

IC REPORT (BLE)

Applicant: Aruba Networks, Inc.

Address of Applicant: 1344 Crossman Ave. Sunnyvale, CA 94089-1113, USA

Equipment Under Test (EUT)

Product Name: Aruba BT-101 Location Beacon

Model No.: ARBT0101

Canada IC: 4675A-BT101

Applicable standards: RSS-210 Issue 8, December 2010
RSS-Gen Issue 3, December 2010

Date of sample receipt: 04 Nov., 2014

Date of Test: 05 Nov., to 13 Nov., 2014

Date of report issued: 14 Nov., 2014

Test Result: PASS *

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

Authorized Signature:



Bruce Zhang
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 CCIS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

2 Version

Version No.	Date	Description
00	14 Nov., 2014	Original

Prepared by:

Luna Gao

Date:

14 Nov., 2014

Report Clerk

Reviewed by:

Abomb Yang

Date:

14 Nov., 2014

Project Engineer

3 Contents

	Page
1 COVER PAGE	1
2 VERSION	2
3 CONTENTS	3
4 TEST SUMMARY	4
5 GENERAL INFORMATION	5
5.1 CLIENT INFORMATION.....	5
5.2 GENERAL DESCRIPTION OF E.U.T.....	5
5.3 TEST ENVIRONMENT AND MODE.....	7
5.4 DESCRIPTION OF SUPPORT UNITS.....	7
5.5 LABORATORY FACILITY.....	7
5.6 LABORATORY LOCATION.....	7
5.7 TEST INSTRUMENTS LIST.....	8
6 TEST RESULTS AND MEASUREMENT DATA	9
6.1 ANTENNA REQUIREMENT:.....	9
6.2 CONDUCTED EMISSION.....	10
6.3 CONDUCTED OUTPUT POWER.....	13
6.4 OCCUPY BANDWIDTH.....	15
6.5 POWER SPECTRAL DENSITY.....	18
6.6 BAND EDGE.....	20
6.6.1 Conducted Emission Method.....	20
6.6.2 Radiated Emission Method.....	21
6.7 SPURIOUS EMISSION.....	26
6.7.1 Conducted Emission Method.....	26
6.7.2 Radiated Emission Method.....	28
7 TEST SETUP PHOTO	33
8 EUT CONSTRUCTIONAL DETAILS	35

4 Test Summary

Test Item	Section	Result
Antenna requirement	RSS-210,RSS-GEN	Pass
AC Power Line Conducted Emission	RSS-210,RSS-GEN	Pass
Conducted Peak Output Power	RSS-210,RSS-GEN	Pass
6dB Emission Bandwidth	RSS-210,RSS-GEN	Pass
Power Spectral Density	RSS-210,RSS-GEN	Pass
Band Edge	RSS-210,RSS-GEN	Pass
Spurious Emission	RSS-210,RSS-GEN	Pass

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

5 General Information

5.1 Client Information

Applicant:	Aruba Networks, Inc.
Address of Applicant:	1344 Crossman Ave. Sunnyvale, CA 94089-1113, USA
Manufacturer:	Aruba Networks, Inc.
Address of Manufacturer:	1344 Crossman Ave. Sunnyvale, CA 94089-1113, USA

5.2 General Description of E.U.T.

Product Name:	Aruba BT-101 Location Beacon
Model No.:	ARBT0101
Operation Frequency:	2402-2480 MHz
Channel numbers:	40
Channel separation:	2 MHz
Modulation technology:	GFSK
Data speed :	1Mbps
Antenna Type:	Internal Antenna
Antenna gain:	-2 dBi
Power supply:	DC 5V by USB port

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	10	2422MHz	20	2442MHz	30	2462MHz
1	2404MHz	11	2424MHz	21	2444MHz	31	2464MHz
2	2406MHz	12	2426MHz	22	2446MHz	32	2466MHz
3	2408MHz	13	2428MHz	23	2448MHz	33	2468MHz
4	2410MHz	14	2430MHz	24	2450MHz	34	2470MHz
5	2412MHz	15	2432MHz	25	2452MHz	35	2472MHz
6	2414MHz	16	2434MHz	26	2454MHz	36	2474MHz
7	2416MHz	17	2436MHz	27	2456MHz	37	2476MHz
8	2418MHz	18	2438MHz	28	2458MHz	38	2478MHz
9	2420MHz	19	2440MHz	29	2460MHz	39	2480MHz

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	2402MHz
The middle channel	2442MHz
The Highest channel	2480MHz

5.3 Test environment and mode

Operating Environment:	
Temperature:	24.0 °C
Humidity:	54 % RH
Atmospheric Pressure:	1010 mbar
Test mode:	
Operation mode	Keep the EUT in continuous transmitting with modulation
<p>The sample was placed 0.8m above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. Duty cycle setting during the transmission is 100% with maximum power setting for all modulations.</p>	

5.4 Description of Support Units

N/A

5.5 Laboratory Facility

<p>The test facility is recognized, certified, or accredited by the following organizations:</p> <ul style="list-style-type: none"> ● FCC - Registration No.: 817957 Shenzhen Zhongjian Nanfang Testing Co., Ltd. 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 out files. Registration 817957, February 27, 2012. ● IC - Registration No.: 10106A-1 The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1. ● CNAS - Registration No.: CNAS L6048 Shenzhen Zhongjian Nanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.
--

5.6 Laboratory Location

<p>Shenzhen Zhongjian Nanfang Testing Co., Ltd. Address: No. B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road, Bao'an District, Shenzhen, Guangdong, China Tel: +86-755-23118282 Fax: +86-755-23116366</p>

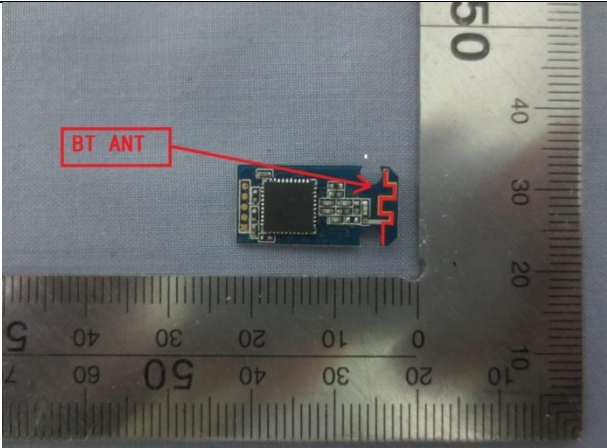
5.7 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
1	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	CCIS0005	04-19-2014	04-19-2015
2	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	CCIS0006	04-19-2014	04-19-2015
3	Amplifier (10kHz-1.3GHz)	HP	8447D	CCIS0003	04-01-2014	03-31-2015
4	Amplifier (1GHz-18GHz)	Compliance Direction Systems Inc.	PAP-1G18	CCIS0011	06-09-2014	06-08-2015
5	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	04-01-2014	03-31-2015
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	03-30-2014	03-29-2015
7	Spectrum analyzer 9k-30GHz	Rohde & Schwarz	FSP	CCIS0023	04-19-2014	04-19-2015
8	EMI Test Receiver	Rohde & Schwarz	ESPI	CCIS0022	04-01-2014	03-31-2015
9	Loop antenna	Laplace instrument	RF300	EMC0701	04-01-2014	03-31-2015
10	Signal Analyzer	Rohde & Schwarz	FSIQ3	CCIS0088	04-19-2014	04-19-2015

Conducted Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
1	Shielding Room	ZhongShuo Electron	11.0(L)x4.0(W)x3.0(H)	CCIS0061	10-10-2012	10-09-2015
2	EMI Test Receiver	Rohde & Schwarz	ESCI	CCIS0002	04-10-2014	04-10-2015
3	LISN	CHASE	MN2050D	CCIS0074	04-10-2014	04-10-2015
4	Coaxial Cable	CCIS	N/A	CCIS0086	04-01-2014	03-31-2015
5	EMI Test Software	AUDIX	E3	N/A	N/A	N/A

6 Test results and Measurement Data

6.1 Antenna requirement:

Standard requirement:	RSS Gen section 7.1.2
<p>A transmitter can only be sold or operated with antennas with which it was approved. Transmitter may be approved with multiple antenna types. An antenna type comprises antennas having similar in-band and out-of-band radiation patterns. Testing shall be performed using the highest gain antenna of each combination of transmitter and antenna type for which approval is being sought, with the transmitter output power set at the maximum level. Any antenna of the same type having equal or lesser gain as an antenna that had been successfully tested with the transmitter, will also be considered approved with the transmitter, and may be used and marketed with the transmitter. For Category I transmitters, the manufacturer shall include with the application for certification a list of acceptable antenna types to be used with the transmitter.</p> <p>When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on measurement or on data from the antenna manufacturer.</p> <p>For transmitters of RF output power of 10 milliwatts or less, only the portion of the antenna gain that is in excess of 6 dBi (6 dB above isotropic gain) shall be added to the measured RF output power to demonstrate compliance with the radiated power limits specified in the applicable standard. For transmitters of output power greater than 10 milliwatts, the total antenna gain shall be added to the measured RF output power to demonstrate compliance to the specified radiated power limits.</p> <p><i>User manuals for transmitters shall display the following notice in a conspicuous location:</i> <i>Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.</i></p> <p>The above notice may be affixed to the device instead of displayed in the user manual.</p> <p>User manuals for transmitters equipped with detachable antennas shall also contain the following notice in a conspicuous location: <i>This radio transmitter (identify the device by certification number, or model number if Category II) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.</i></p> <p>Immediately following the above notice, the manufacturer shall provide a list of all antenna types approved for use with the transmitter, indicating the maximum permissible antenna gain (in dBi) and required impedance for each.</p>	
E.U.T Antenna:	
<p><i>The Bluetooth antenna is a PCB antenna which cannot replace by end-user, the best case gain of the antenna is -2 dBi.</i></p>	
	

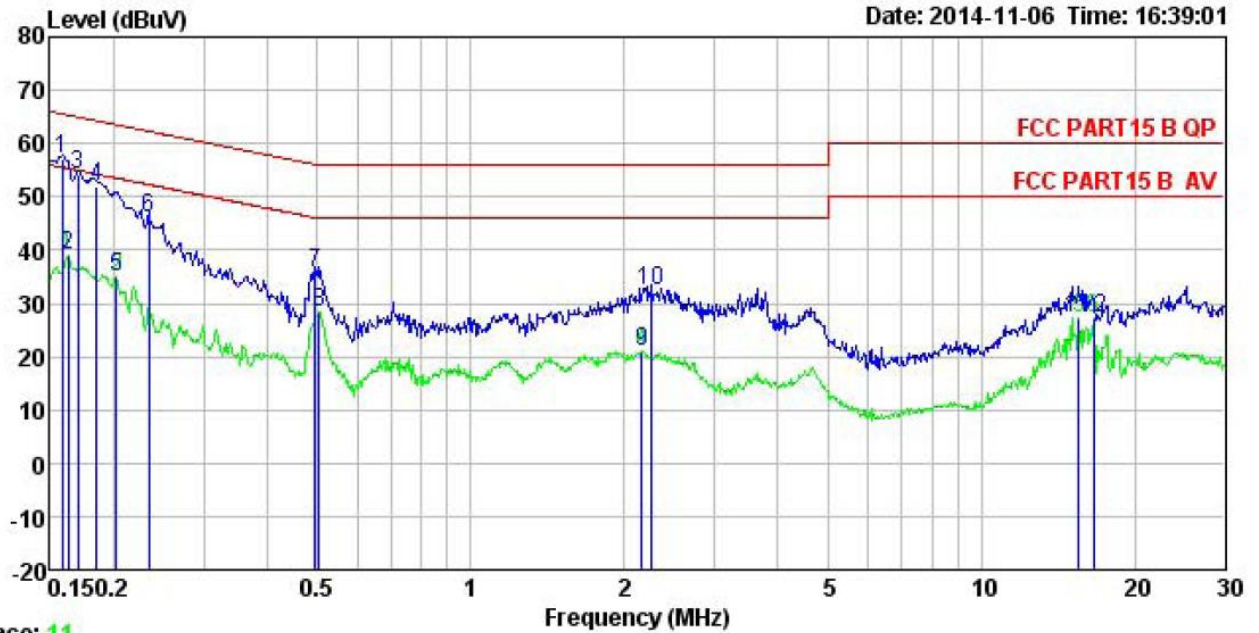
6.2 Conducted Emission

Test Requirement:	RSS Gen section 7.1.4														
Test Method:	ANSI C63.4: 2003														
Test Frequency Range:	150 kHz to 30 MHz														
Class / Severity:	Class B														
Receiver setup:	RBW=9kHz, VBW=30kHz														
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 procedure	<ol style="list-style-type: none"> The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.), which provides a 50ohm/50uH coupling impedance for the measuring equipment. 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). 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 setup:	<p><i>Remark</i> <i>E.U.T: Equipment Under Test</i> <i>LISN: Line Impedance Stabilization Network</i> <i>Test table height=0.8m</i></p>														
Test Instruments:	Refer to section 5.7 for details														
Test mode:	Refer to section 5.3 for details														
Test results:	Passed														

