RADIO TEST REPORT

For

MODEL NO.:1855
FCC ID: C3K1855
IC ID: 3048A-1855

Test Report No. R-TR516-FCCISED-UNII-3
Issue Date: July 15, 2019

FCC CFR47 Part 15 Subpart E
Innovation, Science and Economic Development
Canada RSS-247 Issue 2

Prepared by
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ACCREDITED
TESTING CERT #3472.01

1 Record of Revisions

Revision	Date	Section	Page(s)	Summary of Changes	Author/Revised By:
1.0	6/12/2019	All	All	Version 1.0	Vishwas Narayan
2.0	07/02/2019	5.3	9	Removed Main and MIMO Antenna designation	Daniel Salinas
		9.1.5	18-24	Updated Path A/B to Chain 0/1	
		9.7.5	234-285	Updated plot caption from Chain	
3.0	07/15/2019	5.1	8	Included note on USB charging cable for radiated measurements	Daniel Salinas

Table of Contents

Test Report Attestation

Microsoft Corporation
Model: 1855
FCC ID: C3K1855
ISED ID: 3048A-1855

Applicable Standards

Specification	Test Result
FCC CFR47 Rule Parts 15.207, 15.209, 15.407	Pass
Innovation, Science and Economic Development Canada RSS-247 Issue 2, RSS-GEN Issue 5	Pass

Microsoft EMC Laboratory attests that the product model identified in this report has been tested to and meets the requirements identified in the above standards. The test results in this report solely pertains to the specific sample tested, under the conditions and operating modes as provided by the customer.

This report shall not be used to claim product certification, approval, or endorsement by A2LA or any agency of any Government. Reproduction, duplication or publication of extracts from this test report is prohibited and requires prior written approval of Microsoft EMC Laboratory.

This report replaces previously issued report number R-TR516-FCCISED-UNII-2 issued July 2nd, 2019.

Written By: Vishwas Narayan

Radio Test Engineer

Reviewed/ Issued By: Daniel Salinas

RF Compliance Lab Manager

2 Deviations from Standards

None.

3 Facilities and Accreditations

3.1 Test Facility

All test facilities used to collect the test data are located at
Microsoft EMC Laboratory,
17760 NE 67th Ct,
Redmond WA, 98052, USA

3.2 Accreditations

The lab is established and follows procedures as outlined in IEC/ISO 17025 and A2LA accreditation requirements.
A2LA Accredited Testing Certificate Number: 3472.01
FCC Registration Number: US1141
IC Site Registration Numbers: 3048A-3, 3048A-4

3.3 Test Equipment

The site and related equipment are constructed in conformance with the requirements of ANSI C63.4:2014 and other equivalent applicable standards.
Test site requirements for measurements above 1 GHz are in accordance with ANSI C63.4:2014.
ANSI C63.10:2013 and the appropriate KDB test methods were followed.

4 Measurement Uncertainty

The following measurement uncertainty levels have been estimated for tests performed on the product, as specified in ETSI TR 100 028. This represents an expanded uncertainty expressed at 95% confidence level using a coverage factor k=2. These levels are for reference only and not included to determine product compliance.
Expanded uncertainty calculations are available upon request.

Test item	Uncertainty	Unit
Radiated disturbance (30 MHz to 1 GHz)	5.99	dB
Radiated disturbance (1 GHz to 40 GHz)	5.12	dB
Conducted Disturbance at Mains Port	3.31	dB
Uncertainty for Conducted Power test	1.277	dB
Uncertainty for Conducted Spurious emission test	2.742	dB
Uncertainty for Bandwidth test	178	kHz
Uncertainty for DC power test	0.05	%
Uncertainty for test site temperature	0.5	ºC
Uncertainty for test site Humidity	3	%
Uncertainty for time	0.189	%

5 Product Description

Company Name:	Microsoft Corporation
Address:	One Microsoft Way
City, State, Zip:	Redmond, WA 98052-6399
Customer Contact:	Chaitrali Limaye
Functional Description of the EUT:	Radio transceiver with 802.11a/b/g/n/ac MIMO radio supporting 20/40/8MHz bandwidths, Bluetooth 5.0
Model:	1855
FCC ID:	C3K1855
IC ID:	3048A-1855
Radio under test:	IEEE 802.11a/n/ac supporting 20/40/80 MHz Bandwidths 5150- 5250 MHz, 5250-5350 MHz, 5470-5725 MHz and 5725- 5850 MHz. This device supports the straddle channels that overlap the 5470 - 5725 MHz and 5725-5850 MHz bands.
Modulation(s):	OFDM – BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM
EUT Classification:	UNII
Equipment Design State:	Prototype/Production Equivalent (EV3)
Equipment Condition:	Good
Test Sample Details:	RF Conducted Test Sample: S/N: A24964030112844A, Internal ID: R-516-122718-01 RF Radiated Test Sample: S/N:900054391556, Internal ID: R-516-050219-10 S/N:900218190956, Internal ID: R-516-040919-05 S/N:900128190956, Internal ID: R-516-042219-06 S/N:900216390956, Internal ID: R-516-042219-07

5.1 Test Configurations

Test software “QRCT” (V4.0.00113) provided by the customer was used to program the EUT to transmit continuously.
All modes of operation were investigated initially, and full testing performed on the worst-case modes as described below-
802.11a: 6Mbps
802.11n HT20: MCS0
802.11n HT40: MCS0
802.11ac VHT80: MCS0

All radiated testing reported was performed with the USB charging cord connected as these results were worst case.

5.2 Environmental Conditions

Ambient air temperature of the test site was within the range of 10 ºC to 40 ºC (50 ºF to 104 ºF) unless the EUT specified testing over a different temperature range. Humidity levels were in the range of 10% to 90% relative humidity. Testing conditions were within tolerance, and any deviations required from the EUT are reported.

5.3 Antenna Requirements and Gain Information

The antennas are internal, permanently attached and there are no provisions for connection to an external antenna.

Antenna Gain		
Frequency Band (MHz)	**Wi-Fi Chain 0 Antenna Peak Gain (dBi)**	**Wi-Fi Chain 1 Antenna Peak Gain (dBi)**
UNII Band 1- 5150 to 5250	4.3	5.7
UNII Band 2a – 5250 to 5350	4.3	6
UNII Band 2c – 5470 to 5725	5.2	6.6
UNII Band 3 – 5725 to 5850	3.0	3.2

Simultaneous transmission on both transmit chains was observed to be the worst-case mode of operation for all test cases. Since transmit signals in CSD modes are correlated only over small bandwidths, and not over the entire signal bandwidth, the combined in-band gain for total power is considered as uncorrelated and calculated using the following formula as specified in KDB 662911 D01 Multiple Transmitter Output v02r01:

Uncorrelated Directional gain = $10\log [(10^{G1/10} + 10^{G2/10} + \ldots + 10^{GN/10})/N_{ANT}]$ dBi

Since transmit signals in CSD modes are correlated over small bandwidths, the total gain will influence PSD measurements. The combined gain for PSD is considered to be correlated and calculated using the following formula as specified in KDB 662911 D01 Multiple Transmitter Output v02r01:

Correlated Directional gain = $10\log [(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2/N_{ANT}]$ dBi

Combined Directional Antenna Gain		
Frequency Band (MHz)	**Uncorrelated Directional Gain (dBi)**	**Correlated Directional Gain (dBi) (for PSD only)**
UNII Band 1- 5150 to 5250	5.06	8.04
UNII Band 2a – 5250 to 5350	5.23	8.20
UNII Band 2c – 5470 to 5725	5.96	8.94
UNII Band 3 – 5725 to 5850	3.10	6.11

5.4 Equipment Modifications

No modifications were made during testing.

5.5 Dates of Testing

Testing was performed from Feb 16, 2019 to May 13, 2019.

6 Test Results Summary

Test Description	Applicable Bands (GHz)	FCC CFR 47/ ISED Rule Part	Limit	Test Result
26dB Emission Bandwidth	5.15 – 5.25 5.25 – 5.35 5.47 – 5.725	15.407 (a) RSS-247 [6.2.1]	Reporting and Measurement Purposes	NA
99% bandwidth	5.15 – 5.25 5.25 – 5.35 5.47 – 5.725	RSS-247 [6.2]	Reporting and Measurement Purposes	NA
6 dB Bandwidth	5.725 – 5.85	15.407 (e) RSS-247 [6.2.4]	≥ 500kHz	Pass
Output Power	5.15 – 5.25	15.407 (a)(1)(iv)	≤ 250 mW or $10 + 10 \log_{10}B$* whichever is less	Pass
		RSS-247 [6.2.1]	≤ 200 mW or $10 + 10 \log_{10}B$* e.i.r.p whichever is less	Pass
	5.25 – 5.35 5.47 – 5.725	15.407 (a)(2) RSS-247 [6.2]	≤ 250 mW or $11 + 10 \log_{10}B$* whichever is less ≤ 1 W or $17 + 10 \log_{10}B$* e.i.r.p whichever is less	Pass
	5.725 – 5.85	15.407 (a)(3) RSS-247 [6.2]	≤ 1000 mW	Pass
Power Spectral Density	5.15 – 5.25	15.407 (a)(1)(iv)	≤ 11dBm/MHz	Pass
		RSS-247 [6.2]	≤ 10dBm/MHz e.i.r.p.	Pass
	5.25 – 5.35 5.47 – 5.725	15.407 (a)(2) RSS-247 [6.2]	≤ 11dBm/MHz	Pass
	5.725 – 5.85	15.407 (a)(3) RSS-247 [6.2]	≤ 30dBm/500kHz	Pass
Radiated Spurious Emissions/ Restricted Band Emissions	5.15 – 5.25 5.25 – 5.35 5.47 – 5.725 5.725 – 5.85	15.407 (b), 15.205, 15.209, RSS-Gen [8.9]	FCC CFR 47 15.209 limits RSS-Gen [8.9]	Pass

AC Power Line Conducted Emissions	5.15 – 5.25 5.25 – 5.35 5.47 – 5.725 5.725 – 5.85	15.407 (b), 15.207 RSS-Gen [8.8]	FCC CFR 47 15.207 limits RSS-Gen [8.8]	Pass

* Note: **B-** FCC references 26dB bandwidth and ISED references 99% bandwidth.

7 Equipment List

Manufacturer	Description	Model #	Asset #	Calibration Due
Huber & Suhner	RF Cable	SucoFlex 100	RF-452	N/A
Huber & Suhner	RF Cable	SucoFlex 100	RF-350	N/A
Huber & Suhner	RF Cable	SucoFlex 102A	RF-269	N/A
Huber & Suhner	RF Cable	SucoFlex 106A	RF-599	N/A
PCE	Climate Meter	PCE-THB 40	EMC-1207	9/28/2019
PCE	Climate Meter	PCE-THB 40	EMC-1206	9/28/2019
Madge Tech	THP Monitor	PRHT Temp 2000	EMC-170	10/18/2019
Micro-Coax	RF Cable	UTI Flex	RF-647	N/A
Micro-Coax	RF Cable	UTI Flex	RF-646	N/A
Micro-Coax	RF Cable	UFA210A-Q-2755-3005GU	EMC-648	N/A
Micro-Coax	RF Cable	UFA0311-1-0787-50U50U	EMC-351	N/A
Micro-Coax	RF Cable	UFB311A-0-2756-5005G0	EMC-865	N/A
Micro-Coax	RF Cable	UFA210A-0-0787-300300	RF-297	N/A
Teledyne	RF Cable	57500	EMC-1025	N/A
Micro-Coax	RF Cable	UFC142A	RF-274	N/A
Pasternack	Attenuator	PE7004-6	EMC-950	8/17/2019
MCL	Attenuator	BHBW-S6-2W263+	RF-710	N/A
Pasternack	Attenuator	PE7087-6	RF-801	N/A
Rohde & Schwarz	Software	EMC-32 V10.01.00	RF-464	N/A

