	31.90	8.70	24.05	35.76	54.00	-18.24	Horizontal
7400.46	19.00	36.52	11.76	26.90	40.38	54.00	-13.62	Horizontal
9867.28	15.51	38.72	14.33	25.29	43.27	54.00	-10.73	Horizontal
12334.10	*					54		Horizontal
14800.92	*					54		Horizontal

Remark:

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Pre-amplifier Factor*
2. *“*”*, means this data is the too weak instrument of signal is unable to test.
3. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

7 Test Setup Photo

Radiated Emission

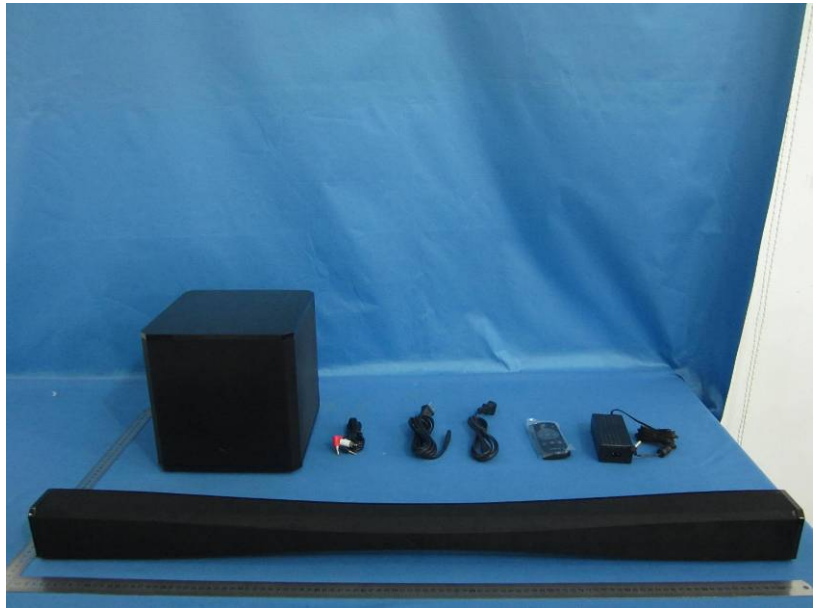


Conducted Emission

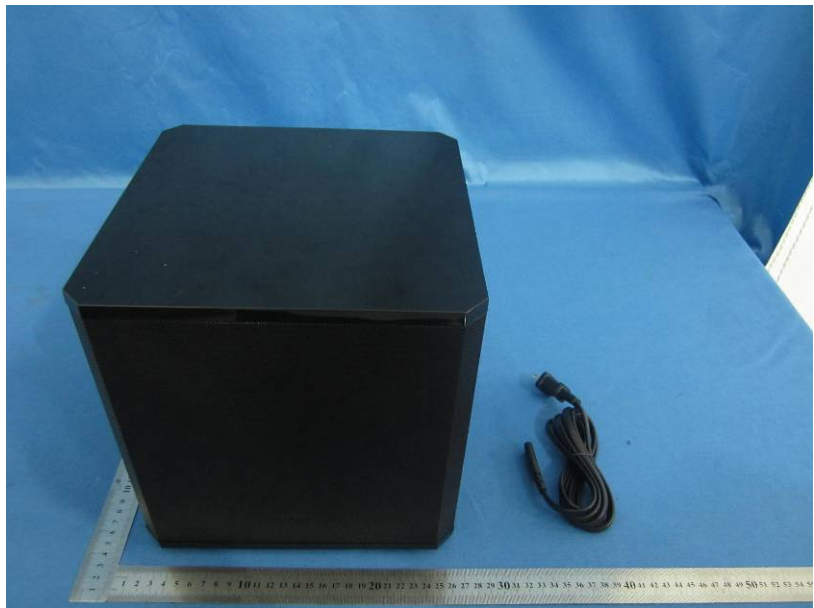


8 EUT Constructional Details

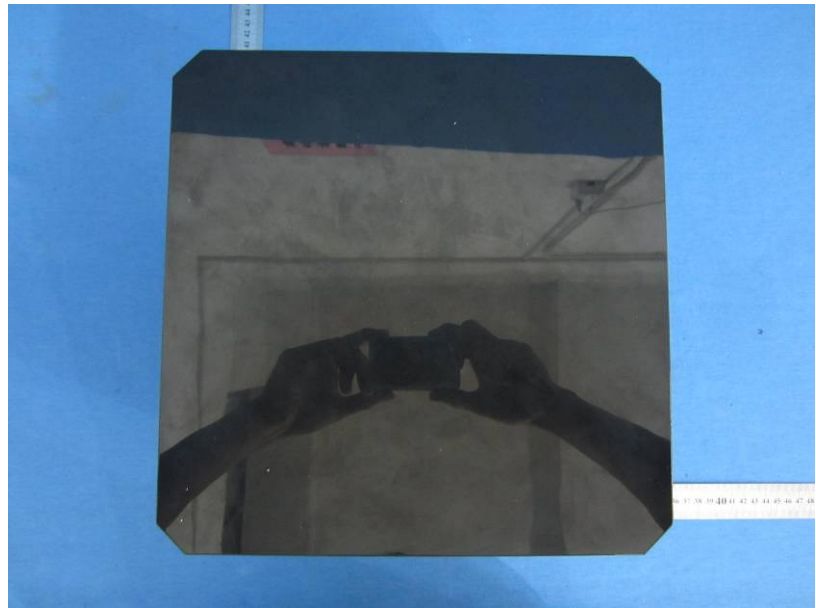
Product View



Product View



