

EMISSION & 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 DESCRIPTION

5.2GHz band

FCC KDB 789033 General UNII Test Procedures were followed.

The transmit frequencies and data rates listed in the datasheet were measured in each band utilized by the radio. 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.

The spectrum analyzer settings were as follows:

- ☐ RBW = Approx. 1% of the emission bandwidth (B).
- ☐ VBW = > RBW
- ☐ Detector = Peak
- ☐ Trace mode = max hold

The spectrum analyzer occupied bandwidth measurement function was then used to measure 26 dB emission bandwidth.

There is no required limit to be met in the rule part for the 5.2GHz band. The purpose of the test is to both report the results as required by the KDB, and to utilize the emission bandwidth for setting the channel power integration bandwidth during conducted output power testing.

5.8GHz band

FCC KDB 789033 General UNII Test Procedures were followed to measure the minimum emission bandwidth for the 5.725-5.85 GHz band.

The transmit frequencies and data rates listed in the datasheet were measured in each band utilized by the radio. The transmit power was set to its default maximum.

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.

The spectrum analyzer settings were as follows:

- RBW = 100 kHz
- VBW = $\geq 3 \times$ RBW
- Detector = Peak
- Trace mode = max hold

The spectrum analyzer occupied bandwidth measurement function was then used to measure 6 dB emission bandwidth.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
DC Block, 40 GHz	Fairview Microwave	SD3379	AMM	2/27/2015	2/27/2016
Attenuator, 20dB, 40 GHz	Fairview Microwave	SA4018-20	TQY	2/27/2015	2/27/2016
Spectrum Analyzer	Agilent	N9010A	AFL	9/20/2014	9/20/2015
Signal Generator, 40 GHz	Agilent	N5173B	TIW	7/15/2014	7/15/2017

EMISSION & OCCUPIED BANDWIDTH

EUT:	Firebox T50-W (BS5AE7W)	Work Order:	VDEI0009
Serial Number:	70AF00069-3EB6	Date:	08/07/15
Customer:	WatchGuard Technologies, Inc.	Temperature:	25.8°C
Attendees:	None	Relative Humidity:	43%
Customer Project:	None	Bar. Pressure:	1013 mbar
Tested By:	Jonathan Kiefer	Job Site:	TX09
Power:	110VAC/60Hz	Configuration:	1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2015	ANSI C63.10:2013

COMMENTS

3x3 MIMO mode, Chain ABC (Chains 0, 1, and 2).

DEVIATIONS FROM TEST STANDARD

None

RESULTS

	Value	Limit (>)	Result
Chain A			
802.11(n) HT, MCS0			
80 MHz			
Low Channel 5210 MHz	87.081 MHz	N/A	N/A
Low Channel 5775 MHz	76.02 MHz	500 kHz	Pass
802.11(ac) VHT, MCS8 (256-QAM)			
20 MHz			
Low Channel 5180 MHz	22.562 MHz	N/A	N/A
High Channel 5240 MHz	23.754 MHz	N/A	N/A
Low Channel 5745 MHz	17.61 MHz	500 kHz	Pass
Mid Channel 5785 MHz	17.247 MHz	500 kHz	Pass
High Channel 5825 MHz	17.589 MHz	500 kHz	Pass
802.11(ac) VHT, MCS9 (256-QAM)			
80 MHz			
Low Channel 5210 MHz	93.927 MHz	N/A	N/A
Low Channel 5775 MHz	75.519 MHz	500 kHz	Pass
40 MHz			
Low Channel 5190 MHz	47.045 MHz	N/A	N/A
High Channel 5230 MHz	44.394 MHz	N/A	N/A
Low Channel 5755 MHz	36.065 MHz	500 kHz	Pass
High Channel 5795 MHz	36.095 MHz	500 kHz	Pass
802.11(n) HT, MCS16			
20 MHz			
Low Channel 5180 MHz	21.548 MHz	N/A	N/A
High Channel 5240 MHz	22.429 MHz	N/A	N/A
Low Channel 5745 MHz	17.531 MHz	500 kHz	Pass
Mid Channel 5785 MHz	17.569 MHz	500 kHz	Pass
High Channel 5825 MHz	17.561 MHz	500 kHz	Pass
40 MHz			
Low Channel 5190 MHz	43.799 MHz	N/A	N/A
High Channel 5230 MHz	45.155 MHz	N/A	N/A
Low Channel 5755 MHz	35.469 MHz	500 kHz	Pass

EMISSION & OCCUPIED BANDWIDTH

		Value	Limit (>)	Result
	High Channel 5795 MHz	36.314 MHz	500 kHz	Pass
802.11(n) HT, MCS23	20 MHz			
	Low Channel 5180 MHz	23.004 MHz	N/A	N/A
	High Channel 5240 MHz	23.637 MHz	N/A	N/A
	Low Channel 5745 MHz	17.542 MHz	500 kHz	Pass
	Mid Channel 5785 MHz	17.591 MHz	500 kHz	Pass
	High Channel 5825 MHz	17.576 MHz	500 kHz	Pass
	40 MHz			
	Low Channel 5190 MHz	45.765 MHz	N/A	N/A
	High Channel 5230 MHz	45.998 MHz	N/A	N/A
	Low Channel 5755 MHz	35.807 MHz	500 kHz	Pass
	High Channel 5795 MHz	35.238 MHz	500 kHz	Pass
Chain B				
802.11(n) HT, MCS0	80 MHz			
	Low Channel 5210 MHz	87.672 MHz	N/A	N/A
	Low Channel 5775 MHz	76.313 MHz	500 kHz	Pass
802.11(ac) VHT, MCS8 (256-QAM)	20 MHz			
	Low Channel 5180 MHz	22.549 MHz	N/A	N/A
	High Channel 5240 MHz	22.973 MHz	N/A	N/A
	Low Channel 5745 MHz	17.596 MHz	500 kHz	Pass
	Mid Channel 5785 MHz	17.57 MHz	500 kHz	Pass
	High Channel 5825 MHz	17.576 MHz	500 kHz	Pass
802.11(ac) VHT, MCS9 (256-QAM)	80 MHz			
	Low Channel 5210 MHz	93.514 MHz	N/A	N/A
	Low Channel 5775 MHz	75.202 MHz	500 kHz	Pass
	40 MHz			
	Low Channel 5190 MHz	46.407 MHz	N/A	N/A
	High Channel 5230 MHz	46.138 MHz	N/A	N/A
	Low Channel 5755 MHz	35.663 MHz	500 kHz	Pass
	High Channel 5795 MHz	36.342 MHz	500 kHz	Pass
802.11(n) HT, MCS16	20 MHz			
	Low Channel 5180 MHz	21.732 MHz	N/A	N/A
	High Channel 5240 MHz	21.573 MHz	N/A	N/A
	Low Channel 5745 MHz	16.935 MHz	500 kHz	Pass
	Mid Channel 5785 MHz	16.942 MHz	500 kHz	Pass
	High Channel 5825 MHz	17.572 MHz	500 kHz	Pass
	40 MHz			
	Low Channel 5190 MHz	45.059 MHz	N/A	N/A
	High Channel 5230 MHz	45.001 MHz	N/A	N/A
	Low Channel 5755 MHz	35.424 MHz	500 kHz	Pass
	High Channel 5795 MHz	35.714 MHz	500 kHz	Pass
802.11(n) HT, MCS23				

EMISSION & OCCUPIED BANDWIDTH

		Value	Limit (>)	Result
20 MHz				
	Low Channel 5180 MHz	24.429 MHz	N/A	N/A
	High Channel 5240 MHz	24.437 MHz	N/A	N/A
	Low Channel 5745 MHz	17.581 MHz	500 kHz	Pass
	Mid Channel 5785 MHz	17.589 MHz	500 kHz	Pass
	High Channel 5825 MHz	17.537 MHz	500 kHz	Pass
40 MHz				
	Low Channel 5190 MHz	47.233 MHz	N/A	N/A
	High Channel 5230 MHz	45.651 MHz	N/A	N/A
	Low Channel 5755 MHz	36.382 MHz	500 kHz	Pass
	High Channel 5795 MHz	36.325 MHz	500 kHz	Pass
Chain C				
802.11(n) HT, MCS0				
80 MHz				
	Low Channel 5210 MHz	84.564 MHz	N/A	N/A
	Low Channel 5775 MHz	76.361 MHz	500 kHz	Pass
802.11(ac) VHT, MCS8 (256-QAM)				
20 MHz				
	Low Channel 5180 MHz	23.128 MHz	N/A	N/A
	High Channel 5240 MHz	23.172 MHz	N/A	N/A
	Low Channel 5745 MHz	17.624 MHz	500 kHz	Pass
	Mid Channel 5785 MHz	17.658 MHz	500 kHz	Pass
	High Channel 5825 MHz	17.626 MHz	500 kHz	Pass
802.11(ac) VHT, MCS9 (256-QAM)				
80 MHz				
	Low Channel 5210 MHz	92.704 MHz	N/A	N/A
	Low Channel 5775 MHz	75.572 MHz	500 kHz	Pass
40 MHz				
	Low Channel 5190 MHz	47.358 MHz	N/A	N/A
	High Channel 5230 MHz	45.625 MHz	N/A	N/A
	Low Channel 5755 MHz	35.995 MHz	500 kHz	Pass
	High Channel 5795 MHz	36.074 MHz	500 kHz	Pass
802.11(n) HT, MCS16				
20 MHz				
	Low Channel 5180 MHz	21.754 MHz	N/A	N/A
	High Channel 5240 MHz	21.435 MHz	N/A	N/A
	Low Channel 5745 MHz	17.574 MHz	500 kHz	Pass
	Mid Channel 5785 MHz	17.573 MHz	500 kHz	Pass
	High Channel 5825 MHz	17.546 MHz	500 kHz	Pass
40 MHz				
	Low Channel 5190 MHz	42.732 MHz	N/A	N/A
	High Channel 5230 MHz	42.939 MHz	N/A	N/A
	Low Channel 5755 MHz	36.027 MHz	500 kHz	Pass
	High Channel 5795 MHz	36.098 MHz	500 kHz	Pass
802.11(n) HT, MCS23				
20 MHz				
	Low Channel 5180 MHz	22.343 MHz	N/A	N/A

EMISSION & OCCUPIED BANDWIDTH

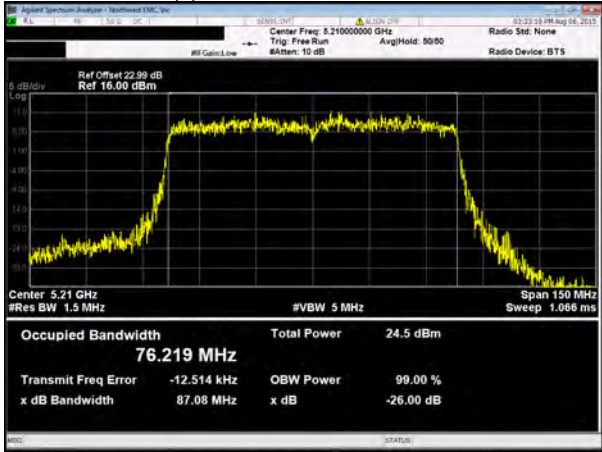
	Value	Limit (>)	Result
High Channel 5240 MHz	22.463 MHz	N/A	N/A
Low Channel 5745 MHz	17.615 MHz	500 kHz	Pass
Mid Channel 5785 MHz	17.652 MHz	500 kHz	Pass
High Channel 5825 MHz	17.657 MHz	500 kHz	Pass
40 MHz			
Low Channel 5190 MHz	44.279 MHz	N/A	N/A
High Channel 5230 MHz	44.351 MHz	N/A	N/A
Low Channel 5755 MHz	36.304 MHz	500 kHz	Pass
High Channel 5795 MHz	36.4 MHz	500 kHz	Pass

Jonathan Kiefer

Tested By

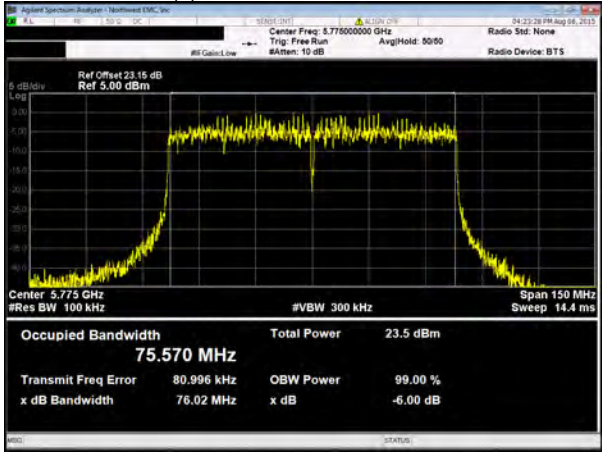
EMISSION & OCCUPIED BANDWIDTH

Chain A, 802.11(n) HT, MCS0, 80 MHz, Low Channel 5210 MHz



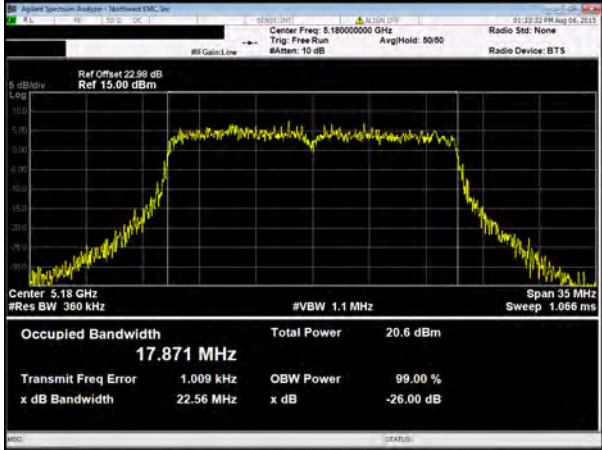
Value	87.081 MHz
Limit (>)	N/A
Result	N/A

Chain A, 802.11(n) HT, MCS0, 80 MHz, Low Channel 5775 MHz



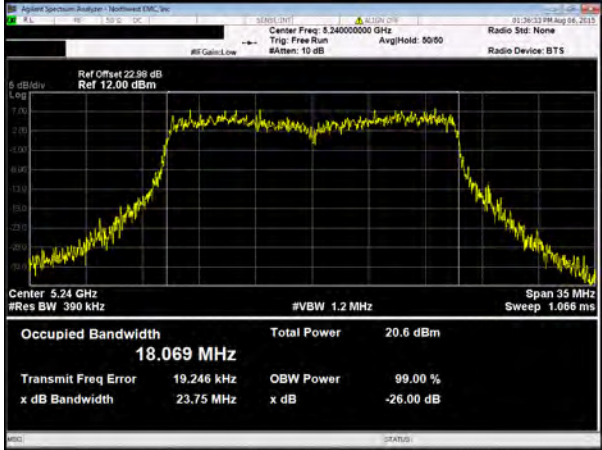
Value	76.02 MHz
Limit (>)	500 kHz
Result	Pass

Chain A, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, Low Channel 5180 MHz



Value	22.562 MHz
Limit (>)	N/A
Result	N/A

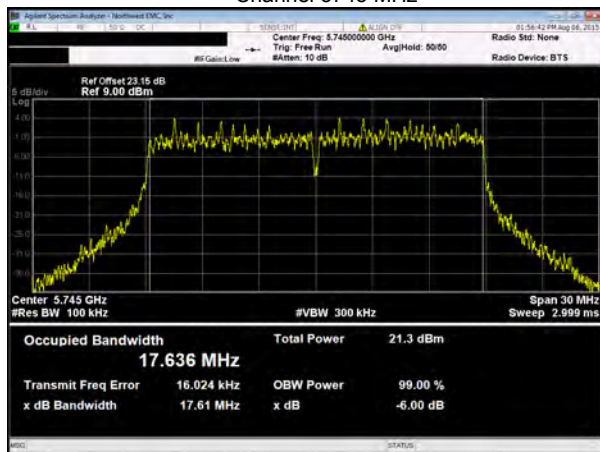
Chain A, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, High Channel 5240 MHz



Value	23.754 MHz
Limit (>)	N/A
Result	N/A

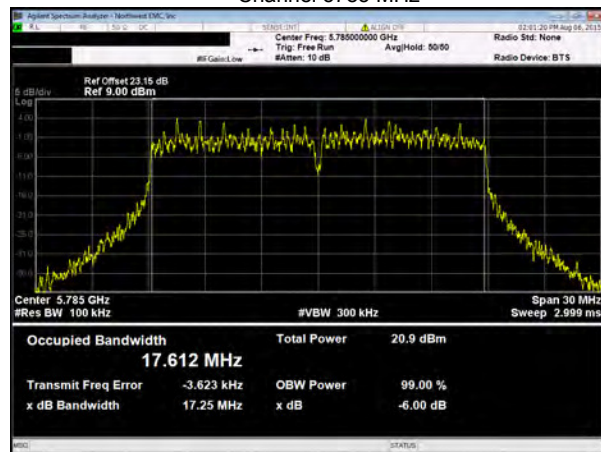
EMISSION & OCCUPIED BANDWIDTH

Chain A, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, Low
Channel 5745 MHz



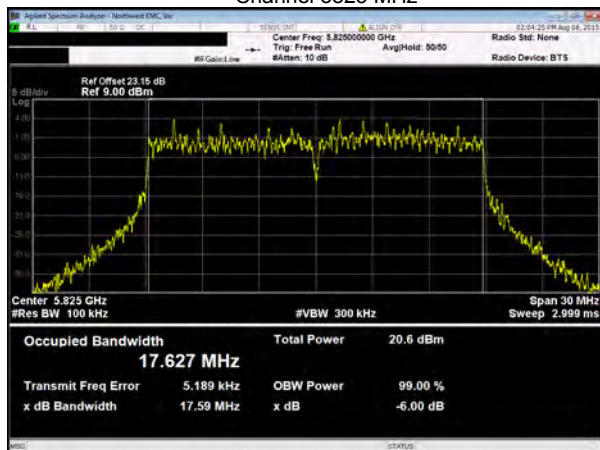
Value	17.61 MHz
Limit (>)	500 kHz
Result	Pass

Chain A, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, Mid
Channel 5785 MHz



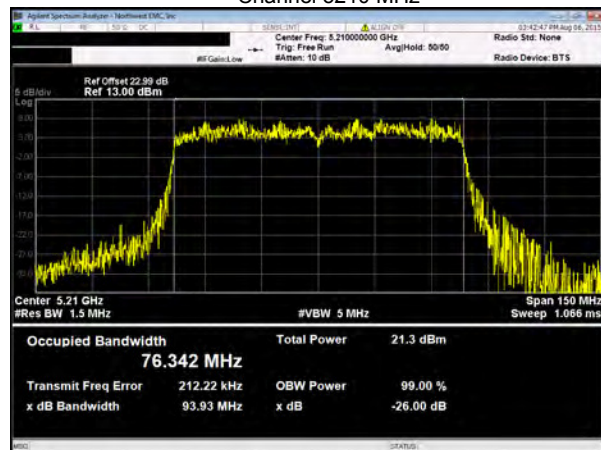
Value	17.247 MHz
Limit (>)	500 kHz
Result	Pass

Chain A, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, High
Channel 5825 MHz



Value	17.589 MHz
Limit (>)	500 kHz
Result	Pass

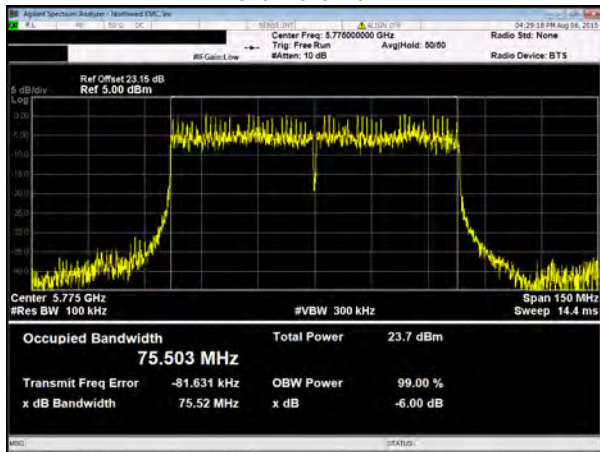
Chain A, 802.11(ac) VHT, MCS9 (256-QAM), 80 MHz, Low
Channel 5210 MHz



Value	93.927 MHz
Limit (>)	N/A
Result	N/A

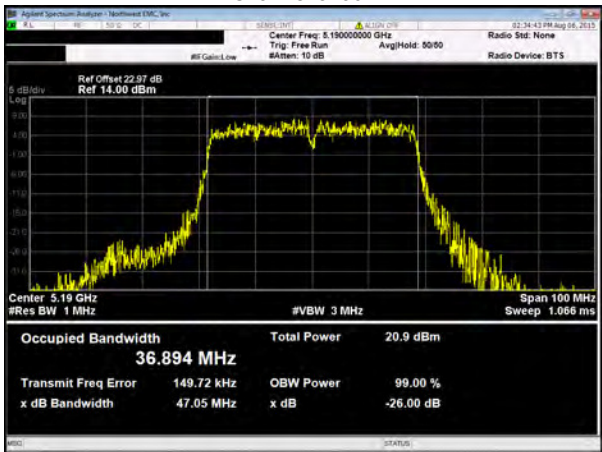
EMISSION & OCCUPIED BANDWIDTH

Chain A, 802.11(ac) VHT, MCS9 (256-QAM), 80 MHz, Low
Channel 5775 MHz



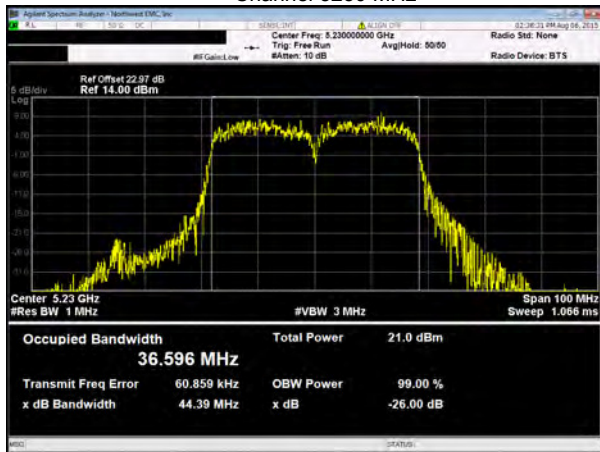
Value	75.519 MHz
Limit (>)	500 kHz
Result	Pass

Chain A, 802.11(ac) VHT, MCS9 (256-QAM), 40 MHz, Low
Channel 5190 MHz



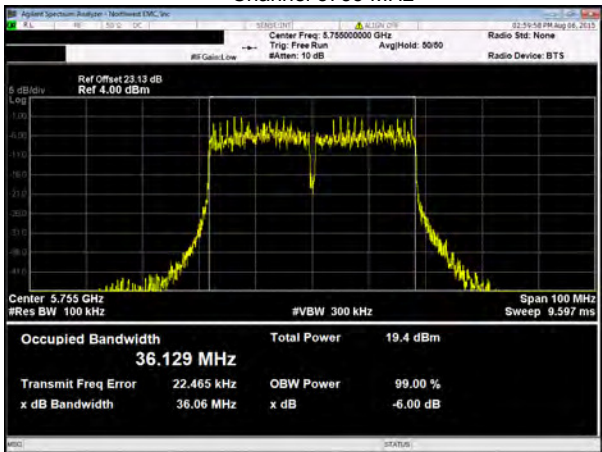
Value	47.045 MHz
Limit (>)	N/A
Result	N/A

Chain A, 802.11(ac) VHT, MCS9 (256-QAM), 40 MHz, High
Channel 5230 MHz



Value	44.394 MHz
Limit (>)	N/A
Result	N/A

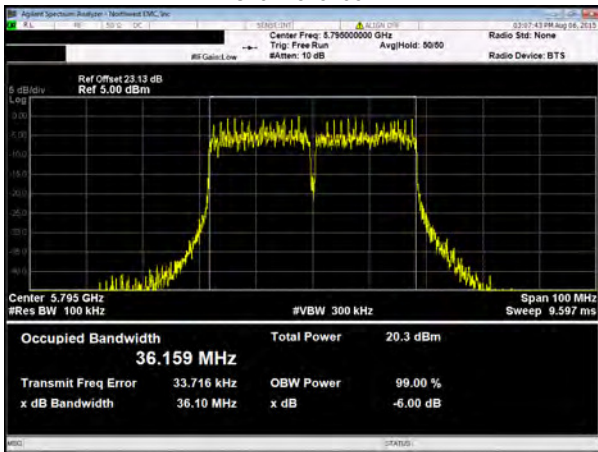
Chain A, 802.11(ac) VHT, MCS9 (256-QAM), 40 MHz, Low
Channel 5755 MHz



Value	36.065 MHz
Limit (>)	500 kHz
Result	Pass

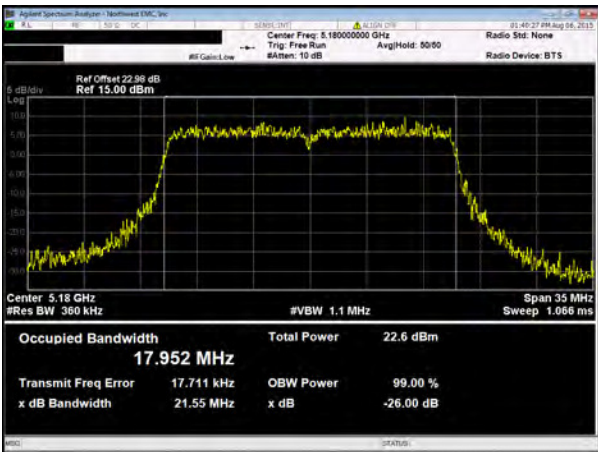
EMISSION & OCCUPIED BANDWIDTH

Chain A, 802.11(ac) VHT, MCS9 (256-QAM), 40 MHz, High Channel 5795 MHz



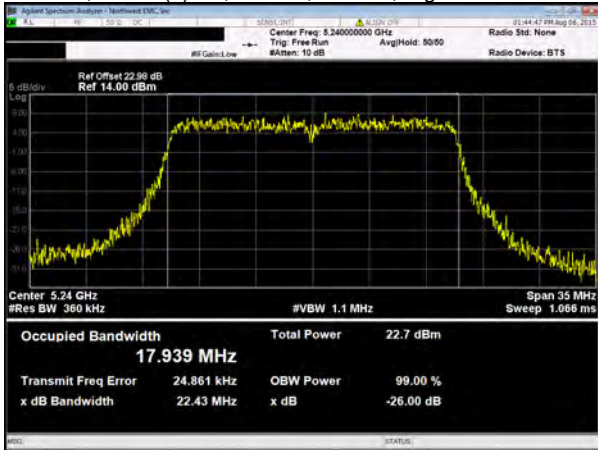
Value	36.095 MHz
Limit (>)	500 kHz
Result	Pass

Chain A, 802.11(n) HT, MCS16, 20 MHz, Low Channel 5180 MHz



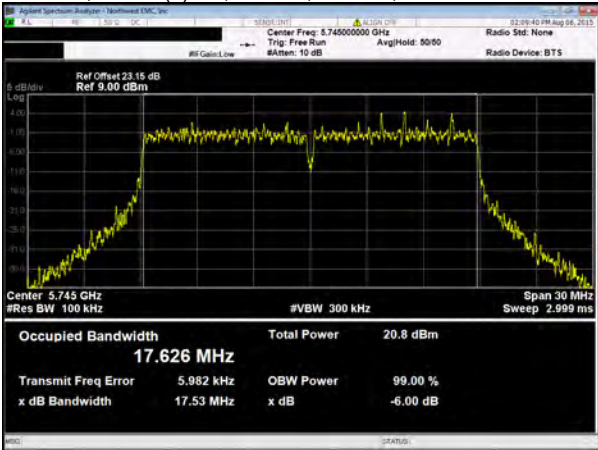
Value	21.548 MHz
Limit (>)	N/A
Result	N/A

Chain A, 802.11(n) HT, MCS16, 20 MHz, High Channel 5240 MHz



Value	22.429 MHz
Limit (>)	N/A
Result	N/A

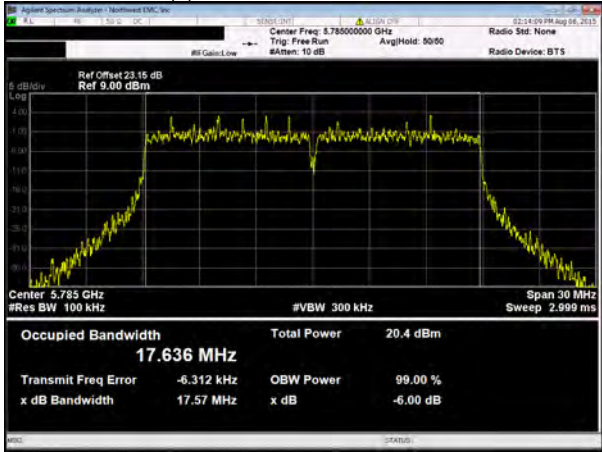
Chain A, 802.11(n) HT, MCS16, 20 MHz, Low Channel 5745 MHz



Value	17.531 MHz
Limit (>)	500 kHz
Result	Pass

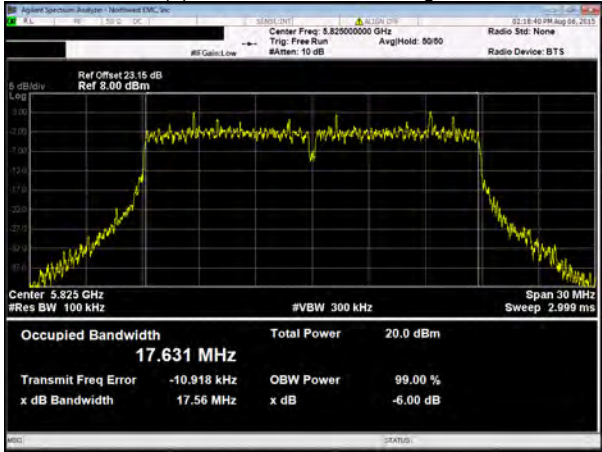
EMISSION & OCCUPIED BANDWIDTH

Chain A, 802.11(n) HT, MCS16, 20 MHz, Mid Channel 5785 MHz



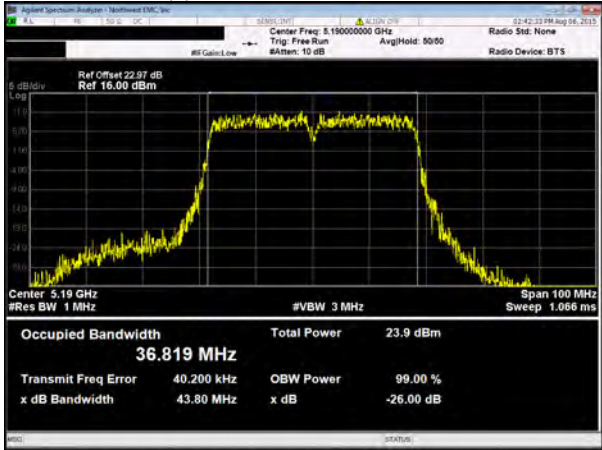
Value	17.569 MHz
Limit (>)	500 kHz
Result	Pass

Chain A, 802.11(n) HT, MCS16, 20 MHz, High Channel 5825 MHz



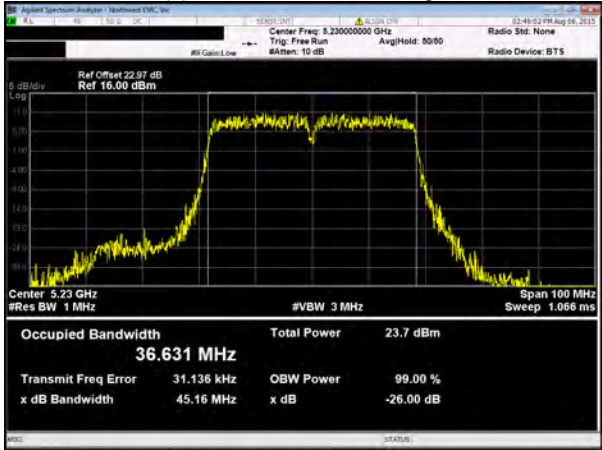
Value	17.561 MHz
Limit (>)	500 kHz
Result	Pass

Chain A, 802.11(n) HT, MCS16, 40 MHz, Low Channel 5190 MHz



Value	43.799 MHz
Limit (>)	N/A
Result	N/A

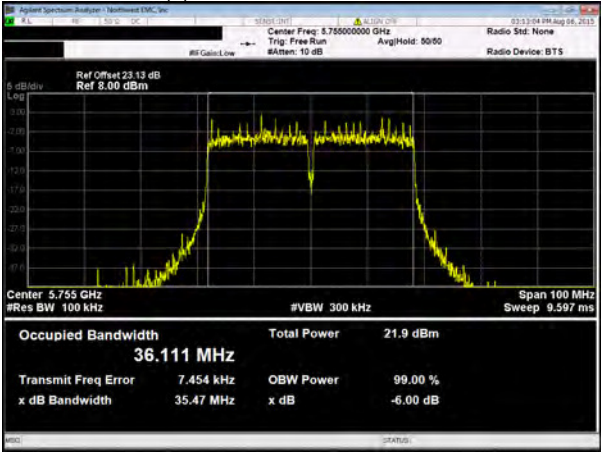
Chain A, 802.11(n) HT, MCS16, 40 MHz, High Channel 5230 MHz



Value	45.155 MHz
Limit (>)	N/A
Result	N/A

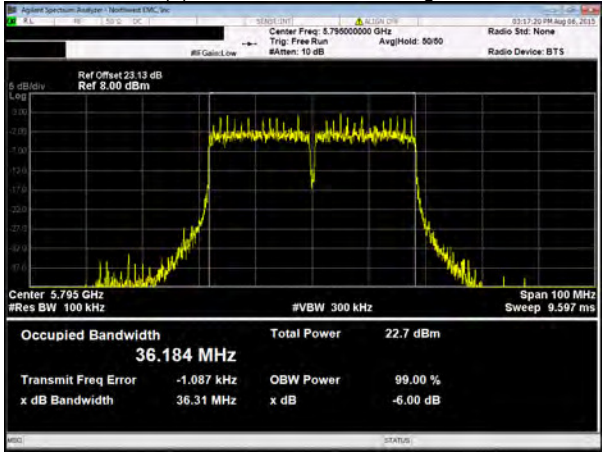
EMISSION & OCCUPIED BANDWIDTH

Chain A, 802.11(n) HT, MCS16, 40 MHz, Low Channel 5755 MHz



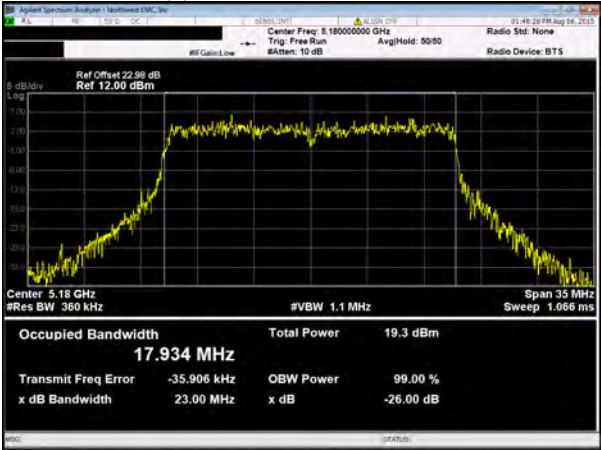
Value	35.469 MHz
Limit (>)	500 kHz
Result	Pass

Chain A, 802.11(n) HT, MCS16, 40 MHz, High Channel 5795 MHz



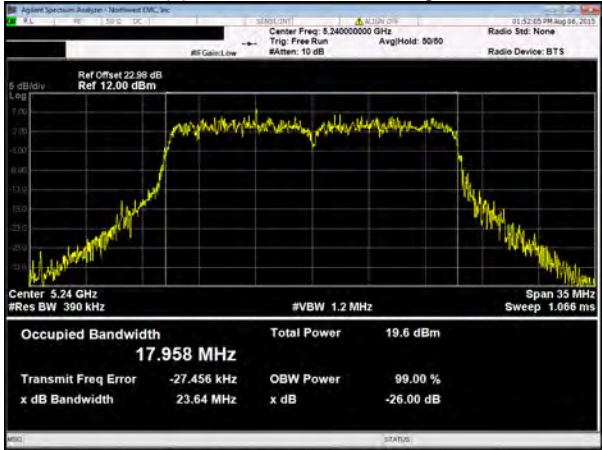
Value	36.314 MHz
Limit (>)	500 kHz
Result	Pass

Chain A, 802.11(n) HT, MCS23, 20 MHz, Low Channel 5180 MHz



Value	23.004 MHz
Limit (>)	N/A
Result	N/A

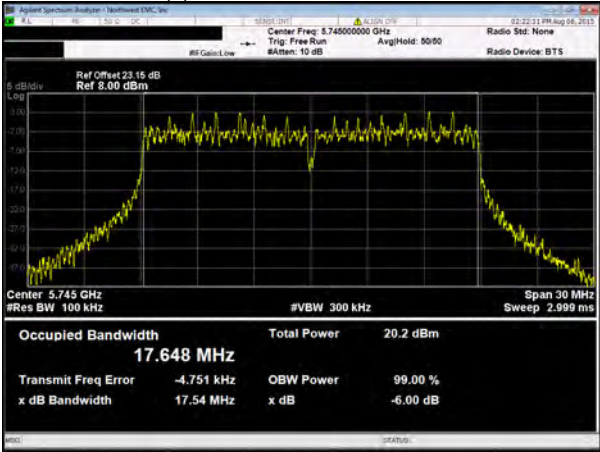
Chain A, 802.11(n) HT, MCS23, 20 MHz, High Channel 5240 MHz



Value	23.637 MHz
Limit (>)	N/A
Result	N/A

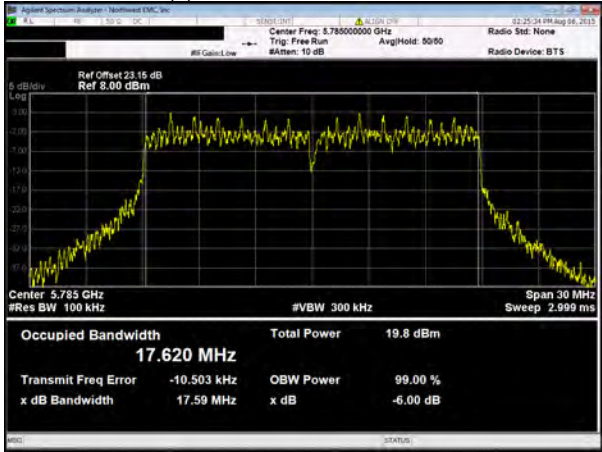
EMISSION & OCCUPIED BANDWIDTH

Chain A, 802.11(n) HT, MCS23, 20 MHz, Low Channel 5745 MHz



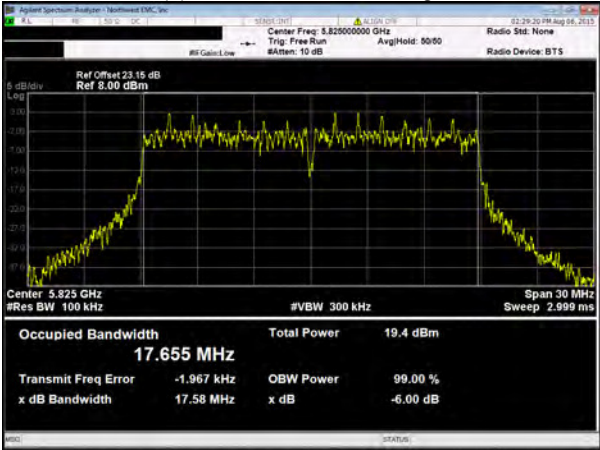
Value	17.542 MHz
Limit (>)	500 kHz
Result	Pass

Chain A, 802.11(n) HT, MCS23, 20 MHz, Mid Channel 5785 MHz



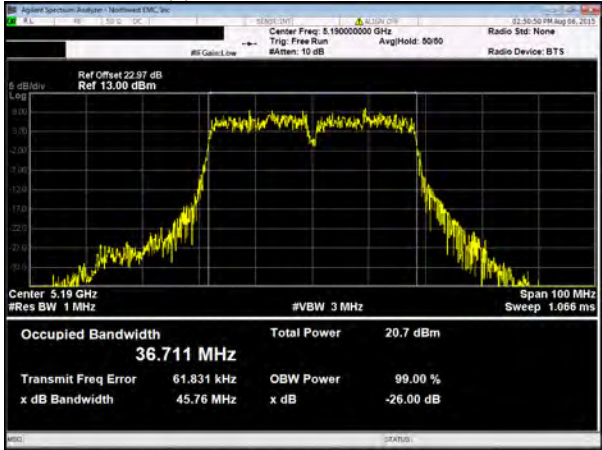
Value	17.591 MHz
Limit (>)	500 kHz
Result	Pass

Chain A, 802.11(n) HT, MCS23, 20 MHz, High Channel 5825 MHz



Value	17.576 MHz
Limit (>)	500 kHz
Result	Pass

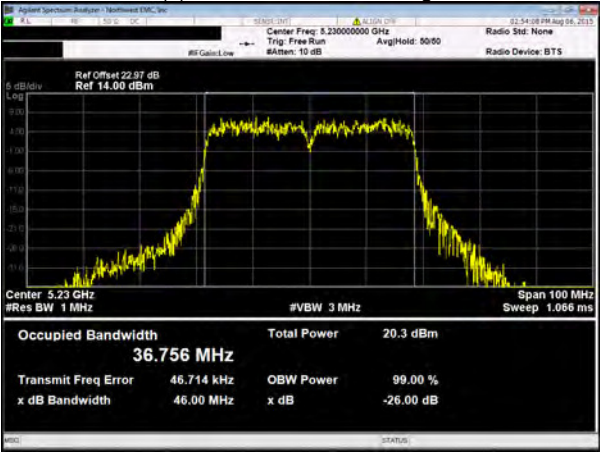
Chain A, 802.11(n) HT, MCS23, 40 MHz, Low Channel 5190 MHz



Value	45.765 MHz
Limit (>)	N/A
Result	N/A

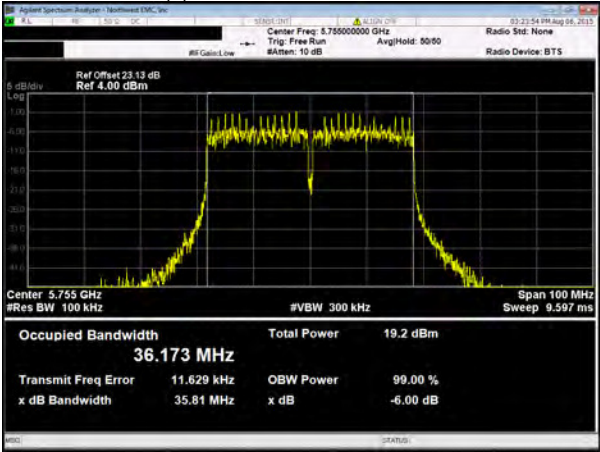
EMISSION & OCCUPIED BANDWIDTH

Chain A, 802.11(n) HT, MCS23, 40 MHz, High Channel 5230 MHz



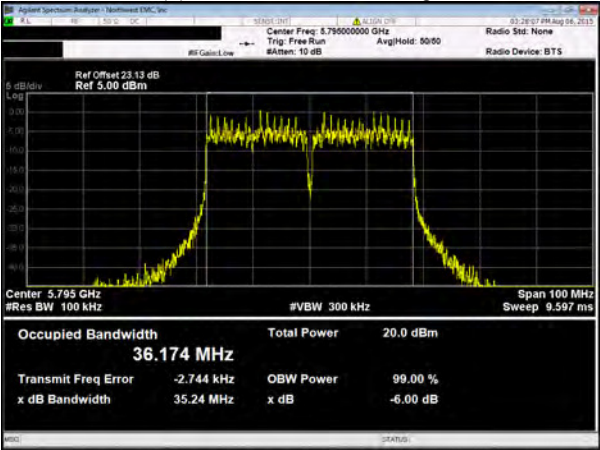
Value	45.998 MHz
Limit (>)	N/A
Result	N/A

Chain A, 802.11(n) HT, MCS23, 40 MHz, Low Channel 5755 MHz



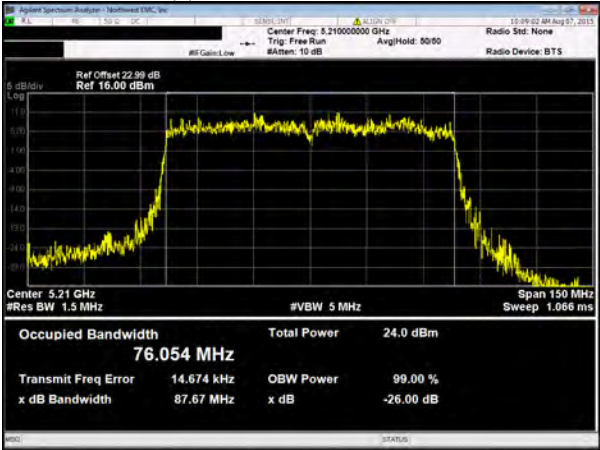
Value	35.807 MHz
Limit (>)	500 kHz
Result	Pass

Chain A, 802.11(n) HT, MCS23, 40 MHz, High Channel 5795 MHz



Value	35.238 MHz
Limit (>)	500 kHz
Result	Pass

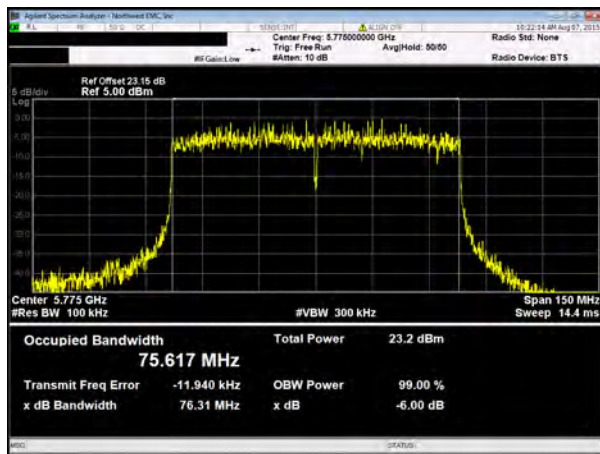
Chain B, 802.11(n) HT, MCS0, 80 MHz, Low Channel 5210 MHz