Manufacturer	Description	Model #	Asset #	Calibration Due
Rohde & Schwarz	EMI Test Receiver	ESU40	RF-192	4/10/2020
Rohde & Schwarz	EMI Test Receiver	ESU40	RF-248	4/11/2020
Rohde & Schwarz	EMI Test Receiver	ESU40	RF-229	4/10/2020
Keysight	Spectrum Analyzer	N9010A	EMC-1213	11/8/2019
Agilent	Spectrum Analyzer	N9030A	EMC-607	2/10/2020
Agilent	Spectrum Analyzer	N9030A	EMC-061	4/23/2020
Sunol Sciences	Antenna - Broadband Hybrid	JB6	EMC-639	8/17/2019
ETS-Lindgren	Antenna	3117-PA	EMC-858	10/8/2019
ETS-Lindgren	Antenna	3117-PA	RF-139	6/1/2019
ETS-Lindgren	Antenna – Standard Gain Horn	3160-09	RF-179	7/30/2019
ETS-Lindgren	Antenna – Standard Gain Horn	3160-10	EMC-602	6/5/2019
Rohde & Schwarz	Custom Filter Bank+PreAmp	SFUNIT RX	RF-322	12/4/2019
Rohde & Schwarz	Custom Filter Bank+PreAmp	SFUNIT RX	RF-323	11/29/2019
Rohde & Schwarz	Pre-Amp	TS-PR26	RF-199	11/29/2019
Rohde & Schwarz	Pre-Amp	TS-PR40	RF-200	11/29/2019
Rohde & Schwarz	Switch and Control Unit	OSP130	RF-569	7/23/2019
Rohde & Schwarz	Switch and Control Unit	OSP130	RF-018	12/4/2019
Rohde & Schwarz	Switch and Control Unit	OSP130	RF-249	11/29/2019
Rohde & Schwarz	Switch and Control Unit	OSP150	RF-019	12/4/2019
Rohde & Schwarz	Switch and Control Unit	OSP150	RF-250	11/29/2019
Murata	RF Cable	MXJA01JA1000	RF-828	N/A
Digi-Key	RF Cable	MXFR01JA1000	RF-847	N/A
Micro-Coax	RF Cable	UTI Flex	RF-359	N/A
Micro-Coax	RF Cable	UTI Flex	RF-354	N/A

Equipment used for Line Conducted Emissions Measurement				
Manufacturer	**Description**	**Model #**	**Asset #**	**Calibration Due**
Rohde & Schwarz	EMI Test Receiver	ESU	RF-604	12/26/2019
Teseq	EUT LISN	NNB 51	EMC-057	6/7/2019
Micro-Coax	RF Cable	UFA210A-1-1800-50U50U	EMC-367	N/A
ETS-Lindgren	TILE SW	Version 7.2.5.7	EMC-985	N/A
PCE	THP Monitor	PCE THB 40	EMC-1208	9/28/2019
Fluke	Multimeter	87V	EMC-650	7/30/2019
Chroma	AC Power source	61602	EMC-055	N/A

Note: Items with Calibration Due data marked as N/A are characterized before test, where applicable.

8 Test Site Description

8.1 Radiated Emissions Test Site

Radiated measurements are performed in a 3m semi-anechoic chamber, which meets NSA requirements for the frequency range of 30MHz to 1000MHz. For measurements above 1 GHz, absorbers are laid out on the ground plane between the receiving antenna and the EUT to meet Site VSWR requirements in accordance with ANSI C63.4:2014.

8.1.1 Radiated Measurements in 30 MHz - 1000 MHz

The EUT is positioned on a turntable at a height of 80cm using a non-conducting table. A linearly polarized broadband antenna is positioned at 3m from the EUT periphery. The turntable is rotated 360 degrees and the antenna height varied from 1m to 4m to determine the highest emissions. This is repeated for both Horizontal and Vertical polarizations of the measurement antenna. All possible orientations of the EUT were investigated for emissions and the flat orientation was identified as the worst-case configuration.

8.1.2 Radiated Measurements above 1GHz

The EUT is positioned on a Turntable at a height of 1.5m. A linearly polarized antenna is positioned at 3m from the EUT periphery. Guidelines in ANSI C63.10:2013 were followed with respect to maximizing the emissions. The measurement antenna is set at a fixed 1.5m height while the turntable is rotated 360 degrees and the EUT elevation angle is varied from 0 to 150 degrees to determine the highest emissions. This is repeated for both Horizontal and Vertical polarizations of the measurement antenna. Measurements above 18GHz were performed at a 3m distance.

8.2 Antenna port conducted measurements

All antenna port conducted measurements were performed on a bench-top setup consisting of a spectrum analyzer, power meter (as necessary), splitters/combiners (as necessary), attenuators, and pre-characterized RF cables.
The correction factors between the EUT and the spectrum analyzer were added internally in the analyzer settings, where applicable. The plots displayed takes into account these correction factors.

8.3 Test Setup Diagrams

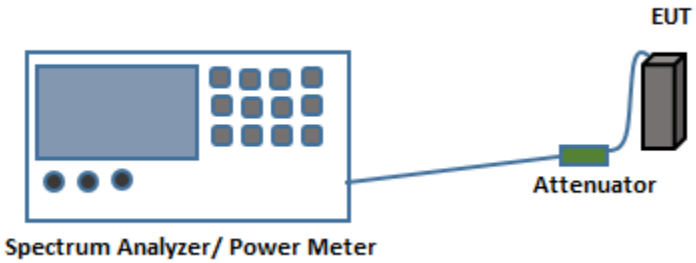


Figure 8-1. Test Setup for Antenna port conducted measurements

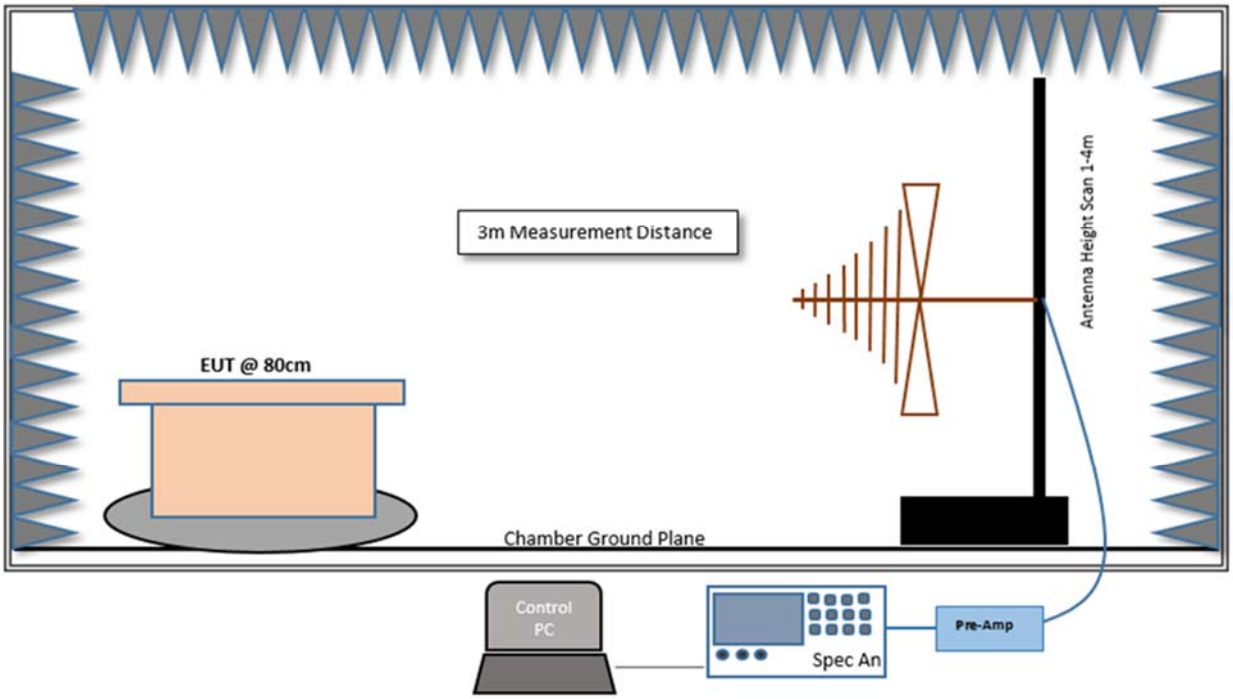


Figure 8-2. Test Setup for Radiated measurements in 30MHz- 1GHz Range

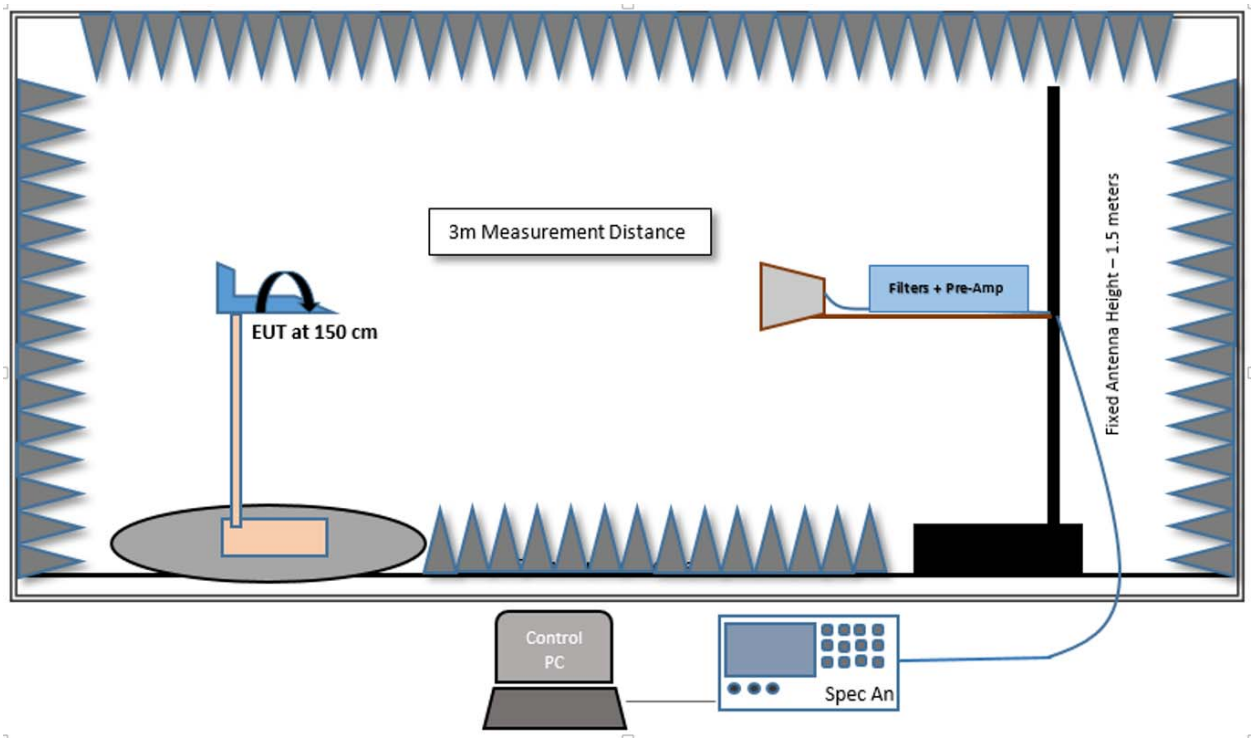


Figure 8-3. Test Setup for Radiated measurements in 1GHz- 18GHz Range

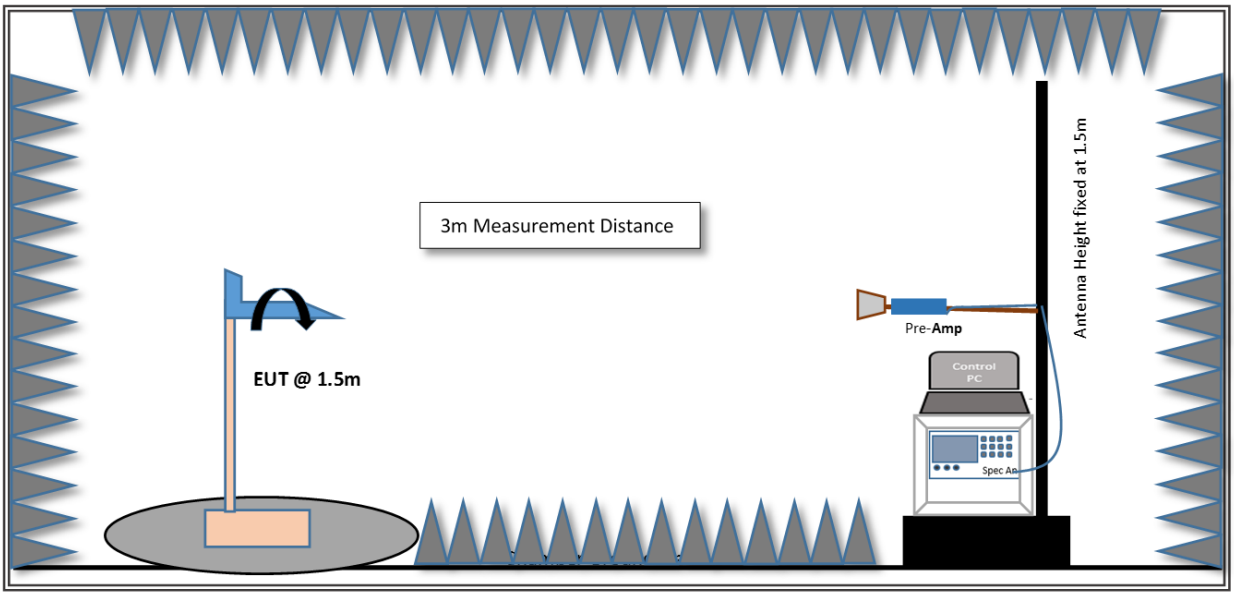


Figure 8-4. Test Setup for Radiated measurements >18GHz

9 Test Results- Conducted

9.1 Duty Cycle

9.1.1 Test Requirement:

Reporting and measurement purposes only.

