

FCC REPORT

Applicant: Shenzhen RF-Link Technology Co., Ltd.

Address of Applicant: Bldg56A, 6/F, Baotian Rd3, Xixiang Town, Baoan District, ShenZhen, China

Equipment Under Test (EUT)

Product Name: WIDI

Model No.: WD01

FCC ID: 2AGQ3-WD01

Applicable standards: FCC CFR Title 47 Part 15 Subpart E Section 15.407

Date of sample receipt: 20 Nov., 2015

Date of Test: 20 Nov., to 07 Dec., 2015

Date of report issued: 07 Dec., 2015

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.

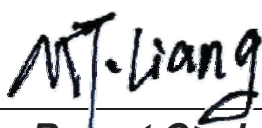
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2 Version

Version No.	Date	Description
00	07 Dec., 2015	Original

Prepared by:


Report Clerk

Date:

07 Dec., 2015

Reviewed by:


Project Engineer

Date:

07 Dec., 2015

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203/15.407 (g)	Pass
AC Power Line Conducted Emission	15.207	Pass
Conducted Peak Output Power	15.407 (a)	Pass
26dB Occupied Bandwidth	15.407 (a)	Pass
6dB Emission Bandwidth	15.407(e)	Pass
Power Spectral Density	15.407 (a)	Pass
Band Edge	15.407(b)	Pass
Spurious Emission	15.205/15.209	Pass
Frequency Stability	15.407(g)	Pass

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

Remark: Test according to ANSI C63.4:2009 and ANSI C63.10:2009

5 General Information

5.1 Client Information

Applicant:	Shenzhen RF-Link Technology Co., Ltd.
Address of Applicant:	Bldg56A, 6/F, Baotian Rd3, Xixiang Town, Baoan District, ShenZhen, China
Manufacturer:	Shenzhen RF-Link Technology Co., Ltd.
Address of Manufacturer:	Bldg56A, 6/F, Baotian Rd3, Xixiang Town, Baoan District, ShenZhen, China
Factory:	Shenzhen RF-Link Industrial Development Co., Ltd.
Address of Factory:	Bldg56A, 4/F, Baotian Rd3, Xixiang Town, Baoan District, Shenzhen, China

5.2 General Description of E.U.T.

Product Name:	WIDI
Model No.:	WD01
Operation Frequency:	Band 1: 5180MHz-5240MHz
Operation mode:	Portable Used
Channel numbers:	802.11a/802.11n20: 4, 802.11n40: 2, 802.11ac:1
Channel separation:	802.11a/802.11n20: 20MHz, 802.11n40: 40MHz, 802.11ac : 80MHz
Modulation technology: (IEEE 802.11a)	BPSK, QPSK, 16-QAM, 64-QAM
Modulation technology: (IEEE 802.11n)	BPSK, QPSK, 16-QAM, 64-QAM
Data speed(IEEE 802.11a)	6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps, 54Mbps
Data speed (IEEE 802.11n20):	MCS0: 6.5Mbps, MCS1:13Mbps, MCS2:19.5Mbps, MCS3:26Mbps, MCS4:39Mbps, MCS5:52Mbps, MCS6:58.5Mbps, MCS7:65Mbps
Data speed (IEEE 802.11n40):	MCS0:15Mbps, MCS1:30Mbps, MCS2:45Mbps, MCS3:60Mbps, MCS4:90Mbps, MCS5:120Mbps, MCS6:135Mbps, MCS7:150Mbps
Modulation technology: (IEEE 802.11ac)	BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM
Antenna Type:	Internal Antenna
Antenna gain:	6 dBi
Power supply:	AC 120V/ 60Hz

Operation Frequency each of channel

Band 1					
802.11a/802.11n20		802.11n40		802.11ac	
Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180MHz	38	5190MHz	42	5210MHz
40	5200MHz	46	5230MHz		
44	5220MHz				
48	5240MHz				

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:

Band 1					
802.11a/802.11n20		802.11n40		802.11ac	
Channel	Frequency	Channel	Frequency	Channel	Frequency
The lowest channel	5180MHz	The lowest channel	5190MHz	The lowest channel	5210MHz
The middle channel	5200MHz	The highest channel	5230MHz		
The highest channel	5240MHz				

5.3 Test environment and mode

Operating Environment:	
Temperature:	24.0 °C
Humidity:	54 % RH
Atmospheric Pressure:	1010 mbar
Test mode:	
Continuously transmitting mode	Keep the EUT in 100% duty cycle transmitting with modulation.

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
802.11a	6 Mbps
802.11n20	6.5 Mbps
802.11n40	13 Mbps
802.11ac	23.9 Mbps

Final Test Mode:

According to ANSI C63.4 standards, the test results are both the “worst case” and “worst setup” 6 Mbps for 802.11a, 6.5 Mbps for 802.11n20 , 13 Mbps for 802.11n40 and 29.3Mbps for 802.11ac. All test items for 802.11a ,802.11ac and 802.11n were performed with duty cycle above 98%, meet the requirements of KDB789033.

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 out files. Registration 817957, February 27, 2012.

● IC - Registration No.: 10106A-1

The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

● CNAS - Registration No.: CNAS L6048

Shenzhen Zhongjian Nanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.

5.5 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: +86-755-23118282
Fax: +86-755-23116366

5.6 Description of Support Units

Manufacturer	Description	Model	Serial Number	FCC ID/DoC
DELL	PC	OPTIPLEX745	N/A	DoC
DELL	MONITOR	E178FPC	N/A	DoC
DELL	KEYBOARD	SK-8115	N/A	DoC
DELL	MOUSE	MOC5UO	N/A	DoC

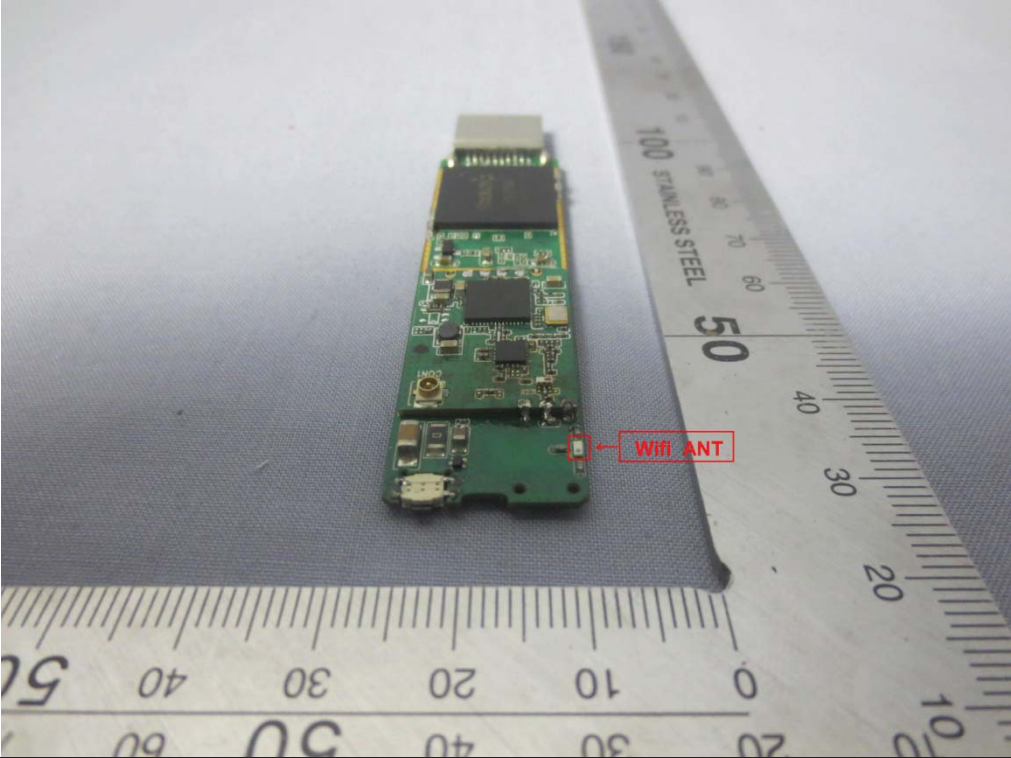
5.7 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
1	3m Semi - Anechoic Chamber	SAEMC	9(L)*6(W)* 6(H)	CCIS0001	08-23-2014	08-22-2017
2	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	CCIS0005	03-28-2015	03-28-2016
3	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	CCIS0006	03-28-2015	03-28-2016
4	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
5	Amplifier (10kHz-1.3GHz)	HP	8447D	CCIS0003	04-01-2015	03-31-2016
6	Amplifier (1GHz-18GHz)	Compliance Direction Systems Inc.	PAP-1G18	CCIS0011	04-01-2015	03-31-2016
7	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	04-01-2015	03-31-2016
8	Horn Antenna	ETS-LINDGREN	3160	GTS217	04-01-2015	03-31-2016
9	Printer	HP	HP LaserJet P1007	N/A	N/A	N/A
10	Positioning Controller	UC	UC3000	CCIS0015	N/A	N/A
11	Spectrum analyzer 9k-30GHz	Rohde & Schwarz	FSP	CCIS0023	03-28-2015	03-28-2016
12	EMI Test Receiver	Rohde & Schwarz	ESPI	CCIS0022	03-28-2015	03-28-2016
13	Loop antenna	Laplace instrument	RF300	EMC0701	04-01-2015	03-31-2016
14	Universal radio communication tester	Rhode & Schwarz	CMU200	CCIS0069	03-28-2015	03-28-2016
15	Signal Analyzer	Rohde & Schwarz	FSIQ3	CCIS0088	04-08-2015	04-08-2016

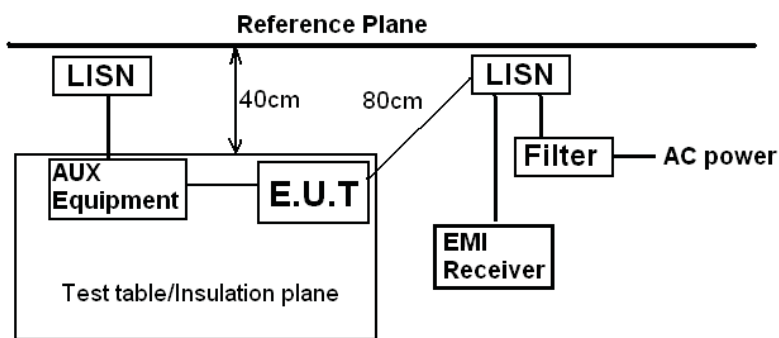
Conducted Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
1	Shielding Room	ZhongShuo Electron	11.0(L)x4.0(W)x3.0(H)	CCIS0061	08-23-2014	08-22-2017
2	EMI Test Receiver	Rohde & Schwarz	ESCI	CCIS0002	03-28-2015	03-28-2016
3	LISN	CHASE	MN2050D	CCIS0074	03-28-2015	03-28-2016
4	Coaxial Cable	CCIS	N/A	CCIS0086	04-01-2015	03-31-2016
5	EMI Test Software	AUDIX	E3	N/A	N/A	N/A