Value	87.672 MHz
Limit (>)	N/A
Result	N/A

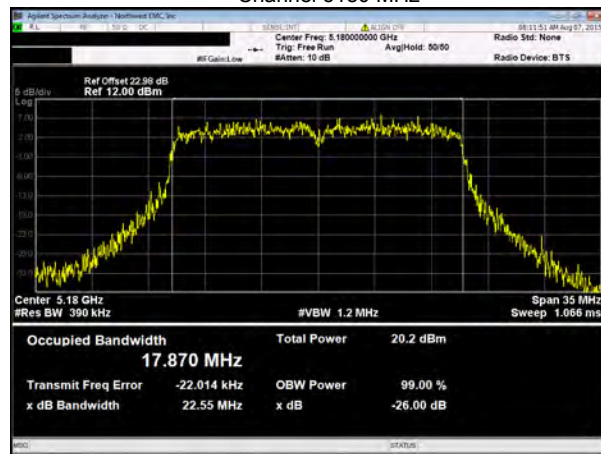
EMISSION & OCCUPIED BANDWIDTH

Chain B, 802.11(n) HT, MCS0, 80 MHz, Low Channel 5775 MHz



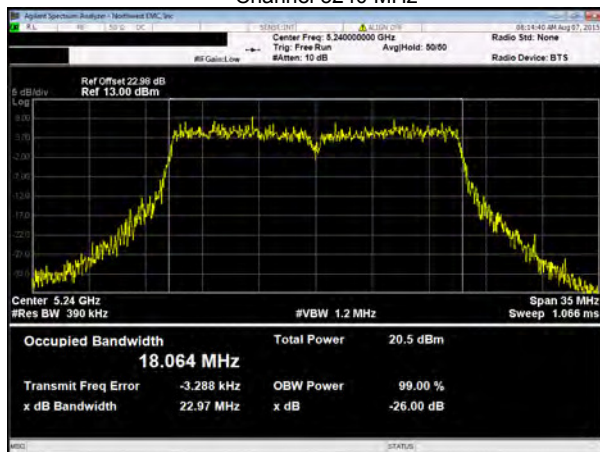
Value	76.313 MHz
Limit (>)	500 kHz
Result	Pass

Chain B, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, Low Channel 5180 MHz



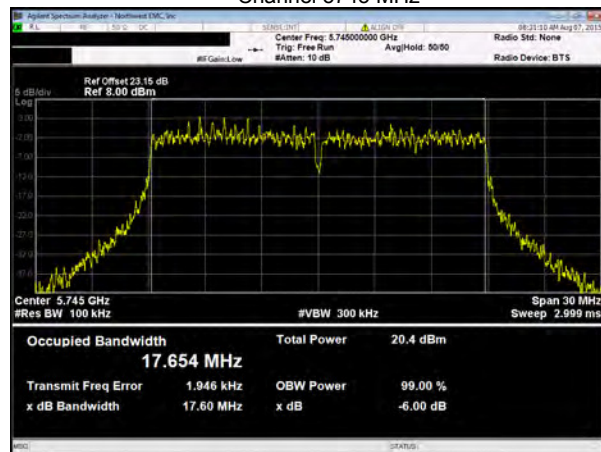
Value	22.549 MHz
Limit (>)	N/A
Result	N/A

Chain B, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, High Channel 5240 MHz



Value	22.973 MHz
Limit (>)	N/A
Result	N/A

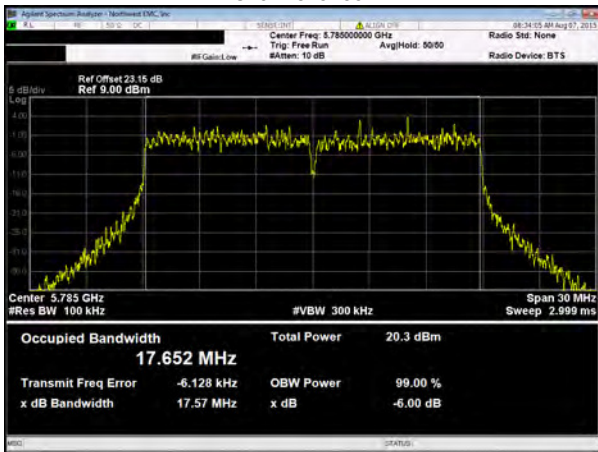
Chain B, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, Low Channel 5745 MHz



Value	17.596 MHz
Limit (>)	500 kHz
Result	Pass

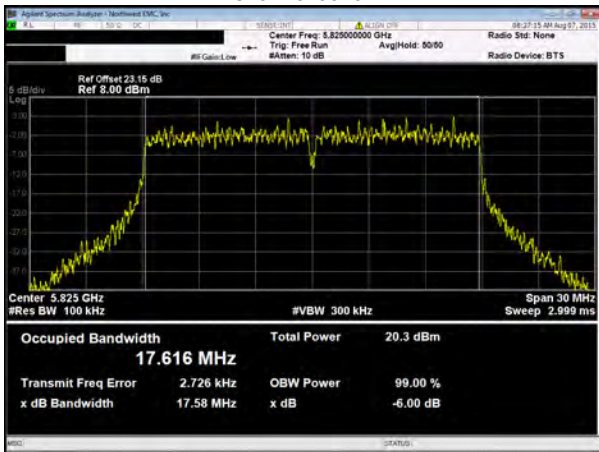
EMISSION & OCCUPIED BANDWIDTH

Chain B, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, Mid
Channel 5785 MHz



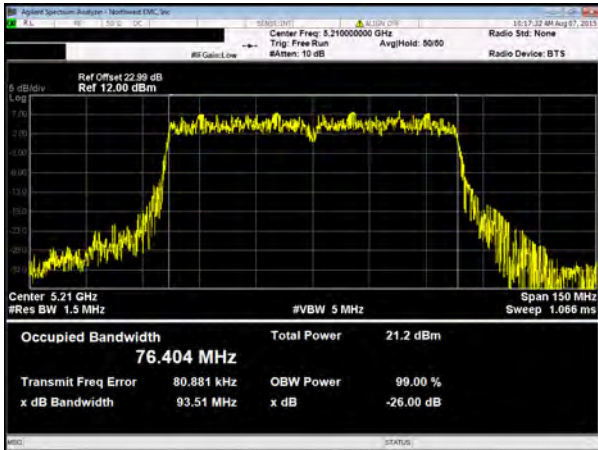
Value	17.57 MHz
Limit (>)	500 kHz
Result	Pass

Chain B, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, High
Channel 5825 MHz



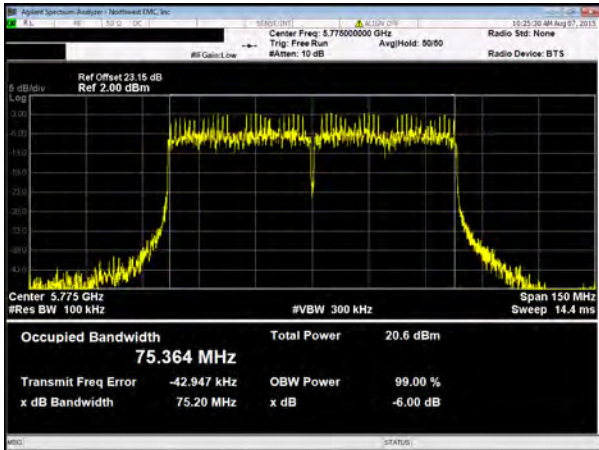
Value	17.576 MHz
Limit (>)	500 kHz
Result	Pass

Chain B, 802.11(ac) VHT, MCS9 (256-QAM), 80 MHz, Low
Channel 5210 MHz



Value	93.514 MHz
Limit (>)	N/A
Result	N/A

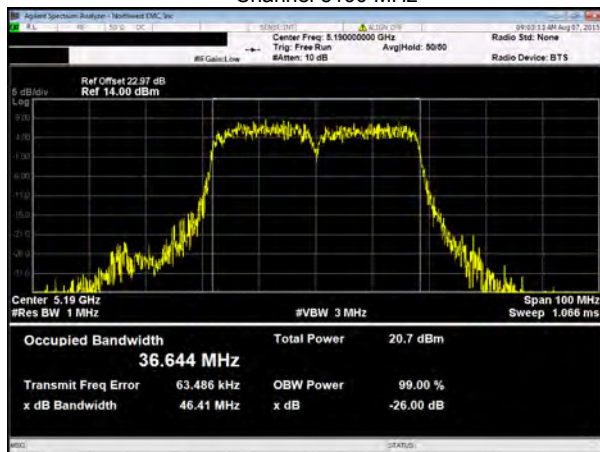
Chain B, 802.11(ac) VHT, MCS9 (256-QAM), 80 MHz, Low
Channel 5775 MHz



Value	75.202 MHz
Limit (>)	500 kHz
Result	Pass

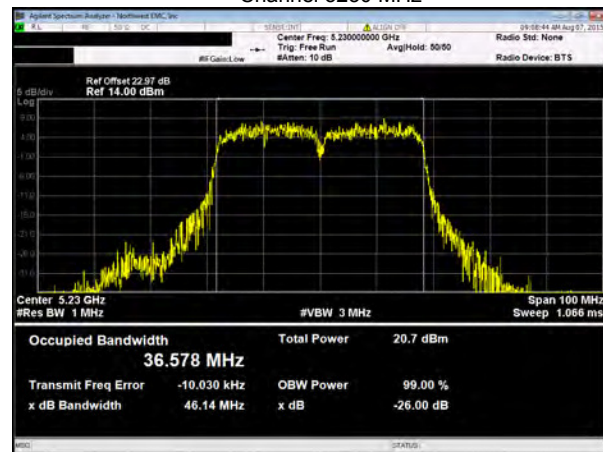
EMISSION & OCCUPIED BANDWIDTH

Chain B, 802.11(ac) VHT, MCS9 (256-QAM), 40 MHz, Low
Channel 5190 MHz



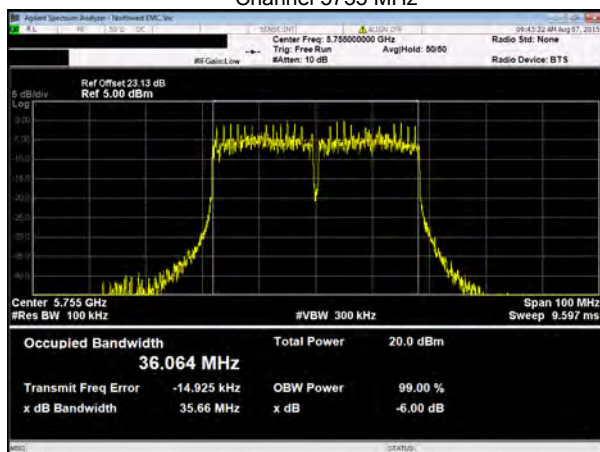
Value	46.407 MHz
Limit (>)	N/A
Result	N/A

Chain B, 802.11(ac) VHT, MCS9 (256-QAM), 40 MHz, High
Channel 5230 MHz



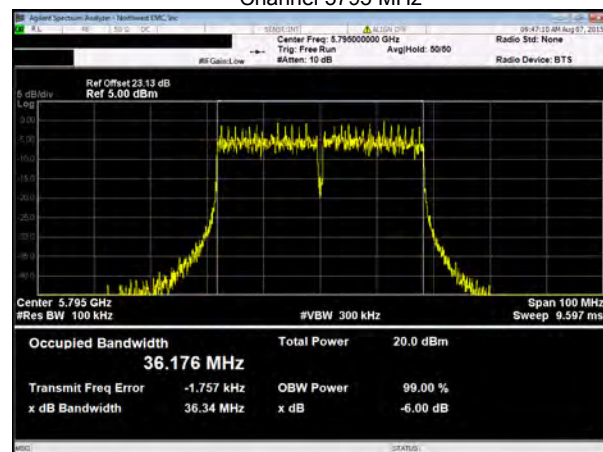
Value	46.138 MHz
Limit (>)	N/A
Result	N/A

Chain B, 802.11(ac) VHT, MCS9 (256-QAM), 40 MHz, Low
Channel 5755 MHz



Value	35.663 MHz
Limit (>)	500 kHz
Result	Pass

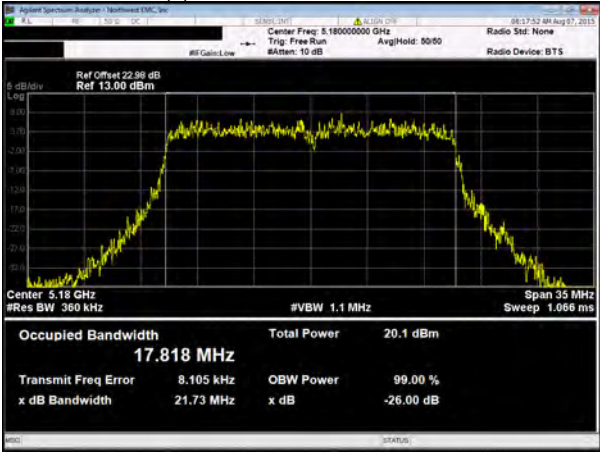
Chain B, 802.11(ac) VHT, MCS9 (256-QAM), 40 MHz, High
Channel 5795 MHz



Value	36.342 MHz
Limit (>)	500 kHz
Result	Pass

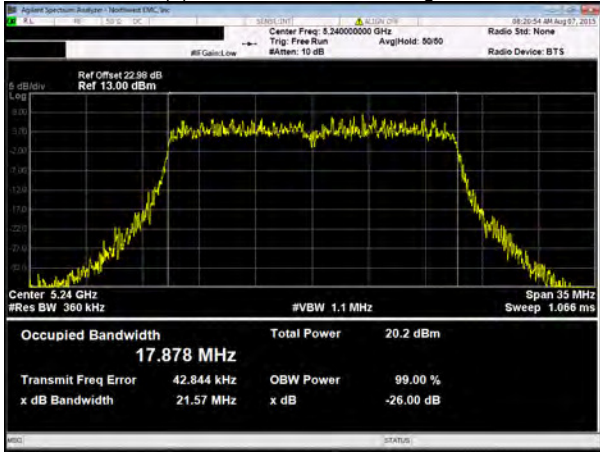
EMISSION & OCCUPIED BANDWIDTH

Chain B, 802.11(n) HT, MCS16, 20 MHz, Low Channel 5180 MHz



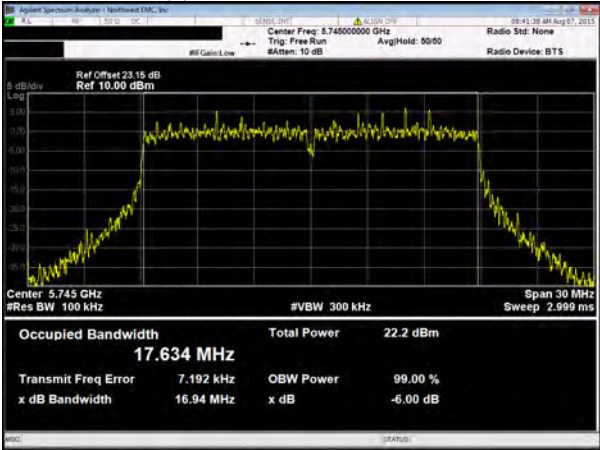
Value	21.732 MHz
Limit (>)	N/A
Result	N/A

Chain B, 802.11(n) HT, MCS16, 20 MHz, High Channel 5240 MHz



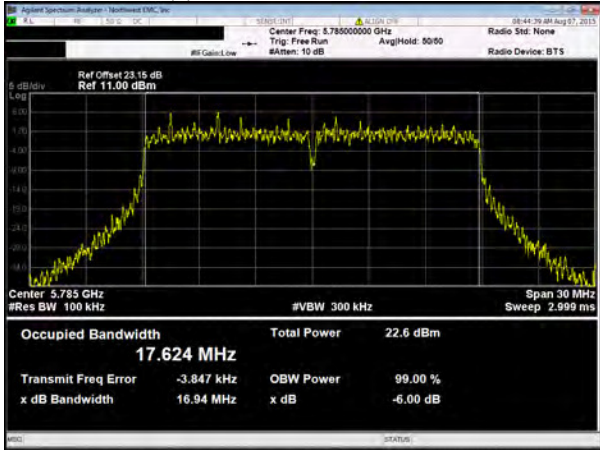
Value	21.573 MHz
Limit (>)	N/A
Result	N/A

Chain B, 802.11(n) HT, MCS16, 20 MHz, Low Channel 5745 MHz



Value	16.935 MHz
Limit (>)	500 kHz
Result	Pass

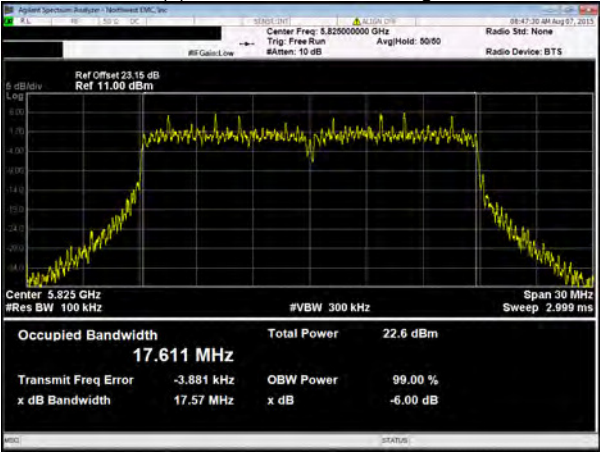
Chain B, 802.11(n) HT, MCS16, 20 MHz, Mid Channel 5785 MHz



Value	16.942 MHz
Limit (>)	500 kHz
Result	Pass

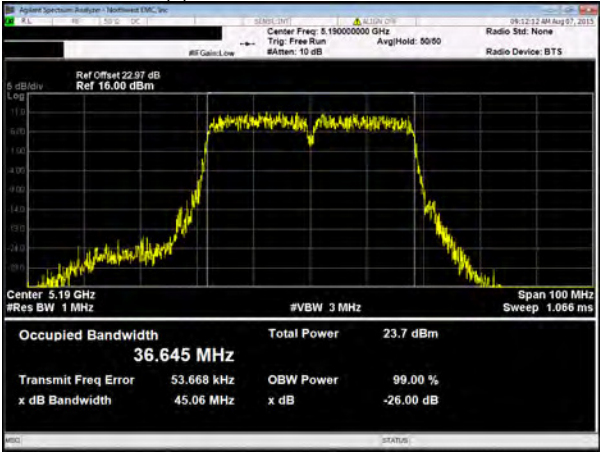
EMISSION & OCCUPIED BANDWIDTH

Chain B, 802.11(n) HT, MCS16, 20 MHz, High Channel 5825 MHz



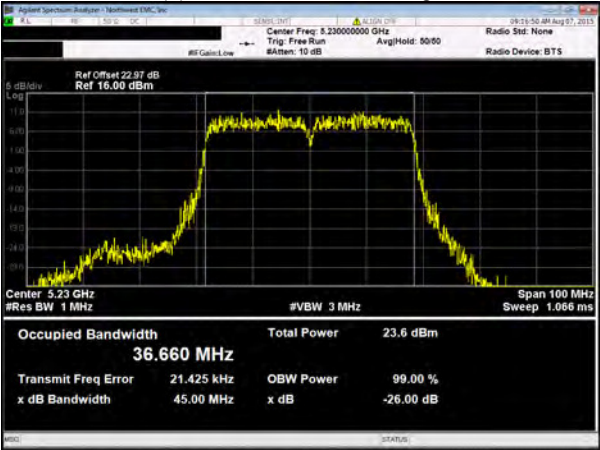
Value	17.572 MHz
Limit (>)	500 kHz
Result	Pass

Chain B, 802.11(n) HT, MCS16, 40 MHz, Low Channel 5190 MHz



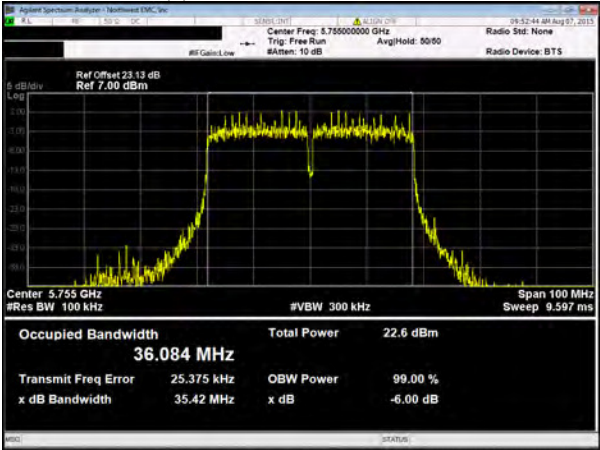
Value	45.059 MHz
Limit (>)	N/A
Result	N/A

Chain B, 802.11(n) HT, MCS16, 40 MHz, High Channel 5230 MHz



Value	45.001 MHz
Limit (>)	N/A
Result	N/A

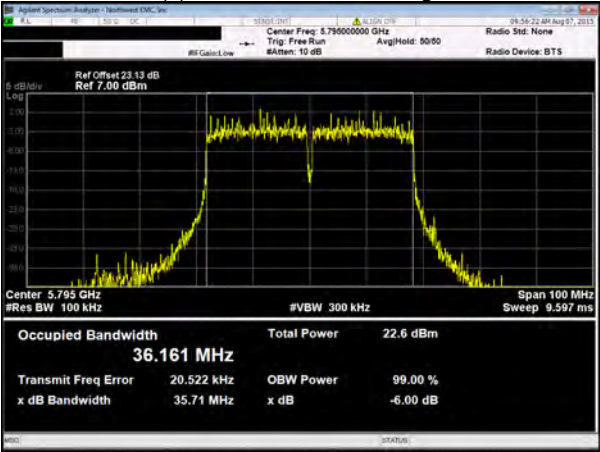
Chain B, 802.11(n) HT, MCS16, 40 MHz, Low Channel 5755 MHz



Value	35.424 MHz
Limit (>)	500 kHz
Result	Pass

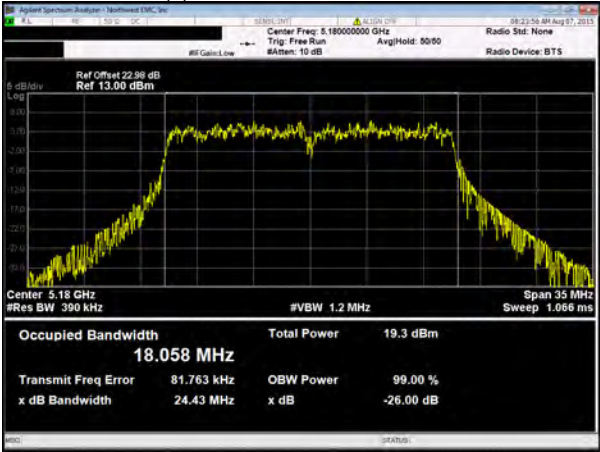
EMISSION & OCCUPIED BANDWIDTH

Chain B, 802.11(n) HT, MCS16, 40 MHz, High Channel 5795 MHz



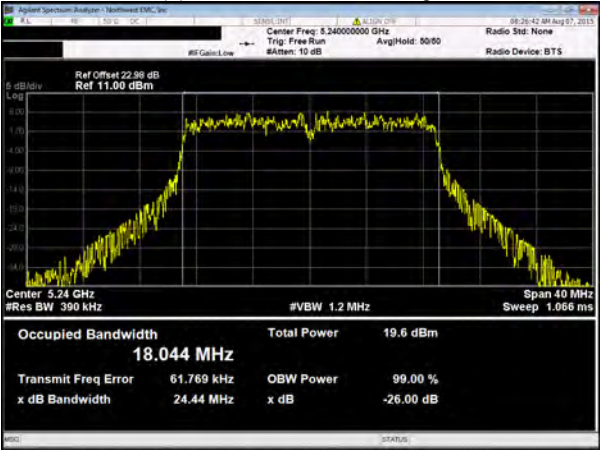
Value	35.714 MHz
Limit (>)	500 kHz
Result	Pass

Chain B, 802.11(n) HT, MCS23, 20 MHz, Low Channel 5180 MHz



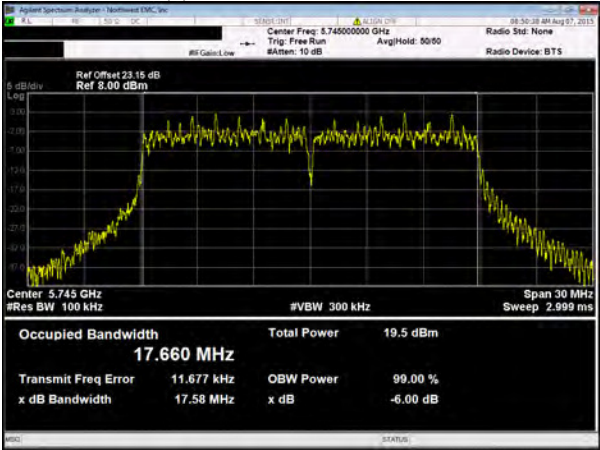
Value	24.429 MHz
Limit (>)	N/A
Result	N/A

Chain B, 802.11(n) HT, MCS23, 20 MHz, High Channel 5240 MHz



Value	24.437 MHz
Limit (>)	N/A
Result	N/A

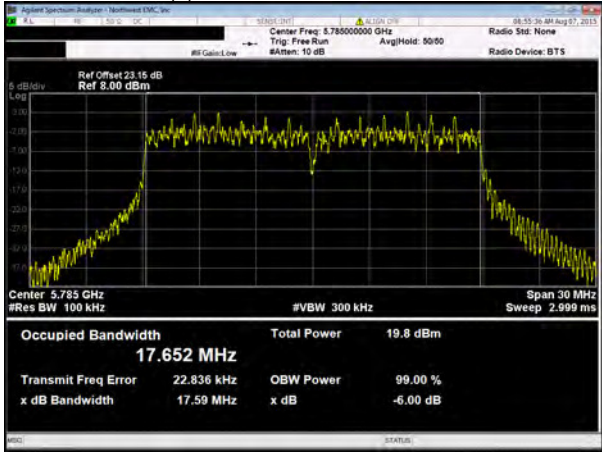
Chain B, 802.11(n) HT, MCS23, 20 MHz, Low Channel 5745 MHz



Value	17.581 MHz
Limit (>)	500 kHz
Result	Pass

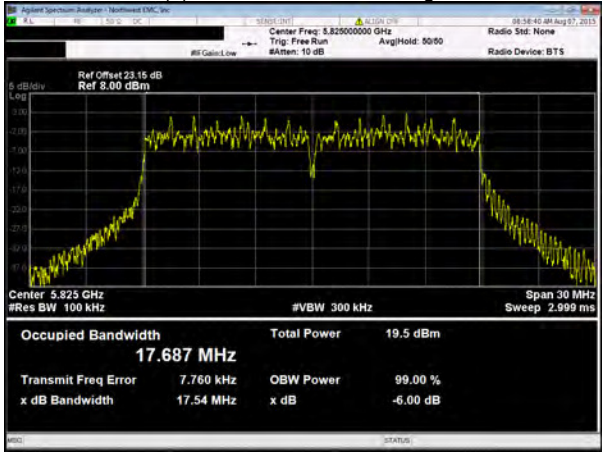
EMISSION & OCCUPIED BANDWIDTH

Chain B, 802.11(n) HT, MCS23, 20 MHz, Mid Channel 5785 MHz



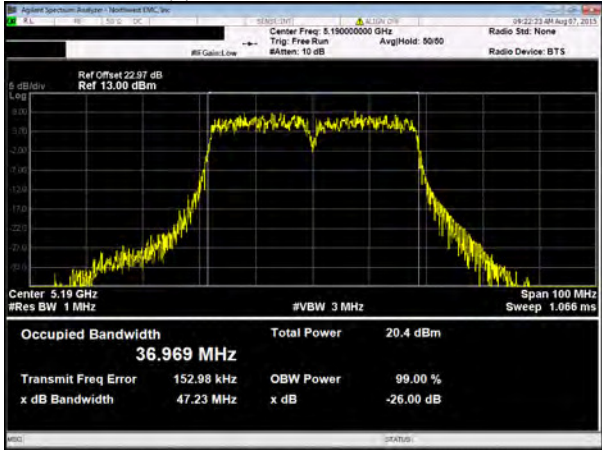
Value	17.589 MHz
Limit (>)	500 kHz
Result	Pass

Chain B, 802.11(n) HT, MCS23, 20 MHz, High Channel 5825 MHz



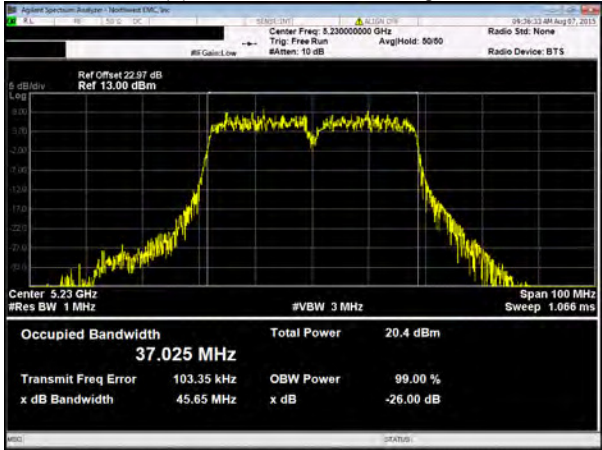
Value	17.537 MHz
Limit (>)	500 kHz
Result	Pass

Chain B, 802.11(n) HT, MCS23, 40 MHz, Low Channel 5190 MHz



Value	47.233 MHz
Limit (>)	N/A
Result	N/A

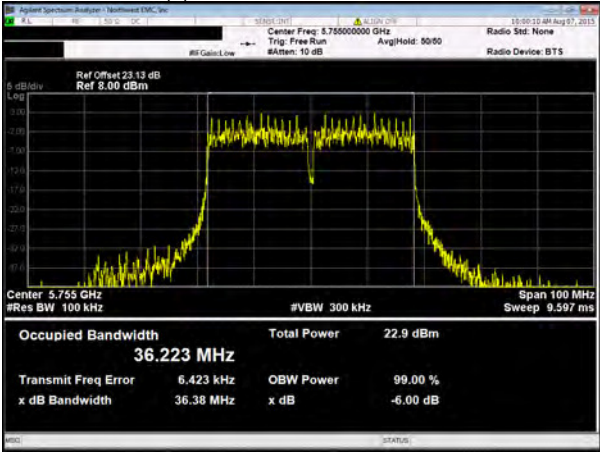
Chain B, 802.11(n) HT, MCS23, 40 MHz, High Channel 5230 MHz



Value	45.651 MHz
Limit (>)	N/A
Result	N/A

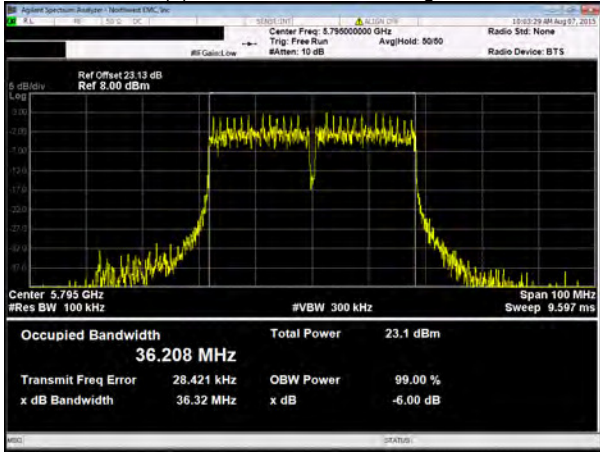
EMISSION & OCCUPIED BANDWIDTH

Chain B, 802.11(n) HT, MCS23, 40 MHz, Low Channel 5755 MHz



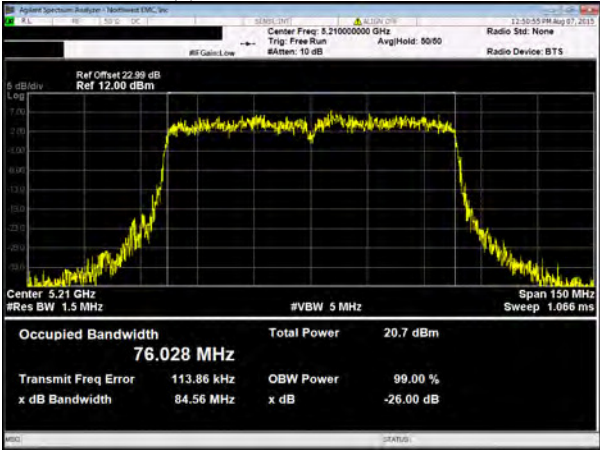
Value	36.382 MHz
Limit (>)	500 kHz
Result	Pass

Chain B, 802.11(n) HT, MCS23, 40 MHz, High Channel 5795 MHz



Value	36.325 MHz
Limit (>)	500 kHz
Result	Pass

Chain C, 802.11(n) HT, MCS0, 80 MHz, Low Channel 5210 MHz



Value	84.564 MHz
Limit (>)	N/A
Result	N/A

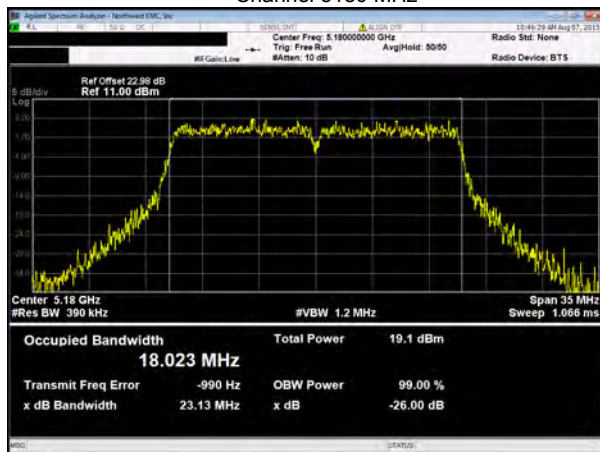
Chain C, 802.11(n) HT, MCS0, 80 MHz, Low Channel 5775 MHz



Value	76.361 MHz
Limit (>)	500 kHz
Result	Pass

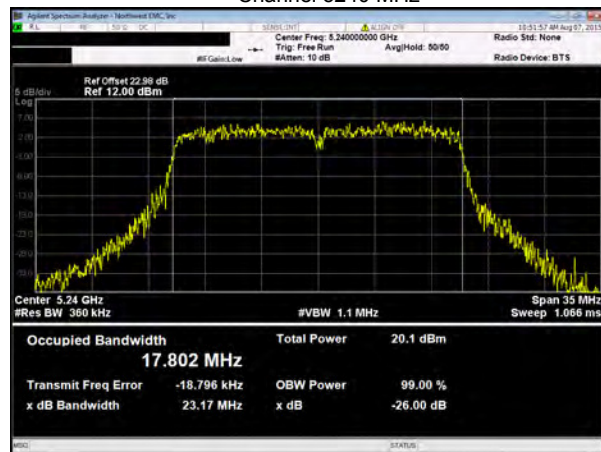
EMISSION & OCCUPIED BANDWIDTH

Chain C, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, Low
Channel 5180 MHz



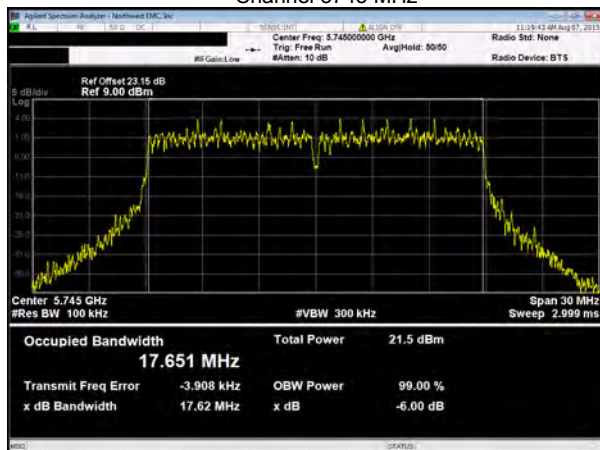
Value	23.128 MHz
Limit (>)	N/A
Result	N/A

Chain C, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, High
Channel 5240 MHz



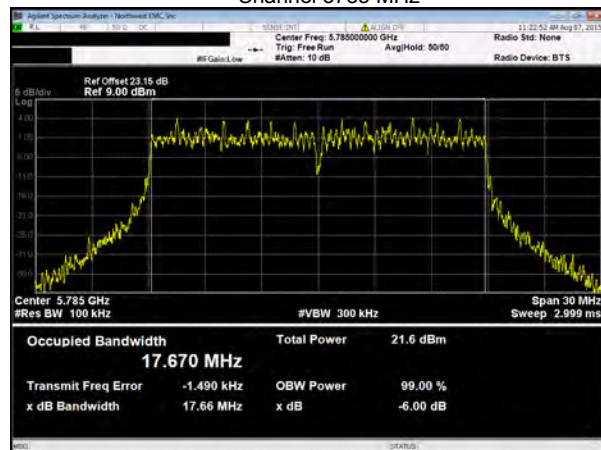
Value	23.172 MHz
Limit (>)	N/A
Result	N/A

Chain C, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, Low
Channel 5745 MHz



Value	17.624 MHz
Limit (>)	500 kHz
Result	Pass

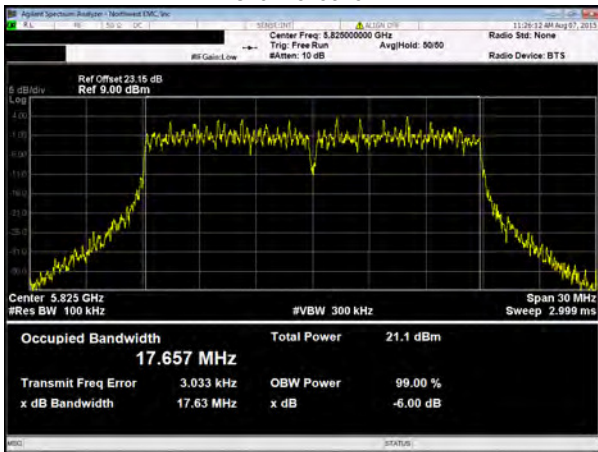
Chain C, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, Mid
Channel 5785 MHz



Value	17.658 MHz
Limit (>)	500 kHz
Result	Pass

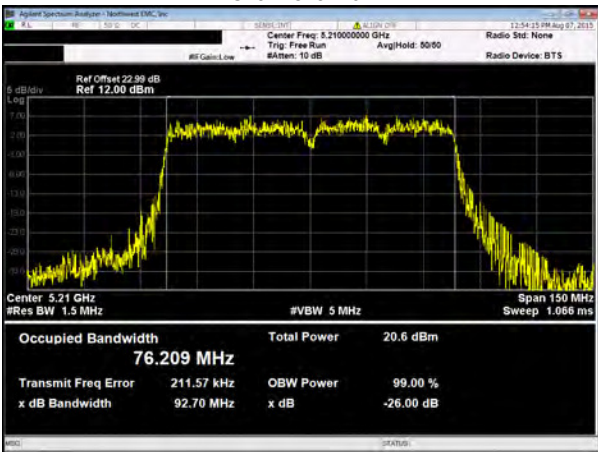
EMISSION & OCCUPIED BANDWIDTH

Chain C, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, High
Channel 5825 MHz



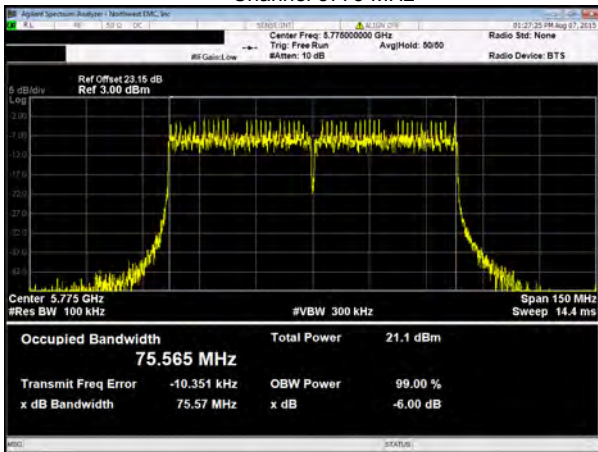
Value	17.626 MHz
Limit (>)	500 kHz
Result	Pass

Chain C, 802.11(ac) VHT, MCS9 (256-QAM), 80 MHz, Low
Channel 5210 MHz



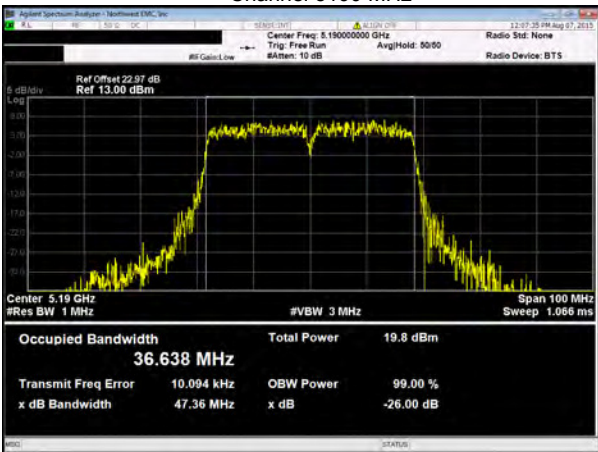
Value	92.704 MHz
Limit (>)	N/A
Result	N/A

Chain C, 802.11(ac) VHT, MCS9 (256-QAM), 80 MHz, Low
Channel 5775 MHz



Value	75.572 MHz
Limit (>)	500 kHz
Result	Pass

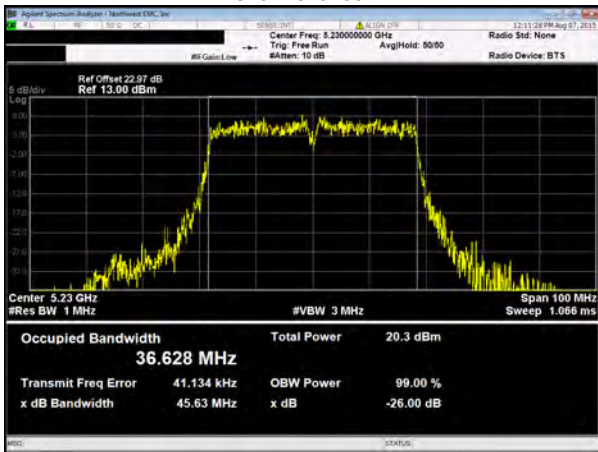
Chain C, 802.11(ac) VHT, MCS9 (256-QAM), 40 MHz, Low
Channel 5190 MHz



Value	47.358 MHz
Limit (>)	N/A
Result	N/A

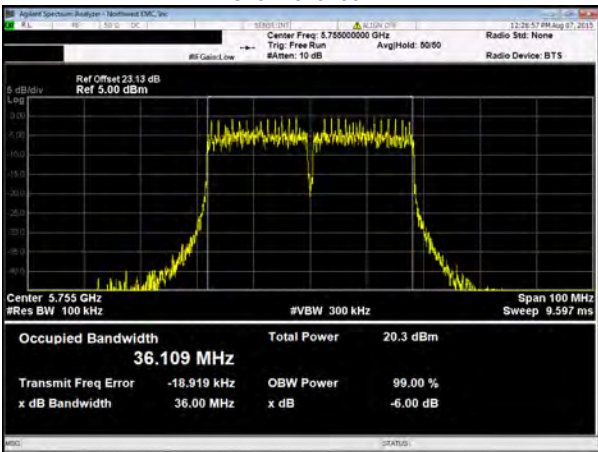
EMISSION & OCCUPIED BANDWIDTH

Chain C, 802.11(ac) VHT, MCS9 (256-QAM), 40 MHz, High
Channel 5230 MHz



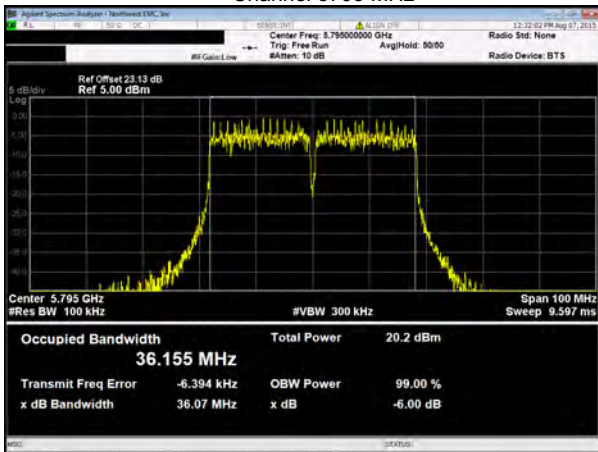
Value	45.625 MHz
Limit (>)	N/A
Result	N/A

Chain C, 802.11(ac) VHT, MCS9 (256-QAM), 40 MHz, Low
Channel 5755 MHz



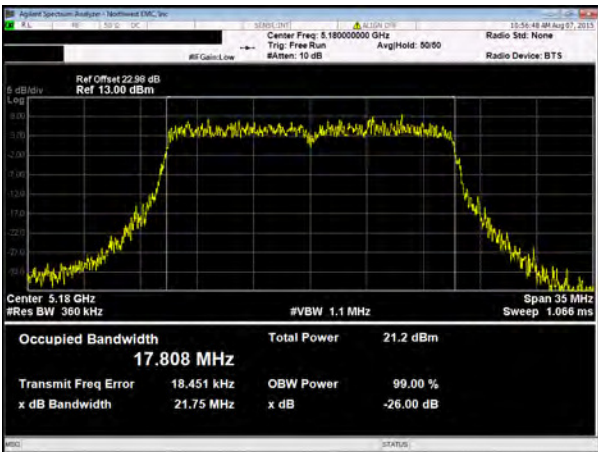
Value	35.995 MHz
Limit (>)	500 kHz
Result	Pass