9.1.2 Test Method:

Measurements were performed according to the procedure defined in ANSI C63.10: 2013.

Spectrum Analyzer Settings:

RBW ≥ Occupied Bandwidth if possible; otherwise, set RBW to the largest available value
VBW ≥ RBW ≥ Signal Period
Detector = Peak
Span = 0 Hz
Sweep points > 100

9.1.3 Sample Calculation:

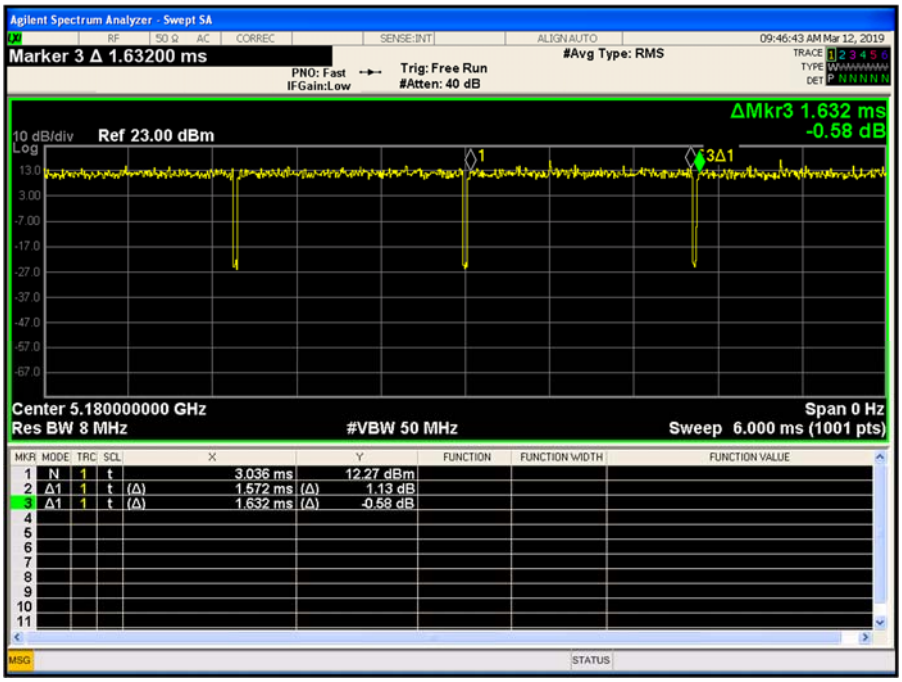
Duty Cycle % = $[(T_{on}) / (T_{on} + T_{off})] *100$
e.g. [8.60/8.67] = 0.9919*100=99.19%
If duty cycle >98% then the correction factor is 0, else the correction factor is calculated as follows.
Duty Cycle Correction Factor = 10 log*(1/DC) =10 log (1/0.92) =0.362dB

9.1.4 Limits:

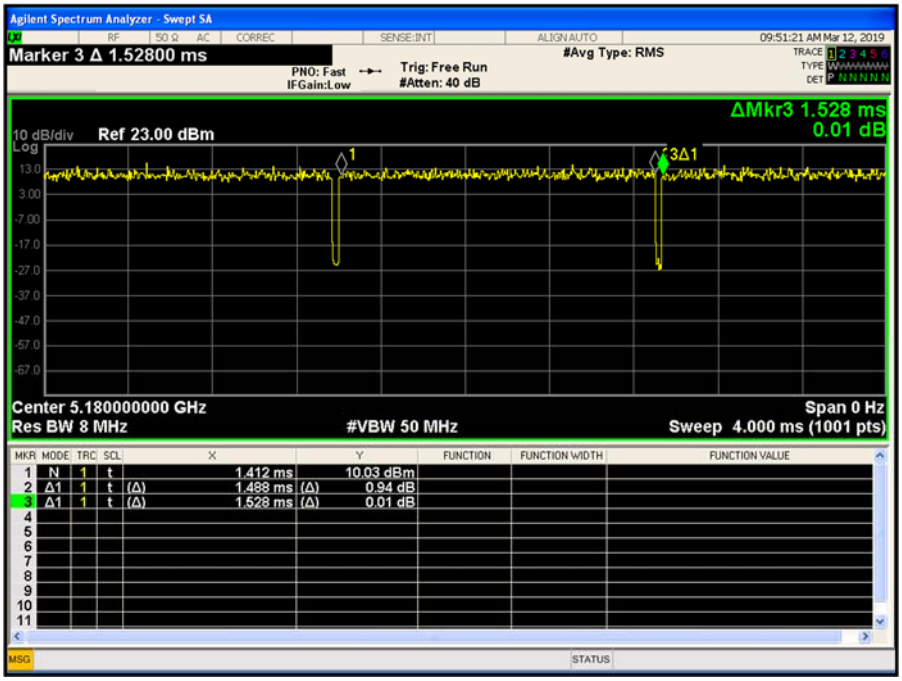
Reporting and measurement purposes only. Duty Cycles > 98% are considered to have a Duty Cycle Correction Factor = 0dB.

9.1.5 Test Results:

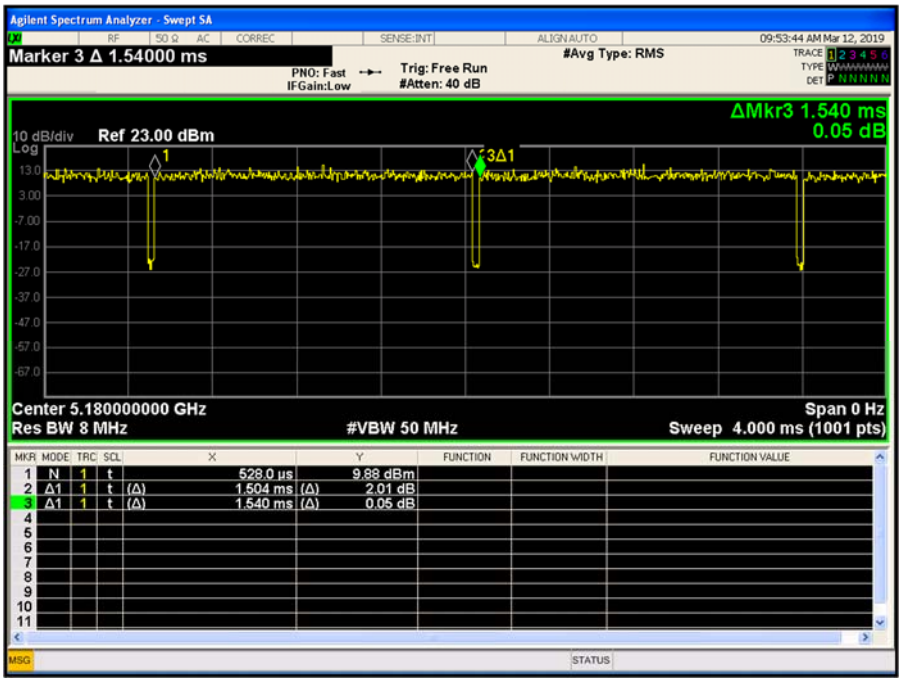
Mode	Chain 0/1	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
802.11a	0	1.57	1.63	96.32	0.16
802.11a	1	1.59	1.64	96.78	0.14
802.11n20	0	1.49	1.53	97.38	0.12
802.11n20	1	1.49	1.54	96.89	0.14
802.11ac20	0	1.50	1.54	97.66	0.10
802.11ac20	1	1.49	1.55	95.59	0.18
802.11n40	0	0.72	0.78	92.70	0.33
802.11n40	1	0.73	0.77	94.12	0.26
802.11ac40	0	0.71	0.78	90.43	0.44
802.11ac40	1	0.74	0.79	93.42	0.30
802.11ac80	0	0.37	0.40	90.43	0.45
802.11ac80	1	0.37	0.40	90.43	0.44



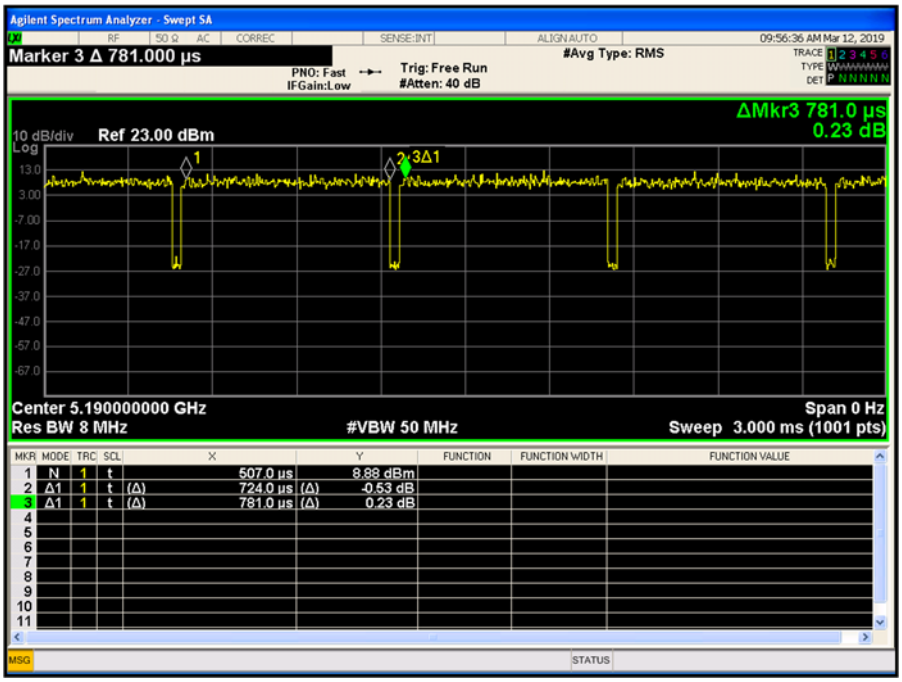
Plot 9-1. Duty cycle 802.11a – Chain 0



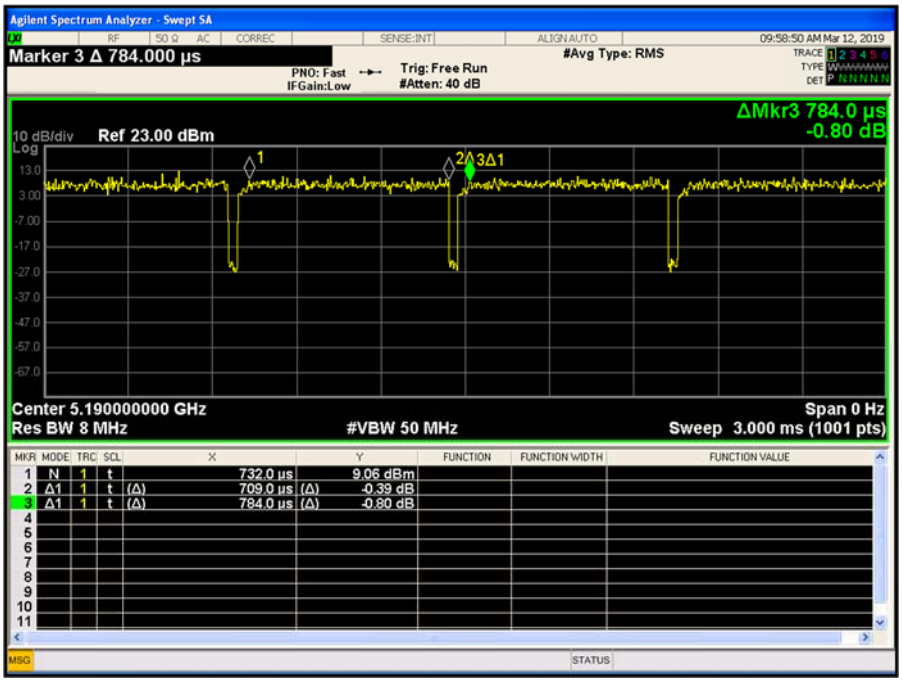
Plot 9-2. Duty cycle 802.11n20 – Chain 0



