

FCC REPORT (WIFI)

Applicant: 8devices

Address of Applicant: Gedimino 47, Kaunas, LT-44242, Lithuania

Equipment Under Test (EUT)

Product Name: Broadband Digital Transmission System

Model No.: Carambola 2

FCC ID: Z9W-CM2

Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247

Date of sample receipt: 18 Sept., 2013

Date of Test: 19 Sept., to 12 Oct., 2013

Date of report issued: 12 Oct., 2013

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.

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2 Version

Version No.	Date	Description
00	12 Oct., 2013	Original

Prepared by: Seva **Date:** 12 Oct., 2013
Report Clerk

Reviewed by: Wimer Zhang **Date:** 12 Oct., 2013
Project Engineer

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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
6dB Emission Bandwidth 99% Occupied 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:	8devices
Address of Applicant:	Gedimino 47, Kaunas, LT-44242, Lithuania
Manufacturer:	8devices
Address of Manufacturer:	Gedimino 47, Kaunas, LT-44242, Lithuania

5.2 General Description of E.U.T.

Product Name:	Broadband Digital Transmission System
Model No.:	Carambola 2
Operation Frequency:	2412MHz~2462MHz (802.11b/802.11g/802.11n(H20)) 2422MHz~2452MHz (802.11n(H40))
Channel numbers:	11 for 802.11b/802.11g/802.11(H20) 7 for 802.11n(H40)
Channel separation:	5MHz
Modulation technology: (IEEE 802.11b)	Direct Sequence Spread Spectrum (DSSS)
Modulation technology: (IEEE 802.11g/802.11n)	Orthogonal Frequency Division Multiplexing(OFDM)
Data speed (IEEE 802.11b):	1Mbps, 2Mbps, 5.5Mbps, 11Mbps
Data speed (IEEE 802.11g):	6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps,54Mbps
Data speed (IEEE 802.11n):	Up to 150Mbps
Antenna Type:	ANT1:Built-in ceramic, ANT2: Omni-directional
Antenna gain:	ANT1:3 dBi, ANT2: 12 dBi
Power supply:	DC5.0V

Operation Frequency each of channel For 802.11b/g/n(H20)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz
3	2422MHz	6	2437MHz	9	2452MHz		

Operation Frequency each of channel For 802.11n(H40)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
		4	2427MHz	7	2442MHz		
		5	2432MHz	8	2447MHz		
3	2422MHz	6	2437MHz	9	2452MHz		

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:

802.11b/802.11g/802.11n (H20)

Channel	Frequency
The lowest channel	2412MHz
The middle channel	2437MHz
The Highest channel	2462MHz

802.11n (H40)

Channel	Frequency
The lowest channel	2422MHz
The middle channel	2437MHz
The Highest channel	2452MHz

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.</p>	

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

Per-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.

Mode	Data rate
802.11b	1Mbps
802.11g	6Mbps
802.11n(H20)	6.5Mbps
802.11n(H40)	13.5Mbps

Final Test Mode:

According to ANSI C63.4 standards, the test results are both the “worst case” and “worst setup” 1Mbps for 802.11b, 6Mbps for 802.11g, 6.5Mbps for 802.11n(H20) and 13.5 Mbps for 802.11n(H40). Duty cycle setting during the transmission is 100% with maximum power setting for all modulations.

5.4 Laboratory Facility

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

● **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 our 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.

5.5 Laboratory Location

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: 0755-23118282
Fax: 0755-23116366

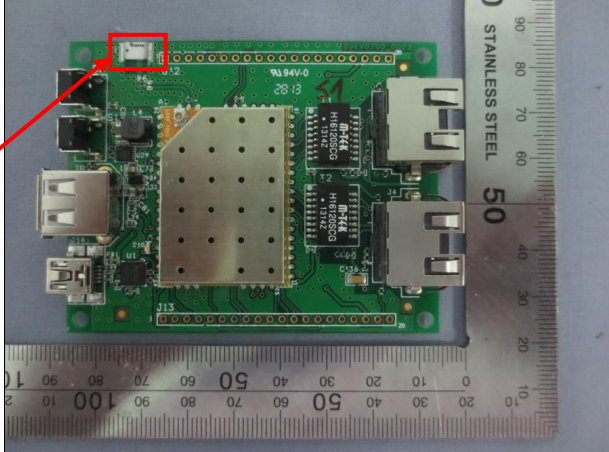
5.6 Test Instruments list

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	SAEMC	9(L)*6(W)* 6(H)	CCIS0001	June 09 2013	June 08 2014
2	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	CCIS0005	May 25 2013	May 24 2014
3	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	CCIS0006	May 25 2013	May 24 2014
4	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
5	Coaxial Cable	CCIS	N/A	CCIS0016	Apr. 01 2013	Mar. 31 2014
6	Coaxial Cable	CCIS	N/A	CCIS0017	Apr. 01 2013	Mar. 31 2014
7	Coaxial cable	CCIS	N/A	CCIS0018	Apr. 01 2013	Mar. 31 2014
8	Coaxial Cable	CCIS	N/A	CCIS0019	Apr. 01 2013	Mar. 31 2014
9	Coaxial Cable	CCIS	N/A	CCIS0087	Apr. 01 2013	Mar. 31 2014
10	Amplifier(10kHz-1.3GHz)	HP	8447D	CCIS0003	Apr. 01 2013	Mar. 31 2014
11	Amplifier(1GHz-18GHz)	Compliance Direction Systems Inc.	PAP-1G18	CCIS0011	June 09 2013	June 08 2014
12	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	Apr. 01 2013	Mar. 31 2014
13	Horn Antenna	ETS-LINDGREN	3160	GTS217	Mar. 30 2013	Mar. 29 2014
14	Printer	HP	HP LaserJet P1007	N/A	N/A	N/A
15	Positioning Controller	UC	UC3000	CCIS0015	N/A	N/A
16	Spectrum analyzer 9k-30GHz	Rohde & Schwarz	FSP	CCIS0023	May. 25 2013	May. 24 2014
17	EMI Test Receiver	Rohde & Schwarz	ESPI	CCIS0022	Apr 01 2013	Mar. 31 2014
18	Loop antenna	Laplace instrument	RF300	EMC0701	Aug. 12 2013	Aug. 11 2014
19	Universal radio communication tester	Rhode & Schwarz	CMU200	CCIS0069	May. 25 2013	May. 24 2014
20	Signal Analyzer	Rohde & Schwarz	FSIQ3	CCIS0088	May. 25 2013	May. 24 2014
21	Spectrum analyzer	Agilent	E4440A	US43362176	Jan.11 2013	Jan.10 2014

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	June 09 2013	June 08 2014
2	EMI Test Receiver	Rohde & Schwarz	ESCI	CCIS0002	May 25 2013	May 24 2014
3	LISN	CHASE	MN2050D	CCIS0074	Apr 01 2013	Mar. 31 2014
4	Coaxial Cable	CCIS	N/A	CCIS0086	Apr. 01 2013	Mar. 31 2014
5	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><i>15.203 requirement:</i> <i>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.</i></p> <p><i>15.247(c) (1)(i) requirement:</i> <i>(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.</i></p>	
E.U.T Antenna:	
<p><i>The 3dBi built-in ceramic antenna is an internal antenna which cannot replace by end-user.</i></p>	
<p>3dBi Built-in ceramic antenna</p>	 <p><i>The 12dBi omni-directional antenna is an removing the antenna. the details of antenna plots please refer to section 8 of this report.</i></p>

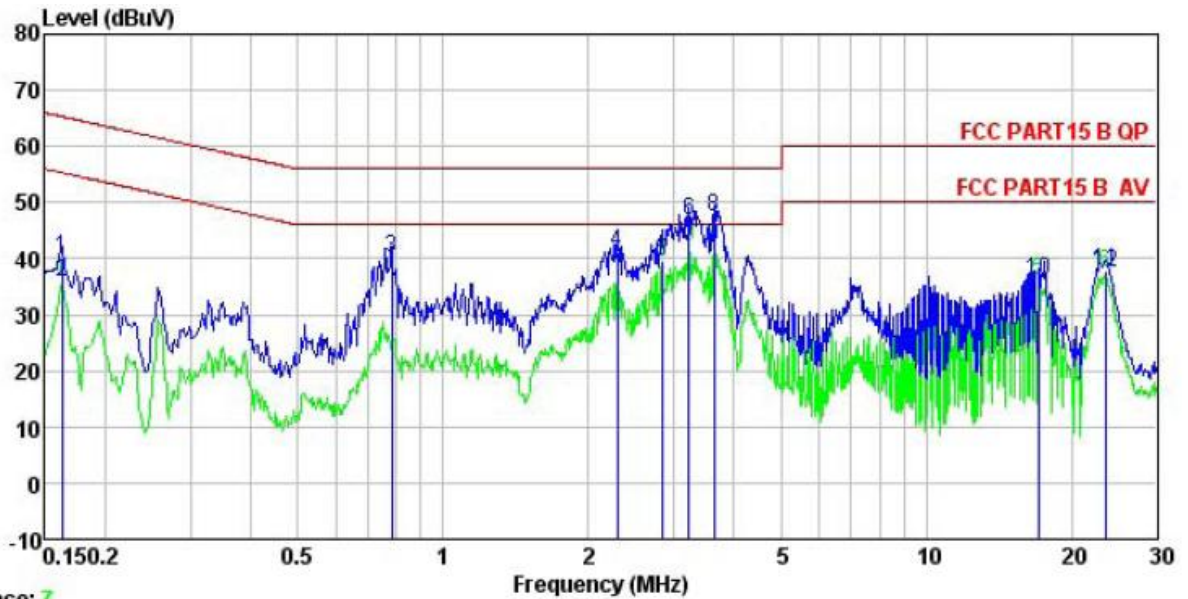
6.2 Conducted Emission

Test Requirement:	FCC Part15 C Section 15.207														
Test Method:	ANSI C63.4: 2003														
Test Frequency Range:	150 kHz to 30 MHz														
Class / Severity:	Class B														
Receiver setup:	RBW=9 kHz, VBW=30 kHz														
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 5.6 for details														
Test mode:	Refer to section 5.3 for details														
Test results:	Passed														

Measurement Data

3dBi antenna

Neutral:

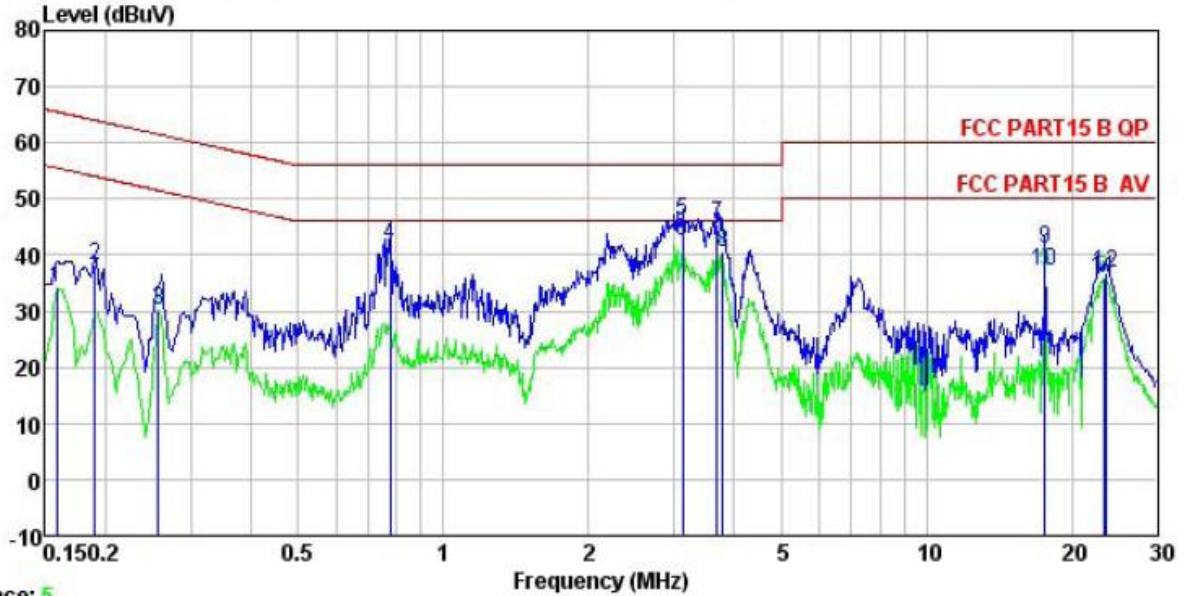


Trace: 7

Site : CCIS Conducted test Site
 Condition : FCC PART15 B QP LISN NEUTRAL
 Job NO. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test Mode : TX mode
 Power Rating : AC 120V/60Hz
 Environment : Temp: 23 °C Humi:56% Atmos:101KPa
 Test Engineer: Winner
 Remark : Ceramic antenna

	Freq	Level	Factor	LISN	Cable	Loss	Level	Limit	Over	Remark
	MHz	dBuV	dB	dB	dB	dB	dBuV	dBuV	dB	
1	0.162	29.10	10.26	0.78	40.14	65.34	-25.20	QP		
2	0.162	24.74	10.26	0.78	35.78	55.34	-19.56	Average		
3	0.783	29.29	10.17	0.80	40.26	56.00	-15.74	QP		
4	2.297	29.86	10.27	0.95	41.08	56.00	-14.92	QP		
5	2.839	28.43	10.27	0.92	39.62	46.00	-6.38	Average		
6	3.224	35.76	10.28	0.91	46.95	56.00	-9.05	QP		
7	3.224	31.04	10.28	0.91	42.23	46.00	-3.77	Average		
8	3.642	36.15	10.28	0.90	47.33	56.00	-8.67	QP		
9	3.642	30.99	10.28	0.90	42.17	46.00	-3.83	Average		
10	17.018	25.06	10.28	0.91	36.25	50.00	-13.75	Average		
11	23.511	26.35	10.49	0.89	37.73	60.00	-22.27	QP		
12	23.511	26.19	10.49	0.89	37.57	50.00	-12.43	Average		

Line:



Trace: 5

Site : CCIS Conducted test Site
 Condition : FCC PART15 B QP LISN LINE
 Job NO. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test Mode : TX mode
 Power Rating : AC 120V/60Hz
 Environment : Temp: 23 °C Humi:56% Atmos:101KPa
 Test Engineer: Winner
 Remark : Ceramic antenna

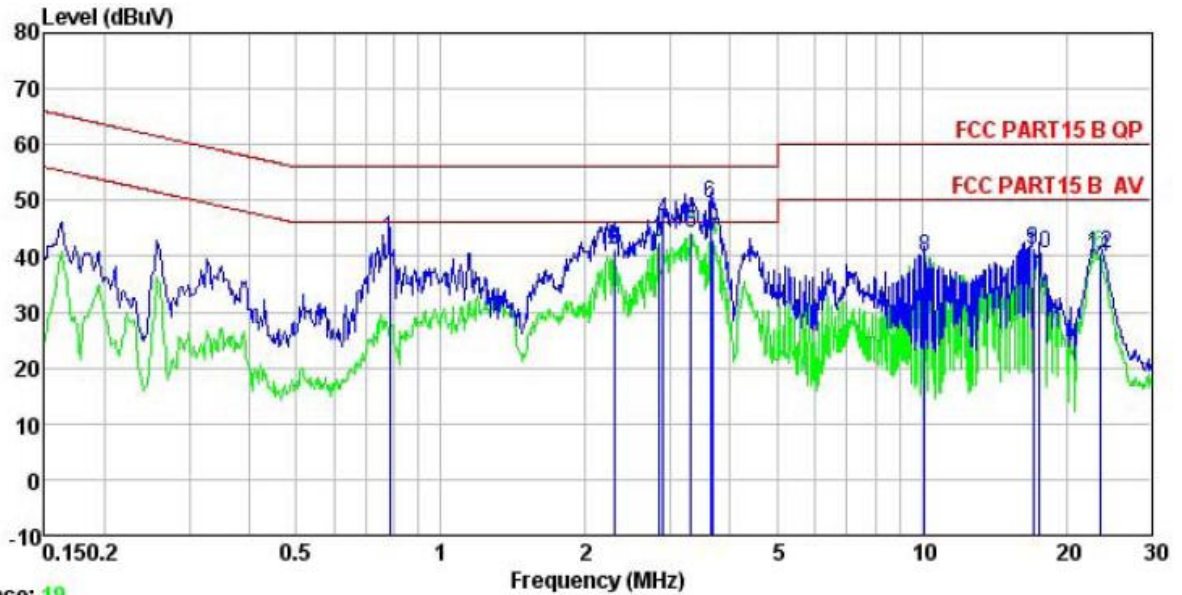
	Read	LISN	Cable	Level	Limit	Over	Remark
Freq	Level	Factor	Loss	Level	Line	Limit	Remark
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.158	23.10	10.24	0.78	34.12	55.56	-21.44 Average
2	0.190	27.13	10.22	0.77	38.12	64.02	-25.90 QP
3	0.258	19.09	10.24	0.75	30.08	51.51	-21.43 Average
4	0.775	30.69	10.19	0.80	41.68	56.00	-14.32 QP
5	3.123	34.96	10.29	0.92	46.17	56.00	-9.83 QP
6	3.123	31.12	10.29	0.92	42.33	46.00	-3.67 Average
7	3.681	34.40	10.29	0.90	45.59	56.00	-10.41 QP
8	3.779	29.41	10.29	0.90	40.60	46.00	-5.40 Average
9	17.568	29.80	10.28	0.92	41.00	60.00	-19.00 QP
10	17.568	26.06	10.28	0.92	37.26	50.00	-12.74 Average
11	23.263	24.30	10.48	0.89	35.67	50.00	-14.33 Average
12	23.511	25.51	10.49	0.89	36.89	60.00	-23.11 QP

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

12dBi antenna

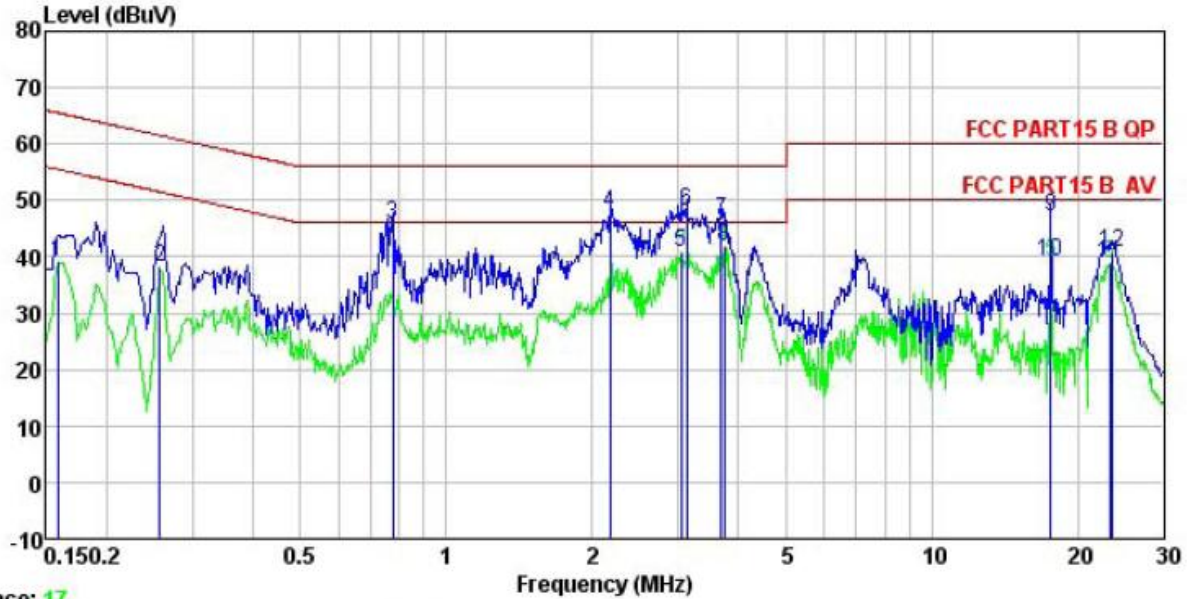
Neutral:



Trace: 19
 Site : CCIS Conducted test Site
 Condition : FCC PART15 B QP LISN NEUTRAL
 Job NO. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test Mode : TX mode
 Power Rating : AC 120V/60Hz
 Environment : Temp: 23 °C Humi:56% Atmos:101KPa
 Test Engineer: Winner
 Remark : 12dBi antenna

	Read	LISN	Cable	Level	Limit	Over	Remark
Freq	Level	Factor	Loss	Level	Line	Limit	Remark
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.783	32.29	10.17	0.80	43.26	56.00	-12.74 QP
2	2.297	30.06	10.27	0.95	41.28	46.00	-4.72 Average
3	2.839	31.43	10.27	0.92	42.62	46.00	-3.38 Average
4	2.900	35.09	10.28	0.92	46.29	56.00	-9.71 QP
5	3.310	32.97	10.28	0.91	44.16	46.00	-1.84 Average
6	3.642	38.15	10.28	0.90	49.33	56.00	-6.67 QP
7	3.681	31.60	10.28	0.90	42.78	46.00	-3.22 Average
8	10.125	28.54	10.22	0.94	39.70	60.00	-20.30 QP
9	17.018	30.06	10.28	0.91	41.25	50.00	-8.75 Average
10	17.568	29.39	10.29	0.92	40.60	60.00	-19.40 QP
11	23.511	28.35	10.49	0.89	39.73	60.00	-20.27 QP
12	23.511	29.19	10.49	0.89	40.57	50.00	-9.43 Average

Line:



Trace: 17

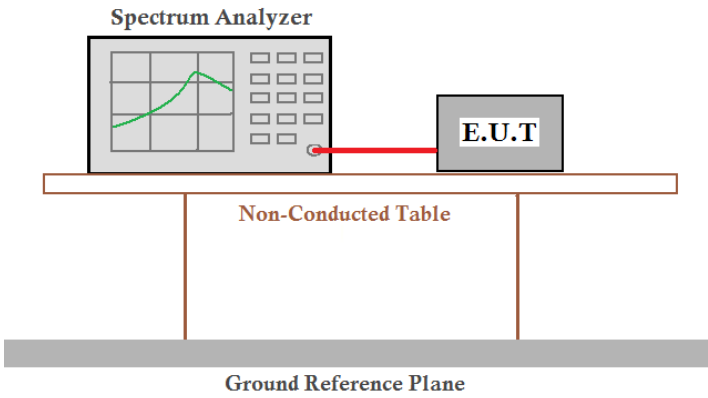
Site : CCIS Conducted test Site
 Condition : FCC PART15 B QP LISN LINE
 Job NO. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test Mode : TX mode
 Power Rating : AC 120V/60Hz
 Environment : Temp: 23 °C Humi:56% Atmos:101KPa
 Test Engineer: Winner
 Remark : 12dBi antenna

	Read	LISN	Cable	Level	Limit	Over	
Freq	Level	Factor	Loss	Level	Line	Limit	Remark
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.158	28.10	10.24	0.78	39.12	55.56	-16.44 Average
2	0.258	27.09	10.24	0.75	38.08	51.51	-13.43 Average
3	0.775	34.69	10.19	0.80	45.68	56.00	-10.32 QP
4	2.178	36.56	10.28	0.95	47.79	56.00	-8.21 QP
5	3.041	29.62	10.29	0.92	40.83	46.00	-5.17 Average
6	3.123	36.96	10.29	0.92	48.17	56.00	-7.83 QP
7	3.681	35.40	10.29	0.90	46.59	56.00	-9.41 QP
8	3.740	30.73	10.29	0.90	41.92	46.00	-4.08 Average
9	17.568	35.80	10.28	0.92	47.00	60.00	-13.00 QP
10	17.568	28.06	10.28	0.92	39.26	50.00	-10.74 Average
11	23.263	27.30	10.48	0.89	38.67	50.00	-11.33 Average
12	23.511	29.51	10.49	0.89	40.89	60.00	-19.11 QP

Notes:

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

6.3 Conducted Output Power

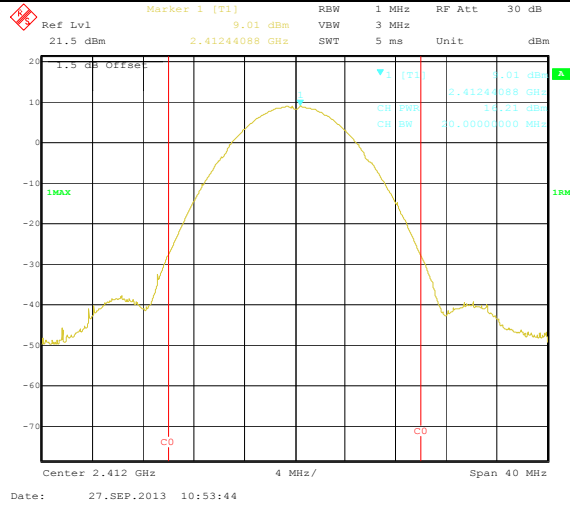
Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	ANSI C63.4:2003 and KDB558074
Limit:	24dBm
Test setup:	
Test Instruments:	Refer to section 5.6 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed
Remark:	Test method refer to KDB558074 (DTS Measure Guidance) section 8.2, option 1.

Measurement Data

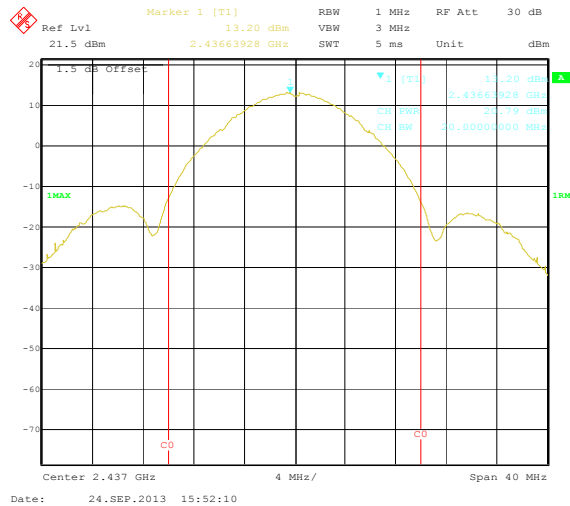
Test CH	Maximum Conducted Output Power (dBm)				Limit(dBm)	Result
	802.11b	802.11g	802.11n(H20)	802.11n(H40)		
Lowest	16.21	12.44	11.66	9.59	24.00	Pass
Middle	20.79	20.60	20.80	20.64		
Highest	19.31	12.21	11.12	10.89		

Test plot as follows:

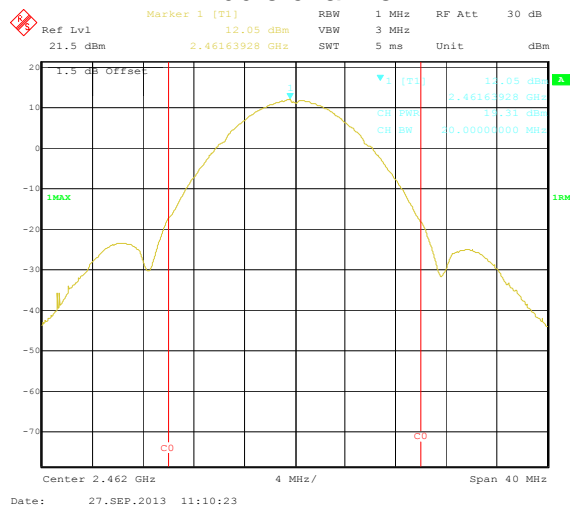
Test mode: 802.11b



Lowest channel

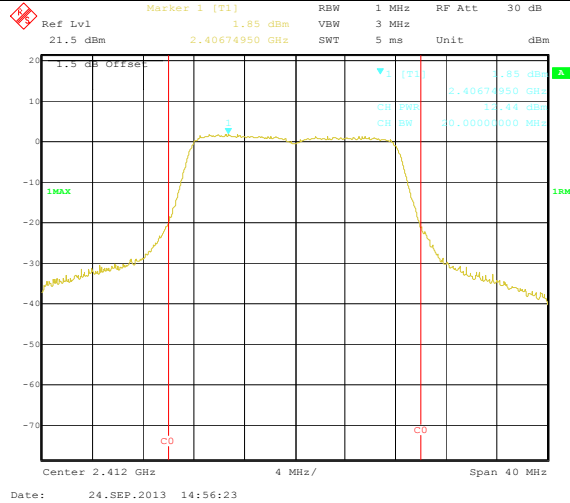


Middle channel

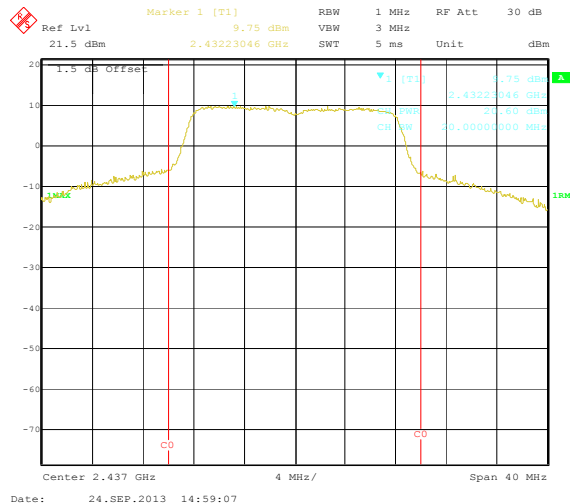


Highest channel

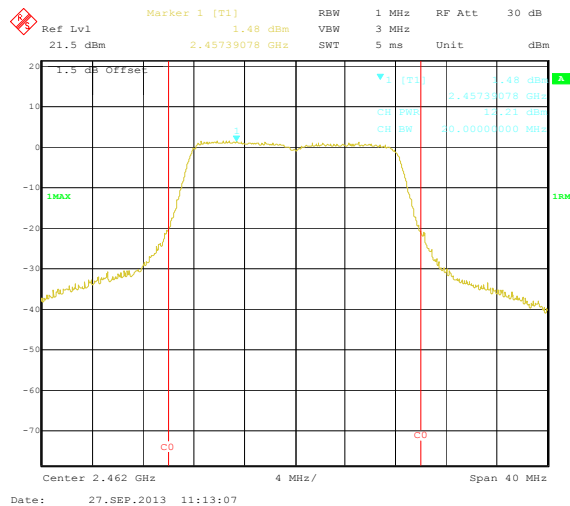
Test mode: 802.11g



Lowest channel

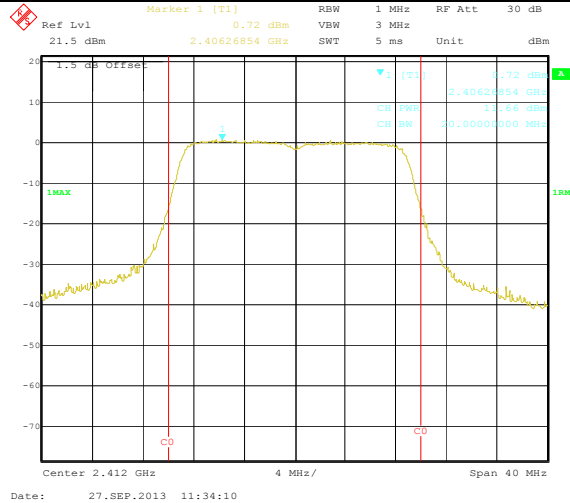


Middle channel

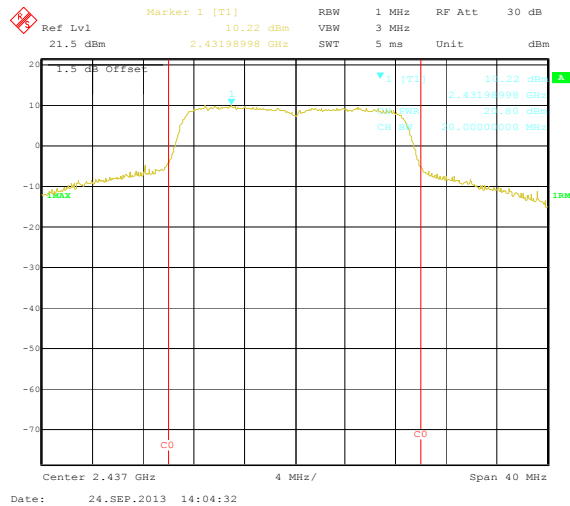


Highest channel

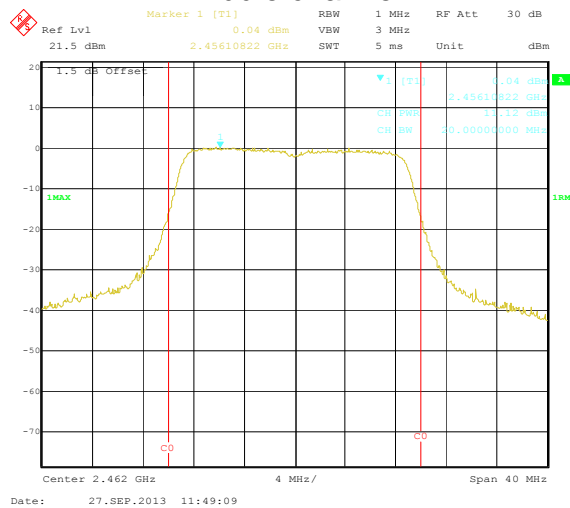
Test mode: 802.11n(H20)