Chain C, 802.11(ac) VHT, MCS9 (256-QAM), 40 MHz, High
Channel 5795 MHz



Value	36.074 MHz
Limit (>)	500 kHz
Result	Pass

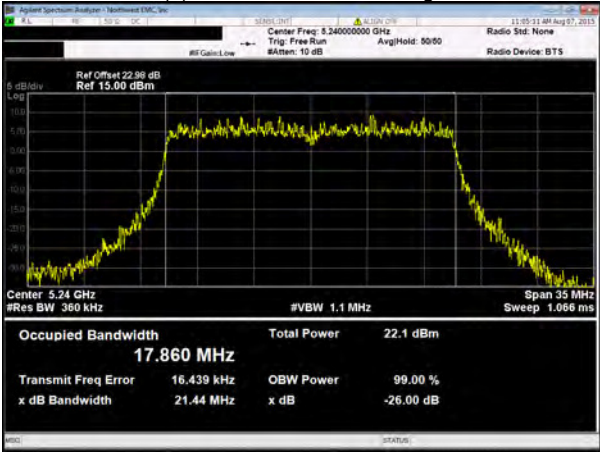
Chain C, 802.11(n) HT, MCS16, 20 MHz, Low Channel 5180 MHz



Value	21.754 MHz
Limit (>)	N/A
Result	N/A

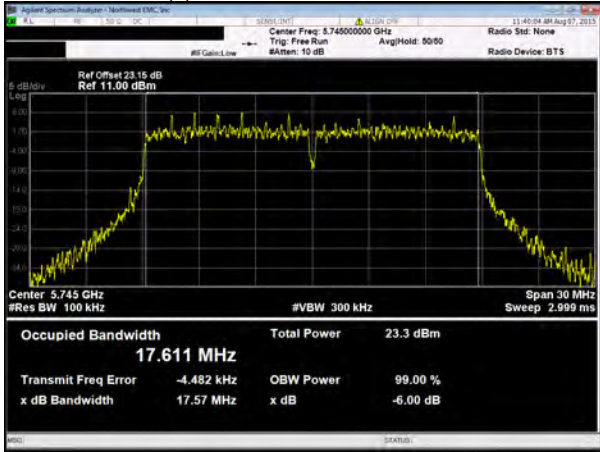
EMISSION & OCCUPIED BANDWIDTH

Chain C, 802.11(n) HT, MCS16, 20 MHz, High Channel 5240 MHz



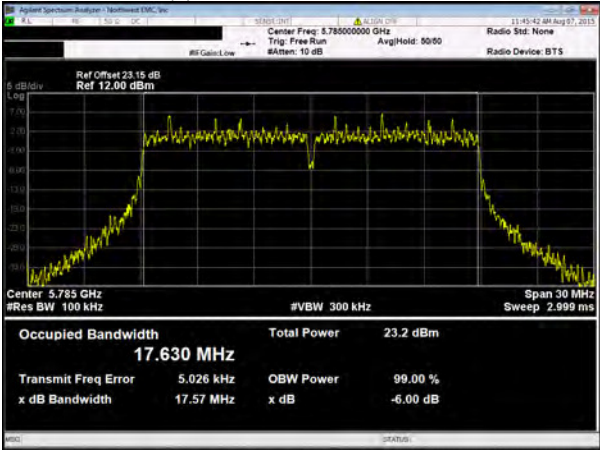
Value	21.435 MHz
Limit (>)	N/A
Result	N/A

Chain C, 802.11(n) HT, MCS16, 20 MHz, Low Channel 5745 MHz



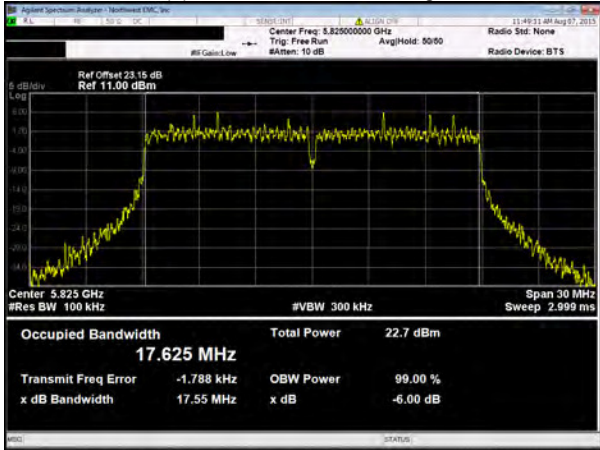
Value	17.574 MHz
Limit (>)	500 kHz
Result	Pass

Chain C, 802.11(n) HT, MCS16, 20 MHz, Mid Channel 5785 MHz



Value	17.573 MHz
Limit (>)	500 kHz
Result	Pass

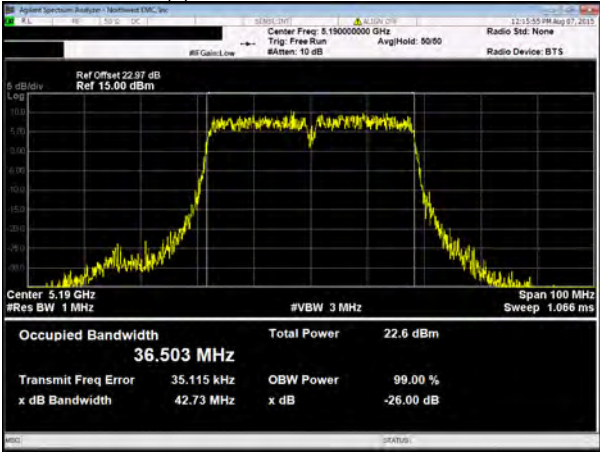
Chain C, 802.11(n) HT, MCS16, 20 MHz, High Channel 5825 MHz



Value	17.546 MHz
Limit (>)	500 kHz
Result	Pass

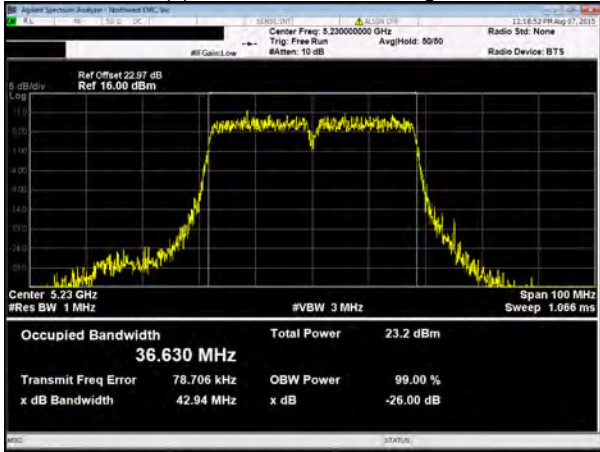
EMISSION & OCCUPIED BANDWIDTH

Chain C, 802.11(n) HT, MCS16, 40 MHz, Low Channel 5190 MHz



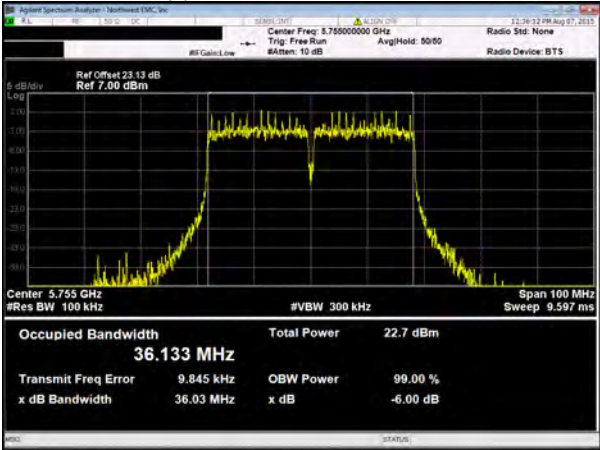
Value	42.732 MHz
Limit (>)	N/A
Result	N/A

Chain C, 802.11(n) HT, MCS16, 40 MHz, High Channel 5230 MHz



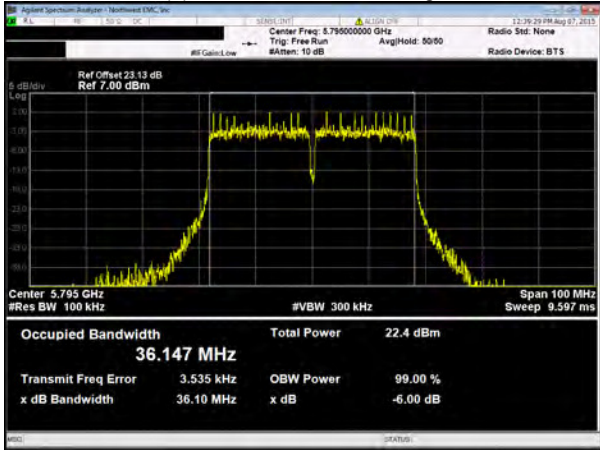
Value	42.939 MHz
Limit (>)	N/A
Result	N/A

Chain C, 802.11(n) HT, MCS16, 40 MHz, Low Channel 5755 MHz



Value	36.027 MHz
Limit (>)	500 kHz
Result	Pass

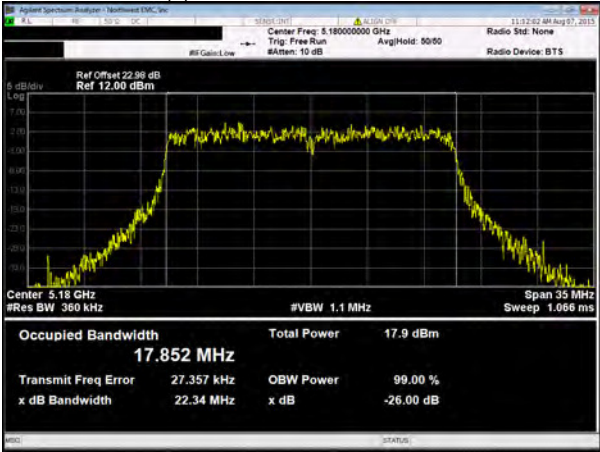
Chain C, 802.11(n) HT, MCS16, 40 MHz, High Channel 5795 MHz



Value	36.098 MHz
Limit (>)	500 kHz
Result	Pass

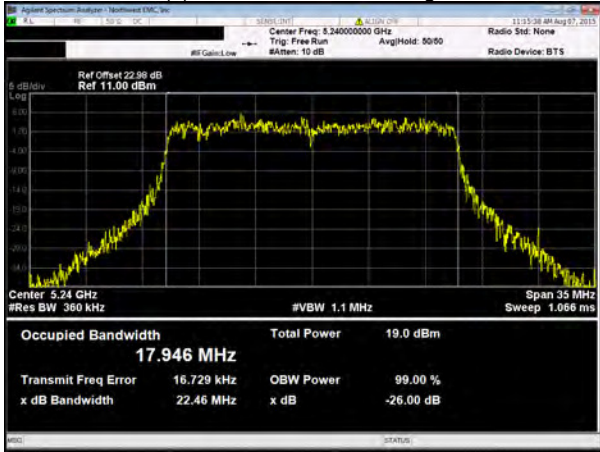
EMISSION & OCCUPIED BANDWIDTH

Chain C, 802.11(n) HT, MCS23, 20 MHz, Low Channel 5180 MHz



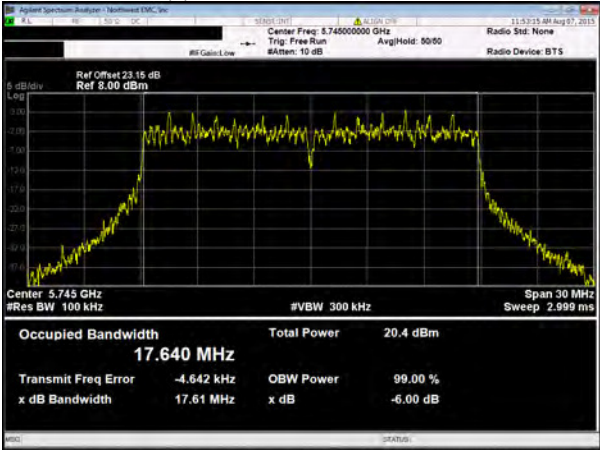
Value	22.343 MHz
Limit (>)	N/A
Result	N/A

Chain C, 802.11(n) HT, MCS23, 20 MHz, High Channel 5240 MHz



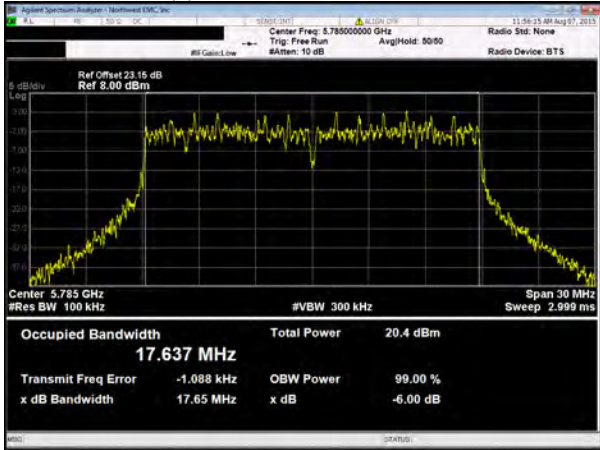
Value	22.463 MHz
Limit (>)	N/A
Result	N/A

Chain C, 802.11(n) HT, MCS23, 20 MHz, Low Channel 5745 MHz



Value	17.615 MHz
Limit (>)	500 kHz
Result	Pass

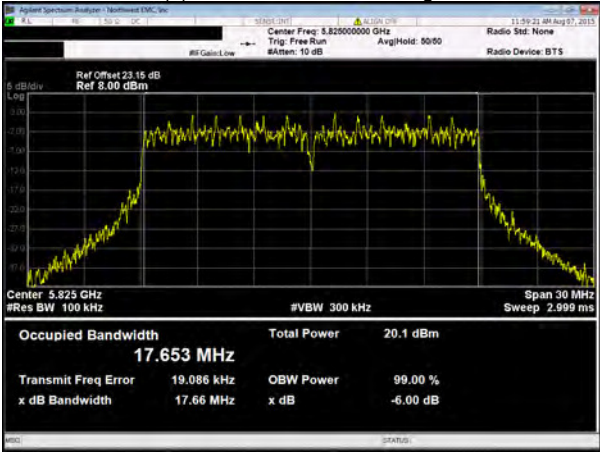
Chain C, 802.11(n) HT, MCS23, 20 MHz, Mid Channel 5785 MHz



Value	17.652 MHz
Limit (>)	500 kHz
Result	Pass

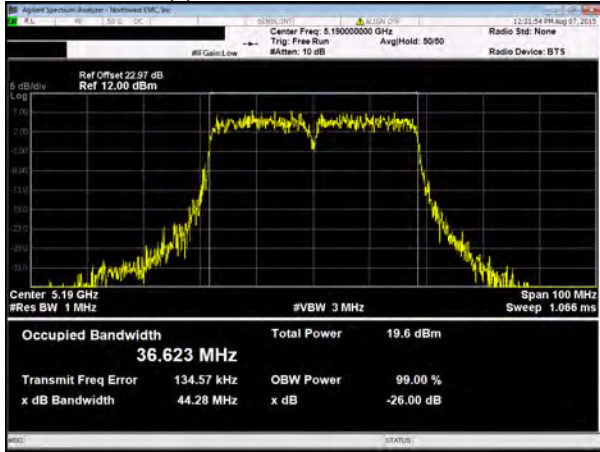
EMISSION & OCCUPIED BANDWIDTH

Chain C, 802.11(n) HT, MCS23, 20 MHz, High Channel 5825 MHz



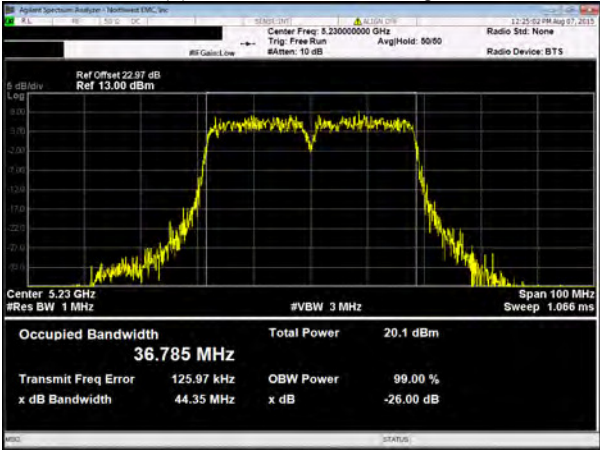
Value	17.657 MHz
Limit (>)	500 kHz
Result	Pass

Chain C, 802.11(n) HT, MCS23, 40 MHz, Low Channel 5190 MHz



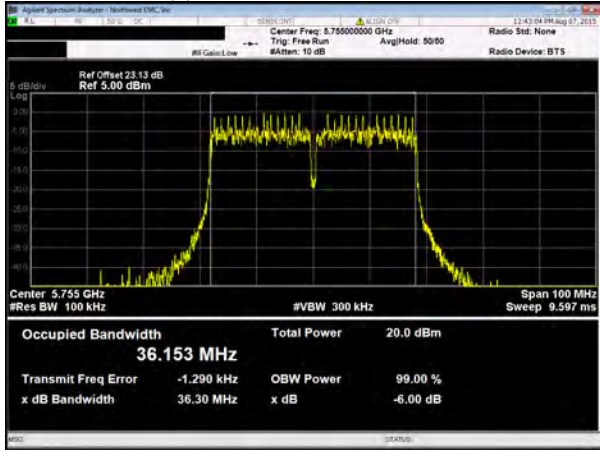
Value	44.279 MHz
Limit (>)	N/A
Result	N/A

Chain C, 802.11(n) HT, MCS23, 40 MHz, High Channel 5230 MHz



Value	44.351 MHz
Limit (>)	N/A
Result	N/A

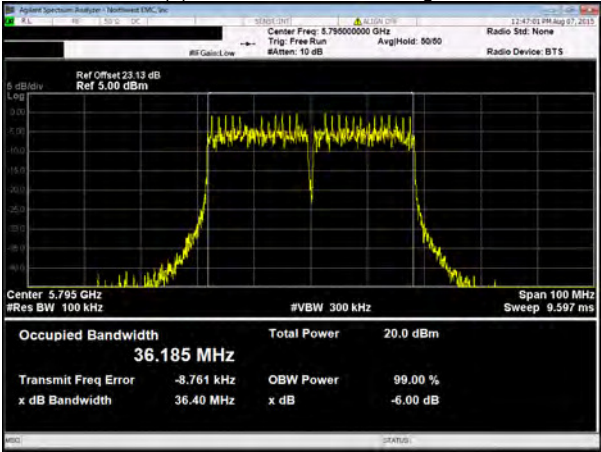
Chain C, 802.11(n) HT, MCS23, 40 MHz, Low Channel 5755 MHz



Value	36.304 MHz
Limit (>)	500 kHz
Result	Pass

EMISSION & OCCUPIED BANDWIDTH

Chain C, 802.11(n) HT, MCS23, 40 MHz, High Channel 5795 MHz



Value	36.4 MHz
Limit (>)	500 kHz
Result	Pass

MAXIMUM POWER SPECTRAL DENSITY

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 DESCRIPTION

FCC KDB 789033 D01 General UNII Test Procedures Section E was followed. The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. The data rate(s) listed in the datasheet were tested. 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 power spectral density, the transmission pulse duration (T) was measured. The transmission pulse duration and the associated data are found elsewhere in this test report.

The spectrum analyzer settings were as follows:

- ☐ The span was set to encompass entire emission bandwidth (B), centered on the transmit channel.
- ☐ RBW = 1 MHz, VBW $\geq$ 3 MHz
- ☐ Sample detector was used because Method SA-1 Alternate was used to measure the Maximum Conducted Output Power.
- ☐ Trace average 100 traces in power averaging mode (not video averaging).

The peak power spectral density (PPSD) was determined to be the highest level found across the emission in any 1 MHz band after 100 sweeps of power averaging (not video averaging).

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFD	7/23/2015	7/23/2016
Block - DC	Fairview Microwave	SD3379	AMM	2/27/2015	2/27/2016
Attenuator	Fairview Microwave	SA4018-20	TQY	2/27/2015	2/27/2016
Generator - Signal	Agilent	N5173B	TIW	7/15/2014	7/15/2017

MAXIMUM POWER SPECTRAL DENSITY

EUT:	Firebox T50-W (BS5AE7W)	Work Order:	VDEI0009
Serial Number:	70AF02717-B385	Date:	09/10/15
Customer:	WatchGuard Technologies, Inc.	Temperature:	25.1°C
Attendees:	None	Relative Humidity:	45%
Customer Project:	None	Bar. Pressure:	1015 mbar
Tested By:	Jonathan Kiefer	Job Site:	TX09
Power:	110VAC/60Hz	Configuration:	5

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2015	ANSI C63.10:2013

COMMENTS

SISO mode, Chain A (Chain 0).

DEVIATIONS FROM TEST STANDARD

None

RESULTS

		Value (dBm / MHz)	Limit (dBm / Ref BW)	Results
Chain A				
802.11(a) 6 Mbps				
20 MHz				
	Low Channel 5180 MHz	3.325	11	Pass
	High Channel 5240 MHz	3.535	11	Pass
	Low Channel 5745 MHz	1.637	30	Pass
	Mid Channel 5785 MHz	1.684	30	Pass
	High Channel 5825 MHz	2.215	30	Pass
802.11(a) 36 Mbps				
20 MHz				
	Low Channel 5180 MHz	2.851	11	Pass
	High Channel 5240 MHz	3.451	11	Pass
	Low Channel 5745 MHz	1.993	30	Pass
	Mid Channel 5785 MHz	1.29	30	Pass
	High Channel 5825 MHz	1.333	30	Pass
802.11(a) 54 Mbps				
20 MHz				
	Low Channel 5180 MHz	1.818	11	Pass
	High Channel 5240 MHz	2.394	11	Pass
	Low Channel 5745 MHz	-0.203	30	Pass
	Mid Channel 5785 MHz	0.097	30	Pass
	High Channel 5825 MHz	0.067	30	Pass
802.11(n) MCS0				
20 MHz				
	Low Channel 5180 MHz	2.643	11	Pass
	High Channel 5240 MHz	3.363	11	Pass
	Low Channel 5745 MHz	1.234	30	Pass
	Mid Channel 5785 MHz	1.36	30	Pass
	High Channel 5825 MHz	2.097	30	Pass
40 MHz				

MAXIMUM POWER SPECTRAL DENSITY

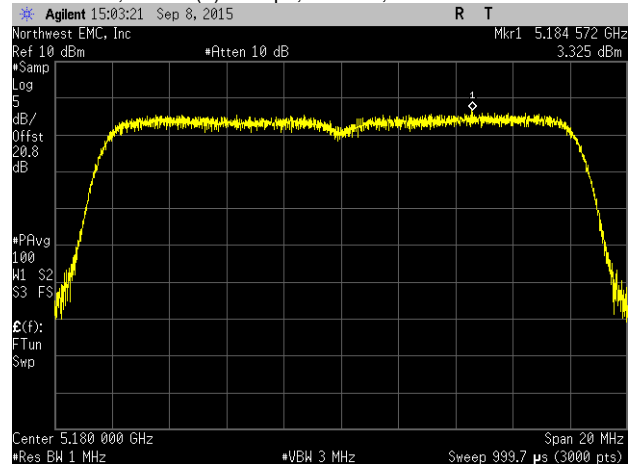
	Value (dBm / MHz)	Limit (dBm / Ref BW)	Results
Low Channel 5190 MHz	-0.871	11	Pass
High Channel 5230 MHz	-0.425	11	Pass
Low Channel 5755 MHz	-4.616	30	Pass
High Channel 5795 MHz	-3.72	30	Pass
80 MHz			
Low Channel 5210 MHz	-3.974	11	Pass
Low Channel 5775 MHz	-7.837	30	Pass
802.11(n) MCS7			
20 MHz			
Low Channel 5180 MHz	0.636	11	Pass
High Channel 5240 MHz	1.179	11	Pass
Low Channel 5745 MHz	-2.482	30	Pass
Mid Channel 5785 MHz	-2.101	30	Pass
High Channel 5825 MHz	-0.52	30	Pass
40 MHz			
Low Channel 5190 MHz	-2.024	11	Pass
High Channel 5230 MHz	-2.336	11	Pass
Low Channel 5755 MHz	-6.097	30	Pass
High Channel 5795 MHz	-5.191	30	Pass
802.11(ac) MCS8 (256-QAM)			
20 MHz			
Low Channel 5180 MHz	-0.924	11	Pass
High Channel 5240 MHz	-0.177	11	Pass
Low Channel 5745 MHz	-3.853	30	Pass
Mid Channel 5785 MHz	-3.215	30	Pass
High Channel 5825 MHz	-2.868	30	Pass
802.11(ac) MCS9 (256-QAM)			
40 MHz			
Low Channel 5190 MHz	-4.686	11	Pass
High Channel 5230 MHz	-4.359	11	Pass
Low Channel 5755 MHz	-8.006	30	Pass
High Channel 5795 MHz	-7.433	30	Pass
80 MHz			
Low Channel 5210 MHz	-8.085	11	Pass
Low Channel 5775 MHz	-11.477	30	Pass

Jonathan Kiefer

Tested By

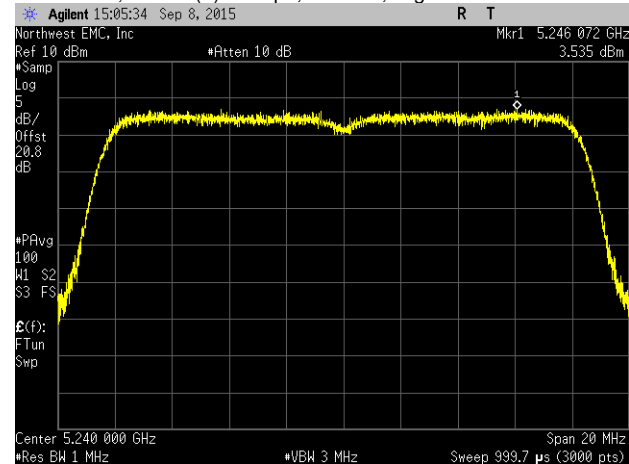
MAXIMUM POWER SPECTRAL DENSITY

Chain A, 802.11(a) 6 Mbps, 20 MHz, Low Channel 5180 MHz



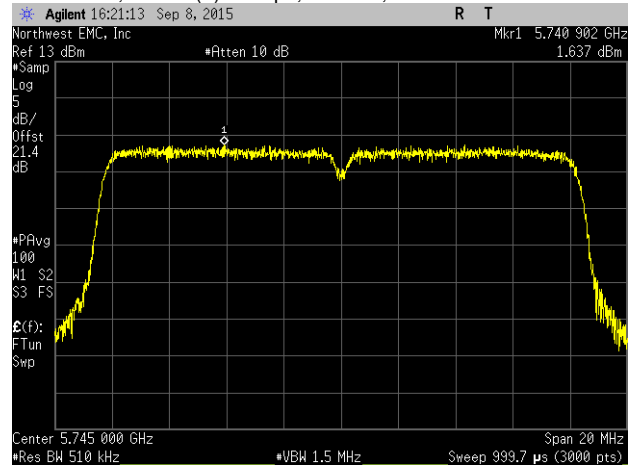
Value (dBm / MHz)	3.325
Limit (dBm / Ref BW)	11
Results	Pass

Chain A, 802.11(a) 6 Mbps, 20 MHz, High Channel 5240 MHz



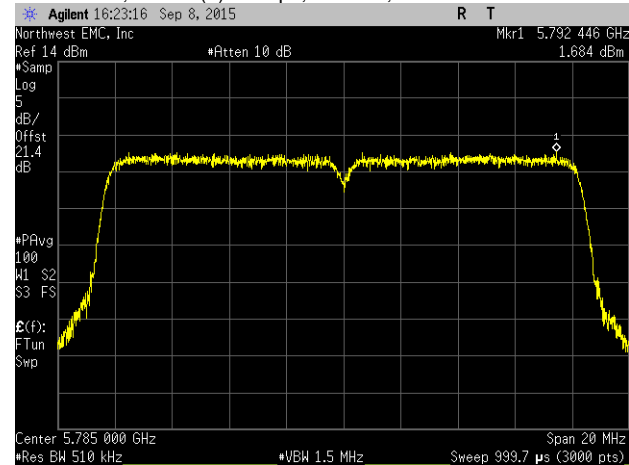
Value (dBm / MHz)	3.535
Limit (dBm / Ref BW)	11
Results	Pass

Chain A, 802.11(a) 6 Mbps, 20 MHz, Low Channel 5745 MHz



Value (dBm / MHz)	1.637
Limit (dBm / Ref BW)	30
Results	Pass

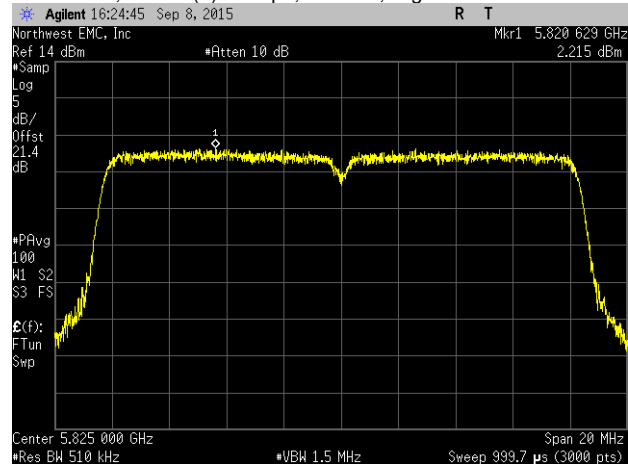
Chain A, 802.11(a) 6 Mbps, 20 MHz, Mid Channel 5785 MHz



Value (dBm / MHz)	1.684
Limit (dBm / Ref BW)	30
Results	Pass

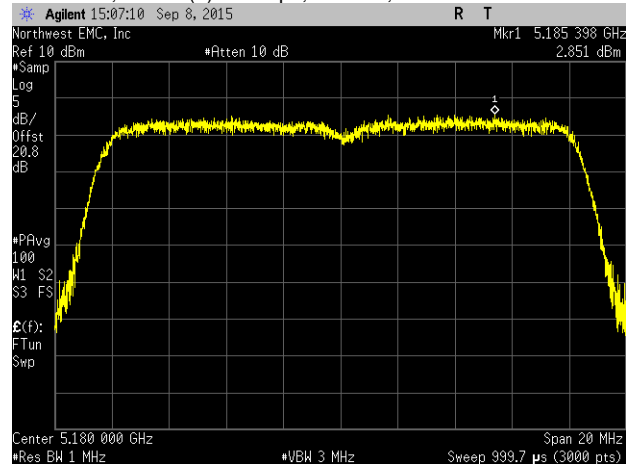
MAXIMUM POWER SPECTRAL DENSITY

Chain A, 802.11(a) 6 Mbps, 20 MHz, High Channel 5825 MHz



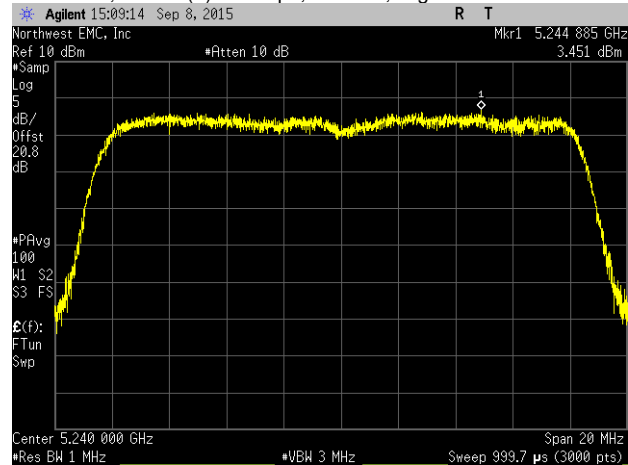
Value (dBm / MHz)	2.215
Limit (dBm / Ref BW)	30
Results	Pass

Chain A, 802.11(a) 36 Mbps, 20 MHz, Low Channel 5180 MHz



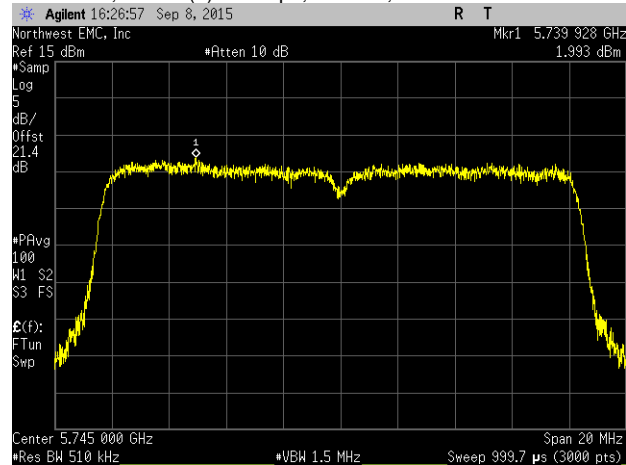
Value (dBm / MHz)	2.851
Limit (dBm / Ref BW)	11
Results	Pass

Chain A, 802.11(a) 36 Mbps, 20 MHz, High Channel 5240 MHz



Value (dBm / MHz)	3.451
Limit (dBm / Ref BW)	11
Results	Pass

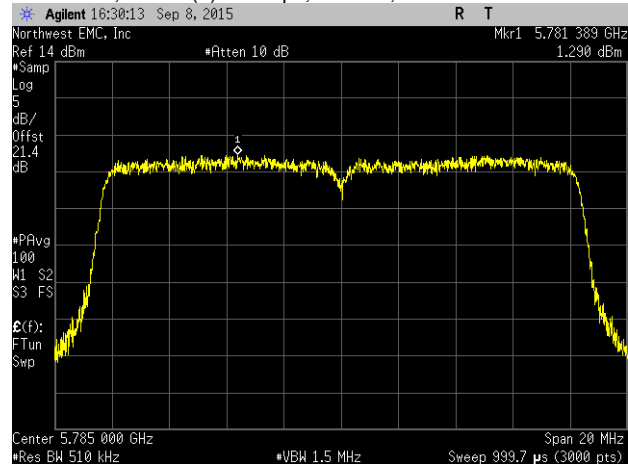
Chain A, 802.11(a) 36 Mbps, 20 MHz, Low Channel 5745 MHz



Value (dBm / MHz)	1.993
Limit (dBm / Ref BW)	30
Results	Pass

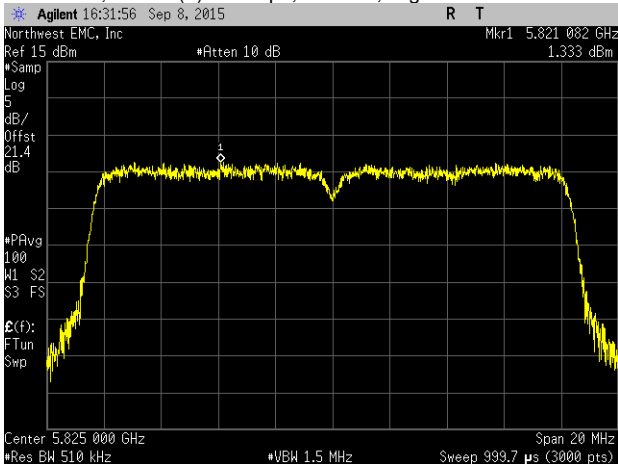
MAXIMUM POWER SPECTRAL DENSITY

Chain A, 802.11(a) 36 Mbps, 20 MHz, Mid Channel 5785 MHz



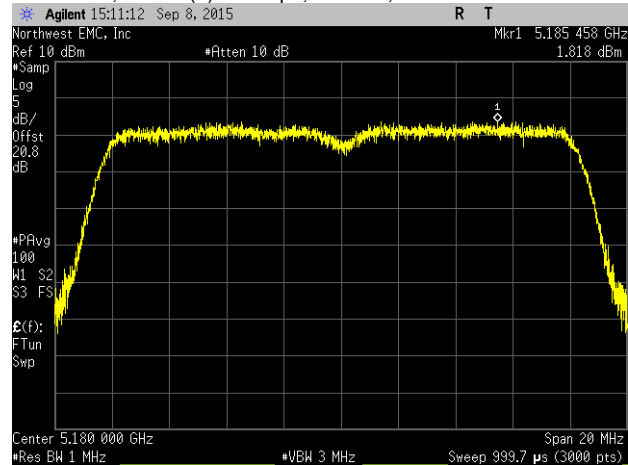
Value (dBm / MHz)	1.29
Limit (dBm / Ref BW)	30
Results	Pass

Chain A, 802.11(a) 36 Mbps, 20 MHz, High Channel 5825 MHz



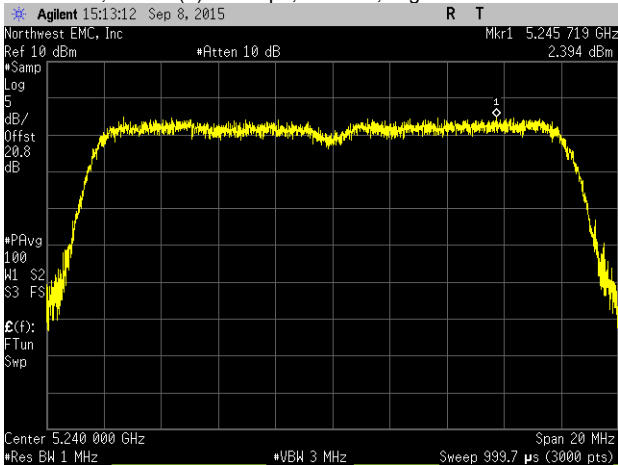
Value (dBm / MHz)	1.333
Limit (dBm / Ref BW)	30
Results	Pass

Chain A, 802.11(a) 54 Mbps, 20 MHz, Low Channel 5180 MHz



Value (dBm / MHz)	1.818
Limit (dBm / Ref BW)	11
Results	Pass

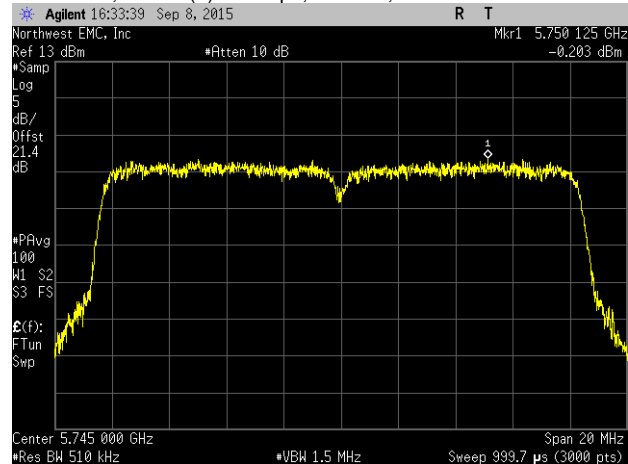
Chain A, 802.11(a) 54 Mbps, 20 MHz, High Channel 5240 MHz



Value (dBm / MHz)	2.394
Limit (dBm / Ref BW)	11
Results	Pass

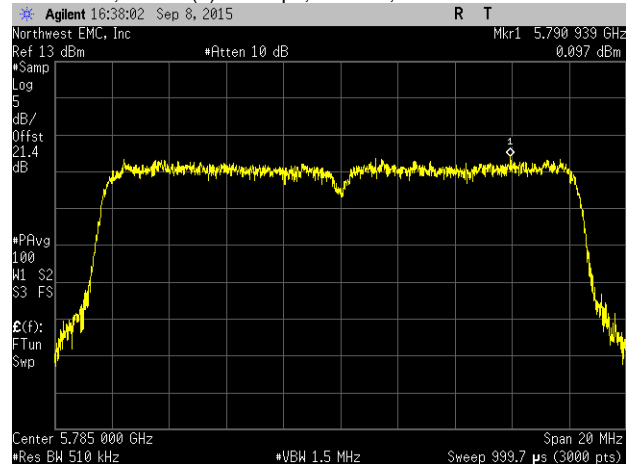
MAXIMUM POWER SPECTRAL DENSITY

Chain A, 802.11(a) 54 Mbps, 20 MHz, Low Channel 5745 MHz



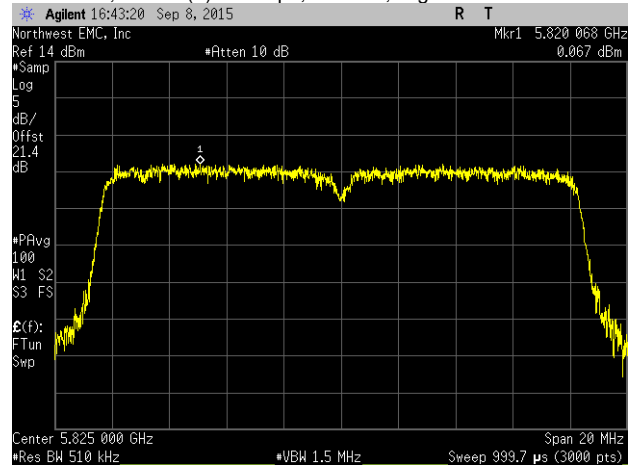
Value (dBm / MHz)	-0.203
Limit (dBm / Ref BW)	30
Results	Pass

Chain A, 802.11(a) 54 Mbps, 20 MHz, Mid Channel 5785 MHz



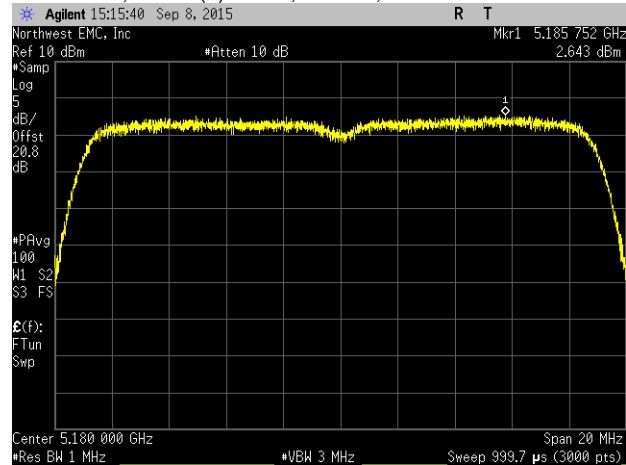
Value (dBm / MHz)	0.097
Limit (dBm / Ref BW)	30
Results	Pass

Chain A, 802.11(a) 54 Mbps, 20 MHz, High Channel 5825 MHz



Value (dBm / MHz)	0.067
Limit (dBm / Ref BW)	30
Results	Pass

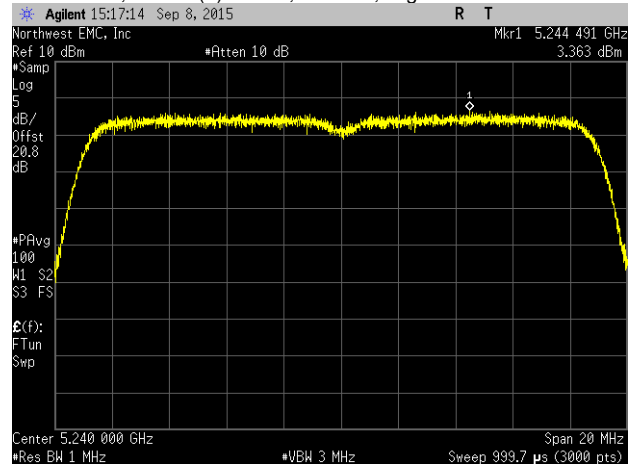
Chain A, 802.11(n) MCS0, 20 MHz, Low Channel 5180 MHz



Value (dBm / MHz)	2.643
Limit (dBm / Ref BW)	11
Results	Pass

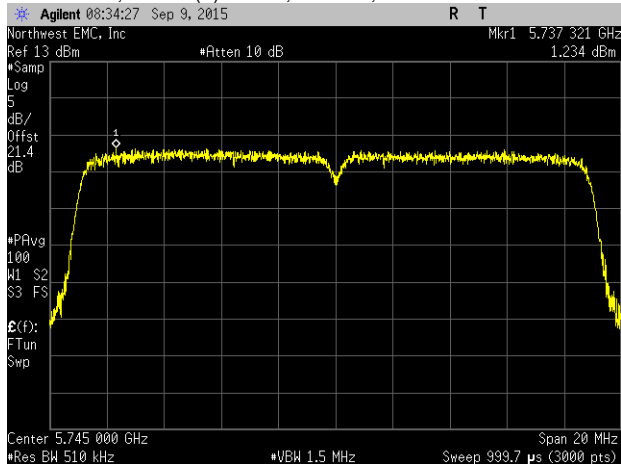
MAXIMUM POWER SPECTRAL DENSITY

Chain A, 802.11(n) MCS0, 20 MHz, High Channel 5240 MHz



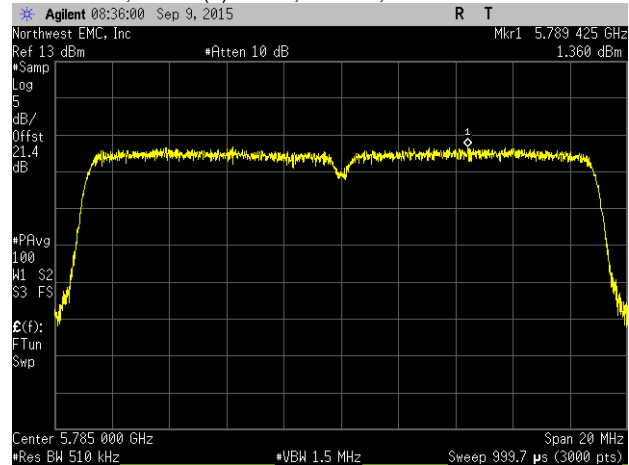
Value (dBm / MHz)	3.363
Limit (dBm / Ref BW)	11
Results	Pass

Chain A, 802.11(n) MCS0, 20 MHz, Low Channel 5745 MHz



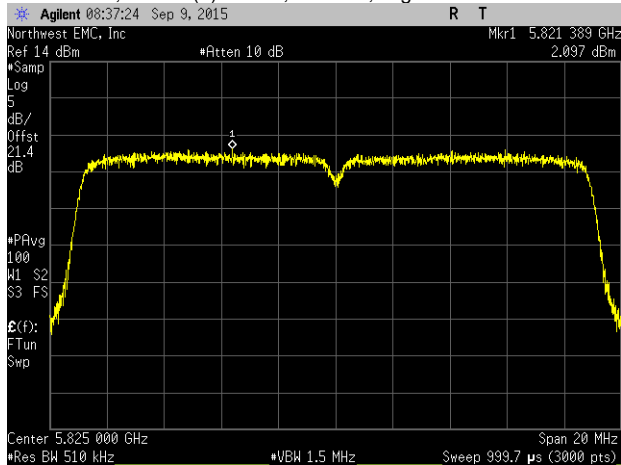
Value (dBm / MHz)	1.234
Limit (dBm / Ref BW)	30
Results	Pass