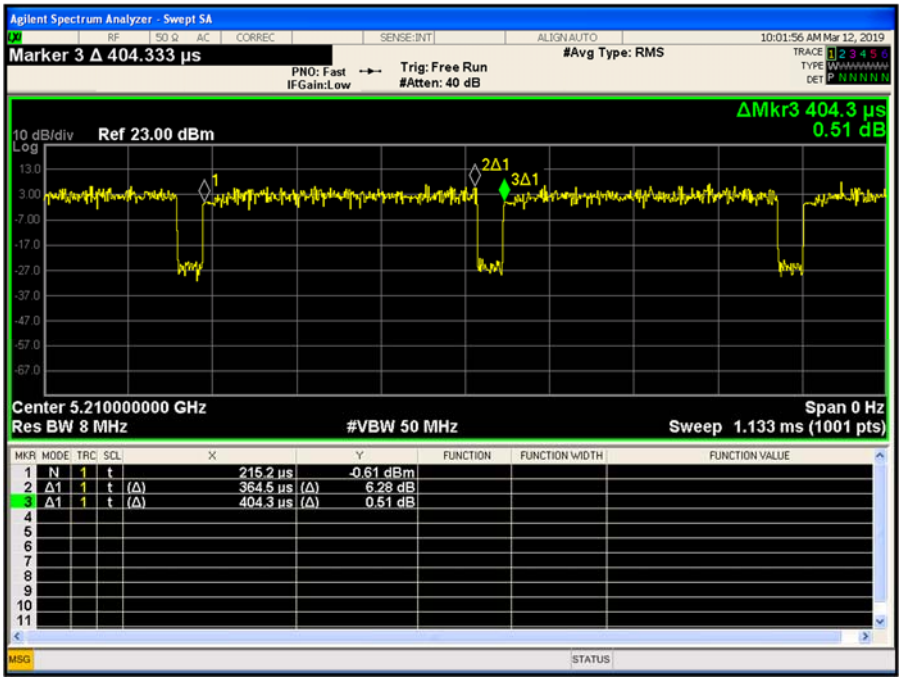
Plot 9-3. Duty cycle 802.11ac20 – Chain 0



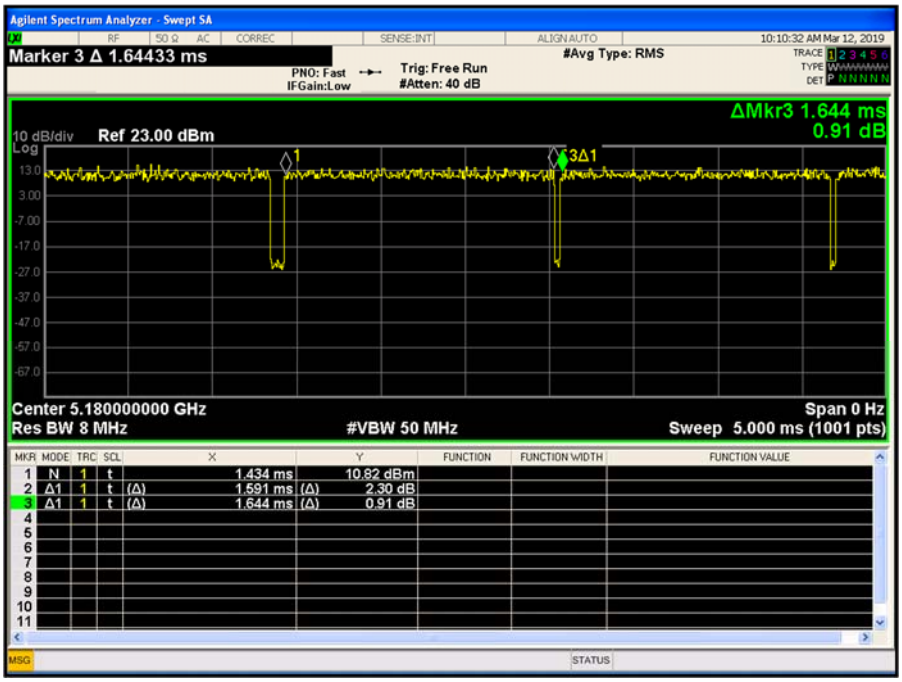
Plot 9-4. Duty cycle 802.11n40 – Chain 0



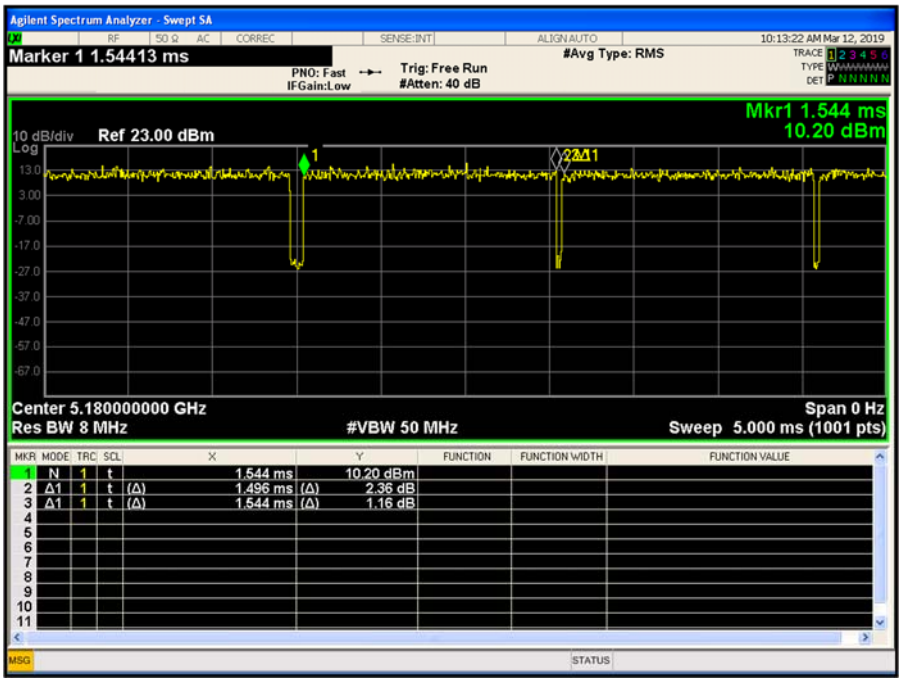
Plot 9-5. Duty cycle 802.11ac40 – Chain 0



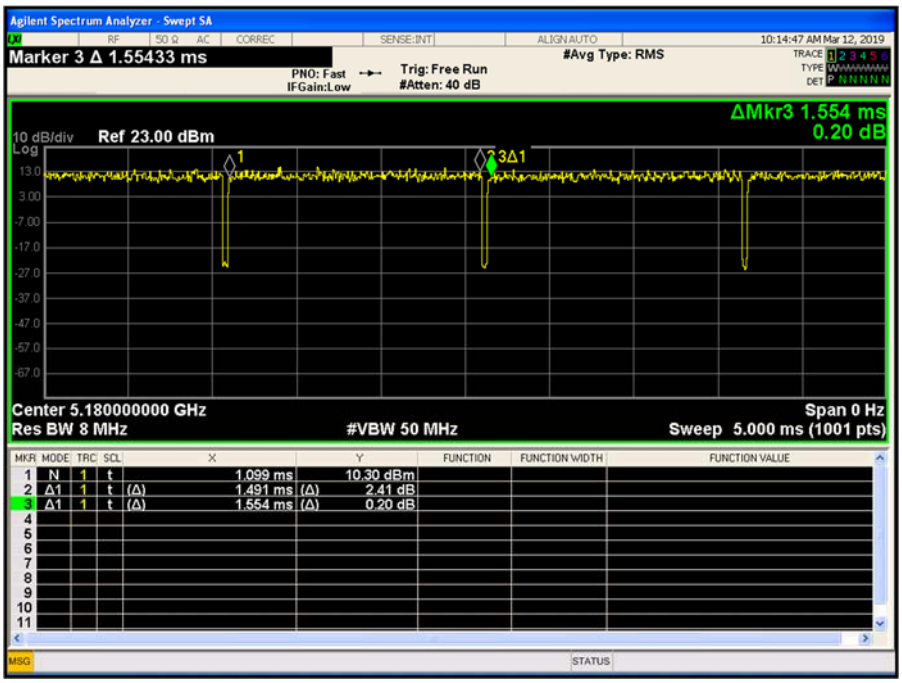
Plot 9-6. Duty cycle 802.11ac80 – Chain 0



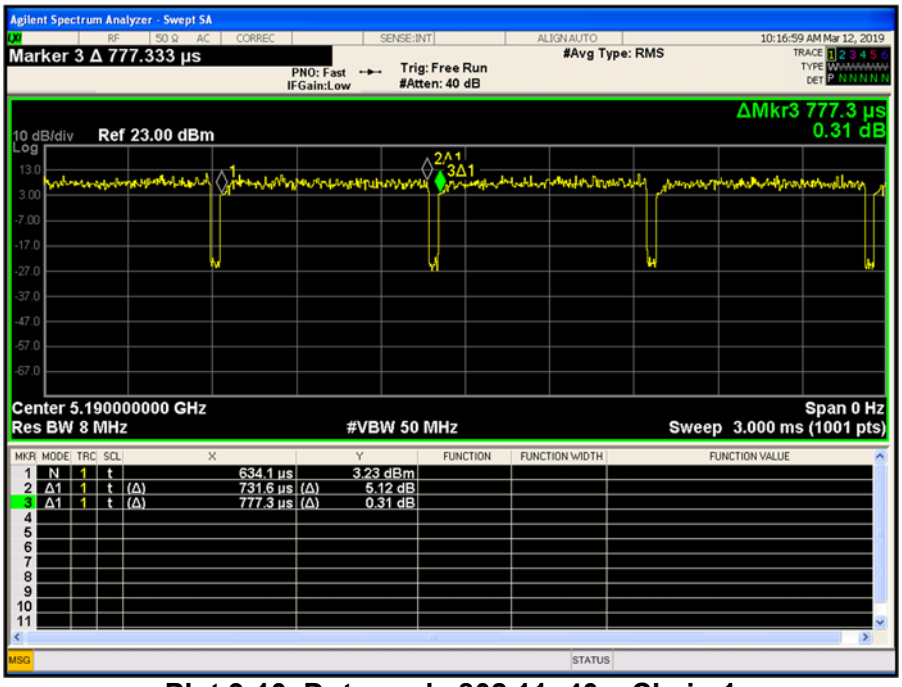
Plot 9-7. Duty cycle 802.11a – Chain 1



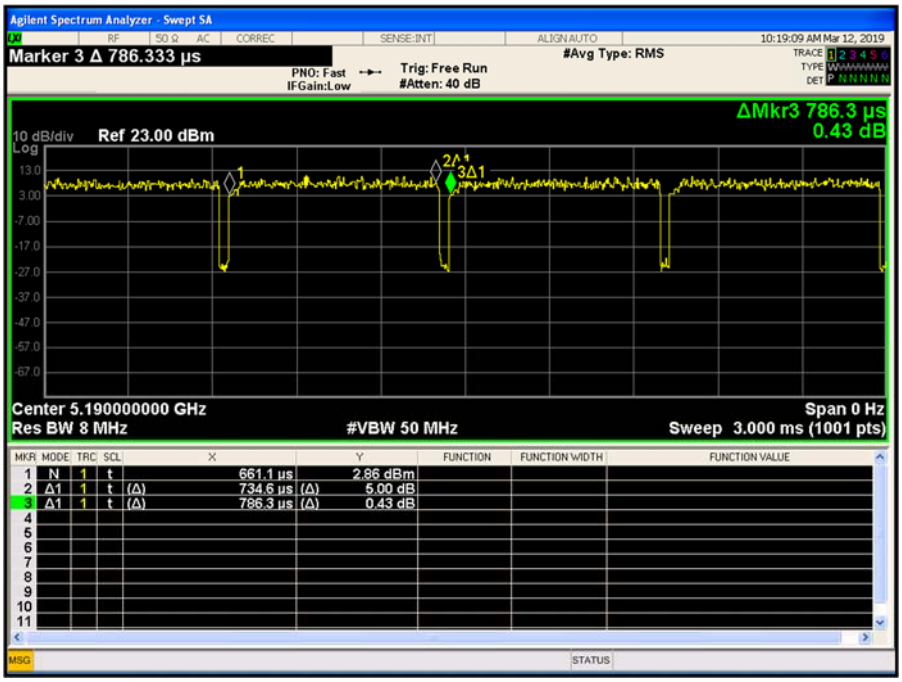
Plot 9-8. Duty cycle 802.11n20 – Chain 1



