Report No: GTSE12030017001

FCC REPORT

Applicant:	SANHO ELECTRONICS TECHNOLOGY CO., LTD
Address of Applicant:	1/F, BLOCK 1, #1177 LINGYUN ROAD, NINGBO, CHINA

Equipment Under Test (EUT)

Product Name:	USB to WiFi Adapter
Model No.:	CloudFTP
FCC ID:	AXDWD700120319
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.247:2010
Date of sample receipt:	Mar. 09, 2012
Date of Test:	Mar. 09-16, 2012
Date of report issued:	Mar. 19, 2012
Test Result :	PASS *

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

Authorized Signature:

Stephen Guo
Laboratory Manager

2 Version

Version No.	Date	Description
00	*Mar. 16, 2012*	*Original*

Prepared By: Collin.He ***Date:*** *Mar. 16, 2012*

Project Engineer

Check By: Hans.Hu ***Date:*** *Mar. 16, 2012*

Reviewer

3 Contents

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203/15.247 (c)	Pass
AC Power Line Conducted Emission	15.207	Pass
Conducted Peak Output Power	15.247 (b)(3)	Pass
Emission 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:	SANHO ELECTRONICS TECHNOLOGY CO., LTD
Address of Applicant:	1/F, BLOCK 1, #1177 LINGYUN ROAD, NINGBO, CHINA
Manufacturer:	SANHO ELECTRONICS TECHNOLOGY CO., LTD
Address of Manufacturer/	1/F, BLOCK 1, #1177 LINGYUN ROAD, NINGBO, CHINA
Factory:	SANHO ELECTRONICS TECHNOLOGY CO., LTD
Address of Factory:	1/F, BLOCK 1, #1177 LINGYUN ROAD, NINGBO, CHINA

5.2 General Description of E.U.T.

Product Name:	USB to WiFi Adapter
Model No.:	CloudFTP
Operation Frequency:	2412MHz~2462MHz (802.11n(H20)) 2422MHz~2452MHz (802.11n(H40))
Channel numbers:	11 for 802.11n(H20) 7 for 802.11(H40)
Channel separation:	5MHz
Modulation technology:	Orthogonal Frequency Division Multiplexing(OFDM)
Antenna Type:	Integral
Antenna gain:	2dBi(declare by Applicant)
Power supply:	DC 5V

Operation Frequency each of channel							
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		

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:

802.11n(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 mode

Transmitting mode	Keep the EUT in 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
802.11n(H20)	6.5Mbps
802.11n(H40)	13.0Mbps

Final Test Mode:

According to ANSI C63.4 standards, the test results are both the “worst case” and “worst setup” 6.5Mbps for 802.11n(H20), 13Mbps for 802.11n(H40)

5.4 Test Facility

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

- **FCC —Registration No.: 600491**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fuly described in a report filed with the (FCC) Federal Communications Commission.

The acceptance letter from the FCC is maintained in out files. Registration 600491, July 20, 2010.

- **Industry Canada (IC)**

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

5.5 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.
Address: 2nd Floor, Block No.2, Laodong Industrial Zone, Xixiang Road Baoan District, Shenzhen, China
Tel: 0755-27798480
Fax: 0755-27798960

5.6 Other Information Requested by the Customer

None.

5.7 Description of Support Units

Manufacturer	Description	Model	Serial Number	FCC ID/DoC
IBM	Notebook	T42	GTS209	DoC

5.8 Test Instruments list

Radiated Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	Mar. 30 2011	Mar. 29 2012
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	Jul. 04 2011	Jul. 03 2012
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	Feb. 25 2012	Feb. 24 2013
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	June 30 2011	June 29 2012
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	Mar. 30 2011	Mar. 29 2012
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	Apr. 01 2011	Mar. 31 2012
9	Coaxial Cable	GTS	N/A	GTS211	Apr. 01 2011	Mar. 31 2012
10	Coaxial cable	GTS	N/A	GTS210	Apr. 01 2011	Mar. 31 2012
11	Coaxial Cable	GTS	N/A	GTS212	Apr. 01 2011	Mar. 31 2012
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	Jul. 04 2011	Jul. 03 2012
13	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	Jul. 04 2011	Jul. 03 2012
14	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June 30 2011	June 29 2012
15	Band filter	Amindeon	82346	GTS219	June 30 2011	June 29 2012

Conducted Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Shielding Room	ZhongYu Electron	7.0(L)x3.0(W)x3.0(H)	GTS252	Jul. 04 2011	Jul. 03 2012
2	EMI Test Receiver	Rohde & Schwarz	ESCS30	GTS223	Jul. 04 2011	Jul. 03 2012
3	10dB Pulse Limit	Rohde & Schwarz	N/A	GTS224	Jul. 04 2011	Jul. 03 2012
4	LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	GTS226	Jul. 04 2011	Jul. 03 2012
5	LISN	ETS-LINDGREN	3816/2	GTS232	Jul. 04 2011	Jul. 03 2012
6	Coaxial Cable	GTS	N/A	GTS227	Apr. 01 2011	Mar. 31 2012
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A

6 Test results and Measurement Data

6.1 Antenna requirement:

Standard requirement:	FCC Part15 C Section 15.203 /247(c)

15.203 requirement:

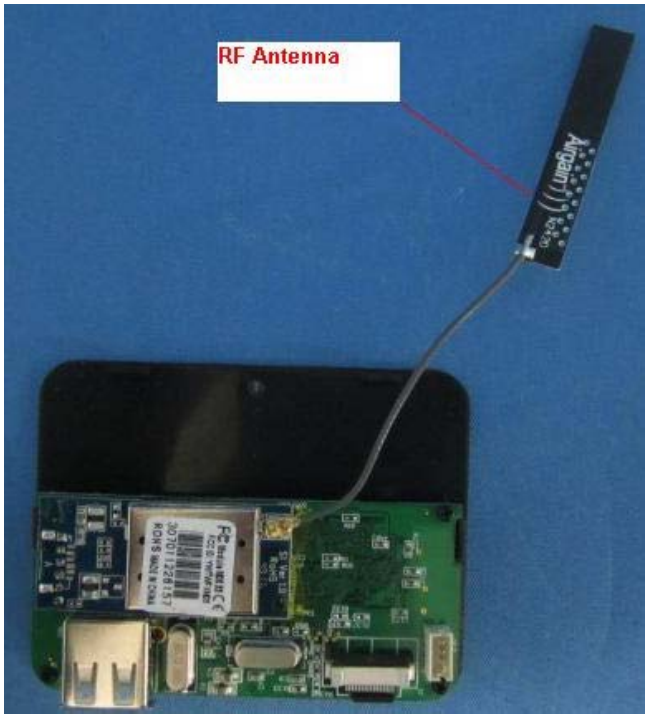
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit 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:

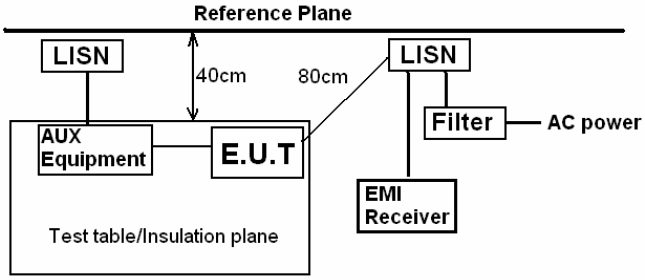
(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

E.U.T Antenna:

The antenna is Integral antenna, the best case gain of the antenna is 2dBi

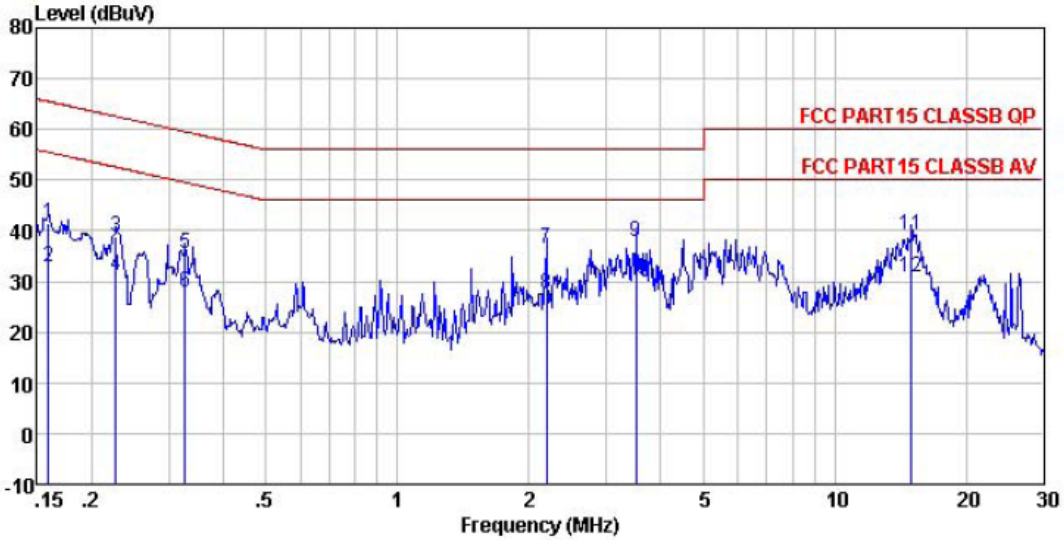


6.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207
Test Method:	ANSI C63.4:2003
Test Frequency Range:	150KHz to 30MHz
Class / Severity:	Class B
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto
Limit:	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 setup:	 *Remark:* *E.U.T: Equipment Under Test* *LISN: Line Impedence Stabilization Network* *Test table height=0.8m*
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.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2003 on conducted measurement.
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement data:

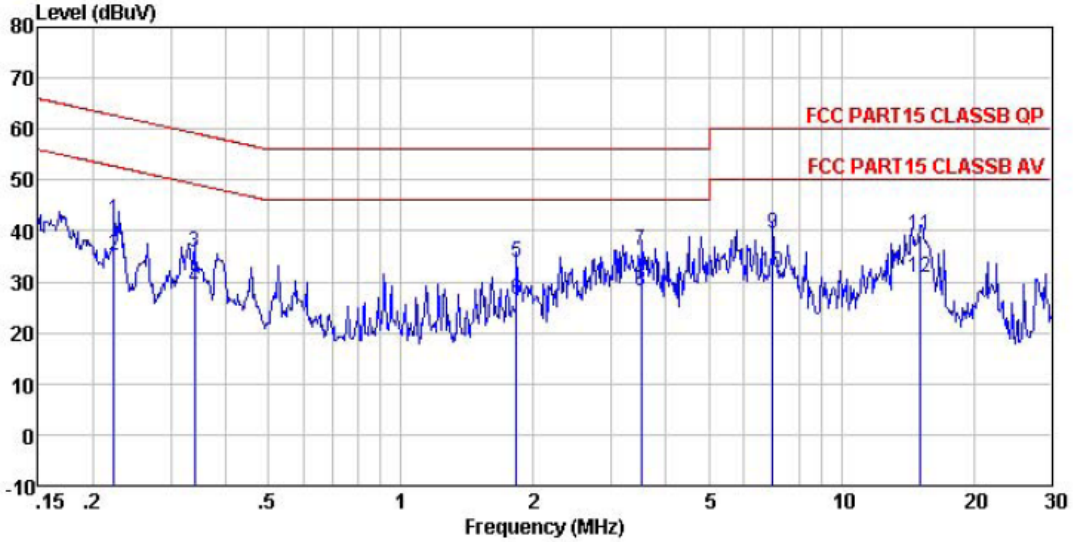
Line:



Condition : FCC PART15 CLASSB QP LISN(2011) LINE
Job No : 170RF
Test Mode : Transmitting mode
Test Engineer: Aarons

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.159	40.77	0.68	0.00	41.45	65.52	-24.07	QP
2	0.159	32.05	0.68	0.00	32.73	55.52	-22.79	Average
3	0.227	38.29	0.64	0.00	38.93	62.57	-23.64	QP
4	0.227	30.67	0.64	0.00	31.31	52.57	-21.26	Average
5	0.327	34.91	0.60	0.00	35.51	59.53	-24.02	QP
6	0.327	27.15	0.60	0.00	27.75	49.53	-21.78	Average
7	2.190	35.94	0.39	0.00	36.33	56.00	-19.67	QP
8	2.190	27.15	0.39	0.00	27.54	46.00	-18.46	Average
9	3.509	37.32	0.34	0.00	37.66	56.00	-18.34	QP
10	3.509	30.04	0.34	0.00	30.38	46.00	-15.62	Average
11	14.986	38.86	0.18	0.00	39.04	60.00	-20.96	QP
12	14.986	30.59	0.18	0.00	30.77	50.00	-19.23	Average

Neutral:



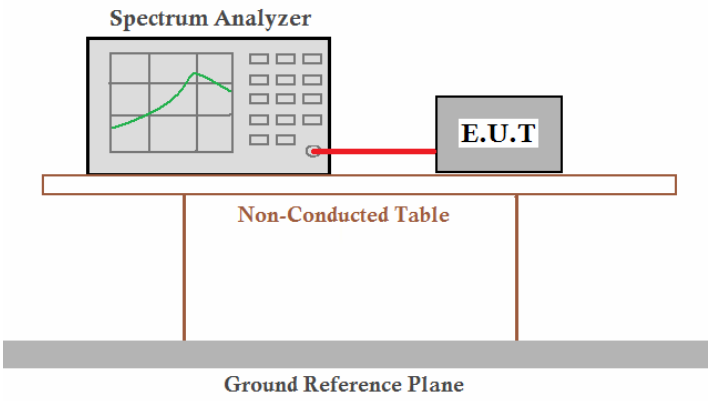
Condition : FCC PART15 CLASSB QP LISN(2011) NEUTRAL
Job No : 170RF
Test Mode : Transmitting mode
Test Engineer: Aarons

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.223	41.41	0.64	0.00	42.05	62.70	-20.65	QP
2	0.223	34.59	0.64	0.00	35.23	52.70	-17.47	Average
3	0.339	35.26	0.60	0.00	35.86	59.22	-23.36	QP
4	0.339	28.14	0.60	0.00	28.74	49.22	-20.48	Average
5	1.829	33.57	0.41	0.00	33.98	56.00	-22.02	QP
6	1.829	25.97	0.41	0.00	26.38	46.00	-19.62	Average
7	3.509	35.84	0.34	0.00	36.18	56.00	-19.82	QP
8	3.509	27.89	0.34	0.00	28.23	46.00	-17.77	Average
9	6.988	39.24	0.26	0.00	39.50	60.00	-20.50	QP
10	6.988	31.58	0.26	0.00	31.84	50.00	-18.16	Average
11	15.146	38.94	0.18	0.00	39.12	60.00	-20.88	QP
12	15.146	30.59	0.18	0.00	30.77	50.00	-19.23	Average

Notes:

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

6.3 Conducted Peak Output Power

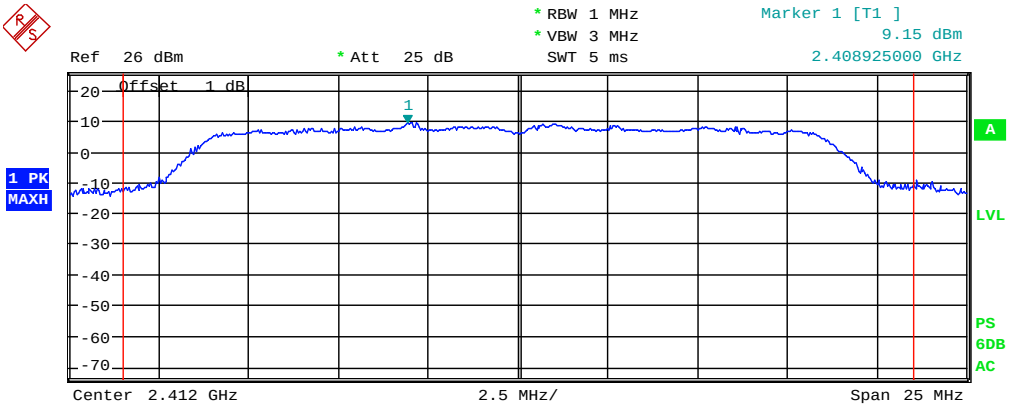
Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	ANSI C63.4:2003 and KDB558074 D01 Meas Guidance
Limit:	30dBm
Test setup:	
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement Data

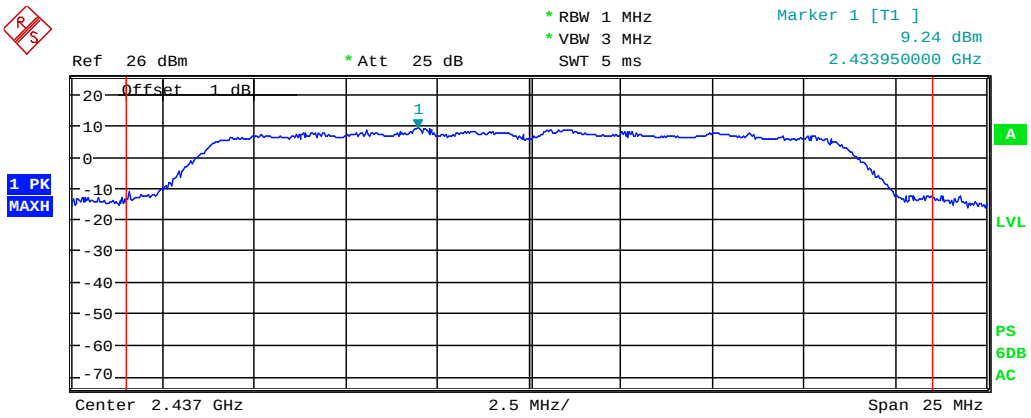
Test CH	Peak Output Power (dBm)		Limit(dBm)	Result
	802.11n(H20)	802.11n(H40)		
Lowest	19.16	18.72	30.00	Pass
Middle	18.92	18.85		
Highest	19.41	18.73		