6 Test results and Measurement Data

6.1 Antenna requirement

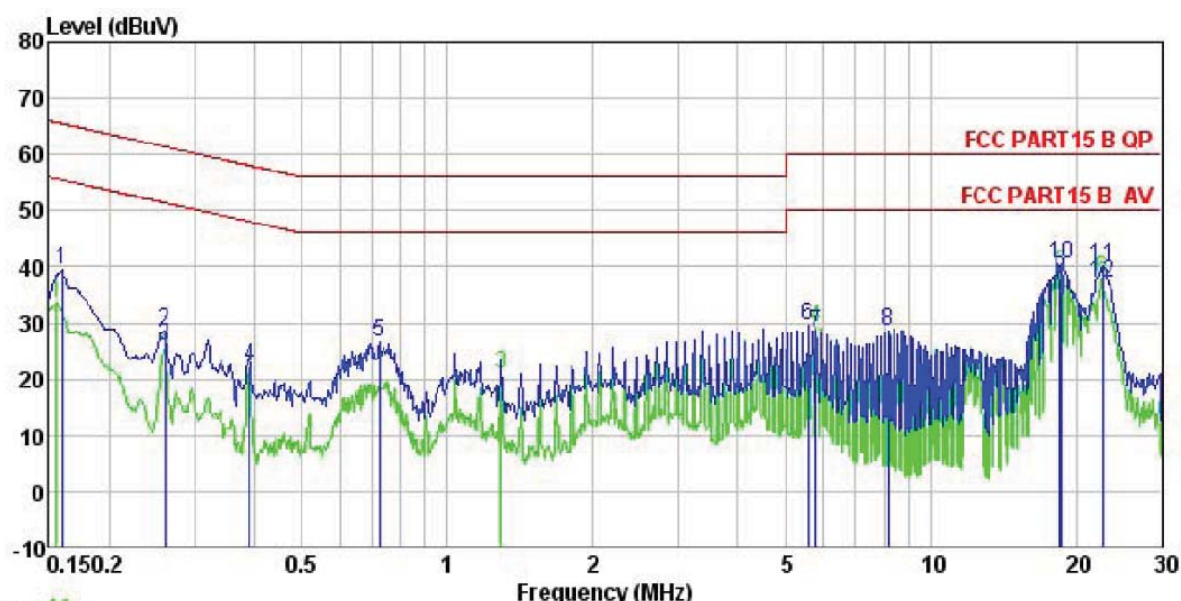
Standard requirement:	FCC Part15 E Section 15.203 /407(a)
<i>15.203 requirement:</i> <i>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that 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> <i>This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, § 15.213, § 15.217, § 15.219, or § 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.</i>	
E.U.T Antenna:	
The WiFi antenna is an internal antenna which cannot replace by end-user, the best case gain of the antenna is 6 dBi. 	

6.2 Conducted Emission

Test Requirement:	FCC Part15 C Section 15.207		
Test Method:	ANSI C63.10: 2009		
Test Frequency Range:	150 kHz to 30 MHz		
Class / Severity:	Class B		
Receiver setup:	RBW=9 kHz, VBW=30 kHz		
Limit:	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
* Decreases with the logarithm of the frequency.			
Test procedure	1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). It provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2009 on conducted measurement.		
Test setup:	 <i>Remark:</i> E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m		
Test Instruments:	Refer to section 5.6 for details		
Test mode:	Refer to section 5.3 for details.		
Test results:	Passed		

Measurement Data

Line:

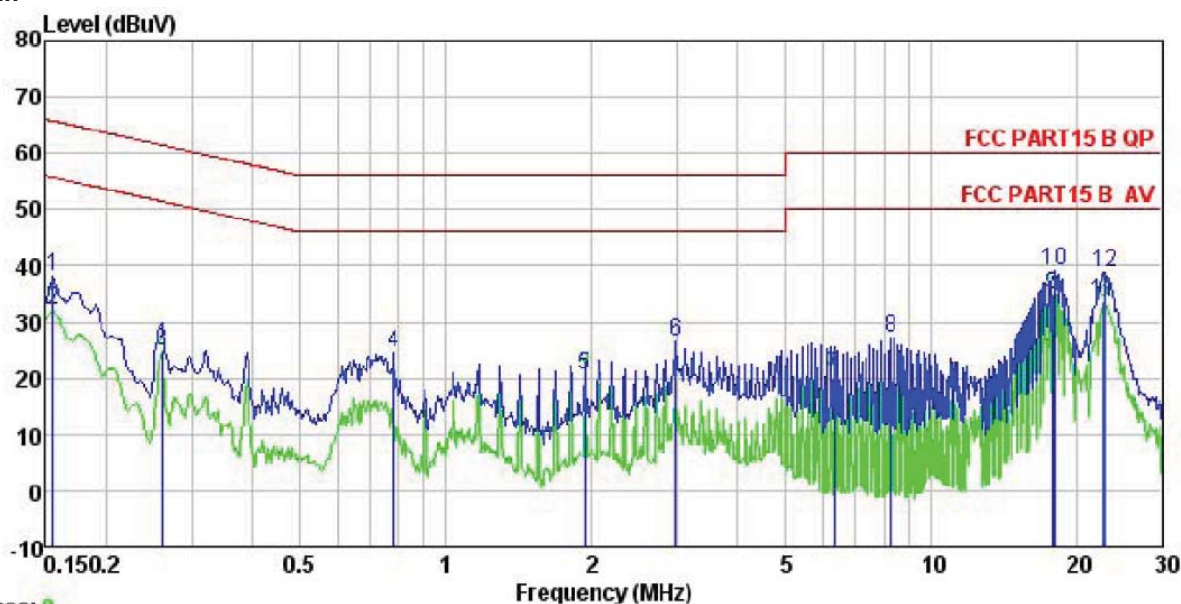


Trace: 11

Site : CCIS Shielding Room
 Condition : FCC PART15 B QP LISN LINE
 EUT : WIDI
 Model : WD01
 Test Mode : 5GWifi mode
 Power Rating : AC 120V/60Hz
 Environment : Temp: 23 °C Humi:56% Atmos:101KPa
 Test Engineer: MT.liang
 Remark :

	Read Freq	LISN Level	Cable Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.160	28.32	0.27	10.78	39.37	65.47	-26.10	QP
2	0.260	17.45	0.27	10.75	28.47	61.42	-32.95	QP
3	0.260	14.79	0.27	10.75	25.81	51.42	-25.61	Average
4	0.389	11.19	0.28	10.72	22.19	48.08	-25.89	Average
5	0.724	15.67	0.22	10.78	26.67	56.00	-29.33	QP
6	5.564	18.30	0.30	10.83	29.43	60.00	-30.57	QP
7	5.805	17.01	0.31	10.83	28.15	50.00	-21.85	Average
8	8.148	17.33	0.32	10.86	28.51	50.00	-21.49	Average
9	18.524	26.49	0.33	10.91	37.73	50.00	-12.27	Average
10	18.721	29.28	0.34	10.91	40.53	60.00	-19.47	QP
11	22.775	28.70	0.44	10.89	40.03	60.00	-19.97	QP
12	22.775	25.74	0.44	10.89	37.07	50.00	-12.93	Average

Neutral:



Trace: 9

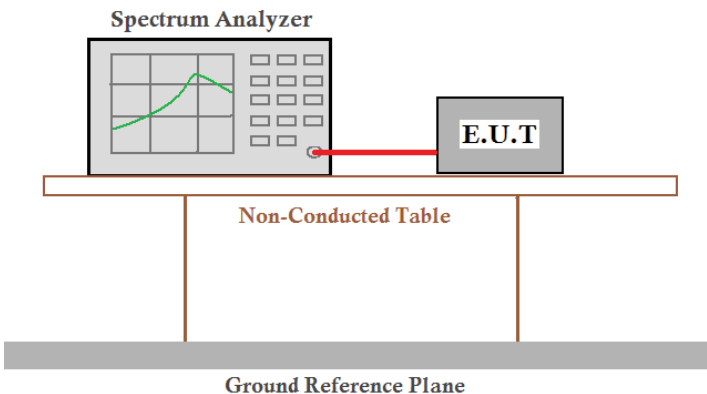
Site : CCIS Shielding Room
 Condition : FCC PART15 B QP LISN NEUTRAL
 EUT : WIDI
 Model : WD01
 Test Mode : 5Gwifi mode
 Power Rating : AC 120V/60Hz
 Environment : Temp: 23 °C Humi:56% Atmos:101KPa
 Test Engineer: MT.linag
 Remark :

	Freq	Read	LISN	Cable	Level	Limit	Over	
	MHz	Level	Factor	Loss	Level	Line	Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.155	27.17	0.25	10.78	38.20	65.74	-27.54	QP
2	0.155	20.99	0.25	10.78	32.02	55.74	-23.72	Average
3	0.260	14.01	0.26	10.75	25.02	51.42	-26.40	Average
4	0.779	13.44	0.19	10.80	24.43	56.00	-31.57	QP
5	1.939	9.40	0.29	10.96	20.65	46.00	-25.35	Average
6	2.978	15.21	0.29	10.92	26.42	56.00	-29.58	QP
7	6.319	9.40	0.27	10.81	20.48	50.00	-29.52	Average
8	8.279	16.11	0.26	10.86	27.23	60.00	-32.77	QP
9	17.849	23.69	0.26	10.90	34.85	50.00	-15.15	Average
10	17.944	27.99	0.26	10.90	39.15	60.00	-20.85	QP
11	22.775	22.20	0.39	10.89	33.48	50.00	-16.52	Average
12	22.896	27.64	0.40	10.89	38.93	60.00	-21.07	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