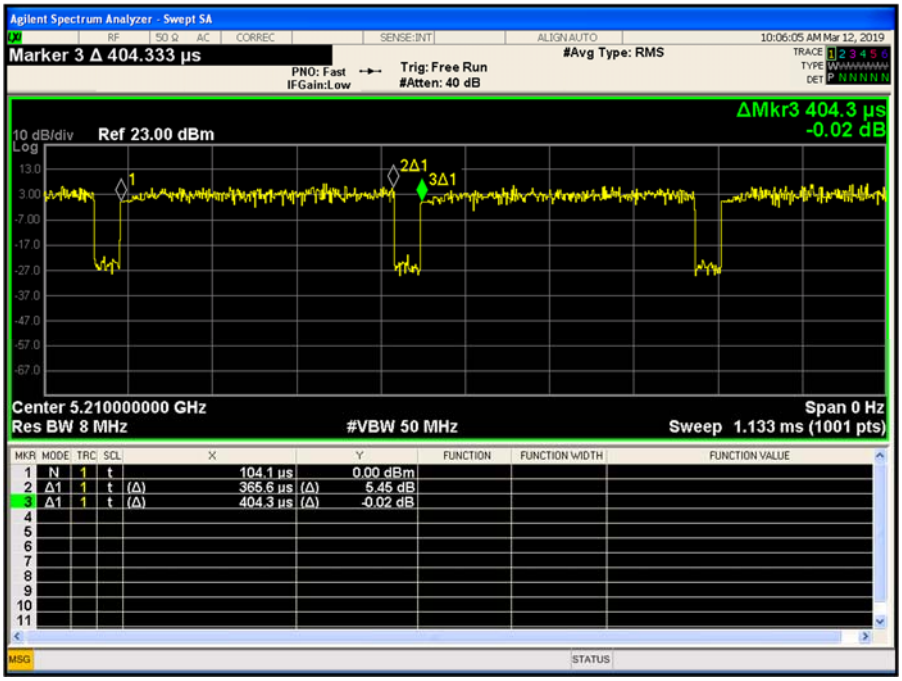
Plot 9-9. Duty cycle 802.11ac20 – Chain 1



Plot 9-10. Duty cycle 802.11n40 – Chain 1



Plot 9-11. Duty cycle 802.11ac40 – Chain 1



Plot 9-12. Duty cycle 802.11ac80 – Chain 1

9.2 26-dB Emission Bandwidth

9.2.1 Test Requirement:

FCC CFR 47 Rule Part 15.407 (a)
ISED RSS-247 [6.2.1]

9.2.2 Test Method:

Measurements were performed according to the procedures defined in KDB 789033- General UNII Test Procedures New Rules v02r01 and ANSI C63.10:2013.

Spectrum Analyzer settings:

RBW = approximately 1% of the Emissions Bandwidth
VBW ≥ 3xRBW
Trace Mode= Peak Detector (Max Hold)
Sweep time= Auto
The in-built functionality of the Spectrum Analyzer is used to measure the 26-dB emission bandwidth.

Sample Calculation:

Corrected Amplitude: Amplitude (Analyzer level) + CL (Cable losses) = -25 dBm + 5 dB = -20dBm.

9.2.3 Limits:

Reporting and measurement purposes only.

9.2.4 Test Results:

See Section 9.2.5.

9.3 99% Occupied Bandwidth

9.3.1 Test Requirement:

ISED RSS-247 [6.2]

9.3.2 Test Method:

Measurements were performed according to the procedures defined in KDB 789033- General UNII Test Procedures New Rules v02r01 and ANSI C63.10 2013.

Spectrum Analyzer settings:

Set the center frequency to the nominal EUT channel center frequency
Span = 1.5 to 5.0 times the 99% Occupied Bandwidth
RBW = 1% to 5% of the 99% Occupied Bandwidth
VBW ≥ 3xRBW
Trace Mode= Peak Detector (Max Hold)
Sweep time= Auto
The built-in functionality of the Spectrum Analyzer is used to measure the 99% Occupied Bandwidth.

Sample Calculation:

Corrected Amplitude: Amplitude (Analyzer level) + CL (Cable losses) = -25 dBm + 5 dB = -20dBm.

9.3.3 Limits:

Reporting and measurement purposes only.

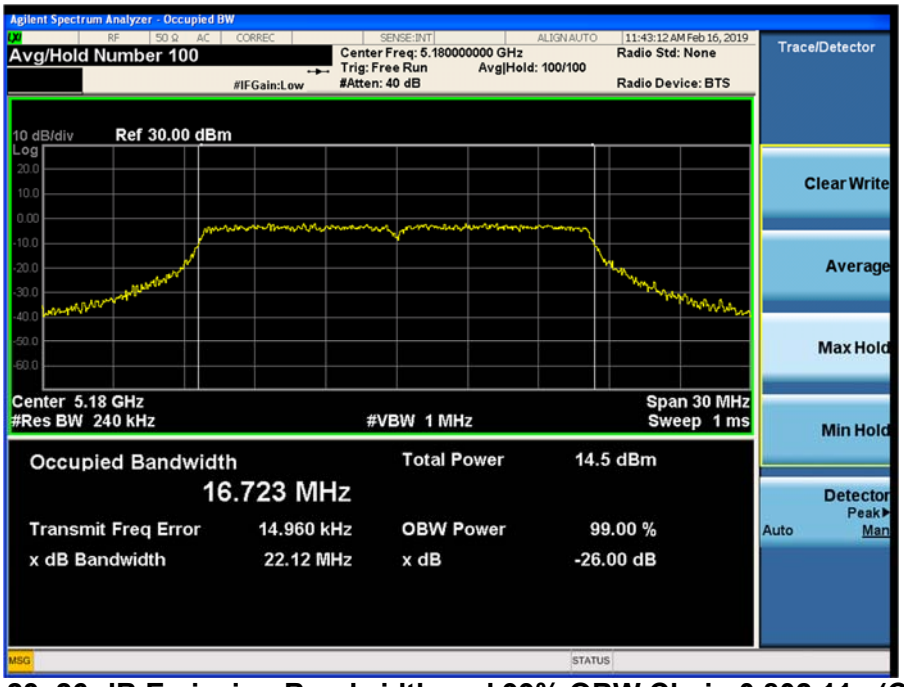
9.3.4 Test Results:

See Section 9.2.5.

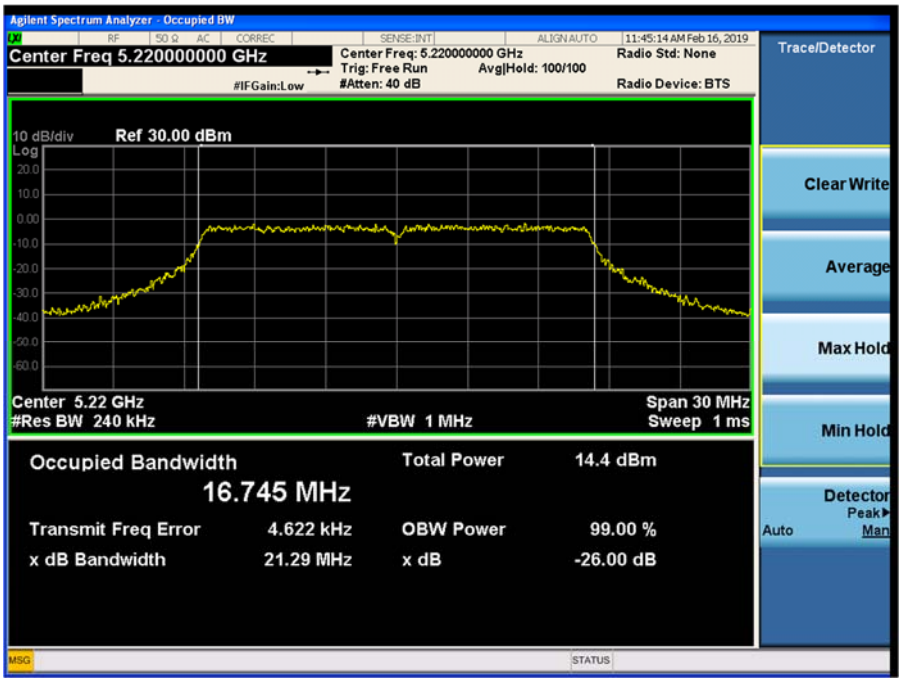
9.3.5 Test Data:

9.3.5.1 Chain 0 802.11a 26-dB Emission Bandwidth

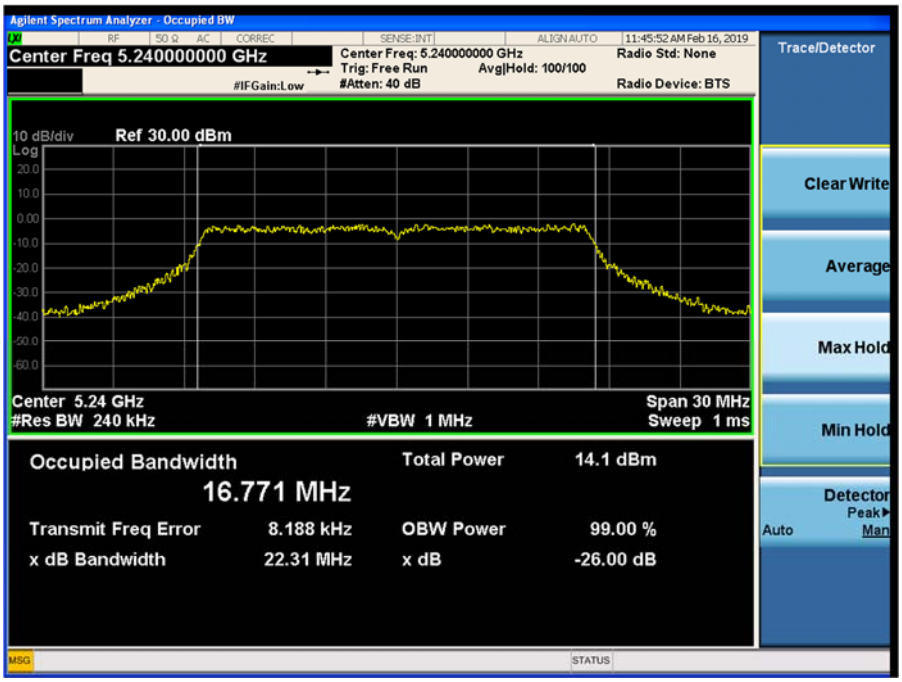
Chain 0 802.11a 26-dB Emission Bandwidth				
Band	**Channel No.**	**Frequency (MHz)**	**26-dB Emission Bandwidth (MHz)**	**99% Occupied BW (MHz)**
UNII-1	36	5180	22.12	16.72
	44	5220	21.29	16.75
	48	5240	22.31	16.77
UNII-2A	52	5260	22.53	16.77
	60	5300	21.99	16.73
	64	5320	21.85	16.69
UNII-2C	100	5500	21.76	16.74
	116	5580	22.08	16.72
	140	5700	21.47	16.68
Straddle	142	5720	23.31	16.75
UNII-3	149	5745	22.88	16.75
	157	5785	24.90	16.78
	165	5825	23.58	16.69



Plot 9-23. 26-dB Emission Bandwidth and 99% OBW Chain 0 802.11a (Ch. 36)

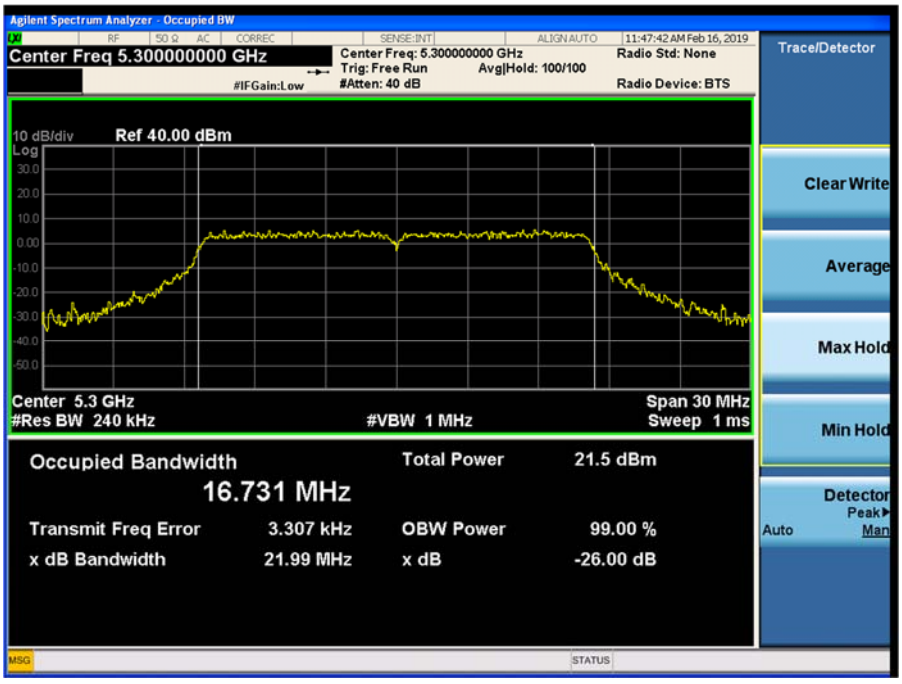


Plot 9-14. 26-dB Emission Bandwidth and 99% OBW Chain 0 802.11a (Ch. 44)