Test plot as follows:

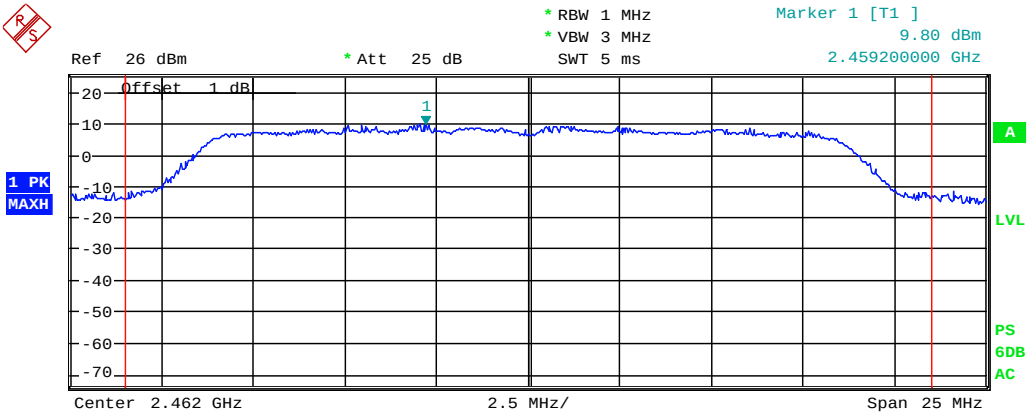
Test mode:	802.11n(H20)



Lowest channel

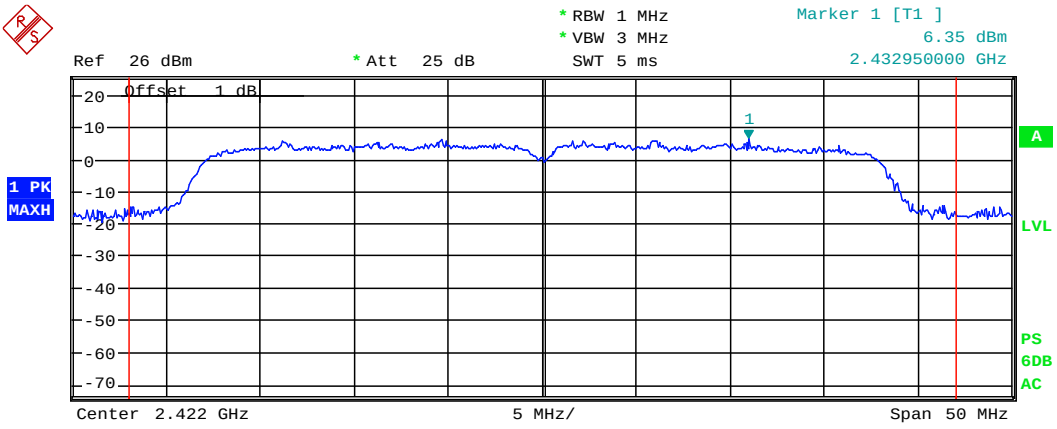


Middle channel

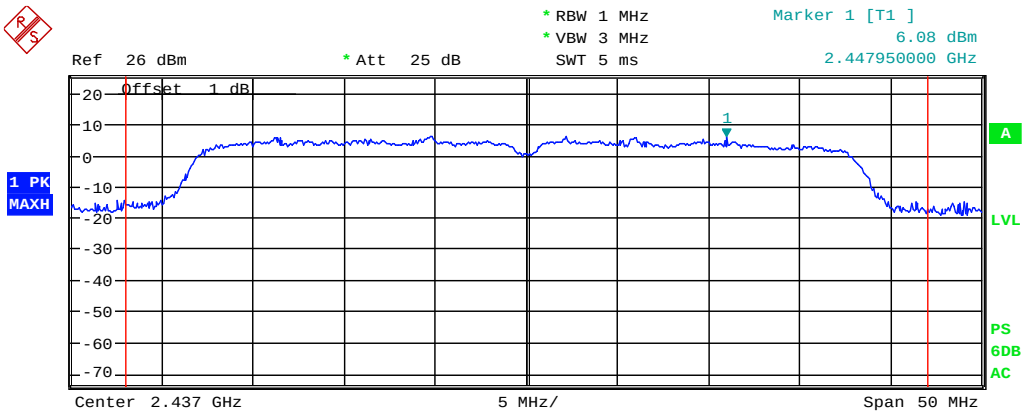


Highest channel

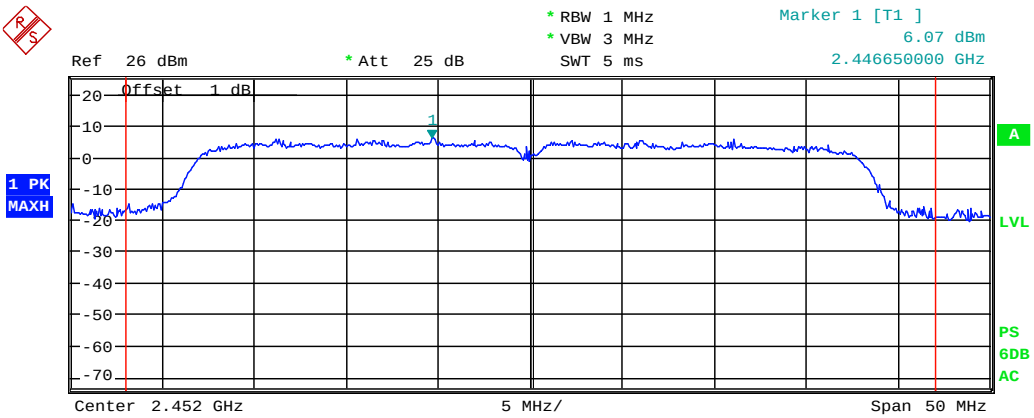
Test mode:	802.11n(H40)



Lowest channel

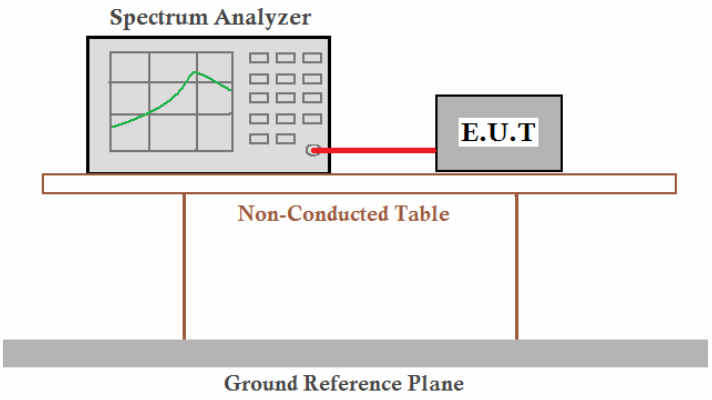


Middle channel



Highest channel

6.4 Emission Bandwidth

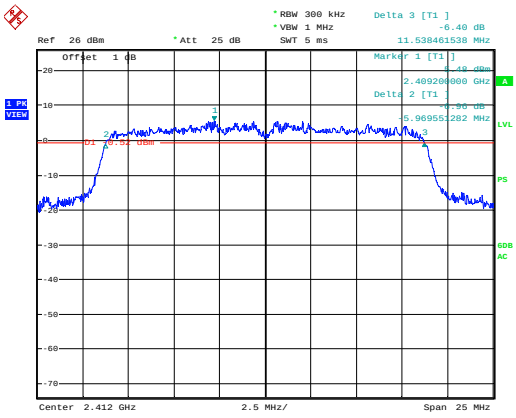
Test Requirement:	FCC Part15 C Section 15.247 (a)(2)
Test Method:	ANSI C63.4:2003 and KDB558074 D01 Meas Guidance
Limit:	>500KHz
Test setup:	
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement Data

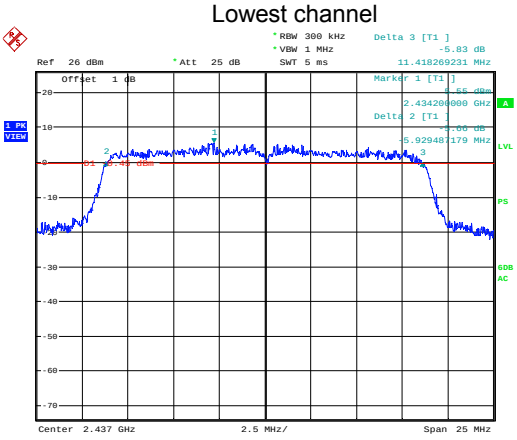
Test CH	Emission Bandwidth (MHz)		Limit(KHz)	Result
	802.11n(H20)	802.11n(H40)		
Lowest	17.51	35.58	>500	Pass
Middle	17.35	35.74		
Highest	17.43	35.66		

Test plot as follows:

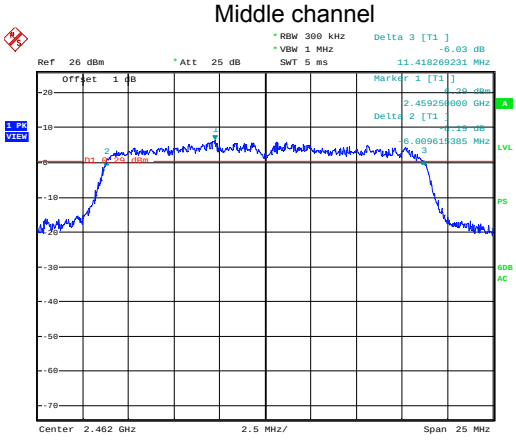
Test mode:	802.11n(H20)



Lowest channel

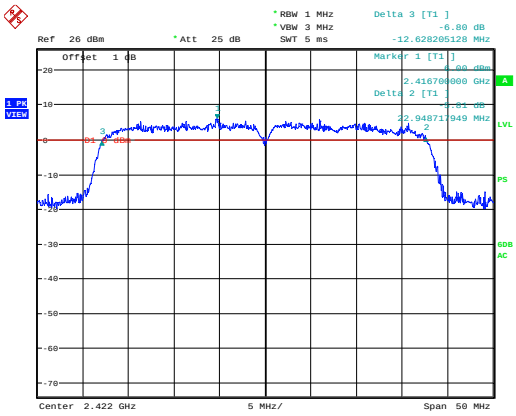


Middle channel



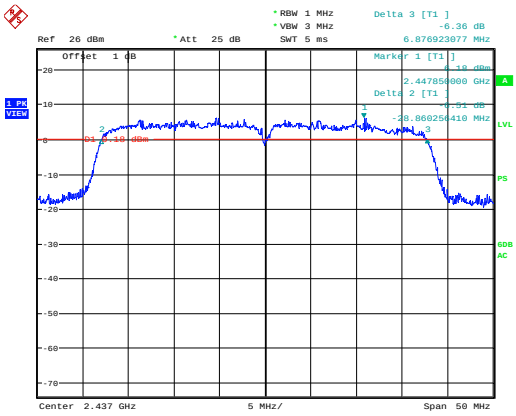
Highest channel

Test mode:	802.11n(H40)



Date: 15.MAR.2012 21:57:20

Lowest channel



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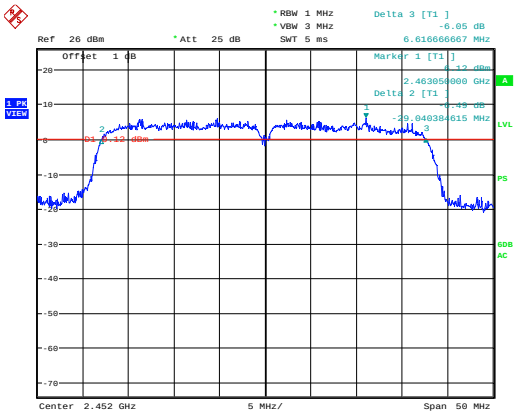
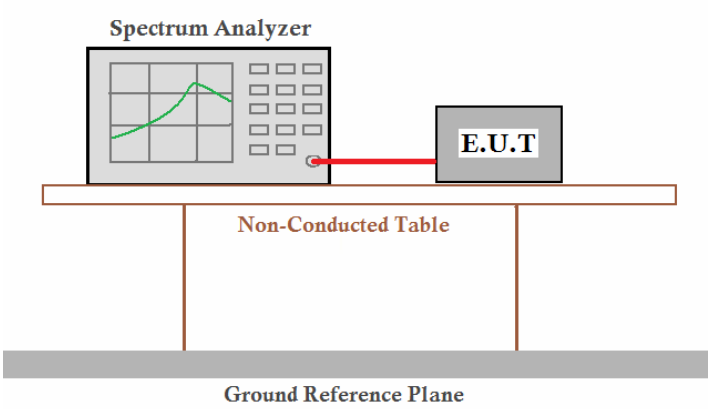
Middle channel



Date: 15.MAR.2012 22:04:21

Highest channel

6.5 Power Spectral Density

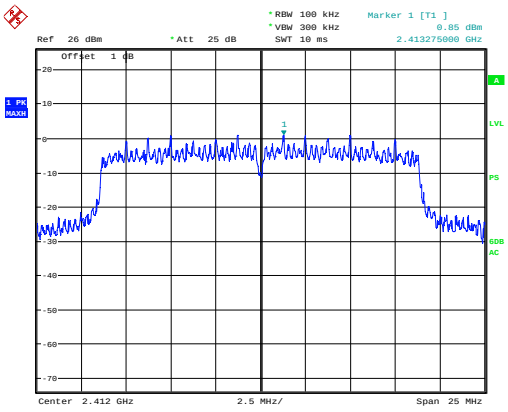
Test Requirement:	FCC Part15 C Section 15.247 (e)
Test Method:	ANSI C63.4:2003 and KDB558074 D01 Meas Guidance
Limit:	8dBm
Test setup:	
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement Data

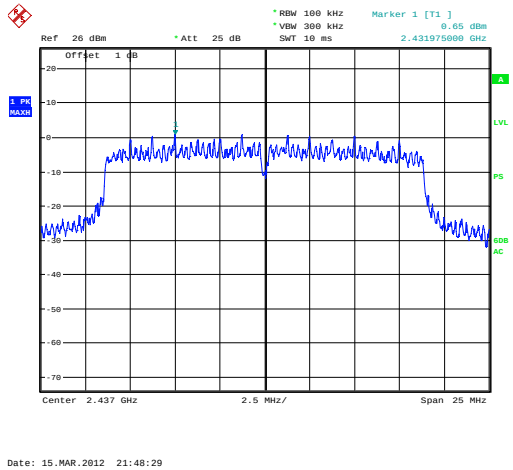
Test CH	Power Spectral Density (dBm/100KHz)		BWCF	Power Spectral Density (dBm/3KHz)		Limit (dBm/3KHz)	Result
	802.11n(H20)	802.11n(H40)		802.11n(H20)	802.11n(H40)		
Lowest	0.85	-2.35	-15.20	-14.35	-17.55	8.00	Pass
Middle	0.65	-2.50	-15.20	-14.55	-17.70		
Highest	1.11	-2.74	-15.20	-14.09	-17.94		
Remark: BWCF = 10log(3 kHz/100 kHz)= -15.20 dB							

Test plot as follows:

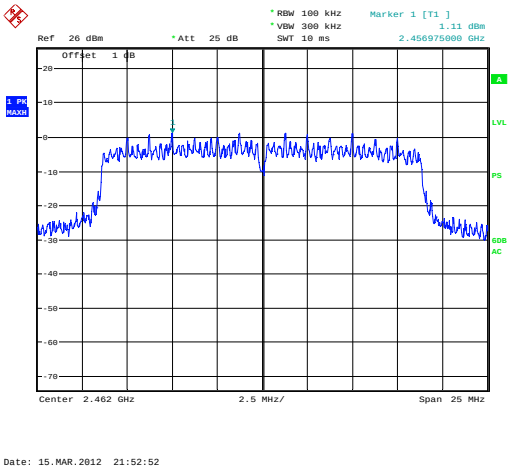
Test mode:	802.11n(H20)



Lowest channel

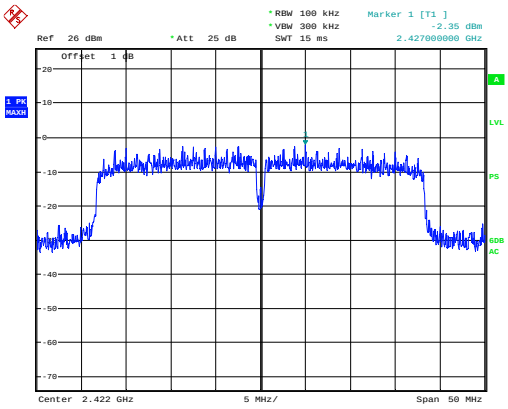


Middle channel

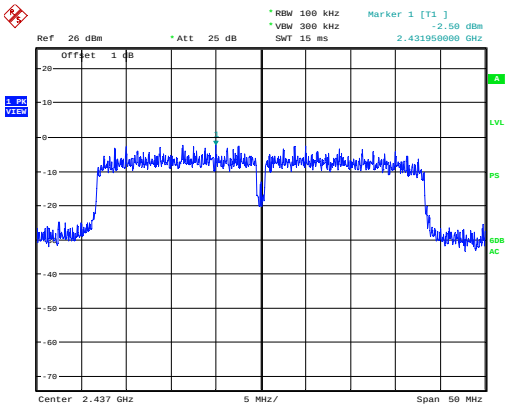


Highest channel

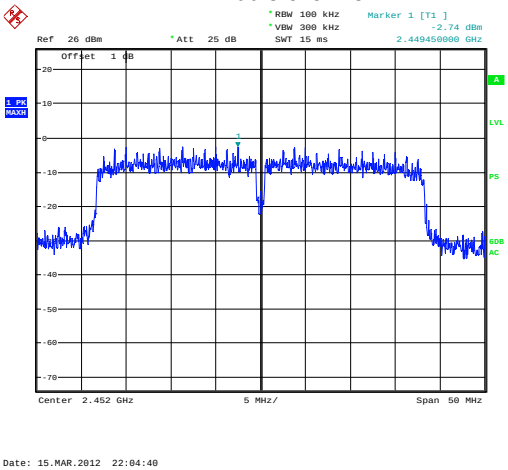
Test mode:	802.11n(H40)