Chain A, 802.11(n) MCS0, 20 MHz, Mid Channel 5785 MHz



Value (dBm / MHz)	1.36
Limit (dBm / Ref BW)	30
Results	Pass

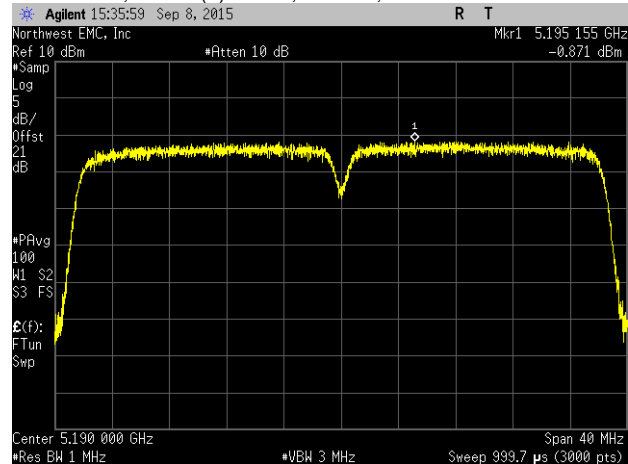
Chain A, 802.11(n) MCS0, 20 MHz, High Channel 5825 MHz



Value (dBm / MHz)	2.097
Limit (dBm / Ref BW)	30
Results	Pass

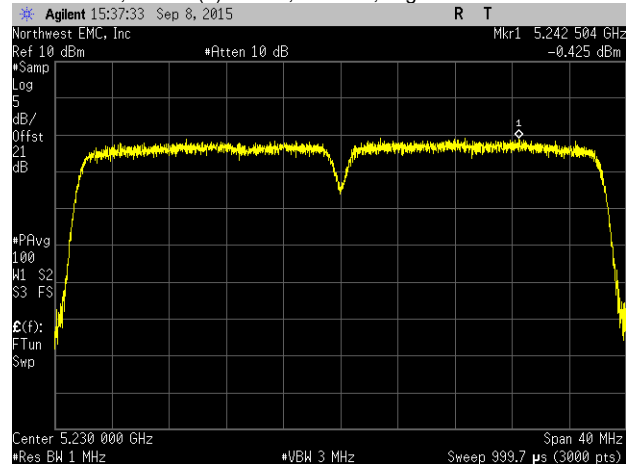
MAXIMUM POWER SPECTRAL DENSITY

Chain A, 802.11(n) MCS0, 40 MHz, Low Channel 5190 MHz



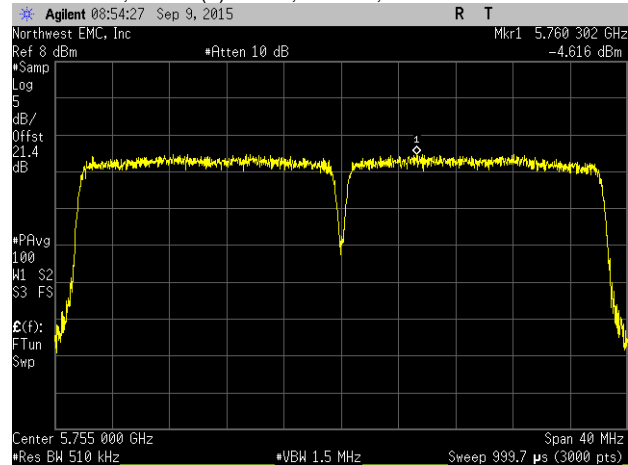
Value (dBm / MHz)	-0.871
Limit (dBm / Ref BW)	11
Results	Pass

Chain A, 802.11(n) MCS0, 40 MHz, High Channel 5230 MHz



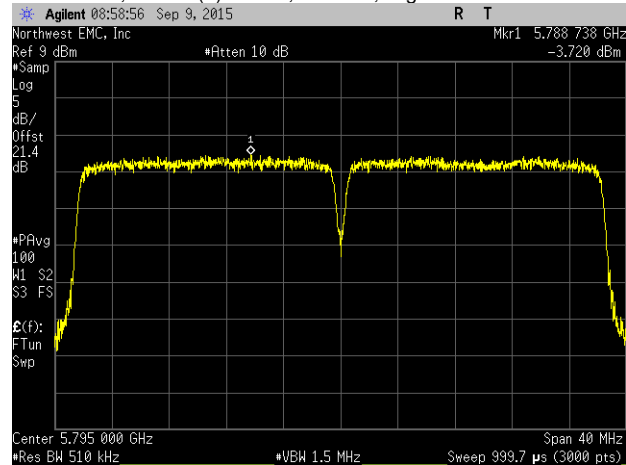
Value (dBm / MHz)	-0.425
Limit (dBm / Ref BW)	11
Results	Pass

Chain A, 802.11(n) MCS0, 40 MHz, Low Channel 5755 MHz



Value (dBm / MHz)	-4.616
Limit (dBm / Ref BW)	30
Results	Pass

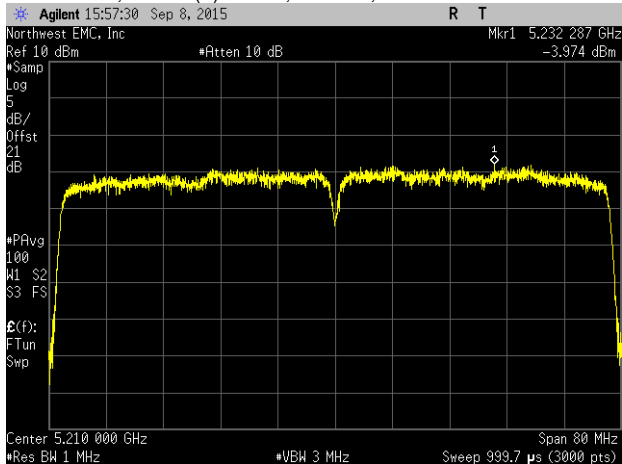
Chain A, 802.11(n) MCS0, 40 MHz, High Channel 5795 MHz



Value (dBm / MHz)	-3.72
Limit (dBm / Ref BW)	30
Results	Pass

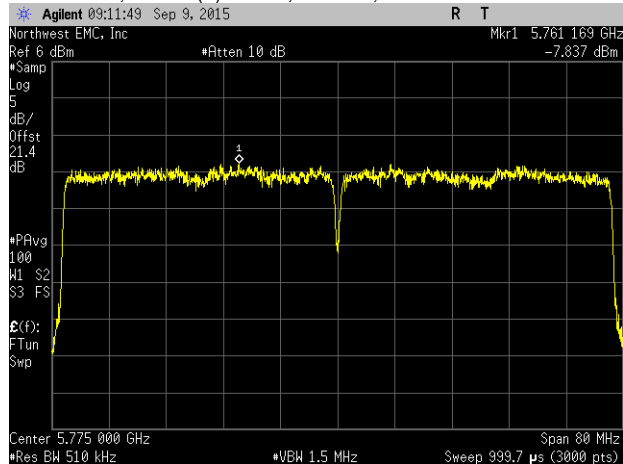
MAXIMUM POWER SPECTRAL DENSITY

Chain A, 802.11(n) MCS0, 80 MHz, Low Channel 5210 MHz



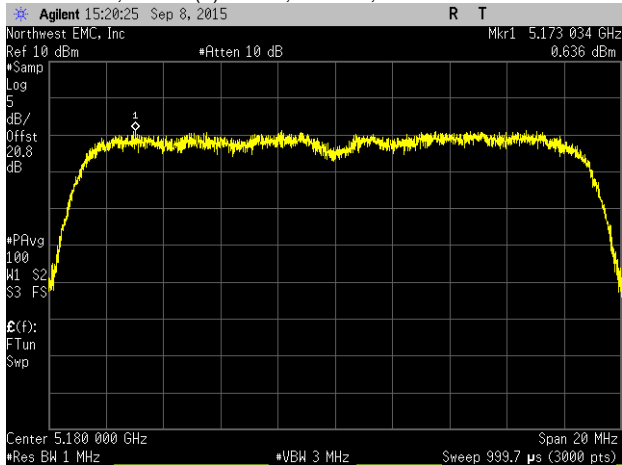
Value (dBm / MHz)	-3.974
Limit (dBm / Ref BW)	11
Results	Pass

Chain A, 802.11(n) MCS0, 80 MHz, Low Channel 5775 MHz



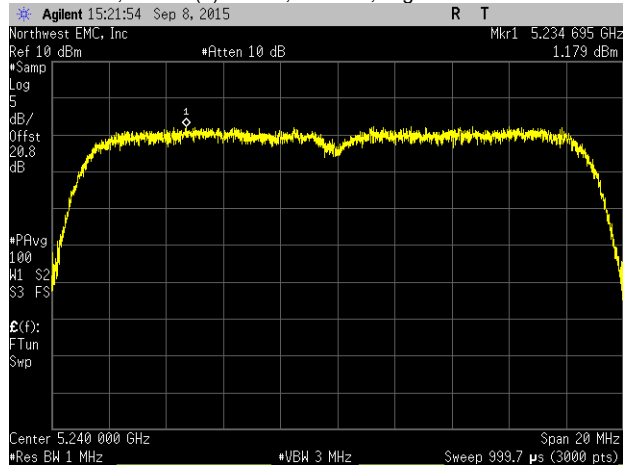
Value (dBm / MHz)	-7.837
Limit (dBm / Ref BW)	30
Results	Pass

Chain A, 802.11(n) MCS7, 20 MHz, Low Channel 5180 MHz



Value (dBm / MHz)	0.636
Limit (dBm / Ref BW)	11
Results	Pass

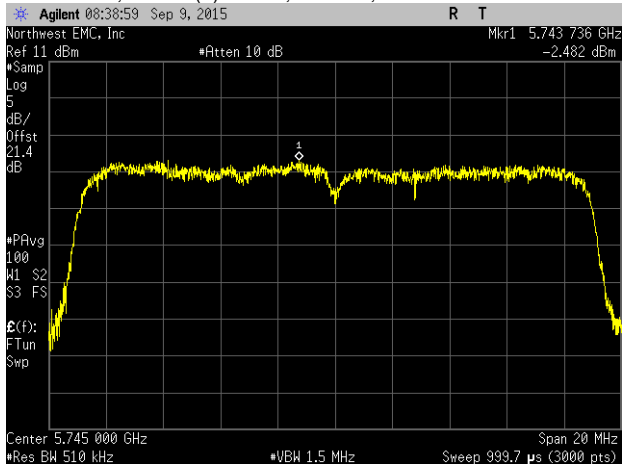
Chain A, 802.11(n) MCS7, 20 MHz, High Channel 5240 MHz



Value (dBm / MHz)	1.179
Limit (dBm / Ref BW)	11
Results	Pass

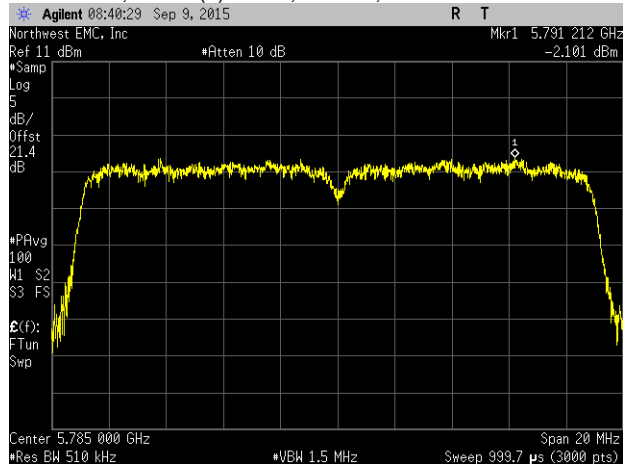
MAXIMUM POWER SPECTRAL DENSITY

Chain A, 802.11(n) MCS7, 20 MHz, Low Channel 5745 MHz



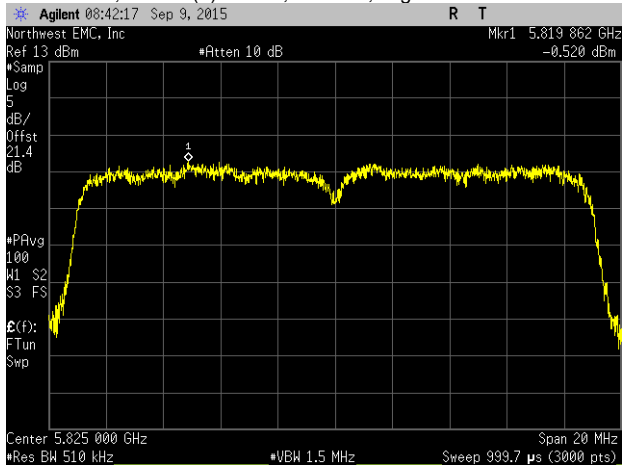
Value (dBm / MHz)	-2.482
Limit (dBm / Ref BW)	30
Results	Pass

Chain A, 802.11(n) MCS7, 20 MHz, Mid Channel 5785 MHz



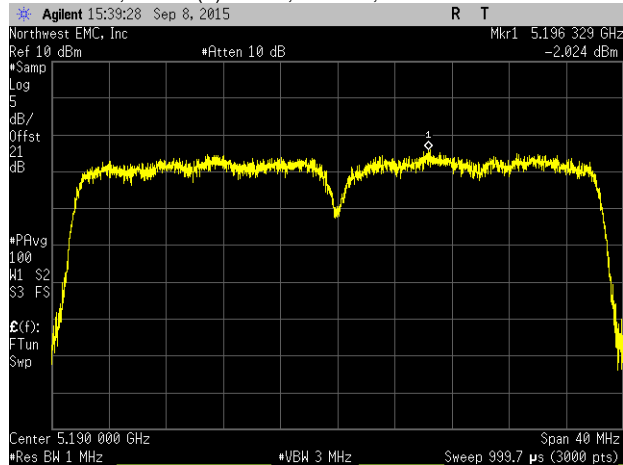
Value (dBm / MHz)	-2.101
Limit (dBm / Ref BW)	30
Results	Pass

Chain A, 802.11(n) MCS7, 20 MHz, High Channel 5825 MHz



Value (dBm / MHz)	-0.52
Limit (dBm / Ref BW)	30
Results	Pass

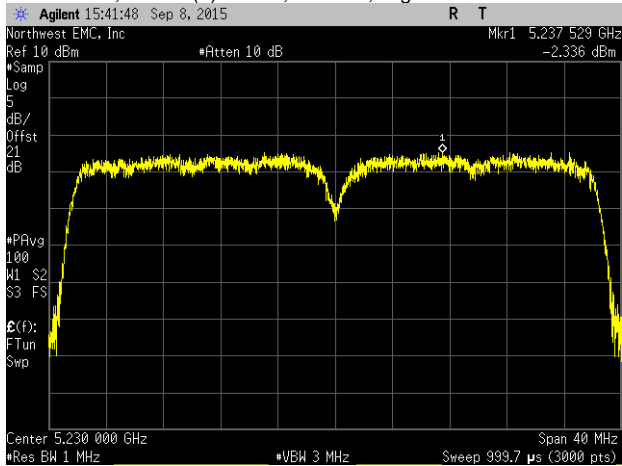
Chain A, 802.11(n) MCS7, 40 MHz, Low Channel 5190 MHz



Value (dBm / MHz)	-2.024
Limit (dBm / Ref BW)	11
Results	Pass

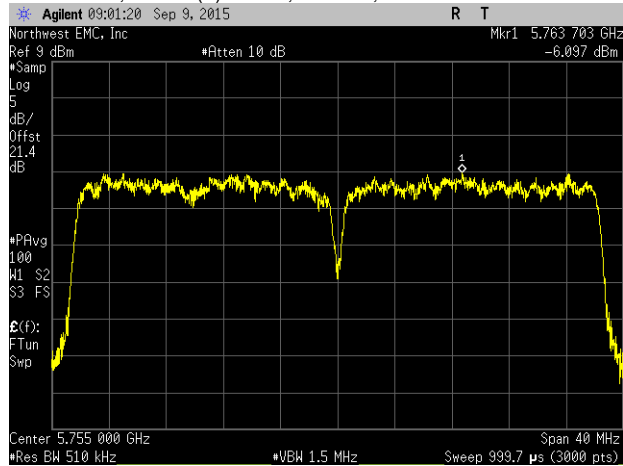
MAXIMUM POWER SPECTRAL DENSITY

Chain A, 802.11(n) MCS7, 40 MHz, High Channel 5230 MHz



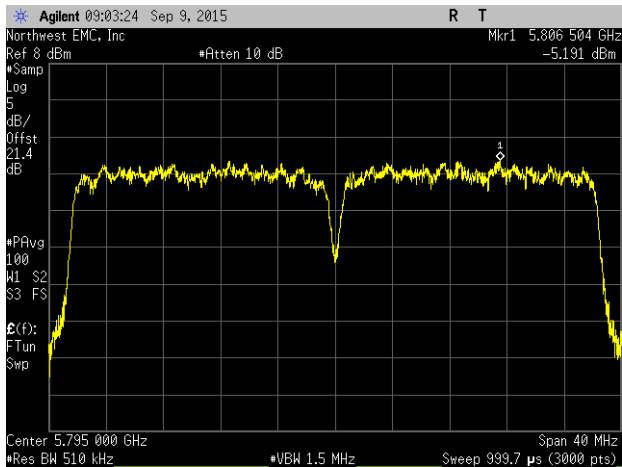
Value (dBm / MHz)	-2.336
Limit (dBm / Ref BW)	11
Results	Pass

Chain A, 802.11(n) MCS7, 40 MHz, Low Channel 5755 MHz



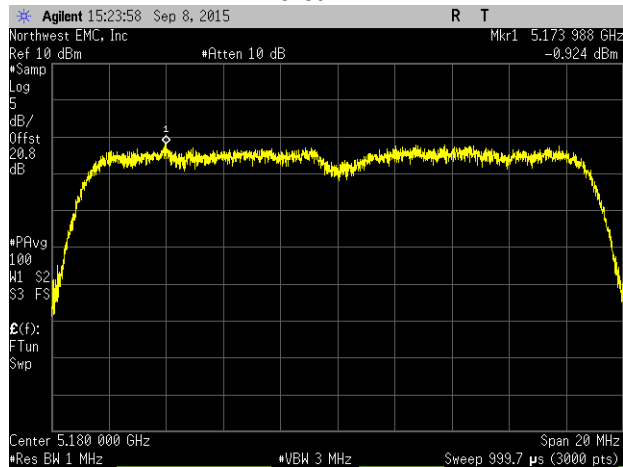
Value (dBm / MHz)	-6.097
Limit (dBm / Ref BW)	30
Results	Pass

Chain A, 802.11(n) MCS7, 40 MHz, High Channel 5795 MHz



Value (dBm / MHz)	-5.191
Limit (dBm / Ref BW)	30
Results	Pass

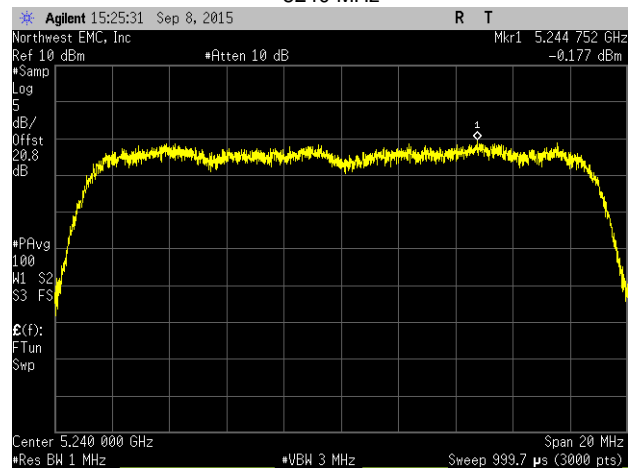
Chain A, 802.11(ac) MCS8 (256-QAM), 20 MHz, Low Channel 5180 MHz



Value (dBm / MHz)	-0.924
Limit (dBm / Ref BW)	11
Results	Pass

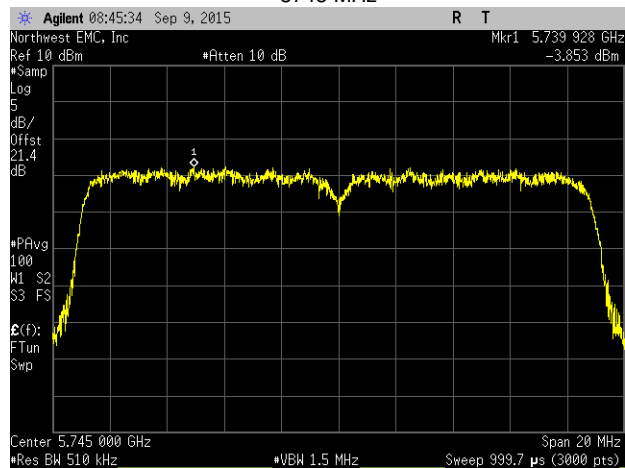
MAXIMUM POWER SPECTRAL DENSITY

Chain A, 802.11(ac) MCS8 (256-QAM), 20 MHz, High Channel
5240 MHz



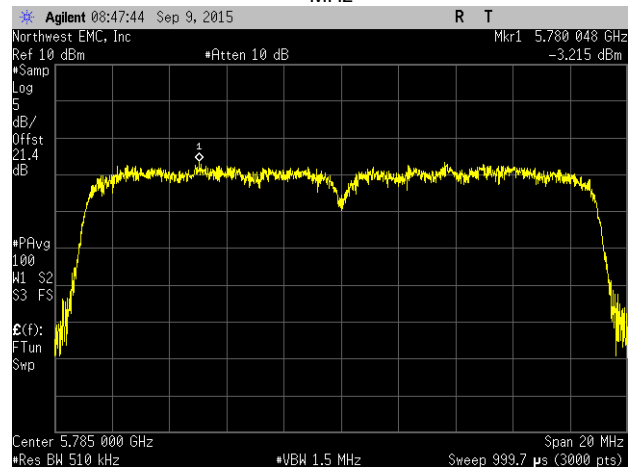
Value (dBm / MHz)	-0.177
Limit (dBm / Ref BW)	11
Results	Pass

Chain A, 802.11(ac) MCS8 (256-QAM), 20 MHz, Low Channel
5745 MHz



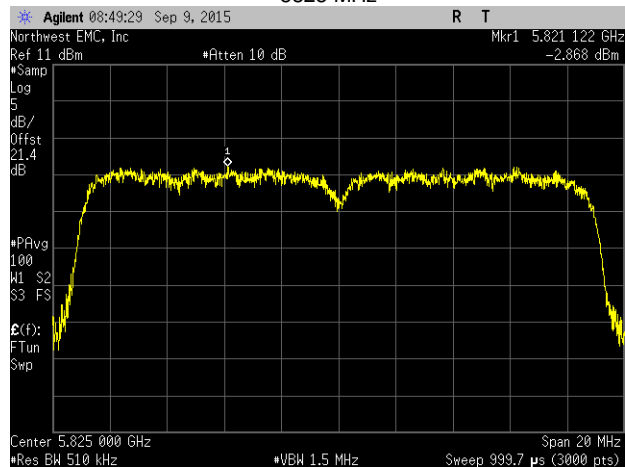
Value (dBm / MHz)	-3.853
Limit (dBm / Ref BW)	30
Results	Pass

Chain A, 802.11(ac) MCS8 (256-QAM), 20 MHz, Mid Channel 5785 MHz



Value (dBm / MHz)	-3.215
Limit (dBm / Ref BW)	30
Results	Pass

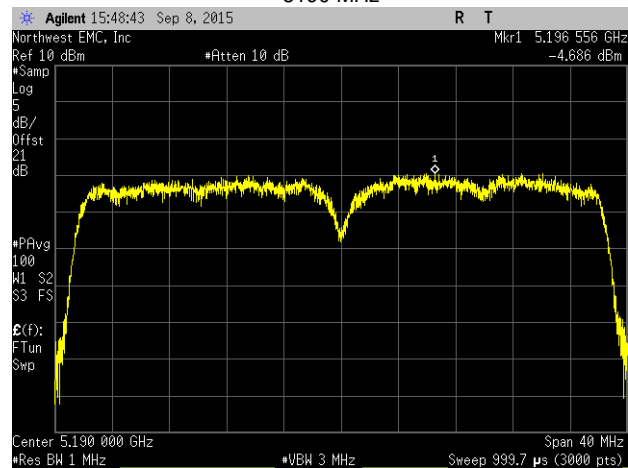
Chain A, 802.11(ac) MCS8 (256-QAM), 20 MHz, High Channel
5825 MHz



Value (dBm / MHz)	-2.868
Limit (dBm / Ref BW)	30
Results	Pass

MAXIMUM POWER SPECTRAL DENSITY

Chain A, 802.11(ac) MCS9 (256-QAM), 40 MHz, Low Channel
5190 MHz



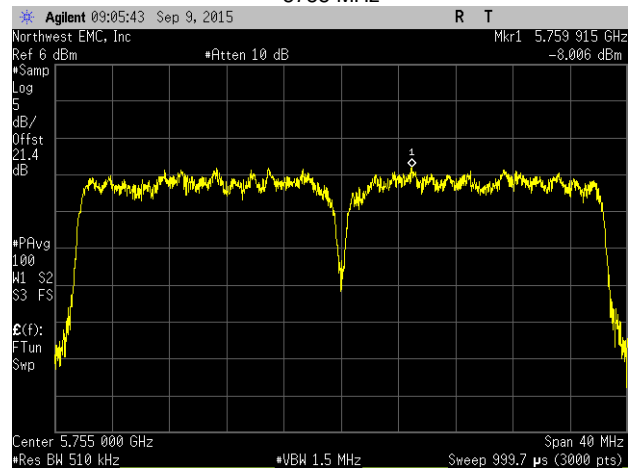
Value (dBm / MHz)	-4.686
Limit (dBm / Ref BW)	11
Results	Pass

Chain A, 802.11(ac) MCS9 (256-QAM), 40 MHz, High Channel
5230 MHz



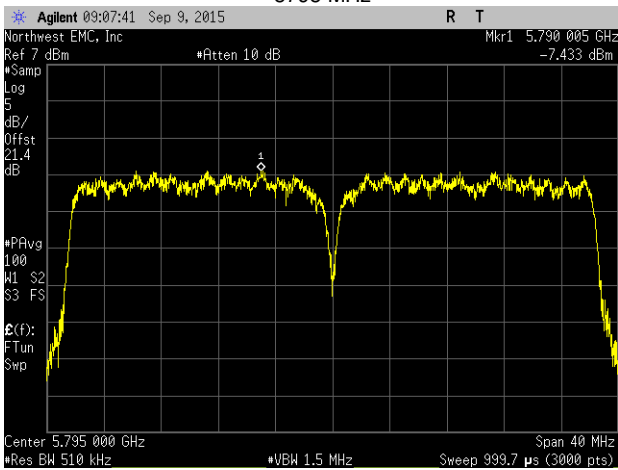
Value (dBm / MHz)	-4.359
Limit (dBm / Ref BW)	11
Results	Pass

Chain A, 802.11(ac) MCS9 (256-QAM), 40 MHz, Low Channel
5755 MHz



Value (dBm / MHz)	-8.006
Limit (dBm / Ref BW)	30
Results	Pass

Chain A, 802.11(ac) MCS9 (256-QAM), 40 MHz, High Channel
5795 MHz

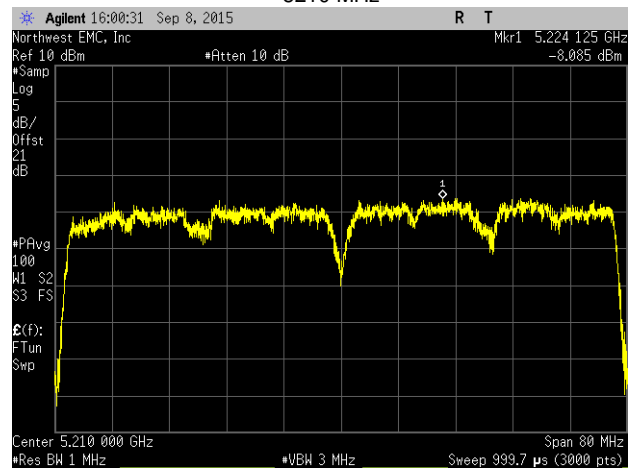


Value (dBm / MHz)	-7.433
Limit (dBm / Ref BW)	30
Results	Pass

MAXIMUM POWER SPECTRAL DENSITY

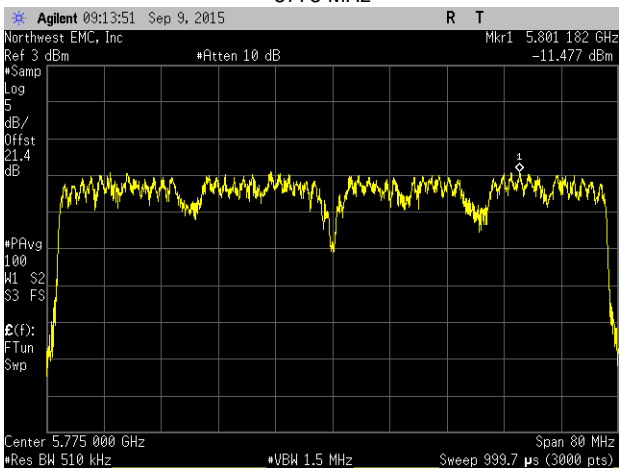


Chain A, 802.11(ac) MCS9 (256-QAM), 80 MHz, Low Channel
5210 MHz



Value (dBm / MHz)	-8.085
Limit (dBm / Ref BW)	11
Results	Pass

Chain A, 802.11(ac) MCS9 (256-QAM), 80 MHz, Low Channel
5775 MHz



Value (dBm / MHz)	-11.477
Limit (dBm / Ref BW)	30
Results	Pass

MAXIMUM POWER SPECTRAL DENSITY

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 DESCRIPTION

FCC KDB 789033 D01 General UNII Test Procedures Section E was followed. The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. The data rate(s) listed in the datasheet were tested. 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 power spectral density, the transmission pulse duration (T) was measured. The transmission pulse duration and the associated data are found elsewhere in this test report.

The spectrum analyzer settings were as follows:

- ☐ The span was set to encompass entire emission bandwidth (B), centered on the transmit channel.
- ☐ RBW = 1 MHz, VBW $\geq$ 3 MHz
- ☐ Sample detector was used because Method SA-1 Alternate was used to measure the Maximum Conducted Output Power.
- ☐ Trace average 100 traces in power averaging mode (not video averaging).

The peak power spectral density (PPSD) was determined to be the highest level found across the emission in any 1 MHz band after 100 sweeps of power averaging (not video averaging).

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFD	7/23/2015	7/23/2016
Block - DC	Fairview Microwave	SD3379	AMM	2/27/2015	2/27/2016
Attenuator	Fairview Microwave	SA4018-20	TQY	2/27/2015	2/27/2016
Generator - Signal	Agilent	N5173B	TIW	7/15/2014	7/15/2017

MAXIMUM POWER SPECTRAL DENSITY

EUT:	Firebox T50-W (BS5AE7W)	Work Order:	VDEI0009
Serial Number:	70AF02717-B385	Date:	09/10/15
Customer:	WatchGuard Technologies, Inc.	Temperature:	25.1°C
Attendees:	None	Relative Humidity:	45%
Customer Project:	None	Bar. Pressure:	1015 mbar
Tested By:	Jonathan Kiefer	Job Site:	TX09
Power:	110VAC/60Hz	Configuration:	5

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2015	ANSI C63.10:2013

COMMENTS

SISO mode, Chain B (Chain 1).

DEVIATIONS FROM TEST STANDARD

None

RESULTS

		Value (dBm / MHz)	Limit (dBm / Ref BW)	Results
Chain B				
802.11(a) 6 Mbps				
20 MHz				
	Low Channel 5180 MHz	6.039	11	Pass
	High Channel 5240 MHz	6.488	11	Pass
	Low Channel 5745 MHz	3.465	30	Pass
	Mid Channel 5785 MHz	3.796	30	Pass
	High Channel 5825 MHz	3.773	30	Pass
802.11(a) 36 Mbps				
20 MHz				
	Low Channel 5180 MHz	5.567	11	Pass
	High Channel 5240 MHz	5.916	11	Pass
	Low Channel 5745 MHz	2.76	30	Pass
	Mid Channel 5785 MHz	3.045	30	Pass
	High Channel 5825 MHz	3.019	30	Pass
802.11(a) 54 Mbps				
20 MHz				
	Low Channel 5180 MHz	4.826	11	Pass
	High Channel 5240 MHz	5.22	11	Pass
	Low Channel 5745 MHz	1.251	30	Pass
	Mid Channel 5785 MHz	1.966	30	Pass
	High Channel 5825 MHz	1.682	30	Pass
802.11(n) HT, MCS0				
20 MHz				
	Low Channel 5180 MHz	5.373	11	Pass
	High Channel 5240 MHz	5.953	11	Pass
	Low Channel 5745 MHz	2.991	30	Pass
	Mid Channel 5785 MHz	3.49	30	Pass
	High Channel 5825 MHz	3.237	30	Pass
40 MHz				
	Low Channel 5190 MHz	0.941	11	Pass
	High Channel 5230 MHz	1.521	11	Pass

MAXIMUM POWER SPECTRAL DENSITY

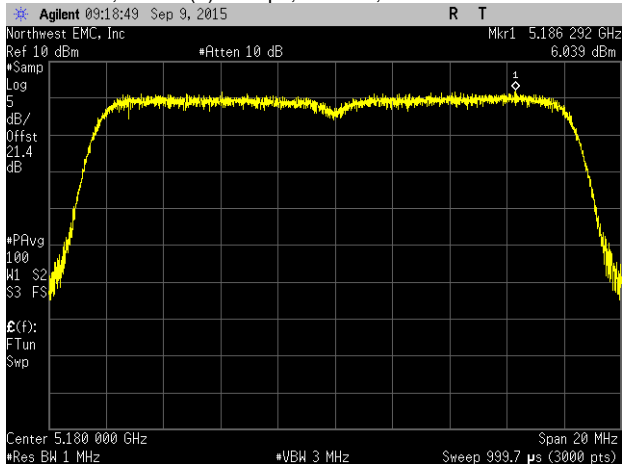
	Value (dBm / MHz)	Limit (dBm / Ref BW)	Results
Low Channel 5755 MHz	-1.399	30	Pass
High Channel 5795 MHz	-2.226	30	Pass
80 MHz			
Low Channel 5210 MHz	-2.46	11	Pass
Low Channel 5775 MHz	-5.81	30	Pass
802.11(n) HT, MCS7			
20 MHz			
Low Channel 5180 MHz	2.695	11	Pass
High Channel 5240 MHz	3.15	11	Pass
Low Channel 5745 MHz	0.367	30	Pass
Mid Channel 5785 MHz	0.782	30	Pass
High Channel 5825 MHz	1.038	30	Pass
40 MHz			
Low Channel 5190 MHz	-0.73	11	Pass
High Channel 5230 MHz	-0.264	11	Pass
Low Channel 5755 MHz	-3.062	30	Pass
High Channel 5795 MHz	-3.712	30	Pass
802.11(ac) VHT, MCS8 (256-QAM)			
20 MHz			
Low Channel 5180 MHz	1.251	11	Pass
High Channel 5240 MHz	2.306	11	Pass
Low Channel 5745 MHz	-1.167	30	Pass
Mid Channel 5785 MHz	-0.417	30	Pass
High Channel 5825 MHz	-0.074	30	Pass
802.11(ac) VHT, MCS9 (256-QAM)			
40 MHz			
Low Channel 5190 MHz	-2.778	11	Pass
High Channel 5230 MHz	-2.788	11	Pass
Low Channel 5755 MHz	-4.751	30	Pass
High Channel 5795 MHz	-5.612	30	Pass
80 MHz			
Low Channel 5210 MHz	-5.944	11	Pass
Low Channel 5775 MHz	-9.25	30	Pass

Jonathan Kiefer

Tested By

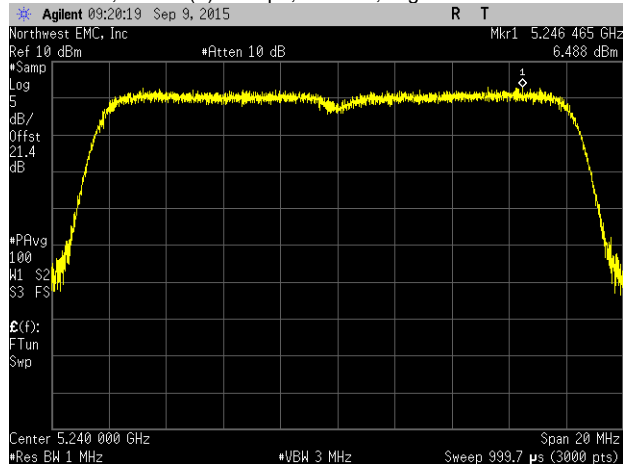
MAXIMUM POWER SPECTRAL DENSITY

Chain B, 802.11(a) 6 Mbps, 20 MHz, Low Channel 5180 MHz



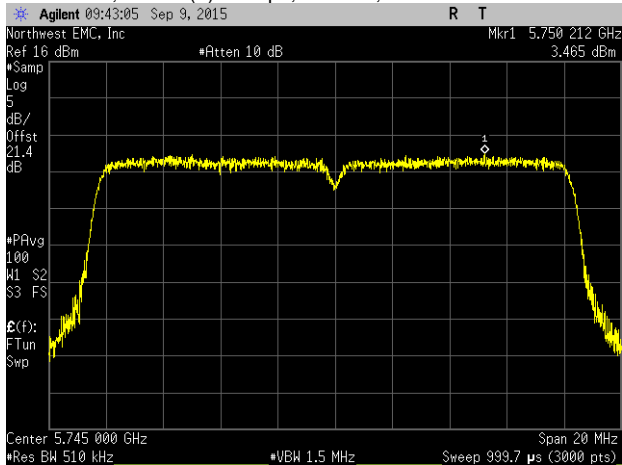
Value (dBm / MHz)	6.039
Limit (dBm / Ref BW)	11
Results	Pass

Chain B, 802.11(a) 6 Mbps, 20 MHz, High Channel 5240 MHz



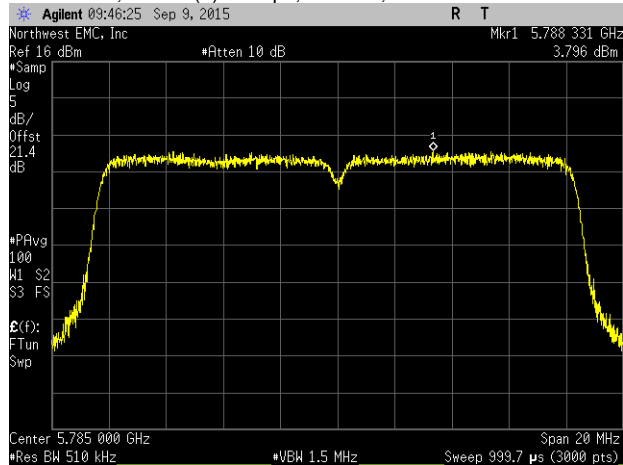
Value (dBm / MHz)	6.488
Limit (dBm / Ref BW)	11
Results	Pass

Chain B, 802.11(a) 6 Mbps, 20 MHz, Low Channel 5745 MHz



Value (dBm / MHz)	3.465
Limit (dBm / Ref BW)	30
Results	Pass

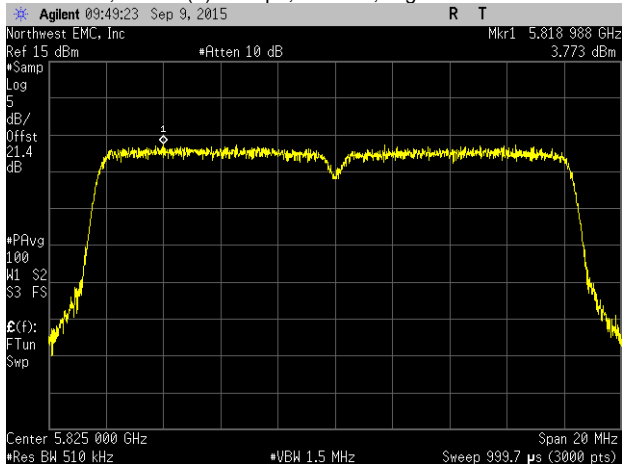
Chain B, 802.11(a) 6 Mbps, 20 MHz, Mid Channel 5785 MHz



Value (dBm / MHz)	3.796
Limit (dBm / Ref BW)	30
Results	Pass

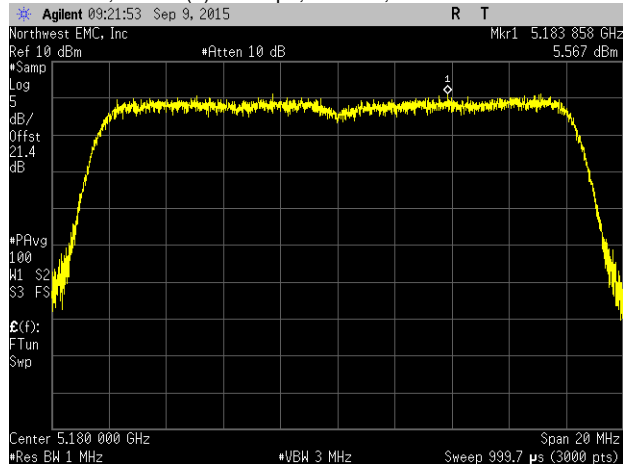
MAXIMUM POWER SPECTRAL DENSITY

Chain B, 802.11(a) 6 Mbps, 20 MHz, High Channel 5825 MHz



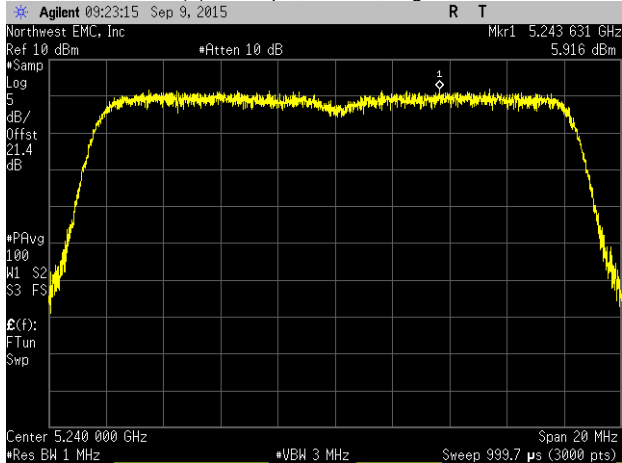
Value (dBm / MHz)	3.773
Limit (dBm / Ref BW)	30
Results	Pass

Chain B, 802.11(a) 36 Mbps, 20 MHz, Low Channel 5180 MHz



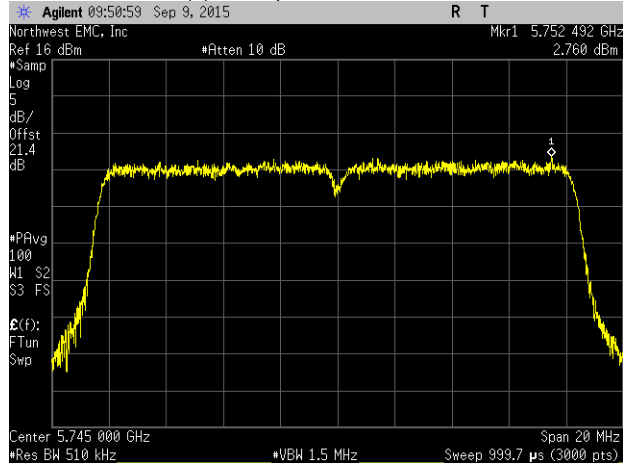
Value (dBm / MHz)	5.567
Limit (dBm / Ref BW)	11
Results	Pass

Chain B, 802.11(a) 36 Mbps, 20 MHz, High Channel 5240 MHz



Value (dBm / MHz)	5.916
Limit (dBm / Ref BW)	11
Results	Pass

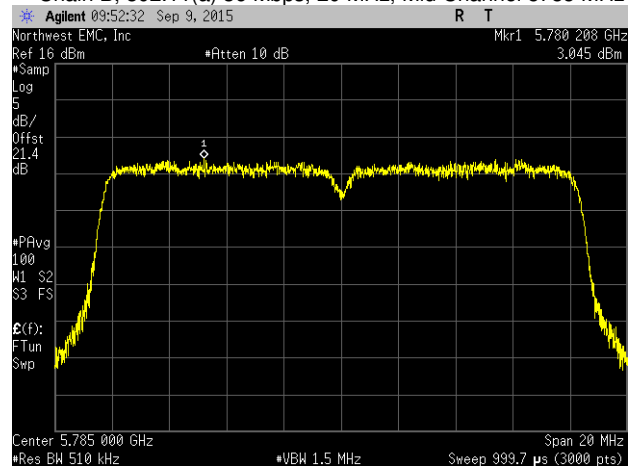
Chain B, 802.11(a) 36 Mbps, 20 MHz, Low Channel 5745 MHz