Measurement Data

Neutral:

Date: 2014-11-06 Time: 16:39:01

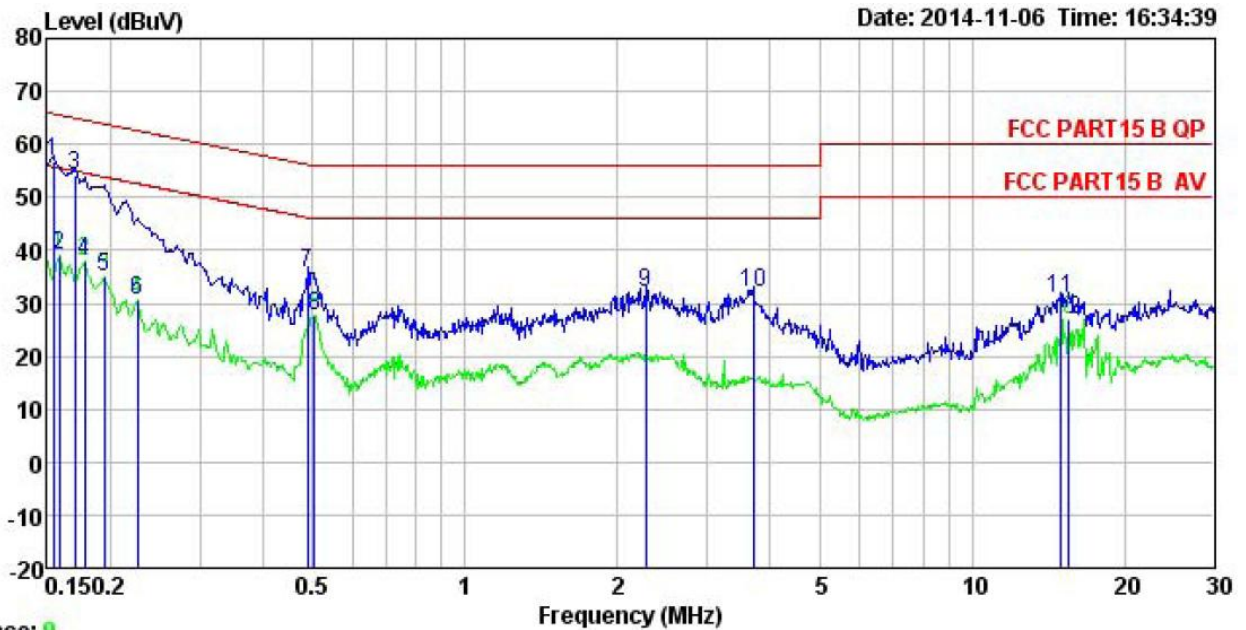


Trace: 11

Site : CCIS Shielding Room
 Condition : FCC PART15 B QP LISN NEUTRAL
 Model : ARBT0101
 Test Mode : BLE mode
 Power Rating : DC 5W
 Environment : Temp: 23 °C Humi:56% Atmos:101KPa
 Test Engineer: Wendell
 Remark :

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.158	45.92	0.25	10.78	56.95	65.56	-8.61	QP
2	0.162	28.15	0.25	10.77	39.17	55.34	-16.17	Average
3	0.170	43.01	0.25	10.77	54.03	64.94	-10.91	QP
4	0.185	40.99	0.25	10.77	52.01	64.24	-12.23	QP
5	0.202	23.83	0.25	10.76	34.84	53.54	-18.70	Average
6	0.234	35.13	0.25	10.75	46.13	62.30	-16.17	QP
7	0.497	24.68	0.29	10.76	35.73	56.05	-20.32	QP
8	0.505	17.46	0.29	10.76	28.51	46.00	-17.49	Average
9	2.167	9.73	0.29	10.95	20.97	46.00	-25.03	Average
10	2.261	21.27	0.29	10.95	32.51	56.00	-23.49	QP
11	15.552	16.13	0.25	10.90	27.28	50.00	-22.72	Average
12	16.573	15.92	0.25	10.91	27.08	50.00	-22.92	Average

Line:



Trace: 9

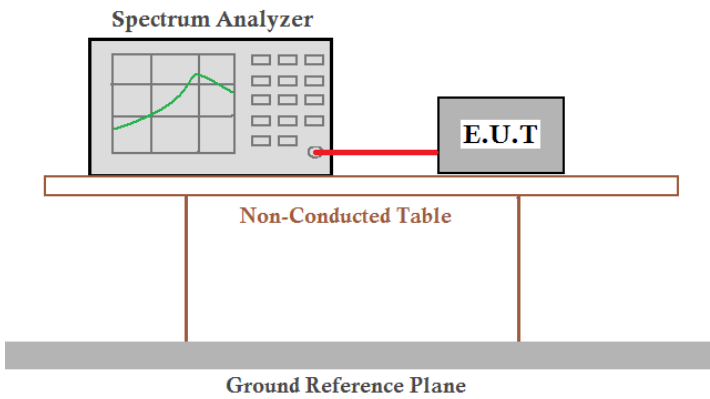
Site : CCIS Shielding Room
 Condition : FCC PART15 B QP LISN LINE
 Model : ARBT0101
 Test Mode : BLE mode
 Power Rating : DC 5V
 Environment : Temp: 23 °C Humi:56% Atmos:101KPa
 Test Engineer: Wendell
 Remark :

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.154	45.65	0.27	10.78	56.70	65.78	-9.08	QP
2	0.158	27.88	0.27	10.78	38.93	55.56	-16.63	Average
3	0.170	43.25	0.27	10.77	54.29	64.94	-10.65	QP
4	0.178	26.88	0.28	10.77	37.93	54.59	-16.66	Average
5	0.194	24.05	0.28	10.76	35.09	53.84	-18.75	Average
6	0.226	19.36	0.27	10.75	30.38	52.61	-22.23	Average
7	0.489	24.81	0.29	10.76	35.86	56.19	-20.33	QP
8	0.505	16.62	0.29	10.76	27.67	46.00	-18.33	Average
9	2.273	20.95	0.26	10.95	32.16	56.00	-23.84	QP
10	3.700	20.92	0.28	10.90	32.10	56.00	-23.90	QP
11	14.986	19.88	0.32	10.90	31.10	60.00	-28.90	QP
12	15.552	15.62	0.32	10.90	26.84	50.00	-23.16	Average

Notes:

1. An initial pre-scan was performed on the live 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

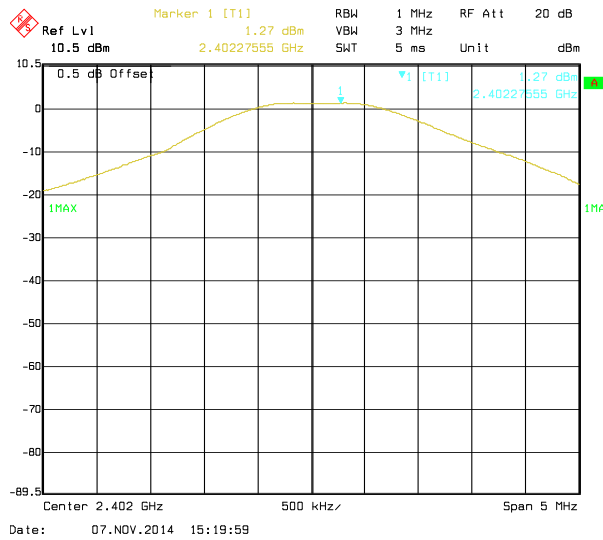
6.3 Conducted Output Power

Test Requirement:	RSS-210 A8.4 section 4
Test Method:	RSS-Gen section 4.8
Limit:	30dBm
Test setup:	
Test Instruments:	Refer to section 5.7 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed
Remark:	Test method refer to KDB558074 v03r01 (DTS Measure Guidance) section 9.2.2.2

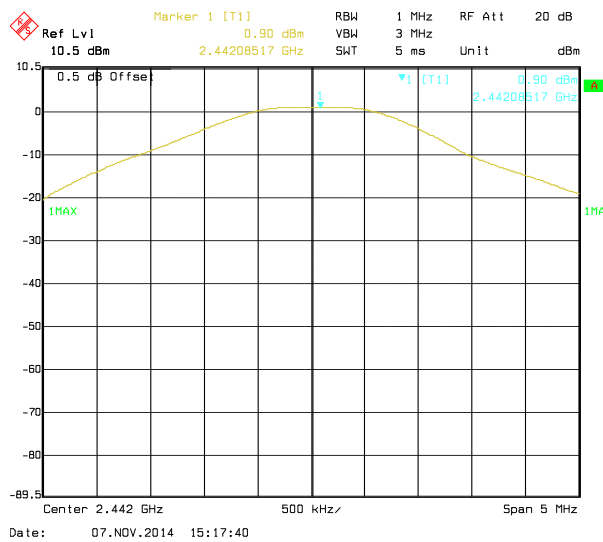
Measurement Data

Test CH	Maximum Conducted Output Power (dBm)	Limit(dBm)	Result
Lowest	1.27	30.00	Pass
Middle	0.90		
Highest	0.14		

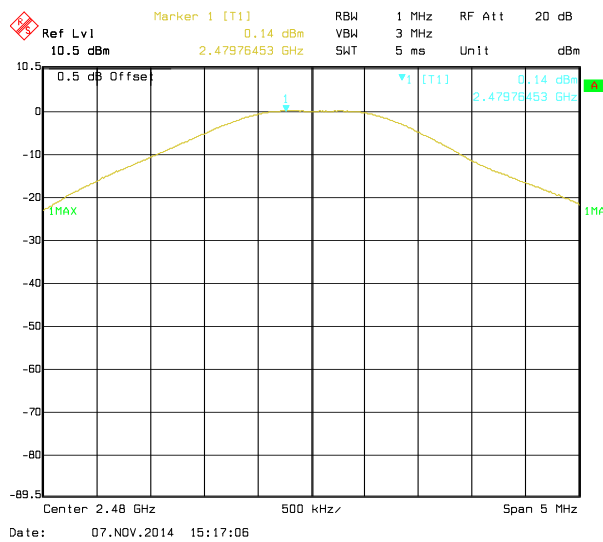
Test plot as follows:



Lowest channel



Middle channel



Highest channel

6.4 Occupy Bandwidth

Test Requirement:	RSS-210 section A8.2(a)
Test Method:	RSS-Gen section 4.6.2
Limit:	>500kHz
Test setup:	<p>The diagram illustrates the test setup. A Spectrum Analyzer is connected via a red cable to an E.U.T. (Equipment Under Test) box. Both are placed on a Non-Conducted Table. 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:	Passed

