APPLICATION FOR CERTIFICATION

On Behalf of

LG Electronics Inc.

Wi-Fi module

Model No.：WN8522D1

FCC ID：BEJWN8522D1

Brand : LG

Prepared for : LG Electronics Inc.
19-1, Cheongho-ri, Jinwi-myeon,
Pyeongtaek-si, Gyeonggi-do, 451-713, Korea

Prepared by : AUDIX Technology Corporation
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Date of Report	：	Nov. 05, 2010

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TEST REPORT CERTIFICATION

Applicant	:	LG Electronics Inc.
Manufacturer	:	Compal Networking (KunShan) Co., Ltd.
EUT Description	:	Wi-Fi module
FCC ID	:	**BEJWN8522D1**
	(A) Model No.	: WN8522D1
	(B) Serial No.	: N/A
	(C) Brand	: LG
	(D) Power Supply	: DC 5V (Powered by Notebook PC)

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C & E, Oct. 2009
And ANSI C63.4/2003

(FCC CFR 47 Part 15C & E, §15.205, §15.207, §15.209 and 15.407)

The device described above was tested by AUDIX Technology Corporation to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the FCC Part 15 subpart C & E limits.

The measurement results are contained in this test report and AUDIX Technology Corporation is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the FCC official limits.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of AUDIX Technology Corporation.

Date of Test: Oct. 06 ~ Nov. 05, 2010 Date of Report: Nov. 05, 2010

Producer: Tina Huang
(Tina Huang/Administrator)

Reviewer: Henning Chang
(Henning Chang/Supervisor)

Signatory: Ben Cheng
(Ben Cheng/Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description	:	Wi-Fi module The frequency range of 5150MHz ~ 5250MHz was tested in this report. The frequency range of 2400MHz ~ 2483.5MHz、5725MHz ~ 5850MHz has been tested and the test data are reported in other report of EM-F991000.
Model Number	:	WN8522D1
Serial Number	:	N/A
Brand	:	LG
FCC ID	:	BEJWN8522D1
Applicant	:	LG Electronics Inc. 19-1, Cheongho-ri, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do, 451-713, Korea
Manufacturer	:	Compal Networking (KunShan) Co., Ltd. 520 HaoTeng RD., Economic & Technical, Development Zone, Kunshan, JiangSu, China
Fundamental Range	:	2400MHz ~ 2483.5MHz and 5150MHz ~ 5250MHz and 5725MHz ~ 5850MHz
Radio Technology	:	802.11b: DSSS Modulation (DBPSK/DQPSK/CCK) 802.11a/g/n-HT20/n-HT40:OFDM Modulation (BPSK/QPSK/16QAM/64QAM)
Data Transfer Rate	:	802.11b: 1/2/5.5/11Mbps 802.11a/g: 6/9/12/18/24/48/54Mbps 802.11n: up to 300Mbps
Antenna Gain	:	4.67dBi (Peak)
Date of Receipt of Sample	:	Oct. 06, 2010
Date of Test	:	Oct. 06 ~ Nov. 05, 2010

Antenna Information

Antenna Part Number	Manufacture	Antenna Type	Peak Gain W/ Cable loss (dBi)	
			Frequency (MHz)	Max Gain (dBi)
Outer Ant./120800003700J	arcadyan	Metal Type-PIFA Antenna	2400-2500MHz	1.17dBi (peak)
			5150-5250MHz	4.67dBi (peak)
			5725-5850MHz	3.30dBi (peak)
Inner Ant./120800003600J	arcadyan	Metal Type-PIFA Antenna	2400-2500MHz	1.39dBi (peak)
			5150-5250MHz	3.89dBi (peak)
			5725-5850MHz	2.34dBi (peak)

1.2. Data Rate Relative to Output Power

802.11a			
Channel	Modulation	Date Rate (Mbps)	Power (dBm)
36	BPSK	6	16.10
36	BPSK	9	16.03
36	QPSK	12	15.98
36	QPSK	18	15.95
36	16-QAM	24	15.89
36	16-QAM	36	15.84
36	64-QAM	48	15.81
36	64-QAM	54	15.80

802.11n-HT20				802.11n-HT40			
Channel	Modulation	Date Rate (Mbps)	Power (dBm)	Channel	Modulation	Date Rate (Mbps)	Power (dBm)
36	BPSK	6.5	15.48	38	BPSK	6.5	14.99
36	QPSK	13	15.45	38	QPSK	13	14.97
36	QPSK	19.5	15.39	38	QPSK	19.5	14.95
36	16-QAM	26	15.37	38	16-QAM	26	14.91
36	16-QAM	39	15.35	38	16-QAM	39	14.88
36	64-QAM	52	15.31	38	64-QAM	52	14.85
36	64-QAM	58.6	15.28	38	64-QAM	58.6	14.83
36	64-QAM	65	15.27	38	64-QAM	65	14.81

1.3. Test Configuration for Each Test Item

Test Item	802.11a	802.11n-HT20	802.11n-HT40
	Data Rate for Test(Mbps)		
26dB Bandwidth	6	6.5	13.5
Emission Limitations	6	6.5	13.5
Maximum peak output power	6	6.5	13.5
Power spectral density	6	6.5	13.5
Peak power Excursion	6	6.5	13.5
Frequency Stability	6	6.5	13.5

1.4. Tested Supporting System Details

1.4.1. NOTEBOOK PC

Model Number	:	PP2170
Serial Number	:	N/A
FCC ID	:	By DoC
BSMI ID	:	33001
Brand	:	hp
AC Adapter	:	COMPAQ, M/N:Series PPP009L FCC By DoC DC Cord: Non-Shielded, Undetachable, 1.8m
USB Cable	:	Non-Shielded, Detachable, 0.25m
Power Cord	:	Non-Shielded, Detachable, 1.8m

1.5. Description of Test Facility

Name of Firm	:	**AUDIX Technology Corporation** EMC Department No. 53-11, Tin-Fu Tsun, Lin-Kou Hsiang, Taipei Hsien, Taiwan
Test Site (C2/Semi-AC)	:	**No. 2 Shielded Room &** No. 53-11, Tin-Fu Tsun, Lin-Kou Hsiang, Taipei Hsien, Taiwan **Semi-Anechoic Chamber** No. 53-11, Tin-Fu Tsun, Lin-Kou, Hsiang, Taipei Hsien, Taiwan May 14, 2009 Renewal on Federal Communication Commission Registration Number: 90993
NVLAP Lab. Code	:	200077-0
TAF Accreditation No	:	1724

1.6. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty (dB)
Conduction Test	150kHz~30MHz	± 1.73dB
Radiation Test (Distance: 3m)	30MHz~300MHz	± 2.91dB
	300MHz~1000MHz	± 2.74dB
	Above 1GHz	± 5.02dB

Remark：Uncertainty = $ku_c(y)$

Test Item	Uncertainty
26dB Bandwidth	± 0.2kHz
Emission Limitations	± 0.13dB
Maximum peak output power	± 0.33dBm
Power spectral density	± 0.13dB
Peak power Excursion	± 0.14dB
Frequency Stability	± 0.01%

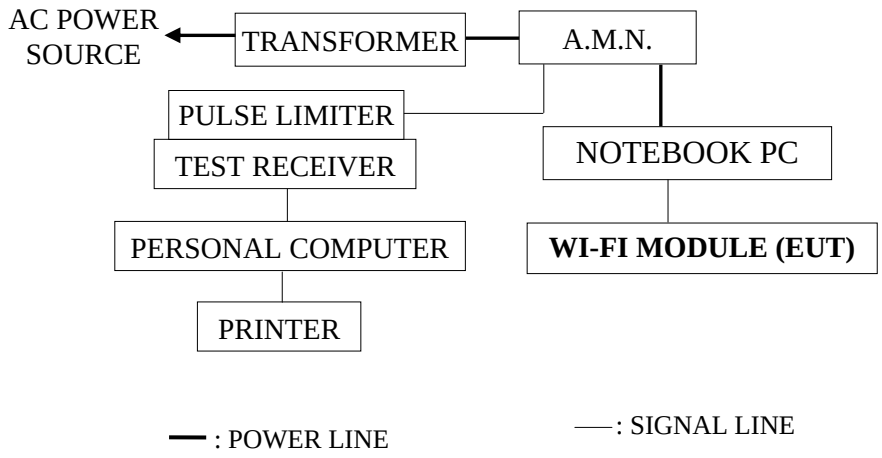
2. CONDUCTED EMISSION MEASUREMENT

2.1. Test Equipment

The following test equipment was used during the powerline conducted emission measurement: (No. 2 Shielded Room)

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R & S	ESCS30	100339	Mar. 10, 10'	Mar. 09, 11'
2.	A.M.N.	R & S	ESH2-Z5	890485/023	Jan. 14, 10'	Jan. 13, 11'
3.	Pulse Limiter	R & S	ESH3-Z2	001	Feb. 08, 10'	Feb. 07, 11'

2.2. Block Diagram of Test Setup



2.3. Powerline Conducted Emission Limit (§15.207, Class B)

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level	Average Level
150kHz ~ 500kHz	66 ~ 56 dBμV	56 ~ 46 dBμV
500kHz ~ 5MHz	56 dBμV	46 dBμV
5MHz ~ 30MHz	60 dBμV	50 dBμV

Remark: 1. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with the average detector is unnecessary.
2. The lower limit applies at the band edges.

2.4. Operating Condition of EUT

2.4.1. Setup the EUT and simulator as shown on 2.2.

2.4.2. Turn on the power of all equipment.

2.4.3. The Notebook PC was running test software “Broadcom WL Command” to set EUT (Wi-Fi module) on transmitting and receiving during all testing.

2.5. Test Procedure

The EUT (link Notebook PC) was put on table which was above the ground by 80cm and Notebook PC’s AC adapter’s power cord connected to the AC mains through an Artificial Mains Network (A.M.N.). This provided a 50Ω coupling impedance for the tested equipment. (Please refer to the block diagram of the test setup and photographs.)
Both sides of A.C. line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables were changed according to FCC ANSI C63.4-2003 during conducted measurement.

The bandwidth of the R&S Test Receiver ESCS30 was set at 9kHz.

The frequency range from 150kHz to 30MHz was pre-scanned with a peak detector.

The all final readings from test receiver were measured with Quasi-Peak detector and Average detector. (Remark : If the Average limit is met when using a Quasi-Peak detector, the Average detector is unnecessary)

2.6. Powerline Conducted Emission Measurement Results

PASSED.
(All the emissions not reported below are too low against the prescribed limits.)

EUT was performed during this section testing and all the test results are listed in next pages.

EUT：Wi-Fi module M/N：WN8522D1

Test Date：Oct. 14, 2010 Temperature：27℃ Humidity：73%

Reference Test Data：Neutral # 3; Line # 4

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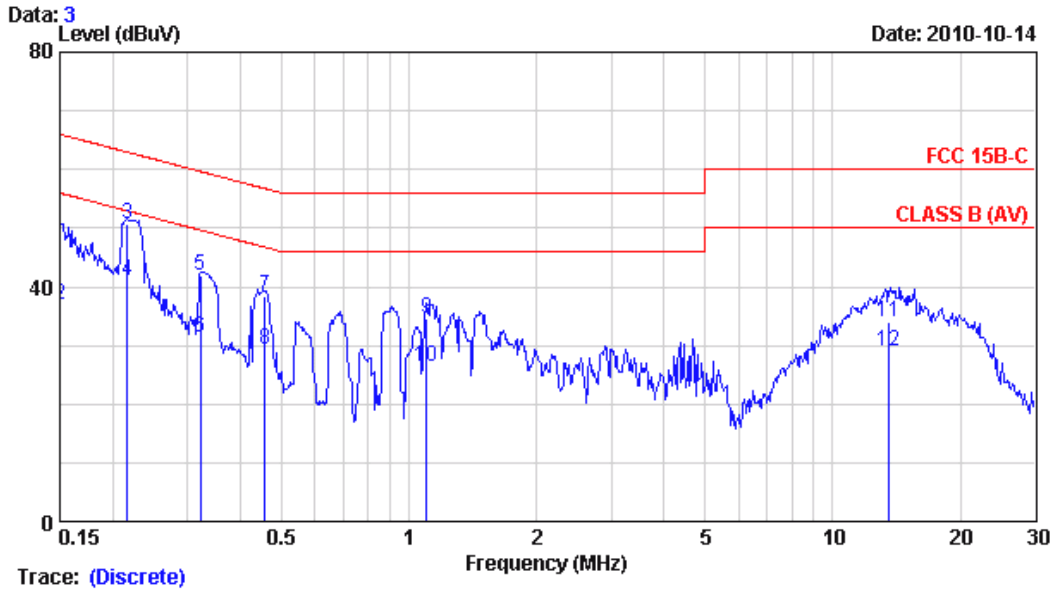


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Site          : No.2 Shielded room          Data     : 3
Condition     : ESH3-Z5                     Phase    : NEUTRAL
Limit         : FCC 15B-C
Env. / Ins.   : 27*C,73% / ESCS 30 (339)    Engineer: Charles_Yuan
EUT           : WN8522D1
Power Rating  : 120Vac/60Hz
Test Mode     : operating
```

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV)	Limits (dBµV)	Margin (dB)	Remark
1	0.150	0.10	0.24	49.49	49.83	66.00	16.17	QP
2	0.150	0.10	0.24	36.61	36.95	56.00	19.05	AVERAGE
3	0.216	0.10	0.27	50.30	50.67	62.96	12.30	QP
4	0.216	0.10	0.27	40.54	40.91	52.96	12.06	AVERAGE
5	0.322	0.10	0.30	41.40	41.80	59.67	17.86	QP
6	0.322	0.10	0.30	30.83	31.23	49.67	18.43	AVERAGE
7	0.456	0.10	0.33	38.01	38.44	56.76	18.32	QP
8	0.456	0.10	0.33	28.74	29.17	46.76	17.59	AVERAGE
9	1.100	0.10	0.40	34.07	34.57	56.00	21.43	QP
10	1.100	0.10	0.40	25.80	26.30	46.00	19.70	AVERAGE
11	13.620	0.56	0.70	32.74	34.00	60.00	26.00	QP
12	13.620	0.56	0.70	27.63	28.89	50.00	21.11	AVERAGE

```
Remarks: 1.Emission Level= AMN Factor + Cable Loss + Reading.
         2.If the average limit is met when using a quasi-peak detector
           ,the EUT shall be deemed to meet both limits and measurement
           with average detector is unnecessary.
```

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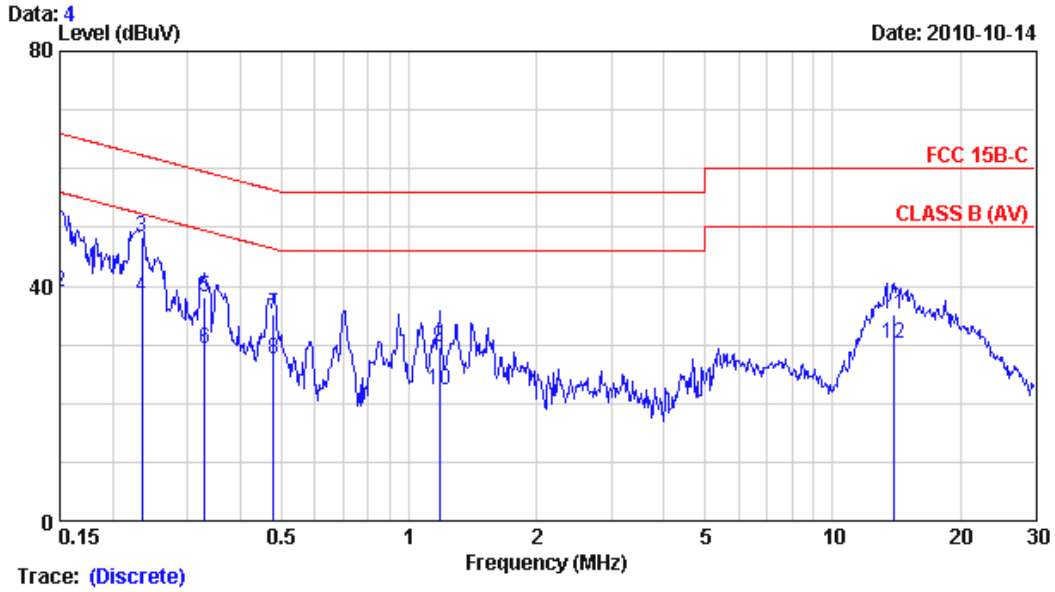



```
Site          : No.2 Shielded room          Data     : 4
Condition     : ESH3-Z5                     Phase    : LINE
Limit         : FCC 15B-C
Env. / Ins.   : 27*C,73% / ESCS 30 (339)    Engineer: Charles_Yuan
EUT           : WN8522D1
Power Rating  : 120Vac/60Hz
Test Mode     : operating
```

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV)	Limits (dBµV)	Margin (dB)	Remark	
1	0.150	0.10	0.24	50.49	50.83	66.00	15.17	QP	
2	0.150	0.10	0.24	38.68	39.02	56.00	16.98	AVERAGE	
3	0.234	0.10	0.27	47.93	48.30	62.31	14.00	QP	@
4	0.234	0.10	0.27	37.74	38.11	52.31	14.19	AVERAGE	
5	0.330	0.10	0.30	37.80	38.20	59.44	21.24	QP	
6	0.330	0.10	0.30	28.94	29.34	49.44	20.10	AVERAGE	
7	0.479	0.10	0.34	34.83	35.27	56.36	21.10	QP	
8	0.479	0.10	0.34	27.22	27.66	46.36	18.71	AVERAGE	
9	1.180	0.12	0.40	29.02	29.54	56.00	26.46	QP	
10	1.180	0.12	0.40	21.72	22.24	46.00	23.76	AVERAGE	
11	13.910	0.66	0.70	33.88	35.24	60.00	24.76	QP	
12	13.910	0.66	0.70	28.69	30.05	50.00	19.95	AVERAGE	

```
Remarks: 1.Emission Level= AMN Factor + Cable Loss + Reading.
         2.If the average limit is met when using a quasi-peak detector
           ,the EUT shall be deemed to meet both limits and measurement
           with average detector is unnecessary.
```

3. RADIATED EMISSION MEASUREMENT

3.1. Test Equipment

The following test equipment was used during the radiated emission measurement:

3.1.1. For Frequency Range 30MHz~1000MHz (at Semi-Anechoic Chamber)

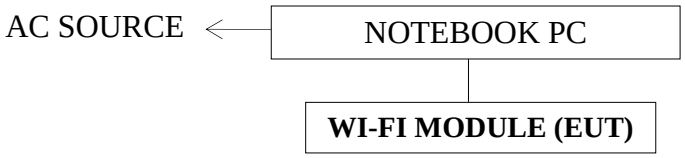
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	HP	8564EC	3946A00249	Oct. 27, 09’	Oct. 26, 10’
2.	Test Receiver	R & S	ESCS30	100338	Jul. 08, 10’	Jul. 07, 11’
3.	Amplifier	HP	8447D	2944A06305	Feb. 03, 10’	Feb. 02, 11’
4.	Log Periodic Antenna	Schwarzbeck	UHALP 9108-A	0810	Mar. 13, 10’	Mar. 12, 11’
5.	Biconical Antenna	CHASE	VBA6106A	1264	Mar. 13, 10’	Mar. 12, 11’

3.1.2. For Frequency Above 1GHz (at Semi-Anechoic Chamber)

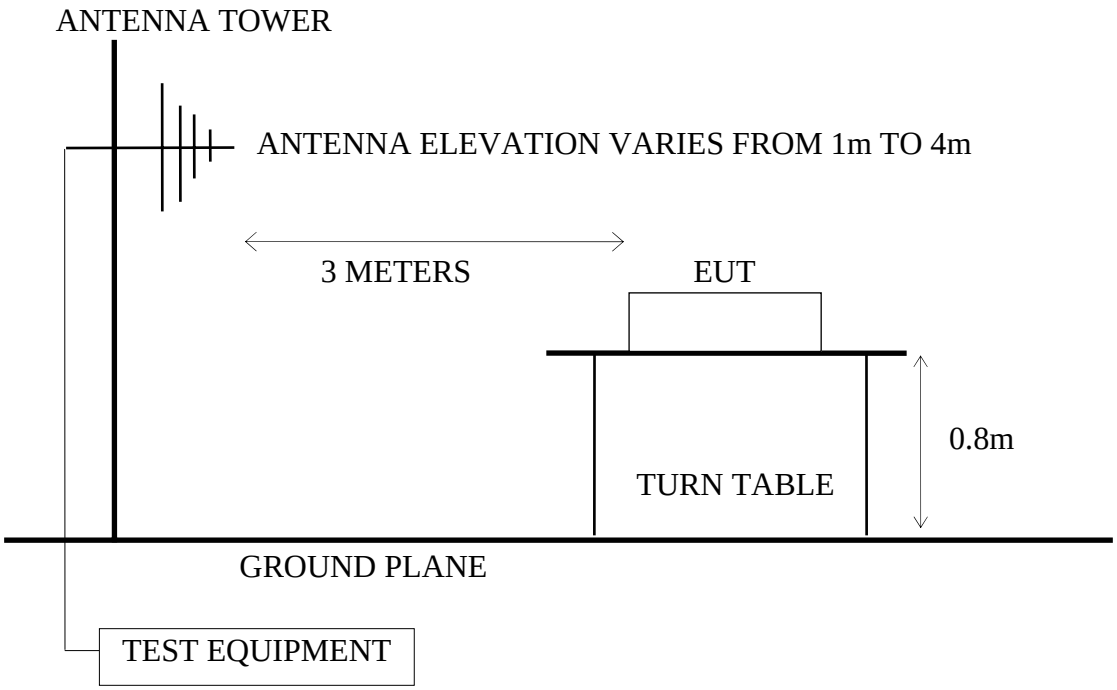
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	HP	8564EC	3946A00249	Oct. 27, 09’	Oct. 26, 10’
2.	Test Receiver	R & S	ESCS30	100338	Jul. 08, 10’	Jul. 07, 11’
3.	Amplifier	HP	8449B	3008A00529	Dec. 15, 09’	Dec. 14, 10’
4.	Horn Antenna	EMCO	3115	9112-3775	May 10, 10’	May 09, 11’
5.	Horn Antenna	EMCO	3116	2653	Oct. 04, 10’	Oct. 03, 11’

3.2. Test Setup

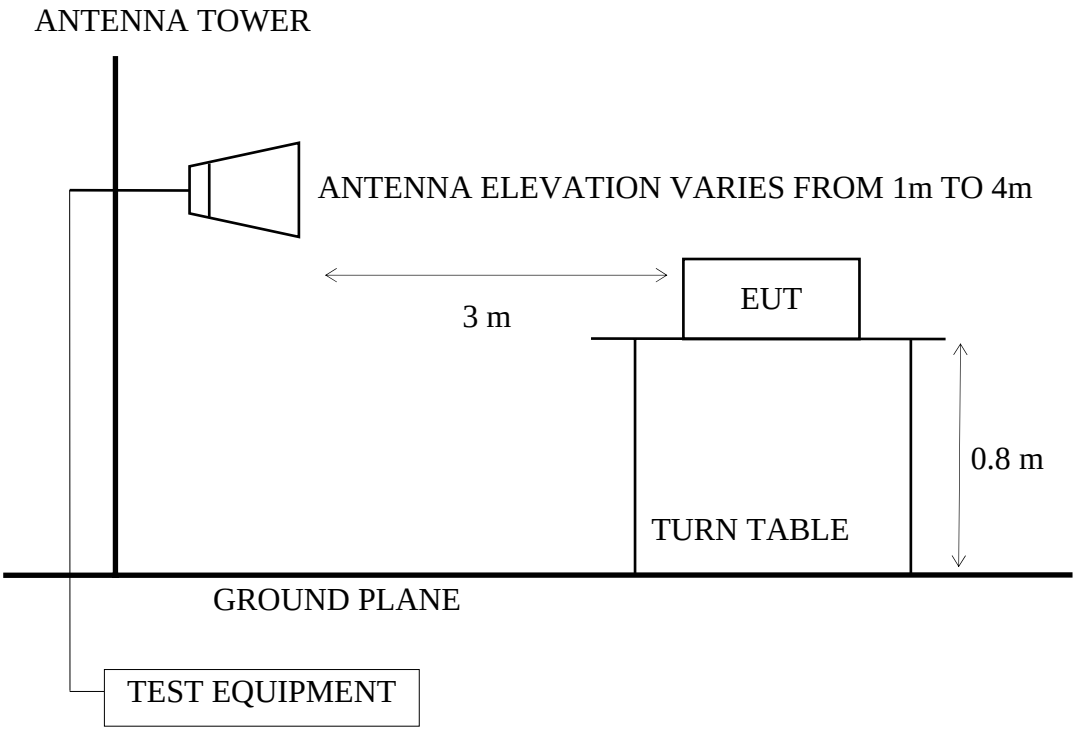
3.2.1. Block Diagram of connection between EUT and simulators



3.2.2. Semi-Anechoic Chamber (3m) Setup Diagram for 30-1000MHz



3.2.3. Semi-Anechoic Chamber (3m) Setup Diagram for above 1GHz



3.3. Radiated Emission Limits (§15.209)

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMITS	
		μV/m	dBμV/m
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
Above 960	3	500	54.0
Above 1000	3	74.0 dBμV/m (Peak) 54.0 dBμV/m (Average)	

Remark：(1) Emission level (dBμV/m) = 20 log Emission level (μV/m)
(2) The tighter limit applies at the edge between two frequency bands.
(3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
(4) The limits in this table are based on CFR 47 Part 15.205(a)(b) and Part 15.209 (a).
(5) The over 1GHz limit, FCC limit is used based on CFR 47 Part 15.35 (b) and Part 15.205(b) & Part 15.209(e) and Part 15.207(c).

3.4. Operating Condition of EUT

3.4.1. Set up the EUT (Wi-Fi module) via Notebook PC and simulator as shown on 3.2.

3.4.2. To turn on the power of all equipments.

3.4.3. The EUT was set the Notebook PC using test program “Broadcom WL Command”.

802.11a/802.11n-HT20

3.4.4. Transmit Mode: The EUT was set to continuously transmit signals at 5180Hz、5200MHz and 5240MHz during testing.

3.4.5. Receive Mode: The EUT was set to continuously receive signals at 5200MHz during testing.

802.11n-HT40

3.4.6. Transmit Mode: The EUT was set to continuously transmit signals at 5190Hz and 5230MHz during testing.

3.4.7. Receive Mode: The EUT was set to continuously receive signals at 5230MHz during testing.

3.5. Test Procedure

The EUT and its simulators were placed on a turn table which was 0.8 meter above the ground. The turn table rotated 360 degrees to determine the position of the maximum emission level. EUT was set 3 meters away from the receiving antenna which was mounted on a antenna tower. The antenna moved up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna such as calibrated biconical and log-periodical antenna or horn antenna were used as a receiving antenna. Both horizontal and vertical polarization of the antenna were set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to FCC ANSI C63.4-2003 regulation.

The bandwidth of the R&S Test Receiver was set at 120kHz. (For 30MHz to 1000MHz)

The resolution bandwidth and video bandwidth of test spectrum analyzer is 1MHz for peak detection (PK) at frequency above 1GHz.

The resolution bandwidth of test spectrum analyzer is 1MHz and the video bandwidth is 10Hz for average detection (AV) at frequency above 1GHz.

The frequency range from 30MHz to 40GHz (Up to 10^{th} harmonics from fundamental frequency) was checked. 30MHz to 1000MHz was measured with Quasi-Peak detector.

Above 1GHz was measured with peak and average detector. For frequency from 1GHz to 40GHz, we checked it in 1 meter distance and with a shorter cable 2 meter instead of original's. There is no signal exist.

3.6. Test Results

PASSED.
(All emissions not reported below are too low against the prescribed limits.)

EUT：Wi-Fi module M/N：WN8522D1

Test Date：Oct. 08, 2010 Temperature：25℃ Humidity：56%

The radiation tests on three different axes (stand, lie and side), we assessed the value and we selected the worst radiation position "lie" for our measured results.

For Frequency Range 30MHz~1000MHz:

The EUT select **worst position "lie"** and with following test modes was performed during this section testing and all the test results are listed in section 3.6.1.

Mode	Type of Network	Channel	Frequency	Test Mode	Reference Test Data	
					Horizontal	Vertical
1.	802.11a	CH 36	5180MHz	Transmit	# 1	# 2
2.		CH 40	5200MHz		# 2	# 1
3.		CH 48	5240MHz		# 1	# 2
4.		CH 40	5200MHz	Receive	# 2	# 1
5.	802.11n-HT20	CH 36	5180MHz	Transmit	# 1	# 2
6.		CH 40	5200MHz		# 2	# 1
7.		CH 48	5240MHz		# 1	# 2
8.		CH 40	5200MHz	Receive	# 2	# 1
9.	802.11n-HT40	CH 38	5190MHz	Transmit	# 1	# 2
10.		CH 46	5230MHz		# 2	# 1
11.		CH 46	5230MHz	Receive	# 2	# 1

* Above all final readings were measured with Quasi-Peak detector.

For Frequency above 1GHz:

The emissions not reported are too low to be measured.

For Restricted Bands:

The EUT was tested in restricted bands and all the test results are listed in section 3.6.3. (The restricted bands defined in part 15.205(a))

Mode	Type of Network	Channel	Frequency	Test Mode	Reference Test Data	
					Horizontal	Vertical
1.	802.11a	CH 36	5180MHz	Transmit	# 1, # 4	# 2, # 3
2.	802.11n-HT20	CH 36	5180MHz	Transmit	# 2, # 3	# 1, # 4
3.	802.11n-HT40	CH 38	5190MHz	Transmit	# 1, # 4	# 2, # 3

3.6.1. Frequency Range 30-1000MHz

802.11a, Transmit, Frequency: 5180MHz

```
Site no.      : A/C Chamber                 Data no.  : 1
Dis. / Ant.   : 3m   VBA6106A/UHALP9108A    Ant. pol. : HORIZONTAL
Limit         : FCC PART-15C
Env. / Ins.   : 8564EC 25℃/56%                        □Jarwei Wang
EUT           : WN8522D1
Power Rating  : DC 5V via notebook
Test Mode     : TX5180(802.11a)
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	201.690	22.07	3.03	3.35	28.45	43.50	15.05	
2	280.260	25.30	3.80	0.86	29.95	46.00	16.05	
3	295.780	26.48	4.00	0.18	30.65	46.00	15.35	
4	581.930	20.91	6.30	0.80	28.01	46.00	17.99	
5	880.690	25.34	7.30	0.18	32.82	46.00	13.18	
6	963.140	26.63	7.60	0.41	34.64	54.00	19.36	

```
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
         2. The emission levels that are 20dB below the official
            limit are not reported.
```

```
Site no.      : A/C Chamber                 Data no.  : 2
Dis. / Ant.   : 3m   VBA6106A/UHALP9108A    Ant. pol. : VERTICAL
Limit         : FCC PART-15C
Env. / Ins.   : 8564EC 25℃/56%                        □Jarwei Wang
EUT           : WN8522D1
Power Rating  : DC 5V via notebook
Test Mode     : TX5180(802.11a)
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	200.720	22.08	3.00	3.38	28.46	43.50	15.04	
2	297.720	26.68	3.98	-0.10	30.56	46.00	15.44	
3	619.760	21.35	6.20	0.43	27.98	46.00	18.02	
4	712.880	23.30	6.53	-0.72	29.11	46.00	16.89	
5	910.760	25.03	7.40	-0.18	32.26	46.00	13.74	
6	966.050	26.89	7.70	-0.42	34.17	54.00	19.83	

```
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
         2. The emission levels that are 20dB below the official
            limit are not reported.
```

802.11a, Transmit, Frequency: 5200MHz