Lowest channel

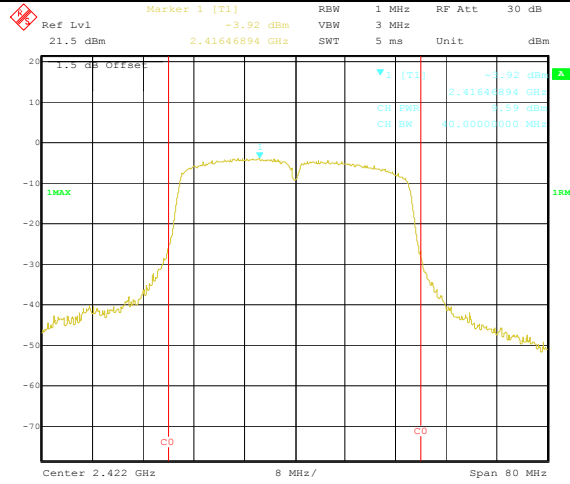


Middle channel



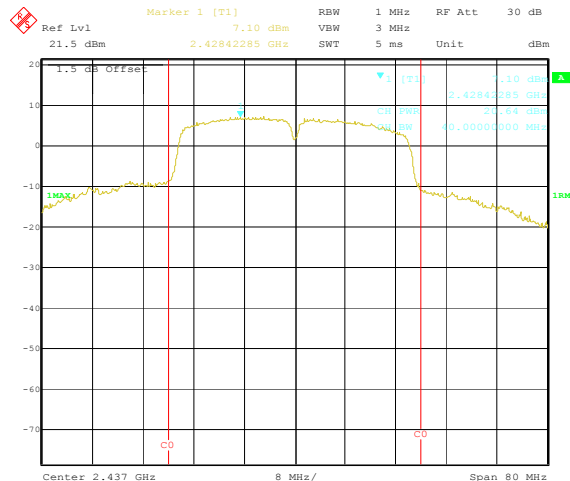
Highest channel

Test mode: 802.11n(H40)



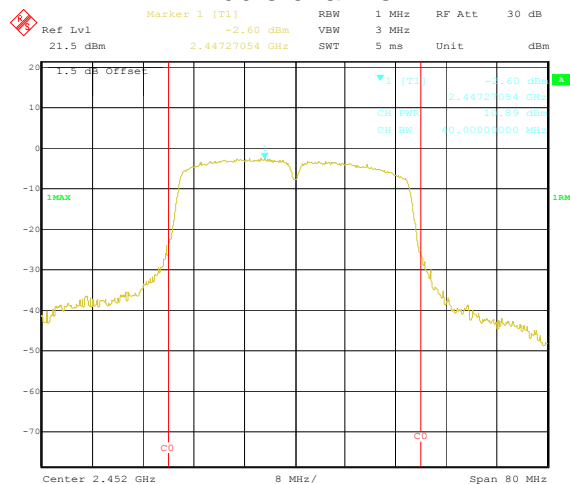
Date: 27.SEP.2013 12:01:28

Lowest channel



Date: 24.SEP.2013 14:15:35

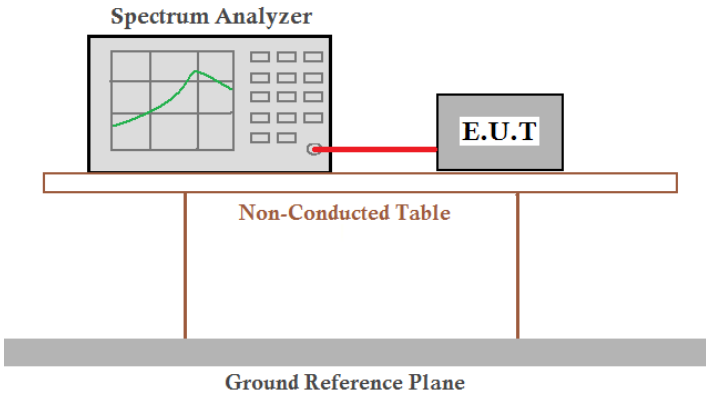
Middle channel



Date: 27.SEP.2013 12:05:24

Highest channel

6.4 Occupy Bandwidth

Test Requirement:	FCC Part15 C Section 15.247 (a)(2)
Test Method:	ANSI C63.4:2003 and KDB558074
Limit:	>500kHz
Test setup:	
Test Instruments:	Refer to section 5.6 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

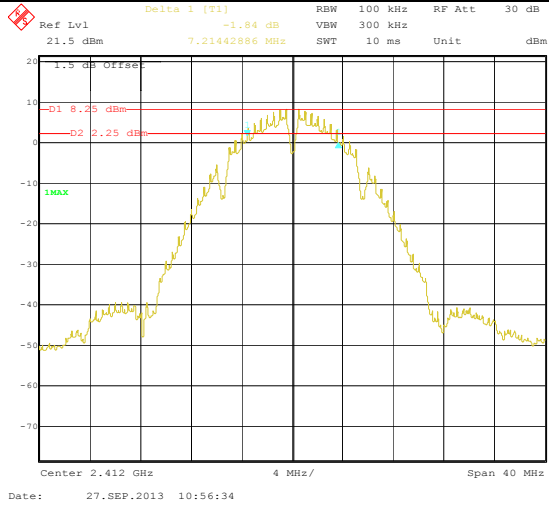
Measurement Data

Test CH	6dB Emission Bandwidth (MHz)				Limit(kHz)	Result
	802.11b	802.11g	802.11n(H20)	802.11n(H40)		
Lowest	7.21	16.51	17.56	35.59	>500	Pass
Middle	9.22	16.59	17.72	35.59		
Highest	8.18	16.51	17.56	35.59		

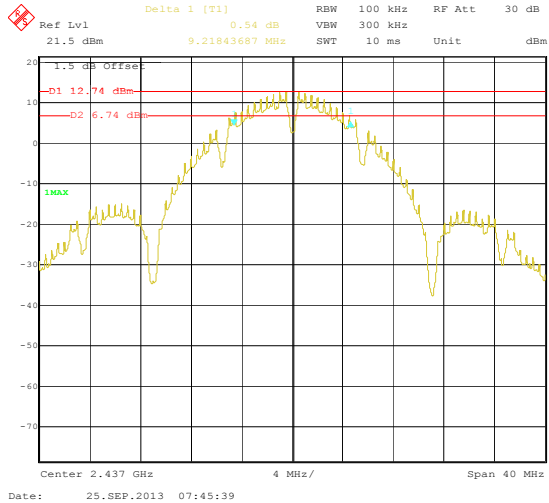
Test CH	99% Occupy Bandwidth (MHz)				Limit(kHz)	Result
	802.11b	802.11g	802.11n(H20)	802.11n(H40)		
Lowest	12.34	16.43	17.64	35.91	N/A	N/A
Middle	14.75	16.75	17.88	36.55		
Highest	13.63	16.43	17.72	35.91		

Test plot as follows:

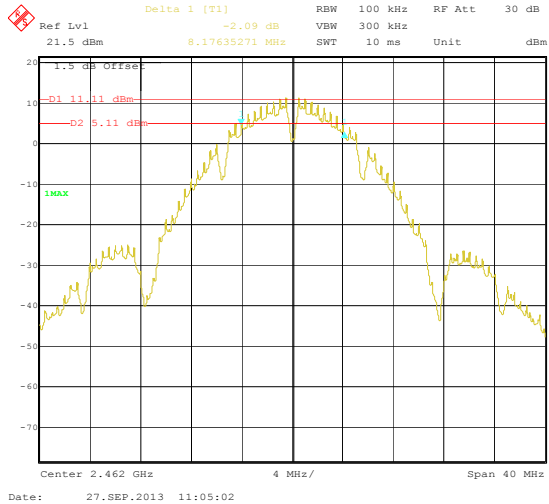
Test mode: 6dB OBW 802.11b



Lowest channel

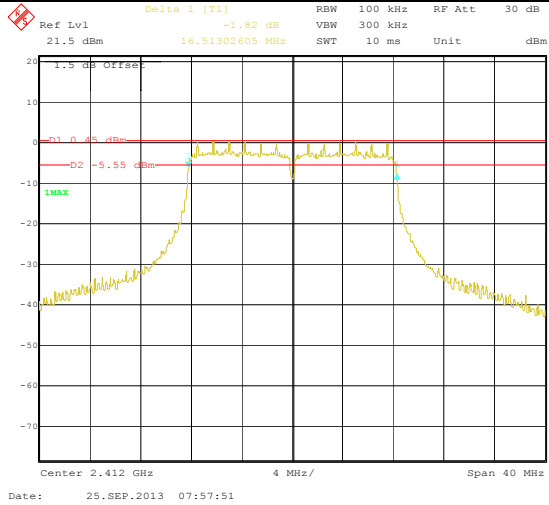


Middle channel

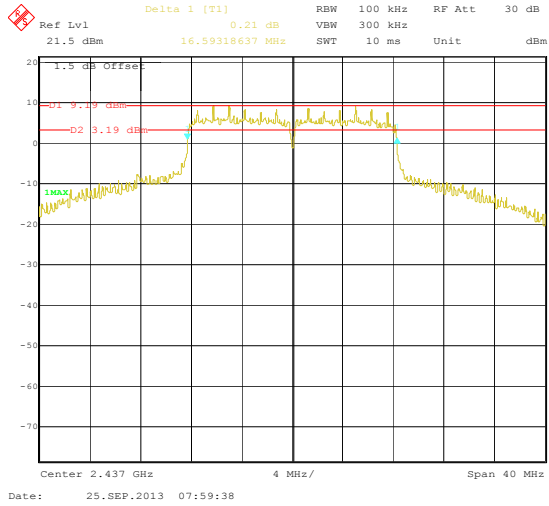


Highest channel

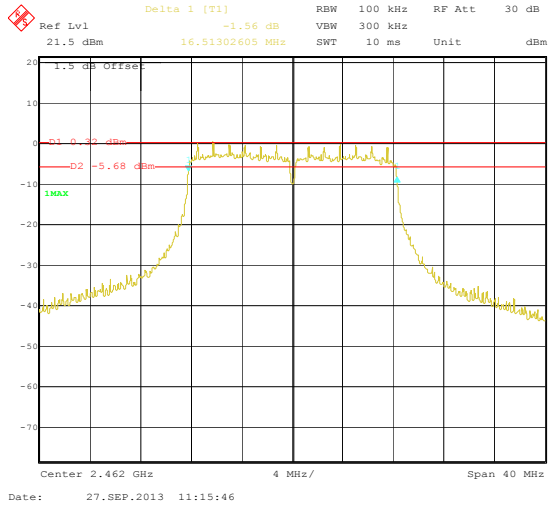
Test mode: 6dB OBW 802.11g



Lowest channel



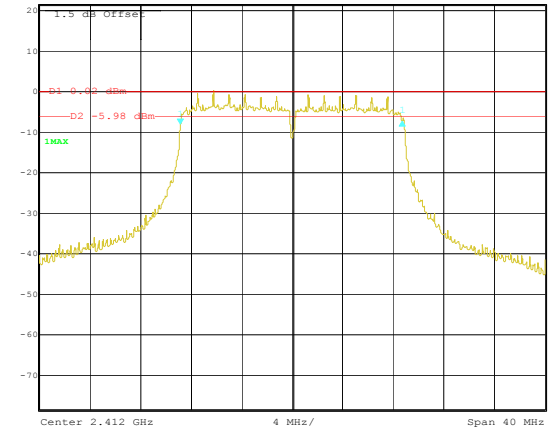
Middle channel



Highest channel

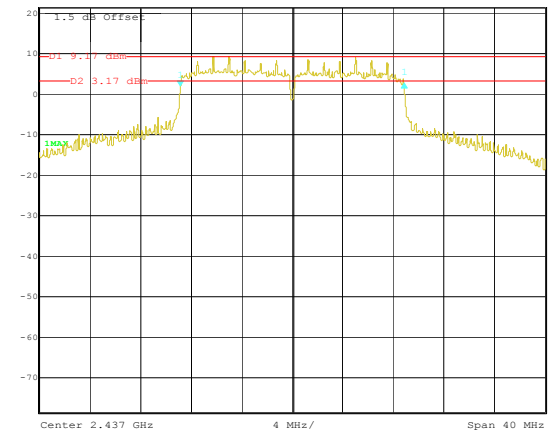
Test mode:6dB OBW 802.11n(H20)

Ref Lvl 21.5 dBm Delta 1 (T1) 0.83 dB RBW 100 kHz RF Att 30 dB
 17.5551022 MHz VBW 300 kHz Unit dBm
 10 ms SWT



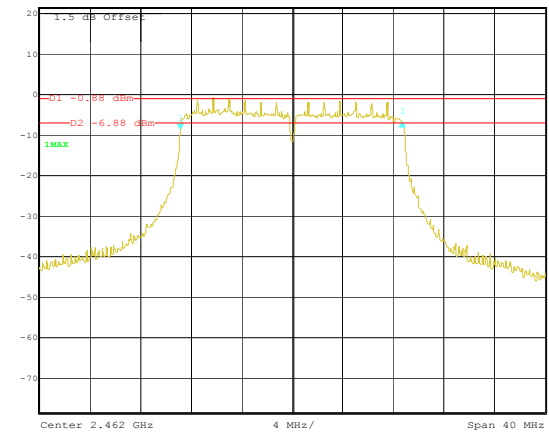
Lowest channel

Ref Lvl 21.5 dBm Delta 1 (T1) 0.67 dB RBW 100 kHz RF Att 30 dB
 17.71543086 MHz VBW 300 kHz Unit dBm
 10 ms SWT



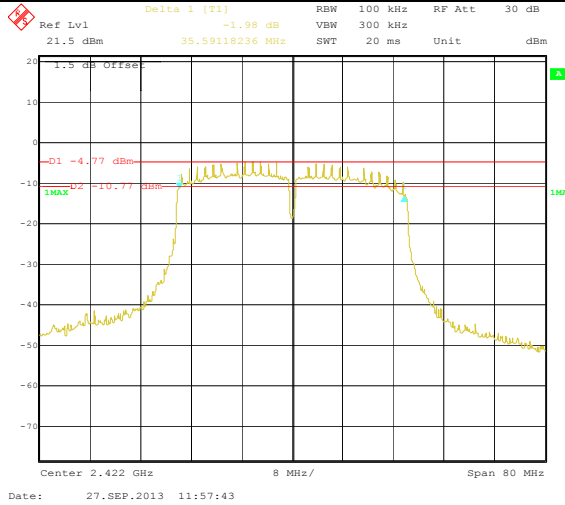
Middle channel

Ref Lvl 21.5 dBm Delta 1 (T1) 1.85 dB RBW 100 kHz RF Att 30 dB
 17.5551022 MHz VBW 300 kHz Unit dBm
 10 ms SWT

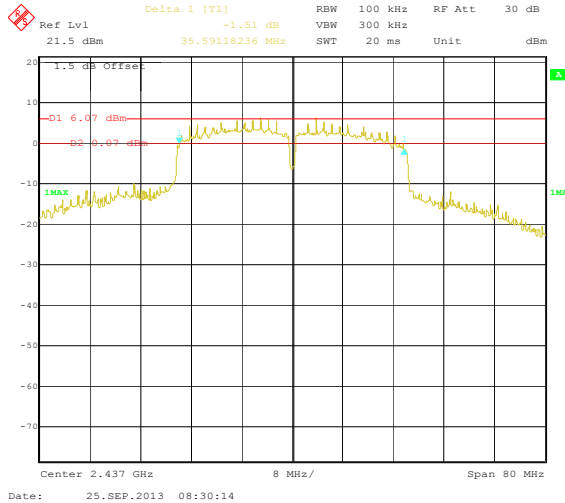


Highest channel

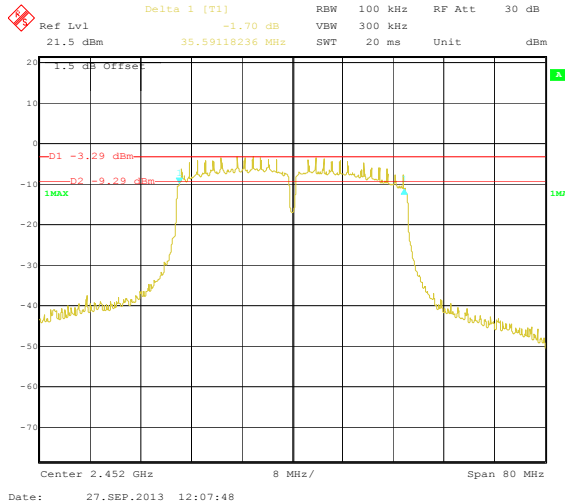
Test mode: 6dB OBW 802.11n(H40)



Lowest channel

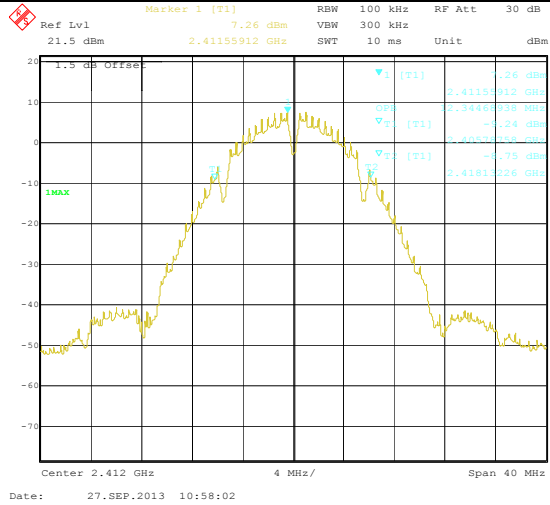


Middle channel

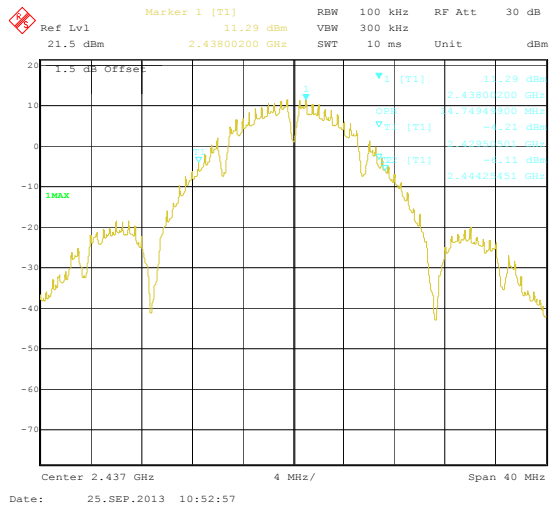


Highest channel

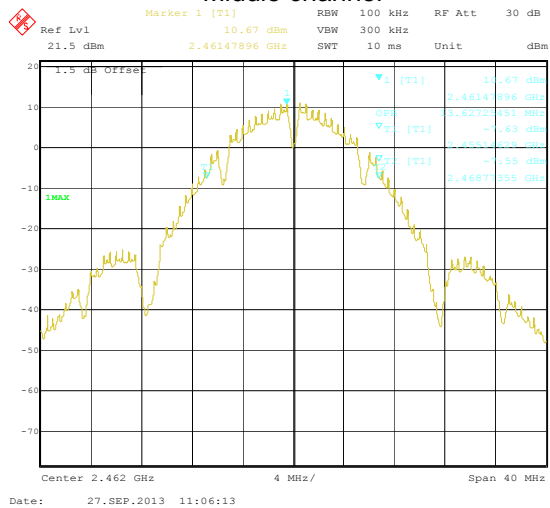
Test mode:99% OBW 802.11b



Lowest channel

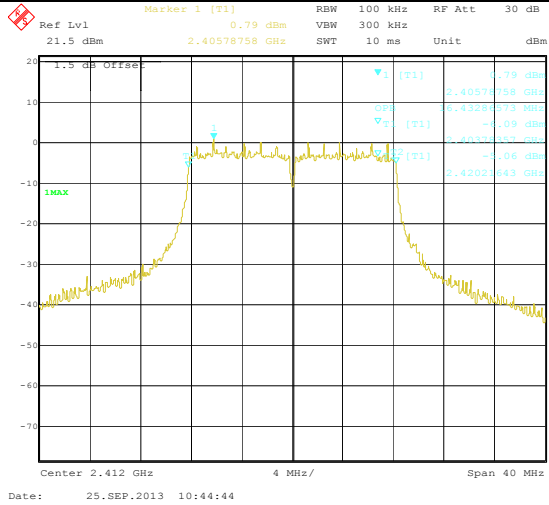


Middle channel

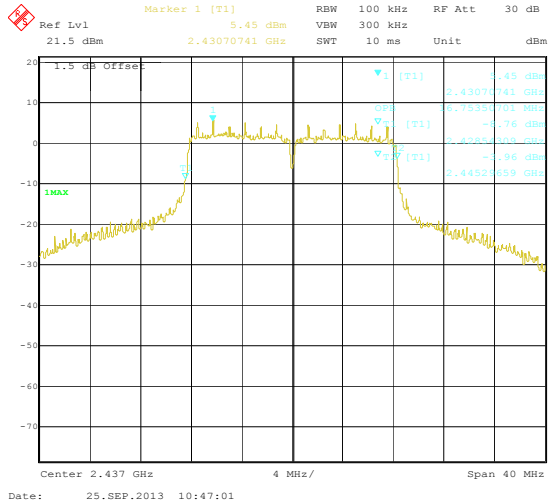


Highest channel

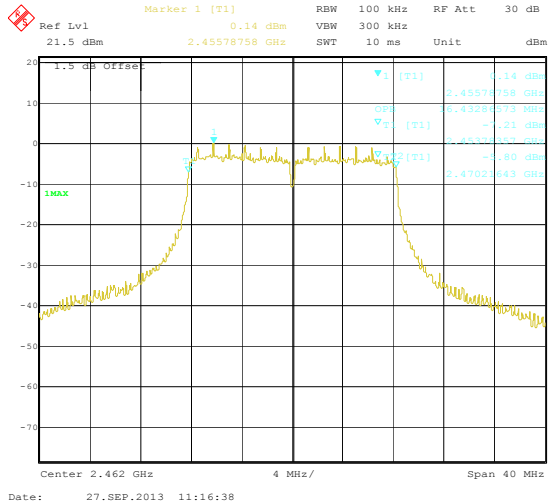
Test mode: 99% OBW 802.11g



Lowest channel

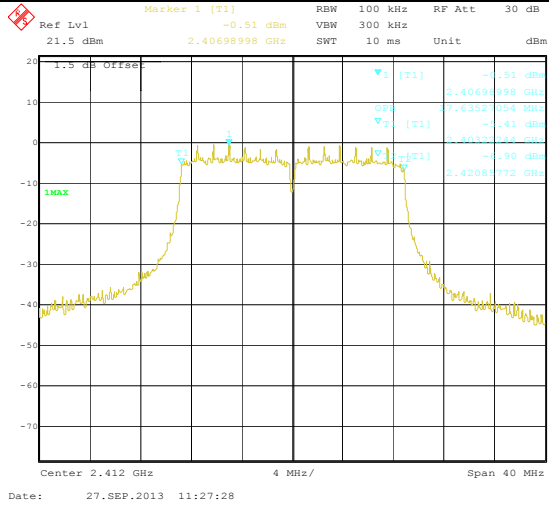


Middle channel

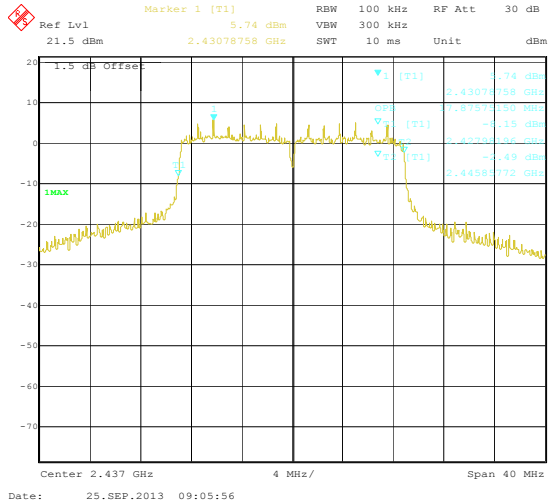


Highest channel

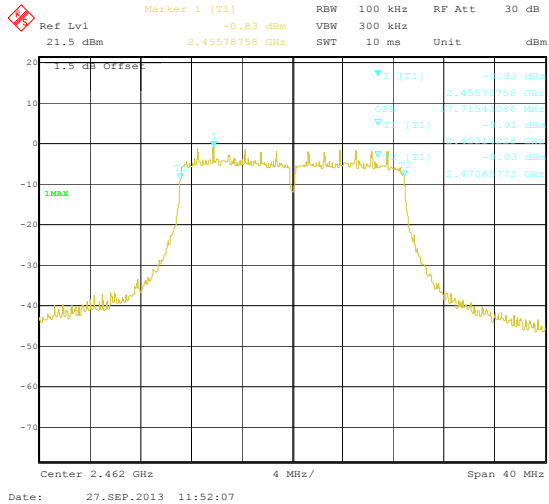
Test mode: 99% OBW 802.11n(H20)



Lowest channel

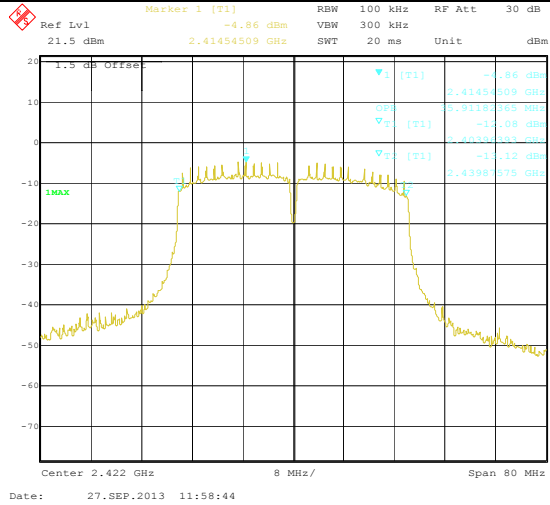


Middle channel

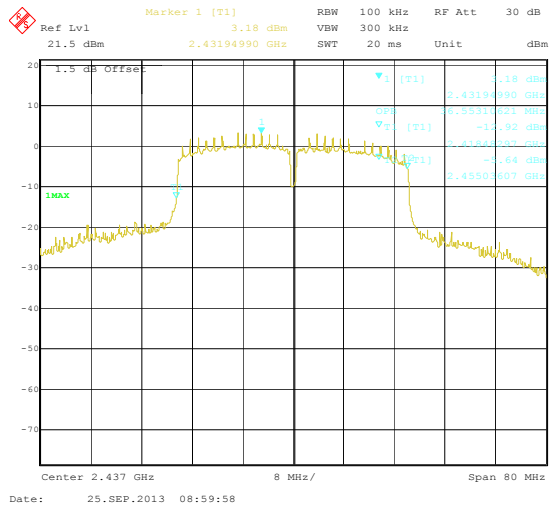


Highest channel

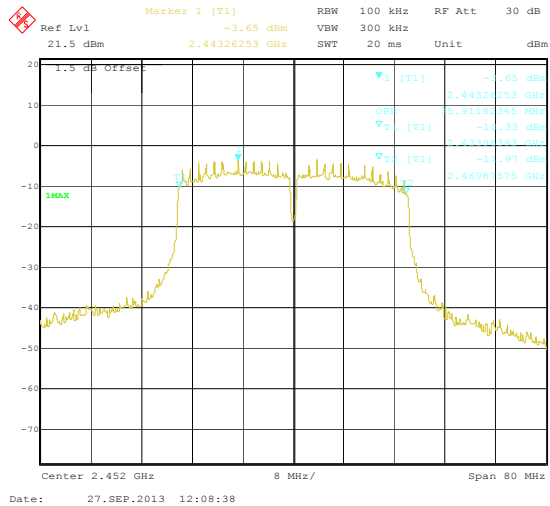
Test mode: 99% OBW 802.11n(H40)



