

OCCUPIED BANDWIDTH

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval (mos)
Spectrum Analyzer	Agilent	N9010A	AFL	9/20/2014	12
DC Block, 40 GHz	Fairview Microwave	SD3379	AMM	2/27/2015	12
Attenuator, 20dB, 40 GHz	Fairview Microwave	SA4018-20	TQY	2/27/2015	12
Signal Generator, 40 GHz	Agilent	N5173B	TIW	7/15/2014	36

TEST DESCRIPTION

The 6dB occupied bandwidth was measured using 100 kHz resolution bandwidth and 300 kHz video bandwidth. The 99.9% (approximate 26 dB) emission bandwidth (EBW) was also measured at the same time.

The EUT was set to the channels and modes listed in the datasheet. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

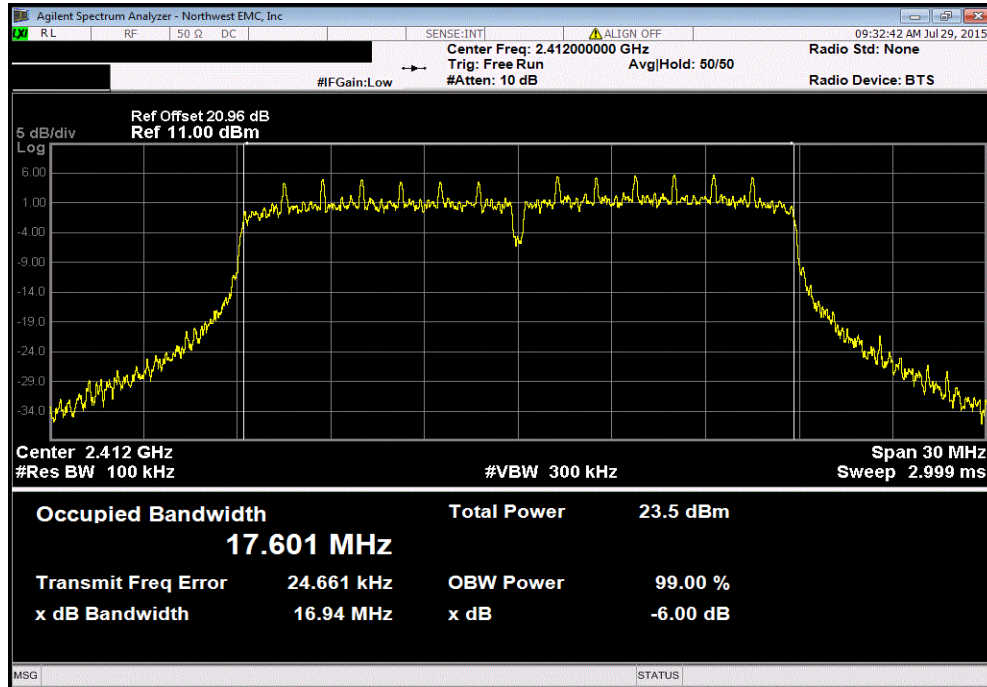
OCCUPIED BANDWIDTH

EUT: Firebox T50-W (BS5AE7W)		Work Order: VDEI0009	
Serial Number: 70AF00069-3EB6		Date: 07/29/15	
Customer: WatchGuard Technologies, Inc.		Temperature: 24.9°C	
Attendees: None		Humidity: 47%	
Project: None		Barometric Pres.: 1014 mbar	
Tested by: Jonathan Kiefer	Power: 110VAC/60Hz	Job Site: TX09	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2015		ANSI C63.10:2013	
COMMENTS			
2x2 MIMO mode, Chain AB (Chains 0 and 1).			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature <i>Jonathan Kiefer</i>	
		Value	Limit (>)
Chain A			
20 MHz			
2400 MHz - 2483.5 MHz Band			
802.11(n) MCS8			
	Low Channel 1, 2412 MHz	16.944 MHz	500 kHz
	Mid Channel 6, 2437 MHz	17.183 MHz	500 kHz
	High Channel 11, 2462 MHz	17.326 MHz	500 kHz
802.11(n) MCS15			
	Low Channel 1, 2412 MHz	17.702 MHz	500 kHz
	Mid Channel 6, 2437 MHz	17.69 MHz	500 kHz
	High Channel 11, 2462 MHz	17.699 MHz	500 kHz
Chain B			
20 MHz			
2400 MHz - 2483.5 MHz Band			
802.11(n) MCS8			
	Low Channel 1, 2412 MHz	17.563 MHz	500 kHz
	Mid Channel 6, 2437 MHz	17.554 MHz	500 kHz
	High Channel 11, 2462 MHz	17.584 MHz	500 kHz
802.11(n) MCS15			
	Low Channel 1, 2412 MHz	17.681 MHz	500 kHz
	Mid Channel 6, 2437 MHz	17.674 MHz	500 kHz
	High Channel 11, 2462 MHz	17.687 MHz	500 kHz

OCCUPIED BANDWIDTH

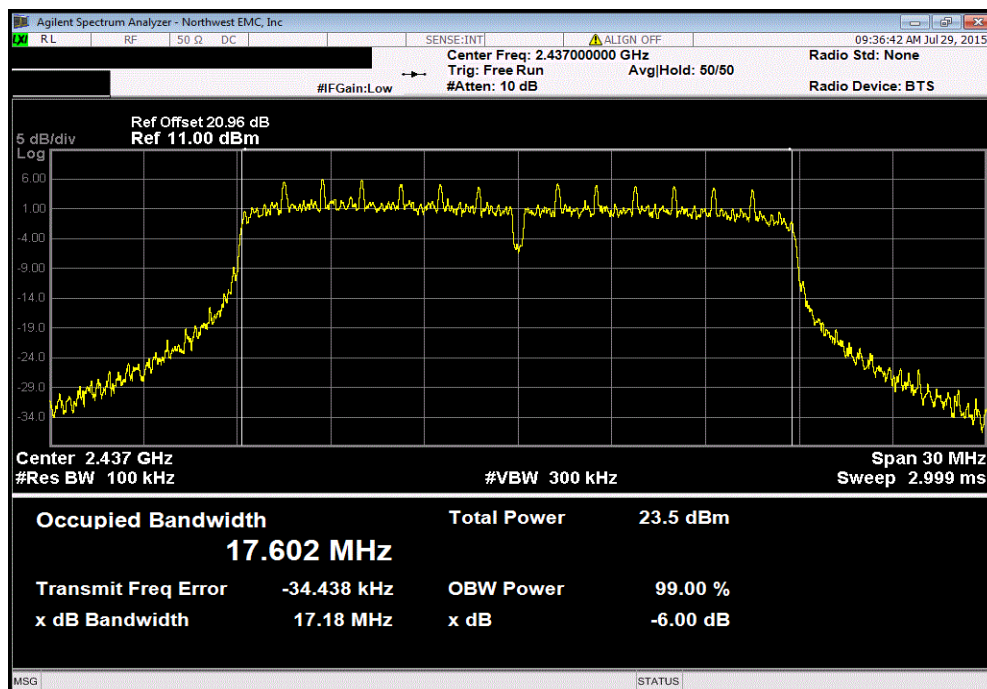
Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS8, Low Channel 1, 2412 MHz

			Limit		
			Value	(>)	Result
			16.944 MHz	500 kHz	Pass



Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS8, Mid Channel 6, 2437 MHz

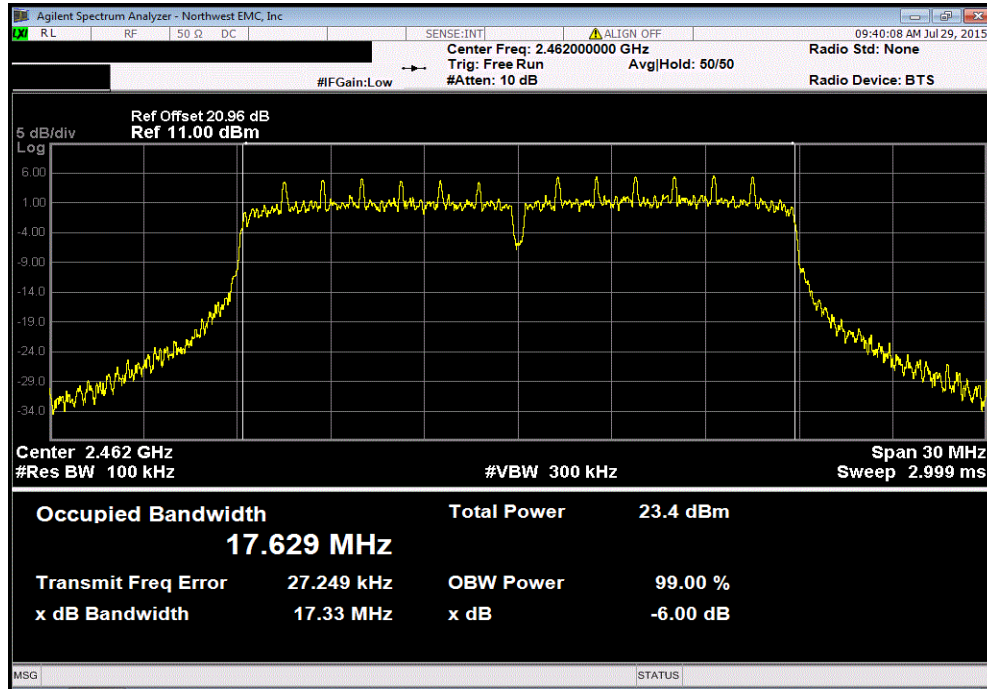
			Limit		
			Value	(>)	Result
			17.183 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

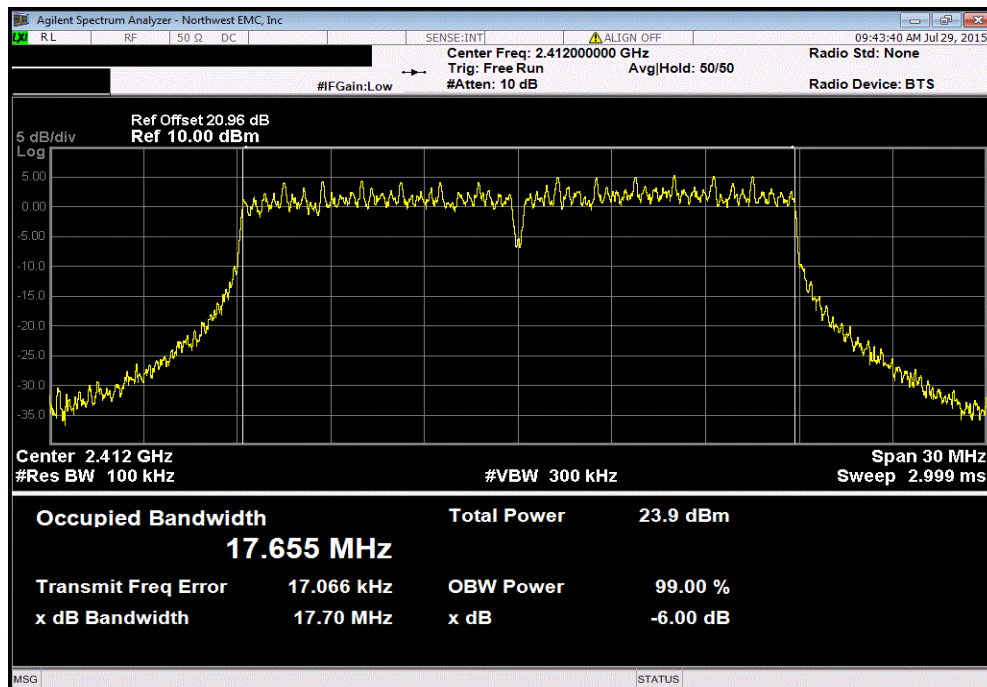
Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS8, High Channel 11, 2462 MHz

			Limit		
			Value	(>)	Result
			17.326 MHz	500 kHz	Pass



Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS15, Low Channel 1, 2412 MHz

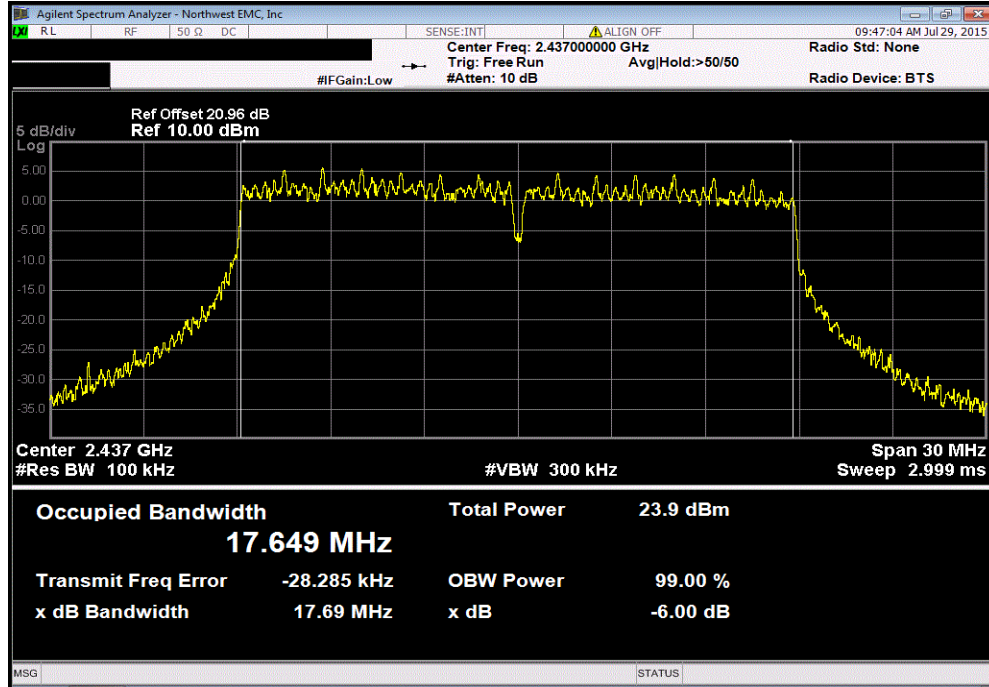
			Limit		
			Value	(>)	Result
			17.702 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

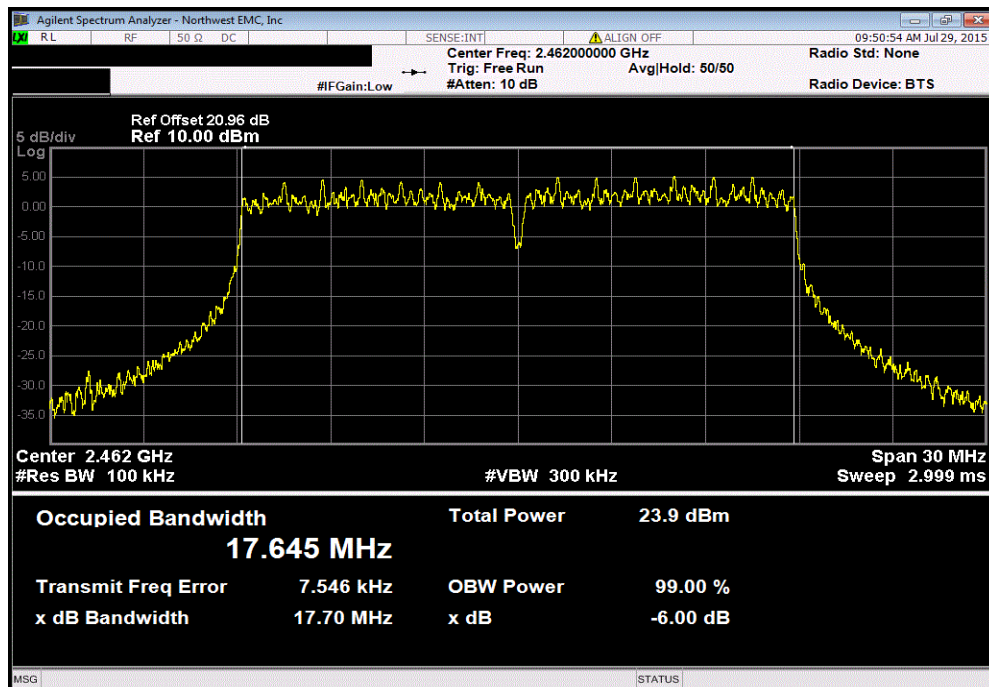
Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS15, Mid Channel 6, 2437 MHz

			Value	Limit	Result
				(>)	
			17.69 MHz	500 kHz	Pass



Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS15, High Channel 11, 2462 MHz

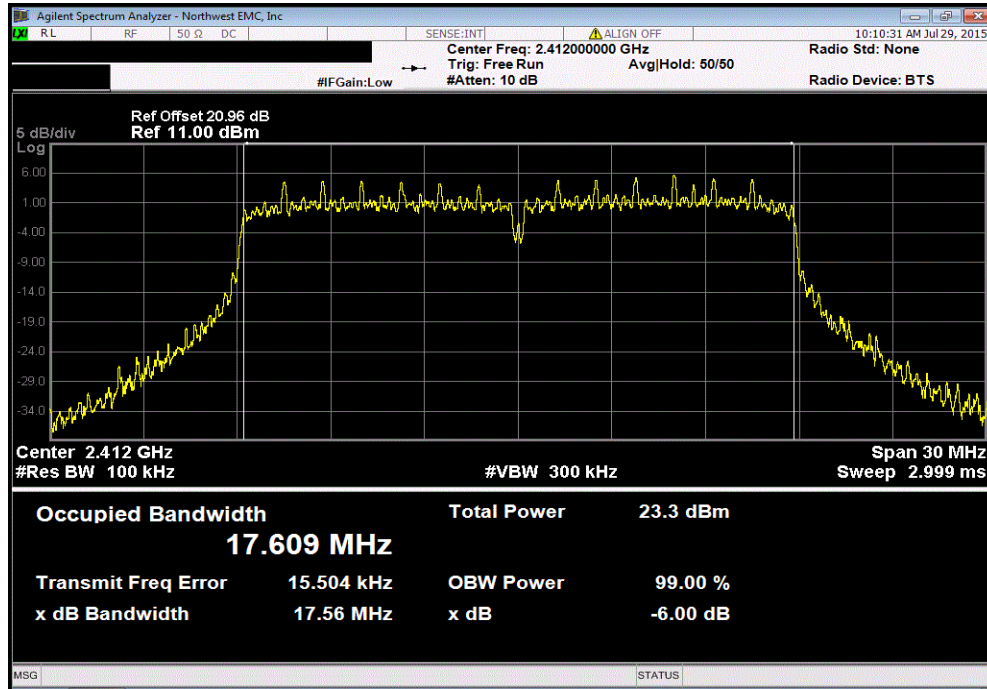
			Value	Limit	Result
				(>)	
			17.699 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

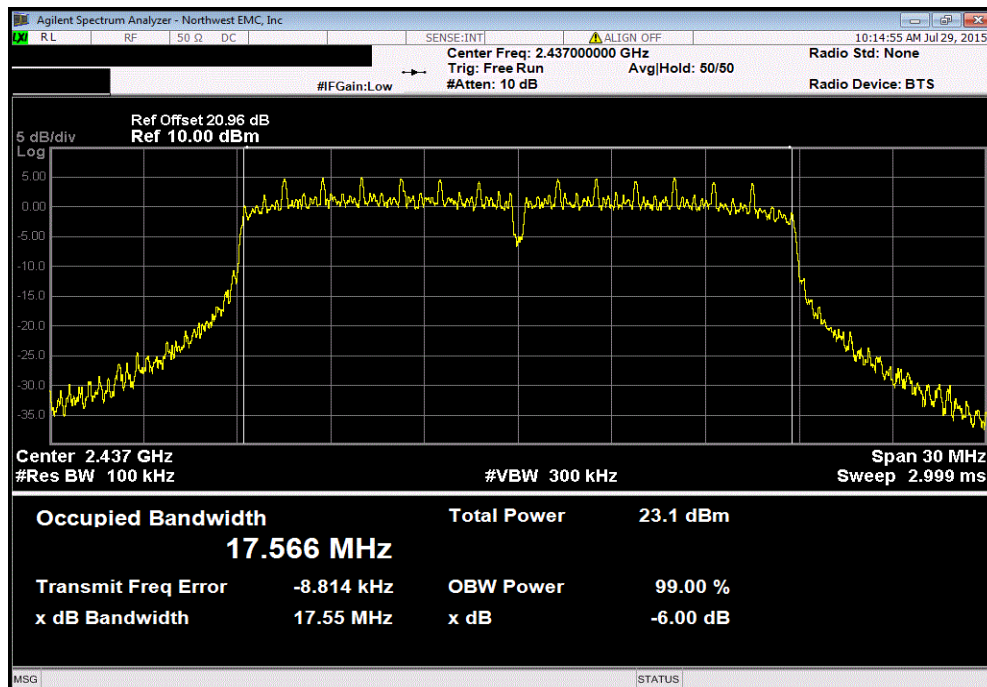
Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS8, Low Channel 1, 2412 MHz

	Value	Limit	Result
	17.563 MHz	(> 500 kHz)	Pass



Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS8, Mid Channel 6, 2437 MHz

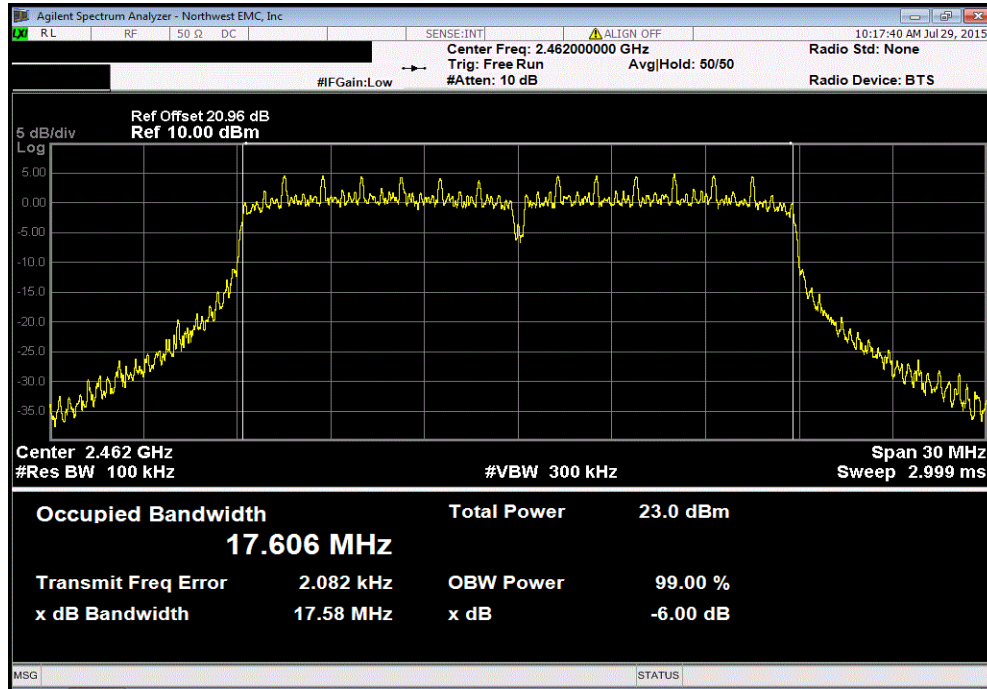
	Value	Limit	Result
	17.554 MHz	(> 500 kHz)	Pass



OCCUPIED BANDWIDTH

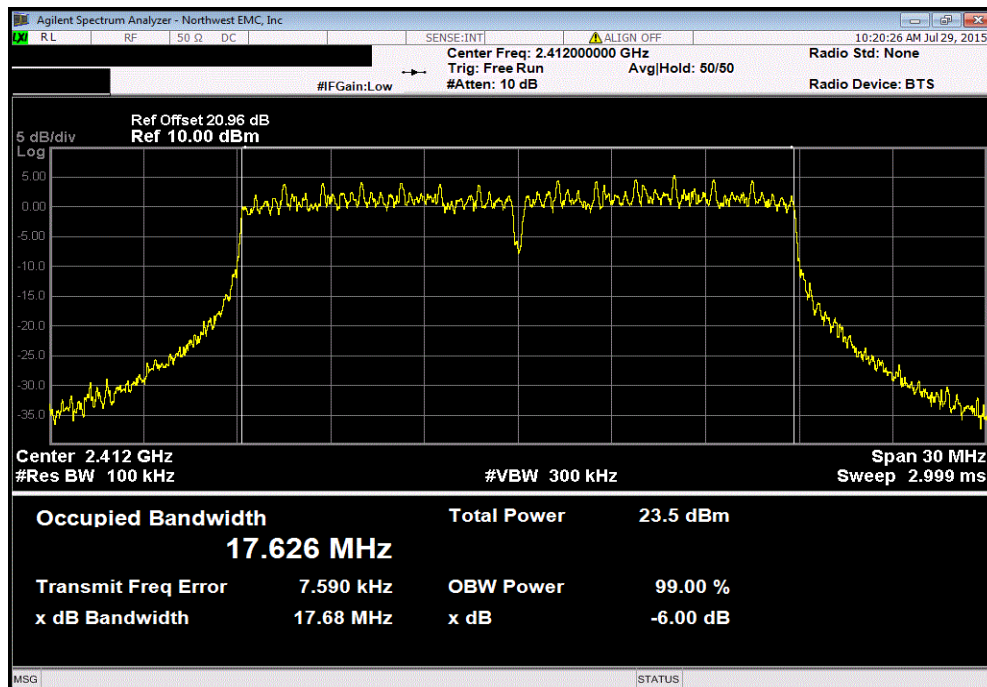
Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS8, High Channel 11, 2462 MHz

			Limit		
			Value	(>)	Result
			17.584 MHz	500 kHz	Pass



Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS15, Low Channel 1, 2412 MHz

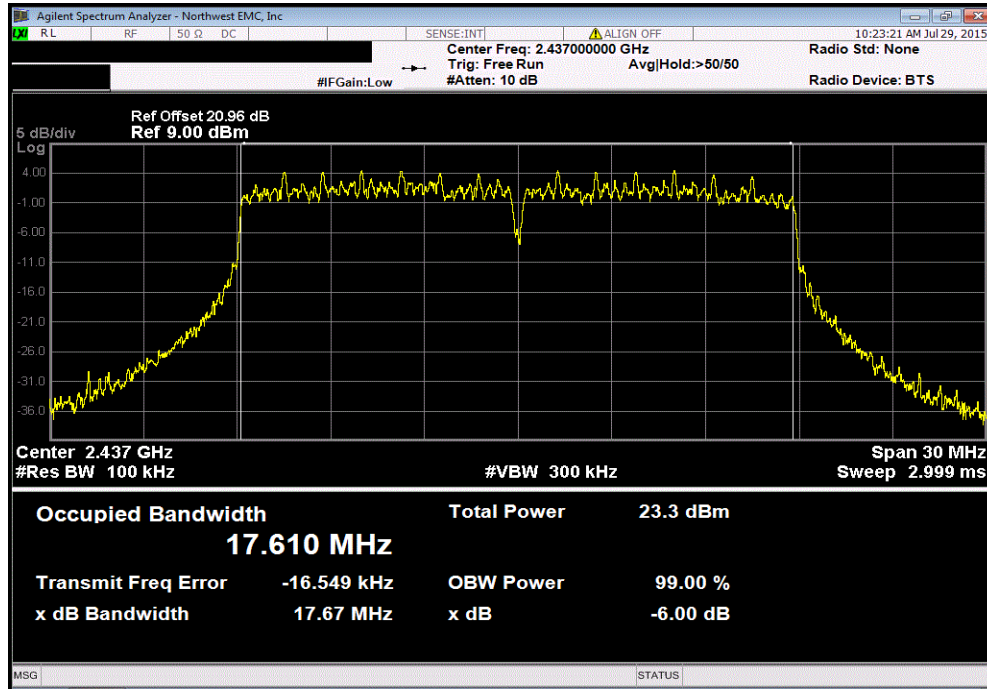
			Limit		
			Value	(>)	Result
			17.681 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

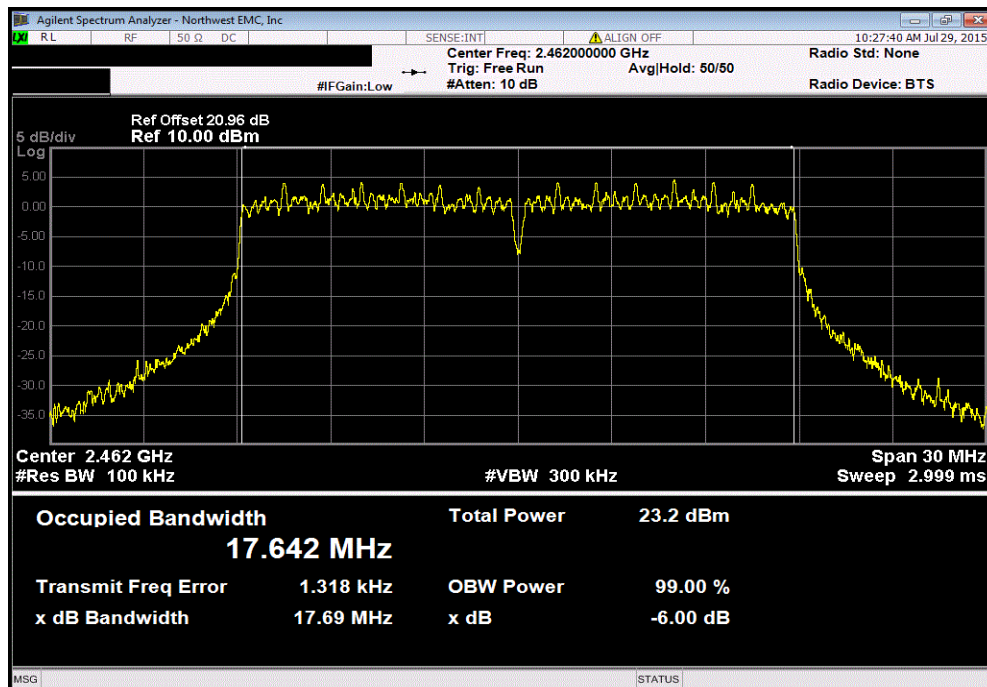
Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS15, Mid Channel 6, 2437 MHz

			Value	Limit	Result
				(>)	
			17.674 MHz	500 kHz	Pass



Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS15, High Channel 11, 2462 MHz

			Value	Limit	Result
				(>)	
			17.687 MHz	500 kHz	Pass



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TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval (mos)
Spectrum Analyzer	Agilent	N9010A	AFL	9/20/2014	12
DC Block, 40 GHz	Fairview Microwave	SD3379	AMM	2/27/2015	12
Attenuator, 20dB, 40 GHz	Fairview Microwave	SA4018-20	TQY	2/27/2015	12
Signal Generator, 40 GHz	Agilent	N5173B	TIW	7/15/2014	36

TEST DESCRIPTION

The 6dB occupied bandwidth was measured using 100 kHz resolution bandwidth and 300 kHz video bandwidth. The 99.9% (approximate 26 dB) emission bandwidth (EBW) was also measured at the same time.

The EUT was set to the channels and modes listed in the datasheet. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

OCCUPIED BANDWIDTH



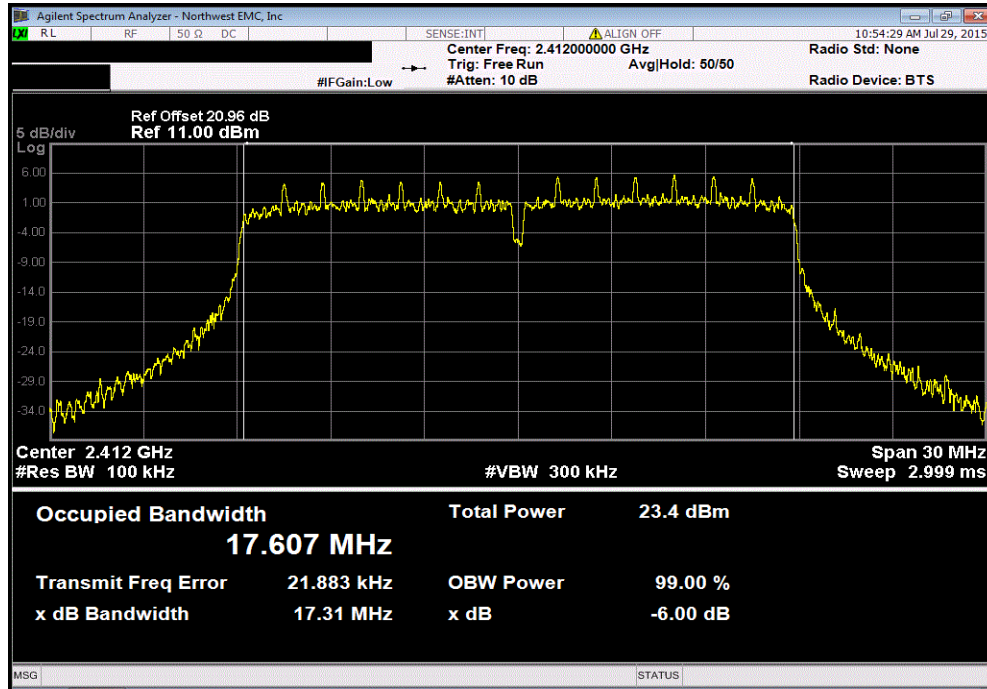
XMit 2015.01.14

EUT: Firebox T50-W (BS5AE7W)		Work Order: VDEI0009	
Serial Number: 70AF00069-3EB6		Date: 07/29/15	
Customer: WatchGuard Technologies, Inc.		Temperature: 24.9°C	
Attendees: None		Humidity: 47%	
Project: None		Barometric Pres.: 1014 mbar	
Tested by: Jonathan Kiefer		Power: 110VAC/60Hz	
		Job Site: TX09	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2015		ANSI C63.10:2013	
COMMENTS			
2x2 MIMO mode, Chain AC (Chains 0 and 2).			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature <i>Jonathan Kiefer</i>	
		Value	Limit (>)
Chain A			
20 MHz			
2400 MHz - 2483.5 MHz Band			
802.11(n) MCS8			
	Low Channel 1, 2412 MHz	17.31 MHz	500 kHz
	Mid Channel 6, 2437 MHz	17.172 MHz	500 kHz
	High Channel 11, 2462 MHz	17.313 MHz	500 kHz
802.11(n) MCS15			
	Low Channel 1, 2412 MHz	17.662 MHz	500 kHz
	Mid Channel 6, 2437 MHz	17.695 MHz	500 kHz
	High Channel 11, 2462 MHz	17.705 MHz	500 kHz
Chain C			
20 MHz			
2400 MHz - 2483.5 MHz Band			
802.11(n) MCS8			
	Low Channel 1, 2412 MHz	17.579 MHz	500 kHz
	Mid Channel 6, 2437 MHz	17.584 MHz	500 kHz
	High Channel 11, 2462 MHz	17.558 MHz	500 kHz
802.11(n) MCS15			
	Low Channel 1, 2412 MHz	17.691 MHz	500 kHz
	Mid Channel 6, 2437 MHz	17.699 MHz	500 kHz
	High Channel 11, 2462 MHz	17.696 MHz	500 kHz

OCCUPIED BANDWIDTH

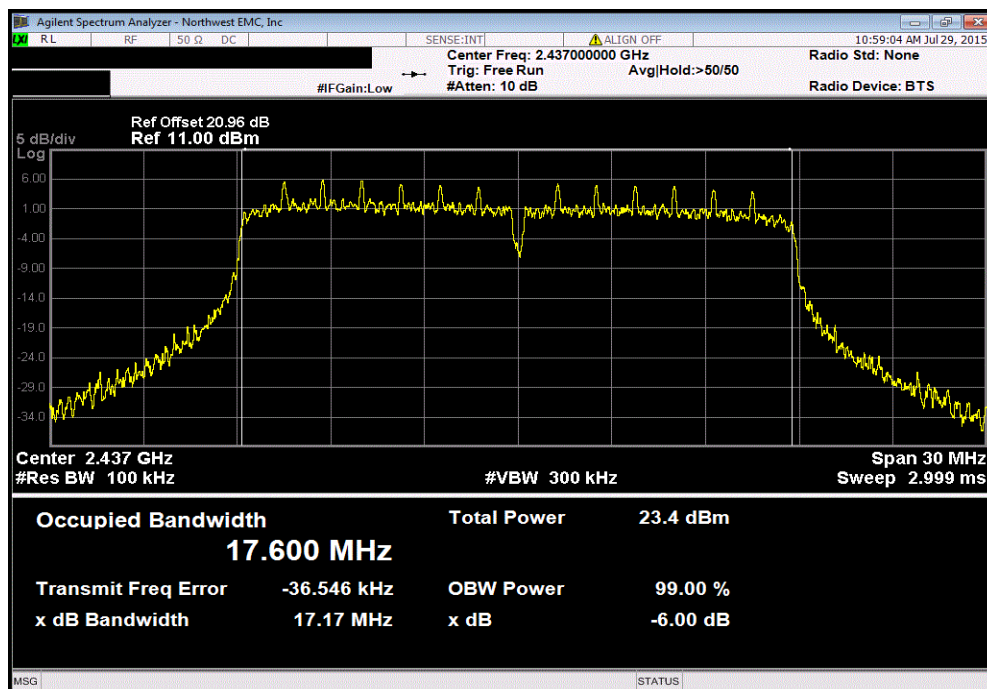
Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS8, Low Channel 1, 2412 MHz

			Limit		
			Value	(>)	Result
			17.31 MHz	500 kHz	Pass



Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS8, Mid Channel 6, 2437 MHz

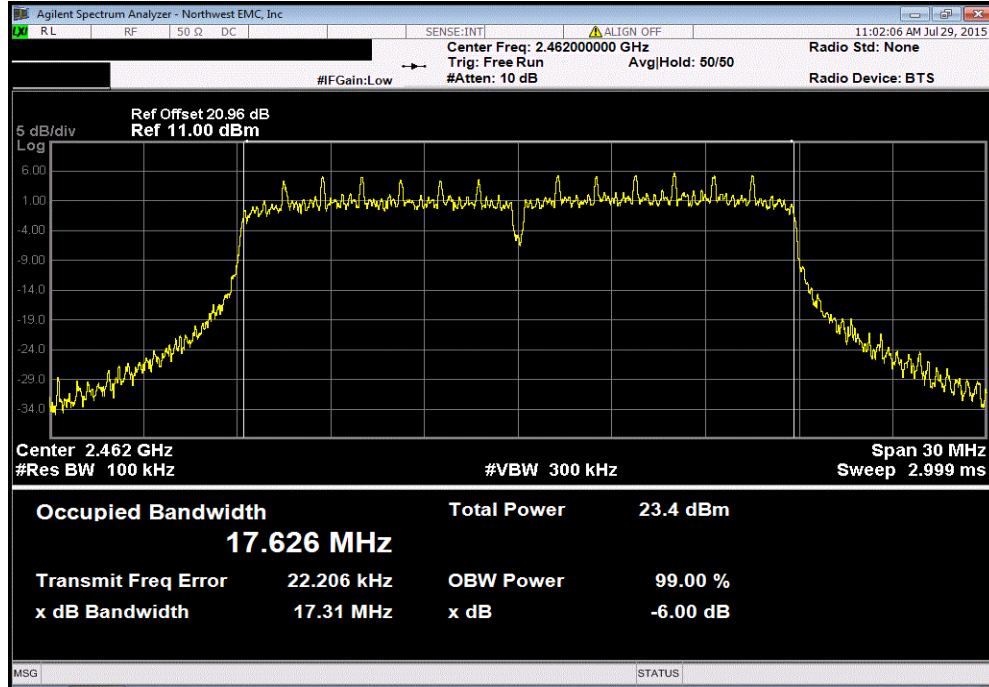
			Limit		
			Value	(>)	Result
			17.172 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

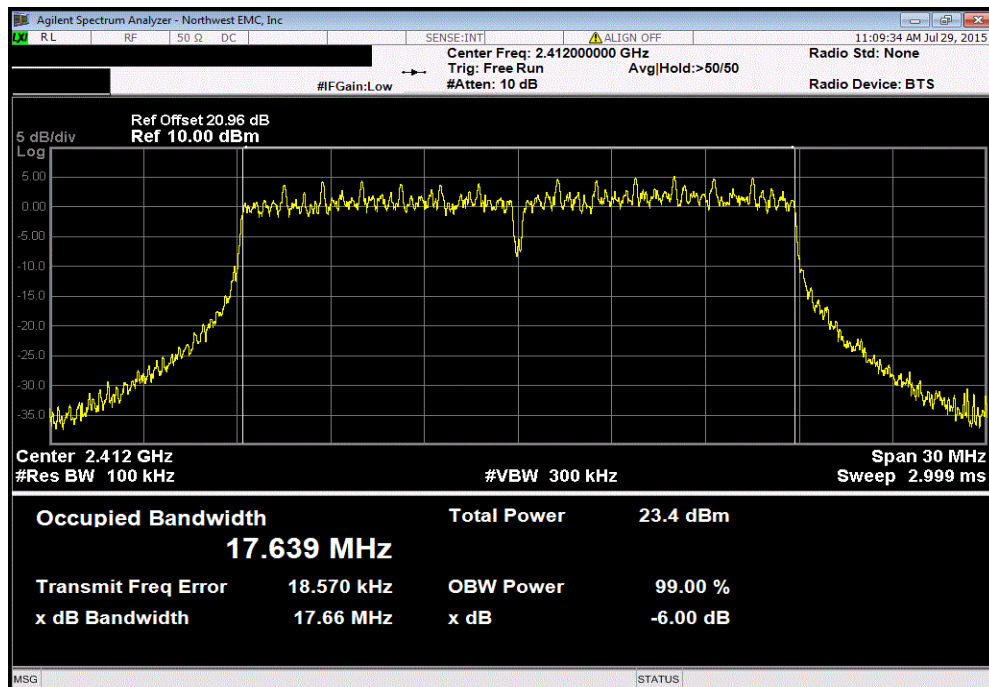
Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS8, High Channel 11, 2462 MHz

			Limit		
			Value	(>)	Result
			17.313 MHz	500 kHz	Pass



Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS15, Low Channel 1, 2412 MHz

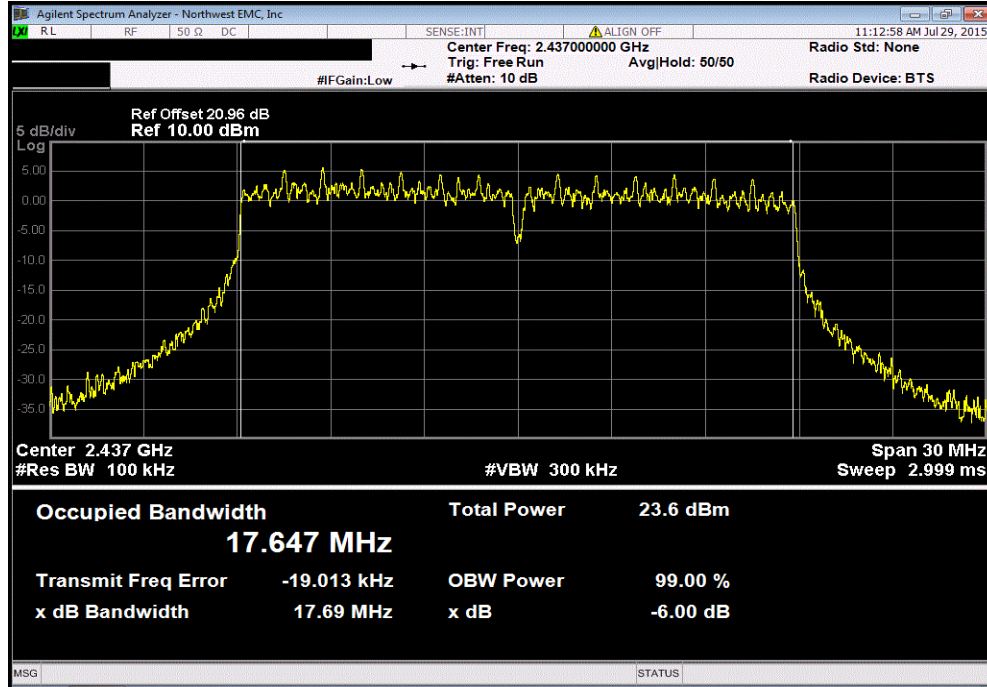
			Limit		
			Value	(>)	Result
			17.662 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

