FCC REPORT

(WIFI)

Applicant:	Antel Communications LLC
Address of Applicant:	21 Bennetts Road, Suite 201 Setauket, NY 11733, USA
Equipment Under Test (EUT)	
Product Name:	Rugged Mobile Phone
Model No.:	TLR500
Trade mark:	OLE
FCC ID:	2AE62-TLR500
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.247
Date of sample receipt:	17 Nov., 2015
Date of Test:	17 Nov., to 01 Dec., 2015
Date of report issued:	01 Dec., 2015
Test Result:	PASS*

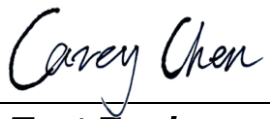
* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

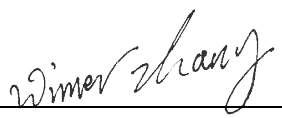
Bruce Zhang
Laboratory Manager

2 Version

Version No.	Date	Description
00	*01 Dec., 2015*	*Original*

Tested by:  ***Date:*** *01 Dec., 2015*

Test Engineer

Reviewed by:  ***Date:*** *01 Dec., 2015*

Project Engineer

3 Contents

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:	Antel Communications LLC
Address of Applicant:	21 Bennetts Road, Suite 201 Setauket, NY 11733, USA
Manufacturer/ Factory:	SHENZHEN TIANLONG CENTURY DEVELOPMENT CO LTD.
Address of Manufacturer/ Factory:	4/F, BCI BLDG, BEIHUAN AVENUE, NANSHAN DIST., SHENZHEN, CHINA

5.2 General Description of E.U.T.

Product Name:	Rugged Mobile Phone
Model No.:	TLR500
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:	Internal Antenna
Antenna gain:	0dBi
AC adapter:	Model: CR-UP01 Input:100-240V AC, 50/60Hz 500mA Output:5V DC MAX 1A
Power supply:	Rechargeable Li-ion Battery DC3.8V/3400mAh

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
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.	

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 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 Test Instruments list

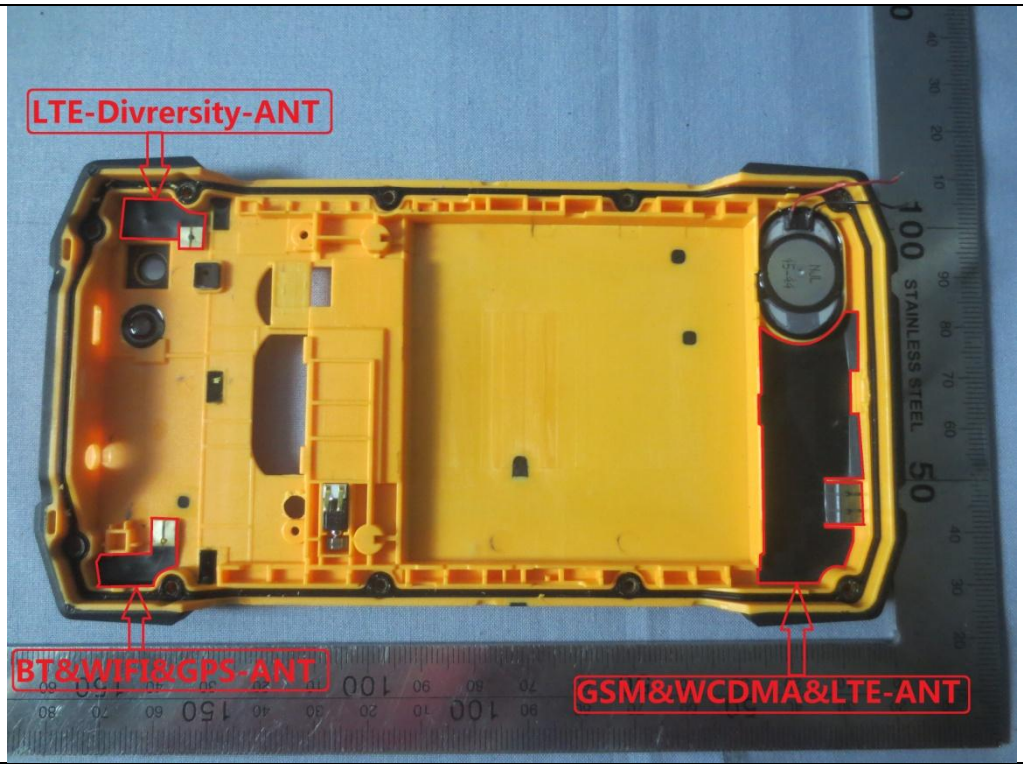
Radiated Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal. Date (mm-dd-yy)**	**Cal. Due date (mm-dd-yy)**
1	3m SAC	SAEMC	9(L)*6(W)* 6(H)	CCIS0001	08-23-2014	08-22-2017
2	BiConiLog Antenna	SCHWARZBECK	VULB9163	CCIS0005	03-28-2015	03-28-2016
3	Horn Antenna	SCHWARZBECK	BBHA9120D	CCIS0006	03-28-2015	03-28-2016
4	Pre-amplifier (10kHz-1.3GHz)	HP	8447D	CCIS0003	04-01-2015	03-31-2016
5	Pre-amplifier (1GHz-18GHz)	Compliance Direction Systems Inc.	PAP-1G18	CCIS0011	04-01-2015	03-31-2016
6	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	04-01-2015	03-31-2016
7	Horn Antenna	ETS-LINDGREN	3160	GTS217	04-01-2015	03-31-2016
8	Spectrum analyzer 9k-30GHz	Rohde & Schwarz	FSP30	CCIS0023	03-28-2015	03-28-2016
9	EMI Test Receiver	Rohde & Schwarz	ESRP7	CCIS0167	03-28-2015	03-28-2016
10	Loop antenna	Laplace instrument	RF300	EMC0701	04-01-2015	03-31-2016

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

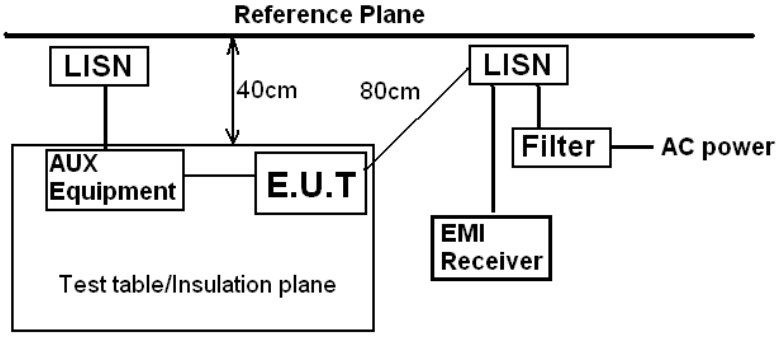
6 Test results and Measurement Data

6.1 Antenna requirement:

Standard requirement:	FCC Part 15 C Section 15.203 /247(c)
15.203 requirement: *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.* *15.247(c) (1)(i) requirement:* *(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.*	
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 0 dBi.	

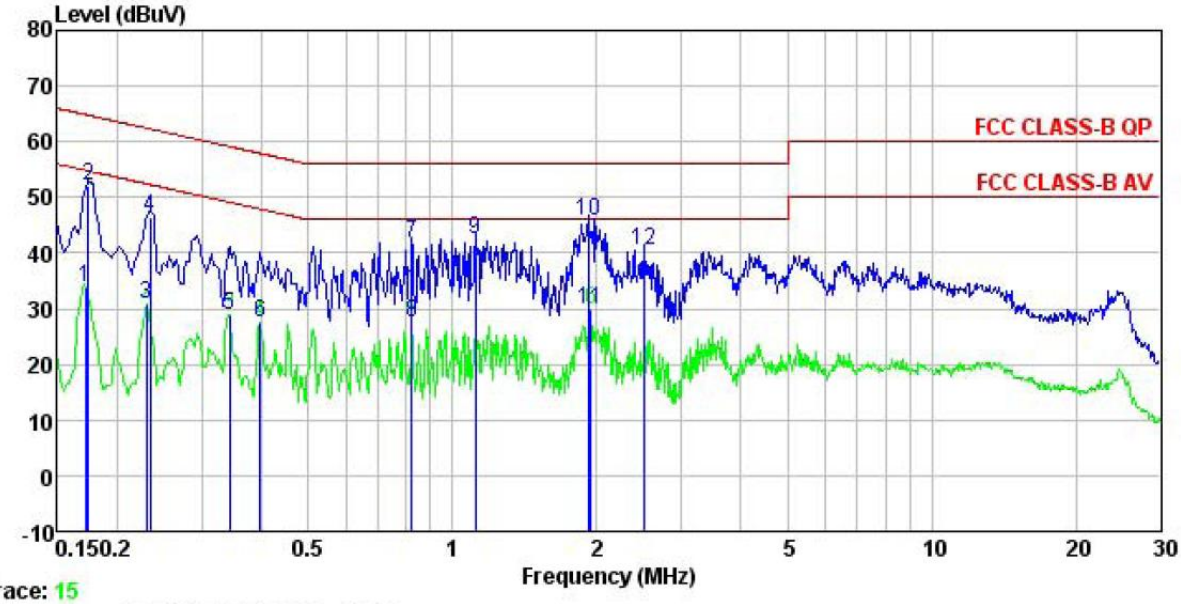


6.2 Conducted Emission

Test Requirement:	FCC Part 15 C Section 15.207
Test Method:	ANSI C63.4: 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.), which provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2009 on conducted measurement.
Test setup:	 *Remark:* *E.U.T: Equipment Under Test* *LISN: Line Impedence Stabilization Network* *Test table height=0.8m*
Test Uncertainty:	±3.28 dB
Test Instruments:	Refer to section 5.6 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data

Neutral:

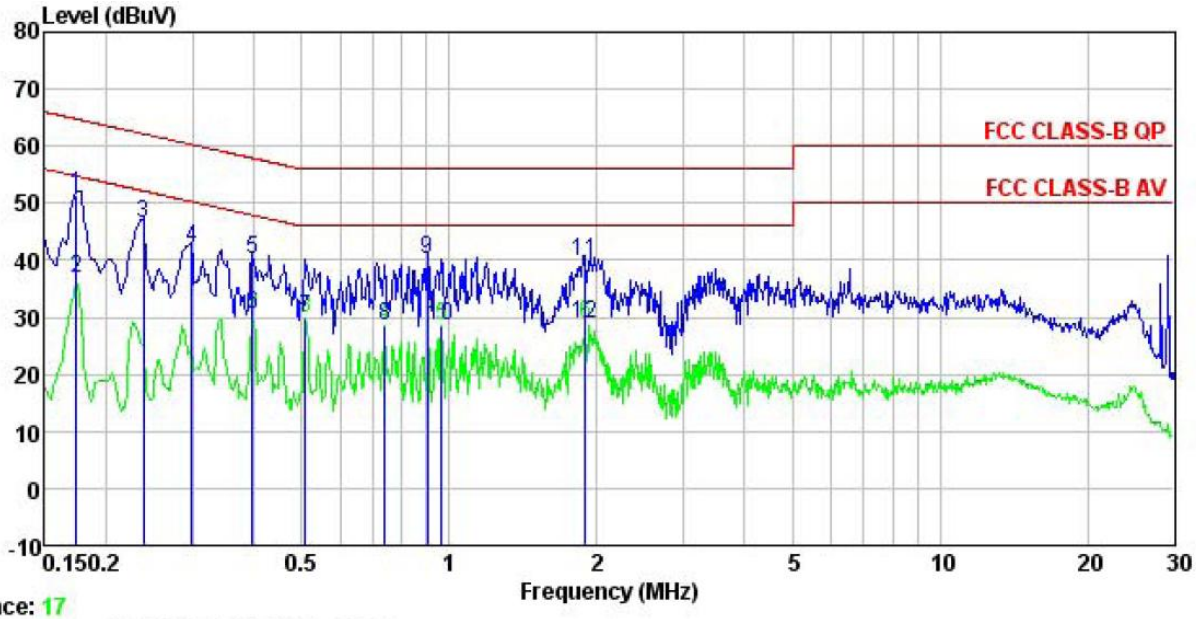


Trace: 15

Site : CCIS Shielding Room
Condition : FCC CLASS-B QP LISN NEUTRAL
: 890RF
EUT : Rugged Mobile Phone
Model : V4
Test Mode : WIFI mode
Power Rating : AC 120V/ 60 Hz
Environment : Temp: 23 'C Huni:56% Atmos:101KPa
Test Engineer: Carey
Remark :

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.171	22.98	0.25	10.77	34.00	54.90	-20.90	Average
2	0.174	41.02	0.25	10.77	52.04	64.77	-12.73	QP
3	0.230	19.84	0.25	10.75	30.84	52.44	-21.60	Average
4	0.234	35.57	0.25	10.75	46.57	62.30	-15.73	QP
5	0.343	18.02	0.26	10.73	29.01	49.13	-20.12	Average
6	0.398	16.69	0.25	10.72	27.66	47.90	-20.24	Average
7	0.822	30.62	0.20	10.82	41.64	56.00	-14.36	QP
8	0.822	16.55	0.20	10.82	27.57	46.00	-18.43	Average
9	1.117	31.25	0.23	10.88	42.36	56.00	-13.64	QP
10	1.918	34.69	0.29	10.95	45.93	56.00	-10.07	QP
11	1.949	18.75	0.29	10.96	30.00	46.00	-16.00	Average
12	2.500	29.19	0.29	10.94	40.42	56.00	-15.58	QP

Line:



Trace: 17

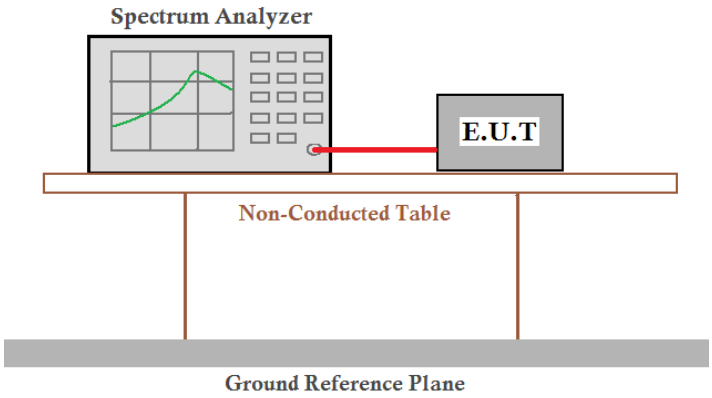
```
Site          : CCIS Shielding Room
Condition     : FCC CLASS-B QP LISN LINE
              : 890RF
EUT           : Rugged Mobile Phone
Model         : V4
Test Mode     : WIFI mode
Power Rating  : AC 120V/ 60 Hz
Environment   : Temp: 23 'C Huni:56%  Atmos:101KPa
Test Engineer: Carey
Remark        :
```

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.174	40.31	0.27	10.77	51.35	64.77	-13.42	QP
2	0.174	25.91	0.27	10.77	36.95	54.77	-17.82	Average
3	0.238	35.32	0.27	10.75	46.34	62.17	-15.83	QP
4	0.299	31.22	0.26	10.74	42.22	60.28	-18.06	QP
5	0.398	29.25	0.28	10.72	40.25	57.90	-17.65	QP
6	0.398	19.45	0.28	10.72	30.45	47.90	-17.45	Average
7	0.510	18.81	0.28	10.76	29.85	46.00	-16.15	Average
8	0.739	17.68	0.22	10.79	28.69	46.00	-17.31	Average
9	0.904	29.06	0.24	10.84	40.14	56.00	-15.86	QP
10	0.963	17.43	0.25	10.86	28.54	46.00	-17.46	Average
11	1.898	28.52	0.26	10.95	39.73	56.00	-16.27	QP
12	1.898	17.80	0.26	10.95	29.01	46.00	-16.99	Average

Notes:

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

6.3 Conducted Output Power

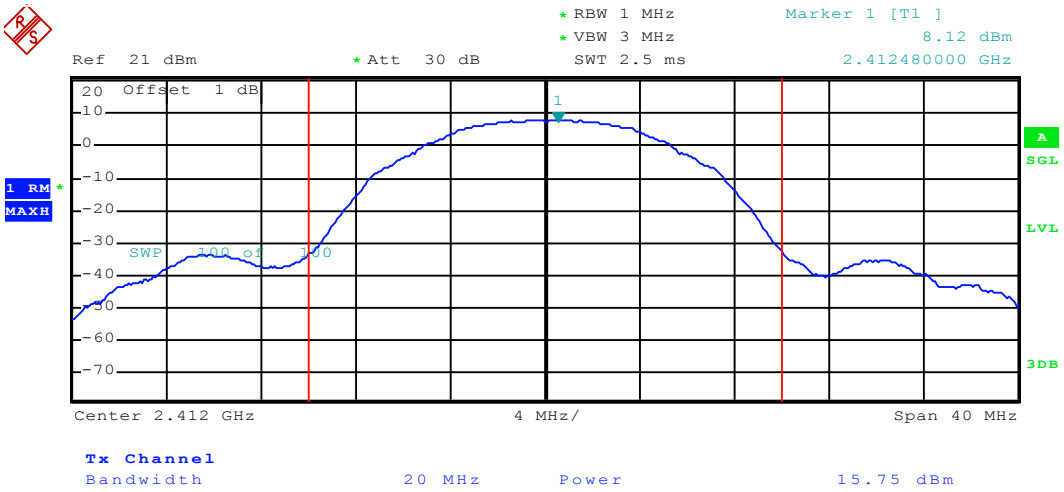
Test Requirement:	FCC Part 15 C Section 15.247 (b)(3)
Test Method:	ANSI C63.10:2009 and KDB558074v03r03 section 9.2.2
Limit:	30dBm
Test setup:	
Test Instruments:	Refer to section 5.6 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data

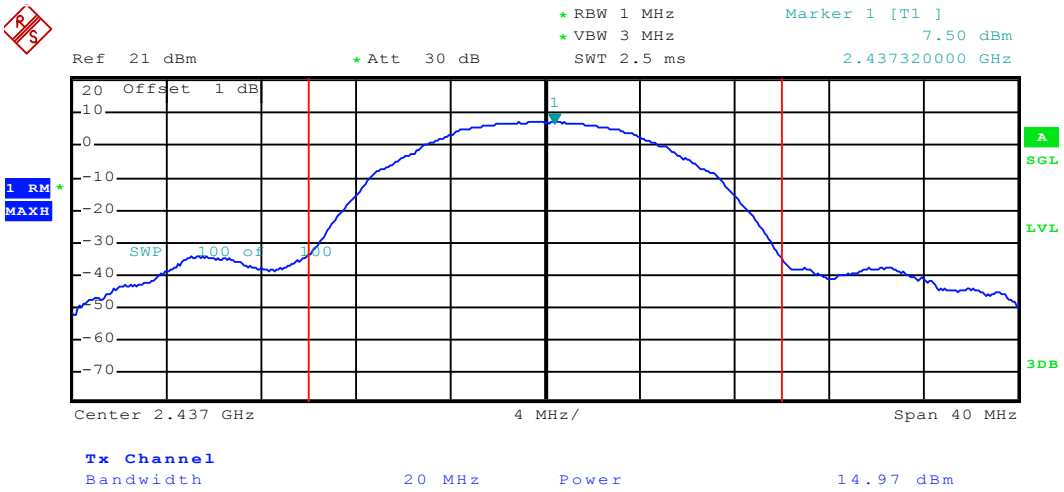
Test CH	Maximum Conducted Output Power (dBm)				Limit(dBm)	Result
	802.11b	802.11g	802.11n(H20)	802.11n(H40)		
Lowest	15.75	13.10	13.17	11.15	30.00	Pass
Middle	14.97	12.32	12.32	10.86		
Highest	15.18	12.60	12.62	10.57		

Test plot as follows:

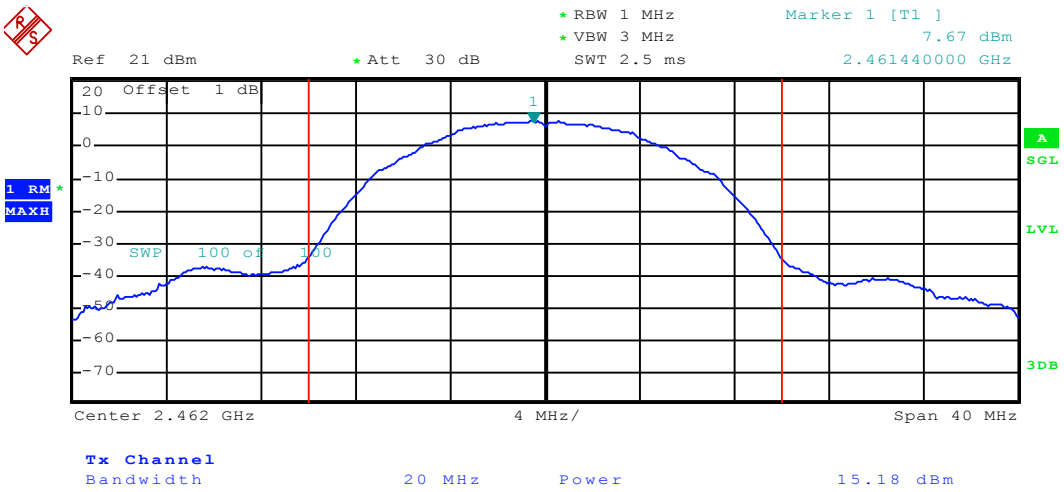
Test mode: 802.11b



Lowest channel

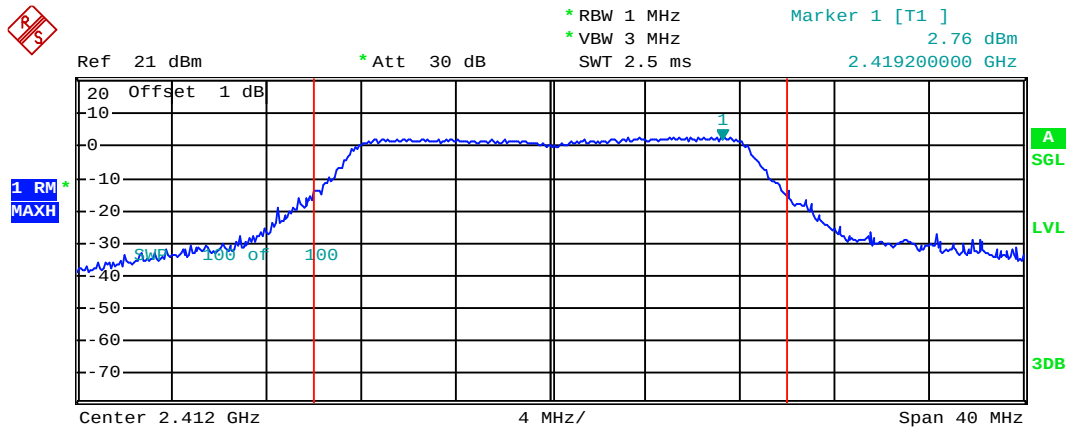


Middle channel



Highest channel

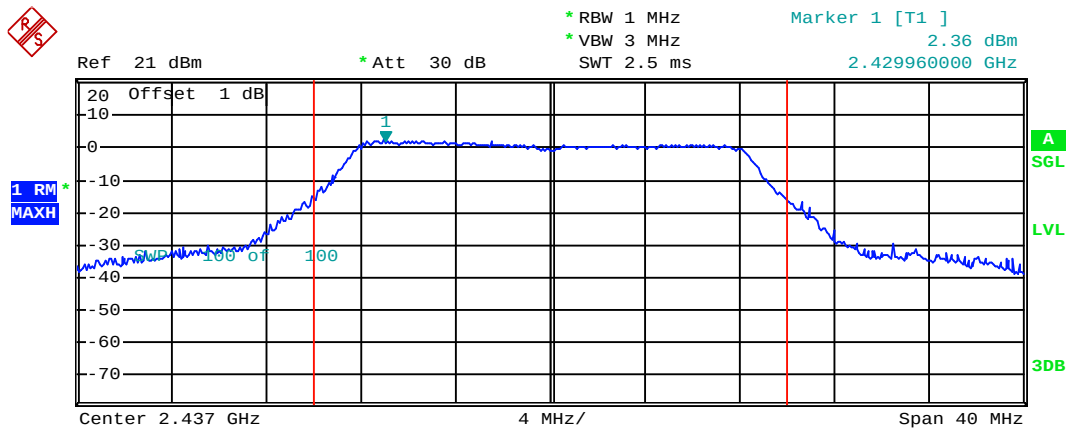
Test mode: 802.11g



Tx Channel

Bandwidth	20 MHz	Power	13.10 dBm

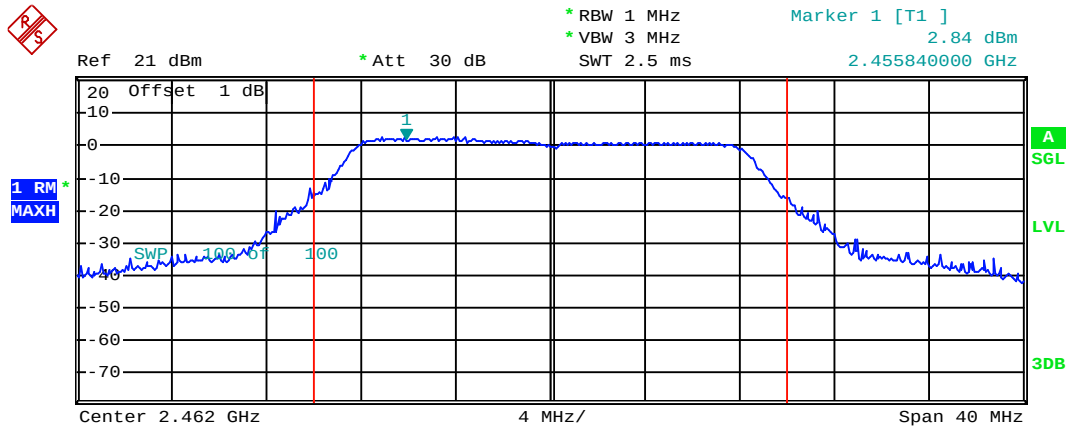
Lowest channel



Tx Channel

Bandwidth	20 MHz	Power	12.32 dBm

Middle channel

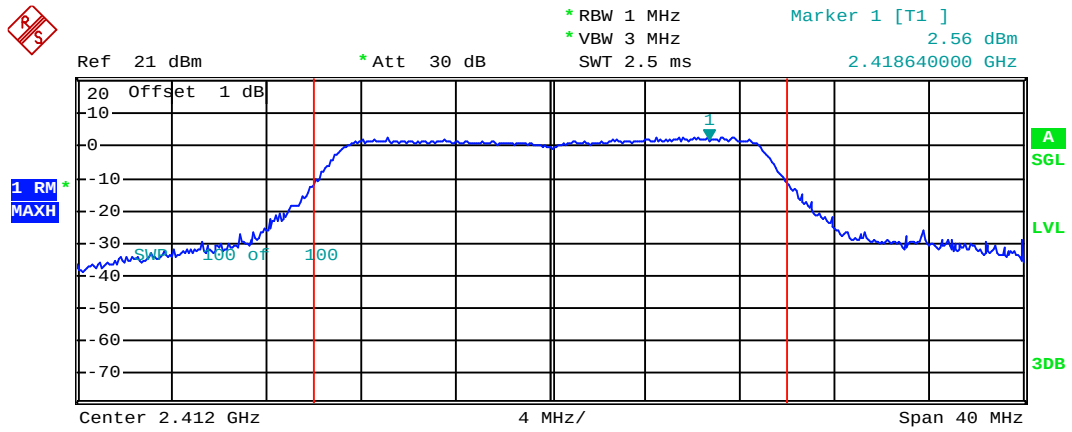


Tx Channel

Bandwidth	20 MHz	Power	12.60 dBm

Highest channel

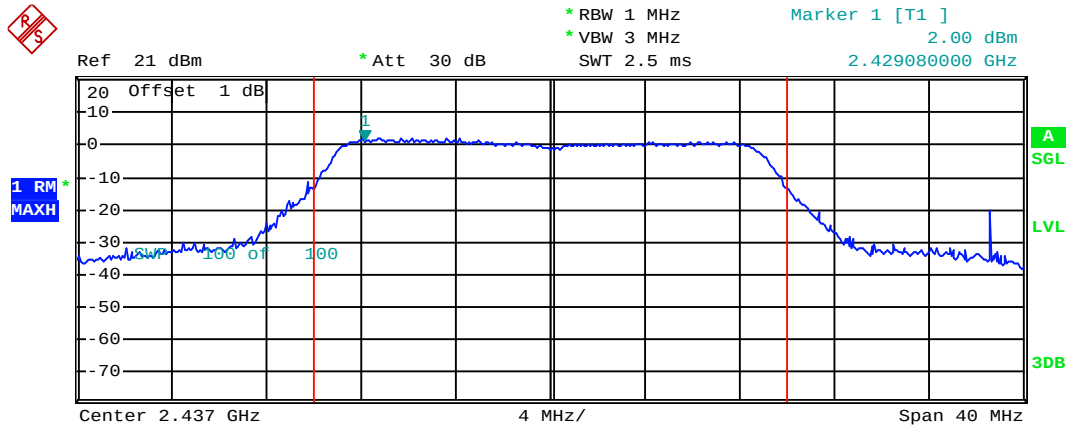
Test mode: 802.11n(H20)



Tx Channel

Bandwidth	20 MHz	Power	13.17 dBm

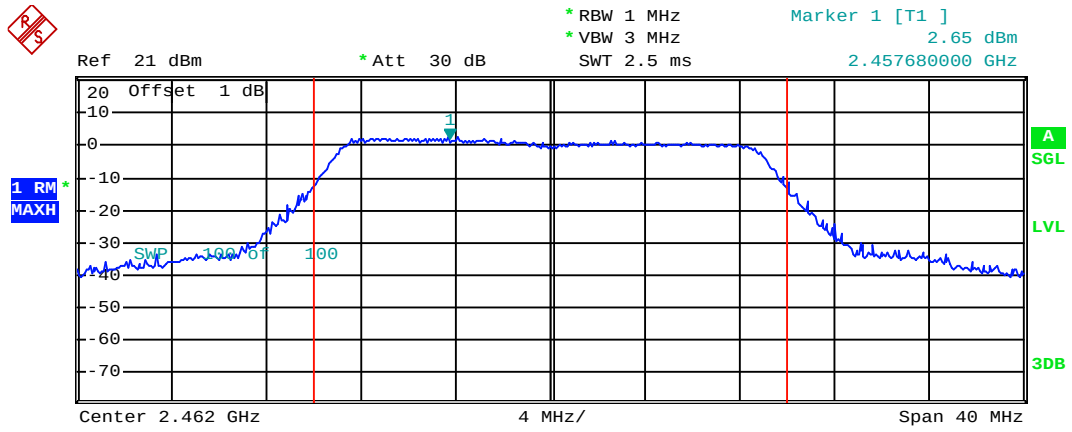
Lowest channel



Tx Channel

Bandwidth	20 MHz	Power	12.32 dBm

Middle channel

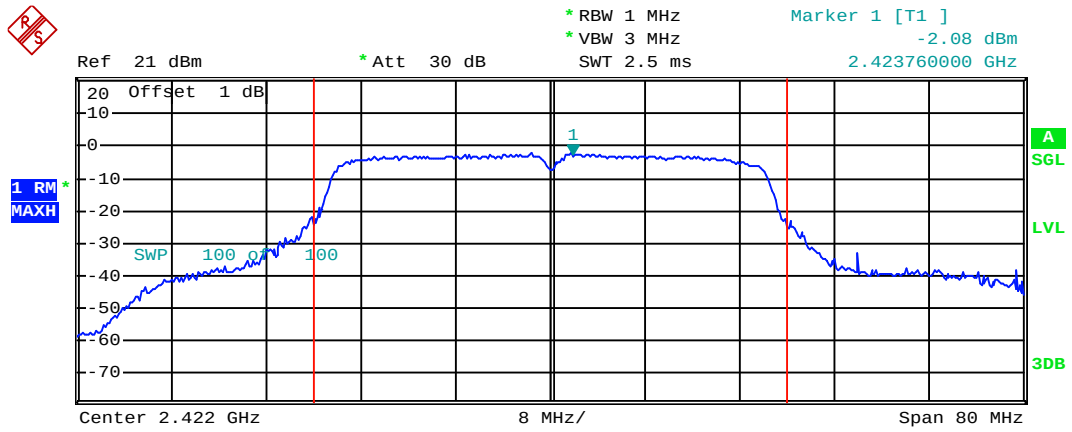


Tx Channel

Bandwidth	20 MHz	Power	12.62 dBm

Highest channel

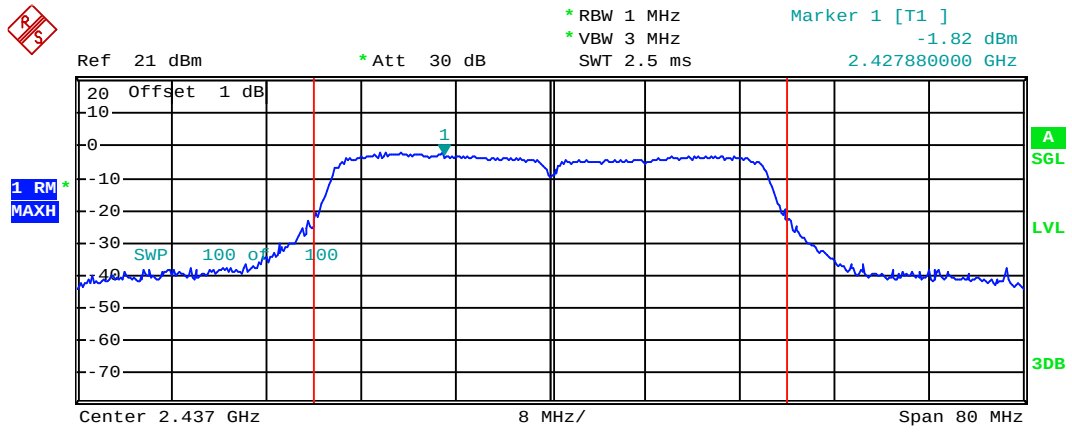
Test mode: 802.11n(H40)



Tx Channel

Bandwidth	40 MHz	Power	11.15 dBm

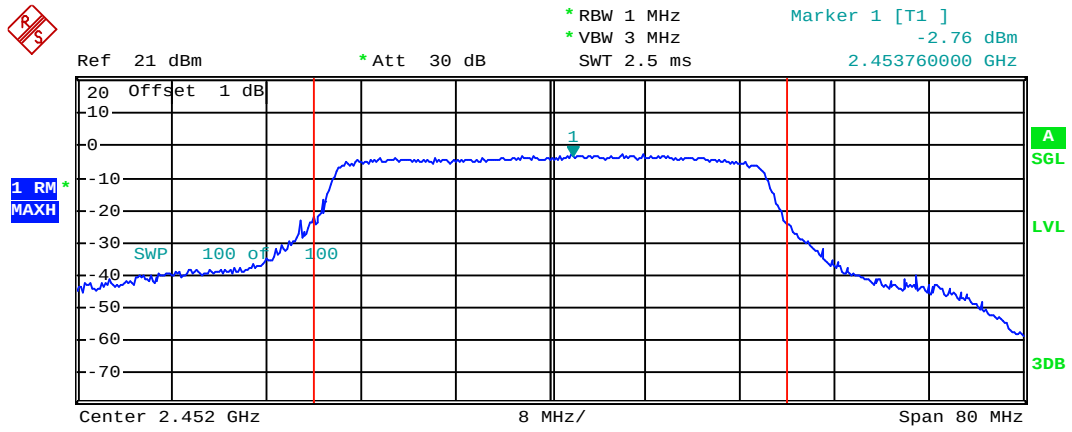
Lowest channel



Tx Channel

Bandwidth	40 MHz	Power	10.86 dBm

Middle channel

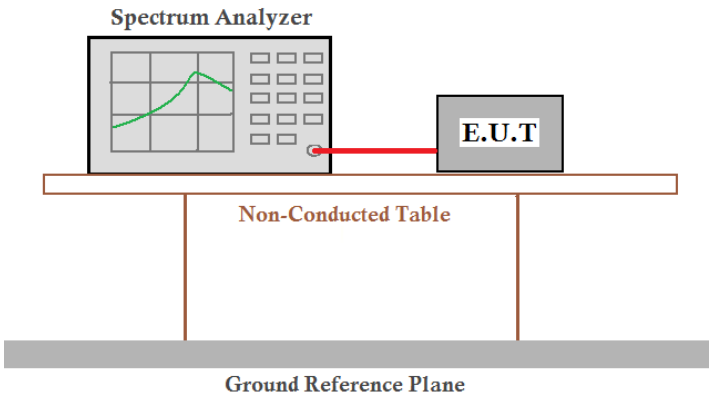


Tx Channel

Bandwidth	40 MHz	Power	10.57 dBm

Highest channel

6.4 Occupy Bandwidth

Test Requirement:	FCC Part 15 C Section 15.247 (a)(2)
Test Method:	ANSI C63.10:2009 and KDB558074v03r03 section 8.1
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

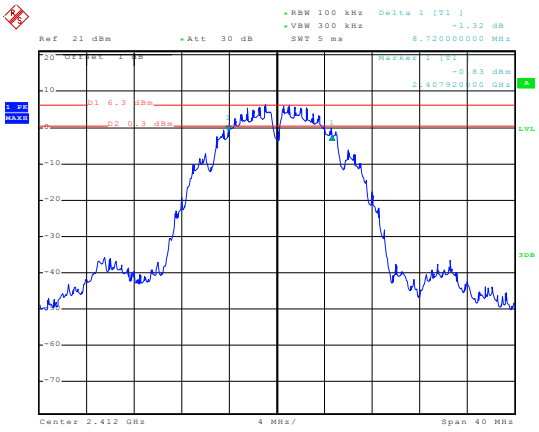
Test CH	6dB Emission Bandwidth (MHz)				Limit(kHz)	Result
	802.11b	802.11g	802.11n(H20)	802.11n(H40)		
Lowest	8.72	16.56	17.76	35.52	>500	Pass
Middle	8.24	16.48	17.76	36.20		
Highest	8.64	16.56	17.72	35.44		

Test CH	99% Occupy Bandwidth (MHz)				Limit(kHz)	Result
	802.11b	802.11g	802.11n(H20)	802.11n(H40)		
Lowest	12.96	16.64	17.84	36.00	N/A	N/A
Middle	12.96	16.72	17.76	36.16		
Highest	12.80	16.64	17.76	35.84		

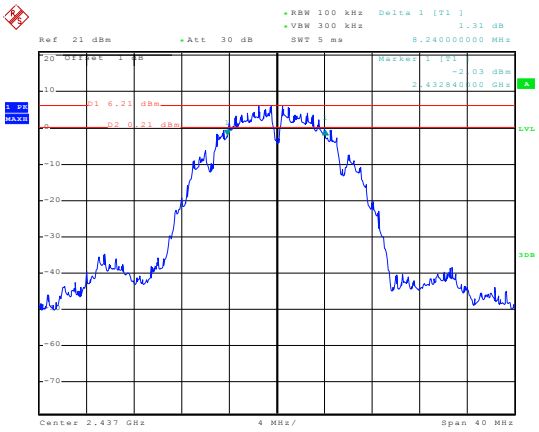
Test plot as follows:

6dB EBW

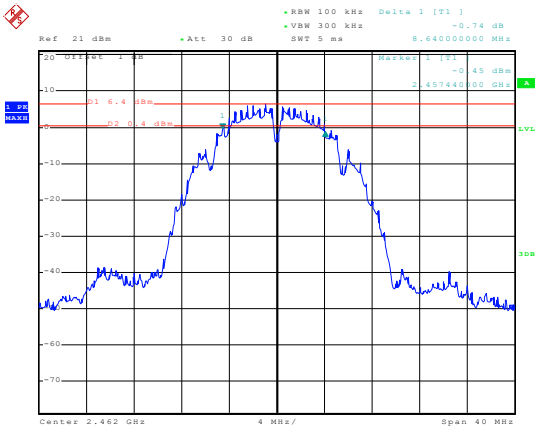
Test mode: 802.11b



Lowest channel

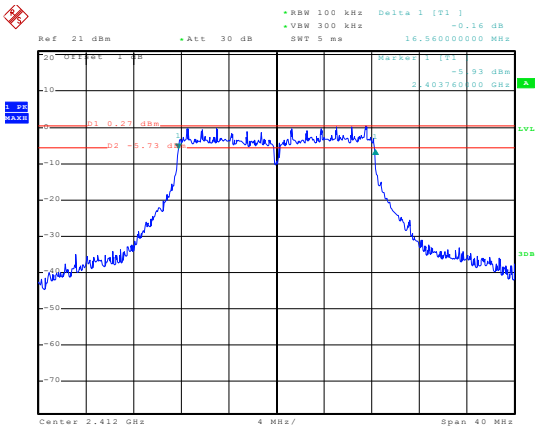


Middle channel



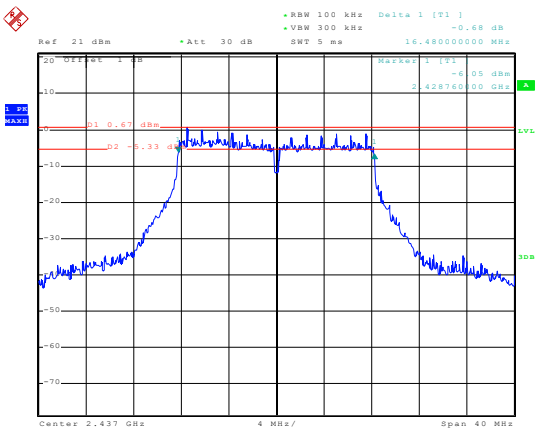
Highest channel

Test mode: 802.11g



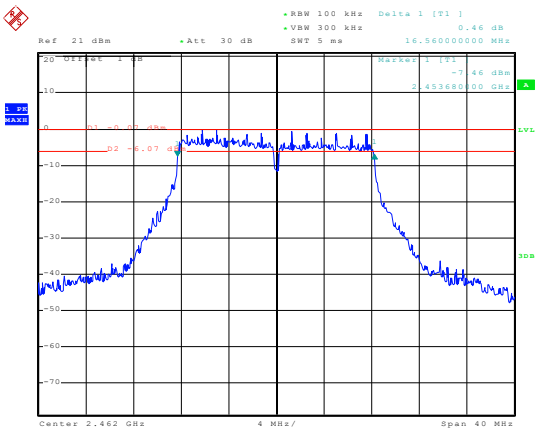
Date: 15.NOV.2015 21:29:16

Lowest channel



Date: 15.NOV.2015 21:28:29

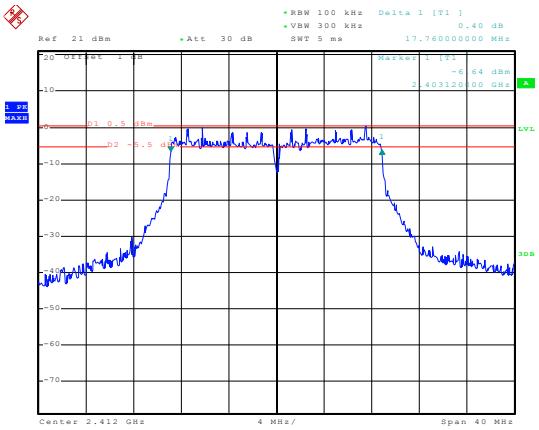
Middle channel



Date: 15.NOV.2015 21:27:51

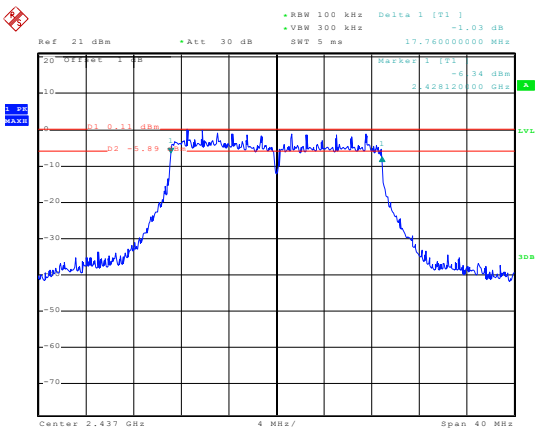
Highest channel

Test mode: 802.11n(H20)



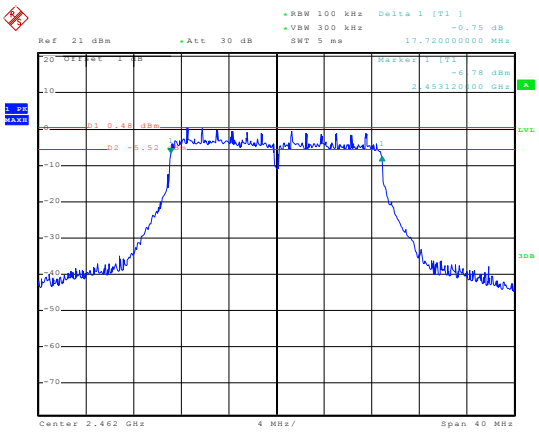
Date: 15.NOV.2015 21:32:28

Lowest channel



Date: 15.NOV.2015 21:33:04

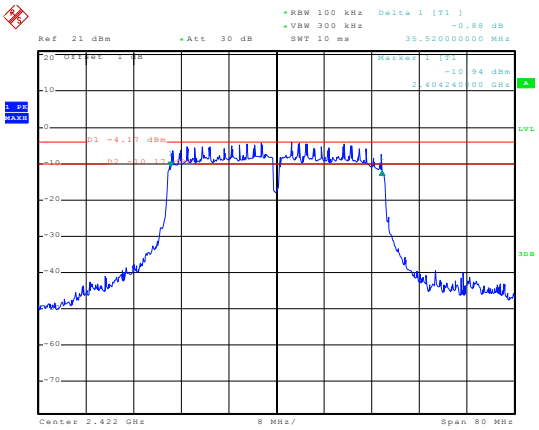
Middle channel



Date: 15.NOV.2015 21:33:36

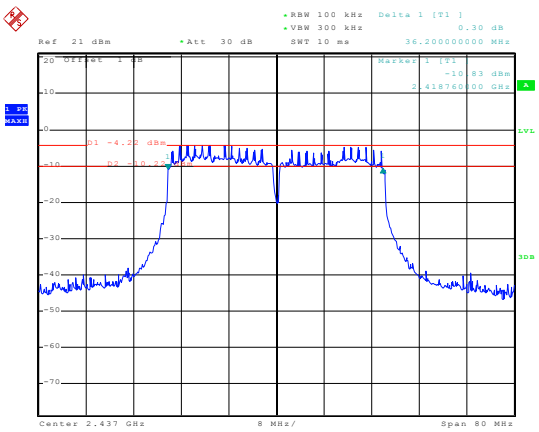
Highest channel

Test mode: 802.11n(H40)



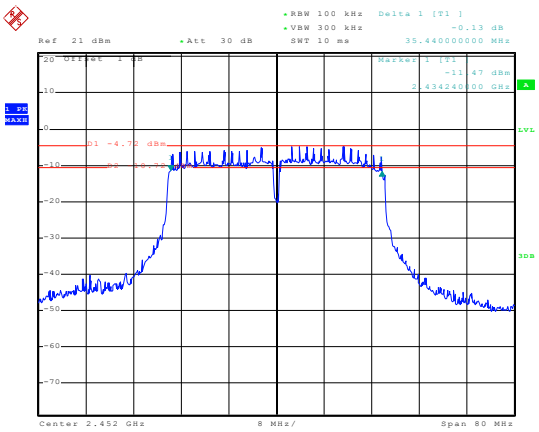
Date: 15.NOV.2015 21:34:38

Lowest channel



Date: 15.NOV.2015 21:35:09

Middle channel

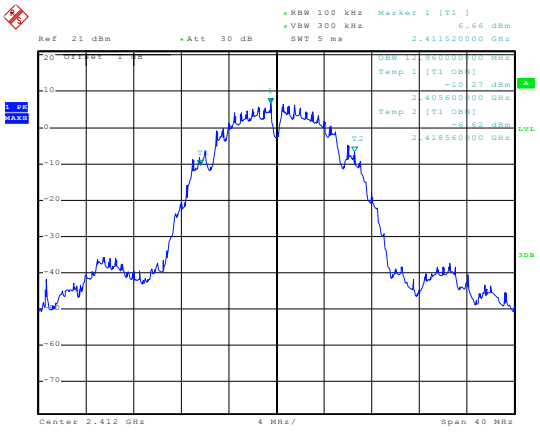


Date: 15.NOV.2015 21:35:47

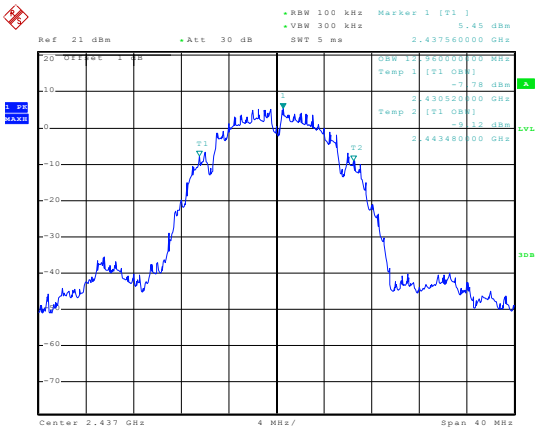
Highest channel

99% OBW

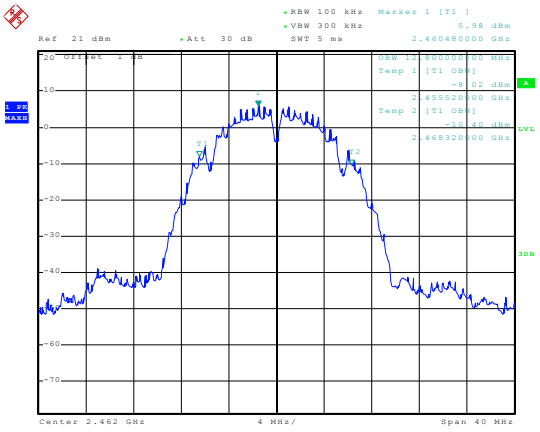
Test mode: 802.11b



Lowest channel

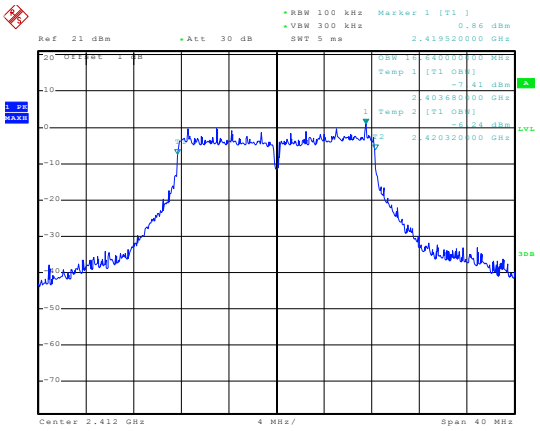


Middle channel

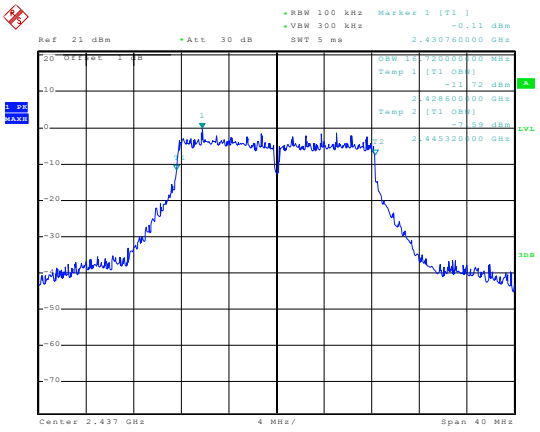


Highest channel

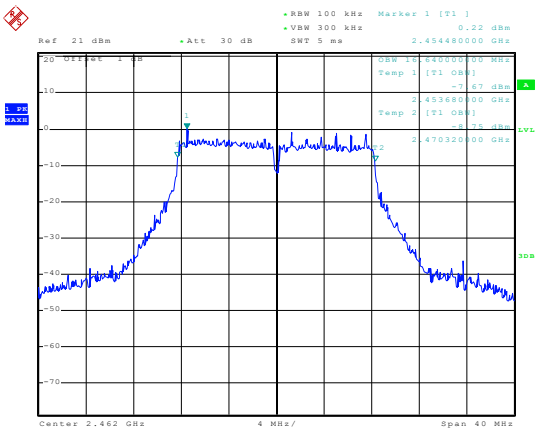
Test mode: 802.11g



Lowest channel

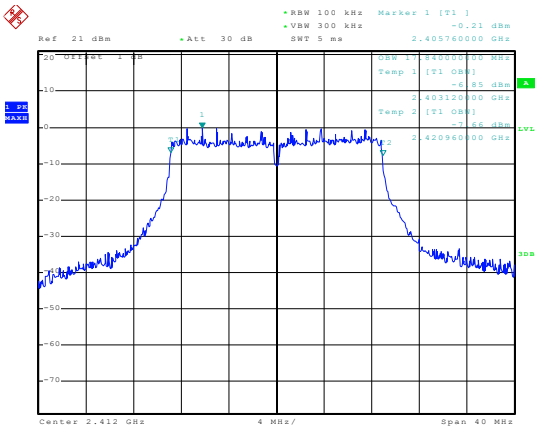


Middle channel



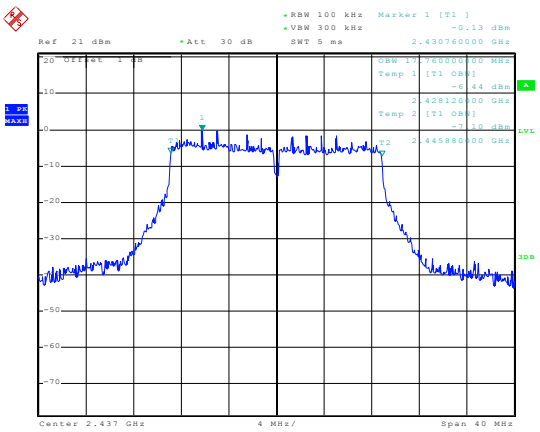
Highest channel

Test mode: 802.11n(H20)



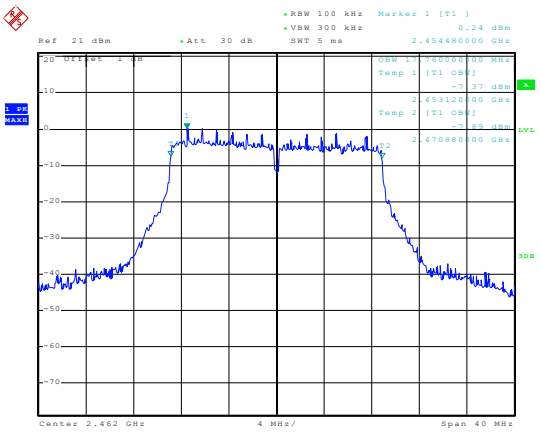
Date: 15.NOV.2015 21:31:53

Lowest channel



Date: 15.NOV.2015 21:31:15

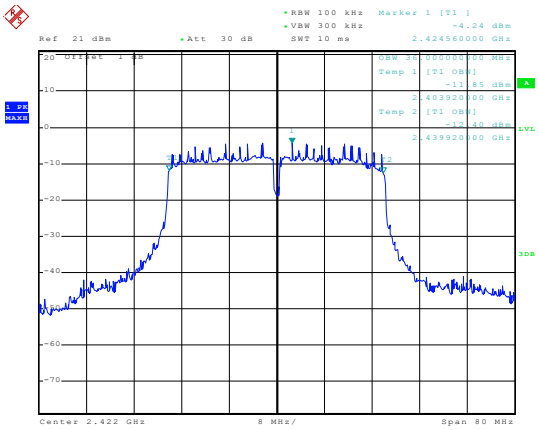
Middle channel



Date: 15.NOV.2015 21:31:03

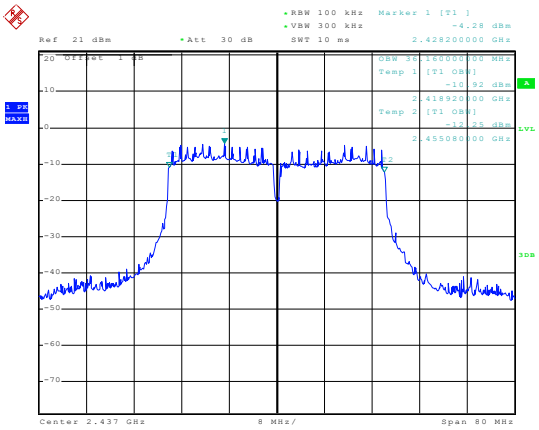
Highest channel

Test mode: 802.11n(H40)



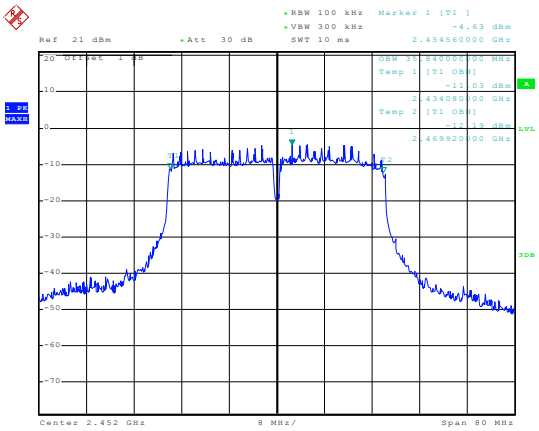
Date: 15.NOV.2015 21:37:02

Lowest channel



Date: 15.NOV.2015 21:36:48

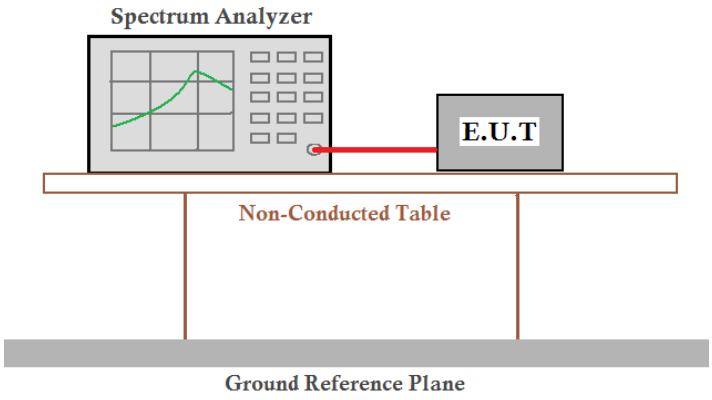
Middle channel



Date: 15.NOV.2015 21:36:09

Highest channel

6.5 Power Spectral Density

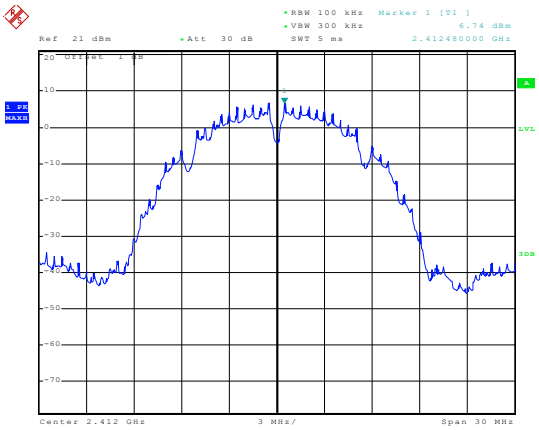
Test Requirement:	FCC Part 15 C Section 15.247 (e)
Test Method:	ANSI C63.10:2009 and KDB558074v03r03 section 10.2
Limit:	8dBm
Test setup:	
Test Instruments:	Refer to section 5.6 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data