Lowest channel



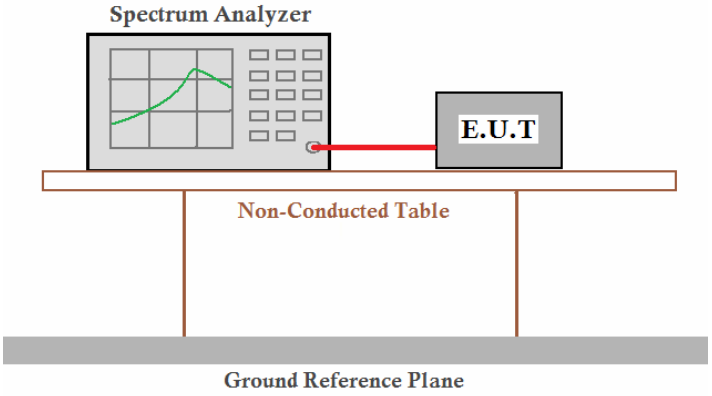
Middle channel



Highest channel

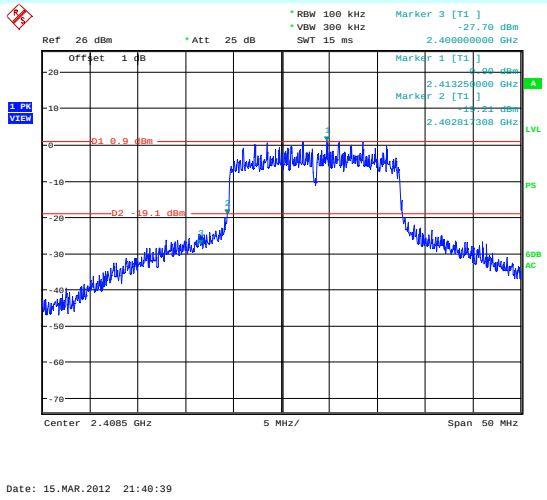
6.6 Band edges

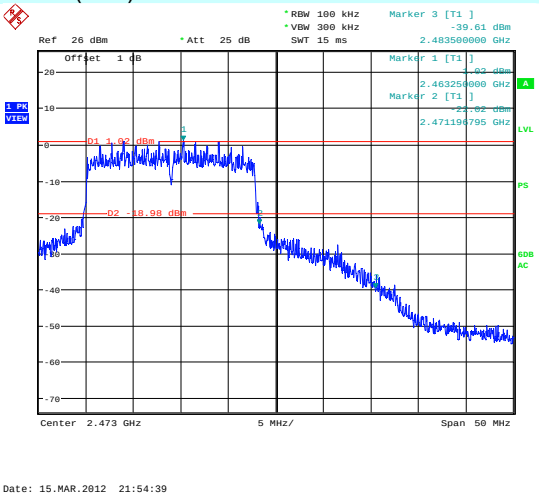
6.6.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.4:2003 and KDB558074 D01 Meas Guidance
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Test plot as follows:

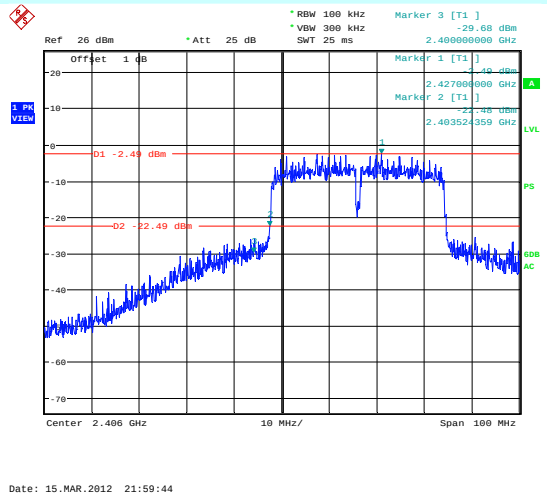
Test mode: 802.11n(H20)

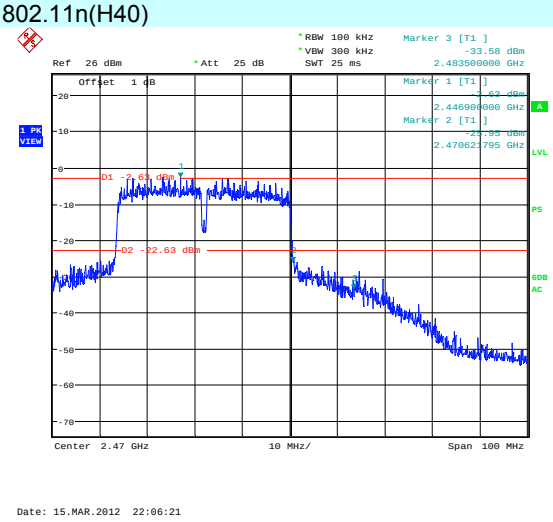




Lowest channel Highest channel

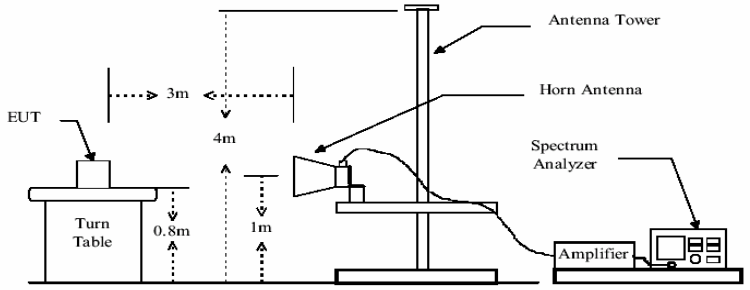
Test mode: 802.11n(H40)





Lowest channel Highest channel

6.6.2 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209 and 15.205
Test Method:	ANSI C63.4: 2003
Test Frequency Range:	30MHz to 25GHz
Test site:	Measurement Distance: 3m
Receiver setup:	Frequency / Detector / RBW / VBW / Remark Above 1GHz / Peak / 1MHz / 3MHz / Peak Value Above 1GHz / Peak / 1MHz / 10Hz / Average Value
Limit:	Frequency / Limit (dBuV/m @3m) / Remark Above 1GHz / 54.00 / Average Value Above 1GHz / 74.00 / Peak Value
Test setup:	
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 Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Remark:

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

Measurement data: Only report worse case

Test mode:	802.11n(H20)	Test channel:	Lowest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	49.42	27.59	3.33	30.10	50.24	74.00	-23.76	Horizontal
2400.00	53.43	27.58	3.37	30.10	54.28	74.00	-19.72	Horizontal
2390.00	35.13	27.59	3.33	30.10	35.95	74.00	-38.05	Vertical
2400.00	47.39	27.58	3.37	30.10	48.24	74.00	-25.76	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	34.75	27.59	3.33	30.10	35.57	54.00	-18.43	Horizontal
2400.00	34.68	27.58	3.37	30.10	35.53	54.00	-18.47	Horizontal
2390.00	35.29	27.59	3.33	30.10	36.11	54.00	-17.89	Vertical
2400.00	39.13	27.58	3.37	30.10	39.98	54.00	-14.02	Vertical

Test mode:	802.11n(H20)	Test channel:	Highest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	50.18	27.53	3.49	29.93	51.27	74.00	-22.73	Horizontal
2500.00	53.92	27.55	3.52	30.70	54.29	74.00	-19.71	Horizontal
2483.50	39.28	27.53	3.49	29.93	40.37	74.00	-33.63	Vertical
2500.00	47.99	27.55	3.52	30.70	48.36	74.00	-25.64	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	37.42	27.53	3.49	29.93	38.51	54.00	-15.49	Horizontal
2500.00	32.97	27.55	3.52	30.70	33.34	54.00	-20.66	Horizontal
2483.50	39.37	27.53	3.49	29.93	40.46	54.00	-13.54	Vertical
2500.00	37.79	27.55	3.52	30.70	38.16	54.00	-15.84	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.*

Test mode:	802.11n(H40)	Test channel:	Lowest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	50.41	27.59	3.33	30.10	51.23	74.00	-22.77	Horizontal
2400.00	53.16	27.58	3.37	30.10	54.01	74.00	-19.99	Horizontal
2390.00	48.97	27.59	3.33	30.10	49.79	74.00	-24.21	Vertical
2400.00	51.78	27.58	3.37	30.10	52.63	74.00	-21.37	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	33.02	27.59	3.33	30.10	33.84	54.00	-20.16	Horizontal
2400.00	38.07	27.58	3.37	30.10	38.92	54.00	-15.08	Horizontal
2390.00	32.24	27.59	3.33	30.10	33.06	54.00	-20.94	Vertical
2400.00	37.36	27.58	3.37	30.10	38.21	54.00	-15.79	Vertical