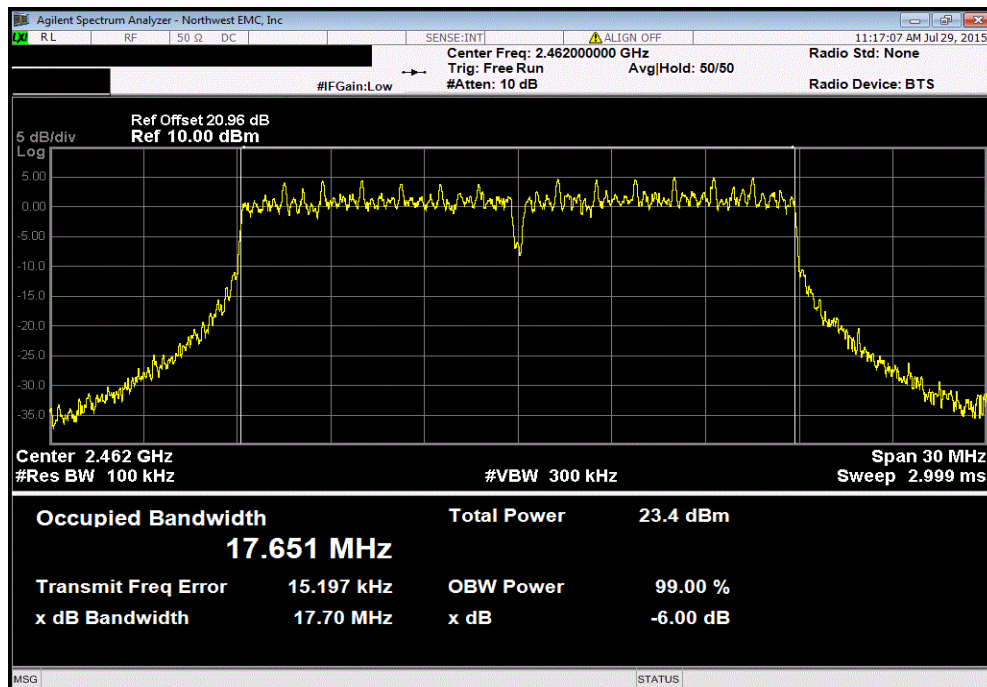
Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS15, Mid Channel 6, 2437 MHz

			Value	Limit	Result
				(>)	
			17.695 MHz	500 kHz	Pass



Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS15, High Channel 11, 2462 MHz

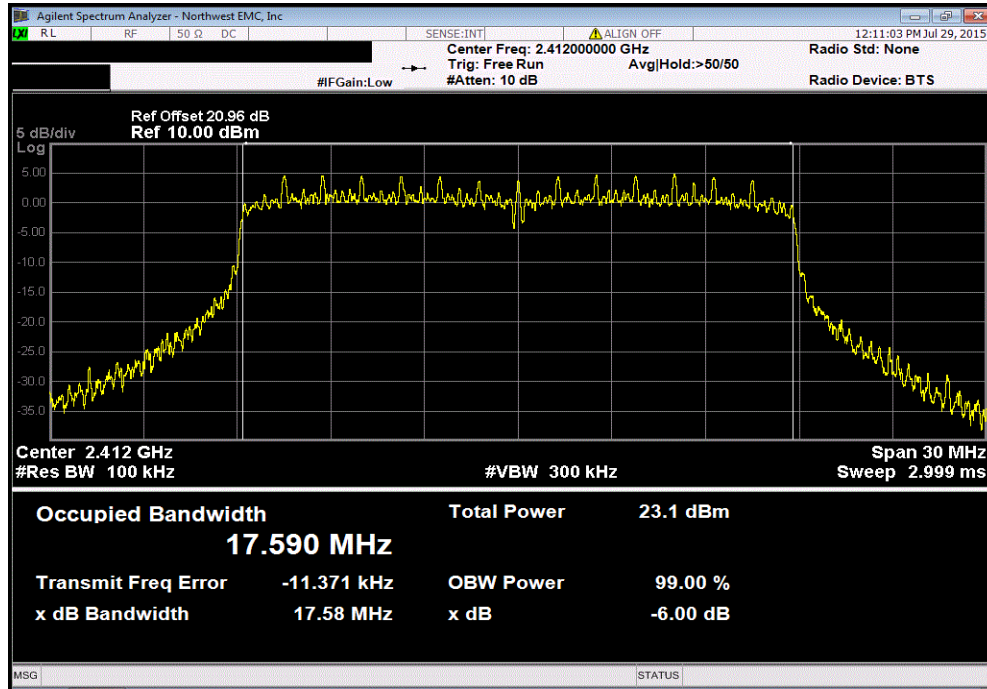
			Value	Limit	Result
				(>)	
			17.705 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

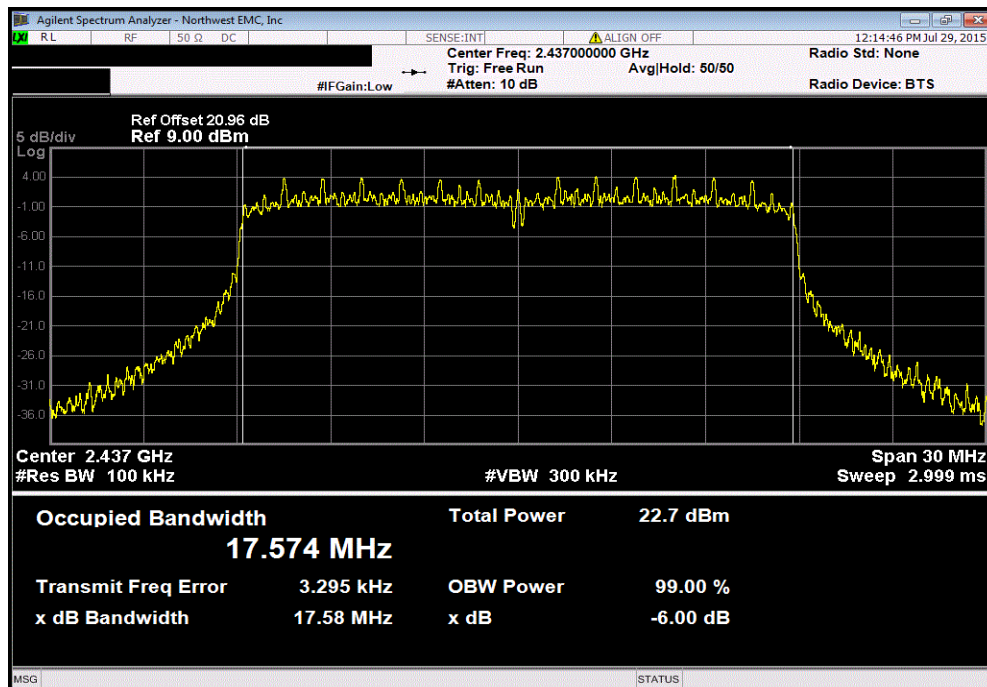
Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS8, Low Channel 1, 2412 MHz

			Limit		
			Value	(>)	Result
			17.579 MHz	500 kHz	Pass



Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS8, Mid Channel 6, 2437 MHz

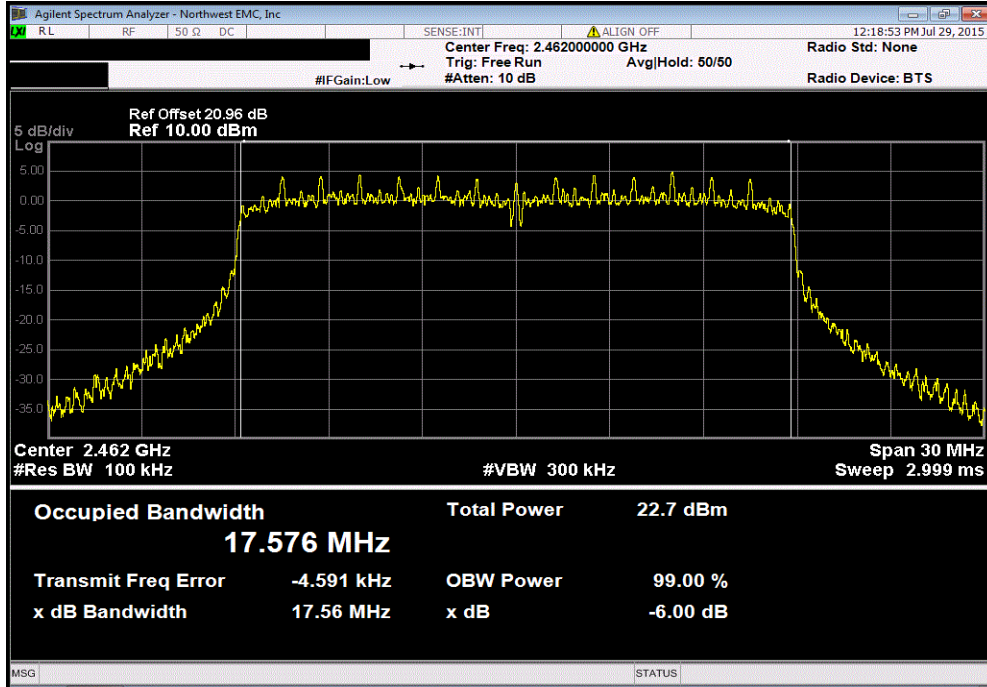
			Limit		
			Value	(>)	Result
			17.584 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

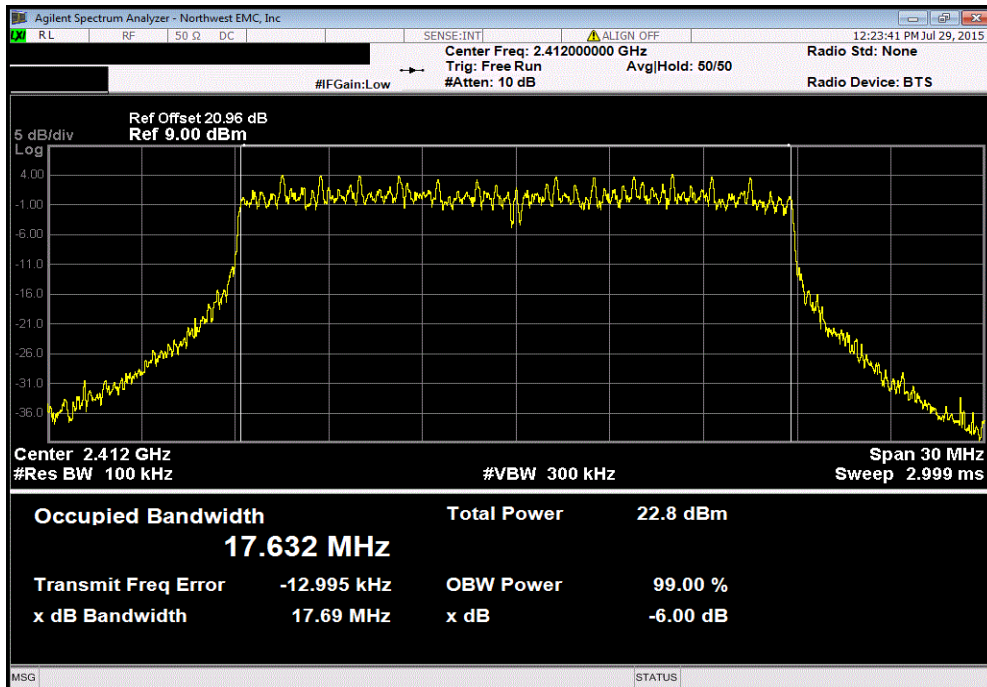
Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS8, High Channel 11, 2462 MHz

			Limit		
			Value	(>)	Result
			17.558 MHz	500 kHz	Pass



Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS15, Low Channel 1, 2412 MHz

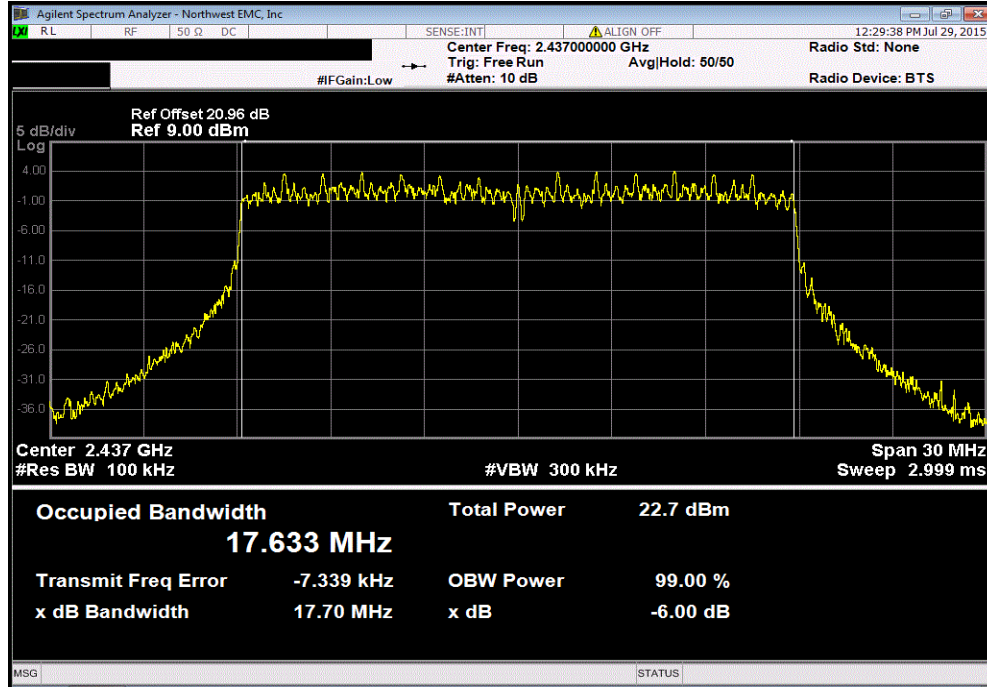
			Limit		
			Value	(>)	Result
			17.691 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

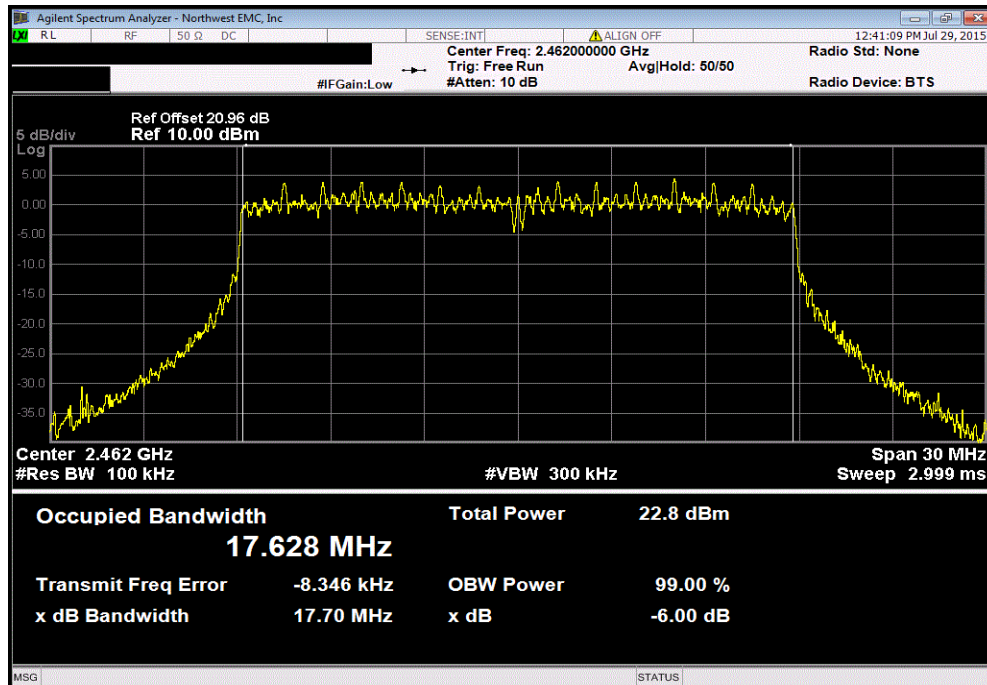
Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS15, Mid Channel 6, 2437 MHz

			Value	Limit	Result
				(>)	
			17.699 MHz	500 kHz	Pass



Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS15, High Channel 11, 2462 MHz

			Value	Limit	Result
				(>)	
			17.696 MHz	500 kHz	Pass



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Signal Generator, 40 GHz	Agilent	N5173B	TIW	7/15/2014	36

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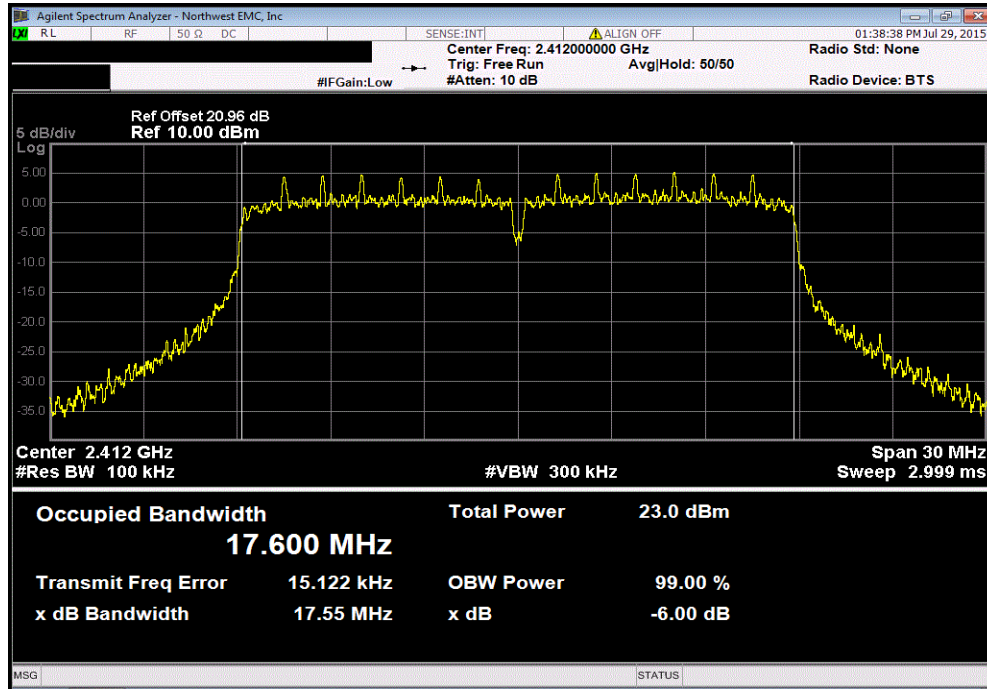
OCCUPIED BANDWIDTH

EUT: Firebox T50-W (BS5AE7W)		Work Order: VDEI0009	
Serial Number: 70AF00069-3EB6		Date: 07/29/15	
Customer: WatchGuard Technologies, Inc.		Temperature: 24.9°C	
Attendees: None		Humidity: 47%	
Project: None		Barometric Pres.: 1014 mbar	
Tested by: Jonathan Kiefer		Power: 110VAC/60Hz	Job Site: TX09
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2015		ANSI C63.10:2013	
COMMENTS			
2x2 MIMO mode, Chain BC (Chains 1 and 2).			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature <i>Jonathan Kiefer</i>	
		Value	Limit (>) Result
Chain B			
20 MHz			
2400 MHz - 2483.5 MHz Band			
802.11(n) MCS8			
	Low Channel 1, 2412 MHz	17.553 MHz	500 kHz Pass
	Mid Channel 6, 2437 MHz	17.178 MHz	500 kHz Pass
	High Channel 11, 2462 MHz	17.548 MHz	500 kHz Pass
802.11(n) MCS15			
	Low Channel 1, 2412 MHz	17.655 MHz	500 kHz Pass
	Mid Channel 6, 2437 MHz	17.664 MHz	500 kHz Pass
	High Channel 11, 2462 MHz	17.685 MHz	500 kHz Pass
Chain C			
20 MHz			
2400 MHz - 2483.5 MHz Band			
802.11(n) MCS8			
	Low Channel 1, 2412 MHz	17.585 MHz	500 kHz Pass
	Mid Channel 6, 2437 MHz	17.553 MHz	500 kHz Pass
	High Channel 11, 2462 MHz	17.557 MHz	500 kHz Pass
802.11(n) MCS15			
	Low Channel 1, 2412 MHz	17.71 MHz	500 kHz Pass
	Mid Channel 6, 2437 MHz	17.676 MHz	500 kHz Pass
	High Channel 11, 2462 MHz	17.68 MHz	500 kHz Pass

OCCUPIED BANDWIDTH

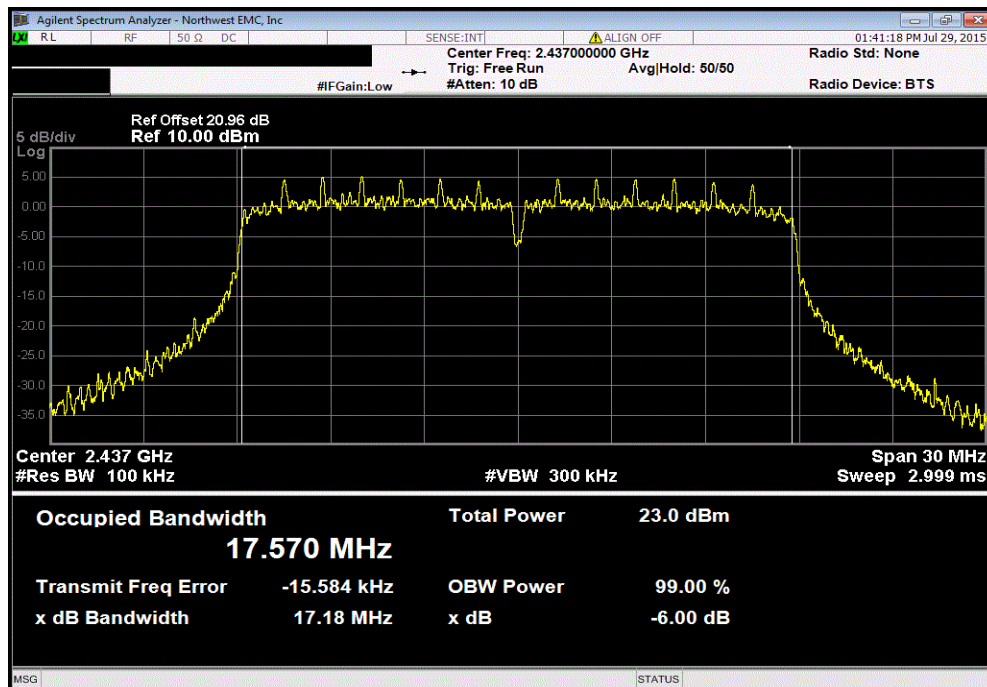
Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS8, Low Channel 1, 2412 MHz

			Limit		
			Value	(>)	Result
			17.553 MHz	500 kHz	Pass



Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS8, Mid Channel 6, 2437 MHz

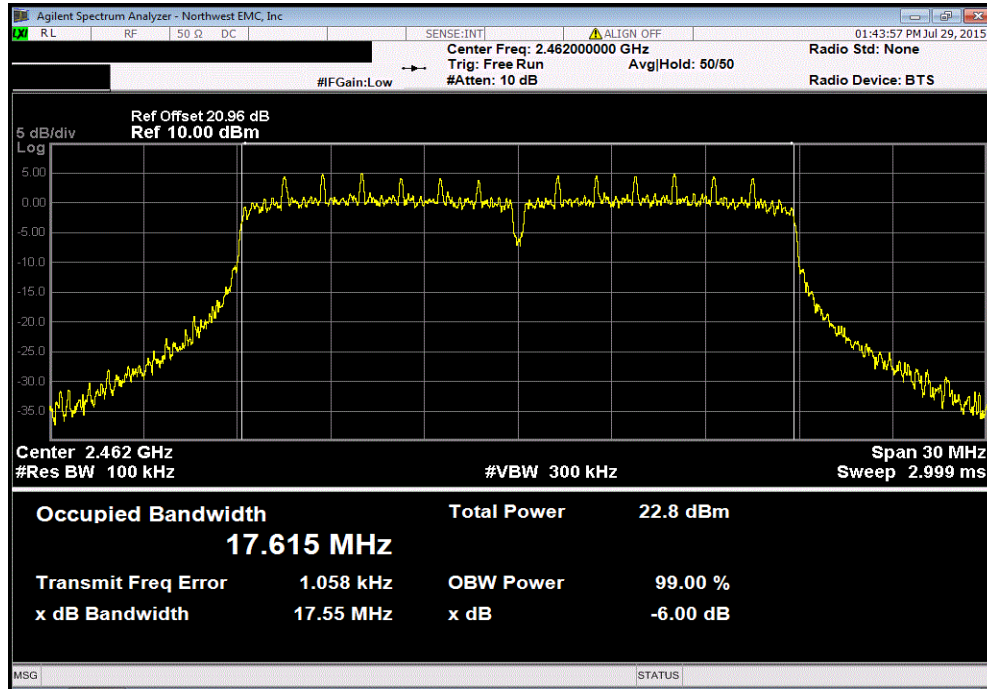
			Limit		
			Value	(>)	Result
			17.178 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

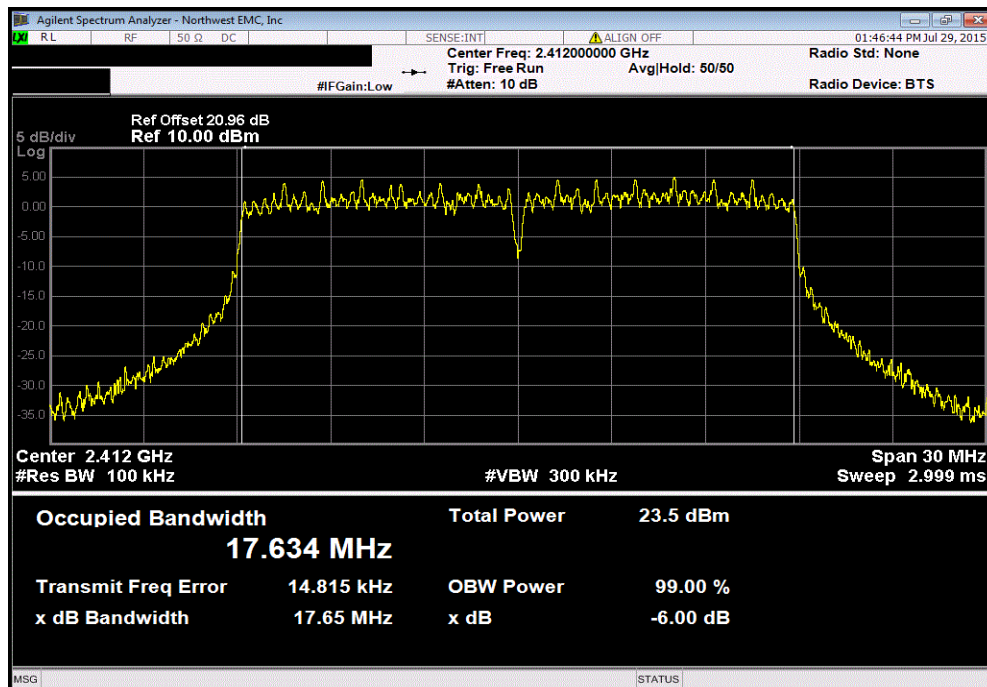
Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS8, High Channel 11, 2462 MHz

			Limit		
			Value	(>)	Result
			17.548 MHz	500 kHz	Pass



Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS15, Low Channel 1, 2412 MHz

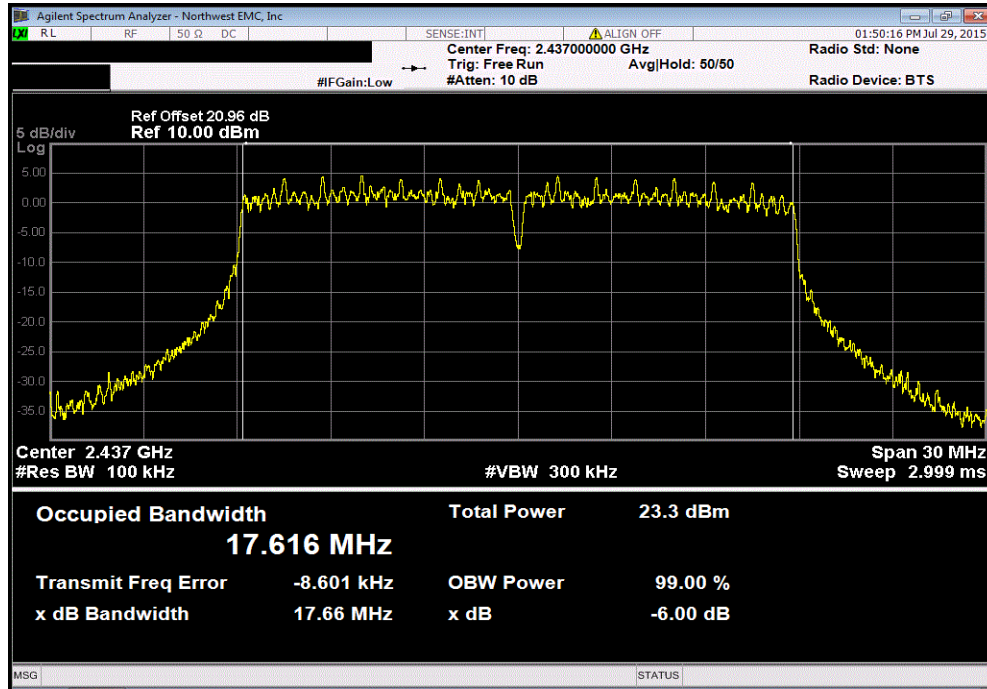
			Limit		
			Value	(>)	Result
			17.655 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

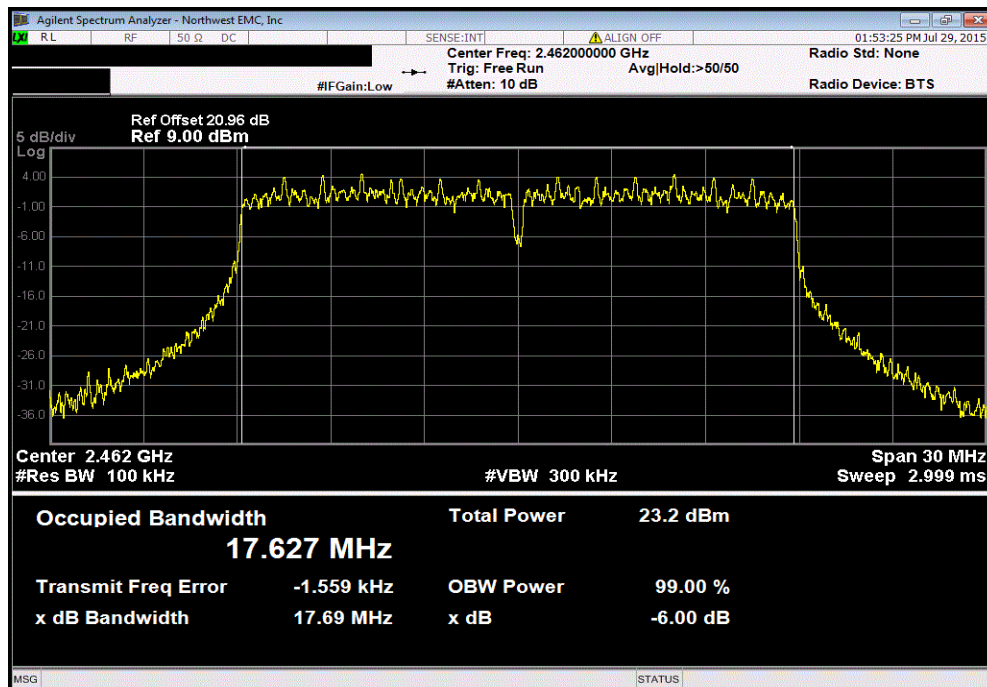
Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS15, Mid Channel 6, 2437 MHz

			Value	Limit	Result
				(>)	
			17.664 MHz	500 kHz	Pass



Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS15, High Channel 11, 2462 MHz

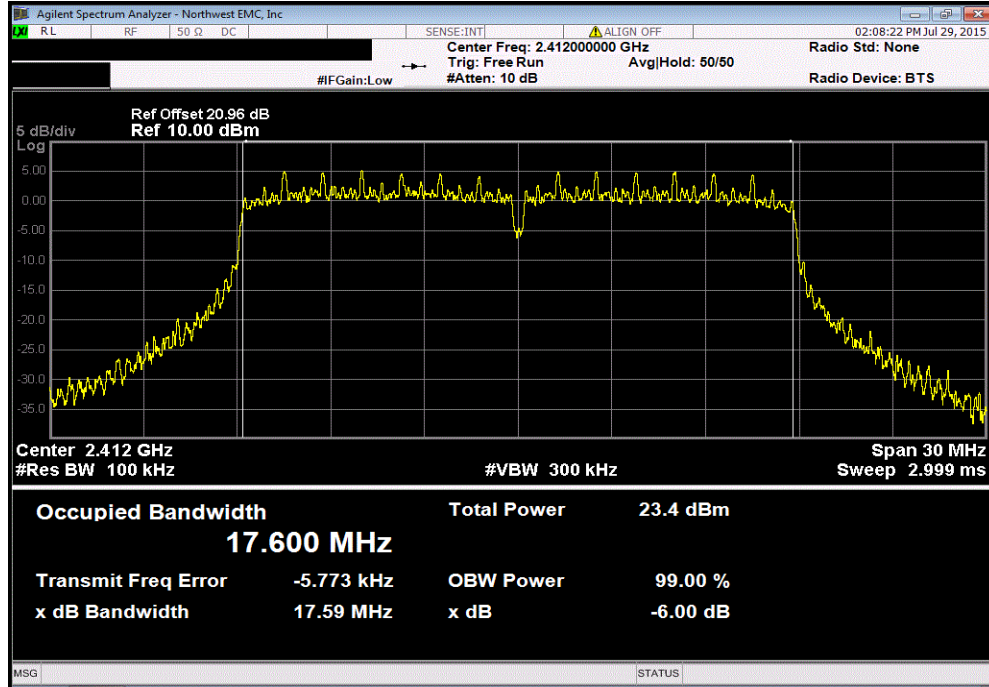
			Value	Limit	Result
				(>)	
			17.685 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

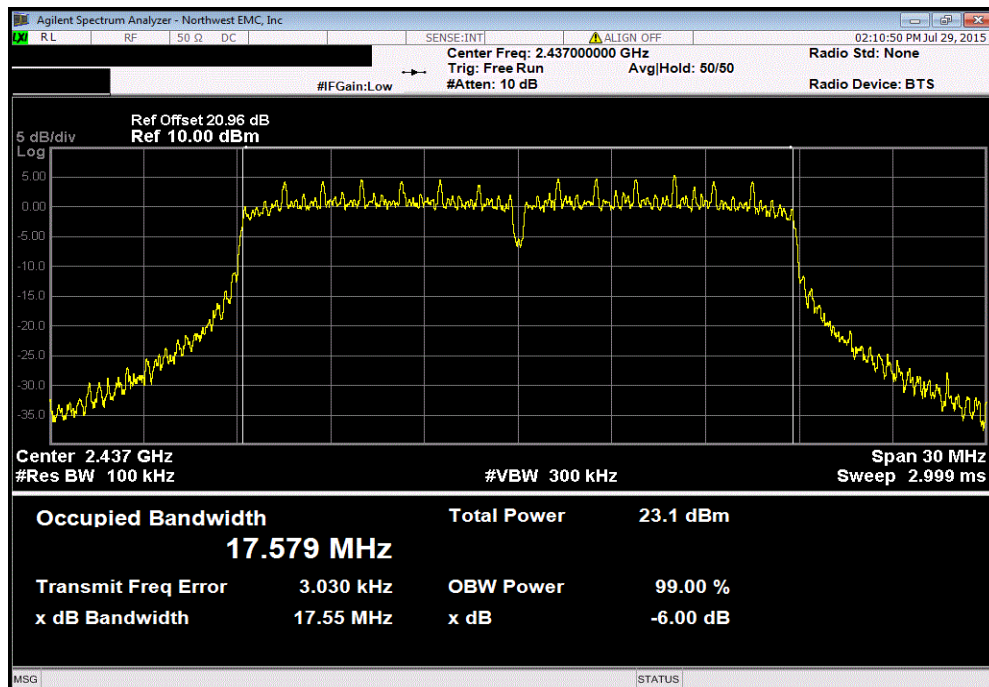
Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS8, Low Channel 1, 2412 MHz

			Limit		Result
			Value	(>)	
			17.585 MHz	500 kHz	Pass



Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS8, Mid Channel 6, 2437 MHz

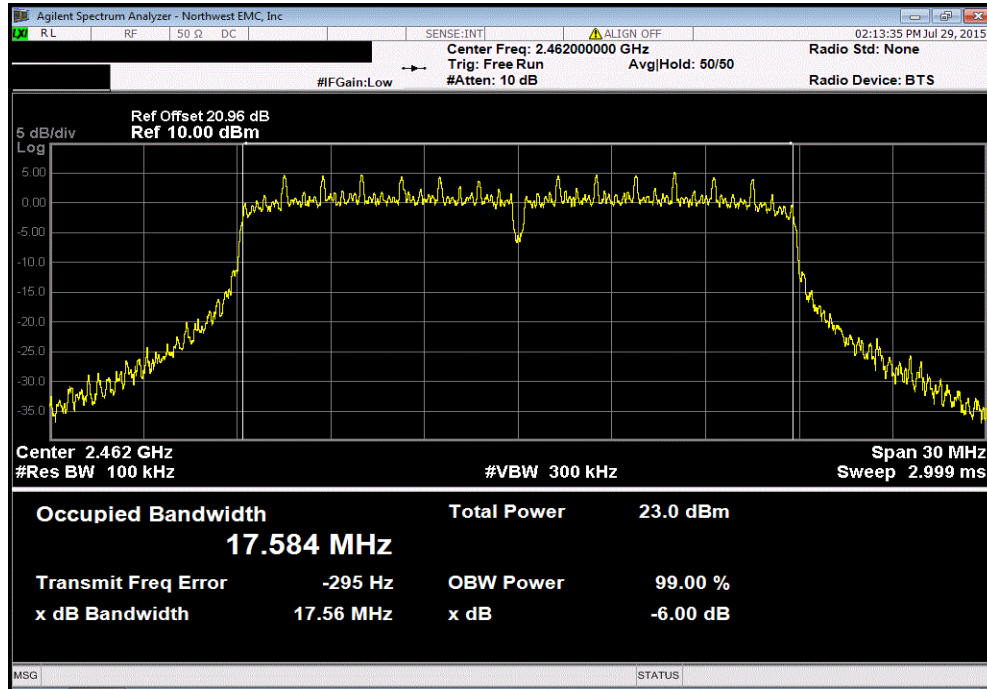
			Limit		Result
			Value	(>)	
			17.553 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

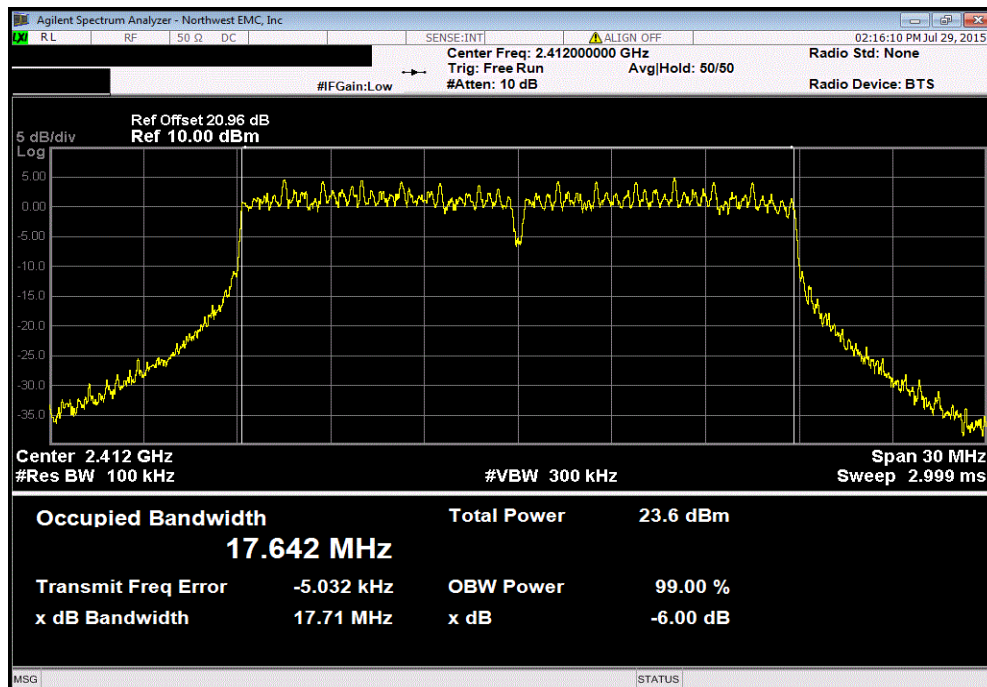
Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS8, High Channel 11, 2462 MHz

			Limit		
			Value	(>)	Result
			17.557 MHz	500 kHz	Pass



Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS15, Low Channel 1, 2412 MHz

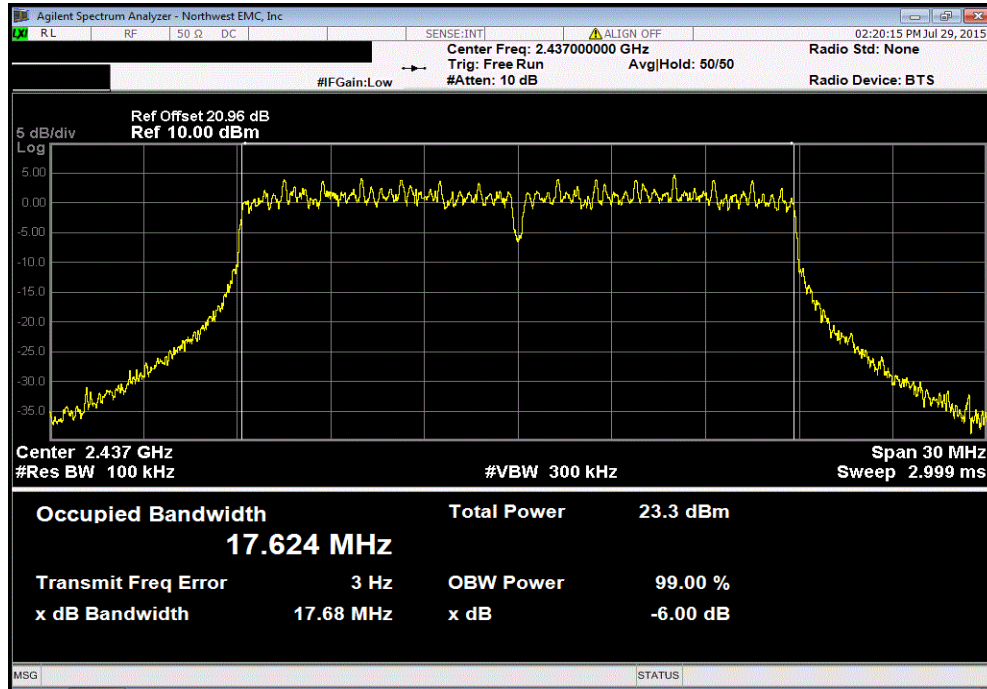
			Limit		
			Value	(>)	Result
			17.71 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

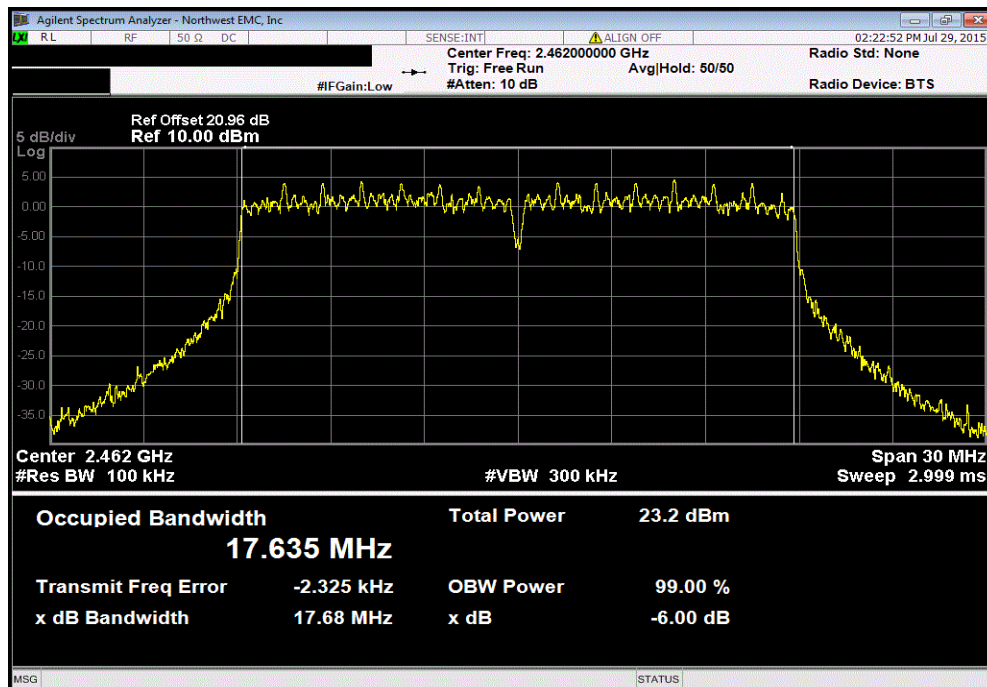
Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS15, Mid Channel 6, 2437 MHz

			Value	Limit	Result
				(>)	
			17.676 MHz	500 kHz	Pass



Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS15, High Channel 11, 2462 MHz

			Value	Limit	Result
				(>)	
			17.68 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval (mos)
Spectrum Analyzer	Agilent	N9010A	AFL	9/20/2014	12
DC Block, 40 GHz	Fairview Microwave	SD3379	AMM	2/27/2015	12
Attenuator, 20dB, 40 GHz	Fairview Microwave	SA4018-20	TQY	2/27/2015	12
Signal Generator, 40 GHz	Agilent	N5173B	TIW	7/15/2014	36

TEST DESCRIPTION

The 6dB occupied bandwidth was measured using 100 kHz resolution bandwidth and 300 kHz video bandwidth. The 99.9% (approximate 26 dB) emission bandwidth (EBW) was also measured at the same time.