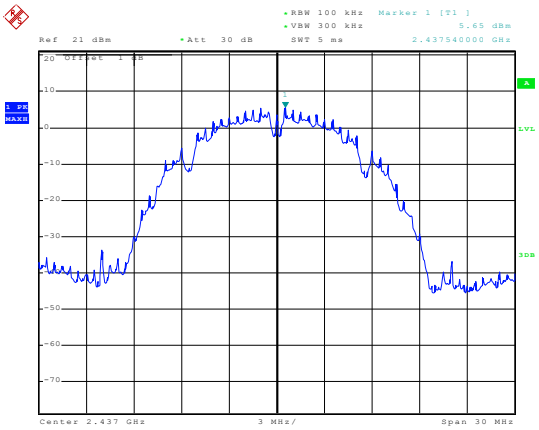
Test CH	Power Spectral Density (dBm)				Limit(dBm)	Result
	802.11b	802.11g	802.11n(H20)	802.11n(H40)		
Lowest	6.74	0.18	-0.03	-4.27	8.00	Pass
Middle	5.65	-0.01	0.05	-4.27		
Highest	6.27	0.14	0.11	-4.68		

Test plot as follows:

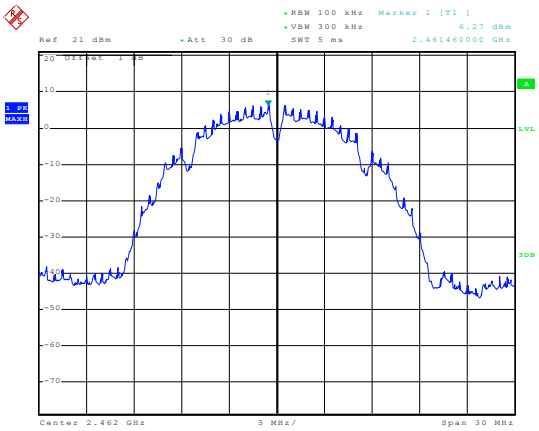
Test mode: 802.11b



Lowest channel

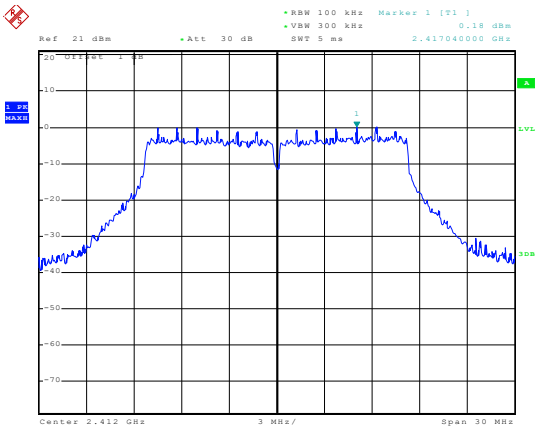


Middle channel



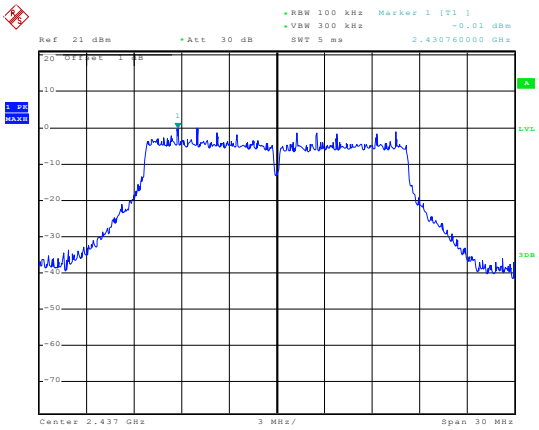
Highest channel

Test mode: 802.11g



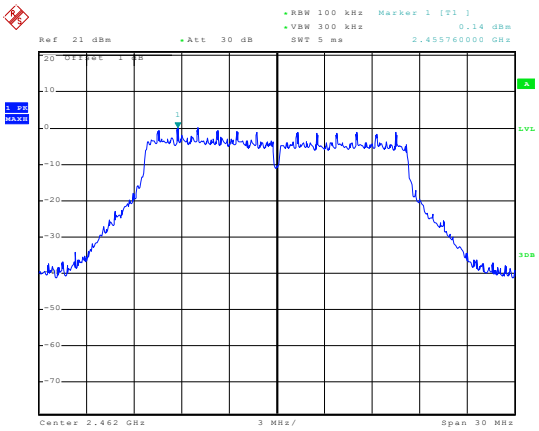
Date: 15.NOV.2015 21:29:49

Lowest channel



Date: 15.NOV.2015 21:30:04

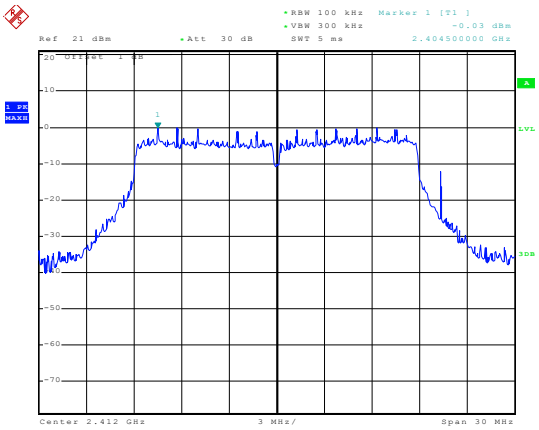
Middle channel



Date: 15.NOV.2015 21:30:40

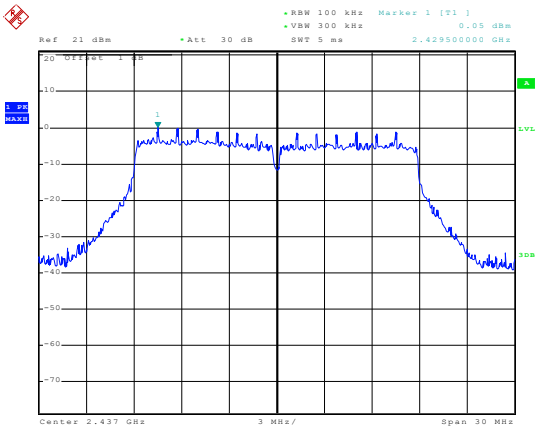
Highest channel

Test mode: 802.11n(H20)



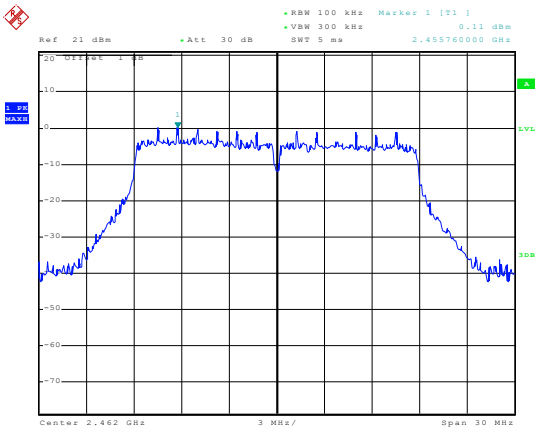
Date: 15.NOV.2015 21:31:43

Lowest channel



Date: 15.NOV.2015 21:31:31

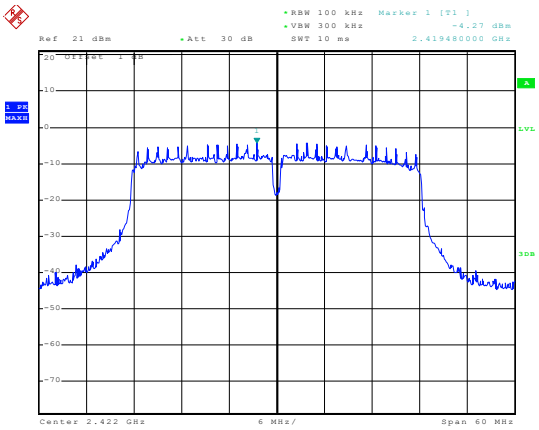
Middle channel



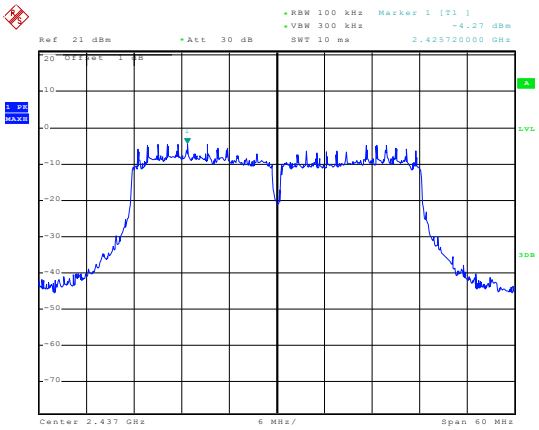
Date: 15.NOV.2015 21:30:54

Highest channel

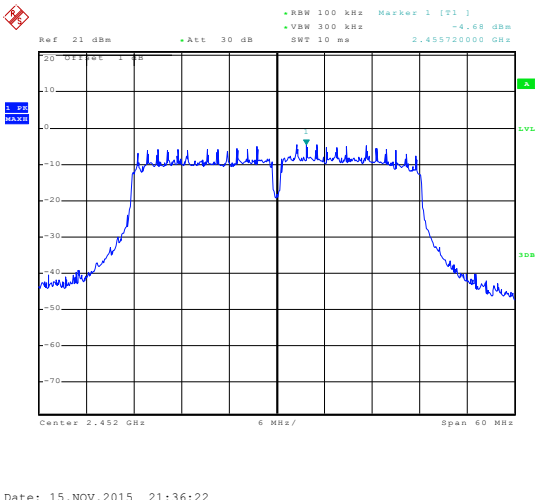
Test mode: 802.11n(H40)



Lowest channel



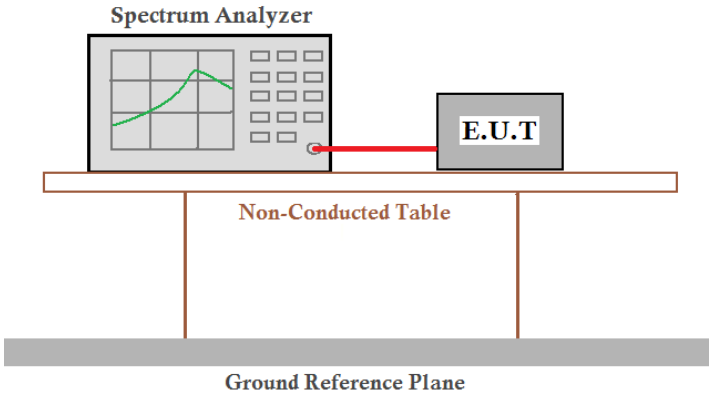
Middle channel



Highest channel

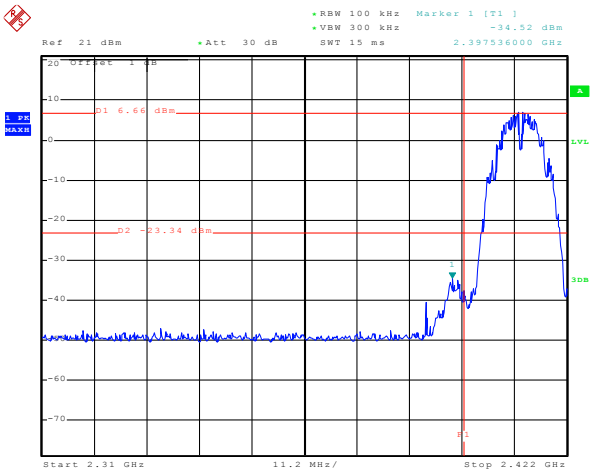
6.6 Band Edge

6.6.1 Conducted Emission Method

Test Requirement:	FCC Part 15 C Section 15.247 (d)
Test Method:	ANSI C63.10:2009 and KDB558074v03r03 section 13
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:	
Test Instruments:	Refer to section 5.6 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

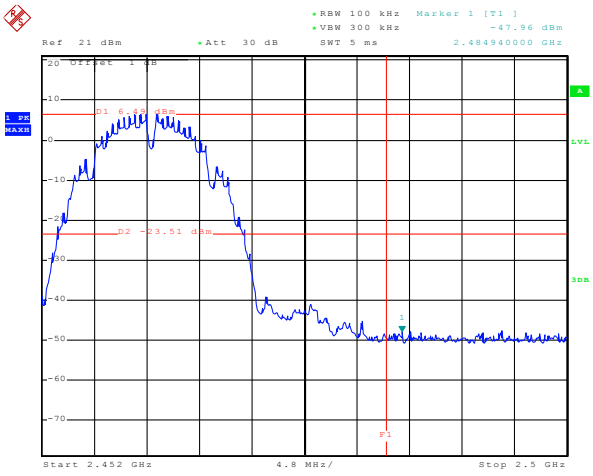
Test plot as follows:

802.11b



Date: 15.NOV.2015 21:22:29

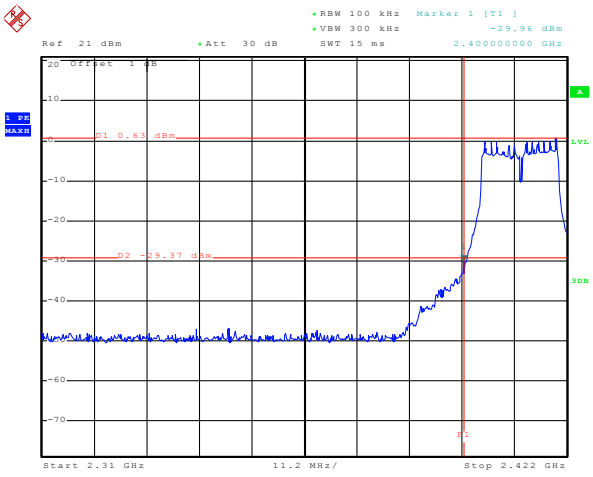
Lowest channel



Date: 15.NOV.2015 21:17:57

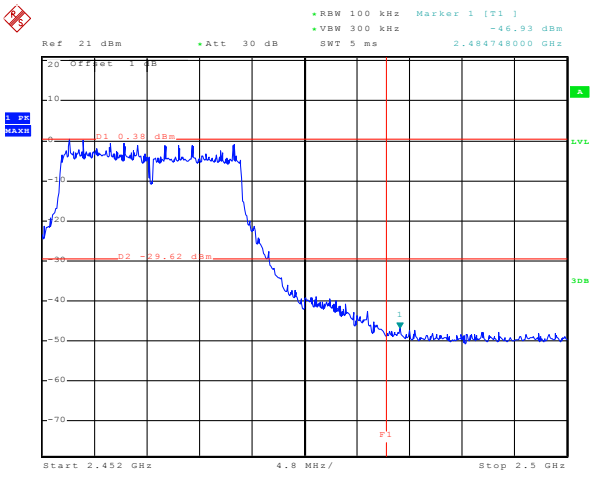
Highest channel

802.11g



Date: 15.NOV.2015 21:21:56

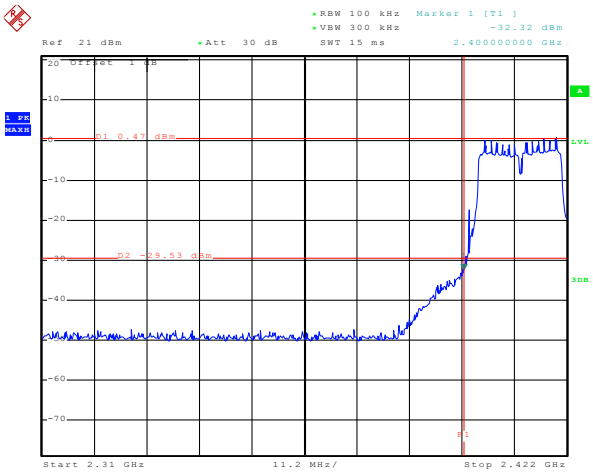
Lowest channel



Date: 15.NOV.2015 21:17:24

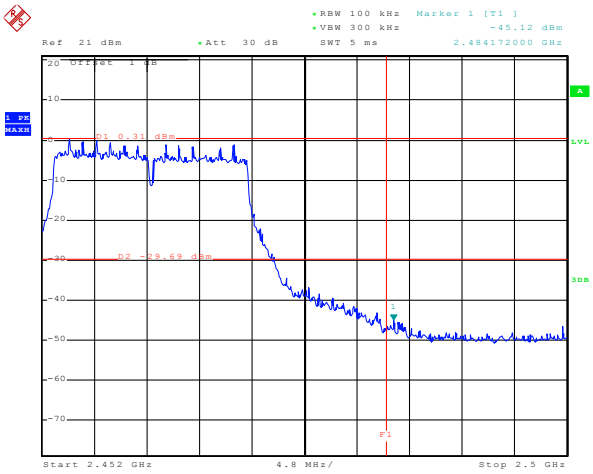
Highest channel

802.11n(H20)



Date: 15.NOV.2015 21:21:25

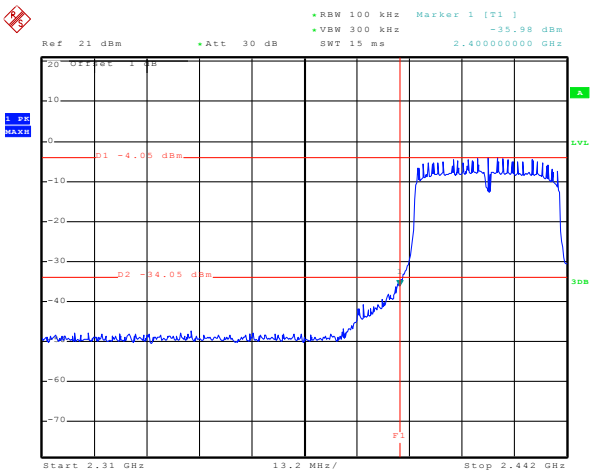
Lowest channel



Date: 15.NOV.2015 21:18:34

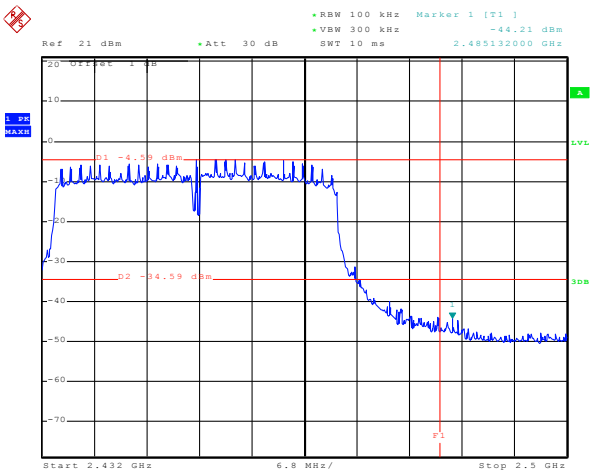
Highest channel

802.11n(H40)