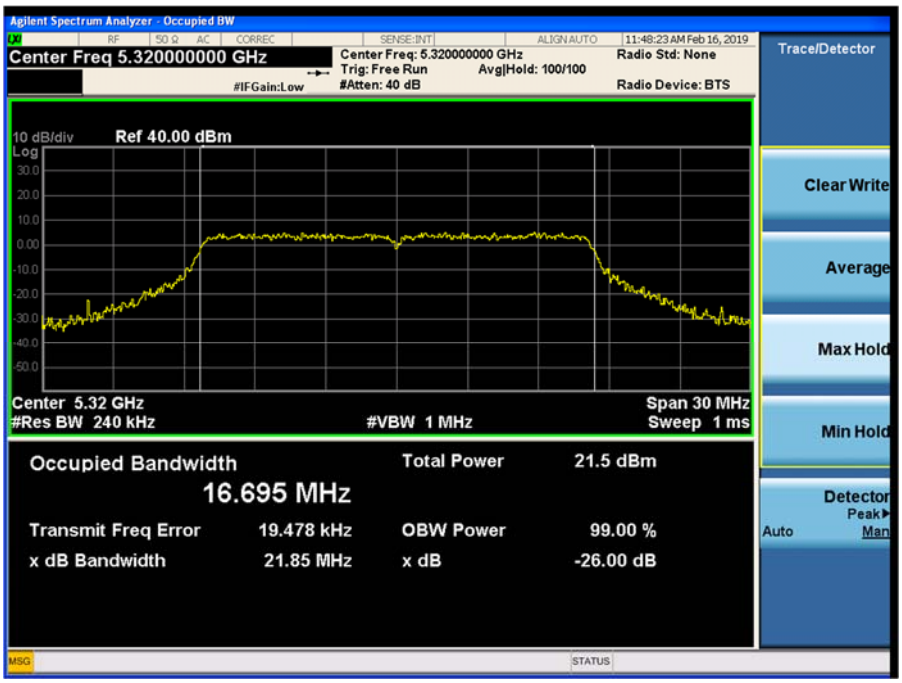


Plot 9-15. 26-dB Emission Bandwidth and 99% OBW Chain 0 802.11a (Ch. 48)

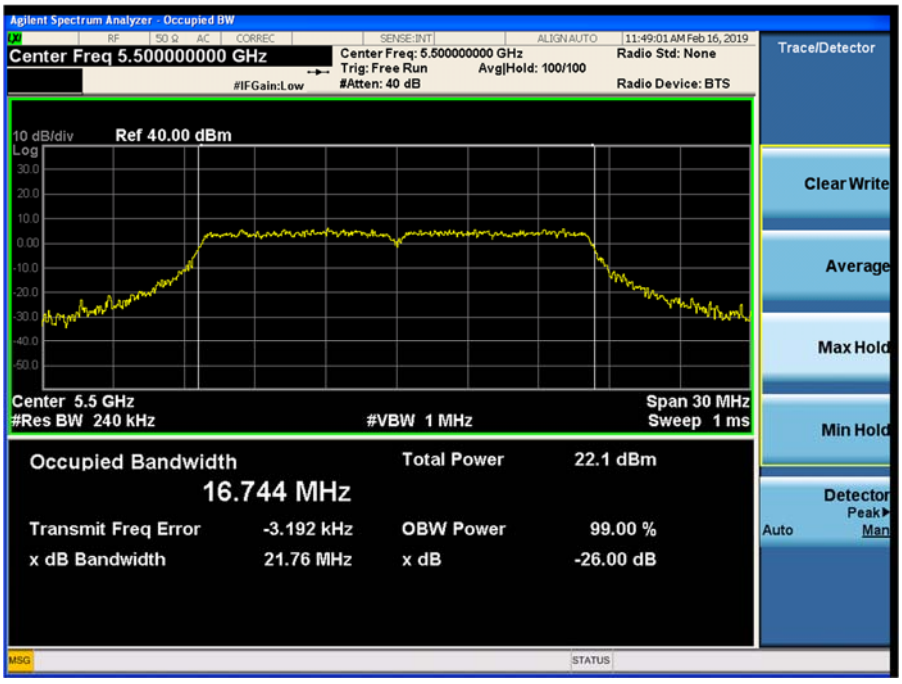
Plot 9-16. 26-dB Emission Bandwidth and 99% OBW Chain 0 802.11a (Ch. 52)



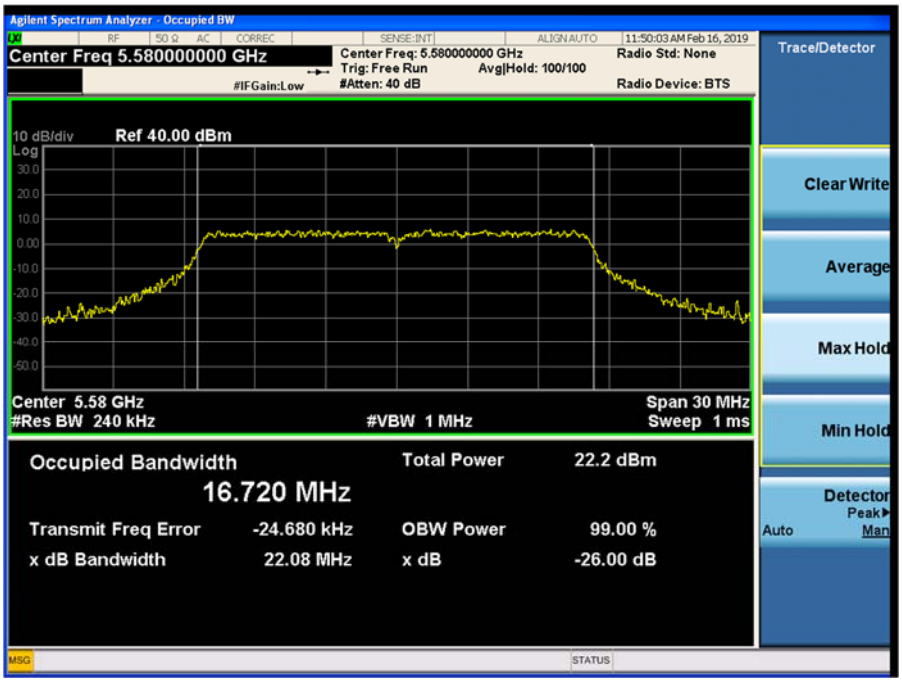
Plot 9-17. 26-dB Emission Bandwidth and 99% OBW Chain 0 802.11a (Ch. 60)



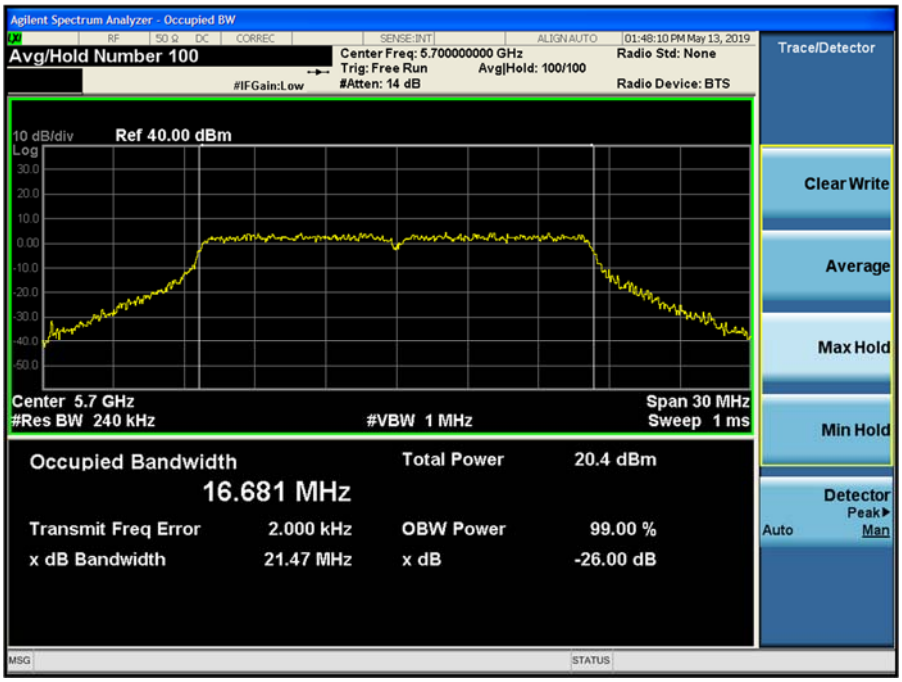
Plot 9-18. 26-dB Emission Bandwidth and 99% OBW Chain 0 802.11a (Ch. 64)



Plot 9-19. 26-dB Emission Bandwidth and 99% OBW Chain 0 802.11a (Ch. 100)



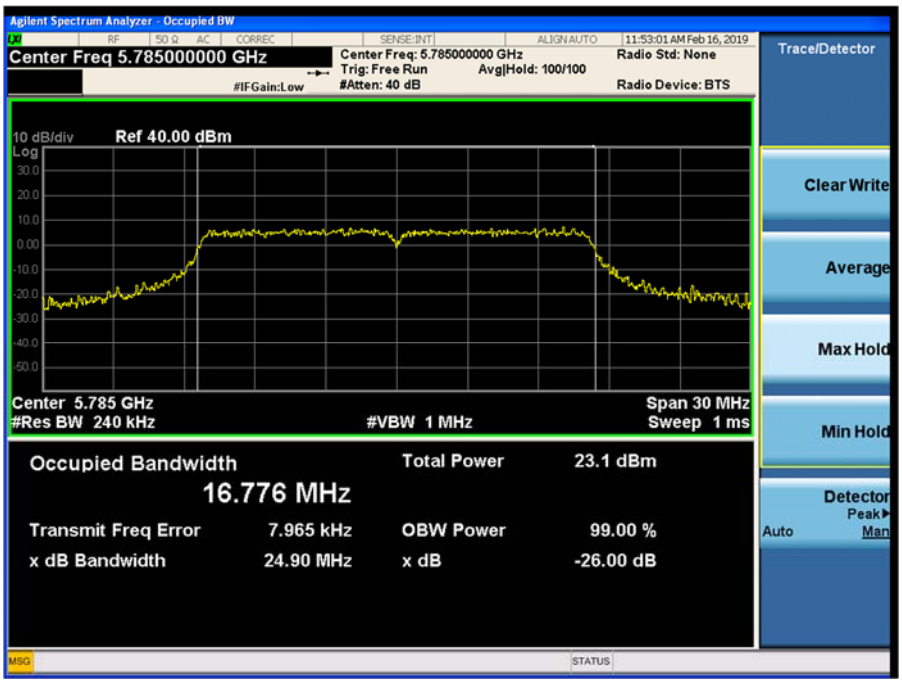
Plot 9-20. 26-dB Emission Bandwidth and 99% OBW Chain 0 802.11a (Ch. 116)



Plot 9-21. 26-dB Emission Bandwidth and 99% OBW Chain 0 802.11a (Ch. 140)

Plot 9-22 26-dB Emission Bandwidth and 99% OBW Chain 0 802.11a (Ch. 144)

Plot 9-23. 26-dB Emission Bandwidth and 99% OBW Chain 0 802.11a (Ch. 149)



