

Variant FCC RF Test Report

APPLICANT : Motorola Solutions, Inc.
EQUIPMENT : Access Point, Radio Module 6
BRAND NAME : Motorola
MODEL NAME : AP-6
FCC ID : UZ7AP6
STANDARD : FCC Part 15 Subpart E
CLASSIFICATION : Unlicensed National Information Infrastructure (UNII)

This is a variant report which is only valid combine with the original test report. The product was received on Jul. 14, 2011 and completely tested on Jul. 22, 2011. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:



Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.



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SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.403(i)	A9.2	26dB Bandwidth	-	Pass	-
3.2	15.407(a)	A9.2	Maximum Conducted Output Power	$\leq 17, 24, 30$ dBm (depend on band)	Pass	-



1 General Description

1.1 Applicant

Motorola Solutions, Inc.

One Motorola Plaza, Holtsville, NY 11742-1300 USA

1.2 Manufacturer

Motorola Solutions, Inc.

One Motorola Plaza, Holtsville, NY 11742-1300 USA

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Access Point, Radio Module 6
Brand Name	Motorola
Model Name	AP-6
FCC ID	UZ7AP6
Tx/Rx Frequency Range	5150 MHz ~ 5250 MHz
Maximum Output Power to Antenna	802.11a : 15.39 dBm / 0.0346 W 802.11n (BW 20MHz) : 16.65 dBm / 0.0462 W 802.11n (BW 40MHz) : 16.79 dBm / 0.0478 W
SW Version	ART Rev 0.9 Build #16
Type of Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)
EUT Stage	Production Unit

Remark:

1. For other wireless features of this EUT, test report will be issued separately.
2. This test report recorded only product characteristics and test results of Unlicensed National Information Infrastructure (UNII).
3. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

<Antenna Information>

Type	Model Number	2.4GHz				
		Peak Gain	Cable Loss (external)	Cable Loss (internal)	Net Peak Gain	Note
PIFA_NCAP	NCAP PIFA	3	0	0	3	Antenna 5

Type	Model Number	5GHz				
		Peak Gain	Cable Loss (external)	Cable Loss (internal)	Net Peak Gain	Note
PIFA_NCAP	NCAP PIFA	6	0	0	6	Antenna 5

1.4 Testing Site

Test Site	SPORTON INTERNATIONAL INC.	
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-3273456 / FAX: +886-3-3284978	
Test Site No.	Sporton Site No.	FCC/IC Registration No.
	TH02-HY	722060/4086B-1

1.5 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15 Subpart E
- FCC Public Notice DA 02-2138, (Measurement Guidelines of UNII)
- ANSI C63.4-2003
- IC RSS-210 Issued 8

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B (DoC), recorded in a separate test report.



2 Test Configuration of Equipment Under Test

2.1 Carrier Frequency Channel

802.11a Carrier Frequency Channel							
Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
36	5180	40	5200	44	5220	48	5240

802.11n (BW 20MHz) Carrier Frequency Channel							
Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
36	5180	40	5200	44	5220	48	5240

802.11n (BW 40MHz) Carrier Frequency Channel							
Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
38	5190	46	5230	-	-	-	-



2.2 Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction (150 kHz to 30 MHz), radiation (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

Pre-scanned tests were conducted to determine the final configuration from all possible combinations. The worst case modes for legacy mode, and n modes, were chosen from the highest RF output power chain. The following table is showing the total pre-scanned test modes, and the worst case modes which are only recorded in this report.

The following tables are showing the test modes as the worst cases and recorded in this report.

Test Cases	
Test Item	802.11a/n (Modulation : OFDM)
Conducted TCs	<ul style="list-style-type: none">■ Mode 1: 802.11a_CH36_5180 MHz■ Mode 2: 802.11a_CH44_5220 MHz■ Mode 3: 802.11a_CH48_5240 MHz■ Mode 4: 802.11a_CH36_5180 MHz (BW 20M)■ Mode 5: 802.11a_CH44_5220 MHz (BW 20M)■ Mode 6: 802.11a_CH48_5240 MHz (BW 20M)■ Mode 7: 802.11n_CH38_5190 MHz (BW 40M)■ Mode 8: 802.11n_CH46_5230 MHz (BW 40M)

3 Test Result

3.1 26dB Bandwidth Measurement

3.1.1 Limit of 26dB Bandwidth

There is no restriction limits for bandwidth. The maximum conducted output power can be limited by measured emission bandwidth (B). For the band 5.15~5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW (17dBm) or 4 dBm + 10log B. For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW (24dBm) or 11 dBm + 10log B. For the band 5.725-5.825 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W (30dBm) or 17 dBm + 10log B.

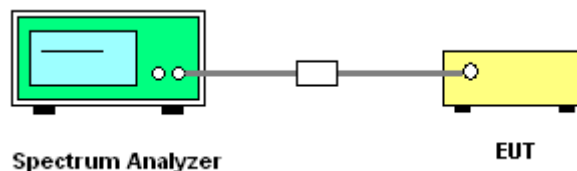
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The testing follows FCC Public Notice DA 02-2138 (Measurement Guidelines of UNII).
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. Read RBW and repeat measurement as needed until the RBW/BW ratio is approximately 1%.
4. Use a RBW = approximately 1% of the emission bandwidth; Set the VBW > RBW; Use a peak detector.
5. Measure the maximum width of the emission that is 26 dB relative to the peak of the emission and 99% occupied bandwidth.

3.1.4 Test Setup





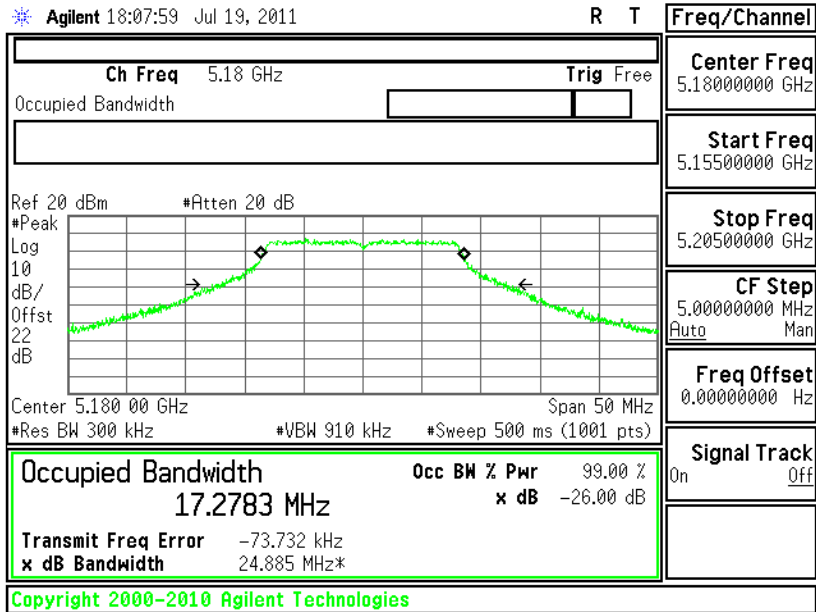
3.1.5 Test Result of 26dB Bandwidth

Test Mode :	Mode 1~3	Temperature :	24~26°C
Test Engineer :	Ken Hsu amd Alan Liu	Relative Humidity :	52~55%

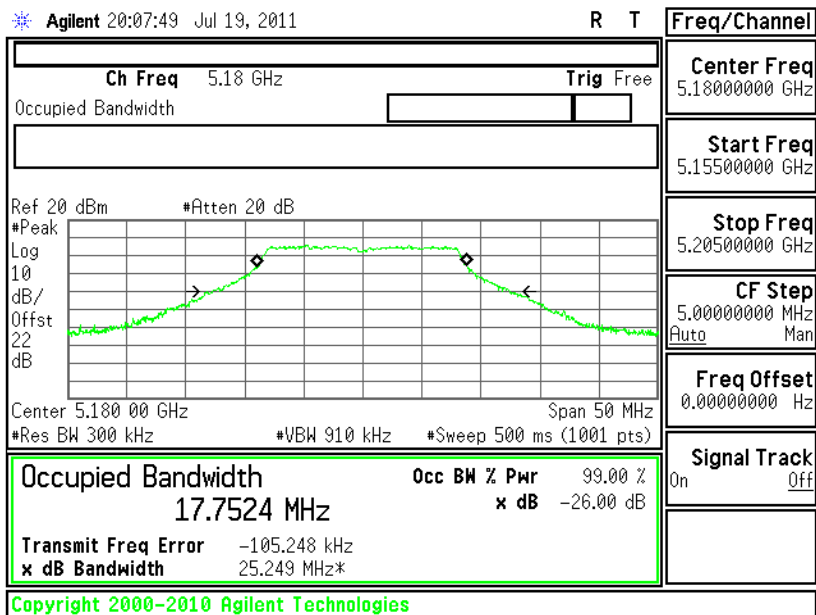
Channel	Frequency (MHz)	802.11a 26dB Bandwidth (MHz)				Pass/Fail
		Chain A	Chain B	Chain A+B(A)	Chain A+B(B)	
36	5180	24.88	25.24	25.27	23.60	Pass
44	5220	25.46	25.42	24.93	23.64	Pass
48	5240	24.78	25.17	25.52	23.66	Pass



26 dB Bandwidth Plot on 802.11a Channel 36 - Chain A

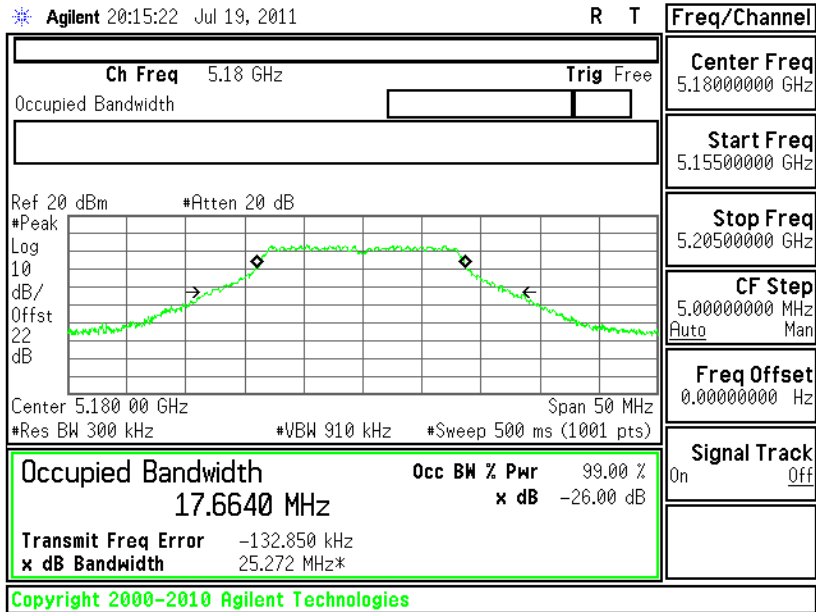


26 dB Bandwidth Plot on 802.11a Channel 36 - Chain B

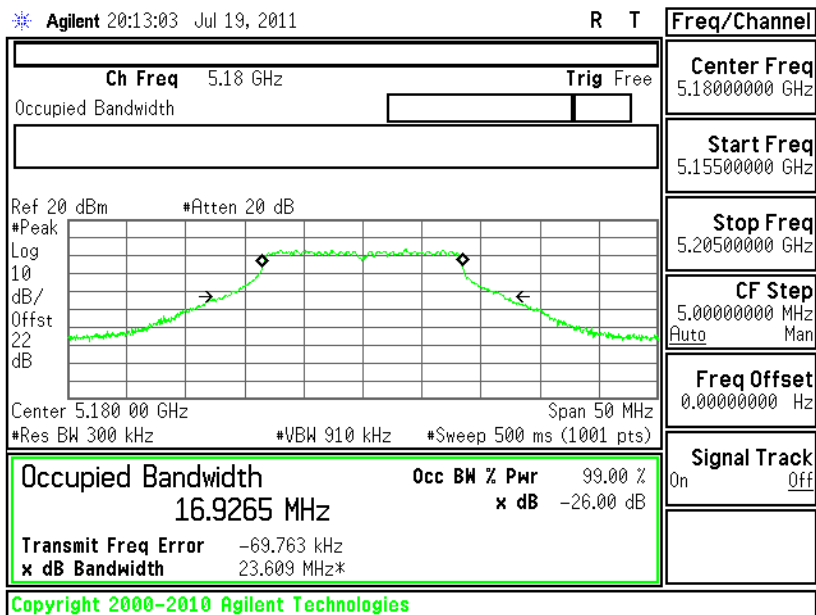




26 dB Bandwidth Plot on 802.11a Channel 36 - Chain A+B(A)

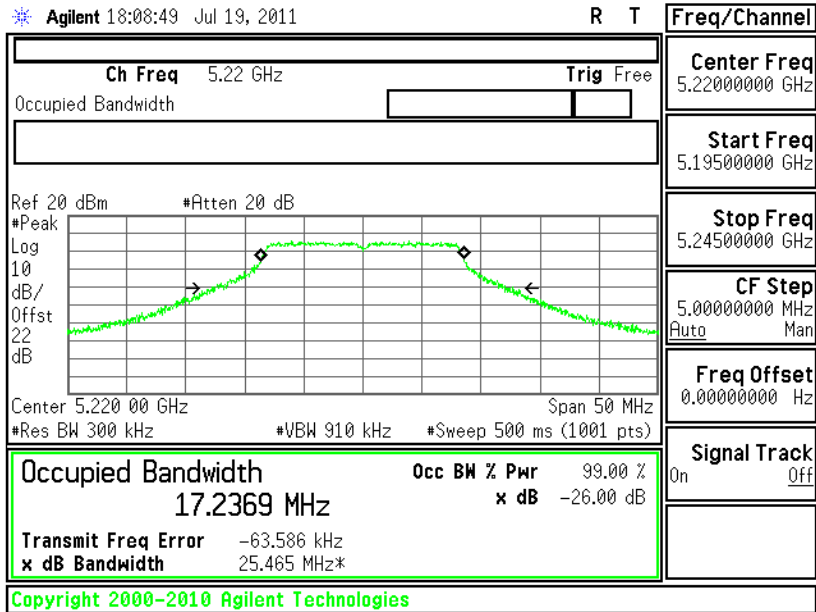


26 dB Bandwidth Plot on 802.11a Channel 36 - Chain A+B(B)