Date: 15.NOV.2015 21:20:07

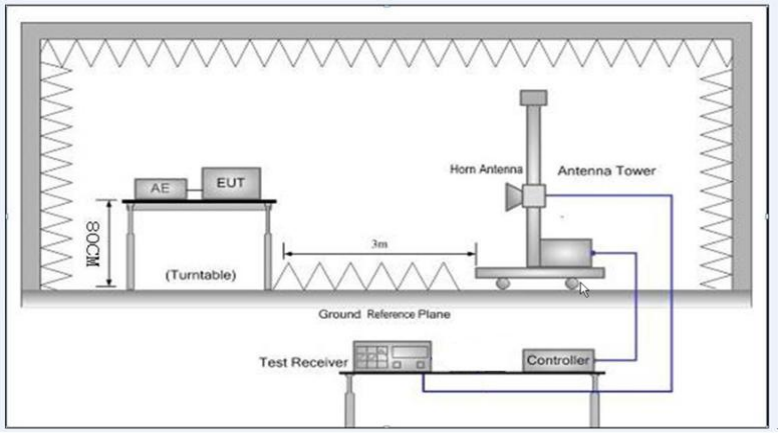
Lowest channel



Date: 15.NOV.2015 21:19:14

Highest channel

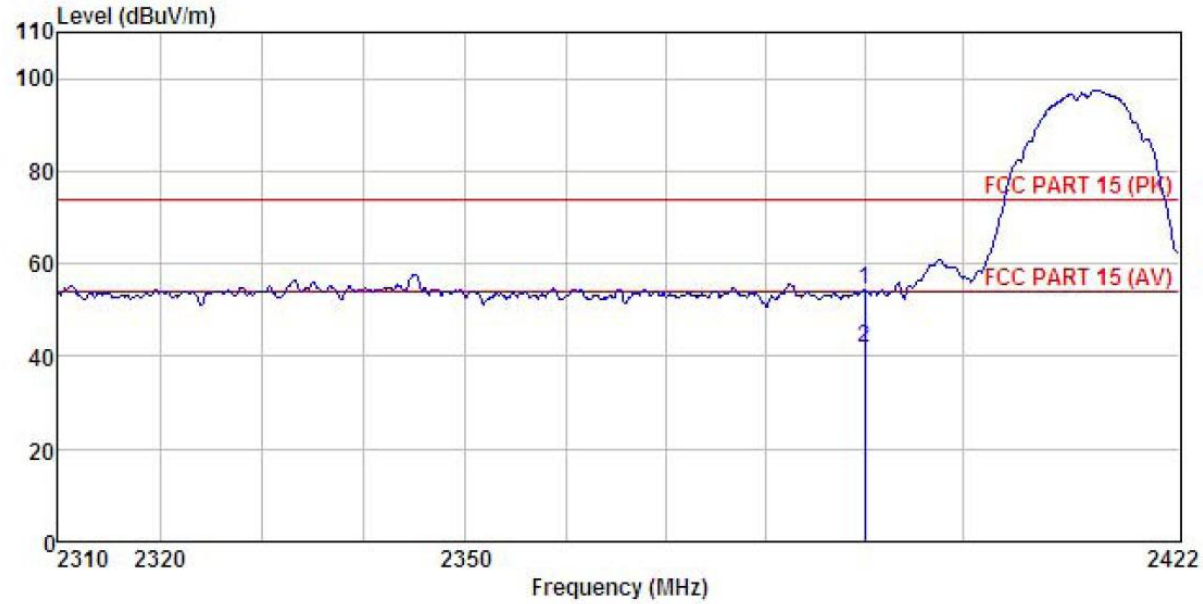
6.6.2 Radiated Emission Method

<table>
<tr><td>Test Requirement:</td><td>FCC Part 15 C Section 15.209 and 15.205</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10: 2009 and KDB 558074v03r03 section 12.1</td></tr>
<tr><td>Test Frequency Range:</td><td>2.3GHz to 2.5GHz</td></tr>
<tr><td>Test site:</td><td>Measurement Distance: 3m</td></tr>
<tr><td>Receiver setup:</td><td>
<table>
<tr><th>Frequency</th><th>Detector</th><th>RBW</th><th>VBW</th><th>Remark</th></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>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><th>Frequency</th><th>Limit (dBuV/m @3m)</th><th>Remark</th></tr>
<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>
</table>
</td></tr>
<tr><td>Test Procedure:</td><td>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.</td></tr>
<tr><td>Test setup:</td><td> 
</td></tr>
<tr><td>Test Instruments:</td><td>Refer to section 5.6 for details</td></tr>
<tr><td>Test mode:</td><td>Refer to section 5.3 for details</td></tr>
<tr><td>Test results:</td><td>Passed</td></tr>
</table>

802.11b

Test channel: Lowest

Horizontal:



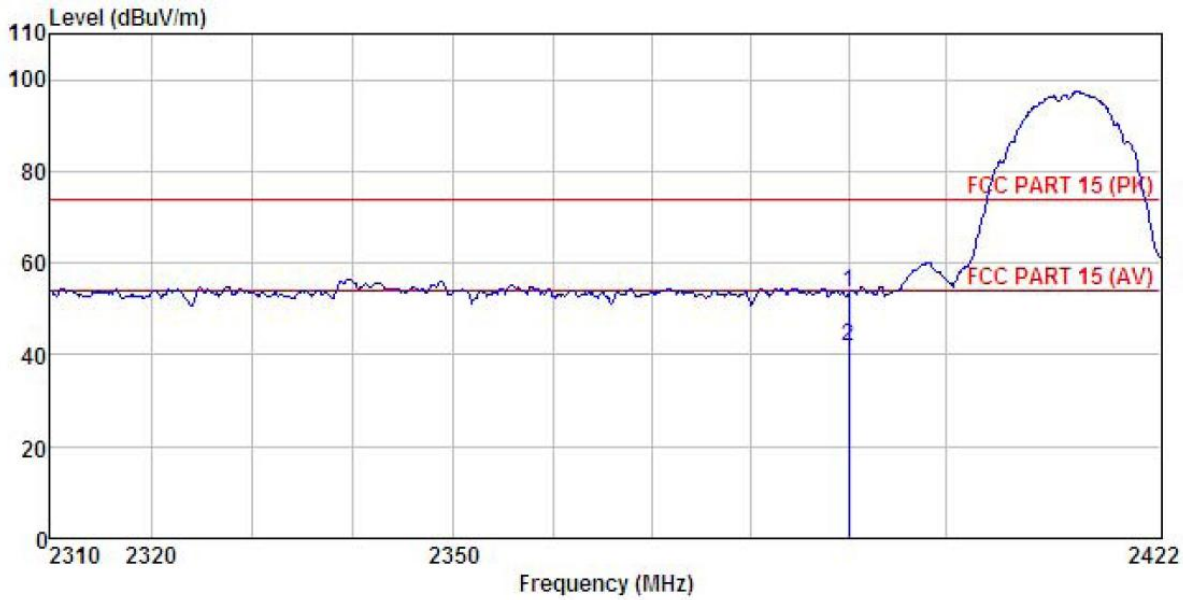
Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
EUT : Rugged Mobile Phone
Model : V4
Test mode : 802.11B-L Mode
Power Rating : AC 120V/60Hz
Environment : Temp:25.5℃ Huni:55%
Test Engineer: Carey
REMARK :

	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2390.000	20.06	27.58	6.63	0.00	54.27	74.00	-19.73	Peak
2	2390.000	7.60	27.58	6.63	0.00	41.81	54.00	-12.19	Average

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.*

Vertical:



Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
EUT : Rugged Mobile Phone
Model : V4
Test mode : 802.11B-L Mode
Power Rating : AC 120V/60Hz
Environment : Temp:25.5'C Huni:55%
Test Engineer: Carey
REMARK :

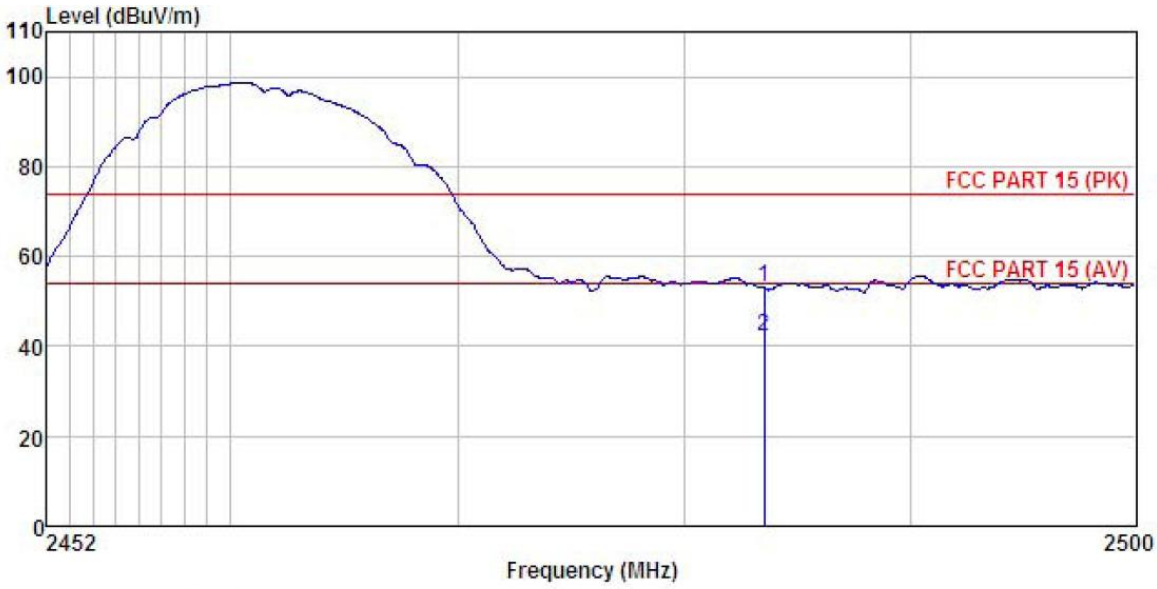
	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2390.000	19.45	27.58	6.63	0.00	53.66	74.00	-20.34	Peak
2	2390.000	7.62	27.58	6.63	0.00	41.83	54.00	-12.17	Average

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.*

Test channel: Highest

Horizontal:



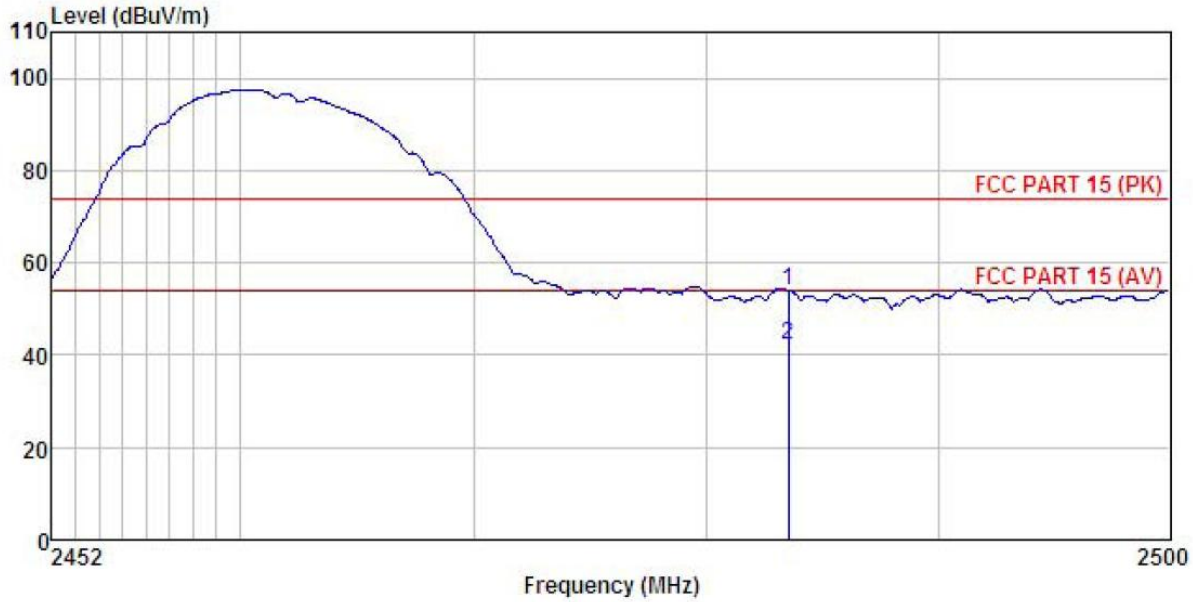
Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
EUT : Rugged Mobile Phone
Model : V4
Test mode : 802.11B-H Mode
Power Rating : AC 120V/60Hz
Environment : Temp:25.5℃ Huni:55%
Test Engineer: Carey
REMARK :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2483.500	18.73	27.52	6.85	0.00	53.10	74.00	-20.90	Peak
2	2483.500	7.76	27.52	6.85	0.00	42.13	54.00	-11.87	Average

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.*

Vertical:



Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
EUT : Rugged Mobile Phone
Model : V4
Test mode : 802.11B-H Mode
Power Rating : AC 120V/60Hz
Environment : Temp:25.5'C Huni:55%
Test Engineer: Carey
REMARK :

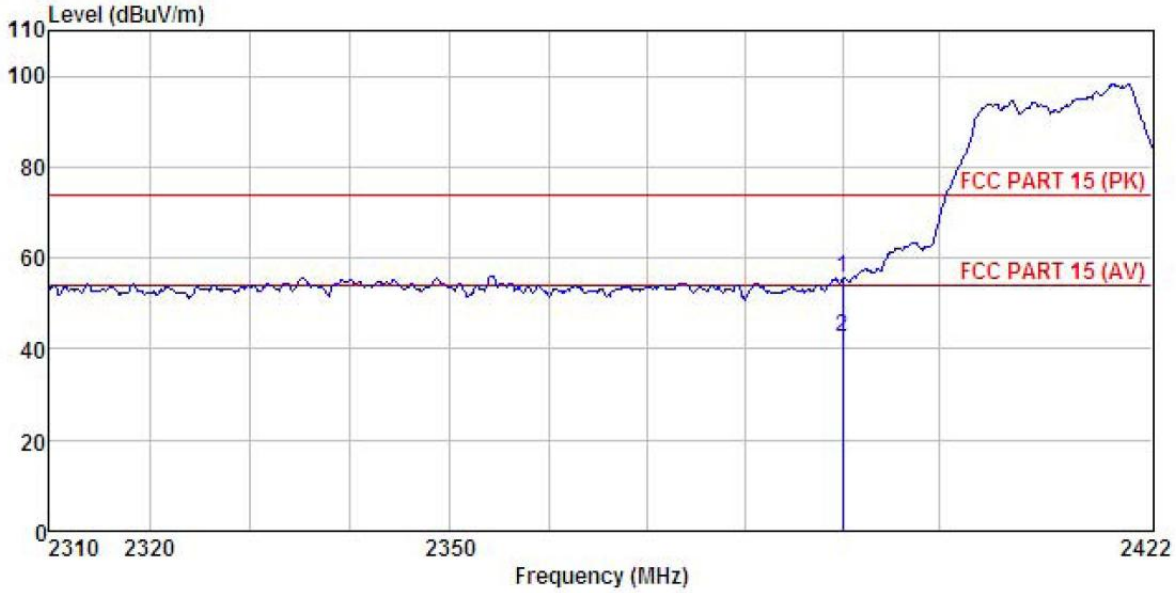
	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2483.500	19.73	27.52	6.85	0.00	54.10	74.00	-19.90	Peak
2	2483.500	7.71	27.52	6.85	0.00	42.08	54.00	-11.92	Average

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.*

802.11g
Test channel: Lowest

Horizontal:



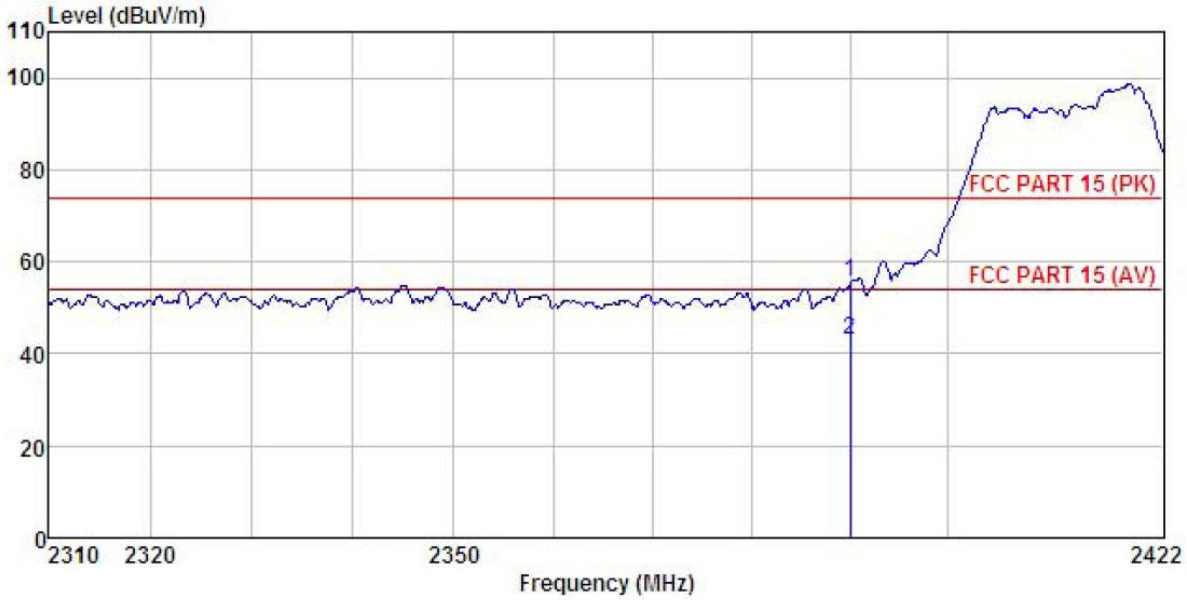

```
Site          : 3m chamber
Condition     : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
EUT           : Rugged Mobile Phone
Model         : V4
Test mode     : 802.11G-L Mode
Power Rating  : AC 120V/60Hz
Environment   : Temp:25.5'C  Huni:55%
Test Engineer: Carey
REMARK        :
```

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2390.000	21.56	27.58	6.63	0.00	55.77	74.00	-18.23	Peak
2	2390.000	8.55	27.58	6.63	0.00	42.76	54.00	-11.24	Average

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.*

Vertical:



Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
EUT : Rugged Mobile Phone
Model : V4
Test mode : 802.11G-L Mode
Power Rating : AC 120V/60Hz
Environment : Temp:25.5℃ Huni:55%
Test Engineer: Carey
REMARK :

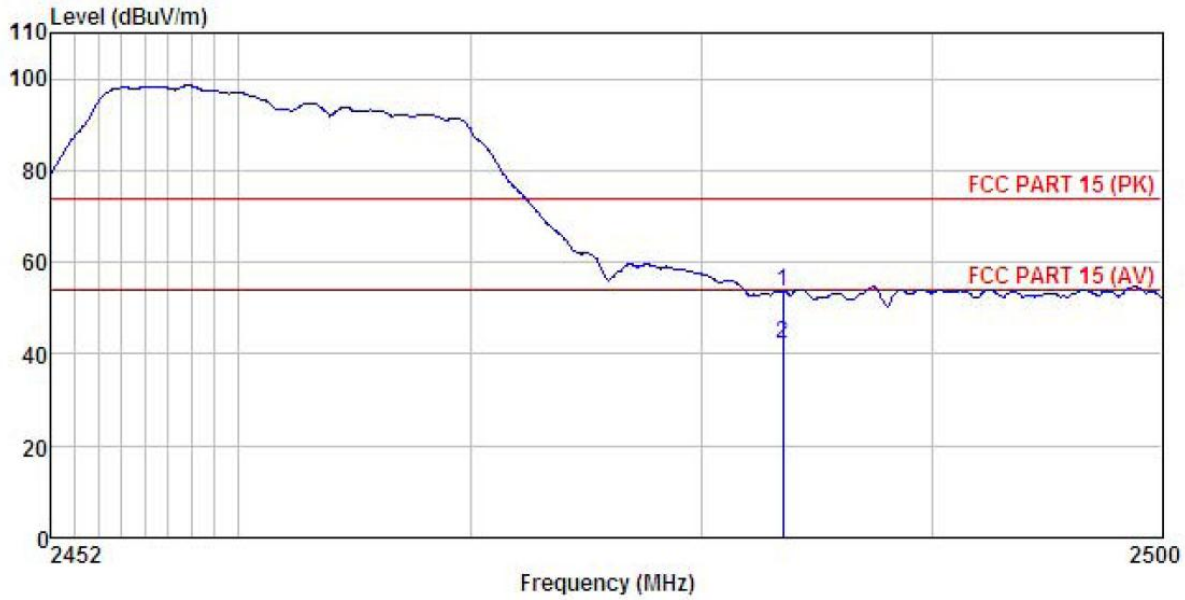
	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2390.000	21.36	27.58	6.63	0.00	55.57	74.00	-18.43	Peak
2	2390.000	8.67	27.58	6.63	0.00	42.88	54.00	-11.12	Average