The EUT was set to the channels and modes listed in the datasheet. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

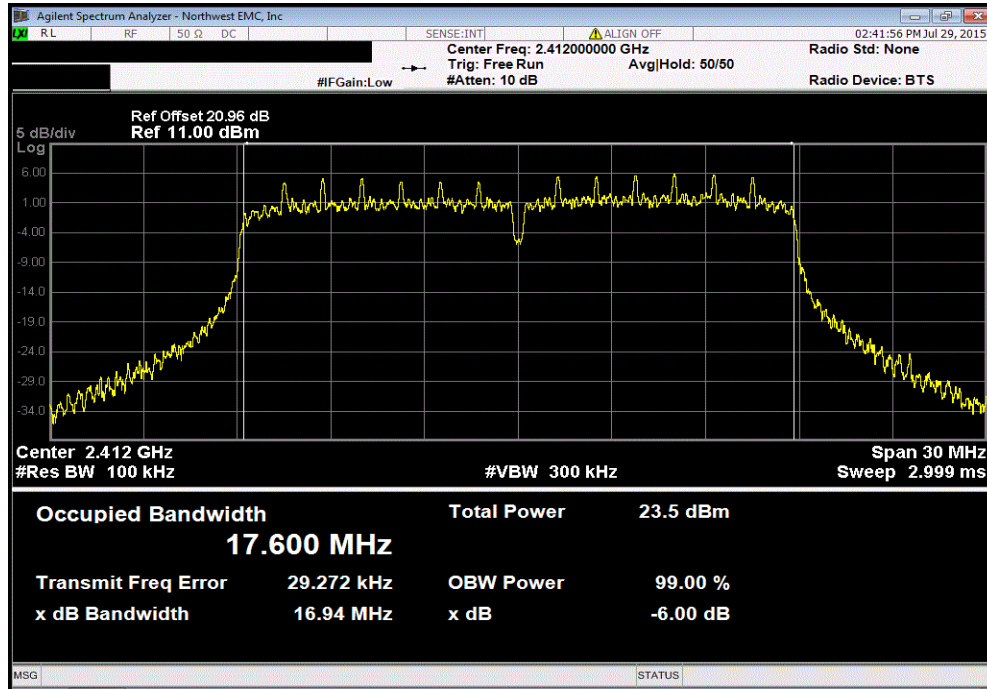
OCCUPIED BANDWIDTH

EUT: Firebox T50-W (BS5AE7W)		Work Order: VDEI0009	
Serial Number: 70AF00069-3EB6		Date: 07/29/15	
Customer: WatchGuard Technologies, Inc.		Temperature: 24.9°C	
Attendees: None		Humidity: 47%	
Project: None		Barometric Pres.: 1014 mbar	
Tested by: Jonathan Kiefer		Job Site: TX09	
Power: 110VAC/60Hz			
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2015		ANSI C63.10:2013	
COMMENTS			
3x3 MIMO mode, Chain ABC (Chains 0, 1 and 2).			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	1	Signature <i>Jonathan Kiefer</i>	
		Value	Limit (>)
Chain A	20 MHz		Result
	2400 MHz - 2483.5 MHz Band		
	802.11(n) MCS16		
	Low Channel 1, 2412 MHz	16.936 MHz	500 kHz Pass
	Mid Channel 6, 2437 MHz	17.17 MHz	500 kHz Pass
	High Channel 11, 2462 MHz	17.31 MHz	500 kHz Pass
	802.11(n) MCS23		
	Low Channel 1, 2412 MHz	17.698 MHz	500 kHz Pass
	Mid Channel 6, 2437 MHz	17.661 MHz	500 kHz Pass
	High Channel 11, 2462 MHz	17.691 MHz	500 kHz Pass
Chain B	20 MHz		
	2400 MHz - 2483.5 MHz Band		
	802.11(n) MCS16		
	Low Channel 1, 2412 MHz	17.569 MHz	500 kHz Pass
	Mid Channel 6, 2437 MHz	17.556 MHz	500 kHz Pass
	High Channel 11, 2462 MHz	17.586 MHz	500 kHz Pass
	802.11(n) MCS23		
	Low Channel 1, 2412 MHz	17.7 MHz	500 kHz Pass
	Mid Channel 6, 2437 MHz	17.674 MHz	500 kHz Pass
	High Channel 11, 2462 MHz	17.67 MHz	500 kHz Pass
Chain C	20 MHz		
	2400 MHz - 2483.5 MHz Band		
	802.11(n) MCS16		
	Low Channel 1, 2412 MHz	17.303 MHz	500 kHz Pass
	Mid Channel 6, 2437 MHz	17.541 MHz	500 kHz Pass
	High Channel 11, 2462 MHz	17.54 MHz	500 kHz Pass
	802.11(n) MCS23		
	Low Channel 1, 2412 MHz	17.675 MHz	500 kHz Pass
	Mid Channel 6, 2437 MHz	17.668 MHz	500 kHz Pass
	High Channel 11, 2462 MHz	17.661 MHz	500 kHz Pass

OCCUPIED BANDWIDTH

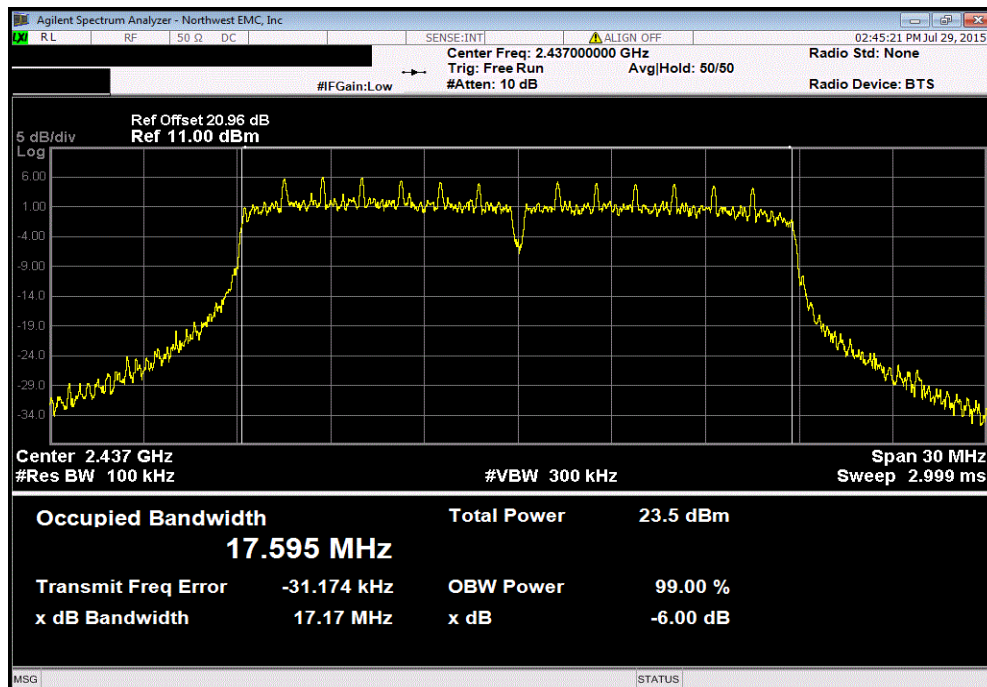
Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS16, Low Channel 1, 2412 MHz

			Value	Limit	Result
				(>)	
			16.936 MHz	500 kHz	Pass



Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS16, Mid Channel 6, 2437 MHz

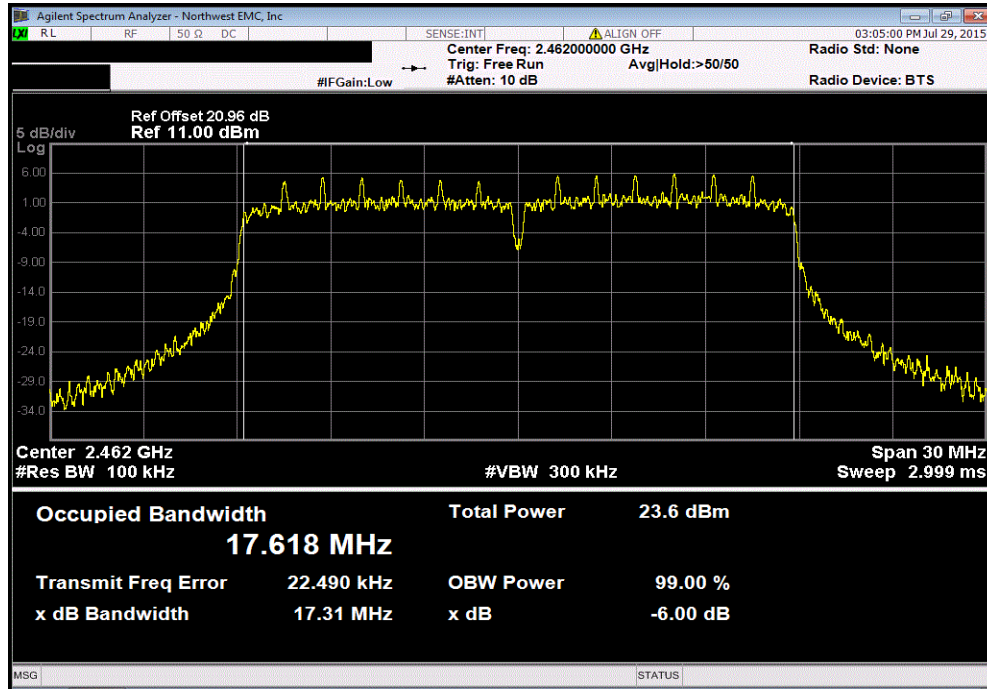
			Value	Limit	Result
				(>)	
			17.17 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

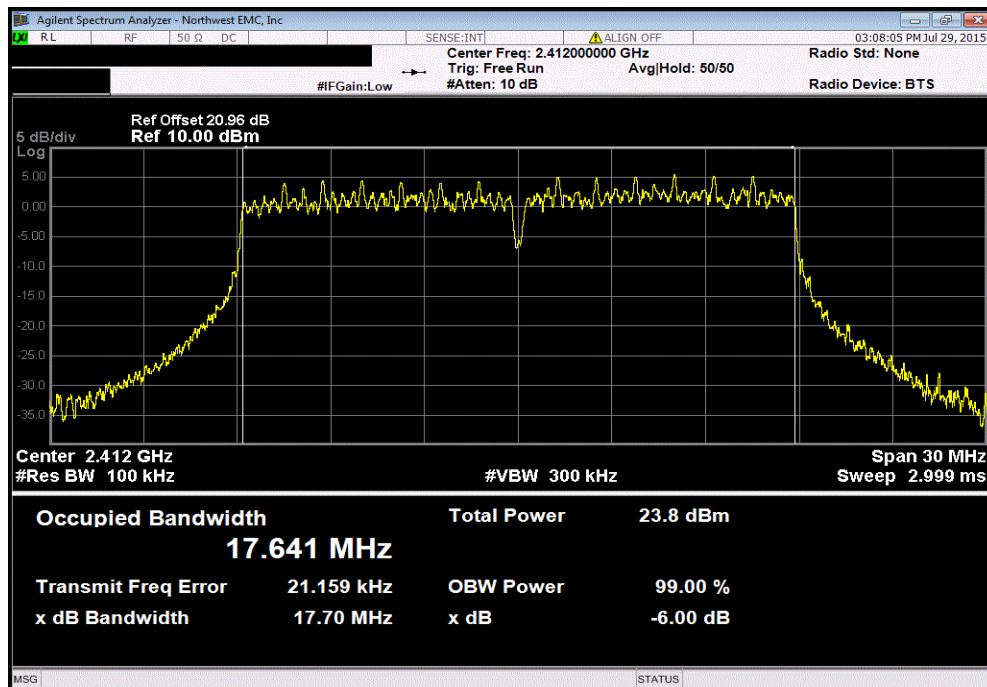
Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS16, High Channel 11, 2462 MHz

			Limit		
			Value	(>)	Result
			17.31 MHz	500 kHz	Pass



Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS23, Low Channel 1, 2412 MHz

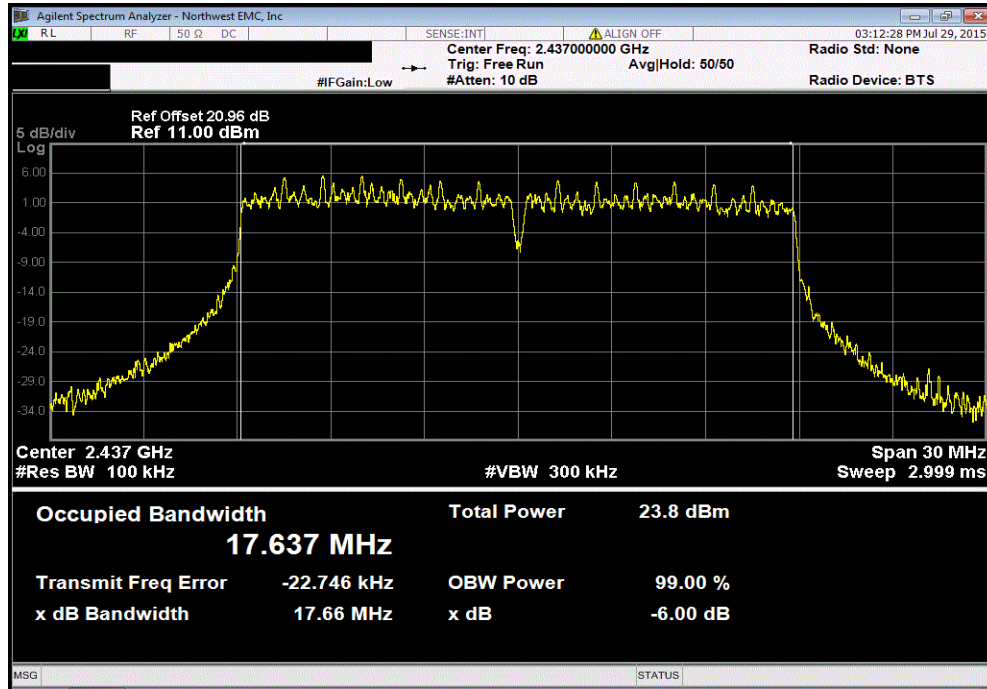
			Limit		
			Value	(>)	Result
			17.698 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

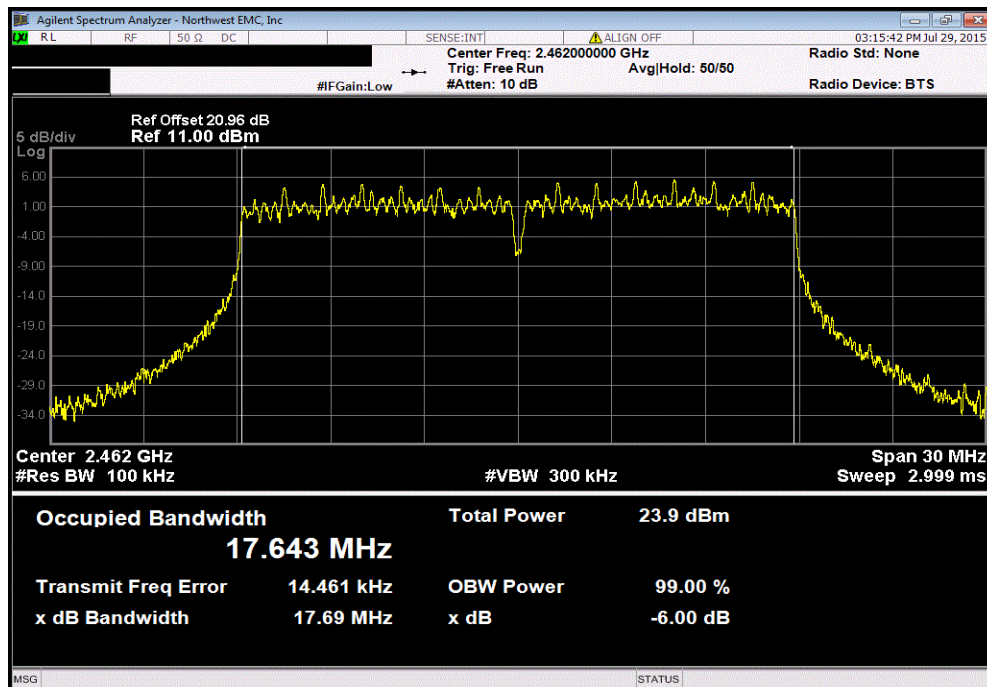
Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS23, Mid Channel 6, 2437 MHz

	Value	Limit	Result
	17.661 MHz	(> 500 kHz)	Pass



Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS23, High Channel 11, 2462 MHz

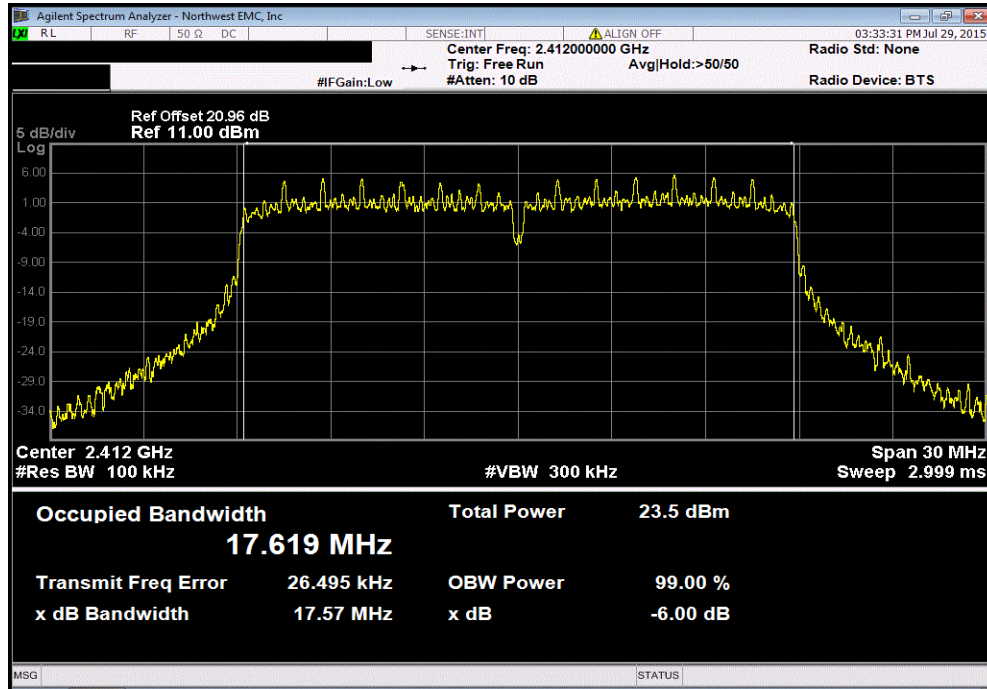
	Value	Limit	Result
	17.691 MHz	(> 500 kHz)	Pass



OCCUPIED BANDWIDTH

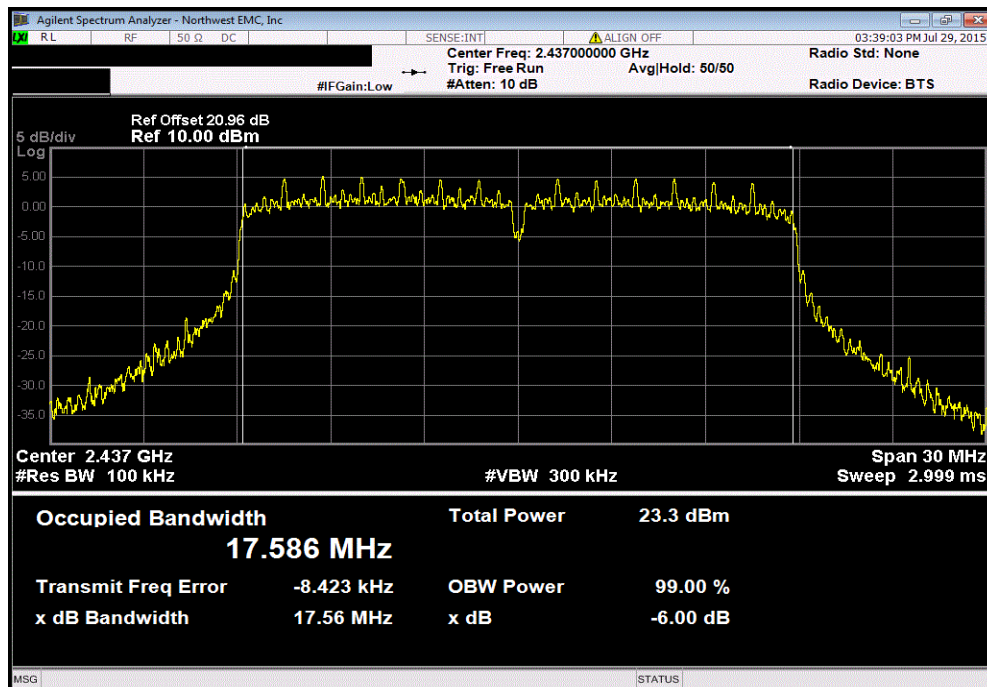
Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS16, Low Channel 1, 2412 MHz

	Value	Limit	Result
	17.569 MHz	(>) 500 kHz	Pass



Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS16, Mid Channel 6, 2437 MHz

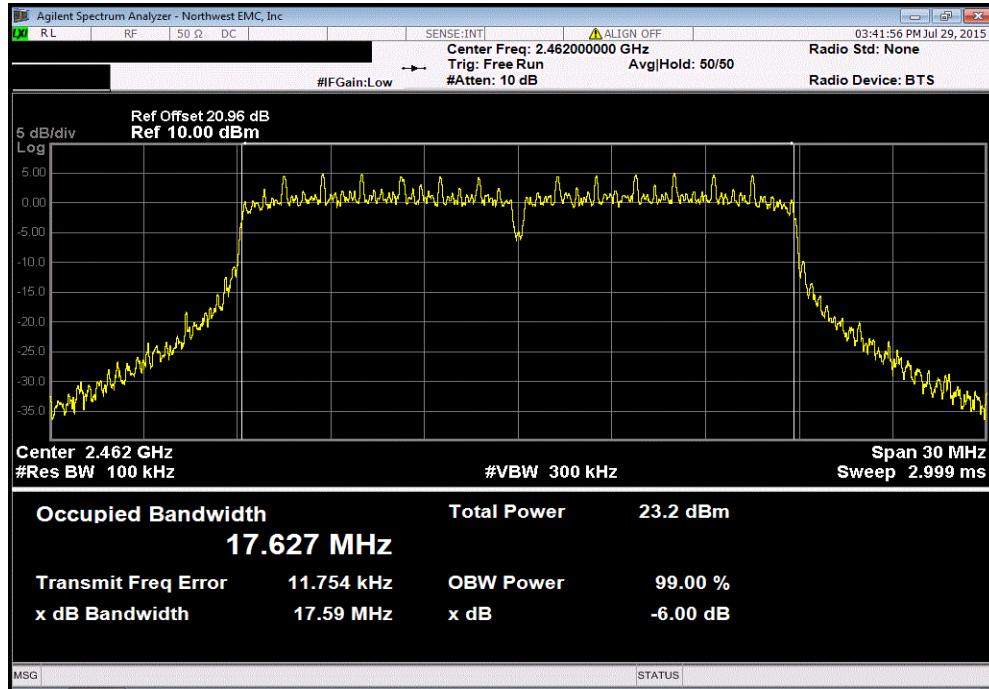
	Value	Limit	Result
	17.556 MHz	(>) 500 kHz	Pass



OCCUPIED BANDWIDTH

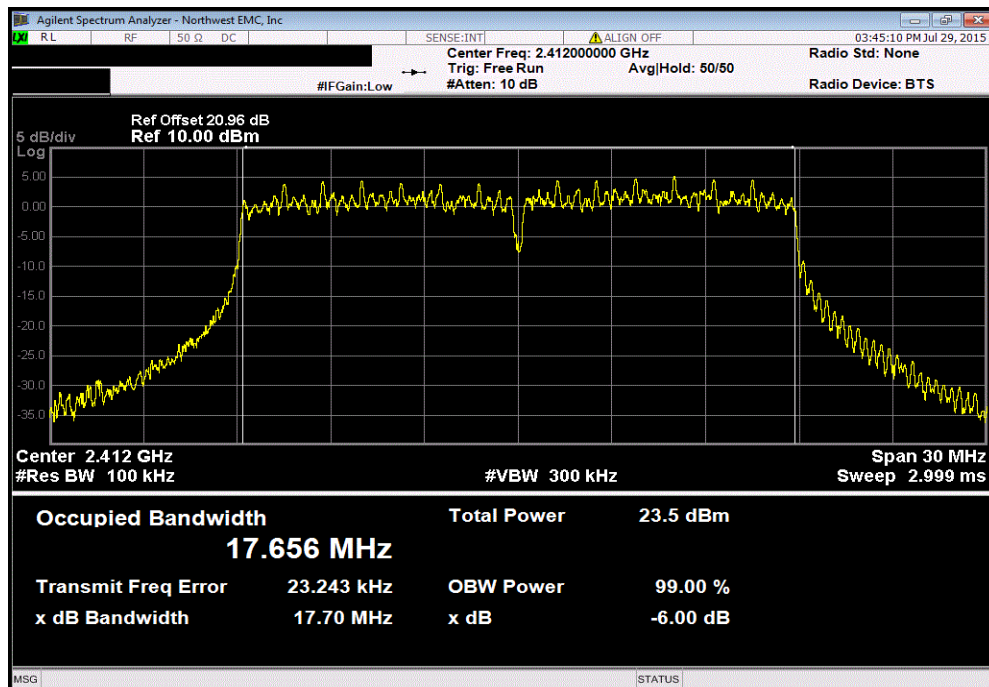
Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS16, High Channel 11, 2462 MHz

			Limit		
			Value	(>)	Result
			17.586 MHz	500 kHz	Pass



Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS23, Low Channel 1, 2412 MHz

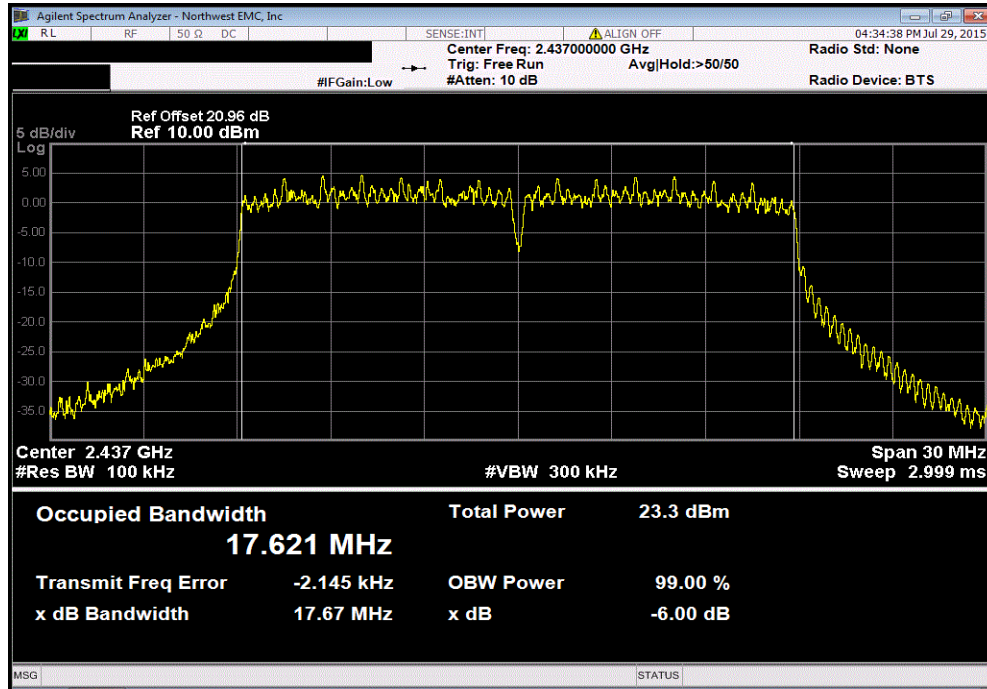
			Limit		
			Value	(>)	Result
			17.7 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

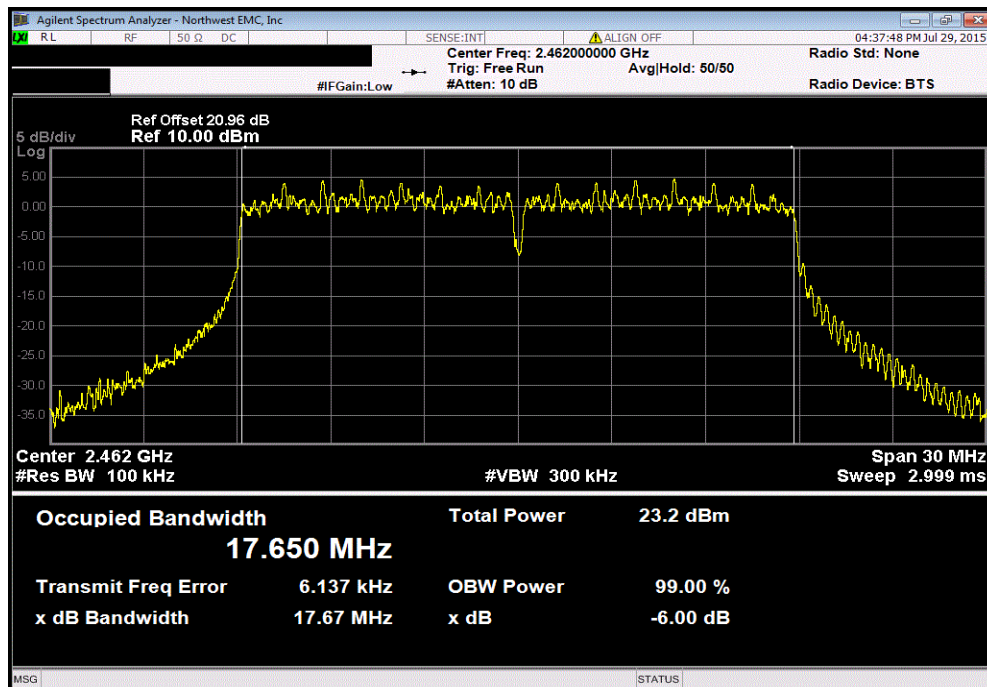
Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS23, Mid Channel 6, 2437 MHz

			Value	Limit	Result
				(>)	
			17.674 MHz	500 kHz	Pass



Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS23, High Channel 11, 2462 MHz

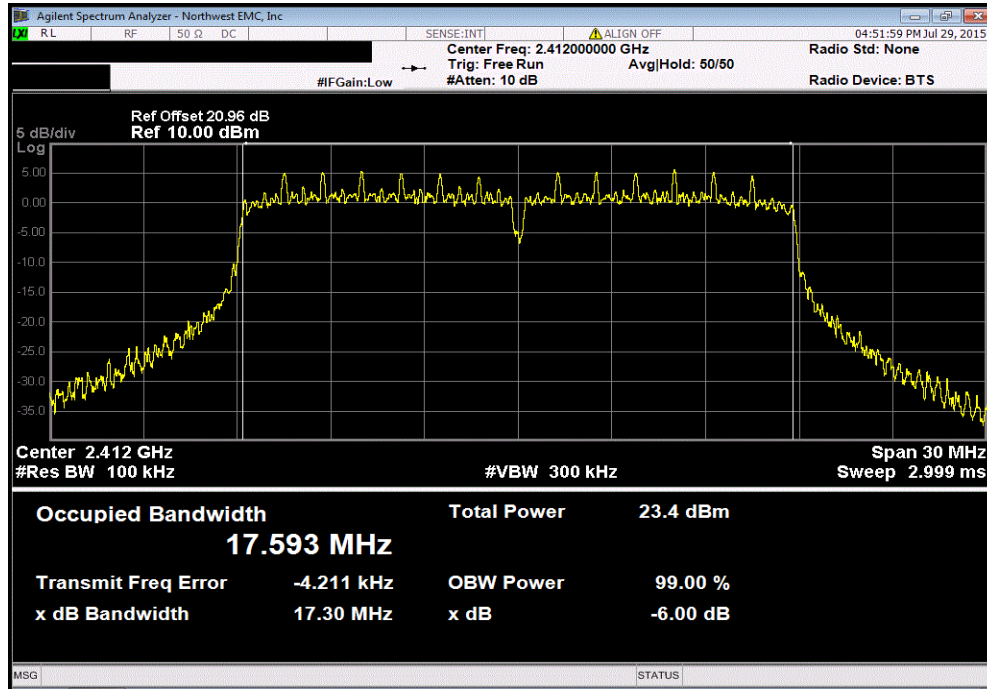
			Value	Limit	Result
				(>)	
			17.67 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

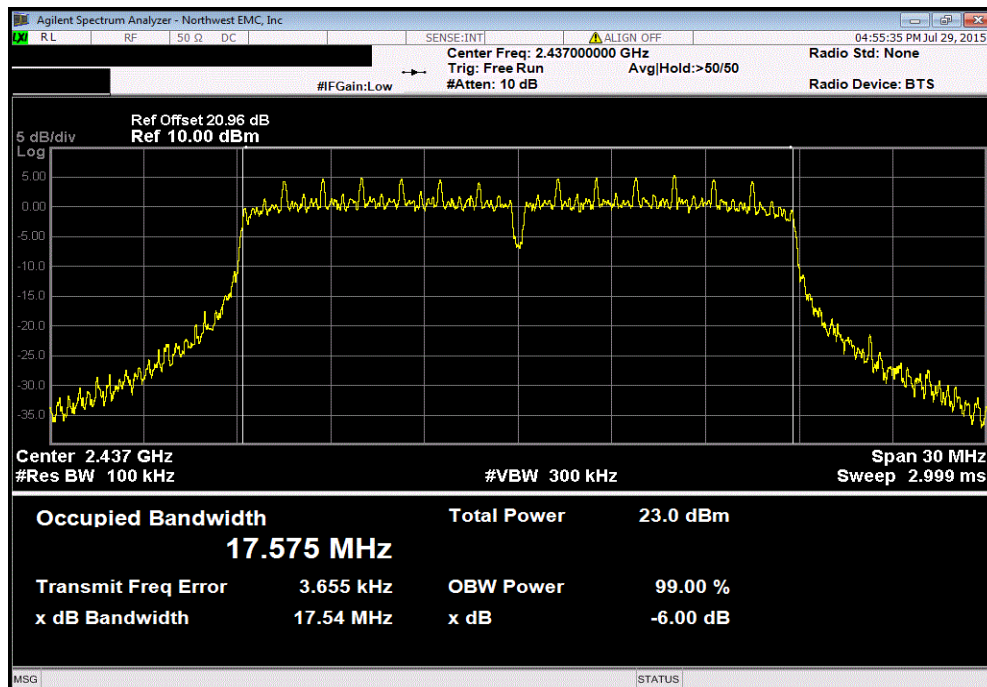
Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS16, Low Channel 1, 2412 MHz

	Value	Limit	Result
	17.303 MHz	(>) 500 kHz	Pass



Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS16, Mid Channel 6, 2437 MHz

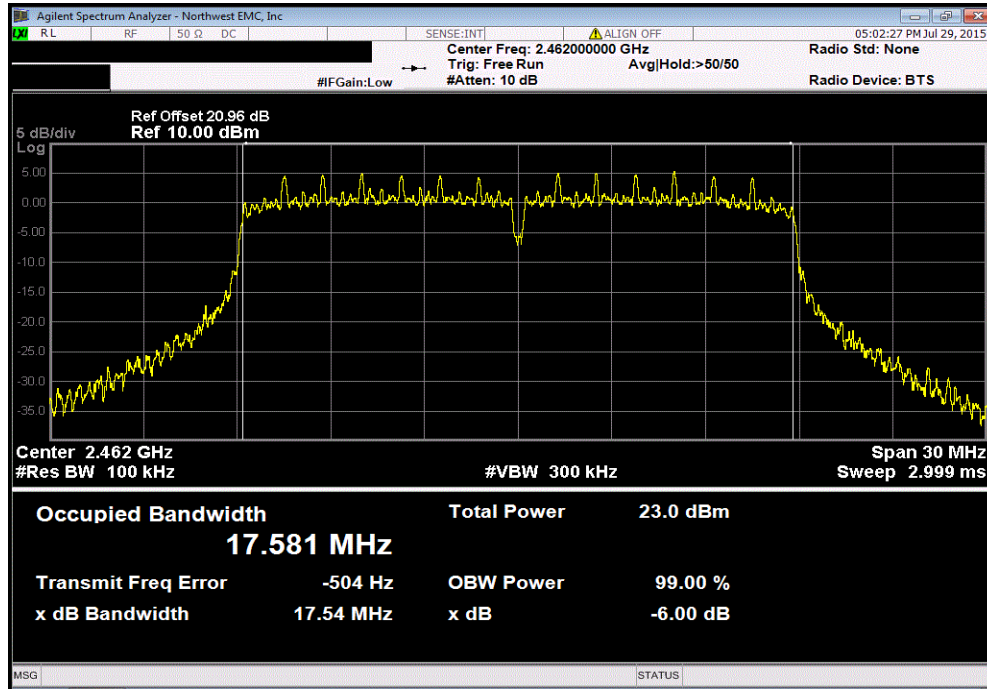
	Value	Limit	Result
	17.541 MHz	(>) 500 kHz	Pass



OCCUPIED BANDWIDTH

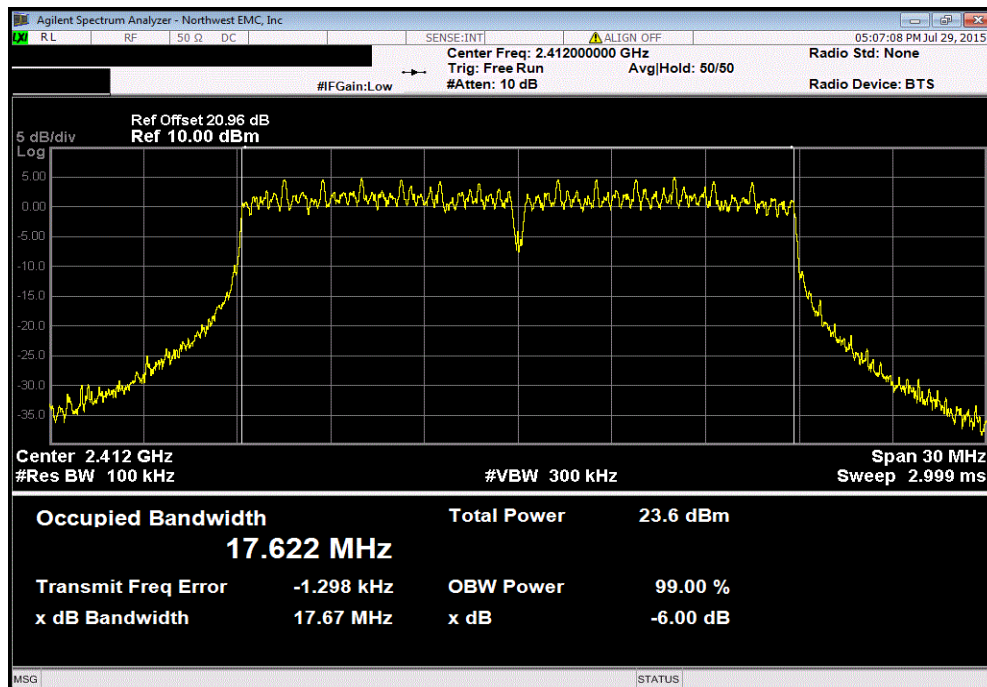
Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS16, High Channel 11, 2462 MHz

			Limit		
			Value	(>)	Result
			17.54 MHz	500 kHz	Pass



Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS23, Low Channel 1, 2412 MHz

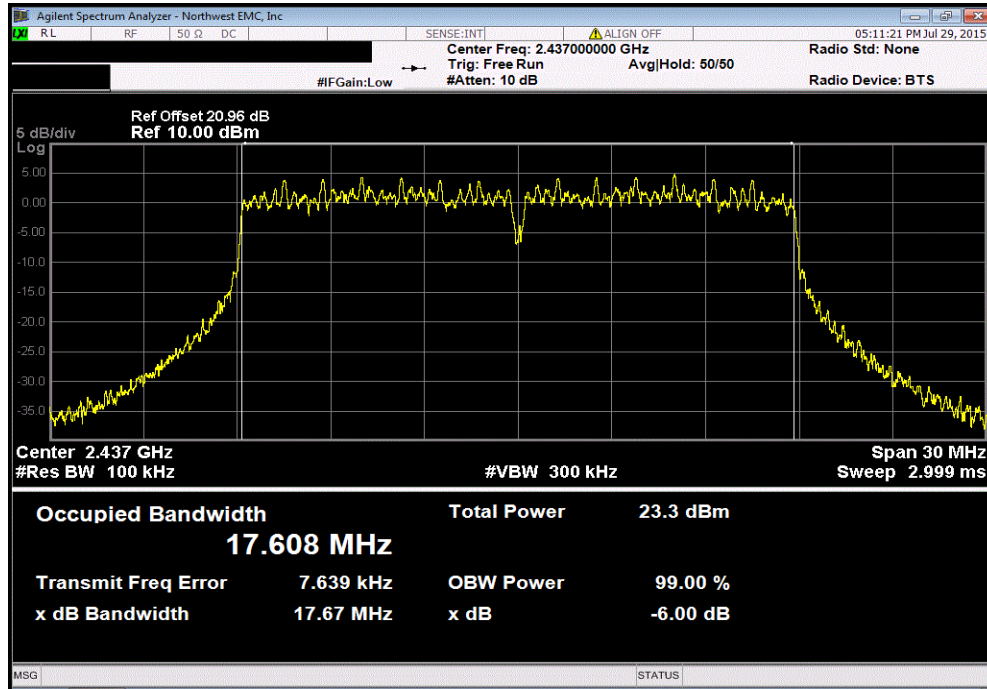
			Limit		
			Value	(>)	Result
			17.675 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

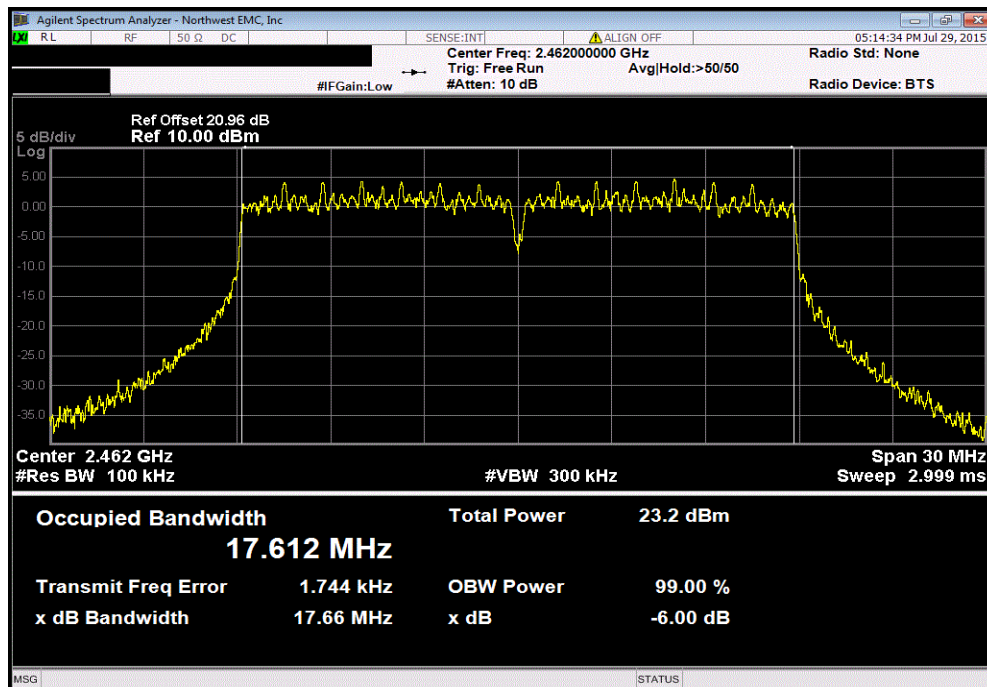
Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS23, Mid Channel 6, 2437 MHz

			Value	Limit	Result
				(>)	
			17.668 MHz	500 kHz	Pass



Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS23, High Channel 11, 2462 MHz

			Value	Limit	Result
				(>)	
			17.661 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval (mos)
DC Block, 40 GHz	Fairview Microwave	SD3379	AMM	2/27/2015	12
Attenuator, 20dB, 40 GHz	Fairview Microwave	SA4018-20	TQY	2/27/2015	12
Spectrum Analyzer	Agilent	N9010A	AFL	9/20/2014	12
Signal Generator, 40 GHz	Agilent	N5173B	TIW	7/15/2014	36

TEST DESCRIPTION

The 6dB occupied bandwidth was measured using 100 kHz resolution bandwidth and 300 kHz video bandwidth. The 99.9% (approximate 26 dB) emission bandwidth (EBW) was also measured at the same time.