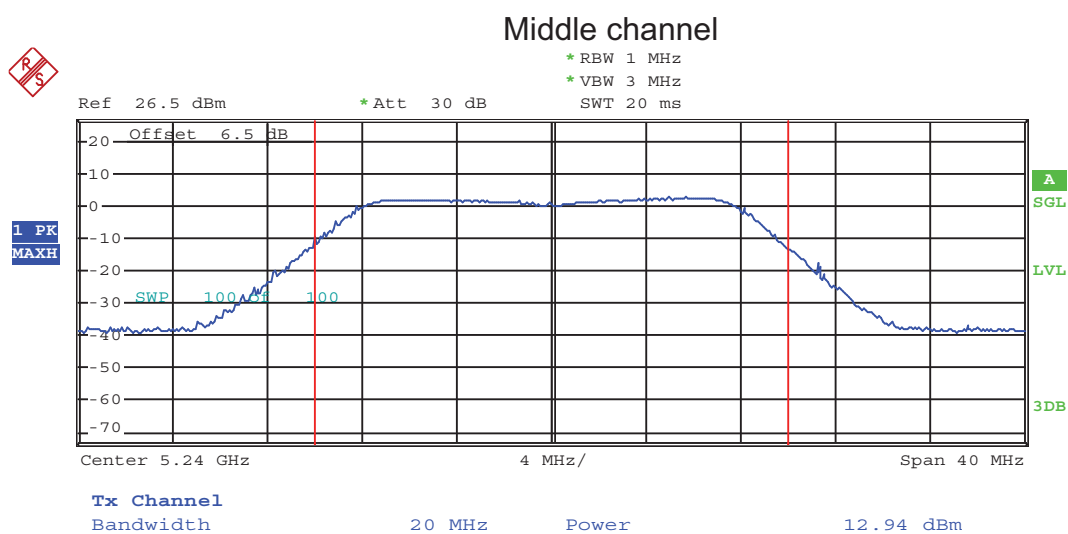
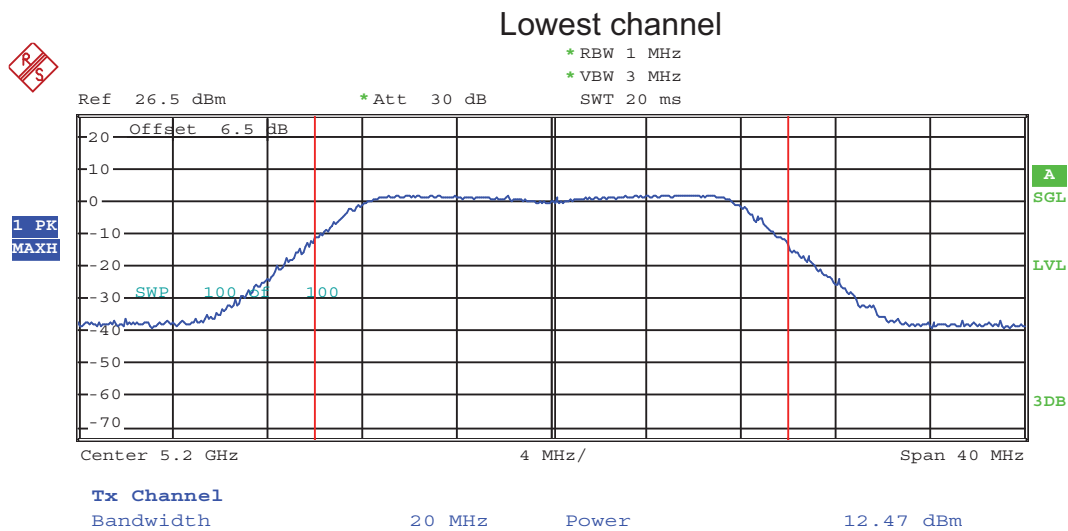
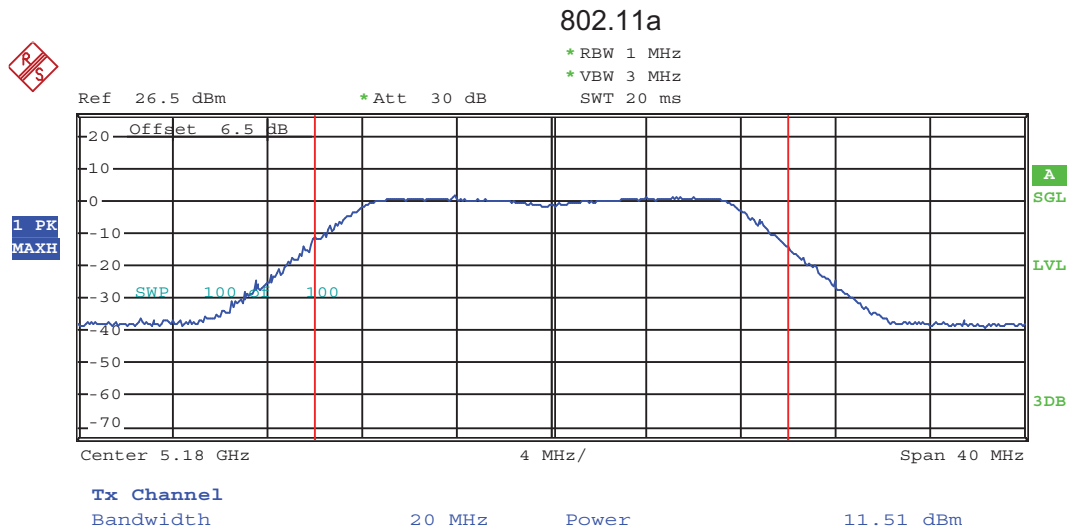
6.3 Conducted Output Power

Test Requirement:	FCC Part15 E Section 15.407 (a) (1) (iv)
Test Method:	ANSI C63.10: 2009, KDB 789033
Limit:	30.00dBm
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.
Test Instruments:	Refer to section 5.6 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data

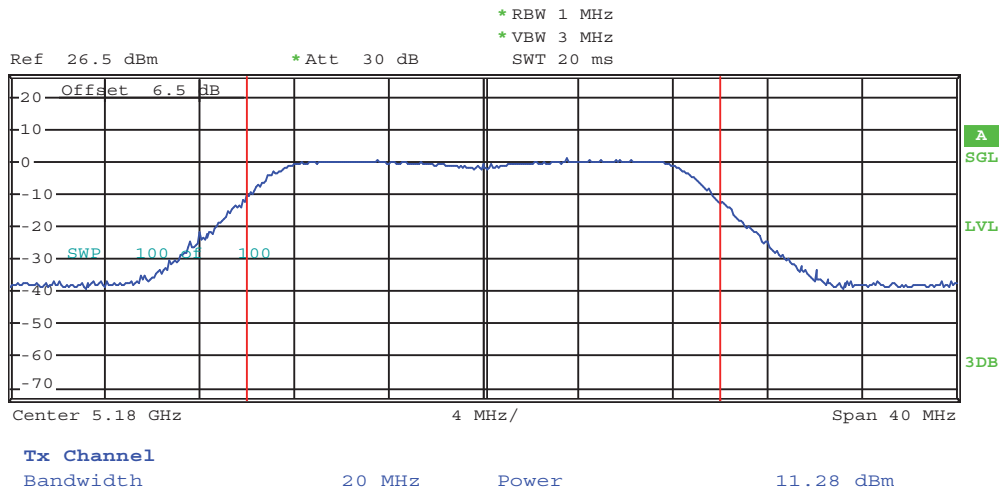
Mode	Test CH	Conducted Output power (dBm)	Limit (dBm)	Result
802.11a	Lowest	11.51	30.00	Pass
	Middle	12.47	30.00	Pass
	Highest	12.94	30.00	Pass
802.11n20	Lowest	11.28	30.00	Pass
	Middle	11.63	30.00	Pass
	Highest	12.59	30.00	Pass
802.11n40	Lowest	10.18	30.00	Pass
	Highest	10.77	30.00	Pass
802.11ac	Lowest	10.55	30.00	Pass

Test plot as follows:

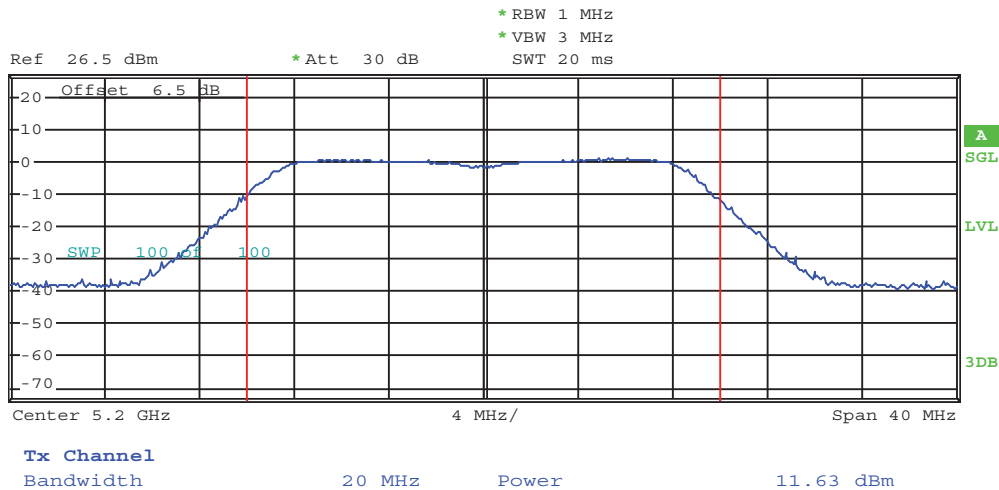


Highest channel

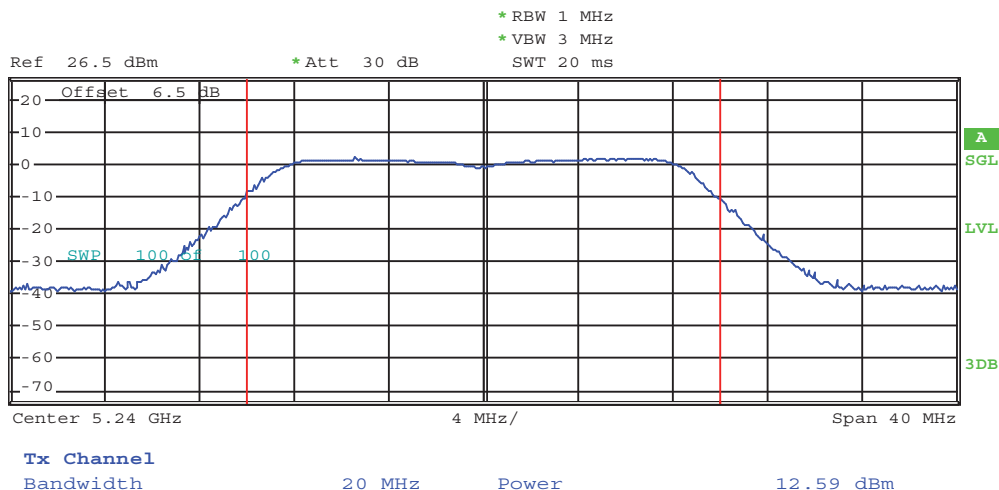
802.11n20



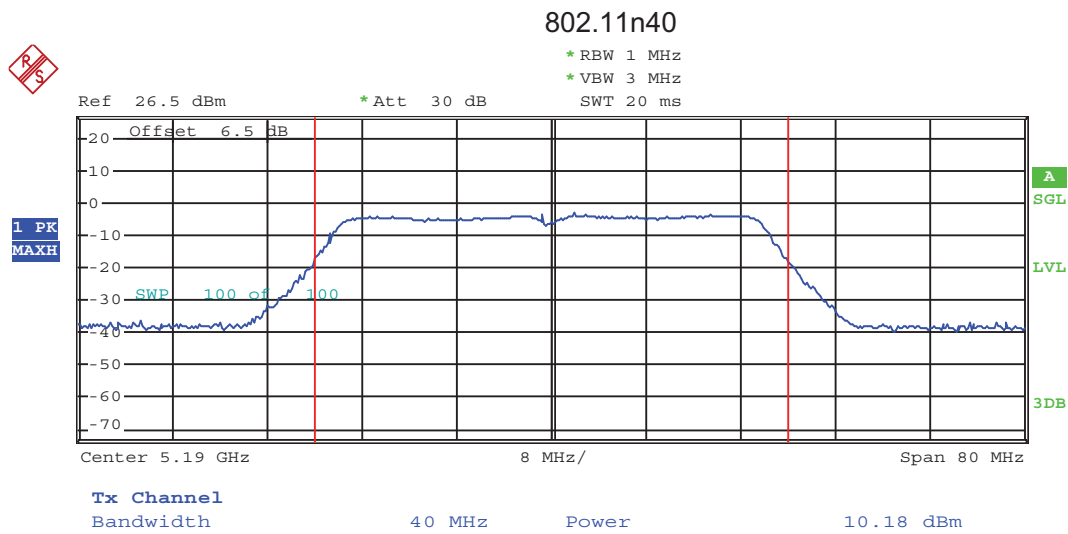
Lowest channel



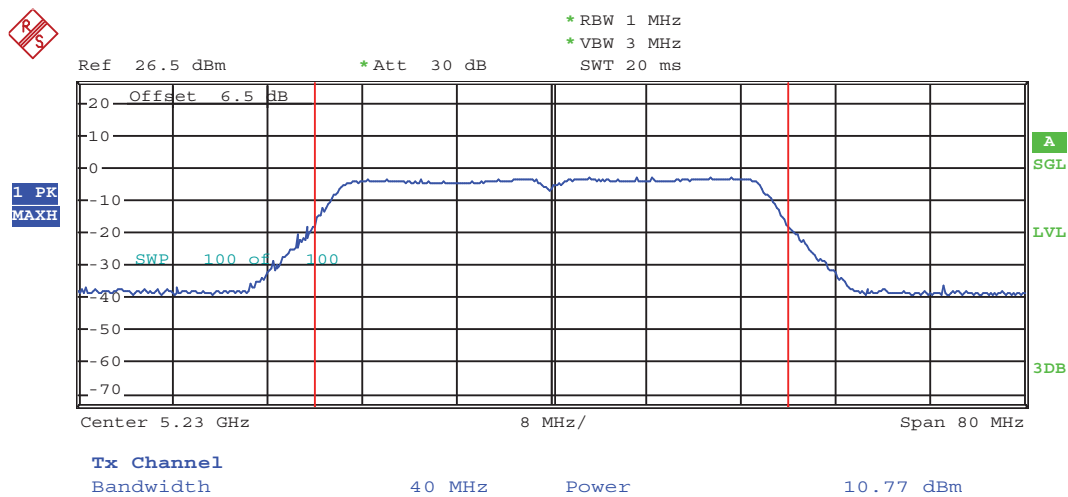
Middle channel



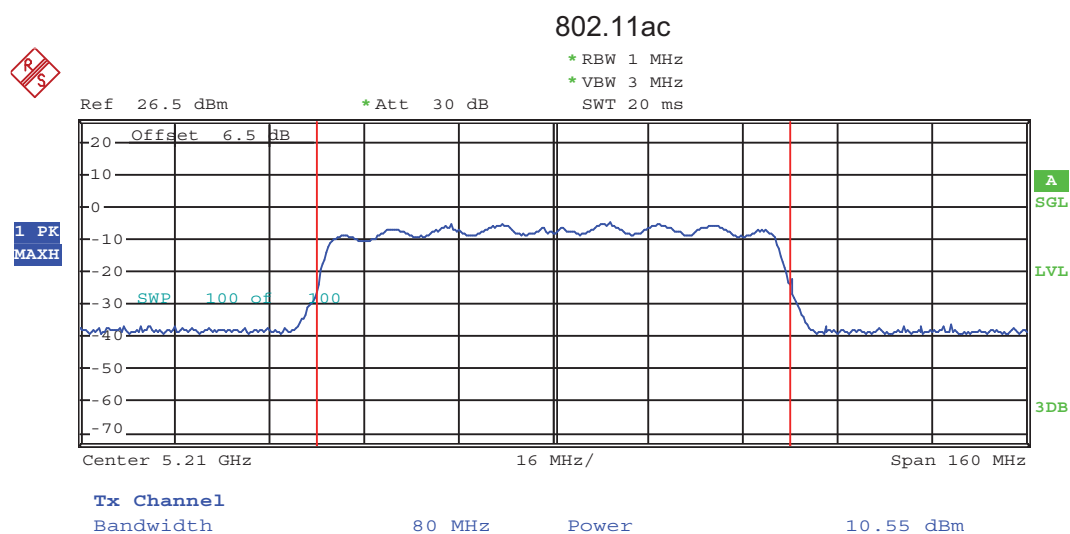
Highest channel



Lowest channel

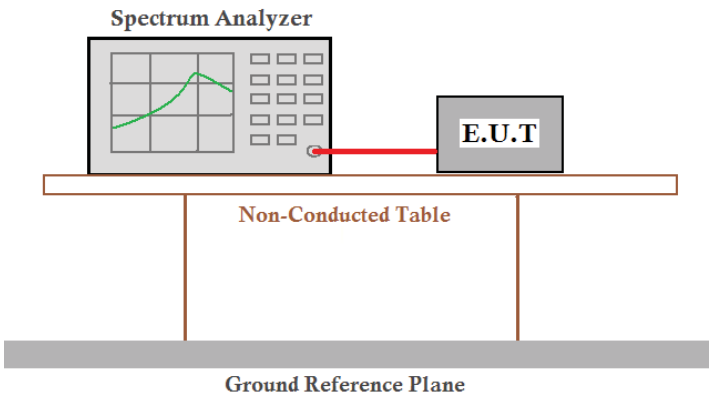


Highest channel



Lowest channel

6.4 Occupy Bandwidth

Test Requirement:	FCC Part15 E Section 15.407 (a) (5)
Test Method:	ANSI C63.10: 2009 and KDB 789033
Limit:	N/A(26dB Emission Bandwidth and 99% Occupy Bandwidth)
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.
Test Instruments:	Refer to section 5.6 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

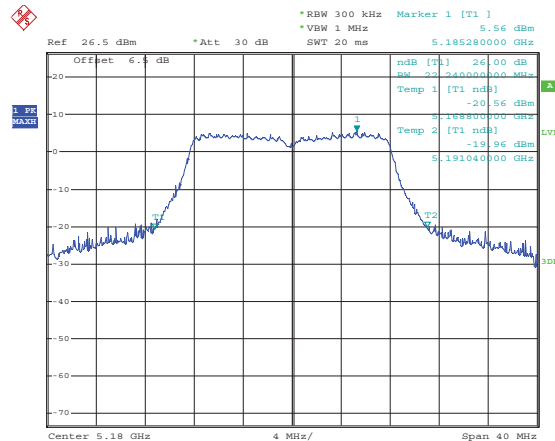
Measurement Data

Test Channel	26dB Emission Bandwidth (MHz)				Limit	Result
	802.11a	802.11n20	802.11n40	802.11ac		
Lowest	22.24	22.48	43.52	83.52	N/A	N/A
Middle	22.80	22.88	---	---		
Highest	22.64	22.72	43.84	---		

Test Channel	99% Occupy Bandwidth (MHz)				Limit	Result
	802.11a	802.11n20	802.11n40	802.11ac		
Lowest	17.36	18.16	36.64	75.52	N/A	N/A
Middle	17.28	18.24	---	---		
Highest	17.36	18.16	36.64	---		

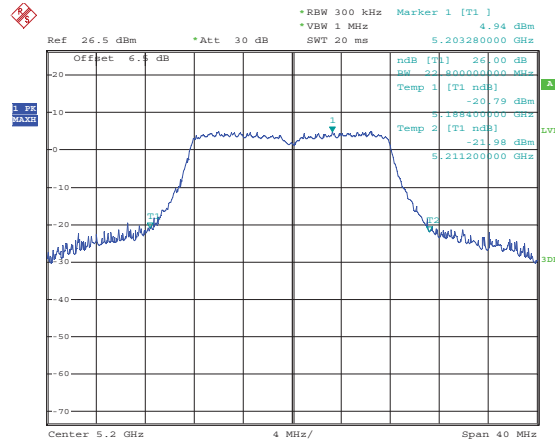
Test plot as follows:

26 dB EBW - 802.11a



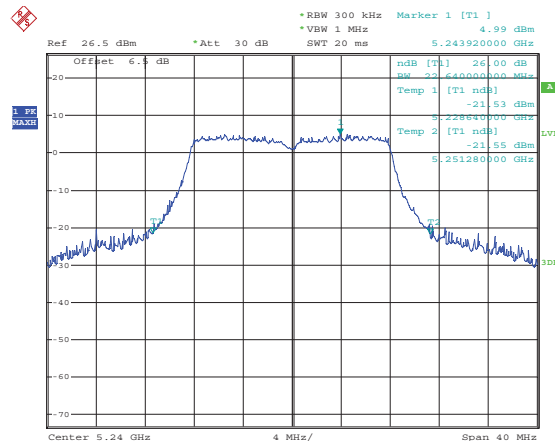
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Lowest channel



Date: 23.NOV.2015 07:50:49

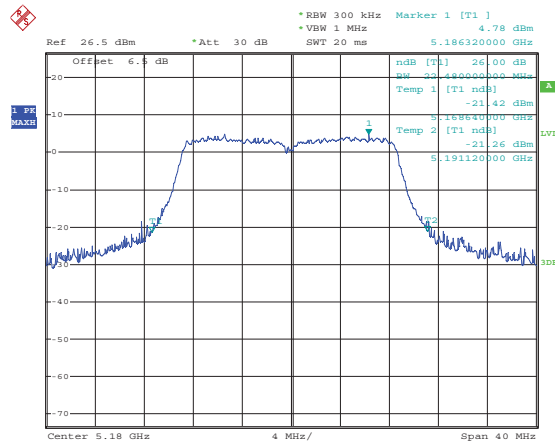
Middle channel



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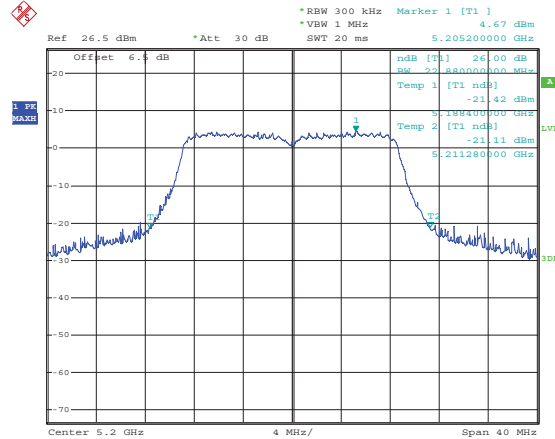
Highest channel