```
Site no.      : A/C Chamber                  Data no.  : 2
Dis. / Ant.   : 3m   VBA6106A/UHALP9108A     Ant. pol. : HORIZONTAL
Limit         : FCC PART-15C
Env. / Ins.   : 8564EC 25℃/56%                          □Jarwei Wang
EUT           : WN8522D1
Power Rating  : DC 5V via notebook
Test Mode     : TX5200(802.11a)
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	189.080	21.46	2.90	1.58	25.94	43.50	17.56	
2	201.690	22.07	3.03	2.81	27.91	43.50	15.59	
3	569.320	21.17	6.50	-0.05	27.63	46.00	18.37	
4	863.230	26.09	7.20	-0.22	33.07	46.00	12.93	
5	901.060	24.95	7.40	1.04	33.39	46.00	12.61	
6	971.870	26.79	7.70	-0.18	34.31	54.00	19.69	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

```
Site no.      : A/C Chamber                  Data no.  : 1
Dis. / Ant.   : 3m   VBA6106A/UHALP9108A     Ant. pol. : VERTICAL
Limit         : FCC PART-15C
Env. / Ins.   : 8564EC 25℃/56%                          □Jarwei Wang
EUT           : WN8522D1
Power Rating  : DC 5V via notebook
Test Mode     : TX5200(802.11a)
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	200.720	22.08	3.00	2.94	28.02	43.50	15.48	
2	526.640	19.67	6.90	0.73	27.30	46.00	18.70	
3	581.930	20.91	6.30	0.82	28.03	46.00	17.97	
4	796.300	24.04	6.90	0.88	31.82	46.00	14.18	
5	959.260	26.38	7.60	0.58	34.57	46.00	11.43	
6	971.870	26.79	7.70	-0.20	34.29	54.00	19.71	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

802.11a, Transmit, Frequency: 5240MHz

```
Site no.      : A/C Chamber                  Data no.  : 1
Dis. / Ant.   : 3m   VBA6106A/UHALP9108A     Ant. pol. : HORIZONTAL
Limit         : FCC PART-15C
Env. / Ins.   : 8564EC 25℃/56%                          □Jarwei Wang
EUT           : WN8522D1
Power Rating  : DC 5V via notebook
Test Mode     : TX5240(802.11a)
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	200.720	22.08	3.00	3.78	28.86	43.50	14.64	
2	291.900	26.17	3.90	-0.45	29.62	46.00	16.38	
3	586.780	21.01	6.30	0.31	27.61	46.00	18.39	
4	700.270	23.46	6.50	-0.41	29.55	46.00	16.45	
5	830.250	24.75	7.10	1.08	32.93	46.00	13.07	
6	964.110	26.80	7.60	0.53	34.93	54.00	19.07	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

```
Site no.      : A/C Chamber                  Data no.  : 2
Dis. / Ant.   : 3m   VBA6106A/UHALP9108A     Ant. pol. : VERTICAL
Limit         : FCC PART-15C
Env. / Ins.   : 8564EC 25℃/56%                          □Jarwei Wang
EUT           : WN8522D1
Power Rating  : DC 5V via notebook
Test Mode     : TX5240(802.11a)
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	200.720	22.08	3.00	4.46	29.54	43.50	13.96	
2	299.660	26.77	3.90	0.31	30.98	46.00	15.02	
3	358.830	16.02	4.40	2.01	22.43	46.00	23.57	
4	784.660	23.87	6.90	0.64	31.41	46.00	14.59	
5	870.020	25.71	7.20	1.07	33.98	46.00	12.02	
6	961.200	26.50	7.60	-0.31	33.79	54.00	20.21	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

802.11a, Receive, Frequency: 5200MHz

```
Site no.      : A/C Chamber                  Data no.  : 2
Dis. / Ant.   : 3m   VBA6106A/UHALP9108A     Ant. pol. : HORIZONTAL
Limit         : FCC PART-15C
Env. / Ins.   : 8564EC 25℃/56%                         □Jarwei Wang
EUT           : WN8522D1
Power Rating  : DC 5V via notebook
Test Mode     : RX5200(802.11a)
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	200.720	22.08	3.00	3.06	28.14	43.50	15.36	
2	291.900	26.17	3.90	0.47	30.54	46.00	15.46	
3	581.930	20.91	6.30	1.17	28.38	46.00	17.62	
4	815.700	23.89	7.00	0.29	31.18	46.00	14.82	
5	870.020	25.71	7.20	0.46	33.37	46.00	12.63	
6	969.930	26.83	7.69	-0.18	34.35	54.00	19.65	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

```
Site no.      : A/C Chamber                  Data no.  : 1
Dis. / Ant.   : 3m   VBA6106A/UHALP9108A     Ant. pol. : VERTICAL
Limit         : FCC PART-15C
Env. / Ins.   : 8564EC 25℃/56%                         □Jarwei Wang
EUT           : WN8522D1
Power Rating  : DC 5V via notebook
Test Mode     : RX5200(802.11a)
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	200.720	22.08	3.00	3.29	28.37	43.50	15.13	
2	285.110	25.54	3.80	0.46	29.80	46.00	16.20	
3	297.720	26.68	3.98	-0.35	30.31	46.00	15.69	
4	581.930	20.91	6.30	1.56	28.77	46.00	17.23	
5	705.120	23.56	6.60	-0.09	30.07	46.00	15.93	
6	868.080	25.89	7.20	-0.52	32.57	46.00	13.43	
7	969.930	26.83	7.69	-0.86	33.67	54.00	20.33	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

802.11n-HT20, Transmit, Frequency: 5180MHz

```
Site no.      : A/C Chamber                  Data no.  : 1
Dis. / Ant.   : 3m   VBA6106A/UHALP9108A     Ant. pol. : HORIZONTAL
Limit         : FCC PART-15C
Env. / Ins.   : 8564EC 25℃/56%                          □Jarwei Wang
EUT           : WN8522D1
Power Rating  : DC 5V via notebook
Test Mode     : TX5180(802.11n-HT20)
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	201.690	22.07	3.03	3.72	28.82	43.50	14.68	
2	289.960	26.08	3.80	0.18	30.06	46.00	15.94	
3	375.320	17.15	4.60	1.93	23.68	46.00	22.32	
4	578.050	20.97	6.40	0.00	27.37	46.00	18.63	
5	852.560	25.70	7.10	-0.33	32.48	46.00	13.52	
6	971.870	26.79	7.70	1.04	35.53	54.00	18.47	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

```
Site no.      : A/C Chamber                  Data no.  : 2
Dis. / Ant.   : 3m   VBA6106A/UHALP9108A     Ant. pol. : VERTICAL
Limit         : FCC PART-15C
Env. / Ins.   : 8564EC 25℃/56%                          □Jarwei Wang
EUT           : WN8522D1
Power Rating  : DC 5V via notebook
Test Mode     : TX5180(802.11n-HT20)
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	201.690	22.07	3.03	3.32	28.42	43.50	15.08	
2	295.780	26.48	4.00	-0.28	30.20	46.00	15.80	
3	581.930	20.91	6.30	1.12	28.33	46.00	17.67	
4	705.120	23.56	6.60	-0.16	30.00	46.00	16.00	
5	840.920	25.08	7.10	0.26	32.44	46.00	13.56	
6	971.870	26.79	7.70	-0.20	34.29	54.00	19.71	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

802.11n-HT20, Transmit, Frequency: 5200MHz

```
Site no.      : A/C Chamber                  Data no.   : 2
Dis. / Ant.   : 3m   VBA6106A/UHALP9108A     Ant. pol. : HORIZONTAL
Limit         : FCC PART-15C
Env. / Ins.   : 8564EC 25℃/56%                          □Jarwei Wang
EUT           : WN8522D1
Power Rating  : DC 5V via notebook
Test Mode     : TX5200(802.11n-HT20)
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	201.690	22.07	3.03	28.57	27.87	43.50	15.63	
2	297.720	26.68	3.98	25.37	30.33	46.00	15.67	
3	569.320	21.17	6.50	26.73	27.33	46.00	18.67	
4	787.570	23.78	6.90	27.68	31.05	46.00	14.95	
5	859.350	26.01	7.20	27.39	33.47	46.00	12.53	
6	963.140	26.63	7.60	28.29	35.72	54.00	18.28	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

```
Site no.      : A/C Chamber                  Data no.   : 1
Dis. / Ant.   : 3m   VBA6106A/UHALP9108A     Ant. pol. : VERTICAL
Limit         : FCC PART-15C
Env. / Ins.   : 8564EC 25℃/56%                          □Jarwei Wang
EUT           : WN8522D1
Power Rating  : DC 5V via notebook
Test Mode     : TX5200(802.11n-HT20)
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	201.690	22.07	3.03	29.57	28.87	43.50	14.63	
2	261.830	24.57	3.60	26.81	29.25	46.00	16.75	
3	288.990	25.97	3.80	26.46	30.52	46.00	15.48	
4	611.030	21.41	6.30	27.39	27.87	46.00	18.13	
5	702.210	23.53	6.50	27.54	30.18	46.00	15.82	
6	973.810	26.64	7.70	26.66	34.23	54.00	19.77	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

802.11n-HT20, Transmit, Frequency: 5240MHz

```
Site no.      : A/C Chamber                 Data no.  : 1
Dis. / Ant.   : 3m   VBA6106A/UHALP9108A    Ant. pol. : HORIZONTAL
Limit         : FCC PART-15C
Env. / Ins.   : 8564EC 25℃/56%                        □Jarwei Wang
EUT           : WN8522D1
Power Rating  : DC 5V via notebook
Test Mode     : TX5240(802.11n-HT20)
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	201.690	22.07	3.03	3.88	28.98	43.50	14.52	
2	432.550	17.28	5.20	1.79	24.26	46.00	21.74	
3	581.930	20.91	6.30	0.82	28.03	46.00	17.97	
4	707.060	23.55	6.60	0.80	30.95	46.00	15.05	
5	865.170	26.00	7.20	-0.51	32.69	46.00	13.31	
6	969.930	26.83	7.69	-0.08	34.45	54.00	19.55	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

```
Site no.      : A/C Chamber                 Data no.  : 2
Dis. / Ant.   : 3m   VBA6106A/UHALP9108A    Ant. pol. : VERTICAL
Limit         : FCC PART-15C
Env. / Ins.   : 8564EC 25℃/56%                        □Jarwei Wang
EUT           : WN8522D1
Power Rating  : DC 5V via notebook
Test Mode     : TX5240(802.11n-HT20)
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	201.690	22.07	3.03	2.93	28.03	43.50	15.47	
2	299.660	26.77	3.90	-0.21	30.46	46.00	15.54	
3	525.670	19.66	6.90	1.32	27.88	46.00	18.12	
4	704.150	23.56	6.60	-0.50	29.66	46.00	16.34	
5	863.230	26.09	7.20	-0.71	32.58	46.00	13.42	
6	969.930	26.83	7.69	-0.75	33.78	54.00	20.22	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

802.11n-HT20, Receive, Frequency: 5200MHz

```
Site no.      : A/C Chamber                  Data no.  : 2
Dis. / Ant.   : 3m   VBA6106A/UHALP9108A     Ant. pol. : HORIZONTAL
Limit         : FCC PART-15C
Env. / Ins.   : 8564EC 25℃/56%                         □Jarwei Wang
EUT           : WN8522D1
Power Rating  : DC 5V via notebook
Test Mode     : RX5200(802.11n-HT20)
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	201.690	22.07	3.03	2.88	27.98	43.50	15.52	
2	290.930	26.14	3.90	-0.44	29.60	46.00	16.40	
3	581.930	20.91	6.30	0.98	28.19	46.00	17.81	
4	676.020	22.89	6.40	0.33	29.61	46.00	16.39	
5	866.140	25.97	7.20	-0.23	32.94	46.00	13.06	
6	964.110	26.80	7.60	1.71	36.11	54.00	17.89	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

```
Site no.      : A/C Chamber                  Data no.  : 1
Dis. / Ant.   : 3m   VBA6106A/UHALP9108A     Ant. pol. : VERTICAL
Limit         : FCC PART-15C
Env. / Ins.   : 8564EC 25℃/56%                         □Jarwei Wang
EUT           : WN8522D1
Power Rating  : DC 5V via notebook
Test Mode     : RX5200(802.11n-HT20)
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	201.690	22.07	3.03	3.14	28.24	43.50	15.26	
2	297.720	26.68	3.98	0.29	30.95	46.00	15.05	
3	403.450	17.54	4.90	0.79	23.23	46.00	22.77	
4	571.260	21.14	6.50	0.24	27.88	46.00	18.12	
5	705.120	23.56	6.60	0.40	30.56	46.00	15.44	
6	964.110	26.80	7.60	-0.26	34.14	54.00	19.86	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

802.11n-HT40, Transmit, Frequency: 5190MHz

```
Site no.      : A/C Chamber                  Data no.  : 1
Dis. / Ant.   : 3m   VBA6106A/UHALP9108A     Ant. pol. : HORIZONTAL
Limit         : FCC PART-15C
Env. / Ins.   : 8564EC 25℃/56%                          □Jarwei Wang
EUT           : WN8522D1
Power Rating  : DC 5V via notebook
Test Mode     : TX5190(802.11n-HT40)
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	201.690	22.07	3.03	4.10	29.20	43.50	14.30	
2	297.720	26.68	3.98	-0.56	30.10	46.00	15.90	
3	534.400	19.57	7.00	1.08	27.65	46.00	18.35	
4	707.060	23.55	6.60	-0.75	29.40	46.00	16.60	
5	878.750	25.35	7.30	0.68	33.33	46.00	12.67	
6	967.990	26.90	7.69	-0.41	34.18	54.00	19.82	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

```
Site no.      : A/C Chamber                  Data no.  : 2
Dis. / Ant.   : 3m   VBA6106A/UHALP9108A     Ant. pol. : VERTICAL
Limit         : FCC PART-15C
Env. / Ins.   : 8564EC 25℃/56%                          □Jarwei Wang
EUT           : WN8522D1
Power Rating  : DC 5V via notebook
Test Mode     : TX5190(802.11n-HT40)
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	201.690	22.07	3.03	30.39	29.69	43.50	13.81	
2	297.720	26.68	3.98	25.42	30.38	46.00	15.62	
3	504.330	19.02	6.62	28.33	27.15	46.00	18.85	
4	705.120	23.56	6.60	27.39	30.16	46.00	15.84	
5	870.020	25.71	7.20	27.61	33.44	46.00	12.56	
6	966.050	26.89	7.70	27.35	35.14	54.00	18.86	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

802.11n-HT40, Transmit, Frequency: 5230MHz

```
Site no.      : A/C Chamber                 Data no.  : 2
Dis. / Ant.   : 3m   VBA6106A/UHALP9108A    Ant. pol. : HORIZONTAL
Limit         : FCC PART-15C
Env. / Ins.   : 8564EC 25℃/56%                        □Jarwei Wang
EUT           : WN8522D1
Power Rating  : DC 5V via notebook
Test Mode     : TX5230(802.11n-HT40)
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	200.720	22.08	3.00	29.11	28.39	43.50	15.11	
2	297.720	26.68	3.98	25.31	30.27	46.00	15.73	
3	476.200	18.55	6.00	28.40	26.19	46.00	19.81	
4	704.150	23.56	6.60	26.45	29.22	46.00	16.78	
5	861.290	26.09	7.20	26.64	32.83	46.00	13.17	
6	964.110	26.80	7.60	26.61	34.21	54.00	19.79	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

```
Site no.      : A/C Chamber                 Data no.  : 1
Dis. / Ant.   : 3m   VBA6106A/UHALP9108A    Ant. pol. : VERTICAL
Limit         : FCC PART-15C
Env. / Ins.   : 8564EC 25℃/56%                        □Jarwei Wang
EUT           : WN8522D1
Power Rating  : DC 5V via notebook
Test Mode     : TX5230(802.11n-HT40)
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	201.690	22.07	3.03	3.39	28.49	43.50	15.01	
2	295.780	26.48	4.00	-0.83	29.64	46.00	16.36	
3	480.080	18.68	6.05	2.16	26.89	46.00	19.11	
4	569.320	21.17	6.50	-0.05	27.63	46.00	18.37	
5	791.450	23.94	6.90	0.94	31.78	46.00	14.22	
6	858.380	25.98	7.20	-0.45	32.73	46.00	13.27	
7	971.870	26.79	7.70	-0.09	34.40	54.00	19.60	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

802.11n-HT40, Receive, Frequency: 5230MHz