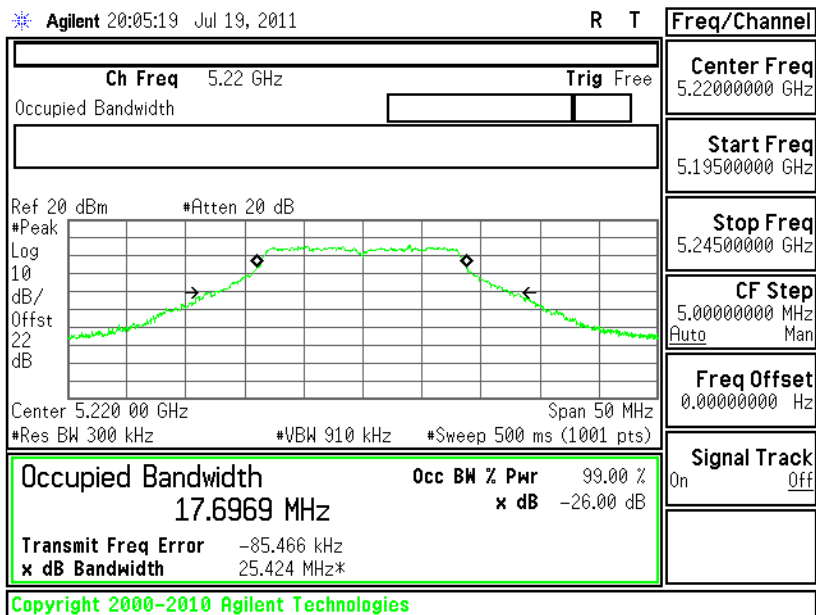




26 dB Bandwidth Plot on 802.11a Channel 44 - Chain A

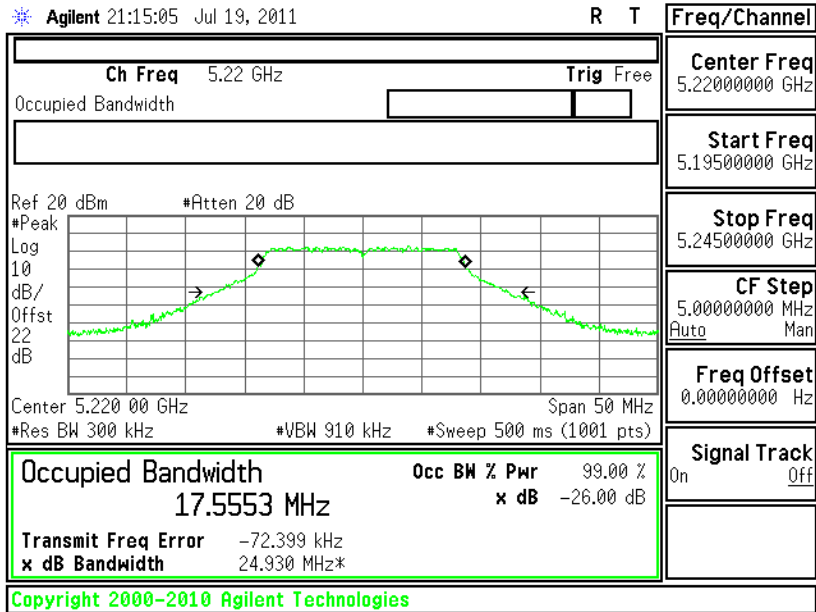


26 dB Bandwidth Plot on 802.11a Channel 44 - Chain B

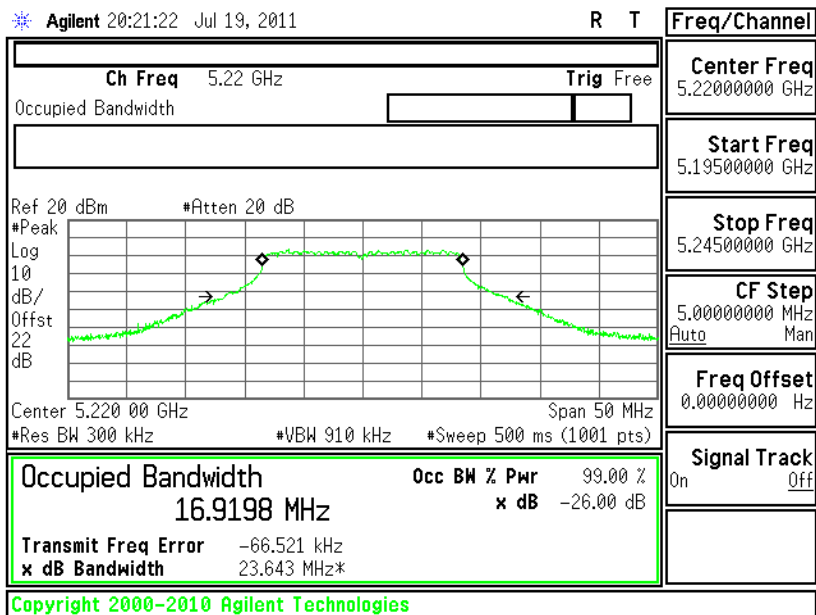




26 dB Bandwidth Plot on 802.11a Channel 44 - Chain A+B(A)

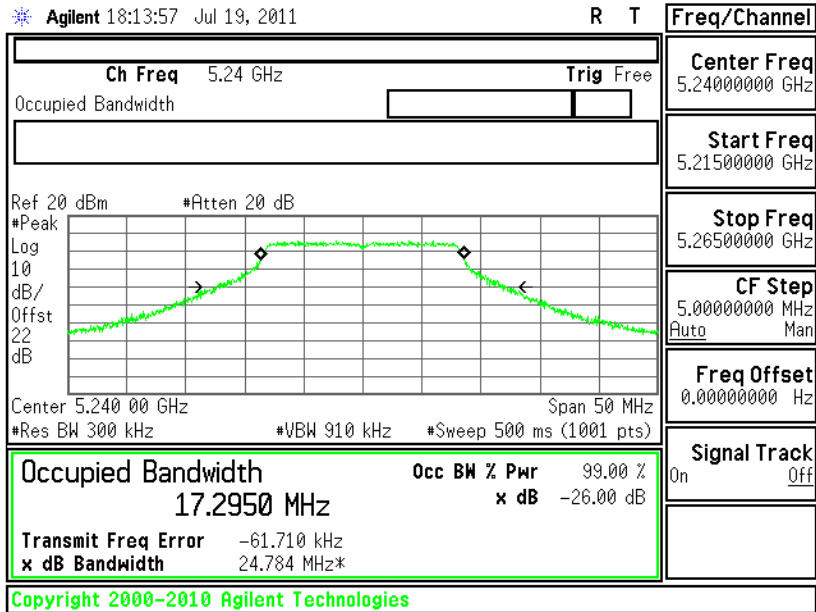


26 dB Bandwidth Plot on 802.11a Channel 44 - Chain A+B(B)

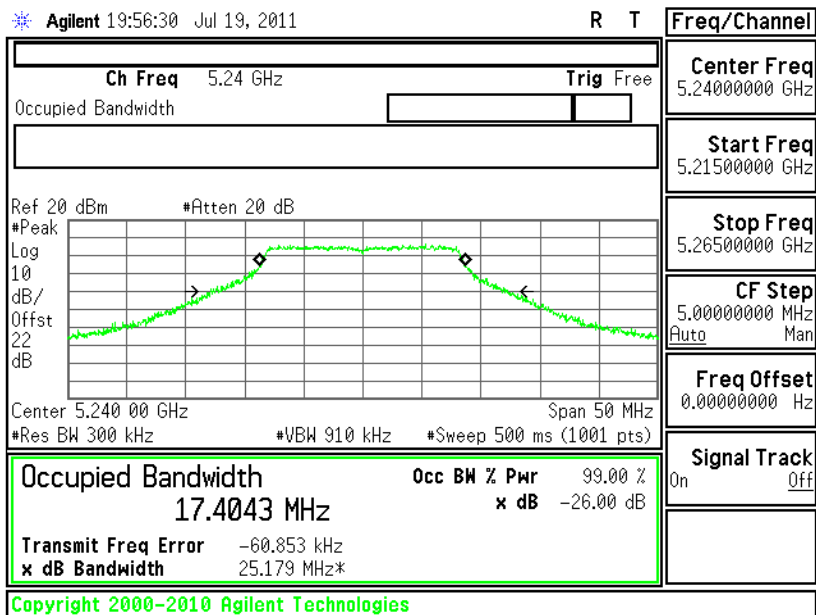




26 dB Bandwidth Plot on 802.11a Channel 48 - Chain A

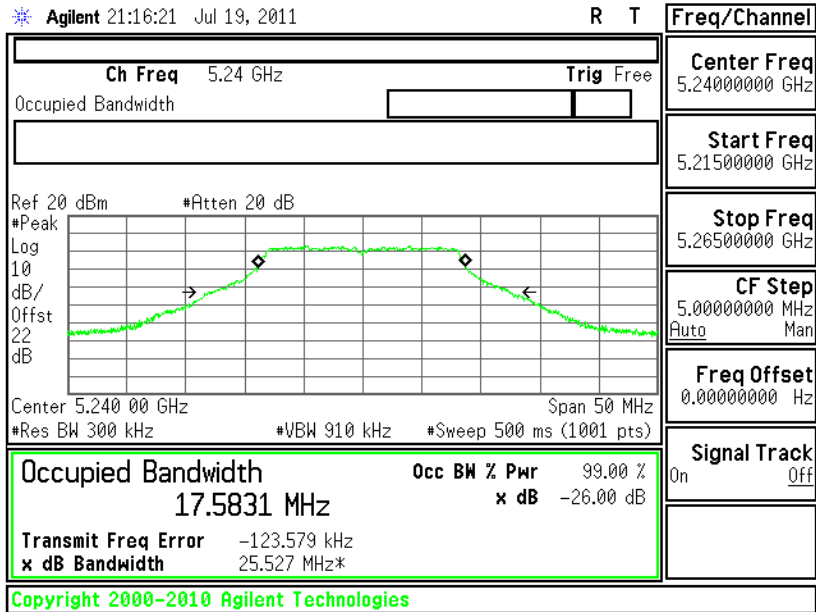


26 dB Bandwidth Plot on 802.11a Channel 48 - Chain B

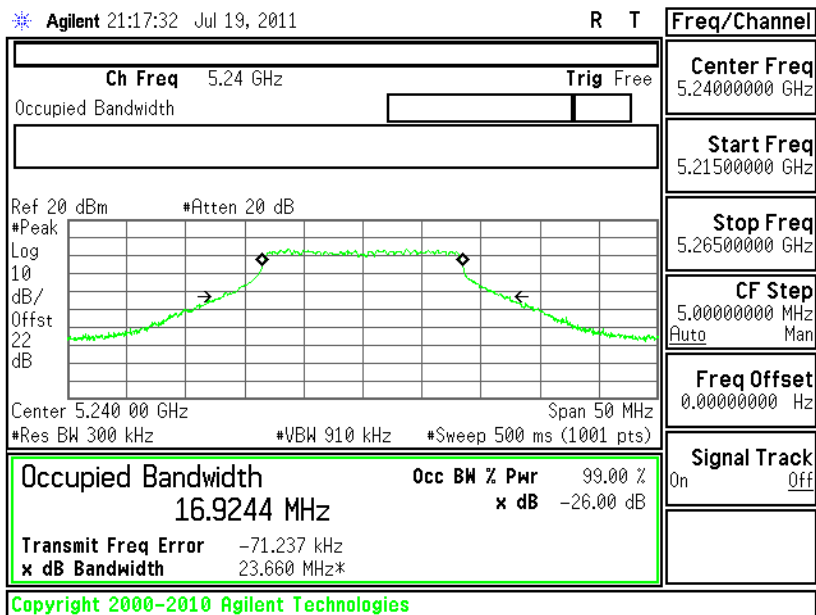




26 dB Bandwidth Plot on 802.11a Channel 48 - Chain A+B(A)



26 dB Bandwidth Plot on 802.11a Channel 48 - Chain A+B(B)





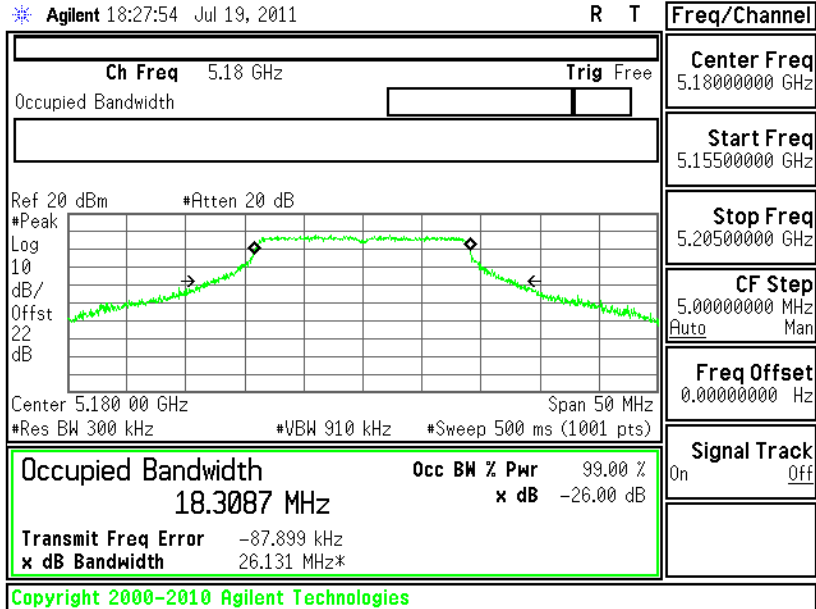
Test Mode :	Mode 4~6	Temperature :	25~27°C
Test Engineer :	Alan Liu	Relative Humidity :	37~40%

Channel	Frequency (MHz)	802.11n (BW 20MHz) 26dB Bandwidth (MHz)				Pass/Fail
		Chain A	Chain B	Chain A+B(A)	Chain A+B(B)	
36	5180	26.13	26.22	25.45	24.88	Pass
44	5220	25.72	26.05	25.54	24.79	Pass
48	5240	25.61	26.16	24.93	25.47	Pass



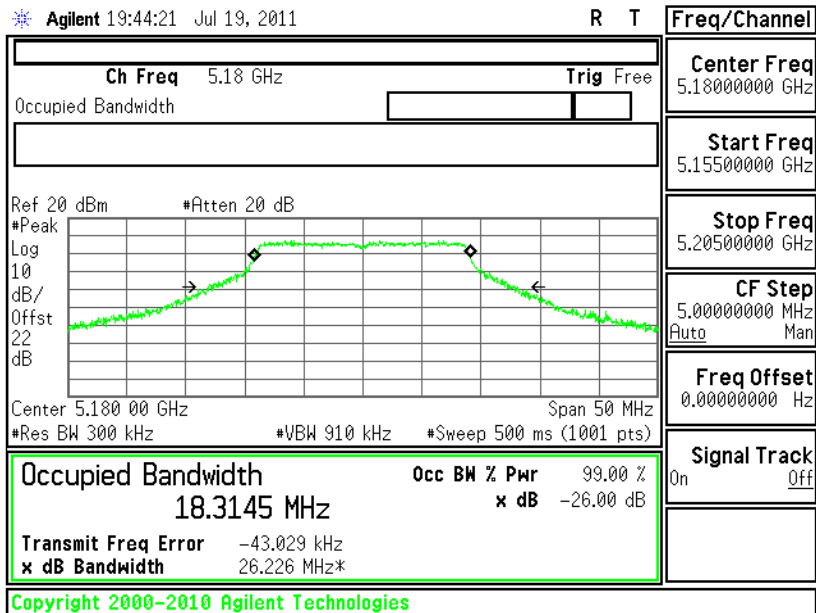
26 dB Bandwidth Plot on 802.11n (BW 20MHz) Channel 36