Lowest channel

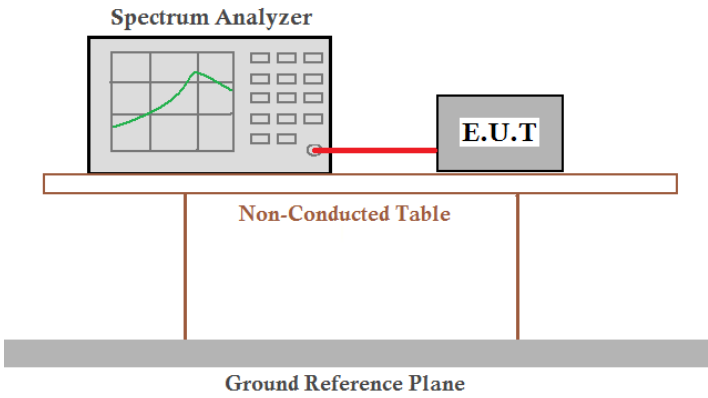


Middle channel



Highest channel

6.5 Power Spectral Density

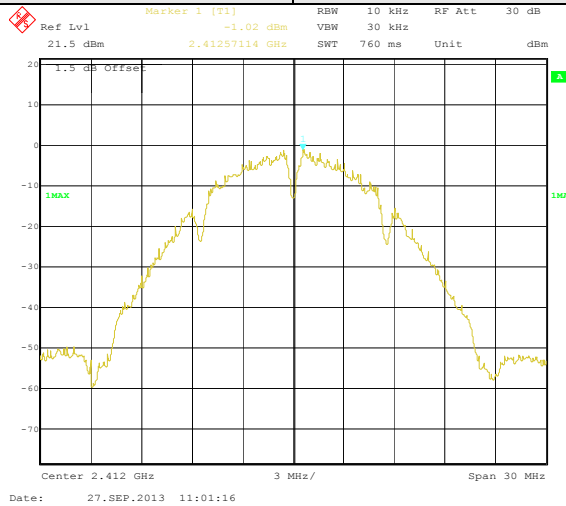
Test Requirement:	FCC Part15 C Section 15.247 (e)
Test Method:	ANSI C63.4:2003 and KDB558074
Limit:	8dBm
Test setup:	
Test Instruments:	Refer to section 5.6 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data

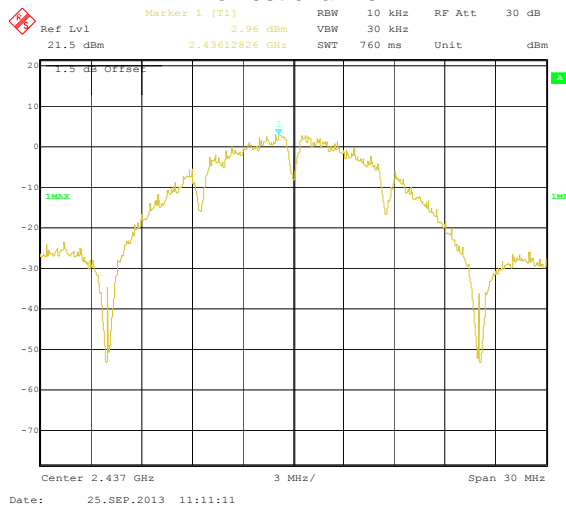
Test CH	Power Spectral Density (dBm)				Limit(dBm)	Result
	802.11b	802.11g	802.11n(H20)	802.11n(H40)		
Lowest	-1.02	-8.45	-8.51	-14.44	8.00	Pass
Middle	2.96	0.59	0.32	-2.41		
Highest	1.61	-8.51	-9.92	-13.68		

Test plot as follows:

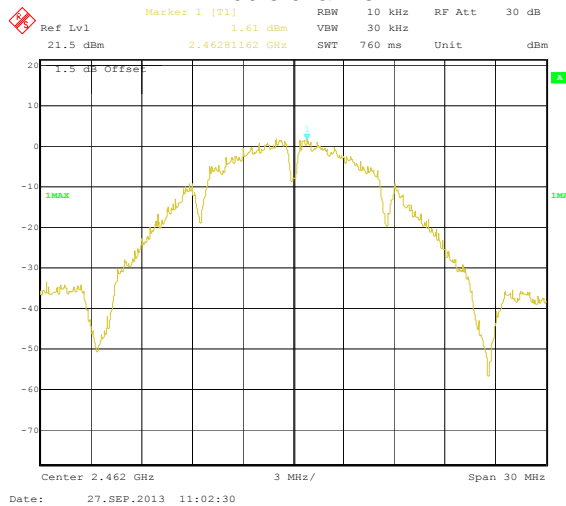
Test mode:	802.11b
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Lowest channel

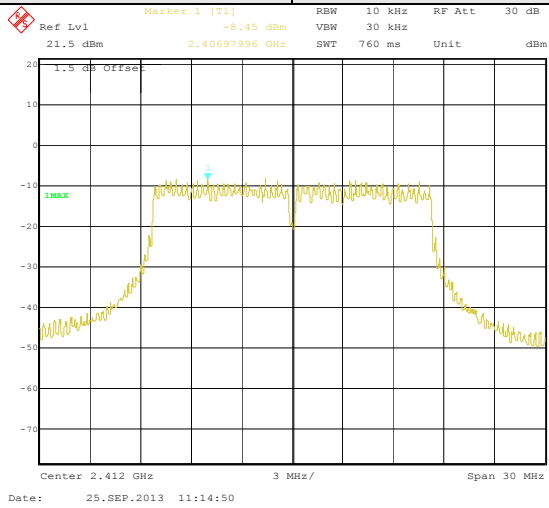


Middle channel

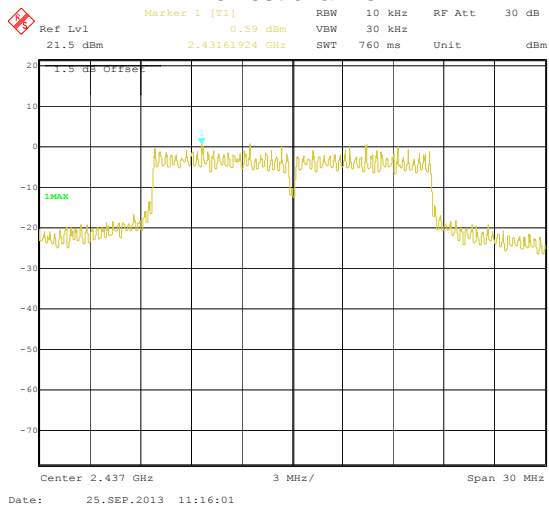


Highest channel

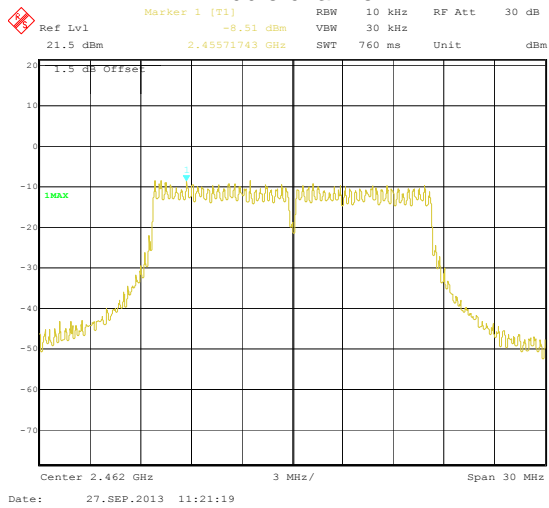
Test mode:	802.11g
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Lowest channel

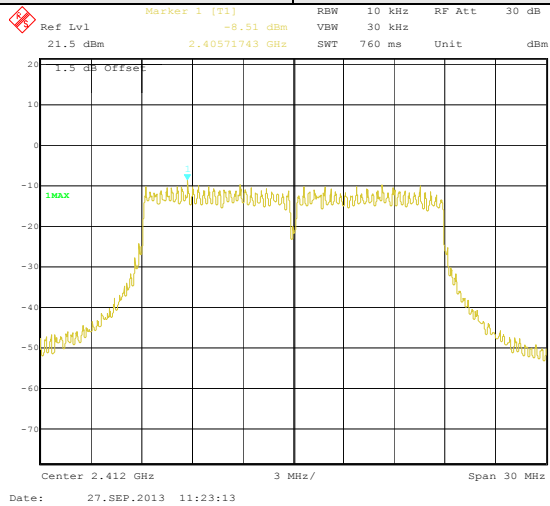


Middle channel

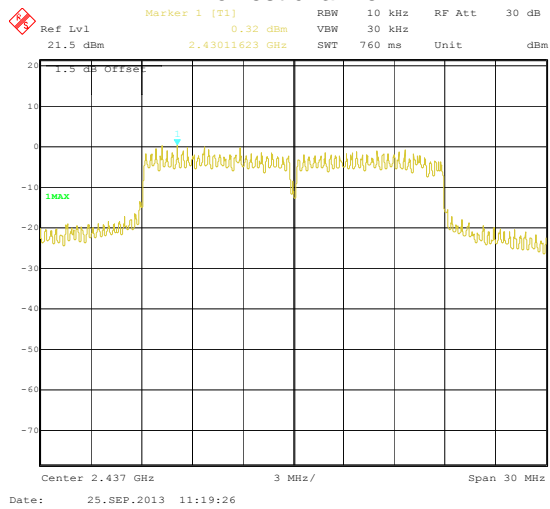


Highest channel

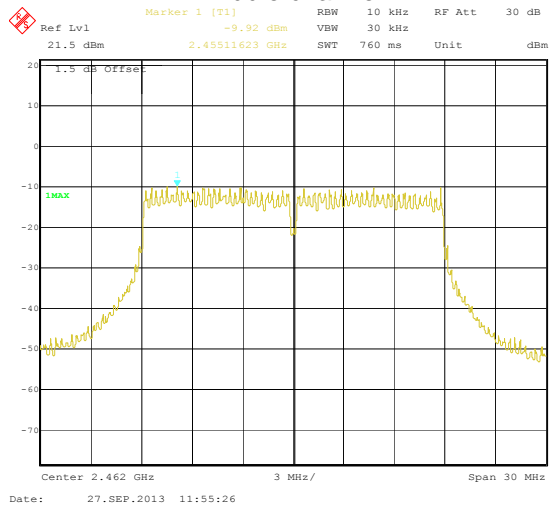
Test mode:	802.11n(H20)
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Lowest channel

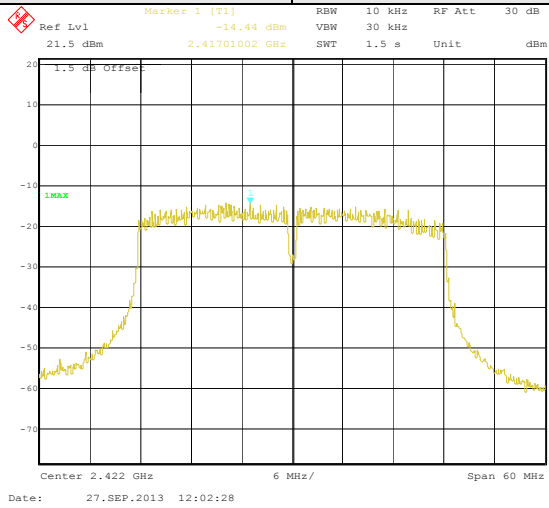


Middle channel

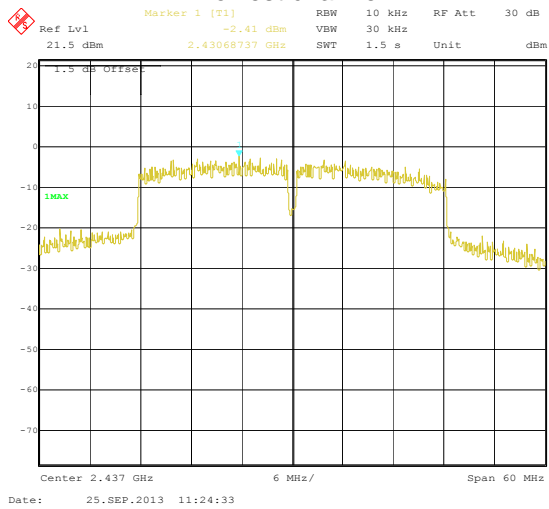


Highest channel

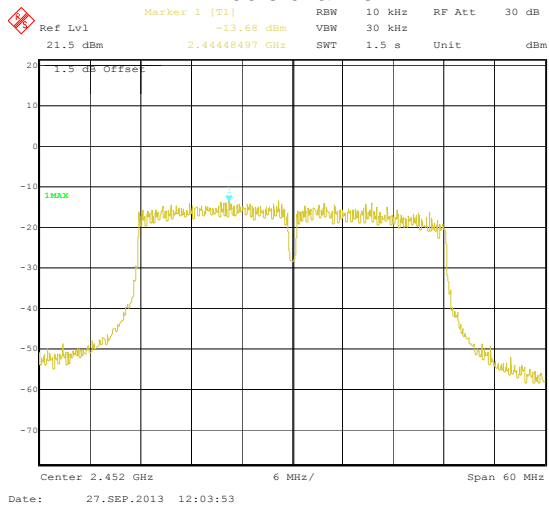
Test mode:	802.11n(H40)
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Lowest channel



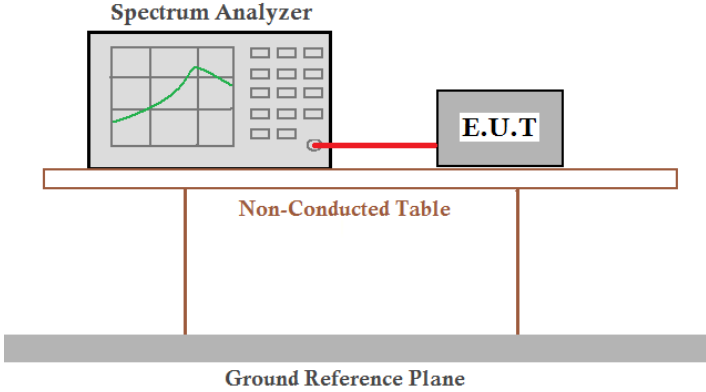
Middle channel



Highest channel

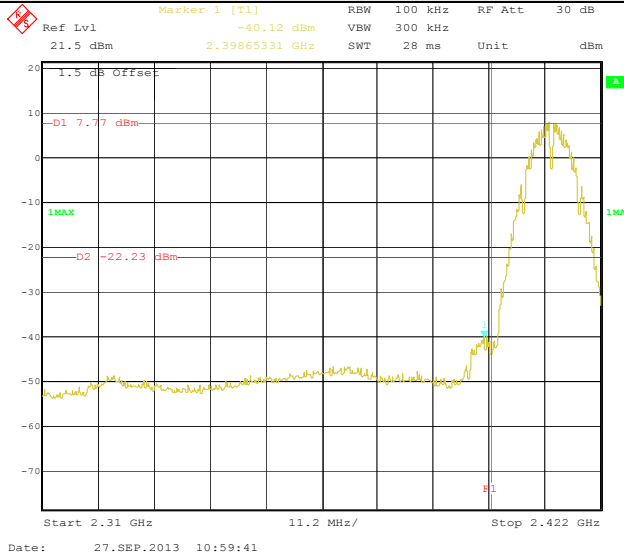
6.6 Band Edge

6.6.1 Conducted Emission Method

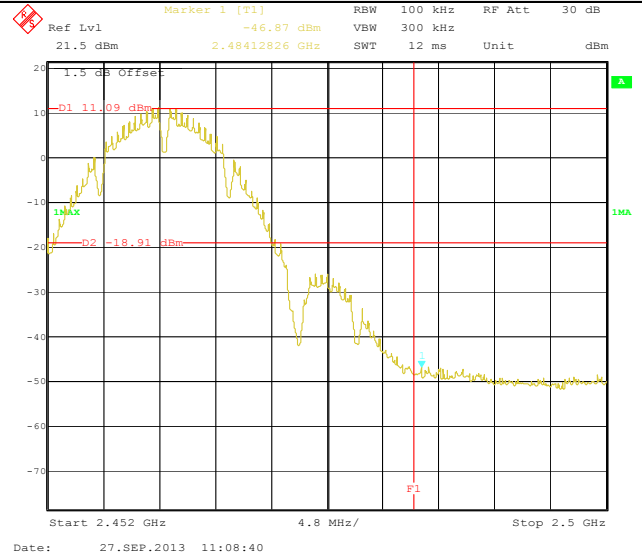
Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.4:2003 and KDB558074
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 30 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 a Ground Reference Plane.</p>
Test Instruments:	Refer to section 5.6 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Test plot as follows:

Test mode: 802.11b

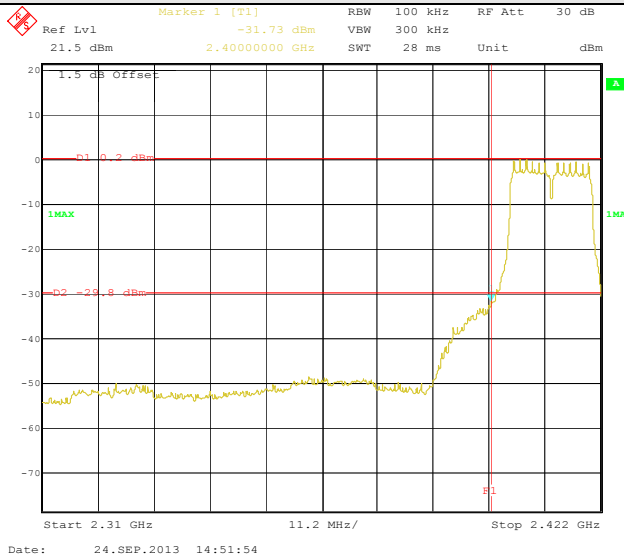


Lowest channel

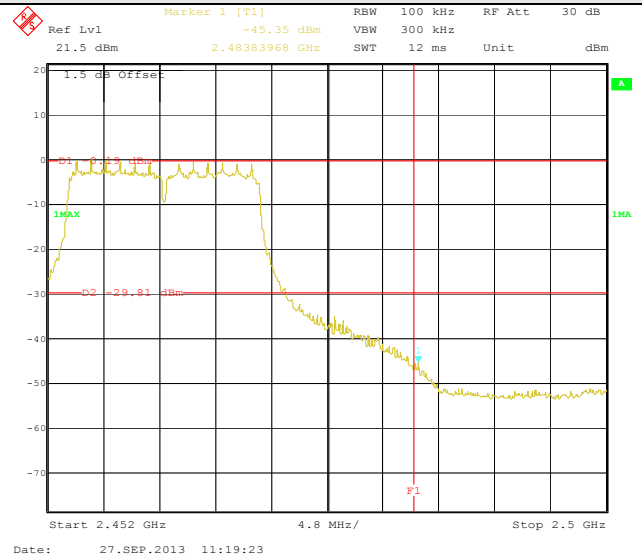


Highest channel

Test mode: 802.11g

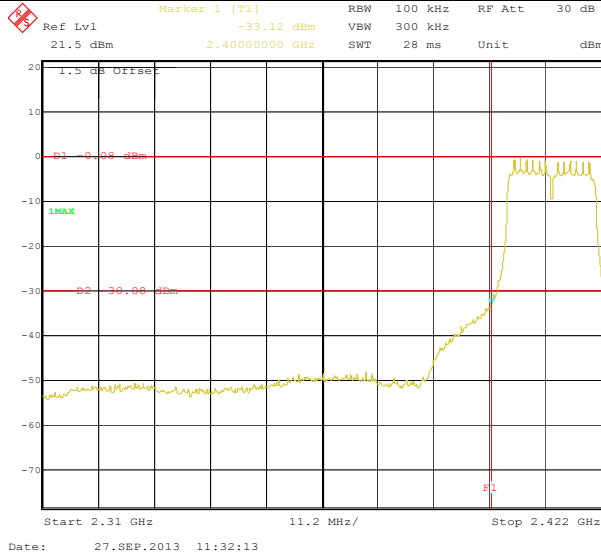


Lowest channel

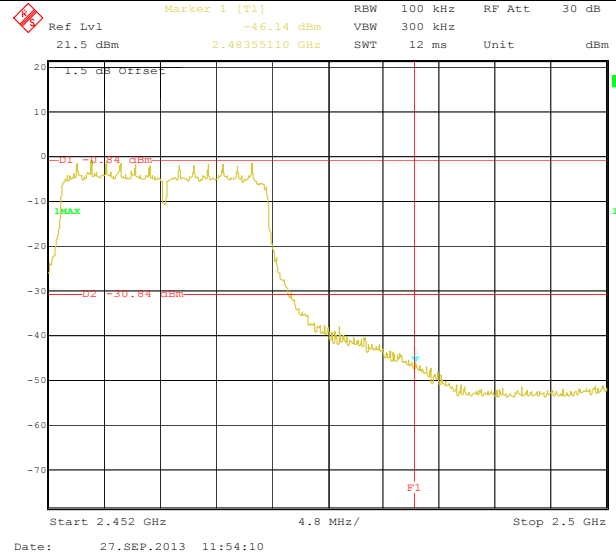


Highest channel

Test mode: 802.11n(H20)

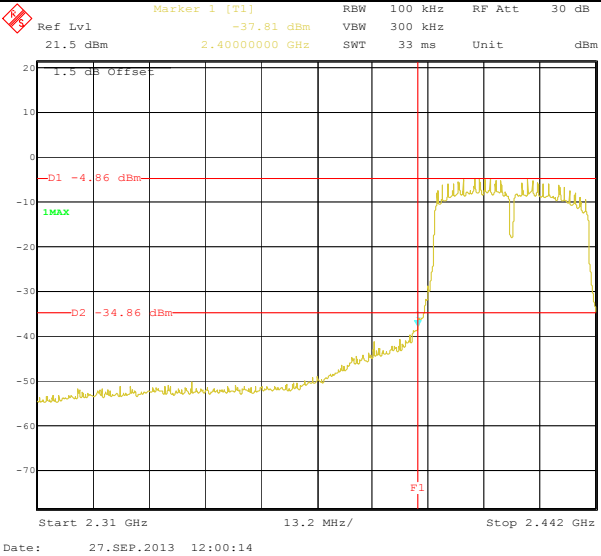


Lowest channel

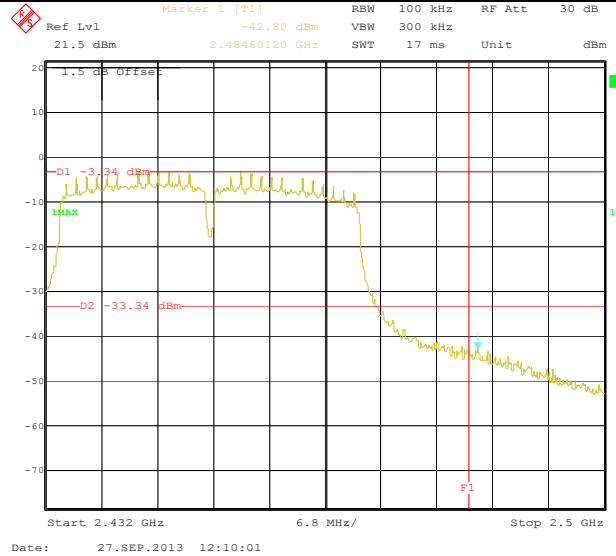


Highest channel

Test mode: 802.11n(H40)



Lowest channel



Highest channel

6.6.2 Radiated Emission Method

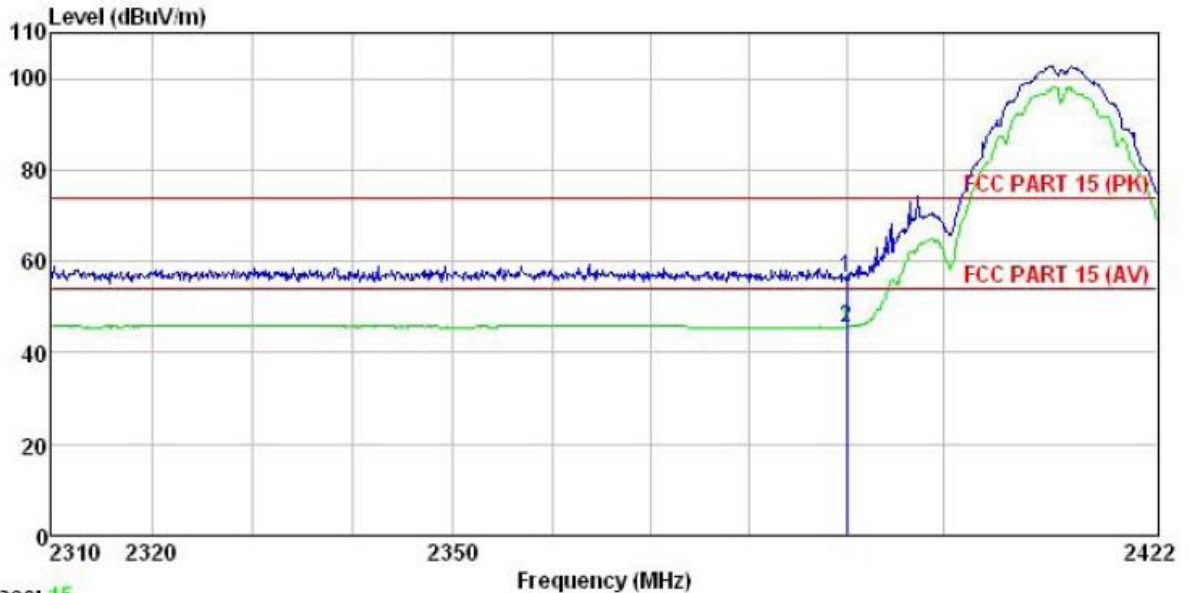
Test Requirement:	FCC Part15 C Section 15.209 and 15.205														
Test Method:	ANSI C63.4: 2003														
Test Frequency Range:	2.3GHz to 2.5GHz														
Test site:	Measurement Distance: 3m														
Receiver setup:	<table border="1"> <thead> <tr> <th>Frequency</th> <th>Detector</th> <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 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 setup:															
Test Instruments:	Refer to section 5.6 for details														
Test mode:	Refer to section 5.3 for details														
Test results:	Passed														

3dBi antenna:

802.11b

Test channel: Lowest

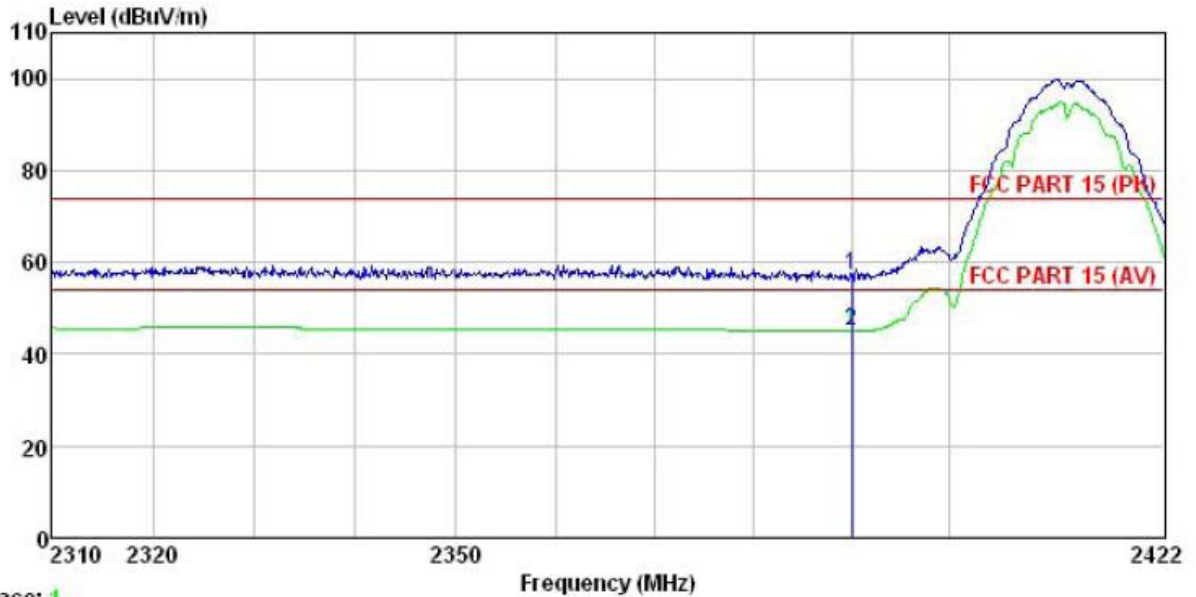
Horizontal:



Trace: 15
 Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11b(Low Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : Ceramic antenna

	Read	Antenna	Cable	Preamp	Level	Limit	Over	
-----	Level	Factor	Loss	Factor	-----	Line	Limit	Remark
-----	MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB
1	2390.000	23.13	27.58	5.67	0.00	56.38	74.00	-17.62 Peak
2	2390.000	12.20	27.58	5.67	0.00	45.45	54.00	-8.55 Average

Vertical :