Value (dBm / MHz)	2.76
Limit (dBm / Ref BW)	30
Results	Pass

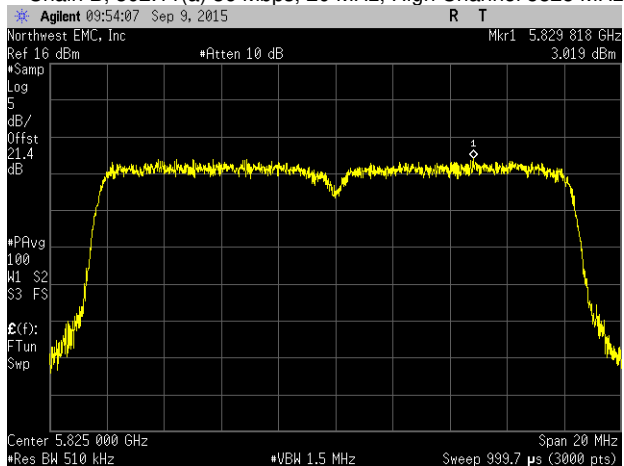
MAXIMUM POWER SPECTRAL DENSITY

Chain B, 802.11(a) 36 Mbps, 20 MHz, Mid Channel 5785 MHz



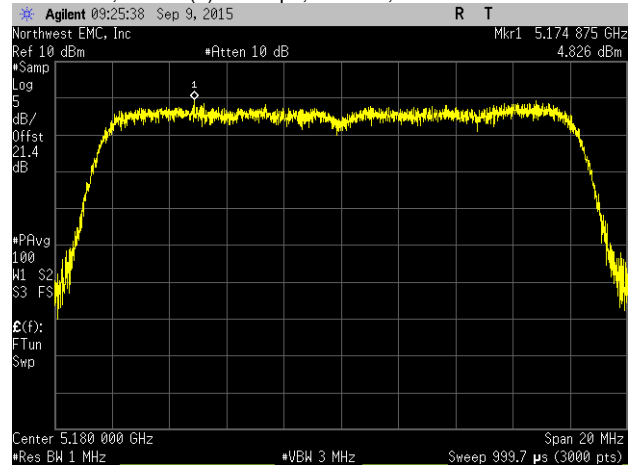
Value (dBm / MHz)	3.045
Limit (dBm / Ref BW)	30
Results	Pass

Chain B, 802.11(a) 36 Mbps, 20 MHz, High Channel 5825 MHz



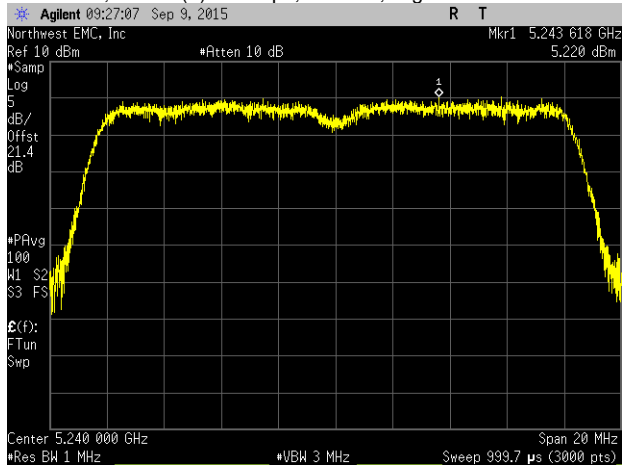
Value (dBm / MHz)	3.019
Limit (dBm / Ref BW)	30
Results	Pass

Chain B, 802.11(a) 54 Mbps, 20 MHz, Low Channel 5180 MHz



Value (dBm / MHz)	4.826
Limit (dBm / Ref BW)	11
Results	Pass

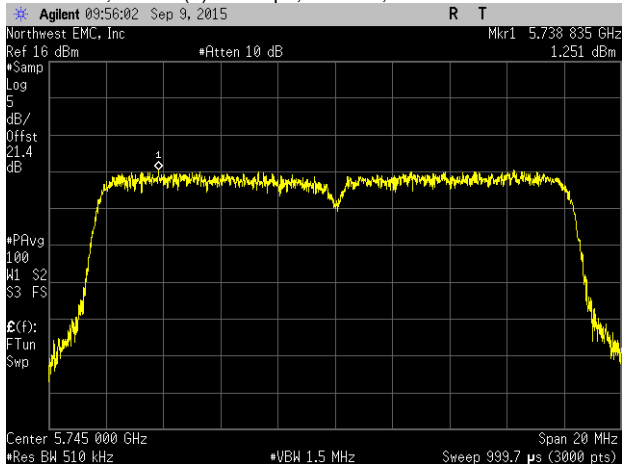
Chain B, 802.11(a) 54 Mbps, 20 MHz, High Channel 5240 MHz



Value (dBm / MHz)	5.22
Limit (dBm / Ref BW)	11
Results	Pass

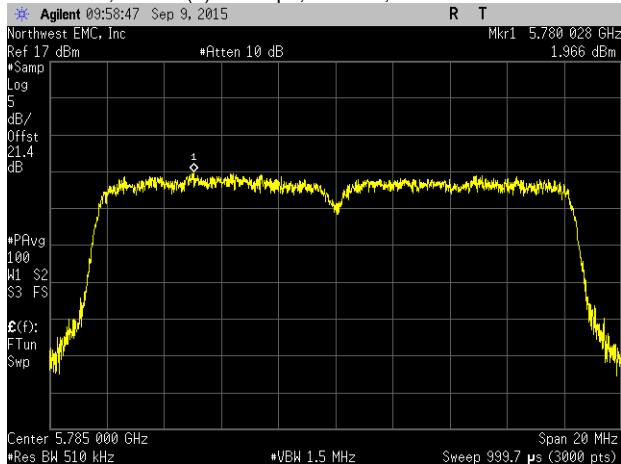
MAXIMUM POWER SPECTRAL DENSITY

Chain B, 802.11(a) 54 Mbps, 20 MHz, Low Channel 5745 MHz



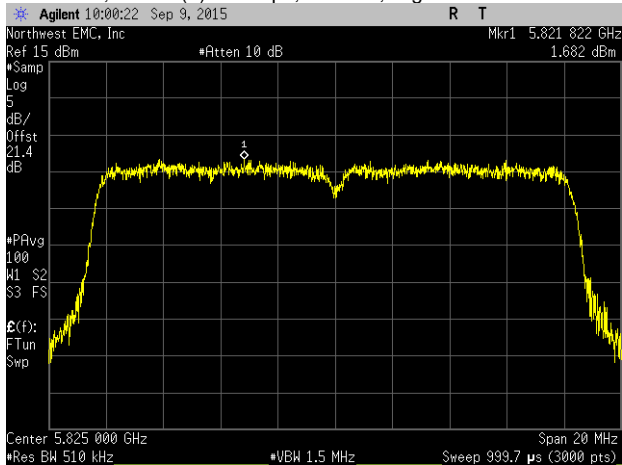
Value (dBm / MHz)	1.251
Limit (dBm / Ref BW)	30
Results	Pass

Chain B, 802.11(a) 54 Mbps, 20 MHz, Mid Channel 5785 MHz



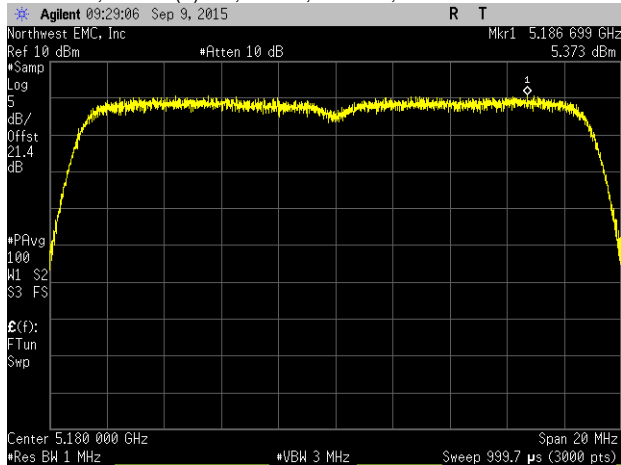
Value (dBm / MHz)	1.966
Limit (dBm / Ref BW)	30
Results	Pass

Chain B, 802.11(a) 54 Mbps, 20 MHz, High Channel 5825 MHz



Value (dBm / MHz)	1.682
Limit (dBm / Ref BW)	30
Results	Pass

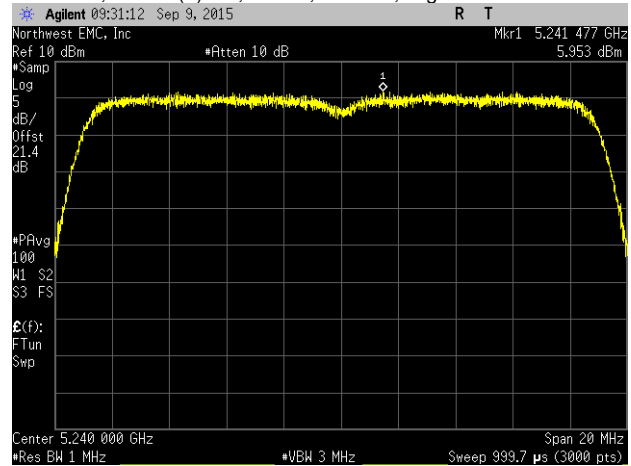
Chain B, 802.11(n) HT, MCS0, 20 MHz, Low Channel 5180 MHz



Value (dBm / MHz)	5.373
Limit (dBm / Ref BW)	11
Results	Pass

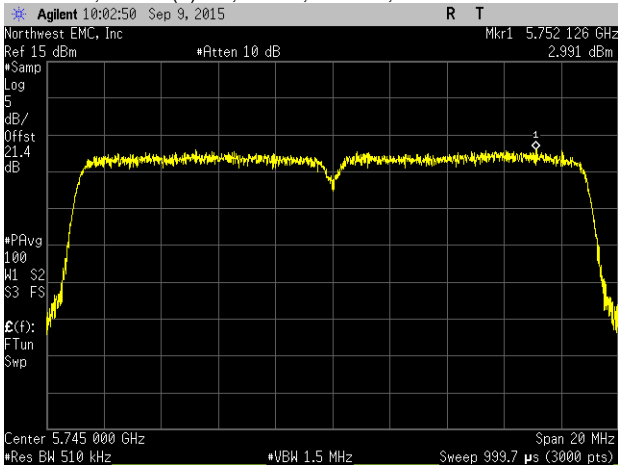
MAXIMUM POWER SPECTRAL DENSITY

Chain B, 802.11(n) HT, MCS0, 20 MHz, High Channel 5240 MHz



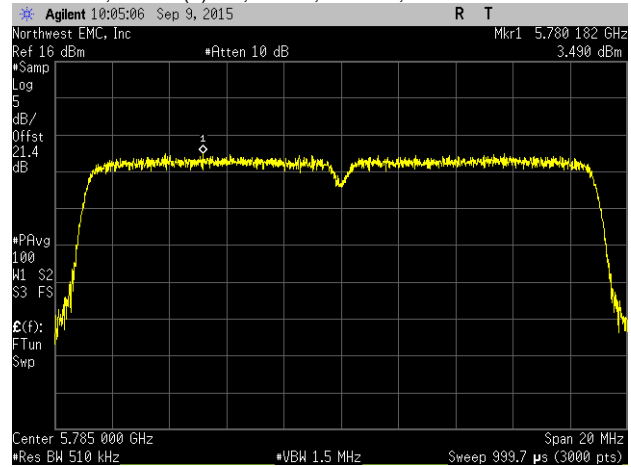
Value (dBm / MHz)	5.953
Limit (dBm / Ref BW)	11
Results	Pass

Chain B, 802.11(n) HT, MCS0, 20 MHz, Low Channel 5745 MHz



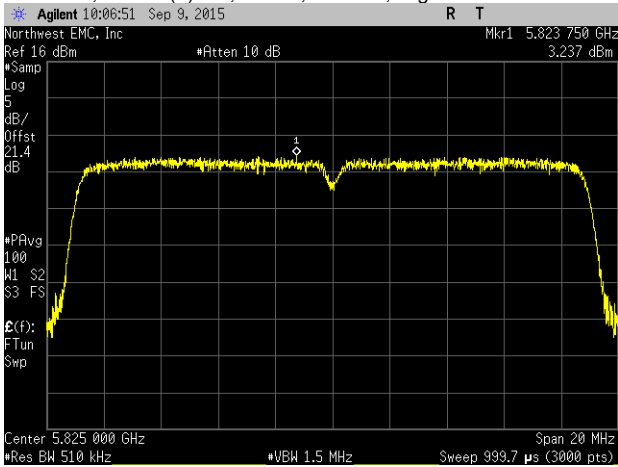
Value (dBm / MHz)	2.991
Limit (dBm / Ref BW)	30
Results	Pass

Chain B, 802.11(n) HT, MCS0, 20 MHz, Mid Channel 5785 MHz



Value (dBm / MHz)	3.49
Limit (dBm / Ref BW)	30
Results	Pass

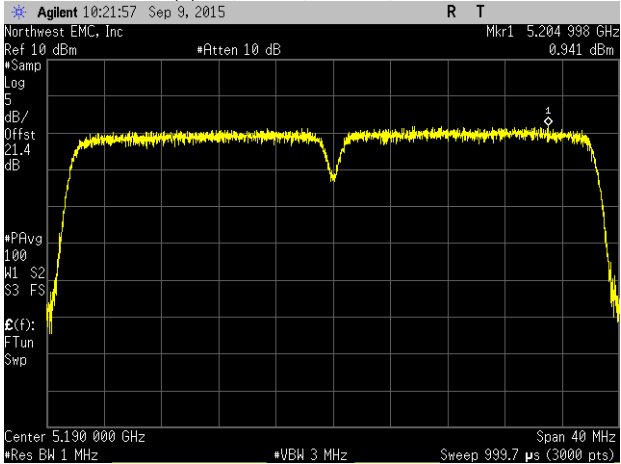
Chain B, 802.11(n) HT, MCS0, 20 MHz, High Channel 5825 MHz



Value (dBm / MHz)	3.237
Limit (dBm / Ref BW)	30
Results	Pass

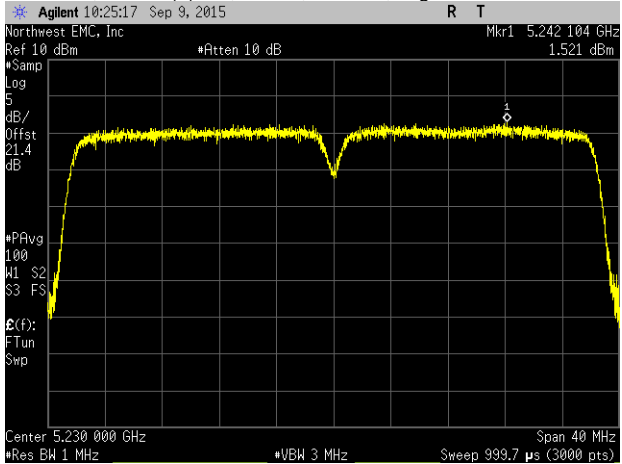
MAXIMUM POWER SPECTRAL DENSITY

Chain B, 802.11(n) HT, MCS0, 40 MHz, Low Channel 5190 MHz



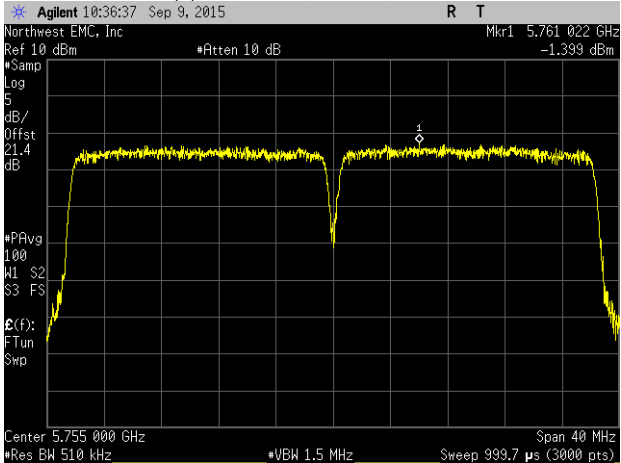
Value (dBm / MHz)	0.941
Limit (dBm / Ref BW)	11
Results	Pass

Chain B, 802.11(n) HT, MCS0, 40 MHz, High Channel 5230 MHz



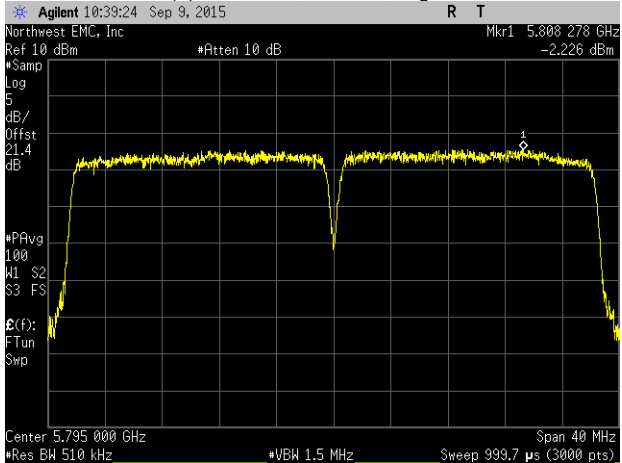
Value (dBm / MHz)	1.521
Limit (dBm / Ref BW)	11
Results	Pass

Chain B, 802.11(n) HT, MCS0, 40 MHz, Low Channel 5755 MHz



Value (dBm / MHz)	-1.399
Limit (dBm / Ref BW)	30
Results	Pass

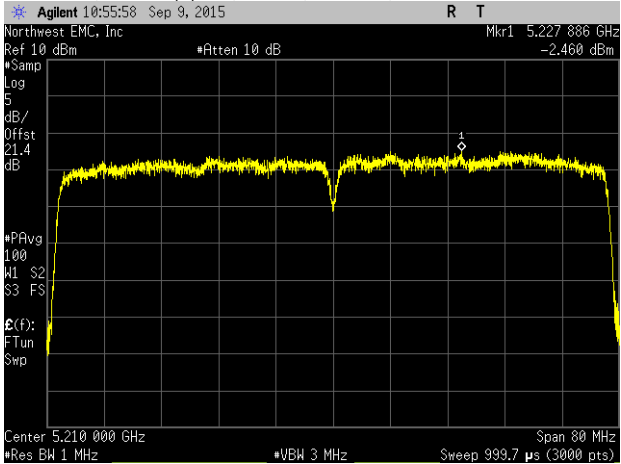
Chain B, 802.11(n) HT, MCS0, 40 MHz, High Channel 5795 MHz



Value (dBm / MHz)	-2.226
Limit (dBm / Ref BW)	30
Results	Pass

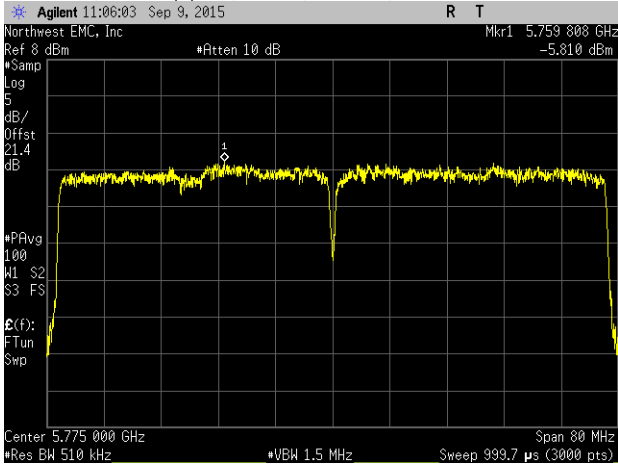
MAXIMUM POWER SPECTRAL DENSITY

Chain B, 802.11(n) HT, MCS0, 80 MHz, Low Channel 5210 MHz



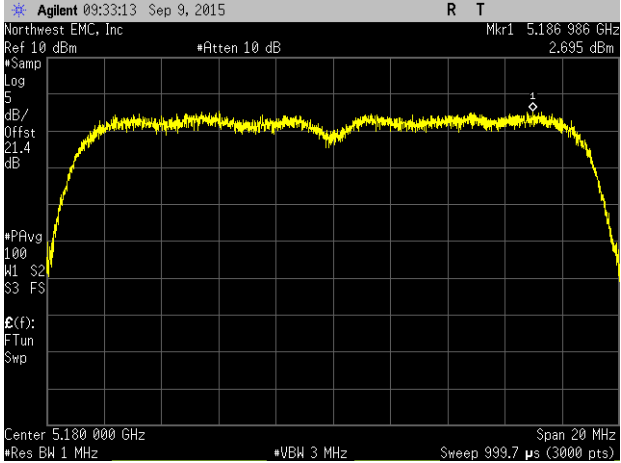
Value (dBm / MHz)	-2.46
Limit (dBm / Ref BW)	11
Results	Pass

Chain B, 802.11(n) HT, MCS0, 80 MHz, Low Channel 5775 MHz



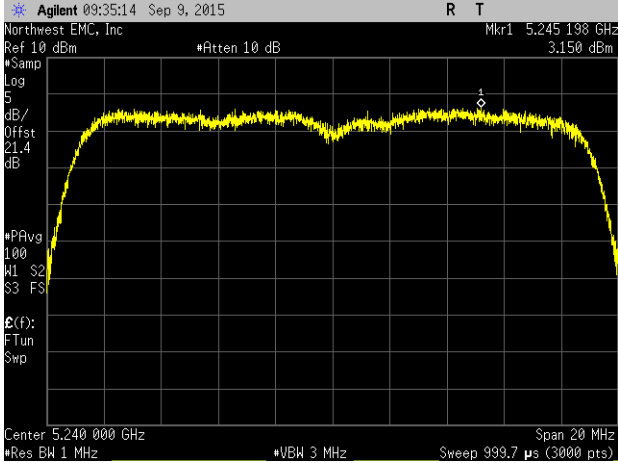
Value (dBm / MHz)	-5.81
Limit (dBm / Ref BW)	30
Results	Pass

Chain B, 802.11(n) HT, MCS7, 20 MHz, Low Channel 5180 MHz



Value (dBm / MHz)	2.695
Limit (dBm / Ref BW)	11
Results	Pass

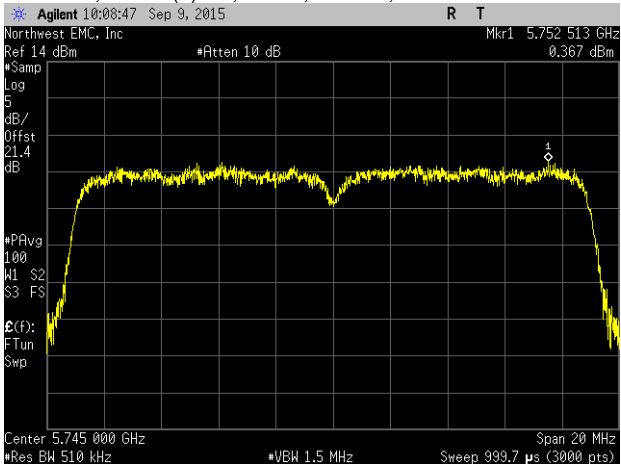
Chain B, 802.11(n) HT, MCS7, 20 MHz, High Channel 5240 MHz



Value (dBm / MHz)	3.15
Limit (dBm / Ref BW)	11
Results	Pass

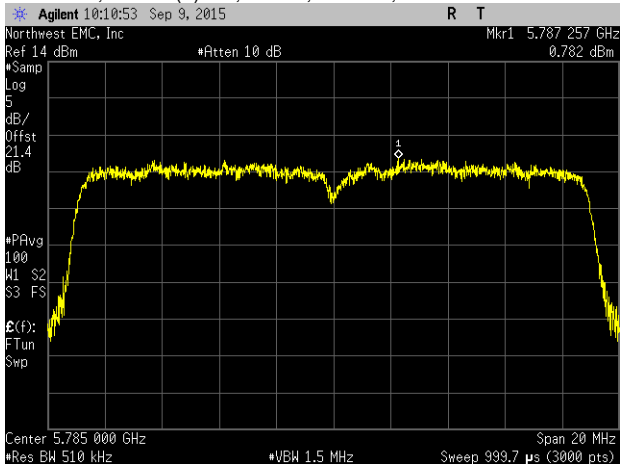
MAXIMUM POWER SPECTRAL DENSITY

Chain B, 802.11(n) HT, MCS7, 20 MHz, Low Channel 5745 MHz



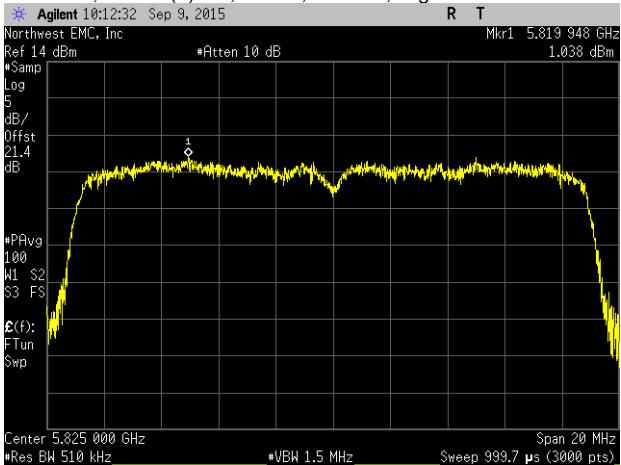
Value (dBm / MHz)	0.367
Limit (dBm / Ref BW)	30
Results	Pass

Chain B, 802.11(n) HT, MCS7, 20 MHz, Mid Channel 5785 MHz



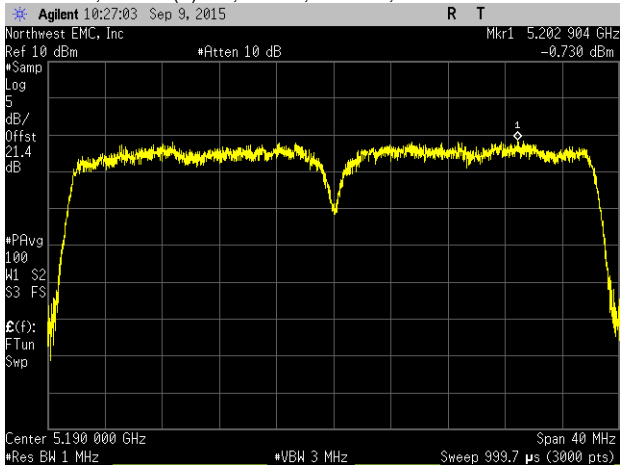
Value (dBm / MHz)	0.782
Limit (dBm / Ref BW)	30
Results	Pass

Chain B, 802.11(n) HT, MCS7, 20 MHz, High Channel 5825 MHz



Value (dBm / MHz)	1.038
Limit (dBm / Ref BW)	30
Results	Pass

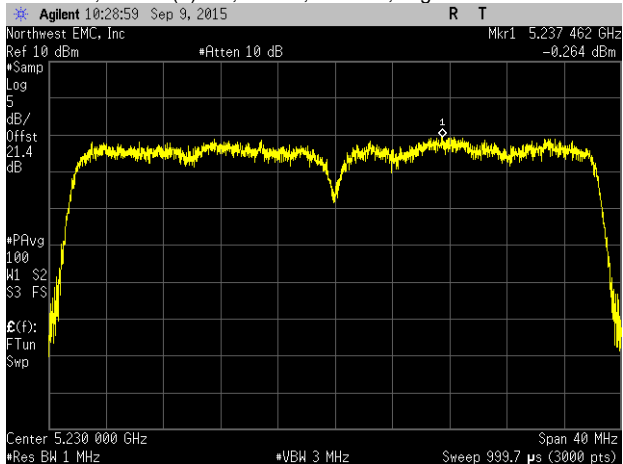
Chain B, 802.11(n) HT, MCS7, 40 MHz, Low Channel 5190 MHz



Value (dBm / MHz)	-0.73
Limit (dBm / Ref BW)	11
Results	Pass

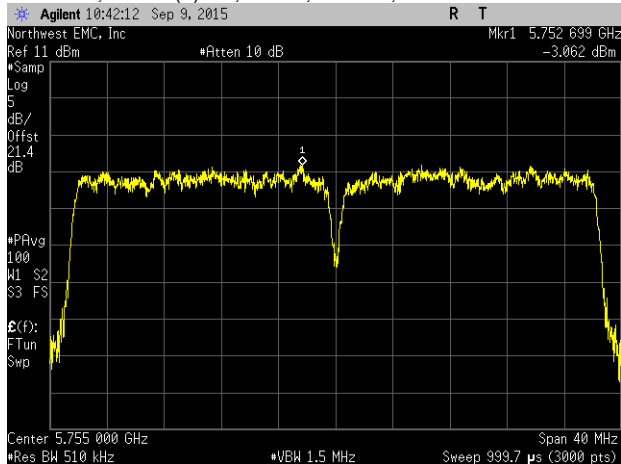
MAXIMUM POWER SPECTRAL DENSITY

Chain B, 802.11(n) HT, MCS7, 40 MHz, High Channel 5230 MHz



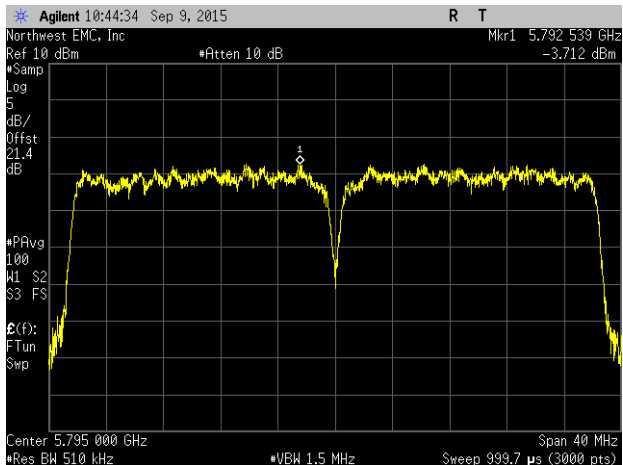
Value (dBm / MHz)	-0.264
Limit (dBm / Ref BW)	11
Results	Pass

Chain B, 802.11(n) HT, MCS7, 40 MHz, Low Channel 5755 MHz



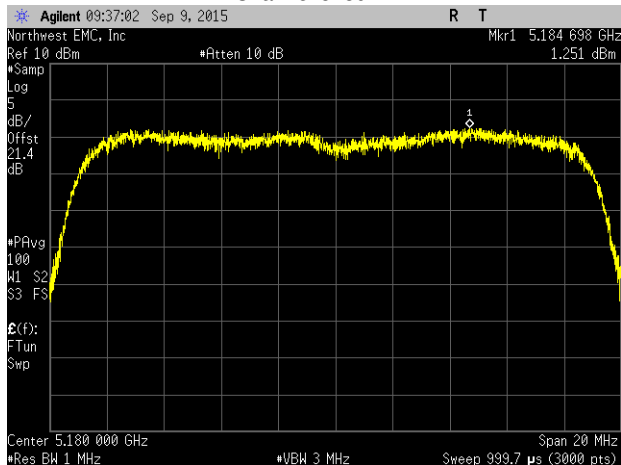
Value (dBm / MHz)	-3.062
Limit (dBm / Ref BW)	30
Results	Pass

Chain B, 802.11(n) HT, MCS7, 40 MHz, High Channel 5795 MHz



Value (dBm / MHz)	-3.712
Limit (dBm / Ref BW)	30
Results	Pass

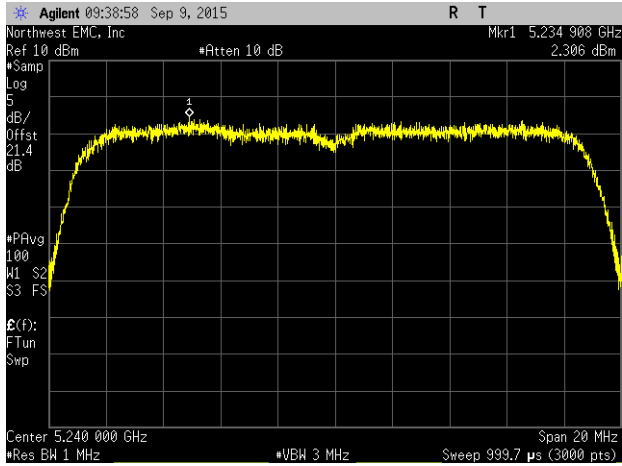
Chain B, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, Low Channel 5180 MHz



Value (dBm / MHz)	1.251
Limit (dBm / Ref BW)	11
Results	Pass

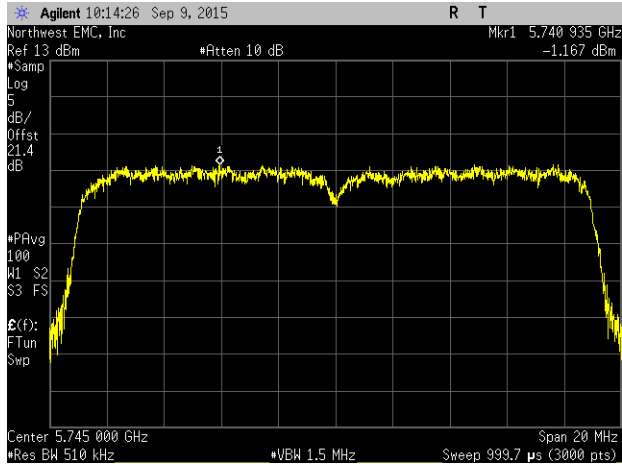
MAXIMUM POWER SPECTRAL DENSITY

Chain B, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, High
Channel 5240 MHz



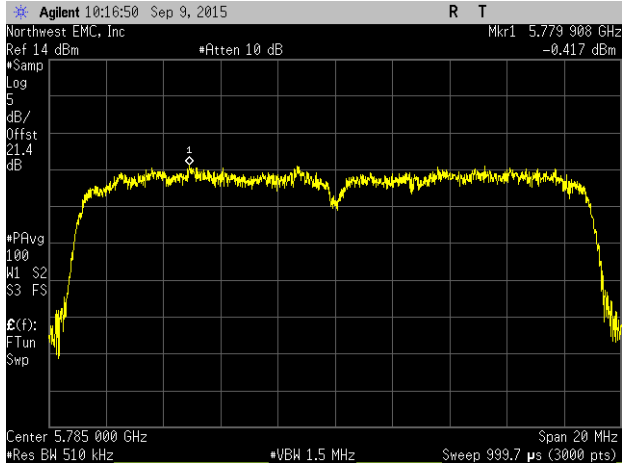
Value (dBm / MHz)	2.306
Limit (dBm / Ref BW)	11
Results	Pass

Chain B, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, Low
Channel 5745 MHz



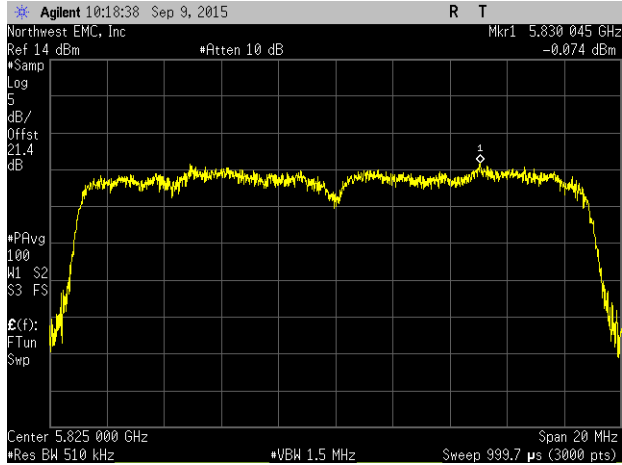
Value (dBm / MHz)	-1.167
Limit (dBm / Ref BW)	30
Results	Pass

Chain B, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, Mid
Channel 5785 MHz



Value (dBm / MHz)	-0.417
Limit (dBm / Ref BW)	30
Results	Pass

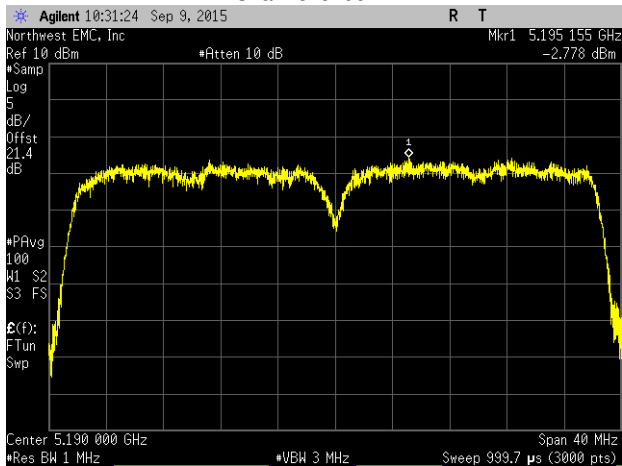
Chain B, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, High
Channel 5825 MHz



Value (dBm / MHz)	-0.074
Limit (dBm / Ref BW)	30
Results	Pass

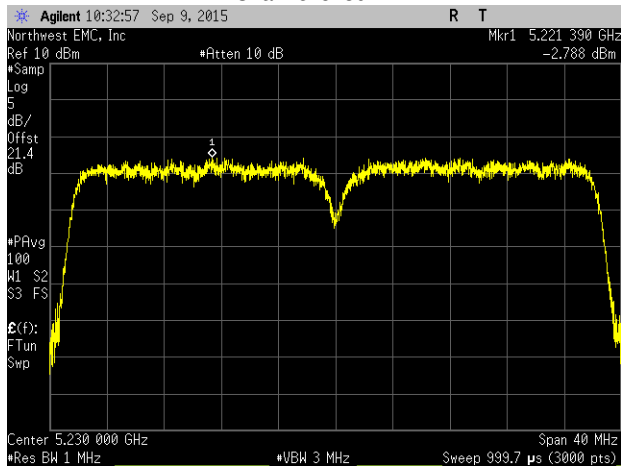
MAXIMUM POWER SPECTRAL DENSITY

Chain B, 802.11(ac) VHT, MCS9 (256-QAM), 40 MHz, Low
Channel 5190 MHz



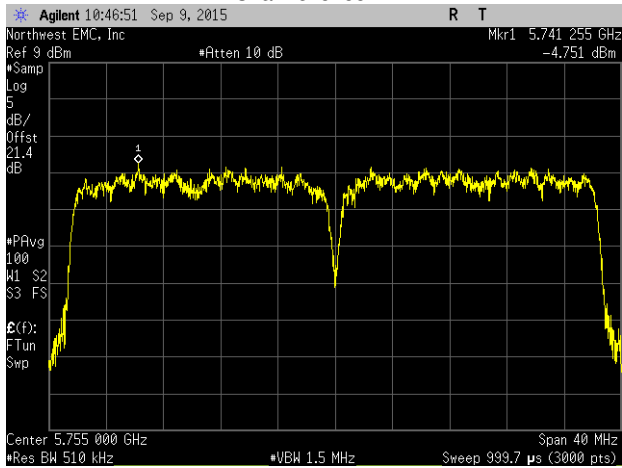
Value (dBm / MHz)	-2.778
Limit (dBm / Ref BW)	11
Results	Pass

Chain B, 802.11(ac) VHT, MCS9 (256-QAM), 40 MHz, High
Channel 5230 MHz



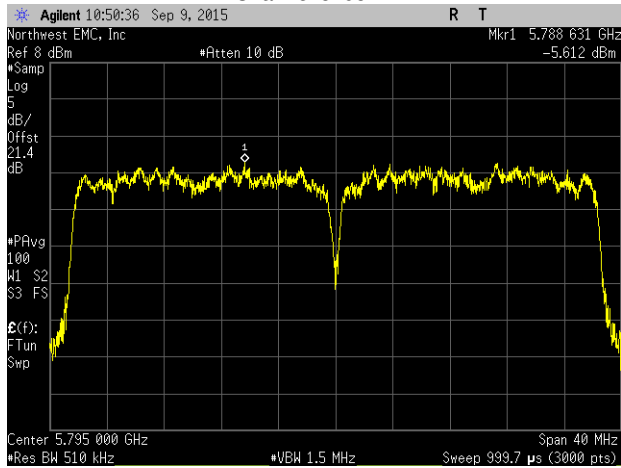
Value (dBm / MHz)	-2.788
Limit (dBm / Ref BW)	11
Results	Pass

Chain B, 802.11(ac) VHT, MCS9 (256-QAM), 40 MHz, Low
Channel 5755 MHz



Value (dBm / MHz)	-4.751
Limit (dBm / Ref BW)	30
Results	Pass

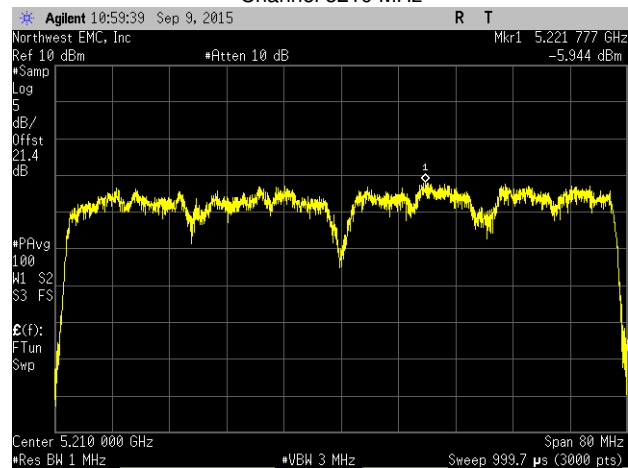
Chain B, 802.11(ac) VHT, MCS9 (256-QAM), 40 MHz, High
Channel 5795 MHz



Value (dBm / MHz)	-5.612
Limit (dBm / Ref BW)	30
Results	Pass

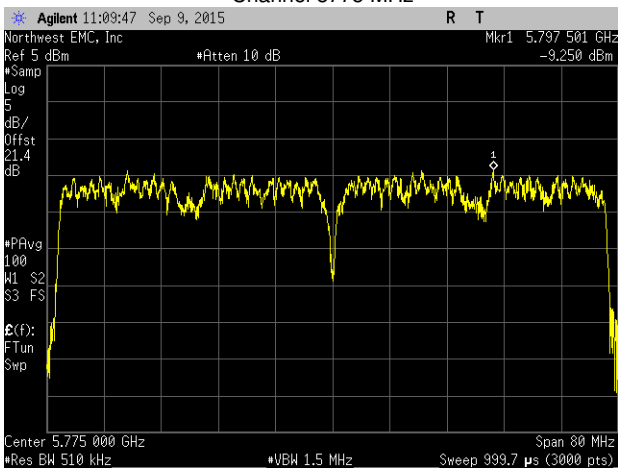
MAXIMUM POWER SPECTRAL DENSITY

Chain B, 802.11(ac) VHT, MCS9 (256-QAM), 80 MHz, Low
Channel 5210 MHz



Value (dBm / MHz)	-5.944
Limit (dBm / Ref BW)	11
Results	Pass

Chain B, 802.11(ac) VHT, MCS9 (256-QAM), 80 MHz, Low
Channel 5775 MHz



Value (dBm / MHz)	-9.25
Limit (dBm / Ref BW)	30
Results	Pass

MAXIMUM POWER SPECTRAL DENSITY

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 DESCRIPTION

FCC KDB 789033 D01 General UNII Test Procedures Section E was followed. The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. The data rate(s) listed in the datasheet were tested. 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 power spectral density, the transmission pulse duration (T) was measured. The transmission pulse duration and the associated data are found elsewhere in this test report.

The spectrum analyzer settings were as follows:

- ☐ The span was set to encompass entire emission bandwidth (B), centered on the transmit channel.
- ☐ RBW = 1 MHz, VBW $\geq$ 3 MHz
- ☐ Sample detector was used because Method SA-1 Alternate was used to measure the Maximum Conducted Output Power.
- ☐ Trace average 100 traces in power averaging mode (not video averaging).

The peak power spectral density (PPSD) was determined to be the highest level found across the emission in any 1 MHz band after 100 sweeps of power averaging (not video averaging).

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFD	7/23/2015	7/23/2016
Block - DC	Fairview Microwave	SD3379	AMM	2/27/2015	2/27/2016
Generator - Signal	Agilent	N5173B	TIW	7/15/2014	7/15/2017
Attenuator	Fairview Microwave	SA4018-20	TQY	2/27/2015	2/27/2016

MAXIMUM POWER SPECTRAL DENSITY

EUT:	Firebox T50-W (BS5AE7W)	Work Order:	VDEI0009
Serial Number:	70AF02717-B385	Date:	09/10/15
Customer:	WatchGuard Technologies, Inc.	Temperature:	25.1°C
Attendees:	None	Relative Humidity:	45%
Customer Project:	None	Bar. Pressure:	1015 mbar
Tested By:	Jonathan Kiefer	Job Site:	TX09
Power:	110VAC/60Hz	Configuration:	5

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2015	ANSI C63.10:2013

COMMENTS

SISO mode, Chain C (Chain 2).