```
Site no.      : A/C Chamber                  Data no.  : 2
Dis. / Ant.   : 3m   VBA6106A/UHALP9108A     Ant. pol. : HORIZONTAL
Limit         : FCC PART-15C
Env. / Ins.   : 8564EC 25℃/56%                         □Jarwei Wang
EUT           : WN8522D1
Power Rating  : DC 5V via notebook
Test Mode     : RX5230(802.11n-HT40)
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	201.690	22.07	3.03	3.74	28.84	43.50	14.66	
2	292.870	26.24	3.90	-0.12	30.02	46.00	15.98	
3	581.930	20.91	6.30	0.70	27.91	46.00	18.09	
4	709.000	23.54	6.60	-0.62	29.53	46.00	16.47	
5	858.380	25.98	7.20	-0.50	32.68	46.00	13.32	
6	966.050	26.89	7.70	0.53	35.12	54.00	18.88	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

```
Site no.      : A/C Chamber                  Data no.  : 1
Dis. / Ant.   : 3m   VBA6106A/UHALP9108A     Ant. pol. : VERTICAL
Limit         : FCC PART-15C
Env. / Ins.   : 8564EC 25℃/56%                         □Jarwei Wang
EUT           : WN8522D1
Power Rating  : DC 5V via notebook
Test Mode     : RX5230(802.11n-HT40)
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	201.690	22.07	3.03	4.06	29.16	43.50	14.34	
2	292.870	26.24	3.90	0.19	30.33	46.00	15.67	
3	511.120	19.69	6.80	0.90	27.39	46.00	18.61	
4	581.930	20.91	6.30	0.75	27.96	46.00	18.04	
5	808.910	24.13	7.00	0.48	31.61	46.00	14.39	
6	963.140	26.63	7.60	0.25	34.48	54.00	19.52	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

3.6.2. Restricted Bands Measurement Results

Date of Test： Oct. 08, 2010 Temperature： 25℃

EUT： Wi-Fi module Humidity： 56%

Test Mode： 802.11a, Transmit, Channel: 36, Frequency: 5180MHz

	Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Horizontal dBμV	Emission Level Horizontal dBμV/m	Limits dBμV/m	Margin dB
Peak *	5149.900	33.64	9.43	19.97	63.04	74.00	10.96
Average *	5150.00	33.64	9.43	5.09	48.16	54.00	5.84

Remark ： 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
2. Low frequency section (spurious in the restricted band 4500-5150MHz).
3. '*' The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.

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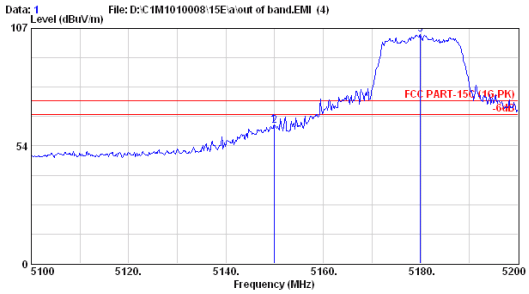

Site no. : A/C Chamber Data no. : 1
Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
Limit : FCC PART-15C (1G-PK)
Env. / Ins. : 8564EC 25℃/56% ☐Jarwei Wang
EUT : WN8522D1
Power Rating : DC 5V via notebook
Test Mode : TX5180(802.11a)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	5149.900	33.64	9.43	19.97	63.05	74.00	10.95	Peak
2	5150.000	33.64	9.43	19.71	62.79	74.00	11.21	Peak
3	5179.900	33.69	9.46	61.00	104.15	74.00	-30.15	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

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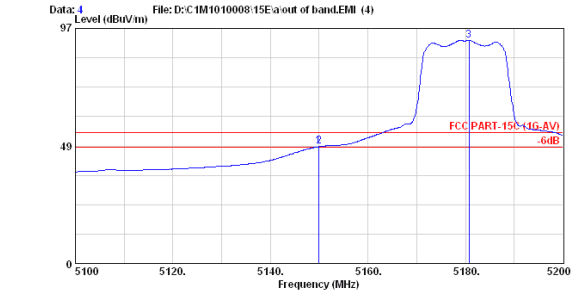

Site no. : A/C Chamber Data no. : 4
Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
Limit : FCC PART-15C (1G-AV)
Env. / Ins. : 8564EC 25℃/56% ☐Jarwei Wang
EUT : WN8522D1
Power Rating : DC 5V via notebook
Test Mode : TX5180(802.11a)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	5149.900	33.64	9.43	5.07	48.15	54.00	5.85	Average
2	5150.000	33.64	9.43	5.09	48.17	54.00	5.83	Average
3	5180.700	33.69	9.46	48.94	92.09	54.00	-38.09	Average

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Date of Test： Oct. 08, 2010 Temperature： 25℃

EUT： Wi-Fi module Humidity： 56%

Test Mode： 802.11a, Transmit, Channel: 36, Frequency: 5180MHz

	Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Vertical dBμV	Emission Level Vertical dBμV/m	Limits dBμV/m	Margin dB
Peak *	5150.000	33.64	9.43	20.45	63.52	74.00	10.48
Average *	5150.000	33.64	9.43	2.94	46.01	54.00	7.99

Remark ： 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
2. Low frequency section (spurious in the restricted band 4500-5150MHz).
3. '*' The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.

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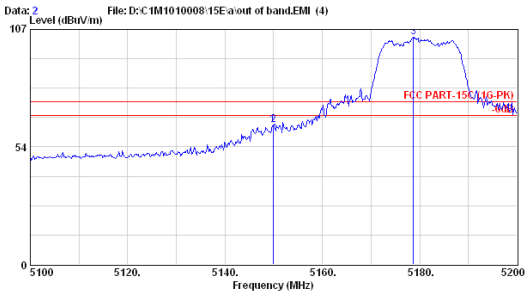

Site no. : A/C Chamber Data no. : 2
Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
Limit : FCC PART-15C (1G-PK)
Env. / Ins. : 8564EC 25℃/56% ☐Jarwei Wang
EUT : WN8522D1
Power Rating : DC 5V via notebook
Test Mode : TX5180(802.11a)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	5149.900	33.64	9.43	20.32	63.40	74.00	10.60	Peak
2	5150.000	33.64	9.43	20.45	63.52	74.00	10.48	Peak
3	5178.700	33.69	9.46	60.52	103.67	74.00	-29.67	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

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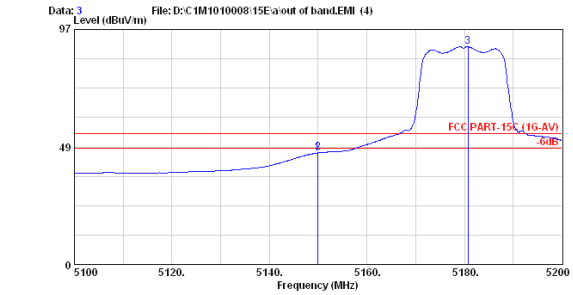

Site no. : A/C Chamber Data no. : 3
Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
Limit : FCC PART-15C (1G-AV)
Env. / Ins. : 8564EC 25℃/56% ☐Jarwei Wang
EUT : WN8522D1
Power Rating : DC 5V via notebook
Test Mode : TX5180(802.11a)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	5149.900	33.64	9.43	2.90	45.98	54.00	8.02	Average
2	5150.000	33.64	9.43	2.94	46.02	54.00	7.98	Average
3	5180.700	33.69	9.46	46.63	89.78	54.00	-35.78	Average