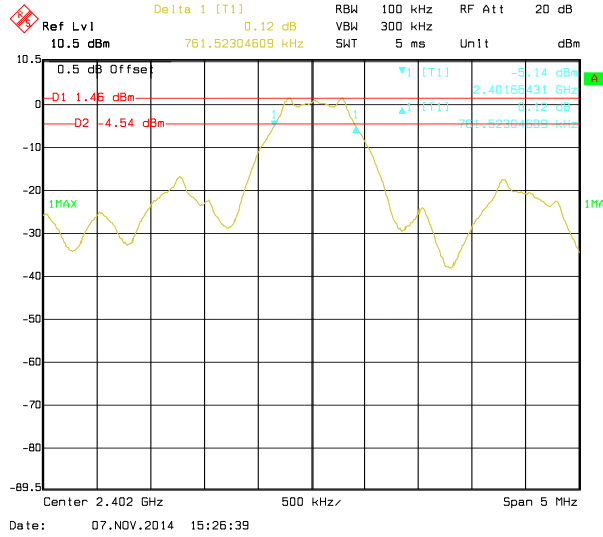
Measurement Data

Test CH	6dB Emission Bandwidth (MHz)	Limit(kHz)	Result
Lowest	0.76	>500	Pass
Middle	0.74		
Highest	0.75		

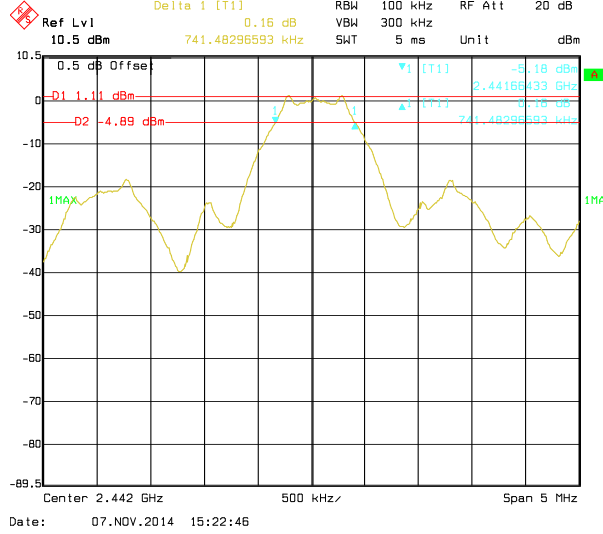
Test CH	99% Occupy Bandwidth (MHz)	Limit(kHz)	Result
Lowest	3.06	N/A	N/A
Middle	2.97		
Highest	1.26		

Test plot as follows:

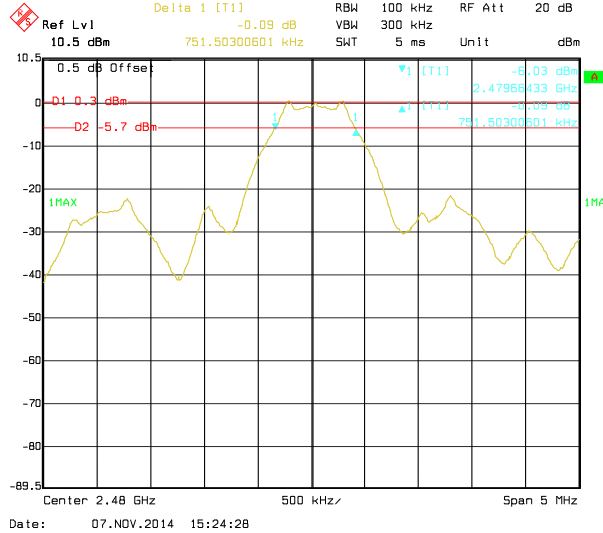
Test mode:6dB EBW



Lowest channel

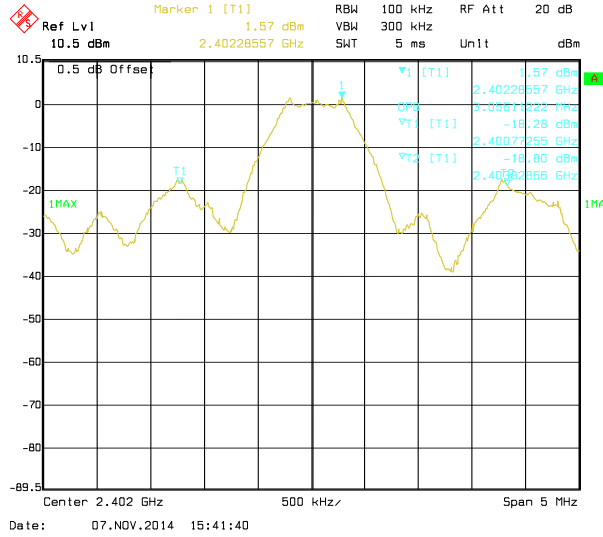


Middle channel

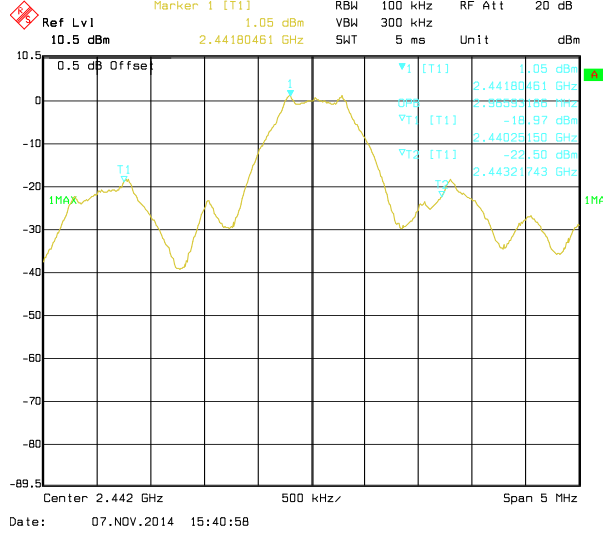


Highest channel

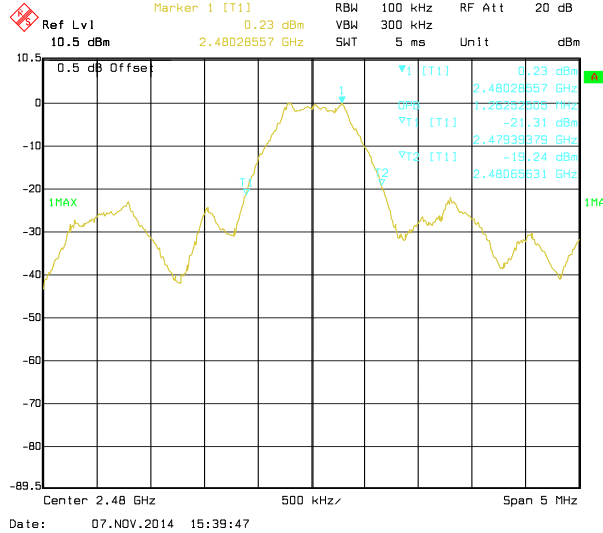
Test mode:99% OBW



Lowest channel

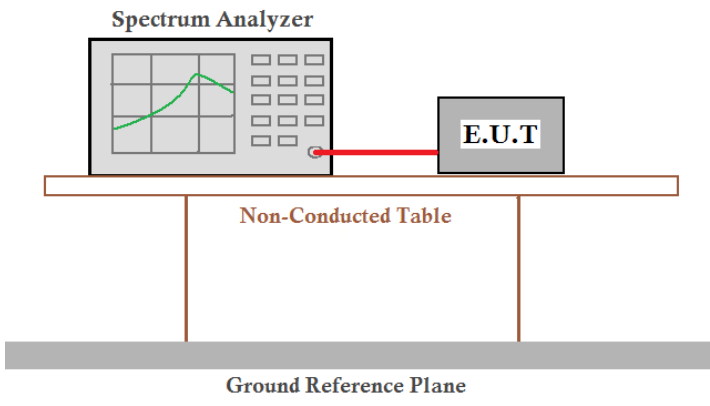


Middle channel



Highest channel

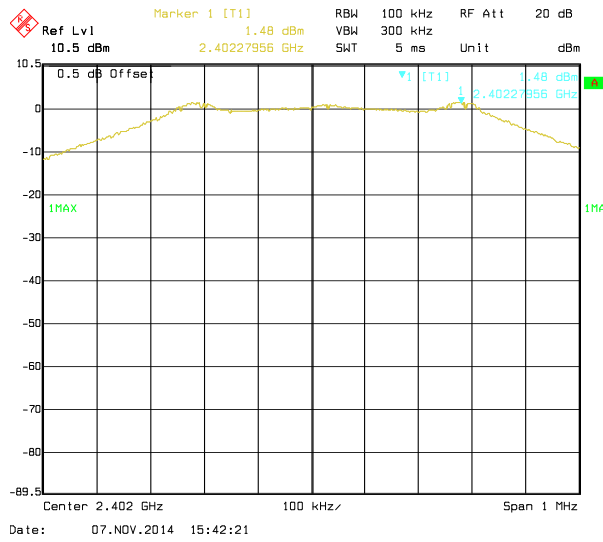
6.5 Power Spectral Density

Test Requirement:	RSS-210 section A8.2 (b)
Test Method:	RSS-210 section A8.2 (b) and KDB558074
Limit:	8 dBm
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:	Passed

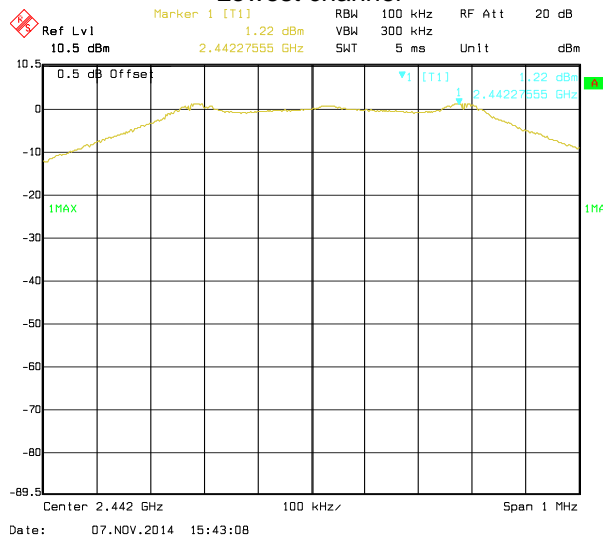
Measurement Data

Test CH	Power Spectral Density (dBm)	Limit(dBm)	Result
Lowest	1.48	8.00	Pass
Middle	1.22		
Highest	0.47		

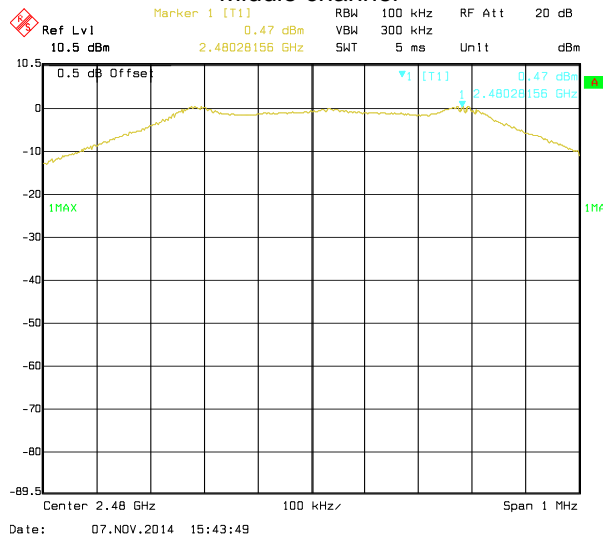
Test plots as follow:



Lowest channel



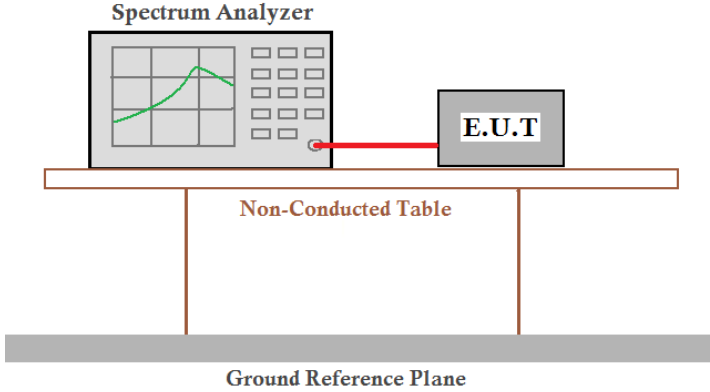
Middle channel



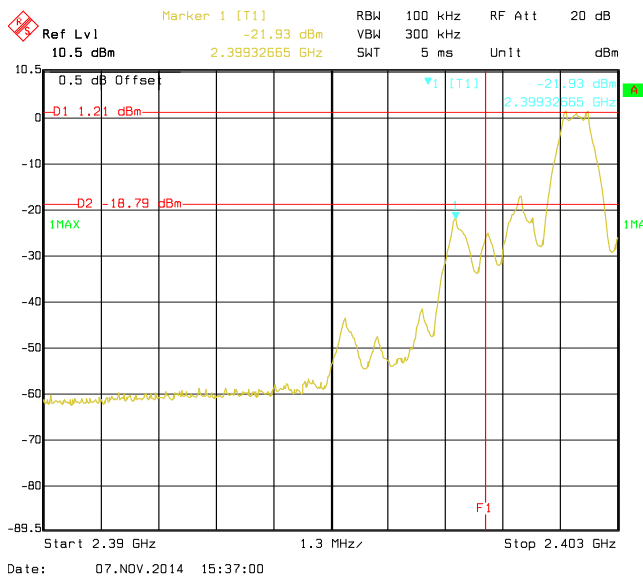
Highest channel

6.6 Band Edge

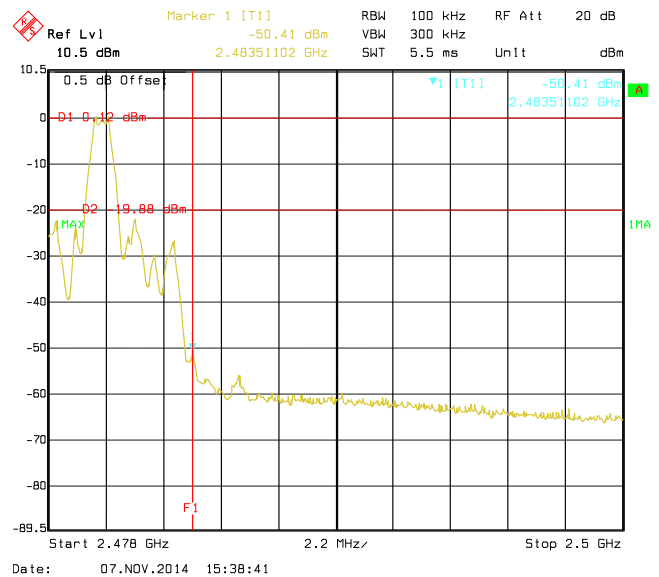
6.6.1 Conducted Emission Method

Test Requirement:	RSS-210 section A8.5
Test Method:	RSS-210 section A8.5
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:	Passed

Test plots as follow:



Lowest channel



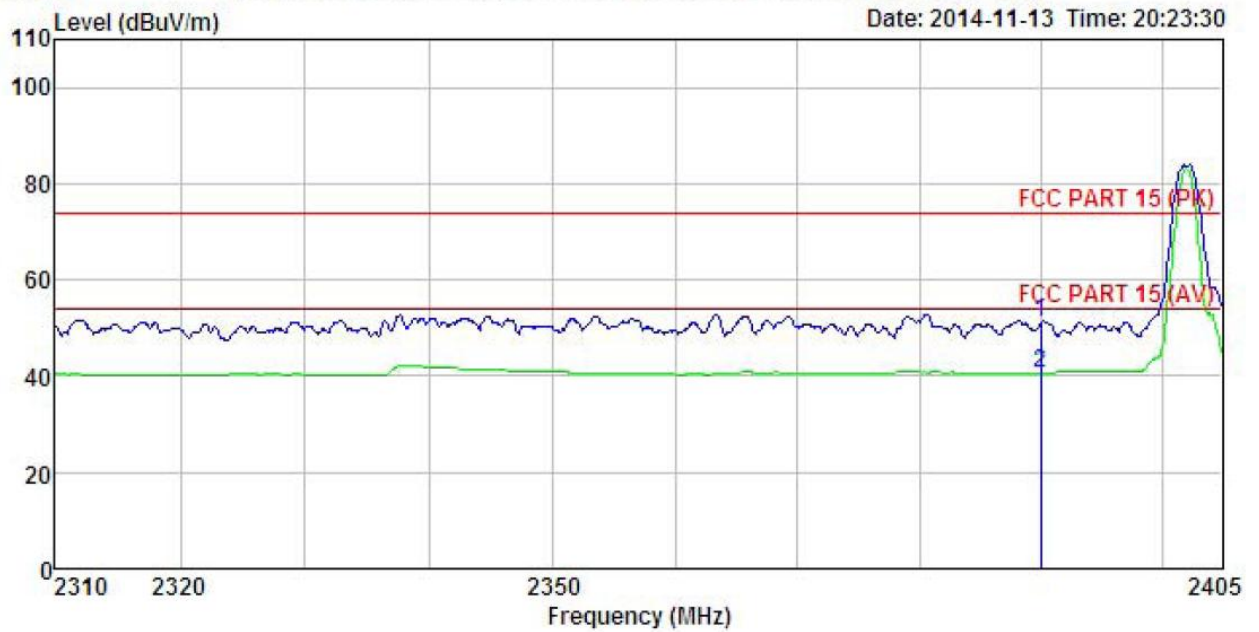
Highest channel

6.6.2 Radiated Emission Method

Test Requirement:	RSS-210 section A8.5														
Test Method:	RSS-Gen section 4.9														
Test Frequency Range:	2.3GHz to 2.5GHz														
Test site:	Measurement Distance: 3m														
Receiver setup:	<table border="1"> <thead> <tr> <th>Frequency</th> <th>Detector</th> <th>RBW</th> <th>VBW</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Above 1GHz</td> <td>Peak</td> <td>1MHz</td> <td>3MHz</td> <td>Peak Value</td> </tr> <tr> <td>Peak</td> <td>1MHz</td> <td>10Hz</td> <td>Average Value</td> </tr> </tbody> </table>	Frequency	Detector	RBW	VBW	Remark	Above 1GHz	Peak	1MHz	3MHz	Peak Value	Peak	1MHz	10Hz	Average Value
	Frequency	Detector	RBW	VBW	Remark										
	Above 1GHz	Peak	1MHz	3MHz	Peak Value										
Peak		1MHz	10Hz	Average Value											
Limit:	<table border="1"> <thead> <tr> <th>Frequency</th> <th>Limit (dBuV/m @3m)</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Above 1GHz</td> <td>54.00</td> <td>Average Value</td> </tr> <tr> <td>74.00</td> <td>Peak Value</td> </tr> </tbody> </table>	Frequency	Limit (dBuV/m @3m)	Remark	Above 1GHz	54.00	Average Value	74.00	Peak Value						
	Frequency	Limit (dBuV/m @3m)	Remark												
	Above 1GHz	54.00	Average Value												
74.00		Peak Value													
Test Procedure:	<ol style="list-style-type: none"> 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. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 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. 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. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. If the emission level of the EUT in peak mode was 10 dB 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 10 dB 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 setup:															
Test Instruments:	Refer to section 5.7 for details														
Test mode:	Refer to section 5.3 for details														
Test results:	Passed														

Test channel: Lowest

Horizontal:

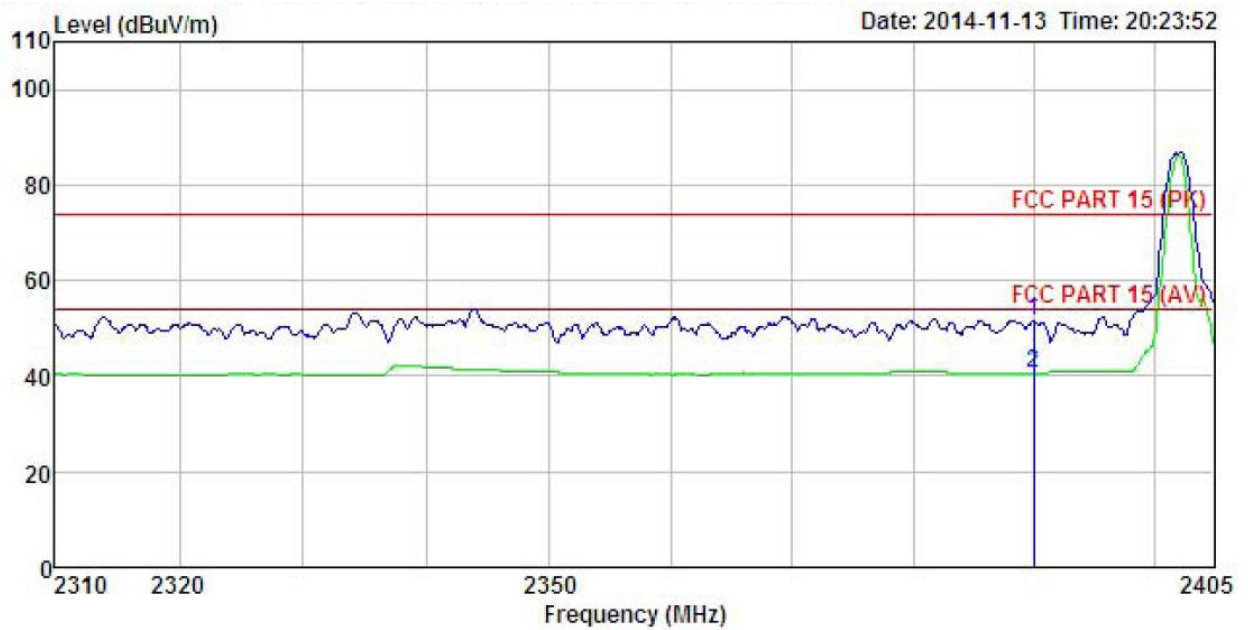


Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
 Model : ARBT0101
 Test mode : BLE-L Mode
 Power Rating : DC 5V
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Wendell
 REMARK :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2390.000	17.84	27.58	5.67	0.00	51.09	74.00	-22.91	Peak
2	2390.000	7.28	27.58	5.67	0.00	40.53	54.00	-13.47	Average

Test channel: Lowest

Vertical:

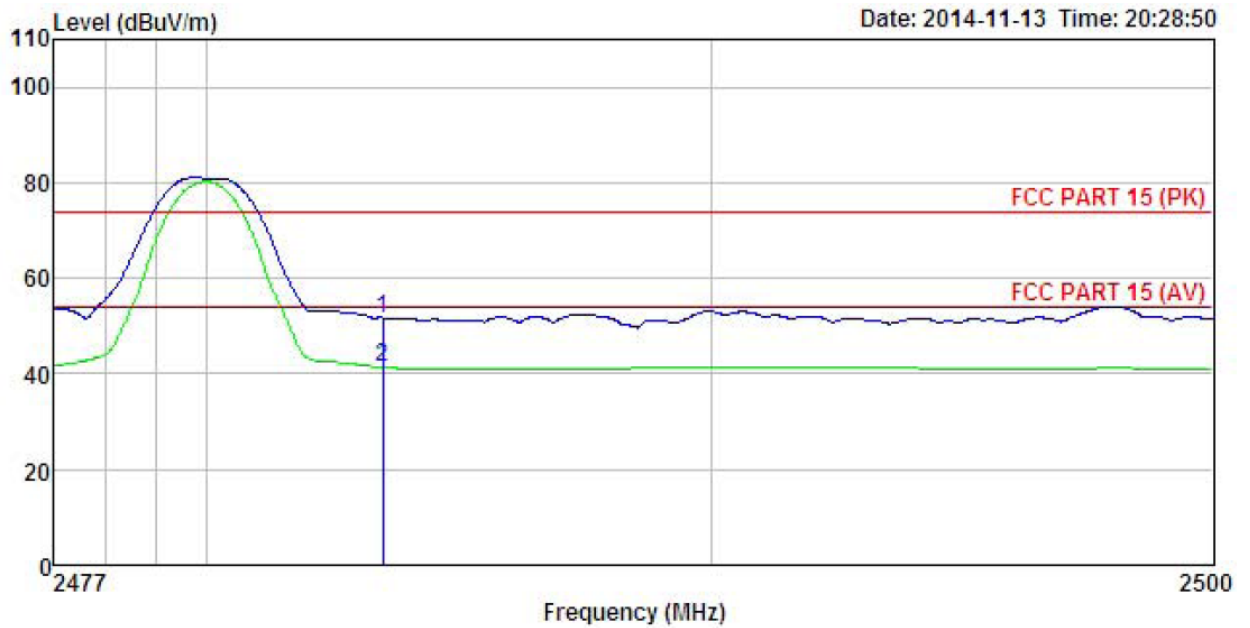


Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
 Model : ARBT0101
 Test mode : BLE-L Mode
 Power Rating : DC 5V
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Wendell
 REMARK :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2390.000	18.27	27.58	5.67	0.00	51.52	74.00	-22.48	Peak
2	2390.000	7.30	27.58	5.67	0.00	40.55	54.00	-13.45	Average

Test channel: Highest

Horizontal:

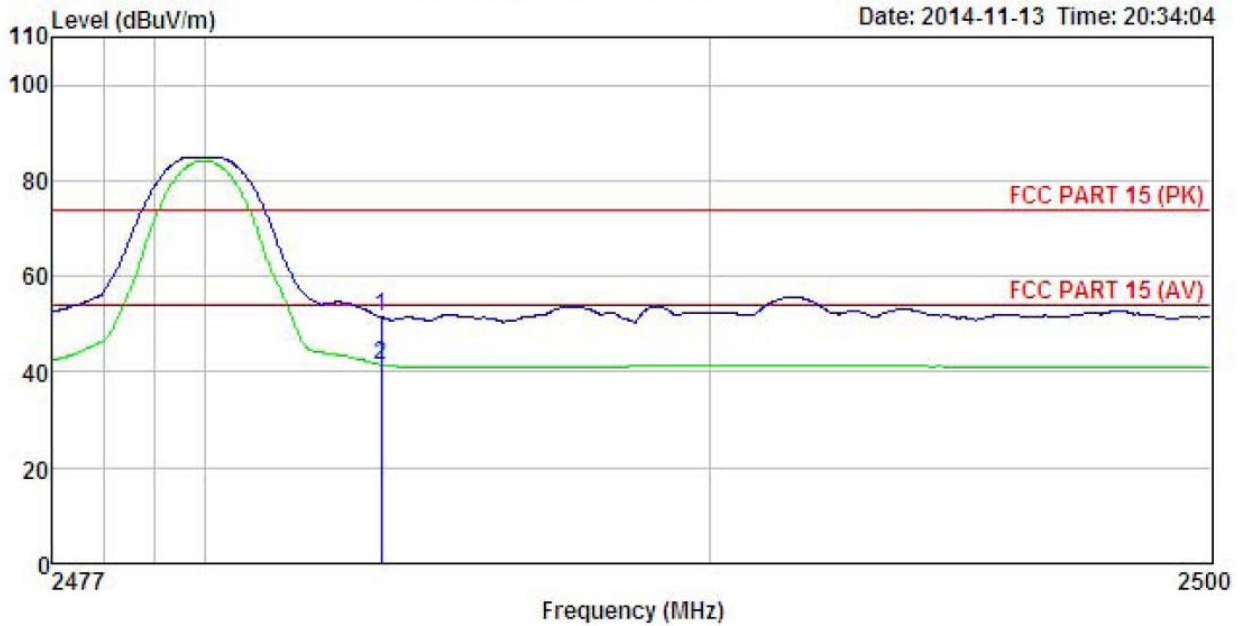


Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
 Model : ARBT0101
 Test mode : BLE-H Mode
 Power Rating : DC 5V
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Wendell
 REMARK :

	Read	Antenna	Cable	Preamp	Limit	Over	
Freq	Level	Factor	Loss	Factor	Line	Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	2483.500	18.53	27.52	5.70	0.00	51.75	74.00 -22.25 Peak
2	2483.500	8.10	27.52	5.70	0.00	41.32	54.00 -12.68 Average

Test channel: Highest

Vertical:

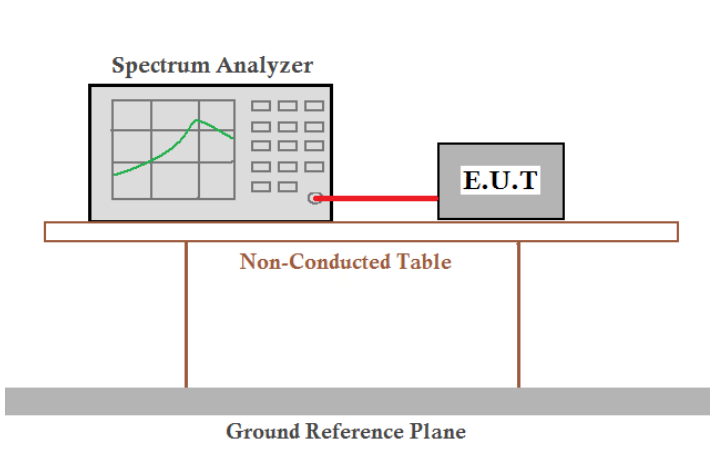


Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
 Model : ARBT0101
 Test mode : BLE-H Mode
 Power Rating : DC 5V
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Wendell
 REMARK :

	Read	Antenna	Cable	Preamp	Limit	Over	
Freq	Level	Factor	Loss	Factor	Line	Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	2483.500	18.24	27.52	5.70	0.00	51.46	74.00 -22.54 Peak
2	2483.500	8.30	27.52	5.70	0.00	41.52	54.00 -12.48 Average

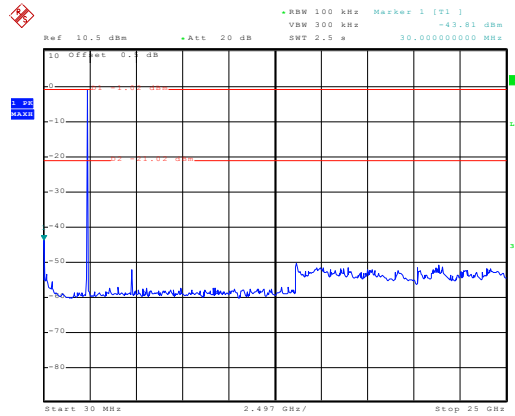
6.7 Spurious Emission

6.7.1 Conducted Emission Method

Test Requirement:	RSS-210 section A8.5
Test Method:	RSS-210 section A8.5
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 the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by two legs and sits on 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:	Passed

Test plot as follows:

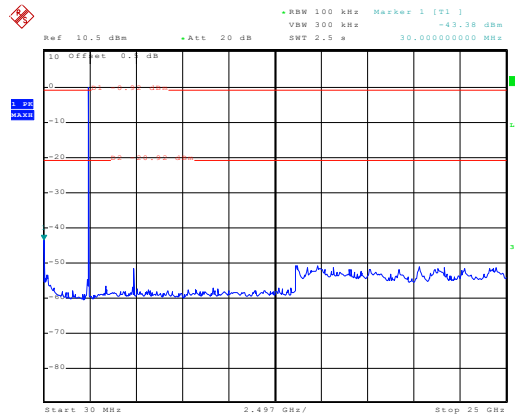
Lowest channel



Date: 10.NOV.2014 13:33:56

30MHz~25GHz

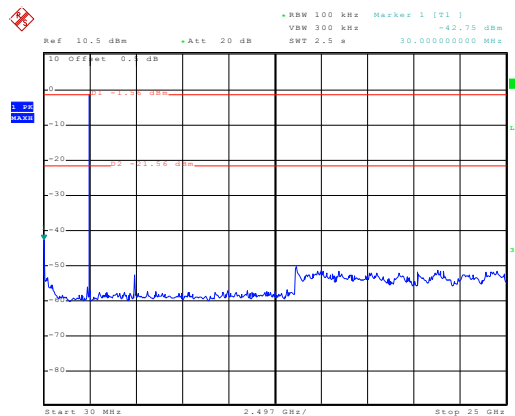
Middle channel



Date: 10.NOV.2014 13:34:46

30MHz~25GHz

Highest channel

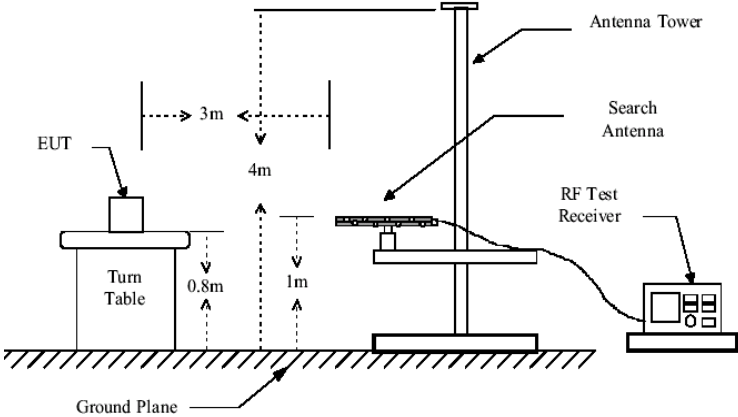
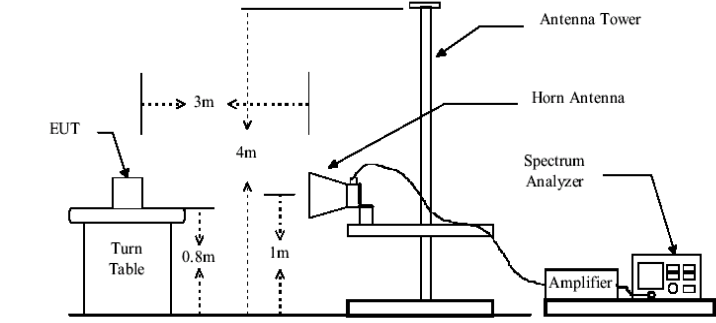