Test mode:	802.11n(H40)	Test channel:	Highest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	52.48	27.53	3.49	29.93	53.57	74.00	-20.43	Horizontal
2500.00	48.83	27.55	3.52	30.70	49.20	74.00	-24.80	Horizontal
2483.50	50.98	27.53	3.49	29.93	52.07	74.00	-21.93	Vertical
2500.00	47.47	27.55	3.52	30.70	47.84	74.00	-26.16	Vertical

Average value:

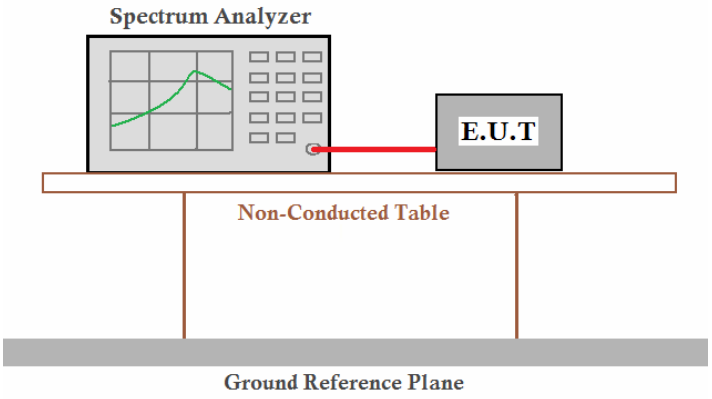
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	40.73	27.53	3.49	29.93	41.82	54.00	-12.18	Horizontal
2500.00	39.03	27.55	3.52	30.70	39.40	54.00	-14.60	Horizontal
2483.50	41.52	27.53	3.49	29.93	42.61	54.00	-11.39	Vertical
2500.00	39.79	27.55	3.52	30.70	40.16	54.00	-13.84	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

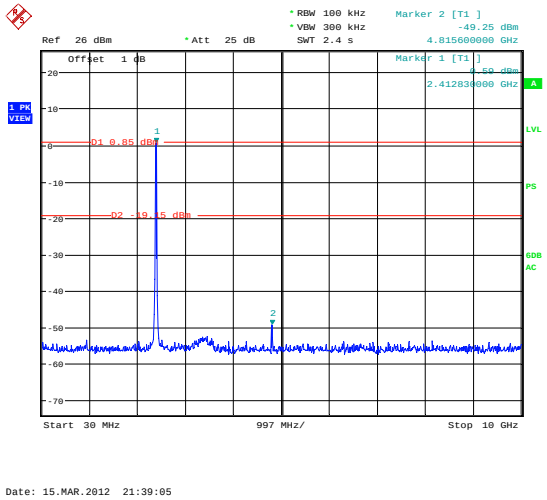
6.7.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.4:2003 and KDB558074 D01 Meas Guidance
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

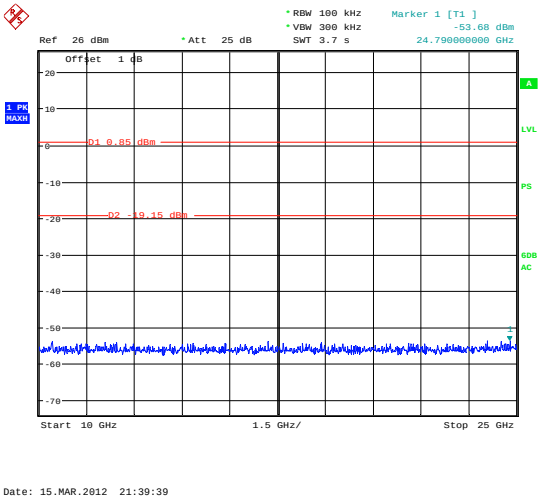
Test plot as follows:

Test mode:	802.11n(H20)

Lowest channel

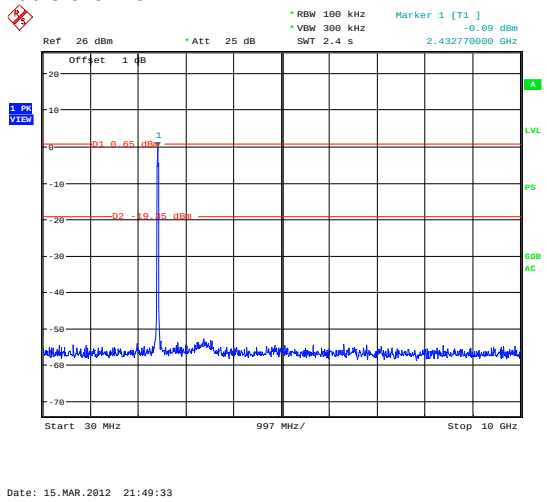


30MHz~10GHz

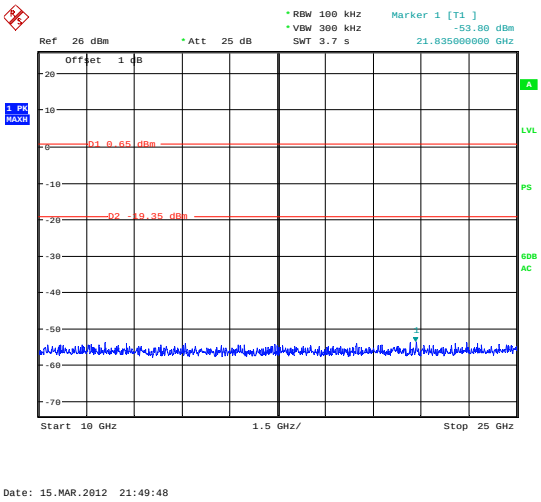


10GHz~25GHz

Middle channel

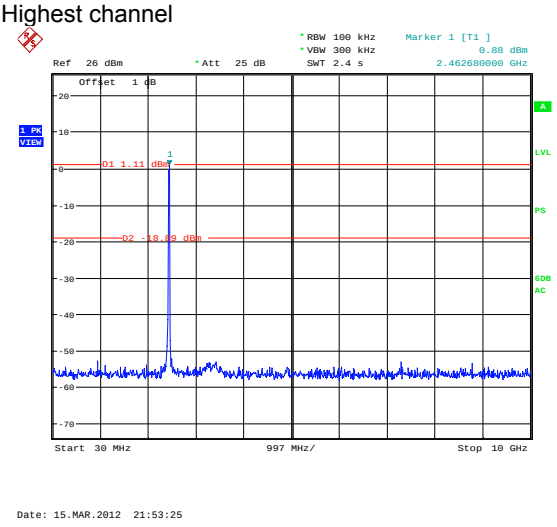


30MHz~10GHz

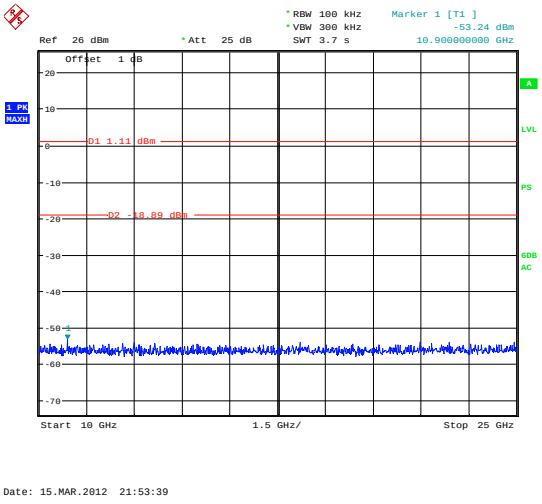


10GHz~25GHz

Highest channel



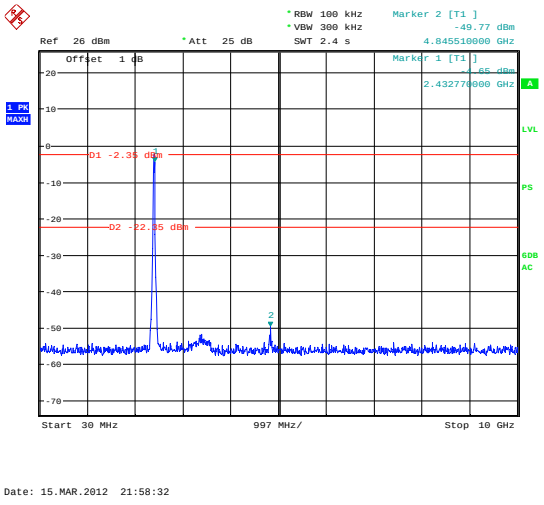
30MHz~10GHz



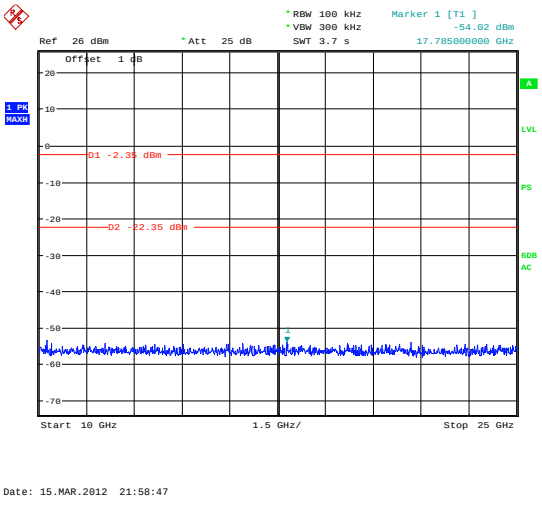
10GHz~25GHz

Test mode:	802.11n(H40)