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Date of Test： Oct. 08, 2010 Temperature： 25℃

EUT： Wi-Fi module Humidity： 56%

Test Mode： 802.11n-HT20, Transmit, Channel: 36, Frequency: 5180MHz

	Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Horizontal dBμV	Emission Level Horizontal dBμV/m	Limits dBμV/m	Margin dB
Peak *	5142.200	33.64	9.43	18.75	61.82	74.00	12.18
Average *	5150.000	33.64	9.43	3.89	46.96	54.00	7.04

Remark ： 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
2. High frequency section (spurious in the restricted band 4500-5150MHz).
3. '*' The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.

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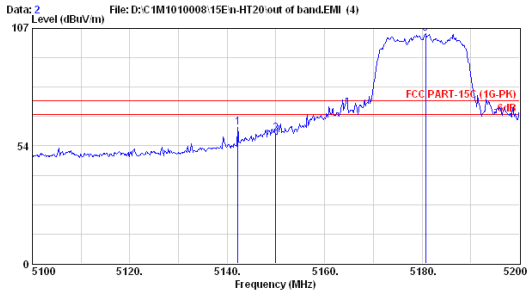

Site no. : A/C Chamber Data no. : 2
Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
Limit : FCC PART-15C (1G-PK)
Env. / Ins. : 8564EC 25℃/56% ☐Jarwei Wang
EUT : WN8522D1
Power Rating : DC 5V via notebook
Test Mode : TX5180(802.11n-HT20)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	5142.200	33.64	9.43	18.75	61.82	74.00	12.18	Peak
2	5150.000	33.64	9.43	15.93	59.00	74.00	15.00	Peak
3	5180.700	33.69	9.46	61.68	104.83	74.00	-30.83	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

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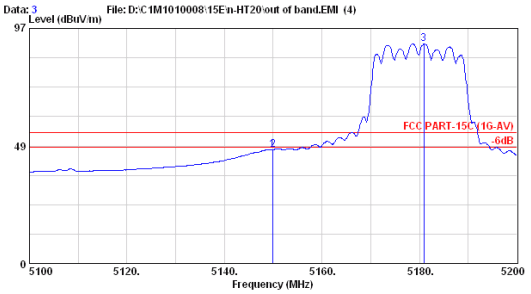

Site no. : A/C Chamber Data no. : 3
Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
Limit : FCC PART-15C (1G-AV)
Env. / Ins. : 8564EC 25℃/56% ☐Jarwei Wang
EUT : WN8522D1
Power Rating : DC 5V via notebook
Test Mode : TX5180(802.11n-HT20)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	5149.900	33.64	9.43	3.85	46.93	54.00	7.07	Average
2	5150.000	33.64	9.43	3.89	46.97	54.00	7.03	Average
3	5180.900	33.69	9.46	47.38	90.53	54.00	-36.53	Average

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Date of Test： Oct. 08, 2010 Temperature： 25℃

EUT： Wi-Fi module Humidity： 56%

Test Mode： 802.11n-HT20, Transmit, Channel: 36, Frequency: 5180MHz

	Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Vertical dBμV	Emission Level Vertical dBμV/m	Limits dBμV/m	Margin dB
Peak *	5149.900	33.64	9.43	17.60	60.67	74.00	13.33
Average *	5150.000	33.64	9.43	2.94	46.01	54.00	7.99

Remark ： 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
2. High frequency section (spurious in the restricted band 4500-5150MHz).
3. '*' The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.

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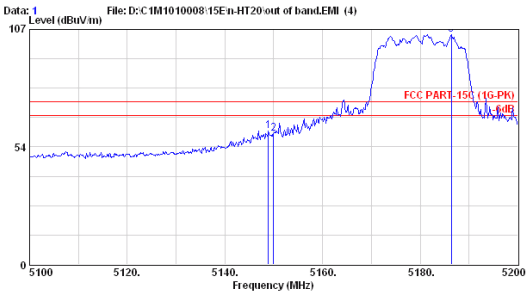

Site no. : A/C Chamber Data no. : 1
Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
Limit : FCC PART-15C (1G-PK)
Env. / Ins. : 8564EC 25℃/56% ☐Jarwei Wang
EUT : WN8522D1
Power Rating : DC 5V via notebook
Test Mode : TX5180(802.11n-HT20)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	5148.900	33.64	9.43	17.60	60.67	74.00	13.33	Peak
2	5150.000	33.64	9.43	16.67	59.75	74.00	14.25	Peak
3	5186.400	33.69	9.46	61.63	104.78	74.00	-30.78	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

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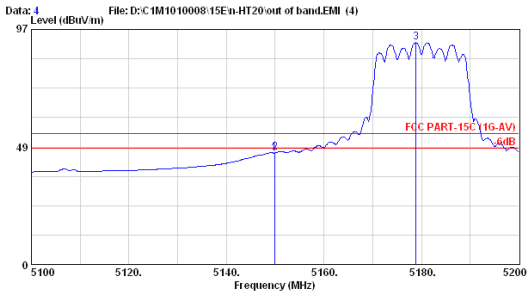

Site no. : A/C Chamber Data no. : 4
Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
Limit : FCC PART-15C (1G-AV)
Env. / Ins. : 8564EC 25℃/56% ☐Jarwei Wang
EUT : WN8522D1
Power Rating : DC 5V via notebook
Test Mode : TX5180(802.11n-HT20)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	5149.900	33.64	9.43	2.90	45.98	54.00	8.02	Average
2	5150.000	33.64	9.43	2.94	46.02	54.00	7.98	Average
3	5178.900	33.69	9.46	48.37	91.52	54.00	-37.52	Average

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Date of Test： Oct. 08, 2010 Temperature： 25℃

EUT： Wi-Fi module Humidity： 56%

Test Mode： 802.11n-HT40, Transmit, Channel: 38, Frequency: 5190MHz

	Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Horizontal dBμV	Emission Level Horizontal dBμV/m	Limits dBμV/m	Margin dB
Peak *	5149.920	33.64	9.43	23.98	67.05	74.00	6.95
Average *	5149.680	33.64	9.43	7.19	50.26	54.00	3.74

Remark ： 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
2. High frequency section (spurious in the restricted band 4500-5150MHz).
3. '*' The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.

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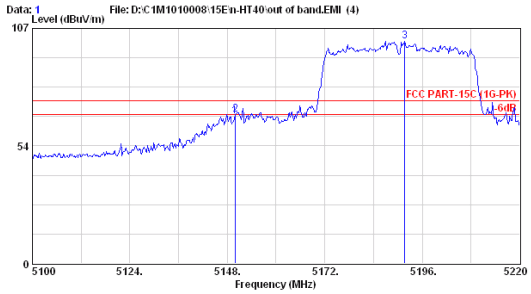

Site no. : A/C Chamber Data no. : 1
Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
Limit : FCC PART-15C (1G-PK)
Env. / Ins. : 8564EC 25℃/56% ☐Jarwei Wang
EUT : WN8522D1
Power Rating : DC 5V via notebook
Test Mode : TX5190(802.11n-HT40)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	5149.920	33.64	9.43	23.98	67.05	74.00	6.95	Peak
2	5150.040	33.64	9.43	24.68	67.76	74.00	6.24	Peak
3	5191.680	33.72	9.48	58.05	101.24	74.00	-27.24	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

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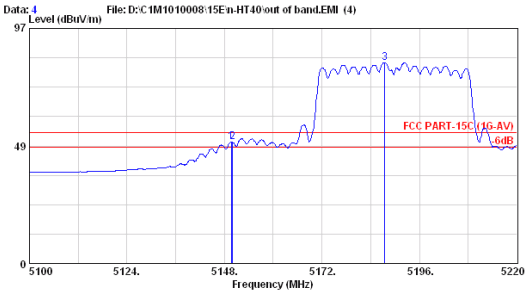
Email:ttemc@ttemc.com.tw



Site no. : A/C Chamber Data no. : 4
Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