DEVIATIONS FROM TEST STANDARD

None

RESULTS

		Value (dBm / MHz)	Limit (dBm / Ref BW)	Results
Chain C				
802.11(a) 6 Mbps				
20 MHz				
	Low Channel 5180 MHz	4.253	11	Pass
	High Channel 5240 MHz	5.003	11	Pass
	Low Channel 5745 MHz	0.905	30	Pass
	Mid Channel 5785 MHz	1.821	30	Pass
	High Channel 5825 MHz	1.934	30	Pass
802.11(a) 36 Mbps				
20 MHz				
	Low Channel 5180 MHz	3.901	11	Pass
	High Channel 5240 MHz	4.242	11	Pass
	Low Channel 5745 MHz	0.807	30	Pass
	Mid Channel 5785 MHz	0.943	30	Pass
	High Channel 5825 MHz	1.225	30	Pass
802.11(a) 54 Mbps				
20 MHz				
	Low Channel 5180 MHz	3.117	11	Pass
	High Channel 5240 MHz	4.617	11	Pass
	Low Channel 5745 MHz	-0.069	30	Pass
	Mid Channel 5785 MHz	0.661	30	Pass
	High Channel 5825 MHz	1.04	30	Pass
802.11(n) HT, MCS0				
20 MHz				
	Low Channel 5180 MHz	3.962	11	Pass
	High Channel 5240 MHz	4.448	11	Pass
	Low Channel 5745 MHz	0.706	30	Pass
	Mid Channel 5785 MHz	1.376	30	Pass
	High Channel 5825 MHz	1.108	30	Pass
40 MHz				

MAXIMUM POWER SPECTRAL DENSITY

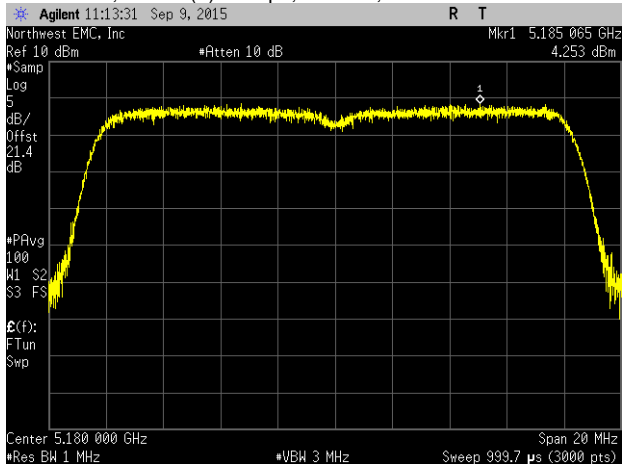
	Value (dBm / MHz)	Limit (dBm / Ref BW)	Results
Low Channel 5190 MHz	0.223	11	Pass
High Channel 5230 MHz	0.595	11	Pass
Low Channel 5755 MHz	-2.53	30	Pass
High Channel 5795 MHz	-1.827	30	Pass
80 MHz			
Low Channel 5210 MHz	-3.479	11	Pass
Low Channel 5775 MHz	-6.198	30	Pass
802.11(n) HT, MCS7			
20 MHz			
Low Channel 5180 MHz	1.825	11	Pass
High Channel 5240 MHz	2.507	11	Pass
Low Channel 5745 MHz	-1.309	30	Pass
Mid Channel 5785 MHz	-0.534	30	Pass
High Channel 5825 MHz	-0.191	30	Pass
40 MHz			
Low Channel 5190 MHz	-1.426	11	Pass
High Channel 5230 MHz	-1.248	11	Pass
Low Channel 5755 MHz	-4.533	30	Pass
High Channel 5795 MHz	-3.033	30	Pass
802.11(ac) VHT, MCS8 (256-QAM)			
20 MHz			
Low Channel 5180 MHz	0.698	11	Pass
High Channel 5240 MHz	1.105	11	Pass
Low Channel 5745 MHz	-2.463	30	Pass
Mid Channel 5785 MHz	-1.85	30	Pass
High Channel 5825 MHz	-1.386	30	Pass
802.11(ac) VHT, MCS9 (256-QAM)			
40 MHz			
Low Channel 5190 MHz	-3.433	11	Pass
High Channel 5230 MHz	-3.629	11	Pass
Low Channel 5755 MHz	-6.554	30	Pass
High Channel 5795 MHz	-5.39	30	Pass
80 MHz			
Low Channel 5210 MHz	-6.878	11	Pass
Low Channel 5775 MHz	-9.457	30	Pass

Jonathan Kiefer

Tested By

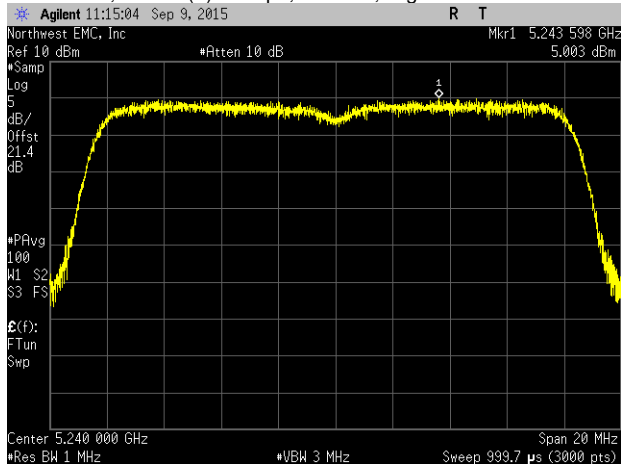
MAXIMUM POWER SPECTRAL DENSITY

Chain C, 802.11(a) 6 Mbps, 20 MHz, Low Channel 5180 MHz



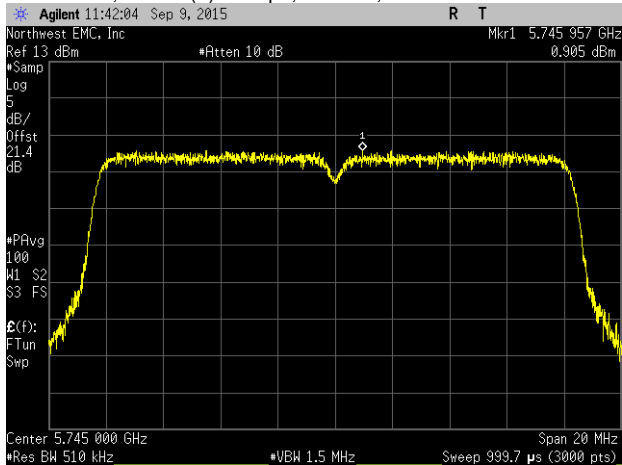
Value (dBm / MHz)	4.253
Limit (dBm / Ref BW)	11
Results	Pass

Chain C, 802.11(a) 6 Mbps, 20 MHz, High Channel 5240 MHz



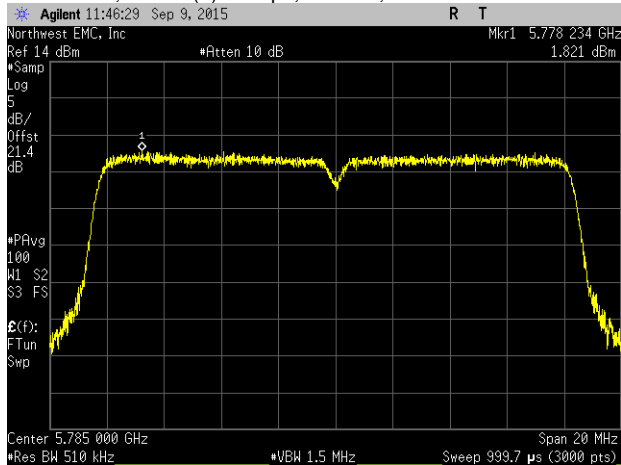
Value (dBm / MHz)	5.003
Limit (dBm / Ref BW)	11
Results	Pass

Chain C, 802.11(a) 6 Mbps, 20 MHz, Low Channel 5745 MHz



Value (dBm / MHz)	0.905
Limit (dBm / Ref BW)	30
Results	Pass

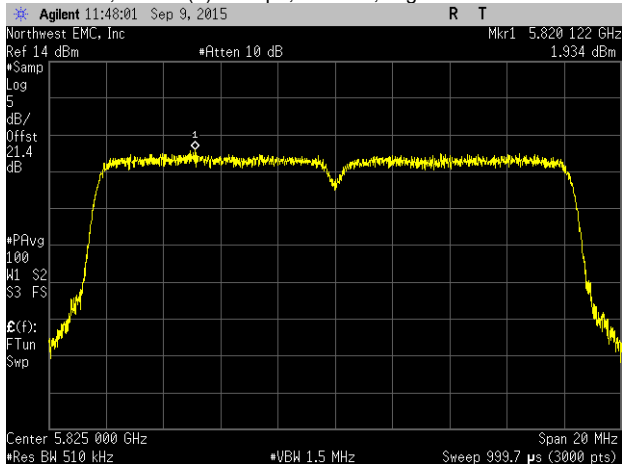
Chain C, 802.11(a) 6 Mbps, 20 MHz, Mid Channel 5785 MHz



Value (dBm / MHz)	1.821
Limit (dBm / Ref BW)	30
Results	Pass

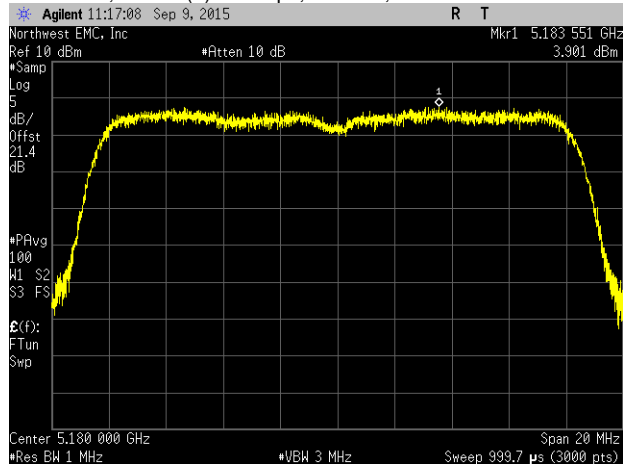
MAXIMUM POWER SPECTRAL DENSITY

Chain C, 802.11(a) 6 Mbps, 20 MHz, High Channel 5825 MHz



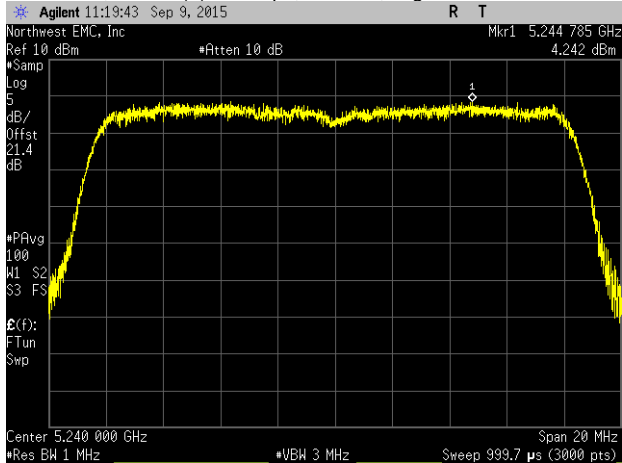
Value (dBm / MHz)	1.934
Limit (dBm / Ref BW)	30
Results	Pass

Chain C, 802.11(a) 36 Mbps, 20 MHz, Low Channel 5180 MHz



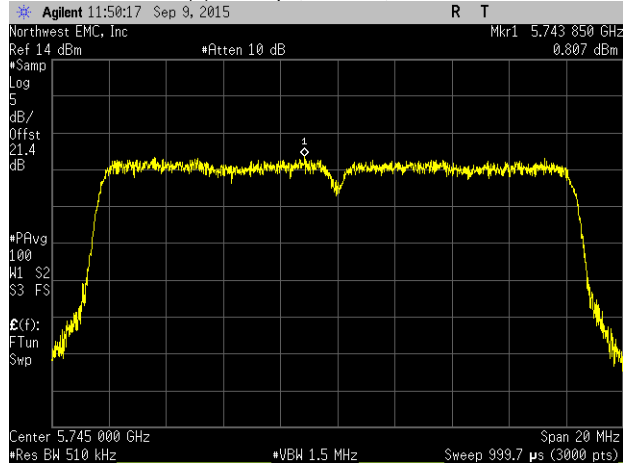
Value (dBm / MHz)	3.901
Limit (dBm / Ref BW)	11
Results	Pass

Chain C, 802.11(a) 36 Mbps, 20 MHz, High Channel 5240 MHz



Value (dBm / MHz)	4.242
Limit (dBm / Ref BW)	11
Results	Pass

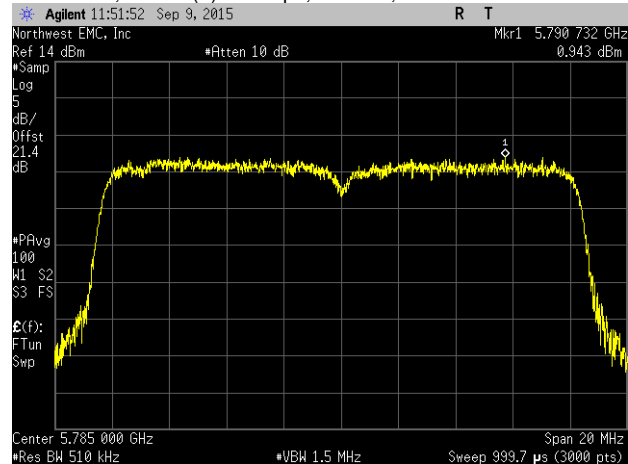
Chain C, 802.11(a) 36 Mbps, 20 MHz, Low Channel 5745 MHz



Value (dBm / MHz)	0.807
Limit (dBm / Ref BW)	30
Results	Pass

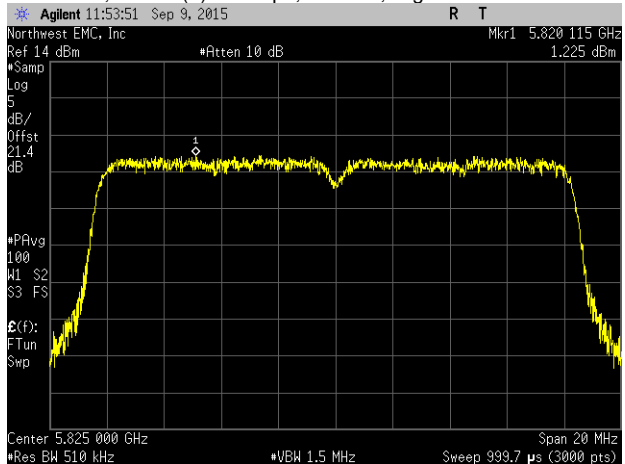
MAXIMUM POWER SPECTRAL DENSITY

Chain C, 802.11(a) 36 Mbps, 20 MHz, Mid Channel 5785 MHz



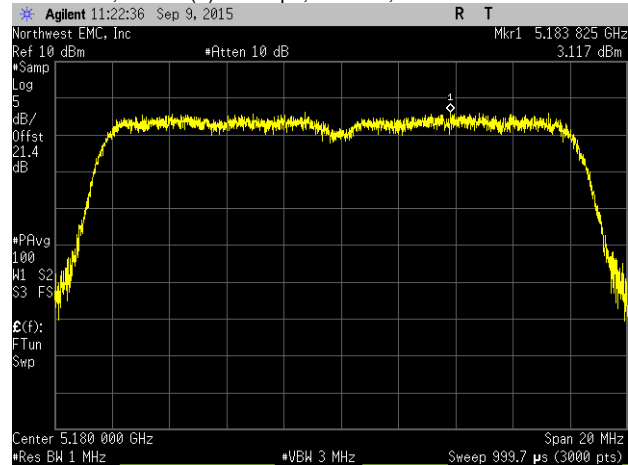
Value (dBm / MHz)	0.943
Limit (dBm / Ref BW)	30
Results	Pass

Chain C, 802.11(a) 36 Mbps, 20 MHz, High Channel 5825 MHz



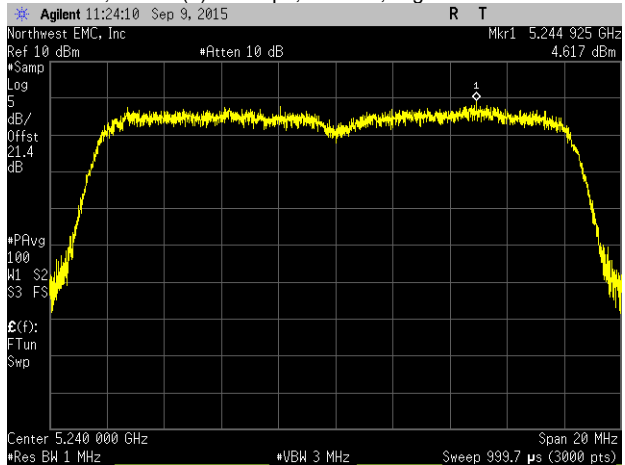
Value (dBm / MHz)	1.225
Limit (dBm / Ref BW)	30
Results	Pass

Chain C, 802.11(a) 54 Mbps, 20 MHz, Low Channel 5180 MHz



Value (dBm / MHz)	3.117
Limit (dBm / Ref BW)	11
Results	Pass

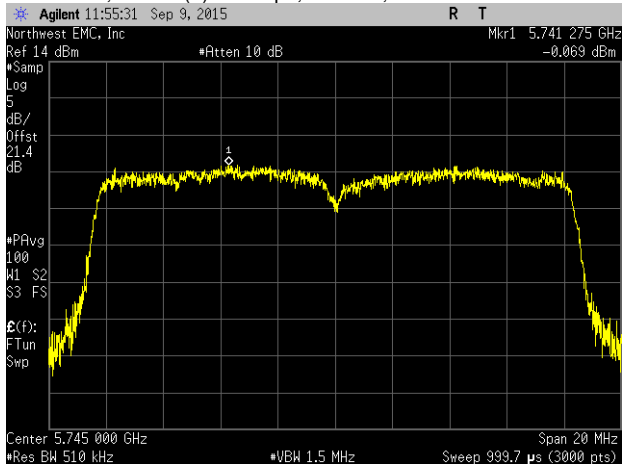
Chain C, 802.11(a) 54 Mbps, 20 MHz, High Channel 5240 MHz



Value (dBm / MHz)	4.617
Limit (dBm / Ref BW)	11
Results	Pass

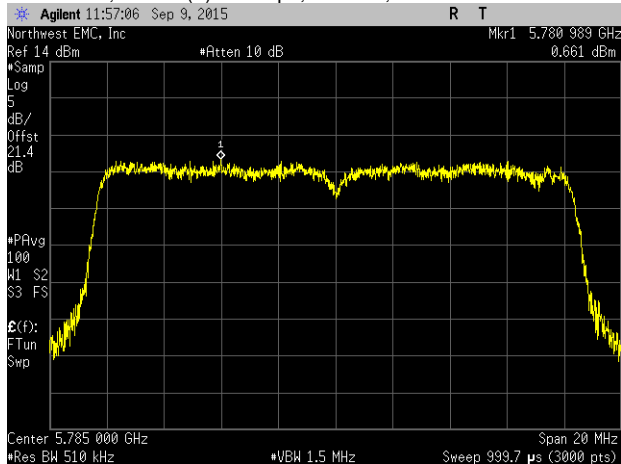
MAXIMUM POWER SPECTRAL DENSITY

Chain C, 802.11(a) 54 Mbps, 20 MHz, Low Channel 5745 MHz



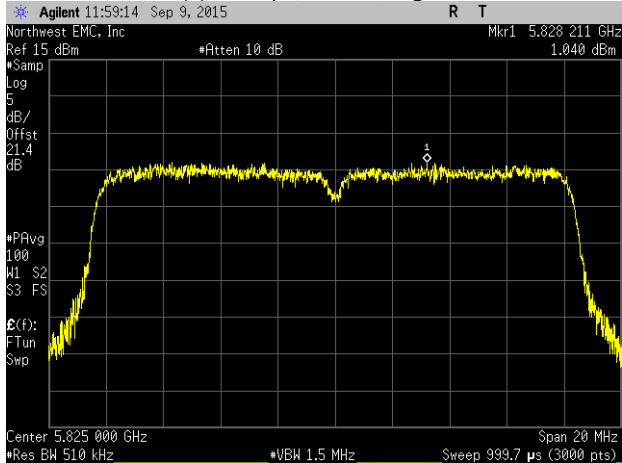
Value (dBm / MHz)	-0.069
Limit (dBm / Ref BW)	30
Results	Pass

Chain C, 802.11(a) 54 Mbps, 20 MHz, Mid Channel 5785 MHz



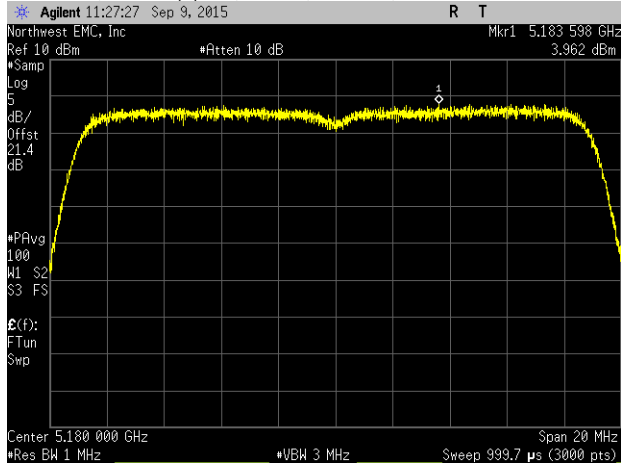
Value (dBm / MHz)	0.661
Limit (dBm / Ref BW)	30
Results	Pass

Chain C, 802.11(a) 54 Mbps, 20 MHz, High Channel 5825 MHz



Value (dBm / MHz)	1.04
Limit (dBm / Ref BW)	30
Results	Pass

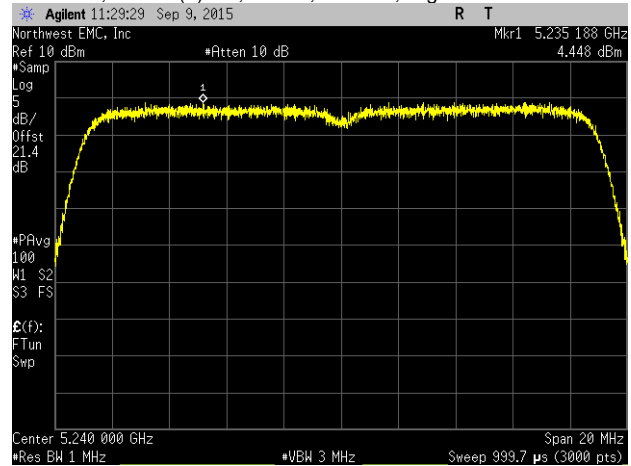
Chain C, 802.11(n) HT, MCS0, 20 MHz, Low Channel 5180 MHz



Value (dBm / MHz)	3.962
Limit (dBm / Ref BW)	11
Results	Pass

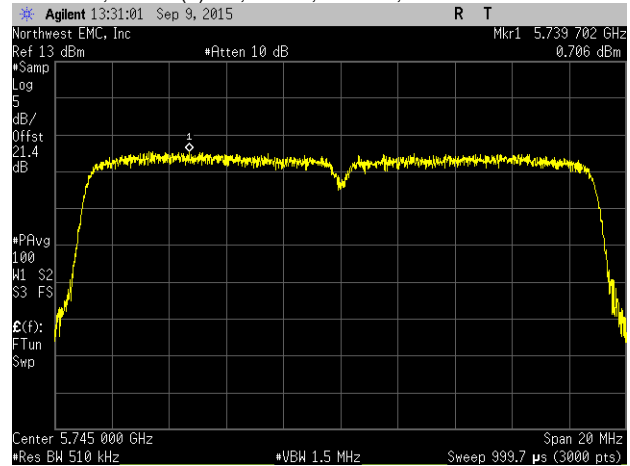
MAXIMUM POWER SPECTRAL DENSITY

Chain C, 802.11(n) HT, MCS0, 20 MHz, High Channel 5240 MHz



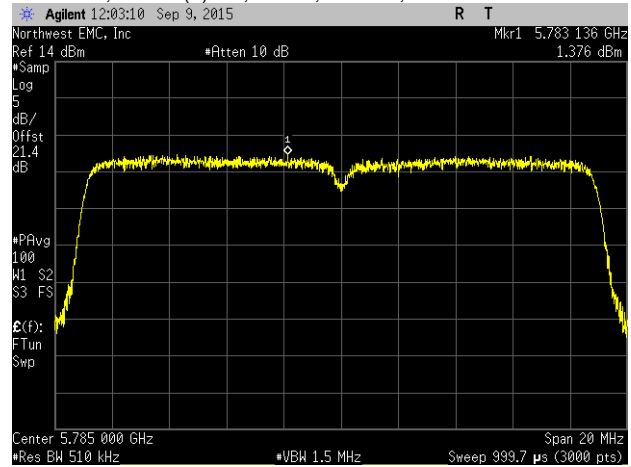
Value (dBm / MHz)	4.448
Limit (dBm / Ref BW)	11
Results	Pass

Chain C, 802.11(n) HT, MCS0, 20 MHz, Low Channel 5745 MHz



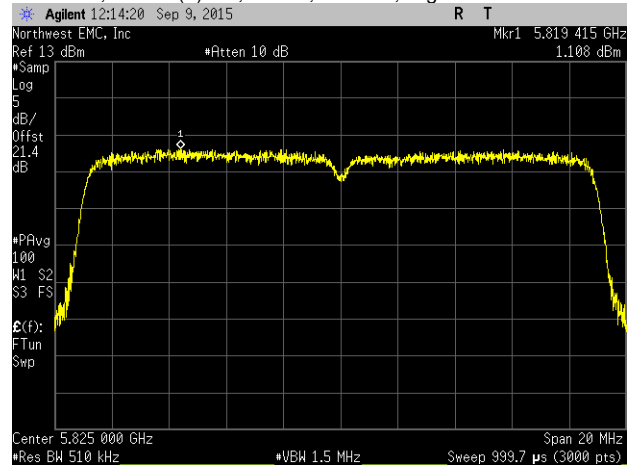
Value (dBm / MHz)	0.706
Limit (dBm / Ref BW)	30
Results	Pass

Chain C, 802.11(n) HT, MCS0, 20 MHz, Mid Channel 5785 MHz



Value (dBm / MHz)	1.376
Limit (dBm / Ref BW)	30
Results	Pass

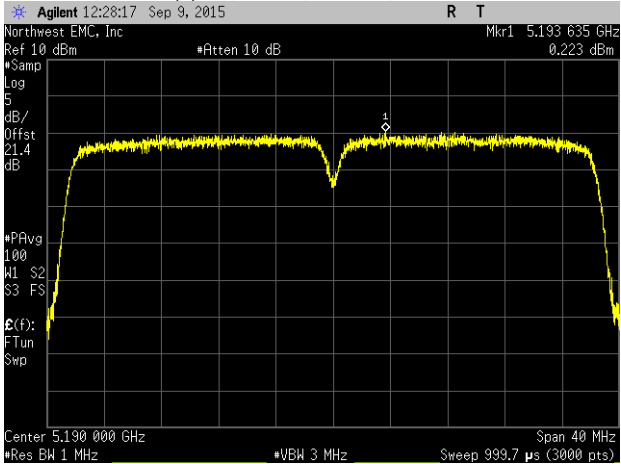
Chain C, 802.11(n) HT, MCS0, 20 MHz, High Channel 5825 MHz



Value (dBm / MHz)	1.108
Limit (dBm / Ref BW)	30
Results	Pass

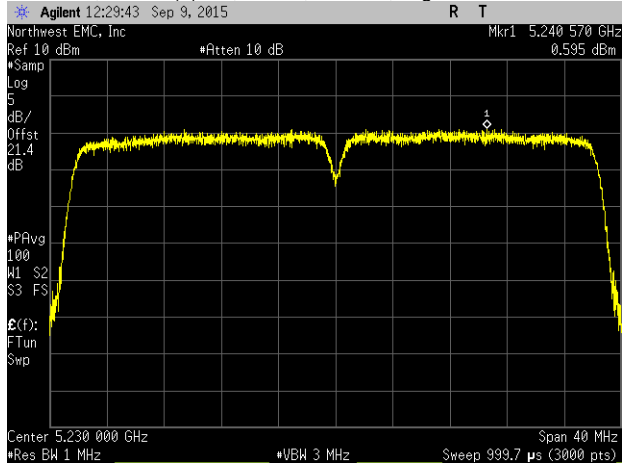
MAXIMUM POWER SPECTRAL DENSITY

Chain C, 802.11(n) HT, MCS0, 40 MHz, Low Channel 5190 MHz



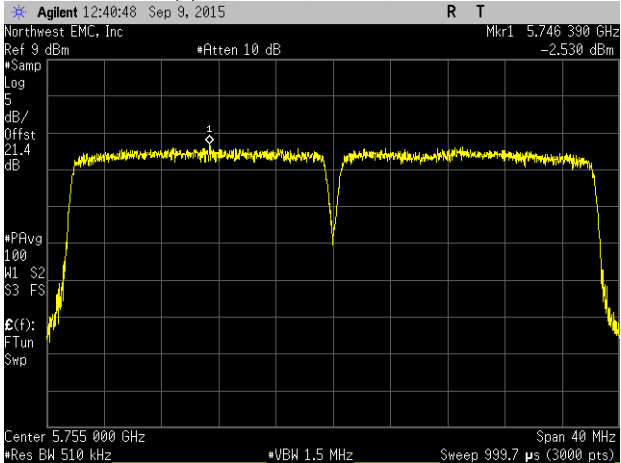
Value (dBm / MHz)	0.223
Limit (dBm / Ref BW)	11
Results	Pass

Chain C, 802.11(n) HT, MCS0, 40 MHz, High Channel 5230 MHz



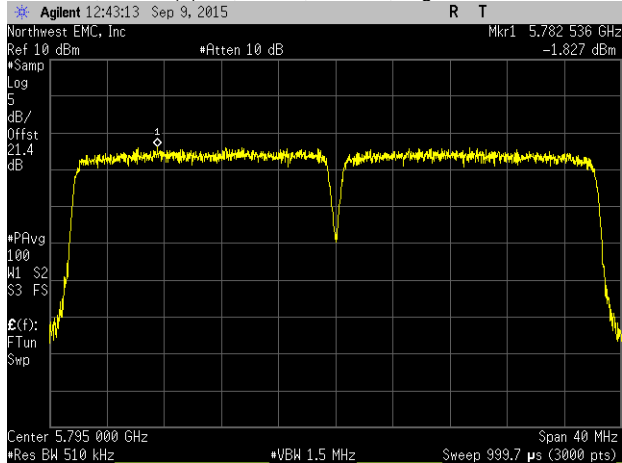
Value (dBm / MHz)	0.595
Limit (dBm / Ref BW)	11
Results	Pass

Chain C, 802.11(n) HT, MCS0, 40 MHz, Low Channel 5755 MHz



Value (dBm / MHz)	-2.53
Limit (dBm / Ref BW)	30
Results	Pass

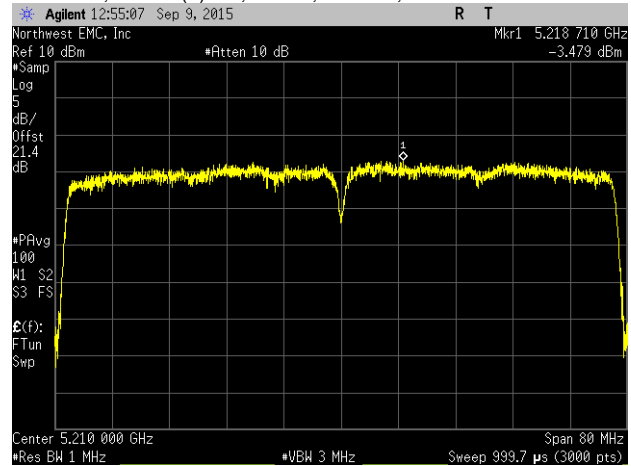
Chain C, 802.11(n) HT, MCS0, 40 MHz, High Channel 5795 MHz



Value (dBm / MHz)	-1.827
Limit (dBm / Ref BW)	30
Results	Pass

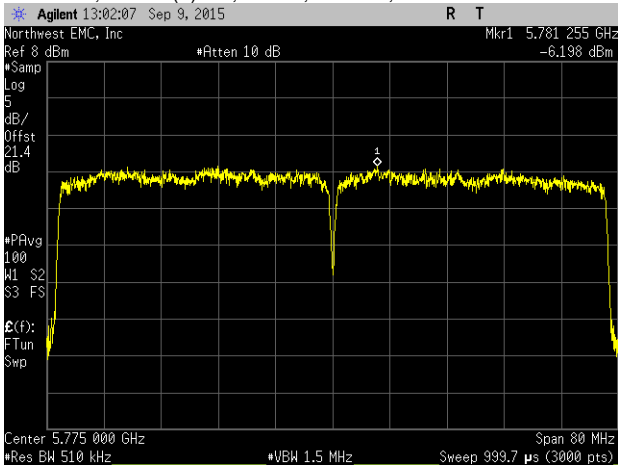
MAXIMUM POWER SPECTRAL DENSITY

Chain C, 802.11(n) HT, MCS0, 80 MHz, Low Channel 5210 MHz



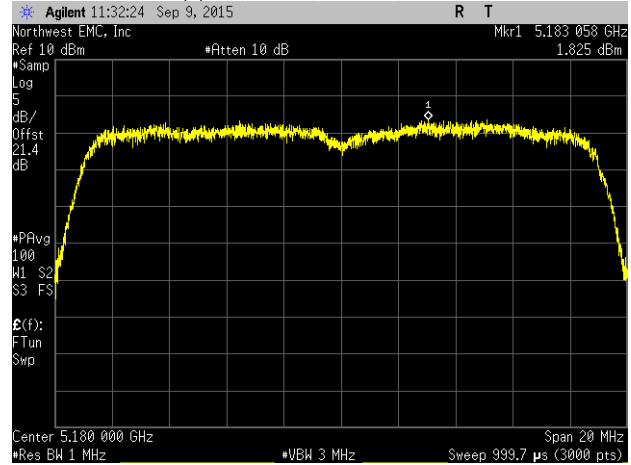
Value (dBm / MHz)	-3.479
Limit (dBm / Ref BW)	11
Results	Pass

Chain C, 802.11(n) HT, MCS0, 80 MHz, Low Channel 5775 MHz



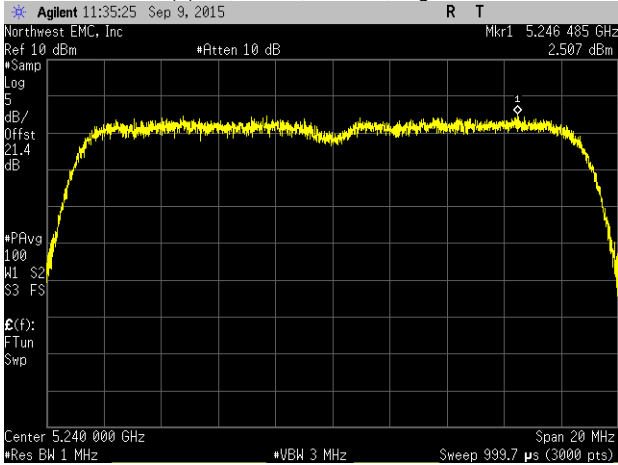
Value (dBm / MHz)	-6.198
Limit (dBm / Ref BW)	30
Results	Pass

Chain C, 802.11(n) HT, MCS7, 20 MHz, Low Channel 5180 MHz



Value (dBm / MHz)	1.825
Limit (dBm / Ref BW)	11
Results	Pass

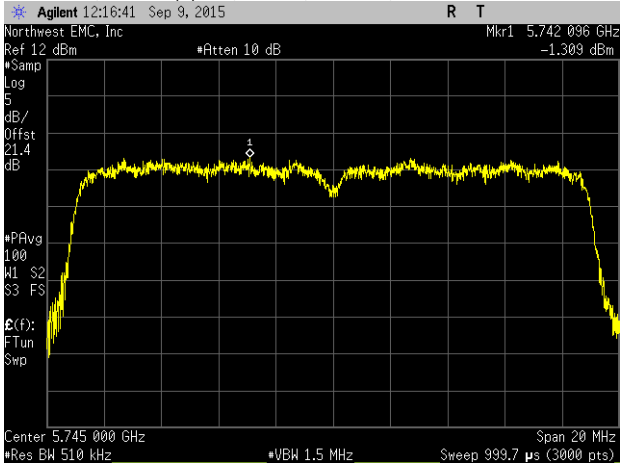
Chain C, 802.11(n) HT, MCS7, 20 MHz, High Channel 5240 MHz



Value (dBm / MHz)	2.507
Limit (dBm / Ref BW)	11
Results	Pass

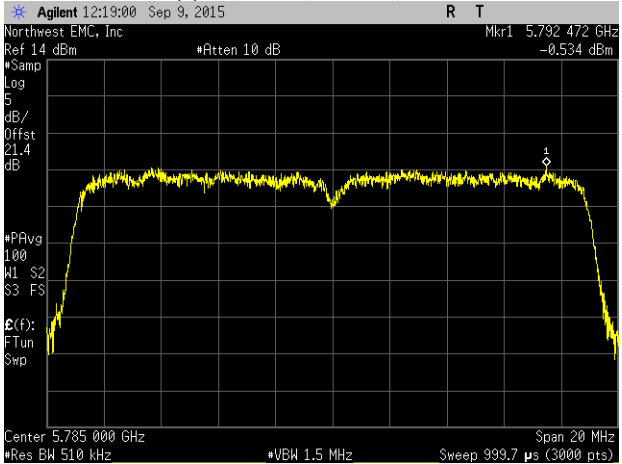
MAXIMUM POWER SPECTRAL DENSITY

Chain C, 802.11(n) HT, MCS7, 20 MHz, Low Channel 5745 MHz



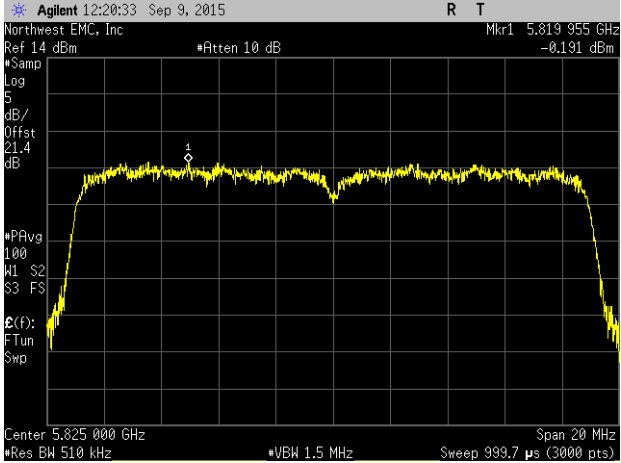
Value (dBm / MHz)	-1.309
Limit (dBm / Ref BW)	30
Results	Pass

Chain C, 802.11(n) HT, MCS7, 20 MHz, Mid Channel 5785 MHz



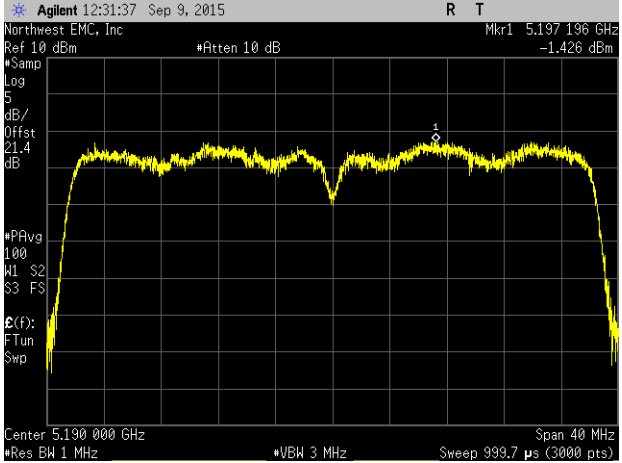
Value (dBm / MHz)	-0.534
Limit (dBm / Ref BW)	30
Results	Pass

Chain C, 802.11(n) HT, MCS7, 20 MHz, High Channel 5825 MHz



Value (dBm / MHz)	-0.191
Limit (dBm / Ref BW)	30
Results	Pass

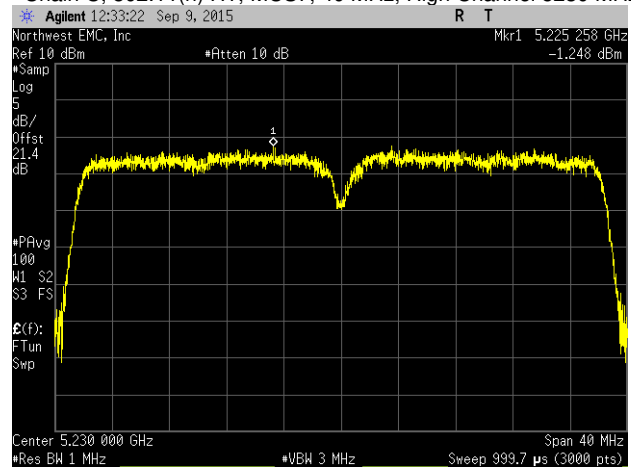
Chain C, 802.11(n) HT, MCS7, 40 MHz, Low Channel 5190 MHz



Value (dBm / MHz)	-1.426
Limit (dBm / Ref BW)	11
Results	Pass

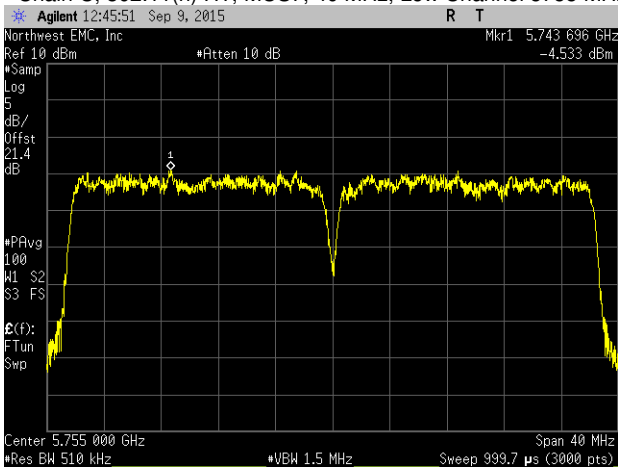
MAXIMUM POWER SPECTRAL DENSITY

Chain C, 802.11(n) HT, MCS7, 40 MHz, High Channel 5230 MHz



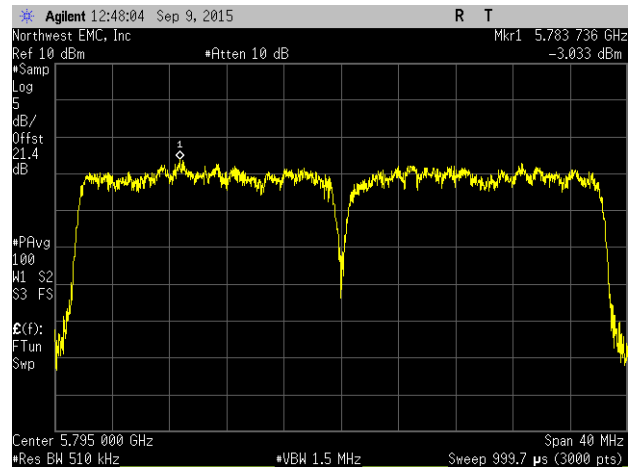
Value (dBm / MHz)	-1.248
Limit (dBm / Ref BW)	11
Results	Pass

Chain C, 802.11(n) HT, MCS7, 40 MHz, Low Channel 5755 MHz



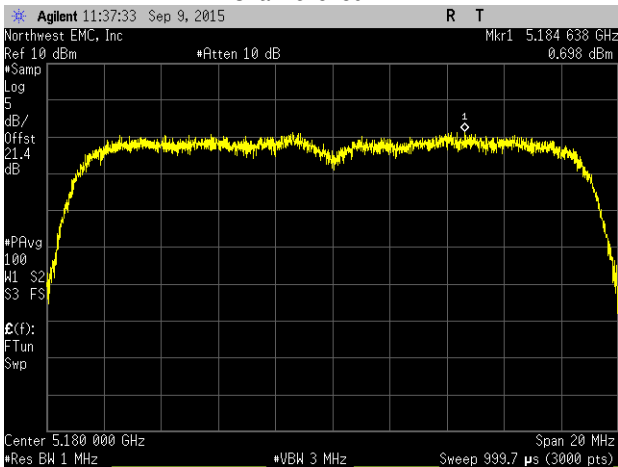
Value (dBm / MHz)	-4.533
Limit (dBm / Ref BW)	30
Results	Pass

Chain C, 802.11(n) HT, MCS7, 40 MHz, High Channel 5795 MHz



Value (dBm / MHz)	-3.033
Limit (dBm / Ref BW)	30
Results	Pass

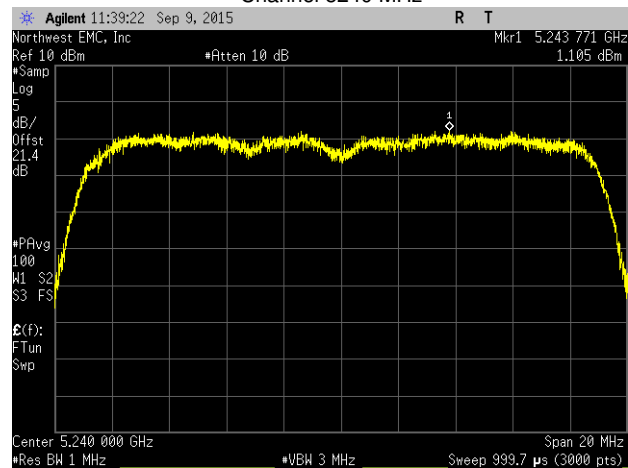
Chain C, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, Low Channel 5180 MHz



Value (dBm / MHz)	0.698
Limit (dBm / Ref BW)	11
Results	Pass

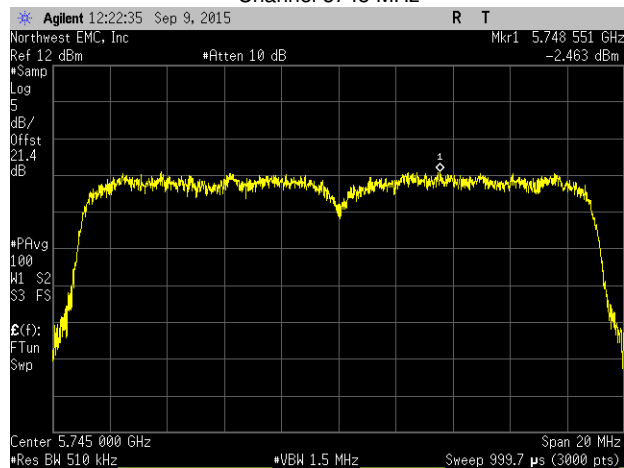
MAXIMUM POWER SPECTRAL DENSITY

Chain C, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, High
Channel 5240 MHz



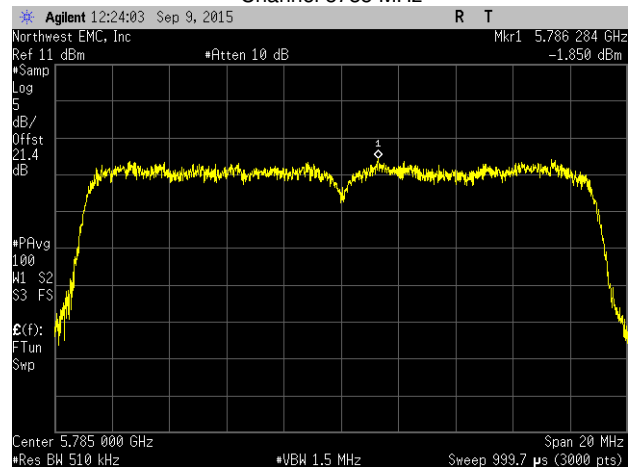
Value (dBm / MHz)	1.105
Limit (dBm / Ref BW)	11
Results	Pass

Chain C, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, Low
Channel 5745 MHz