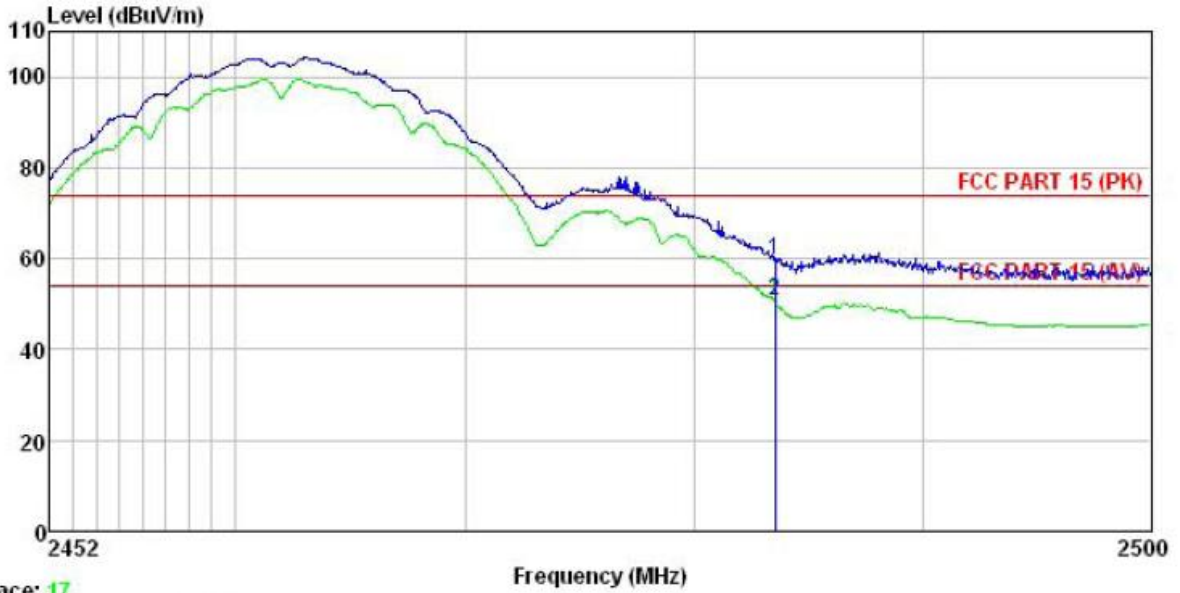


Trace: 1
 Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11b(Low Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : Ceramic antenna

	Read	Antenna	Cable	Preamp	Limit	Over	
Freq	Level	Factor	Loss	Factor	Line	Limit	Remark
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB
1	2390.000	24.02	27.58	5.67	0.00	57.27	74.00 -16.73 Peak
2	2390.000	11.82	27.58	5.67	0.00	45.07	54.00 -8.93 Average

Test channel: Highest

Horizontal:

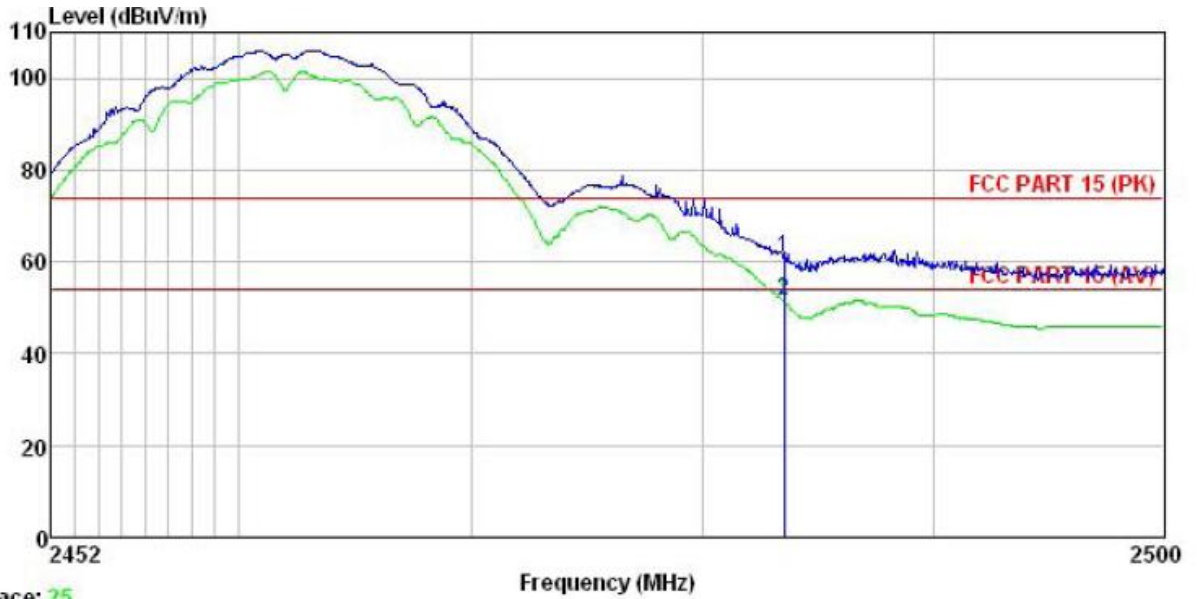


Trace: 17

Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11b(High Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : Ceramic antenna

	Read	Antenna	Cable	Preamp	Limit	Over	
Freq	Level	Factor	Loss	Factor	Line	Limit	Remark
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB
1	2483.500	26.56	27.52	5.70	0.00	59.78	74.00 -14.22 Peak
2	2483.500	17.59	27.52	5.70	0.00	50.81	54.00 -3.19 Average

Vertical :

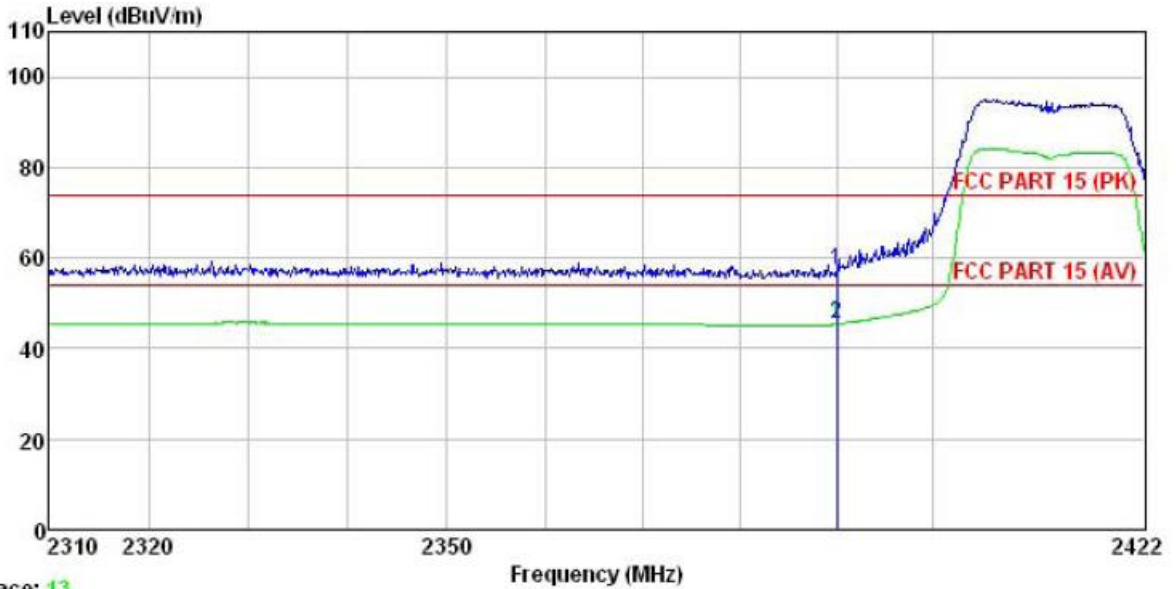


Trace: 25
 Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11b(High Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : Ceramic antenna

	Read	Antenna	Cable	Preamp	Level	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB	
1	2483.500	27.69	27.52	5.70	0.00	60.91	74.00	-13.09 Peak
2	2483.500	18.15	27.52	5.70	0.00	51.37	54.00	-2.63 Average

802.11g
 Test channel: Lowest

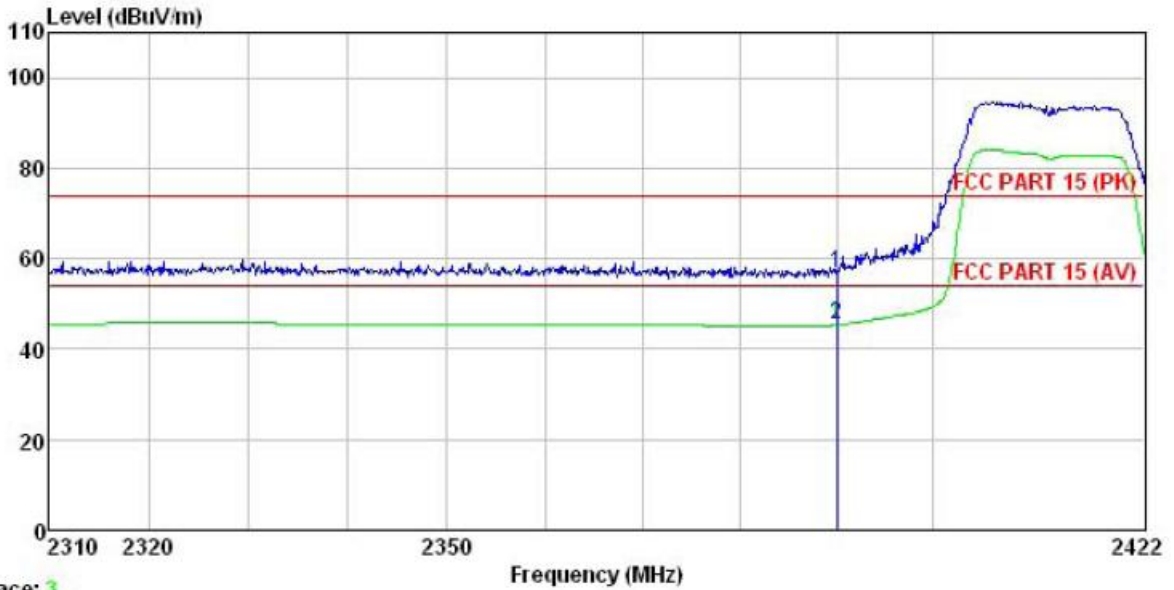
Horizontal :



Trace: 13
 Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11g(Low Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : Ceramic antenna

	Read	Antenna	Cable	Preamp	Level	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB	
1	2390.000	24.16	27.58	5.67	0.00	57.41	74.00	-16.59 Peak
2	2390.000	12.16	27.58	5.67	0.00	45.41	54.00	-8.59 Average

Vertical :

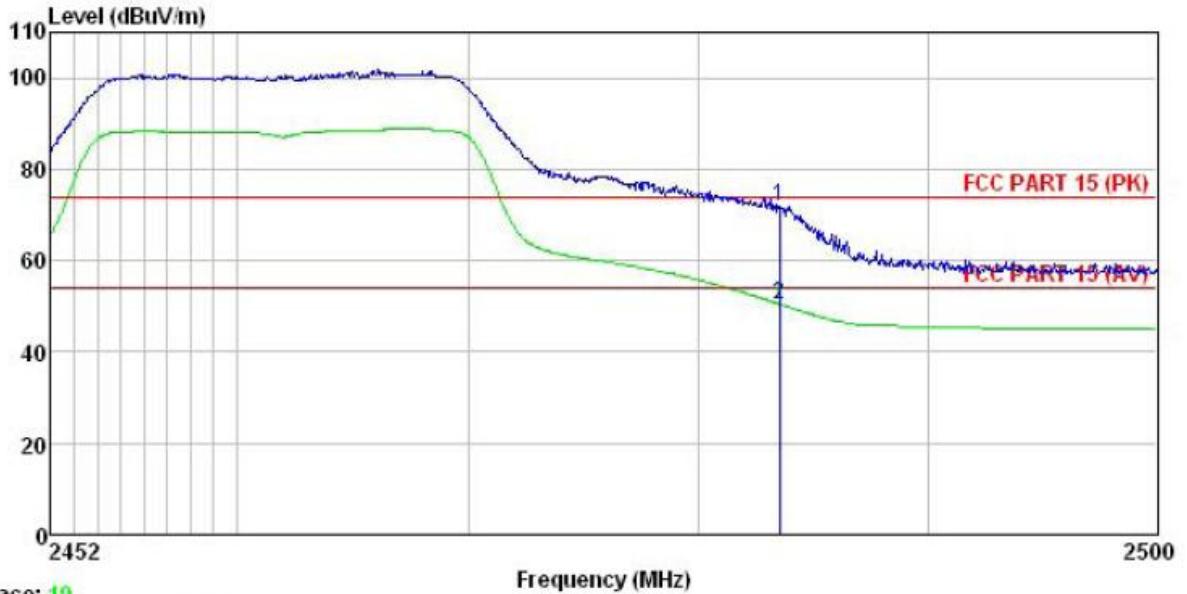


Trace: 3
 Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11g(Low Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : Ceramic antenna

	Read	Antenna	Cable	Preamp	Level	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB	
1	2390.000	23.44	27.58	5.67	0.00	56.69	74.00	-17.31 Peak
2	2390.000	12.16	27.58	5.67	0.00	45.41	54.00	-8.59 Average

Test channel: Highest

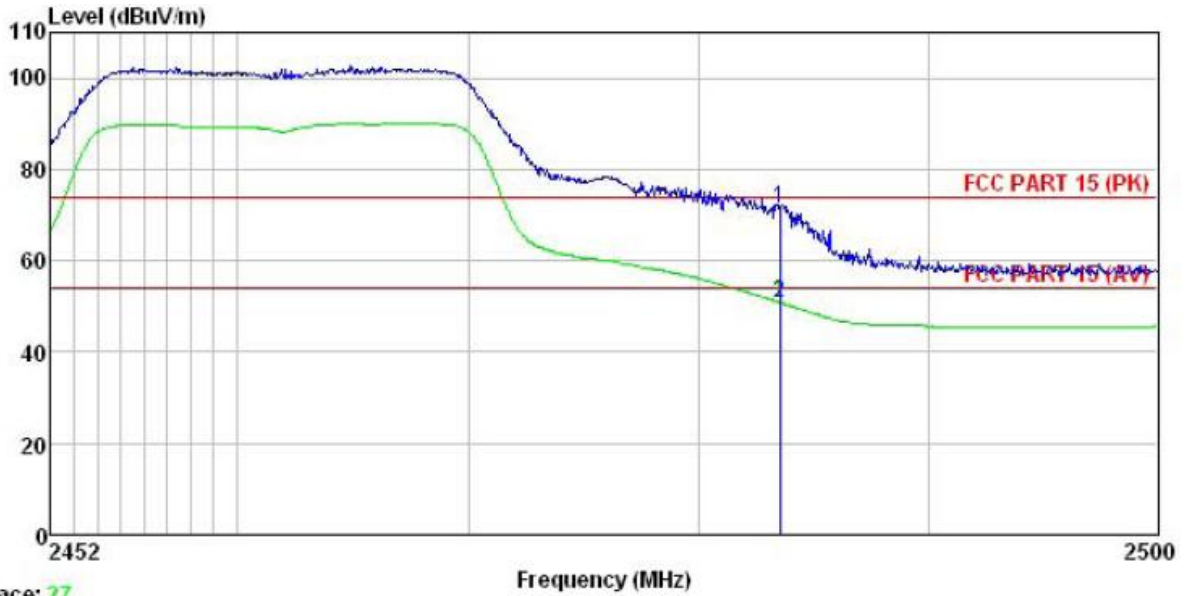
Horizontal :



Trace: 19
 Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11g (High Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : Ceramic antenna

	Read	Antenna	Cable	Preamp	Limit	Over		
Freq	Level	Factor	Loss	Factor	Line	Limit	Remark	
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB	
1	2483.500	38.48	27.52	5.70	0.00	71.70	74.00	-2.30 Peak
2	2483.500	17.31	27.52	5.70	0.00	50.53	54.00	-3.47 Average

Vertical :



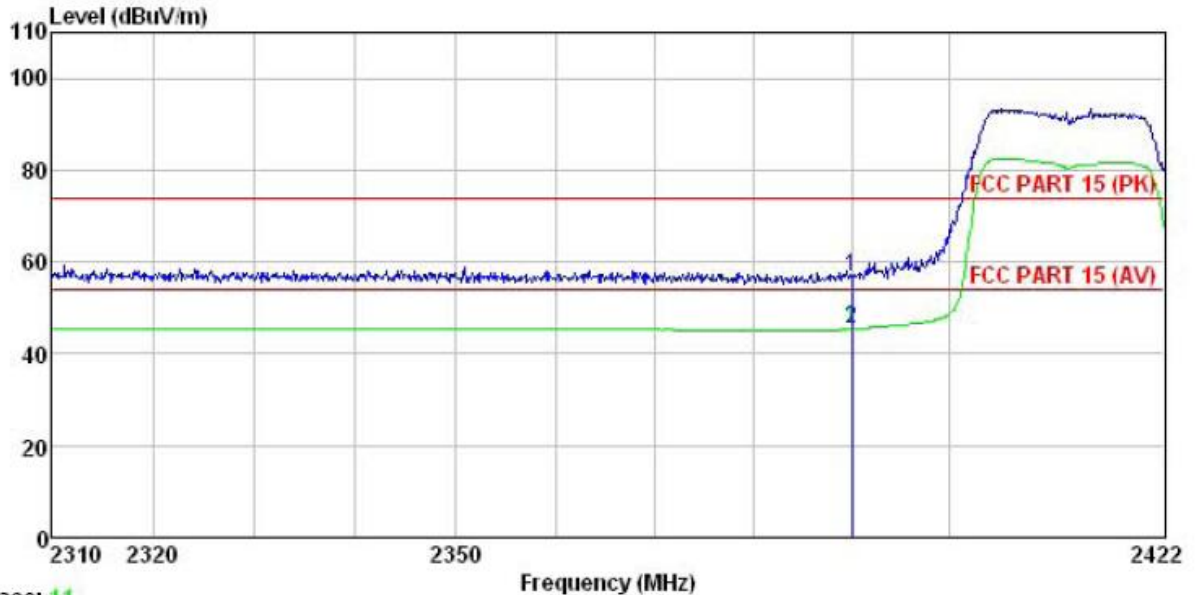
Trace: 27

Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11g(High Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : Ceramic antenna

	Freq	Read	Antenna	Cable	Preamp	Level	Limit	Over	Remark
	MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB	
1	2483.500	38.14	27.52	5.70	0.00	71.36	74.00	-2.64	Peak
2	2483.500	17.68	27.52	5.70	0.00	50.90	54.00	-3.10	Average

802.11n (H20)
 Test channel: Lowest

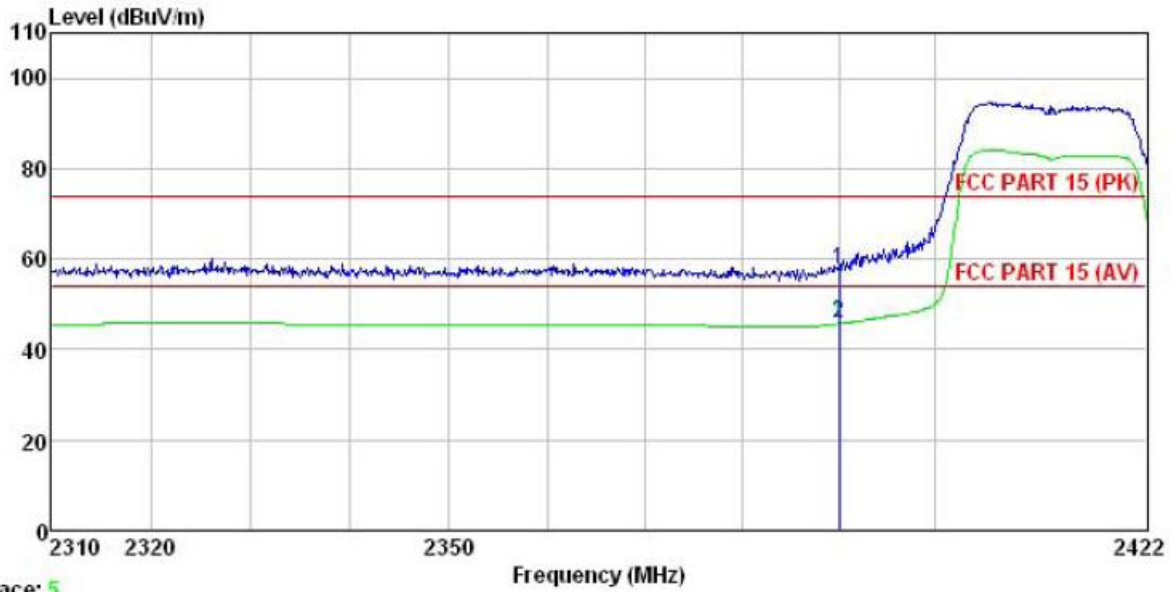
Horizontal :



Trace: 11
 Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11n20(Low Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : Ceramic antenna

	Read	Antenna	Cable	Preamp	Limit	Over	
Freq	Level	Factor	Loss	Factor	Line	Limit	Remark
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB
1	2390.000	23.50	27.58	5.67	0.00	56.75	74.00 -17.25 Peak
2	2390.000	12.16	27.58	5.67	0.00	45.41	54.00 -8.59 Average

Vertical :



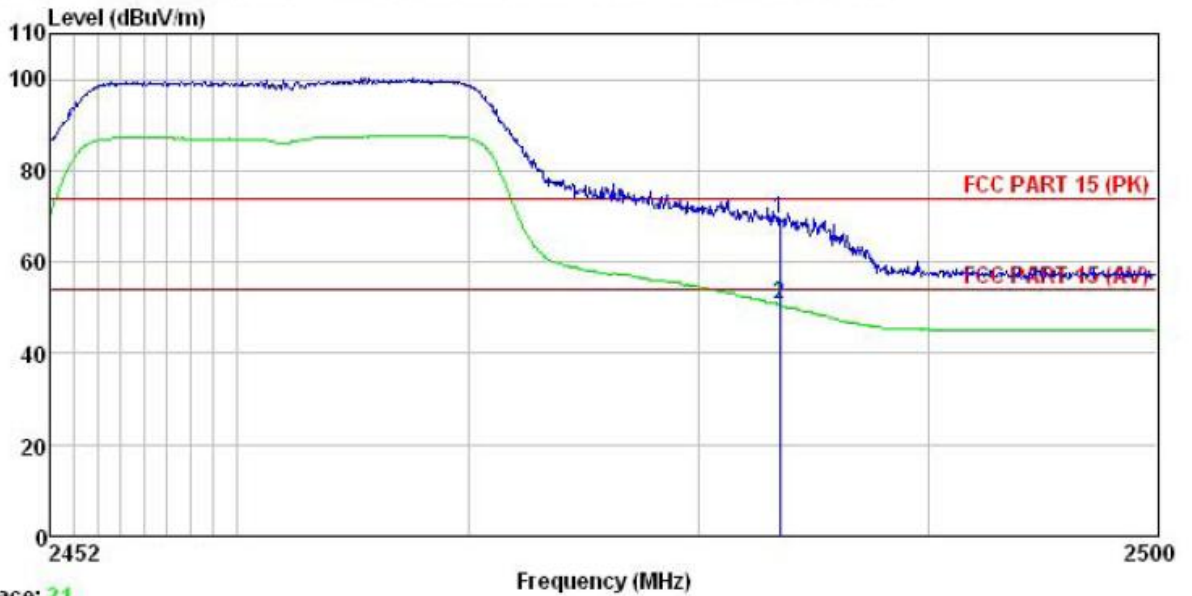
Trace: 5

Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11n20(Low Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : Ceramic antenna

	Read	Antenna	Cable	Preamp	Level	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB	
1	2390.000	24.23	27.58	5.67	0.00	57.48	74.00	-16.52 Peak
2	2390.000	12.51	27.58	5.67	0.00	45.76	54.00	-8.24 Average

Test channel: Highest

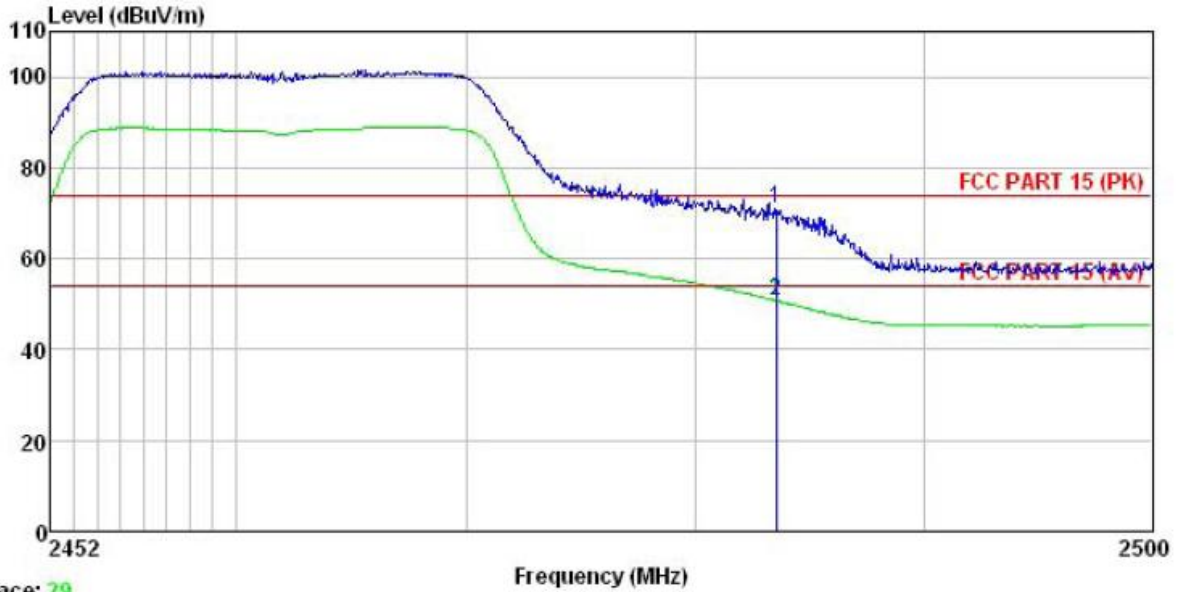
Horizontal :



Trace: 21
 Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11n20 (High Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : Ceramic antenna

	Read	Antenna	Cable	Preamp	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit Remark
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB
1	2483.500	36.28	27.52	5.70	0.00	69.50	74.00 -4.50 Peak
2	2483.500	17.34	27.52	5.70	0.00	50.56	54.00 -3.44 Average

Vertical :

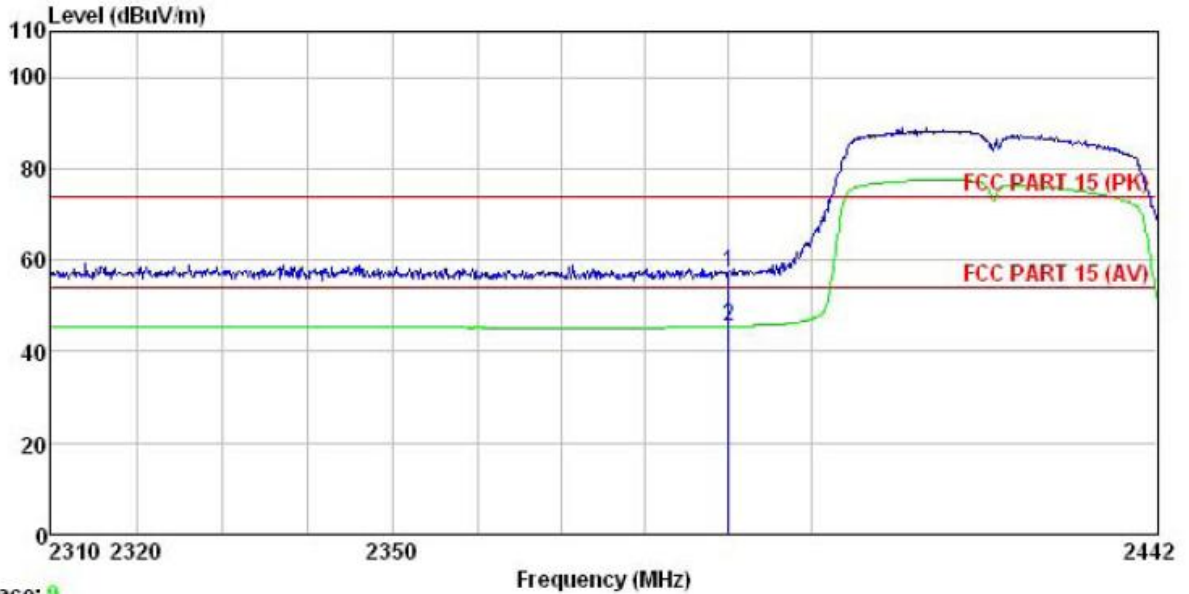


Trace: 29
 Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11n20(High Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : Ceramic antenna

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit	Over	Remark
	MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB	
1	2483.500	37.84	27.52	5.70	0.00	71.06	74.00	-2.94	Peak
2	2483.500	17.56	27.52	5.70	0.00	50.78	54.00	-3.22	Average