Limit : FCC PART-15C (1G-AV)
Env. / Ins. : 8564EC 25℃/56% ☐Jarwei Wang
EUT : WN8522D1
Power Rating : DC 5V via notebook
Test Mode : TX5190(802.11n-HT40)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	5149.680	33.64	9.43	7.19	50.27	54.00	3.73	Average
2	5150.040	33.64	9.43	7.03	50.11	54.00	3.89	Average
3	5187.480	33.69	9.48	39.72	82.89	54.00	-28.89	Average

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Date of Test： Oct. 08, 2010 Temperature： 25℃

EUT： Wi-Fi module Humidity： 56%

Test Mode： 802.11n-HT20, Transmit, Channel: 36, Frequency: 5180MHz

	Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Vertical dBμV	Emission Level Vertical dBμV/m	Limits dBμV/m	Margin dB
Peak *	5149.680	33.64	9.43	25.30	68.37	74.00	5.63
Average *	5148.840	33.64	9.43	6.81	49.88	54.00	4.12

Remark ： 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
2. High frequency section (spurious in the restricted band 4500-5150MHz).
3. '*' The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.

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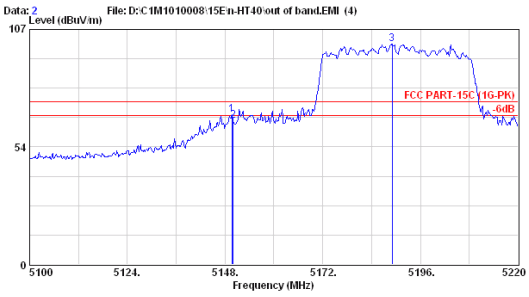
Tel:+886-2-26092133 Fax:+886-2-26099303
Email:ttemc@ttemc.com.tw



Site no. : A/C Chamber Data no. : 2
Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
Limit : FCC PART-15C (1G-PK)
Env. / Ins. : 8564EC 25℃/56% ☐Jarwei Wang
EUT : WN8522D1
Power Rating : DC 5V via notebook
Test Mode : TX5190(802.11n-HT40)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	5149.680	33.64	9.43	25.30	68.38	74.00	5.62	Peak
2	5150.040	33.64	9.43	22.29	65.37	74.00	8.63	Peak
3	5189.040	33.69	9.48	57.33	100.50	74.00	-26.50	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

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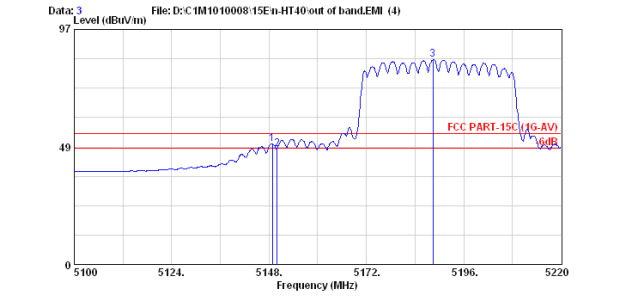


Site no. : A/C Chamber Data no. : 3
Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
Limit : FCC PART-15C (1G-AV)
Env. / Ins. : 8564EC 25℃/56% ☐Jarwei Wang
EUT : WN8522D1
Power Rating : DC 5V via notebook
Test Mode : TX5190(802.11n-HT40)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	5148.840	33.64	9.43	6.81	49.88	54.00	4.12	Average
2	5150.040	33.64	9.43	4.62	47.70	54.00	6.30	Average
3	5188.440	33.69	9.48	41.32	84.49	54.00	-30.49	Average

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

4. 26dB BANDWIDTH MEASUREMENT

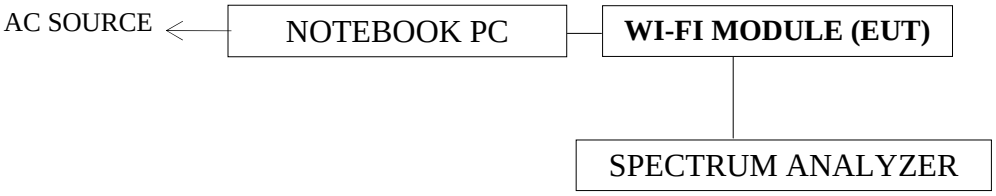
4.1. Test Equipment

The following test equipment was used during the Emission Bandwidth measurement:

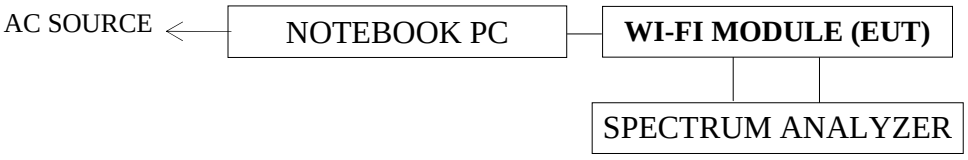
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E4446A	US44300366	Aug. 04, 10’	Aug. 03, 11’

4.2. Block Diagram of Test Setup

4.2.1. For 802.11a



4.2.2. For 802.11n-HT20/802.11n-HT40



4.3. Operating Condition of EUT

The test program “Broadcom WL Command” was used to enable the EUT to transmit data at different channel frequency individually.

4.4. Test Procedure

The transmitter output was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measure by spectrum analyzer with RBW=300kHz VBW=1MHz. The 26dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 26dB.
The measurement guideline was according to DA-02-2138.

4.5. Test Results

PASSED. All the test results are attached in next pages.

(Test Date : Oct. 21, 2010 Temperature : 26℃ Humidity : 55%)
(Test Date : Nov. 05, 2010 Temperature : 24℃ Humidity : 58%)

4.5.1. For 802.11a

Mode	Type of Network	Channel	Frequency	**26dB Bandwidth**
1.	802.11a	CH 36	5180MHz	**19.528MHz**
2.		CH 40	5200MHz	**19.093MHz**
3.		CH 48	5240MHz	**22.437MHz**

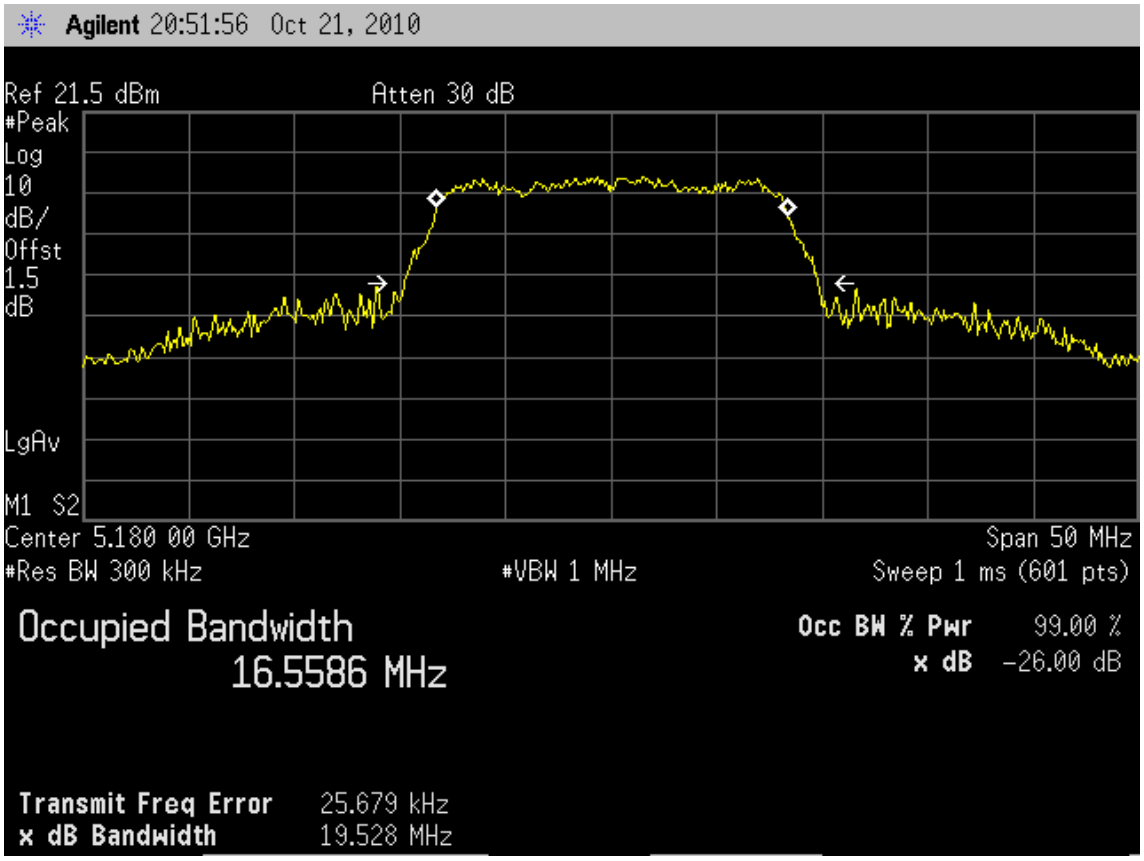
4.5.2. For 802.11n-HT20

Mode	Type of Network	Channel	Frequency	**26dB Bandwidth**	
				Ant. 0	**Ant.1**
1.	802.11n-HT20	CH 36	5180MHz	**19.661MHz**	**19.496MHz**
2.		CH 40	5200MHz	**19.631MHz**	**19.473MHz**
3.		CH 48	5240MHz	**19.678MHz**	**19.442 MHz**

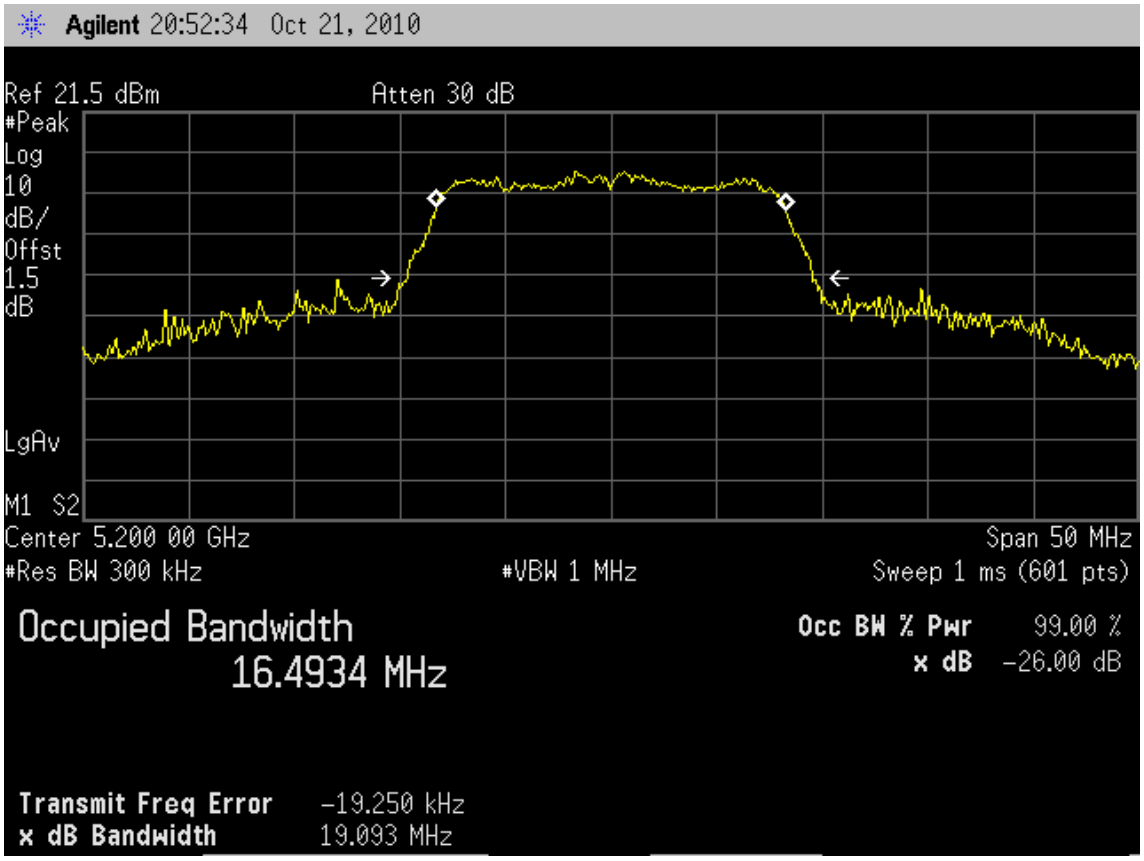
4.5.3. For 802.11n-HT40

Mode	Type of Network	Channel	Frequency	**26dB Bandwidth**	
				Ant. 0	**Ant.1**
1.	802.11n-HT40	CH 38	5190MHz	**39.018MHz**	**39.097MHz**
2.		CH 46	5230MHz	**39.069MHz**	**39.060MHz**

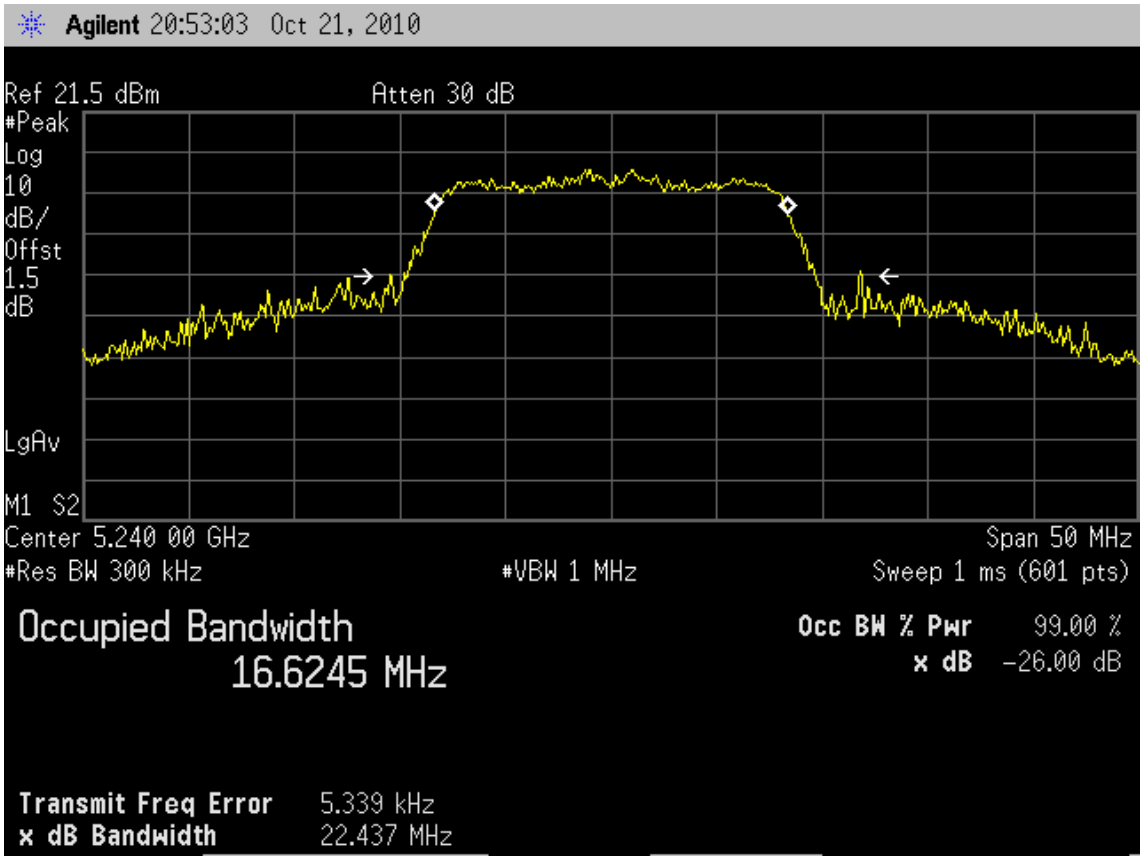
802.11a, Frequency: 5180MHz



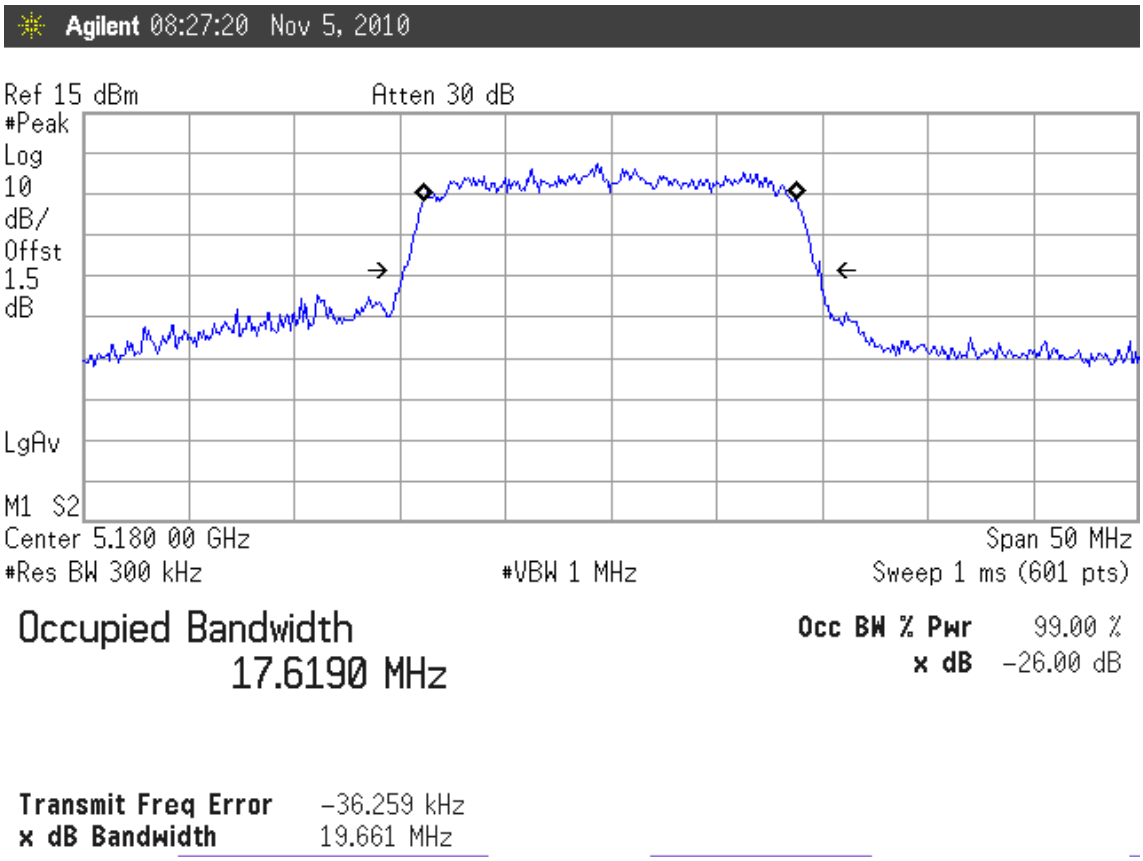
802.11a, Frequency: 5200MHz



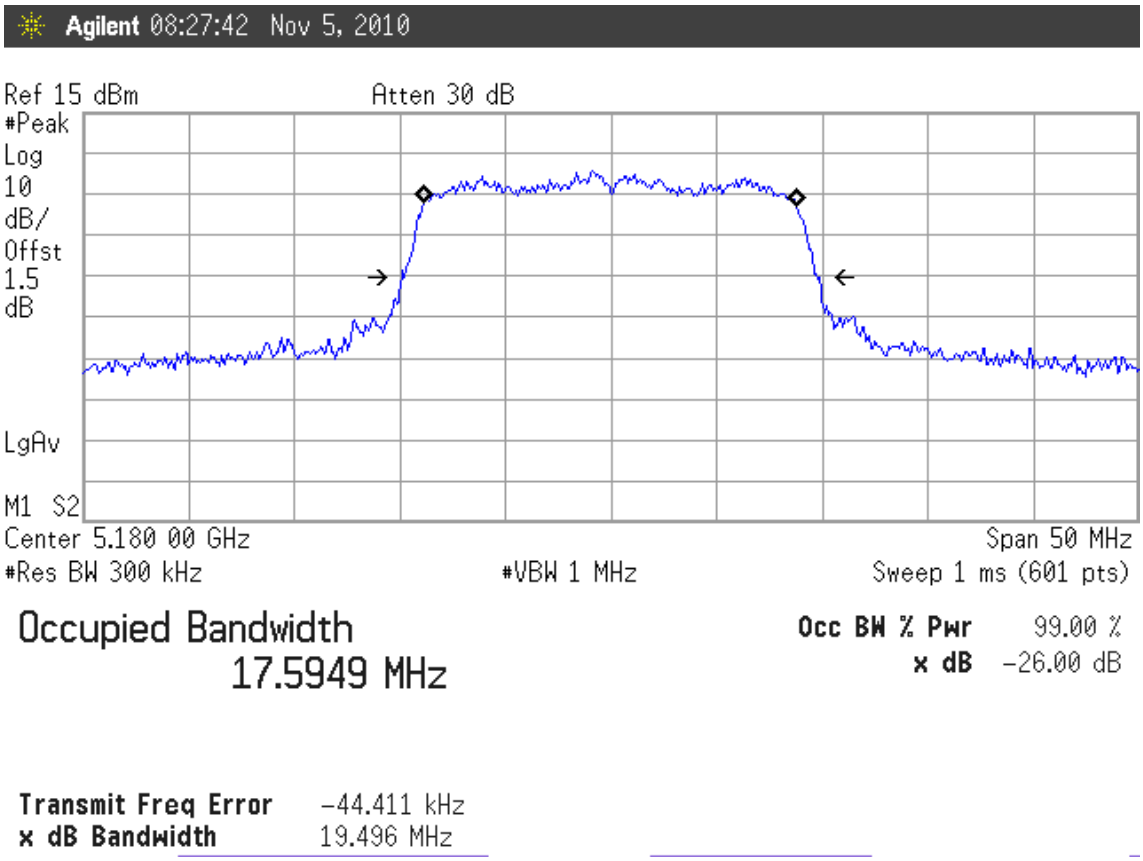
802.11a, Frequency: 5240MHz



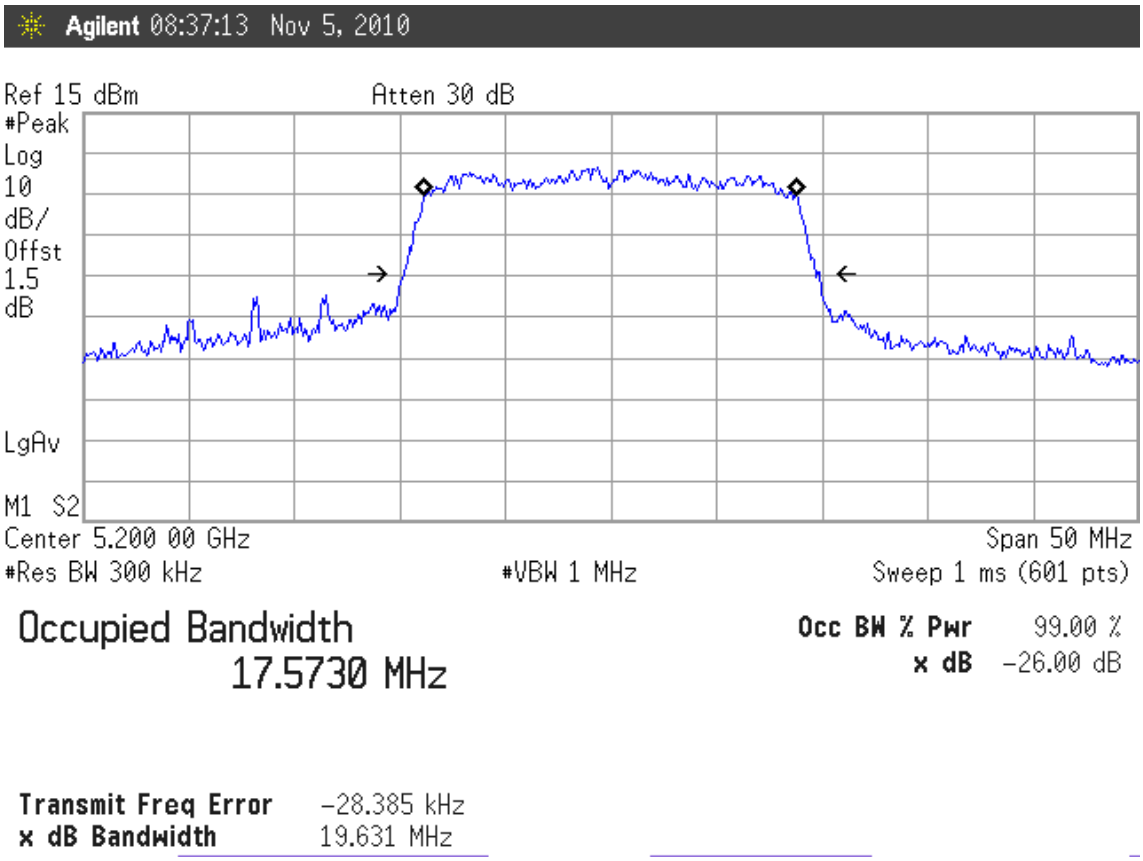
802.11n-HT20, Frequency: 5180MHz (Ant. 0)



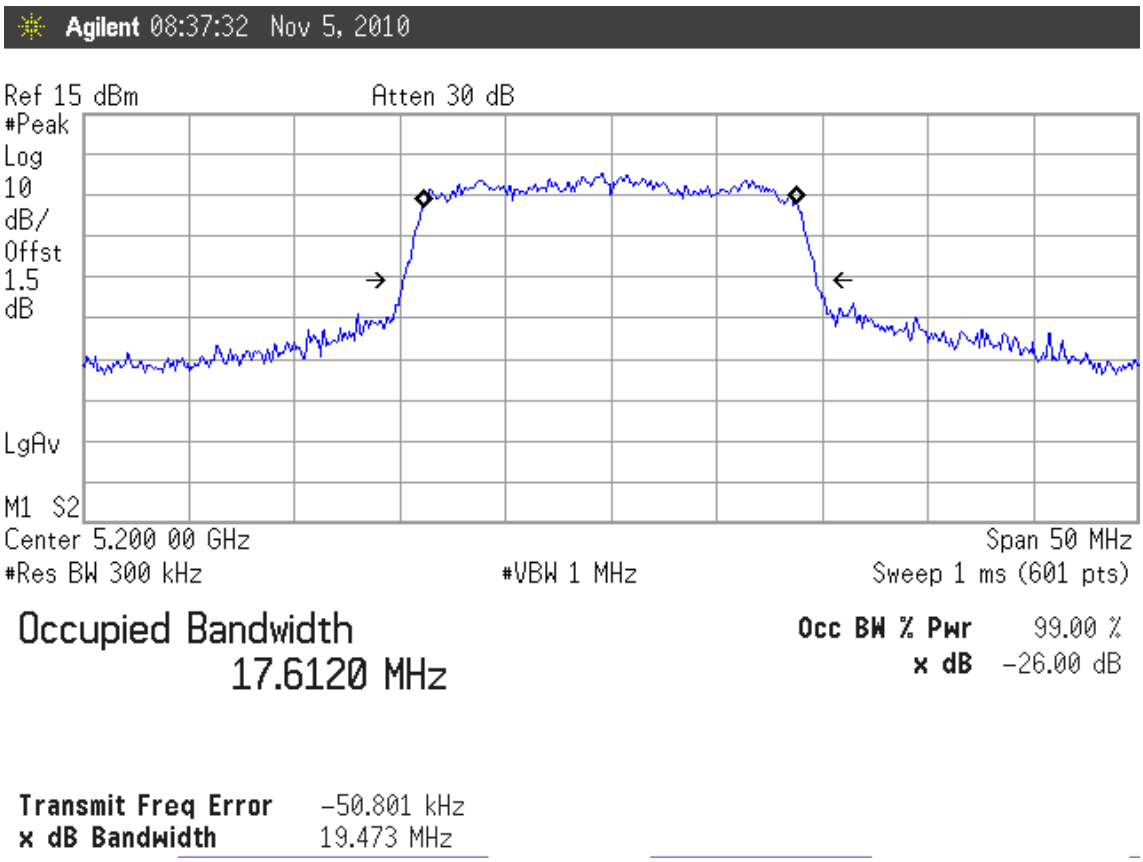
802.11n-HT20, Frequency: 5180MHz (Ant. 1)



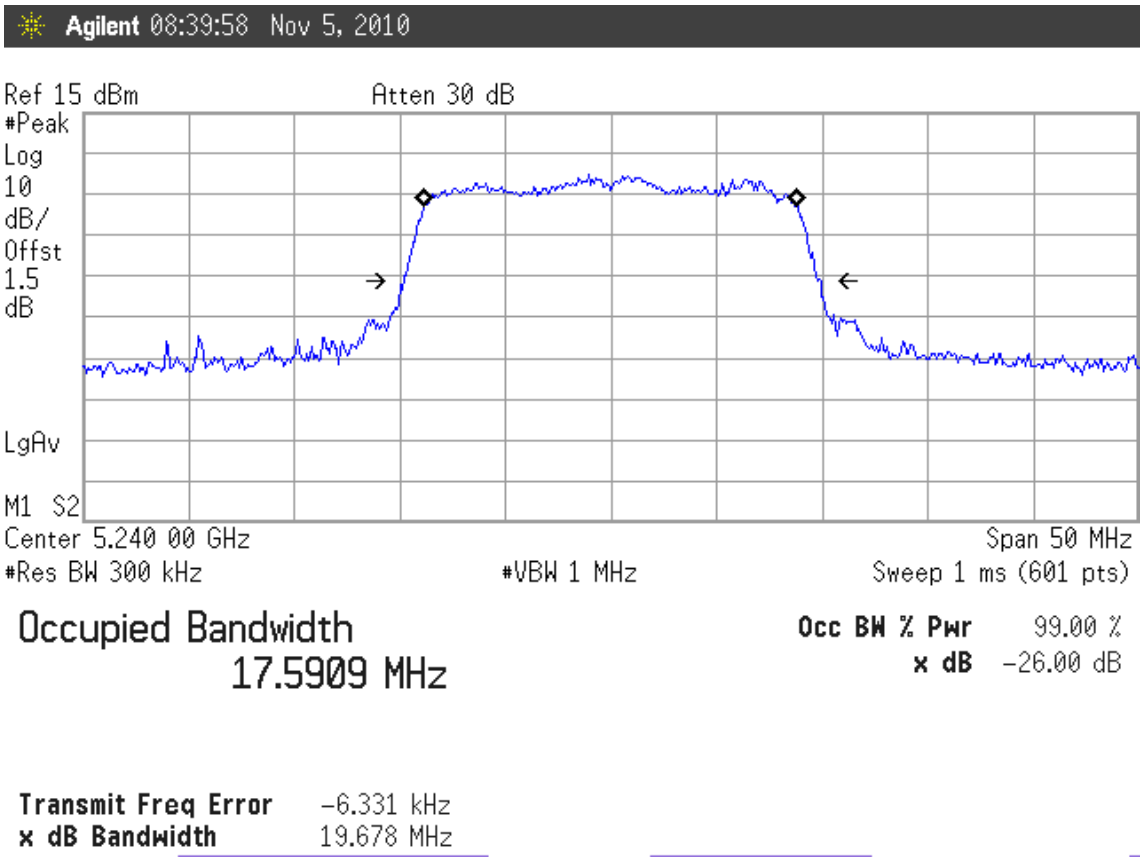
802.11n-HT20, Frequency: 5200MHz (Ant. 0)



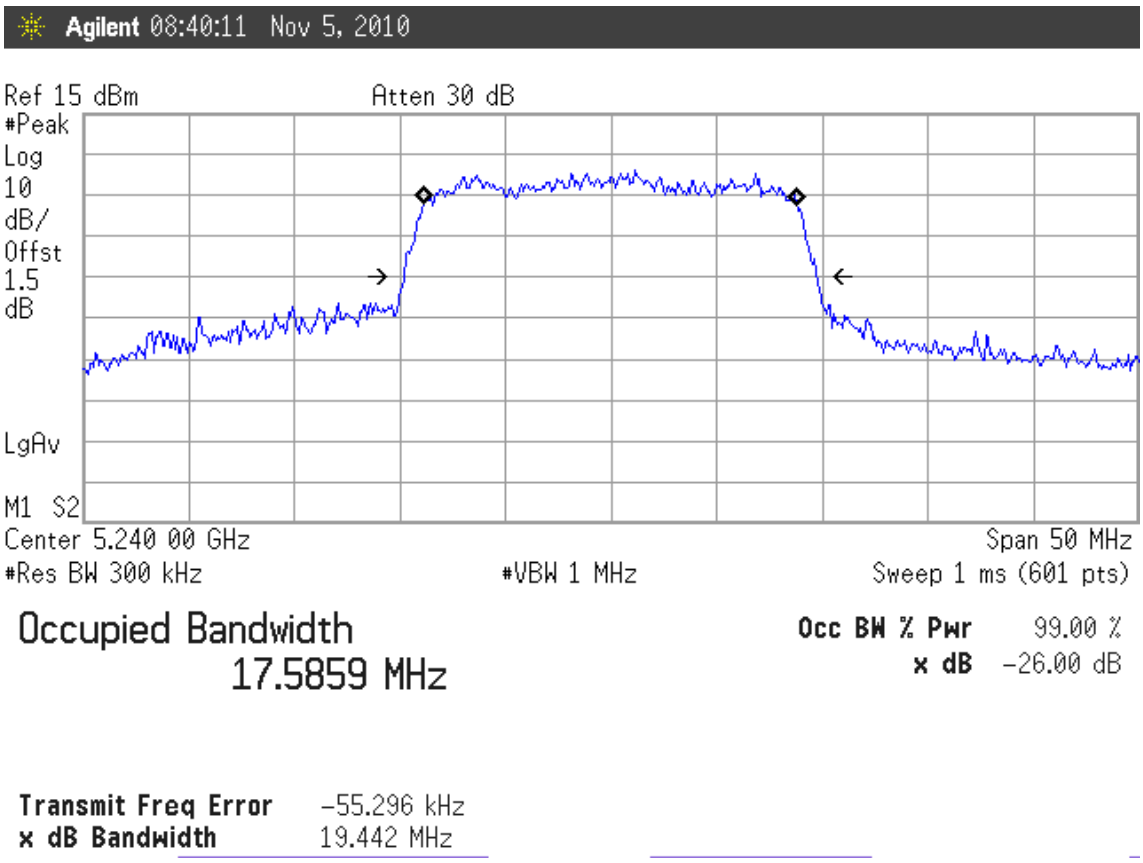
802.11n-HT20, Frequency: 5200MHz (Ant. 1)



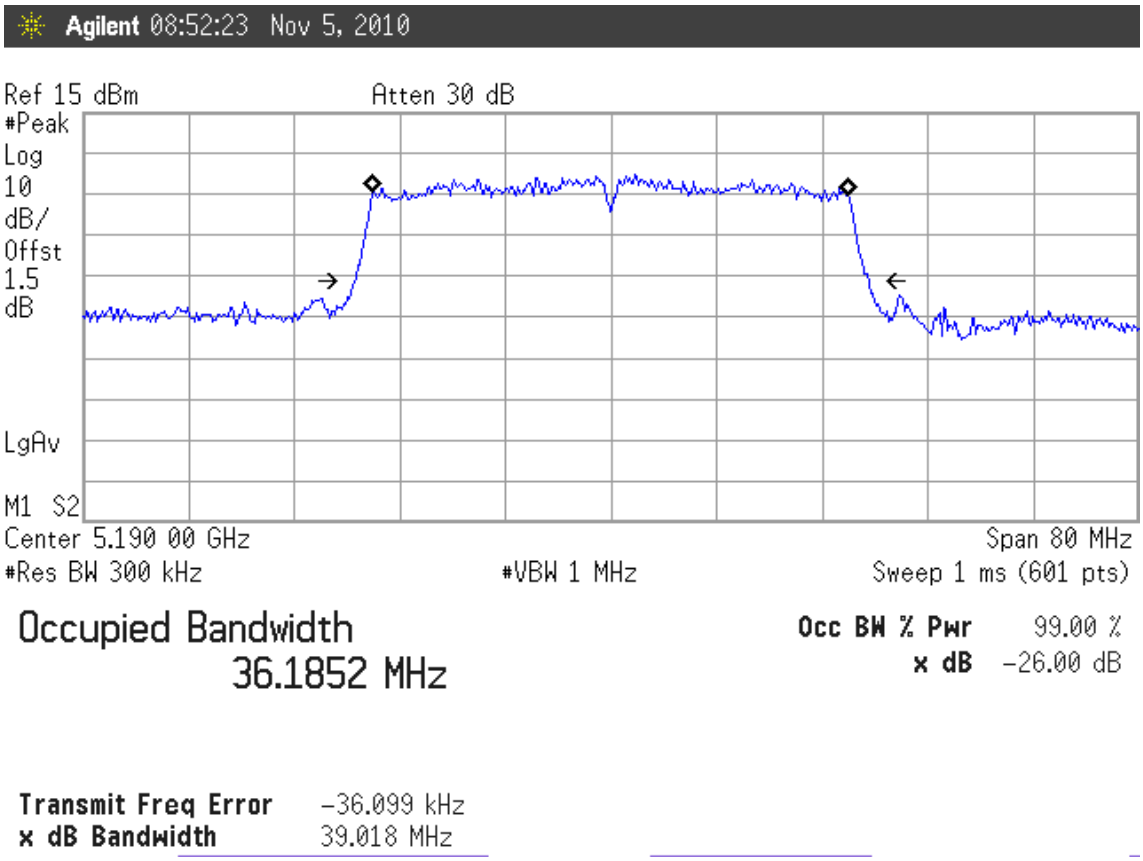
802.11n-HT20, Frequency: 5240MHz (Ant. 0)



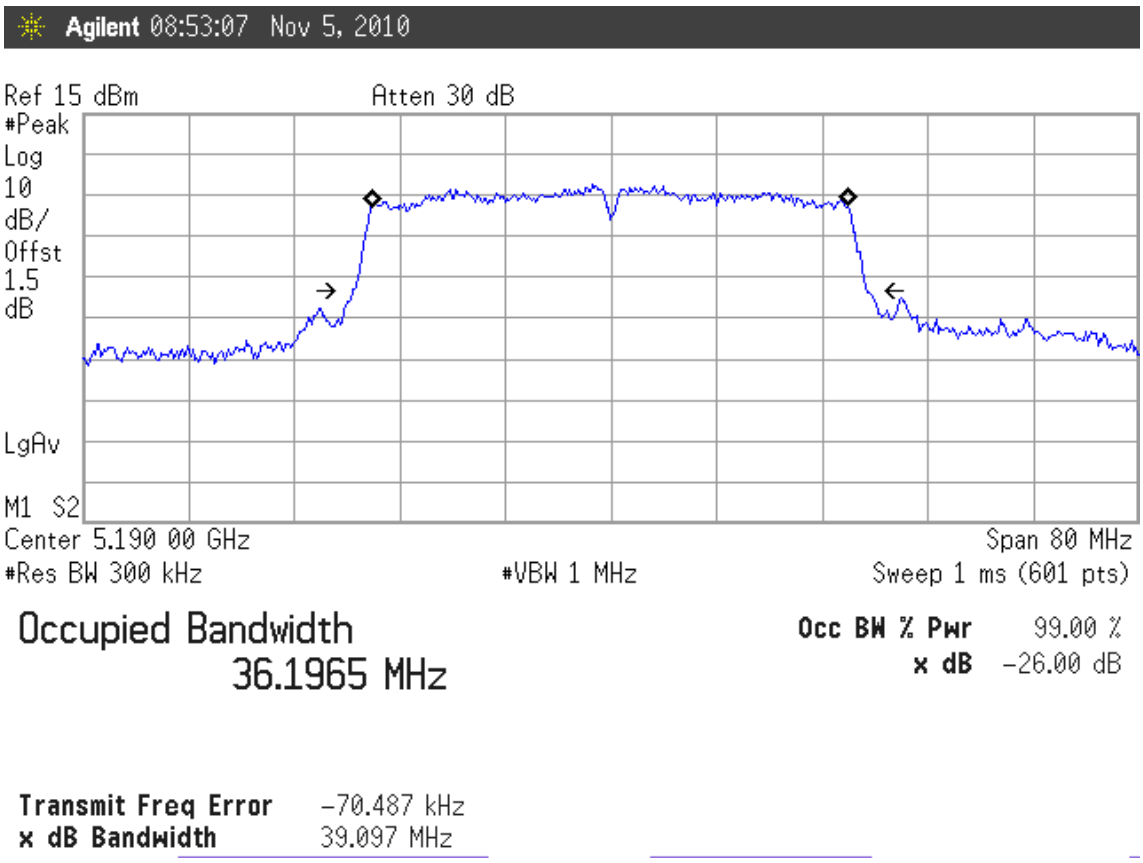
802.11n-HT20, Frequency: 5240MHz (Ant. 1)



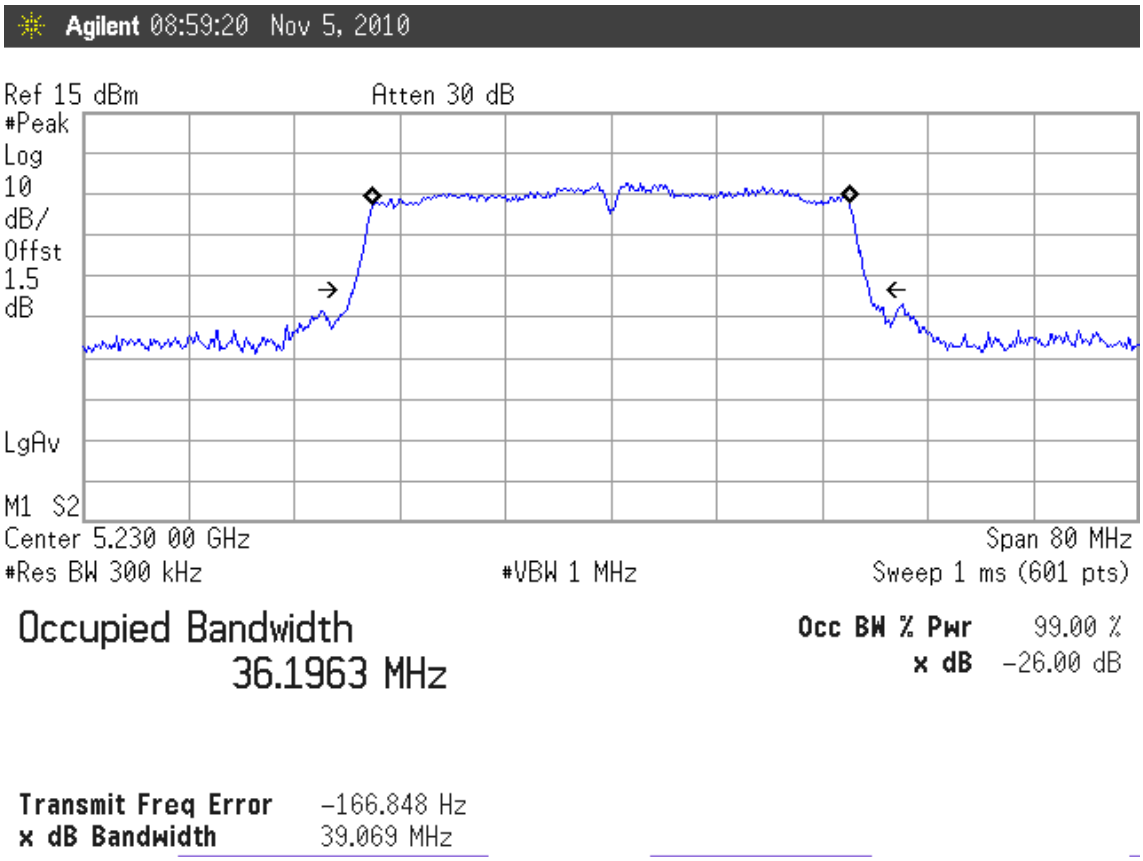
802.11n-HT40, Frequency: 5190MHz (Ant. 0)



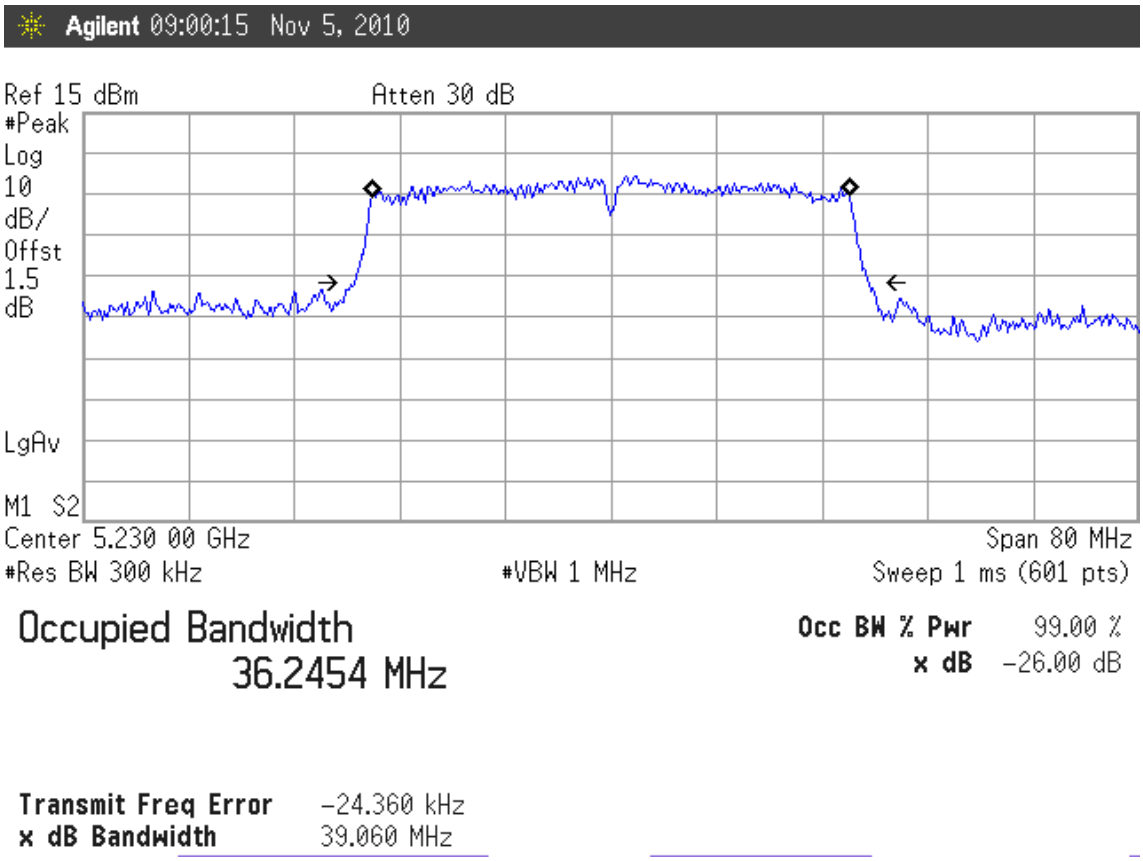