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.*

Test channel: Highest

Horizontal:



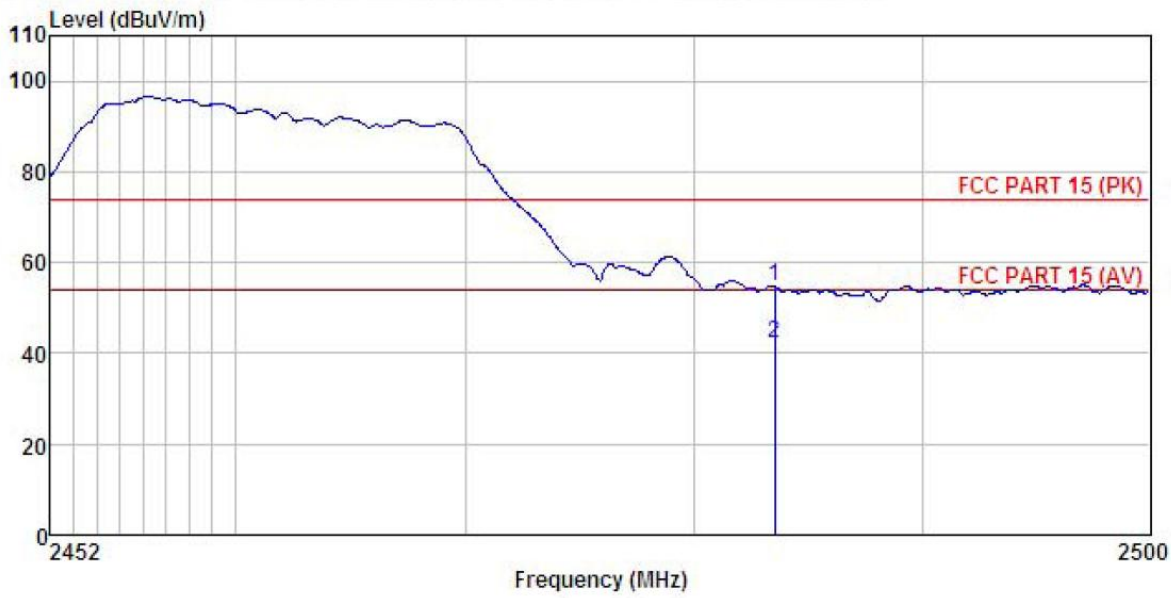
Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
EUT : Rugged Mobile Phone
Model : V4
Test mode : 802.11G-H Mode
Power Rating : AC 120V/60Hz
Environment : Temp:25.5℃ Huni:55%
Test Engineer: Carey
REMARK :

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2483.500	19.24	27.52	6.85	0.00	53.61	74.00	-20.39	Peak
2	2483.500	7.99	27.52	6.85	0.00	42.36	54.00	-11.64	Average

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.*

Vertical:



Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
EUT : Rugged Mobile Phone
Model : V4
Test mode : 802.11G-H Mode
Power Rating : AC 120V/60Hz
Environment : Temp:25.5'C Huni:55%
Test Engineer: Carey
REMARK :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2483.500	20.27	27.52	6.85	0.00	54.64	74.00	-19.36	Peak
2	2483.500	7.85	27.52	6.85	0.00	42.22	54.00	-11.78	Average

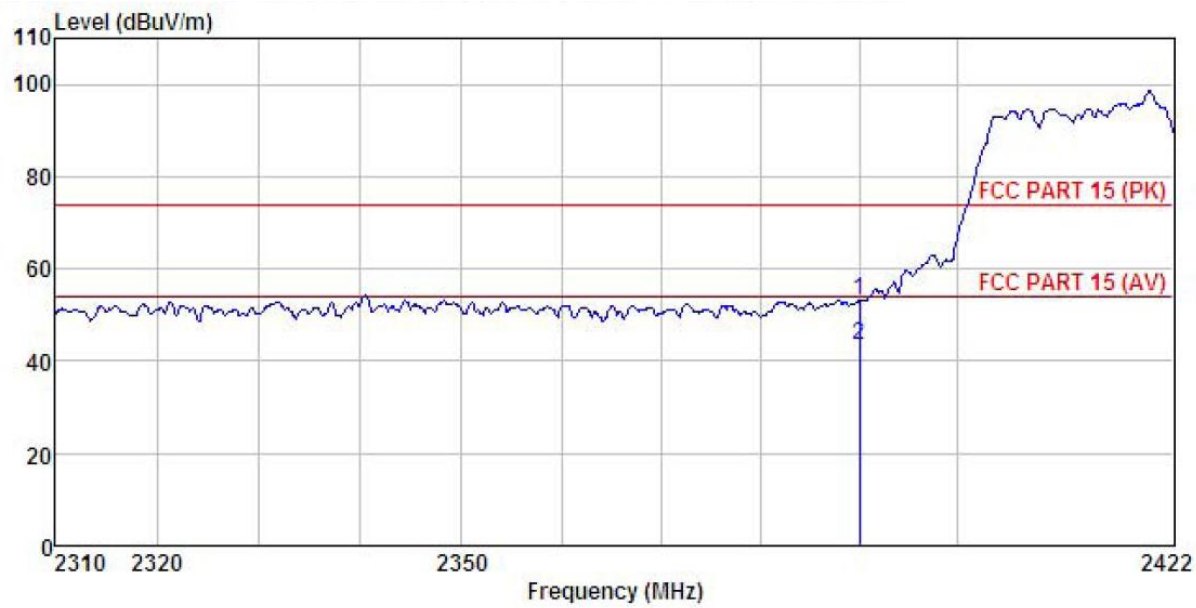
Remark:

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 (H20)

Test channel: Lowest

Horizontal:



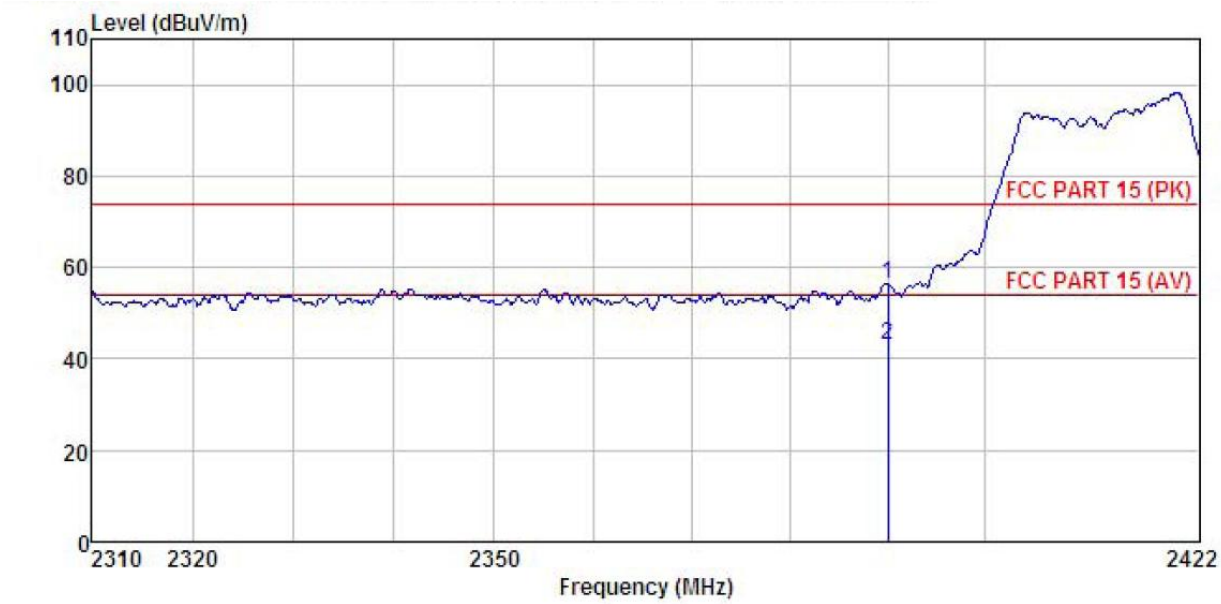
Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
EUT : Rugged Mobile Phone
Model : V4
Test mode : 802.11N20-L Mode
Power Rating : AC 120V/60Hz
Environment : Temp:25.5℃ Huni:55%
Test Engineer: Carey
REMARK :

	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2390.000	19.10	27.58	6.63	0.00	53.31	74.00	-20.69	Peak
2	2390.000	9.26	27.58	6.63	0.00	43.47	54.00	-10.53	Average

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.*

Vertical:



Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
EUT : Rugged Mobile Phone
Model : V4
Test mode : 802.11N20-L Mode
Power Rating : AC 120V/60Hz
Environment : Temp:25.5'C Huni:55%
Test Engineer: Carey
REMARK :

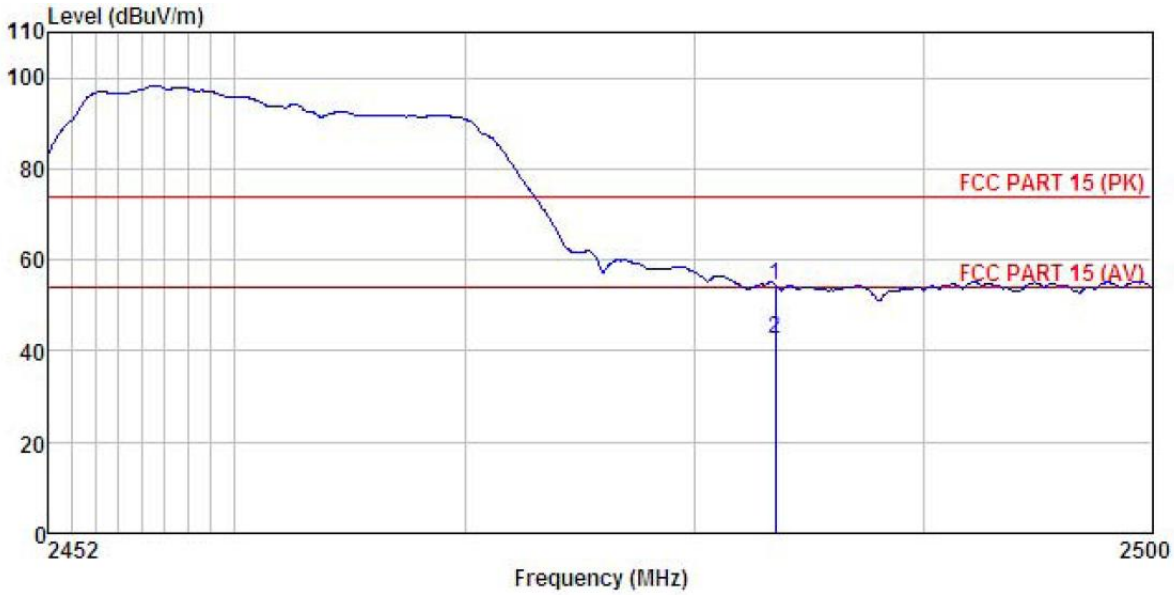
	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2390.000	22.12	27.58	6.63	0.00	56.33	74.00	-17.67	Peak
2	2390.000	8.87	27.58	6.63	0.00	43.08	54.00	-10.92	Average

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.*

Test channel: Highest

Horizontal:



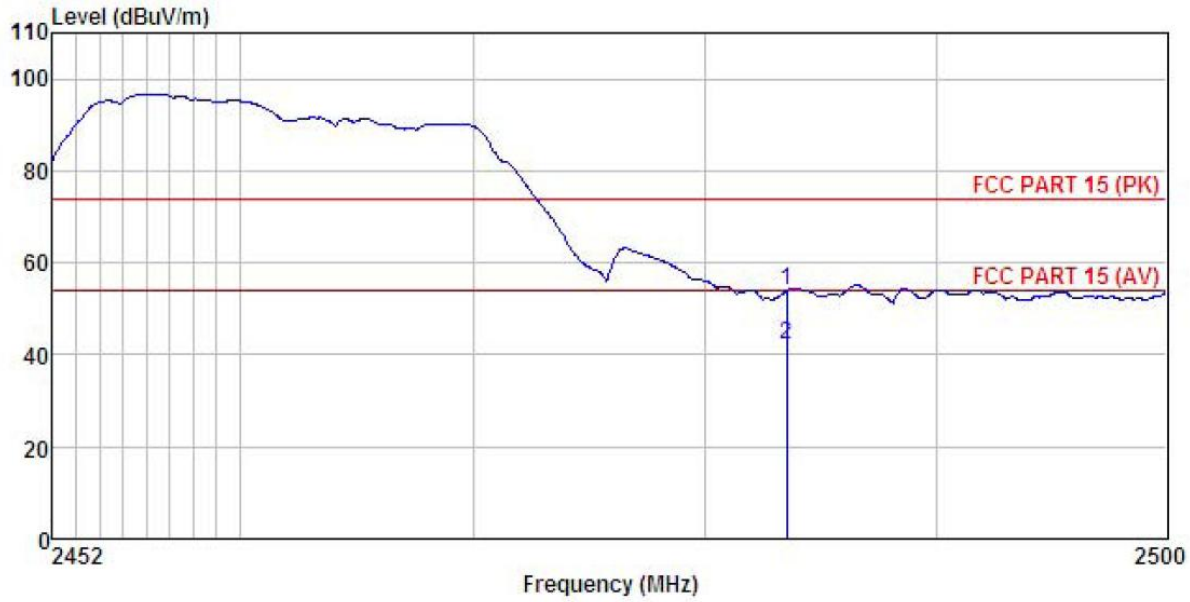
Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
EUT : Rugged Mobile Phone
Model : V4
Test mode : 802.11N20-H Mode
Power Rating : AC 120V/60Hz
Environment : Temp:25.5℃ Huni:55%
Test Engineer: Carey
REMARK :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2483.500	20.16	27.52	6.85	0.00	54.53	74.00	-19.47	Peak
2	2483.500	8.14	27.52	6.85	0.00	42.51	54.00	-11.49	Average

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.*

Vertical:



Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
EUT : Rugged Mobile Phone
Model : V4
Test mode : 802.11N20-H Mode
Power Rating : AC 120V/60Hz
Environment : Temp:25.5'C Huni:55%
Test Engineer: Carey
REMARK :

	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2483.500	19.61	27.52	6.85	0.00	53.98	74.00	-20.02	Peak
2	2483.500	7.95	27.52	6.85	0.00	42.32	54.00	-11.68	Average

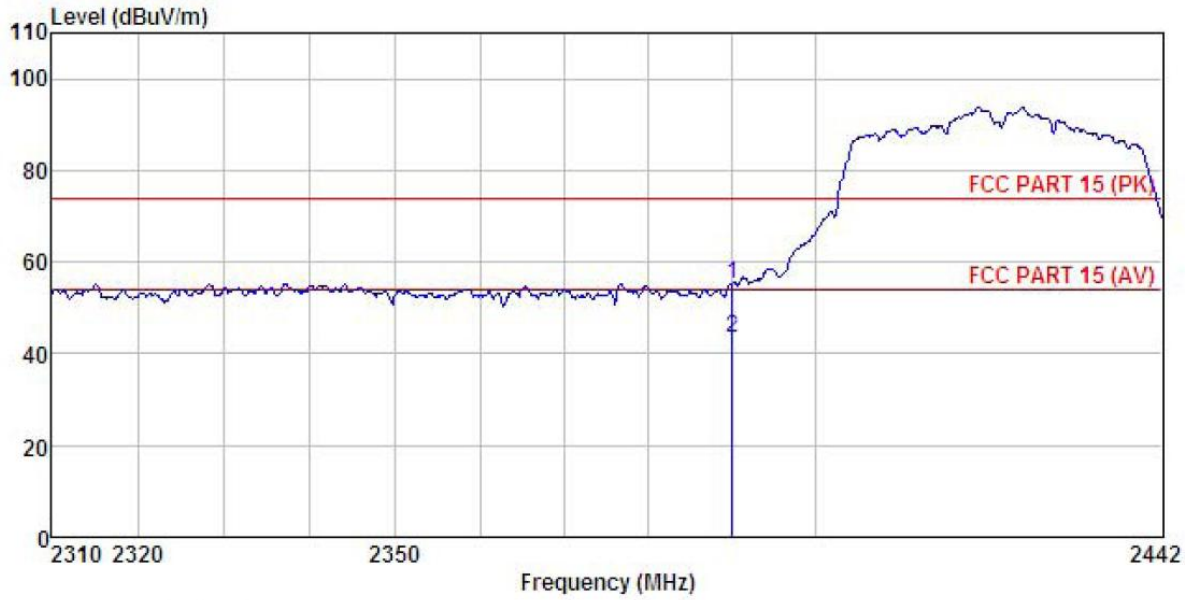
Remark:

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 (H40)

Test channel: Lowest

Horizontal:



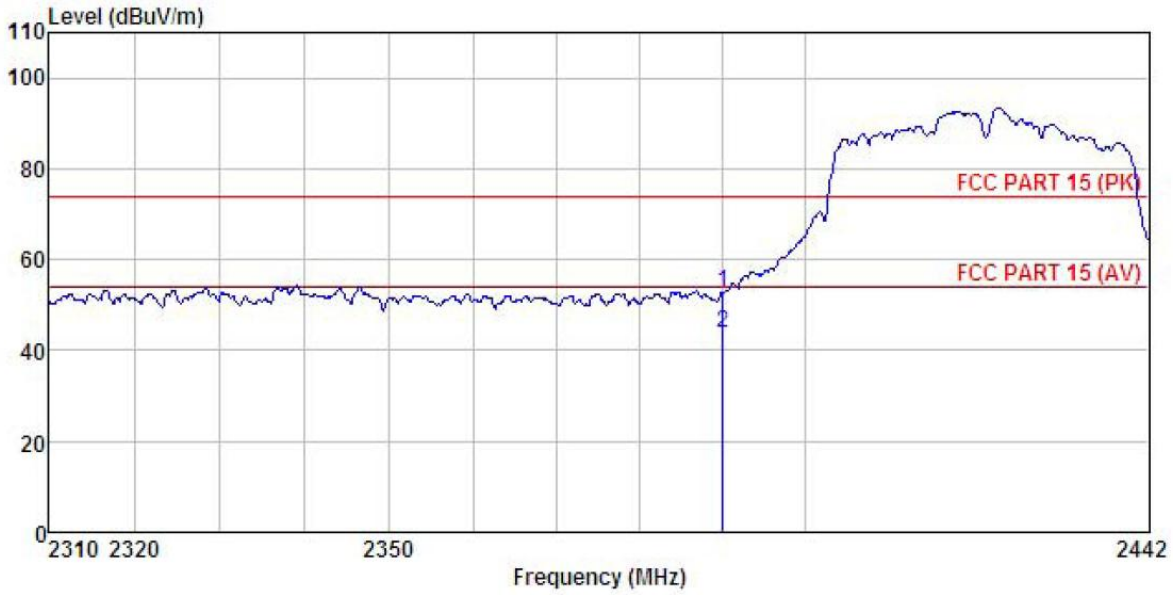

```
Site          : 3m chamber
Condition     : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
EUT           : Rugged Mobile Phone
Model         : V4
Test mode     : 802.11N40-L Mode
Power Rating  : AC 120V/60Hz
Environment   : Temp:25.5℃  Huni:55%
Test Engineer: Carey
REMARK        :
```

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2390.000	20.99	27.58	6.63	0.00	55.20	74.00	-18.80	Peak
2	2390.000	9.21	27.58	6.63	0.00	43.42	54.00	-10.58	Average

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.*

Vertical:



Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
EUT : Rugged Mobile Phone
Model : V4
Test mode : 802.11N40-L Mode
Power Rating : AC 120V/60Hz
Environment : Temp:25.5°C Huni:55%
Test Engineer: Carey
REMARK :