802.11n (H40)
 Test channel: Lowest

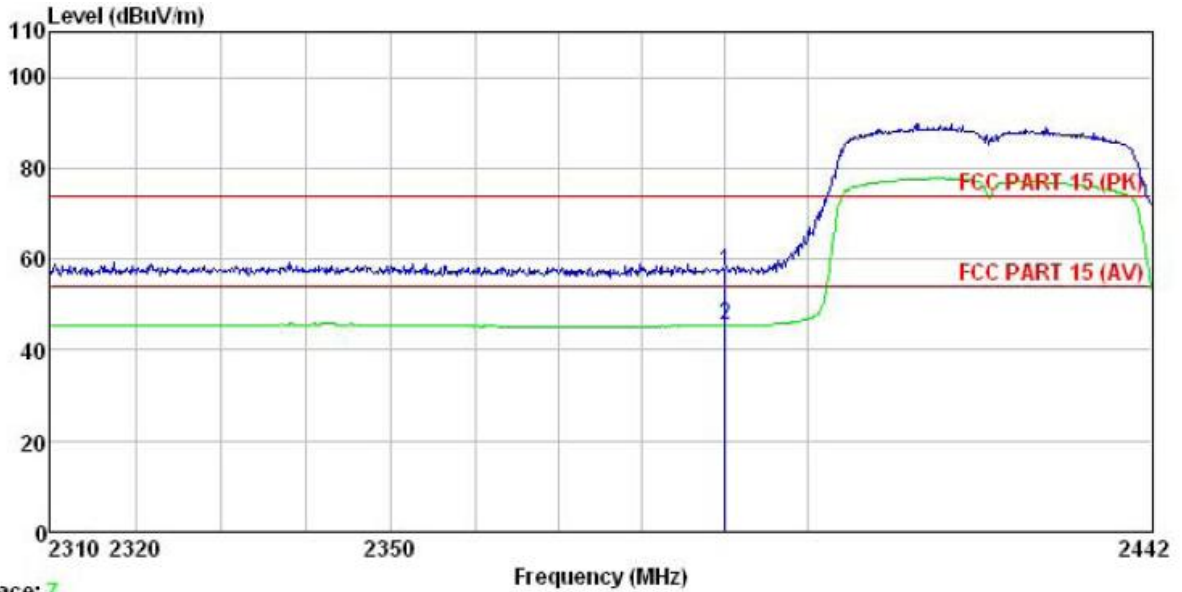
Horizontal :



Trace: 9
 Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11n40(Low Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : Ceramic antenna

	Read	Antenna	Cable	Preamp	Limit	Over		
Freq	Level	Factor	Loss	Factor	Line	Limit	Remark	
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB	
1	2390.000	24.14	27.58	5.67	0.00	57.39	74.00	-16.61 Peak
2	2390.000	12.30	27.58	5.67	0.00	45.55	54.00	-8.45 Average

Vertical :

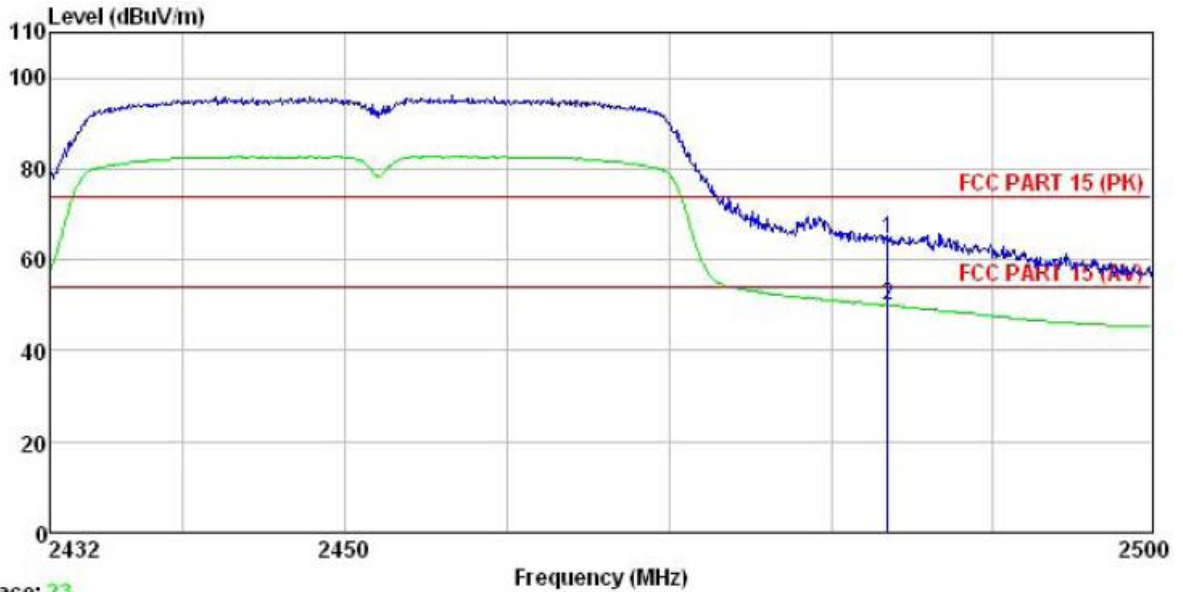


Trace: 7
 Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11n40(Low Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : Ceramic antenna

	Read	Antenna	Cable	Preamp	Level	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB	
1	2390.000	23.91	27.58	5.67	0.00	57.16	74.00	-16.84 Peak
2	2390.000	12.19	27.58	5.67	0.00	45.44	54.00	-8.56 Average

Test channel: Highest

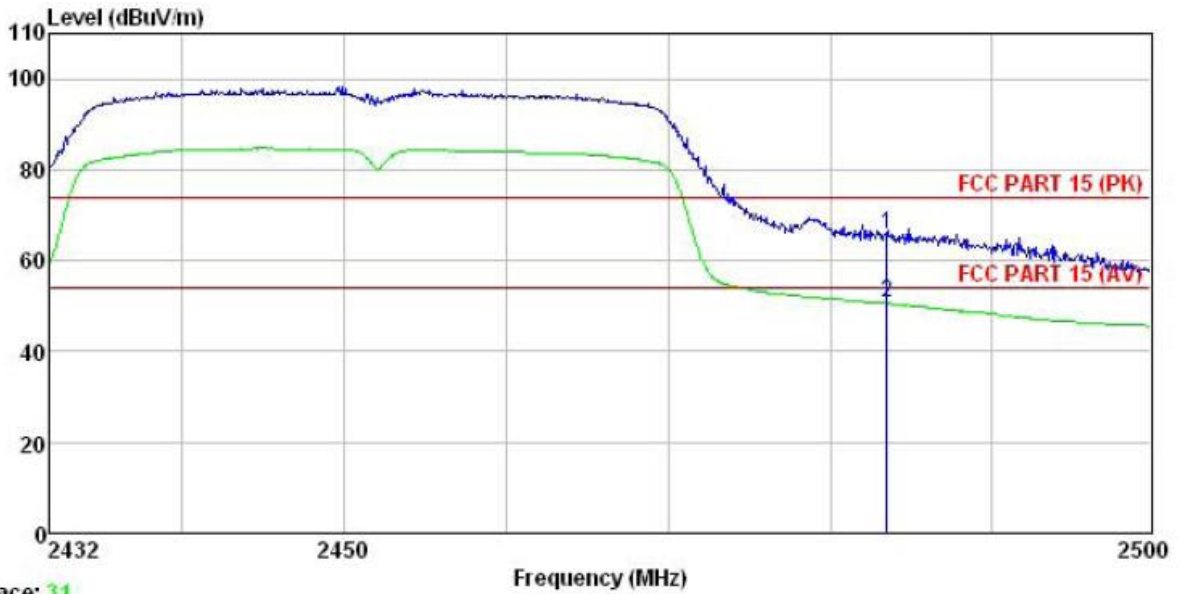
Horizontal :



Trace: 23
 Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11n40 (High Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : Ceramic antenna

	Read	Antenna	Cable	Preamp	Level	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB	
1	2483.500	31.43	27.52	5.70	0.00	64.65	74.00	-9.35 Peak
2	2483.500	16.77	27.52	5.70	0.00	49.99	54.00	-4.01 Average

Vertical :



Trace: 31
 Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11n40(High Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : Ceramic antenna

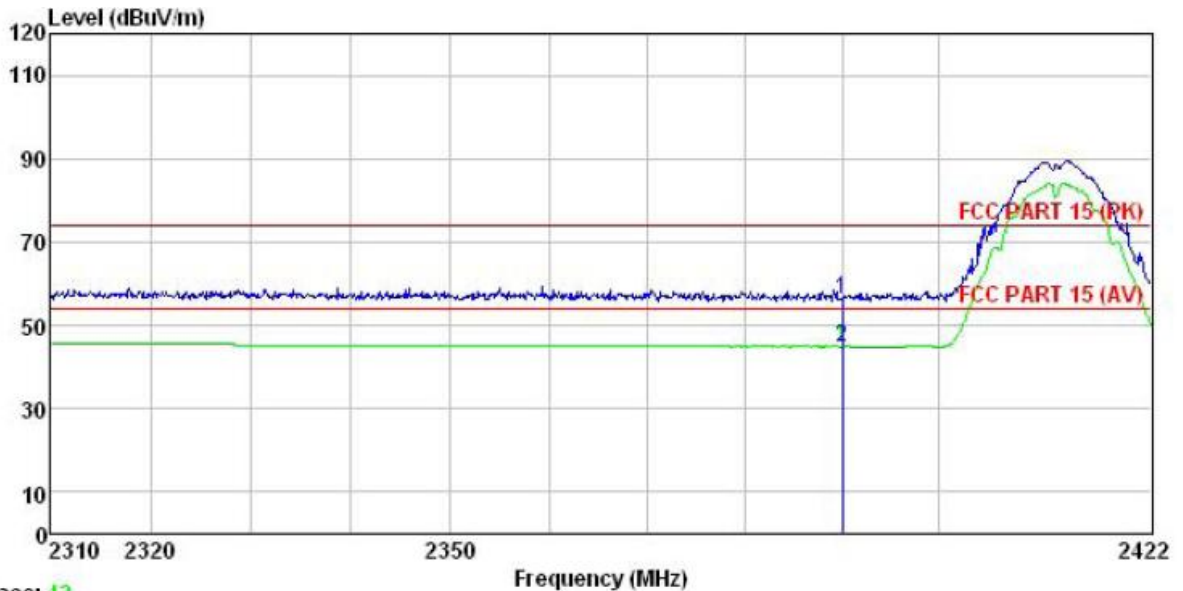
	Read	Antenna	Cable	Preamp	Level	Limit	Over		
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark	
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB		
1	2483.500	32.48	27.52	5.70	0.00	65.70	74.00	-8.30	Peak
2	2483.500	17.40	27.52	5.70	0.00	50.62	54.00	-3.38	Average

12dBi antenna:

802.11b

Test channel: Lowest

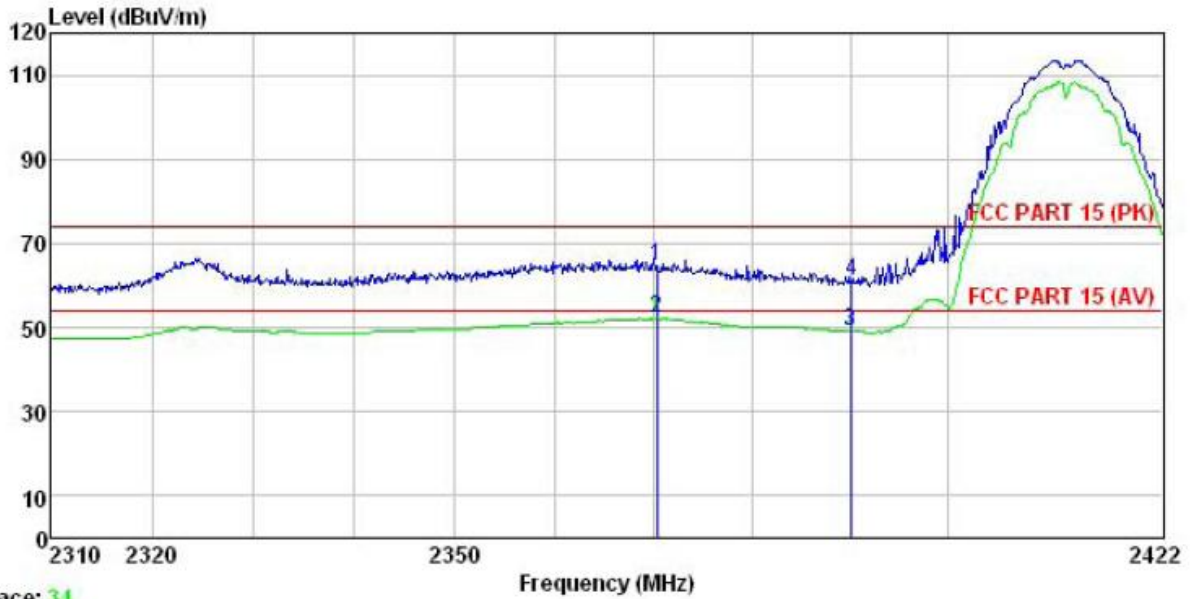
Horizontal:



Trace: 42
 Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11b(Low Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : 12dBi antenna

	Read	Antenna	Cable	Preamp	Limit	Over	
Freq	Level	Factor	Loss	Factor	Line	Limit	Remark
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB
1	2390.000	23.11	27.58	5.67	0.00	56.36	74.00 -17.64 Peak
2	2390.000	11.69	27.58	5.67	0.00	44.94	54.00 -9.06 Average

Vertical :

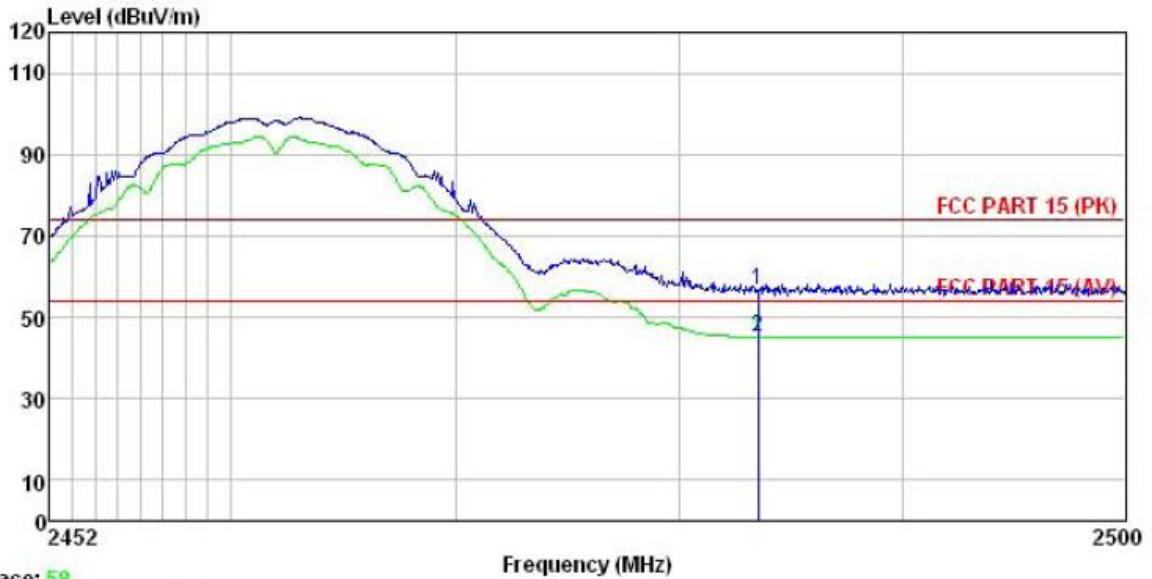


Trace: 34
 Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11b(Low Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : 12dBi antenna

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit	Over Limit	Remark
	MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB	
1	2370.382	31.58	27.65	5.59	0.00	64.82	74.00	-9.18	Peak
2	2370.382	18.96	27.65	5.59	0.00	52.20	54.00	-1.80	Average
3	2390.000	15.84	27.58	5.67	0.00	49.09	54.00	-4.91	Average
4	2390.104	27.75	27.58	5.67	0.00	61.00	74.00	-13.00	Peak

Test channel: Highest

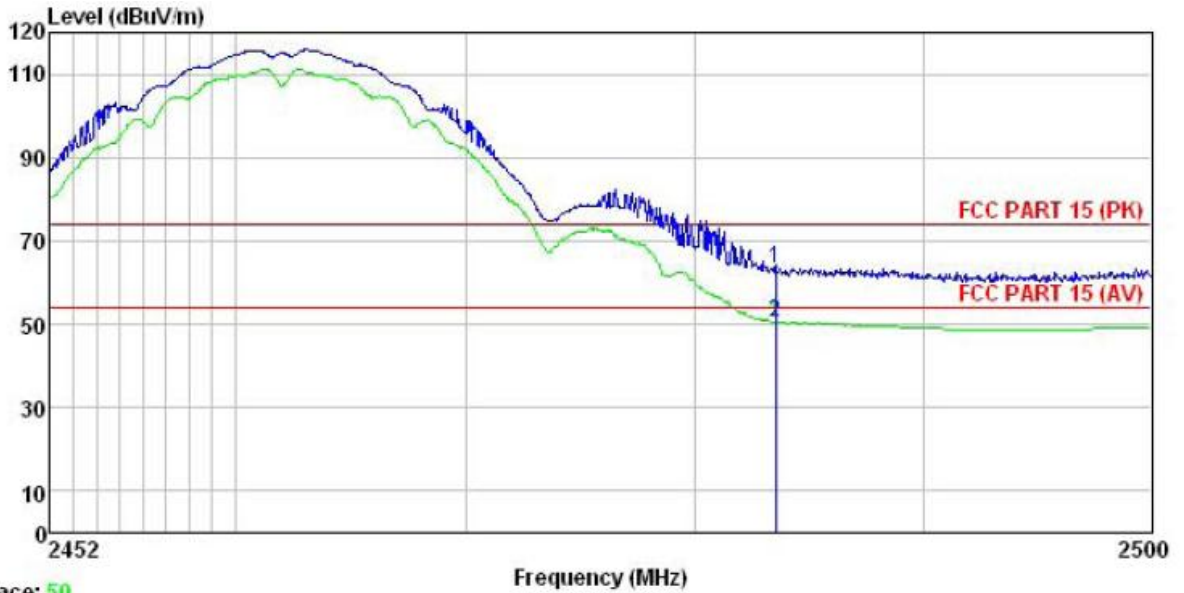
Horizontal:



Trace: 58
 Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11b(High Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : 12dBi antenna

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB	
1	2483.500	23.64	27.52	5.70	0.00	56.86	74.00	-17.14	Peak
2	2483.500	11.96	27.52	5.70	0.00	45.18	54.00	-8.82	Average

Vertical :

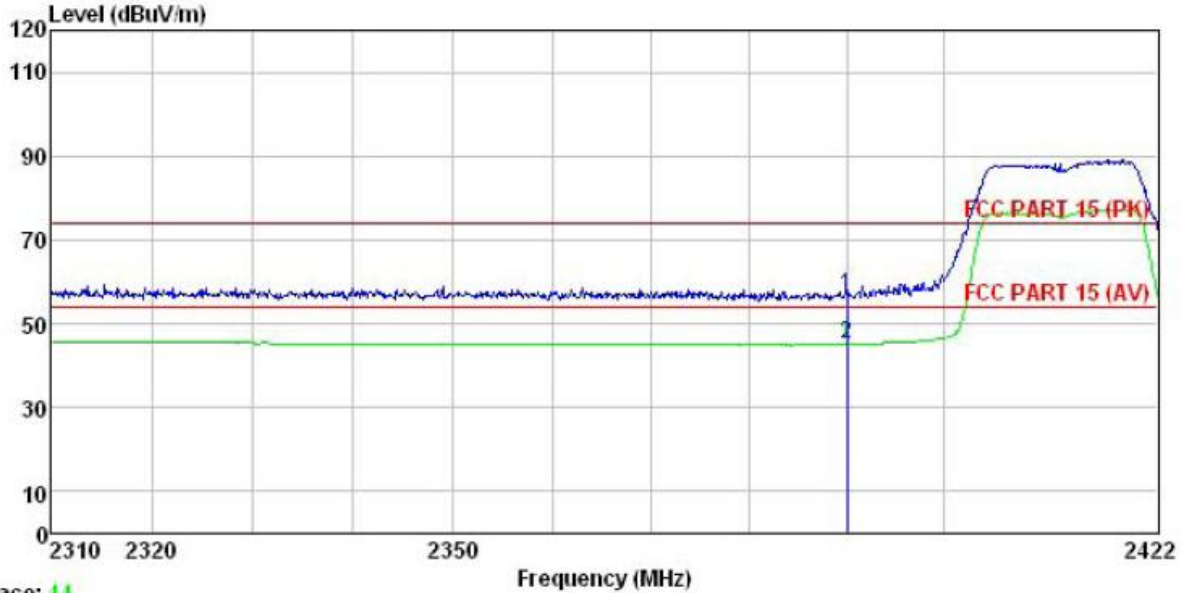


Trace: 50
 Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11b(High Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : 12dBi antenna

	Read	Antenna	Cable	Preamp	Level	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB	
1	2483.500	29.91	27.52	5.70	0.00	63.13	74.00	-10.87 Peak
2	2483.500	17.41	27.52	5.70	0.00	50.63	54.00	-3.37 Average

802.11g
 Test channel: Lowest

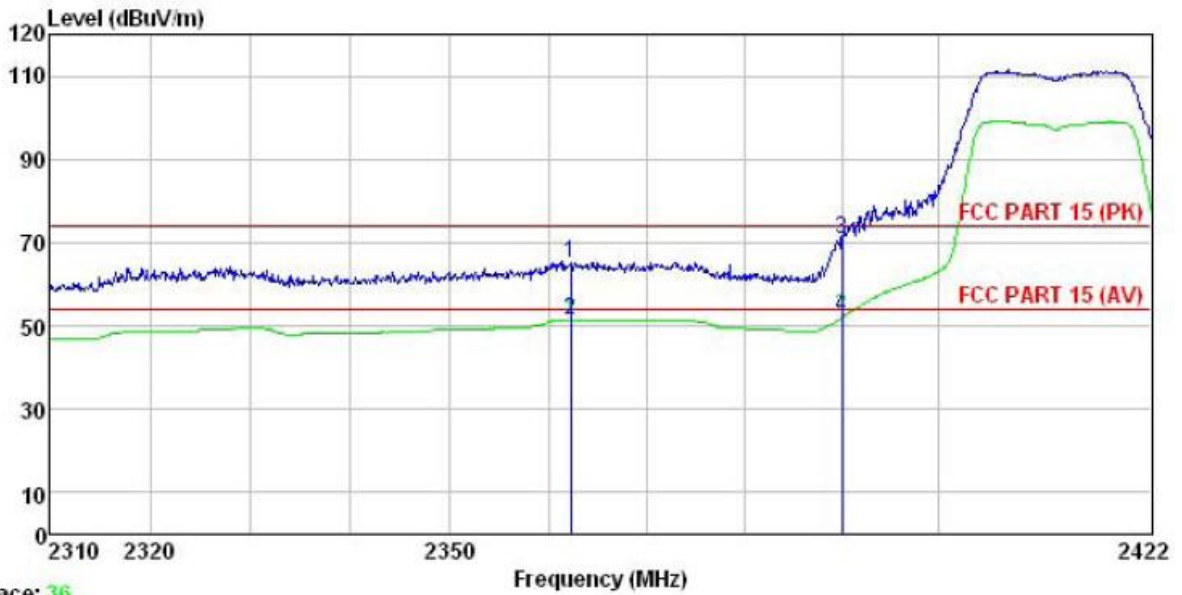
Horizontal :



Trace: 44
 Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11g(Low Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : 12dBi antenna

	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over	
	MHz	Level	Factor	Loss	Factor	Line	Limit	Remark
		dBm	dB/m	dB	dB	dBm/m	dBm/m	dB
1	2390.000	23.44	27.58	5.67	0.00	56.69	74.00	-17.31 Peak
2	2390.000	11.83	27.58	5.67	0.00	45.08	54.00	-8.92 Average

Vertical :

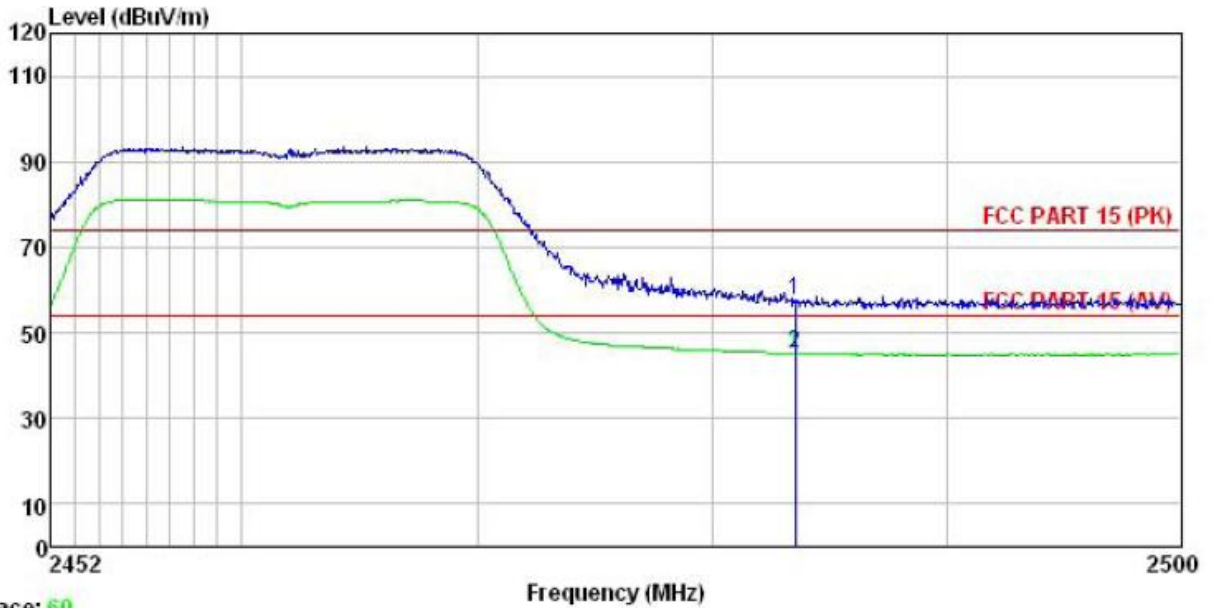


Trace: 36
 Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11g(Low Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : 12dBi antenna

	Read	Antenna	Cable	Preamp	Level	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB	
1	2362.315	31.82	27.71	5.51	0.00	65.04	74.00	-8.96 Peak
2	2362.315	18.31	27.71	5.51	0.00	51.53	54.00	-2.47 Average
3	2390.000	37.76	27.58	5.67	0.00	71.01	74.00	-2.99 Peak
4	2390.000	18.90	27.58	5.67	0.00	52.15	54.00	-1.85 Average

Test channel: Highest

Horizontal :

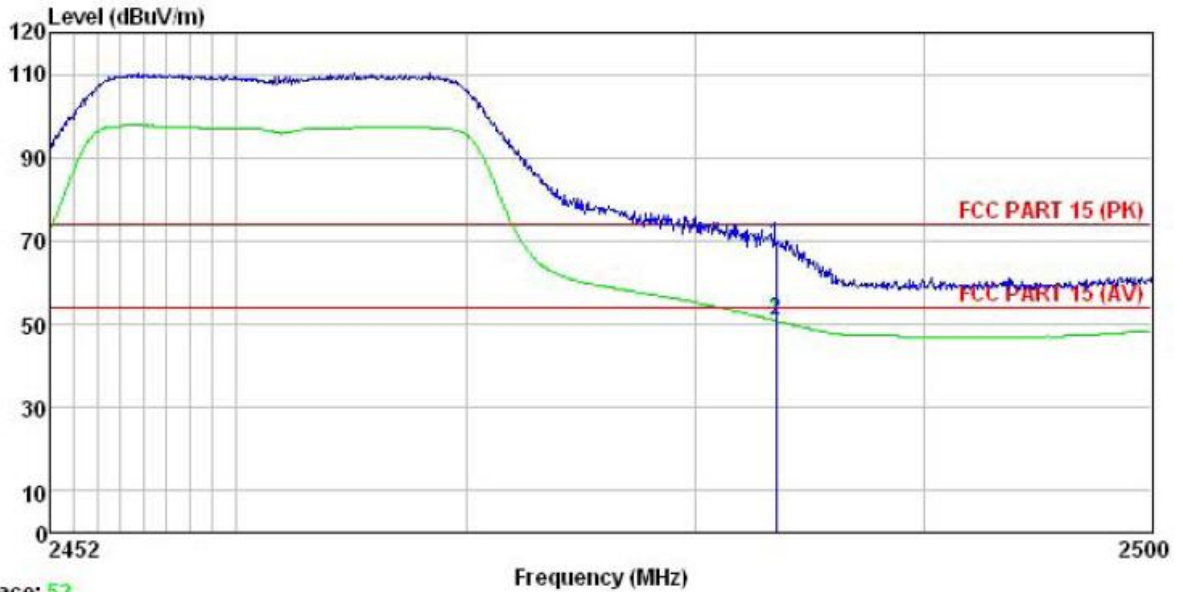


Trace: 60

Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11g(High Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : 12dBi antenna

	Read	Antenna	Cable	Preamp	Level	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB	
1	2483.500	24.37	27.52	5.70	0.00	57.59	74.00	-16.41 Peak
2	2483.500	11.99	27.52	5.70	0.00	45.21	54.00	-8.79 Average

Vertical :

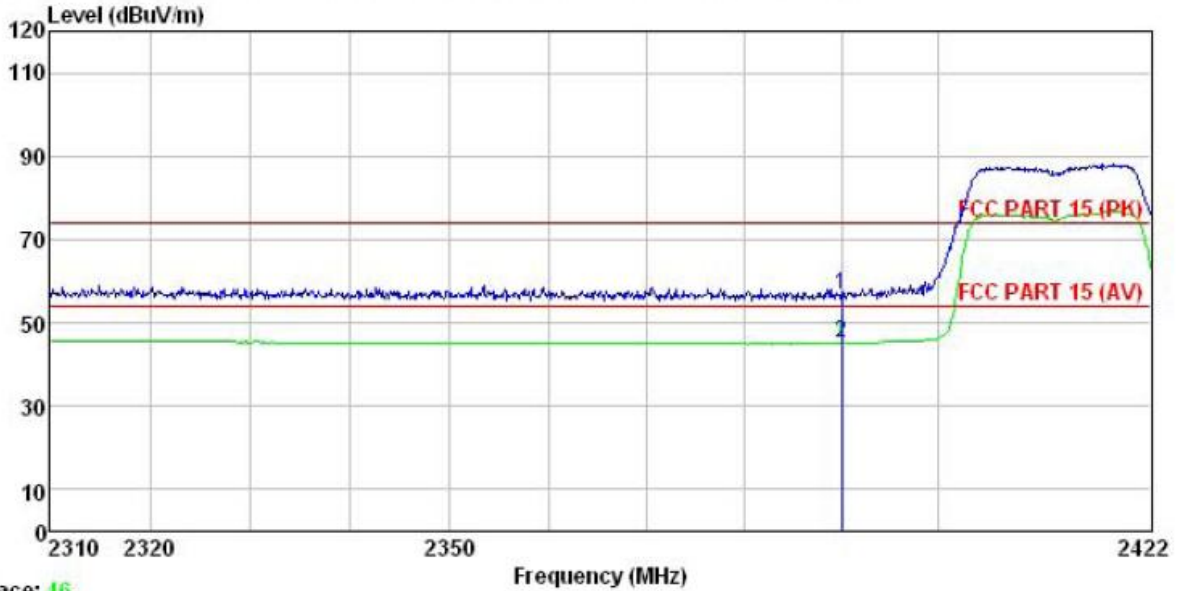


Trace: 52
 Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11g(High Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : 12dBi antenna