802.11n-HT40, Frequency: 5190MHz (Ant. 1)



802.11n-HT40, Frequency: 5230MHz (Ant. 0)



802.11n-HT40, Frequency: 5230MHz (Ant. 1)



5. MAXIMUM PEAK OUTPUT POWER MEASUREMENT

5.1. Test Equipment

The following test equipment was used during the maximum peak output power measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E4446A	US44300366	Aug. 04, 10’	Aug. 03, 11’

5.2. Block Diagram of Test Setup

The same as section.4.2.

5.3. Specification Limits (§15.407(a)-(1))

5.3.1. For 802.11a

Frequency	Limit 1	Limit 2 (4dBm+10log B)
5150~5250MHz	50mW (17dBm)	16.92dBm

Remark: B= 26dB Bandwidth

5.3.2. For 802.11n-HT20

Frequency	Limit 1	Limit 2 (4dBm+10log B)
5150~5250MHz	50mW (17dBm)	16.93dBm

Remark: B= 26dB Bandwidth

5.3.3. For 802.11n-HT40

Frequency	Limit 1	Limit 2 (4dBm+10log B)
5150~5250MHz	50mW (17dBm)	19.93dBm

Remark: B= 26dB Bandwidth

5.4. Operating Condition of EUT

The test program “Broadcom WL Command” was used to enable the EUT to transmit data at different channel frequency individually.

5.5. Test Procedure

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices-Part 15, Subpart E, August 2002.

The transmitter output operates continuously therefore Method#1 is used.

5.6. Test Results

PASSED. All the test results are listed below.

(Test Date : Oct. 21, 2010 Temperature : 26℃ Humidity : 55%)
(Test Date : Nov. 05, 2010 Temperature : 24℃ Humidity : 58%)

5.6.1. For 802.11a

Mode	Type of Network	Channel	Frequency	**Peak Output Power (dBm)**	Power Setting
1.	802.11a	CH 36	5180MHz	**13.92**	56
2.		CH 40	5200MHz	**13.77**	56
3.		CH 48	5240MHz	**14.33**	56

[Limit: 1Watt. (17dBm)]

5.6.2. For 802.11n-HT20

Mode	Type of Network	Channel	Frequency	**Peak output power (dBm)**		**Total Peak Output Power (dBm)**	Power Setting
				Ant. 0	**Ant. 1**		
1.	802.11n-HT20	CH 36	5180MHz	**8.70**	**9.15**	**11.94**	36
2.		CH 40	5200MHz	**8.82**	**9.71**	**12.29**	36
3.		CH 48	5240MHz	**9.26**	**8.64**	**11.97**	36

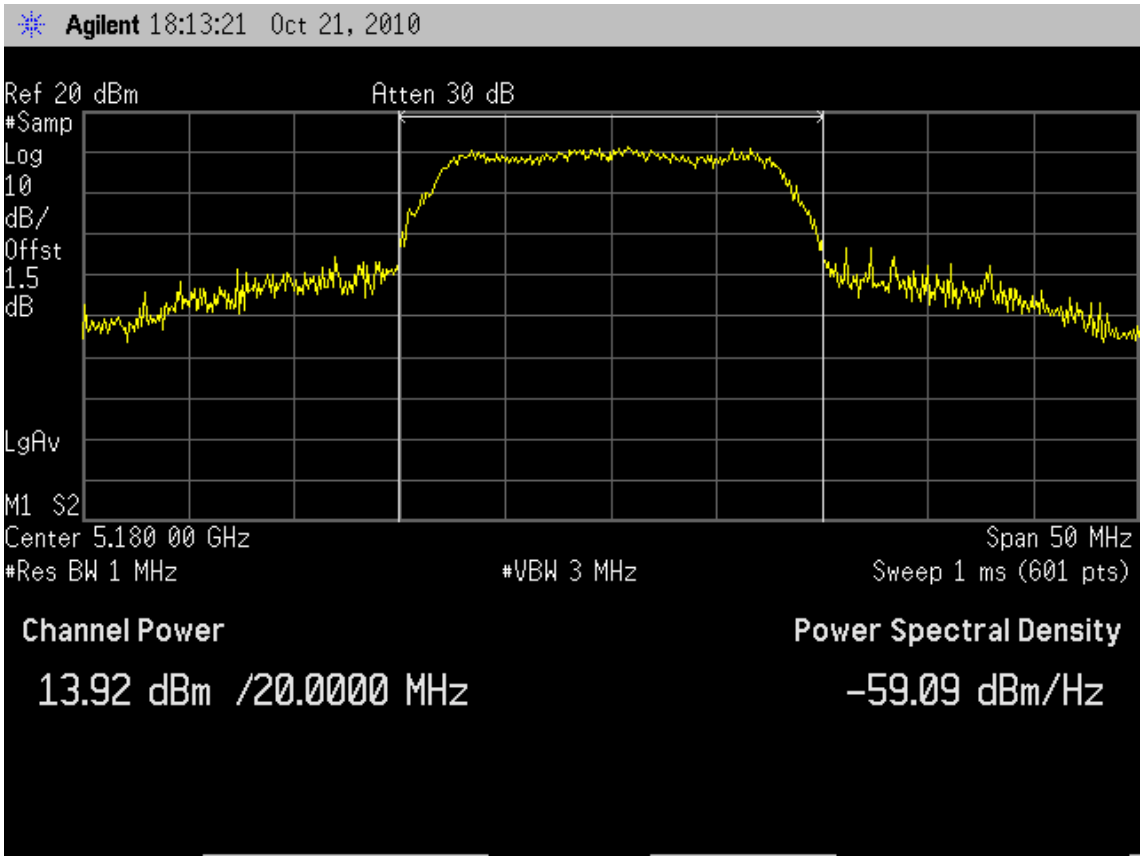
[Limit: 1Watt. (17dBm)]

5.6.3. For 802.11n-HT40

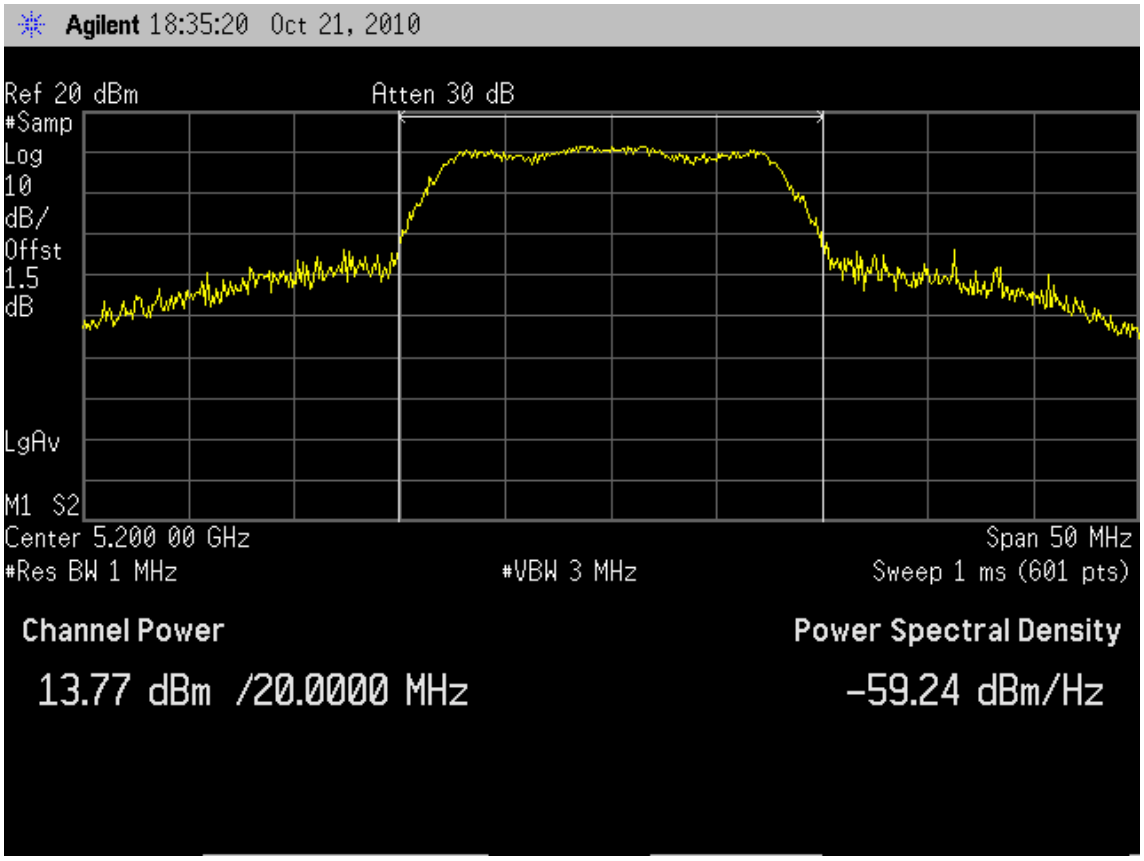
Mode	Type of Network	Channel	Frequency	**Peak output power (dBm)**		**Total Peak Output Power (dBm)**	Power Setting
				Ant. 0	**Ant. 1**		
1.	802.11n-HT40	CH 38	5190MHz	**9.16**	**10.37**	**12.82**	42
2.		CH 46	5230MHz	**10.01**	**9.17**	**12.62**	42

[Limit: 1Watt. (19.93dBm)]

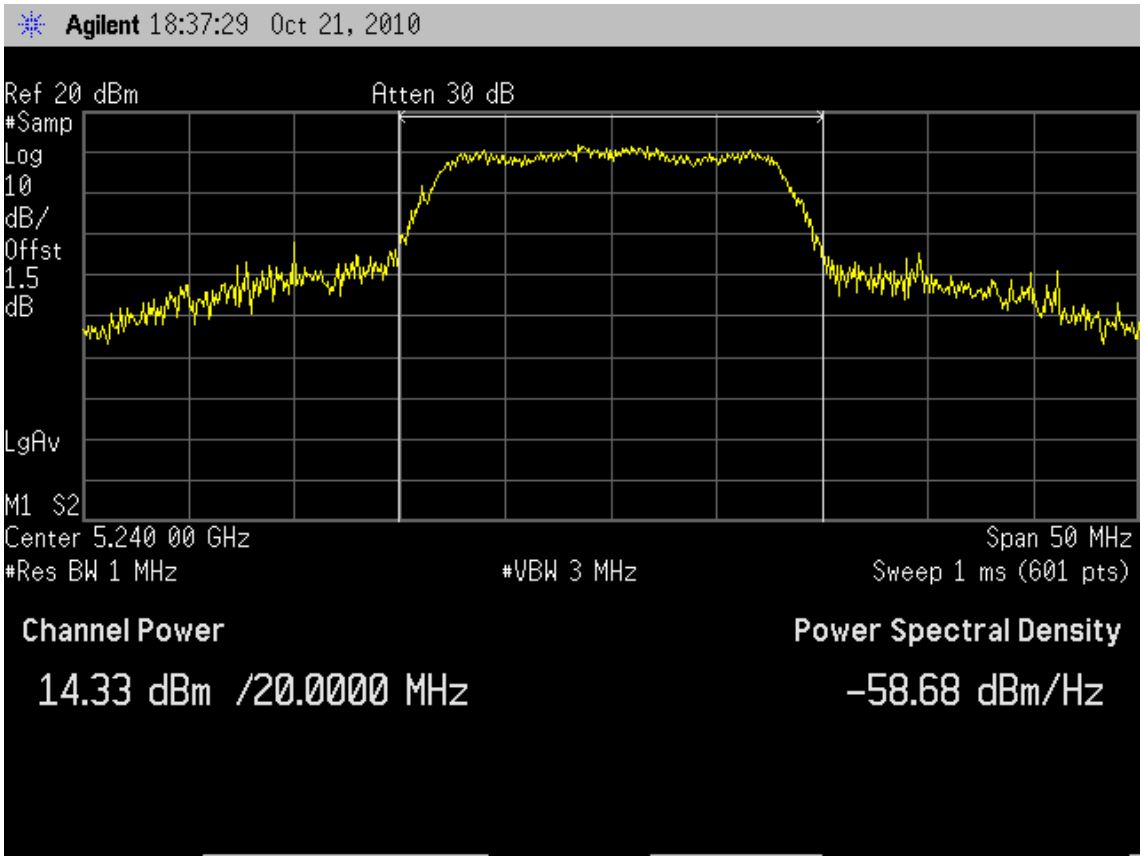
802.11a, Frequency: 5180MHz



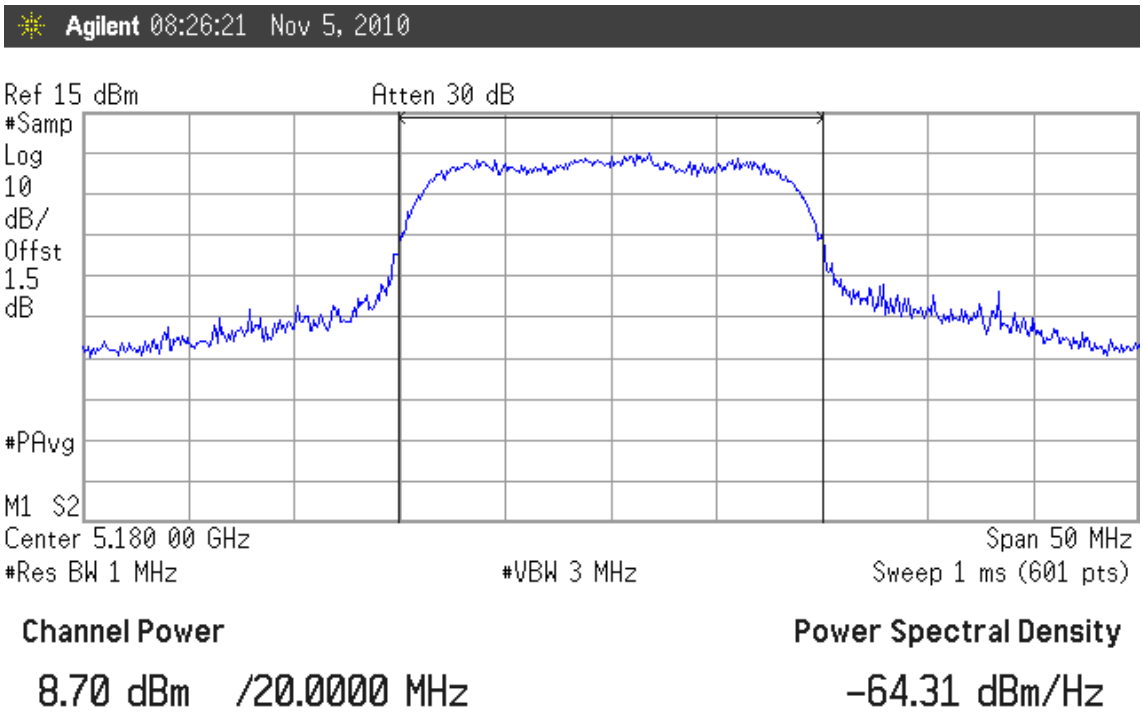
802.11a, Frequency: 5200MHz



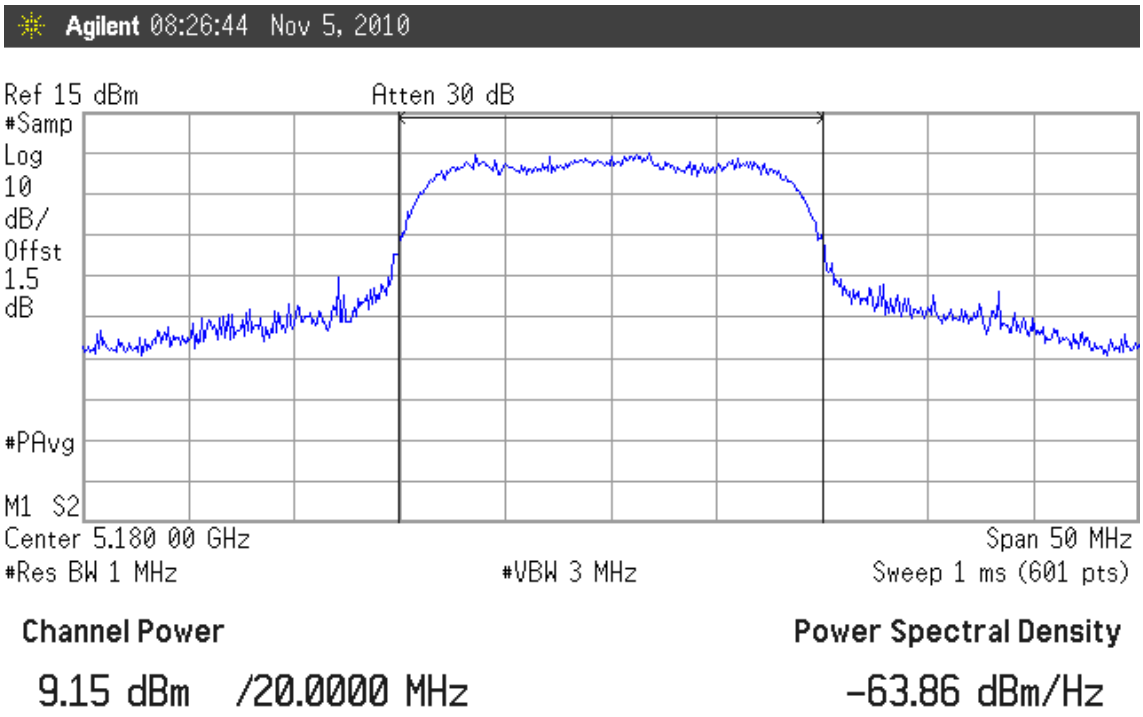
802.11a, Frequency: 5240MHz



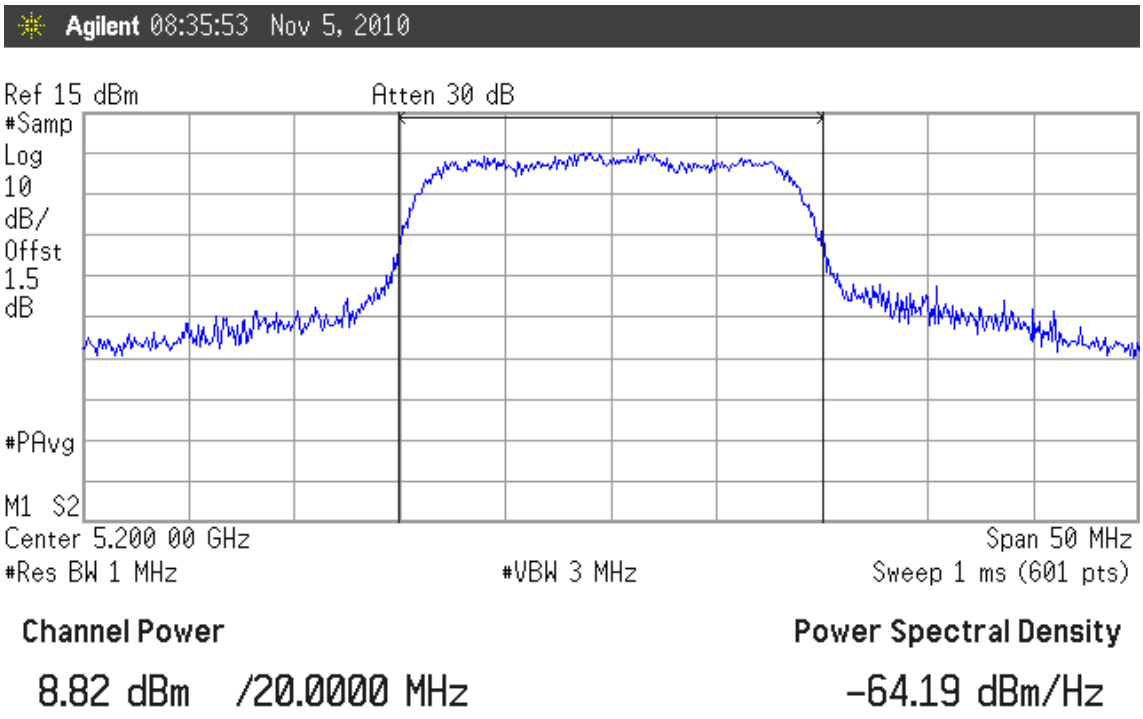
802.11n-HT20, Frequency: 5180MHz (Ant. 0)



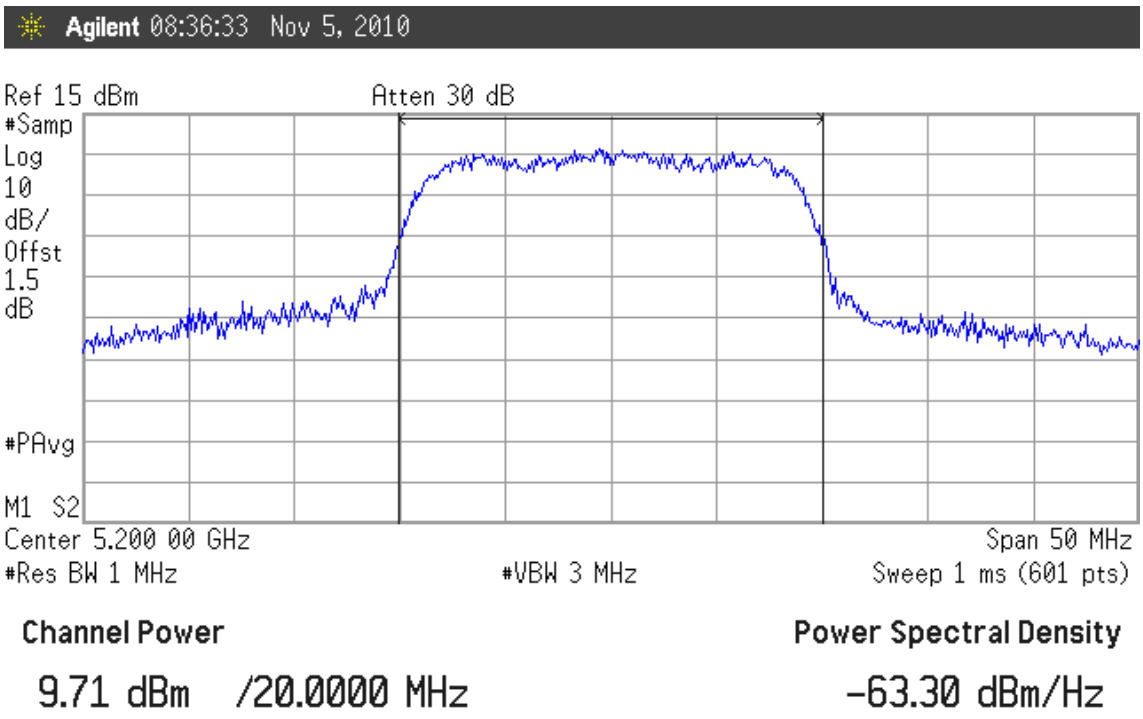
802.11n-HT20, Frequency: 5180MHz (Ant. 1)



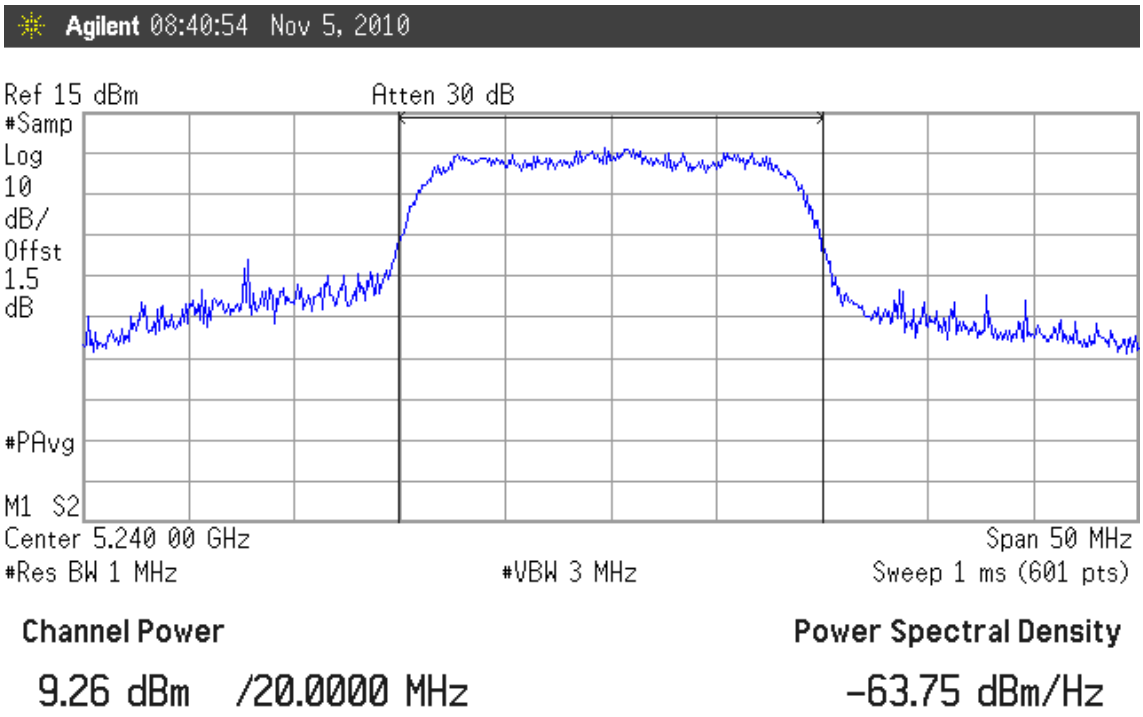
802.11n-HT20, Frequency: 5200MHz (Ant. 0)



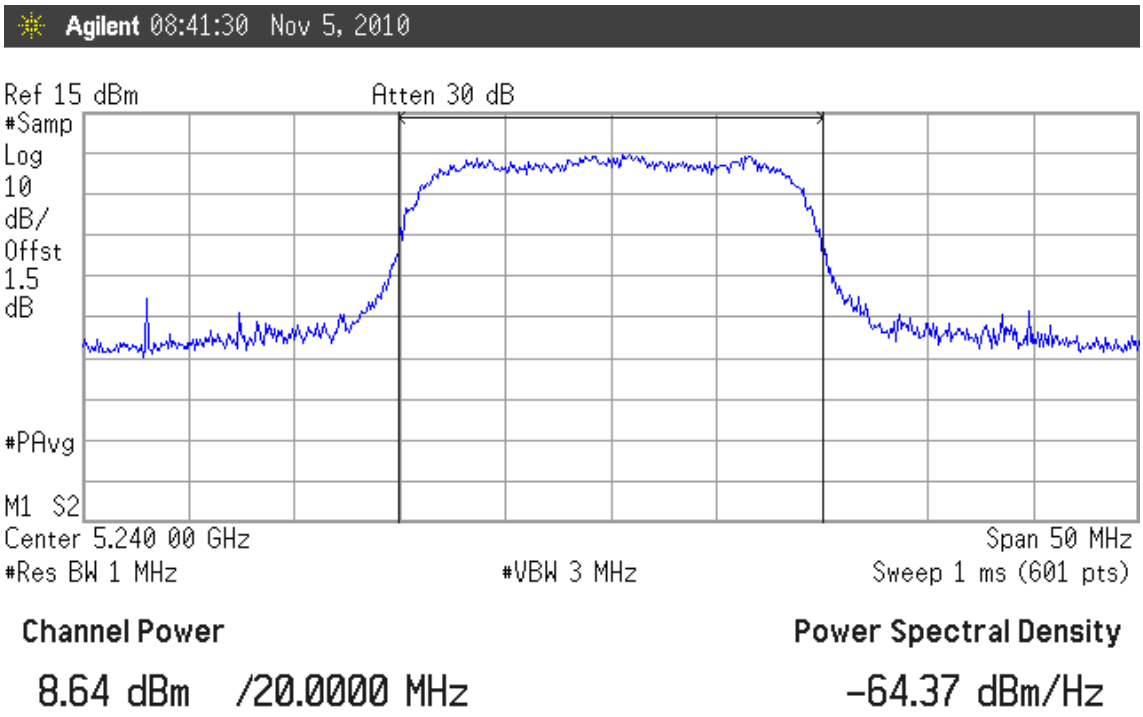
802.11n-HT20, Frequency: 5200MHz (Ant. 1)



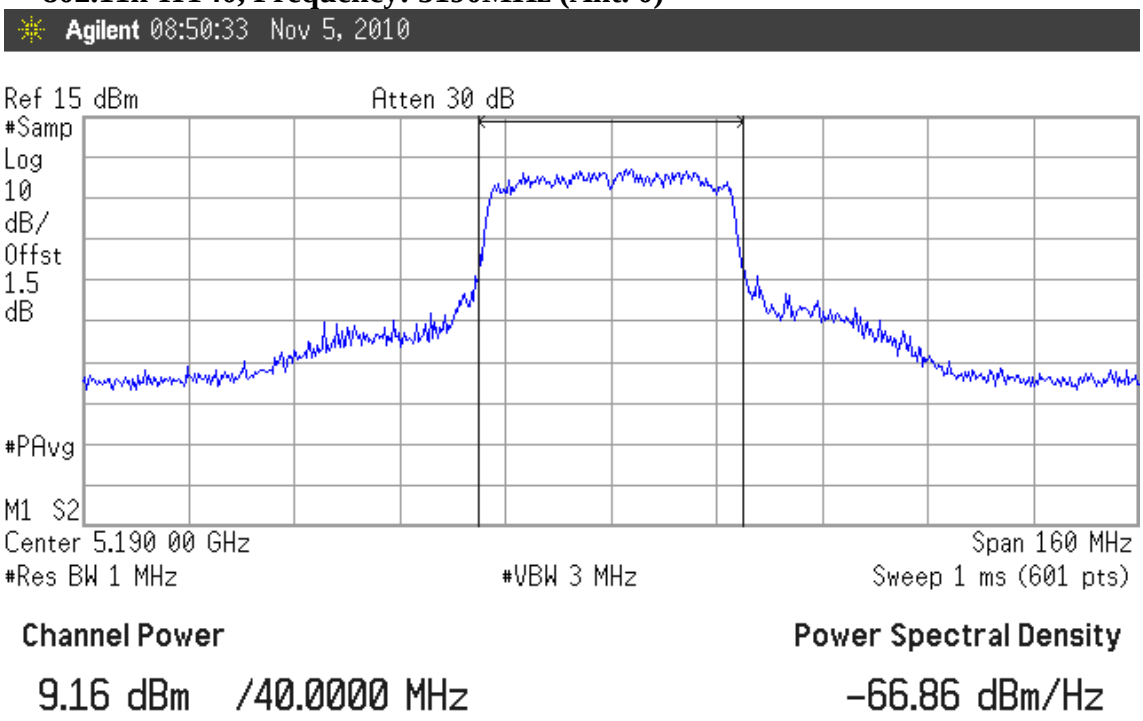
802.11n-HT20, Frequency: 5240MHz (Ant. 0)



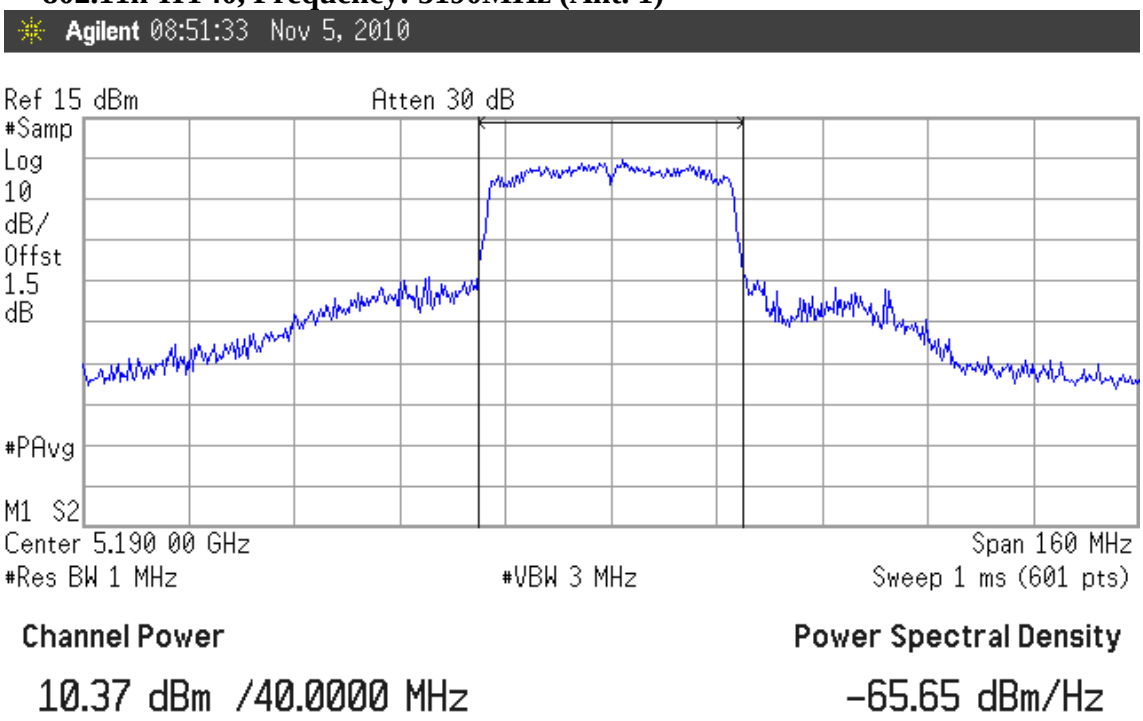
802.11n-HT20, Frequency: 5240MHz (Ant. 1)



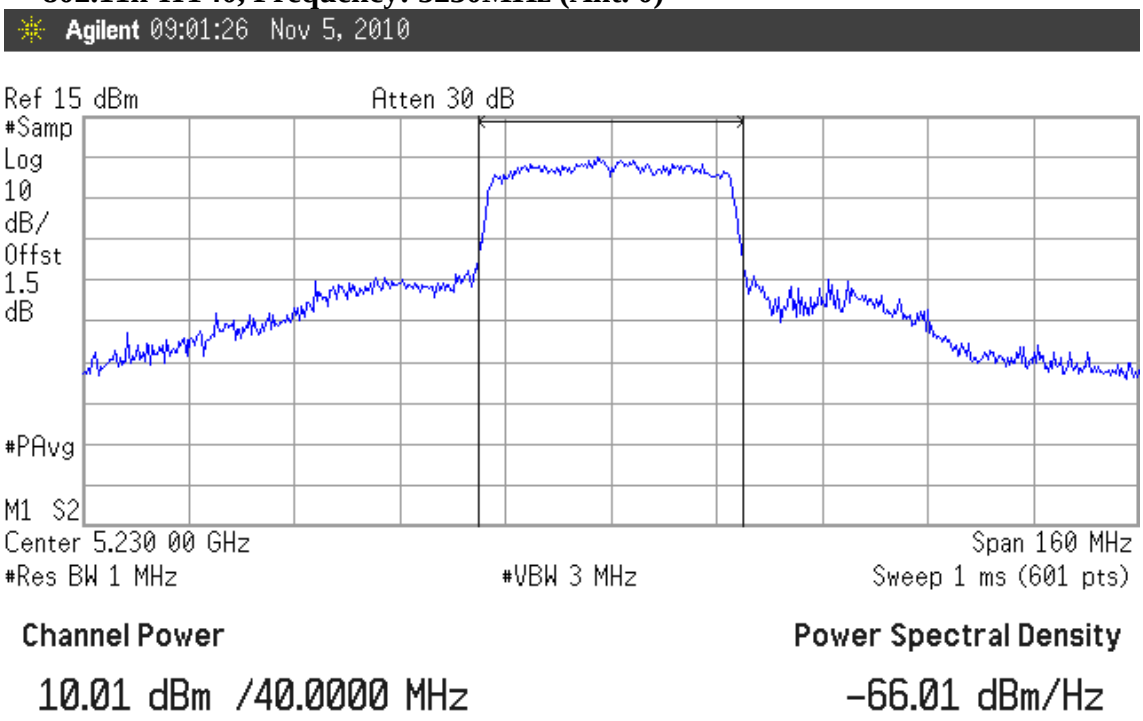
802.11n-HT40, Frequency: 5190MHz (Ant. 0)



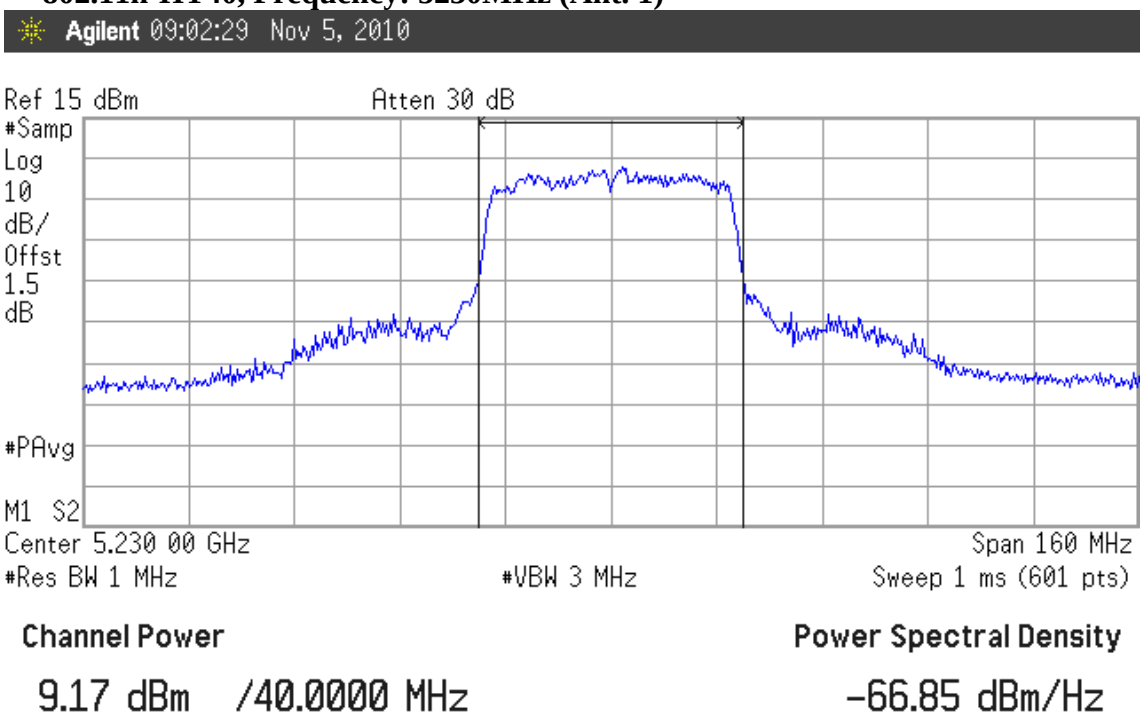
802.11n-HT40, Frequency: 5190MHz (Ant. 1)



802.11n-HT40, Frequency: 5230MHz (Ant. 0)



802.11n-HT40, Frequency: 5230MHz (Ant. 1)



6. EMISSION LIMITATIONS MEASUREMENT

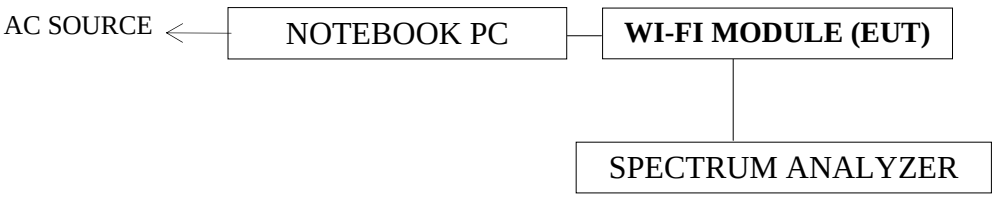
6.1. Test Equipment

The following test equipment was used during the emission limitations test：

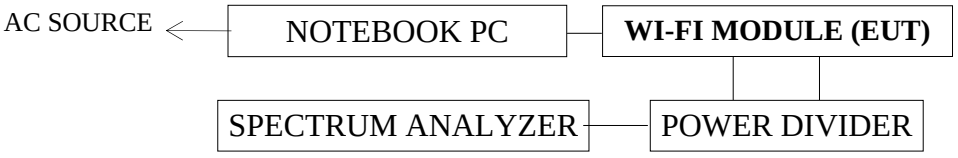
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E4446A	US44300366	Aug. 04, 10’	Aug. 03, 11’
2.	Power Divider	Anritsu	K240C	019728	Aug. 05, 10’	Aug. 04, 11’

6.2. Block Diagram of Test Setup

6.2.1. For 802.11a



6.2.2. For 802.11n-HT20/802.11n-HT40



6.3. Specification Limits (§15.407(b)-(1))

For transmitters operating in the 5.15-5.25GHz band: all emission outside of the 5.150-5.350GHz band shall not exceed an EIRP of -27dBm/MHz.

Maximum Antenna Gain: 4.67dBi
Spurious Limit: -27dBm/MHz eirp
Limit Used on Plots [Note 1]: -31.67dBm/MHz

[Note 1]: The -27dBm/MHz limit is an eirp limit. The limit for antenna port conducted measurements is adjusted to take into consideration the maximum antenna gain (limit = -27dBm-antenna gain). Radiated field strength measurements for signals more than 50MHz from the bands and that are close to the limit are made to determine compliance as the antenna gain is not known at these frequencies.

6.4. Operating Condition of EUT

The test program “Broadcom WL Command” was used to enable the EUT to transmit data at different channel frequency individually.

6.5. Test Procedure

The transmitter output was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measure by spectrum analyzer with 1MHz RBW and 1MHz VBW.

6.6. Test Results

PASSED. The testing data was attached in the next pages.

(Test Date : Oct. 21, 2010 Temperature : 26℃ Humidity : 55%)