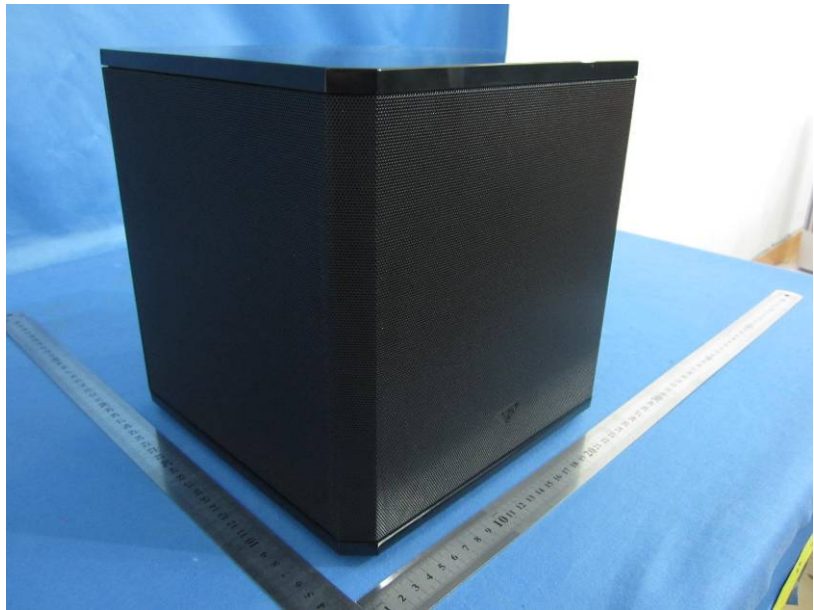
Top



Bottom



Front & Left



Back & Right



Open-1



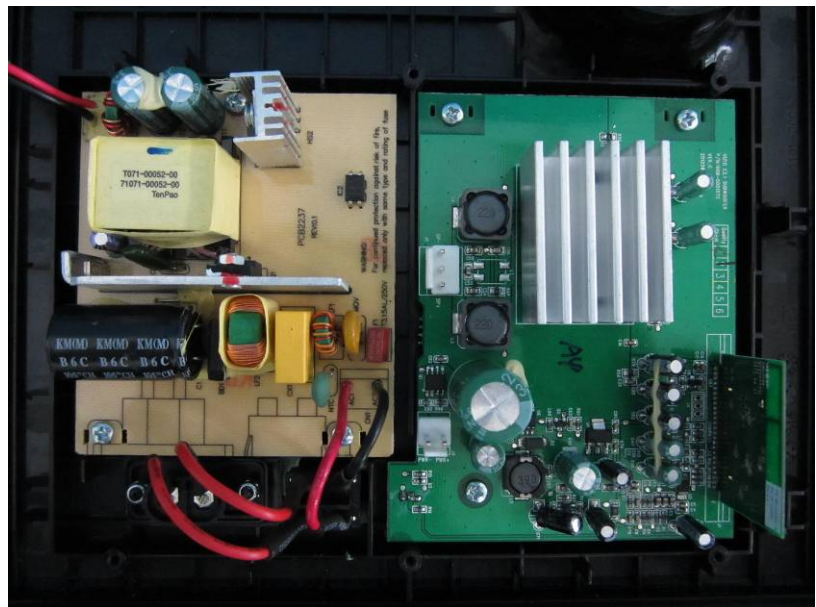
Open-2



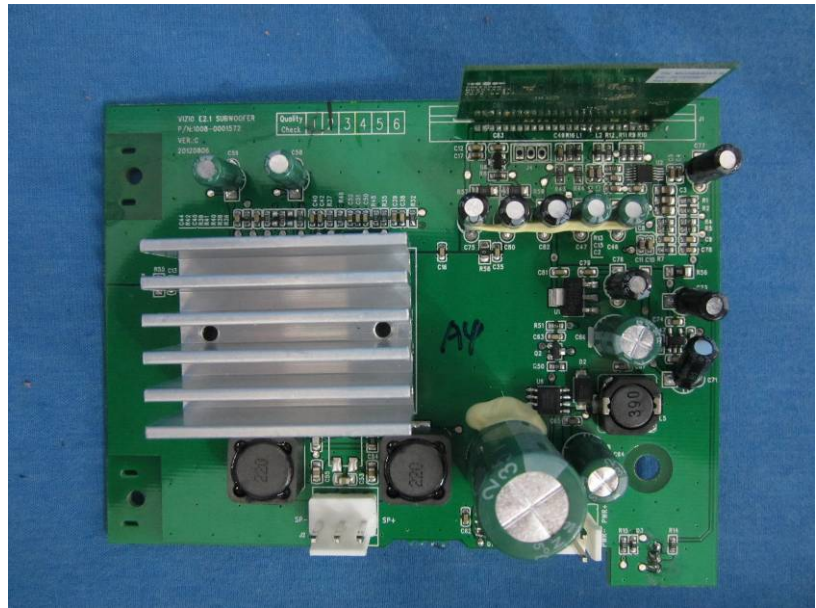
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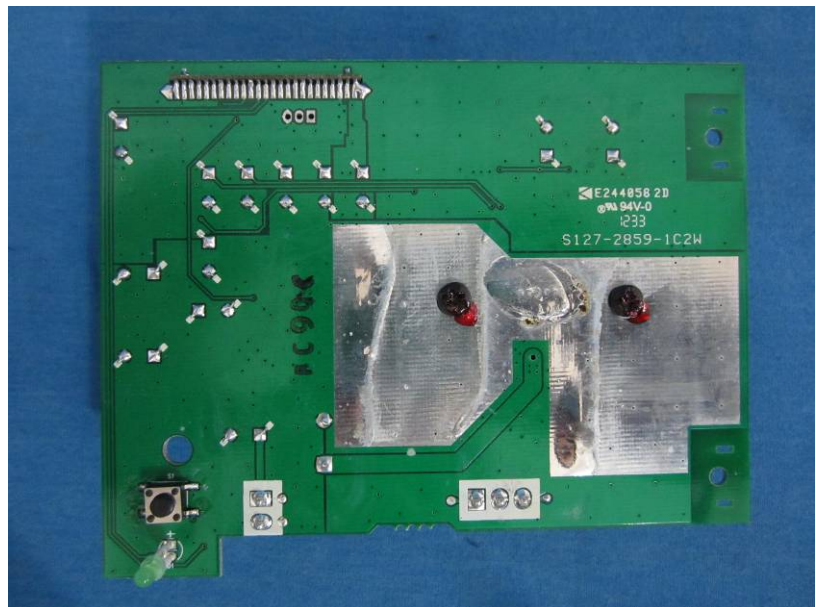
Open-4



Mainboard-1



Mainboard-2



RF Module



RF Module



-----end-----