The EUT was set to the channels and modes listed in the datasheet. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

OCCUPIED BANDWIDTH



XMIT 2015.01.14

EUT: Firebox T50-W (BS5AE7W)		Work Order: VDEI0009	
Serial Number: 70AF0069-3EB6		Date: 07/28/15	
Customer: WatchGuard Technologies, Inc.		Temperature: 24.7°C	
Attendees: None		Humidity: 44%	
Project: None		Barometric Pres.: 1014 mbar	
Tested by: Jonathan Kiefer		Power: 110VAC/60Hz	
FCC 15.247-2015		Test Method: ANSI C63.10-2013	
Job Site: TX09			

COMMENTS
Reference power level table for channel power setting. Chains A, B, and C, correspond to Chains 0, 1, and 2, respectively.

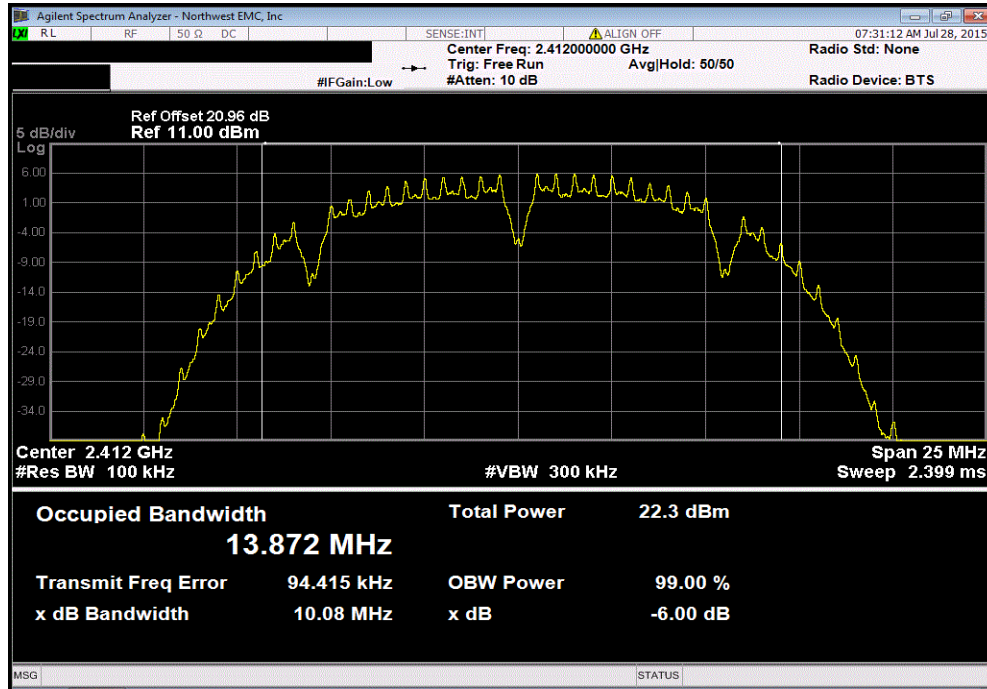
DEVIATIONS FROM TEST STANDARD
None

Configuration #	1	Signature	Value	Limit (>)	Result
Chain A					
20 MHz					
2400 MHz - 2483.5 MHz Band					
802.11(b) 1 Mbps					
	Low Channel 1, 2412 MHz	10.078 MHz	500 kHz	Pass	
	Mid Channel 6, 2437 MHz	10.085 MHz	500 kHz	Pass	
	High Channel 11, 2462 MHz	10.089 MHz	500 kHz	Pass	
802.11(b) 11 Mbps					
	Low Channel 1, 2412 MHz	10.361 MHz	500 kHz	Pass	
	Mid Channel 6, 2437 MHz	10.781 MHz	500 kHz	Pass	
	High Channel 11, 2462 MHz	10.726 MHz	500 kHz	Pass	
802.11(g) 6 Mbps					
	Low Channel 1, 2412 MHz	16.34 MHz	500 kHz	Pass	
	Mid Channel 6, 2437 MHz	16.071 MHz	500 kHz	Pass	
	High Channel 11, 2462 MHz	16.339 MHz	500 kHz	Pass	
802.11(g) 36 Mbps					
	Low Channel 1, 2412 MHz	16.452 MHz	500 kHz	Pass	
	Mid Channel 6, 2437 MHz	16.449 MHz	500 kHz	Pass	
	High Channel 11, 2462 MHz	16.46 MHz	500 kHz	Pass	
802.11(g) 54 Mbps					
	Low Channel 1, 2412 MHz	16.489 MHz	500 kHz	Pass	
	Mid Channel 6, 2437 MHz	16.484 MHz	500 kHz	Pass	
	High Channel 11, 2462 MHz	16.512 MHz	500 kHz	Pass	
802.11(n) MCS0					
	Low Channel 1, 2412 MHz	17.315 MHz	500 kHz	Pass	
	Mid Channel 6, 2437 MHz	16.94 MHz	500 kHz	Pass	
	High Channel 11, 2462 MHz	17.315 MHz	500 kHz	Pass	
802.11(n) MCS7					
	Low Channel 1, 2412 MHz	17.692 MHz	500 kHz	Pass	
	Mid Channel 6, 2437 MHz	17.712 MHz	500 kHz	Pass	
	High Channel 11, 2462 MHz	17.726 MHz	500 kHz	Pass	
Chain B					
20 MHz					
2400 MHz - 2483.5 MHz Band					
802.11(b) 1 Mbps					
	Low Channel 1, 2412 MHz	10.095 MHz	500 kHz	Pass	
	Mid Channel 6, 2437 MHz	10.089 MHz	500 kHz	Pass	
	High Channel 11, 2462 MHz	10.094 MHz	500 kHz	Pass	
802.11(b) 11 Mbps					
	Low Channel 1, 2412 MHz	10.762 MHz	500 kHz	Pass	
	Mid Channel 6, 2437 MHz	10.533 MHz	500 kHz	Pass	
	High Channel 11, 2462 MHz	10.831 MHz	500 kHz	Pass	
802.11(g) 6 Mbps					
	Low Channel 1, 2412 MHz	16.341 MHz	500 kHz	Pass	
	Mid Channel 6, 2437 MHz	16.329 MHz	500 kHz	Pass	
	High Channel 11, 2462 MHz	16.338 MHz	500 kHz	Pass	
802.11(g) 36 Mbps					
	Low Channel 1, 2412 MHz	16.477 MHz	500 kHz	Pass	
	Mid Channel 6, 2437 MHz	16.475 MHz	500 kHz	Pass	
	High Channel 11, 2462 MHz	16.461 MHz	500 kHz	Pass	
802.11(g) 54 Mbps					
	Low Channel 1, 2412 MHz	16.507 MHz	500 kHz	Pass	
	Mid Channel 6, 2437 MHz	16.482 MHz	500 kHz	Pass	
	High Channel 11, 2462 MHz	16.511 MHz	500 kHz	Pass	
802.11(n) MCS0					
	Low Channel 1, 2412 MHz	17.317 MHz	500 kHz	Pass	
	Mid Channel 6, 2437 MHz	17.309 MHz	500 kHz	Pass	
	High Channel 11, 2462 MHz	17.538 MHz	500 kHz	Pass	
802.11(n) MCS7					
	Low Channel 1, 2412 MHz	17.718 MHz	500 kHz	Pass	
	Mid Channel 6, 2437 MHz	17.715 MHz	500 kHz	Pass	
	High Channel 11, 2462 MHz	17.714 MHz	500 kHz	Pass	
Chain C					
20 MHz					
2400 MHz - 2483.5 MHz Band					
802.11(b) 1 Mbps					
	Low Channel 1, 2412 MHz	10.099 MHz	500 kHz	Pass	
	Mid Channel 6, 2437 MHz	10.082 MHz	500 kHz	Pass	
	High Channel 11, 2462 MHz	10.088 MHz	500 kHz	Pass	
802.11(b) 11 Mbps					
	Low Channel 1, 2412 MHz	10.503 MHz	500 kHz	Pass	
	Mid Channel 6, 2437 MHz	10.529 MHz	500 kHz	Pass	
	High Channel 11, 2462 MHz	10.536 MHz	500 kHz	Pass	
802.11(g) 6 Mbps					
	Low Channel 1, 2412 MHz	16.333 MHz	500 kHz	Pass	
	Mid Channel 6, 2437 MHz	16.342 MHz	500 kHz	Pass	
	High Channel 11, 2462 MHz	16.323 MHz	500 kHz	Pass	
802.11(g) 36 Mbps					
	Low Channel 1, 2412 MHz	16.448 MHz	500 kHz	Pass	
	Mid Channel 6, 2437 MHz	16.465 MHz	500 kHz	Pass	
	High Channel 11, 2462 MHz	16.465 MHz	500 kHz	Pass	
802.11(g) 54 Mbps					
	Low Channel 1, 2412 MHz	16.489 MHz	500 kHz	Pass	
	Mid Channel 6, 2437 MHz	16.497 MHz	500 kHz	Pass	
	High Channel 11, 2462 MHz	16.488 MHz	500 kHz	Pass	
802.11(n) MCS0					
	Low Channel 1, 2412 MHz	17.553 MHz	500 kHz	Pass	
	Mid Channel 6, 2437 MHz	17.559 MHz	500 kHz	Pass	
	High Channel 11, 2462 MHz	17.296 MHz	500 kHz	Pass	
802.11(n) MCS7					
	Low Channel 1, 2412 MHz	17.716 MHz	500 kHz	Pass	
	Mid Channel 6, 2437 MHz	17.711 MHz	500 kHz	Pass	
	High Channel 11, 2462 MHz	17.742 MHz	500 kHz	Pass	

OCCUPIED BANDWIDTH

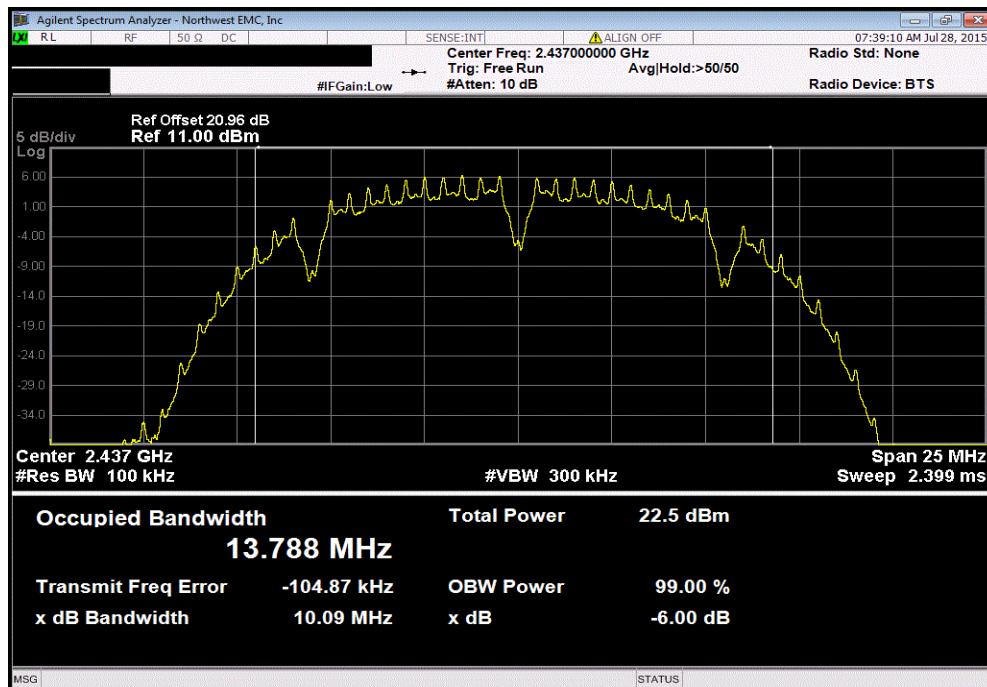
Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz

			Limit		
			Value	(>)	Result
			10.078 MHz	500 kHz	Pass



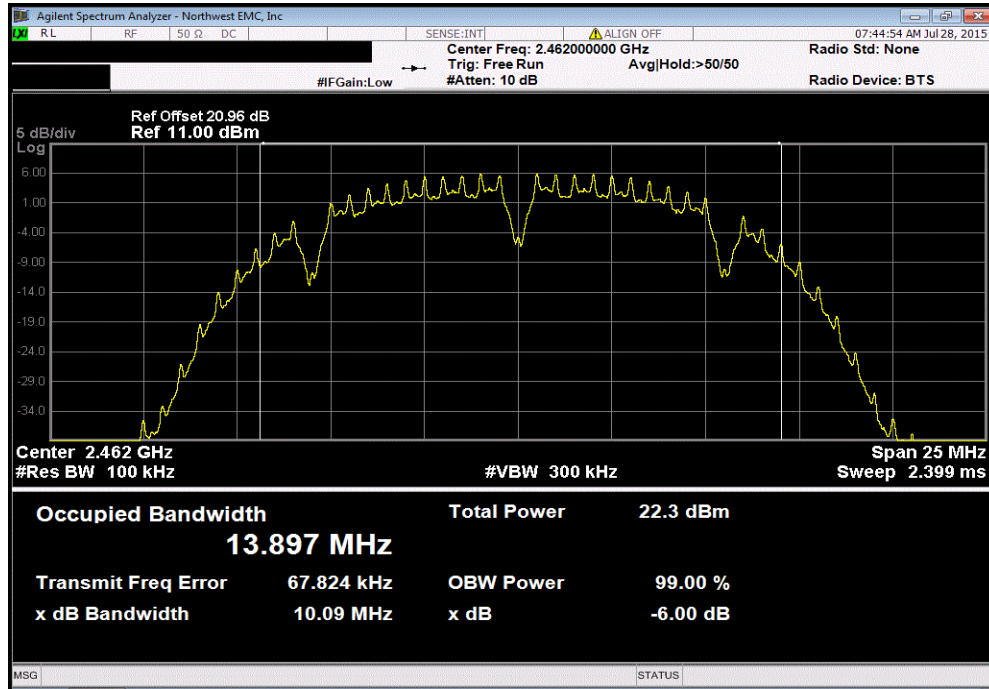
Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz

			Limit		
			Value	(>)	Result
			10.085 MHz	500 kHz	Pass

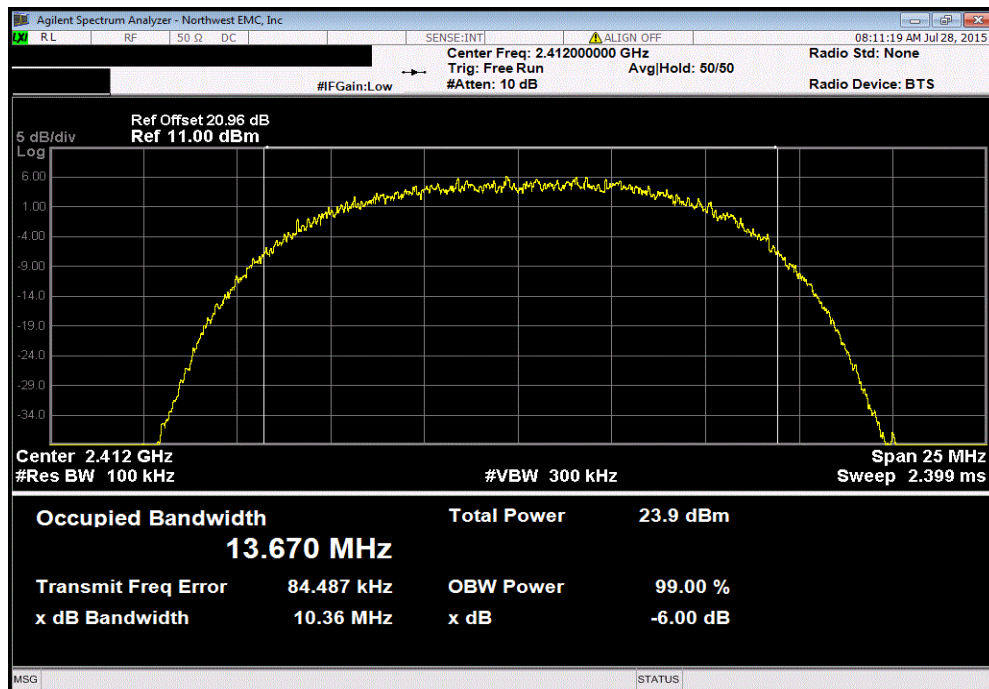


OCCUPIED BANDWIDTH

Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz						
				Limit		
				Value	(>)	Result
				10.089 MHz	500 kHz	Pass



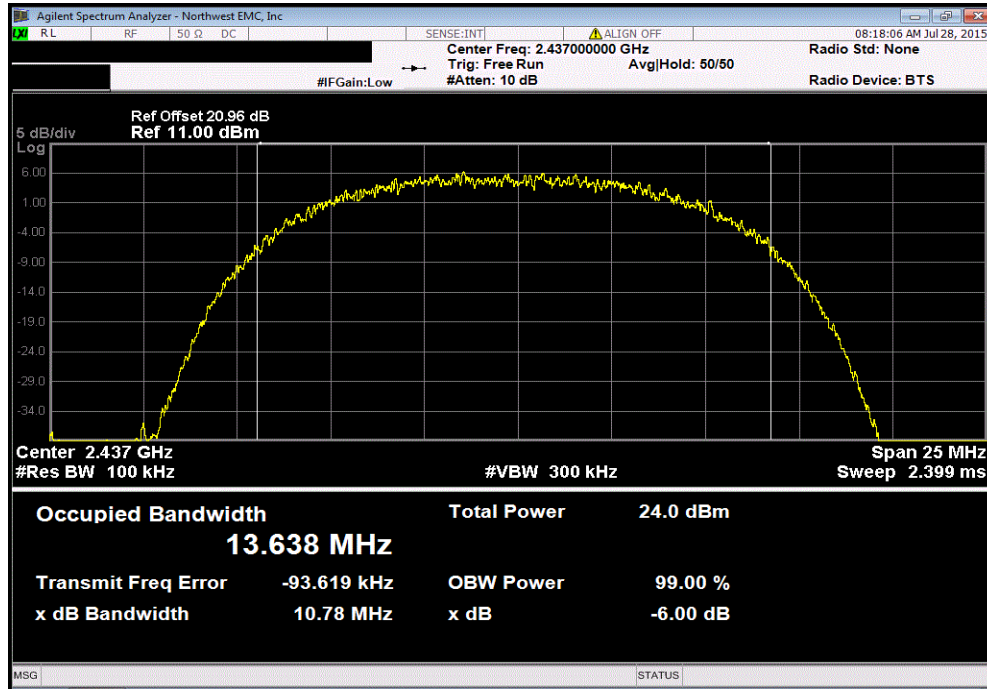
Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz						
				Limit		
				Value	(>)	Result
				10.361 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

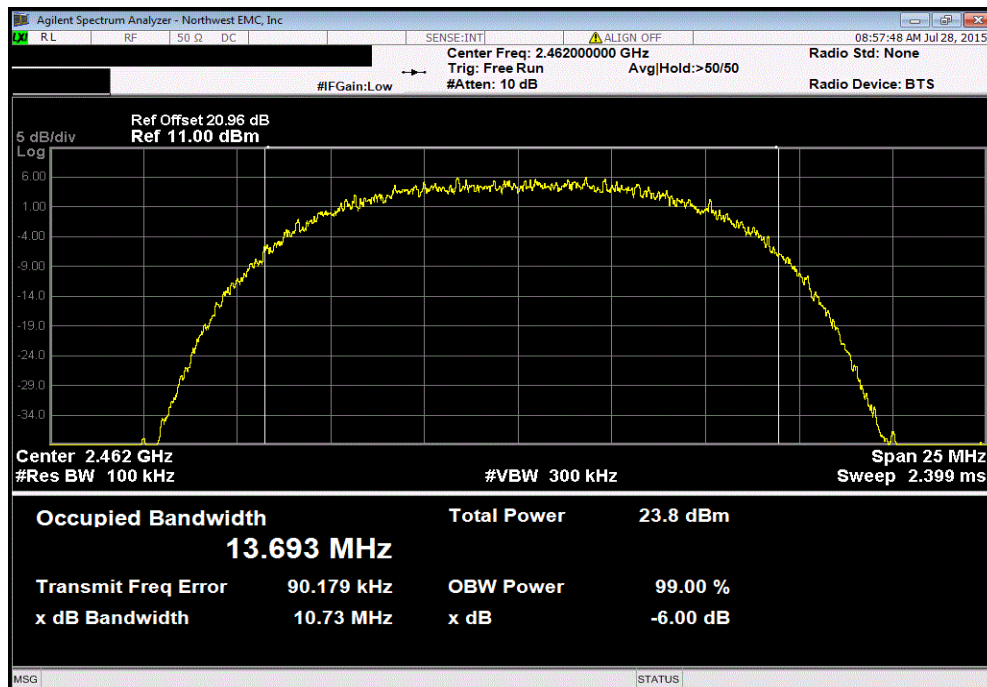
Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz

			Limit		
			Value	(>)	Result
			10.781 MHz	500 kHz	Pass



Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz

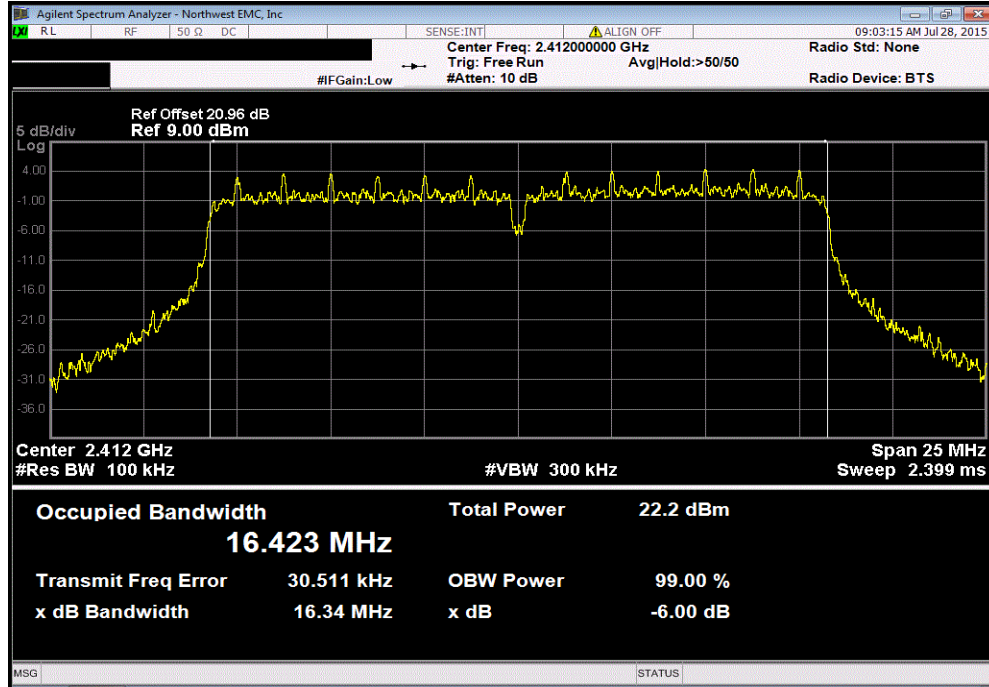
			Limit		
			Value	(>)	Result
			10.726 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

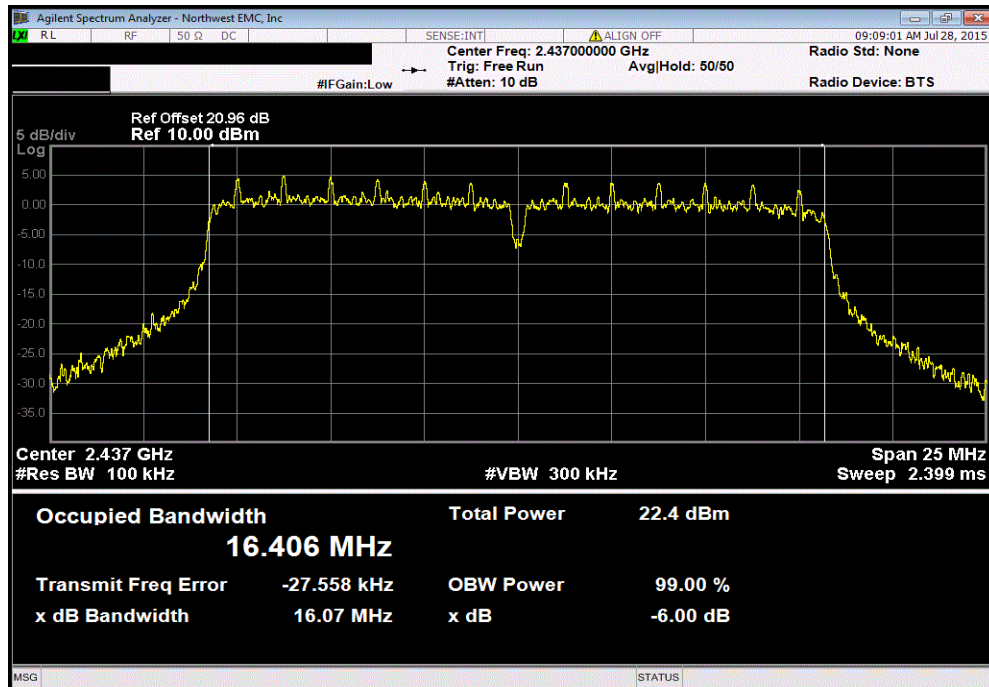
Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz

			Limit		
			Value	(>)	Result
			16.34 MHz	500 kHz	Pass



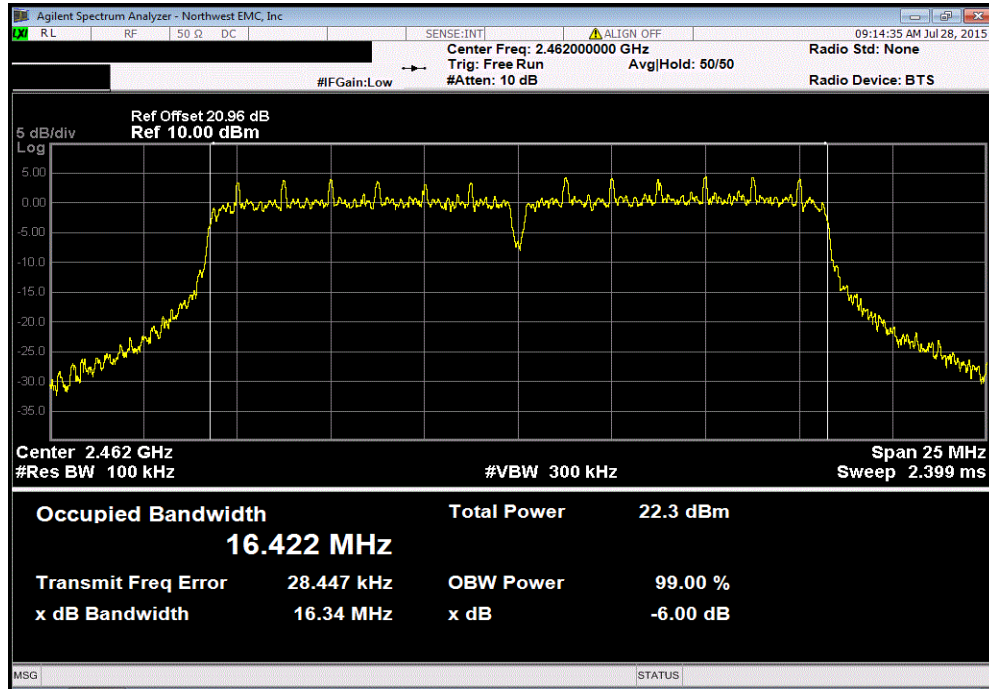
Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz

			Limit		
			Value	(>)	Result
			16.071 MHz	500 kHz	Pass

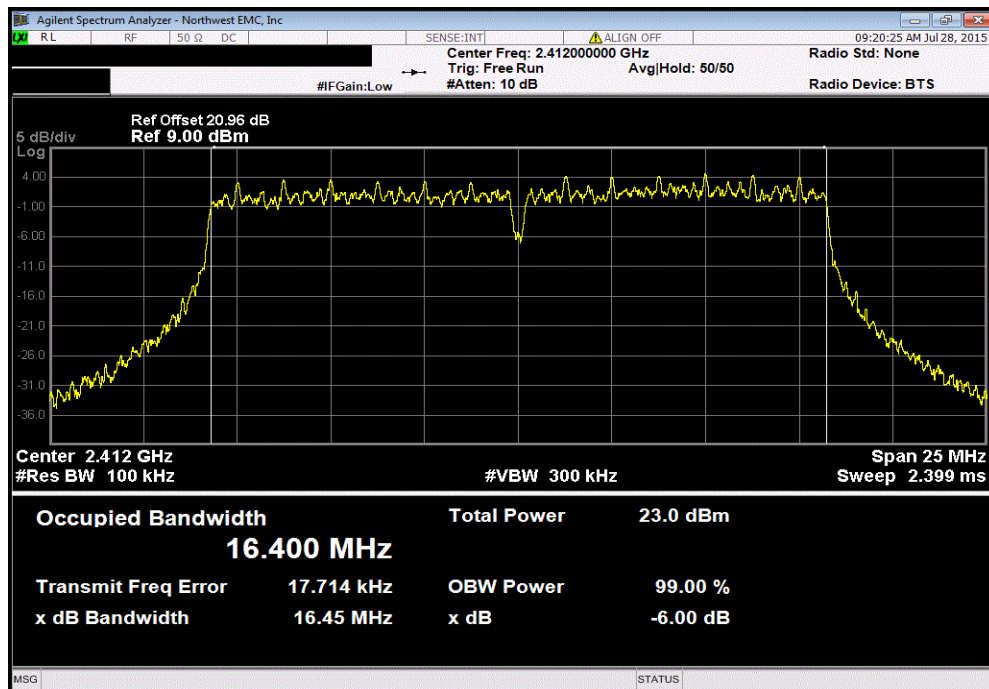


OCCUPIED BANDWIDTH

Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
				Limit		
				Value	(>)	Result
				16.339 MHz	500 kHz	Pass



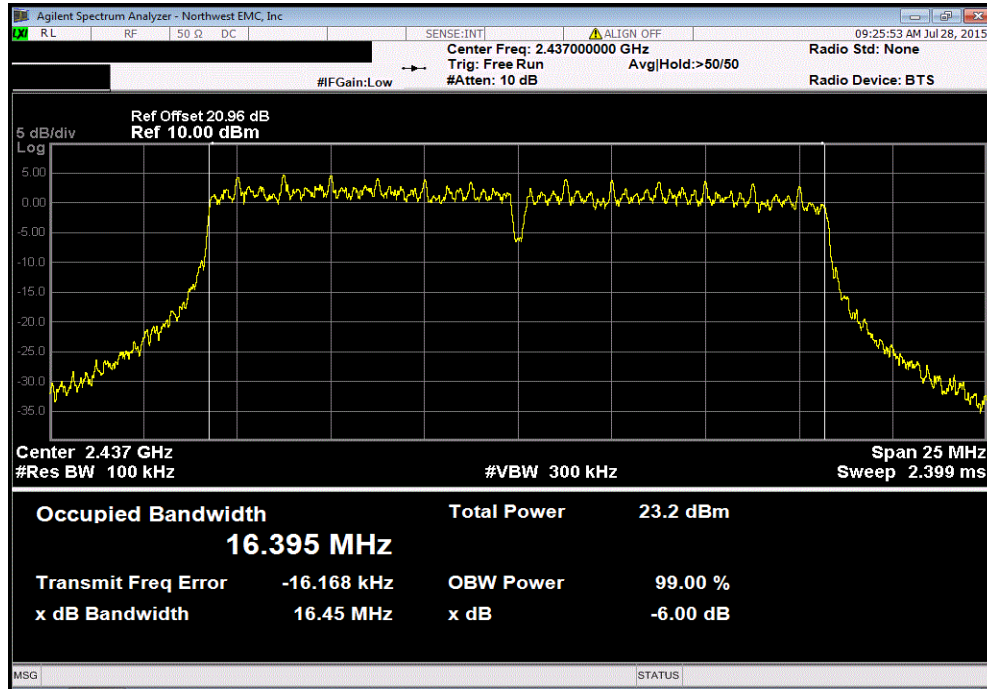
Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
				Limit		
				Value	(>)	Result
				16.452 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

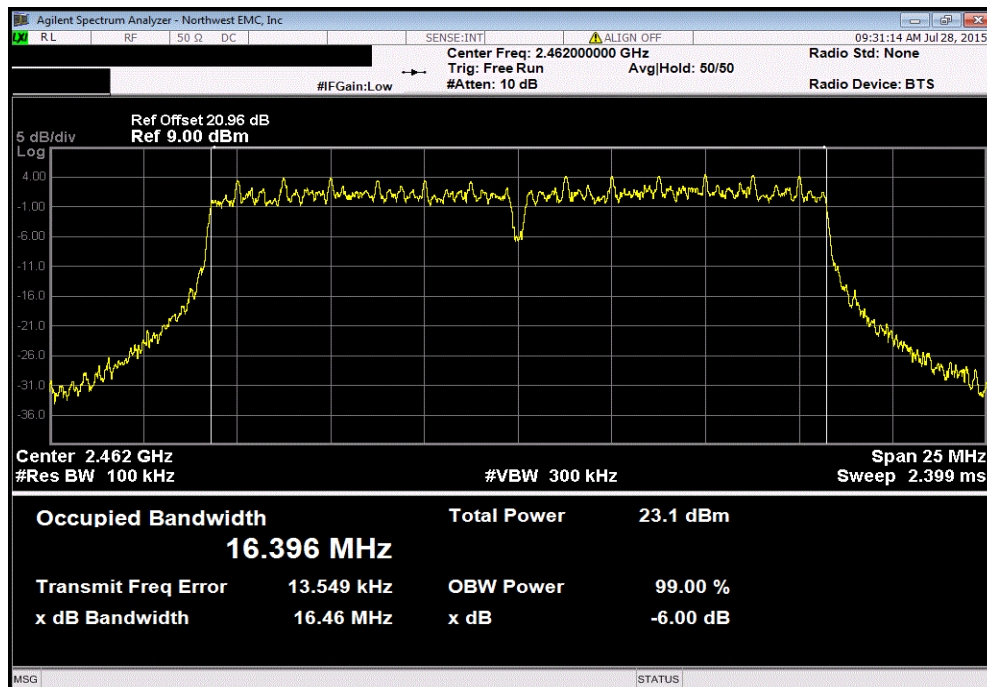
Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz

			Limit		
			Value	(>)	Result
			16.449 MHz	500 kHz	Pass



Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz

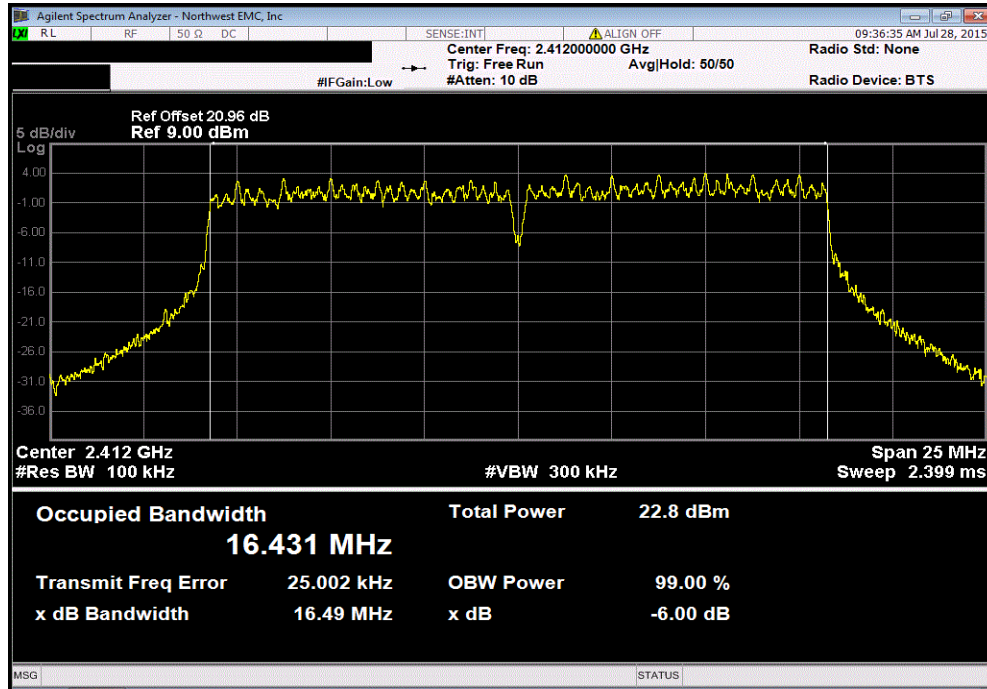
			Limit		
			Value	(>)	Result
			16.46 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

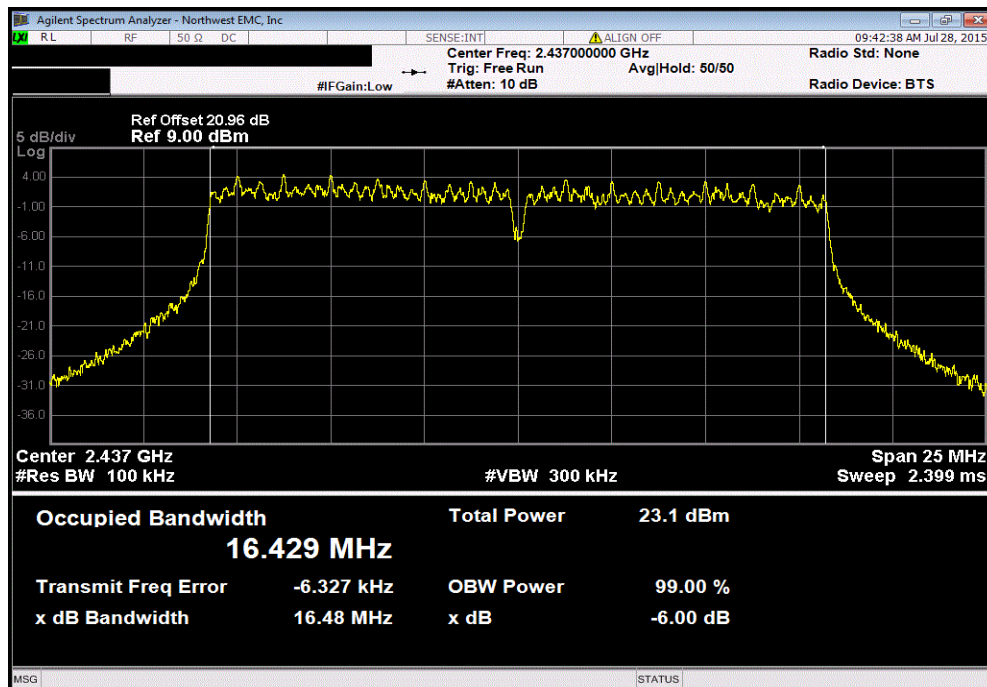
Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz

			Limit		
			Value	(>)	Result
			16.489 MHz	500 kHz	Pass



Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz

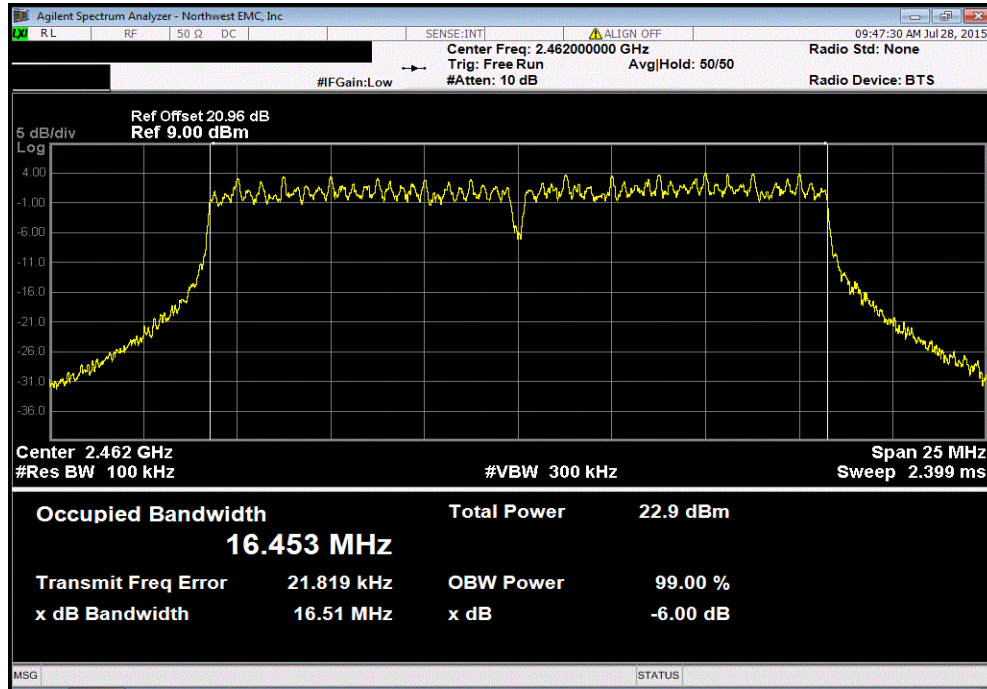
			Limit		
			Value	(>)	Result
			16.484 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

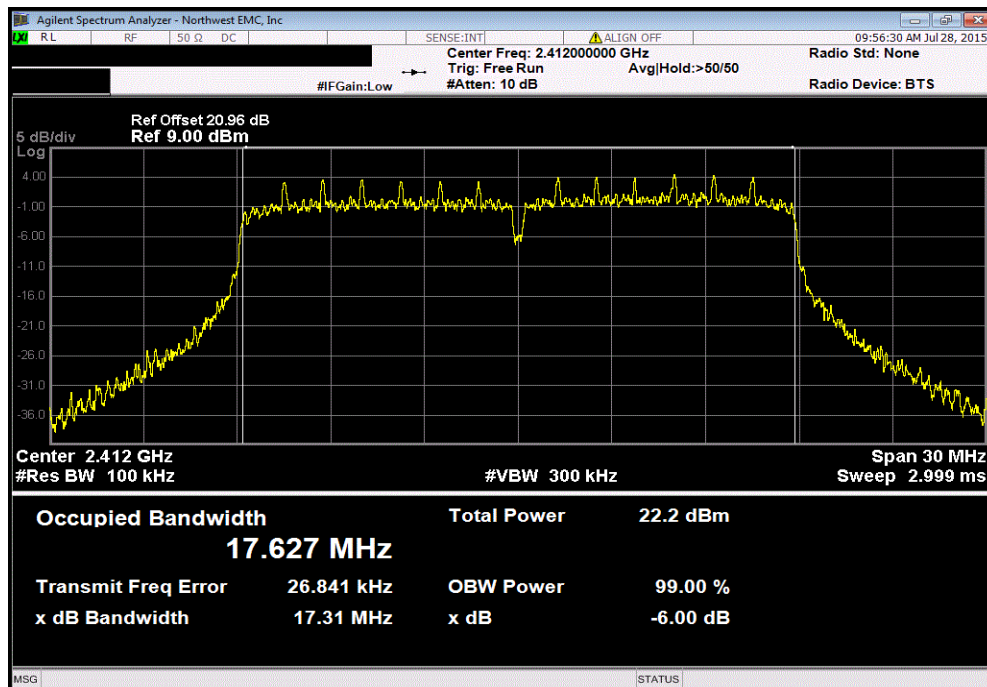
Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz

	Value	Limit	Result
	16.512 MHz	> 500 kHz	Pass



Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Low Channel 1, 2412 MHz

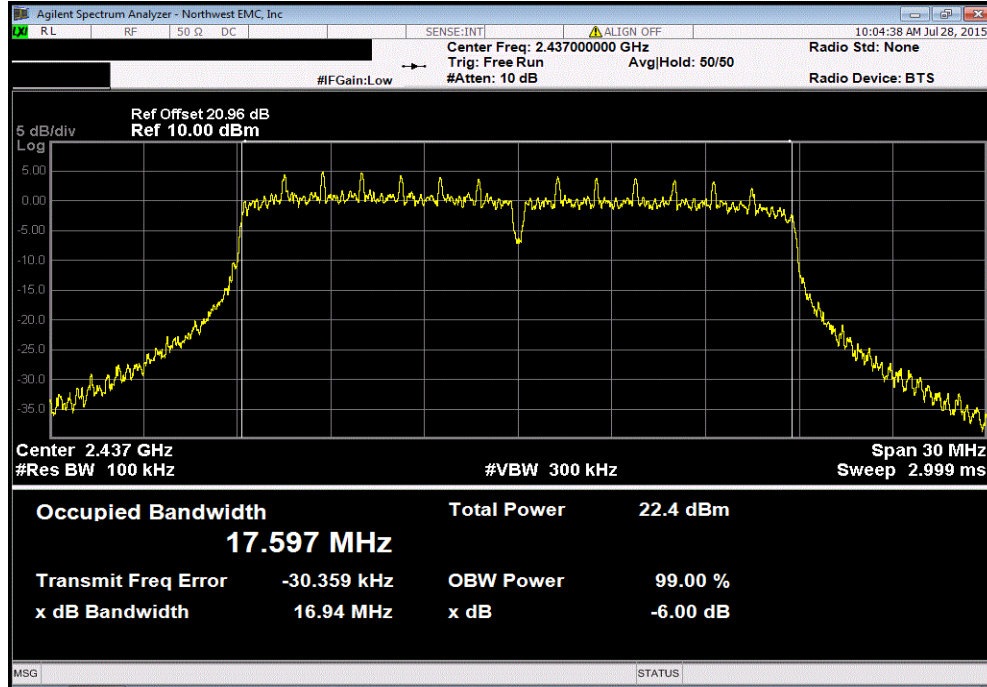
	Value	Limit	Result
	17.315 MHz	> 500 kHz	Pass



OCCUPIED BANDWIDTH

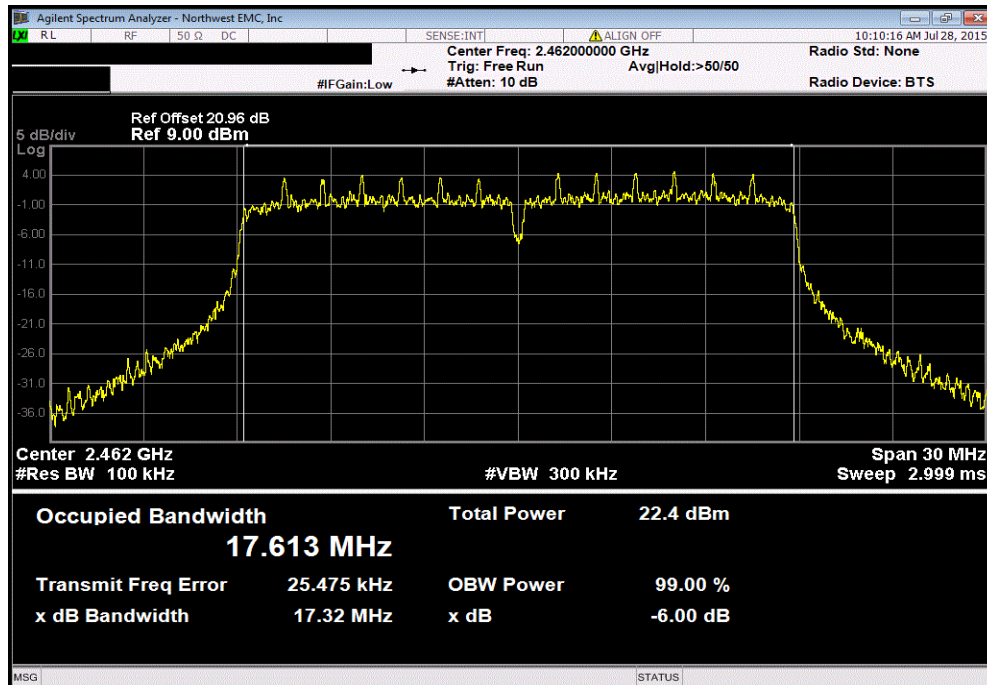
Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Mid Channel 6, 2437 MHz

			Limit		
			(>)	Value	Result
				16.94 MHz	500 kHz
					Pass



Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz

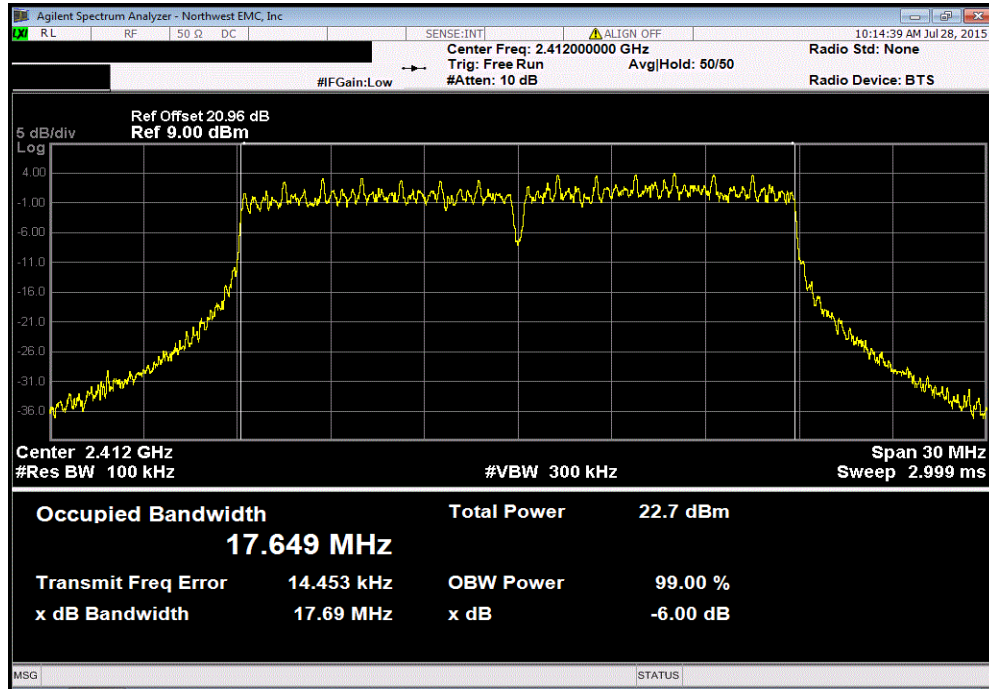
			Limit		
			(>)	Value	Result
				17.315 MHz	500 kHz
					Pass



OCCUPIED BANDWIDTH

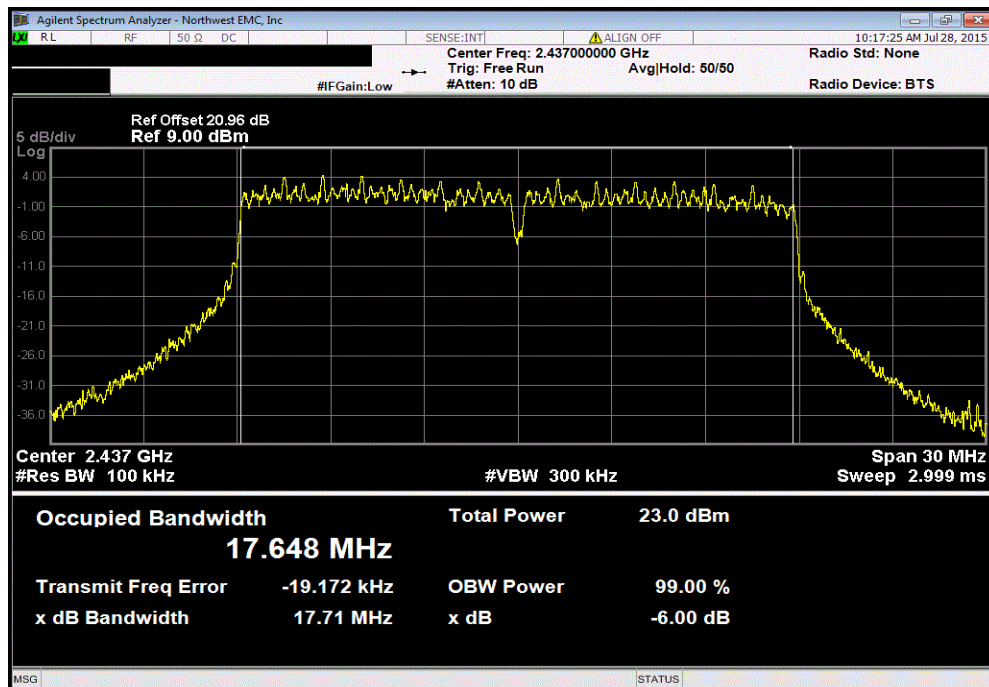
Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Low Channel 1, 2412 MHz

			Value	Limit	Result
				(>)	
			17.692 MHz	500 kHz	Pass



Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Mid Channel 6, 2437 MHz

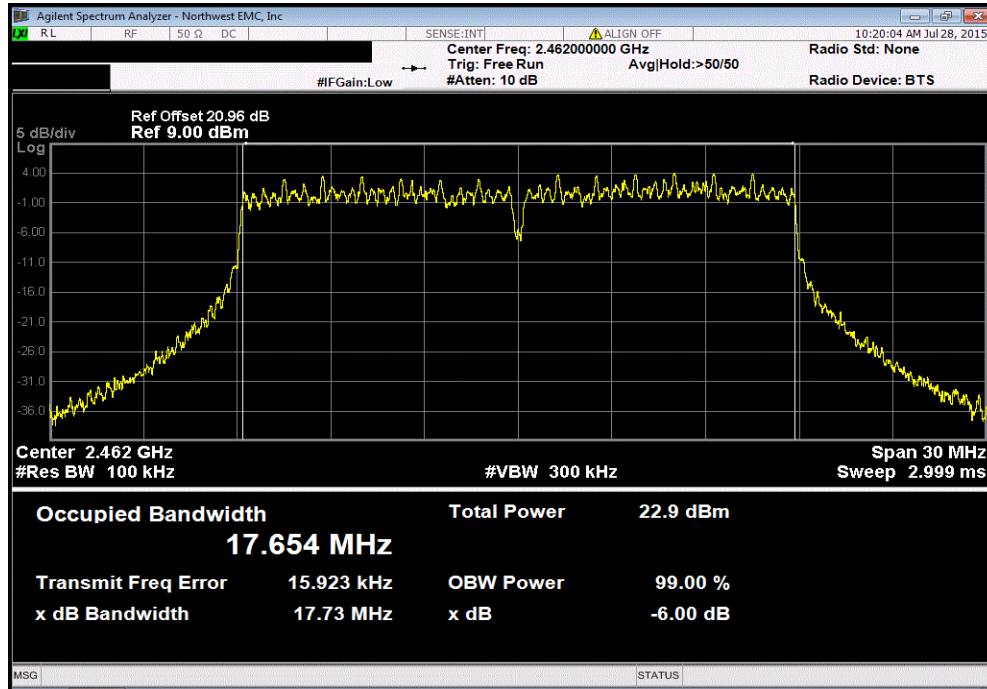
			Value	Limit	Result
				(>)	
			17.712 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

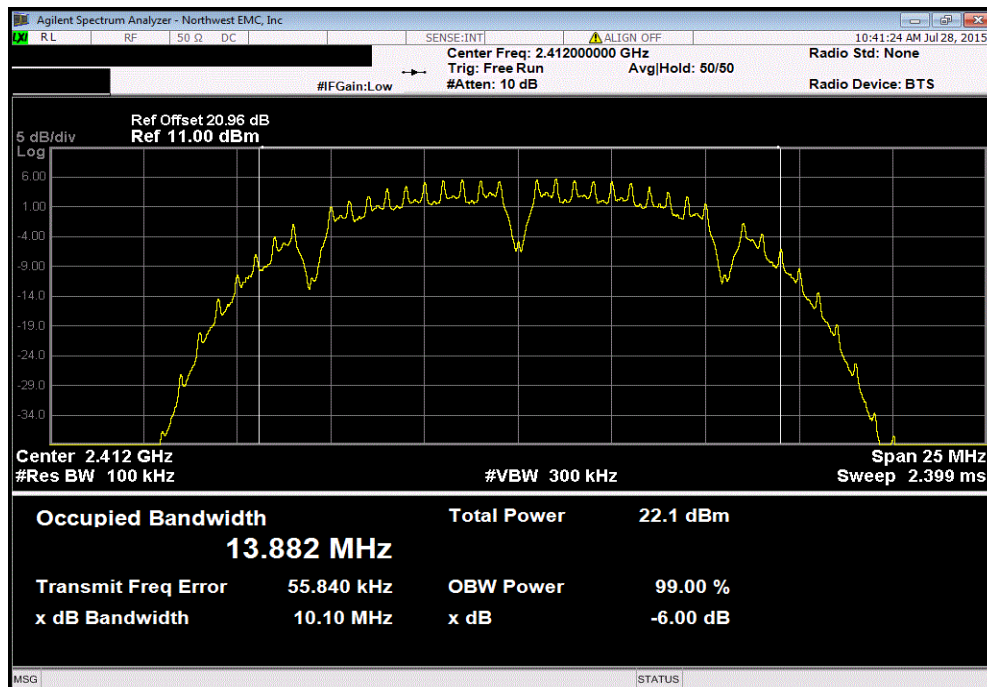
Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, High Channel 11, 2462 MHz

			Value	Limit	Result
				(>)	
			17.726 MHz	500 kHz	Pass



Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz

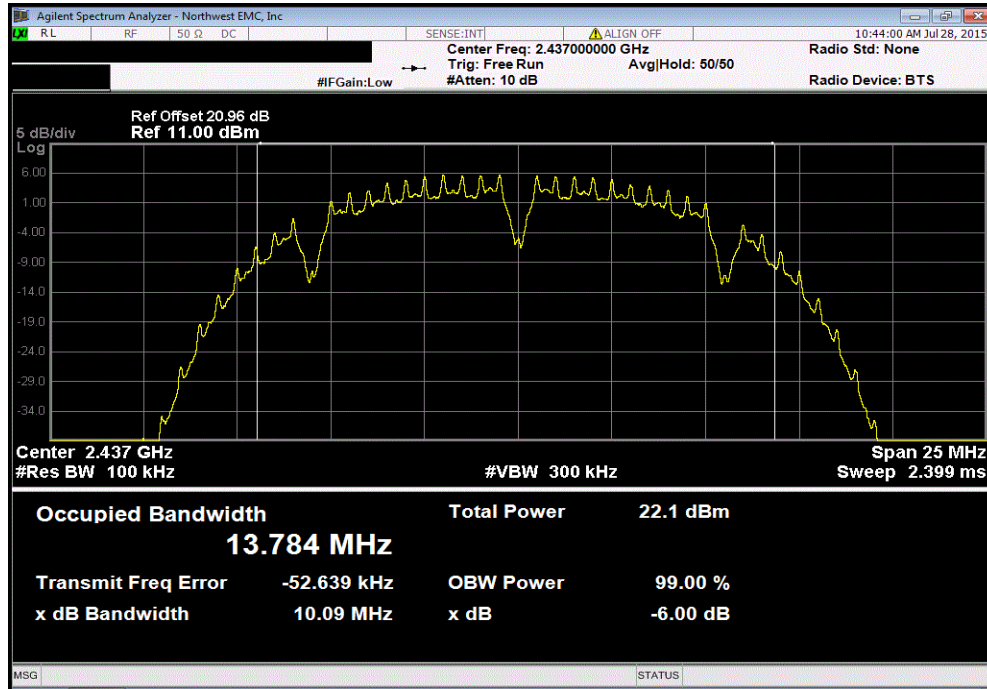
			Value	Limit	Result
				(>)	
			10.095 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

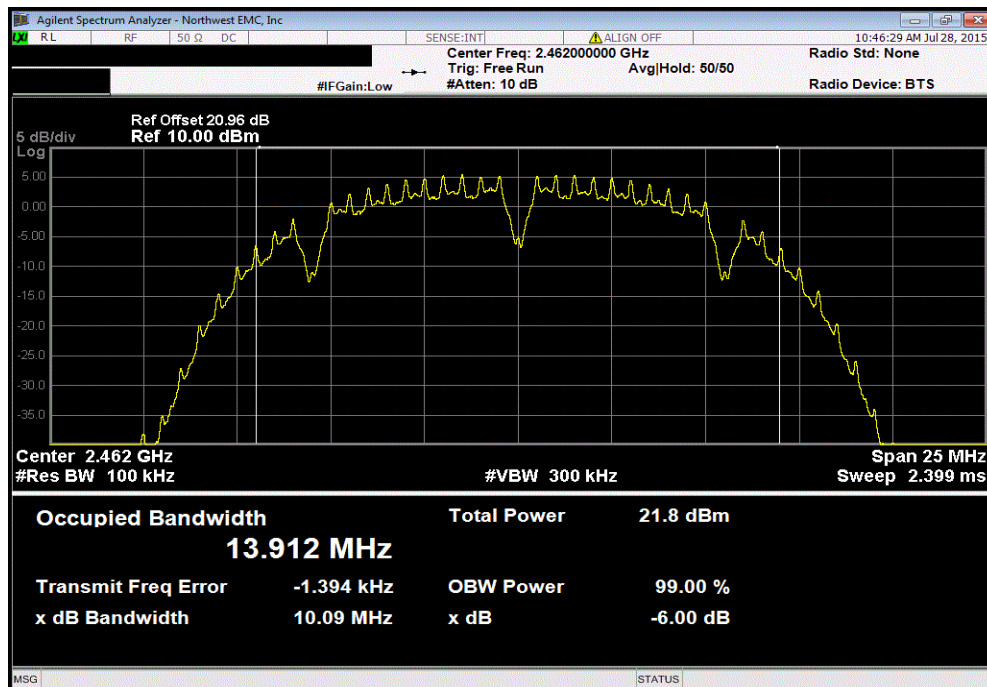
Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz

			Limit		
			Value	(>)	Result
			10.089 MHz	500 kHz	Pass



Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz

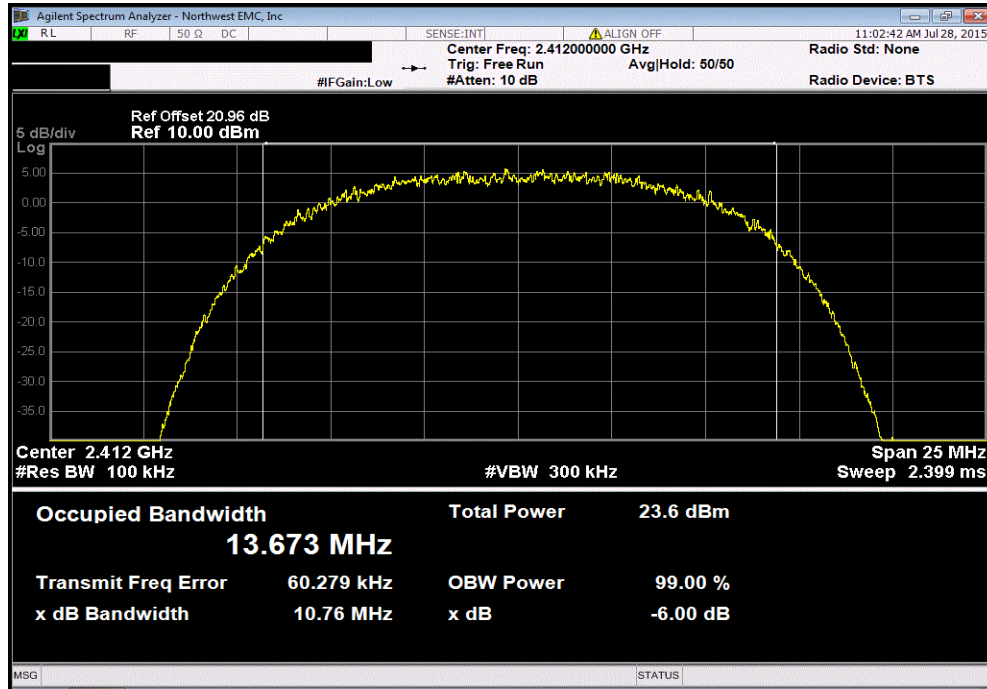
			Limit		
			Value	(>)	Result
			10.094 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

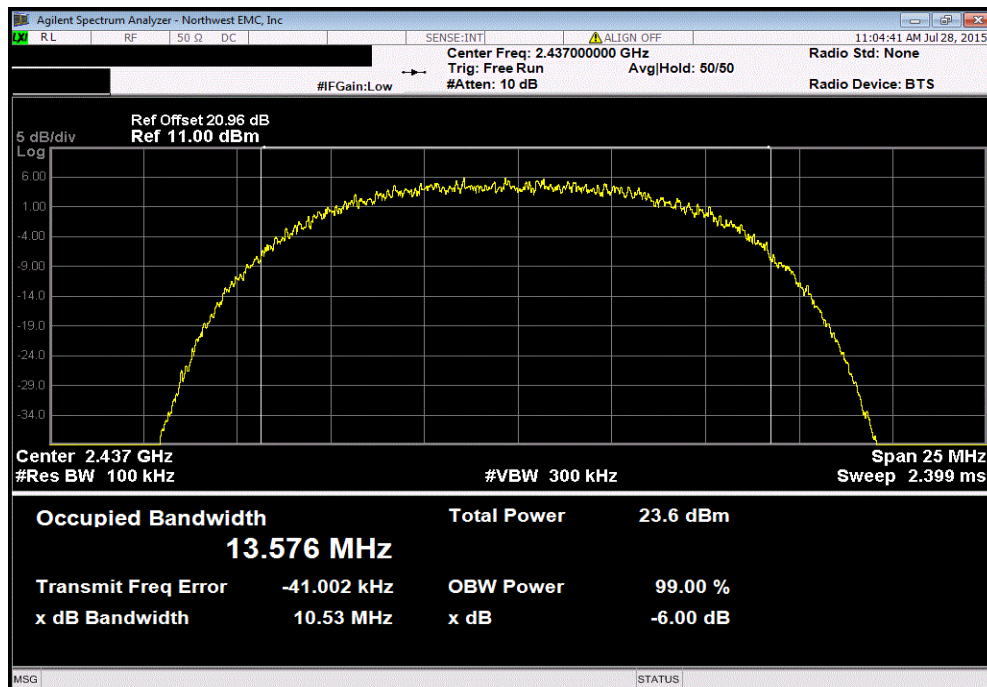
Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz

	Value	Limit	Result
	10.762 MHz	(>) 500 kHz	Pass



Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz

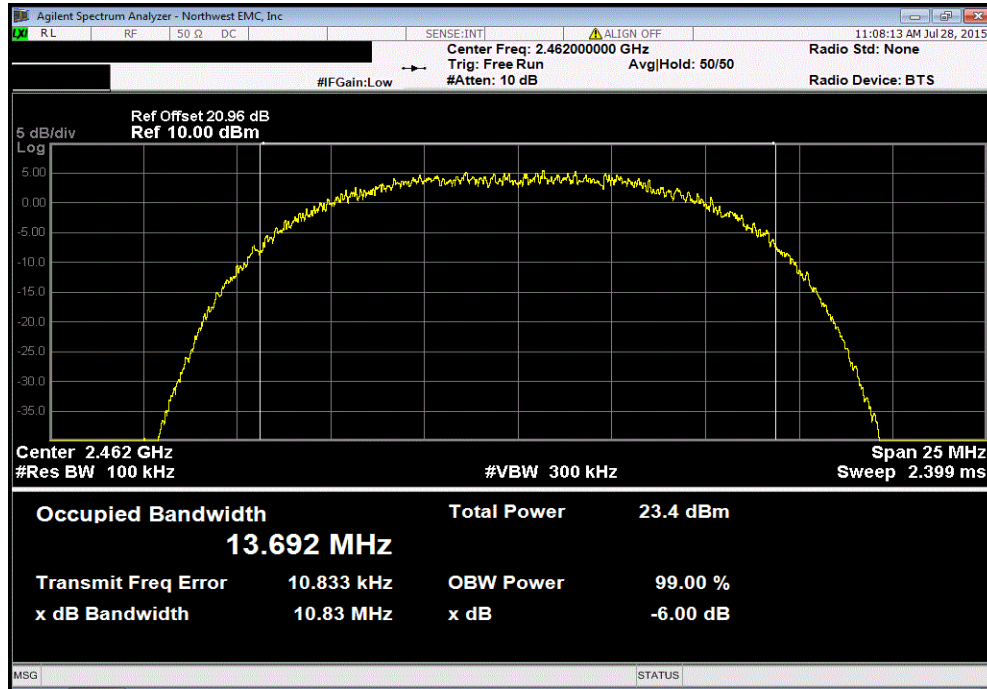
	Value	Limit	Result
	10.533 MHz	(>) 500 kHz	Pass



OCCUPIED BANDWIDTH

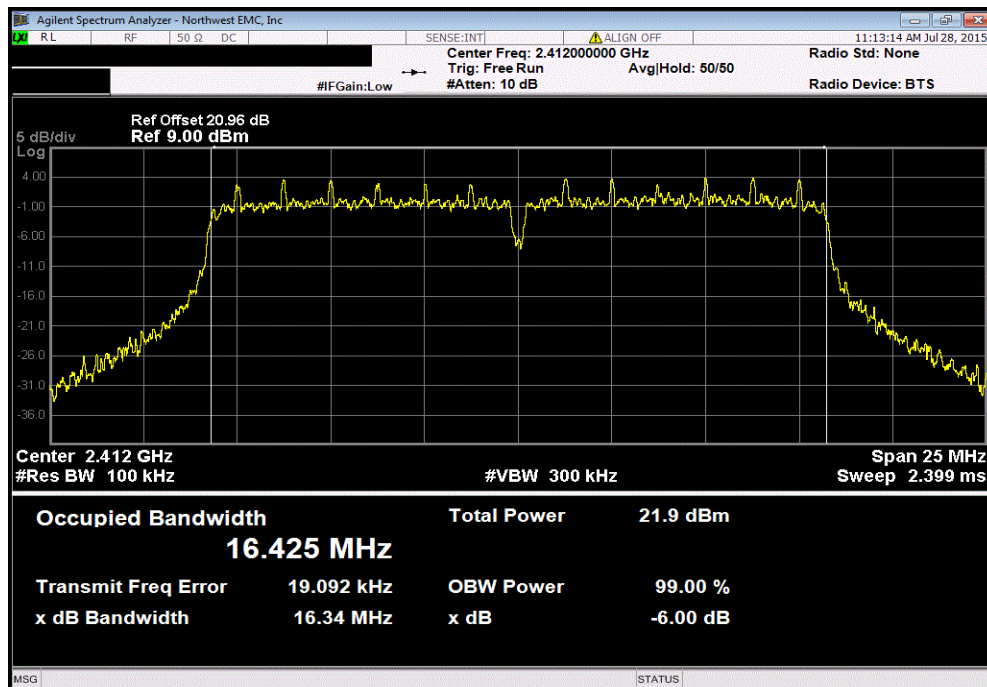
Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz

	Value	Limit	Result
	10.831 MHz	(> 500 kHz)	Pass



Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz

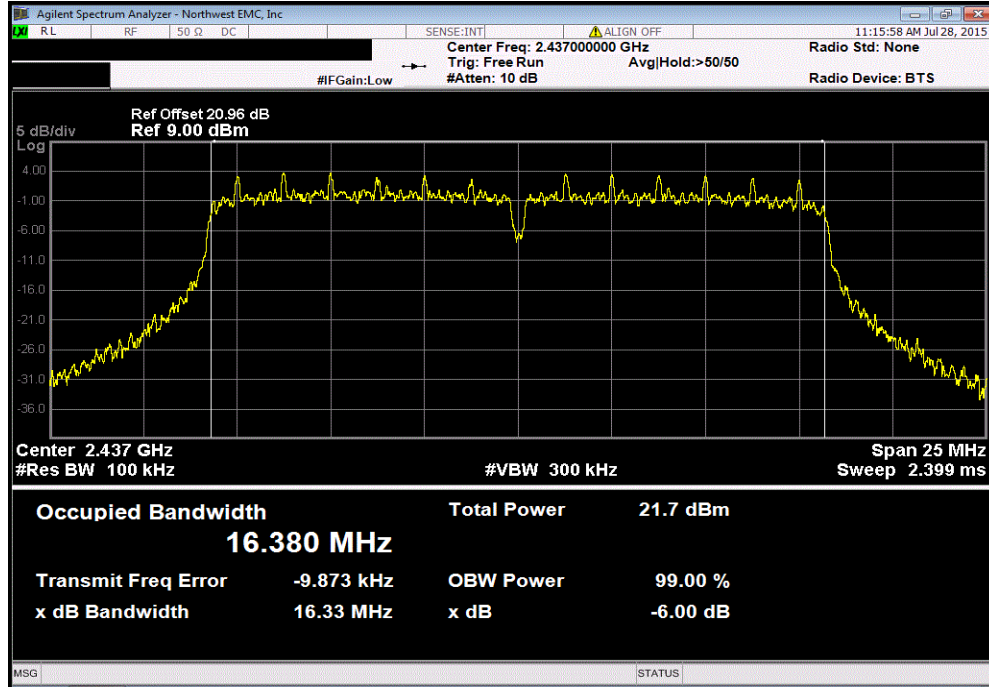
	Value	Limit	Result
	16.341 MHz	(> 500 kHz)	Pass



OCCUPIED BANDWIDTH

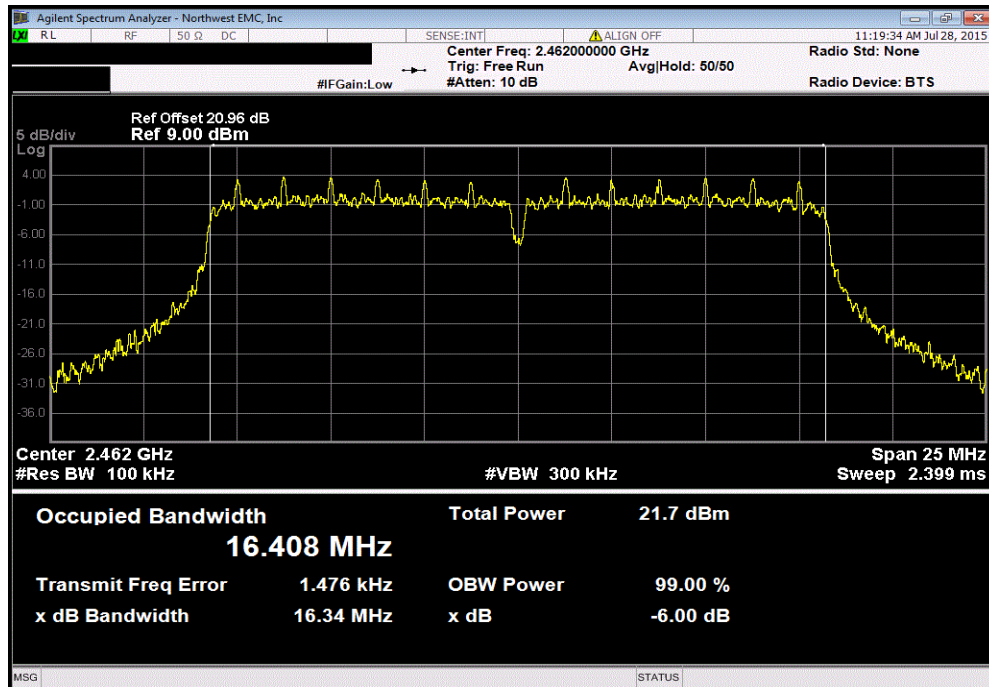
Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz

			Limit		
			Value	(>)	Result
			16.329 MHz	500 kHz	Pass



Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz

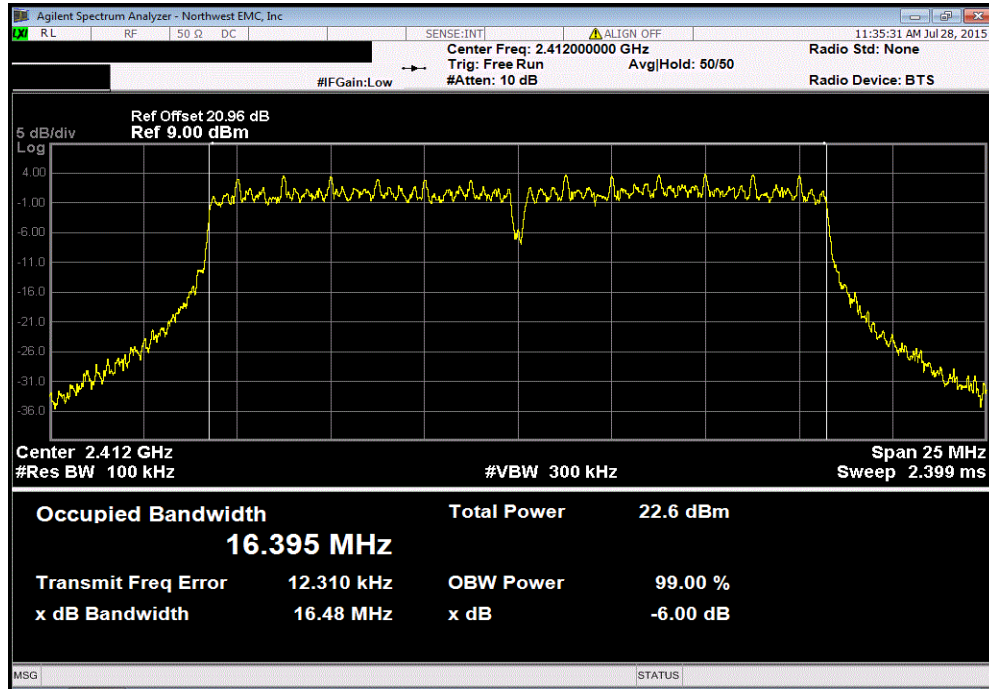
			Limit		
			Value	(>)	Result
			16.338 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

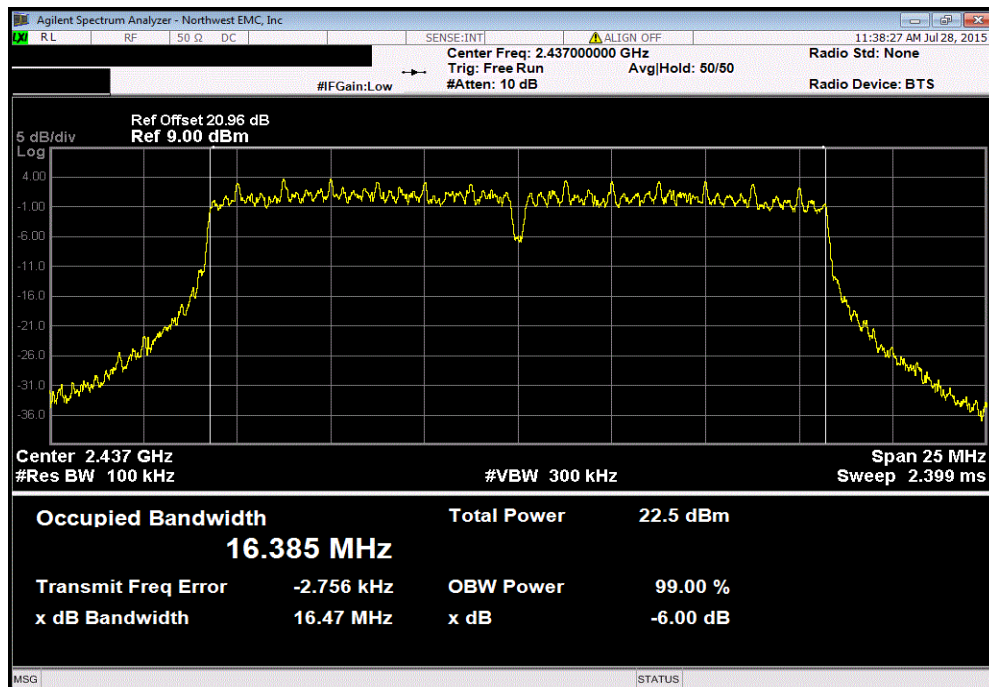
Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz

			Limit		
			Value	(>)	Result
			16.477 MHz	500 kHz	Pass



Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz

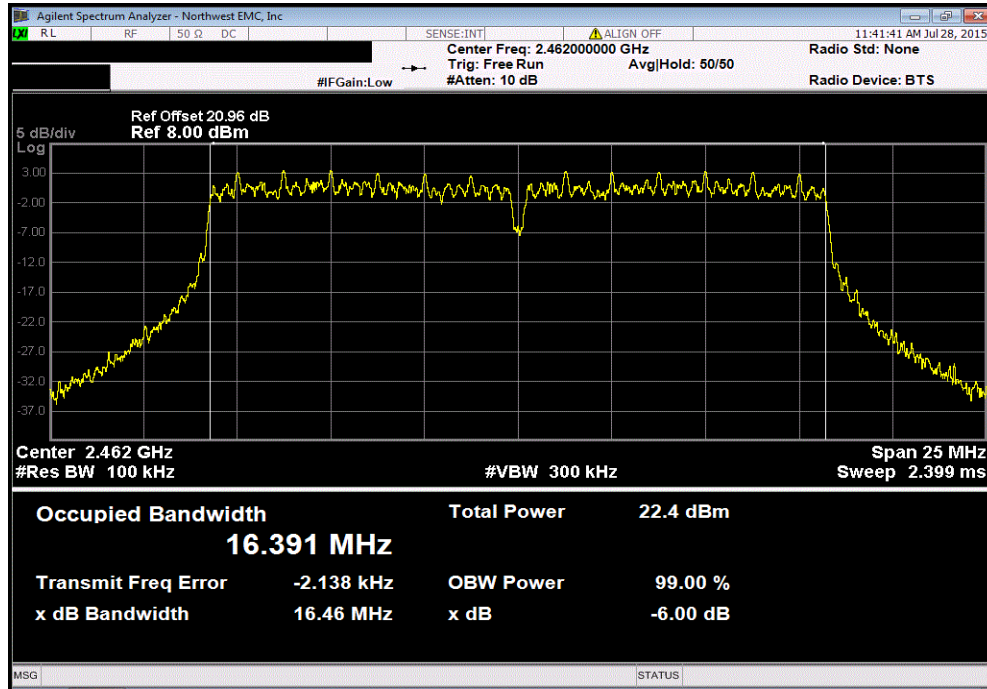
			Limit		
			Value	(>)	Result
			16.475 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