In the 802.11n-HT20 and 802.11n-HT40 mode, we using power divider for measuring in the worst case.

All emission limitations were under limit -31.67dBm.

802.11a

1. 5180MHz: During 30MHz~40GHz bandwidth, the emission limitation was under limit -31.67dBm.
2. 5200MHz: During 30MHz~40GHz bandwidth, the emission limitation was under limit -31.67dBm.
3. 5240MHz: During 30MHz~40GHz bandwidth, the emission limitation was under limit -31.67dBm.

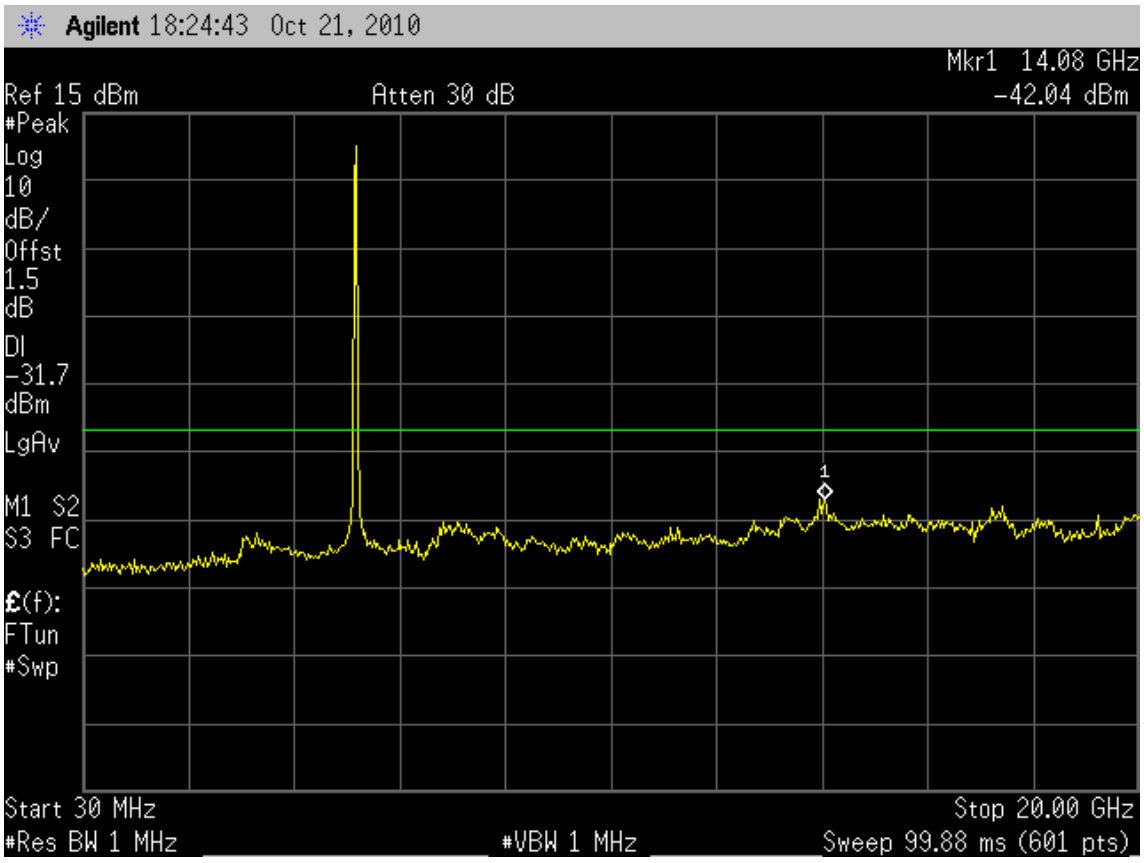
802.11n-HT20

1. 5180MHz: During 30MHz~40GHz bandwidth, the emission limitation was under limit -31.67dBm.
2. 5200MHz: During 30MHz~40GHz bandwidth, the emission limitation was under limit -31.67dBm.
3. 5240MHz: During 30MHz~40GHz bandwidth, the emission limitation was under limit -31.67dBm.

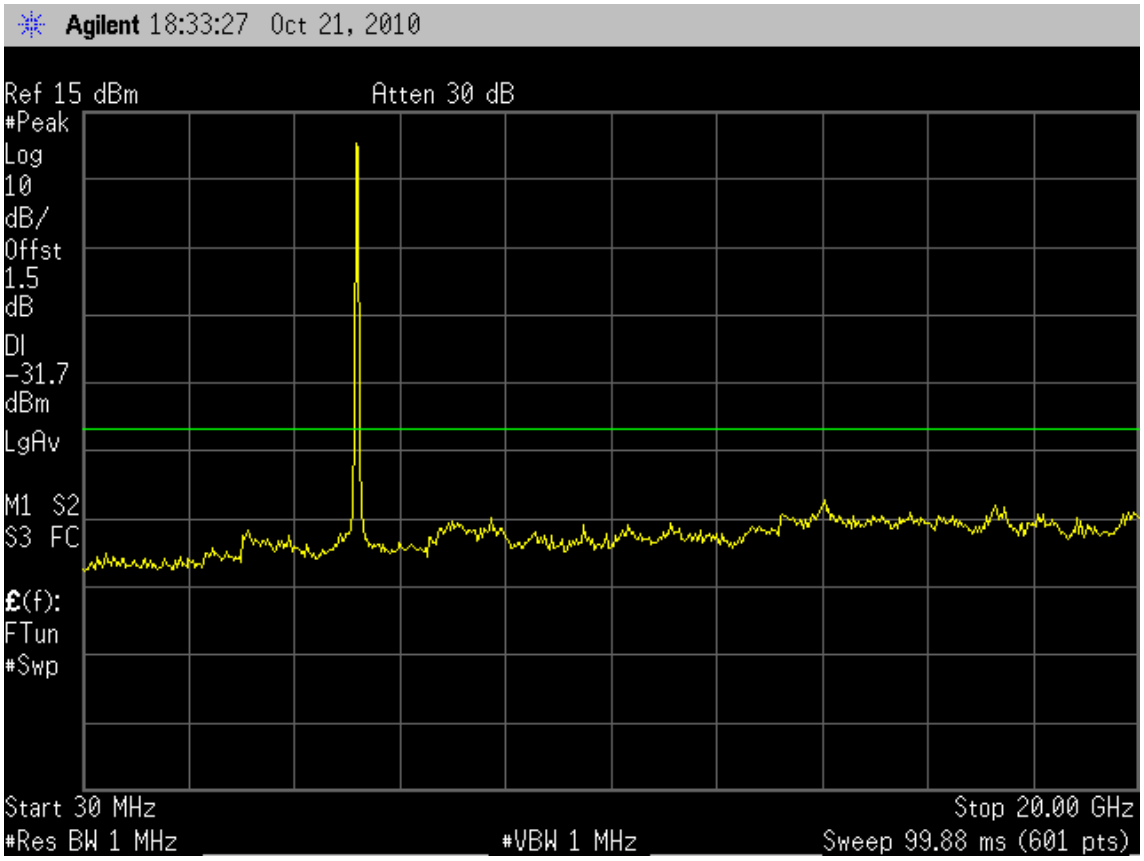
802.11n-HT40

1. 5190MHz: During 30MHz~40GHz bandwidth, the emission limitation was under limit -31.67dBm.
2. 5230MHz: During 30MHz~40GHz bandwidth, the emission limitation was under limit -31.67dBm.

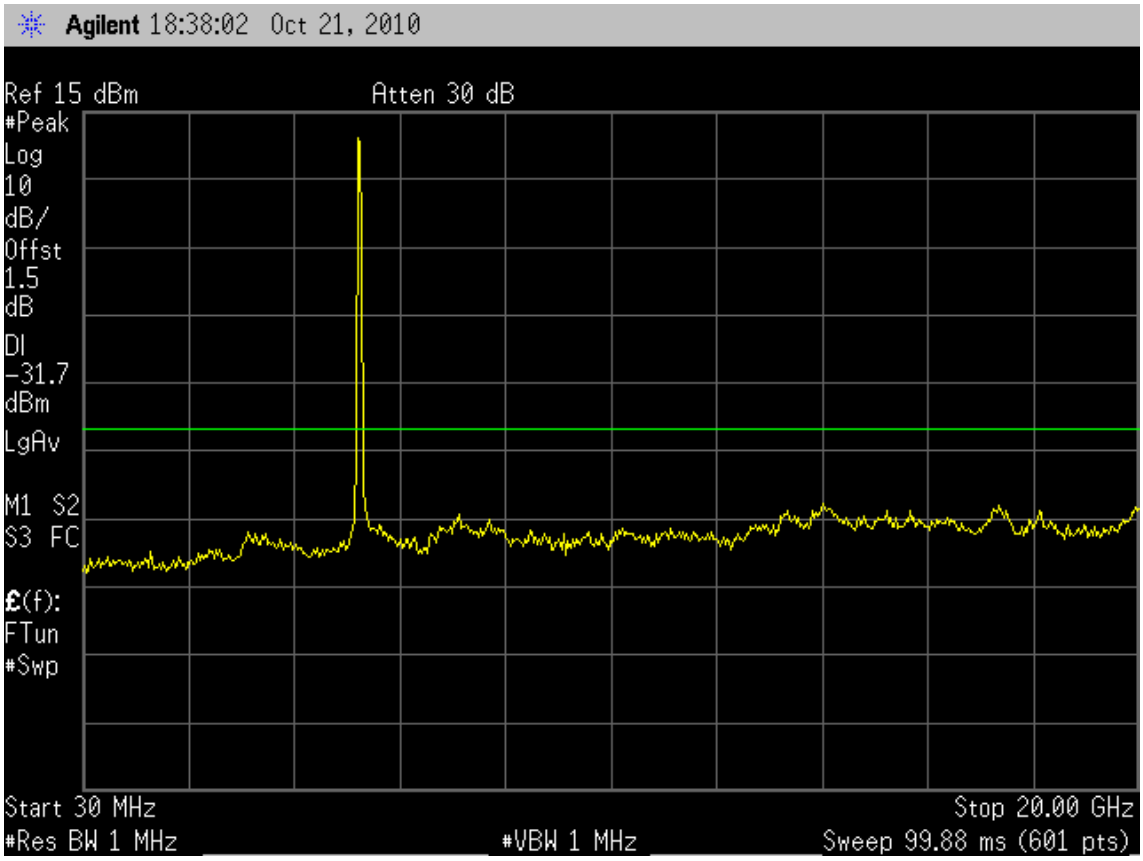
802.11a, Frequency: 5180MHz



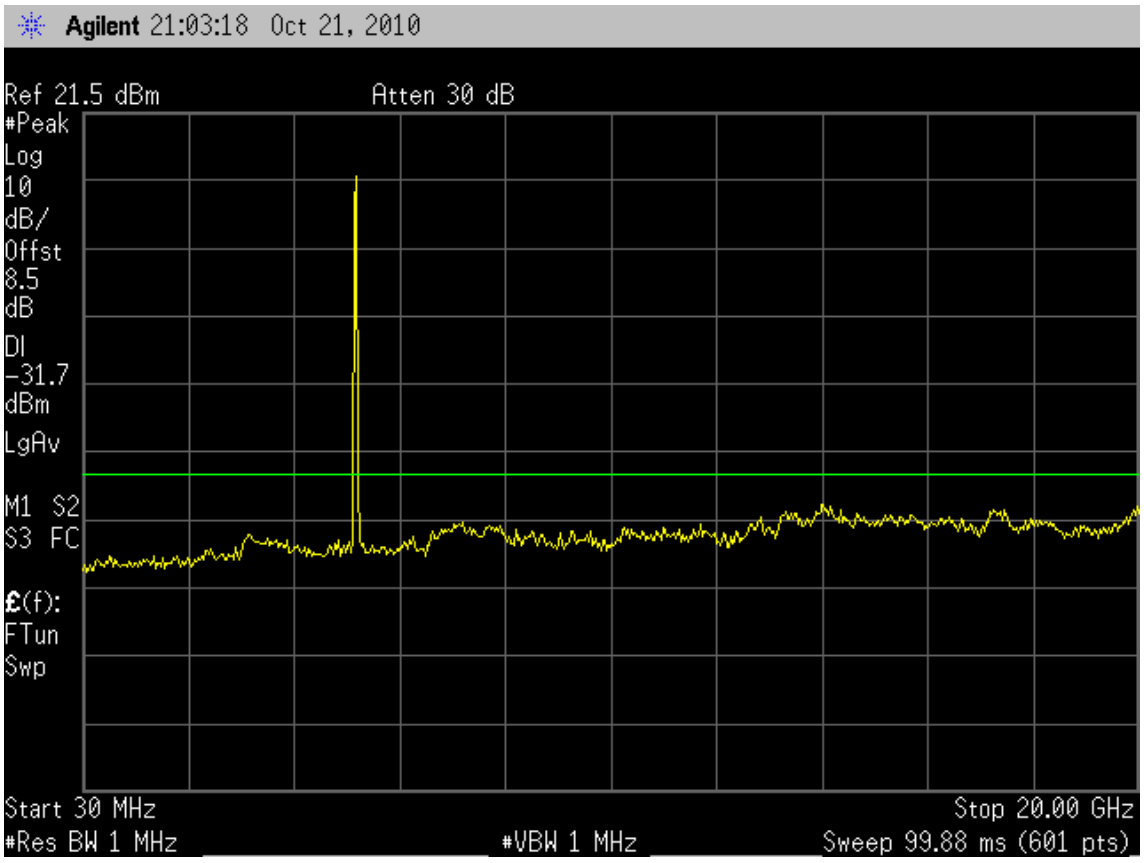
802.11a, Frequency: 5200MHz



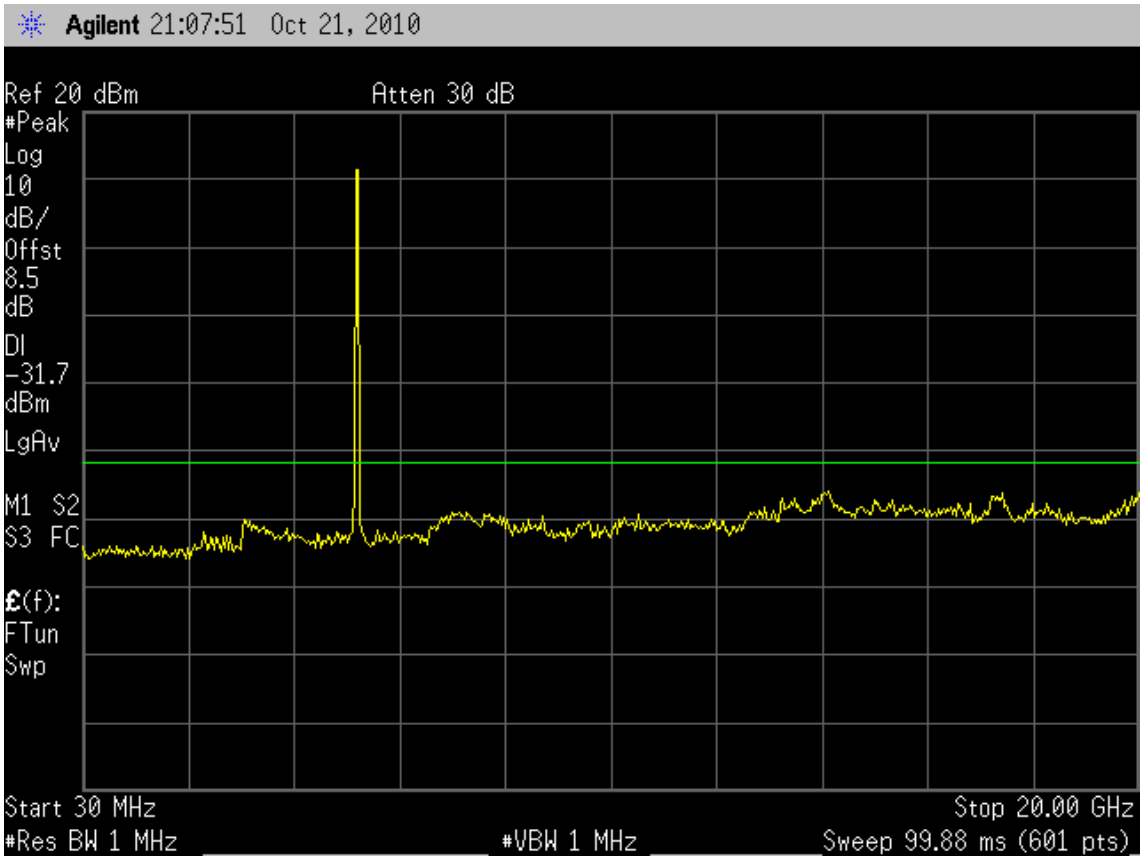
802.11a, Frequency: 5240MHz



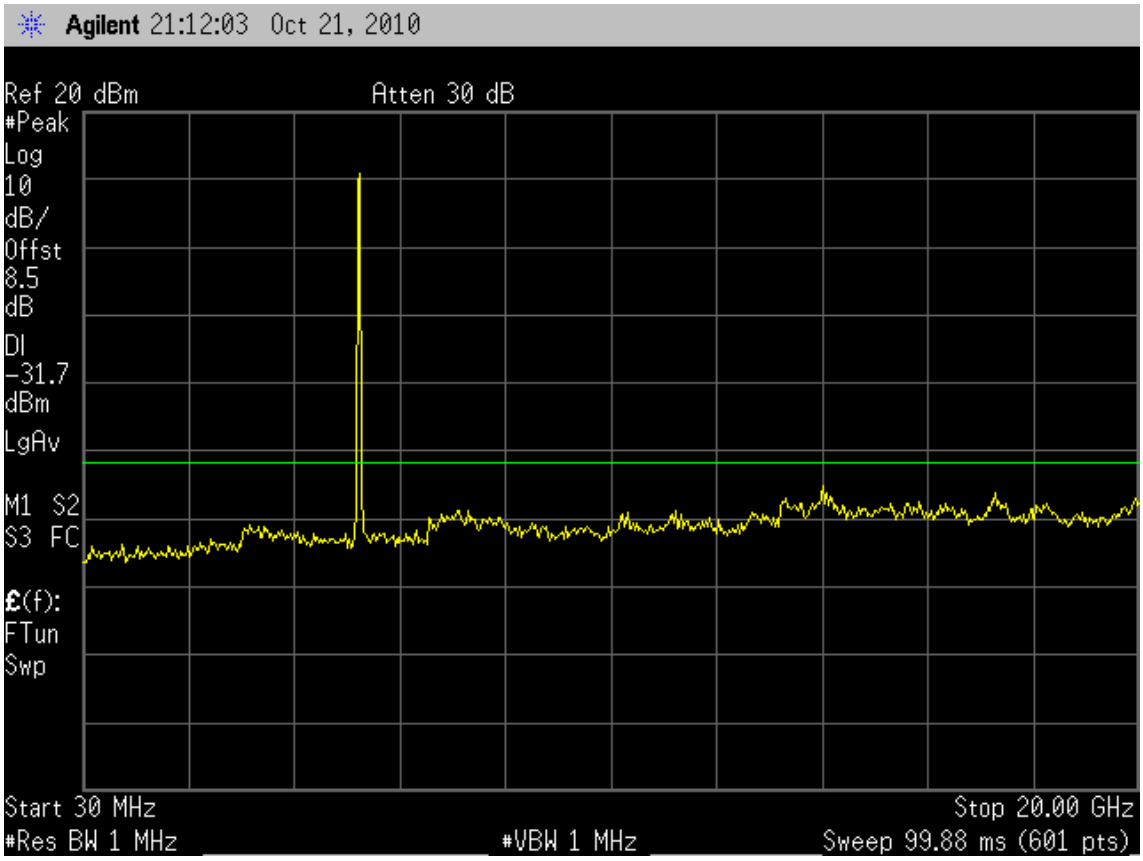
802.11n-HT20, Frequency: 5180MHz



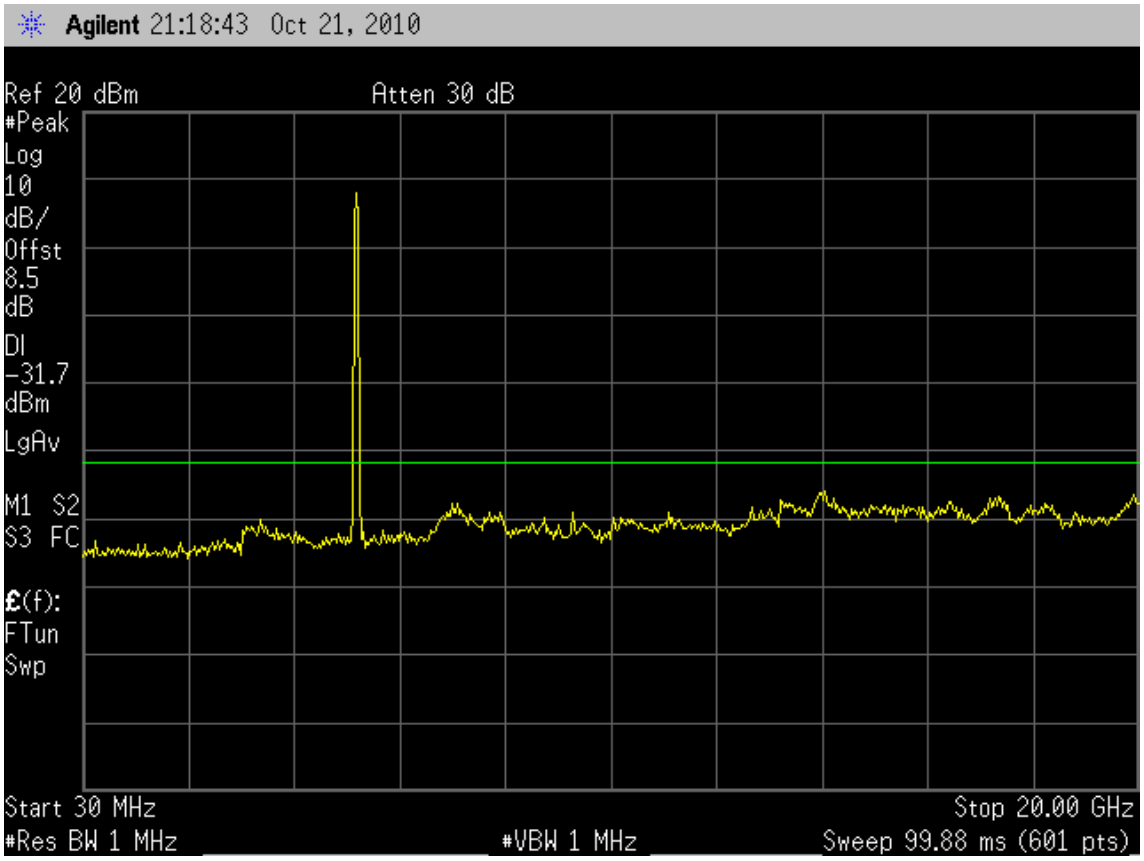
802.11n-HT20, Frequency: 5200MHz



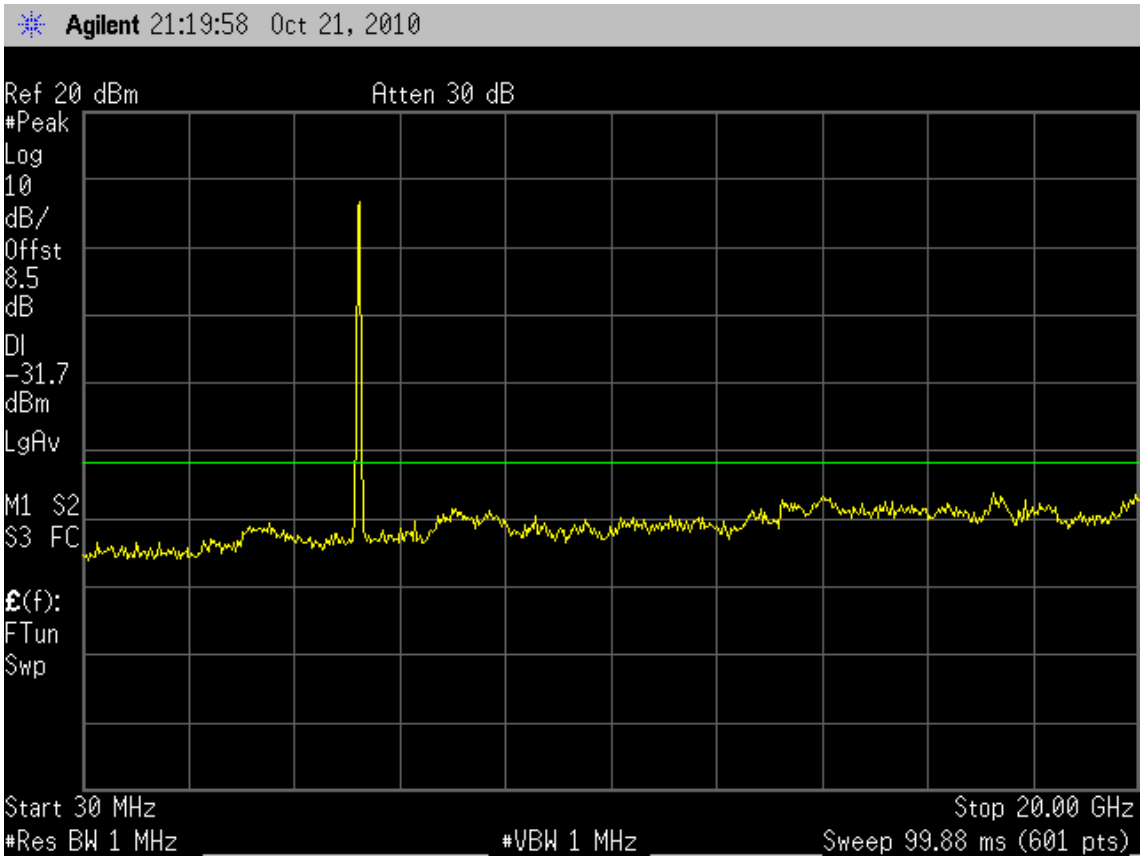
802.11n-HT20, Frequency: 5240MHz



802.11n-HT40, Frequency: 5190MHz



802.11n-HT40, Frequency: 5230MHz



7. POWER SPECTRAL DENSITY MEASUREMENT

7.1. Test Equipment

The following test equipment was used during the power spectral density measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E4446A	US44300366	Aug. 04, 10’	Aug. 03, 11’
2.	Power Divider	Anritsu	K240C	019728	Aug. 05, 10’	Aug. 04, 11’

7.2. Block Diagram of Test Setup

The same as section.6.2.

7.3. Specification Limits (§15.407(a)-(1))

For the band 5.15-5.25GHz, the peak power spectral density shall not exceed 4dBm in any 1MHz band.

7.4. Operating Condition of EUT

The test program “Broadcom WL Command” was used to enable the EUT to transmit data at different channel frequency individually.

7.5. Test Procedure

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices-Part 15, Subpart E, August 2002.
PPSD Method#2 was used.

7.6. Test Results

PASSED. All the test results are attached in next pages.

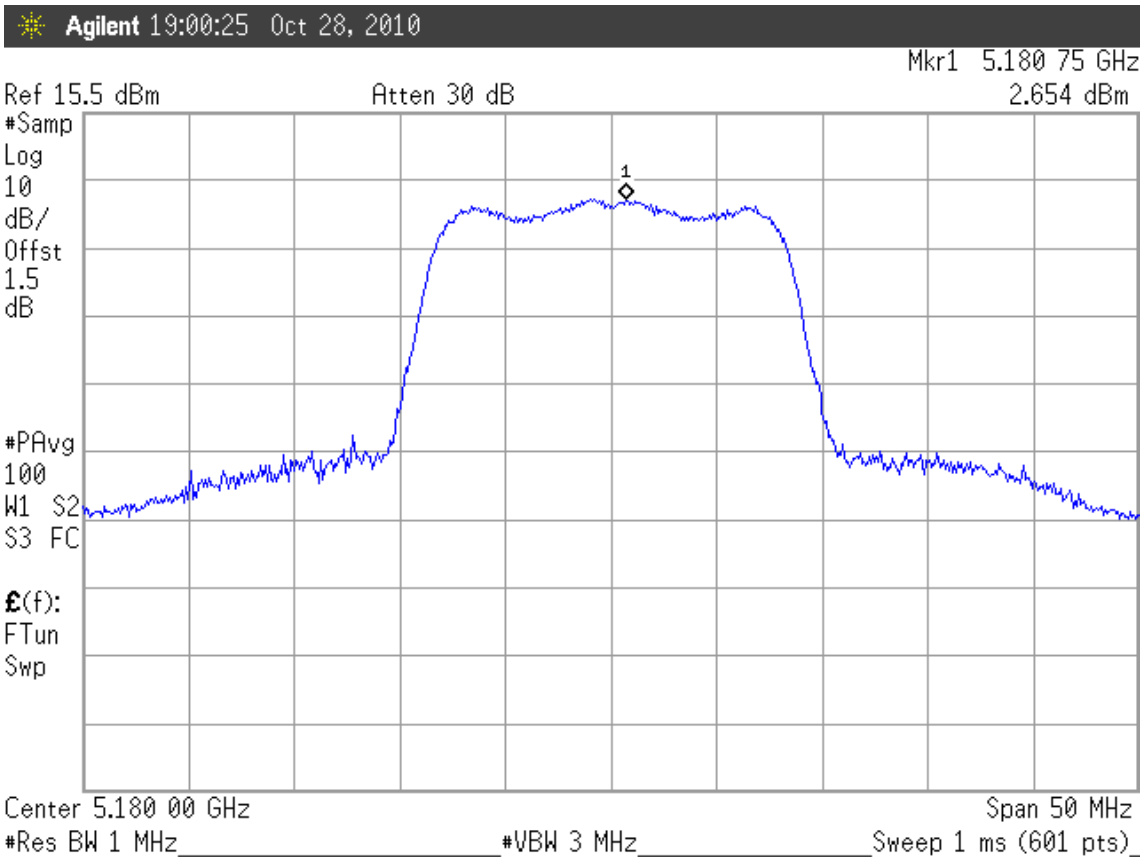
(Test Date : Oct. 21, 2010 Temperature : 26℃ Humidity : 55%)

In the 802.11n-HT20 and 802.11n-HT40 mode, we using power divider for measuring in the worst case.

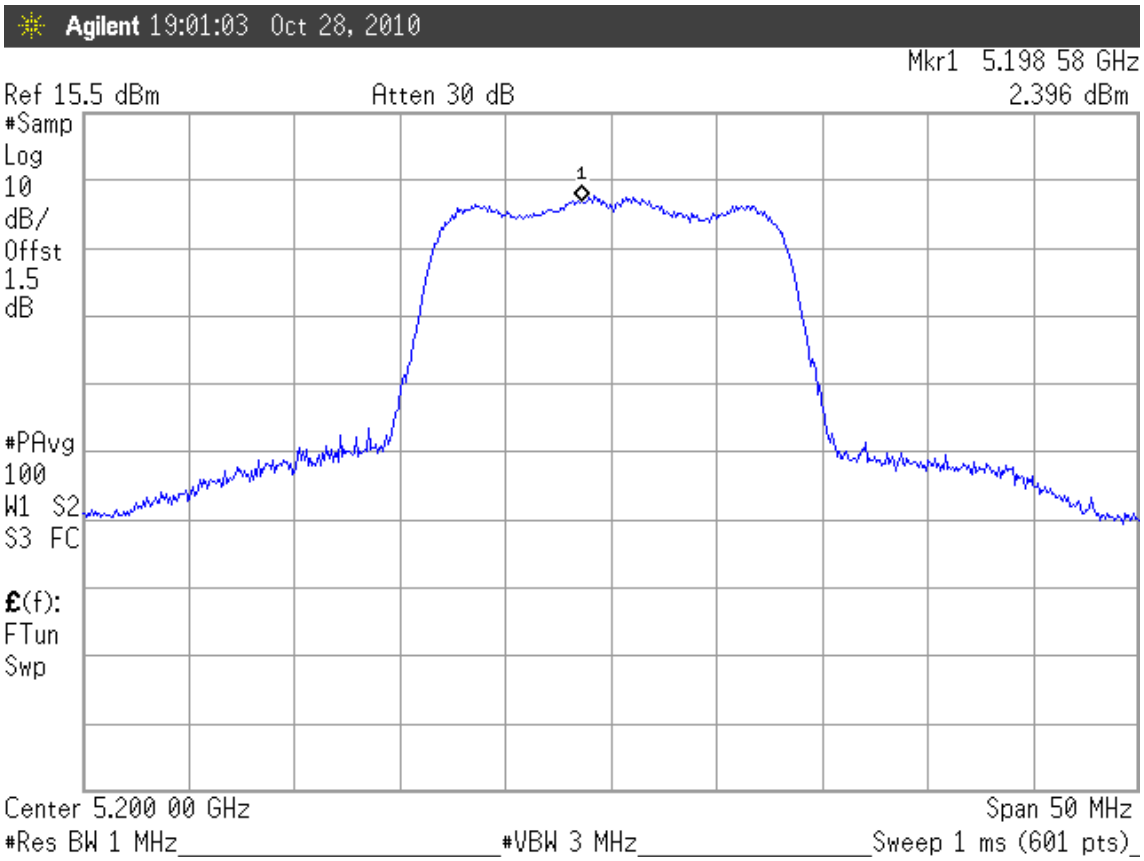
Mode	Type of Network	Channel	Frequency	**Power Spectral Density (dBm)**
1.	802.11a	CH 36	5180MHz	**2.654**
2.		CH 40	5200MHz	**2.396**
3.		CH 48	5240MHz	**2.542**
1.	802.11n-HT20	CH 36	5180MHz	**2.360**
2.		CH 40	5200MHz	**2.402**
3.		CH 48	5240MHz	**2.662**
1.	802.11n-HT40	CH 38	5190MHz	**0.697**
2.		CH 46	5230MHz	**0.786**

[Limit: 4dBm]

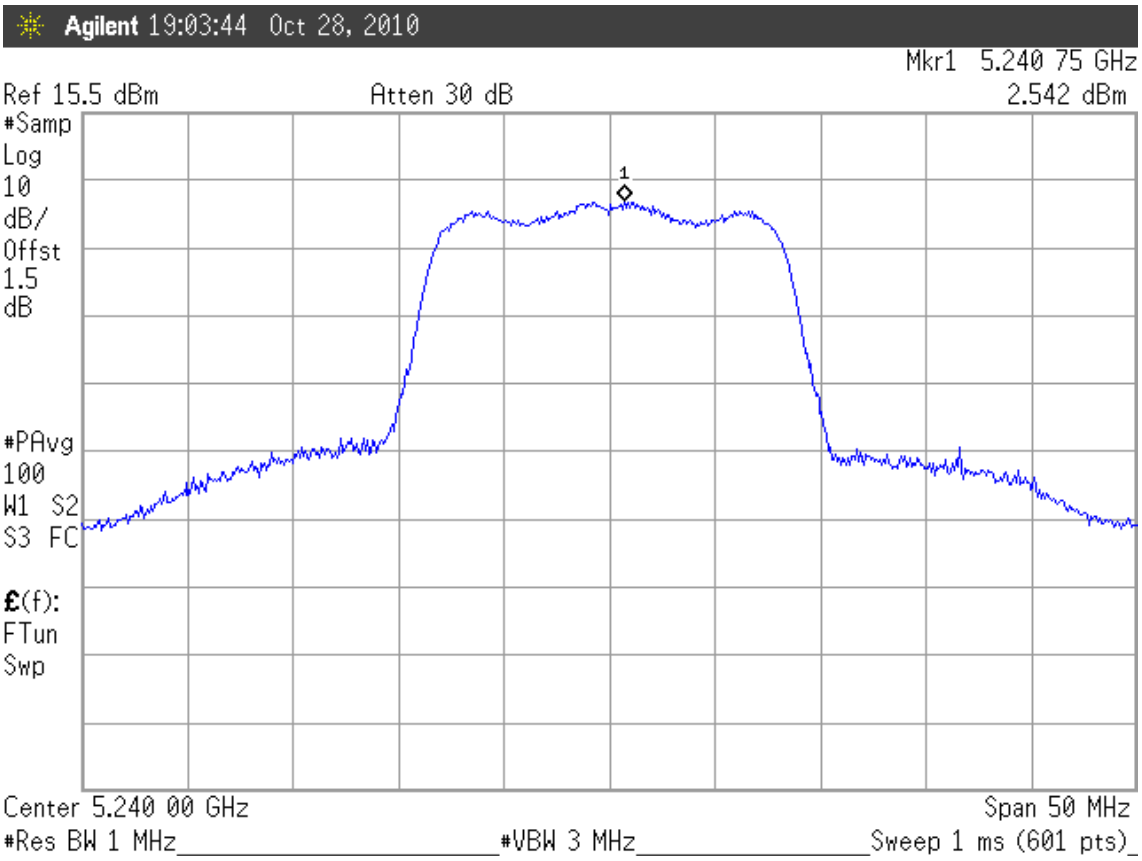
802.11a, Frequency: 5180MHz



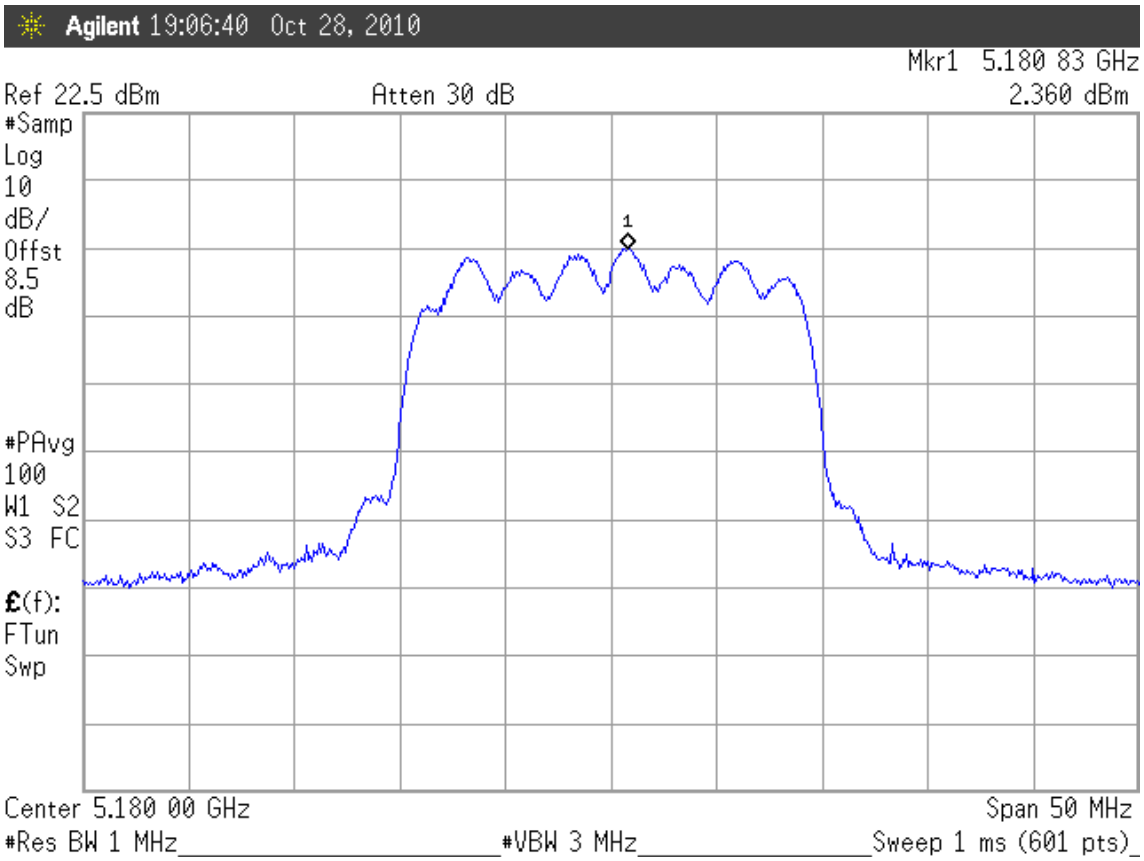
802.11a, Frequency: 5200MHz



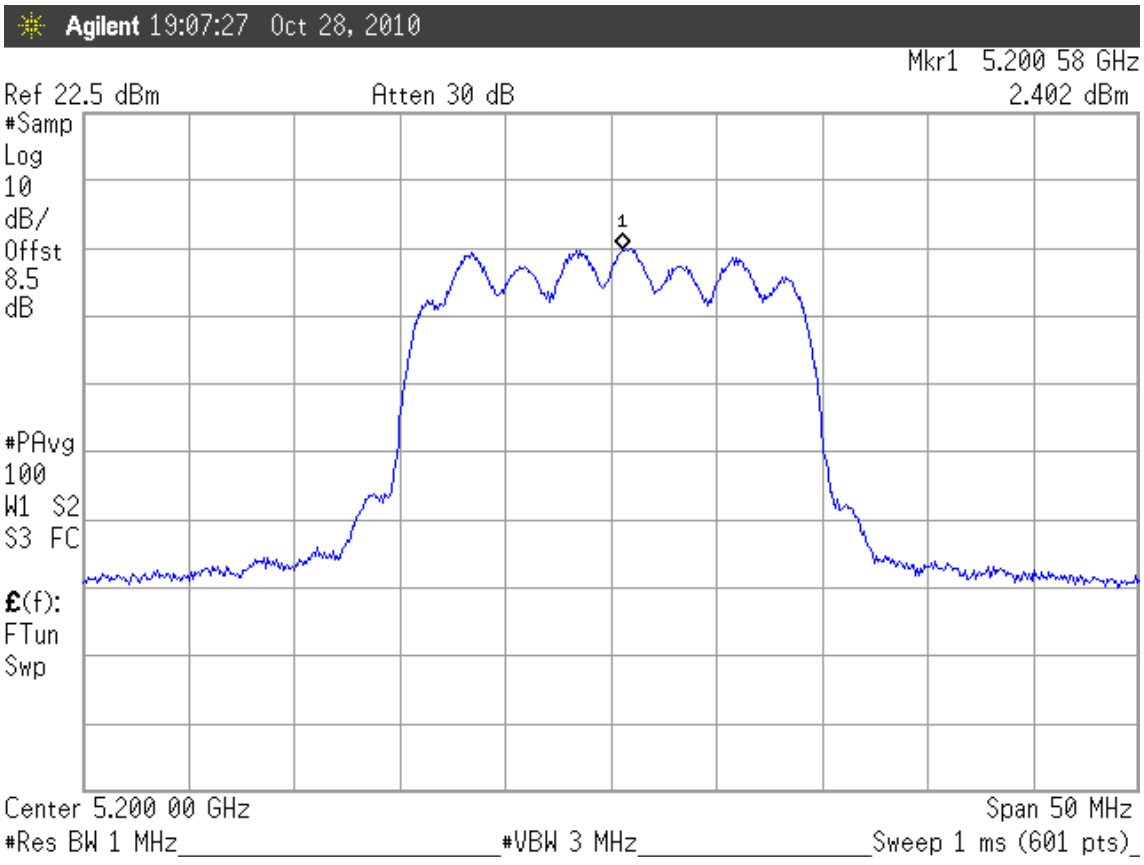
802.11a, Frequency: 5240MHz



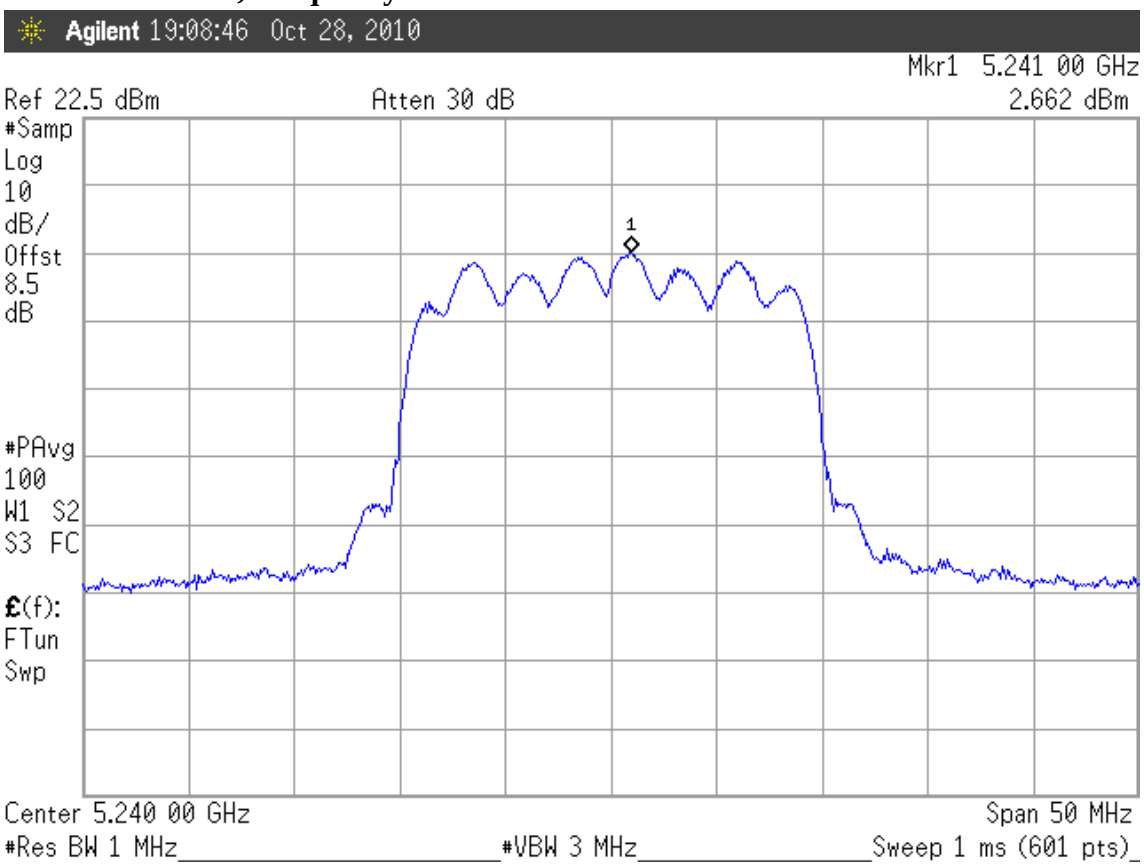
802.11n-HT20, Frequency: 5180MHz



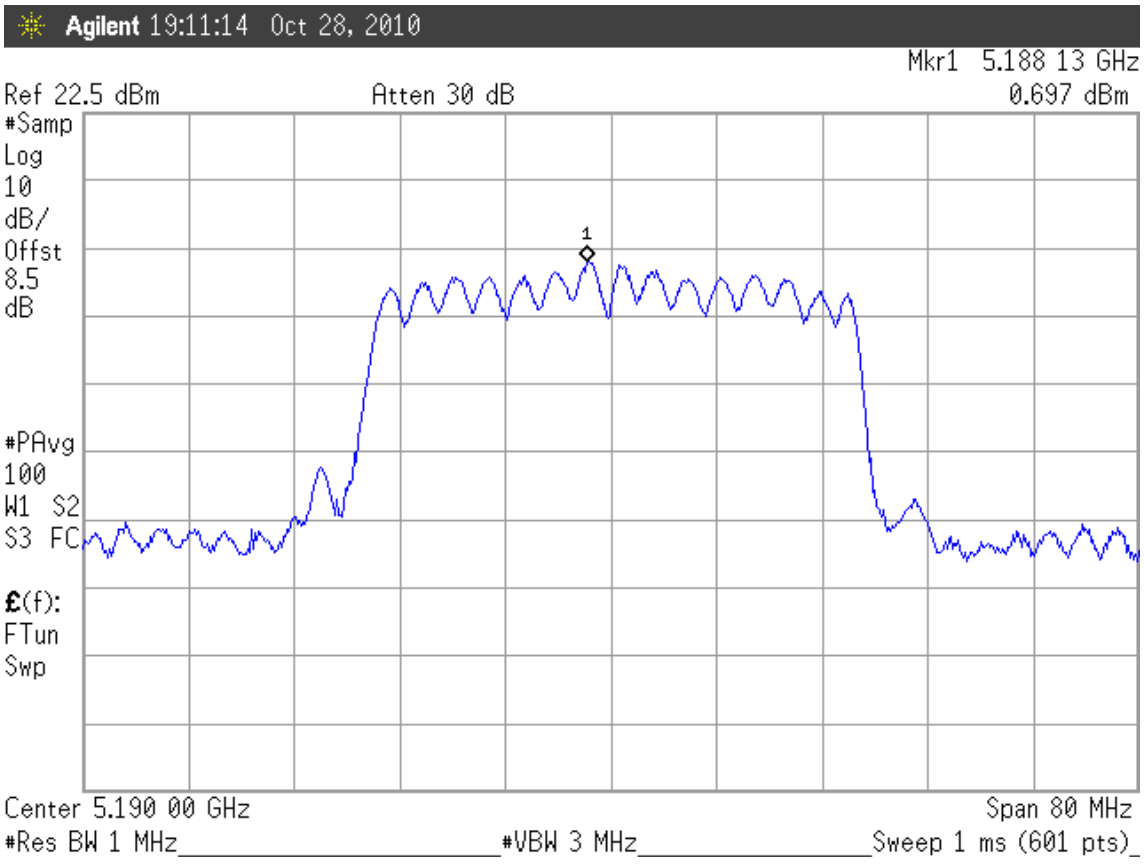
802.11n-HT20, Frequency: 5200MHz



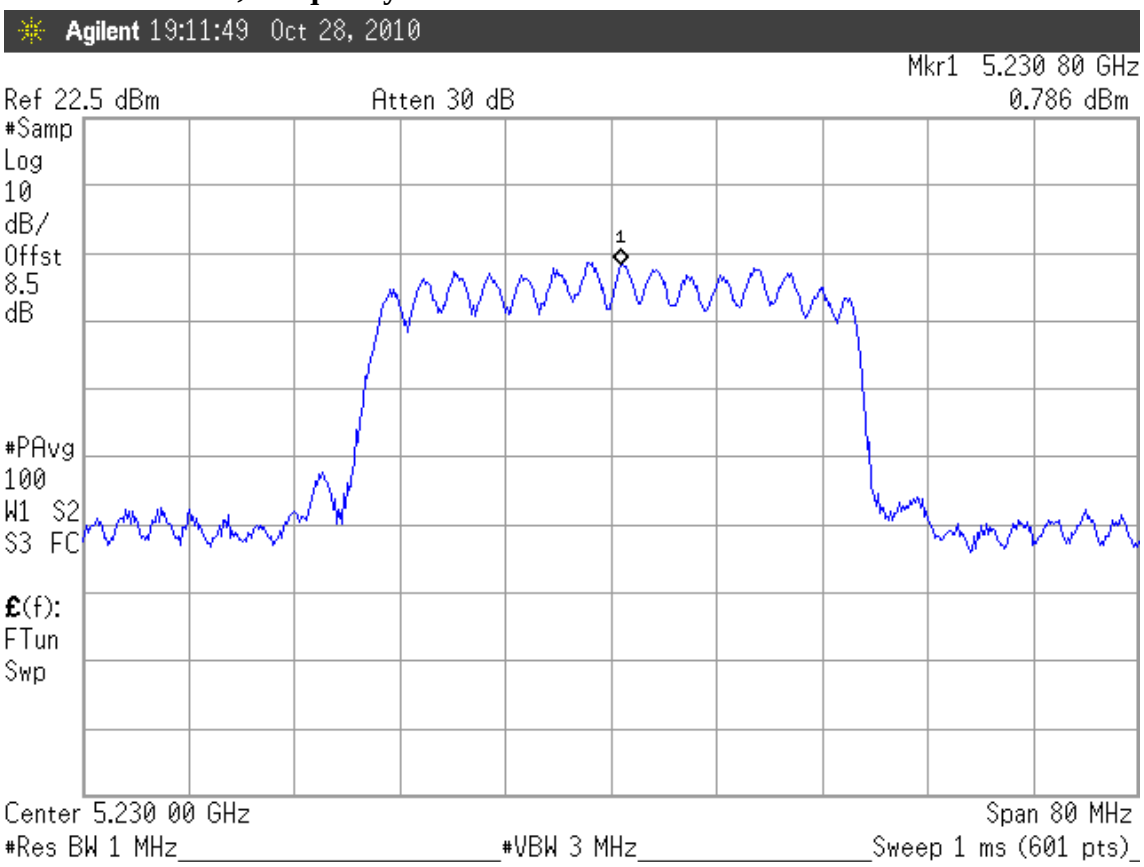
802.11n-HT20, Frequency: 5240MHz



802.11n-HT40, Frequency: 5190MHz



802.11n-HT40, Frequency: 5230MHz



8. PEAK POWER EXCURSION MEASUREMENT

8.1. Test Equipment

The following test equipment was used during the power spectral density measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E4446A	US44300366	Aug. 04, 10’	Aug. 03, 11’

8.2. Block Diagram of Test Setup

The same as section.4.2.

8.3. Specification Limits (§15.407(a)-(6))

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13dB across any 1MHz bandwidth or the emission bandwidth whichever is less.

8.4. Operating Condition of EUT

The test program “Broadcom WL Command” was used to enable the EUT to transmit data at different channel frequency individually.

8.5. Test Procedure

Transmitter output was connected to the spectrum analyzer. Using peak detector and Max-hold function for Trace 1 (RBW=1MHz, VBW=3MHz) and Trace 2 (RBW=1MHz, VBW=300kHz).
The measurement guideline was according to DA-02-2138

8.6. Test Results

PASSED. All the test results are attached in next pages.

(Test Date : Oct. 21, 2010 Temperature : 26℃ Humidity : 55%)
(Test Date : Nov. 05, 2010 Temperature : 24℃ Humidity : 58%)

8.6.1. For 802.11a

Mode	Type of Network	Channel	Frequency	**Peak Power Excursion**
1.	802.11a	CH 36	5180MHz	**-4.02dB**
2.		CH 40	5200MHz	**-5.46dB**
3.		CH 48	5240MHz	**-6.12dB**

[Limit: 13dB]

8.6.2. For 802.11n-HT20

Mode	Type of Network	Channel	Frequency	**Peak Power Excursion**	
				Ant. 0	**Ant.1**