802.11n20



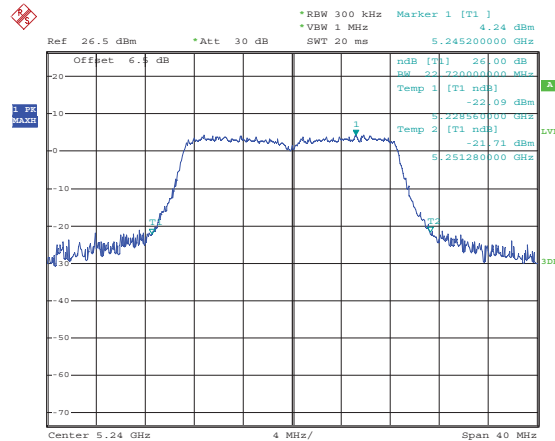
Date: 23.NOV.2015 07:56:25

Lowest channel



Date: 23.NOV.2015 07:57:18

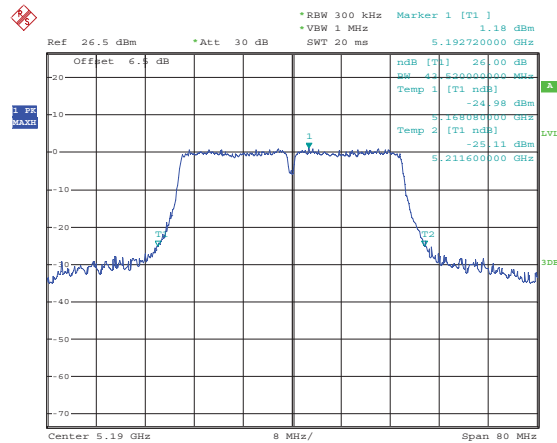
Middle channel



Date: 23.NOV.2015 07:58:17

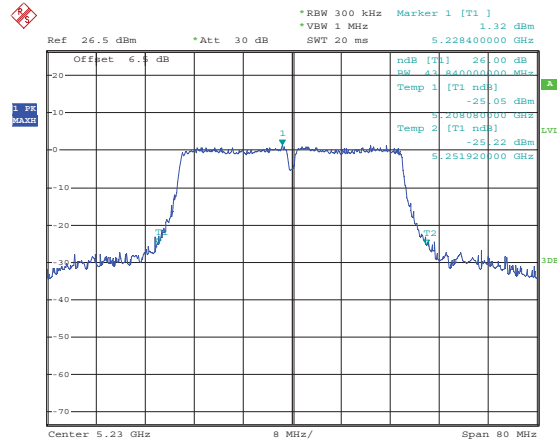
Highest channel

802.11n40



Date: 23.NOV.2015 07:59:24

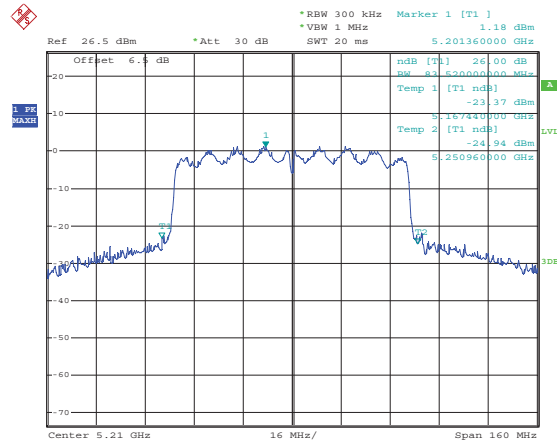
Lowest channel



Date: 23.NOV.2015 07:59:55

Highest channel

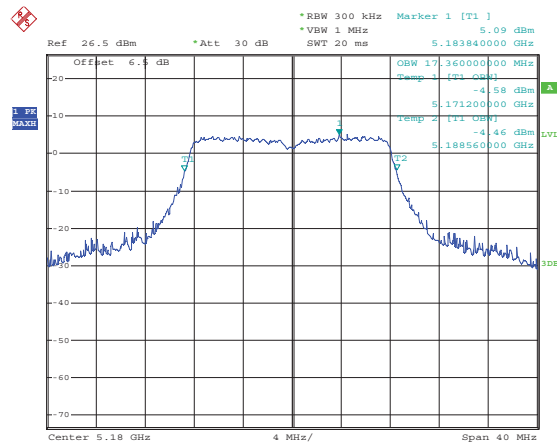
802.11ac



Date: 23.NOV.2015 09:45:11

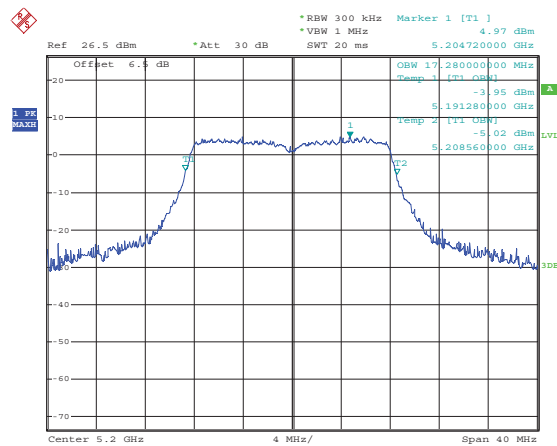
Lowest channel

99% OBW - 802.11a



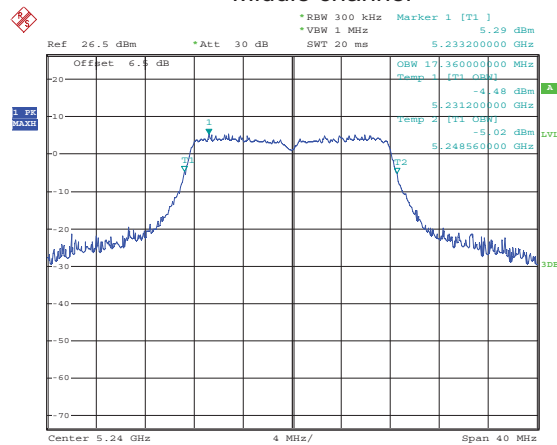
Date: 23.NOV.2015 07:51:30

Lowest channel



Date: 23.NOV.2015 07:51:03

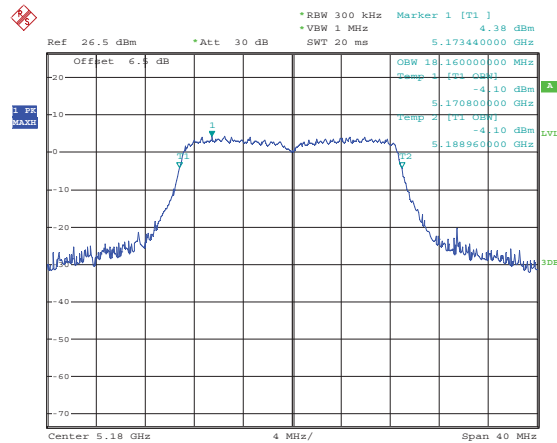
Middle channel



Date: 23.NOV.2015 07:51:59

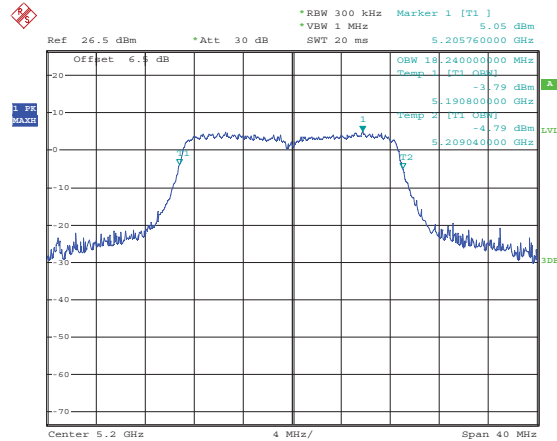
Highest channel

802.11n20



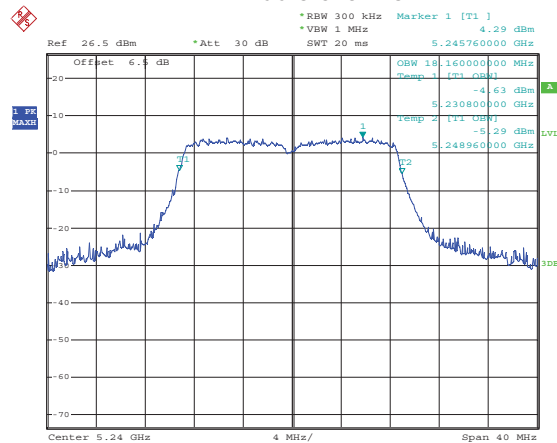
Date: 23.NOV.2015 07:56:40

Lowest channel



Date: 23.NOV.2015 07:57:04

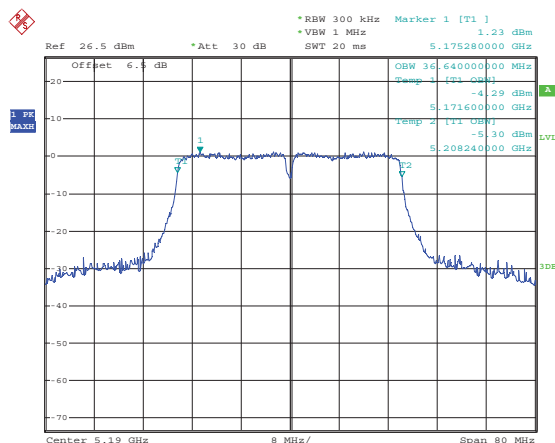
Middle channel



Date: 23.NOV.2015 07:58:33

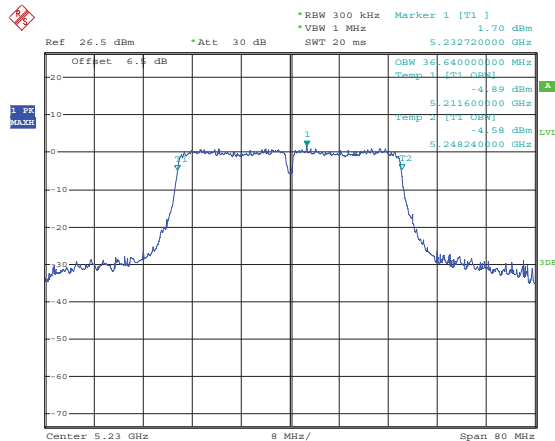
Highest channel

802.11n40



Date: 23.NOV.2015 07:59:10

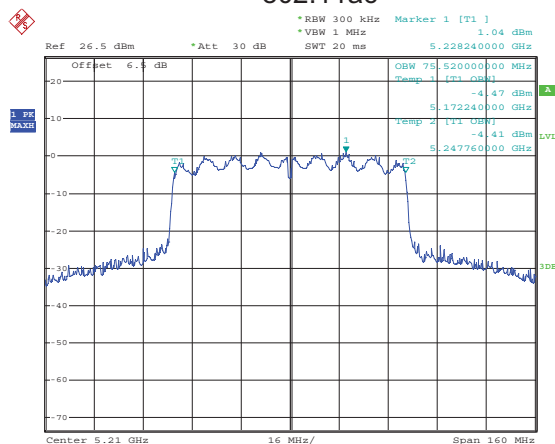
Lowest channel



Date: 23.NOV.2015 08:00:09

Highest channel

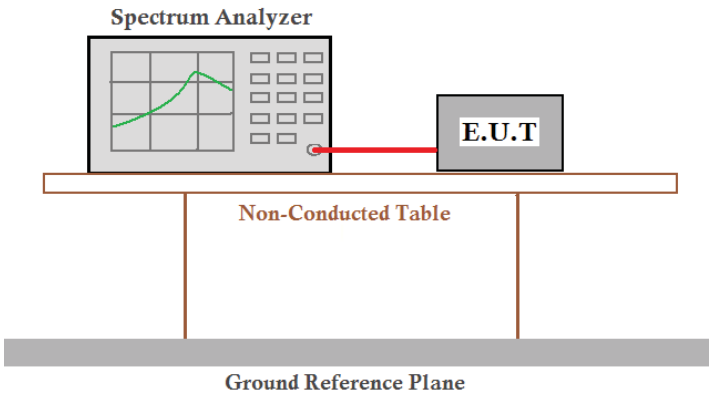
802.11ac



Date: 23.NOV.2015 09:45:24

Lowest channel

6.5 Power Spectral Density

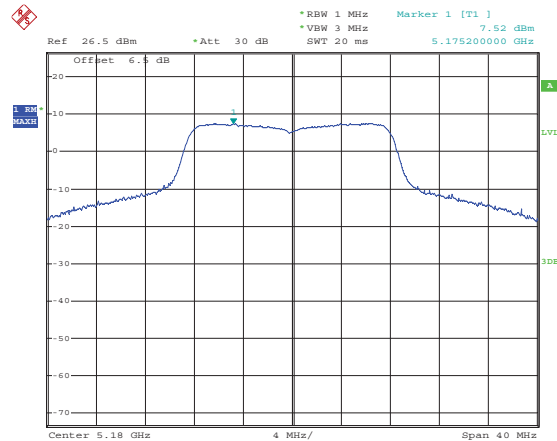
Test Requirement:	FCC Part15 E Section 15.407 (a) (1) (iv)
Test Method:	ANSI C63.10: 2009 KDB 789033
Limit:	17 dBm/MHz
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.
Test Instruments:	Refer to section 5.6 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data

Mode	Test CH	PSD (dBm)	Limit (dBm)	Result
802.11a	Lowest	7.52	17.00	Pass
	Middle	7.26	17.00	Pass
	Highest	7.09	17.00	Pass
802.11n20	Lowest	6.39	17.00	Pass
	Middle	6.66	17.00	Pass
	Highest	6.76	17.00	Pass
802.11n40	Lowest	3.24	17.00	Pass
	Highest	2.96	17.00	Pass
802.11ac	Lowest	1.96	17.00	Pass

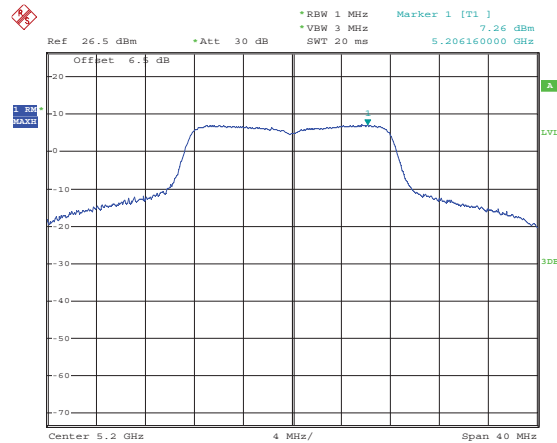
Test plot as follows:

Test mode: 802.11a



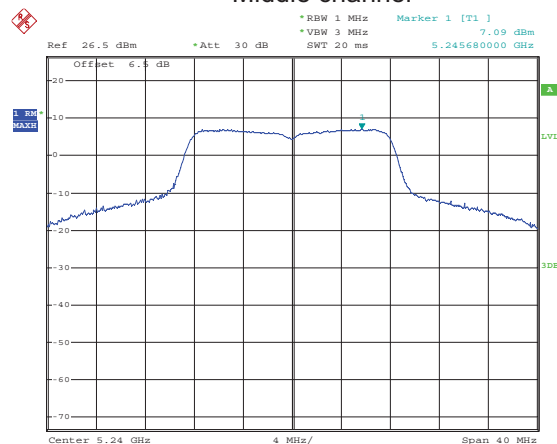
Date: 23.NOV.2015 09:52:18

Lowest channel



Date: 23.NOV.2015 09:52:45

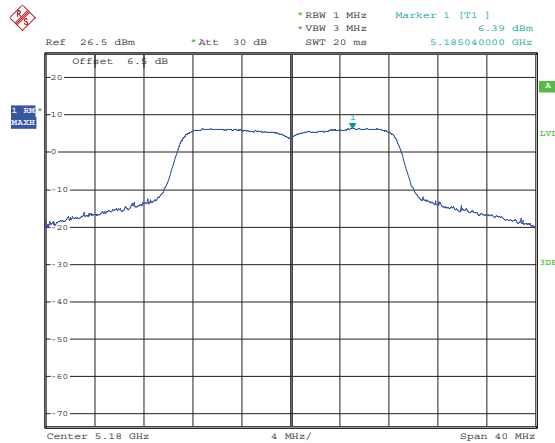
Middle channel



Date: 23.NOV.2015 09:53:15

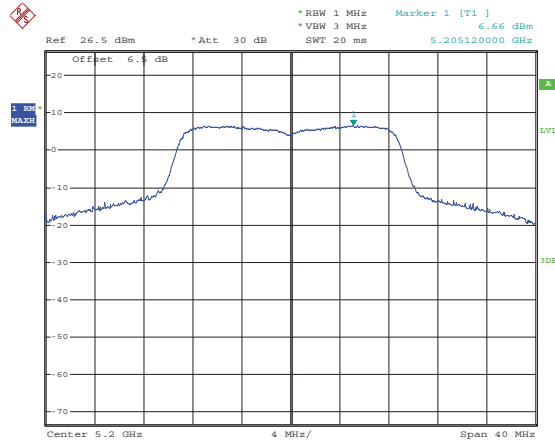
Highest channel

Test mode: 802.11n20



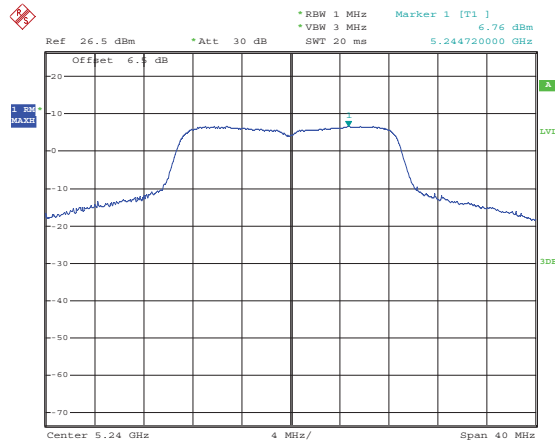
Date: 23.NOV.2015 09:54:31

Lowest channel



Date: 23.NOV.2015 09:54:09

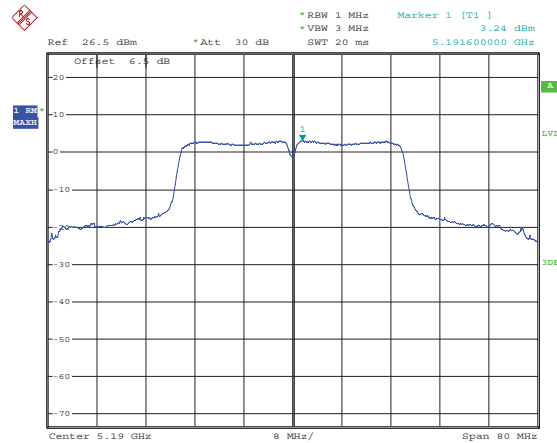
Middle channel



Date: 23.NOV.2015 09:53:48

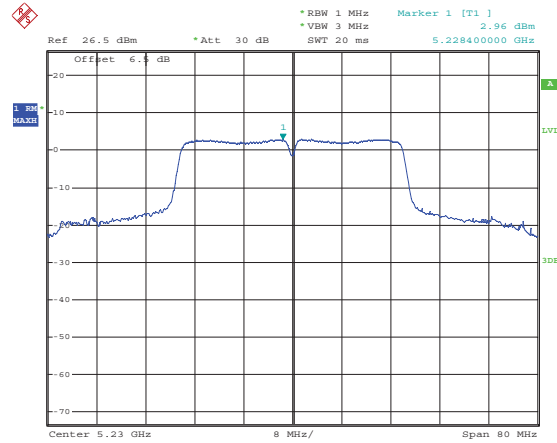
Highest channel

Test mode: 802.11n40



Date: 23.NOV.2015 09:55:13

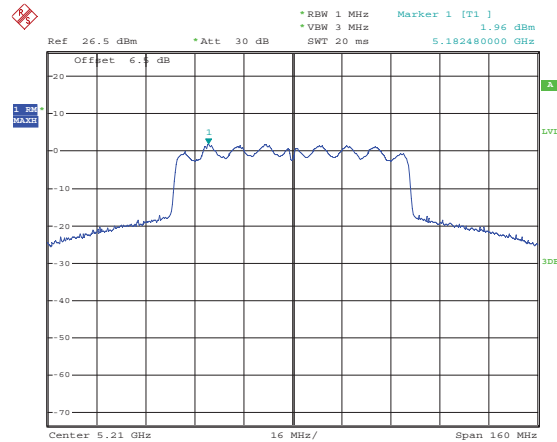
Lowest channel



Date: 23.NOV.2015 09:55:36

Highest channel

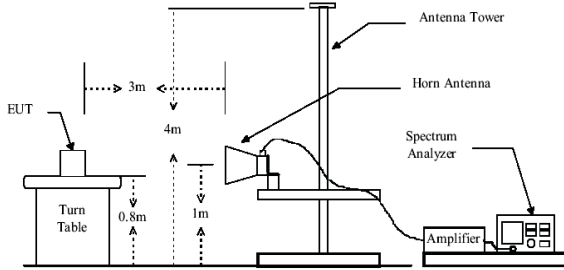
Test mode: 802.11ac



Date: 23.NOV.2015 09:49:26

Lowest channel

6.6 Band Edge

Test Requirement:	FCC Part15 E Section 15.407 (b)												
Test Method:	ANSI C63.10:2009 , KDB 789033												
Receiver setup:	<table><tr><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr><tr><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr><tr><td>RMS</td><td>1MHz</td><td>3MHz</td><td>Average Value</td></tr></table>	Detector	RBW	VBW	Remark	Peak	1MHz	3MHz	Peak Value	RMS	1MHz	3MHz	Average Value
Detector	RBW	VBW	Remark										
Peak	1MHz	3MHz	Peak Value										
RMS	1MHz	3MHz	Average Value										
Limit:	<table><tr><td></td><td>Limit (dBuV/m @3m)</td><td>Remark</td></tr><tr><td rowspan="2">Band 1</td><td>68.20</td><td>Peak Value</td></tr><tr><td>54.00</td><td>Average Value</td></tr></table> Remark: limit: $E[\text{dB}\mu\text{V/m}] = \text{EIRP}[\text{dBm}] + 95.2 = 68.2 \text{ dB}\mu\text{V/m}$, for $\text{EIPR}[\text{dBm}] = -27\text{dBm}$.		Limit (dBuV/m @3m)	Remark	Band 1	68.20	Peak Value	54.00	Average Value				
	Limit (dBuV/m @3m)	Remark											
Band 1	68.20	Peak Value											
	54.00	Average Value											
Test Procedure:	1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.												
Test setup:													
Test Instruments:	Refer to section 5.6 for details												
Test mode:	Refer to section 5.3 for details												
Test results:	Passed												

802.11a								
Test channel		Lowest			Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	37.15	32.07	9.13	40.06	38.29	68.20	-29.91	Horizontal
5150.00	36.69	32.07	9.13	40.06	37.83	68.20	-30.37	Vertical
802.11a								
Test channel		Lowest			Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	27.12	32.07	9.13	40.06	28.26	54.00	-25.74	Horizontal
5150.00	26.52	32.07	9.13	40.06	27.66	54.00	-26.34	Vertical
802.11a								
Test channel		Highest			Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	37.52	31.78	9.15	40.18	38.27	68.20	-29.93	Horizontal
5350.00	37.65	31.78	9.15	40.18	38.40	68.20	-29.80	Vertical
802.11a								
Test channel		Highest			Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	27.85	31.78	9.15	40.18	28.60	54.00	-25.40	Horizontal
5350.00	27.54	31.78	9.15	40.18	28.29	54.00	-25.71	Vertical

802.11n-HT20								
Test channel		Lowest			Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	37.12	32.07	9.13	40.06	38.26	68.20	-29.94	Horizontal
5150.00	36.69	32.07	9.13	40.06	37.83	68.20	-30.37	Vertical
802.11n-HT20								
Test channel		Lowest			Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	27.83	32.07	9.13	40.06	28.97	54.00	-25.04	Horizontal
5150.00	27.98	32.07	9.13	40.06	29.12	54.00	-24.88	Vertical
802.11n-HT20								
Test channel		Highest			Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	36.69	31.78	9.15	40.18	37.44	68.20	-30.76	Horizontal
5350.00	36.19	31.78	9.15	40.18	36.94	68.20	-31.26	Vertical
802.11n-HT20								
Test channel		Highest			Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	27.54	31.78	9.15	40.18	28.29	54.00	-25.71	Horizontal
5350.00	28.62	31.78	9.15	40.18	29.37	54.00	-24.63	Vertical

Remark:

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

802.11n-HT40								
Test channel		Lowest			Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	36.35	32.07	9.13	40.06	37.49	68.20	-30.71	Horizontal
5150.00	36.14	32.07	9.13	40.06	37.28	68.20	-30.92	Vertical
802.11n-HT40								
Test channel		Lowest			Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	26.54	32.07	9.13	40.06	27.68	54.00	-26.32	Horizontal
5150.00	25.37	32.07	9.13	40.06	26.51	54.00	-27.49	Vertical
802.11n-HT40								
Test channel		Highest			Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	36.32	31.78	9.15	40.18	37.07	68.20	-31.13	Horizontal
5350.00	36.77	31.78	9.15	40.18	37.52	68.20	-30.68	Vertical
802.11n-HT40								
Test channel		Highest			Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	26.36	31.78	9.15	40.18	27.11	54.00	-26.89	Horizontal
5350.00	26.74	31.78	9.15	40.18	27.49	54.00	-26.51	Vertical