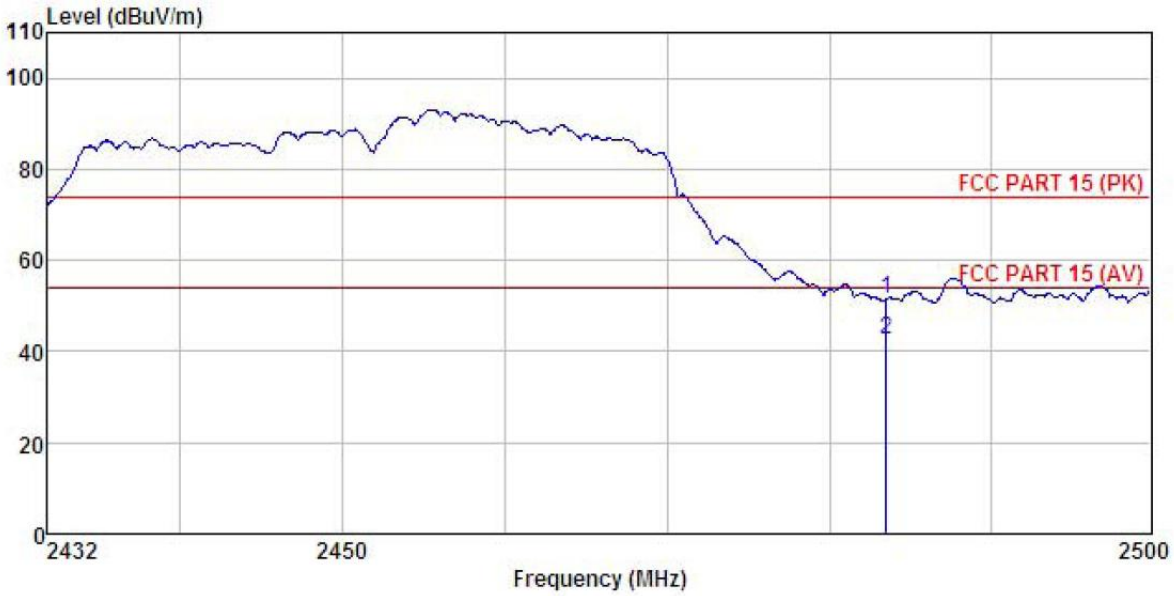
	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2390.000	18.73	27.58	6.63	0.00	52.94	74.00	-21.06	Peak
2	2390.000	9.60	27.58	6.63	0.00	43.81	54.00	-10.19	Average

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.*

Test channel: Highest

Horizontal:



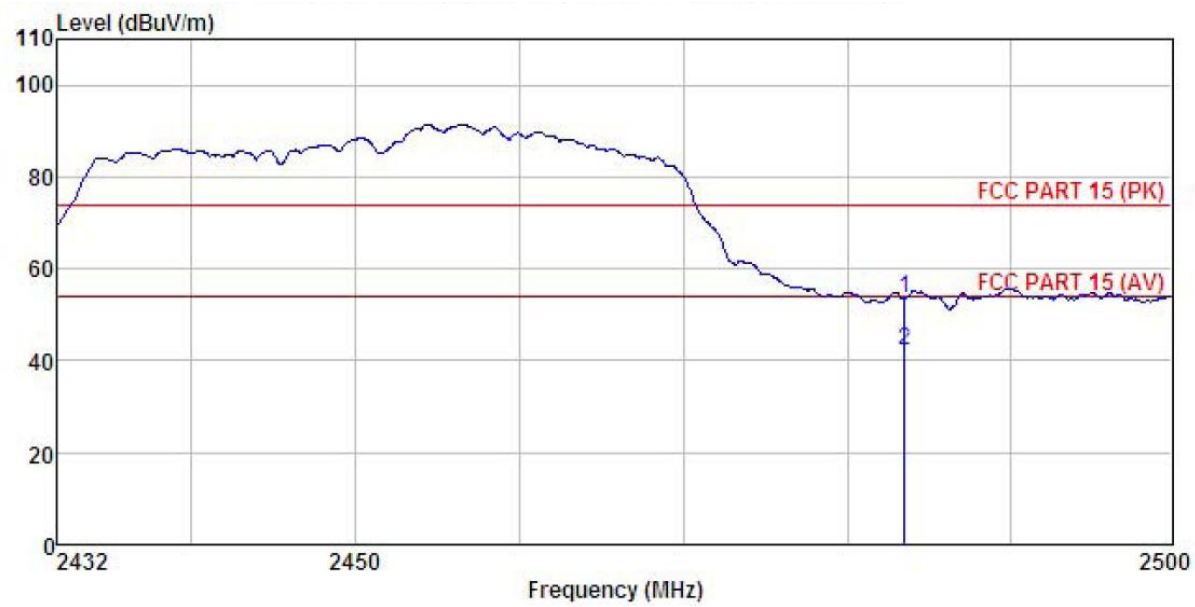
Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
EUT : Rugged Mobile Phone
Model : V4
Test mode : 802.11N40-H Mode
Power Rating : AC 120V/60Hz
Environment : Temp:25.5'C Huni:55%
Test Engineer: Carey
REMARK :

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2483.500	17.09	27.52	6.85	0.00	51.46	74.00	-22.54	Peak
2	2483.500	8.26	27.52	6.85	0.00	42.63	54.00	-11.37	Average

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.*

Vertical:



Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
EUT : Rugged Mobile Phone
Model : V4
Test mode : 802.11N40-H Mode
Power Rating : AC 120V/60Hz
Environment : Temp:25.5℃ Huni:55%
Test Engineer: Carey
REMARK :

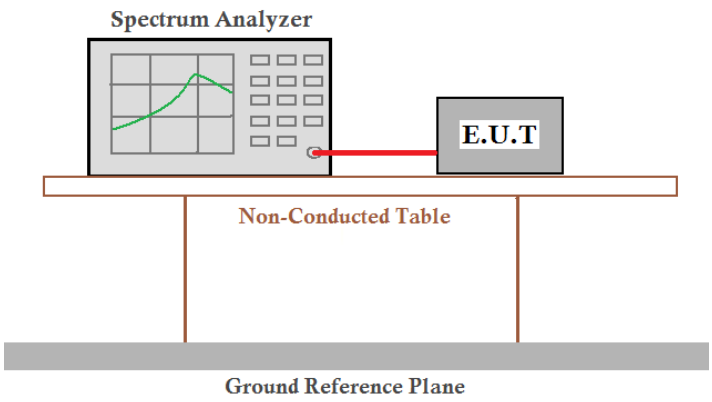
	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2483.500	19.21	27.52	6.85	0.00	53.58	74.00	-20.42	Peak
2	2483.500	7.99	27.52	6.85	0.00	42.36	54.00	-11.64	Average

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

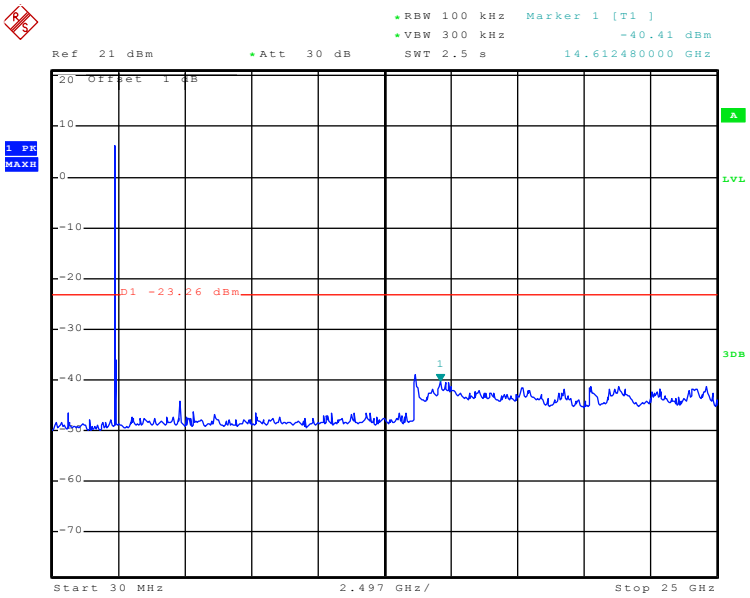
6.7.1 Conducted Emission Method

Test Requirement:	FCC Part 15 C Section 15.247 (d)
Test Method:	ANSI C63.10:2009 and KDB558074 section 11
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	
Test Instruments:	Refer to section 5.6 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Test plot as follows:

Test mode: 802.11b

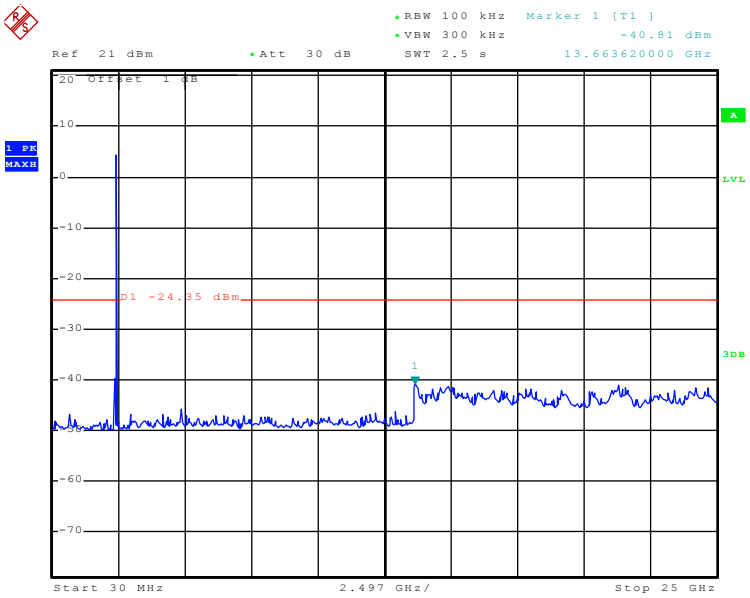
Lowest channel



Date: 15.NOV.2015 21:40:54

30MHz~25GHz

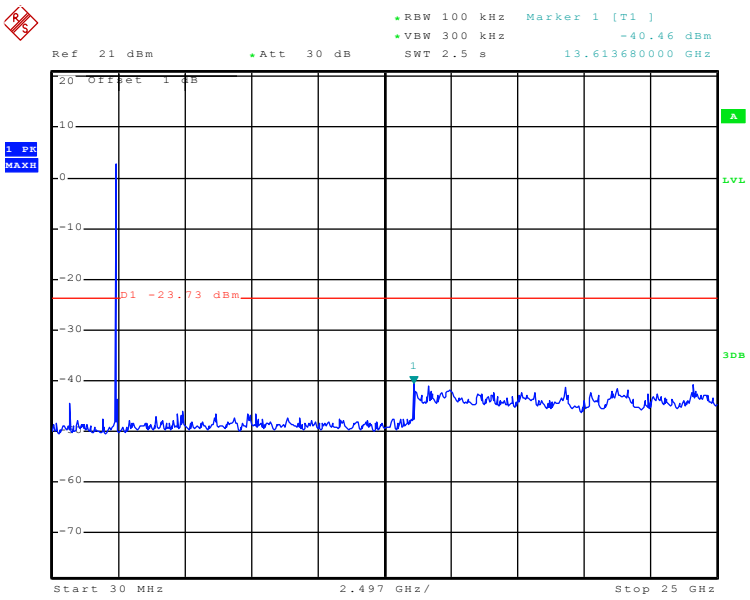
Middle channel



Date: 15.NOV.2015 21:41:23

30MHz~25GHz

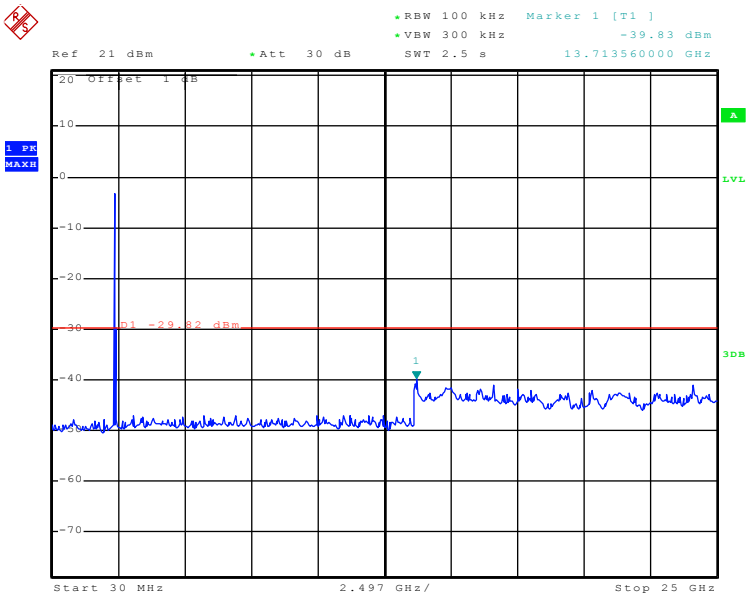
Highest channel



30MHz~25GHz

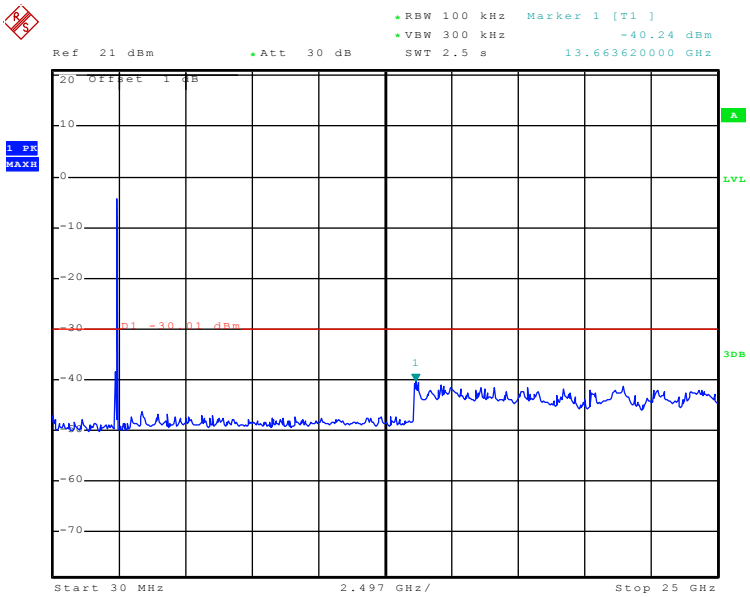
Test mode: 802.11g

Lowest channel



30MHz~25GHz

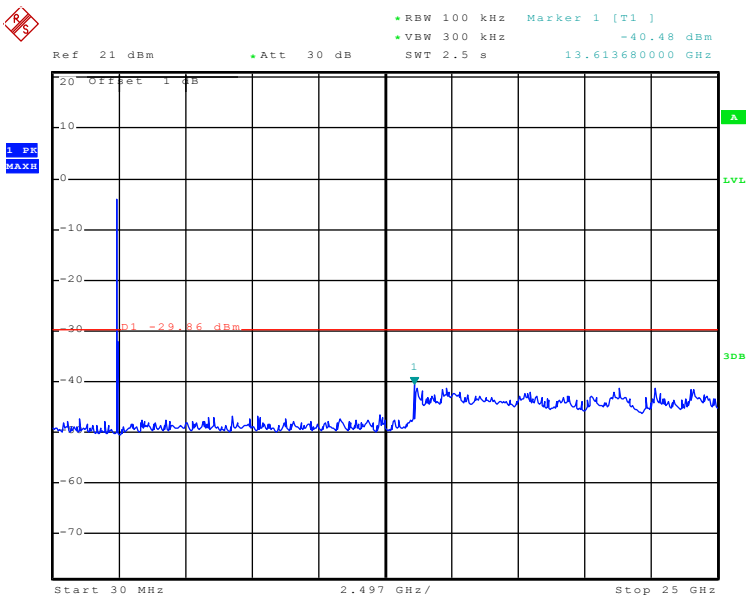
Middle channel



Date: 15.NOV.2015 21:42:45

30MHz~25GHz

Highest channel

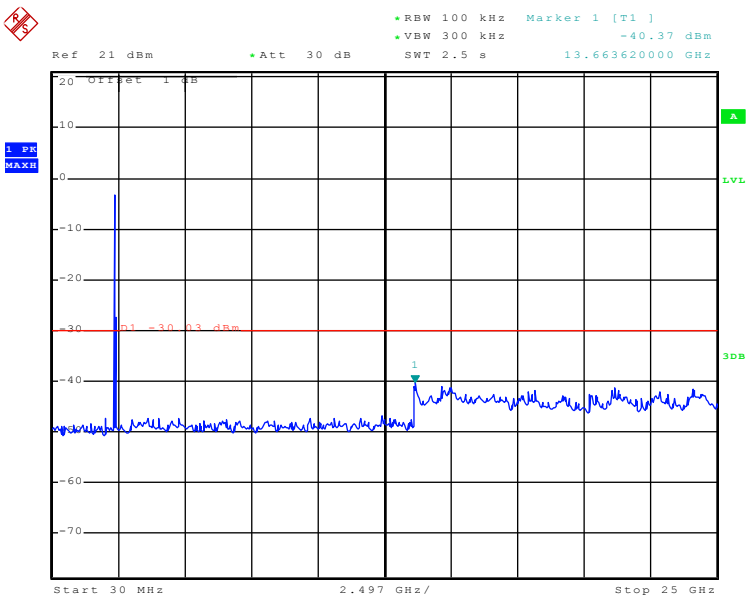


Date: 15.NOV.2015 21:43:39

30MHz~25GHz

Test mode: 802.11n(H20)

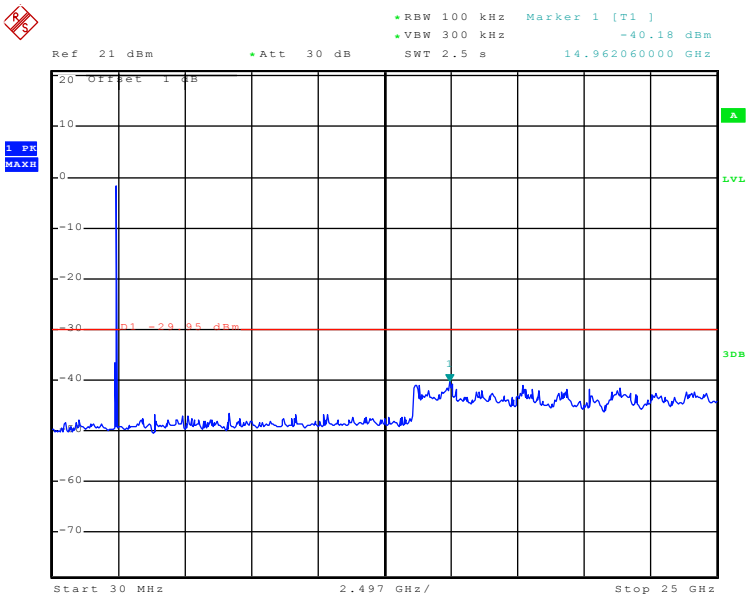
Lowest channel



Date: 15.NOV.2015 21:44:02

30MHz~25GHz

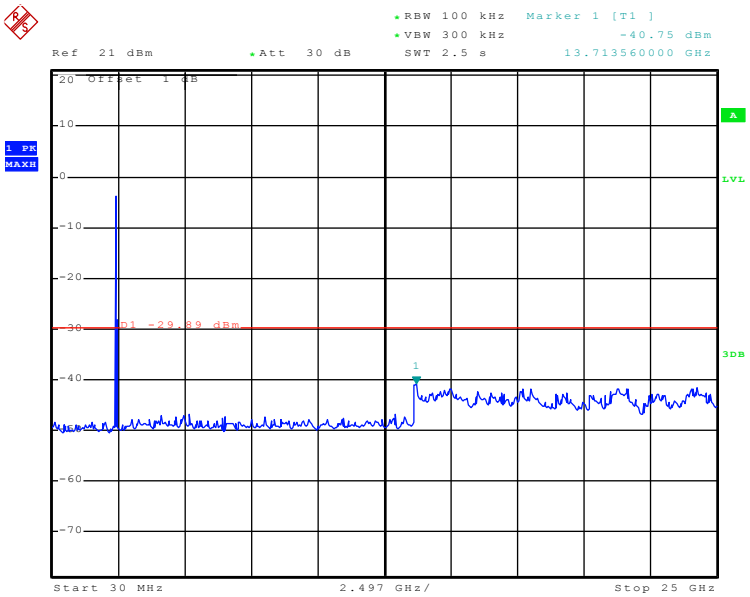
Middle channel



Date: 15.NOV.2015 21:44:29

30MHz~25GHz

Highest channel

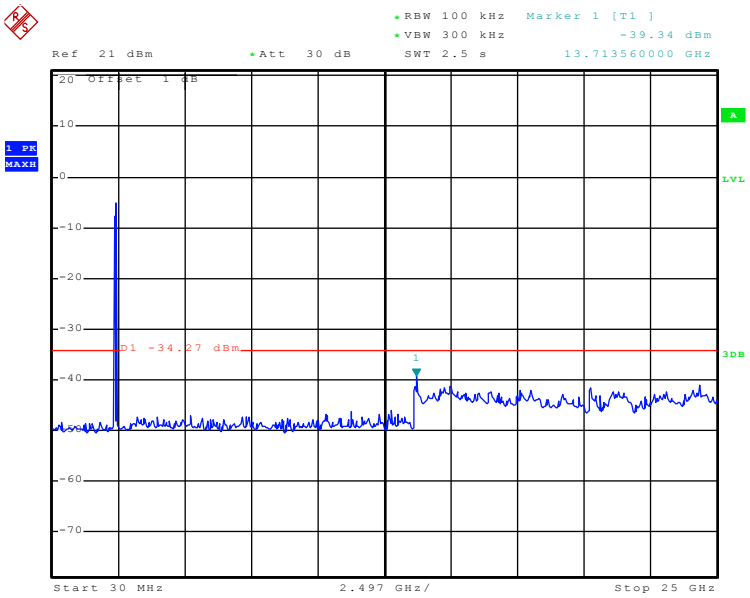


Date: 15.NOV.2015 21:44:50

30MHz~25GHz

Test mode: 802.11n(H40)