- Chain A



26 dB Bandwidth Plot on 802.11n (BW 20MHz) Channel 36

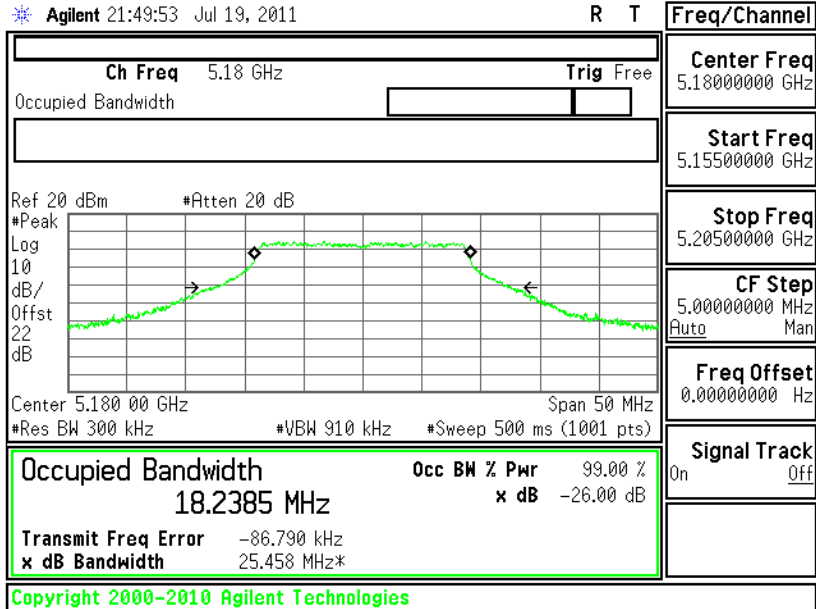
- Chain B





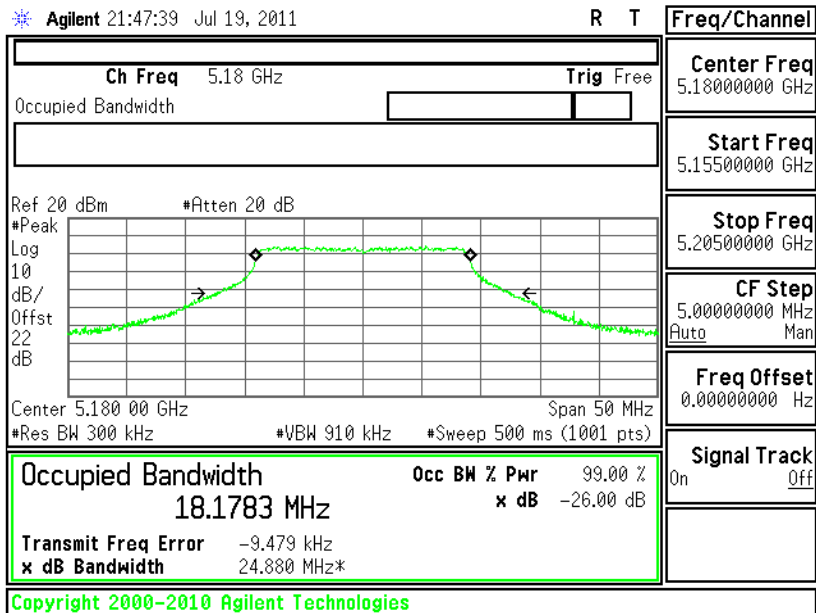
26 dB Bandwidth Plot on 802.11n (BW 20MHz) Channel 36 - Chain

A+B(A)



26 dB Bandwidth Plot on 802.11n (BW 20MHz) Channel 36 - Chain

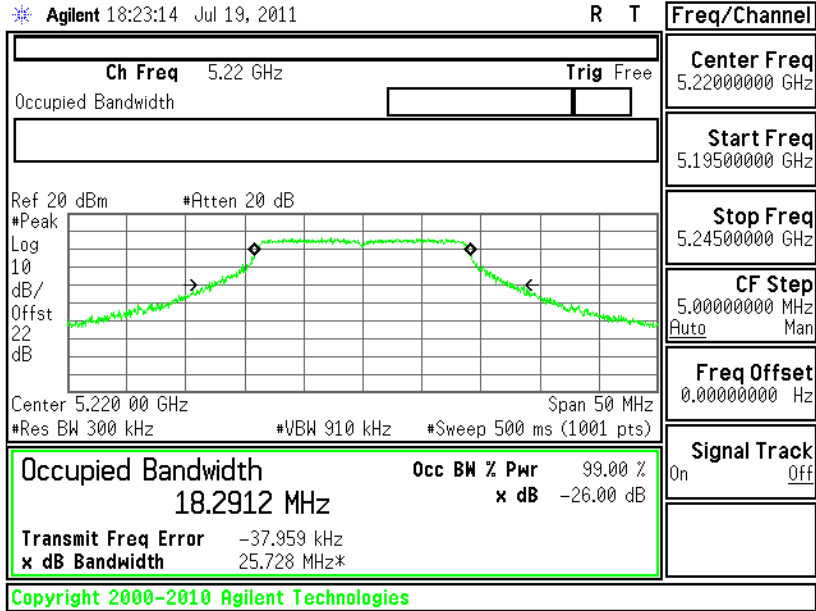
A+B(B)





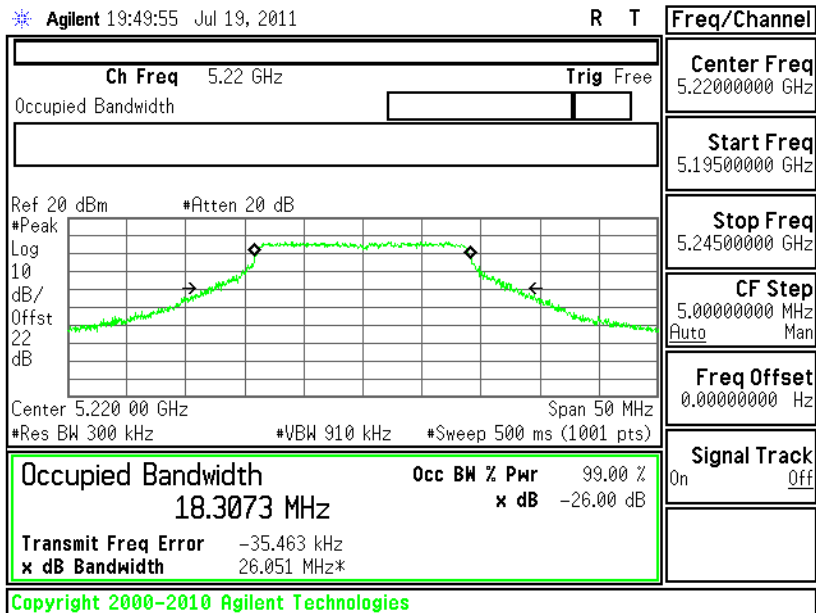
26 dB Bandwidth Plot on 802.11n (BW 20MHz) Channel 44

- Chain A



26 dB Bandwidth Plot on 802.11n (BW 20MHz) Channel 44

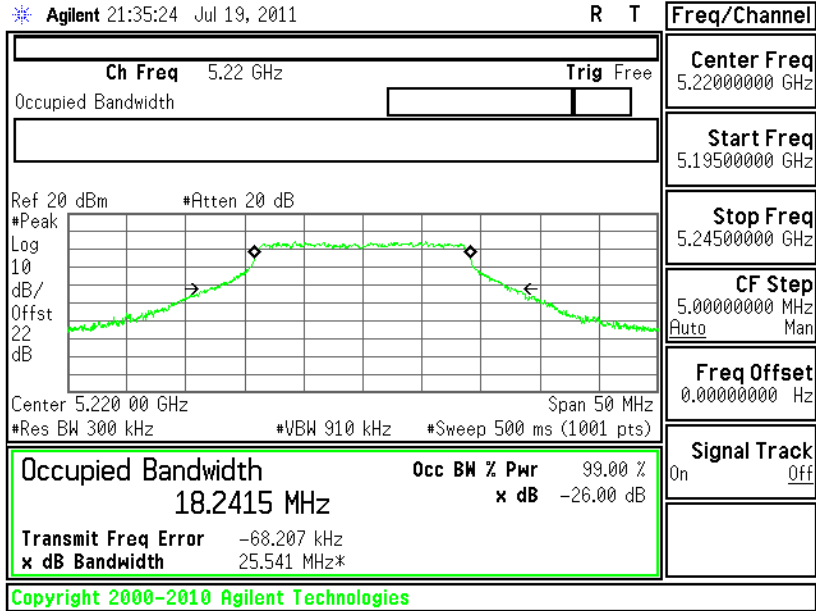
- Chain B





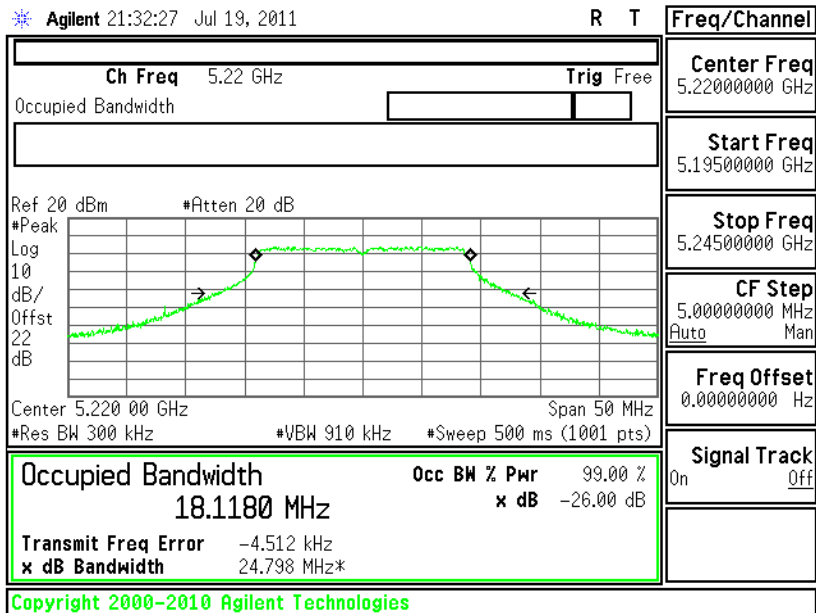
26 dB Bandwidth Plot on 802.11n (BW 20MHz) Channel 44 - Chain

A+B(A)



26 dB Bandwidth Plot on 802.11n (BW 20MHz) Channel 44 - Chain

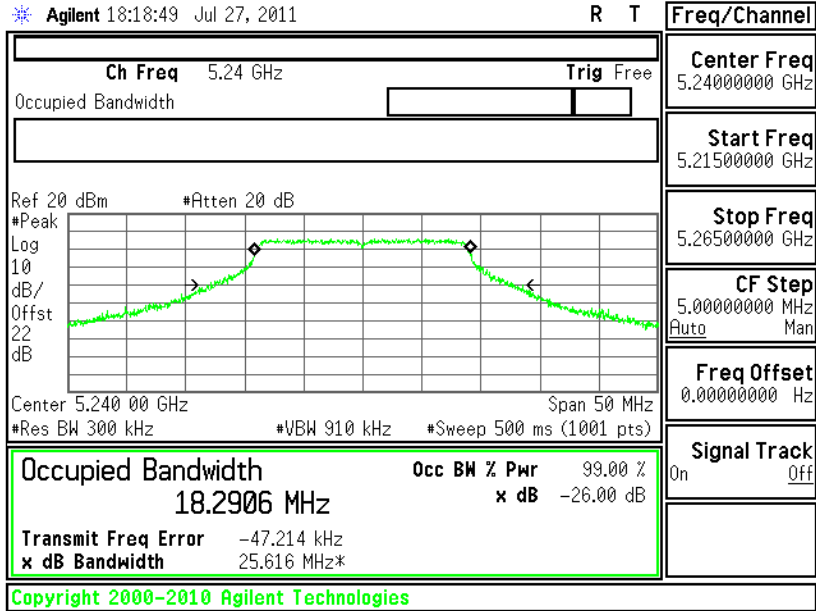
A+B(B)





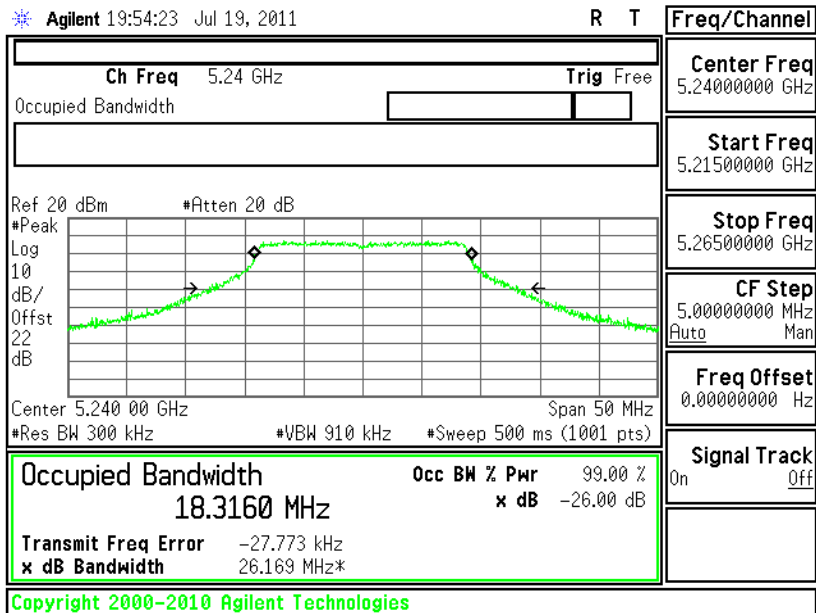
26 dB Bandwidth Plot on 802.11n (BW 20MHz) Channel 48