Date: 10.NOV.2014 13:35:41

30MHz~25GHz

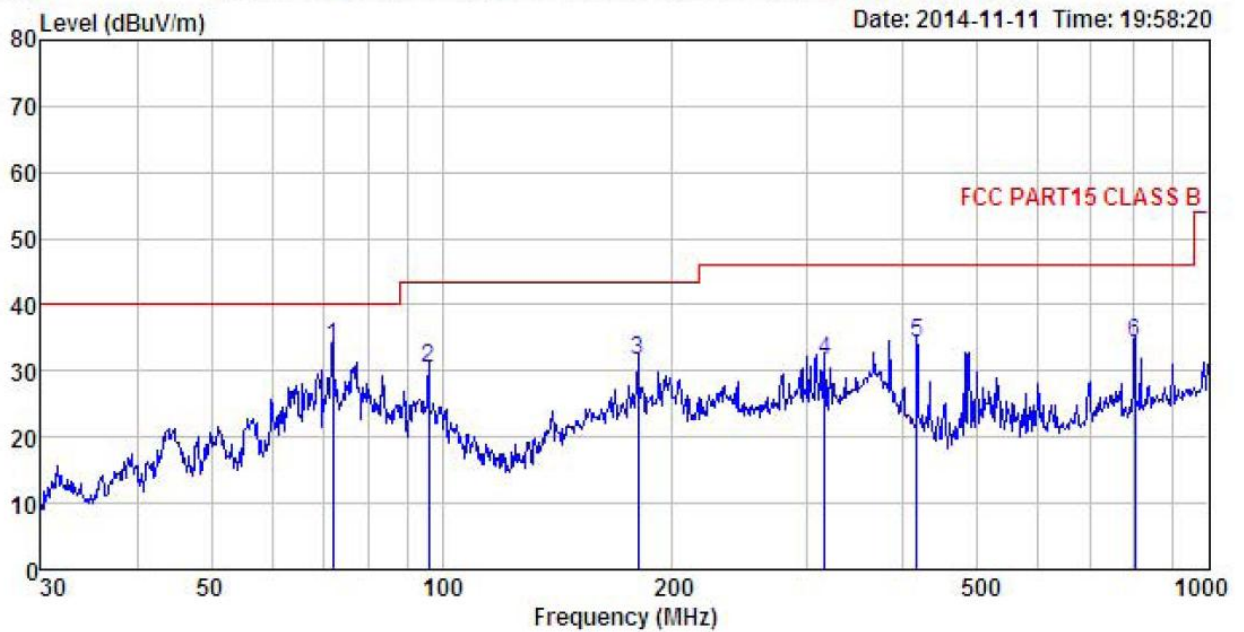
6.7.2 Radiated Emission Method

Test Requirement:	RSS-Gen section 4.9				
Test Method:	RSS-Gen section 4.9				
Test Frequency Range:	9KHz to 25GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		Peak	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 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 10 dB 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 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. 				

<p>Test setup:</p>	<p>Below 1GHz</p>  <p>Above 1GHz</p> 
<p>Test Instruments:</p>	<p>Refer to section 5.7 for details</p>
<p>Test mode:</p>	<p>Refer to section 5.3 for details</p>
<p>Test results:</p>	<p>Passed</p>
<p>Remark:</p>	<ol style="list-style-type: none"> 1. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis is the worst case. 2. 9 kHz to 30MHz is too low, so only shows the data of above 30MHz in this report.

Below 1GHz

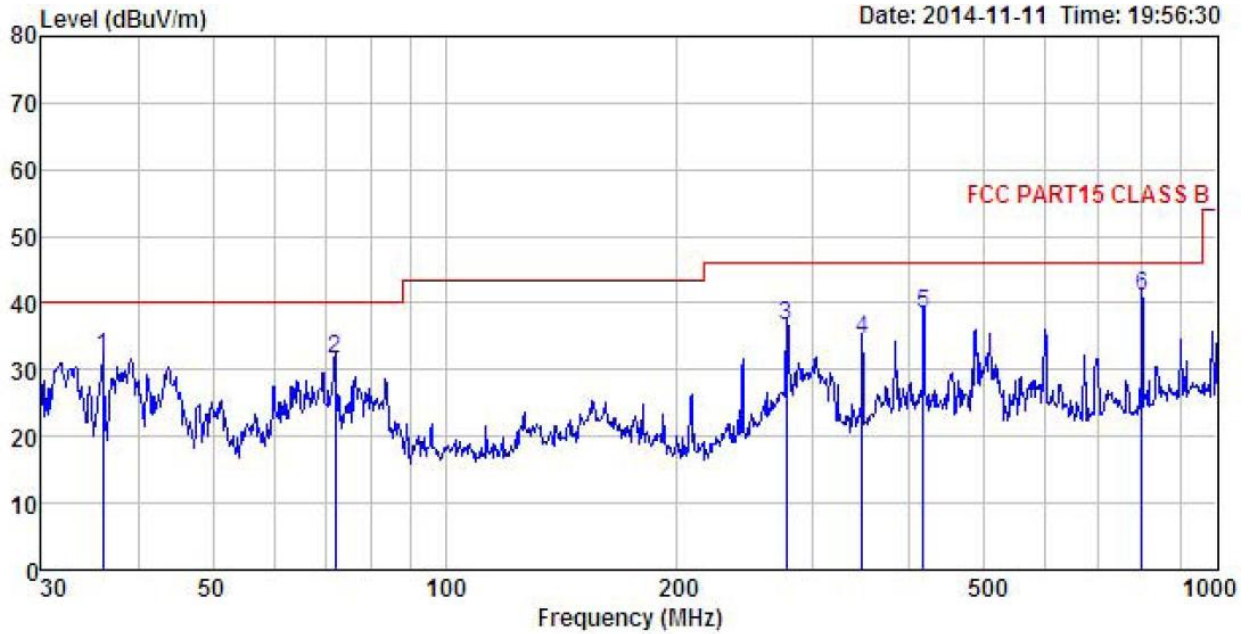
Horizontal:



Site : 3m chamber
 Condition : FCC PART15 CLASS B 3m VULB9163(30M1G) HORIZONTAL
 Model : ARBT0101
 Test mode : BLE Mode
 Power Rating : DC 5V
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Wendell
 REMARK :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	72.084	54.32	8.26	0.80	29.70	33.68	40.00	-6.32	QP
2	96.099	46.05	12.90	0.94	29.55	30.34	43.50	-13.16	QP
3	180.017	49.39	9.68	1.36	28.97	31.46	43.50	-12.04	QP
4	315.481	45.03	13.28	1.82	28.49	31.64	46.00	-14.36	QP
5	416.179	45.53	15.39	2.16	28.81	34.27	46.00	-11.73	QP
6	801.786	39.15	20.06	3.17	28.19	34.19	46.00	-11.81	QP

Vertical:



Site : 3m chamber
 Condition : FCC PART15 CLASS B 3m VULB9163(30M1G) VERTICAL
 Model : ARBT0101
 Test mode : BLE Mode
 Power Rating : DC 5V
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Wendell
 REMARK :

	Read	Antenna	Cable	Preamp	Limit	Over	
Freq	Level	Factor	Loss	Factor	Line	Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	36.001	48.67	12.58	0.49	29.94	31.80	40.00 -8.20 QP
2	72.084	52.23	8.26	0.80	29.70	31.59	40.00 -8.41 QP
3	277.094	50.71	12.59	1.70	28.49	36.51	46.00 -9.49 QP
4	346.809	46.81	14.22	1.93	28.55	34.41	46.00 -11.59 QP
5	416.179	49.75	15.39	2.16	28.81	38.49	46.00 -7.51 QP
6	798.980	45.93	20.06	3.17	28.20	40.96	46.00 -5.04 QP

Above 1GHz

Test channel:			Lowest		Level:		Peak	
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
4804.00	55.61	31.53	8.90	40.24	55.80	74.00	-18.20	Vertical
4804.00	55.63	31.53	8.90	40.24	55.82	74.00	-18.18	Horizontal
Test channel:			Lowest		Level:		Average	
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
4804.00	44.08	31.53	8.90	40.24	44.27	54.00	-9.73	Vertical
4804.00	41.62	31.53	8.90	40.24	41.81	54.00	-12.19	Horizontal

Test channel:			Middle		Level:		Peak	
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
4882.00	57.77	31.58	8.98	40.15	58.18	74.00	-15.82	Vertical
4882.00	54.40	31.58	8.98	40.15	54.81	74.00	-19.19	Horizontal
Test channel:			Middle		Level:		Average	
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
4882.00	45.17	31.58	8.98	40.15	45.58	54.00	-8.42	Vertical
4882.00	40.36	31.58	8.98	40.15	40.77	54.00	-13.23	Horizontal

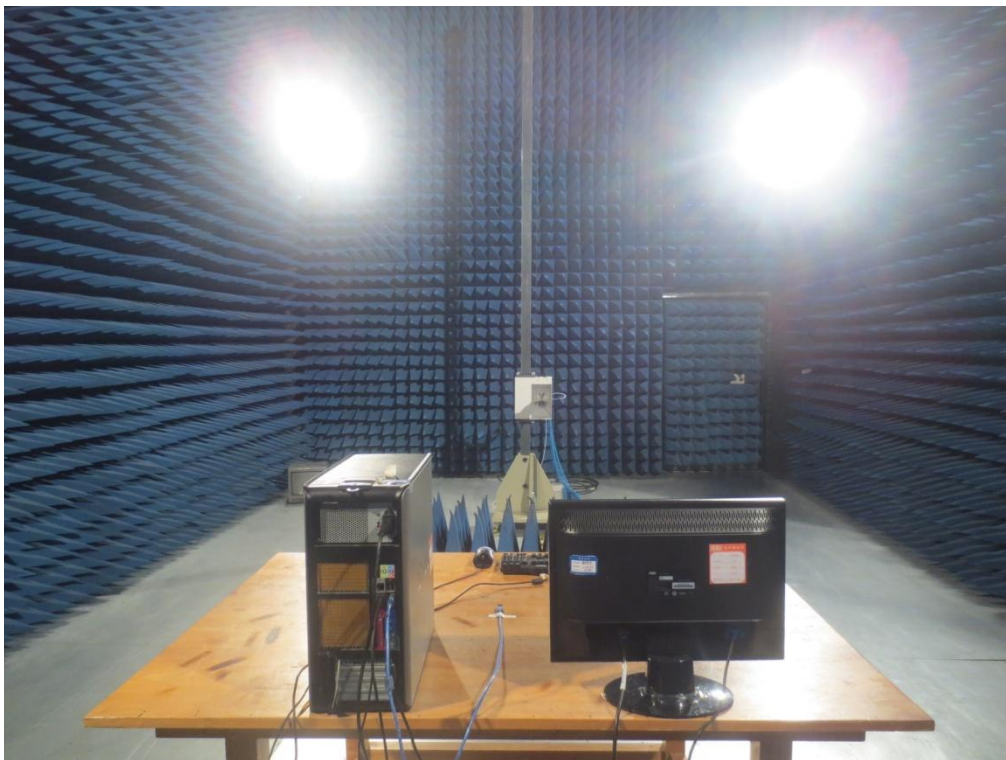
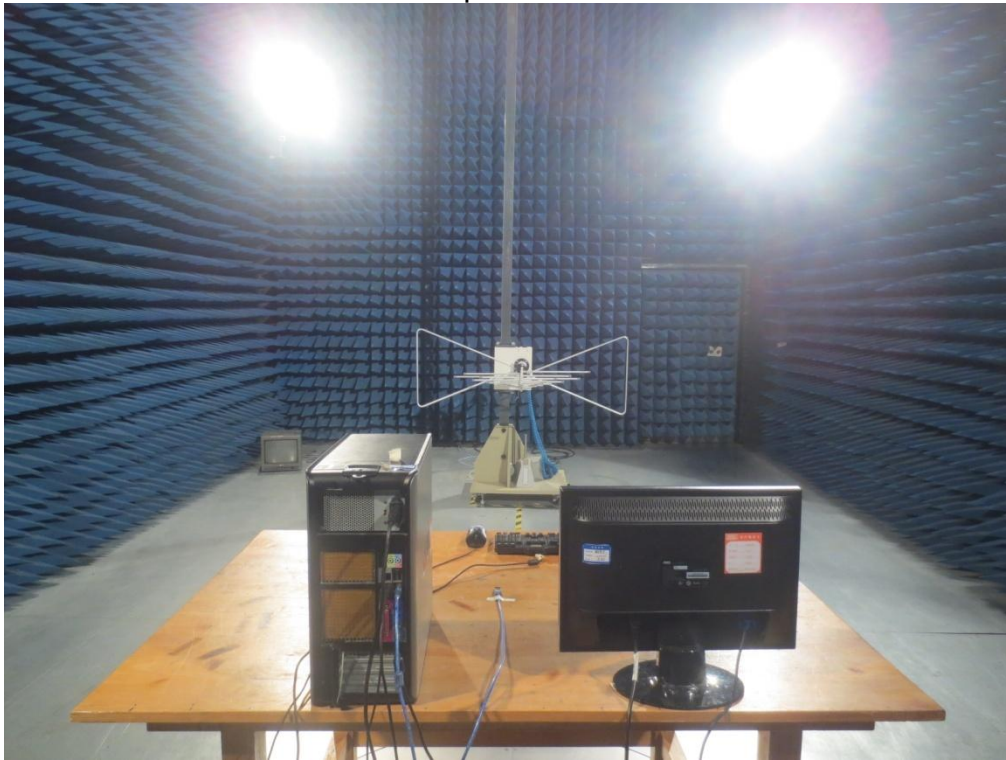
Test channel:			Highest		Level:		Peak	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4960.00	60.02	31.69	9.08	40.03	60.76	74.00	-13.24	Vertical
4960.00	56.58	31.69	9.08	40.03	57.32	74.00	-16.68	Horizontal
Test channel:			Highest		Level:		Average	
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
4960.00	47.20	31.69	9.08	40.03	47.94	54.00	-6.06	Vertical
4960.00	42.36	31.69	9.08	40.03	43.10	54.00	-10.90	Horizontal

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.