1.	802.11n-HT20	CH 36	5180MHz	**-6.17dB**	**-5.16dB**
2.		CH 40	5200MHz	**-6.11dB**	**-4.55dB**
3.		CH 48	5240MHz	**-6.63dB**	**-3.50dB**

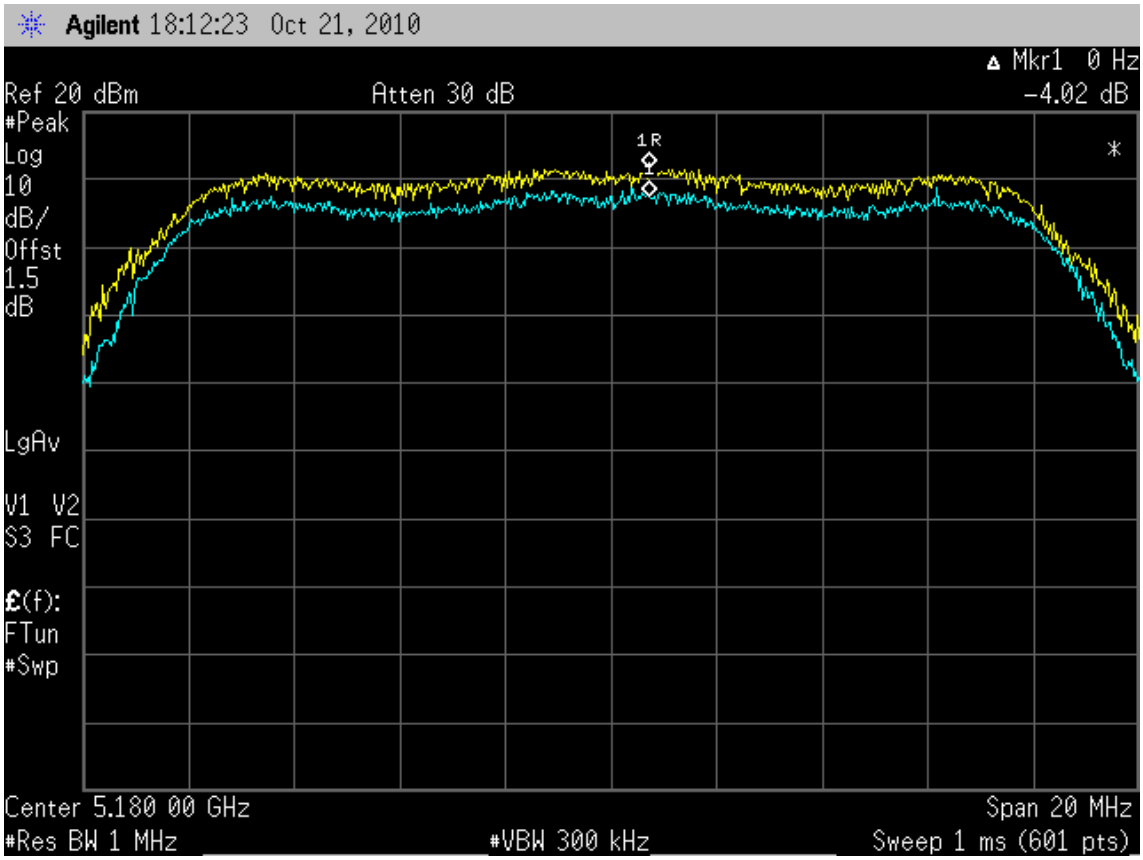
[Limit: 13dB]

8.6.3. For 802.11n-HT40

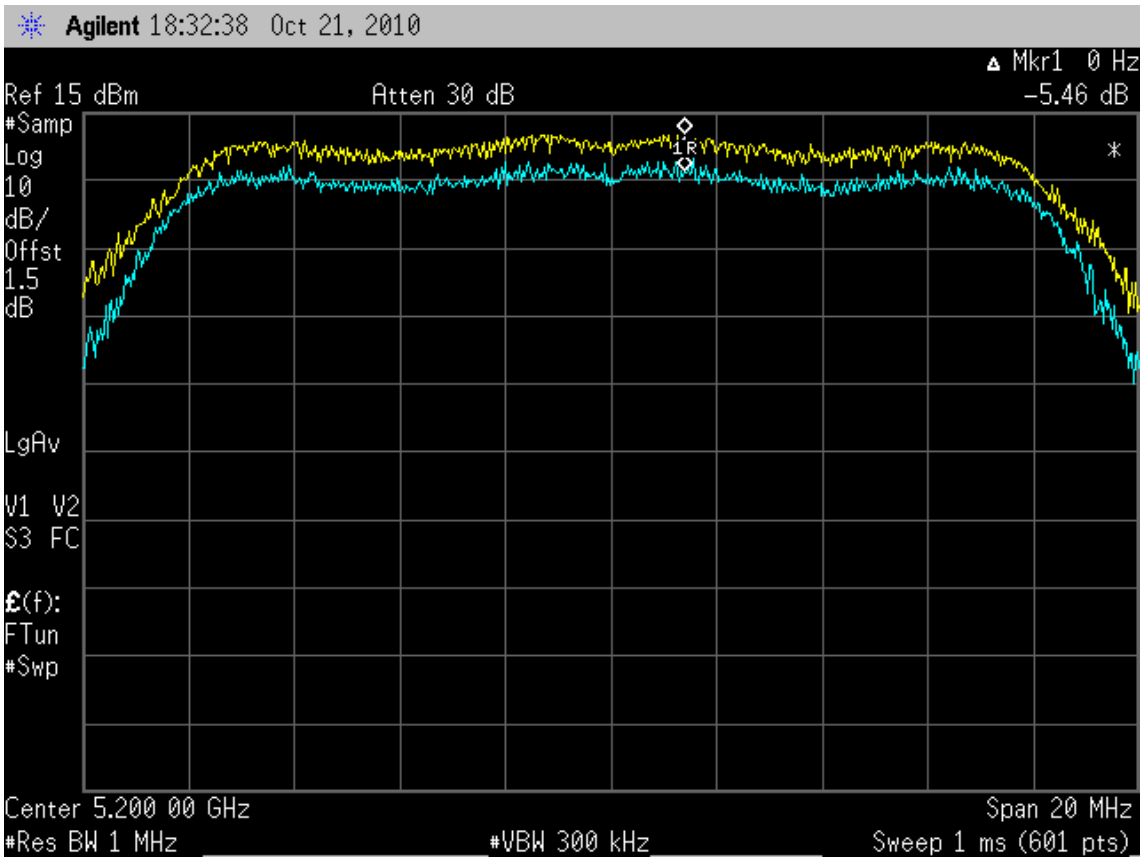
Mode	Type of Network	Channel	Frequency	**Peak Power Excursion**	
				Ant. 0	**Ant.1**
1.	802.11n-HT40	CH 38	5190MHz	**-3.50dB**	**-3.77dB**
2.		CH 46	5230MHz	**-3.22dB**	**-5.55dB**

[Limit: 13dB]

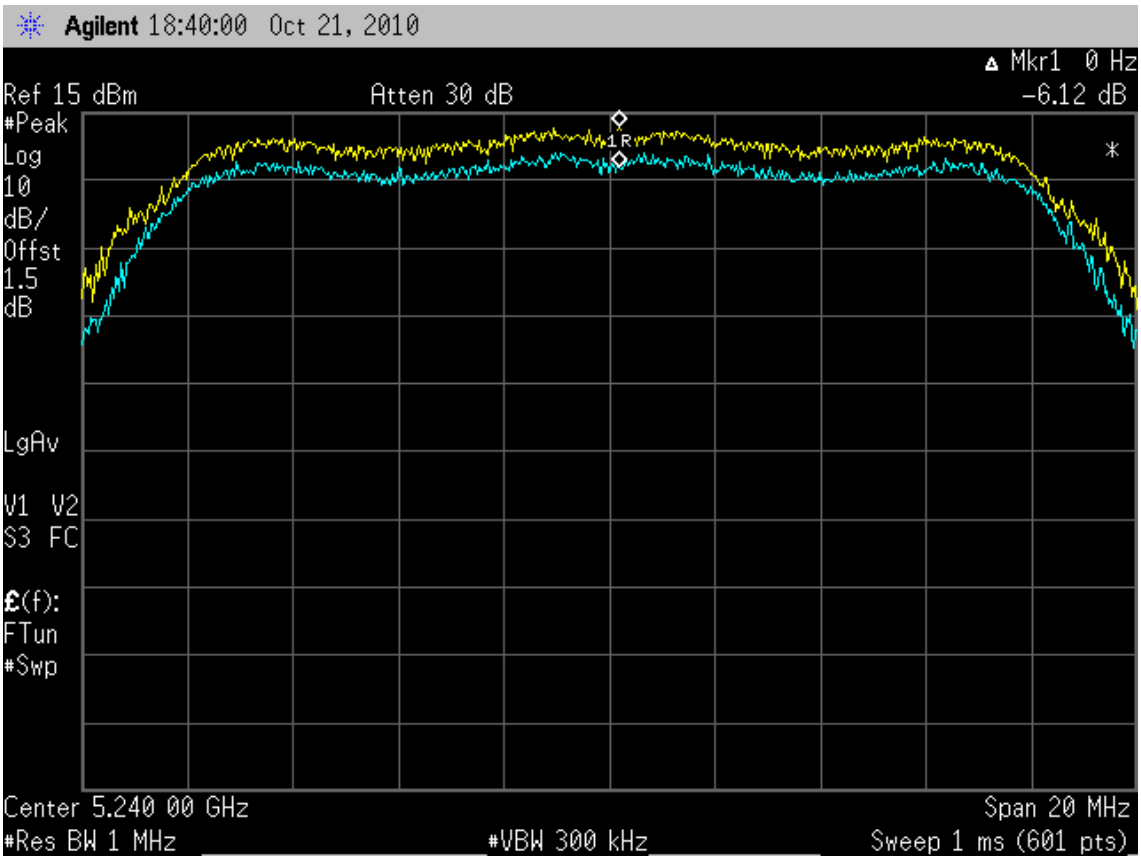
802.11a, Frequency: 5180MHz



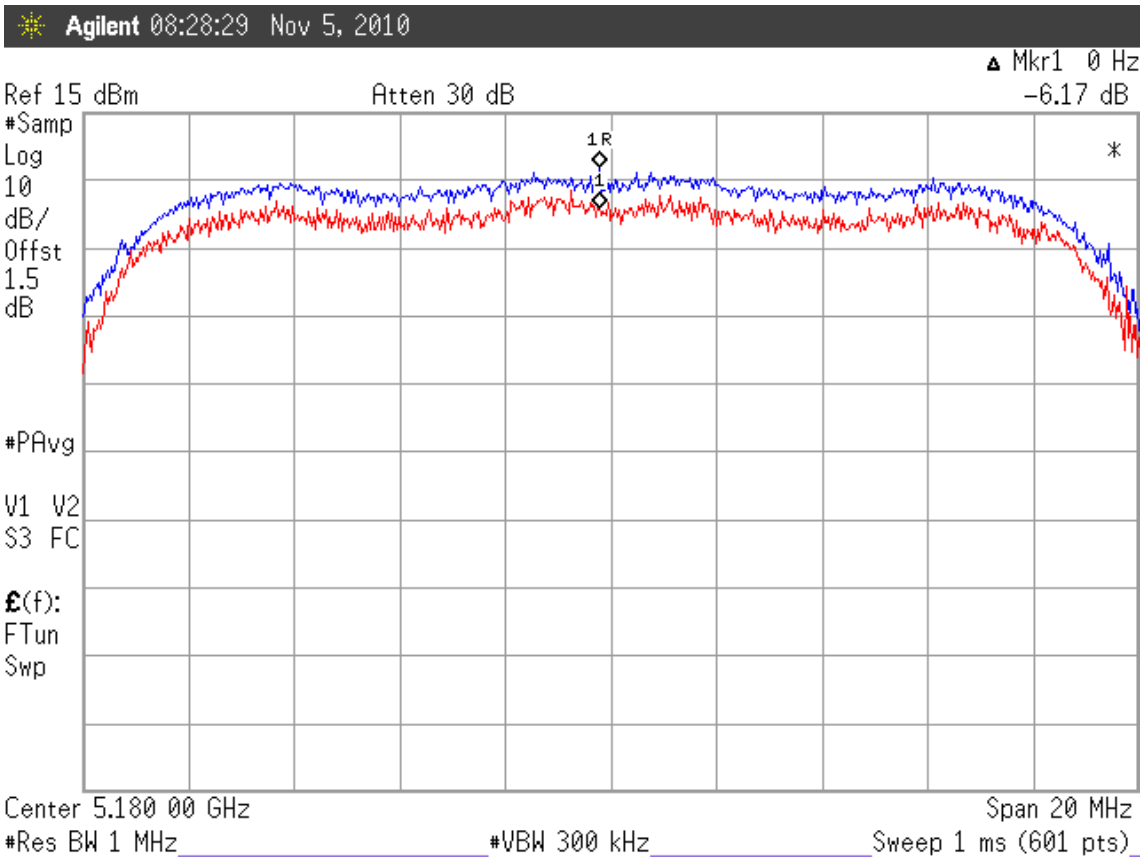
802.11a, Frequency: 5200MHz



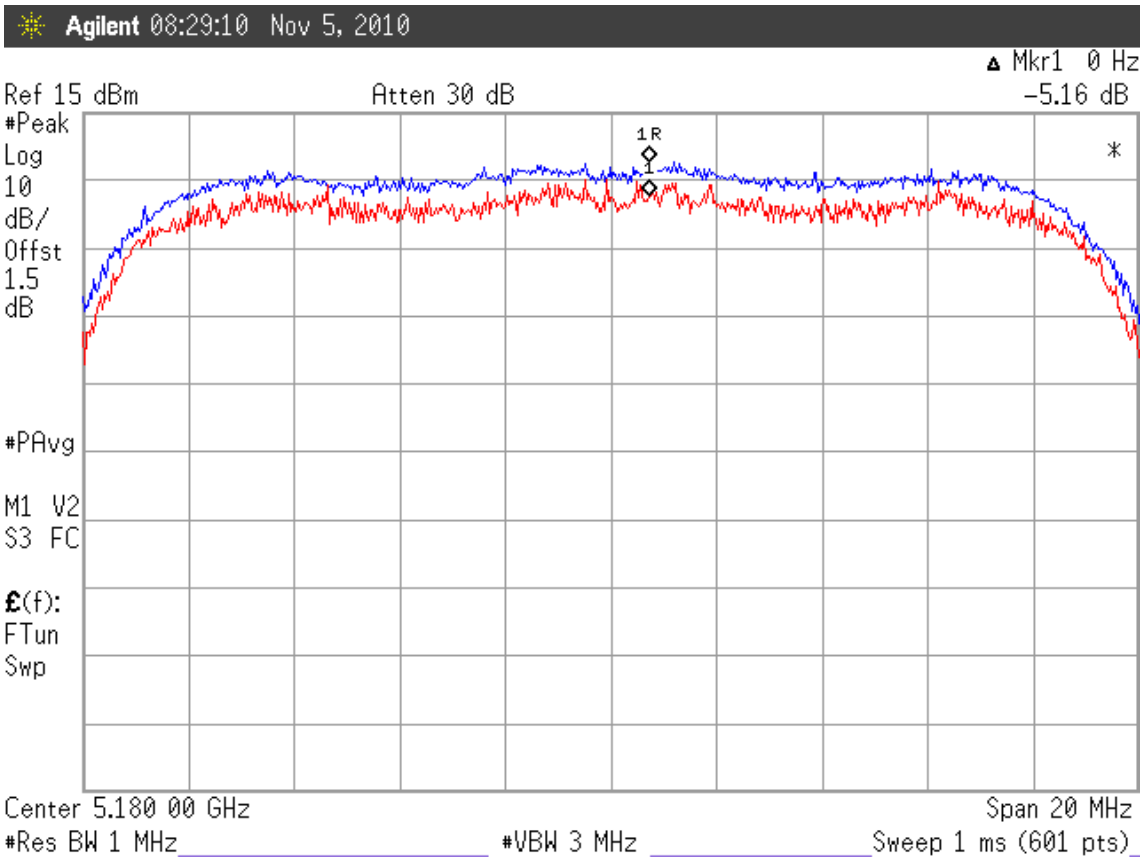
802.11a, Frequency: 5240MHz



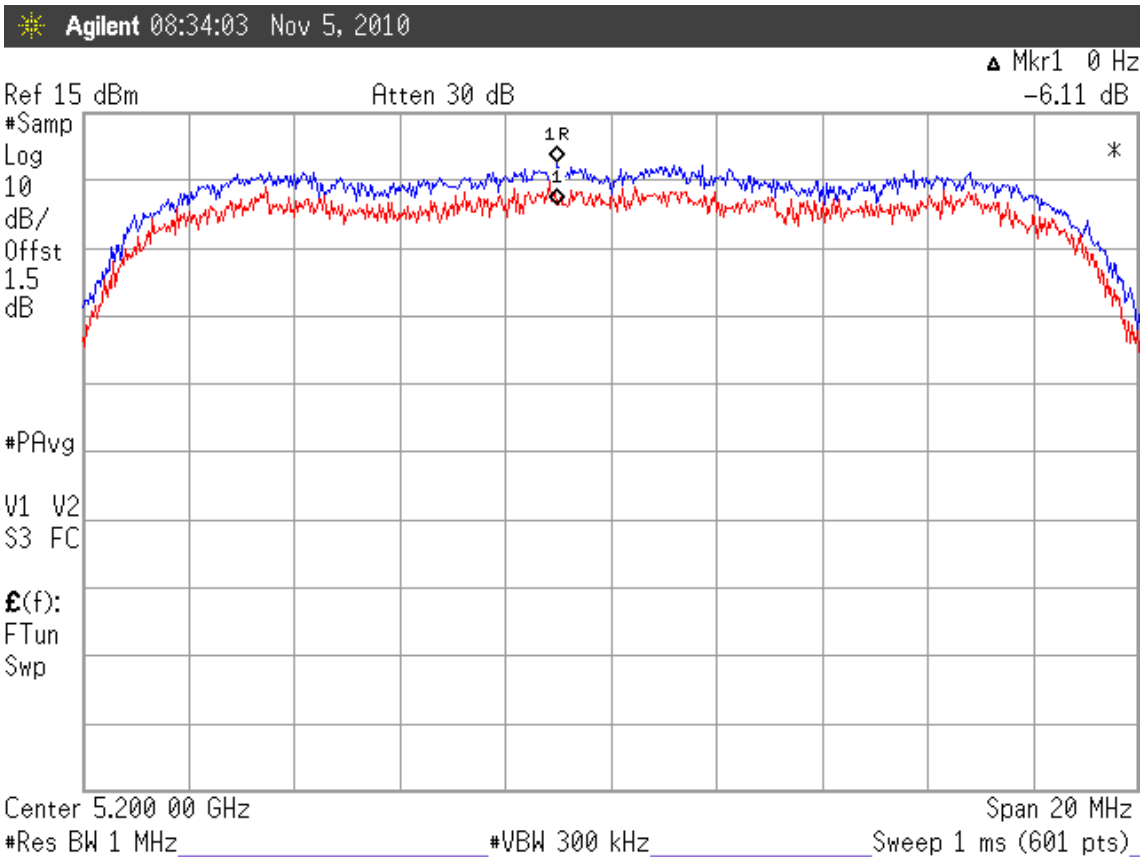
802.11n-HT20, Frequency: 5180MHz (Ant. 0)



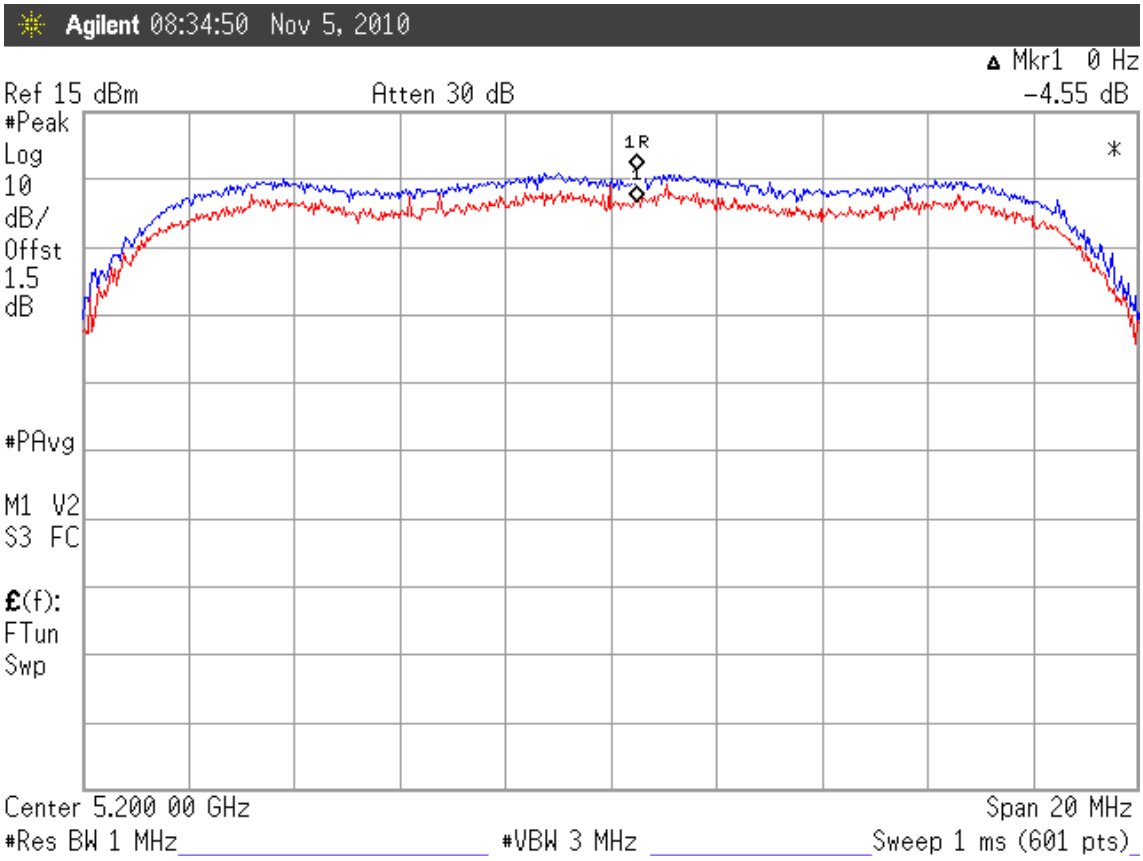
802.11n-HT20, Frequency: 5180MHz (Ant. 1)



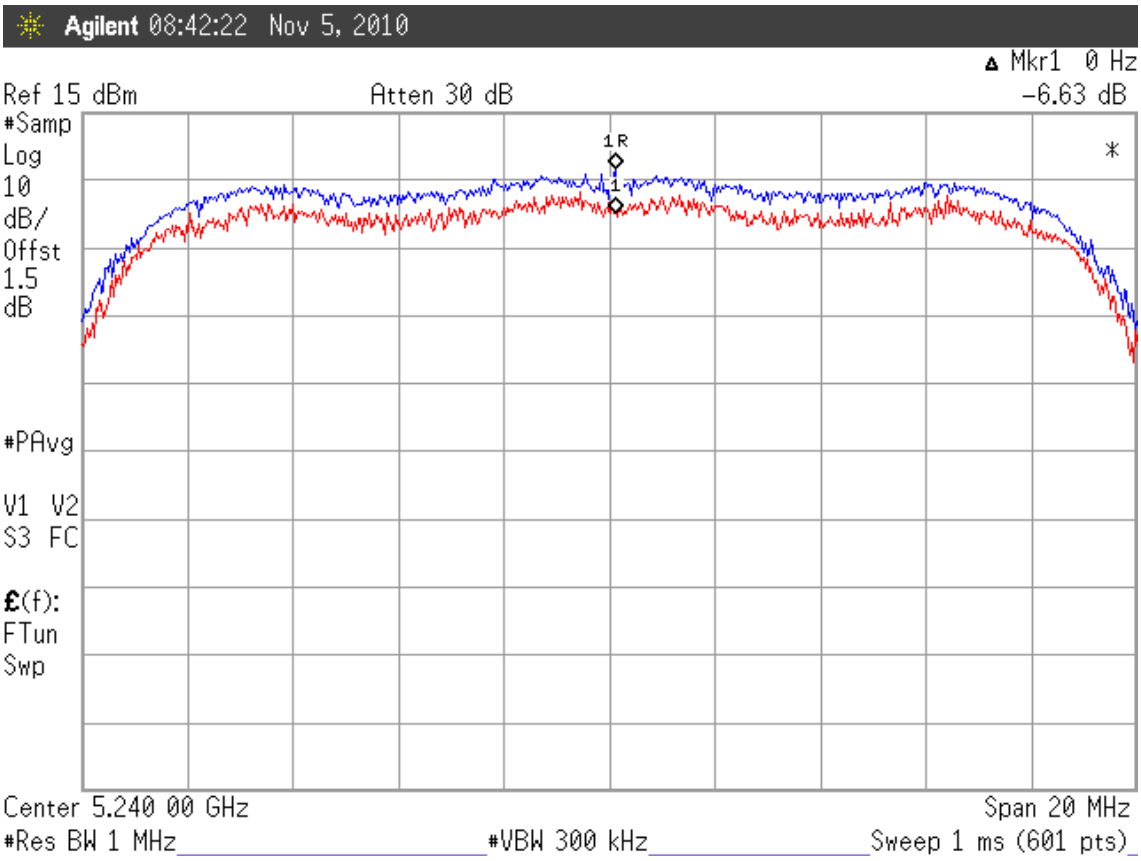
802.11n-HT20, Frequency: 5200MHz (Ant. 0)



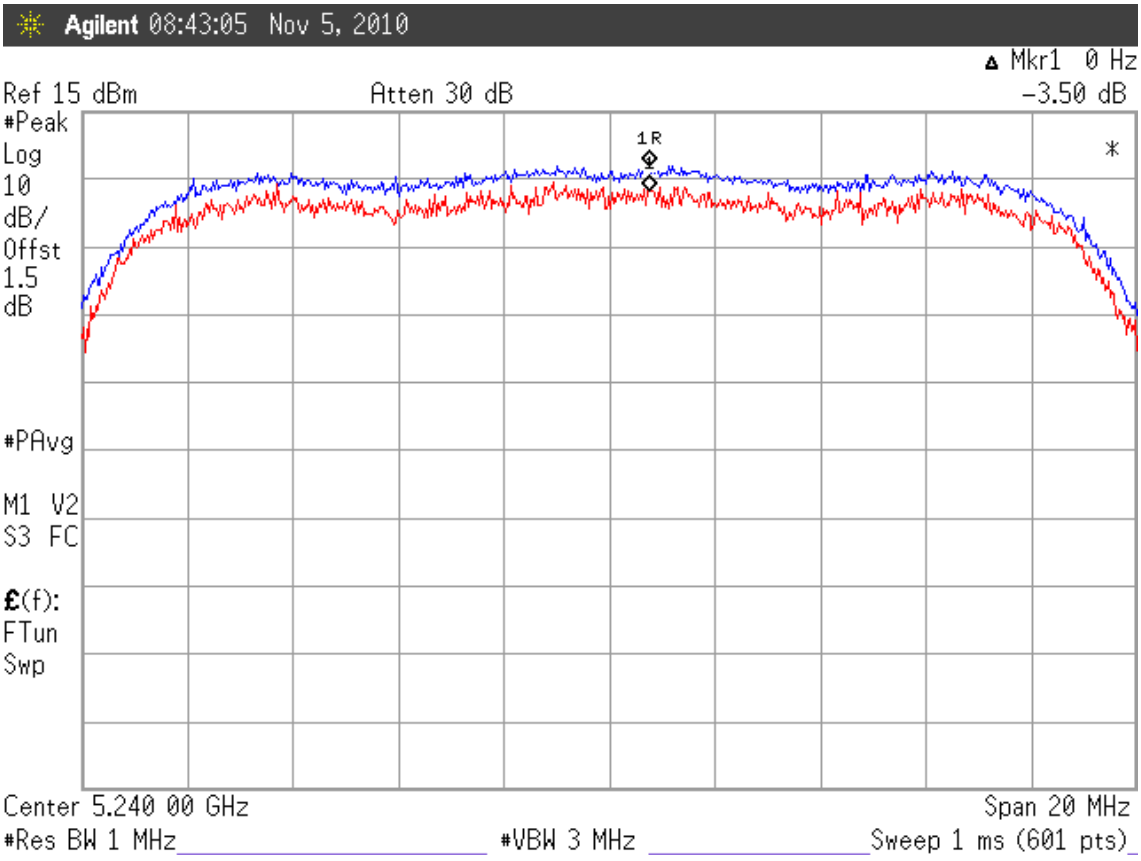
802.11n-HT20, Frequency: 5200MHz (Ant. 1)



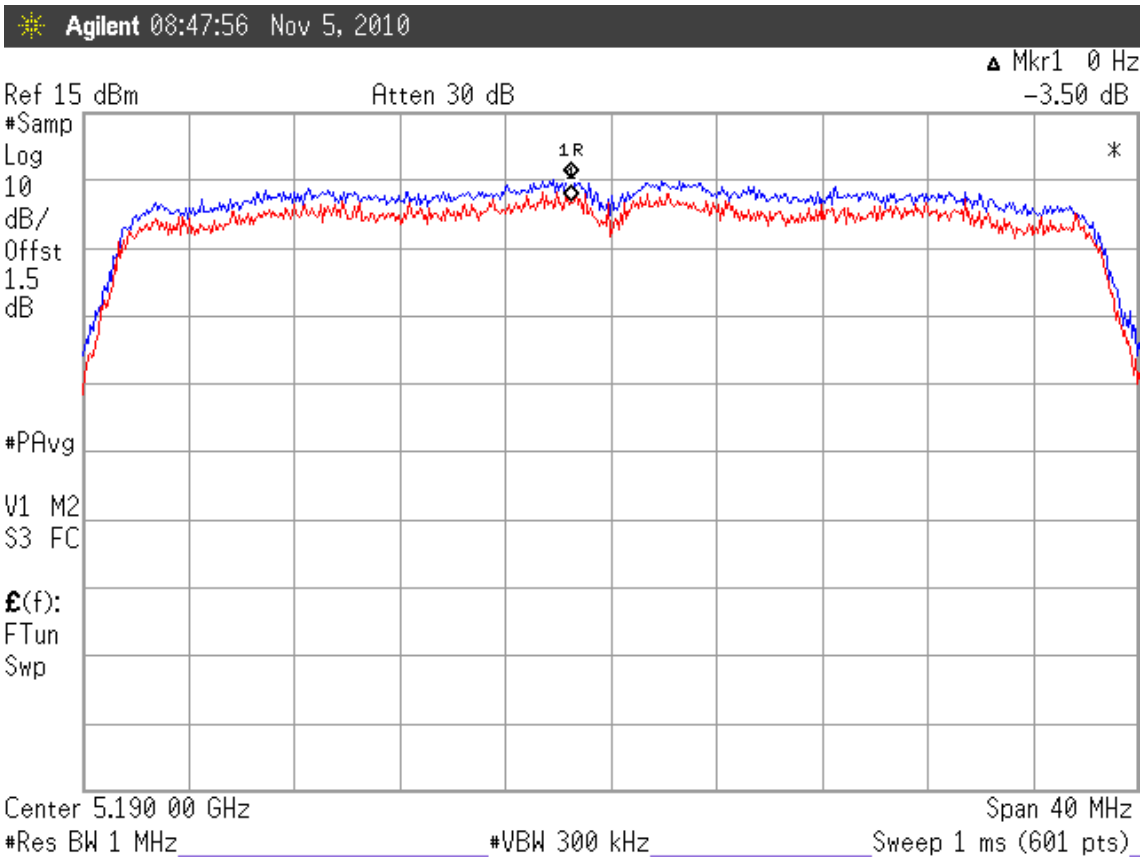
802.11n-HT20, Frequency: 5240MHz (Ant. 0)



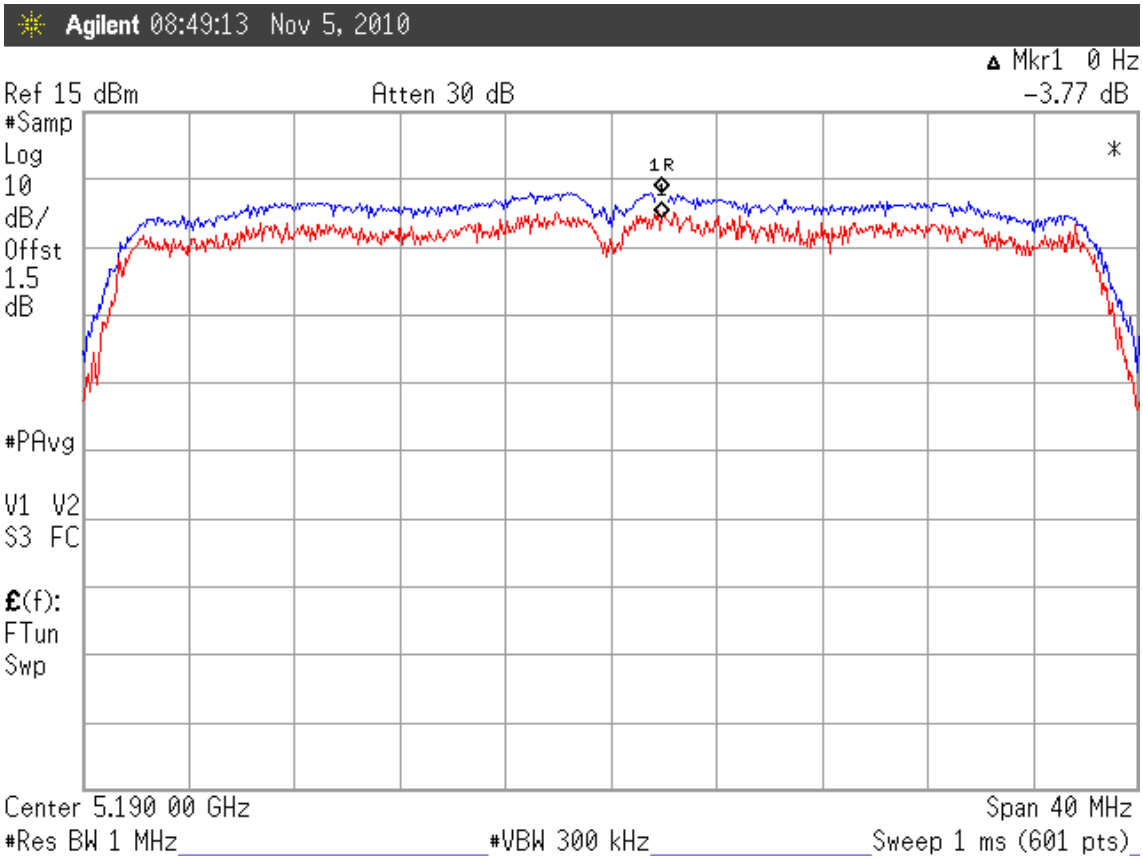
802.11n-HT20, Frequency: 5240MHz (Ant. 1)



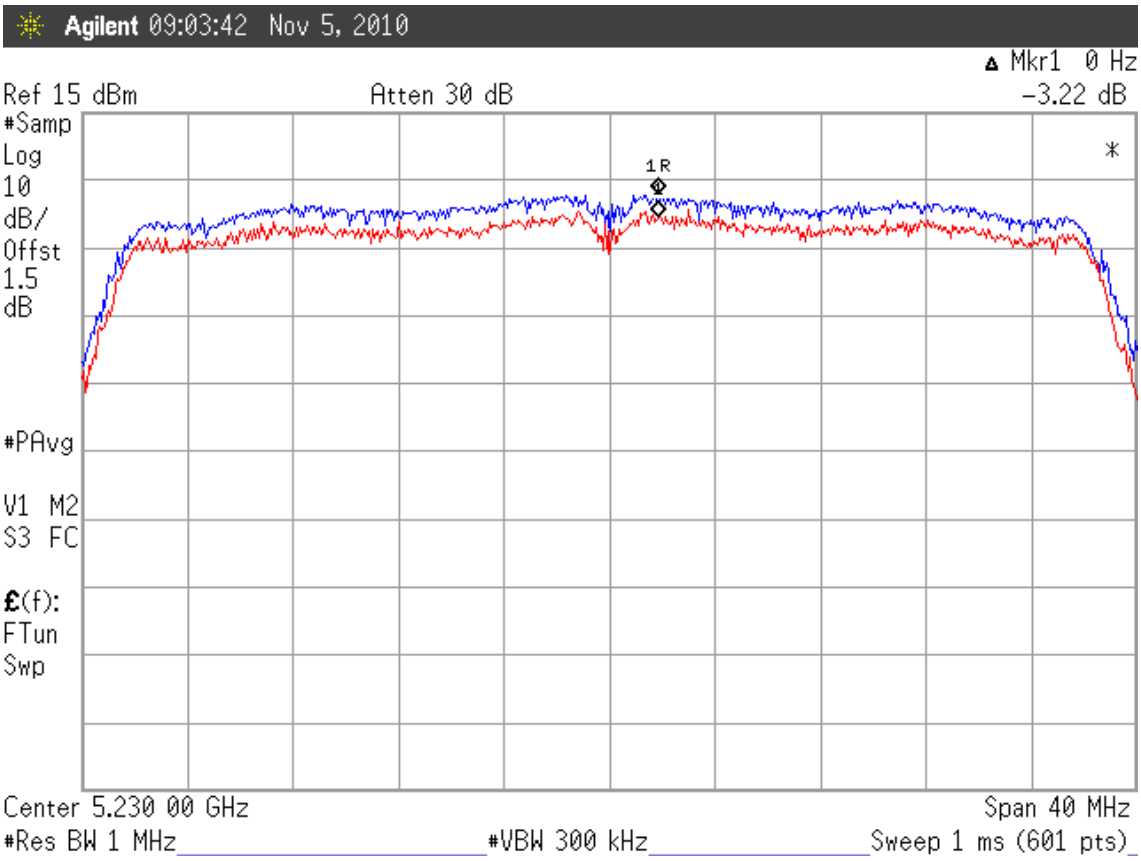
802.11n-HT40, Frequency: 5190MHz (Ant. 0)



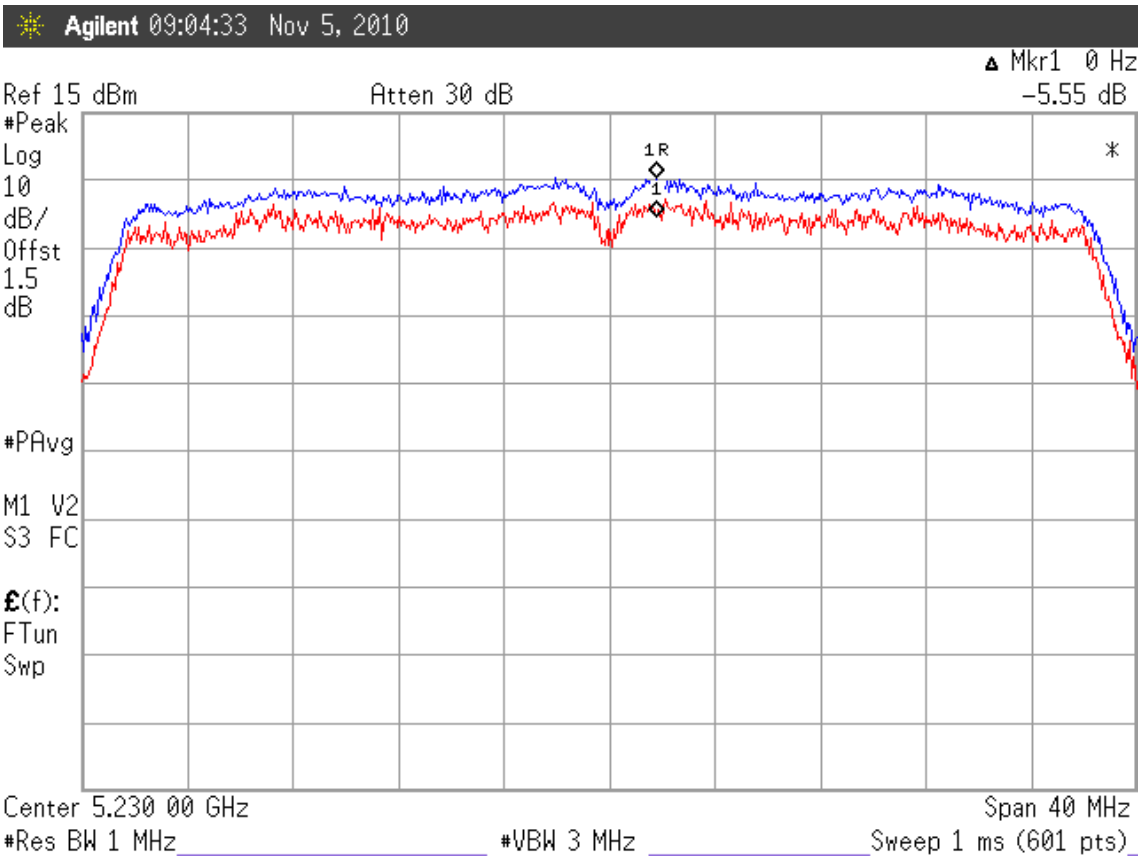
802.11n-HT40, Frequency: 5190MHz (Ant. 1)



802.11n-HT40, Frequency: 5230MHz (Ant. 0)



802.11n-HT40, Frequency: 5230MHz (Ant. 1)



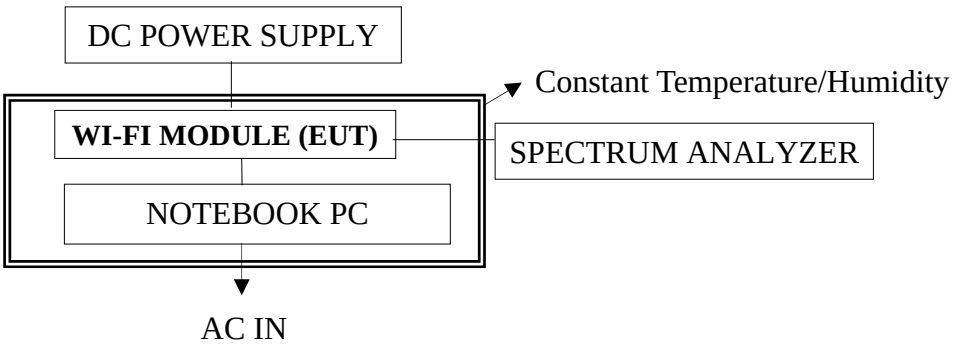
9. FREQUENCY STABILITY MEASUREMENT

9.1. Test Equipment

The following test equipment was used during the power spectral density measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E4446A	US44300366	Aug. 04, 10’	Aug. 03, 11’
2.	Constant Temperature/ Humidity	Taichy	MHG-120LF	920538	Jun. 17, 10’	Jun. 16, 11’
3.	DC Power Supply	TOP WARD	3303A	721773	N/A	N/A

9.2. Block Diagram of Test Setup



9.3. Specification Limits (§15.407(g))

Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user’s manual.

9.4. Operating Condition of EUT

The test program “Broadcom WL Command” was used to enable the EUT to transmit data at different channel frequency individually.

9.5. Test Procedure

Set the EUT un-modulation mode and RBW=10kHz, VBW=10kHz.

9.6. Test Results

PASSED. All the test results are attached in next pages.

(Test Date : Oct. 06, 2010 Temperature : 26℃ Humidity : 55%)

Test Condition		**After 2mimute**		
Temperature (℃)	Voltage (V)	Frequency (MHz)	Measurement Value (MHz)	Result (ppm)
25℃	4.75	5180	5180.0222	-4.29
		5190	5190.0234	-4.51
		5200	5200.0217	-4.17
		5230	5230.0224	-4.28
		5240	5240.0217	-4.14
	5.25	5180	5180.0225	-4.34
		5190	5190.0229	-4.41
		5200	5200.0219	-4.21
		5230	5230.0225	-4.30
		5240	5240.0211	-4.03
-20	4.75	5180	5180.0271	-5.23
		5190	5190.0277	-5.34
		5200	5200.0265	-5.10
		5230	5230.0268	-5.12
		5240	5240.0261	-4.98
	5.25	5180	5180.0272	-5.25
		5190	5190.0269	-5.18
		5200	5200.0265	-5.10
		5230	5230.0268	-5.12
		5240	5240.0264	-5.04
55℃	4.75	5180	5180.0202	-3.90
		5190	5190.0205	-3.95
		5200	5200.0198	-3.81
		5230	5230.0199	-3.80
		5240	5240.0207	-3.95
	5.25	5180	5180.0202	-3.90
		5190	5190.024	-4.62
		5200	5200.0198	-3.81
		5230	5230.0201	-3.84
		5240	5240.0207	-3.95

Test Condition		**After 5mimute**		
Temperature (℃)	Voltage (V)	Frequency (MHz)	Measurement Value (MHz)	Result (ppm)
25℃	4.75	5180	5180.0222	-4.29
		5190	5190.023	-4.43
		5200	5200.0214	-4.12
		5230	5230.022	-4.21
		5240	5240.0215	-4.10
	5.25	5180	5180.022	-4.25
		5190	5190.0227	-4.37
		5200	5200.0223	-4.29
		5230	5230.0223	-4.26
		5240	5240.0215	-4.10
-20	4.75	5180	5180.0268	-5.17
		5190	5190.0272	-5.24
		5200	5200.0268	-5.15
		5230	5230.0269	-5.14
		5240	5240.0262	-5.00
	5.25	5180	5180.0273	-5.27
		5190	5190.0271	-5.22
		5200	5200.0267	-5.13
		5230	5230.0262	-5.01
		5240	5240.0263	-5.02
55℃	4.75	5180	5180.0207	-4.00
		5190	5190.0208	-4.01
		5200	5200.0196	-3.77
		5230	5230.0195	-3.73
		5240	5240.0209	-3.99
	5.25	5180	5180.0201	-3.88
		5190	5190.0237	-4.57
		5200	5200.0199	-3.83
		5230	5230.0207	-3.96
		5240	5240.021	-4.01

Test Condition		**After 10mimute**		
Temperature (℃)	Voltage (V)	Frequency (MHz)	Measurement Value (MHz)	Result (ppm)
25℃	4.75	5180	5180.0221	-4.27
		5190	5190.0228	-4.39
		5200	5200.0222	-4.27
		5230	5230.0227	-4.34
		5240	5240.0219	-4.18
	5.25	5180	5180.0224	-4.32
		5190	5190.0223	-4.30
		5200	5200.0216	-4.15
		5230	5230.0222	-4.24
		5240	5240.0211	-4.03
-20	4.75	5180	5180.0269	-5.19
		5190	5190.0272	-5.24
		5200	5200.0263	-5.06
		5230	5230.0261	-4.99
		5240	5240.0263	-5.02
	5.25	5180	5180.027	-5.21
		5190	5190.0264	-5.09
		5200	5200.0268	-5.15
		5230	5230.0262	-5.01
		5240	5240.0262	-5.00
55℃	4.75	5180	5180.0201	-3.88
		5190	5190.0202	-3.89
		5200	5200.0201	-3.87
		5230	5230.0197	-3.77
		5240	5240.0206	-3.93
	5.25	5180	5180.0204	-3.94
		5190	5190.0241	-4.64
		5200	5200.0201	-3.87
		5230	5230.0203	-3.88
		5240	5240.0204	-3.89

10. DEVIATION TO TEST SPECIFICATIONS

【NONE】