- Chain A



26 dB Bandwidth Plot on 802.11n (BW 20MHz) Channel 48

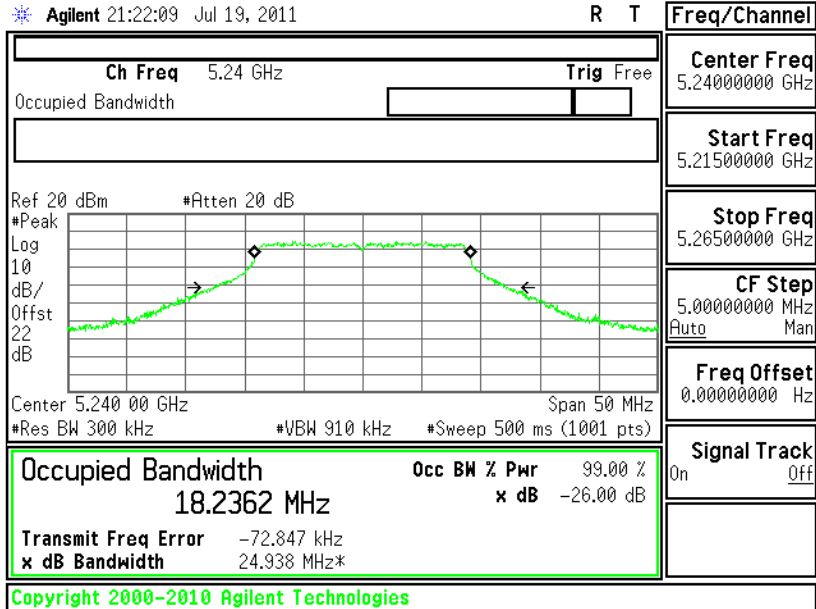
- Chain B





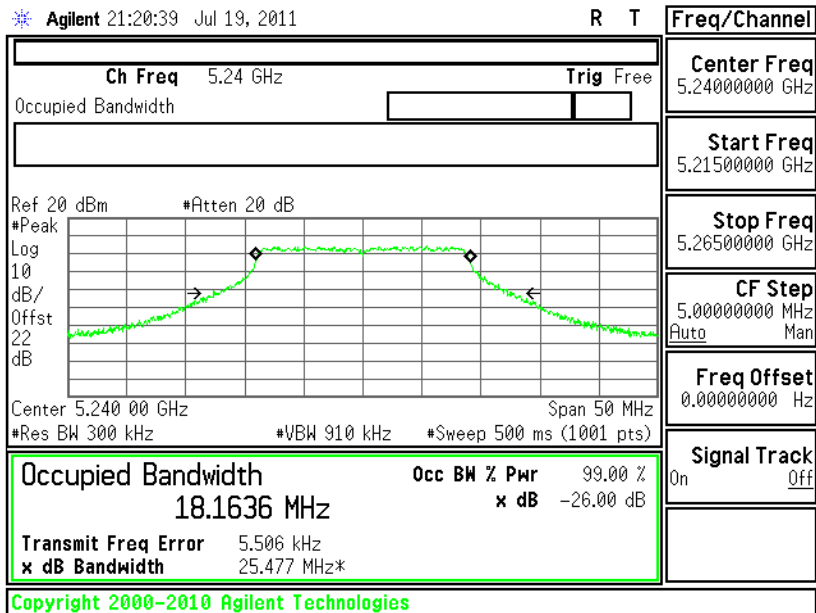
26 dB Bandwidth Plot on 802.11n (BW 20MHz) Channel 48 - Chain

A+B(A)



26 dB Bandwidth Plot on 802.11n (BW 20MHz) Channel 48 - Chain

A+B(B)





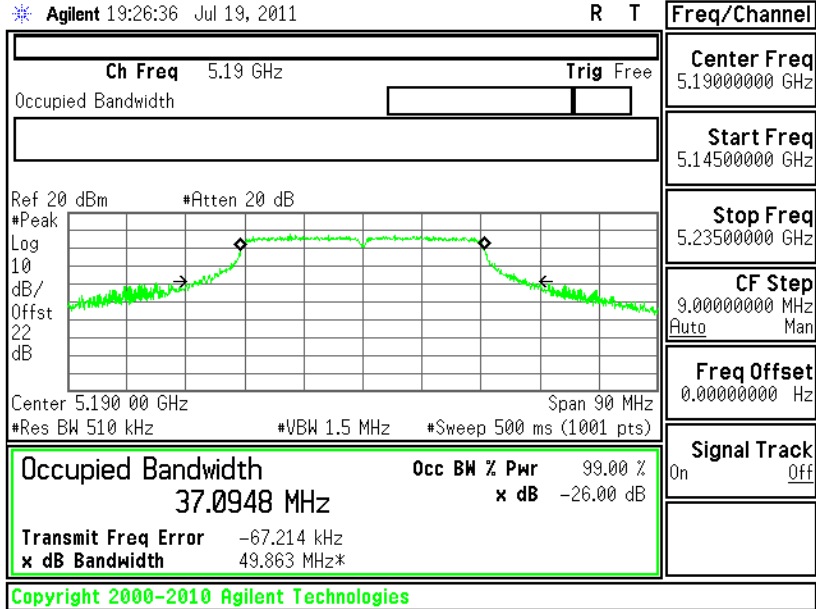
Test Mode :	Mode 7~8	Temperature :	25~27°C
Test Engineer :	Alan Liu	Relative Humidity :	37~40%

Channel	Frequency (MHz)	802.11n (BW 40MHz) 26dB Bandwidth (MHz)				Pass/Fail
		Chain A	Chain B	Chain A+B(A)	Chain A+B(B)	
38	5190	49.86	51.79	49.72	49.02	Pass
46	5230	50.84	50.92	50.89	50.26	Pass



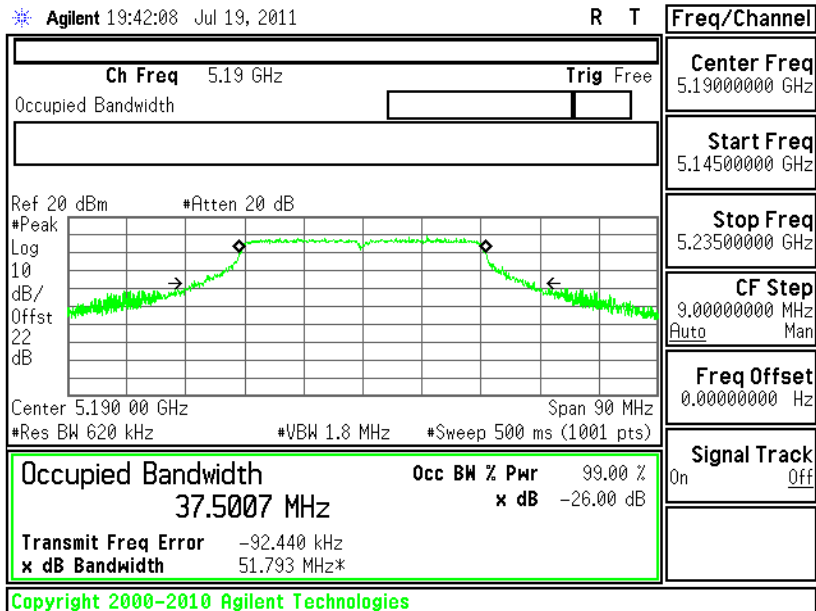
26 dB Bandwidth Plot on 802.11n (BW 40MHz) Channel 38

- Chain A



26 dB Bandwidth Plot on 802.11n (BW 40MHz) Channel 38

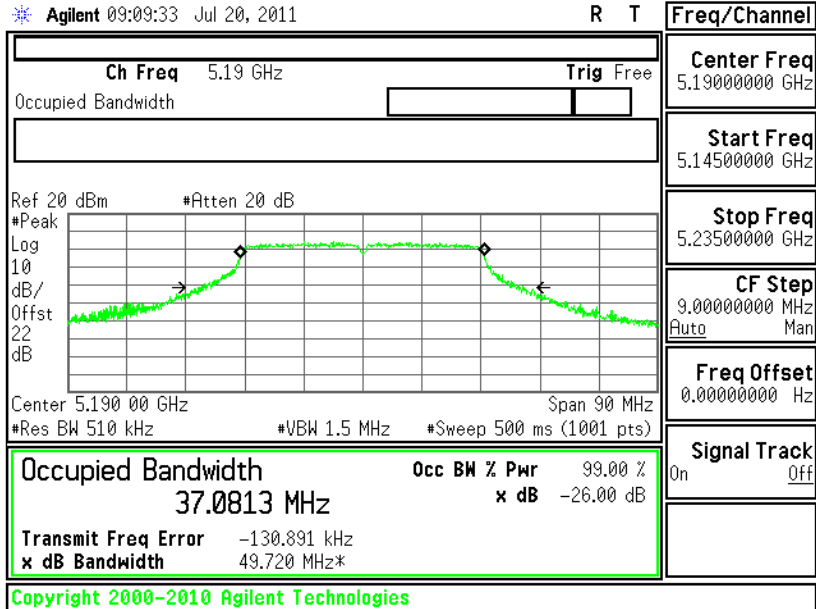
- Chain B





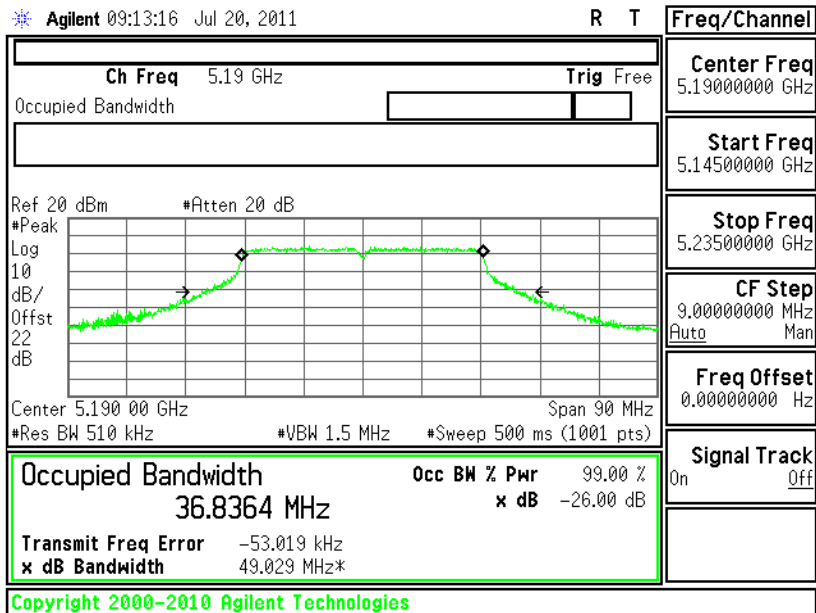
26 dB Bandwidth Plot on 802.11n (BW 40MHz) Channel 38 - Chain

A+B(A)



26 dB Bandwidth Plot on 802.11n (BW 40MHz) Channel 38 - Chain

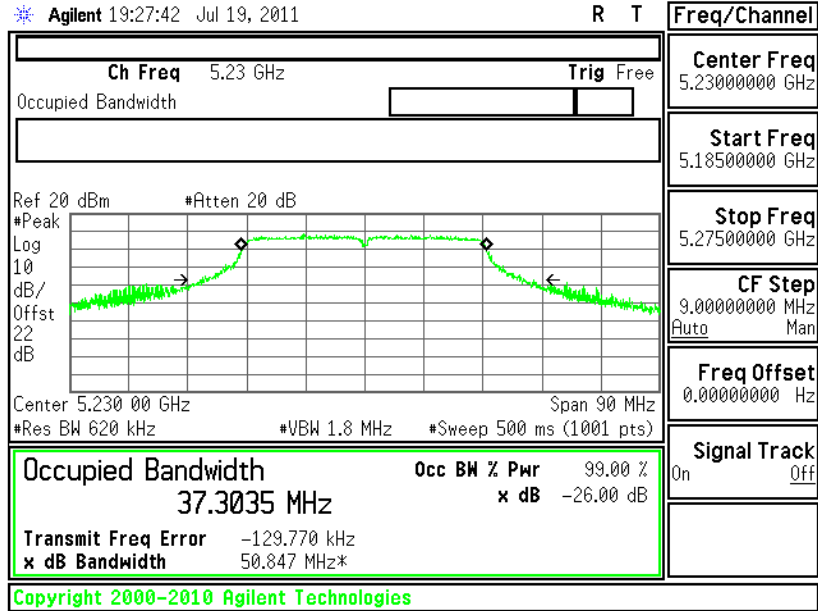
A+B(B)





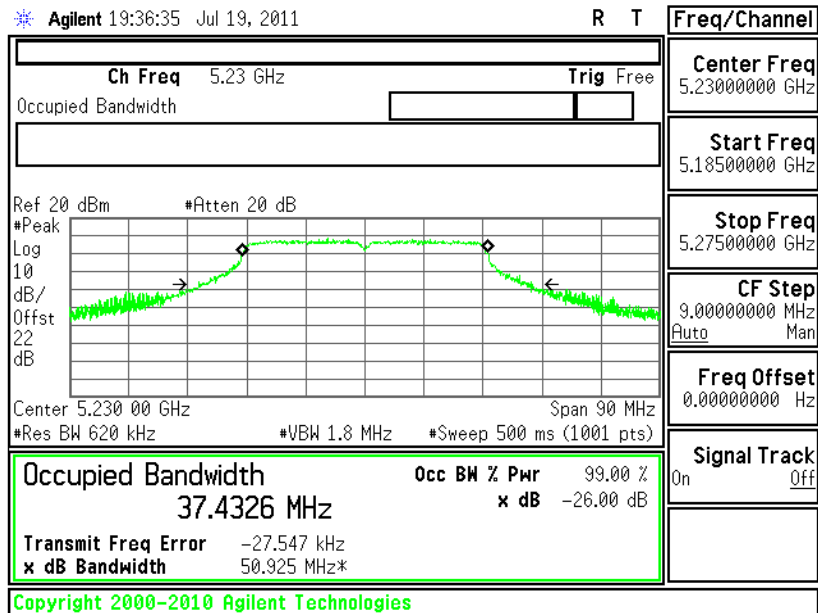
26 dB Bandwidth Plot on 802.11n (BW 40MHz) Channel 46

- Chain A



26 dB Bandwidth Plot on 802.11n (BW 40MHz) Channel 46

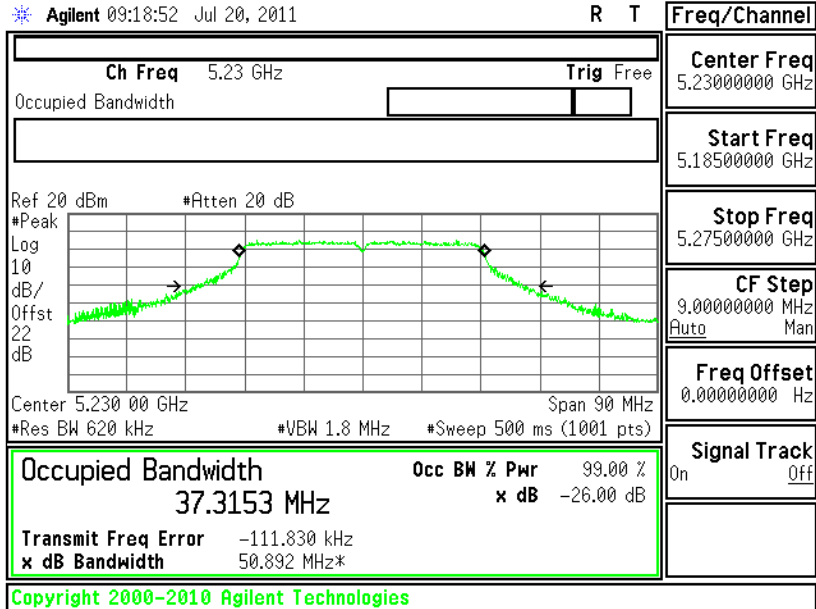
- Chain B





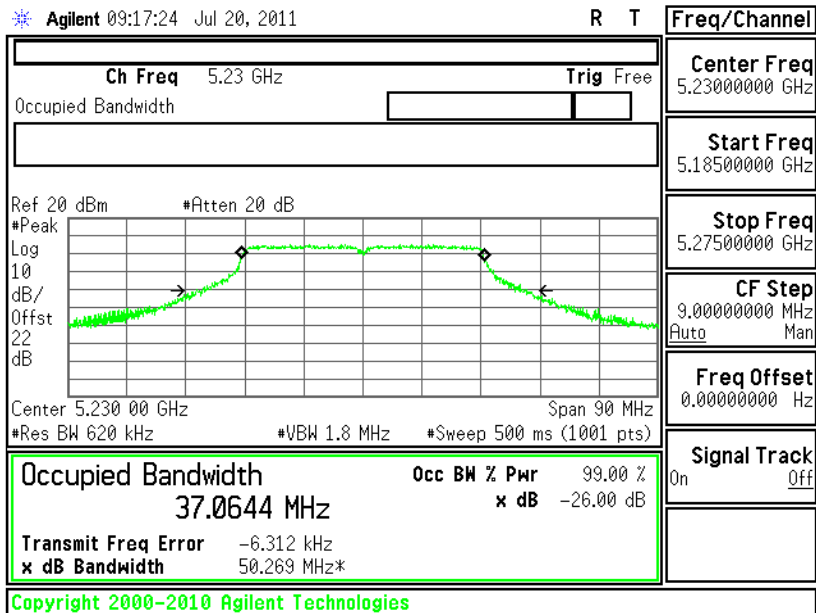
26 dB Bandwidth Plot on 802.11n (BW 40MHz) Channel 46 - Chain