	Freq	ReadAntenna	Cable Preamp	Level	Limit	Over	Remark
	MHz	Level	Loss Factor	dBm/m	Line	Limit	
		dBm	dB/m	dB	dBm/m	dB	
1	2483.500	35.94	27.52	5.70	0.00	69.16	74.00 -4.84 Peak
2	2483.500	17.66	27.52	5.70	0.00	50.88	54.00 -3.12 Average

802.11n (H20)
 Test channel: Lowest

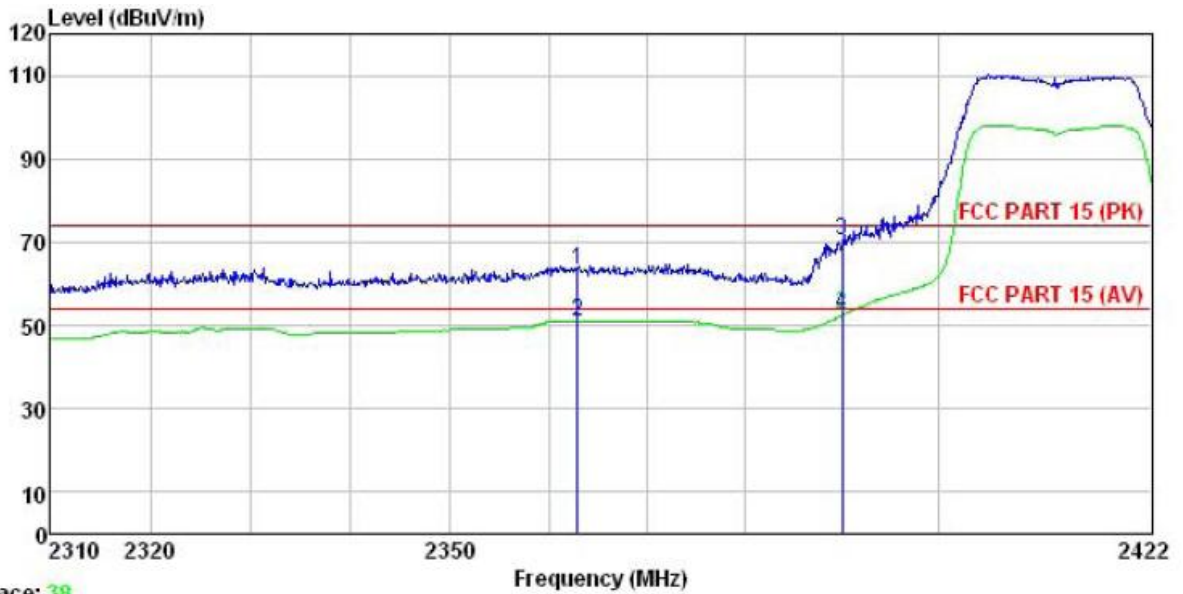
Horizontal :



Trace: 46
 Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11n20(Low Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : 12dBi antenna

	Freq	ReadAntenna	Cable Preamp	Limit	Over			
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit
		dBm	dB/m	dB	dB	dBm/m	dBm/m	dB
1	2390.000	23.62	27.58	5.67	0.00	56.87	74.00	-17.13 Peak
2	2390.000	11.88	27.58	5.67	0.00	45.13	54.00	-8.87 Average

Vertical :

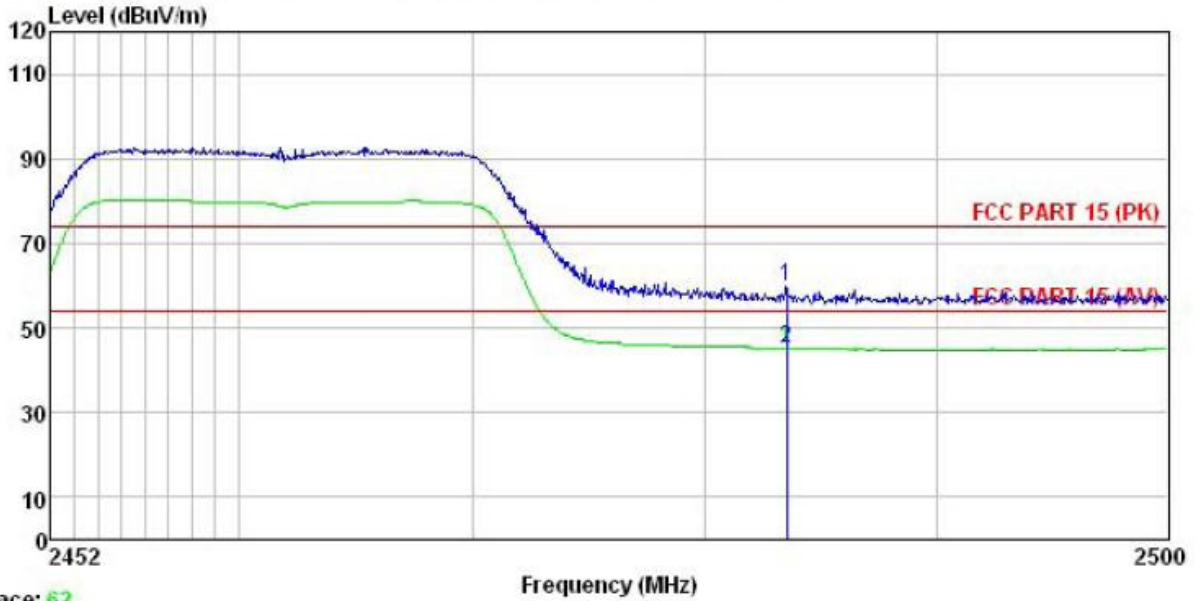


Trace: 38
 Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11n20(Low Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : 12dBi antenna

	Read	Antenna	Cable	Preamp	Level	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB	
1	2362.987	29.97	27.71	5.51	0.00	63.19	74.00	-10.81 Peak
2	2362.987	17.82	27.71	5.51	0.00	51.04	54.00	-2.96 Average
3	2390.000	37.23	27.58	5.67	0.00	70.48	74.00	-3.52 Peak
4	2390.000	19.28	27.58	5.67	0.00	52.53	54.00	-1.47 Average

Test channel: Highest

Horizontal :

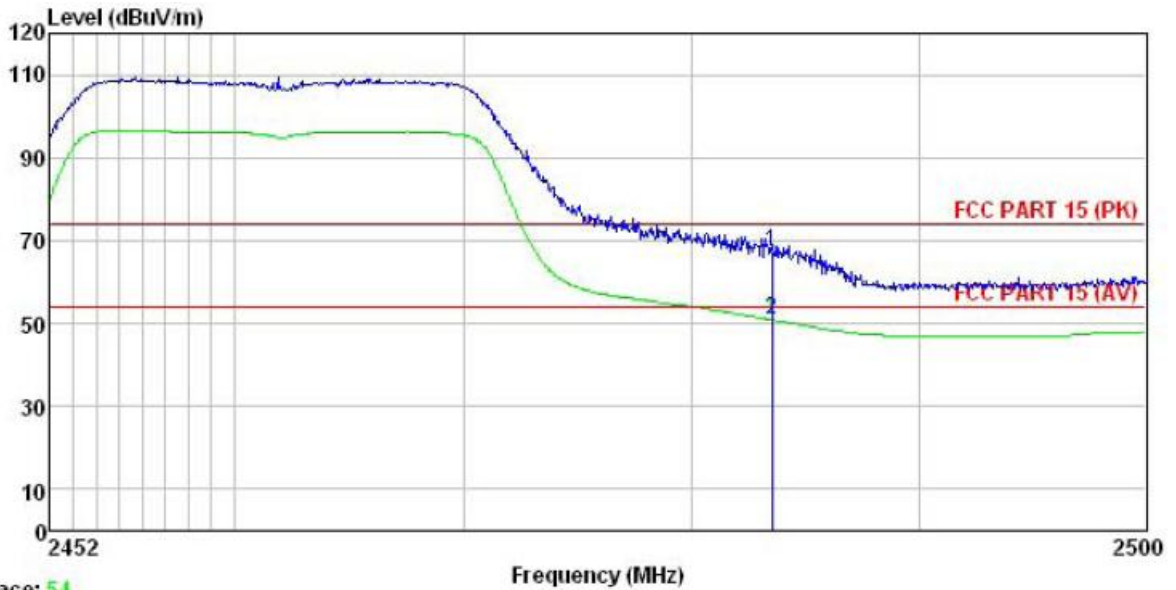


Trace: 62

Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11n20 (High Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : 12dBi antenna

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit	Over Limit	Remark
	MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB	
1	2483.500	26.62	27.52	5.70	0.00	59.84	74.00	-14.16	Peak
2	2483.500	11.95	27.52	5.70	0.00	45.17	54.00	-8.83	Average

Vertical :

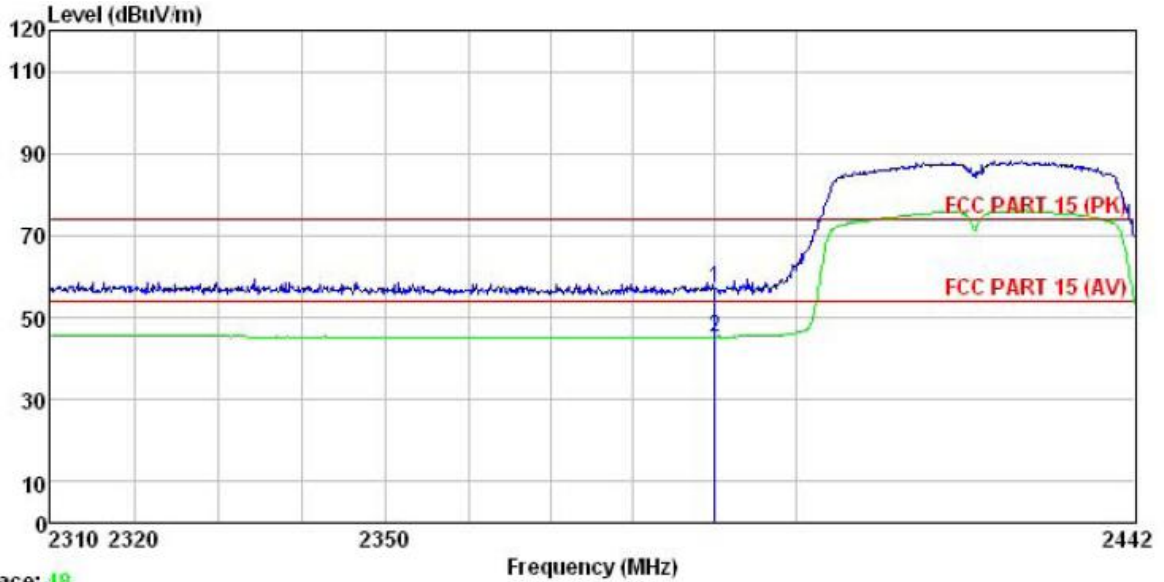


Trace: 54
 Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11n20(High Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : 12dBi antenna

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB	
1	2483.500	34.31	27.52	5.70	0.00	67.53	74.00	-6.47	Peak
2	2483.500	17.67	27.52	5.70	0.00	50.89	54.00	-3.11	Average

802.11n (H40)
 Test channel: Lowest

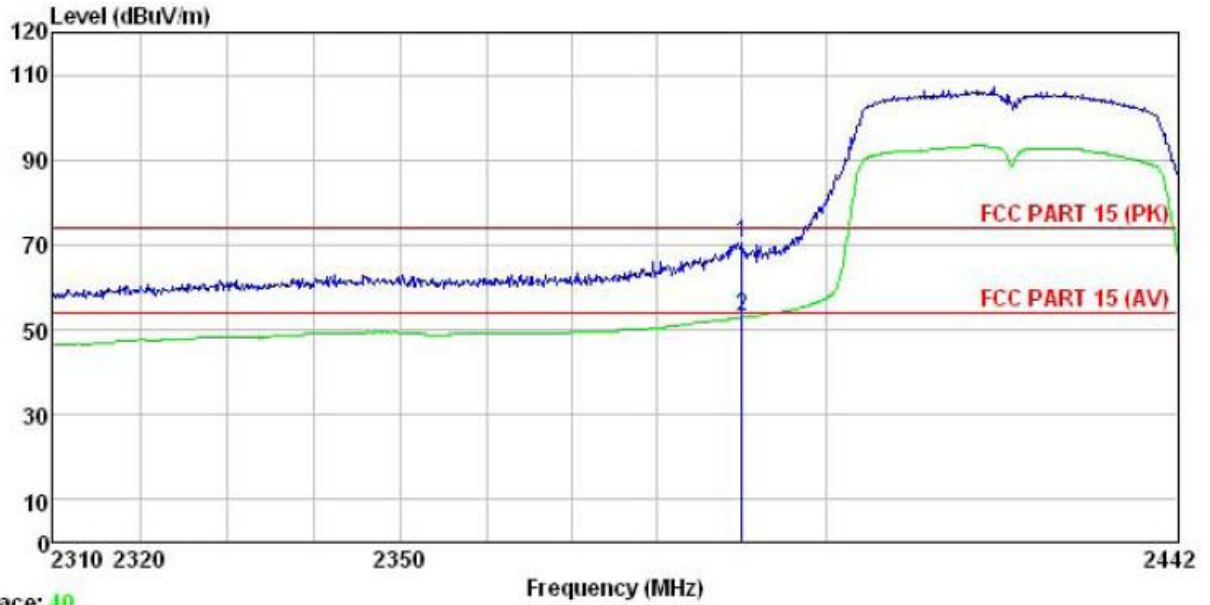
Horizontal :



Trace: 48
 Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11n40(Low Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : 12dBi antenna

	Read	Antenna	Cable	Preamp	Limit	Over	
Freq	Level	Factor	Loss	Factor	Line	Limit	Remark
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB
1	2390.000	23.89	27.58	5.67	0.00	57.14	74.00 -16.86 Peak
2	2390.000	12.13	27.58	5.67	0.00	45.38	54.00 -8.62 Average

Vertical :

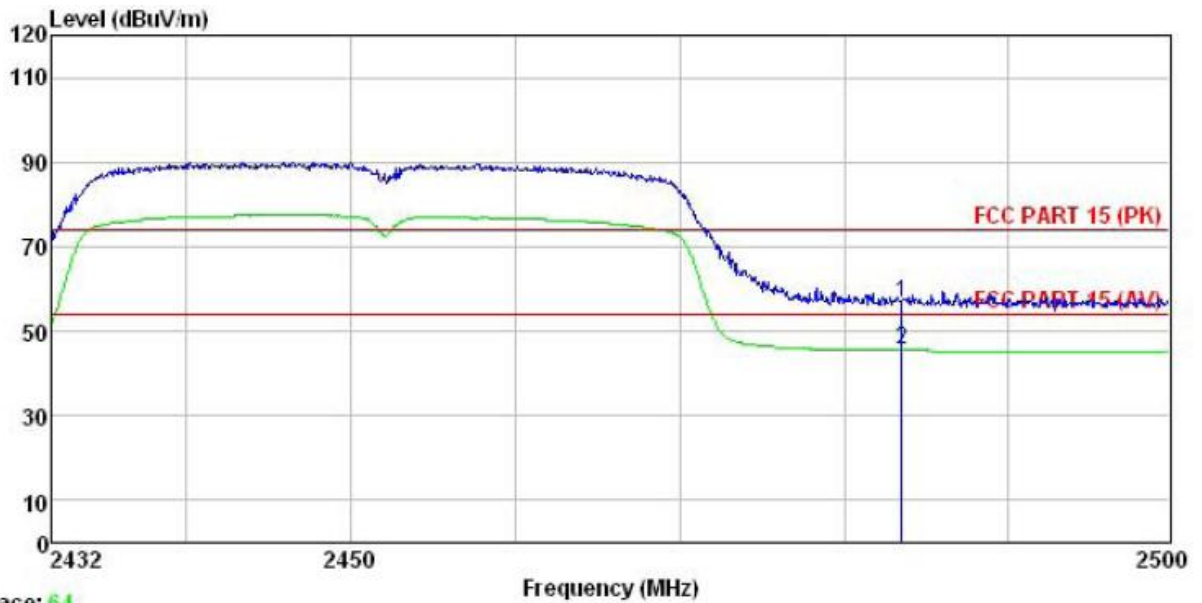


Trace: 40
 Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11n40(Low Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : 12dBi antenna

	ReadAntenna	Cable Preamp	Limit	Over					
Freq	Level	Loss Factor	Line	Limit	Remark				
MHz	dBm	dB/m	dB	dB	dBm/m				
1	2390.000	37.13	27.58	5.67	0.00	70.38	74.00	-3.62	Peak
2	2390.000	19.74	27.58	5.67	0.00	52.99	54.00	-1.01	Average

Test channel: Highest

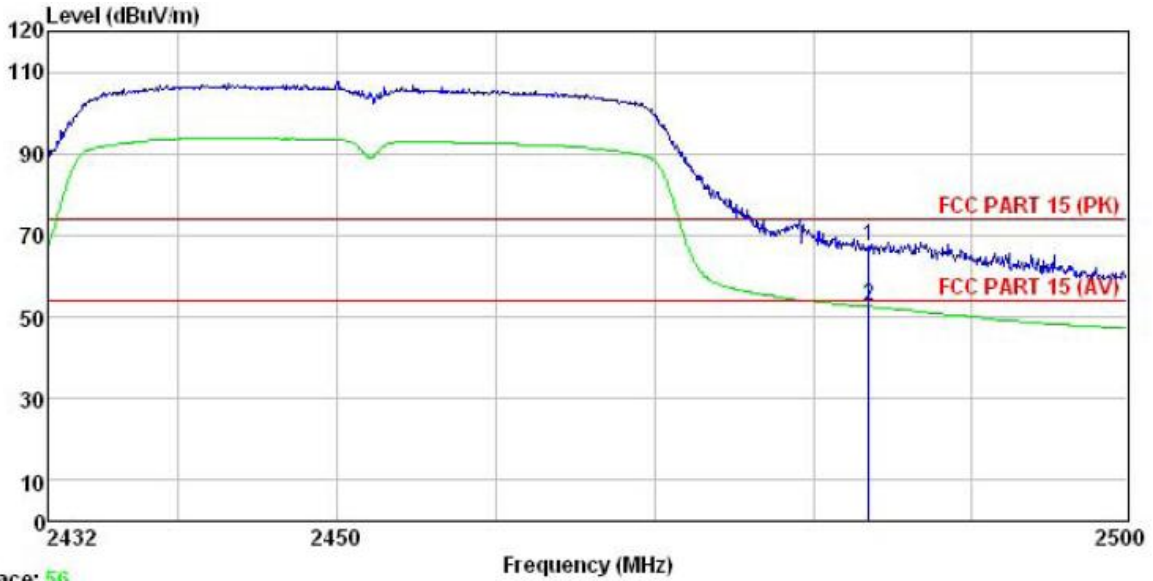
Horizontal :



Trace: 64
 Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11n40(High Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : 12dBi antenna

	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over	
	MHz	Level	Factor	Loss	Factor	Line	Limit	Remark
	MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB
1	2483.500	23.35	27.52	5.70	0.00	56.57	74.00	-17.43 Peak
2	2483.500	12.23	27.52	5.70	0.00	45.45	54.00	-8.55 Average

Vertical :



Trace: 56
 Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX 802.11n40 (High Channel) mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : 12dBi antenna

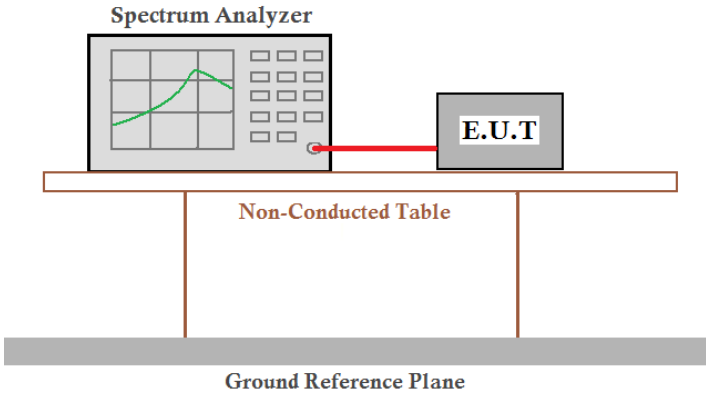
	Read	Antenna	Cable	Preamp	Limit	Over	
Freq	Level	Factor	Loss	Factor	Line	Limit	Remark
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB
1	2483.500	33.99	27.52	5.70	0.00	67.21	74.00 -6.79 Peak
2	2483.500	19.39	27.52	5.70	0.00	52.61	54.00 -1.39 Average

Remark:

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

6.7 Spurious Emission

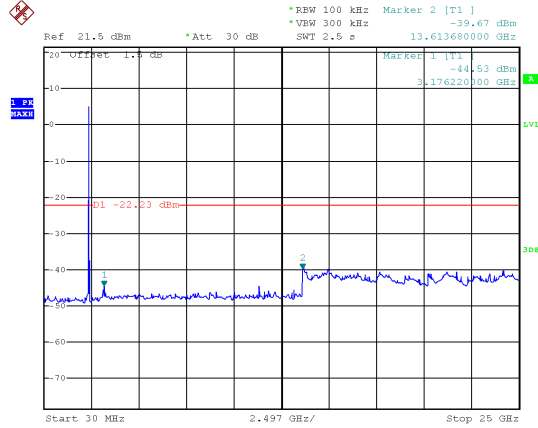
6.7.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.4:2003 and KDB558074
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 legs. Below the table is a Ground Reference Plane.</p>
Test Instruments:	Refer to section 5.6 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Test plot as follows:

Test mode:	802.11b
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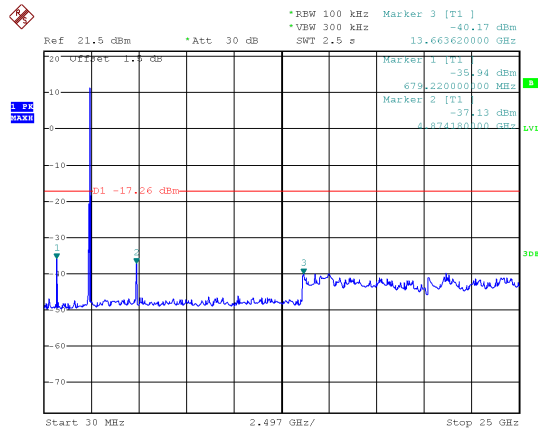
Lowest channel



Date: 27.SEP.2013 15:54:33

30MHz~25GHz

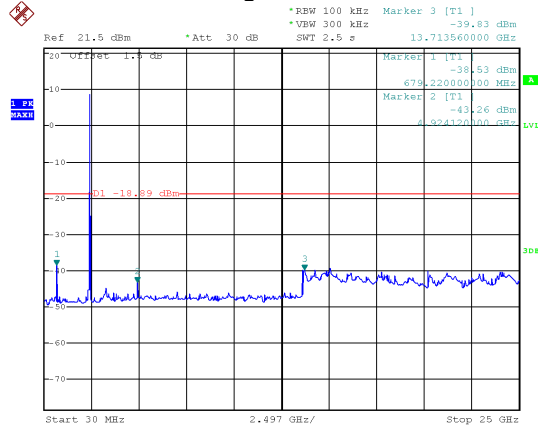
Middle channel



Date: 26.SEP.2013 19:24:01

30MHz~25GHz

Highest channel

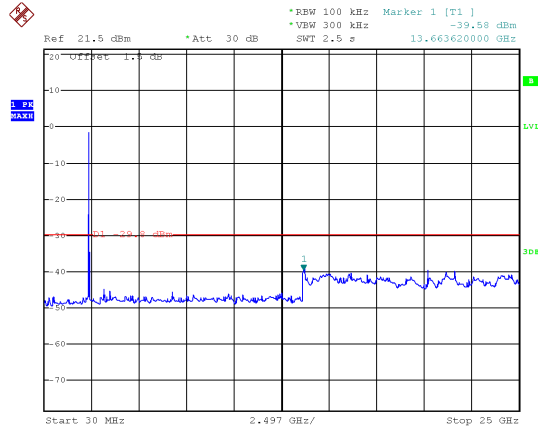


Date: 27.SEP.2013 15:55:53

30MHz~25GHz

Test mode:	802.11g
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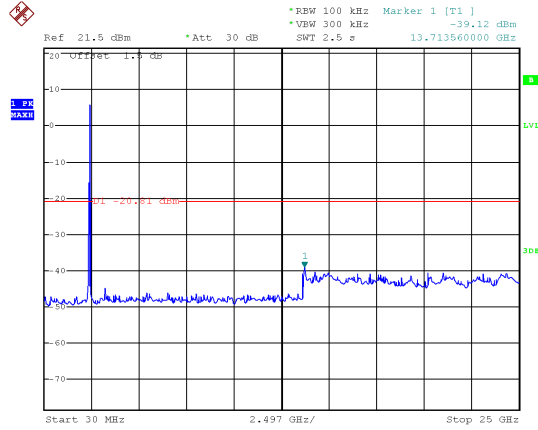
Lowest channel



Date: 26.SEP.2013 19:20:18

30MHz~25GHz

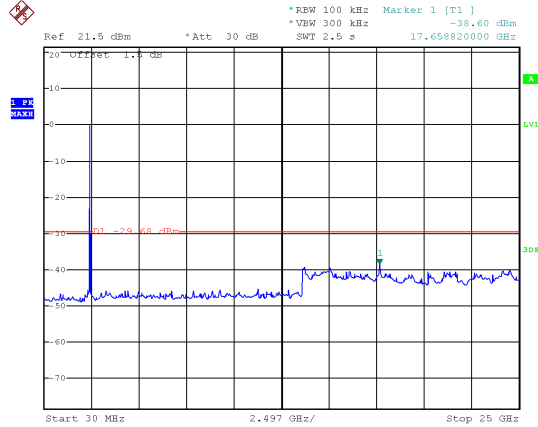
Middle channel



Date: 26.SEP.2013 19:21:10

30MHz~25GHz

Highest channel

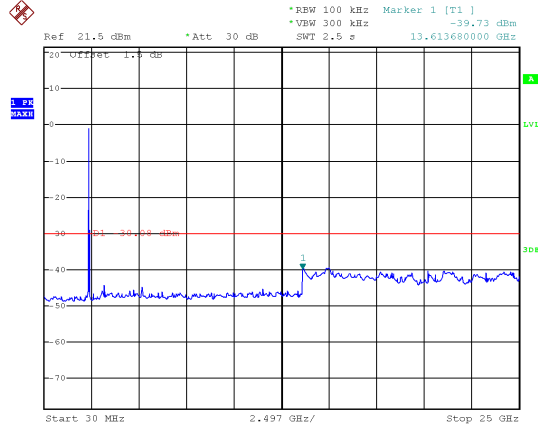


Date: 27.SEP.2013 15:53:06

30MHz~25GHz

Test mode:	802.11n(H20)
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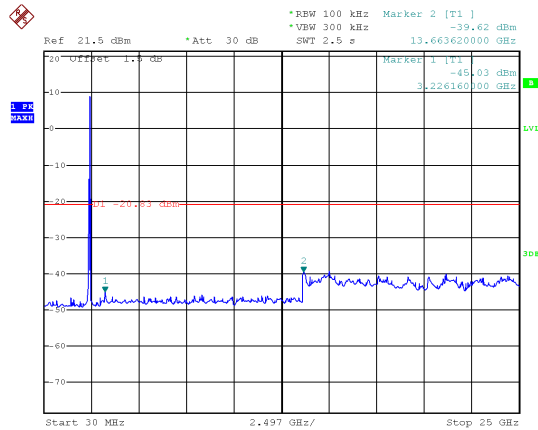
Lowest channel



Date: 27.SEP.2013 15:58:22

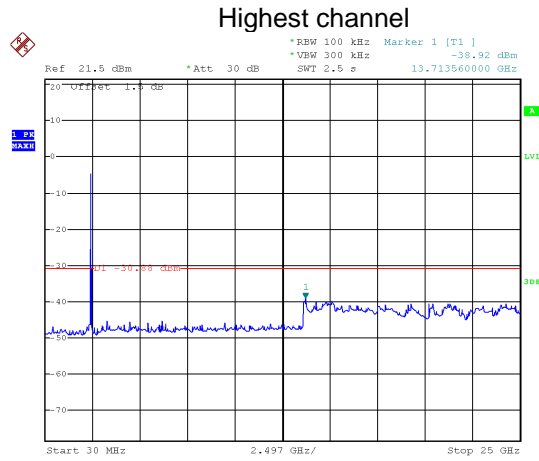
30MHz~25GHz

Middle channel



Date: 26.SEP.2013 19:18:17

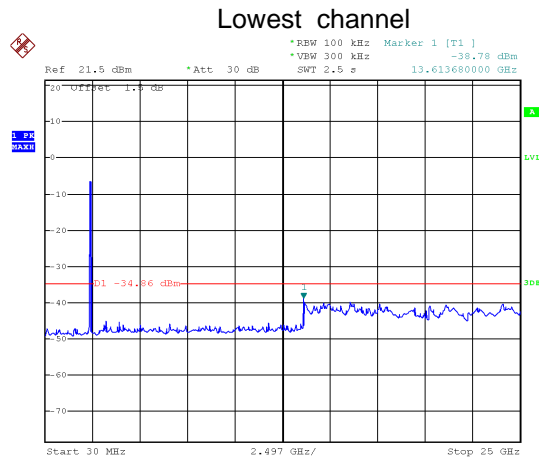
30MHz~25GHz



Date: 27.SEP.2013 15:59:35

30MHz~25GHz

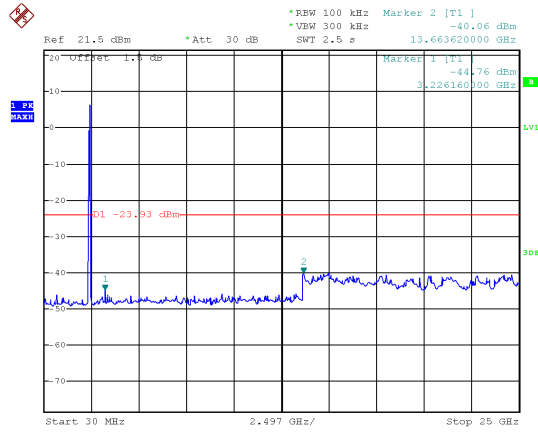
Test mode:	802.11n(H40)
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Date: 27.SEP.2013 16:01:10