Lowest channel

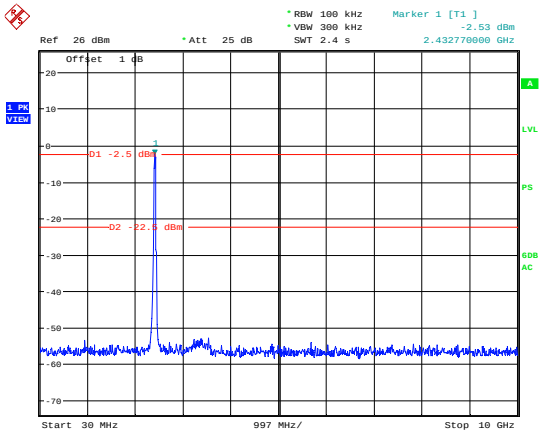


30MHz~10GHz

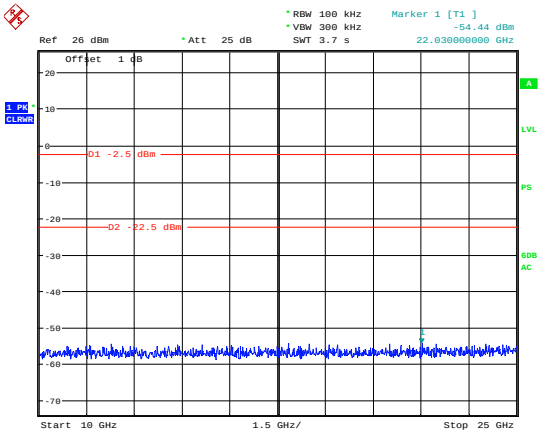


10GHz~25GHz

Middle channel

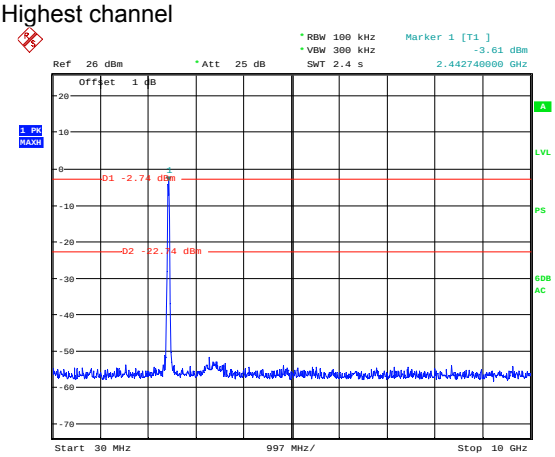


30MHz~10GHz

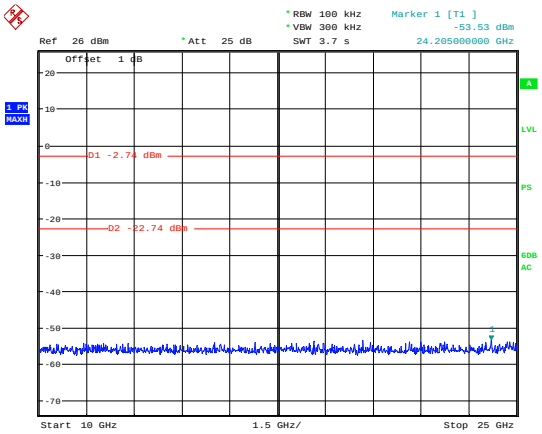


10GHz~25GHz

Highest channel

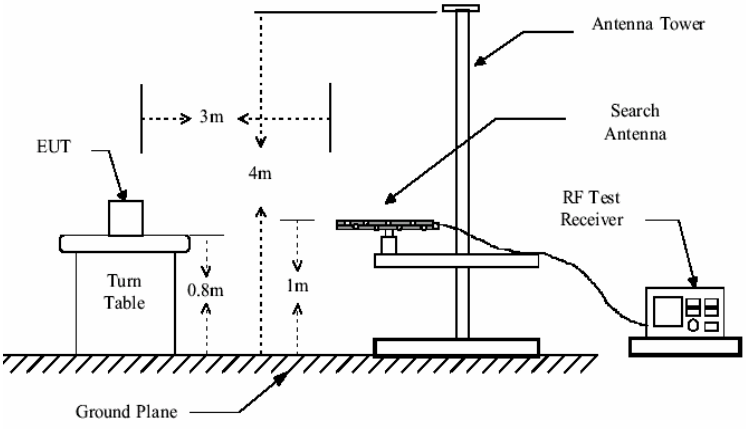


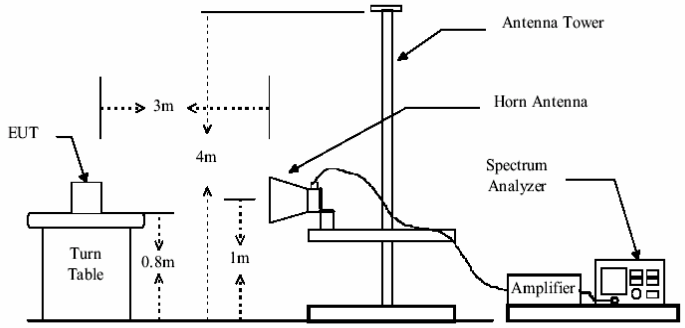
30MHz~10GHz



10GHz~25GHz

6.7.2 Radiated Emission Method

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.209</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.4: 2003</td></tr>
<tr><td>Test Frequency Range:</td><td>30MHz to 25GHz</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>30MHz-1GHz</td><td>Quasi-peak</td><td>100KHz</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>Peak</td><td>1MHz</td><td>10Hz</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>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 setup:</td><td>Below 1GHz
 

Above 1GHz
 
</td></tr>
</table>

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 Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Remark:

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

■ **Below 1GHz**

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
180.02	41.03	11.63	1.68	25.62	28.72	43.50	-14.78	Vertical
260.14	43.70	10.30	1.98	25.60	30.38	46.00	-15.62	Vertical
312.18	43.77	12.71	2.10	25.58	33.00	46.00	-13.00	Vertical
495.93	44.75	17.56	2.39	25.55	39.15	46.00	-6.85	Vertical
506.48	43.50	18.33	2.43	25.55	38.71	46.00	-7.29	Vertical
755.39	40.09	23.56	3.06	25.52	41.19	46.00	-4.81	Vertical
312.18	38.32	16.22	2.10	25.58	31.06	46.00	-14.94	Horizontal
497.68	38.95	21.19	2.40	25.55	36.99	46.00	-9.01	Horizontal
510.04	42.20	21.72	2.44	25.55	40.81	46.00	-5.19	Horizontal
614.21	40.89	22.16	2.73	25.54	40.24	46.00	-5.76	Horizontal
729.36	41.41	21.91	3.01	25.52	40.81	46.00	-5.19	Horizontal
768.75	40.68	22.64	3.09	25.52	40.89	46.00	-5.11	Horizontal

■ **Above 1GHz**

Test mode:	802.11n(H20)	Test channel:	Lowest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4824.00	52.36	31.79	5.34	24.07	65.42	74.00	-8.58	Vertical
7236.00	37.2	36.19	6.88	26.44	53.83	74.00	-20.17	Vertical
9648.00	31.91	38.07	8.96	25.36	53.58	74.00	-20.42	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
16884.00	*					74.00		Vertical
4824.00	44.44	31.79	5.34	24.07	57.50	74.00	-16.50	Horizontal
7236.00	32.98	36.19	6.88	26.44	49.61	74.00	-24.39	Horizontal
9648.00	31.54	38.07	8.96	25.36	53.21	74.00	-20.79	Horizontal
12060.00	*					74.00		Horizontal
14472.00	*					74.00		Horizontal
16884.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4824.00	30.93	31.79	5.34	24.07	43.99	54.00	-10.01	Vertical
7236.00	22	36.19	6.88	26.44	38.63	54.00	-15.37	Vertical
9648.00	21.45	38.07	8.96	25.36	43.12	54.00	-10.88	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
16884.00	*					54.00		Vertical
4824.00	39.57	31.79	5.34	24.07	52.63	54.00	-1.37	Horizontal
7236.00	30.73	36.19	6.88	26.44	47.36	54.00	-6.64	Horizontal
9648.00	21.27	38.07	8.96	25.36	42.94	54.00	-11.06	Horizontal
12060.00	*					54.00		Horizontal
14472.00	*					54.00		Horizontal
16884.00	*					54.00		Horizontal