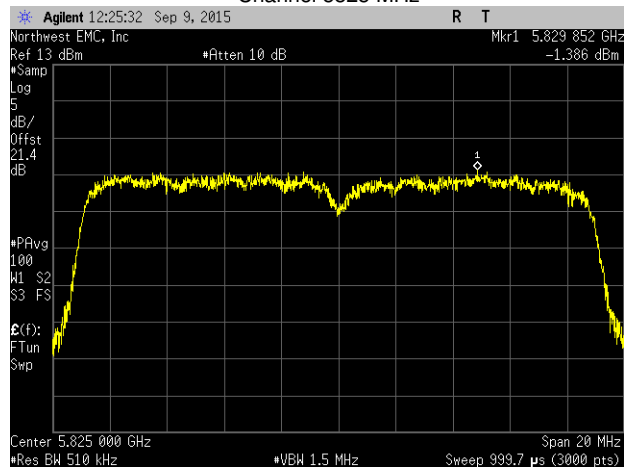
Value (dBm / MHz)	-2.463
Limit (dBm / Ref BW)	30
Results	Pass

Chain C, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, Mid
Channel 5785 MHz



Value (dBm / MHz)	-1.85
Limit (dBm / Ref BW)	30
Results	Pass

Chain C, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, High
Channel 5825 MHz



Value (dBm / MHz)	-1.386
Limit (dBm / Ref BW)	30
Results	Pass

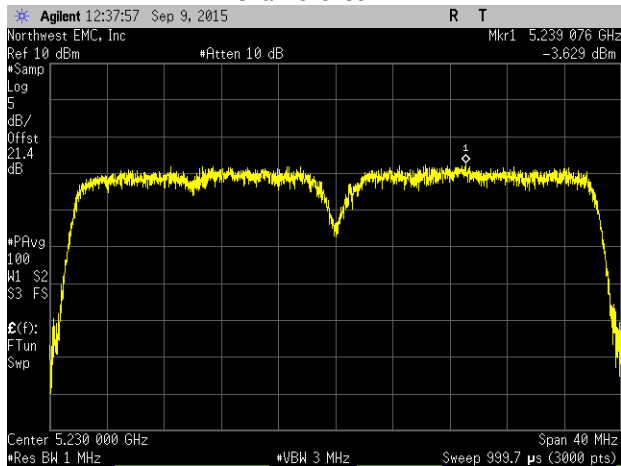
MAXIMUM POWER SPECTRAL DENSITY

Chain C, 802.11(ac) VHT, MCS9 (256-QAM), 40 MHz, Low
Channel 5190 MHz



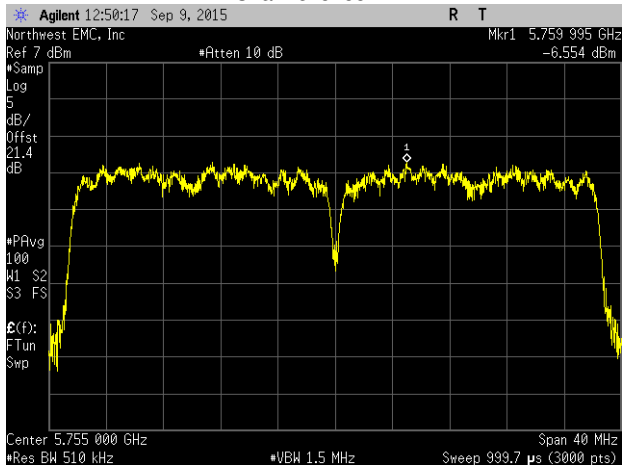
Value (dBm / MHz)	-3.433
Limit (dBm / Ref BW)	11
Results	Pass

Chain C, 802.11(ac) VHT, MCS9 (256-QAM), 40 MHz, High
Channel 5230 MHz



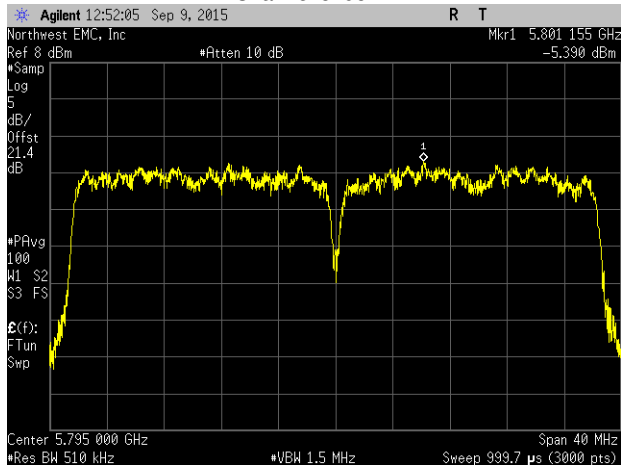
Value (dBm / MHz)	-3.629
Limit (dBm / Ref BW)	11
Results	Pass

Chain C, 802.11(ac) VHT, MCS9 (256-QAM), 40 MHz, Low
Channel 5755 MHz



Value (dBm / MHz)	-6.554
Limit (dBm / Ref BW)	30
Results	Pass

Chain C, 802.11(ac) VHT, MCS9 (256-QAM), 40 MHz, High
Channel 5795 MHz

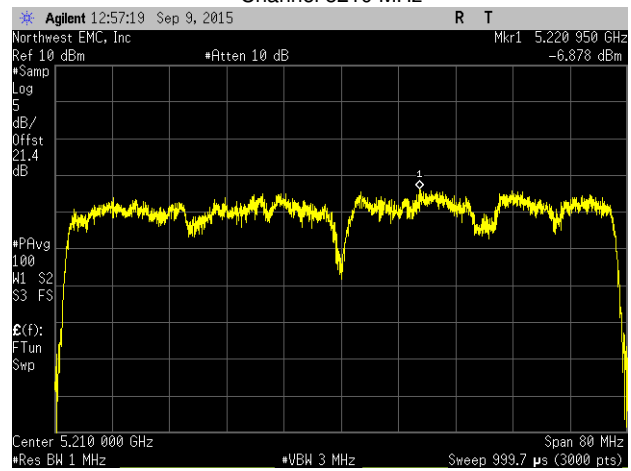


Value (dBm / MHz)	-5.39
Limit (dBm / Ref BW)	30
Results	Pass

MAXIMUM POWER SPECTRAL DENSITY

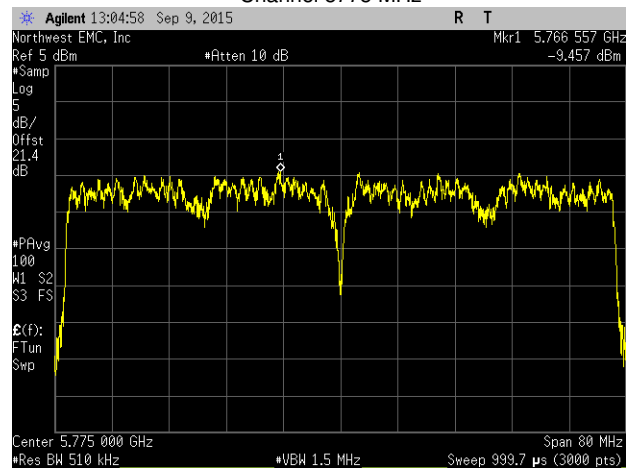


Chain C, 802.11(ac) VHT, MCS9 (256-QAM), 80 MHz, Low
Channel 5210 MHz



Value (dBm / MHz)	-6.878
Limit (dBm / Ref BW)	11
Results	Pass

Chain C, 802.11(ac) VHT, MCS9 (256-QAM), 80 MHz, Low
Channel 5775 MHz



Value (dBm / MHz)	-9.457
Limit (dBm / Ref BW)	30
Results	Pass

MAXIMUM POWER SPECTRAL DENSITY

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 DESCRIPTION

FCC KDB 789033 D01 General UNII Test Procedures Section E was followed. The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. The data rate(s) listed in the datasheet were tested. 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 power spectral density, the transmission pulse duration (T) was measured. The transmission pulse duration and the associated data are found elsewhere in this test report.

The spectrum analyzer settings were as follows:

- ☐ The span was set to encompass entire emission bandwidth (B), centered on the transmit channel.
- ☐ RBW = 1 MHz, VBW $\geq$ 3 MHz
- ☐ Sample detector was used because Method SA-1 Alternate was used to measure the Maximum Conducted Output Power.
- ☐ Trace average 100 traces in power averaging mode (not video averaging).

The peak power spectral density (PPSD) was determined to be the highest level found across the emission in any 1 MHz band after 100 sweeps of power averaging (not video averaging).

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFD	7/23/2015	7/23/2016
Block - DC	Fairview Microwave	SD3379	AMM	2/27/2015	2/27/2016
Attenuator	Fairview Microwave	SA4018-20	TQY	2/27/2015	2/27/2016
Generator - Signal	Agilent	N5173B	TIW	7/15/2014	7/15/2017

MAXIMUM POWER SPECTRAL DENSITY



EUT:	Firebox T50-W (BS5AE7W)	Work Order:	VDEI0009
Serial Number:	70AF02717-B385	Date:	09/10/15
Customer:	WatchGuard Technologies, Inc.	Temperature:	25.1°C
Attendees:	None	Relative Humidity:	45%
Customer Project:	None	Bar. Pressure:	1015 mbar
Tested By:	Jonathan Kiefer	Job Site:	TX09
Power:	110VAC/60Hz	Configuration:	5

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.407:2015	ANSI C63.10:2013

COMMENTS

2x2 MIMO mode, Chain AB (Chains 0 and 1).

DEVIATIONS FROM TEST STANDARD

None

RESULTS

		Value (dBm / MHz)	Limit (dBm / Ref BW)	Results
Chain A				
802.11(n) HT, MCS0				
80 MHz				
	Low Channel 5210 MHz	-3.889	11	Pass
	Low Channel 5775 MHz	-3.927	30	Pass
802.11(n) HT, MCS8				
20 MHz				
	Low Channel 5180 MHz	2.996	11	Pass
	High Channel 5240 MHz	3.639	11	Pass
	Low Channel 5745 MHz	1.291	30	Pass
	Mid Channel 5785 MHz	1.14	30	Pass
	High Channel 5825 MHz	1.014	30	Pass
40 MHz				
	Low Channel 5190 MHz	-0.568	11	Pass
	High Channel 5230 MHz	-0.062	11	Pass
	Low Channel 5755 MHz	-4.844	30	Pass
	High Channel 5795 MHz	-4.012	30	Pass
802.11(ac) VHT, MCS8 (256-QAM)				
20 MHz				

MAXIMUM POWER SPECTRAL DENSITY

	Value (dBm / MHz)	Limit (dBm / Ref BW)	Results
Low Channel 5180 MHz	0.098	11	Pass
High Channel 5240 MHz	0.221	11	Pass
Low Channel 5745 MHz	-3.595	30	Pass
Mid Channel 5785 MHz	-2.635	30	Pass
High Channel 5825 MHz	-2.262	30	Pass
802.11(ac) VHT, MCS9 (256-QAM)			
80 MHz			
Low Channel 5210 MHz	-7.487	11	Pass
Low Channel 5775 MHz	-7.583	30	Pass
40 MHz			
Low Channel 5190 MHz	-4.532	11	Pass
High Channel 5230 MHz	-3.959	11	Pass
Low Channel 5755 MHz	-8.426	30	Pass
High Channel 5795 MHz	-7.96	30	Pass
802.11(n) HT, MCS15			
20 MHz			
Low Channel 5180 MHz	0.164	11	Pass
High Channel 5240 MHz	-0.206	11	Pass
Low Channel 5745 MHz	-3.773	30	Pass
Mid Channel 5785 MHz	-3.586	30	Pass
High Channel 5825 MHz	-2.352	30	Pass
40 MHz			
Low Channel 5190 MHz	-4.444	11	Pass
High Channel 5230 MHz	-4.685	11	Pass
Low Channel 5755 MHz	-8.065	30	Pass
High Channel 5795 MHz	-7.365	30	Pass
Chain B			
802.11(n) HT,			

MAXIMUM POWER SPECTRAL DENSITY

		Value (dBm / MHz)	Limit (dBm / Ref BW)	Results
MCS0				
80 MHz				
	Low Channel 5210 MHz	-2.239	11	Pass
	Low Channel 5775 MHz	-3.571	30	Pass
802.11(n) HT, MCS8				
20 MHz				
	Low Channel 5180 MHz	5.765	11	Pass
	High Channel 5240 MHz	5.908	11	Pass
	Low Channel 5745 MHz	2.723	30	Pass
	Mid Channel 5785 MHz	2.886	30	Pass
	High Channel 5825 MHz	2.714	30	Pass
40 MHz				
	Low Channel 5190 MHz	-1.076	11	Pass
	High Channel 5230 MHz	-0.667	11	Pass
	Low Channel 5755 MHz	-1.604	30	Pass
	High Channel 5795 MHz	-2.215	30	Pass
802.11(ac) VHT, MCS8 (256-QAM)				
20 MHz				
	Low Channel 5180 MHz	1.549	11	Pass
	High Channel 5240 MHz	2.25	11	Pass
	Low Channel 5745 MHz	-1.013	30	Pass
	Mid Channel 5785 MHz	-0.128	30	Pass
	High Channel 5825 MHz	0.407	30	Pass
802.11(ac) VHT, MCS9 (256-QAM)				
80 MHz				
	Low Channel 5210 MHz	-5.895	11	Pass
	Low Channel 5775 MHz	-4.396	30	Pass
40 MHz				
	Low Channel 5190	-2.539	11	Pass

MAXIMUM POWER SPECTRAL DENSITY

		Value (dBm / MHz)	Limit (dBm / Ref BW)	Results		
802.11(n) HT, MCS15	MHz					
	High Channel 5230					
	MHz	-2.394	11	Pass		
	Low Channel 5755					
	MHz	-4.241	30	Pass		
	High Channel 5795					
	MHz	-5.499	30	Pass		
	20 MHz					
	Low Channel 5180					
MHz	1.792	11	Pass			
High Channel 5240						
MHz	2.083	11	Pass			
Low Channel 5745						
MHz	-1.083	30	Pass			
Mid Channel 5785						
MHz	-0.605	30	Pass			
High Channel 5825						
MHz	-0.597	30	Pass			
40 MHz						
	Low Channel 5190					
	MHz	-2.891	11	Pass		
	High Channel 5230					
	MHz	-2.755	11	Pass		
	Low Channel 5755					
	MHz	-5.154	30	Pass		
	High Channel 5795					
	MHz	-5.82	30	Pass		
Power Summing Chain A						
802.11(n) HT, MCS0		Value (dBm/MHz)	Summing Factor (dBm)	Summed Value (dBm/MHz)	Limit (dBm/Ref BW)	Result
	80 MHz					
	Low Channel 5210					
	MHz	-3.889	3.0	-0.879	11	Pass
	Low Channel 5775					
	MHz	-3.927	3.0	-0.917	30	Pass
802.11(n) HT, MCS8						
	20 MHz					
	Low Channel 5180					
	MHz	2.996	3.0	6.006	11	Pass
	High Channel 5240					
	MHz	3.639	3.0	6.649	11	Pass
	Low Channel 5745					
	MHz	1.291	3.0	4.301	30	Pass
	Mid Channel 5785					
	MHz	1.14	3.0	4.150	30	Pass

MAXIMUM POWER SPECTRAL DENSITY

				Value (dBm / MHz)	Limit (dBm / Ref BW)	Results
	MHz					
	High Channel 5825					
	MHz	1.014	3.0	4.024	30	Pass
40 MHz						
	Low Channel 5190					
	MHz	-0.568	3.0	2.442	11	Pass
	High Channel 5230					
	MHz	-0.062	3.0	2.948	11	Pass
	Low Channel 5755					
	MHz	-4.844	3.0	-1.834	30	Pass
	High Channel 5795					
	MHz	-4.012	3.0	-1.002	30	Pass
802.11(ac) VHT, MCS8 (256-QAM)						
20 MHz						
	Low Channel 5180					
	MHz	0.098	3.0	3.108	11	Pass
	High Channel 5240					
	MHz	0.221	3.0	3.231	11	Pass
	Low Channel 5745					
	MHz	-3.595	3.0	-0.585	30	Pass
	Mid Channel 5785					
	MHz	-2.635	3.0	0.375	30	Pass
	High Channel 5825					
	MHz	-2.262	3.0	0.748	30	Pass
802.11(ac) VHT, MCS9 (256-QAM)						
80 MHz						
	Low Channel 5210					
	MHz	-7.487	3.0	-4.477	11	Pass
	Low Channel 5775					
	MHz	-7.583	3.0	-4.573	30	Pass
40 MHz						
	Low Channel 5190					
	MHz	-4.532	3.0	-1.522	11	Pass
	High Channel 5230					
	MHz	-3.959	3.0	-0.949	11	Pass
	Low Channel 5755					
	MHz	-8.426	3.0	-5.416	30	Pass
	High Channel 5795					
	MHz	-7.96	3.0	-4.950	30	Pass
802.11(n) HT, MCS15						
20 MHz						
	Low Channel 5180					
	MHz	0.164	3.0	3.174	11	Pass
	High Channel 5240					
	MHz	-0.206	3.0	2.804	11	Pass
	Low Channel 5745					
	MHz	-3.773	3.0	-0.763	30	Pass

MAXIMUM POWER SPECTRAL DENSITY

				Value (dBm / MHz)	Limit (dBm / Ref BW)	Result s			
Power Summing Chain B	802.11(n) HT, MCS0	40 MHz	Mid Channel 5785 MHz	-3.586	3.0	-0.576	30	Pass	
			High Channel 5825 MHz	-2.352	3.0	0.658	30	Pass	
		80 MHz	Low Channel 5190 MHz	-4.444	3.0	-1.434	11	Pass	
			High Channel 5230 MHz	-4.685	3.0	-1.675	11	Pass	
			Low Channel 5755 MHz	-8.065	3.0	-5.055	30	Pass	
			High Channel 5795 MHz	-7.365	3.0	-4.355	30	Pass	
			Power Summing Chain B						
			802.11(n) HT, MCS8	80 MHz		Value (dBm/MHz)	Summing Factor (dBm)	Summed Value (dBm/MHz)	Limit (dBm/Ref BW)
		Low Channel 5210 MHz			-2.239	3.0	0.771	11	Pass
		Low Channel 5775 MHz		-3.571	3.0	-0.561	30	Pass	
20 MHz	Low Channel 5180 MHz	5.765		3.0	8.775	11	Pass		
	High Channel 5240 MHz	5.908		3.0	8.918	11	Pass		
	Low Channel 5745 MHz	2.723		3.0	5.733	30	Pass		
	Mid Channel 5785 MHz	2.886		3.0	5.896	30	Pass		
	High Channel 5825 MHz	2.714		3.0	5.724	30	Pass		
	40 MHz								
	Low Channel 5190 MHz	-1.076		3.0	1.934	11	Pass		
	High Channel 5230 MHz	-0.667	3.0	2.343	11	Pass			
Low Channel 5755 MHz	-1.604	3.0	1.406	30	Pass				
High Channel 5795 MHz	-2.215	3.0	0.795	30	Pass				
802.11(ac) VHT, MCS8 (256-QAM)	20 MHz	Low Channel 5180 MHz	1.549	3.0	4.559	11	Pass		

MAXIMUM POWER SPECTRAL DENSITY

				Value (dBm / MHz)	Limit (dBm / Ref BW)	Results
	High Channel 5240 MHz	2.25	3.0	5.260	11	Pass
	Low Channel 5745 MHz	-1.013	3.0	1.997	30	Pass
	Mid Channel 5785 MHz	-0.128	3.0	2.882	30	Pass
	High Channel 5825 MHz	0.407	3.0	3.417	30	Pass
802.11(ac) VHT, MCS9 (256-QAM)						
	80 MHz					
	Low Channel 5210 MHz	-5.895	3.0	-2.885	11	Pass
	Low Channel 5775 MHz	-4.396	3.0	-1.386	30	Pass
	40 MHz					
	Low Channel 5190 MHz	-2.539	3.0	0.471	11	Pass
	High Channel 5230 MHz	-2.394	3.0	0.616	11	Pass
	Low Channel 5755 MHz	-4.241	3.0	-1.231	30	Pass
	High Channel 5795 MHz	-5.499	3.0	-2.489	30	Pass
802.11(n) HT, MCS15						
	20 MHz					
	Low Channel 5180 MHz	1.792	3.0	4.802	11	Pass
	High Channel 5240 MHz	2.083	3.0	5.093	11	Pass
	Low Channel 5745 MHz	-1.083	3.0	1.927	30	Pass
	Mid Channel 5785 MHz	-0.605	3.0	2.405	30	Pass
	High Channel 5825 MHz	-0.597	3.0	2.413	30	Pass
	40 MHz					
	Low Channel 5190 MHz	-2.891	3.0	0.119	11	Pass
	High Channel 5230 MHz	-2.755	3.0	0.255	11	Pass
	Low Channel 5755 MHz	-5.154	3.0	-2.144	30	Pass
	High Channel 5795 MHz	-5.82	3.0	-2.810	30	Pass

MAXIMUM POWER SPECTRAL DENSITY

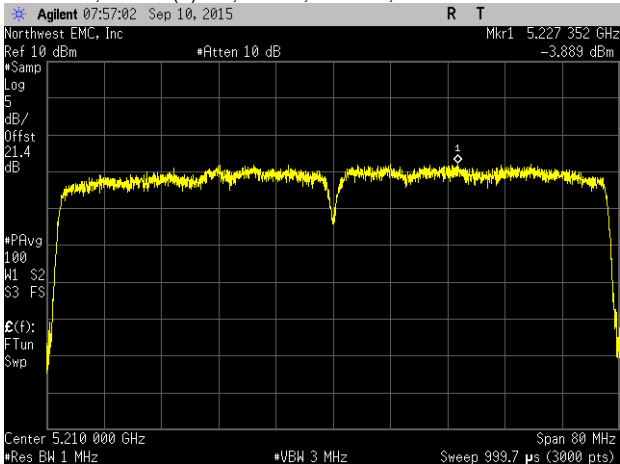


Jonathan Kiefer

Tested By

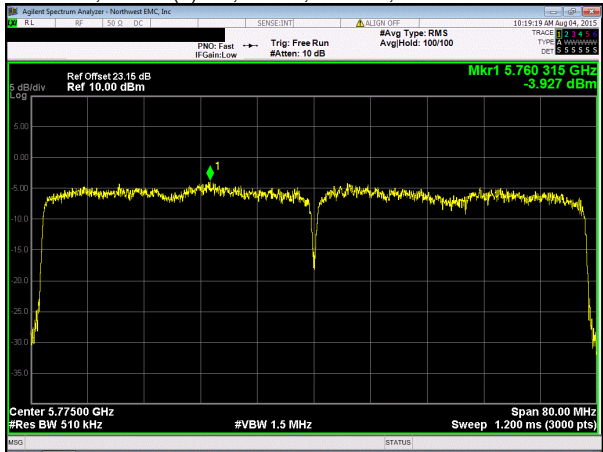
MAXIMUM POWER SPECTRAL DENSITY

Chain A, 802.11(n) HT, MCS0, 80 MHz, Low Channel 5210 MHz



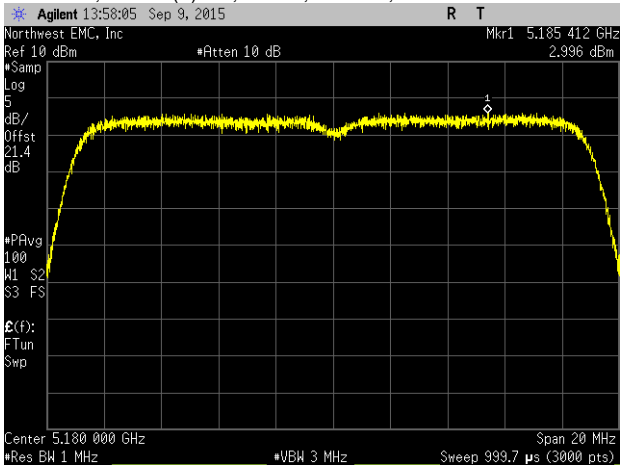
Value (dBm / MHz)	-3.889
Limit (dBm / Ref BW)	11
Results	Pass

Chain A, 802.11(n) HT, MCS0, 80 MHz, Low Channel 5775 MHz



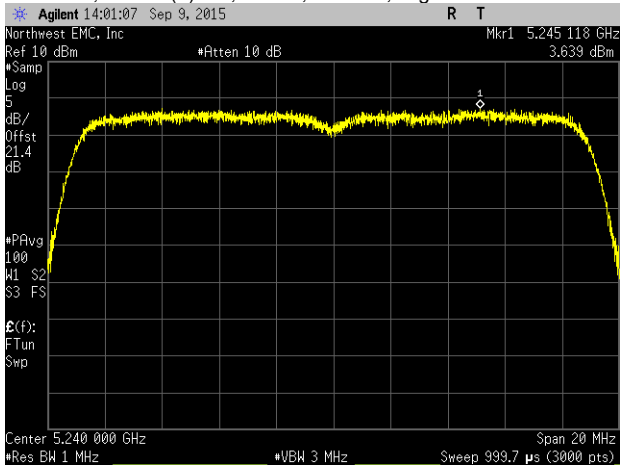
Value (dBm / MHz)	-3.927
Limit (dBm / Ref BW)	30
Results	Pass

Chain A, 802.11(n) HT, MCS8, 20 MHz, Low Channel 5180 MHz



Value (dBm / MHz)	2.996
Limit (dBm / Ref BW)	11
Results	Pass

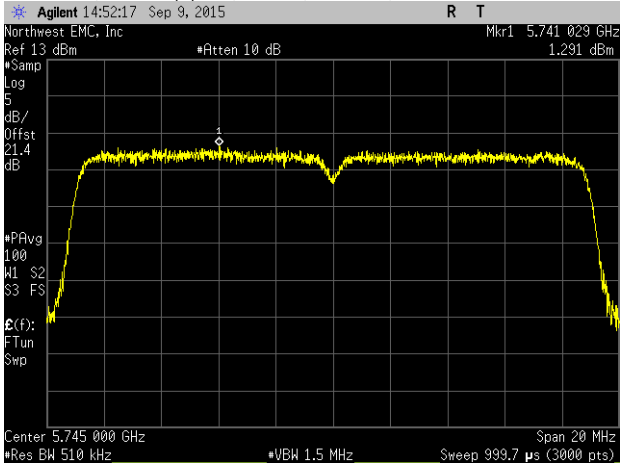
Chain A, 802.11(n) HT, MCS8, 20 MHz, High Channel 5240 MHz



Value (dBm / MHz)	3.639
Limit (dBm / Ref BW)	11
Results	Pass

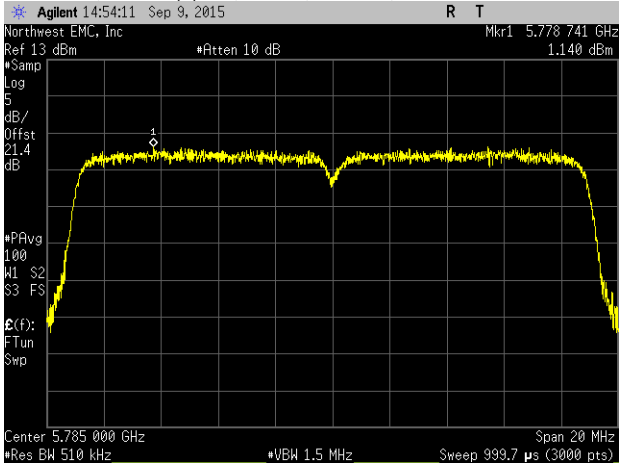
MAXIMUM POWER SPECTRAL DENSITY

Chain A, 802.11(n) HT, MCS8, 20 MHz, Low Channel 5745 MHz



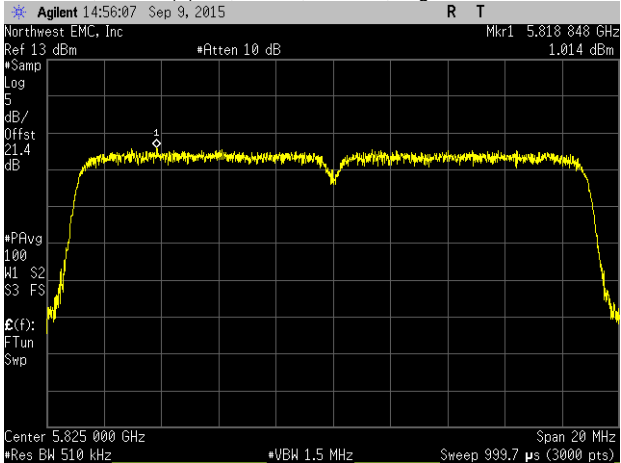
Value (dBm / MHz)	1.291
Limit (dBm / Ref BW)	30
Results	Pass

Chain A, 802.11(n) HT, MCS8, 20 MHz, Mid Channel 5785 MHz



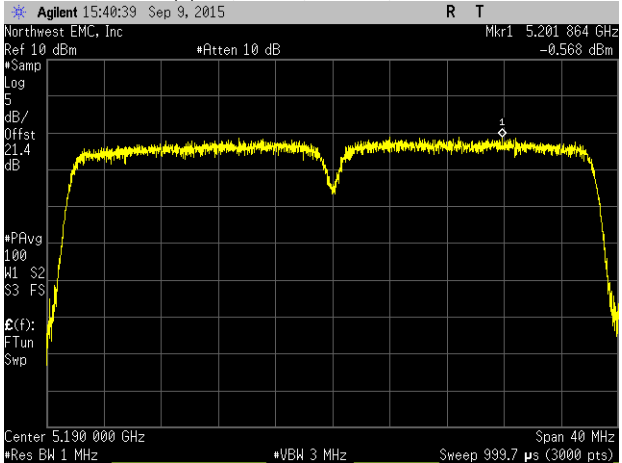
Value (dBm / MHz)	1.14
Limit (dBm / Ref BW)	30
Results	Pass

Chain A, 802.11(n) HT, MCS8, 20 MHz, High Channel 5825 MHz



Value (dBm / MHz)	1.014
Limit (dBm / Ref BW)	30
Results	Pass

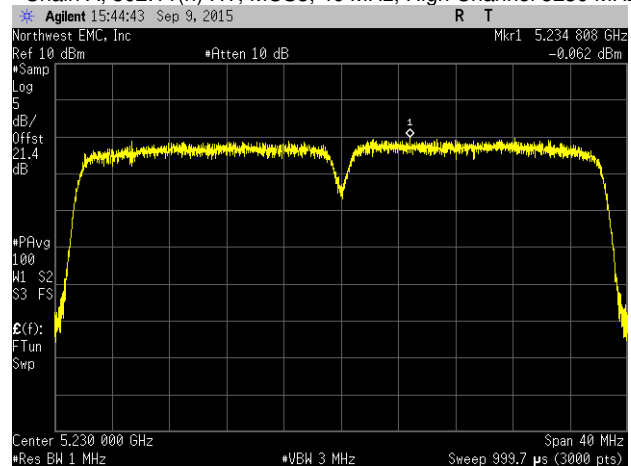
Chain A, 802.11(n) HT, MCS8, 40 MHz, Low Channel 5190 MHz



Value (dBm / MHz)	-0.568
Limit (dBm / Ref BW)	11
Results	Pass

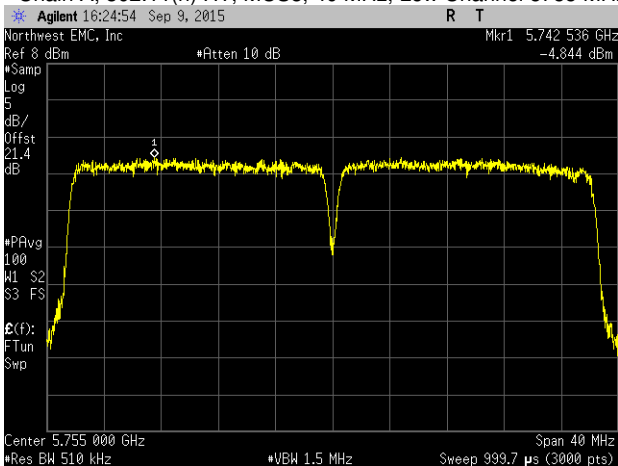
MAXIMUM POWER SPECTRAL DENSITY

Chain A, 802.11(n) HT, MCS8, 40 MHz, High Channel 5230 MHz



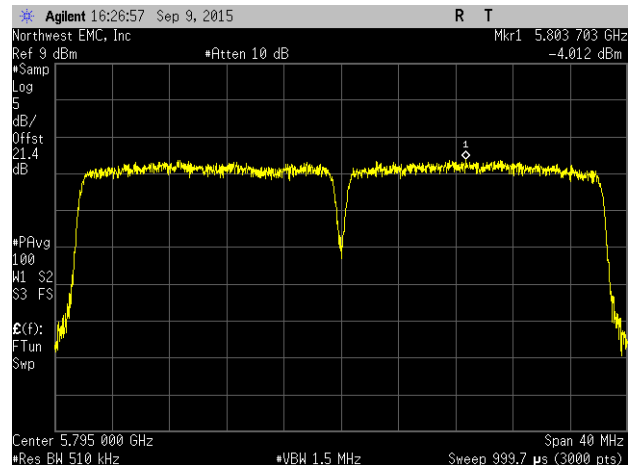
Value (dBm / MHz)	-0.062
Limit (dBm / Ref BW)	11
Results	Pass

Chain A, 802.11(n) HT, MCS8, 40 MHz, Low Channel 5755 MHz



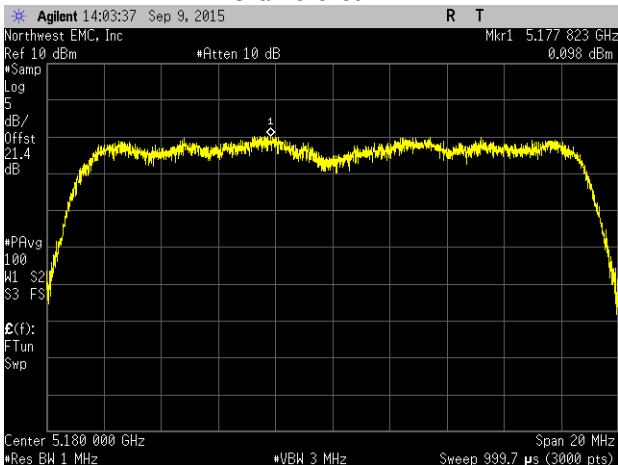
Value (dBm / MHz)	-4.844
Limit (dBm / Ref BW)	30
Results	Pass

Chain A, 802.11(n) HT, MCS8, 40 MHz, High Channel 5795 MHz



Value (dBm / MHz)	-4.012
Limit (dBm / Ref BW)	30
Results	Pass

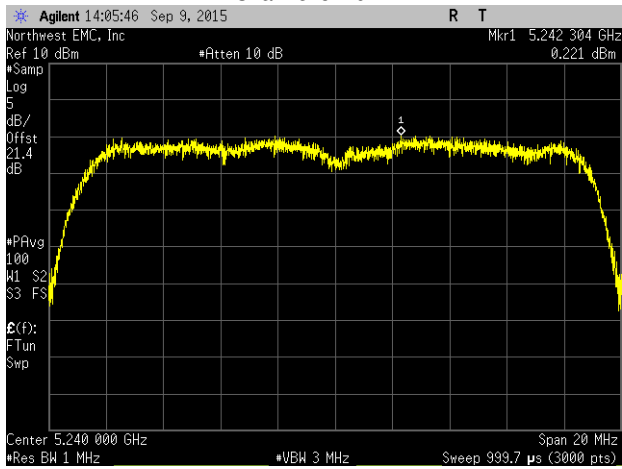
Chain A, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, Low Channel 5180 MHz



Value (dBm / MHz)	0.098
Limit (dBm / Ref BW)	11
Results	Pass

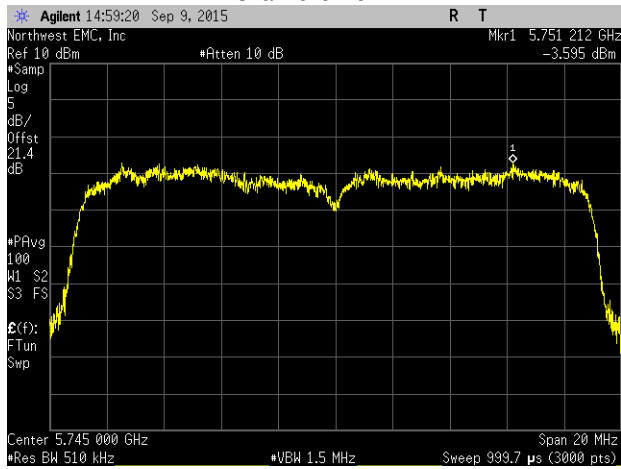
MAXIMUM POWER SPECTRAL DENSITY

Chain A, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, High
Channel 5240 MHz



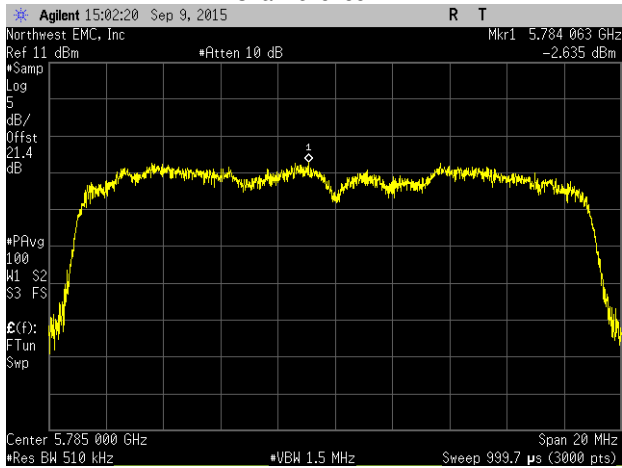
Value (dBm / MHz)	0.221
Limit (dBm / Ref BW)	11
Results	Pass

Chain A, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, Low
Channel 5745 MHz



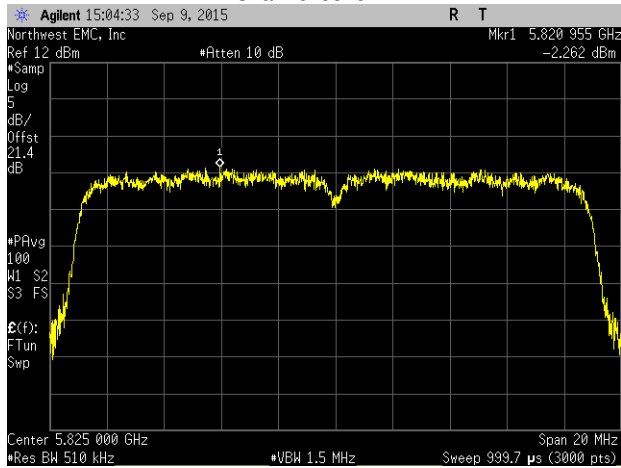
Value (dBm / MHz)	-3.595
Limit (dBm / Ref BW)	30
Results	Pass

Chain A, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, Mid
Channel 5785 MHz



Value (dBm / MHz)	-2.635
Limit (dBm / Ref BW)	30
Results	Pass

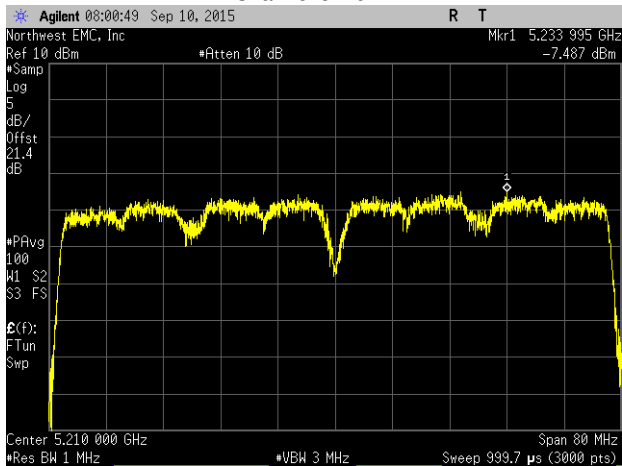
Chain A, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, High
Channel 5825 MHz



Value (dBm / MHz)	-2.262
Limit (dBm / Ref BW)	30
Results	Pass

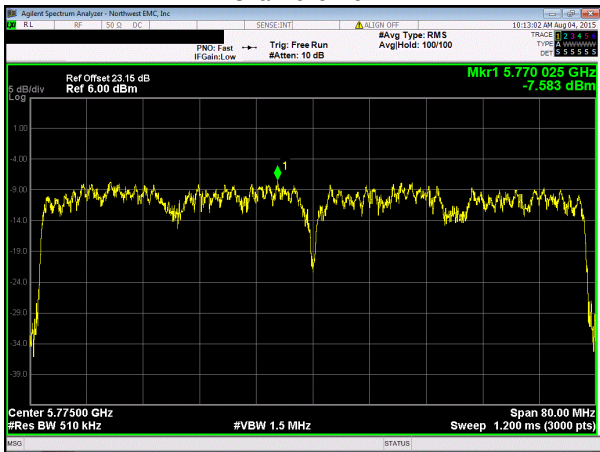
MAXIMUM POWER SPECTRAL DENSITY

Chain A, 802.11(ac) VHT, MCS9 (256-QAM), 80 MHz, Low
Channel 5210 MHz



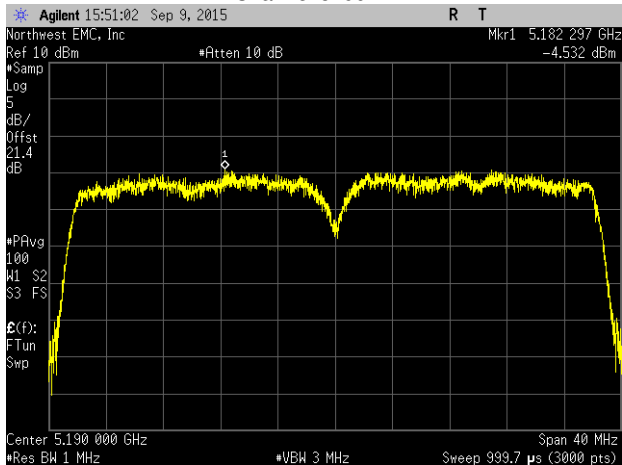
Value (dBm / MHz)	-7.487
Limit (dBm / Ref BW)	11
Results	Pass

Chain A, 802.11(ac) VHT, MCS9 (256-QAM), 80 MHz, Low
Channel 5775 MHz



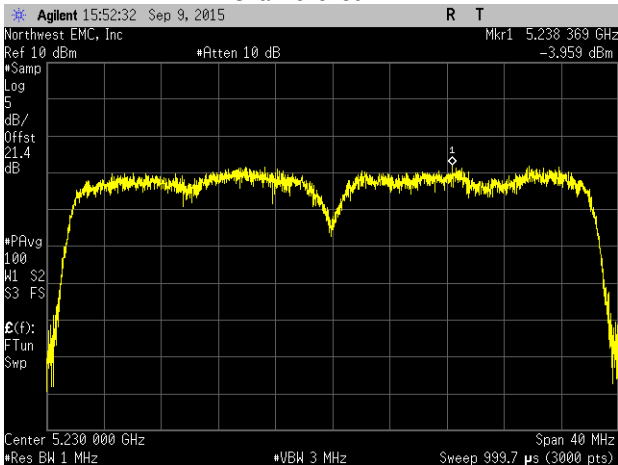
Value (dBm / MHz)	-7.583
Limit (dBm / Ref BW)	30
Results	Pass

Chain A, 802.11(ac) VHT, MCS9 (256-QAM), 40 MHz, Low
Channel 5190 MHz



Value (dBm / MHz)	-4.532
Limit (dBm / Ref BW)	11
Results	Pass

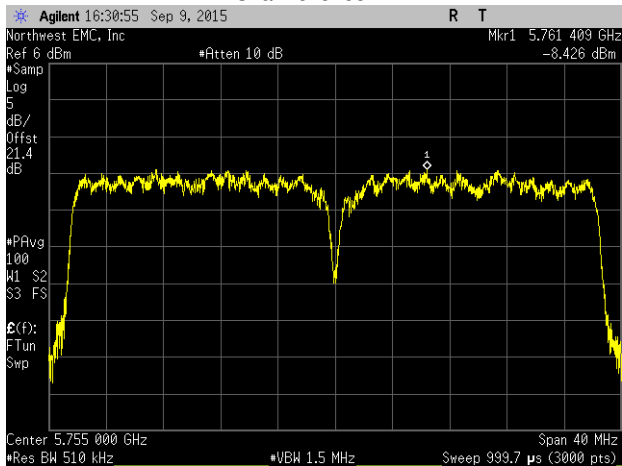
Chain A, 802.11(ac) VHT, MCS9 (256-QAM), 40 MHz, High
Channel 5230 MHz



Value (dBm / MHz)	-3.959
Limit (dBm / Ref BW)	11
Results	Pass

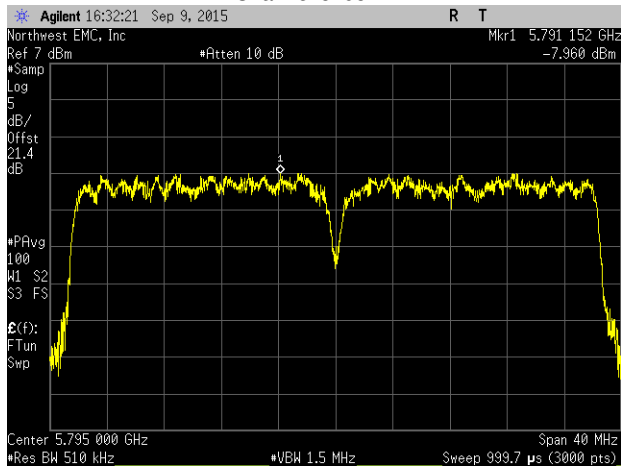
MAXIMUM POWER SPECTRAL DENSITY

Chain A, 802.11(ac) VHT, MCS9 (256-QAM), 40 MHz, Low
Channel 5755 MHz



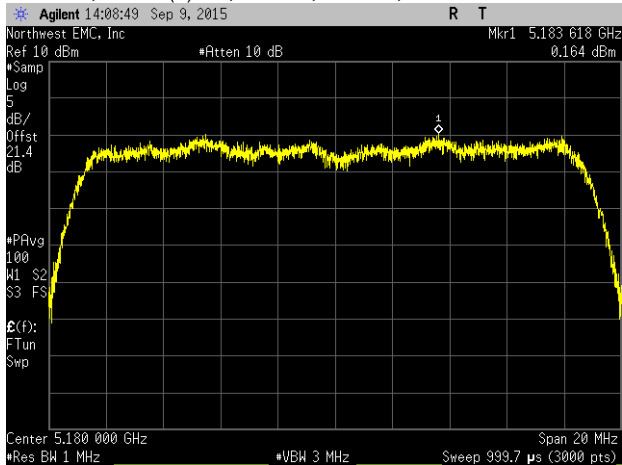
Value (dBm / MHz)	-8.426
Limit (dBm / Ref BW)	30
Results	Pass