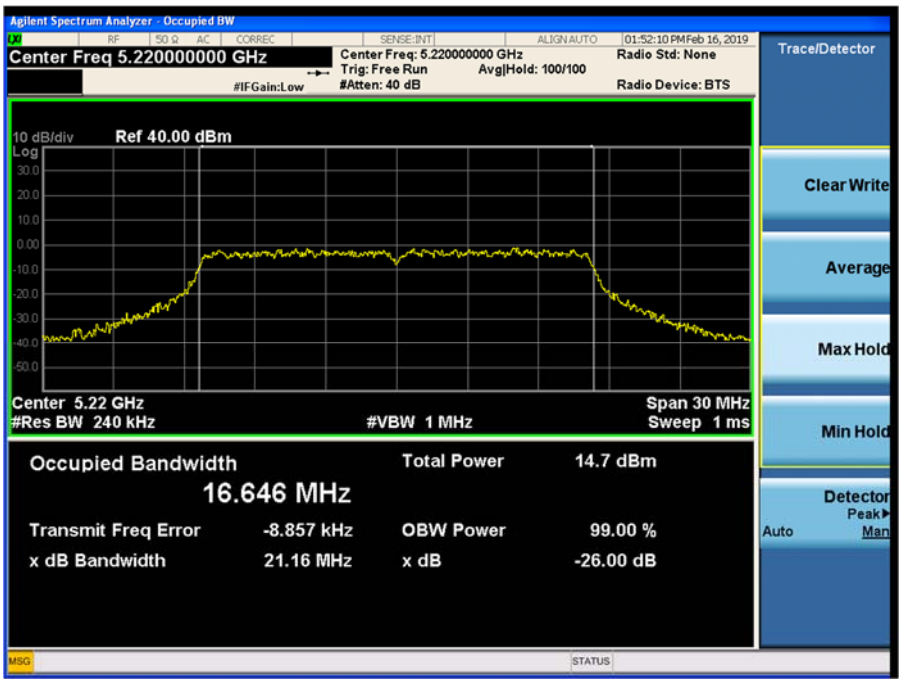
Plot 9-24. 26-dB Emission Bandwidth and 99% OBW Chain 0 802.11a (Ch. 157)

Plot 9-25. 26-dB Emission Bandwidth and 99% OBW Chain 0 802.11a (Ch. 165)

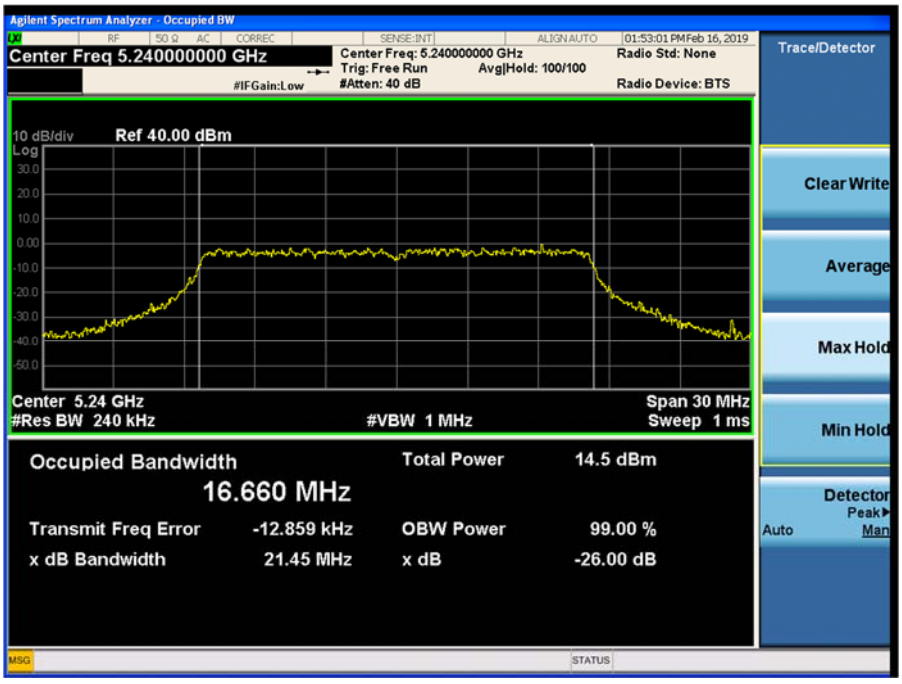
9.3.5.2 Chain 1 802.11a 26-dB Emission Bandwidth

Chain 1 802.11a 26-dB Emission Bandwidth				
Band	**Channel No.**	**Frequency (MHz)**	**26-dB Emission Bandwidth (MHz)**	**99% Occupied BW (MHz)**
UNII-1	36	5180	21.11	16.64
	44	5220	21.16	16.65
	48	5240	21.45	16.66
UNII-2A	52	5260	21.37	16.64
	60	5300	21.73	16.64
	64	5320	21.40	16.66
UNII-2C	100	5500	21.02	16.64
	116	5580	21.73	16.67
	140	5700	21.30	16.72
Straddle	144	5720	22.82	16.68
UNII-3	149	5745	23.41	16.71
	157	5785	24.91	16.69
	165	5825	23.88	16.75

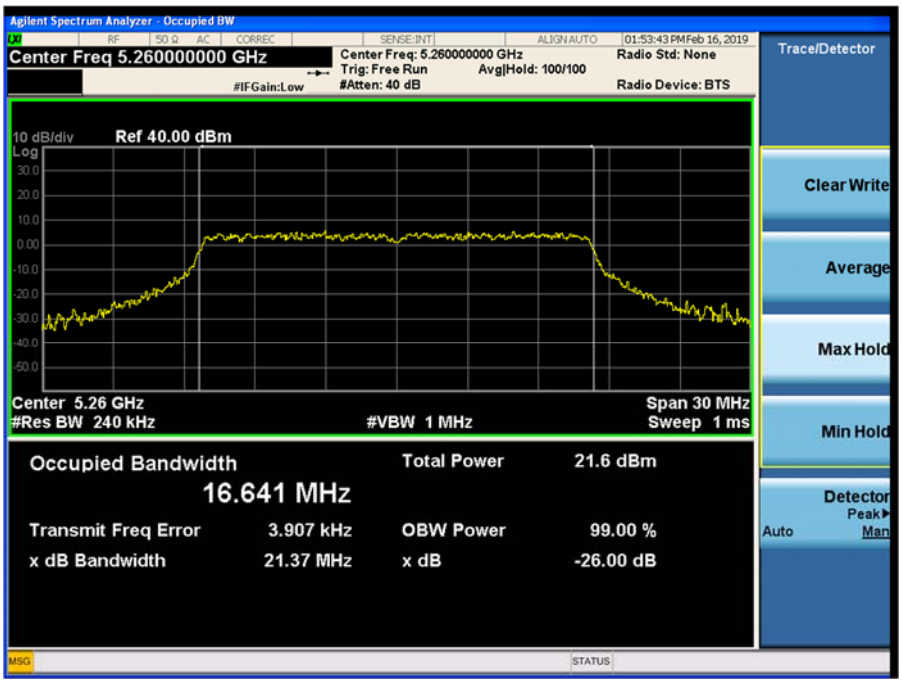
Plot 9-26. 26-dB Emission Bandwidth and 99% OBW Chain 1 802.11a (Ch. 36)



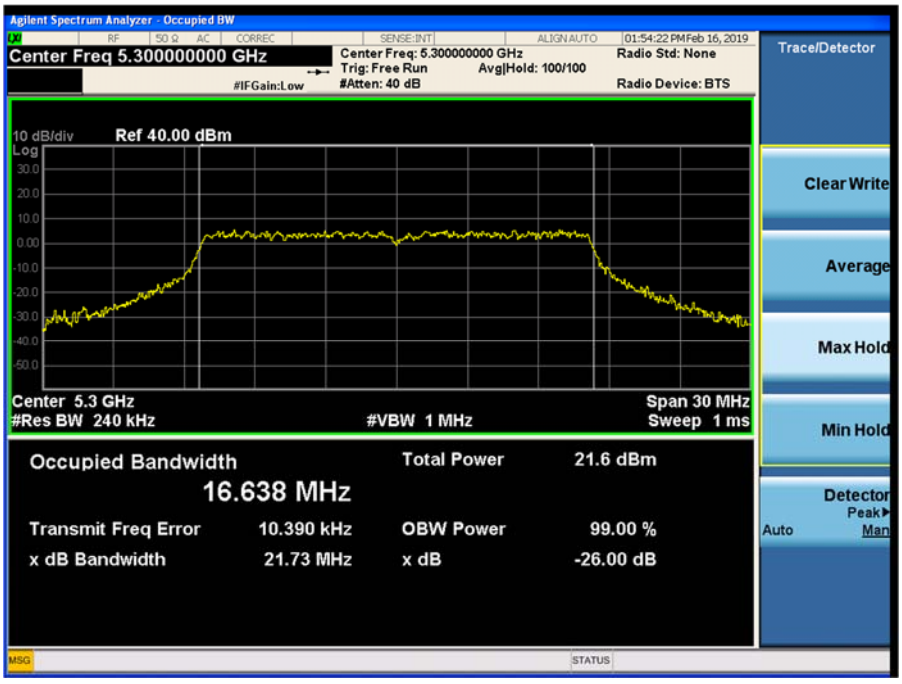
Plot 9-27. 26-dB Emission Bandwidth and 99% OBW Chain 1 802.11a (Ch. 44)



Plot 9-28. 26-dB Emission Bandwidth and 99% OBW Chain 1 802.11a (Ch. 48)

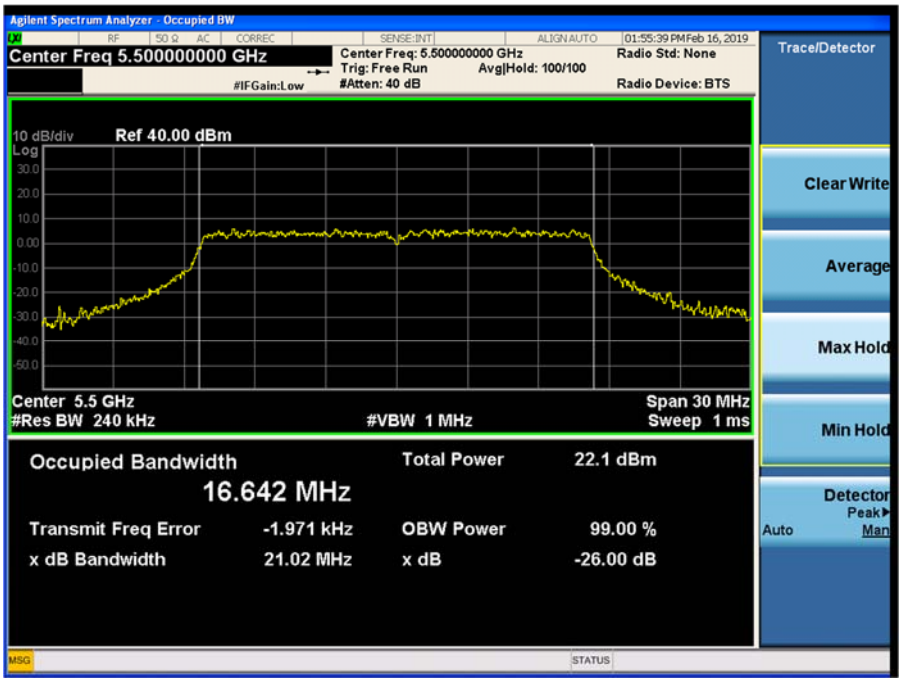


Plot 9-29. 26-dB Emission Bandwidth and 99% OBW Chain 1 802.11a (Ch. 52)



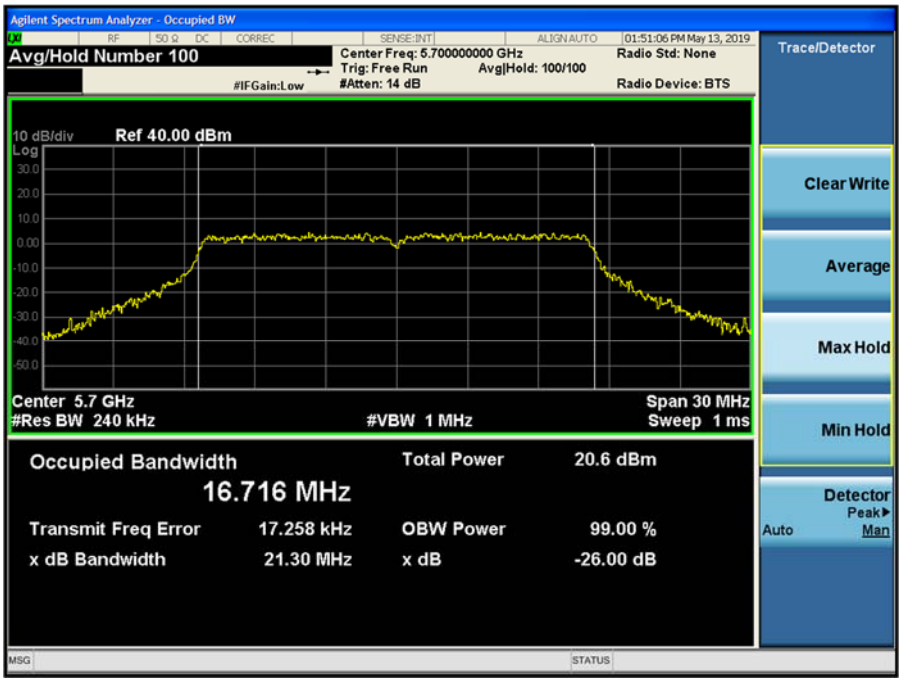
Plot 9-30. 26-dB Emission Bandwidth and 99% OBW Chain 1 802.11a (Ch. 60)