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *"*", means this data is the too weak instrument of signal is unable to test.*

Test mode:	802.11n(H20)	Test channel:	Middle

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
4874.00	42.89	31.85	5.40	24.01	56.13	74.00	-17.87	Vertical
7311.00	34.66	36.37	6.90	26.58	51.35	74.00	-22.65	Vertical
9748.00	29.51	38.13	8.98	25.34	51.28	74.00	-22.72	Vertical
12185.00	*					74.00		Vertical
14682.00	*					74.00		Vertical
17179.00	*					74.00		Vertical
4874.00	46.17	31.85	5.40	24.01	59.41	74.00	-14.59	Horizontal
7311.00	30.41	36.37	6.90	26.58	47.10	74.00	-26.90	Horizontal
9748.00	26.84	38.13	8.98	25.34	48.61	74.00	-25.39	Horizontal
12185.00	*					74.00		Horizontal
14682.00	*					74.00		Horizontal
17179.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4874.00	30.89	31.85	5.40	24.01	44.13	54.00	-9.87	Vertical
7311.00	21.82	36.37	6.90	26.58	38.51	54.00	-15.49	Vertical
9748.00	19.13	38.13	8.98	25.34	40.90	54.00	-13.10	Vertical
12185.00	*					54.00		Vertical
14682.00	*					54.00		Vertical
17179.00	*					54.00		Vertical
4874.00	30.49	31.85	5.40	24.01	43.73	54.00	-10.27	Horizontal
7311.00	27.38	36.37	6.90	26.58	44.07	54.00	-9.93	Horizontal
9748.00	19.69	38.13	8.98	25.34	41.46	54.00	-12.54	Horizontal
12185.00	*					54.00		Horizontal
14682.00	*					54.00		Horizontal
17179.00	*					54.00		Horizontal

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *"*", means this data is the too weak instrument of signal is unable to test.*

Test mode:	802.11n(H20)	Test channel:	Highest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4924.00	52.73	31.89	5.46	23.96	66.12	74.00	-7.88	Vertical
7386.00	36.44	36.49	6.93	26.79	53.07	74.00	-20.93	Vertical
9848.00	29.56	38.83	10.41	24.90	53.90	74.00	-20.1	Vertical
12310.00	*					74.00		Vertical
14772.00	*					74.00		Vertical
17234.00	*					74.00		Vertical
4924.00	42.74	31.89	5.46	23.96	56.13	74.00	-17.87	Horizontal
7386.00	30.67	36.49	6.93	26.79	47.30	74.00	-26.70	Horizontal
9848.00	28.36	38.83	10.41	24.90	52.70	74.00	-21.30	Horizontal
12310.00	*					74.00		Horizontal
14772.00	*					74.00		Horizontal
17234.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4924.00	34.32	31.89	5.46	23.96	47.71	54.00	-6.29	Vertical
7386.00	23.67	36.49	6.93	26.79	40.30	54.00	-13.70	Vertical
9848.00	21.16	38.83	10.41	24.90	45.50	54.00	-8.50	Vertical
12310.00	*					54.00		Vertical
14772.00	*					54.00		Vertical
17234.00	*					54.00		Vertical
4924.00	25.63	31.89	5.46	23.96	39.02	54.00	-14.98	Horizontal
7386.00	29.11	36.49	6.93	26.79	45.74	54.00	-8.26	Horizontal
9848.00	21.73	38.83	10.41	24.90	46.07	54.00	-7.93	Horizontal
12310.00	*					54.00		Horizontal
14772.00	*					54.00		Horizontal
17234.00	*					54.00		Horizontal

Remark:

1 Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

2 "", means this data is the too weak instrument of signal is unable to test.*

Test mode:	802.11n(H40)	Test channel:	Lowest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4844.00	43.87	31.82	5.36	24.05	57.00	74.00	-17.00	Vertical
7266.00	30.11	36.28	6.89	26.51	46.77	74.00	-27.23	Vertical
9688.00	27.55	38.98	10.37	25.11	51.79	74.00	-22.21	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
16884.00	*					74.00		Vertical
4844.00	45.61	31.82	5.36	24.05	58.74	74.00	-15.26	Horizontal
7266.00	31.37	36.28	6.89	26.51	48.03	74.00	-25.97	Horizontal
9688.00	28.75	38.98	10.37	25.11	52.99	74.00	-21.01	Horizontal
12060.00	*					74.00		Horizontal
14472.00	*					74.00		Horizontal
16884.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4844.00	24.14	31.82	5.36	24.05	37.27	54.00	-16.73	Vertical
7266.00	22.45	36.28	6.89	26.51	39.11	54.00	-14.89	Vertical
9688.00	19.58	38.98	10.37	25.11	43.82	54.00	-10.18	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
16884.00	*					54.00		Vertical
4844.00	33.11	31.82	5.36	24.05	46.24	54.00	-7.76	Horizontal
7266.00	23.02	36.28	6.89	26.51	39.68	54.00	-14.32	Horizontal
9688.00	20.08	38.98	10.37	25.11	44.32	54.00	-9.68	Horizontal
12060.00	*					54.00		Horizontal
14472.00	*					54.00		Horizontal
16884.00	*					54.00		Horizontal

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *"*", means this data is the too weak instrument of signal is unable to test.*

Test mode:	802.11n(H40)	Test channel:	Middle

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
4874.00	43.39	31.85	5.40	24.01	56.63	74.00	-17.37	Vertical
7311.00	32.35	36.37	6.90	26.58	49.04	74.00	-24.96	Vertical
9748.00	28.96	38.13	8.98	25.34	50.73	74.00	-23.27	Vertical
12185.00	*					74.00		Vertical
14682.00	*					74.00		Vertical
17179.00	*					74.00		Vertical
4874.00	46.43	31.85	5.40	24.01	59.67	74.00	-14.33	Horizontal
7311.00	32.58	36.37	6.90	26.58	49.27	74.00	-24.73	Horizontal
9748.00	29.2	38.13	8.98	25.34	50.97	74.00	-23.03	Horizontal
12185.00	*					74.00		Horizontal
14682.00	*					74.00		Horizontal
17179.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4874.00	27.48	31.85	5.40	24.01	40.72	54.00	-13.28	Vertical
7311.00	22.25	36.37	6.90	26.58	38.94	54.00	-15.06	Vertical
9748.00	19.45	38.13	8.98	25.34	41.22	54.00	-12.78	Vertical
12185.00	*					54.00		Vertical
14682.00	*					54.00		Vertical
17179.00	*					54.00		Vertical
4874.00	31.17	31.85	5.40	24.01	44.41	54.00	-9.59	Horizontal
7311.00	22.04	36.37	6.90	26.58	38.73	54.00	-15.27	Horizontal
9748.00	19.14	38.13	8.98	25.34	40.91	54.00	-13.09	Horizontal
12185.00	*					54.00		Horizontal
14682.00	*					54.00		Horizontal
17179.00	*					54.00		Horizontal

Remark:

1. Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

2. "", means this data is the too weak instrument of signal is unable to test.*

Test mode:	802.11n(H40)	Test channel:	Highest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4904.00	42.2	31.88	5.42	23.97	55.53	74.00	-18.47	Vertical
7356.00	32.49	36.45	6.92	26.70	49.16	74.00	-24.84	Vertical
9808.00	30.52	38.27	9.00	25.30	52.49	74.00	-21.51	Vertical
12310.00	*					74.00		Vertical
14772.00	*					74.00		Vertical
17234.00	*					74.00		Vertical
4904.00	45.77	31.88	5.42	23.97	59.10	74.00	-14.90	Horizontal
7356.00	33.57	36.45	6.92	26.70	50.24	74.00	-23.76	Horizontal
9808.00	31.46	38.27	9.00	25.30	53.43	74.00	-20.57	Horizontal
12310.00	*					74.00		Horizontal
14772.00	*					74.00		Horizontal
17234.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4904.00	27.04	31.88	5.42	23.97	40.37	54.00	-13.63	Vertical
7356.00	23.65	36.45	6.92	26.70	40.32	54.00	-13.68	Vertical
9808.00	21.9	38.27	9.00	25.30	43.87	54.00	-10.13	Vertical
12310.00	*					54.00		Vertical
14772.00	*					54.00		Vertical
17234.00	*					54.00		Vertical
4904.00	32.69	31.88	5.42	23.97	46.02	54.00	-7.98	Horizontal
7356.00	24.13	36.45	6.92	26.70	40.80	54.00	-13.20	Horizontal
9808.00	22.56	38.27	9.00	25.30	44.53	54.00	-9.47	Horizontal
12310.00	*					54.00		Horizontal
14772.00	*					54.00		Horizontal
17234.00	*					54.00		Horizontal

Remark:

1 Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

2 "", means this data is the too weak instrument of signal is unable to test.*