Chain A, 802.11(ac) VHT, MCS9 (256-QAM), 40 MHz, High
Channel 5795 MHz



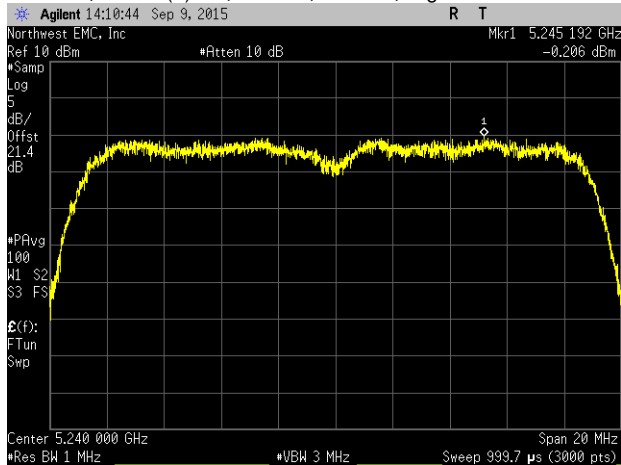
Value (dBm / MHz)	-7.96
Limit (dBm / Ref BW)	30
Results	Pass

Chain A, 802.11(n) HT, MCS15, 20 MHz, Low Channel 5180 MHz



Value (dBm / MHz)	0.164
Limit (dBm / Ref BW)	11
Results	Pass

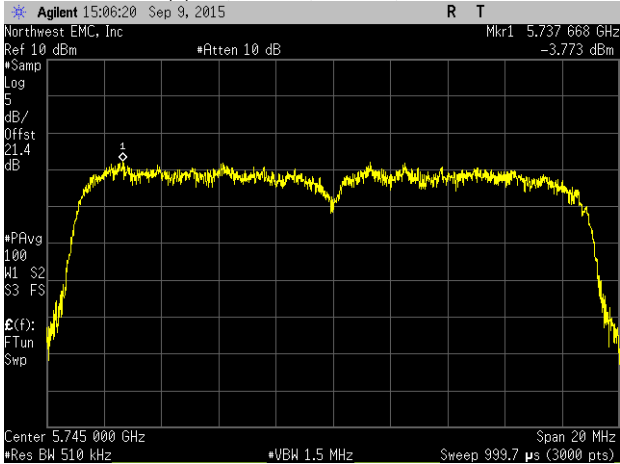
Chain A, 802.11(n) HT, MCS15, 20 MHz, High Channel 5240 MHz



Value (dBm / MHz)	-0.206
Limit (dBm / Ref BW)	11
Results	Pass

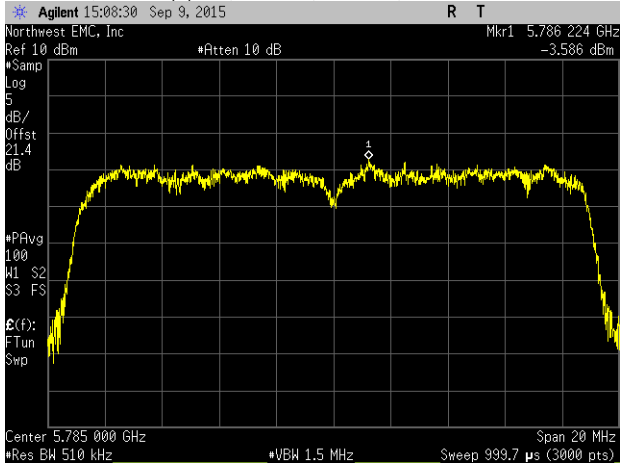
MAXIMUM POWER SPECTRAL DENSITY

Chain A, 802.11(n) HT, MCS15, 20 MHz, Low Channel 5745 MHz



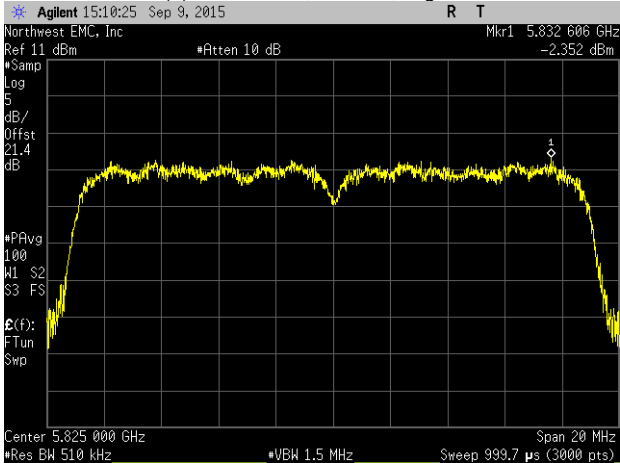
Value (dBm / MHz)	-3.773
Limit (dBm / Ref BW)	30
Results	Pass

Chain A, 802.11(n) HT, MCS15, 20 MHz, Mid Channel 5785 MHz



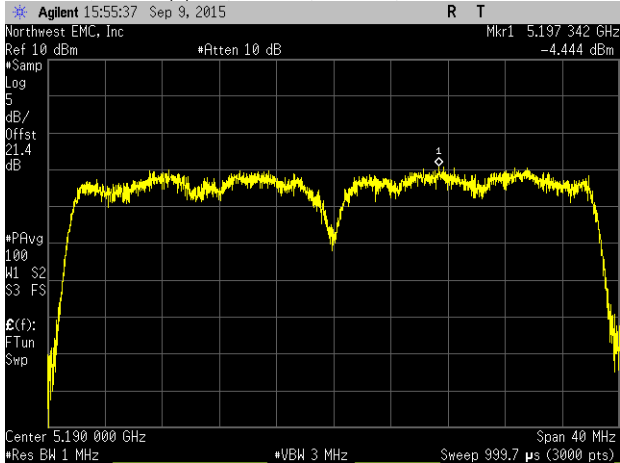
Value (dBm / MHz)	-3.586
Limit (dBm / Ref BW)	30
Results	Pass

Chain A, 802.11(n) HT, MCS15, 20 MHz, High Channel 5825 MHz



Value (dBm / MHz)	-2.352
Limit (dBm / Ref BW)	30
Results	Pass

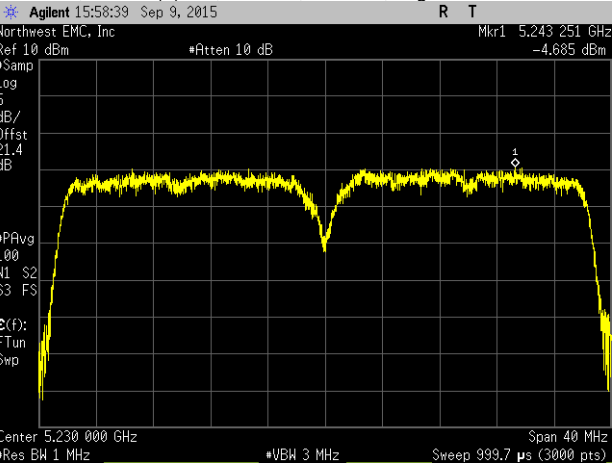
Chain A, 802.11(n) HT, MCS15, 40 MHz, Low Channel 5190 MHz



Value (dBm / MHz)	-4.444
Limit (dBm / Ref BW)	11
Results	Pass

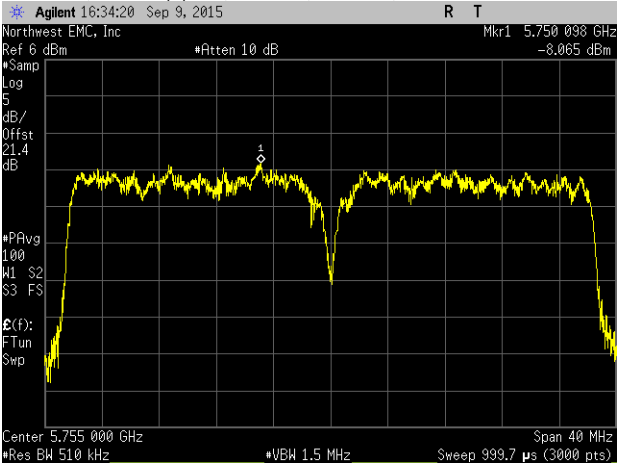
MAXIMUM POWER SPECTRAL DENSITY

Chain A, 802.11(n) HT, MCS15, 40 MHz, High Channel 5230 MHz



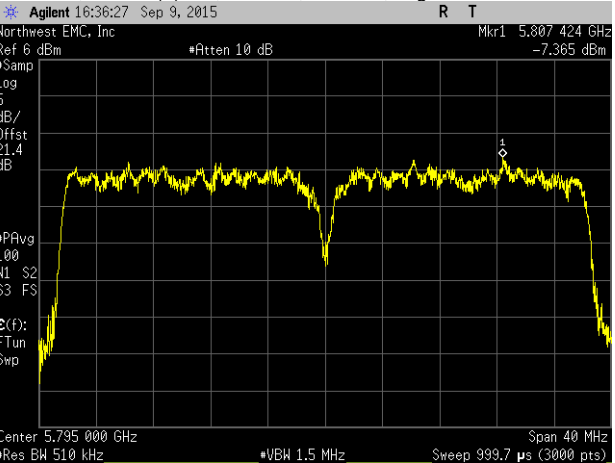
Value (dBm / MHz)	-4.685
Limit (dBm / Ref BW)	11
Results	Pass

Chain A, 802.11(n) HT, MCS15, 40 MHz, Low Channel 5755 MHz



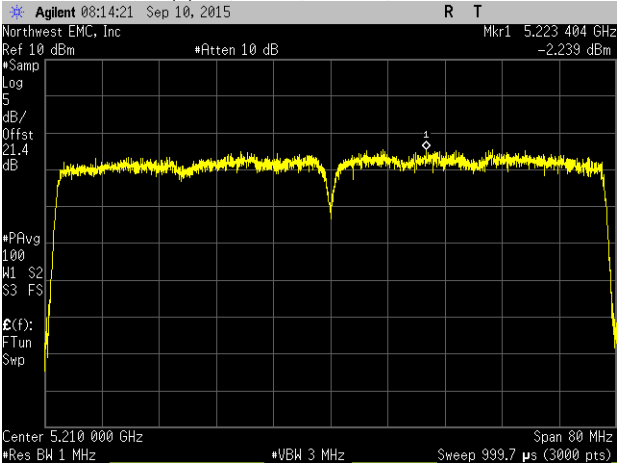
Value (dBm / MHz)	-8.065
Limit (dBm / Ref BW)	30
Results	Pass

Chain A, 802.11(n) HT, MCS15, 40 MHz, High Channel 5795 MHz



Value (dBm / MHz)	-7.365
Limit (dBm / Ref BW)	30
Results	Pass

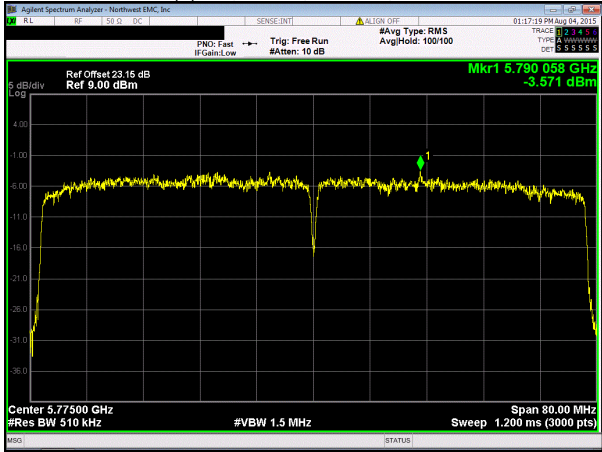
Chain B, 802.11(n) HT, MCS0, 80 MHz, Low Channel 5210 MHz



Value (dBm / MHz)	-2.239
Limit (dBm / Ref BW)	11
Results	Pass

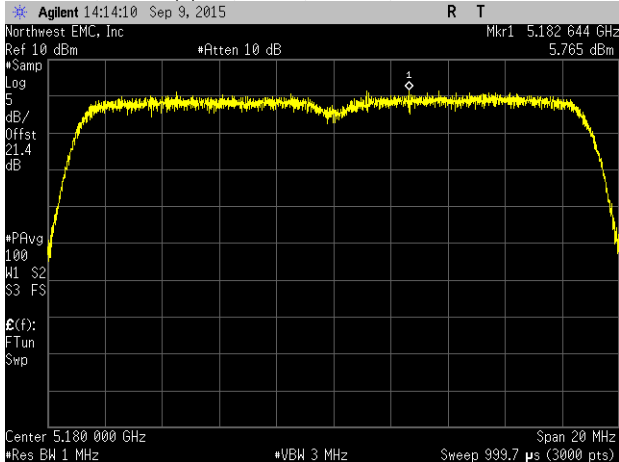
MAXIMUM POWER SPECTRAL DENSITY

Chain B, 802.11(n) HT, MCS0, 80 MHz, Low Channel 5775 MHz



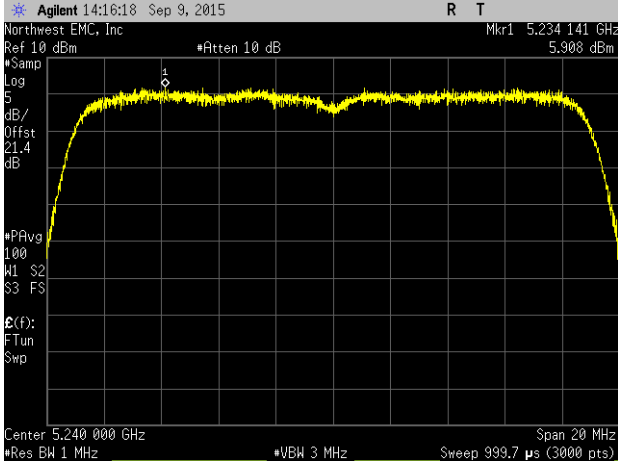
Value (dBm / MHz)	-3.571
Limit (dBm / Ref BW)	30
Results	Pass

Chain B, 802.11(n) HT, MCS8, 20 MHz, Low Channel 5180 MHz



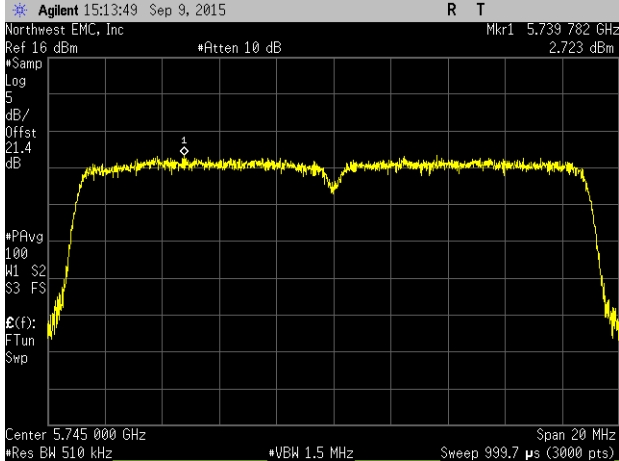
Value (dBm / MHz)	5.765
Limit (dBm / Ref BW)	11
Results	Pass

Chain B, 802.11(n) HT, MCS8, 20 MHz, High Channel 5240 MHz



Value (dBm / MHz)	5.908
Limit (dBm / Ref BW)	11
Results	Pass

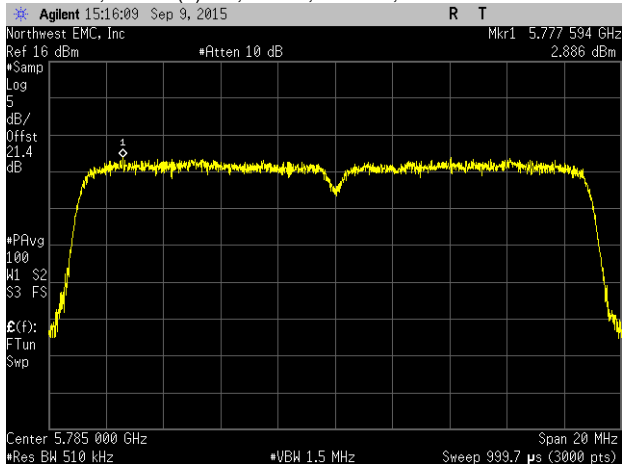
Chain B, 802.11(n) HT, MCS8, 20 MHz, Low Channel 5745 MHz



Value (dBm / MHz)	2.723
Limit (dBm / Ref BW)	30
Results	Pass

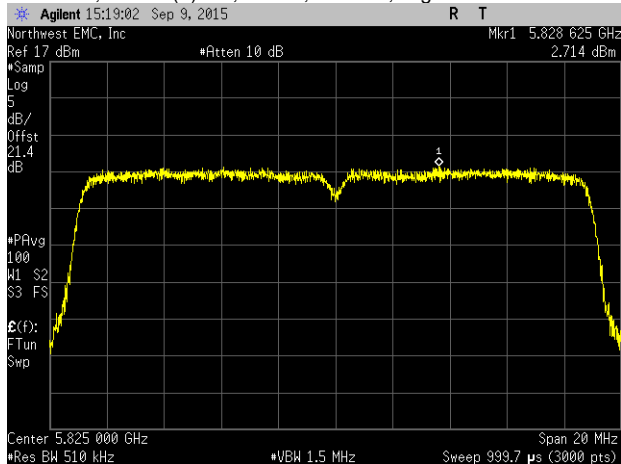
MAXIMUM POWER SPECTRAL DENSITY

Chain B, 802.11(n) HT, MCS8, 20 MHz, Mid Channel 5785 MHz



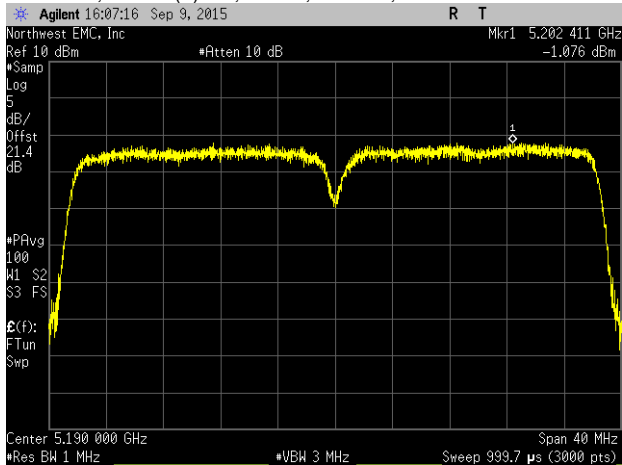
Value (dBm / MHz)	2.886
Limit (dBm / Ref BW)	30
Results	Pass

Chain B, 802.11(n) HT, MCS8, 20 MHz, High Channel 5825 MHz



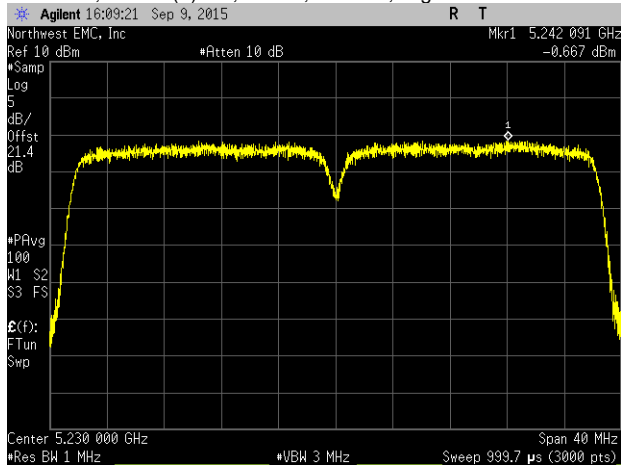
Value (dBm / MHz)	2.714
Limit (dBm / Ref BW)	30
Results	Pass

Chain B, 802.11(n) HT, MCS8, 40 MHz, Low Channel 5190 MHz



Value (dBm / MHz)	-1.076
Limit (dBm / Ref BW)	11
Results	Pass

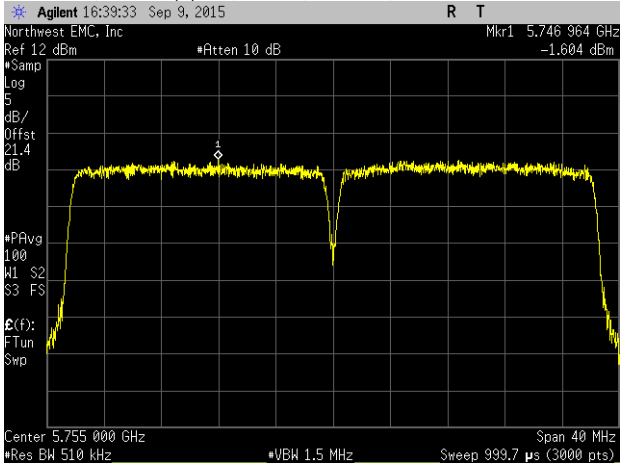
Chain B, 802.11(n) HT, MCS8, 40 MHz, High Channel 5230 MHz



Value (dBm / MHz)	-0.667
Limit (dBm / Ref BW)	11
Results	Pass

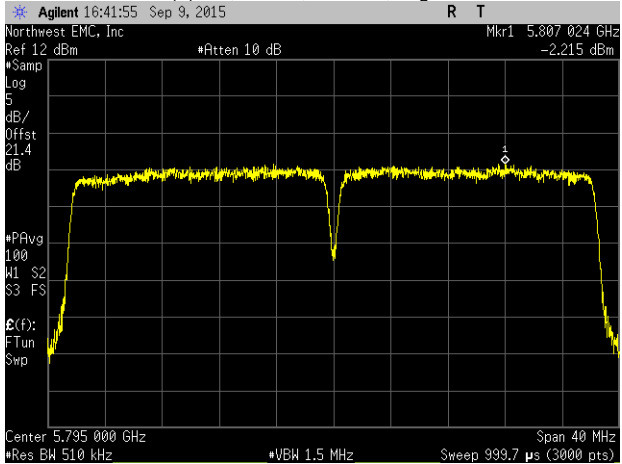
MAXIMUM POWER SPECTRAL DENSITY

Chain B, 802.11(n) HT, MCS8, 40 MHz, Low Channel 5755 MHz



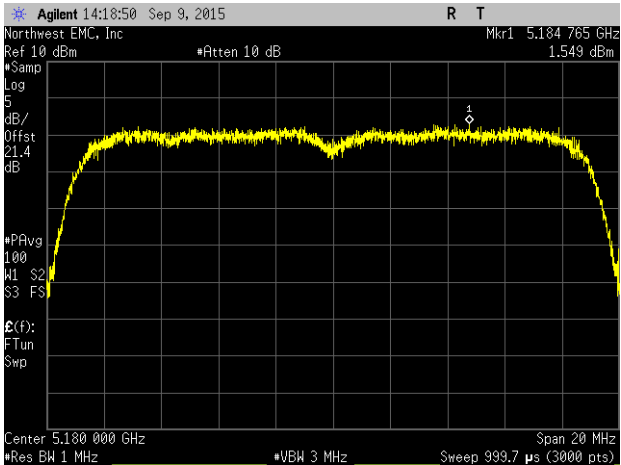
Value (dBm / MHz)	-1.604
Limit (dBm / Ref BW)	30
Results	Pass

Chain B, 802.11(n) HT, MCS8, 40 MHz, High Channel 5795 MHz



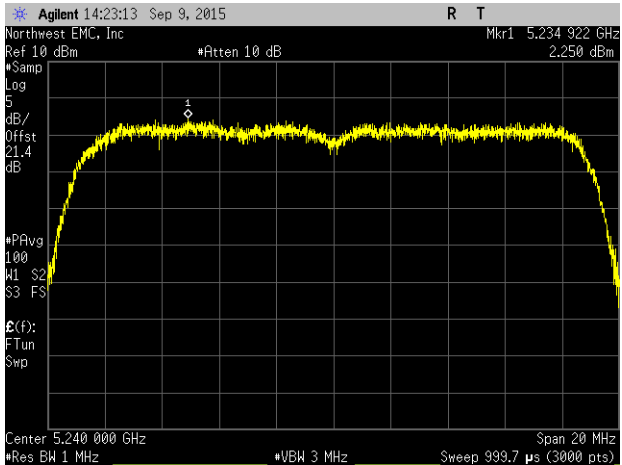
Value (dBm / MHz)	-2.215
Limit (dBm / Ref BW)	30
Results	Pass

Chain B, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, Low Channel 5180 MHz



Value (dBm / MHz)	1.549
Limit (dBm / Ref BW)	11
Results	Pass

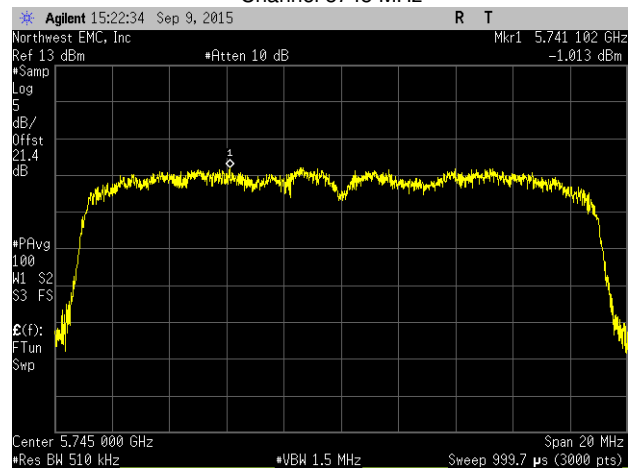
Chain B, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, High Channel 5240 MHz



Value (dBm / MHz)	2.25
Limit (dBm / Ref BW)	11
Results	Pass

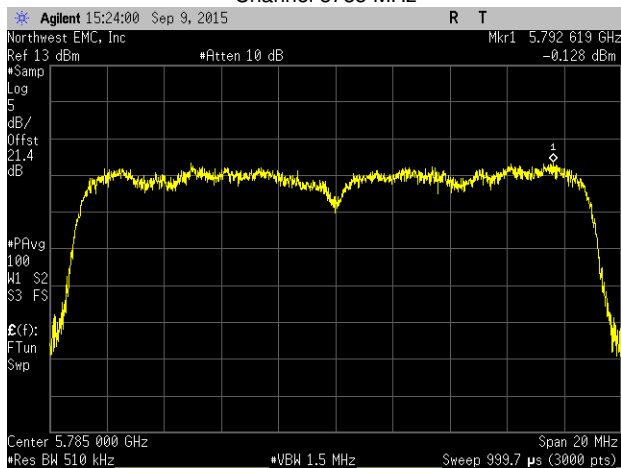
MAXIMUM POWER SPECTRAL DENSITY

Chain B, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, Low
Channel 5745 MHz



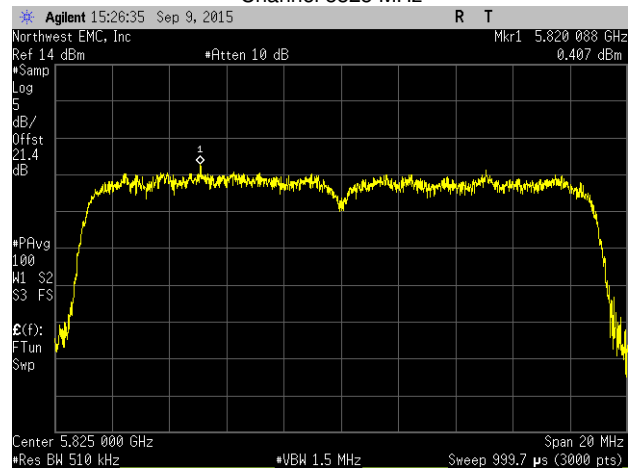
Value (dBm / MHz)	-1.013
Limit (dBm / Ref BW)	30
Results	Pass

Chain B, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, Mid
Channel 5785 MHz



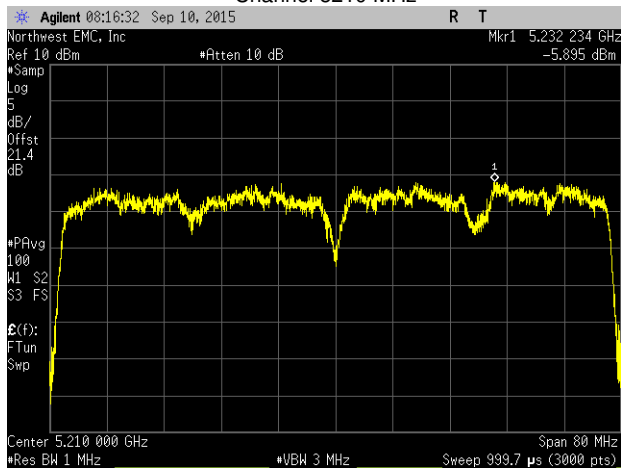
Value (dBm / MHz)	-0.128
Limit (dBm / Ref BW)	30
Results	Pass

Chain B, 802.11(ac) VHT, MCS8 (256-QAM), 20 MHz, High
Channel 5825 MHz



Value (dBm / MHz)	0.407
Limit (dBm / Ref BW)	30
Results	Pass

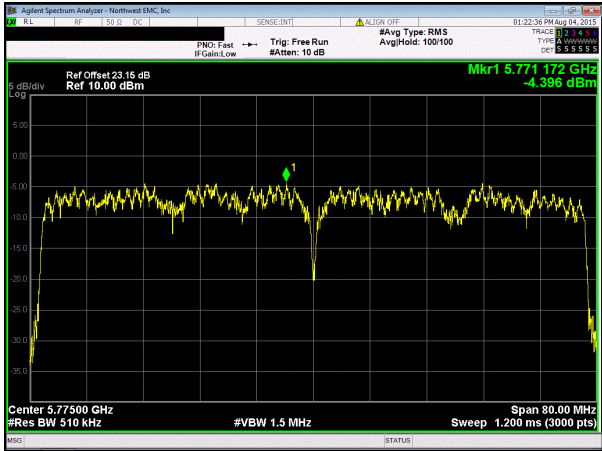
Chain B, 802.11(ac) VHT, MCS9 (256-QAM), 80 MHz, Low
Channel 5210 MHz



Value (dBm / MHz)	-5.895
Limit (dBm / Ref BW)	11
Results	Pass

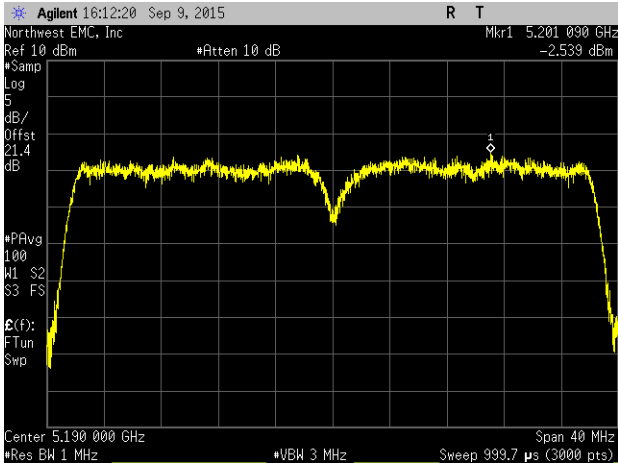
MAXIMUM POWER SPECTRAL DENSITY

Chain B, 802.11(ac) VHT, MCS9 (256-QAM), 80 MHz, Low
Channel 5775 MHz



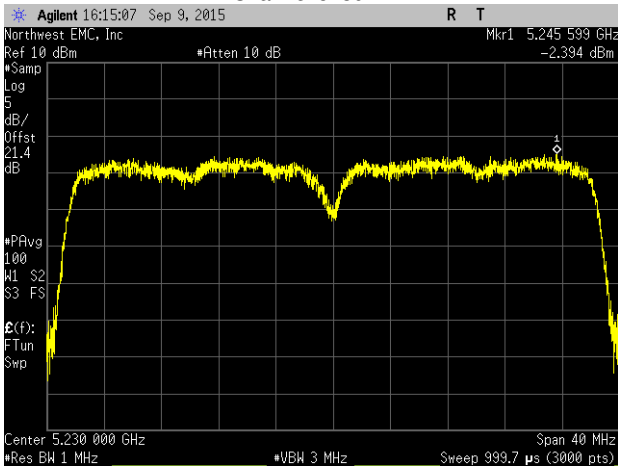
Value (dBm / MHz)	-4.396
Limit (dBm / Ref BW)	30
Results	Pass

Chain B, 802.11(ac) VHT, MCS9 (256-QAM), 40 MHz, Low
Channel 5190 MHz



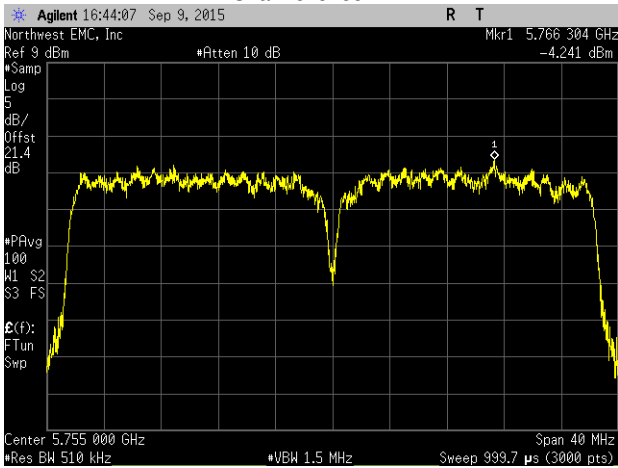
Value (dBm / MHz)	-2.539
Limit (dBm / Ref BW)	11
Results	Pass

Chain B, 802.11(ac) VHT, MCS9 (256-QAM), 40 MHz, High
Channel 5230 MHz



Value (dBm / MHz)	-2.394
Limit (dBm / Ref BW)	11
Results	Pass

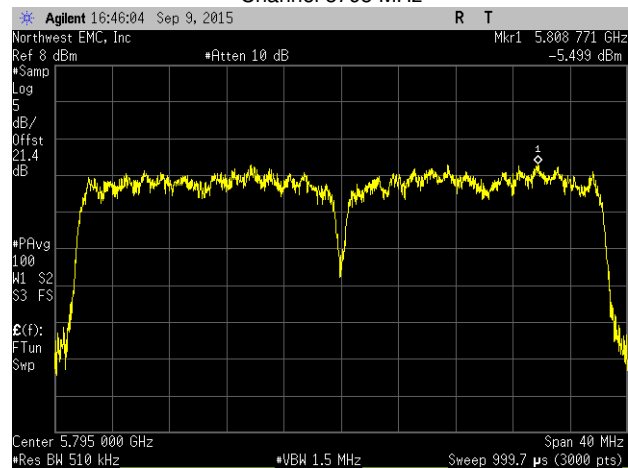
Chain B, 802.11(ac) VHT, MCS9 (256-QAM), 40 MHz, Low
Channel 5755 MHz



Value (dBm / MHz)	-4.241
Limit (dBm / Ref BW)	30
Results	Pass

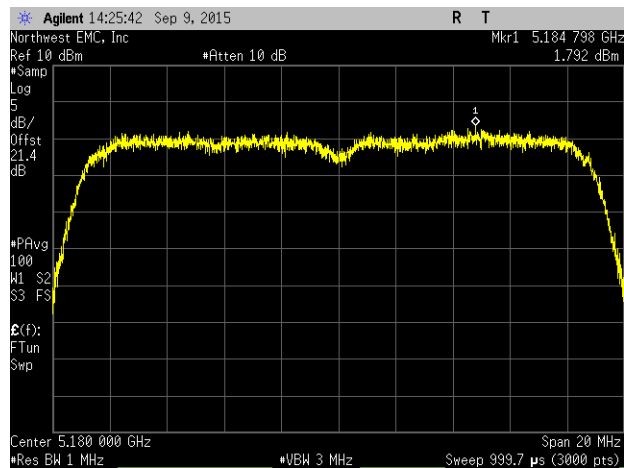
MAXIMUM POWER SPECTRAL DENSITY

Chain B, 802.11(ac) VHT, MCS9 (256-QAM), 40 MHz, High
Channel 5795 MHz



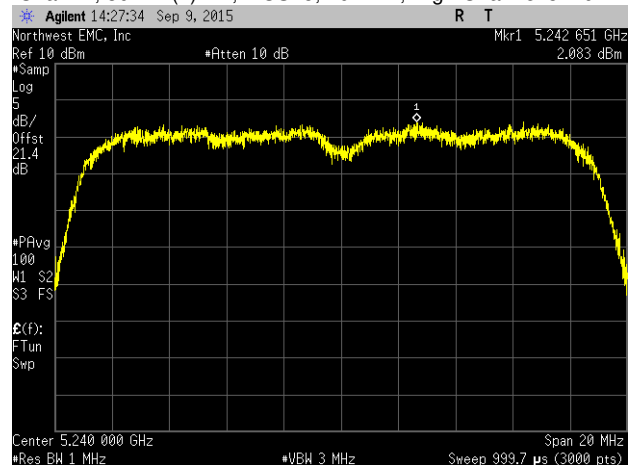
Value (dBm / MHz)	-5.499
Limit (dBm / Ref BW)	30
Results	Pass

Chain B, 802.11(n) HT, MCS15, 20 MHz, Low Channel 5180 MHz



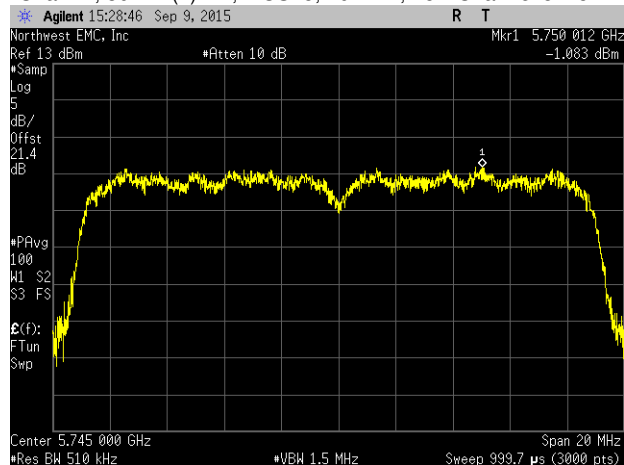
Value (dBm / MHz)	1.792
Limit (dBm / Ref BW)	11
Results	Pass

Chain B, 802.11(n) HT, MCS15, 20 MHz, High Channel 5240 MHz



Value (dBm / MHz)	2.083
Limit (dBm / Ref BW)	11
Results	Pass

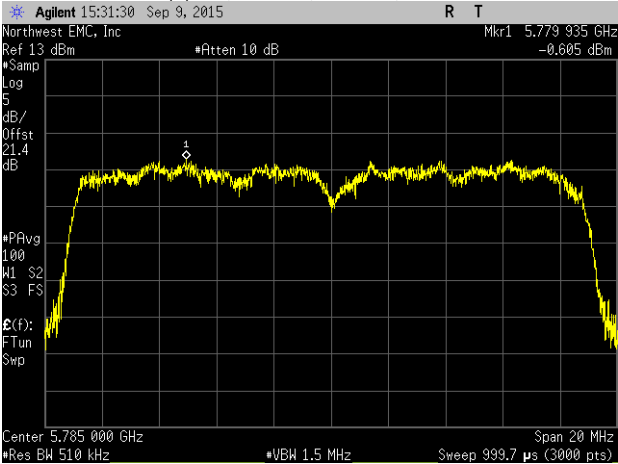
Chain B, 802.11(n) HT, MCS15, 20 MHz, Low Channel 5745 MHz



Value (dBm / MHz)	-1.083
Limit (dBm / Ref BW)	30
Results	Pass

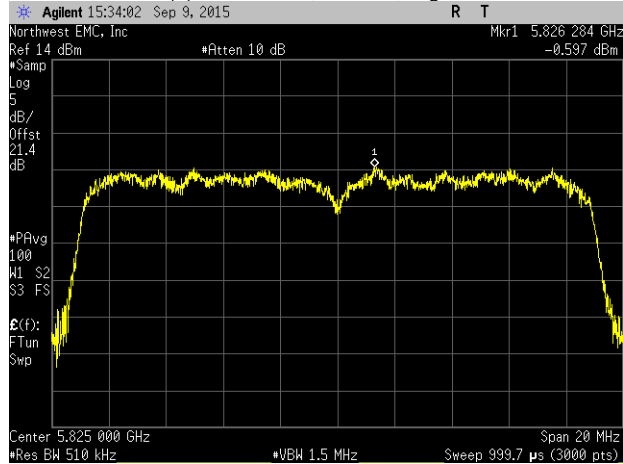
MAXIMUM POWER SPECTRAL DENSITY

Chain B, 802.11(n) HT, MCS15, 20 MHz, Mid Channel 5785 MHz



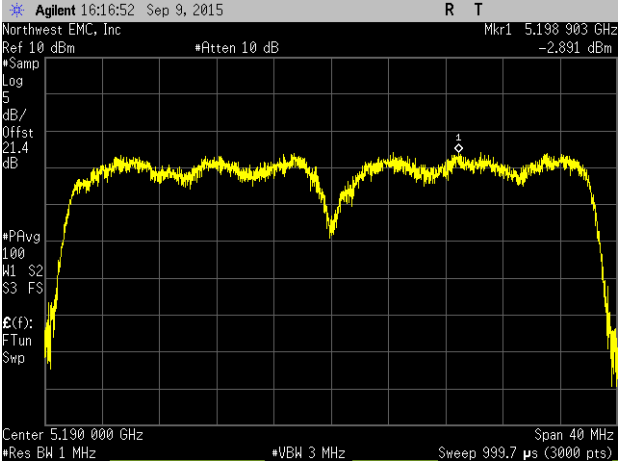
Value (dBm / MHz)	-0.605
Limit (dBm / Ref BW)	30
Results	Pass

Chain B, 802.11(n) HT, MCS15, 20 MHz, High Channel 5825 MHz



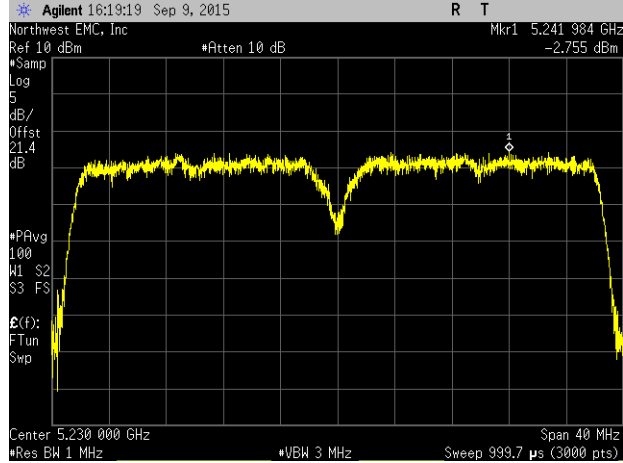
Value (dBm / MHz)	-0.597
Limit (dBm / Ref BW)	30
Results	Pass

Chain B, 802.11(n) HT, MCS15, 40 MHz, Low Channel 5190 MHz



Value (dBm / MHz)	-2.891
Limit (dBm / Ref BW)	11
Results	Pass

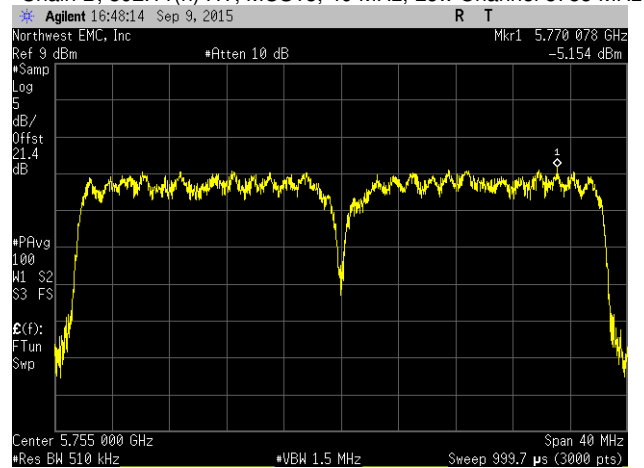
Chain B, 802.11(n) HT, MCS15, 40 MHz, High Channel 5230 MHz



Value (dBm / MHz)	-2.755
Limit (dBm / Ref BW)	11
Results	Pass

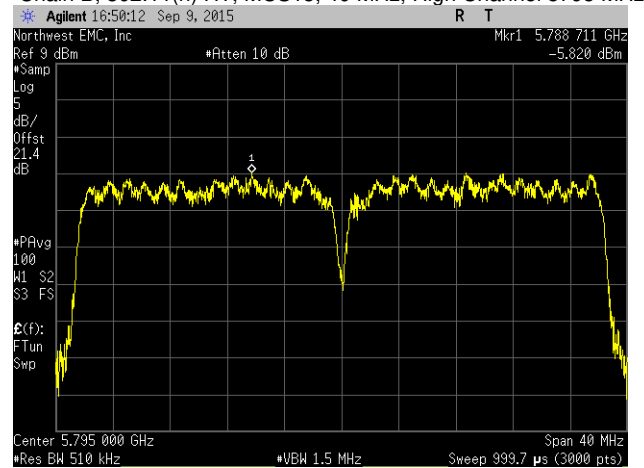
MAXIMUM POWER SPECTRAL DENSITY

Chain B, 802.11(n) HT, MCS15, 40 MHz, Low Channel 5755 MHz



Value (dBm / MHz)	-5.154
Limit (dBm / Ref BW)	30
Results	Pass

Chain B, 802.11(n) HT, MCS15, 40 MHz, High Channel 5795 MHz



Value (dBm / MHz)	-5.82
Limit (dBm / Ref BW)	30
Results	Pass