A+B(A)



26 dB Bandwidth Plot on 802.11n (BW 40MHz) Channel 46 - Chain

A+B(B)



3.2 Maximum Conducted Output Power Measurement

3.2.1 Limit of Maximum Conducted Output Power

For the band 5.15~5.25 GHz, the maximum conducted output power shall not exceed the lesser of 50 mW (17dBm) or $4 \text{ dBm} + 10\log B$, where B is the 26 dB emissions bandwidth in MHz. If transmitting antenna directional gain is greater than 6 dBi, the peak output power and power density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power shall not exceed the lesser of 250 mW (24dBm) or $11 \text{ dBm} + 10\log B$. If transmitting antenna directional gain is greater than 6 dBi, the peak output power and power density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

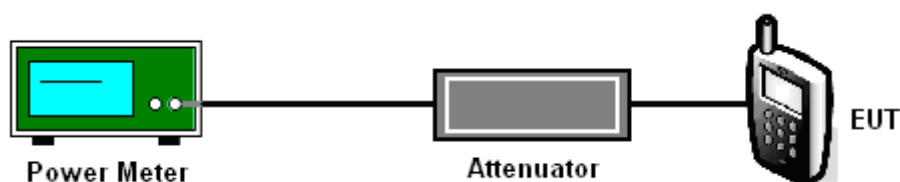
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The testing follows FCC Public Notice DA 02-2138 (Measurement Guidelines of UNII).
2. The RF output of EUT was connected to the power meter by a low loss cable.
3. Measure the power by power meter.

3.2.4 Test Setup



3.2.5 Test Result of Average Conducted Output Power

<Antenna for 4.5V>

Test Mode :	Mode 1~3	Temperature :	25~27°C
Test Engineer :	Alan Liu	Relative Humidity :	37~40%

Ch.	Frequency (MHz)	802.11a Measured Output Power (dBm)						Max. Limits (dBm)	Pass/Fail
		Power Setting	Chain A	Power Setting	Chain B	Power Setting	Chain A+B		
36	5180	14	15.39	13.5	15.05	11	15.12	17	Pass
44	5220	13	14.31	13	14.07	11	14.84	17	Pass
48	5240	13.5	14.63	14	14.91	11.5	14.90	17	Pass

Test Mode :	Mode 4~6	Temperature :	25~27°C
Test Engineer :	Alan Liu	Relative Humidity :	37~40%

Ch.	Frequency (MHz)	802.11n (BW 20MHz) Measured Output Power (dBm)						Max. Limits (dBm)	Pass/Fail
		Power Setting	Chain A	Power Setting	Chain B	Power Setting	Chain A+B		
36	5180	15.5	16.65	14.5	16.07	12	16.65	17	Pass
44	5220	14	15.37	14.5	15.82	12	16.24	17	Pass
48	5240	13.5	15.01	15.5	15.96	12.5	16.22	17	Pass

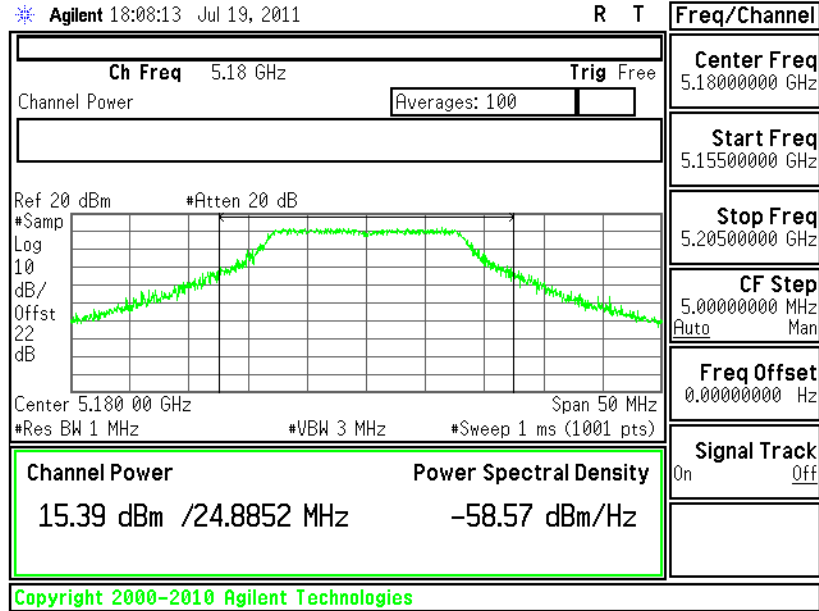
Test Mode :	Mode 7~8	Temperature :	25~27°C
Test Engineer :	Alan Liu	Relative Humidity :	37~40%

Ch.	Frequency (MHz)	802.11n (BW 20MHz) Measured Output Power (dBm)						Max. Limits (dBm)	Pass/Fail
		Power Setting	Chain A	Power Setting	Chain B	Power Setting	Chain A+B		
38	5190	15.5	16.57	15	16.79	12	16.42	17	Pass
46	5230	15.5	16.51	15.5	16.63	12.5	16.55	17	Pass