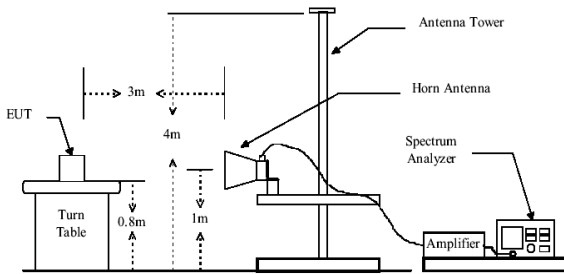
802.11ac								
Test channel		Lowest			Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	37.14	32.07	9.13	40.06	38.28	68.20	-29.92	Horizontal
5150.00	26.38	32.07	9.13	40.06	27.52	68.20	-40.68	Vertical
802.11ac								
Test channel		Lowest			Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	27.01	32.07	9.13	40.06	28.15	54.00	-25.85	Horizontal
5150.00	25.63	32.07	9.13	40.06	26.77	54.00	-27.23	Vertical
802.11ac								
Test channel		Lowest			Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	37.85	31.78	9.15	40.18	38.60	68.20	-29.60	Horizontal
5350.00	37.52	31.78	9.15	40.18	38.27	68.20	-29.93	Vertical
802.11ac								
Test channel		Lowest			Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	27.52	31.78	9.15	40.18	28.27	54.00	-25.73	Horizontal
5350.00	27.14	31.78	9.15	40.18	27.89	54.00	-26.11	Vertical

Remark:

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

6.7 Spurious Emission

6.7.1 Restricted Band

Test Requirement:	FCC Part15 E Section 15.407(b)																		
Test Method:	ANSI C63.10: 2009																		
Test Frequency Range:	4.5 GHz to 5.15 GHz and 5.35GHz to 5.46GHz																		
Test site:	Measurement Distance: 3m																		
Receiver setup:	<table><tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr><tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr><tr><td>RMS</td><td>1MHz</td><td>3MHz</td><td>Average Value</td></tr></table>					Frequency	Detector	RBW	VBW	Remark	Above 1GHz	Peak	1MHz	3MHz	Peak Value	RMS	1MHz	3MHz	Average Value
Frequency	Detector	RBW	VBW	Remark															
Above 1GHz	Peak	1MHz	3MHz	Peak Value															
	RMS	1MHz	3MHz	Average Value															
Limit:	<table><tr><td>Frequency</td><td>Limit (dBuV/m @3m)</td><td>Remark</td></tr><tr><td rowspan="2">Above 1GHz</td><td>74.00</td><td>Peak Value</td></tr><tr><td>54.00</td><td>Average Value</td></tr></table>					Frequency	Limit (dBuV/m @3m)	Remark	Above 1GHz	74.00	Peak Value	54.00	Average Value						
Frequency	Limit (dBuV/m @3m)	Remark																	
Above 1GHz	74.00	Peak Value																	
	54.00	Average Value																	
Test Procedure:	7. 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. 8. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 9. 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. 10. 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. 11. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 12. 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:	 The diagram illustrates the test setup. An EUT (Equipment Under Test) is placed on a turn table at a height of 0.8m. The turn table is rotated 360 degrees. The EUT is positioned 3m away from the antenna tower. The antenna tower is a variable-height tower with a horn antenna at the top. The antenna height is varied from 1m to 4m. The antenna is connected to a spectrum analyzer via an amplifier.																		
Test Instruments:	Refer to section 5.6 for details																		
Test mode:	Refer to section 5.3 for details																		
Test results:	Passed																		

802.11a

Test channel		Lowest			Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	36.24	30.72	8.54	40.67	34.83	74.00	-39.17	Horizontal
4500.00	37.02	30.72	8.54	40.67	35.61	74.00	-38.39	Vertical
Test channel		Lowest			Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	26.54	30.72	8.54	40.67	25.13	54.00	-28.87	Horizontal
4500.00	26.40	30.72	8.54	40.67	24.99	54.00	-29.01	Vertical
Test channel		Highest			Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	37.26	31.99	9.16	40.23	38.18	74.00	-35.82	Horizontal
5460.00	37.05	31.99	9.16	40.23	37.97	74.00	-36.03	Vertical
Test channel		Highest			Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	27.12	31.99	9.16	40.23	28.04	54.00	-25.96	Horizontal
5460.00	27.00	31.99	9.16	40.23	27.92	54.00	-26.08	Vertical

802.11n-HT20

Test channel		Lowest			Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	36.87	30.72	8.54	40.67	35.46	74.00	-38.54	Horizontal
4500.00	36.38	30.72	8.54	40.67	34.97	74.00	-39.03	Vertical
Test channel		Lowest			Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	26.54	30.72	8.54	40.67	25.13	54.00	-28.87	Horizontal
4500.00	26.36	30.72	8.54	40.67	24.95	54.00	-29.05	Vertical
Test channel		Highest			Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	37.28	31.99	9.16	40.23	38.20	74.00	-35.80	Horizontal
5460.00	37.89	31.99	9.16	40.23	38.81	74.00	-35.20	Vertical
Test channel		Highest			Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	27.52	31.99	9.16	40.23	28.44	54.00	-25.56	Horizontal
5460.00	27.18	31.99	9.16	40.23	28.10	54.00	-25.90	Vertical

Remark:

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

802.11n-HT40

Test channel		Lowest			Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	37.50	30.72	8.54	40.67	36.09	74.00	-37.91	Horizontal
4500.00	37.55	30.72	8.54	40.67	36.14	74.00	-37.86	Vertical
Test channel		Lowest			Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	27.55	30.72	8.54	40.67	26.14	54.00	-27.86	Horizontal
4500.00	27.36	30.72	8.54	40.67	25.95	54.00	-28.05	Vertical
Test channel		Highest			Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	36.28	31.99	9.16	40.23	37.20	74.00	-36.80	Horizontal
5460.00	37.29	31.99	9.16	40.23	38.21	74.00	-35.80	Vertical
Test channel		Highest			Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	27.32	31.99	9.16	40.23	28.24	54.00	-25.76	Horizontal
5460.00	27.56	31.99	9.16	40.23	28.48	54.00	-25.52	Vertical

802.11ac

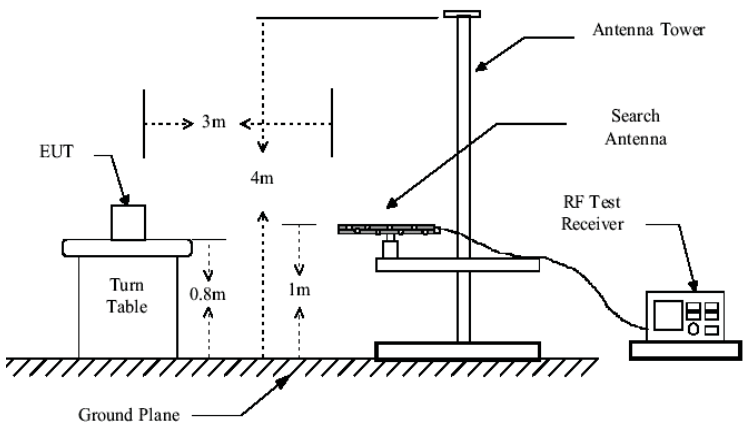
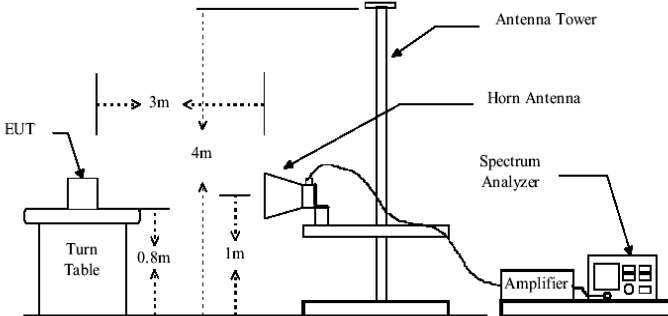
Test channel		Lowest			Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	38.24	30.72	8.54	40.67	36.83	74.00	-37.17	Horizontal
4500.00	37.45	30.72	8.54	40.67	36.04	74.00	-37.96	Vertical
Test channel		Lowest			Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	28.13	31.99	9.16	40.23	29.05	54.00	-24.95	Horizontal
5460.00	28.41	31.99	9.16	40.23	29.33	54.00	-24.67	Vertical

Remark:

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

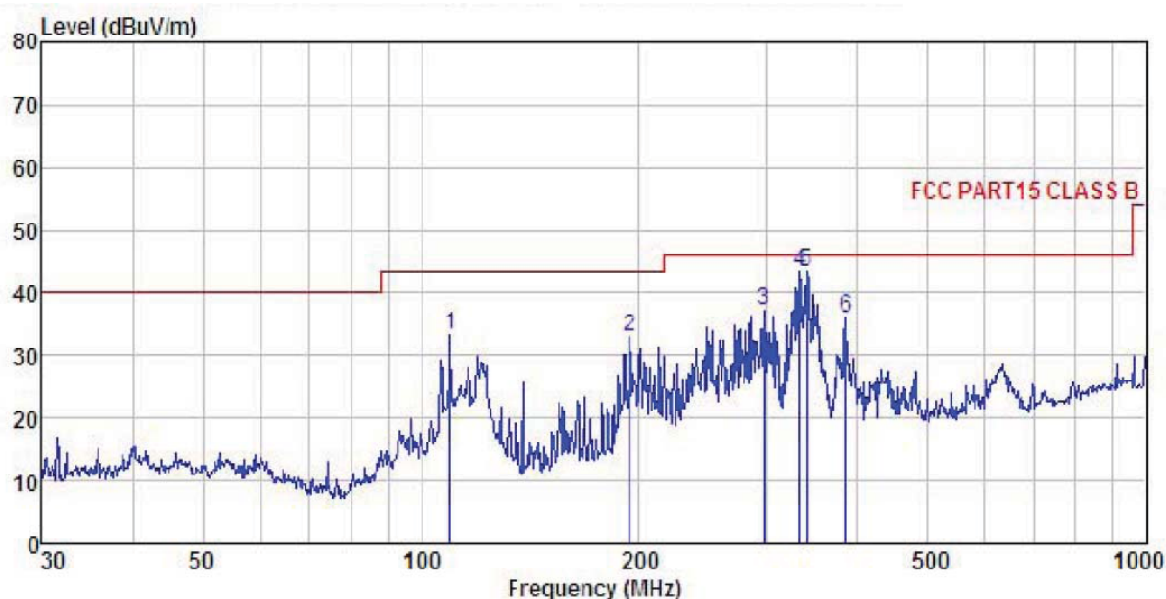
6.7.2 Unwanted Emissions in the Restricted Bands

Test Requirement:	FCC Part15 C Section 15.209 and 15.205																											
Test Method:	ANSI C63.10:2009																											
Test Frequency Range:	30MHz to 40GHz																											
Test site:	Measurement Distance: 3m																											
Receiver setup:	<table><tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr><tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>120kHz</td><td>300kHz</td><td>Quasi-peak Value</td></tr><tr><td>Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr></table>					Frequency	Detector	RBW	VBW	Remark	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value	Above 1GHz	Peak	1MHz	3MHz	Peak Value								
Frequency	Detector	RBW	VBW	Remark																								
30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value																								
Above 1GHz	Peak	1MHz	3MHz	Peak Value																								
Limit:	<table><tr><td>Frequency</td><td>Limit (dBuV/m @3m)</td><td>Remark</td></tr><tr><td>30MHz-88MHz</td><td>40.0</td><td>Quasi-peak Value</td></tr><tr><td>88MHz-216MHz</td><td>43.5</td><td>Quasi-peak Value</td></tr><tr><td>216MHz-960MHz</td><td>46.0</td><td>Quasi-peak Value</td></tr><tr><td>960MHz-1GHz</td><td>54.0</td><td>Quasi-peak Value</td></tr></table> <table><tr><td>Frequency</td><td>Limit (dBm/MHz)</td><td>Remark</td></tr><tr><td rowspan="2">Above 1GHz</td><td>68.20</td><td>Peak Value</td></tr><tr><td>54.00</td><td>Average Value</td></tr></table> Remark: 1. Above 1GHz limit: $E[dBuV/m] = EIRP[dBm] + 95.2=68.2 \text{ dBuV/m}$, for $EIPR[dBm]=-27dBm$.					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	Frequency	Limit (dBm/MHz)	Remark	Above 1GHz	68.20	Peak Value	54.00	Average Value
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																										
Frequency	Limit (dBm/MHz)	Remark																										
Above 1GHz	68.20	Peak Value																										
	54.00	Average Value																										
Test Procedure:	- 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:	Below 1GHz  Above 1GHz 
Test Instruments:	Refer to section 5.6 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Below 1GHz