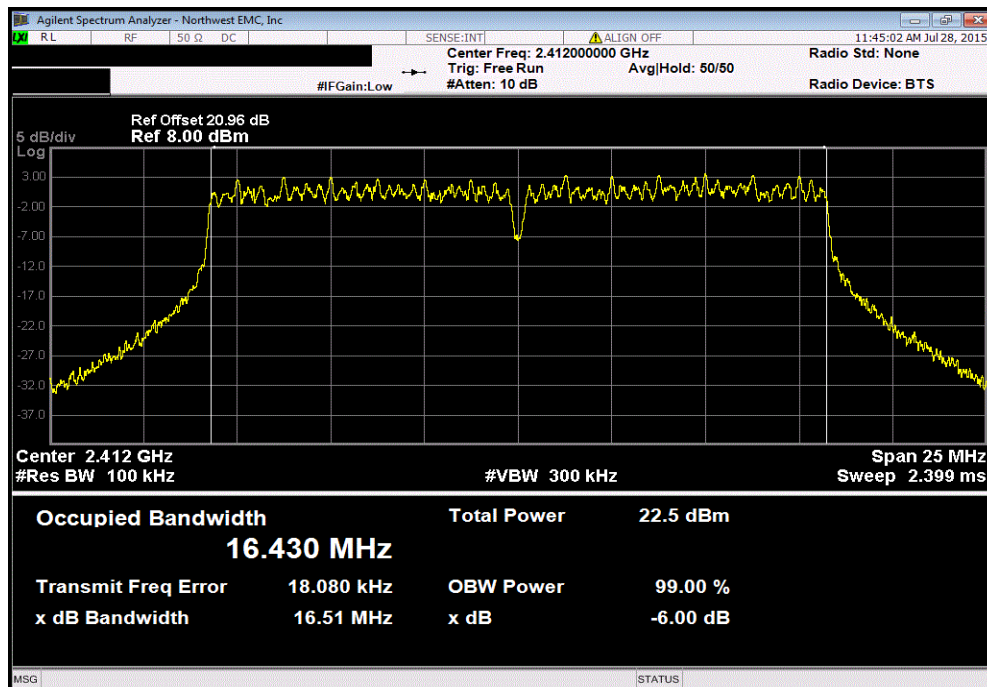
Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz

			Limit		
			Value	(>)	Result
			16.461 MHz	500 kHz	Pass



Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz

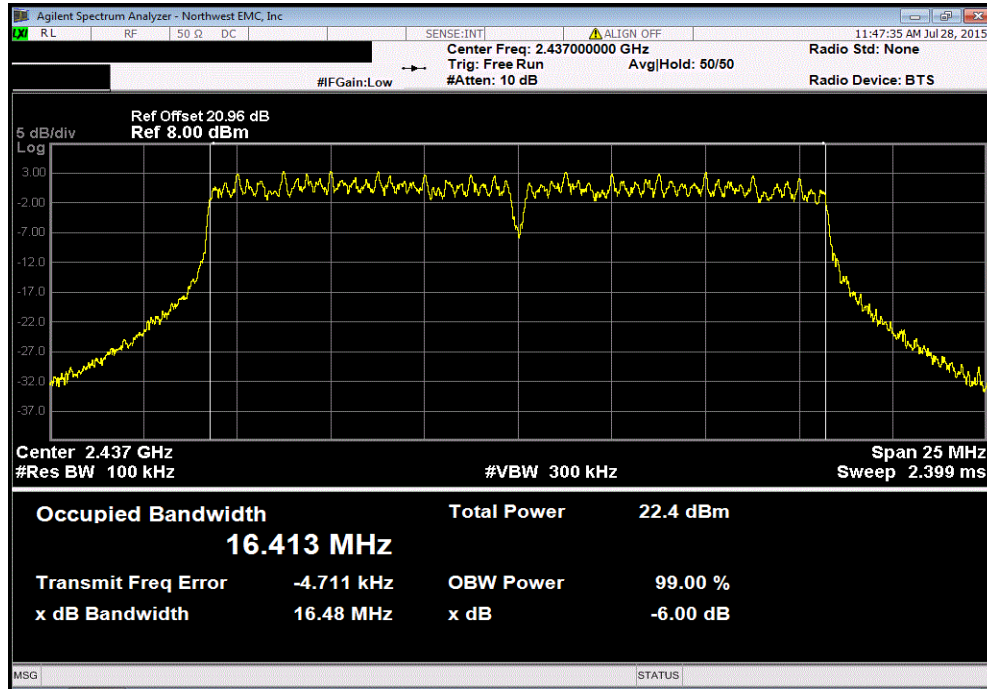
			Limit		
			Value	(>)	Result
			16.507 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

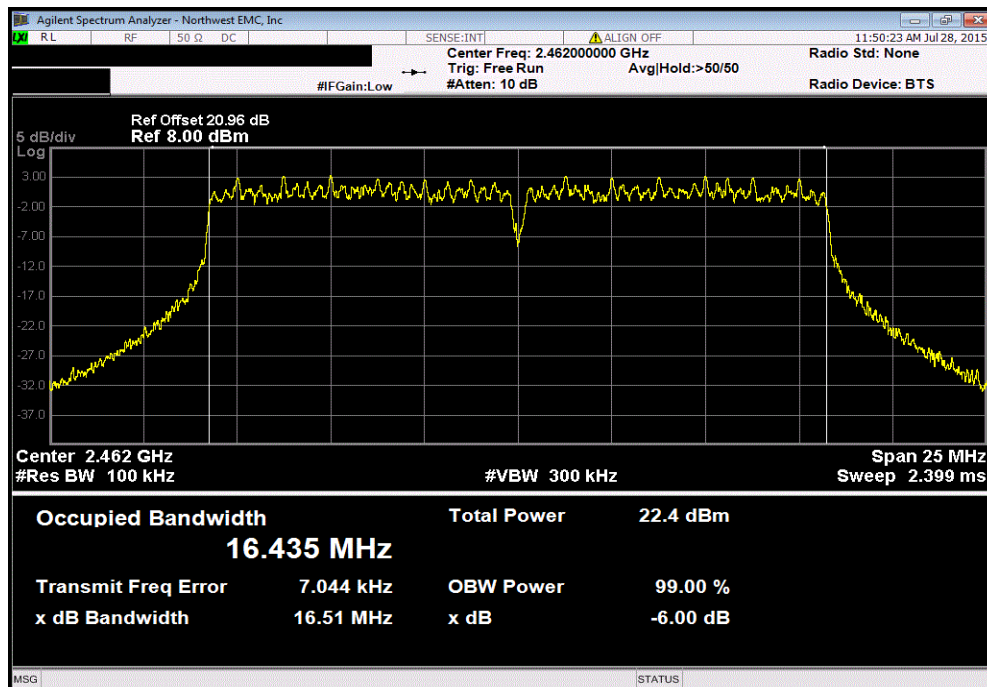
Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz

			Limit		
			Value	(>)	Result
			16.482 MHz	500 kHz	Pass



Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz

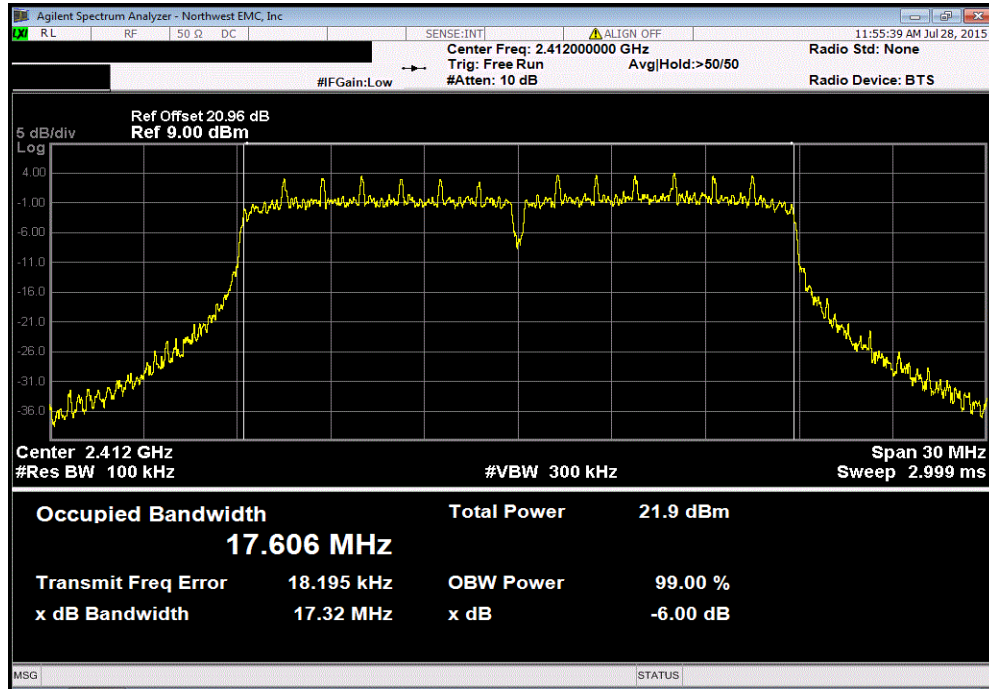
			Limit		
			Value	(>)	Result
			16.511 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

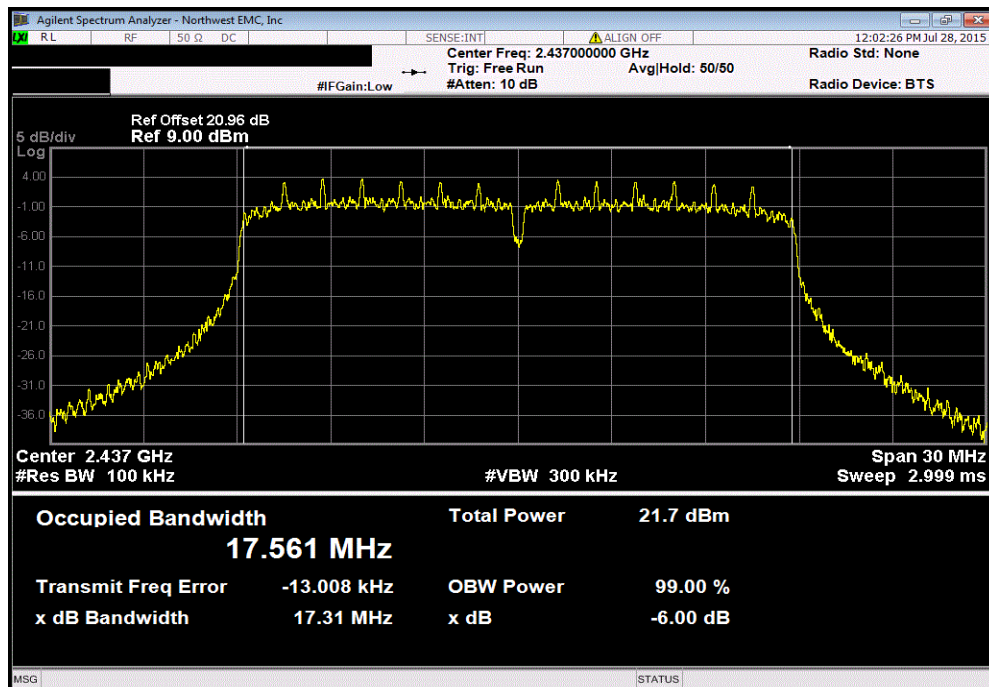
Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Low Channel 1, 2412 MHz

			Value	Limit	Result
				(>)	
			17.317 MHz	500 kHz	Pass



Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Mid Channel 6, 2437 MHz

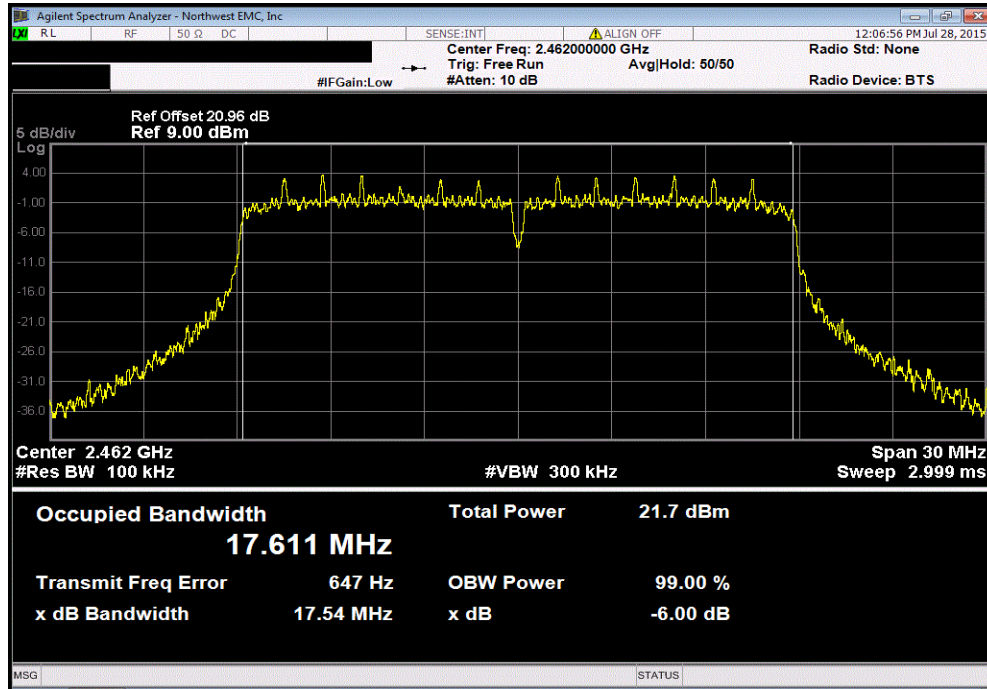
			Value	Limit	Result
				(>)	
			17.309 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

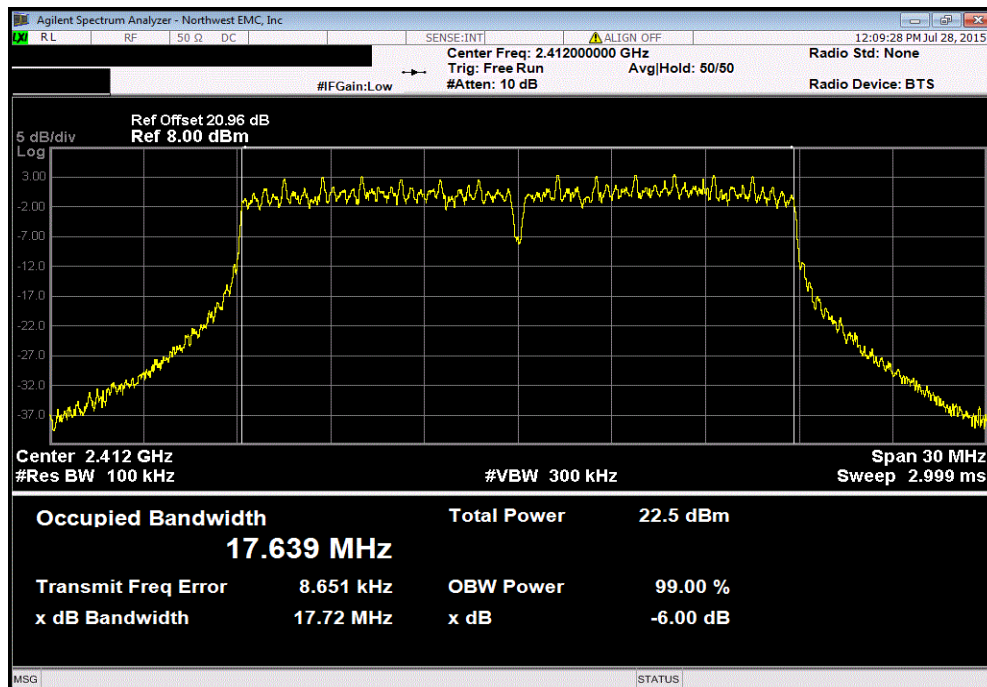
Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz

			Value	Limit	Result
				(>)	
			17.538 MHz	500 kHz	Pass



Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Low Channel 1, 2412 MHz

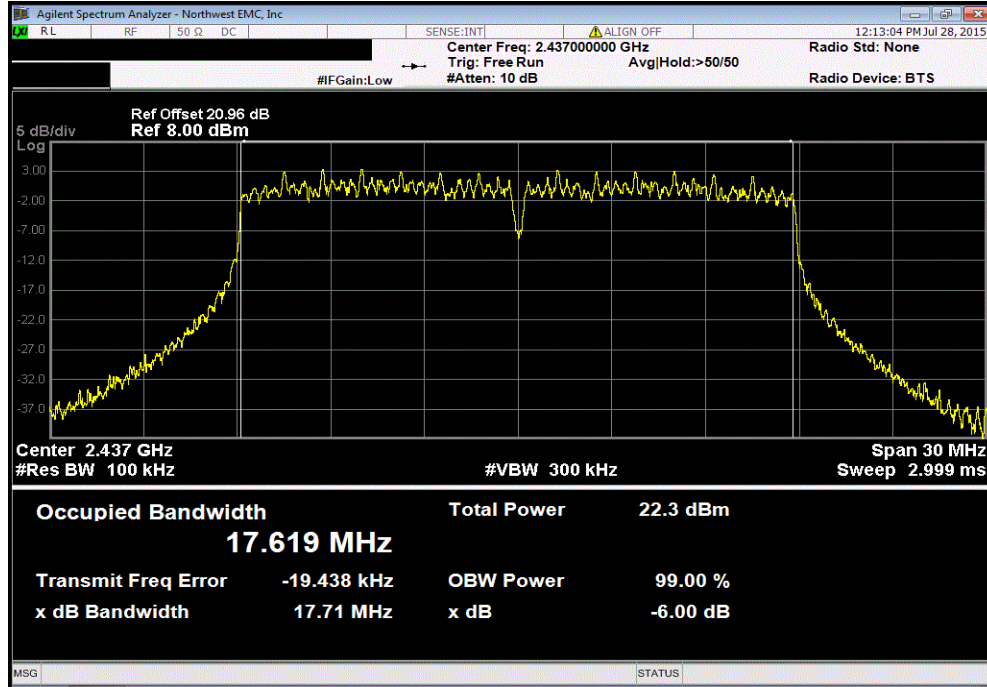
			Value	Limit	Result
				(>)	
			17.718 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

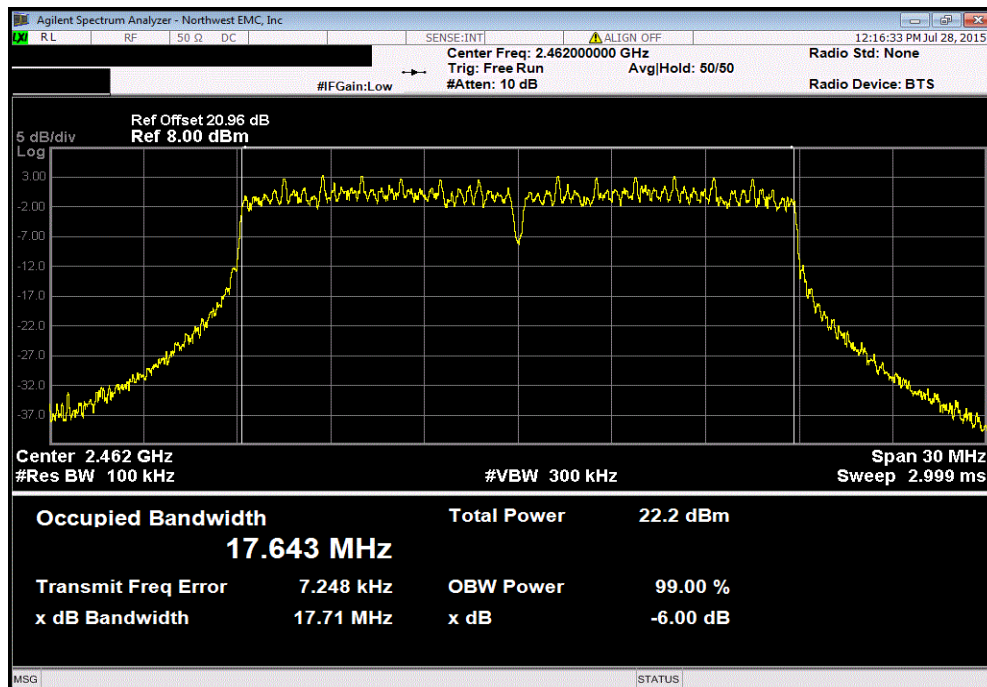
Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Mid Channel 6, 2437 MHz

			Value	Limit	Result
				(>)	
			17.715 MHz	500 kHz	Pass



Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, High Channel 11, 2462 MHz

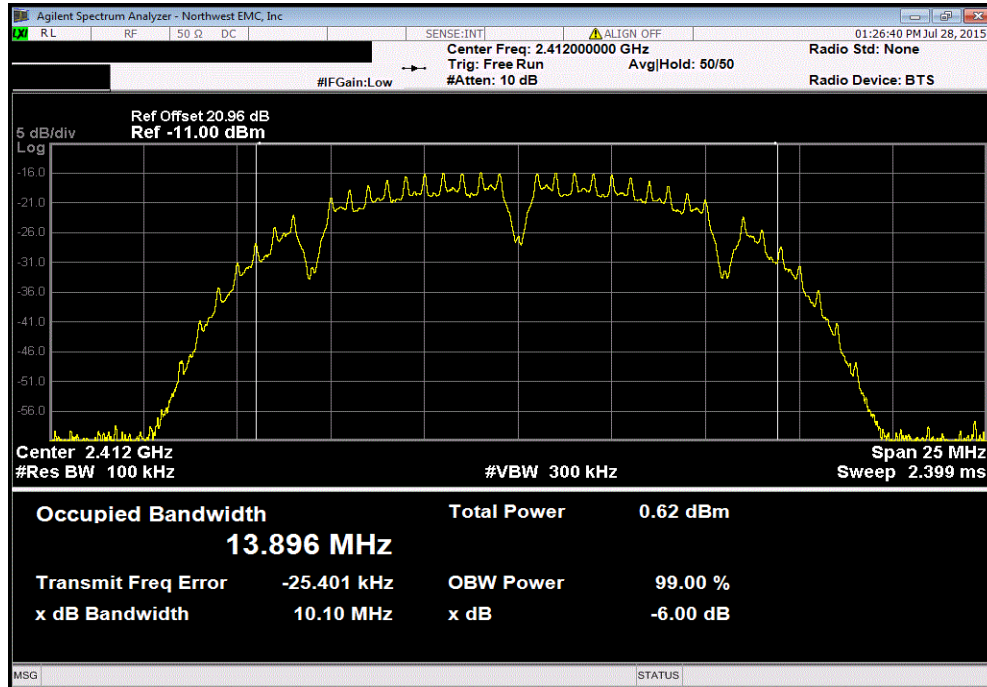
			Value	Limit	Result
				(>)	
			17.714 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

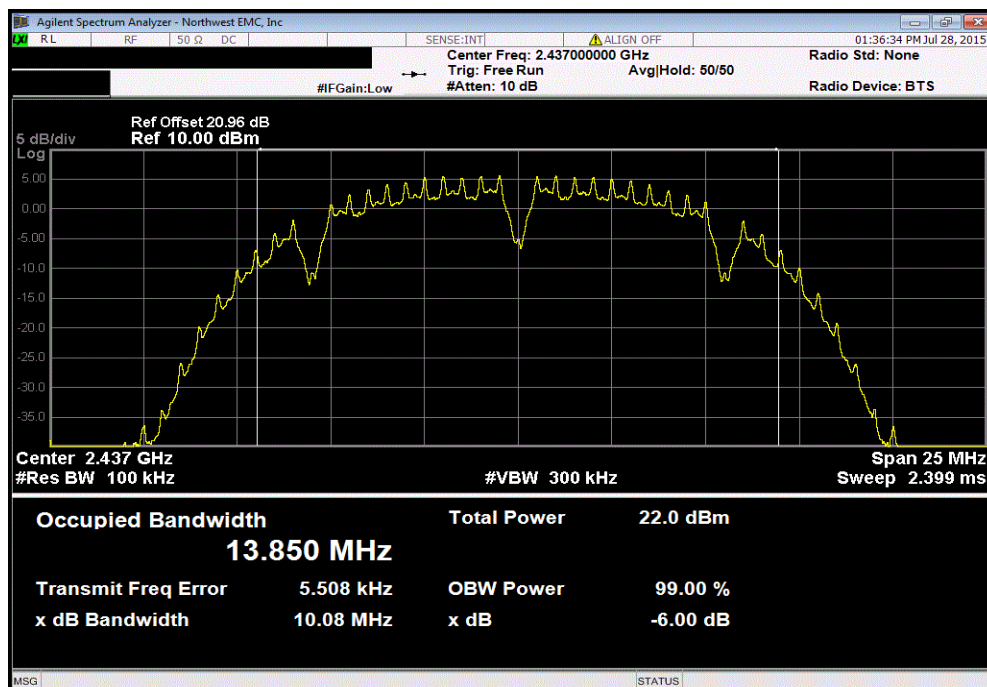
Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz

			Value	Limit	Result
				(>)	
			10.099 MHz	500 kHz	Pass



Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz

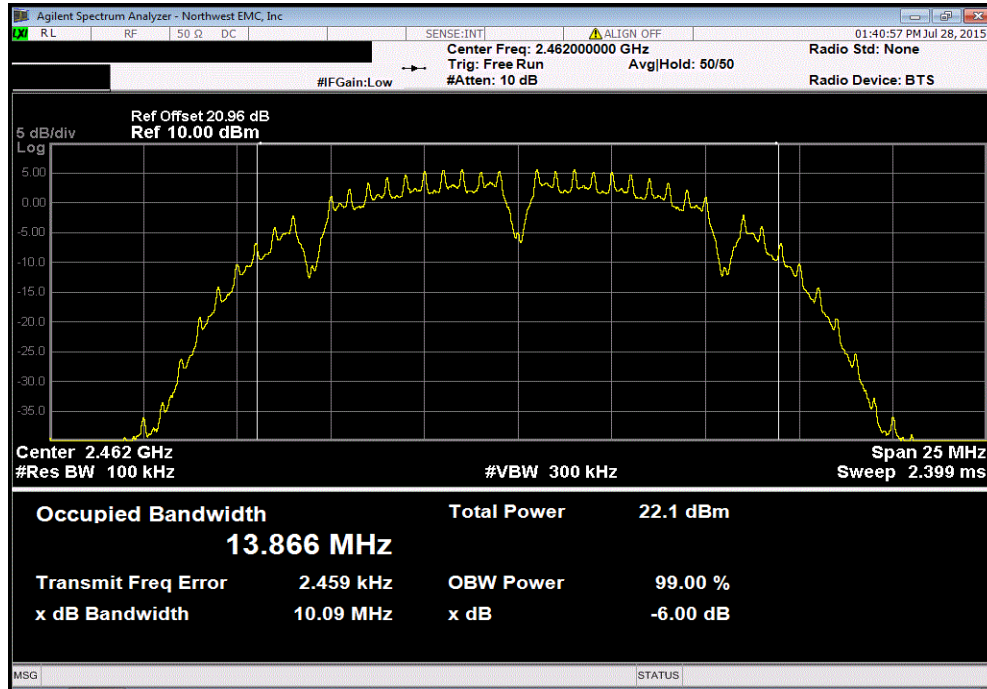
			Value	Limit	Result
				(>)	
			10.082 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

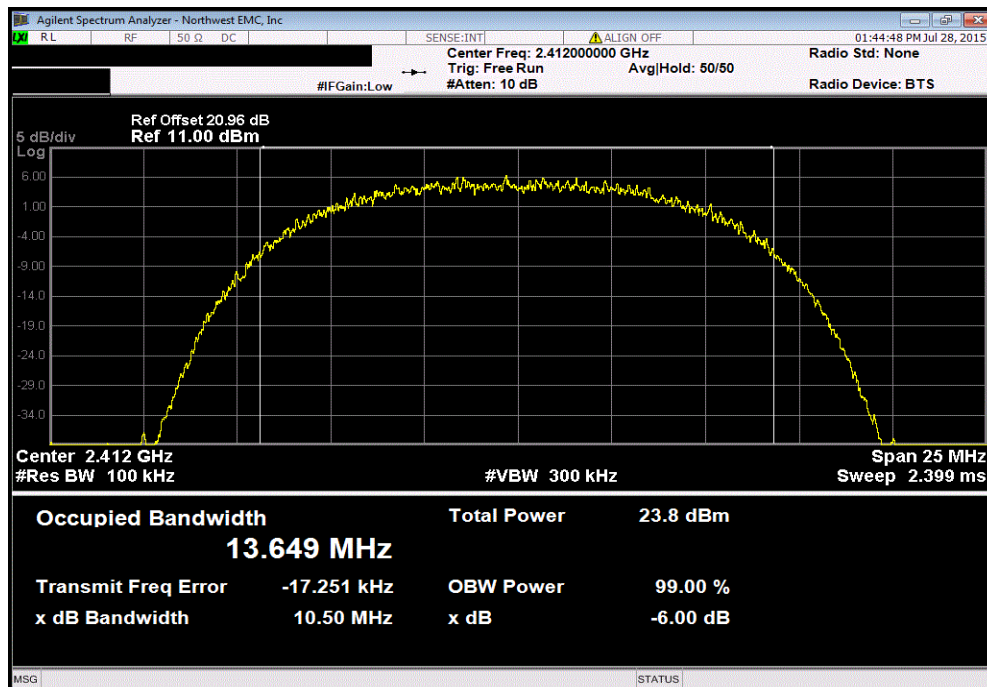
Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz

			Limit		
			Value	(>)	Result
			10.088 MHz	500 kHz	Pass



Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz

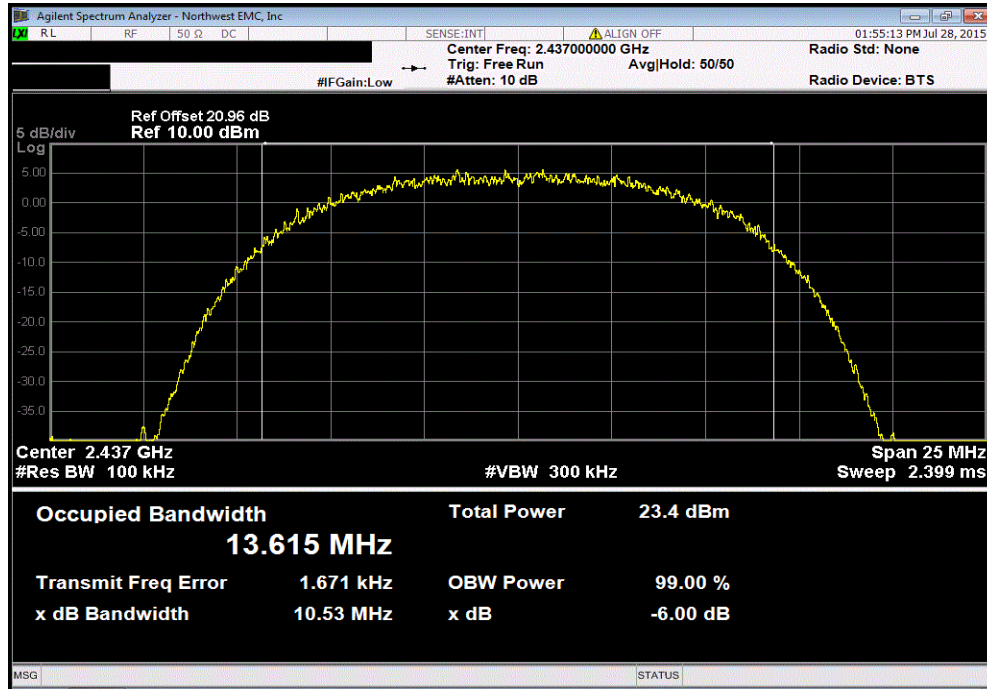
			Limit		
			Value	(>)	Result
			10.503 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

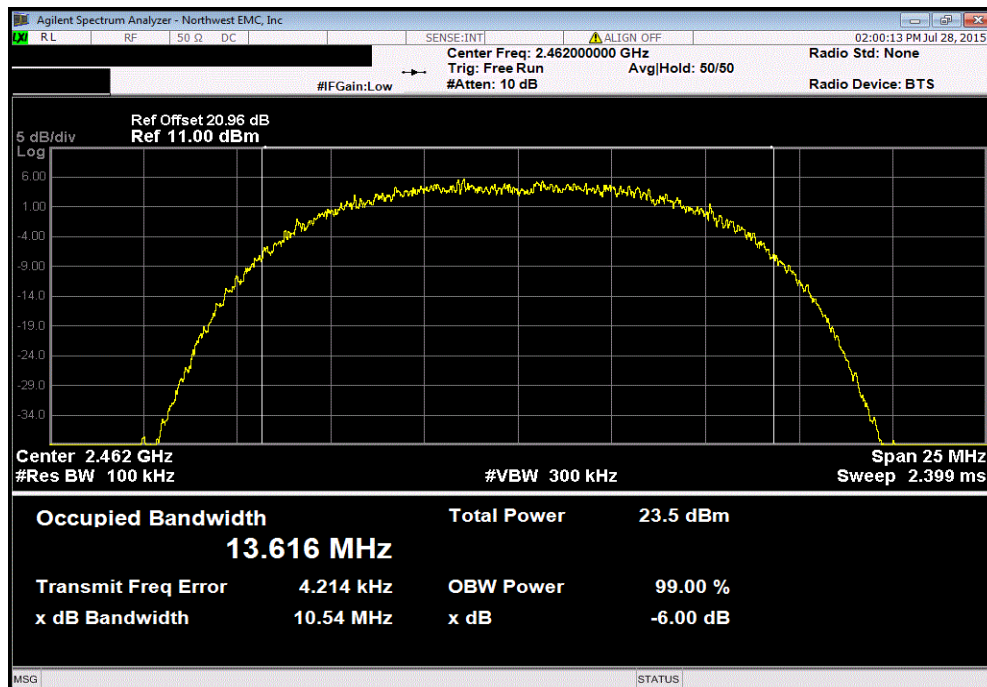
Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz

			Limit		
			Value	(>)	Result
			10.529 MHz	500 kHz	Pass



Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz

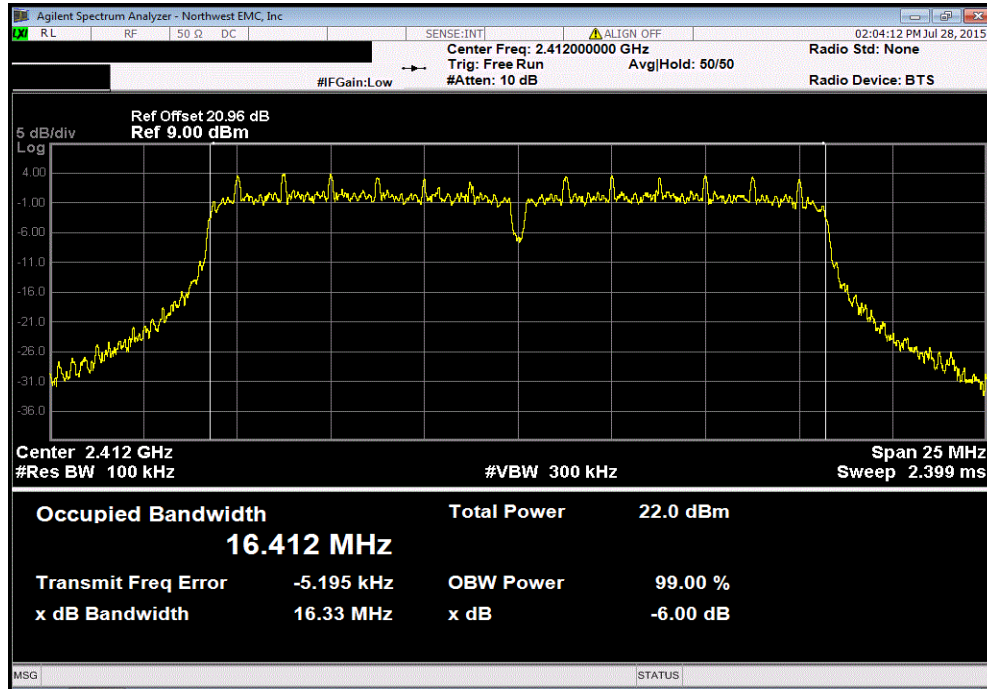
			Limit		
			Value	(>)	Result
			10.536 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

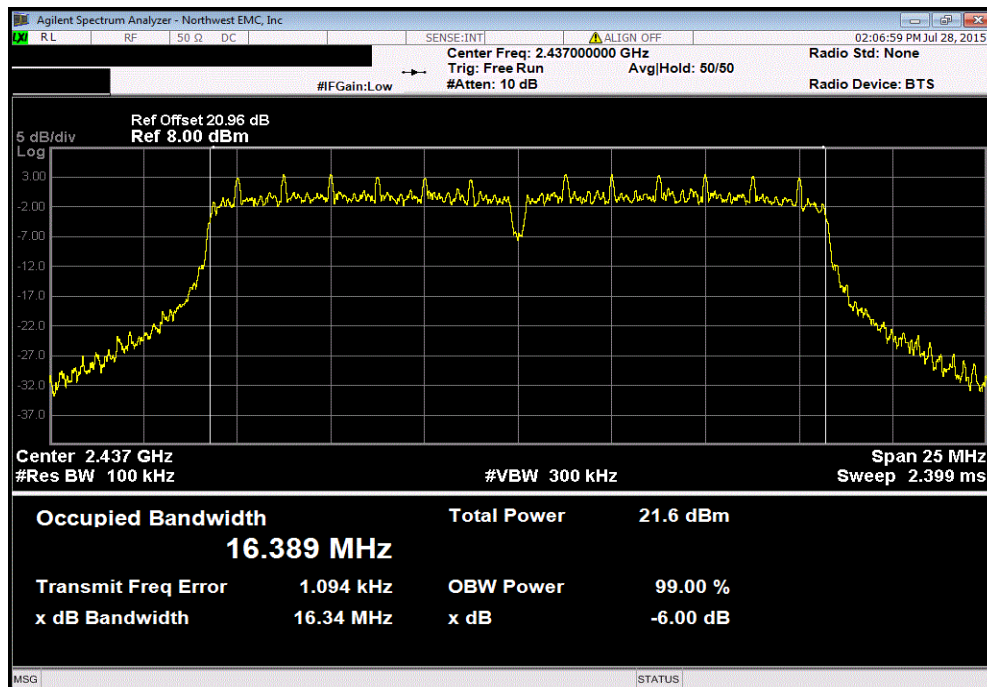
Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz

			Limit		
			Value	(>)	Result
			16.333 MHz	500 kHz	Pass



Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz

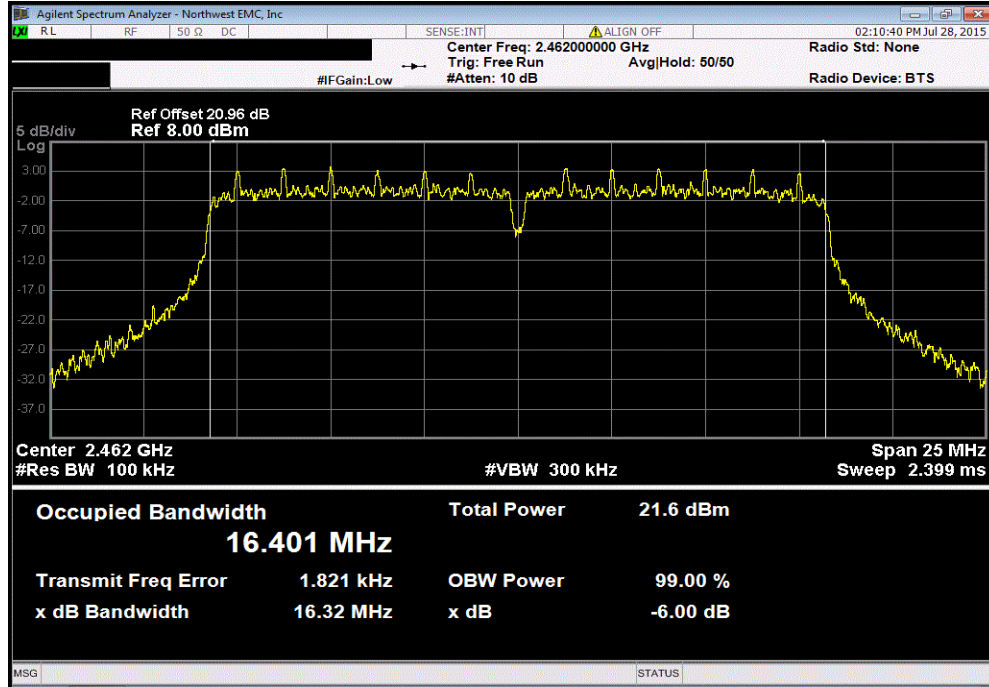
			Limit		
			Value	(>)	Result
			16.342 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

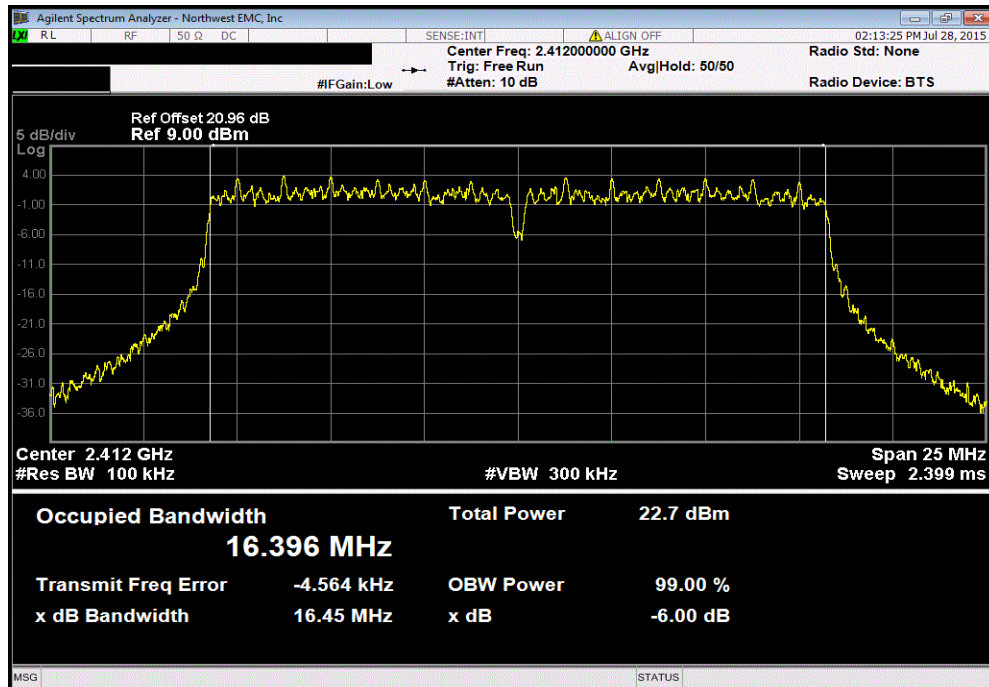
Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz

			Limit		
			Value	(>)	Result
			16.323 MHz	500 kHz	Pass



Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz

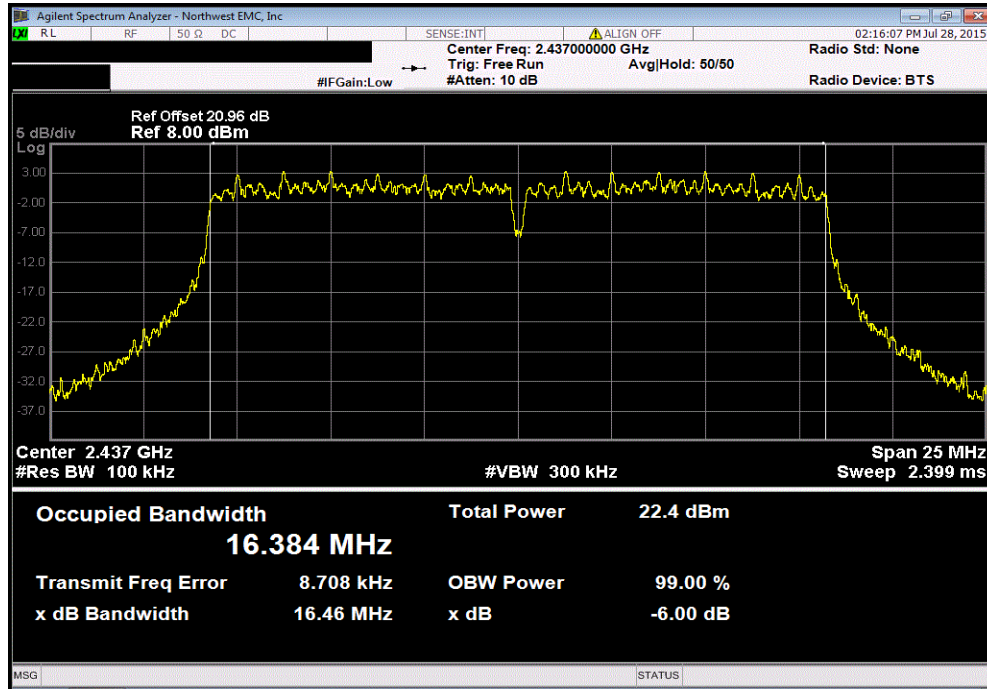
			Limit		
			Value	(>)	Result
			16.448 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

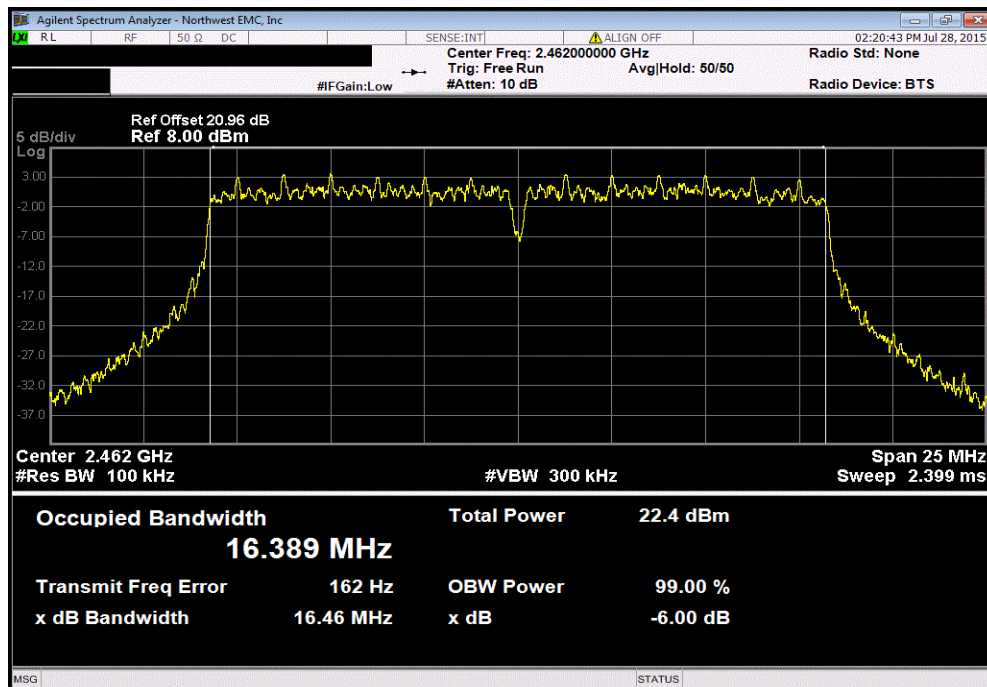
Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz

			Limit		
			Value	(>)	Result
			16.465 MHz	500 kHz	Pass



Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz

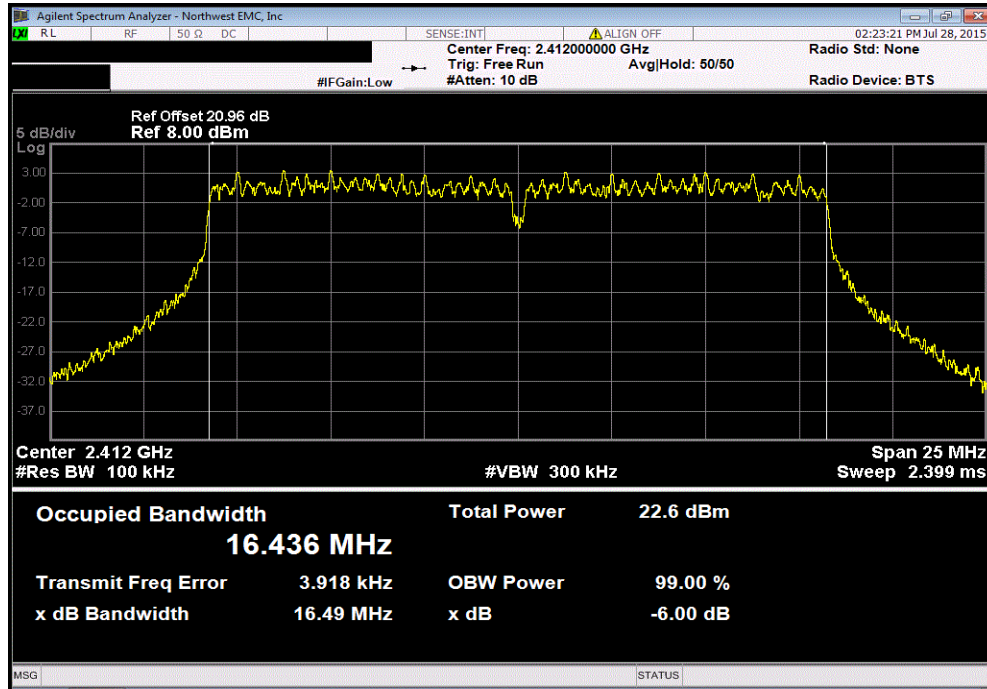
			Limit		
			Value	(>)	Result
			16.465 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

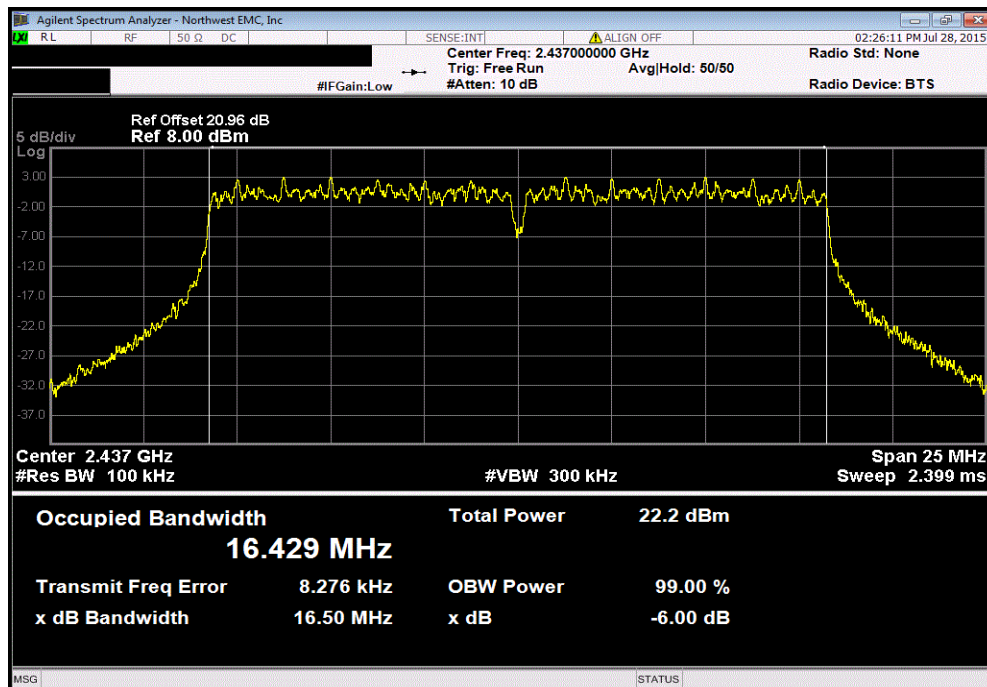
Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz

			Limit		
			Value	(>)	Result
			16.489 MHz	500 kHz	Pass



Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz

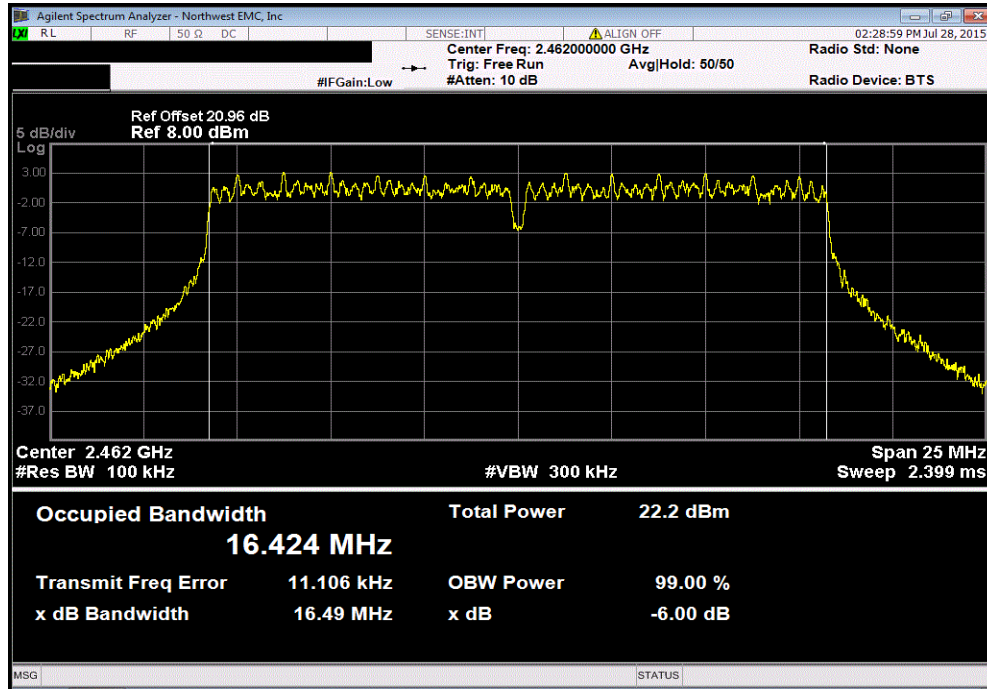
			Limit		
			Value	(>)	Result
			16.497 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

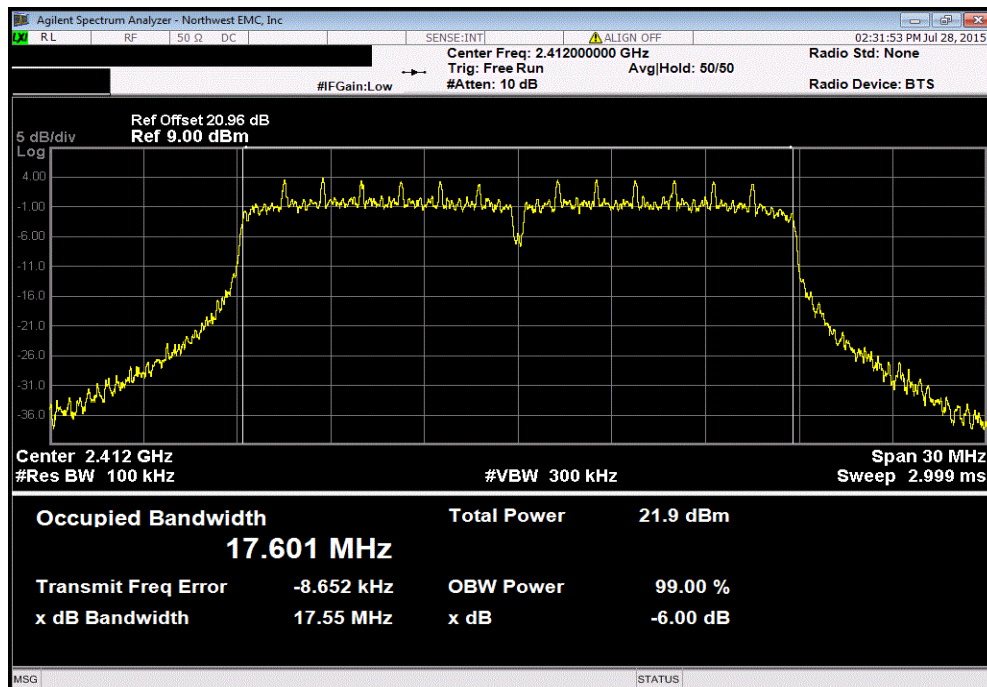
Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz

			Limit		
			Value	(>)	Result
			16.488 MHz	500 kHz	Pass



Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Low Channel 1, 2412 MHz

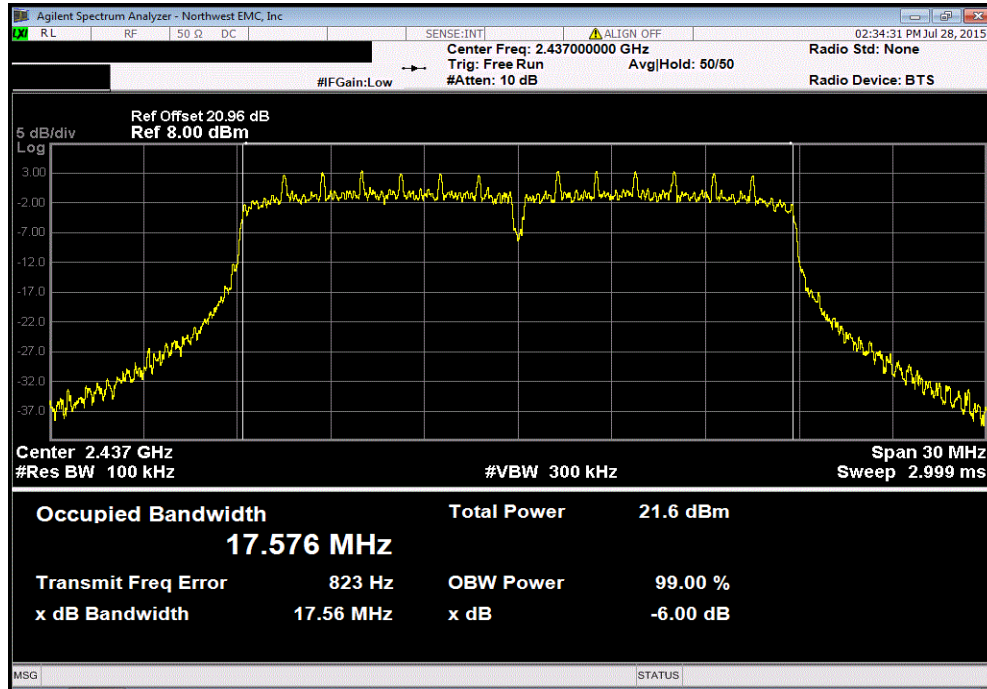
			Limit		
			Value	(>)	Result
			17.553 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

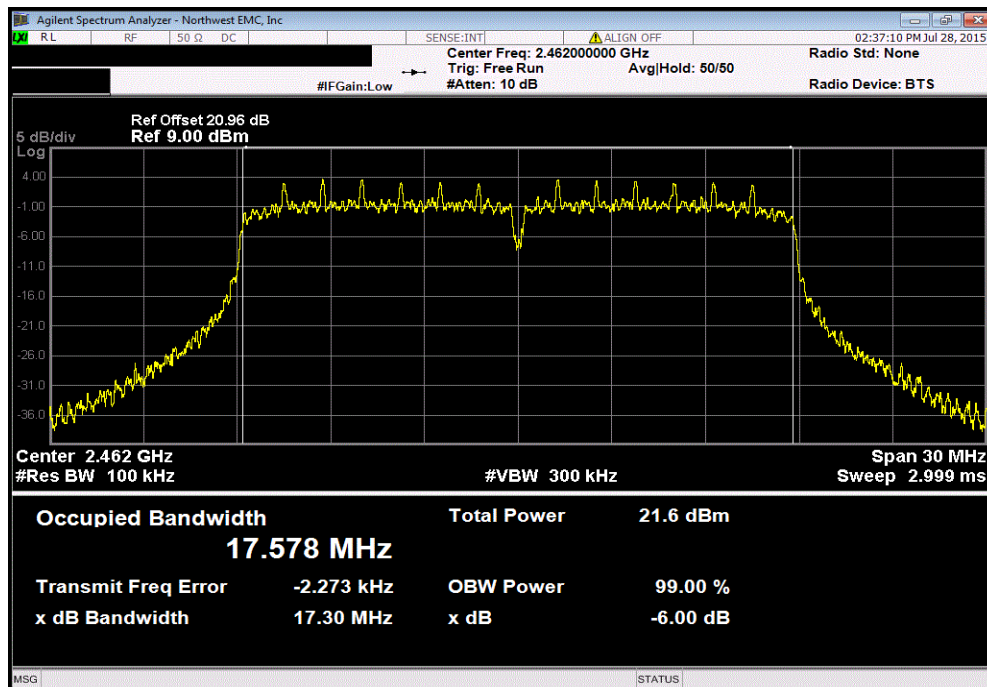
Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Mid Channel 6, 2437 MHz

			Value	Limit	Result
				(>)	
			17.559 MHz	500 kHz	Pass



Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz

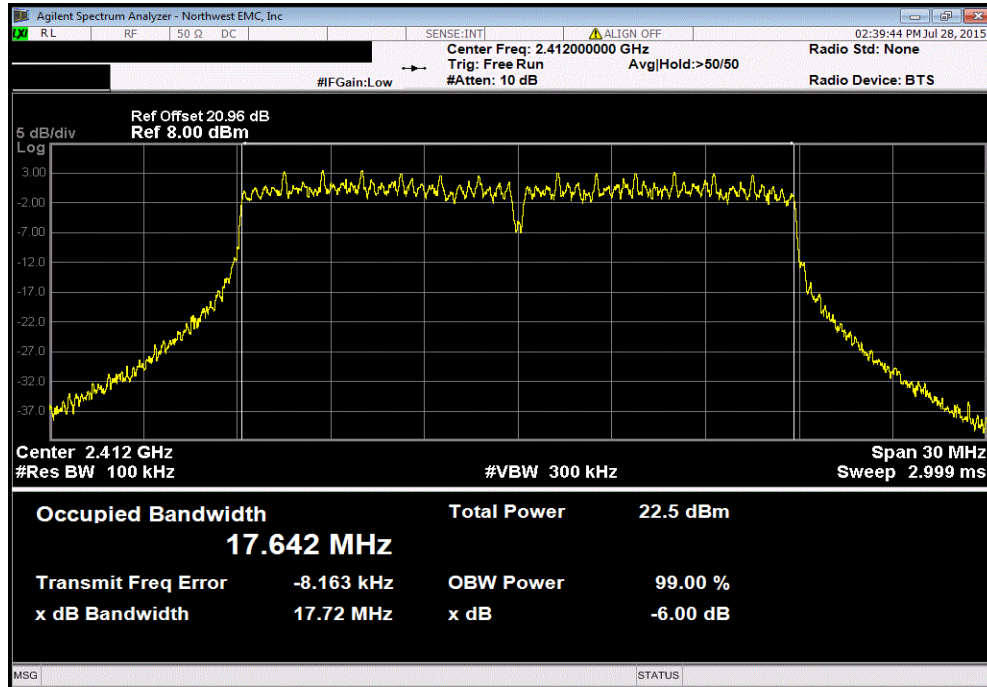
			Value	Limit	Result
				(>)	
			17.296 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

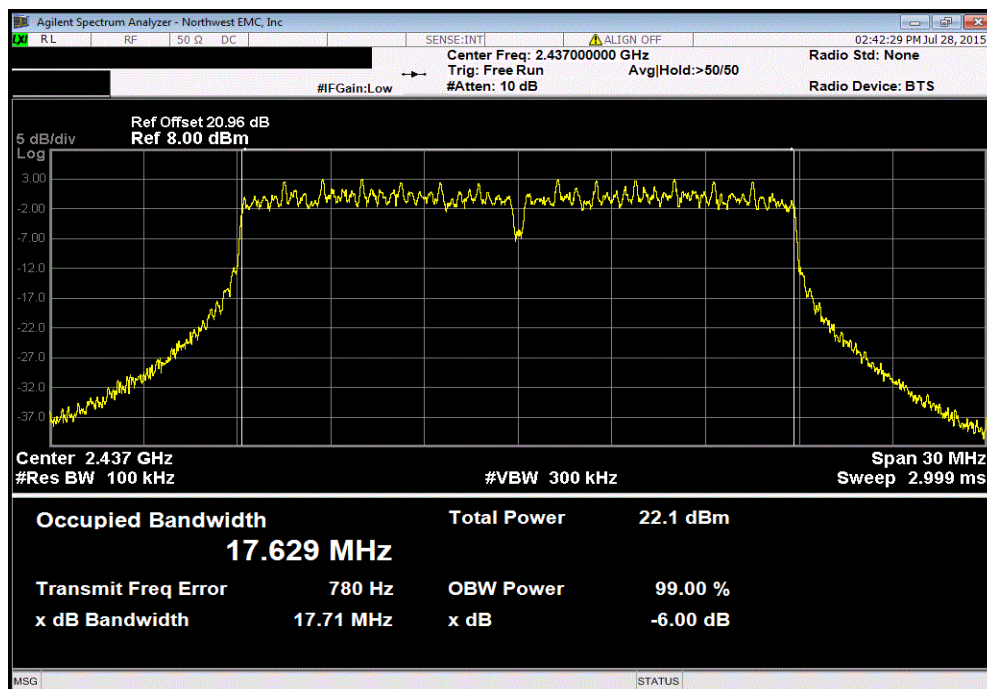
Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Low Channel 1, 2412 MHz

	Value	Limit	Result
	17.716 MHz	(>) 500 kHz	Pass



Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Mid Channel 6, 2437 MHz

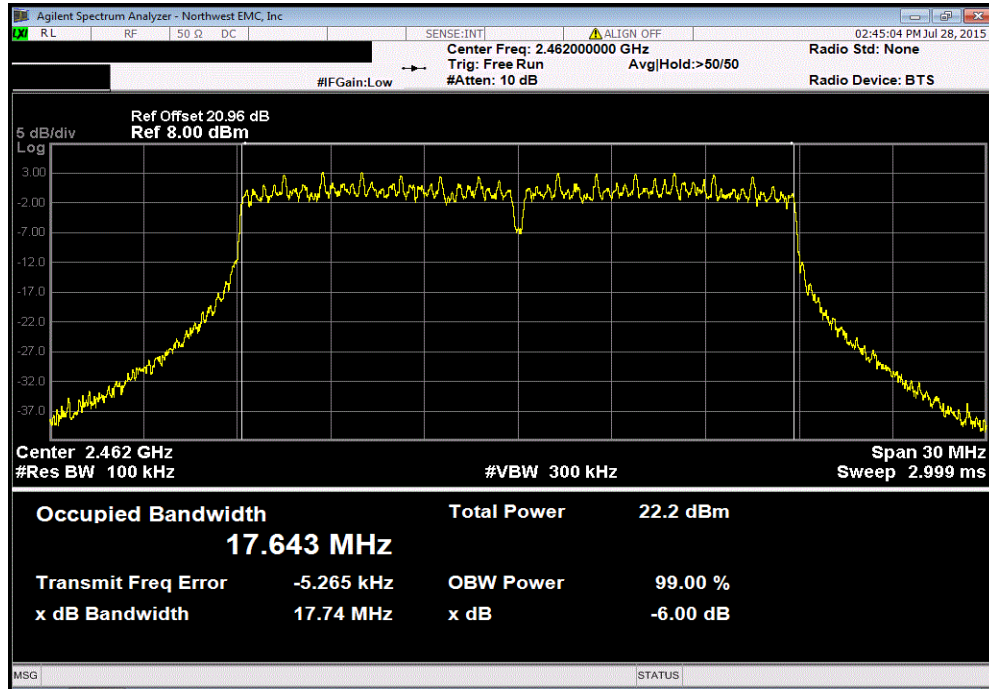
	Value	Limit	Result
	17.711 MHz	(>) 500 kHz	Pass



OCCUPIED BANDWIDTH

Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, High Channel 11, 2462 MHz

			Value	Limit	Result
			17.742 MHz	500 kHz	Pass



OUTPUT POWER

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval (mos)
Block - DC	Fairview Microwave	SD3379	AMM	2/27/2015	12
Attenuator	Fairview Microwave	SA4018-20	TQY	2/27/2015	12
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFD	7/23/2015	12
Generator - Signal	Agilent	N5173B	TIW	7/15/2014	36

TEST DESCRIPTION

The transmit frequency was set to the required channels in each band. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

Prior to measuring peak transmit power; the emission bandwidth (B) and the transmission pulse duration (T) were measured. Both are required to determine the method of measuring Maximum Conducted Output Power. The transmission pulse duration (T) was measured using a zero span on the spectrum analyzer to see the pulses in the time domain.

The channel power integration method found in KDB 558074 DTS D01 Measurement Section 9.1.2 was used because the DTS Bandwidth of the radio was greater than the RBW on the analyzer.

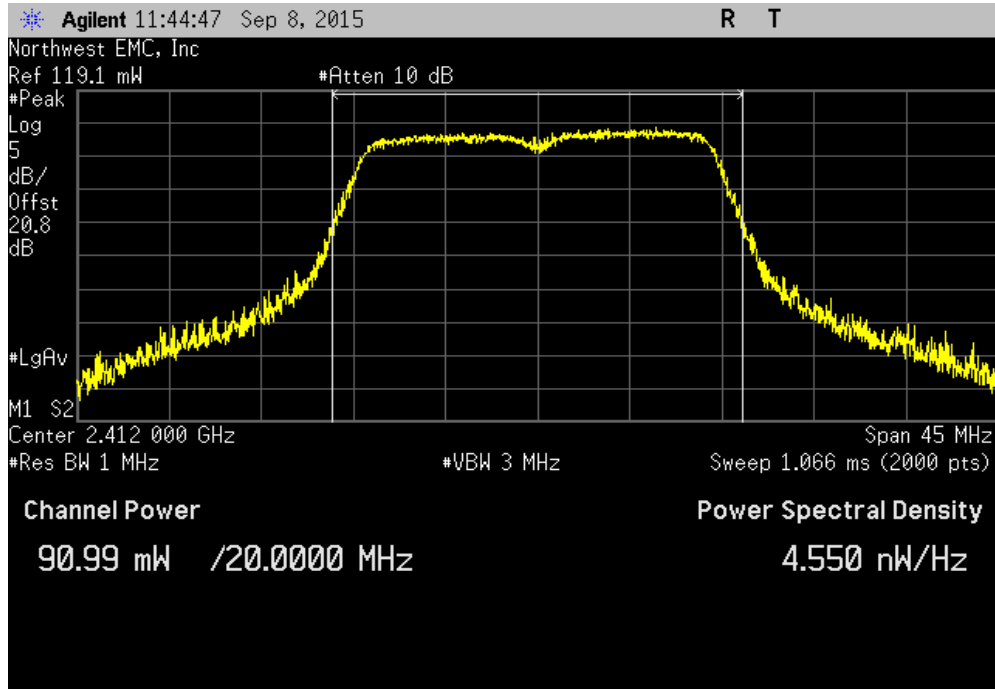
De Facto EIRP Limit: Per 47 CFR 15.247 (b)(1-3), the EUT meets the de facto EIRP limit of +36 dBm.

OUTPUT POWER

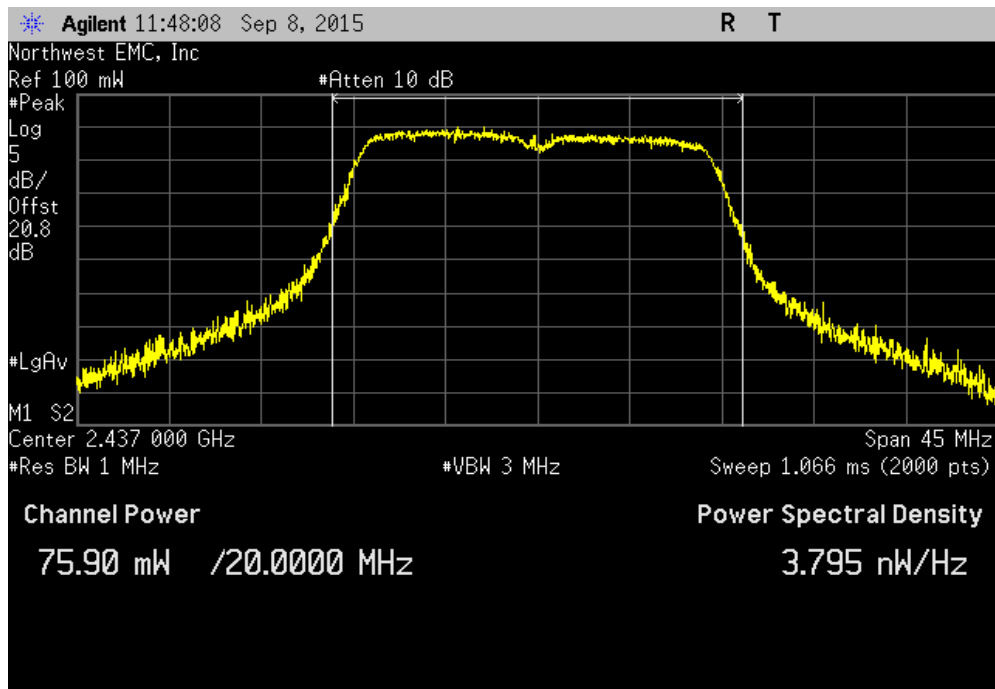
EUT:	Firebox T50-W (BS5AE7W)		Work Order:	VDEI0009			
Serial Number:	70AF02717-B385		Date:	09/08/15			
Customer:	WatchGuard Technologies, Inc.		Temperature:	24.2°C			
Attendees:	None		Humidity:	44%			
Project:	None		Barometric Pres.:	1015 mbar			
Tested by:	Jonathan Kiefer	Power:	110VAC/60Hz	Job Site:	TX09		
TEST SPECIFICATIONS			Test Method				
FCC 15.247:2015			ANSI C63.10:2013				
COMMENTS							
2x2 MIMO mode, Chain AB (Chains 0 and 1).							
DEVIATIONS FROM TEST STANDARD							
None							
Configuration #	5	Signature 					
			Value	Limit (<)	Result		
Chain A							
20 MHz							
2400 MHz - 2483.5 MHz Band							
802.11(n) MCS8							
Low Channel 1, 2412 MHz			90.99 mW	1 W	Pass		
Mid Channel 6, 2437 MHz			75.897 mW	1 W	Pass		
High Channel 11, 2462 MHz			77.122 mW	1 W	Pass		
802.11(n) MCS15							
Low Channel 1, 2412 MHz			31.263 mW	1 W	Pass		
Mid Channel 6, 2437 MHz			29.63 mW	1 W	Pass		
High Channel 11, 2462 MHz			29.475 mW	1 W	Pass		
Chain B							
20 MHz							
2400 MHz - 2483.5 MHz Band							
802.11(n) MCS8							
Low Channel 1, 2412 MHz			126.067 mW	1 W	Pass		
Mid Channel 6, 2437 MHz			103.662 mW	1 W	Pass		
High Channel 11, 2462 MHz			98.912 mW	1 W	Pass		
802.11(n) MCS15							
Low Channel 1, 2412 MHz			41.225 mW	1 W	Pass		
Mid Channel 6, 2437 MHz			34.935 mW	1 W	Pass		
High Channel 11, 2462 MHz			32.061 mW	1 W	Pass		
Power Summing, Chain AB							
20 MHz							
2400 MHz - 2483.5 MHz Band							
802.11(n) MCS8			Chain A (mW)	Chain B (mW)	Summed Power (dBm)		
			Limit (dBm)		Result		
Low Channel 1, 2412 MHz			90.99	120.067	23.24399761	30	Pass
Mid Channel 6, 2437 MHz			75.897	103.662	22.54207178	30	Pass
High Channel 11, 2462 MHz			77.122	98.912	22.45596558	30	Pass
802.11(n) MCS15							
Low Channel 1, 2412 MHz			31.263	41.225	18.60266117	30	Pass
Mid Channel 6, 2437 MHz			29.63	34.935	18.09997155	30	Pass
High Channel 11, 2462 MHz			29.475	32.061	17.89129263	30	Pass

OUTPUT POWER

Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS8, Low Channel 1, 2412 MHz						
				Value	Limit (<)	Result
				90.99 mW	1 W	Pass



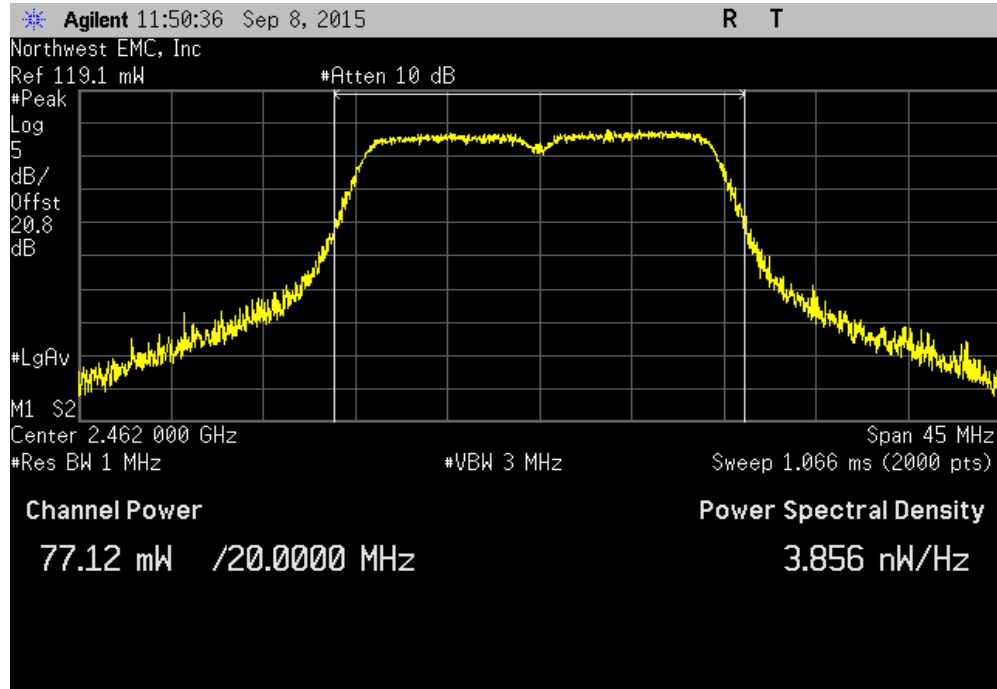
Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS8, Mid Channel 6, 2437 MHz						
				Value	Limit (<)	Result
				75.897 mW	1 W	Pass



OUTPUT POWER

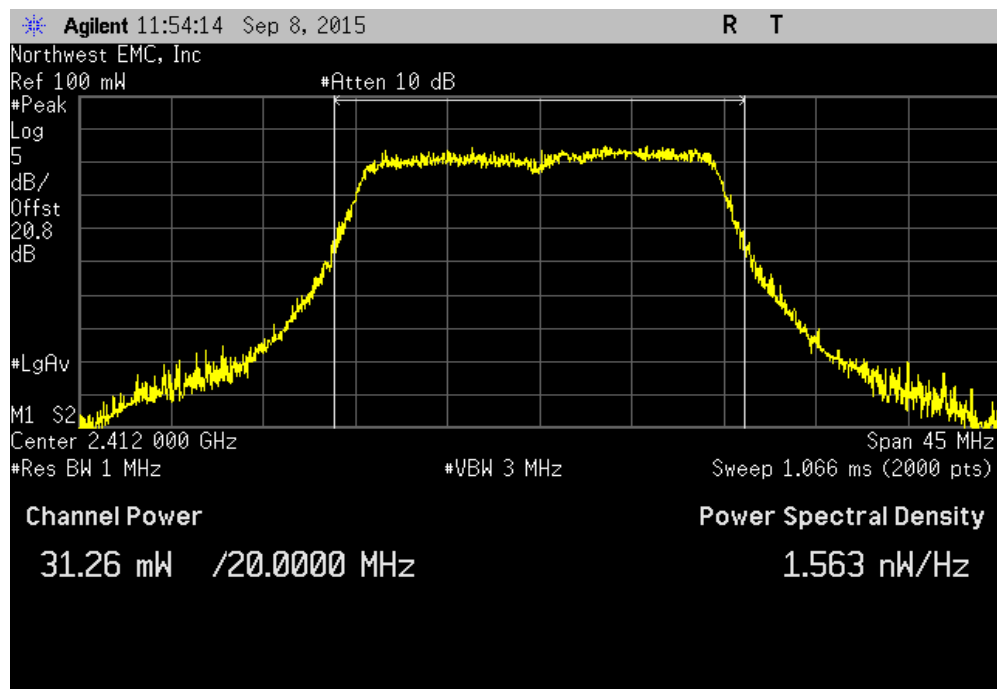
Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS8, High Channel 11, 2462 MHz

	Value	Limit ($\leq$)	Result
	77.122 mW	1 W	Pass



Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS15, Low Channel 1, 2412 MHz

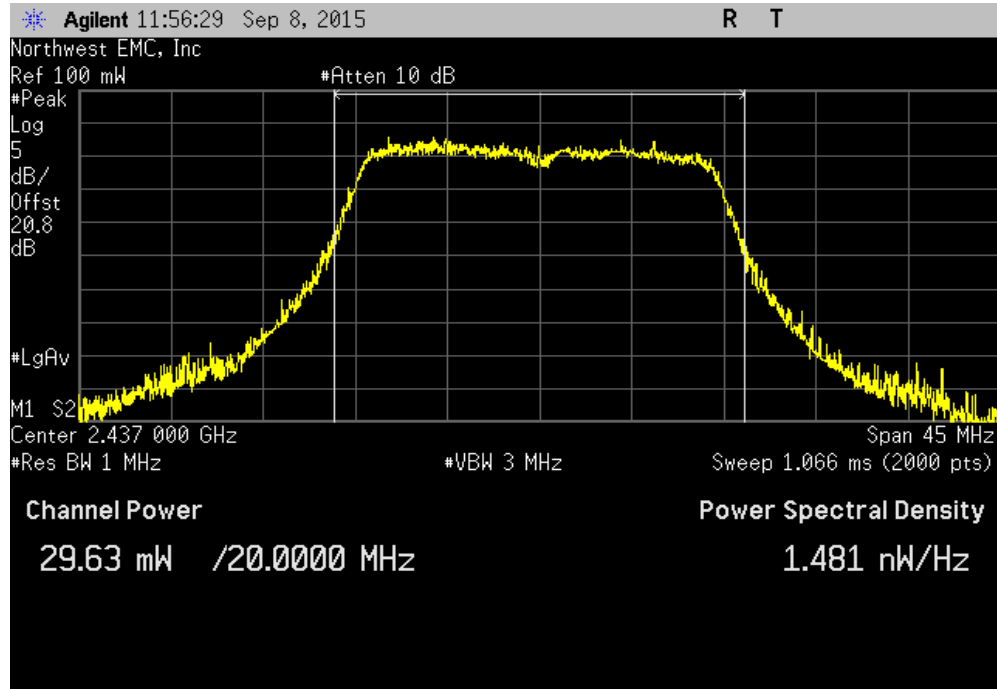
	Value	Limit ($\leq$)	Result
	31.263 mW	1 W	Pass



OUTPUT POWER

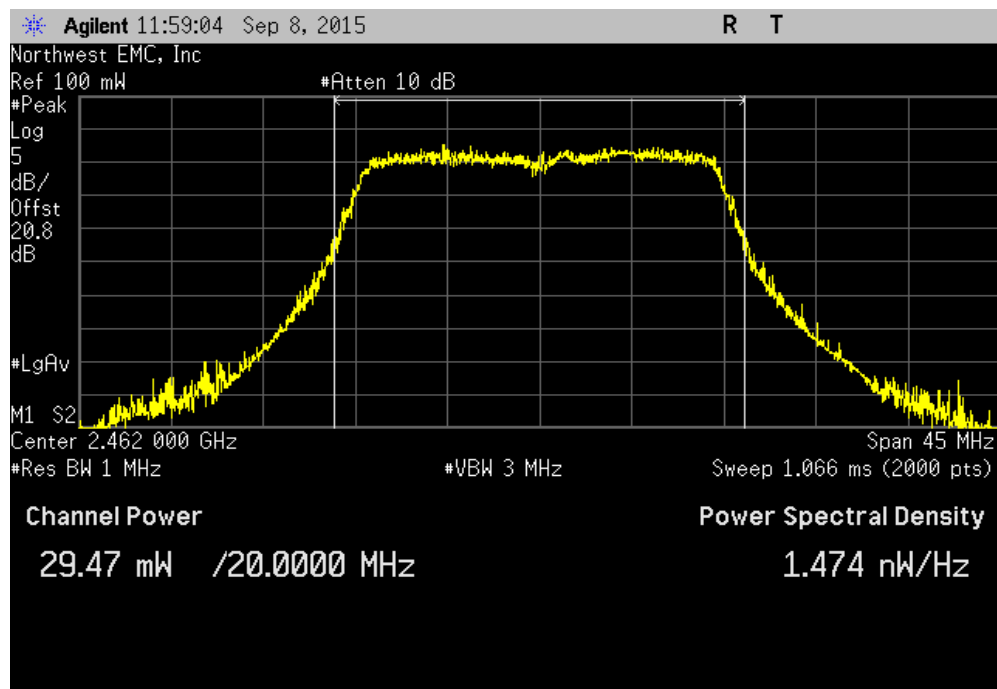
Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS15, Mid Channel 6, 2437 MHz

Value	Limit ($\leq$)	Result
29.63 mW	1 W	Pass



Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS15, High Channel 11, 2462 MHz