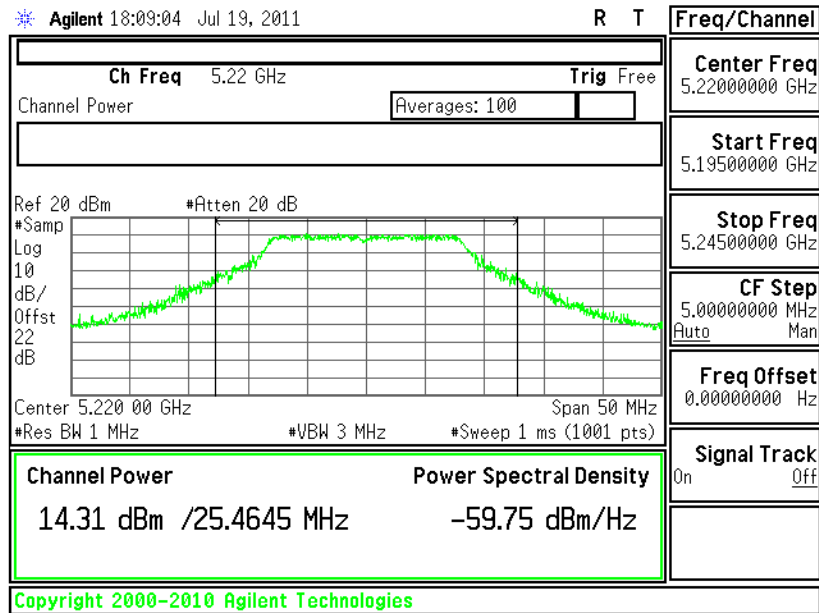


3.2.6 Test Result of Power Output Plots

Output Power Plot on 802.11a Channel 36 - Chain A



Output Power Plot on 802.11a Channel 44 - Chain A

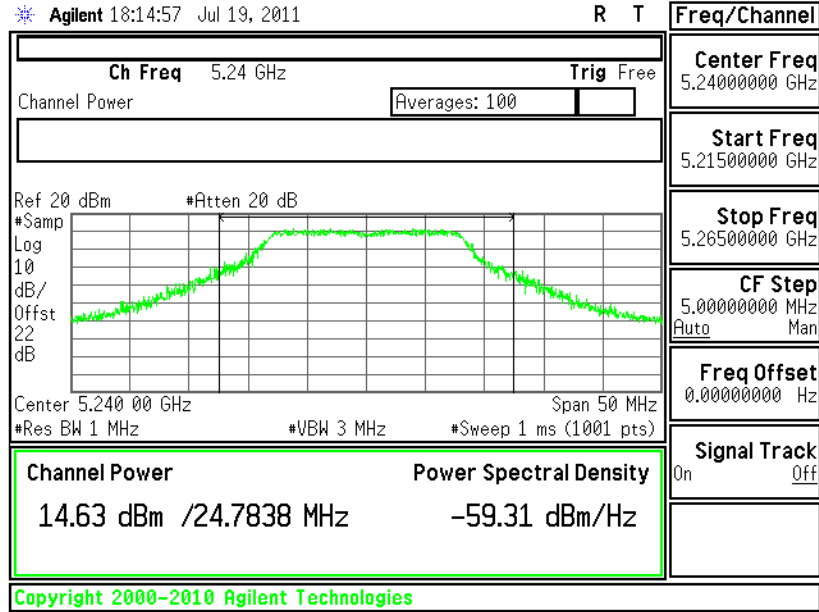




Output Power Plot on 802.11a Channel 48 - Chain A

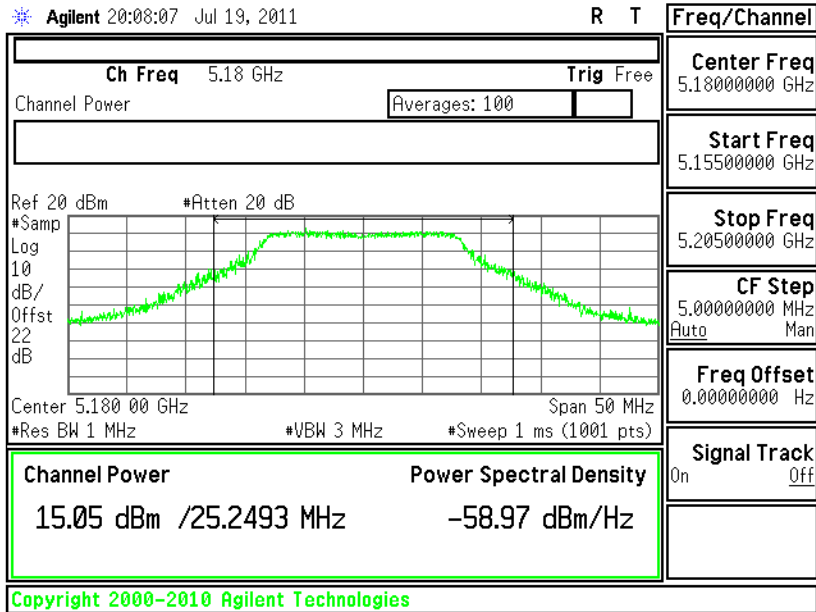
Agilent 18:14:57 Jul 19, 2011

R T

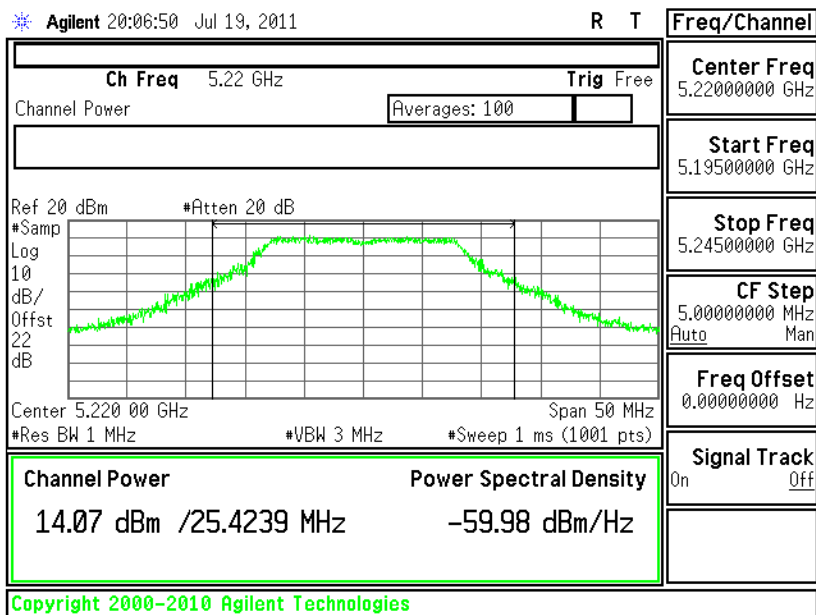




Output Power Plot on 802.11a Channel 36 - Chain B



Output Power Plot on 802.11a Channel 44 - Chain B

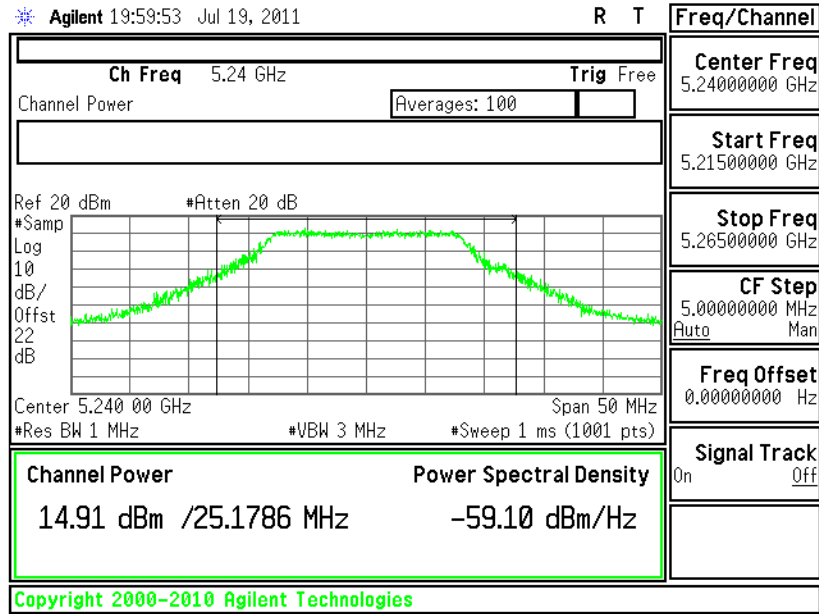




Output Power Plot on 802.11a Channel 48 - Chain B

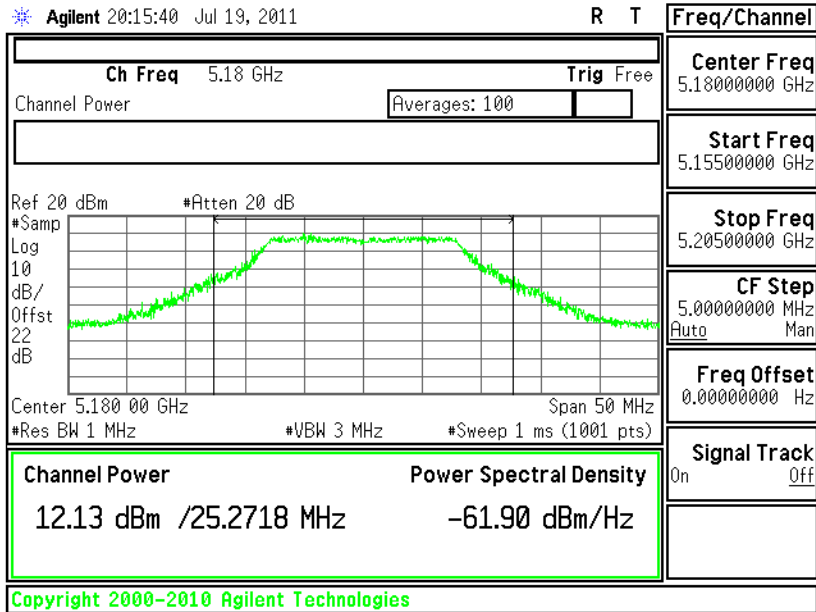
Agilent 19:59:53 Jul 19, 2011

R T

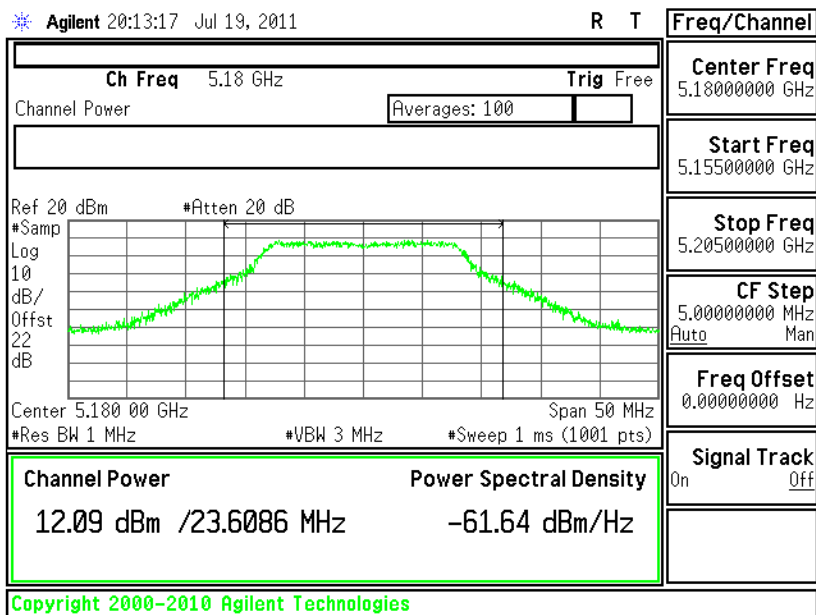




Output Power Plot on 802.11a Channel 36 - Chain A of Chain A+B

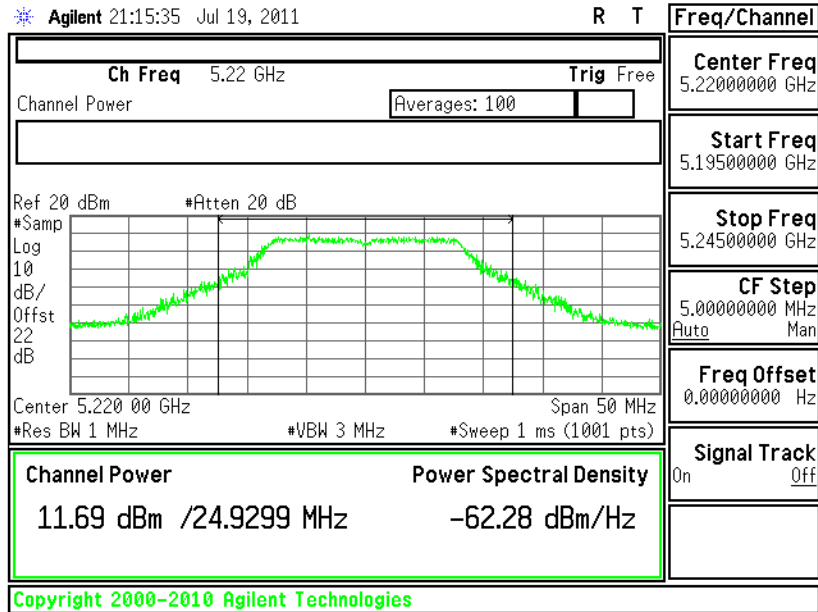


Output Power Plot on 802.11a Channel 36 - Chain B of Chain A+B

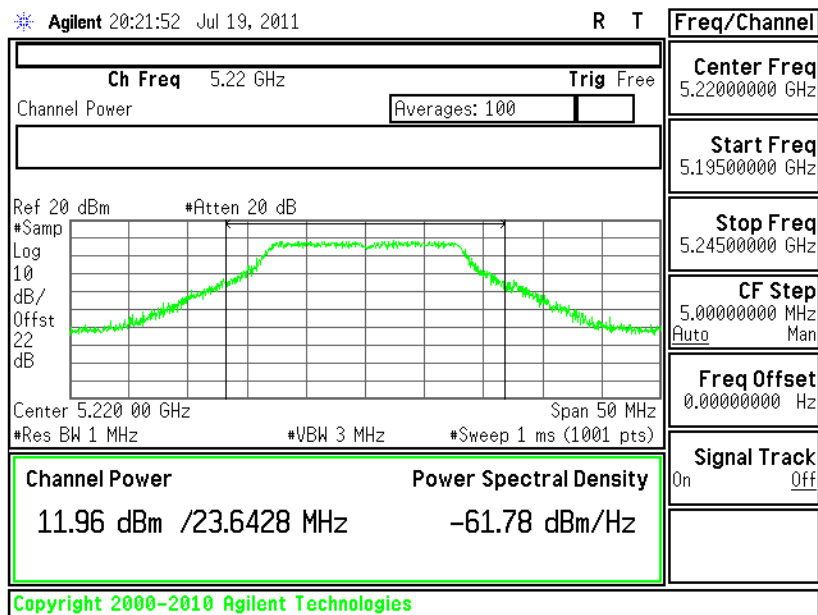




Output Power Plot on 802.11a Channel 44 - Chain A of Chain A+B

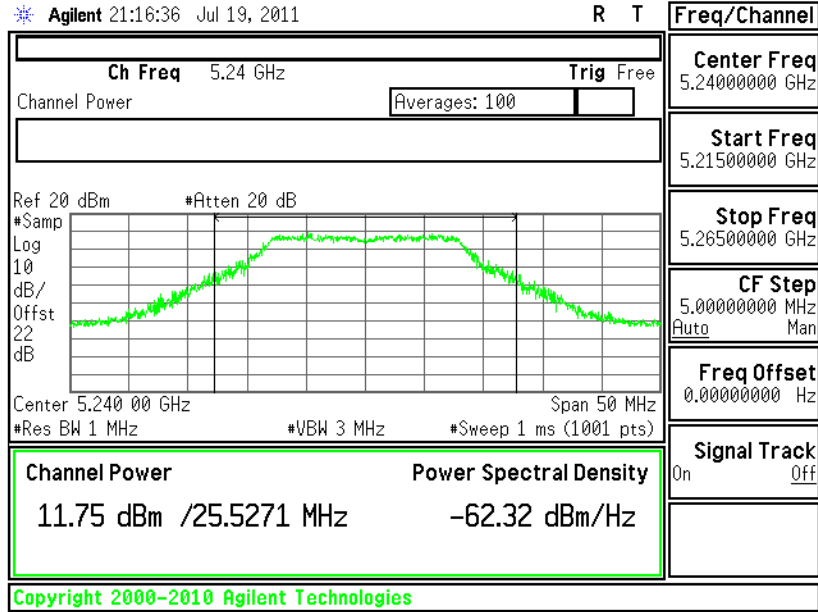


Output Power Plot on 802.11a Channel 44 - Chain B of Chain A+B

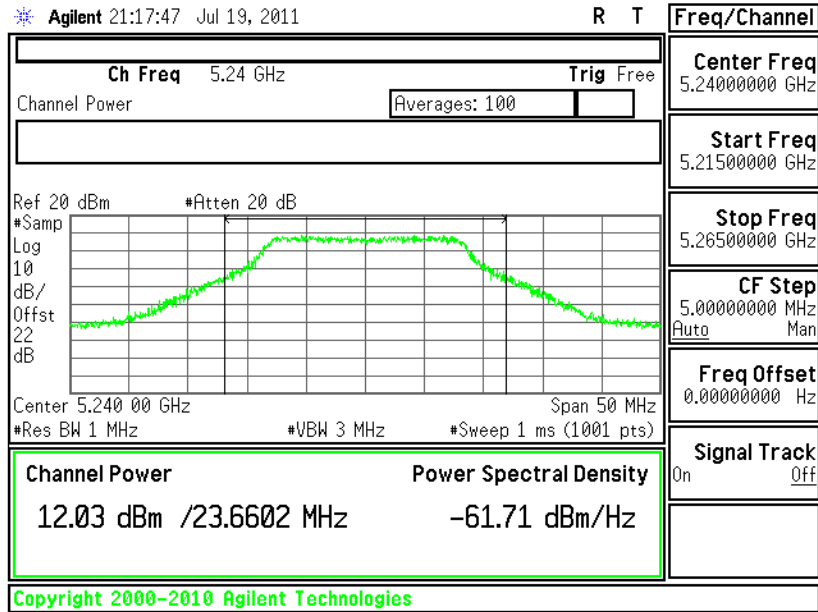




Output Power Plot on 802.11a Channel 48 - Chain A of Chain A+B

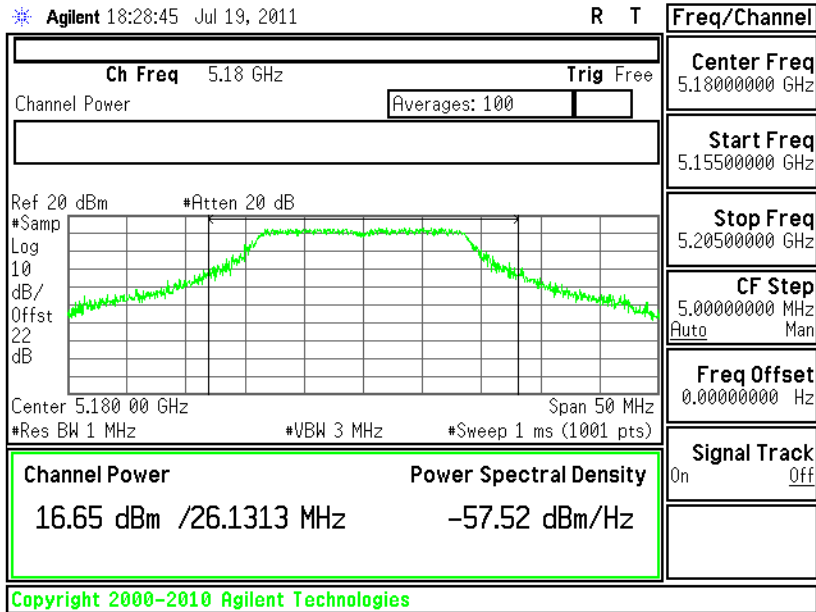


Output Power Plot on 802.11a Channel 48 - Chain B of Chain A+B

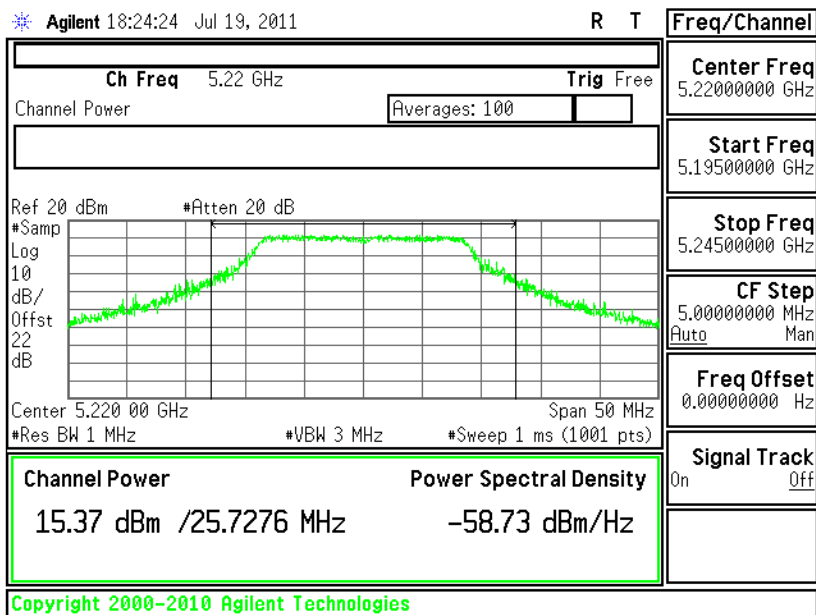