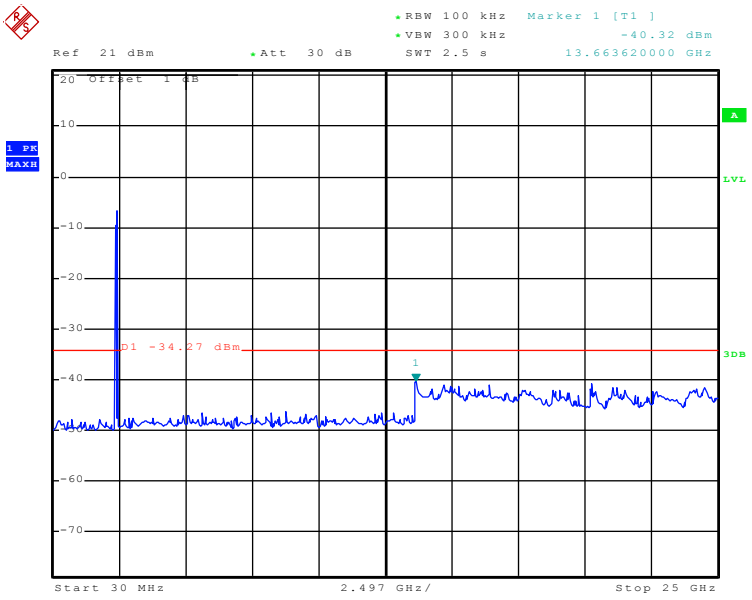
Lowest channel



Date: 15.NOV.2015 21:45:17

30MHz~25GHz

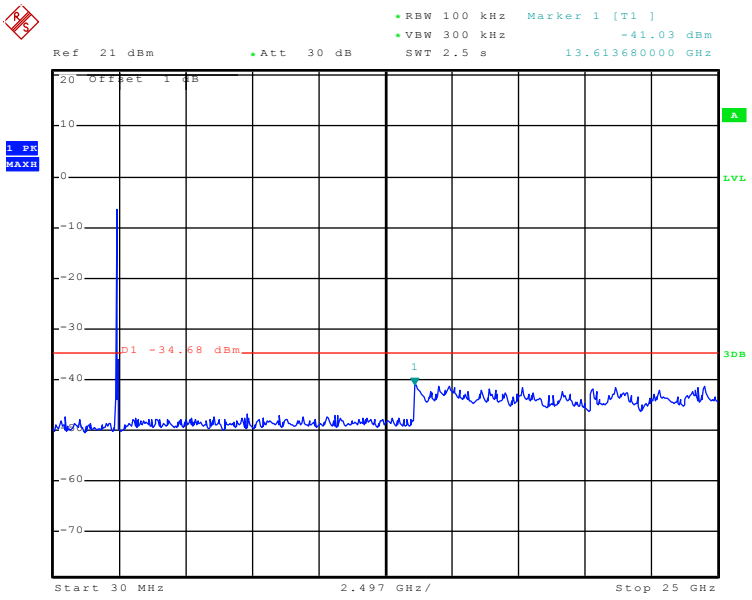
Middle channel



Date: 15.NOV.2015 21:45:48

30MHz~25GHz

Highest channel

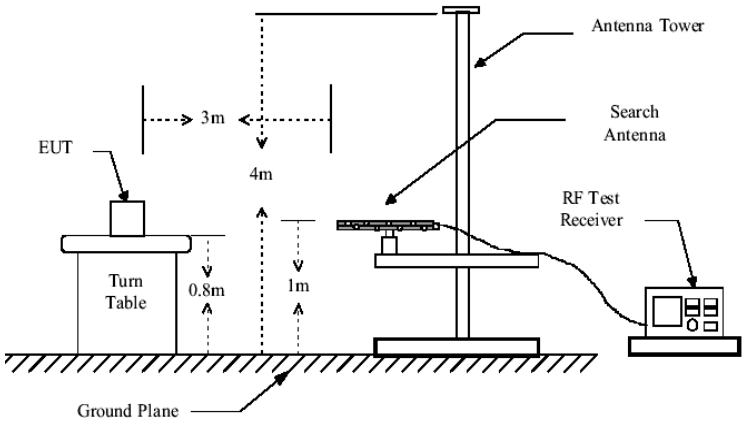
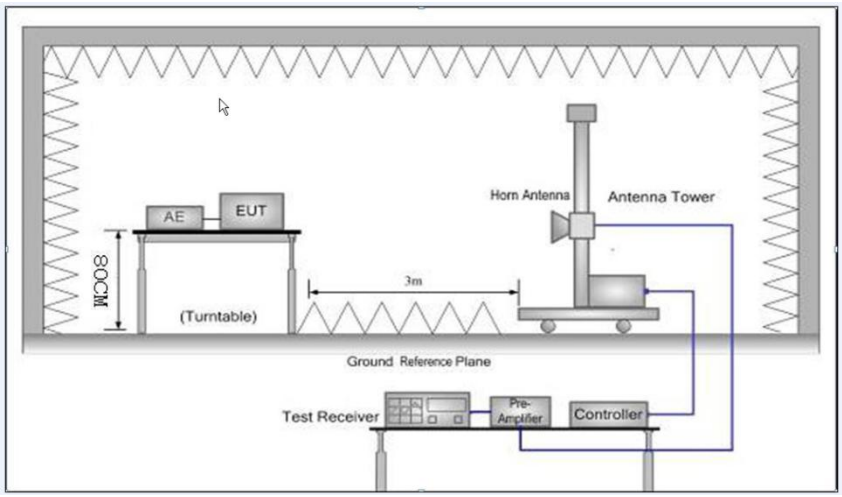


Date: 15.NOV.2015 21:46:13

30MHz~25GHz

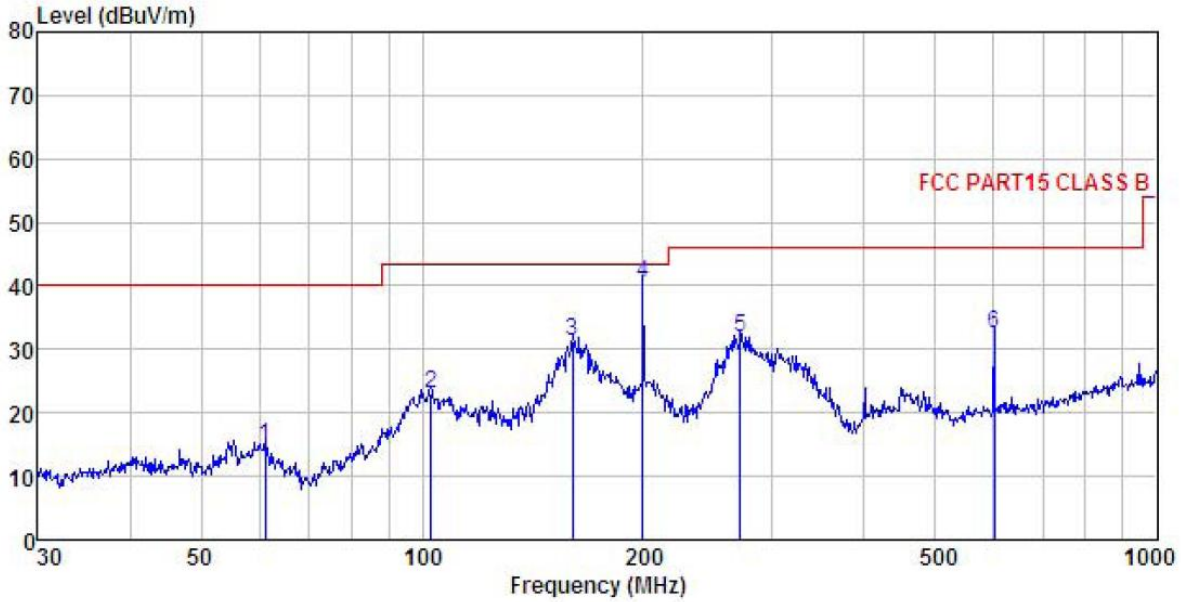
6.7.2 Radiated Emission Method

<table>
<tr><td>Test Requirement:</td><td>FCC Part 15 C Section 15.209 and 15.205</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2009</td></tr>
<tr><td>Test Frequency Range:</td><td>9kHz to 25GHz</td></tr>
<tr><td>Test site:</td><td>Measurement Distance: 3m</td></tr>
<tr><td>Receiver setup:</td><td>
<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 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>
</td></tr>
<tr><td>Limit:</td><td>
<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>
<tr><td rowspan="2">Above 1GHz</td><td>54.0</td><td>Average Value</td></tr>
<tr><td>74.0</td><td>Peak Value</td></tr>
</table>
</td></tr>
<tr><td>Test Procedure:</td><td>
1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber. 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.
</td></tr>
</table>

Test setup:	Below 1GHz  Above 1GHz 
Test Uncertainty:	±4.88 dB
Test Instruments:	Refer to section 5.6 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed
Remark:	1. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis is the worst case. 2. 9 kHz to 30MHz is too low, so only shows the data of above 30MHz in this report.

Below 1GHz

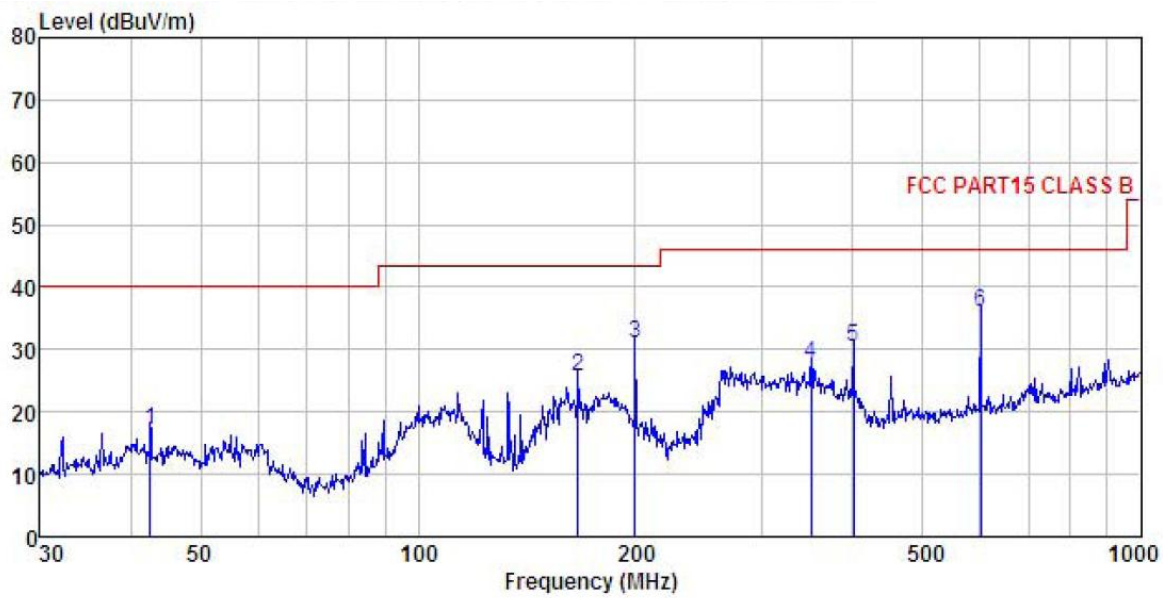
Horizontal：



Site : 3m chamber
Condition : FCC PART15 CLASS B 3m VULB9163(30M1G) HORIZONTAL
EUT : Rugged Mobile Phone
Model : V4
Test mode : WIFI Mode
Power Rating : AC 120V/60Hz
Environment : Temp:25.5℃ Huni:55%
Test Engineer: Carey
REMARK :

	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	61.132	31.58	12.29	0.70	29.77	14.80	40.00	-25.20	QP
2	102.719	38.61	12.92	0.98	29.51	23.00	43.50	-20.50	QP
3	160.346	50.31	8.67	1.33	29.13	31.18	43.50	-12.32	QP
4	199.986	57.40	10.57	1.38	28.83	40.52	43.50	-2.98	QP
5	271.325	46.33	12.42	1.69	28.50	31.94	46.00	-14.06	QP
6	601.427	40.34	18.46	2.63	28.93	32.50	46.00	-13.50	QP

Vertical：



Site : 3m chamber
Condition : FCC PART15 CLASS B 3m VULB9163(30M1G) VERTICAL
EUT : Rugged Mobile Phone
Model : V4
Test mode : WIFI Mode
Power Rating : AC 120V/60Hz
Environment : Temp:25.5℃ Huni:55%
Test Engineer: Carey
REMARK :

	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	42.600	32.94	13.56	0.54	29.88	17.16	40.00	-22.84	QP
2	166.651	44.68	8.87	1.34	29.08	25.81	43.50	-17.69	QP
3	199.986	47.97	10.57	1.38	28.83	31.09	43.50	-12.41	QP
4	350.477	39.96	14.27	1.94	28.56	27.61	46.00	-18.39	QP
5	400.432	42.07	15.10	2.12	28.78	30.51	46.00	-15.49	QP
6	601.427	43.83	18.46	2.63	28.93	35.99	46.00	-10.01	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)	Polar.
4824.00	54.91	31.54	10.58	40.22	56.81	74.00	-17.19	Vertical
4824.00	54.81	31.54	10.58	40.22	56.71	74.00	-17.29	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)	Polar.
4824.00	47.67	31.54	10.58	40.22	49.57	54.00	-4.43	Vertical
4824.00	47.89	31.54	10.58	40.22	49.79	54.00	-4.21	Horizontal

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)	Polar.
4874.00	47.77	31.57	10.64	40.15	49.83	74.00	-24.17	Vertical
4874.00	47.25	31.57	10.64	40.15	49.31	74.00	-24.69	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)	Polar.
4874.00	41.40	31.57	10.64	40.15	43.46	54.00	-10.54	Vertical
4874.00	40.41	31.57	10.64	40.15	42.47	54.00	-11.53	Horizontal

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)	Polar.
4924.00	53.89	31.61	10.70	40.08	56.12	74.00	-17.88	Vertical
4924.00	54.39	31.61	10.70	40.08	56.62	74.00	-17.38	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)	Polar.
4924.00	46.56	31.61	10.70	40.08	48.79	54.00	-5.21	Vertical
4924.00	47.80	31.61	10.70	40.08	50.03	54.00	-3.97	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.*

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/)	Limit Line (dBuV/m)	Over Limit (dB)	Polar.
4824.00	49.93	31.54	10.58	40.22	51.83	74.00	-22.17	Vertical
4824.00	49.95	31.54	10.58	40.22	51.85	74.00	-22.15	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/)	Limit Line (dBuV/m)	Over Limit (dB)	Polar.
4824.00	41.68	31.54	10.58	40.22	43.58	54.00	-10.42	Vertical
4824.00	41.85	31.54	10.58	40.22	43.75	54.00	-10.25	Horizontal

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/)	Limit Line (dBuV/m)	Over Limit (dB)	Polar.
4874.00	47.40	31.57	10.64	40.15	49.46	74.00	-24.54	Vertical
4874.00	47.69	31.57	10.64	40.15	49.75	74.00	-24.25	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/)	Limit Line (dBuV/m)	Over Limit (dB)	Polar.
4874.00	38.61	31.57	10.64	40.15	40.67	54.00	-13.33	Vertical
4874.00	38.70	31.57	10.64	40.15	40.76	54.00	-13.24	Horizontal

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)	Polar.
4924.00	48.91	31.61	10.70	40.08	51.14	74.00	-22.86	Vertical
4924.00	48.92	31.61	10.70	40.08	51.15	74.00	-22.85	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)	Polar.
4924.00	40.96	31.61	10.70	40.08	43.19	54.00	-10.81	Vertical
4924.00	41.18	31.61	10.70	40.08	43.41	54.00	-10.59	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.*

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)	Polar.
4824.00	40.39	31.54	10.58	40.22	42.29	74.00	-31.71	Vertical
4824.00	50.97	31.54	10.58	40.22	52.87	74.00	-21.13	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)	Polar.
4824.00	40.08	31.54	10.58	40.22	41.98	54.00	-12.02	Vertical
4824.00	42.87	31.54	10.58	40.22	44.77	54.00	-9.23	Horizontal

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)	Polar.
4874.00	47.48	31.57	10.64	40.15	49.54	74.00	-24.46	Vertical
4874.00	46.60	31.57	10.64	40.15	48.66	74.00	-25.34	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)	Polar.
4874.00	38.35	31.57	10.64	40.15	40.41	54.00	-13.59	Vertical
4874.00	37.80	31.57	10.64	40.15	39.86	54.00	-14.14	Horizontal

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)	Polar.
4924.00	48.13	31.61	10.70	40.08	50.36	74.00	-23.64	Vertical
4924.00	48.21	31.61	10.70	40.08	50.44	74.00	-23.56	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)	Polar.
4924.00	38.33	31.61	10.70	40.08	40.56	54.00	-13.44	Vertical
4924.00	38.46	31.61	10.70	40.08	40.69	54.00	-13.31	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.*

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)	Polar.
4844.00	47.07	31.55	10.61	40.19	49.04	74.00	-24.96	Vertical
4844.00	45.44	31.55	10.61	40.19	47.41	74.00	-26.59	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)	Polar.
4844.00	37.50	31.55	10.61	40.19	39.47	54.00	-14.53	Vertical
4844.00	36.89	31.55	10.61	40.19	38.86	54.00	-15.14	Horizontal

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)	Polar.
4874.00	47.04	31.57	10.64	40.15	49.10	74.00	-24.90	Vertical
4874.00	46.65	31.57	10.64	40.15	48.71	74.00	-25.29	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)	Polar.
4874.00	36.58	31.57	10.64	40.15	38.64	54.00	-15.36	Vertical
4874.00	36.14	31.57	10.64	40.15	38.20	54.00	-15.80	Horizontal

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)	Polar.
4904.00	45.60	31.59	10.67	40.10	47.76	74.00	-26.24	Vertical
4904.00	47.59	31.59	10.67	40.10	49.75	74.00	-24.25	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)	Polar.
4904.00	36.61	31.59	10.67	40.10	38.77	54.00	-15.23	Vertical
4904.00	37.91	31.59	10.67	40.10	40.07	54.00	-13.93	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.*