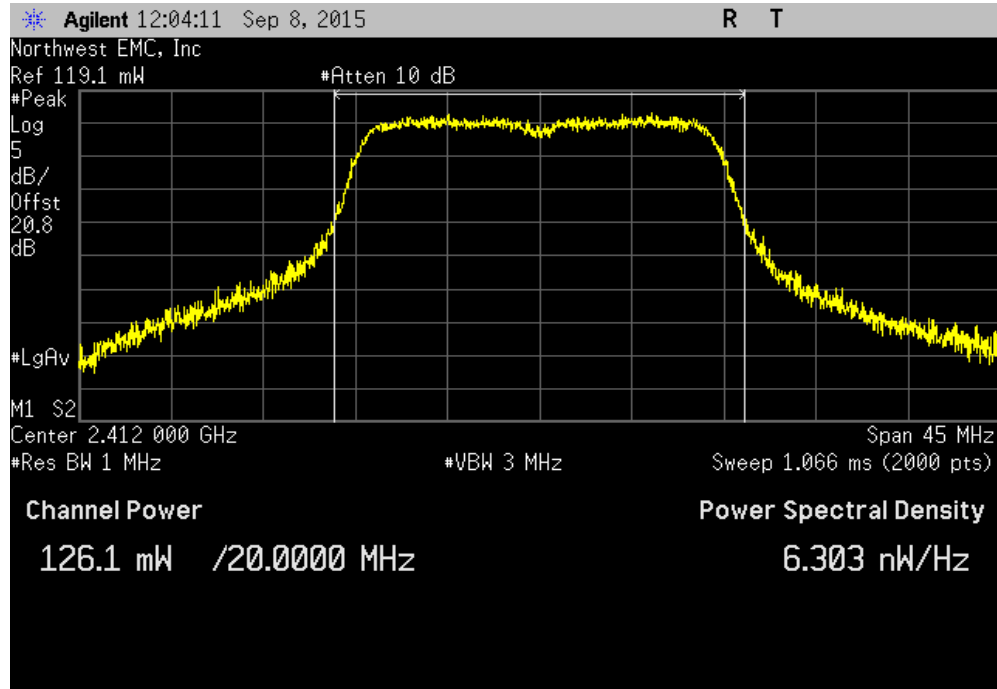
Value	Limit ($\leq$)	Result
29.475 mW	1 W	Pass



OUTPUT POWER

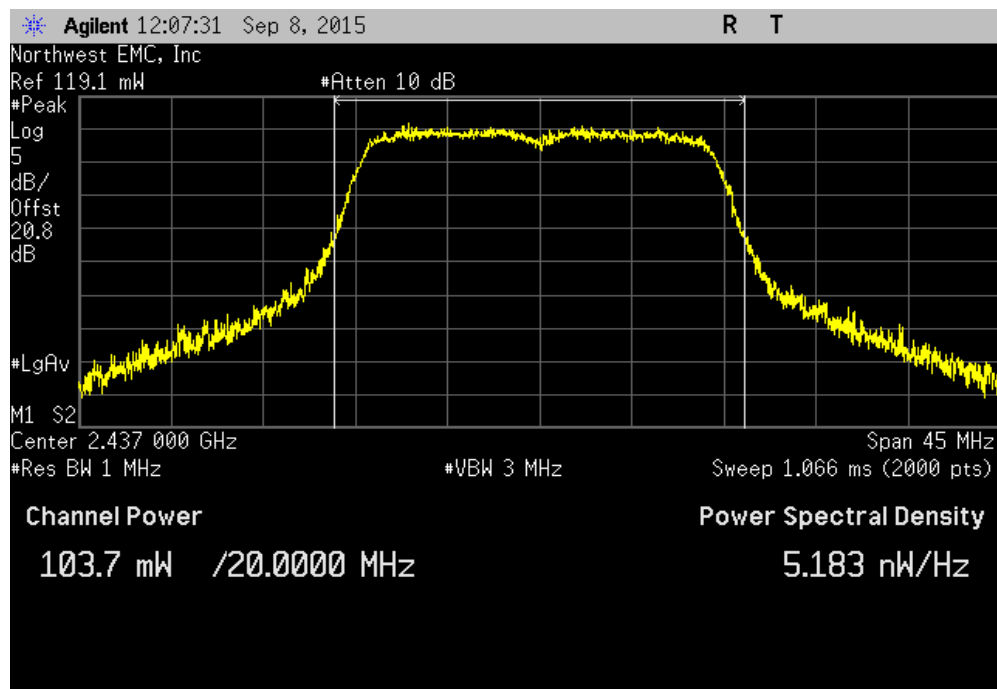
Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS8, Low Channel 1, 2412 MHz

	Value	Limit (<)	Result
	126.067 mW	1 W	Pass



Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS8, Mid Channel 6, 2437 MHz

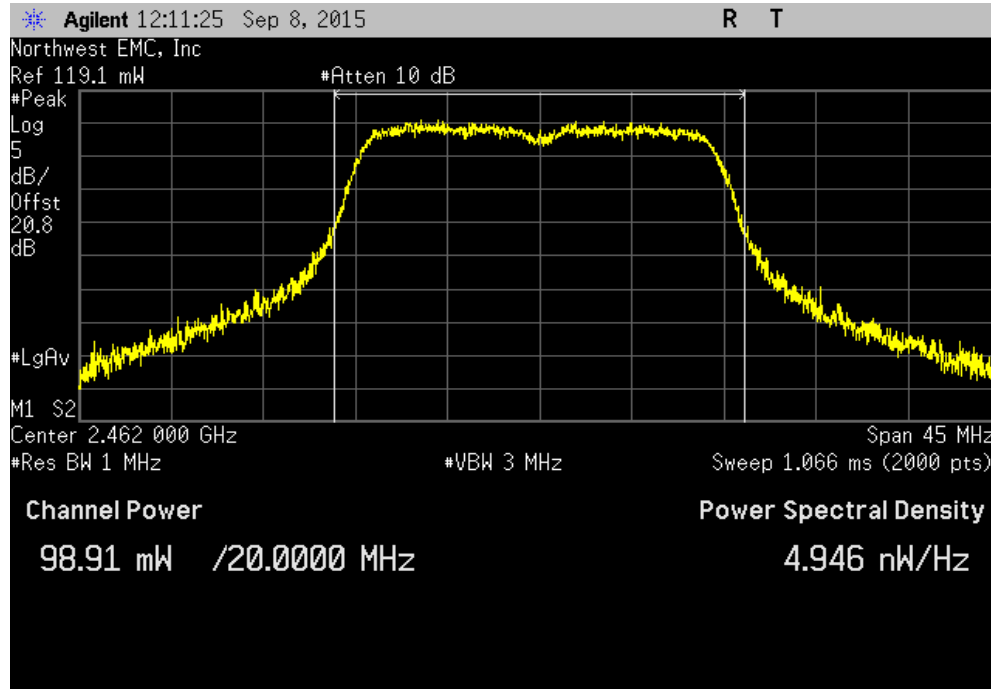
	Value	Limit (<)	Result
	103.662 mW	1 W	Pass



OUTPUT POWER

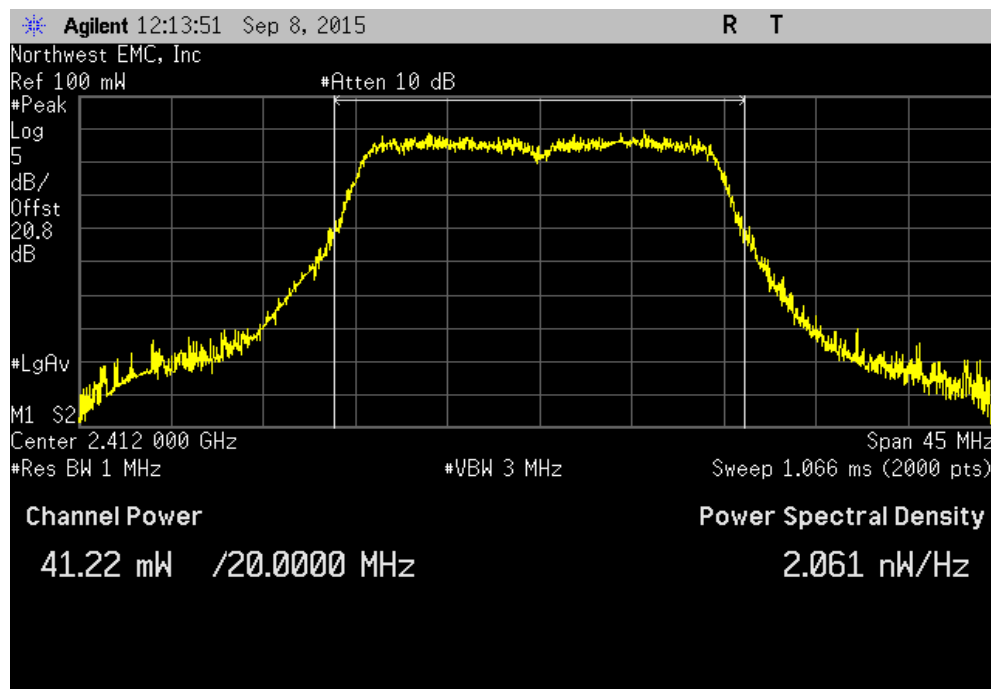
Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS8, High Channel 11, 2462 MHz

	Value	Limit (<)	Result
	98.912 mW	1 W	Pass



Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS15, Low Channel 1, 2412 MHz

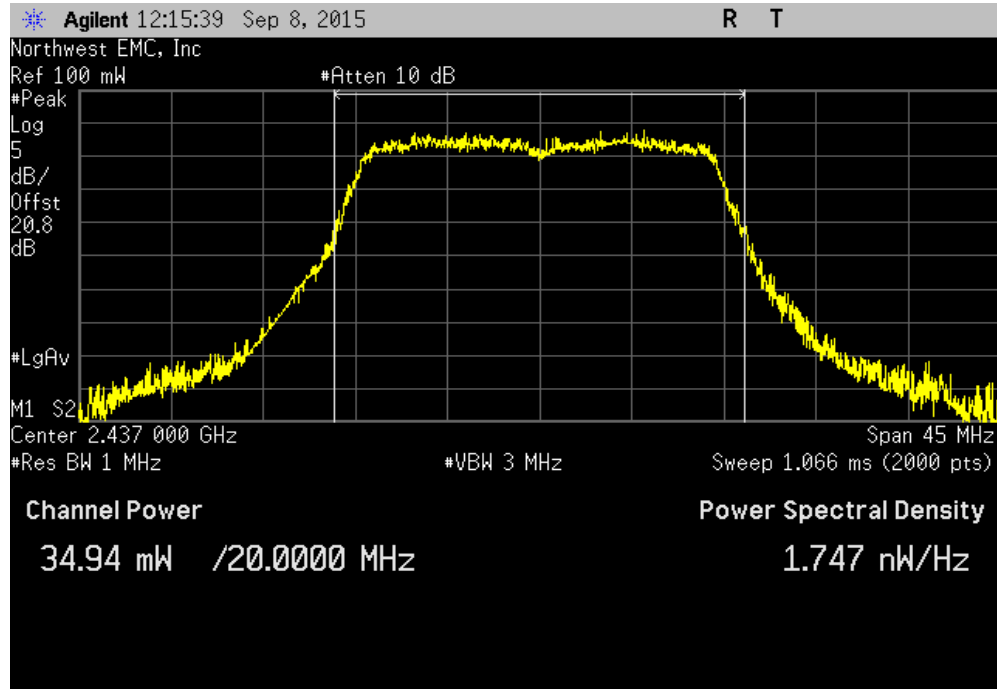
	Value	Limit (<)	Result
	41.225 mW	1 W	Pass



OUTPUT POWER

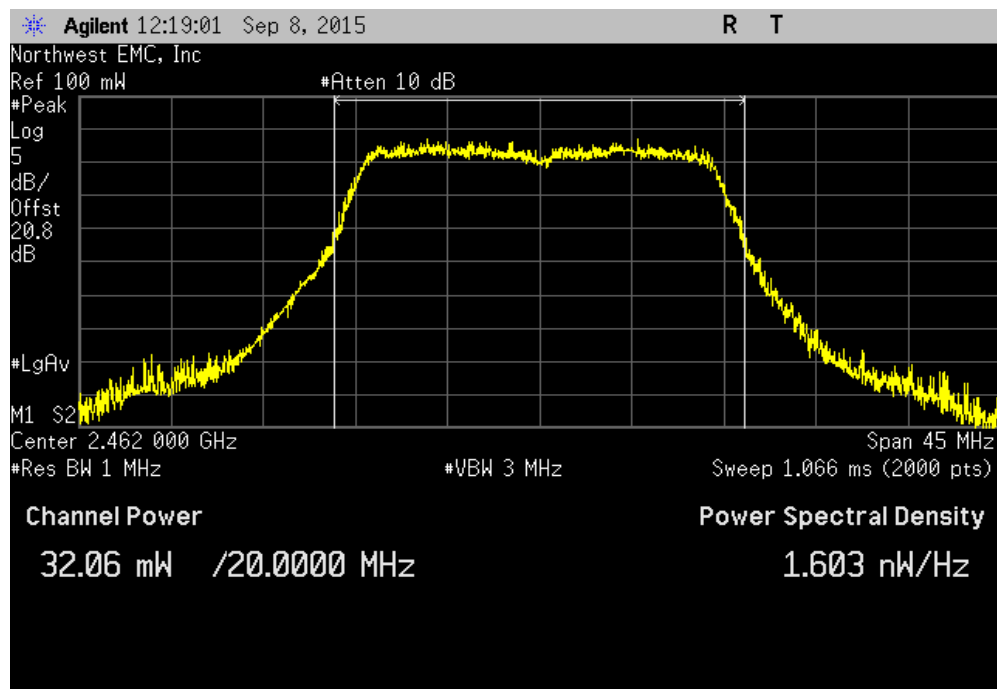
Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS15, Mid Channel 6, 2437 MHz

Value	Limit (<)	Result
34.935 mW	1 W	Pass



Chain B, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS15, High Channel 11, 2462 MHz

Value	Limit (<)	Result
32.061 mW	1 W	Pass



OUTPUT POWER

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval (mos)
Attenuator	Fairview Microwave	SA4018-20	TQY	2/27/2015	12
Block - DC	Fairview Microwave	SD3379	AMM	2/27/2015	12
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFD	7/23/2015	12
Generator - Signal	Agilent	N5173B	TIW	7/15/2014	36

TEST DESCRIPTION

The transmit frequency was set to the required channels in each band. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

Prior to measuring peak transmit power; the emission bandwidth (B) and the transmission pulse duration (T) were measured. Both are required to determine the method of measuring Maximum Conducted Output Power. The transmission pulse duration (T) was measured using a zero span on the spectrum analyzer to see the pulses in the time domain.

The channel power integration method found in KDB 558074 DTS D01 Measurement Section 9.1.2 was used because the DTS Bandwidth of the radio was greater than the RBW on the analyzer.

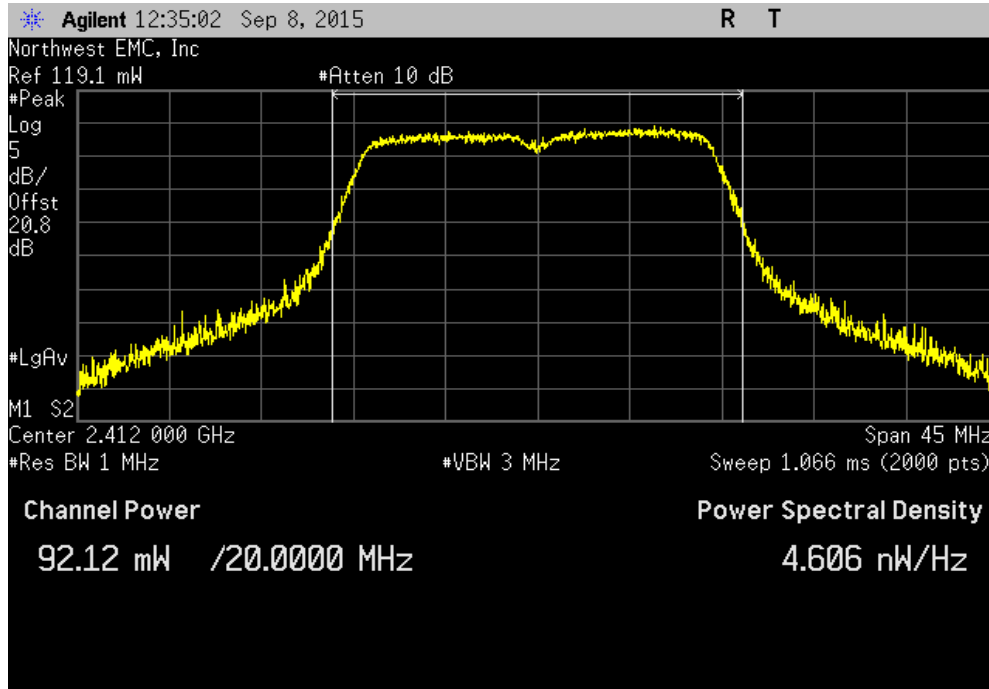
De Facto EIRP Limit: Per 47 CFR 15.247 (b)(1-3), the EUT meets the de facto EIRP limit of +36 dBm.

OUTPUT POWER

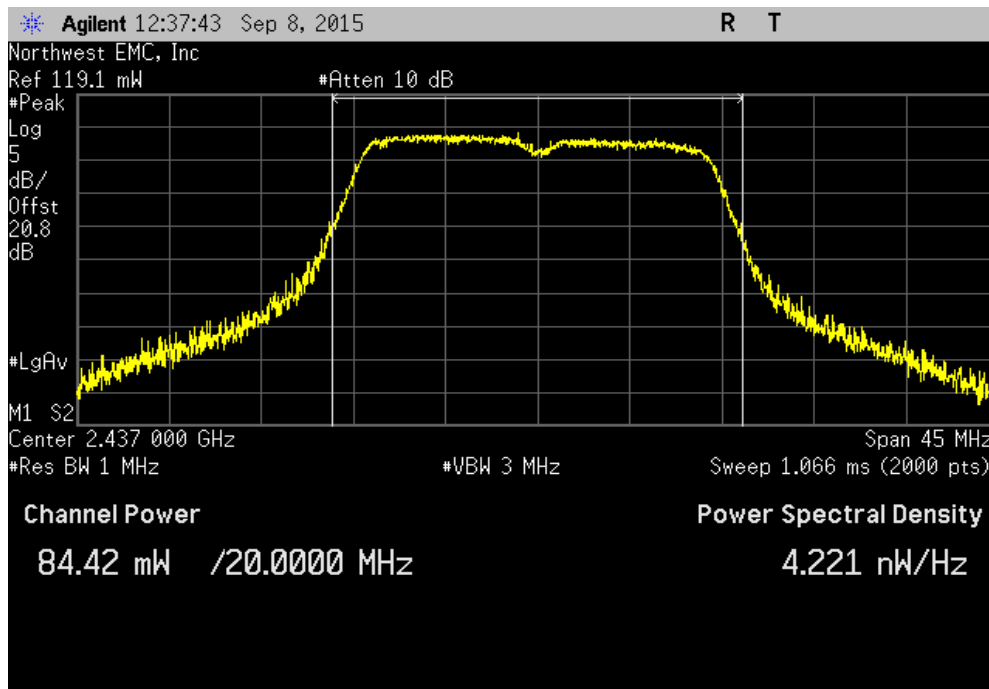
EUT: Firebox T50-W (BS5AE7W)		Work Order: VDEI0009							
Serial Number: 70AF02717-B385		Date: 09/08/15							
Customer: WatchGuard Technologies, Inc.		Temperature: 24.2°C							
Attendees: None		Humidity: 44%							
Project: None		Barometric Pres.: 1015 mbar							
Tested by: Jonathan Kiefer		Power: 110VAC/60Hz	Job Site: TX09						
TEST SPECIFICATIONS		Test Method							
FCC 15.247:2015		ANSI C63.10:2013							
COMMENTS									
2x2 MIMO mode, Chain AC (Chains 0 and 2).									
DEVIATIONS FROM TEST STANDARD									
None									
Configuration #	5	Signature 							
		Value	Limit (<)	Result					
Chain A									
20 MHz									
2400 MHz - 2483.5 MHz Band									
802.11(n) MCS8									
Low Channel 1, 2412 MHz					92.12 mW	1 W	Pass		
Mid Channel 6, 2437 MHz					84.424 mW	1 W	Pass		
High Channel 11, 2462 MHz					87.226 mW	1 W	Pass		
802.11(n) MCS15									
Low Channel 1, 2412 MHz					25.786 mW	1 W	Pass		
Mid Channel 6, 2437 MHz					28.37 mW	1 W	Pass		
High Channel 11, 2462 MHz					33.115 mW	1 W	Pass		
Chain C									
20 MHz									
2400 MHz - 2483.5 MHz Band									
802.11(n) MCS8									
Low Channel 1, 2412 MHz					96.132 mW	1 W	Pass		
Mid Channel 6, 2437 MHz					107.818 mW	1 W	Pass		
High Channel 11, 2462 MHz					83.384 mW	1 W	Pass		
802.11(n) MCS15									
Low Channel 1, 2412 MHz					38.235 mW	1 W	Pass		
Mid Channel 6, 2437 MHz					38.388 mW	1 W	Pass		
High Channel 11, 2462 MHz					37.231 mW	1 W	Pass		
Power Summing, Chain AC									
20 MHz									
2400 MHz - 2483.5 MHz Band									
802.11(n) MCS8					Chain A (mW)	Chain C (mW)	Summed Power (dBm)	Limit (dBm)	Result
Low Channel 1, 2412 MHz					92.12	96.132	22.74739599	30	Pass
Mid Channel 6, 2437 MHz					84.424	107.818	22.83848276	30	Pass
High Channel 11, 2462 MHz					87.226	83.384	22.32004483	30	Pass
802.11(n) MCS15									
Low Channel 1, 2412 MHz					25.786	38.235	18.06322453	30	Pass
Mid Channel 6, 2437 MHz					28.37	38.388	18.24503317	30	Pass
High Channel 11, 2462 MHz					33.115	37.231	18.47239408	30	Pass

OUTPUT POWER

Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS8, Low Channel 1, 2412 MHz						
				Value	Limit (<)	Result
				92.12 mW	1 W	Pass



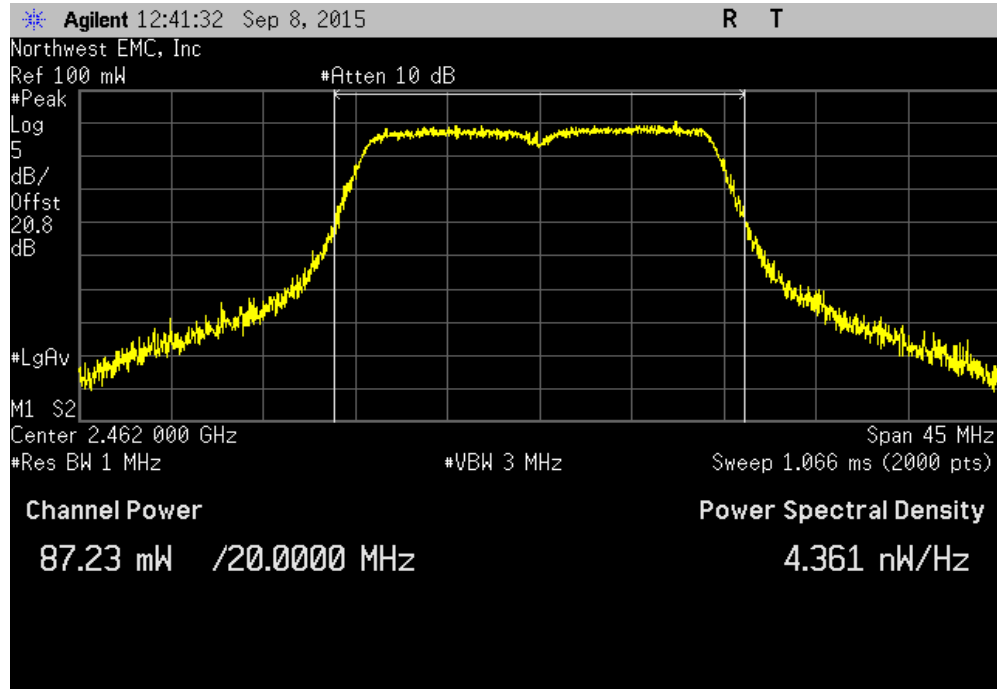
Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS8, Mid Channel 6, 2437 MHz						
				Value	Limit (<)	Result
				84.424 mW	1 W	Pass



OUTPUT POWER

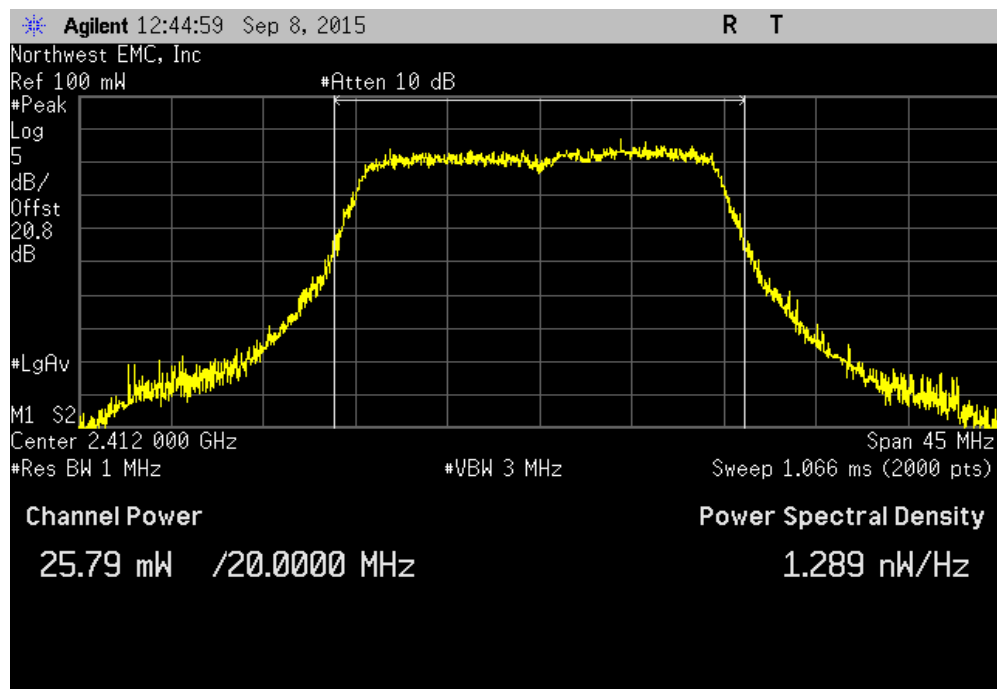
Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS8, High Channel 11, 2462 MHz

				Value	Limit	Result
				(<)		
				87.226 mW	1 W	Pass



Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS15, Low Channel 1, 2412 MHz

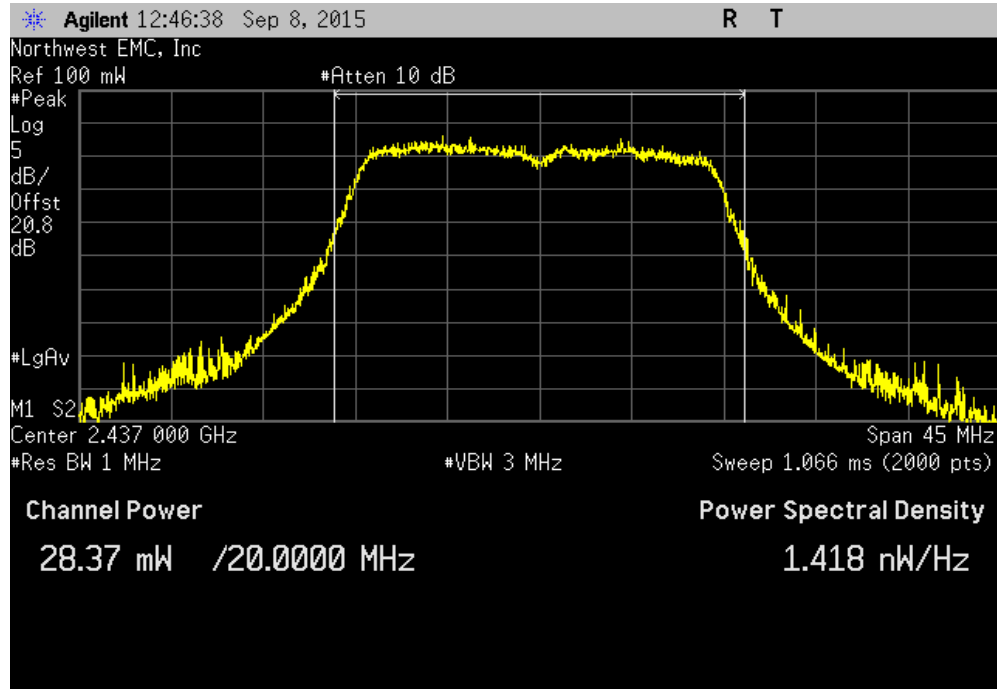
				Value	Limit	Result
				(<)		
				25.786 mW	1 W	Pass



OUTPUT POWER

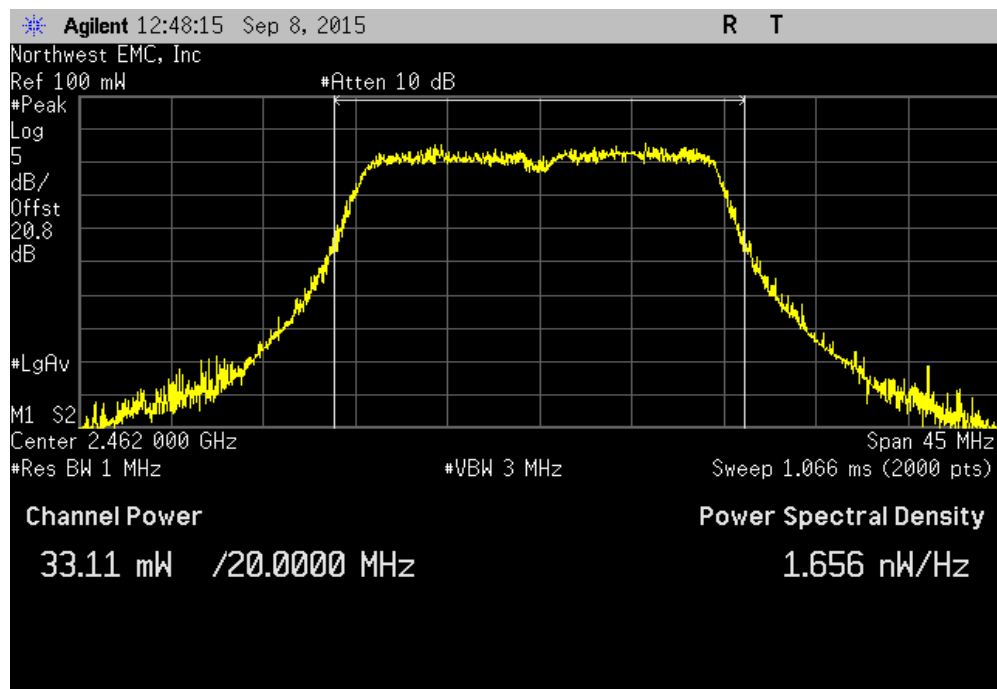
Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS15, Mid Channel 6, 2437 MHz

	Value	Limit (<)	Result
	28.37 mW	1 W	Pass



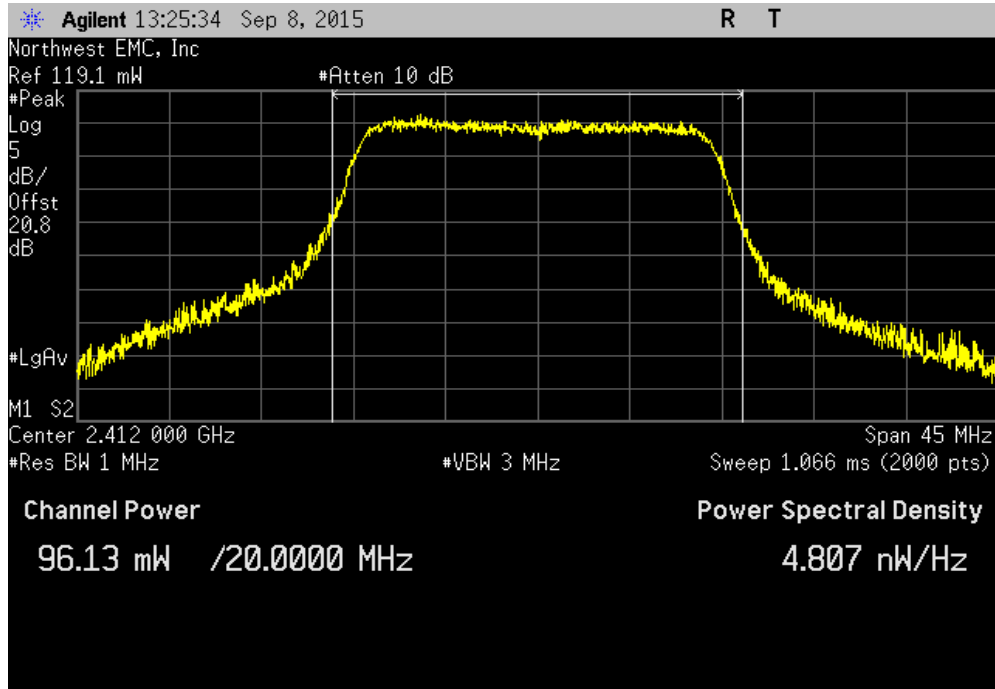
Chain A, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS15, High Channel 11, 2462 MHz

	Value	Limit (<)	Result
	33.115 mW	1 W	Pass

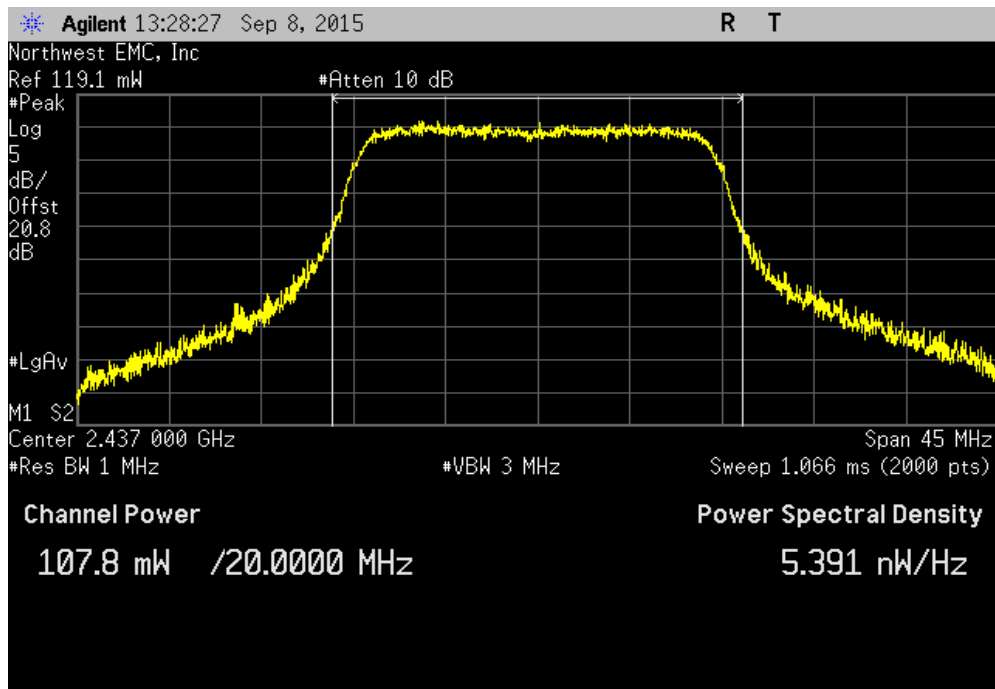


OUTPUT POWER

Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS8, Low Channel 1, 2412 MHz						
				Value	Limit (<)	Result
				96.132 mW	1 W	Pass



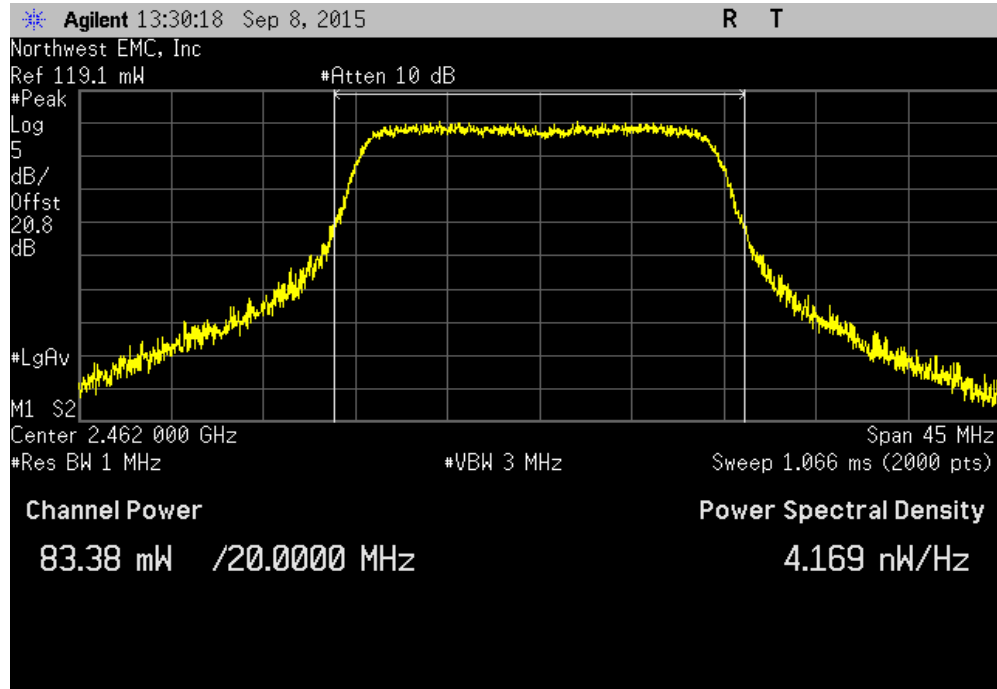
Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS8, Mid Channel 6, 2437 MHz						
				Value	Limit (<)	Result
				107.818 mW	1 W	Pass



OUTPUT POWER

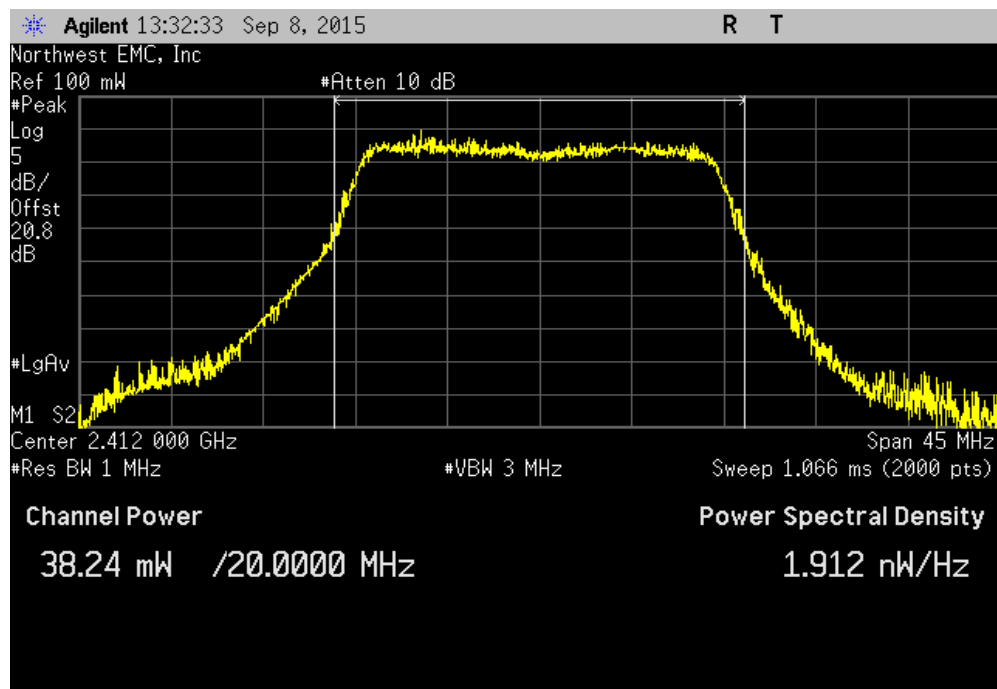
Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS8, High Channel 11, 2462 MHz

	Value	Limit (<)	Result
	83.384 mW	1 W	Pass



Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS15, Low Channel 1, 2412 MHz

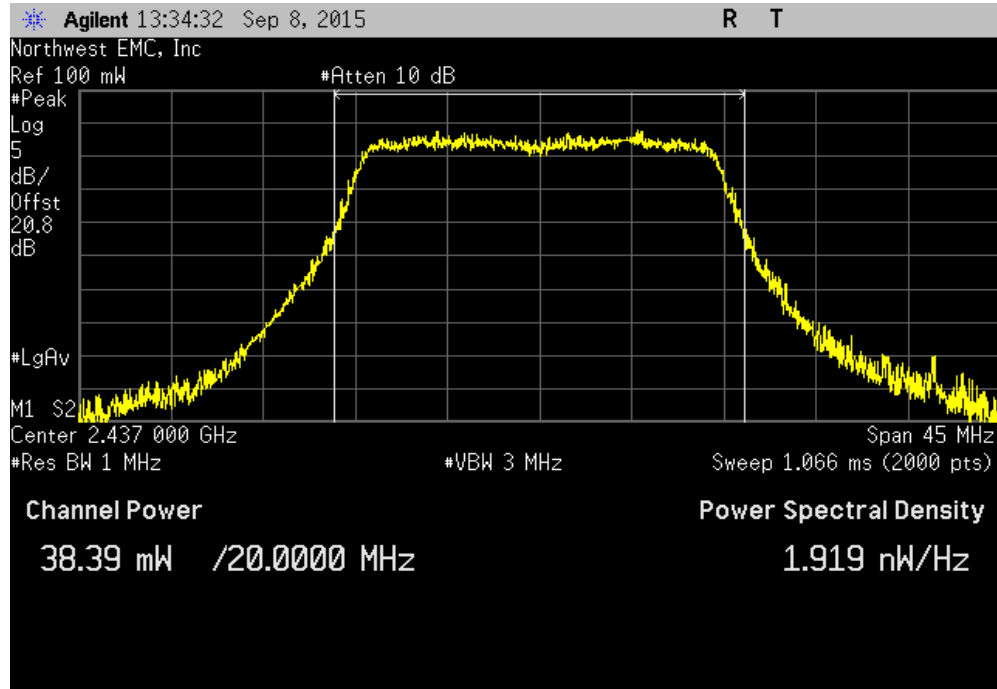
	Value	Limit (<)	Result
	38.235 mW	1 W	Pass



OUTPUT POWER

Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS15, Mid Channel 6, 2437 MHz

Value	Limit (<)	Result
38.388 mW	1 W	Pass



Chain C, 20 MHz, 2400 MHz - 2483.5 MHz Band, 802.11(n) MCS15, High Channel 11, 2462 MHz

Value	Limit (<)	Result
37.231 mW	1 W	Pass