30MHz~25GHz

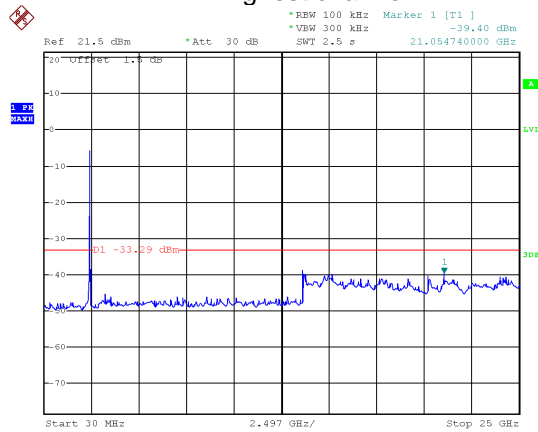
Middle channel



Date: 26.SEP.2013 19:14:00

30MHz~25GHz

Highest channel

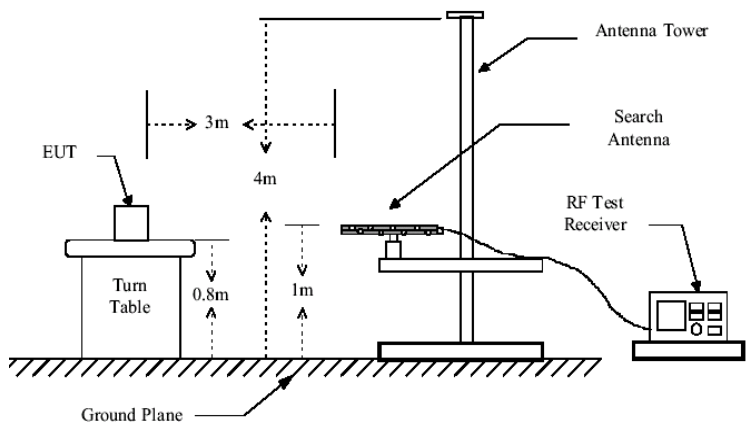
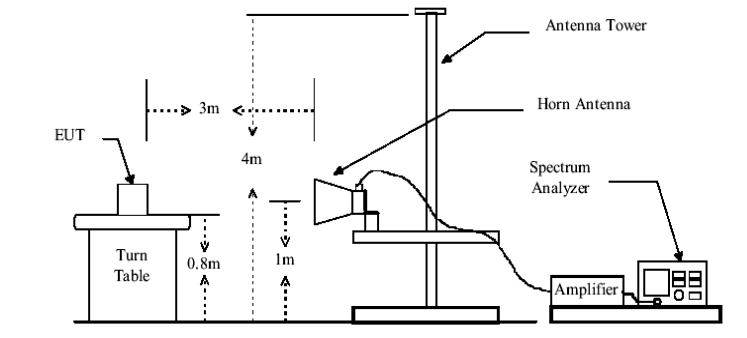


Date: 27.SEP.2013 16:04:38

30MHz~25GHz

6.7.2 Radiated Emission Method

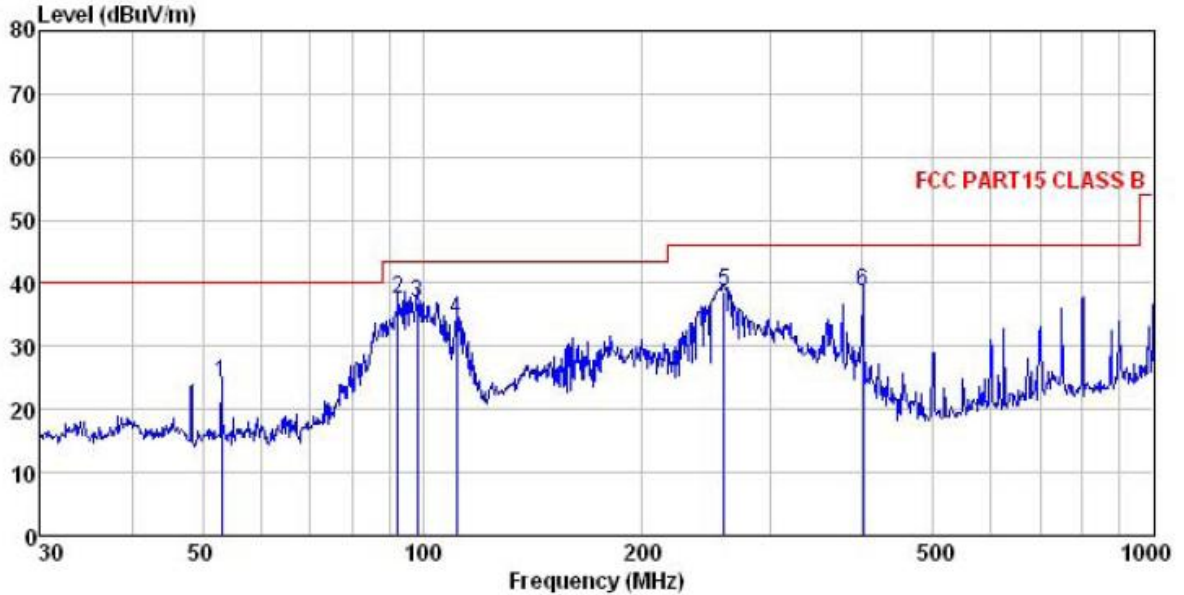
Test Requirement:	FCC Part15 C Section 15.209 and 15.205				
Test Method:	ANSI C63.4:2003				
Test Frequency Range:	9KHz to 25GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	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 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. 				

<p>Test setup:</p>	<p>Below 1GHz</p>  <p>Above 1GHz</p> 
<p>Test Instruments:</p>	<p>Refer to section 5.6 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.

3dBi antenna

Below 1GHz

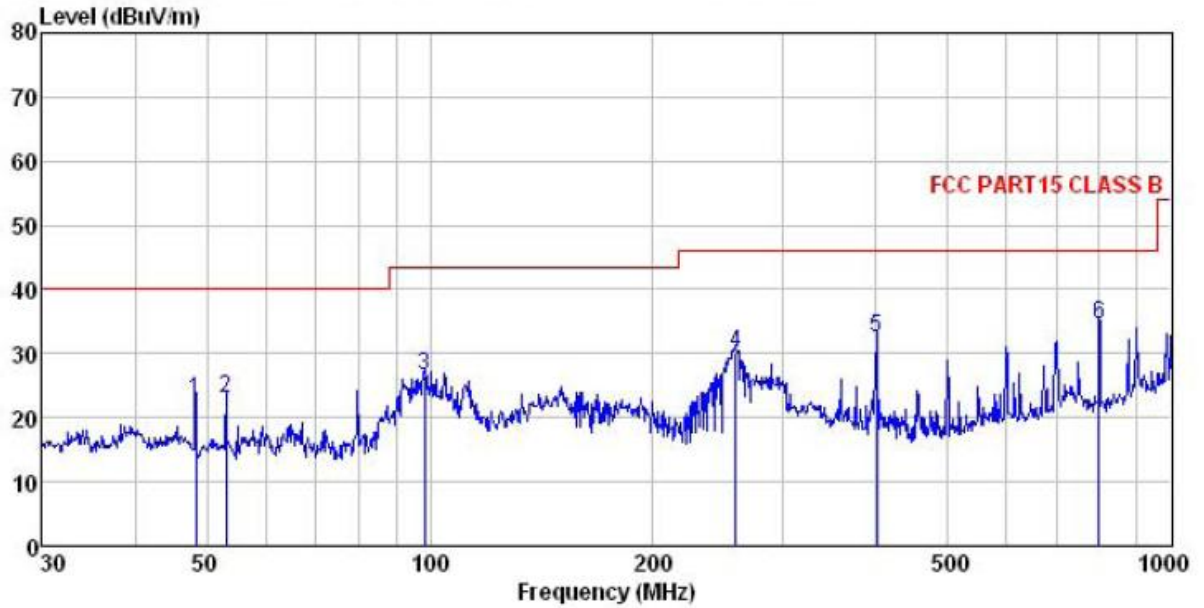
Horizontal :



Site : 3m chamber
 Condition : FCC PART15 CLASS B 3m VULB9163(30M1G) HORIZONTAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : Ceramic antenna

	ReadAntenna	Cable	Preamp		Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	53.131	38.27	13.12	1.32	28.60	24.11	40.00
2	92.462	53.08	12.41	2.03	30.08	37.44	43.50
3	98.487	51.88	13.06	1.97	30.09	36.82	43.50
4	111.347	50.11	12.04	2.07	29.86	34.36	43.50
5	258.326	53.48	12.05	2.83	29.57	38.79	46.00
6	400.432	50.52	15.10	3.08	29.90	38.80	46.00

Vertical :



Site : 3m chamber
 Condition : FCC PART15 CLASS B 3m VULB9163(30M1G) VERTICAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : Ceramic antenna

	Freq	Read	Antenna	Cable	Preamp	Level	Limit	Over	Remark
	MHz	Level	Factor	Loss	Factor	dBuV/m	Line	Limit	
		dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	48.332	36.34	13.35	1.27	28.14	22.82	40.00	-17.18	QP
2	53.131	37.15	13.12	1.32	28.60	22.99	40.00	-17.01	QP
3	98.487	41.68	13.06	1.97	30.09	26.62	43.50	-16.88	QP
4	258.326	44.91	12.05	2.83	29.57	30.22	46.00	-15.78	QP
5	400.432	44.20	15.10	3.08	29.90	32.48	46.00	-13.52	QP
6	798.980	40.50	20.06	4.35	30.41	34.50	46.00	-11.50	QP

Above 1GHz

Test mode:	802.11b		Test channel:	Lowest		Remark:	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
4824.00	49.78	31.53	8.90	40.24	49.97	74.00	-24.03	Vertical
7236.00	*	--	--	--	--	--	--	Vertical
9648.00	*	--	--	--	--	--	--	Vertical
4824.00	47.44	31.53	8.90	40.24	47.63	74.00	-26.37	Horizontal
7236.00	*	--	--	--	--	--	--	Horizontal
9648.00	*	--	--	--	--	--	--	Horizontal

Test mode:	802.11b		Test channel:	Lowest		Remark:	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
4824.00	39.47	31.53	8.90	40.24	39.66	54	-14.34	Vertical
7236.00	*	--	--	--	--	--	--	Vertical
9648.00	*	--	--	--	--	--	--	Vertical
4824.00	37.87	31.53	8.90	40.24	38.06	54	-15.94	Horizontal
7236.00	*	--	--	--	--	--	--	Horizontal
9648.00	*	--	--	--	--	--	--	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 mode:	802.11b		Test channel:	Middle		Remark:	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
4874.00	59.53	31.58	8.98	40.15	59.94	74.00	-14.06	Vertical
7311.00	*	--	--	--	--	--	--	Vertical
9748.00	*	--	--	--	--	--	--	Vertical
4874.00	50.50	31.58	8.98	40.15	50.91	74.00	-23.09	Horizontal
7311.00	*	--	--	--	--	--	--	Horizontal
9748.00	*	--	--	--	--	--	--	Horizontal

Test mode:	802.11b		Test channel:	Middle		Remark:	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
4874.00	49.77	31.58	8.98	40.15	50.18	54.00	-3.82	Vertical
7311.00	*	--	--	--	--	--	--	Vertical
9748.00	*	--	--	--	--	--	--	Vertical
4874.00	40.54	31.58	8.98	40.15	40.95	54.00	-13.05	Horizontal
7311.00	*	--	--	--	--	--	--	Horizontal
9748.00	*	--	--	--	--	--	--	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 mode:	802.11b		Test channel:	Highest		Remark:	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
4924.00	53.90	31.69	9.08	40.03	54.64	74.00	-19.36	Vertical
7386.00	*	--	--	--	--	--	--	Vertical
9848.00	*	--	--	--	--	--	--	Vertical
4924.00	49.72	31.69	9.08	40.03	50.46	74.00	-23.54	Horizontal
7386.00	*	--	--	--	--	--	--	Horizontal
9848.00	*	--	--	--	--	--	--	Horizontal

Test mode:	802.11b		Test channel:	Highest		Remark:	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
4924.00	43.68	31.69	9.08	40.03	44.42	54.00	-9.58	Vertical
7386.00	*	--	--	--	--	--	--	Vertical
9848.00	*	--	--	--	--	--	--	Vertical
4924.00	39.74	31.69	9.08	40.03	40.48	54.00	-13.52	Horizontal
7386.00	*	--	--	--	--	--	--	Horizontal
9848.00	*	--	--	--	--	--	--	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 mode:	802.11g		Test channel:	Lowest		Remark:	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
4824.00	48.10	31.53	8.90	40.24	48.29	74.00	-25.71	Vertical
7236.00	*	--	--	--	--	--	--	Vertical
9648.00	*	--	--	--	--	--	--	Vertical
4824.00	47.73	31.53	8.90	40.24	47.92	74.00	-26.08	Horizontal
7236.00	*	--	--	--	--	--	--	Horizontal
9648.00	*	--	--	--	--	--	--	Horizontal

Test mode:	802.11g		Test channel:	Lowest		Remark:	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
4824.00	38.45	31.53	8.90	40.24	38.64	54	-15.36	Vertical
7236.00	*	--	--	--	--	--	--	Vertical
9648.00	*	--	--	--	--	--	--	Vertical
4824.00	37.55	31.53	8.90	40.24	37.74	54	-16.26	Horizontal
7236.00	*	--	--	--	--	--	--	Horizontal
9648.00	*	--	--	--	--	--	--	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 mode:	802.11g		Test channel:	Middle		Remark:	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
4874.00	51.35	31.58	8.98	40.15	51.76	74.00	-22.24	Vertical
7311.00	*	--	--	--	--	--	--	Vertical
9748.00	*	--	--	--	--	--	--	Vertical
4874.00	48.41	31.58	8.98	40.15	48.82	74.00	-25.18	Horizontal
7311.00	*	--	--	--	--	--	--	Horizontal
9748.00	*	--	--	--	--	--	--	Horizontal

Test mode:	802.11g		Test channel:	Middle		Remark:	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
4874.00	41.25	31.58	8.98	40.15	41.66	54.00	-12.34	Vertical
7311.00	*	--	--	--	--	--	--	Vertical
9748.00	*	--	--	--	--	--	--	Vertical
4874.00	38.97	31.58	8.98	40.15	39.38	54.00	-14.62	Horizontal
7311.00	*	--	--	--	--	--	--	Horizontal
9748.00	*	--	--	--	--	--	--	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 mode:	802.11g		Test channel:	Highest		Remark:	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
4924.00	48.03	31.69	9.08	40.03	48.77	74.00	-25.23	Vertical
7386.00	*	--	--	--	--	--	--	Vertical
9848.00	*	--	--	--	--	--	--	Vertical
4924.00	47.71	31.69	9.08	40.03	48.45	74.00	-25.55	Horizontal
7386.00	*	--	--	--	--	--	--	Horizontal
9848.00	*	--	--	--	--	--	--	Horizontal

Test mode:	802.11g		Test channel:	Highest		Remark:	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
4924.00	37.89	31.69	9.08	40.03	38.63	54.00	-15.37	Vertical
7386.00	*	--	--	--	--	--	--	Vertical
9848.00	*	--	--	--	--	--	--	Vertical
4924.00	37.12	31.69	9.08	40.03	37.86	54.00	-16.14	Horizontal
7386.00	*	--	--	--	--	--	--	Horizontal
9848.00	*	--	--	--	--	--	--	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 mode:	802.11n(H20)		Test channel:	Lowest		Remark:	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
4824.00	48.38	31.53	8.90	40.24	48.57	74.00	-25.43	Vertical
7236.00	*	--	--	--	--	--	--	Vertical
9648.00	*	--	--	--	--	--	--	Vertical
4824.00	48.76	31.53	8.90	40.24	48.95	74.00	-25.05	Horizontal
7236.00	*	--	--	--	--	--	--	Horizontal
9648.00	*	--	--	--	--	--	--	Horizontal

Test mode:	802.11n(H20)		Test channel:	Lowest		Remark:	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
4824.00	38.64	31.53	8.90	40.24	38.83	54	-15.17	Vertical
7236.00	*	--	--	--	--	--	--	Vertical
9648.00	*	--	--	--	--	--	--	Vertical
4824.00	38.70	31.53	8.90	40.24	38.89	54	-15.11	Horizontal
7236.00	*	--	--	--	--	--	--	Horizontal
9648.00	*	--	--	--	--	--	--	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 mode:		802.11n(H20)		Test channel:	Middle		Remark:	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	
4874.00	52.58	31.58	8.98	40.15	52.99	74.00	-21.01	Vertical	
7311.00	*	--	--	--	--	--	--	Vertical	
9748.00	*	--	--	--	--	--	--	Vertical	
4874.00	49.18	31.58	8.98	40.15	49.59	74.00	-24.41	Horizontal	
7311.00	*	--	--	--	--	--	--	Horizontal	
9748.00	*	--	--	--	--	--	--	Horizontal	

Test mode:		802.11n(H20)		Test channel:	Middle		Remark:	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	
4874.00	42.51	31.58	8.98	40.15	42.92	54.00	-11.08	Vertical	
7311.00	*	--	--	--	--	--	--	Vertical	
9748.00	*	--	--	--	--	--	--	Vertical	
4874.00	39.41	31.58	8.98	40.15	39.82	54.00	-14.18	Horizontal	
7311.00	*	--	--	--	--	--	--	Horizontal	
9748.00	*	--	--	--	--	--	--	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 mode:	802.11n(H20)		Test channel:	Highest		Remark:	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
4924.00	48.63	31.69	9.08	40.03	49.37	74.00	-24.63	Vertical
7386.00	*	--	--	--	--	--	--	Vertical
9848.00	*	--	--	--	--	--	--	Vertical
4924.00	47.85	31.69	9.08	40.03	48.59	74.00	-25.41	Horizontal
7386.00	*	--	--	--	--	--	--	Horizontal
9848.00	*	--	--	--	--	--	--	Horizontal

Test mode:	802.11n(H20)		Test channel:	Highest		Remark:	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
4924.00	38.41	31.69	9.08	40.03	39.15	54.00	-14.85	Vertical
7386.00	*	--	--	--	--	--	--	Vertical
9848.00	*	--	--	--	--	--	--	Vertical
4924.00	37.12	31.69	9.08	40.03	37.86	54.00	-16.14	Horizontal
7386.00	*	--	--	--	--	--	--	Horizontal
9848.00	*	--	--	--	--	--	--	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 mode:	802.11n(H40)		Test channel:	Lowest		Remark:	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
4844.00	48.83	31.53	8.90	40.24	49.02	74.00	-24.98	Vertical
7266.00	*	--	--	--	--	--	--	Vertical
9688.00	*	--	--	--	--	--	--	Vertical
4844.00	47.27	31.53	8.90	40.24	47.46	74.00	-26.54	Horizontal
7266.00	*	--	--	--	--	--	--	Horizontal
9688.00	*	--	--	--	--	--	--	Horizontal

Test mode:	802.11n(H40)		Test channel:	Lowest		Remark:	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
4844.00	38.41	31.53	8.90	40.24	38.60	54	-15.40	Vertical
7266.00	*	--	--	--	--	--	--	Vertical
9688.00	*	--	--	--	--	--	--	Vertical
4844.00	37.14	31.53	8.90	40.24	37.33	54	-16.67	Horizontal
7266.00	*	--	--	--	--	--	--	Horizontal
9688.00	*	--	--	--	--	--	--	Horizontal

Remark:

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

Test mode:	802.11n(H40)		Test channel:	Middle		Remark:	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
4874.00	51.16	31.58	8.98	40.15	51.57	74.00	-22.43	Vertical
7311.00	*	--	--	--	--	--	--	Vertical
9748.00	*	--	--	--	--	--	--	Vertical
4874.00	47.57	31.58	8.98	40.15	47.98	74.00	-26.02	Horizontal
7311.00	*	--	--	--	--	--	--	Horizontal
9748.00	*	--	--	--	--	--	--	Horizontal

Test mode:	802.11n(H40)		Test channel:	Middle		Remark:	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
4874.00	41.22	31.58	8.98	40.15	41.63	54.00	-12.37	Vertical
7311.00	*	--	--	--	--	--	--	Vertical
9748.00	*	--	--	--	--	--	--	Vertical
4874.00	37.42	31.58	8.98	40.15	37.83	54.00	-16.17	Horizontal
7311.00	*	--	--	--	--	--	--	Horizontal
9748.00	*	--	--	--	--	--	--	Horizontal

Remark:

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

Test mode:	802.11n(H40)		Test channel:	Highest		Remark:	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
4904.00	48.63	31.69	9.08	40.03	49.37	74.00	-24.63	Vertical
7356.00	*	--	--	--	--	--	--	Vertical
9808.00	*	--	--	--	--	--	--	Vertical
4904.00	46.80	31.69	9.08	40.03	47.54	74.00	-26.46	Horizontal
7356.00	*	--	--	--	--	--	--	Horizontal
9808.00	*	--	--	--	--	--	--	Horizontal

Test mode:	802.11n(H40)		Test channel:	Highest		Remark:	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
4904.00	38.63	31.69	9.08	40.03	39.37	54.00	-14.63	Vertical
7356.00	*	--	--	--	--	--	--	Vertical
9808.00	*	--	--	--	--	--	--	Vertical
4904.00	36.42	31.69	9.08	40.03	37.16	54.00	-16.84	Horizontal
7356.00	*	--	--	--	--	--	--	Horizontal
9808.00	*	--	--	--	--	--	--	Horizontal

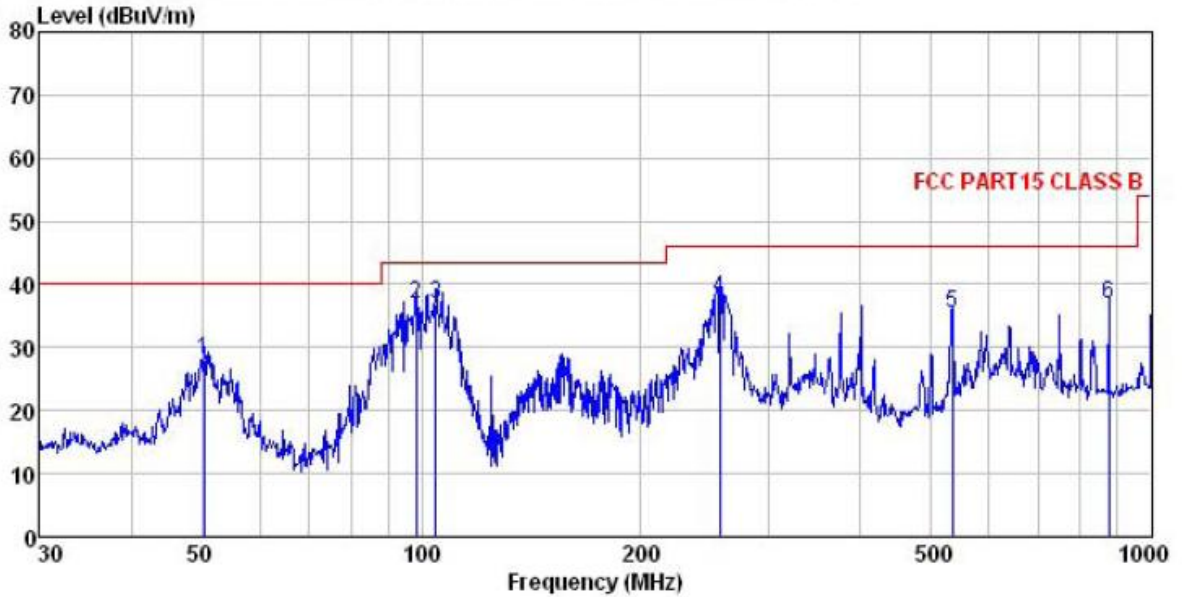
Remark:

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

12 dBi antenna

Below 1GHz

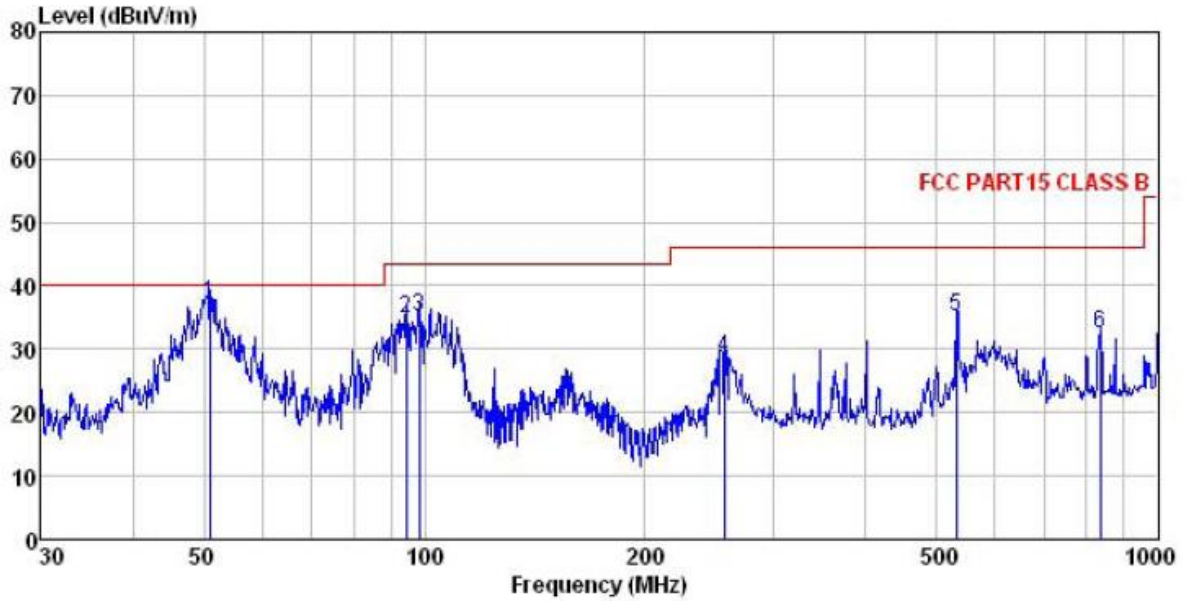
Horizontal :



Site : 3m chamber
 Condition : FCC PART15 CLASS B 3m VULB9163(30M1G) HORIZONTAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : 12dBi antenna

	ReadAntenna	Cable	Preamp	Limit	Over			
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	50.409	41.92	13.24	1.25	28.32	28.09	40.00	-11.91 QP
2	98.487	51.89	13.06	1.97	30.09	36.83	43.50	-6.67 QP
3	104.536	52.29	12.73	1.99	29.99	37.02	43.50	-6.48 QP
4	256.521	52.36	12.06	2.83	29.58	37.67	46.00	-8.33 QP
5	533.832	44.86	17.26	3.80	30.53	35.39	46.00	-10.61 QP
6	875.247	42.42	20.87	3.95	30.20	37.04	46.00	-8.96 QP

Vertical :



Site : 3m chamber
 Condition : FCC PART15 CLASS B 3m VULB9163(30M1G) VERTICAL
 Job No. : 371RF
 EUT : Broadband Digital Transmission System
 Model : Carambola 2
 Test mode : TX mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Winner
 Remark : 12dBi antenna

	ReadAntenna	Cable Preamp	Limit	Over				
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	50.942	51.04	13.22	1.27	28.38	37.15	40.00	-2.85 QP
2	94.428	50.23	12.75	2.01	30.08	34.91	43.50	-8.59 QP
3	98.487	50.16	13.06	1.97	30.09	35.10	43.50	-8.40 QP
4	256.521	43.39	12.06	2.83	29.58	28.70	46.00	-17.30 QP
5	531.964	44.62	17.20	3.79	30.53	35.08	46.00	-10.92 QP
6	836.244	38.09	20.46	4.23	30.31	32.47	46.00	-13.53 QP

Above 1GHz

Test mode:	802.11b		Test channel:	Lowest		Remark:	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
3216.00	57.51	28.62	5.95	40.55	51.53	74.00	-22.47	Vertical
4824.00	49.50	31.53	8.90	40.24	49.69	74.00	-24.31	Vertical
7236.00	*	--	--	--	--	--	--	Vertical
3216.00	42.35	28.62	5.95	40.55	36.37	74.00	-37.63	Horizontal
4824.00	48.67	31.53	8.90	40.24	48.86	74.00	-25.14	Horizontal
7236.00	*	--	--	--	--	--	--	Horizontal

Test mode:	802.11b		Test channel:	Lowest		Remark:	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
3216.00	48.79	28.62	5.95	40.55	42.81	54.00	-11.19	Vertical
4824.00	40.87	31.53	8.90	40.24	41.06	54.00	-12.94	Vertical
7236.00	*	--	--	--	--	--	--	Vertical
3216.00	33.68	28.62	5.95	40.55	27.70	54.00	-26.30	Horizontal
4824.00	39.74	31.53	8.90	40.24	39.93	54.00	-14.07	Horizontal
7236.00	*	--	--	--	--	--	--	Horizontal

Remark:

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

Test mode:	802.11b		Test channel:	Middle		Remark:	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
3249.00	57.58	28.54	6.04	40.24	51.92	74.00	-22.08	Vertical
4874.00	59.58	31.58	8.98	40.15	59.99	74.00	-14.01	Vertical
7311.00	*	--	--	--	--	--	--	Vertical
3249.00	42.66	28.54	6.04	40.24	37.00	74.00	-37.00	Horizontal
4874.00	59.90	31.58	8.98	40.15	60.31	74.00	-13.69	Horizontal
7311.00	*	--	--	--	--	--	--	Horizontal

Test mode:	802.11b		Test channel:	Middle		Remark:	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
3249.00	47.12	28.54	6.04	40.24	41.46	54.00	-12.54	Vertical
4874.00	48.74	31.58	8.98	40.15	49.15	54.00	-4.85	Vertical
7311.00	*	--	--	--	--	--	--	Vertical
3249.00	33.54	28.54	6.04	40.24	27.88	54.00	-26.12	Horizontal
4874.00	49.12	31.58	8.98	40.15	49.53	54.00	-4.47	Horizontal
7311.00	*	--	--	--	--	--	--	Horizontal

Remark:

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

Test mode:	802.11b		Test channel:	Highest		Remark:	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
3283.00	58.35	28.41	6.13	39.93	52.96	74.00	-21.04	Vertical
4924.00	59.46	31.69	9.08	40.03	60.20	74.00	-13.80	Vertical
7386.00	*	--	--	--	--	--	--	Vertical
3283.00	42.65	28.41	6.13	39.93	37.26	74.00	-36.74	Horizontal
4924.00	56.28	31.69	9.08	40.03	57.02	74.00	-16.98	Horizontal
7386.00	*	--	--	--	--	--	--	Horizontal

Test mode:	802.11b		Test channel:	Highest		Remark:	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
3283.00	47.78	28.41	6.13	39.93	42.39	54.00	-11.61	Vertical
4924.00	48.89	31.69	9.08	40.03	49.63	54.00	-4.37	Vertical
7386.00	*	--	--	--	--	--	--	Vertical
3283.00	33.64	28.41	6.13	39.93	28.25	54.00	-25.75	Horizontal
4924.00	47.55	31.69	9.08	40.03	48.29	54.00	-5.71	Horizontal
7386.00	*	--	--	--	--	--	--	Horizontal

Remark:

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

Test mode:	802.11g		Test channel:	Lowest		Remark:	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
3216.00	57.33	28.62	5.95	40.55	51.35	74.00	-22.65	Vertical
4824.00	47.84	31.53	8.90	40.24	48.03	74.00	-25.97	Vertical
7236.00	*	--	--	--	--	--	--	Vertical
3216.00	41.65	28.62	5.95	40.55	35.67	74.00	-38.33	Horizontal
4824.00	48.12	31.53	8.90	40.24	48.31	74.00	-25.69	Horizontal
7236.00	*	--	--	--	--	--	--	Horizontal

Test mode:	802.11g		Test channel:	Lowest		Remark:	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
3216.00	47.54	28.62	5.95	40.55	41.56	54.00	-12.44	Vertical
4824.00	37.45	31.53	8.90	40.24	37.64	54.00	-16.36	Vertical
7236.00	*	--	--	--	--	--	--	Vertical
3216.00	32.10	28.62	5.95	40.55	26.12	54.00	-27.88	Horizontal
4824.00	39.44	31.53	8.90	40.24	39.63	54.00	-14.37	Horizontal
7236.00	*	--	--	--	--	--	--	Horizontal

Remark:

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

Test mode:	802.11g		Test channel:	Middle		Remark:		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
3249.00	58.56	28.54	6.04	40.24	52.90	74.00	-21.10	Vertical
4874.00	57.04	31.58	8.98	40.15	57.45	74.00	-16.55	Vertical
7311.00	*	--	--	--	--	--	--	Vertical
3249.00	41.57	28.54	6.04	40.24	35.91	74.00	-38.09	Horizontal
4874.00	51.25	31.58	8.98	40.15	51.66	74.00	-22.34	Horizontal
7311.00	*	--	--	--	--	--	--	Horizontal

Test mode:	802.11g		Test channel:	Middle		Remark:	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
3249.00	48.68	28.54	6.04	40.24	43.02	54.00	-10.98	Vertical
4874.00	47.59	31.58	8.98	40.15	48.00	54.00	-6.00	Vertical
7311.00	*	--	--	--	--	--	--	Vertical
3249.00	32.02	28.54	6.04	40.24	26.36	54.00	-27.64	Horizontal
4874.00	41.85	31.58	8.98	40.15	42.26	54.00	-11.74	Horizontal
7311.00	*	--	--	--	--	--	--	Horizontal

Remark:

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

Test mode:	802.11g		Test channel:	Highest		Remark:	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
3283.00	57.38	28.41	6.13	39.93	51.99	74.00	-22.01	Vertical
4924.00	48.45	31.69	9.08	40.03	49.19	74.00	-24.81	Vertical
7386.00	*	--	--	--	--	--	--	Vertical
3283.00	42.33	28.41	6.13	39.93	36.94	74.00	-37.06	Horizontal
4924.00	48.06	31.69	9.08	40.03	48.80	74.00	-25.20	Horizontal
7386.00	*	--	--	--	--	--	--	Horizontal

Test mode:	802.11g		Test channel:	Highest		Remark:	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
3283.00	47.66	28.41	6.13	39.93	42.27	54.00	-11.73	Vertical
4924.00	38.41	31.69	9.08	40.03	39.15	54.00	-14.85	Vertical
7386.00	*	--	--	--	--	--	--	Vertical
3283.00	32.51	28.41	6.13	39.93	27.12	54.00	-26.88	Horizontal
4924.00	48.02	31.69	9.08	40.03	48.76	54.00	-5.24	Horizontal
7386.00	*	--	--	--	--	--	--	Horizontal

Remark:

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

Test mode:	802.11n(H20)		Test channel:	Lowest		Remark:	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
3216.00	58.20	28.62	5.95	40.55	52.22	74.00	-21.78	Vertical
4824.00	48.28	31.53	8.90	40.24	48.47	74.00	-25.53	Vertical
7236.00	*	--	--	--	--	--	--	Vertical
3216.00	42.34	28.62	5.95	40.55	36.36	74.00	-37.64	Horizontal
4824.00	48.09	31.53	8.90	40.24	48.28	74.00	-25.72	Horizontal
7236.00	*	--	--	--	--	--	--	Horizontal

Test mode:	802.11n(H20)		Test channel:	Lowest		Remark:	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
3216.00	48.58	28.62	5.95	40.55	42.60	54.00	-11.40	Vertical
4824.00	38.98	31.53	8.90	40.24	39.17	54.00	-14.83	Vertical
7236.00	*	--	--	--	--	--	--	Vertical
3216.00	32.65	28.62	5.95	40.55	26.67	54.00	-27.33	Horizontal
4824.00	38.21	31.53	8.90	40.24	38.40	54.00	-15.60	Horizontal
7236.00	*	--	--	--	--	--	--	Horizontal

Remark:

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

Test mode:	802.11n(H20)		Test channel:	Middle		Remark:	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
3249.00	57.94	28.54	6.04	40.24	52.28	74.00	-21.72	Vertical
4874.00	55.21	31.58	8.98	40.15	55.62	74.00	-18.38	Vertical
7311.00	*	--	--	--	--	--	--	Vertical
3249.00	42.11	28.54	6.04	40.24	36.45	74.00	-37.55	Horizontal
4874.00	52.80	31.58	8.98	40.15	53.21	74.00	-20.79	Horizontal
7311.00	*	--	--	--	--	--	--	Horizontal

Test mode:	802.11n(H20)		Test channel:	Middle		Remark:	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
3249.00	47.66	28.54	6.04	40.24	42.00	54.00	-12.00	Vertical
4874.00	45.74	31.58	8.98	40.15	46.15	54.00	-7.85	Vertical
7311.00	*	--	--	--	--	--	--	Vertical
3249.00	32.64	28.54	6.04	40.24	26.98	54.00	-27.02	Horizontal
4874.00	42.46	31.58	8.98	40.15	42.87	54.00	-11.13	Horizontal
7311.00	*	--	--	--	--	--	--	Horizontal

Remark:

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

Test mode:	802.11n(H20)		Test channel:	Highest		Remark:	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
3283.00	58.81	28.41	6.13	39.93	53.42	74.00	-20.58	Vertical
4924.00	49.09	31.69	9.08	40.03	49.83	74.00	-24.17	Vertical
7386.00	*	--	--	--	--	--	--	Vertical
3283.00	41.22	28.41	6.13	39.93	35.83	74.00	-38.17	Horizontal
4924.00	47.90	31.69	9.08	40.03	48.64	74.00	-25.36	Horizontal
7386.00	*	--	--	--	--	--	--	Horizontal

Test mode:	802.11n(H20)		Test channel:	Highest		Remark:	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
3283.00	48.60	28.41	6.13	39.93	43.21	54.00	-10.79	Vertical
4924.00	39.74	31.69	9.08	40.03	40.48	54.00	-13.52	Vertical
7386.00	*	--	--	--	--	--	--	Vertical
3283.00	41.98	28.41	6.13	39.93	36.59	54.00	-17.41	Horizontal
4924.00	37.46	31.69	9.08	40.03	38.20	54.00	-15.80	Horizontal
7386.00	*	--	--	--	--	--	--	Horizontal

Remark:

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

Test mode:	802.11n(H40)		Test channel:	Lowest		Remark:	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
3233.00	56.93	28.62	6.00	40.40	51.15	74.00	-22.85	Vertical
4844.00	48.49	31.53	8.90	40.24	48.68	74.00	-25.32	Vertical
7266.00	*	--	--	--	--	--	--	Vertical
3233.00	42.12	28.62	6.00	40.40	36.34	74.00	-37.66	Horizontal
4844.00	48.78	31.53	8.90	40.24	48.97	74.00	-25.03	Horizontal
7266.00	*	--	--	--	--	--	--	Horizontal

Test mode:	802.11n(H40)		Test channel:	Lowest		Remark:	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
3233.00	46.52	28.62	6.00	40.40	40.74	54.00	-13.26	Vertical
4844.00	38.65	31.53	8.90	40.24	38.84	54.00	-15.16	Vertical
7266.00	*	--	--	--	--	--	--	Vertical
3233.00	32.54	28.62	6.00	40.40	26.76	54.00	-27.24	Horizontal
4844.00	38.68	31.53	8.90	40.24	38.87	54.00	-15.13	Horizontal
7266.00	*	--	--	--	--	--	--	Horizontal

Remark:

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

Test mode:	802.11n(H40)		Test channel:	Middle		Remark:	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
3249.00	57.54	28.54	6.04	40.24	51.88	74.00	-22.12	Vertical
4874.00	53.57	31.58	8.98	40.15	53.98	74.00	-20.02	Vertical
7311.00	*	--	--	--	--	--	--	Vertical
3249.00	41.87	28.54	6.04	40.24	36.21	74.00	-37.79	Horizontal
4874.00	50.63	31.58	8.98	40.15	51.04	74.00	-22.96	Horizontal
7311.00	*	--	--	--	--	--	--	Horizontal

Test mode:	802.11n(H40)		Test channel:	Middle		Remark:	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
3249.00	47.32	28.54	6.04	40.24	41.66	54.00	-12.34	Vertical
4874.00	43.64	31.58	8.98	40.15	44.05	54.00	-9.95	Vertical
7311.00	*	--	--	--	--	--	--	Vertical
3249.00	31.46	28.54	6.04	40.24	25.80	54.00	-28.20	Horizontal
4874.00	40.46	31.58	8.98	40.15	40.87	54.00	-13.13	Horizontal
7311.00	*	--	--	--	--	--	--	Horizontal

Remark:

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

Test mode:	802.11n(H40)		Test channel:	Highest		Remark:	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
3268.00	57.96	28.48	6.09	40.09	52.44	74.00	-21.56	Vertical
4904.00	48.65	31.69	9.08	40.03	49.39	74.00	-24.61	Vertical
7356.00	*	--	--	--	--	--	--	Vertical
4904.00	42.54	31.69	9.08	40.03	43.28	74.00	-30.72	Horizontal
4904.00	48.54	31.69	9.08	40.03	49.28	74.00	-24.72	Horizontal
7356.00	*	--	--	--	--	--	--	Horizontal

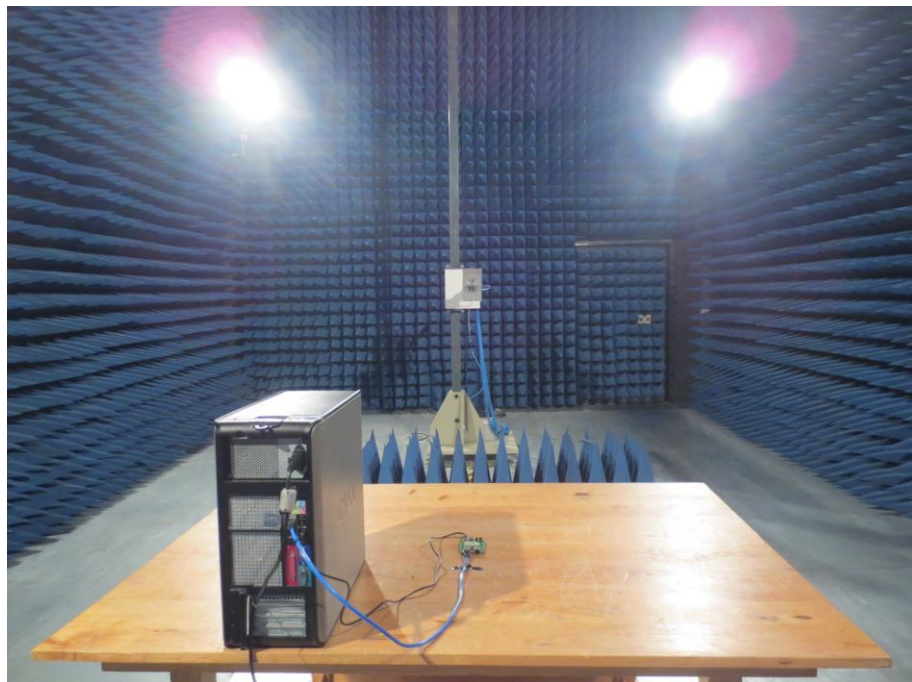
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Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4904.00	47.65	31.69	9.08	40.03	48.39	54.00	-5.61	Vertical
4904.00	38.45	31.69	9.08	40.03	39.19	54.00	-14.81	Vertical
7356.00	*	--	--	--	--	--	--	Vertical
4904.00	32.66	31.69	9.08	40.03	33.40	54.00	-20.60	Horizontal
4904.00	38.72	31.69	9.08	40.03	39.46	54.00	-14.54	Horizontal
7356.00	*	--	--	--	--	--	--	Horizontal

Remark:

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

7 Test Setup Photo

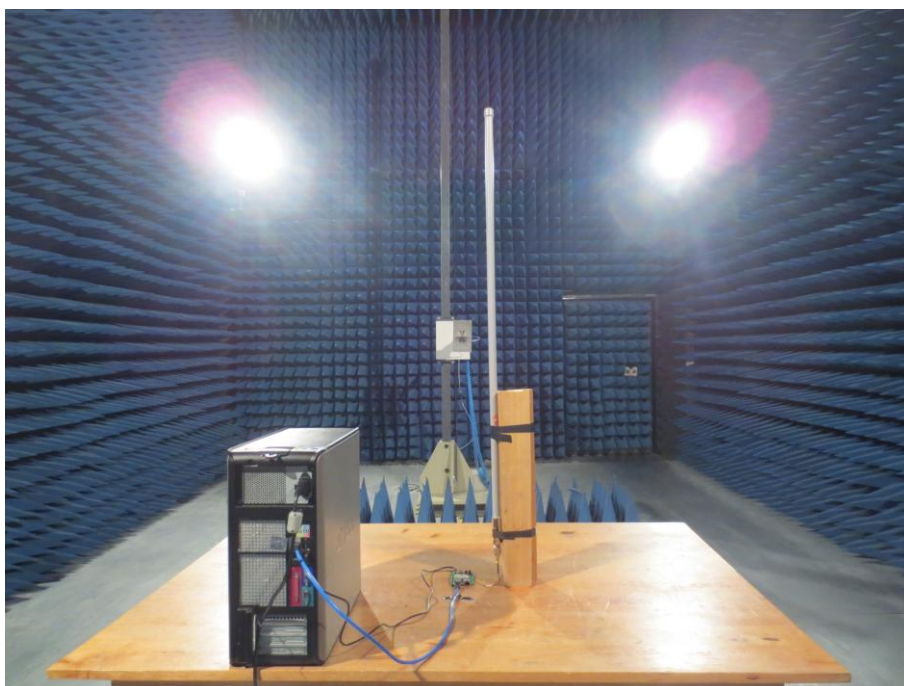
3dBi built-in ceramic antenna
Radiated Spurious Emission



Conducted Emission



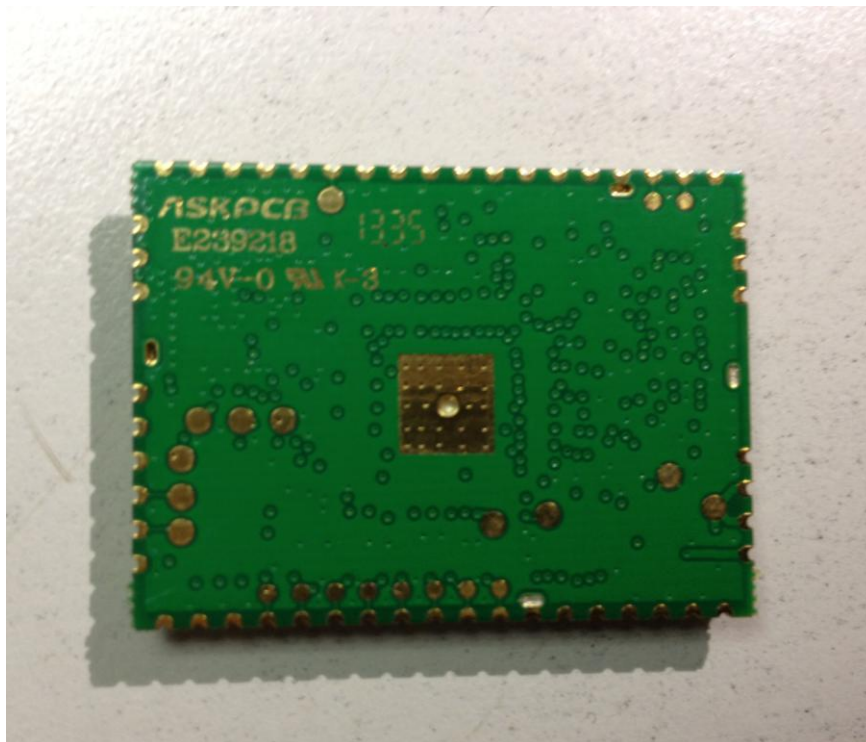
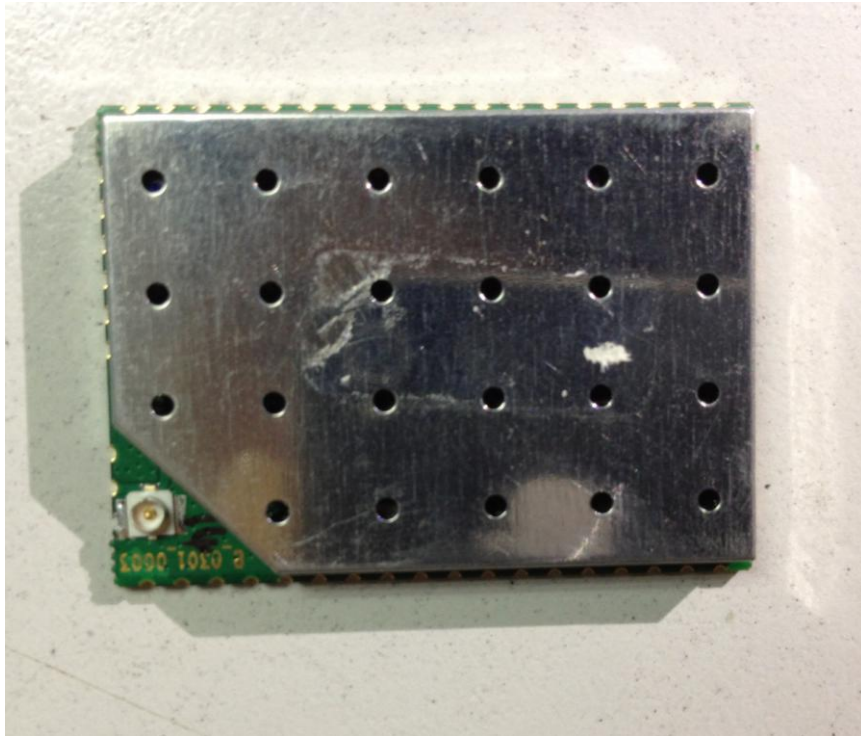
12dBi omni-directional antenna
Radiated Spurious Emission

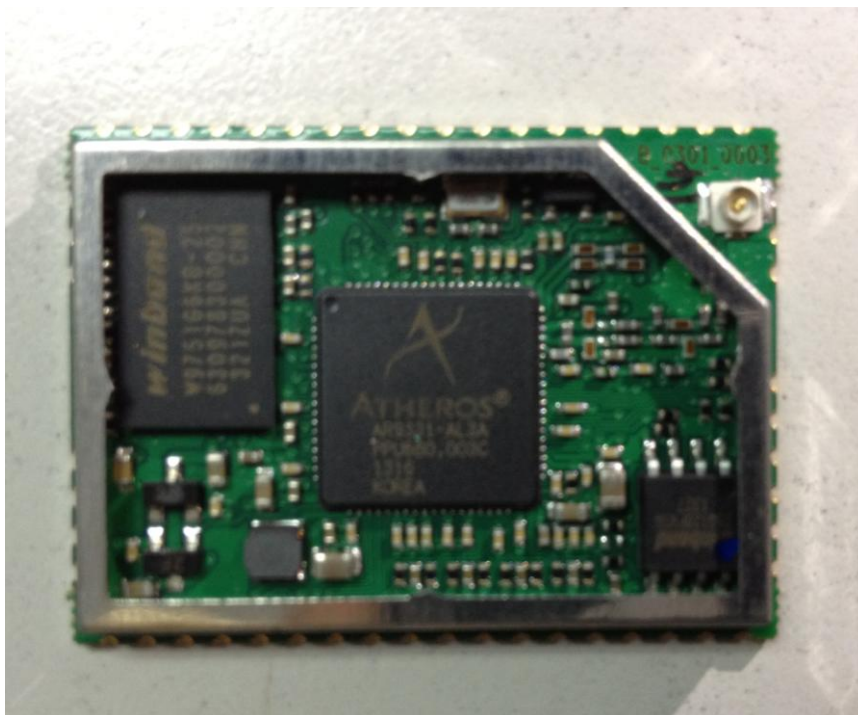


Conducted Emission

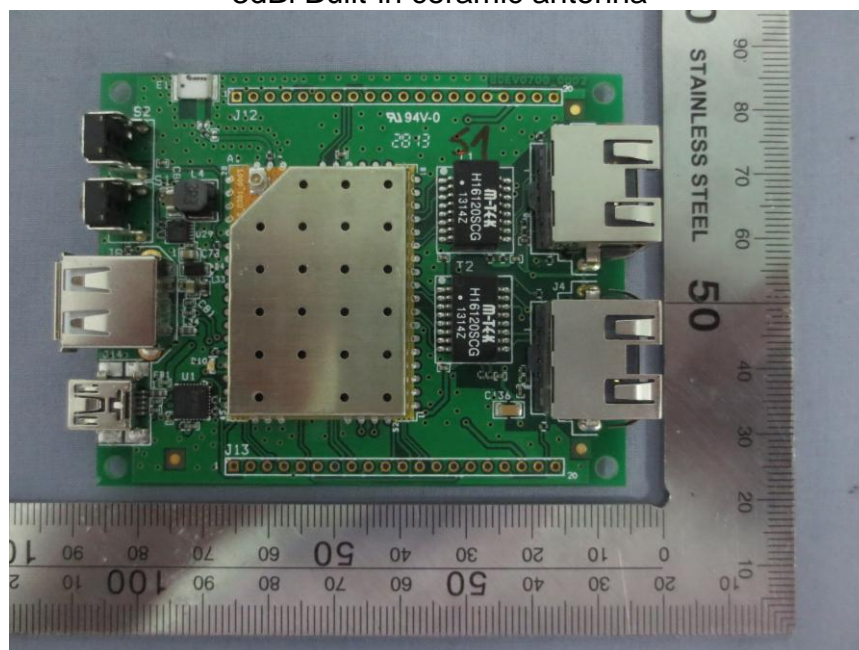


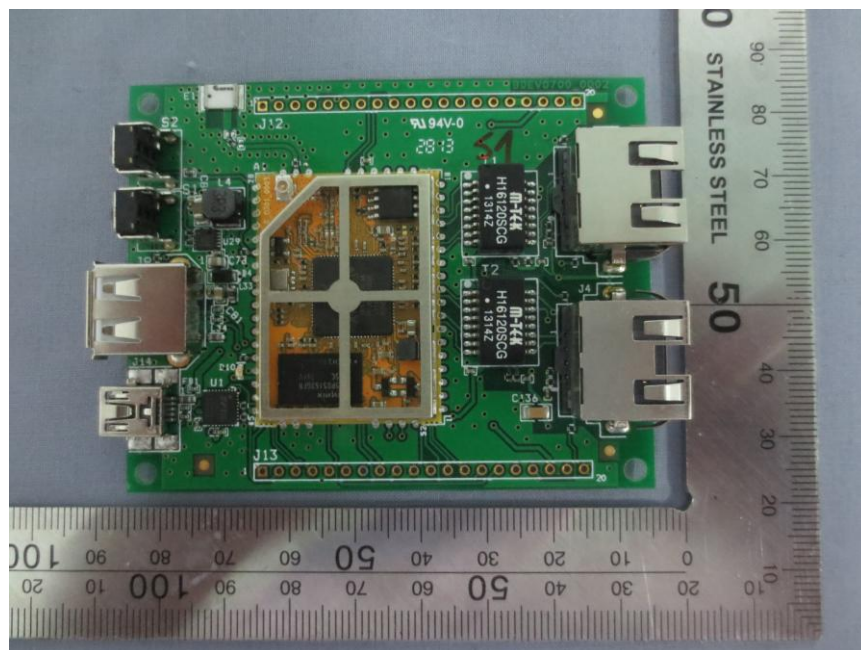
8 EUT Constructional Details



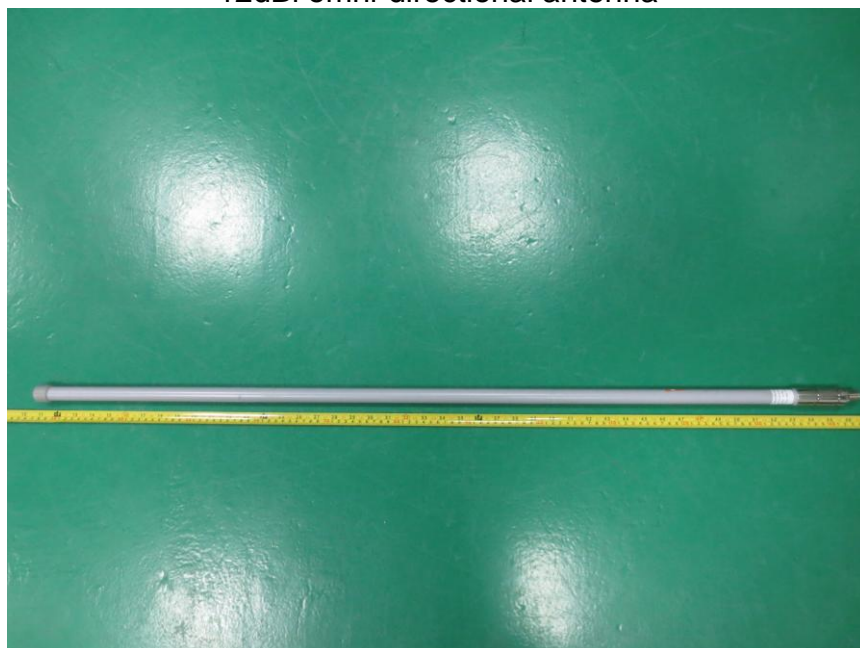


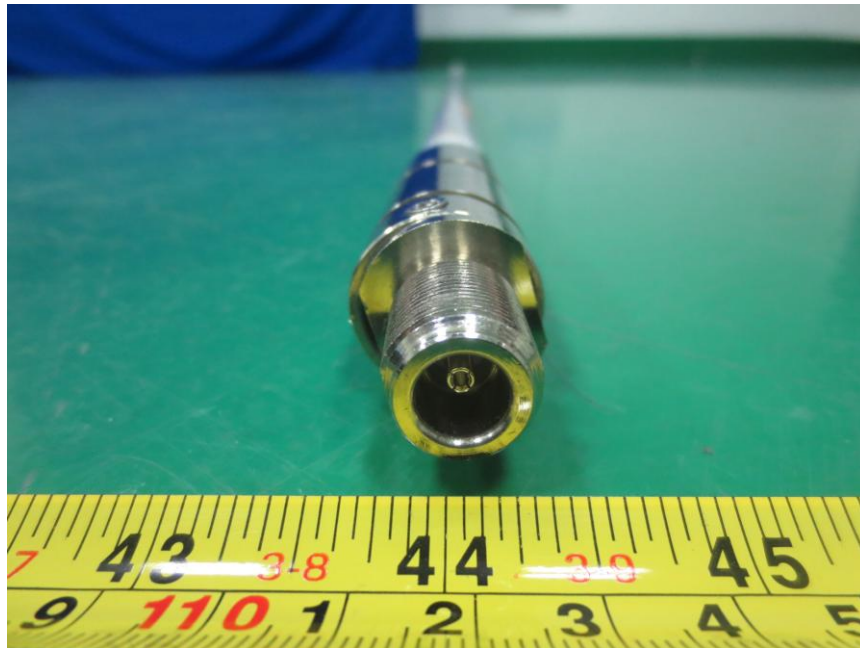
3dBi Built-in ceramic antenna





12dBi omni-directional antenna





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