Output Power Plot on 802.11n (BW 20MHz) Channel 36 - Chain A



Output Power Plot on 802.11n (BW 20MHz) Channel 44 - Chain A

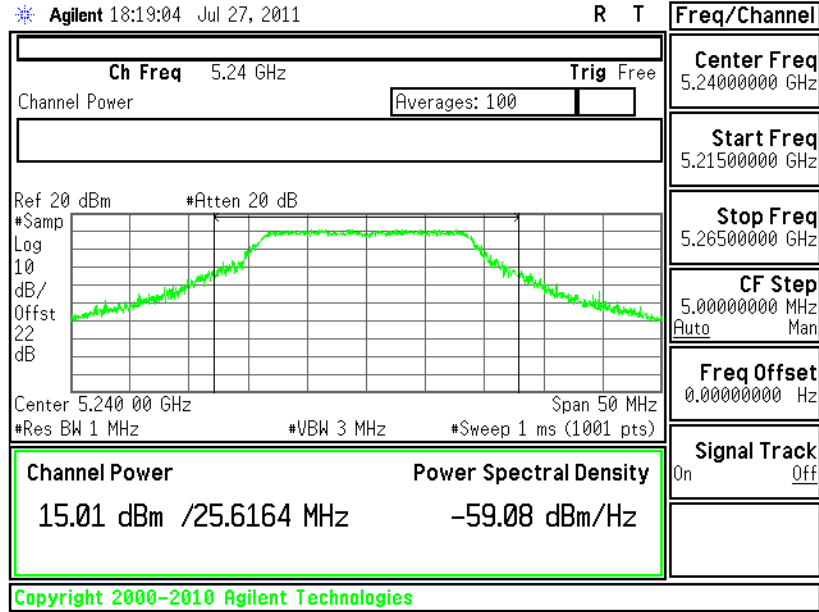




Output Power Plot on 802.11n (BW 20MHz) Channel 48 - Chain A

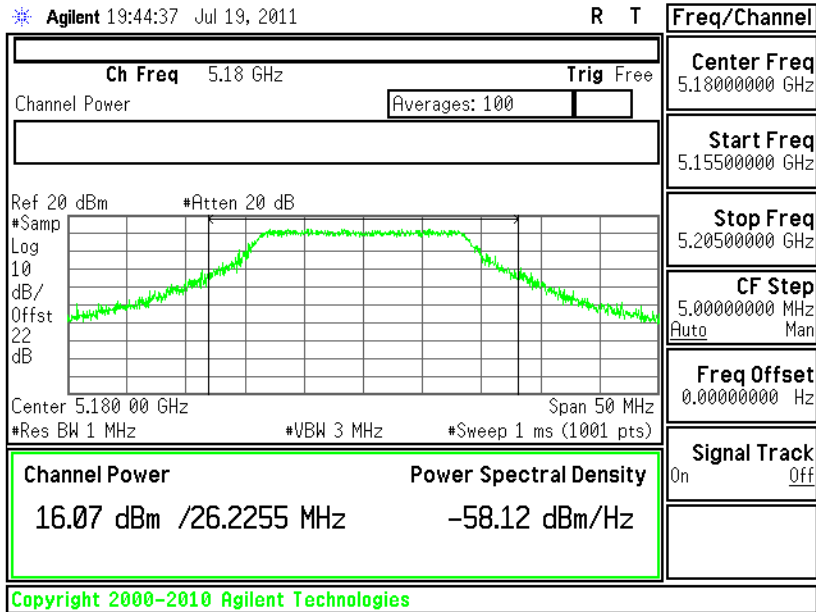
Agilent 18:19:04 Jul 27, 2011

R T

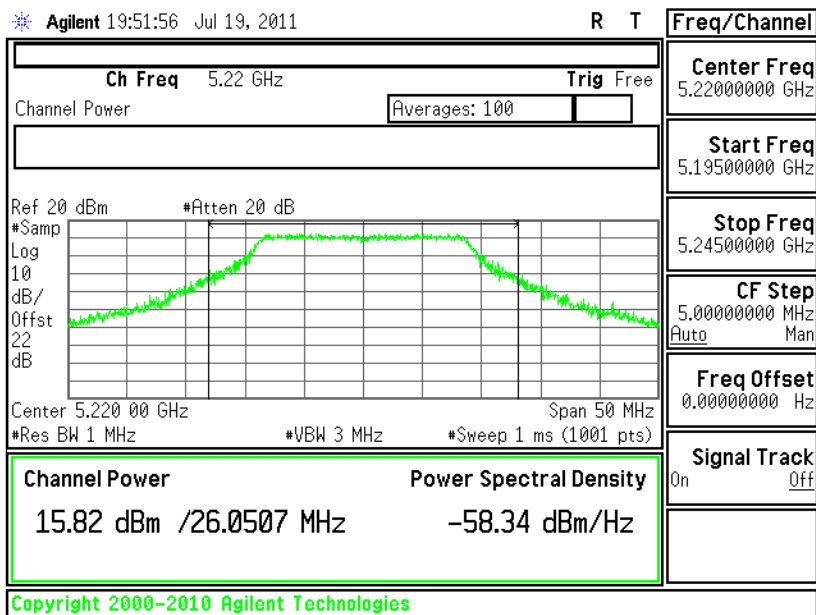




Output Power Plot on 802.11n (BW 20MHz) Channel 36 - Chain B



Output Power Plot on 802.11n (BW 20MHz) Channel 44 - Chain B

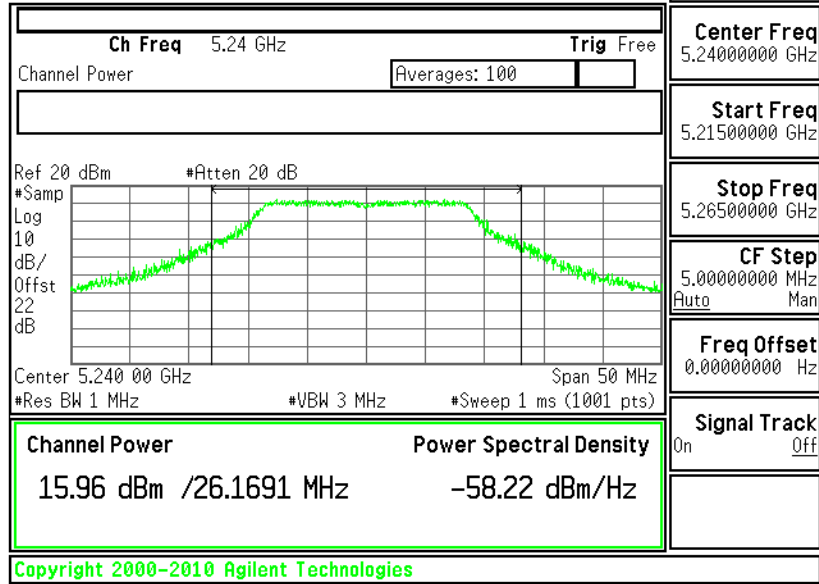




Output Power Plot on 802.11n (BW 20MHz) Channel 48 - Chain B

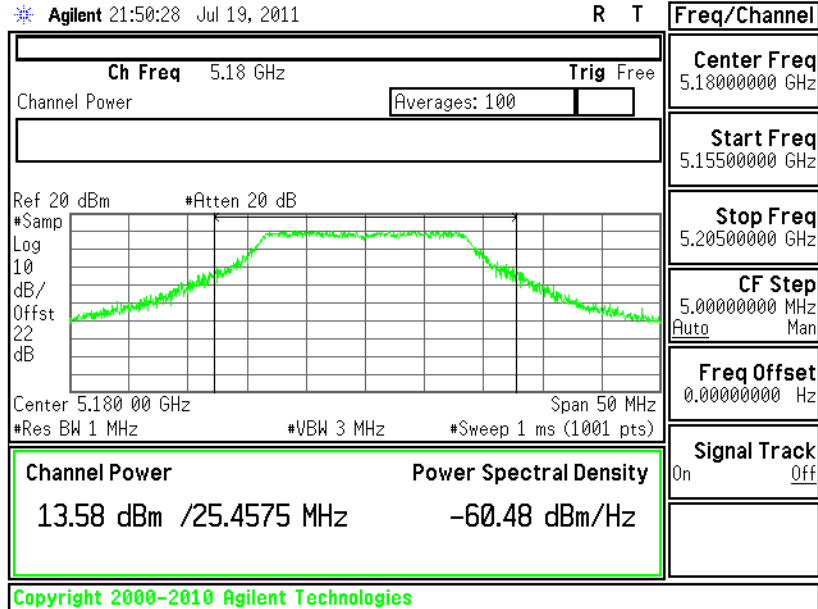
Agilent 19:54:38 Jul 19, 2011

R T

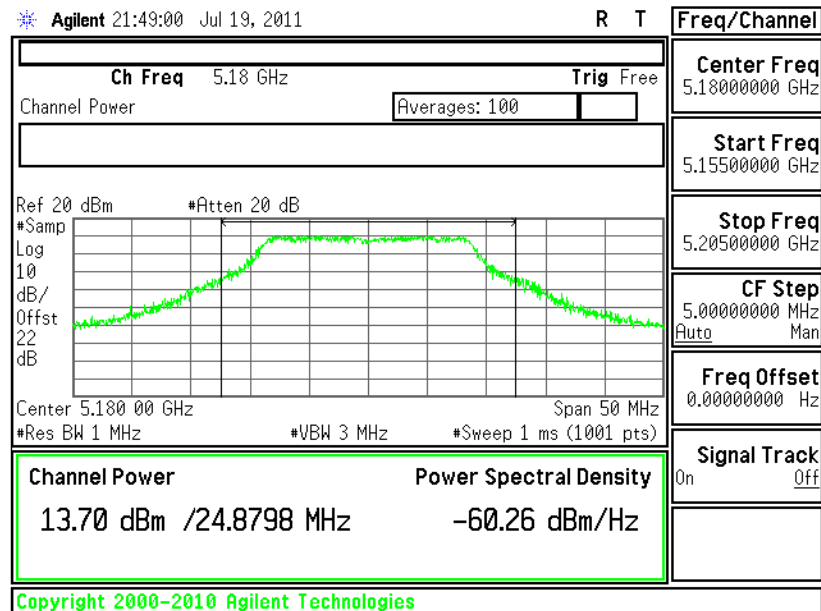




Output Power Plot on 802.11n (BW 20MHz) Channel 36 - Chain A of Chain A+B

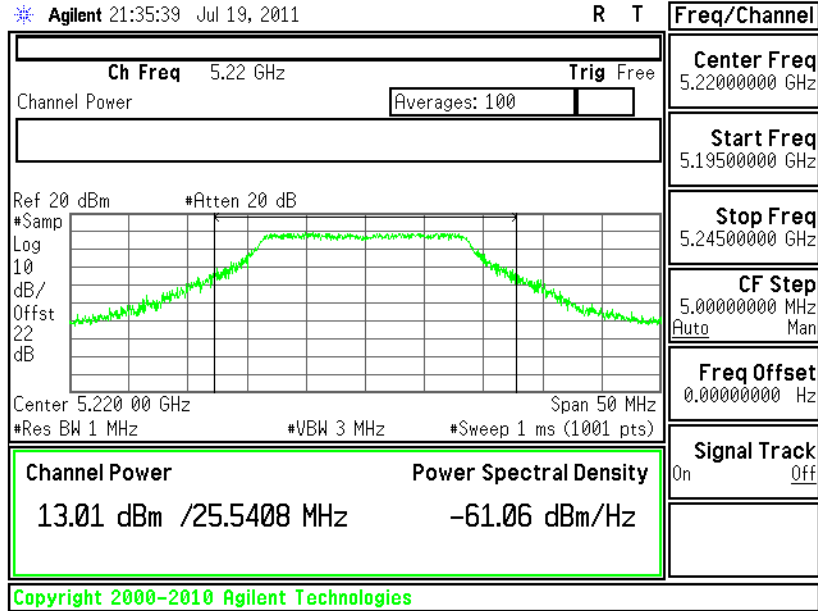


Output Power Plot on 802.11n (BW 20MHz) Channel 36 - Chain B of Chain A+B

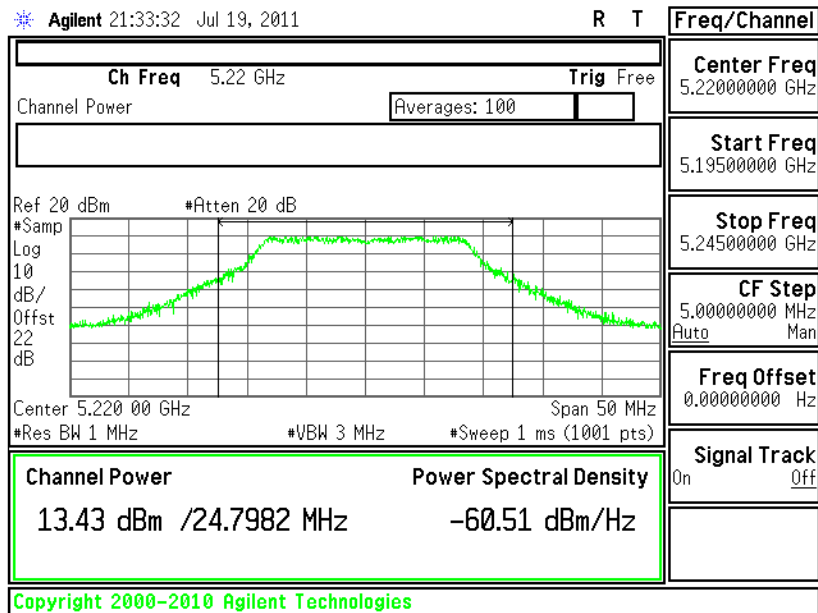




Output Power Plot on 802.11n (BW 20MHz) Channel 44 - Chain A of Chain A+B

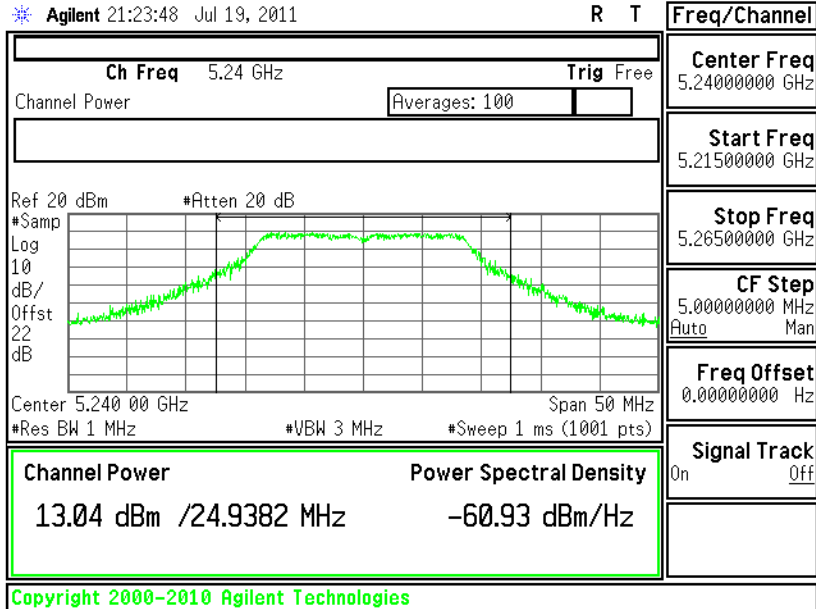


Output Power Plot on 802.11n (BW 20MHz) Channel 44 - Chain B of Chain A+B

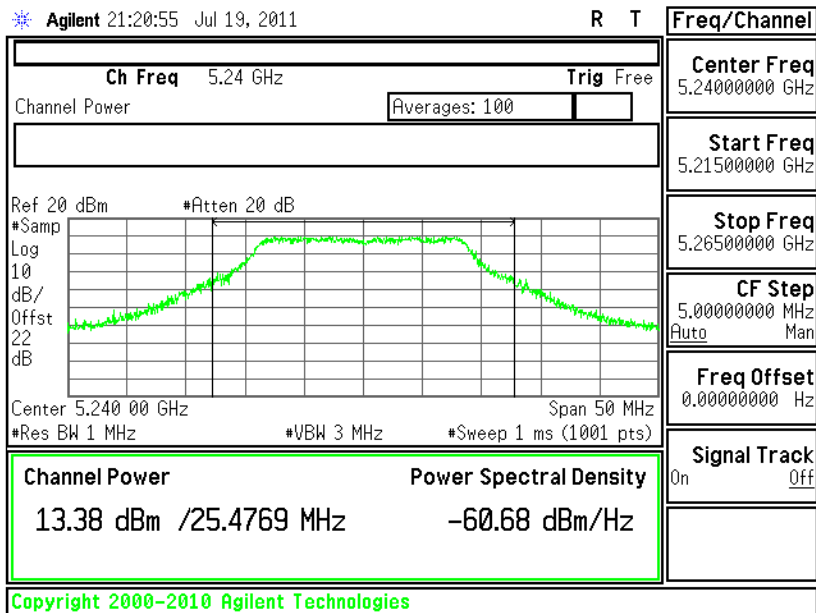




Output Power Plot on 802.11n (BW 20MHz) Channel 48 - Chain A of Chain A+B

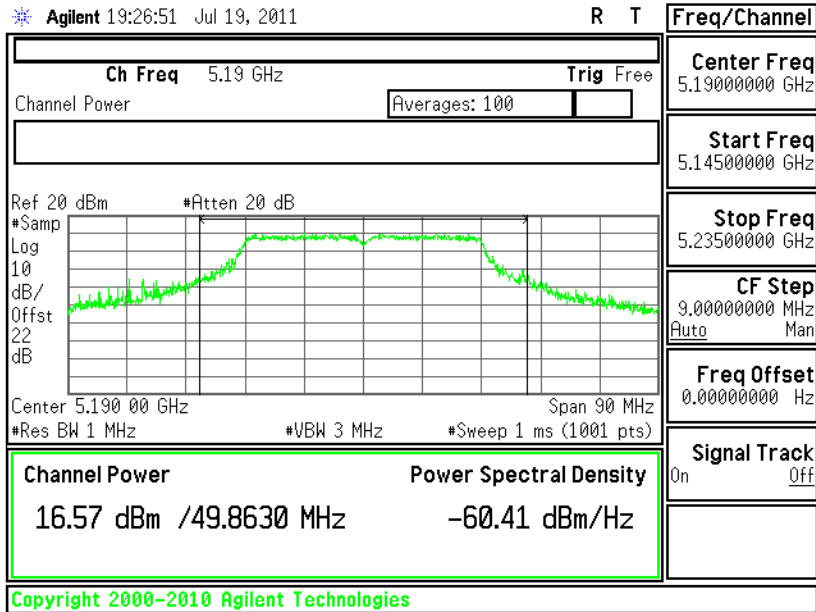


Output Power Plot on 802.11n (BW 20MHz) Channel 48 - Chain B of Chain A+B