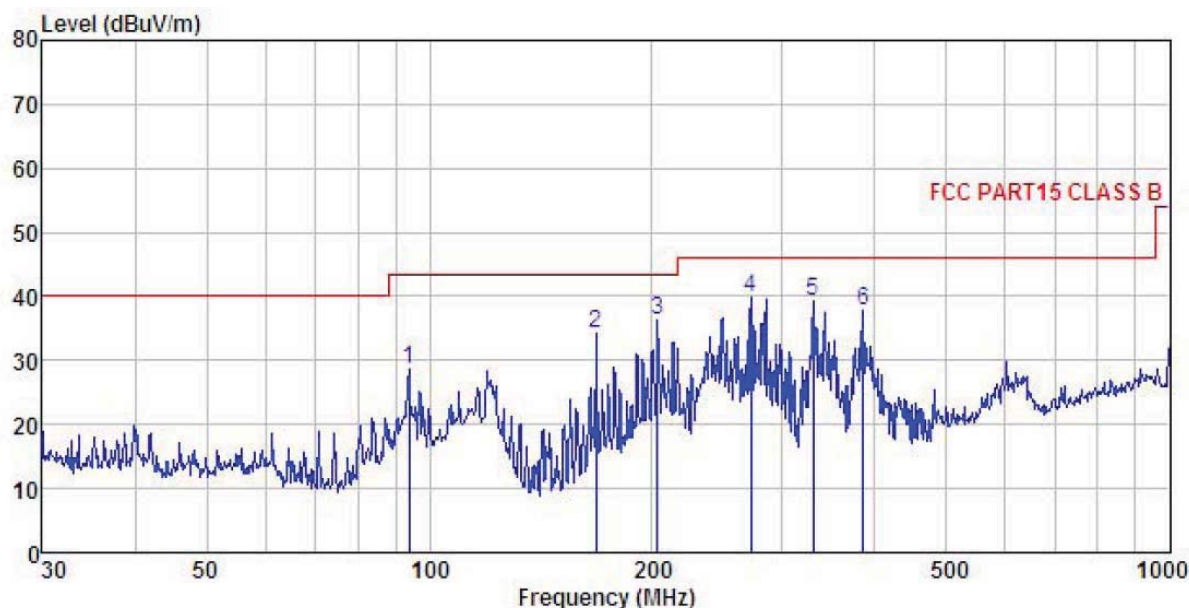
Horizontal:



Site : 3m chamber
 Condition : FCC PART15 CLASS B 3m WULB9163(30M1G) HORIZONTAL
 Pro : 901RF
 EUT : WIDI
 Model : WD01
 Test mode : 5Gwifi mode
 Power Rating : AC120V/60Hz
 Environment : Temp:25.5℃ Humi:55%
 Test Engineer: MT
 REMARK :

	Freq	ReadAntenna	Cable	Preamp	Level	Linit	Over	
	MHz	Level	Factor	Loss	Factor	Line	Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	109.796	49.66	12.25	1.04	29.46	33.49	43.50	-10.01 QP
2	193.773	50.05	10.56	1.37	28.87	33.11	43.50	-10.39 QP
3	297.224	50.90	13.00	1.76	28.46	37.20	46.00	-8.80 QP
4	332.519	56.31	13.86	1.88	28.52	43.53	46.00	-2.47 QP
5	339.589	55.91	14.12	1.91	28.54	43.40	46.00	-2.60 QP
6	385.281	48.00	14.73	2.07	28.72	36.08	46.00	-9.92 QP

Vertical:



Site : 3m chamber
 Condition : FCC PART15 CLASS B 3m VULB9163(30M1G) VERTICAL
 Pro : 901RF
 EUT : WIDI
 Model : WD01
 Test mode : 5GWifi mode
 Power Rating : AC120V/60Hz
 Environment : Temp:25.5'C Humi:55%
 Test Engineer: MT
 REMARK :

	Freq	ReadAntenna	Cable Preamp		Limit	Over	
	Level Factor	Loss Factor	Level	Line	Limit	Remark	
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m
1	93.768	44.72	12.58	0.93	29.56	28.67	43.50
2	167.824	52.93	8.90	1.34	29.07	34.10	43.50
3	203.523	53.19	10.67	1.40	28.81	36.45	43.50
4	272.278	54.32	12.46	1.69	28.50	39.97	46.00
5	330.195	52.04	13.79	1.87	28.52	39.18	46.00
6	385.281	49.57	14.73	2.07	28.72	37.65	46.00

Above 1GHz:

802.11a mode Lowest channel (Peak Value)								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.00	45.62	39.23	13.84	41.34	57.35	68.20	-10.85	Vertical
10360.00	44.12	39.23	13.84	41.34	55.85	68.20	-12.35	Horizontal
802.11a mode Lowest channel (Average Value)								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.00	32.52	39.23	13.84	41.34	44.25	54.00	-9.75	Vertical
10360.00	33.69	39.23	13.84	41.34	45.42	54.00	-8.58	Horizontal

802.11a mode Middle channel (Peak Value)								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400.00	44.62	39.36	13.85	41.27	56.56	68.20	-11.64	Vertical
10400.00	44.95	39.36	13.85	41.27	56.89	68.20	-11.31	Horizontal
802.11a mode Middle channel (Average Value)								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400.00	34.52	39.36	13.85	41.27	46.46	54.00	-7.54	Vertical
10400.00	35.01	39.36	13.85	41.27	46.95	54.00	-7.05	Horizontal

802.11a mode Highest channel (Peak Value)								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480.00	43.62	39.56	13.90	41.06	56.02	68.20	-12.18	Vertical
10480.00	42.35	39.56	13.90	41.06	54.75	68.20	-13.45	Horizontal
802.11a mode Highest channel (Average Value)								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480.00	33.15	39.56	13.90	41.06	45.55	54.00	-8.45	Vertical
10480.00	32.54	39.56	13.90	41.06	44.94	54.00	-9.06	Horizontal

Remark:

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

802.11n20 mode Lowest channel (Peak Value)								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.00	45.32	39.23	13.84	41.34	57.05	68.20	-11.15	Vertical
10360.00	44.21	39.23	13.84	41.34	55.94	68.20	-12.26	Horizontal
802.11n20 mode Lowest channel (Average Value)								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.00	35.62	39.23	13.84	41.34	47.35	54.00	-6.65	Vertical
10360.00	34.85	39.23	13.84	41.34	46.58	54.00	-7.42	Horizontal

802.11n20 mode Middle channel (Peak Value)								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400.00	45.62	39.36	13.85	41.27	57.56	68.20	-10.64	Vertical
10400.00	44.23	39.36	13.85	41.27	56.17	68.20	-12.03	Horizontal
802.11n20 mode Middle channel (Average Value)								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400.00	35.62	39.36	13.85	41.27	47.56	54.00	-6.44	Vertical
10400.00	34.85	39.36	13.85	41.27	46.79	54.00	-7.21	Horizontal

802.11n20 mode Highest channel (Peak Value)								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480.00	43.35	39.56	13.90	41.06	55.75	68.20	-12.45	Vertical
10480.00	44.01	39.56	13.90	41.06	56.41	68.20	-11.79	Horizontal
802.11n20 mode Highest channel (Average Value)								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480.00	32.14	39.56	13.90	41.06	44.54	54.00	-9.46	Vertical
10480.00	31.11	39.56	13.90	41.06	43.51	54.00	-10.49	Horizontal

Remark:

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

802.11n40 mode Lowest channel (Peak Value)								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10380.00	43.25	39.29	13.84	41.31	55.07	68.20	-13.13	Vertical
10380.00	44.57	39.29	13.84	41.31	56.39	68.20	-11.81	Horizontal
802.11n40 mode Lowest channel (Average Value)								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10380.00	31.47	39.29	13.84	41.31	43.29	54.00	-10.71	Vertical
10380.00	32.20	39.29	13.84	41.31	44.02	54.00	-9.98	Horizontal

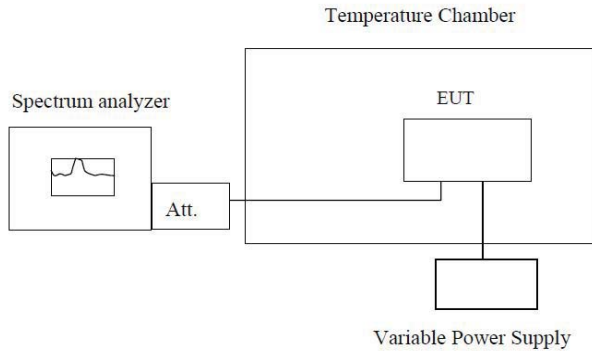
802.11n40 mode Highest channel (Peak Value)								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10460.00	43.25	39.54	13.88	41.17	55.50	68.20	-12.70	Vertical
10460.00	42.28	39.54	13.88	41.17	54.53	68.20	-13.67	Horizontal
802.11n40 mode Highest channel (Average Value)								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10460.00	33.25	39.54	13.88	41.17	45.50	54.00	-8.50	Vertical
10460.00	32.28	39.54	13.88	41.17	44.53	54.00	-9.47	Horizontal

802.11ac mode Lowest channel (Peak Value)								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10420.00	45.17	39.23	13.84	41.34	56.90	68.20	-11.30	Vertical
10420.00	45.32	39.23	13.84	41.34	57.05	68.20	-11.15	Horizontal
802.11ac mode Lowest channel (Average Value)								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10420.00	34.18	39.23	13.84	41.34	45.91	54.00	-8.09	Vertical
10420.00	33.47	39.23	13.84	41.34	45.20	54.00	-8.80	Horizontal

Remark:

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

6.8 Frequency stability

Test Requirement:	FCC Part15 E Section 15.407 (g)
Limit:	Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.
Test setup:	 Note : Measurement setup for testing on Antenna connector
Test procedure:	1. The EUT is installed in an environment test chamber with external power source. 2. Set the chamber to operate at 50 centigrade and external power source to output at nominal voltage of EUT. 3. A sufficient stabilization period at each temperature is used prior to each frequency measurement. 4. When temperature is stabled, measure the frequency stability. 5. The test shall be performed under -30 to 50 centigrade and 85 to 115 percent of the nominal voltage. Change setting of chamber and external power source to complete all conditions.
Test Instruments:	Refer to section 5.6 for details
Test mode:	Refer to section 5.3 for details, and all channels have been tested, only shows the worst channel data in this report.
Test results:	Passed

Measurement Data (the worst channel):

Voltage vs. Frequency Stability (Lowest channel=5180MHz)

Test conditions		Frequency(MHz)	Max. Deviation (ppm)
Temp(°C)	Voltage(DC)		
20	5.2	5179.983638	3.16
	5.0	5179.986754	2.56
	4.8	5179.986285	2.65

Temperature vs. Frequency Stability (Lowest channel=5180MHz)

Test conditions		Frequency(MHz)	Max. Deviation (ppm)
Voltage(DC)	Temp(°C)		
5vdc	-20	5179.986470	2.61
	-10	5179.988638	2.19
	0	5179.988952	2.13
	10	5179.986547	2.60
	20	5179.985025	2.89
	30	5179.984899	2.92
	40	5179.983452	3.19
	50	5179.984852	2.92