7 Test Setup Photo

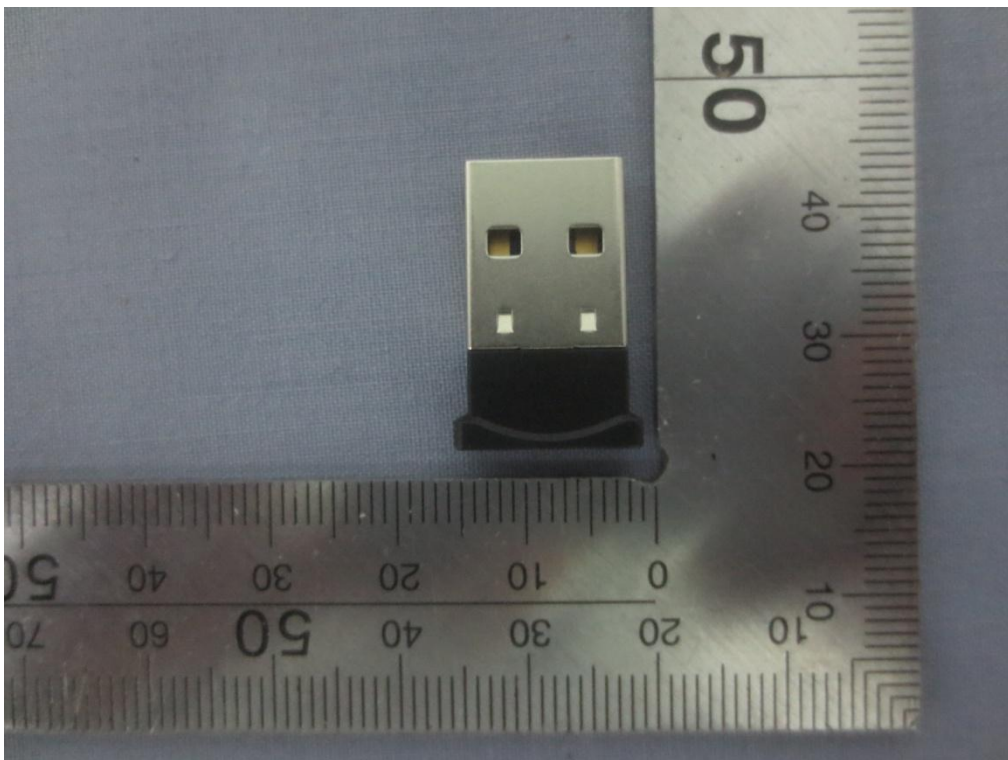
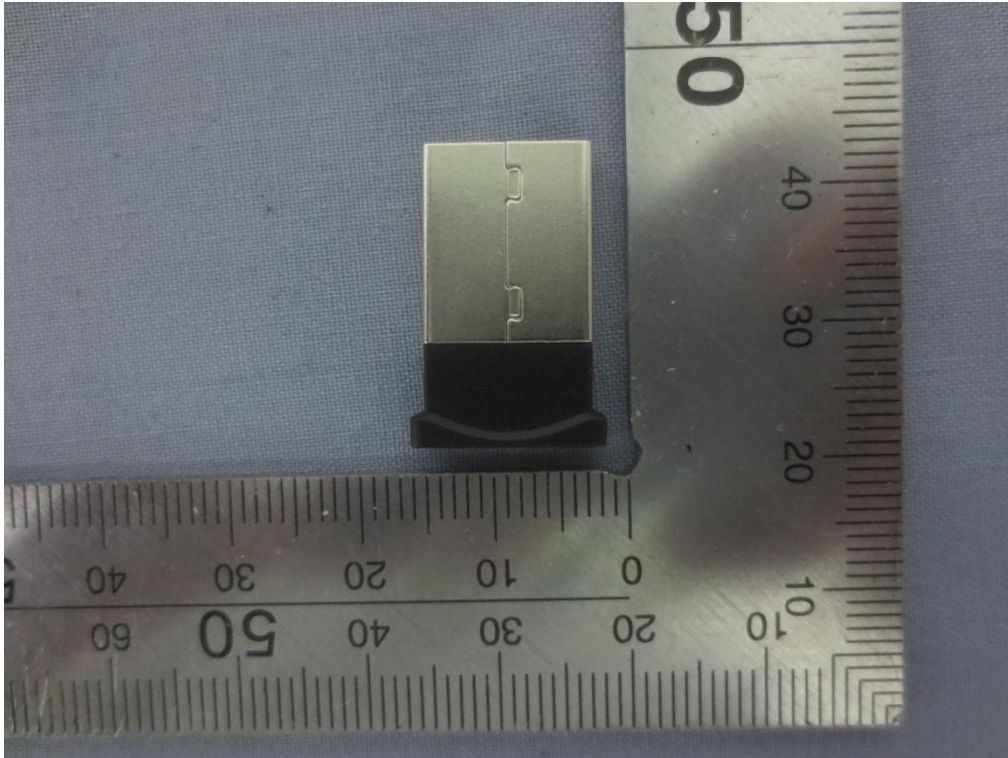
Radiated Spurious Emission

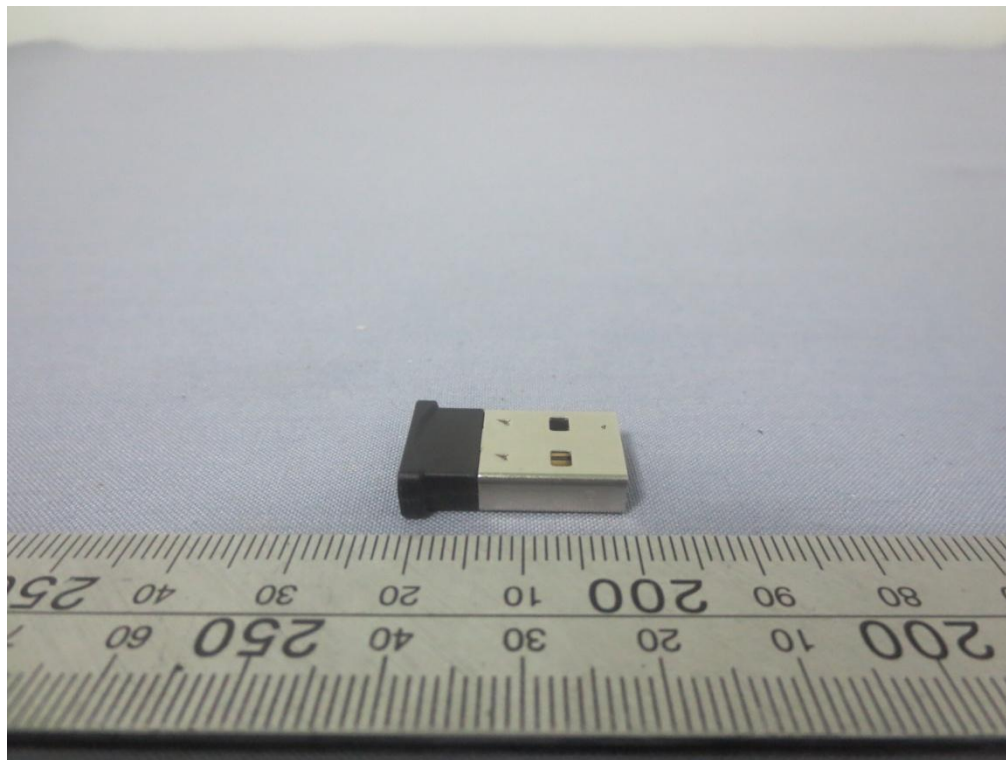
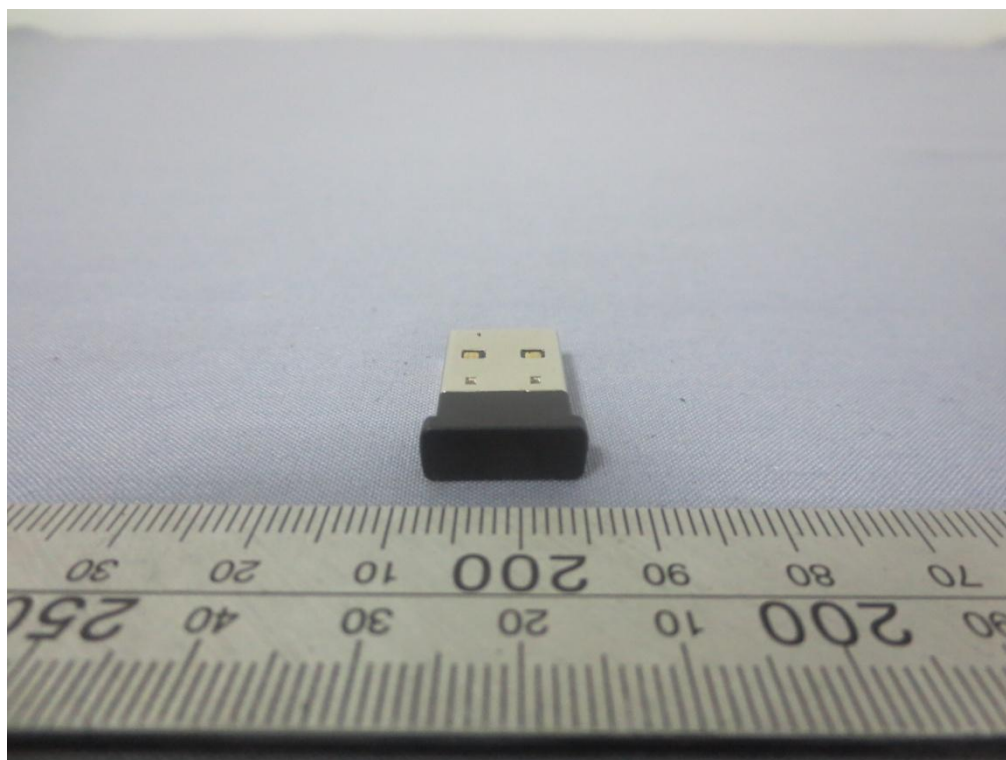