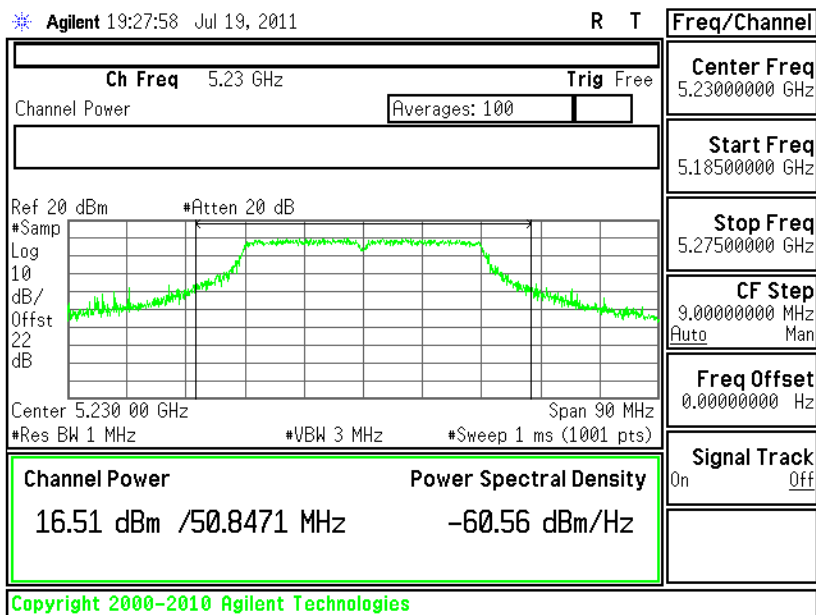




Output Power Plot on 802.11n (BW 40MHz) Channel 38 - Chain A

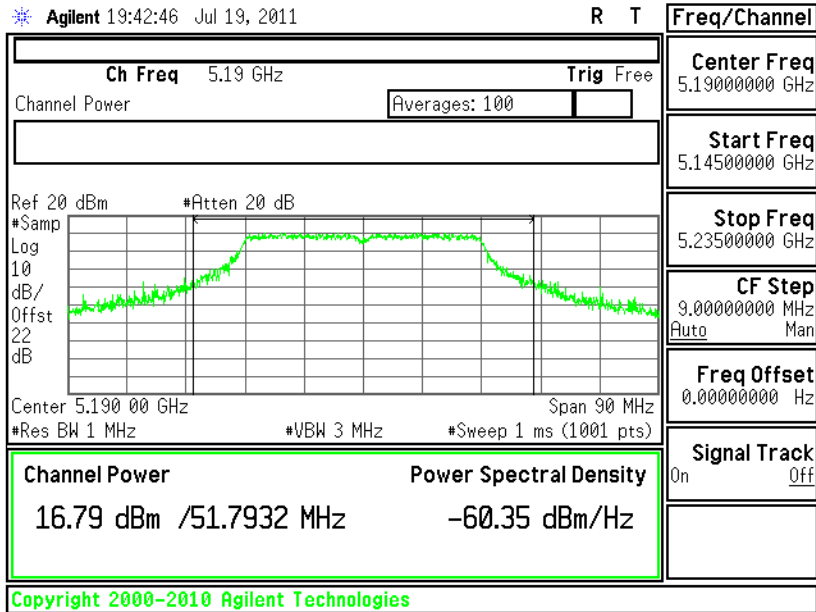


Output Power Plot on 802.11n (BW 40MHz) Channel 46 - Chain A

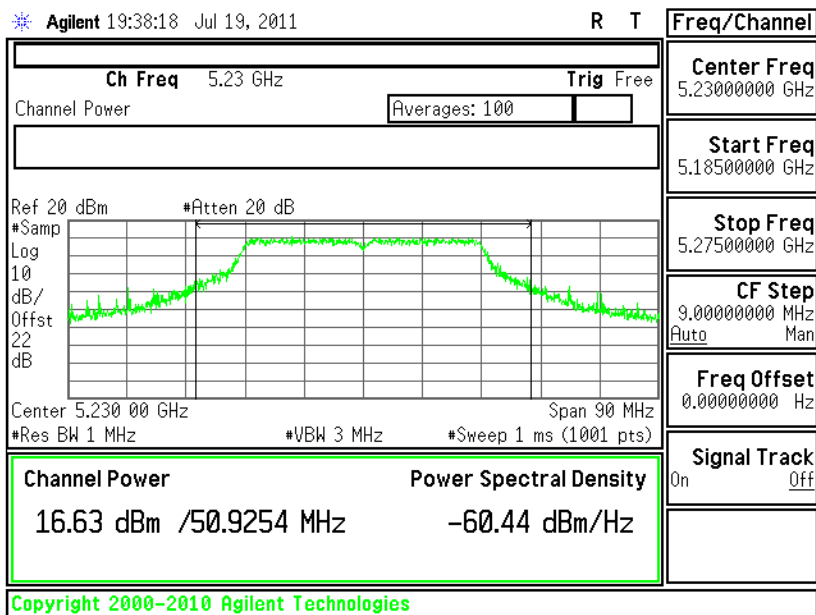




Output Power Plot on 802.11n (BW 40MHz) Channel 38 - Chain B

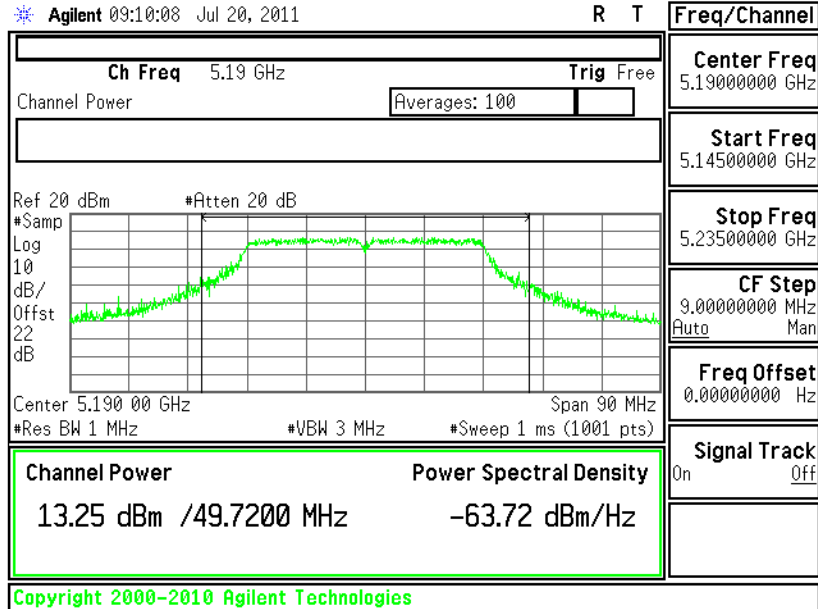


Output Power Plot on 802.11n (BW 40MHz) Channel 46 - Chain B

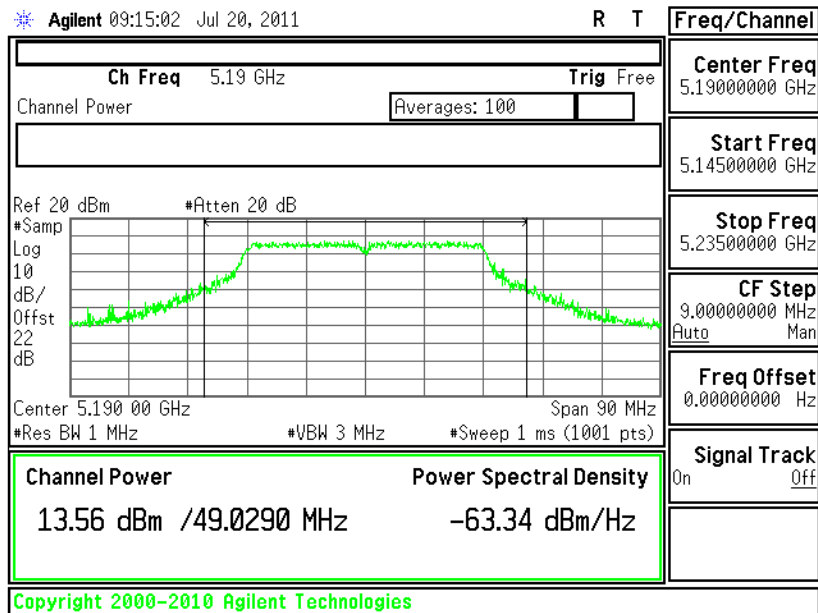




Output Power Plot on 802.11n (BW 40MHz) Channel 38 - Chain A of Chain A+B

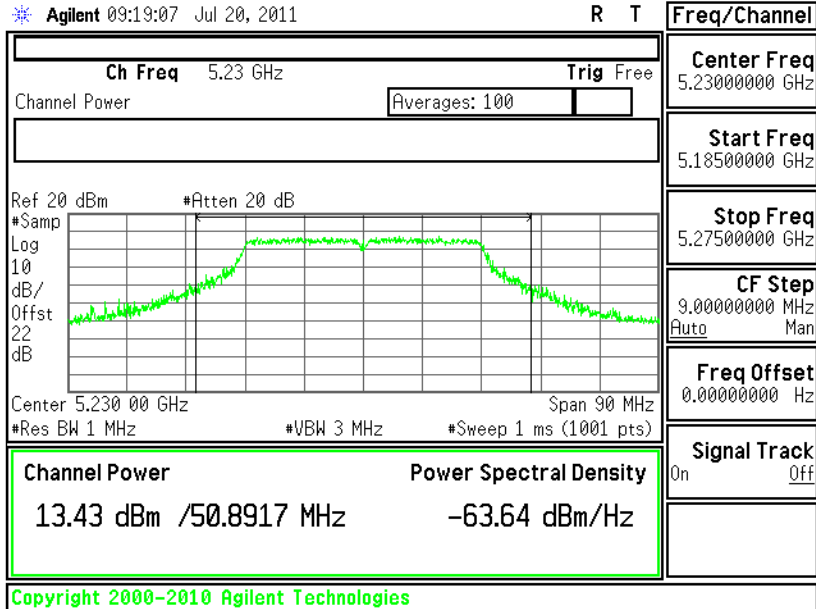


Output Power Plot on 802.11n (BW 40MHz) Channel 38 - Chain B of Chain A+B

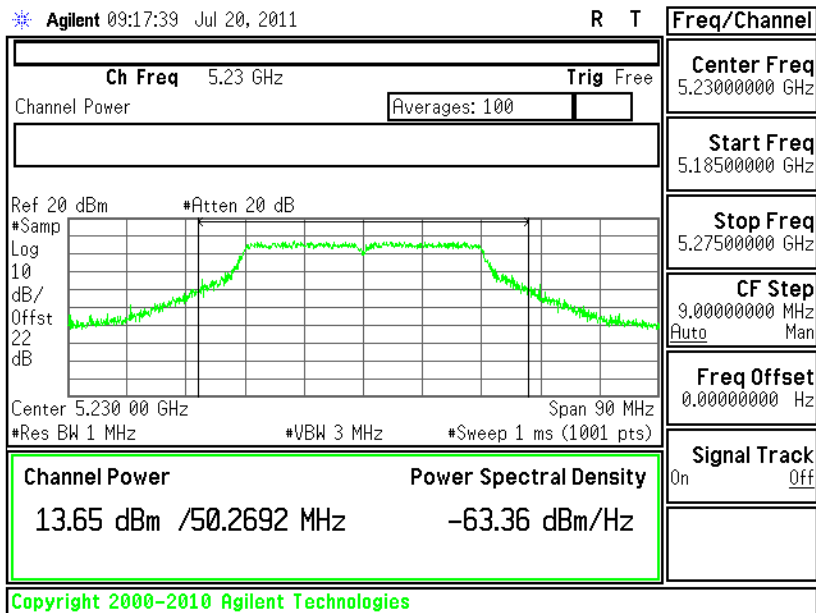




Output Power Plot on 802.11n (BW 40MHz) Channel 46 - Chain A of Chain A+B



Output Power Plot on 802.11n (BW 40MHz) Channel 46 - Chain B of Chain A+B





4 List of Measuring Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
System Simulator	R&S	CMU200	117995	N/A	Aug. 11, 2010	Aug.10, 2011	Conducted (TH02-HY)
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 13, 2011	Jun. 12, 2012	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	0932001	N/A	Sep. 13, 2010	Sep. 12, 2011	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	0846202	N/A	Sep. 14, 2010	Sep. 13, 2011	Conducted (TH02-HY)
Thermal Chamber	Ten Billion	TTH-D35P	TBN-930701	N/A	Jul. 30, 2010	Jul. 29, 2011	Conducted (TH02-HY)