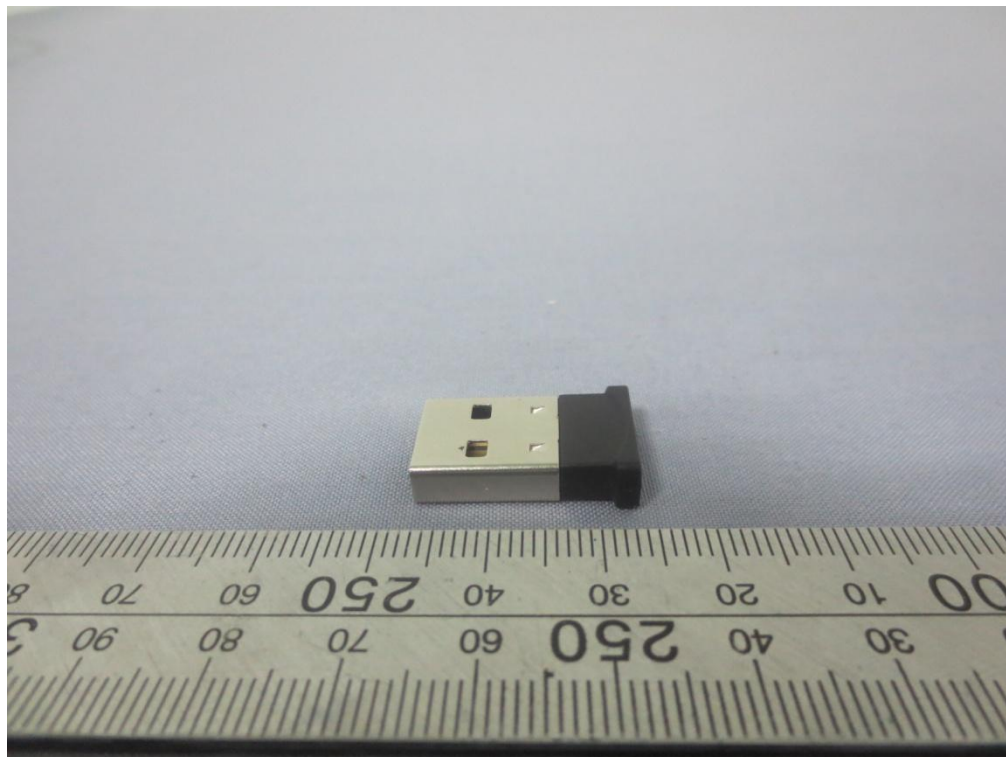
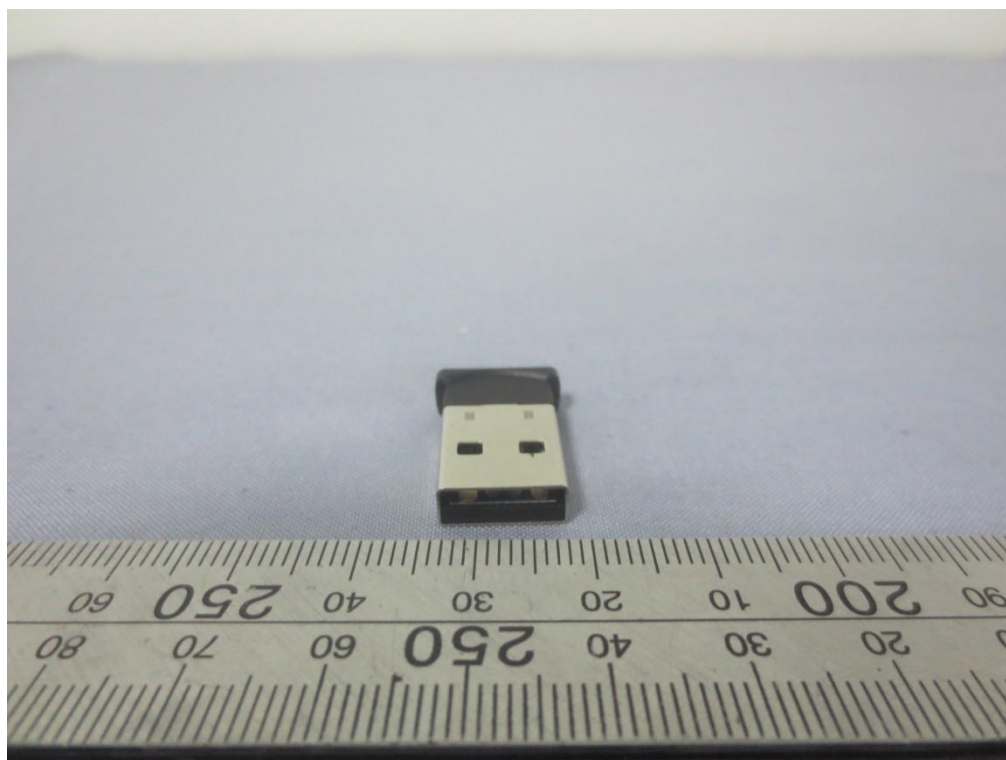
Conducted Emission

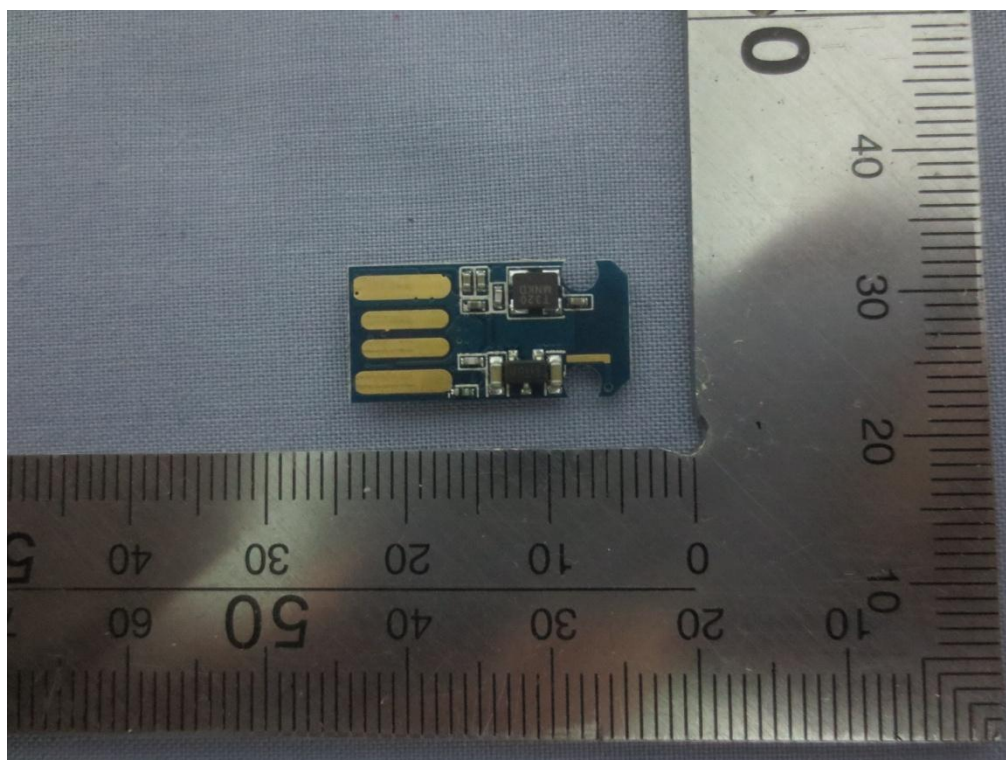
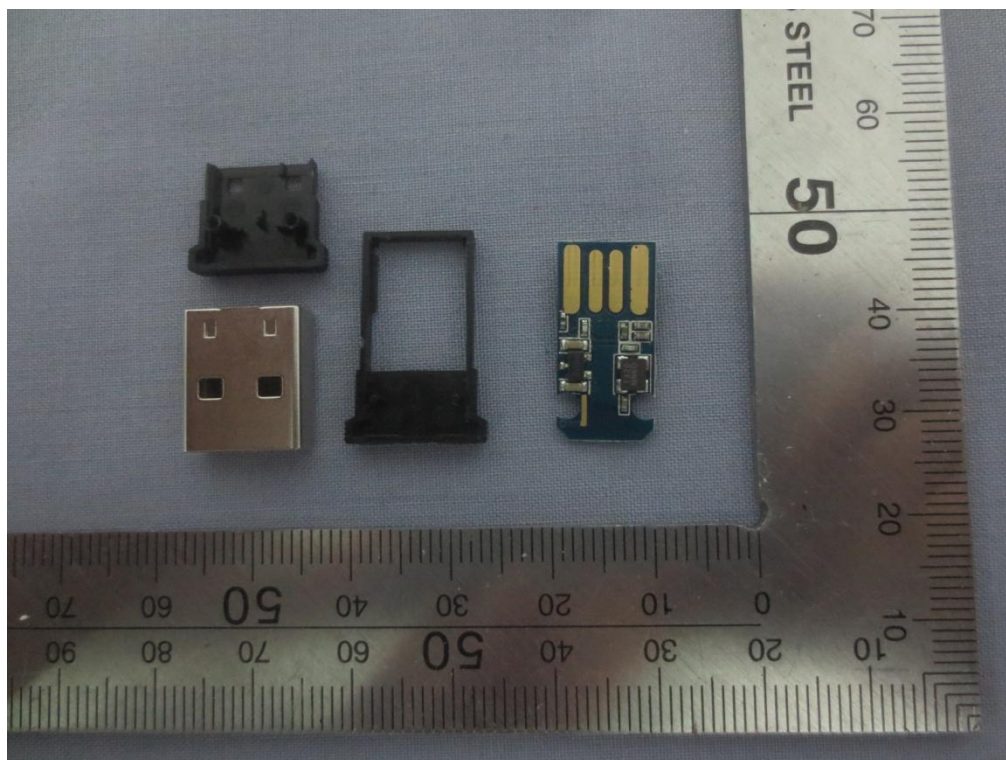


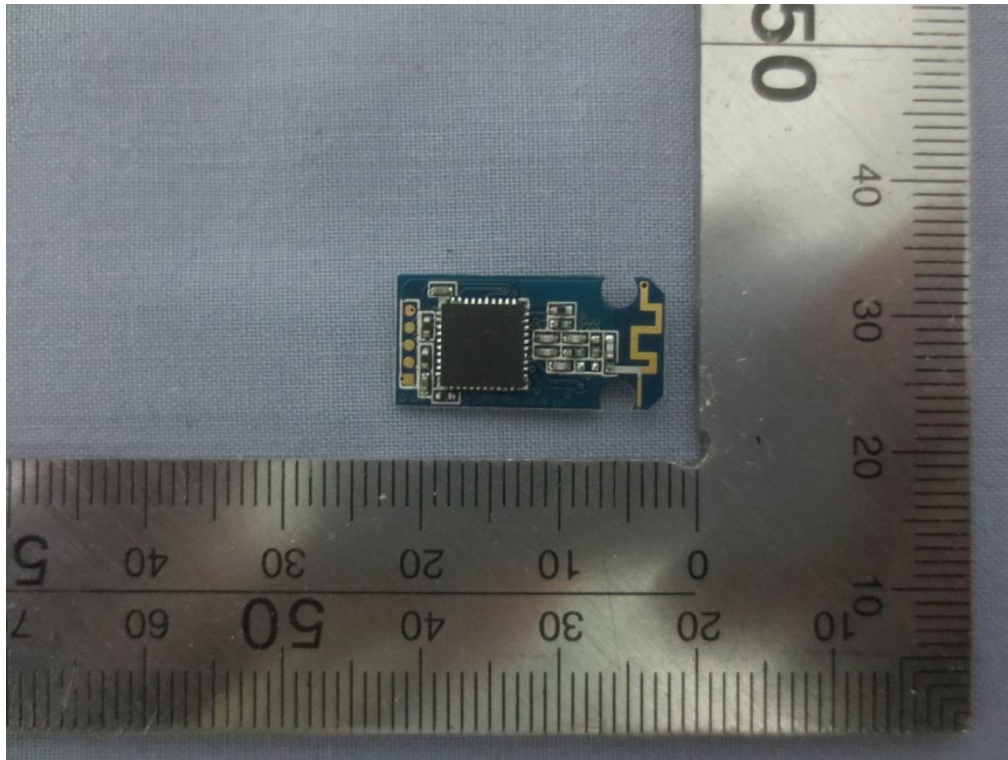
8 EUT Constructional Details











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