Plot 9-31. 26-dB Emission Bandwidth and 99% OBW Chain 1 802.11a (Ch. 64)

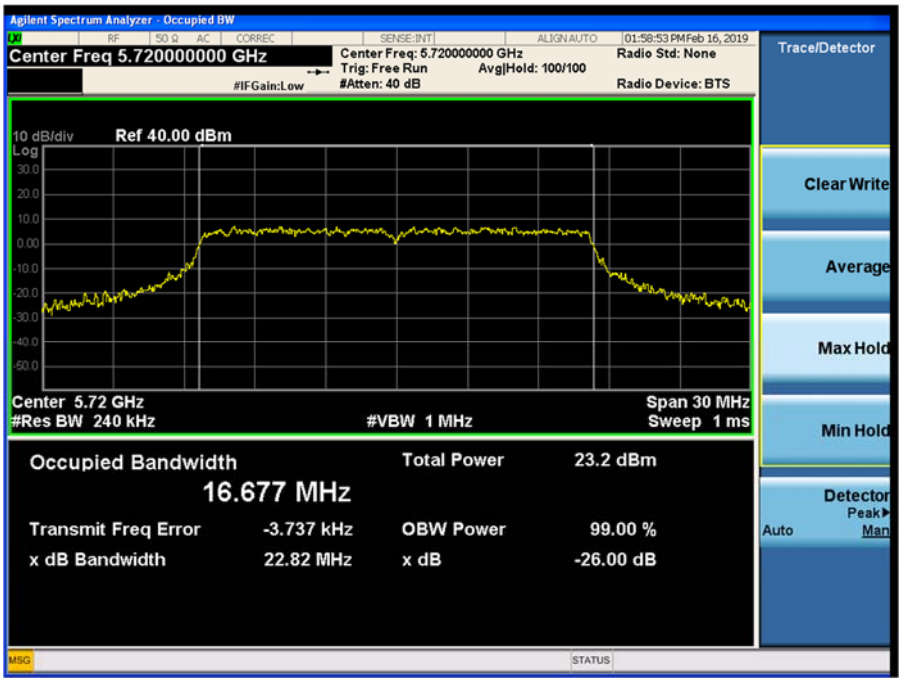


Plot 9-32. 26-dB Emission Bandwidth Chain 0nd 99% OBW B 802.11a (Ch. 100)

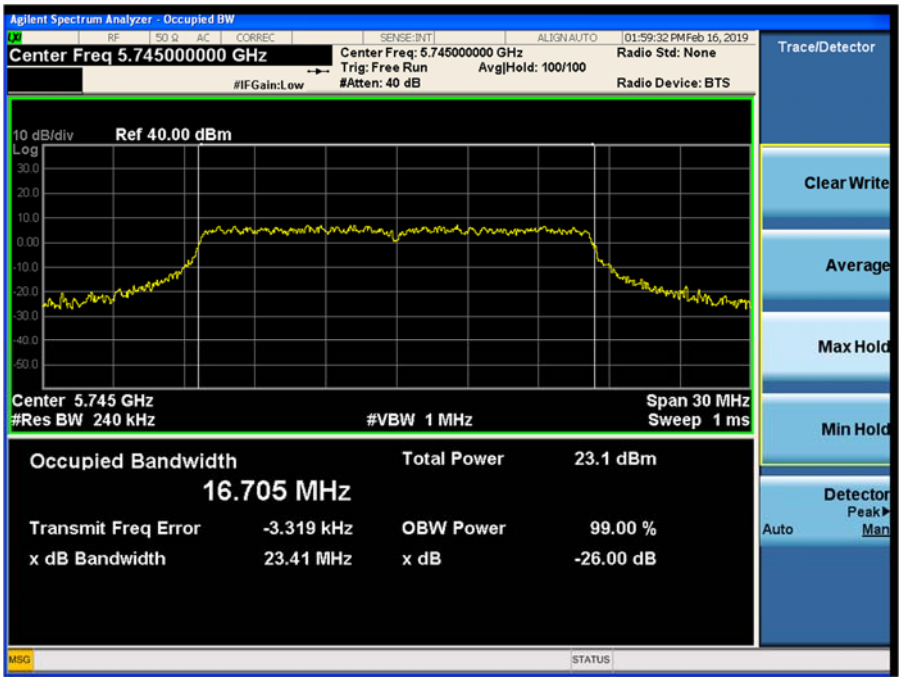
Plot 9-33. 26-dB Emission Bandwidth and 99% OBW Chain 1 802.11a (Ch. 116)



Plot 9-34. 26-dB Emission Bandwidth and 99% OBW Chain 1 802.11a (Ch. 140)

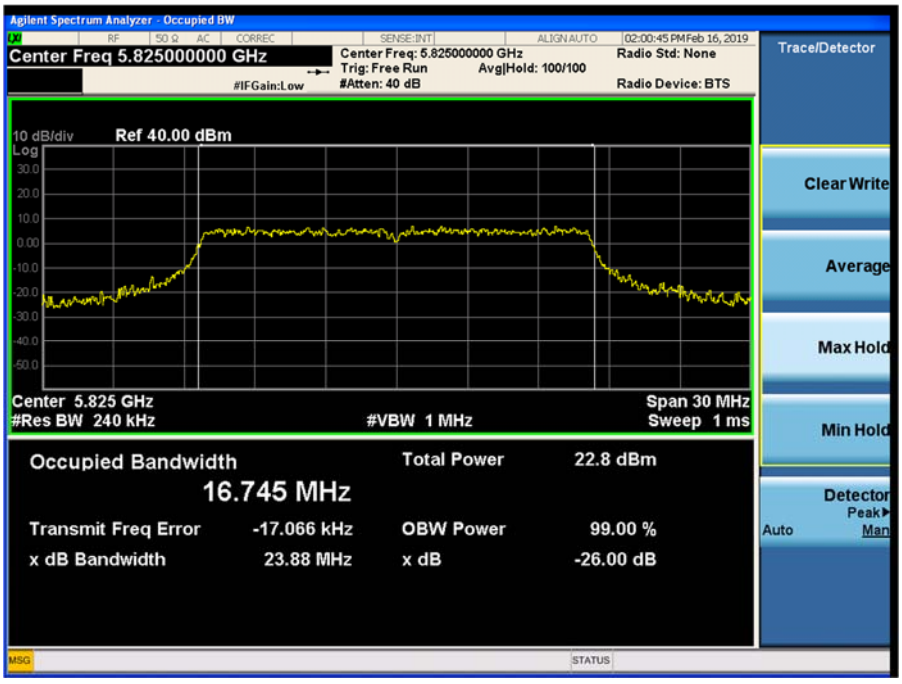


Plot 9-35. 26-dB Emission Bandwidth and 99% OBW Chain 1 802.11a (Ch. 144)



Plot 9-36. 26-dB Emission Bandwidth and 99% OBW Chain 1 802.11a (Ch. 149)

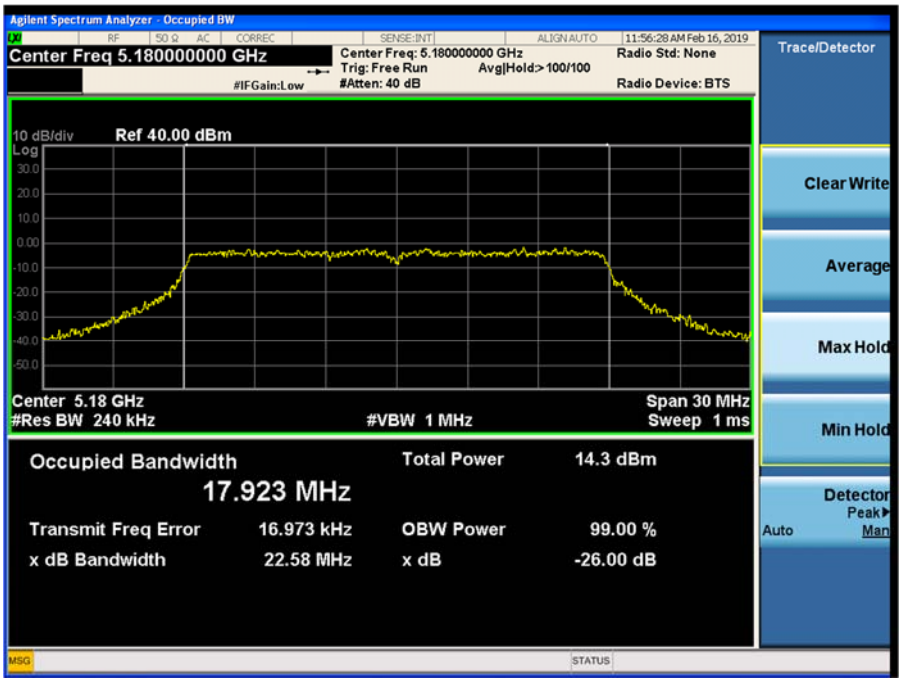
Plot 9-37. 26-dB Emission Bandwidth and 99% OBW Chain 1 802.11a (Ch. 157)



Plot 9-38. 26-dB Emission Bandwidth and 99% OBW Chain 1 802.11a (Ch. 165)

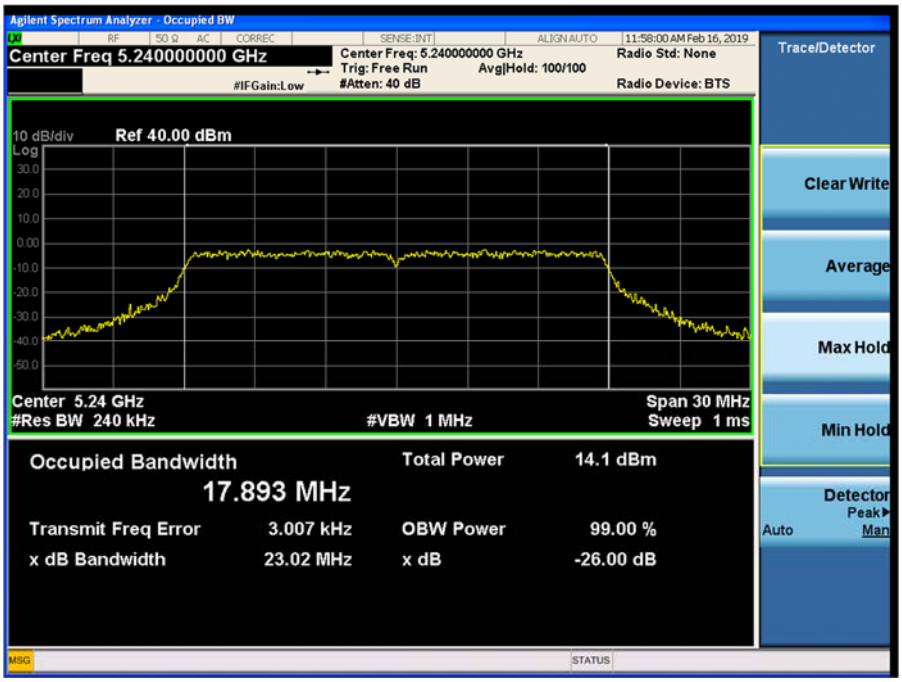
9.3.5.3 Chain 0 802.11n HT20 26-dB Emission Bandwidth

Chain 0 802.11n HT20 26-dB Emission Bandwidth				
Band	**Channel No.**	**Frequency (MHz)**	**26-dB Emission Bandwidth (MHz)**	**99% Occupied BW (MHz)**
UNII-1	36	5180	22.58	17.92
	44	5220	23.27	17.92
	48	5240	23.02	17.89
UNII-2A	52	5260	22.66	17.86
	60	5300	23.18	17.87
	64	5320	22.55	17.89
UNII-2C	100	5500	22.65	17.89
	116	5580	22.90	17.89
	140	5700	22.98	17.87
Straddle	144	5720	23.21	17.92
UNII-3	149	5745	23.74	17.93
	157	5785	28.93	17.95
	165	5825	26.39	17.95



Plot 9-39. 26-dB Emission Bandwidth and 99% OBW Chain 0 802.11n HT20 (Ch. 36)

Plot 9-40. 26-dB Emission Bandwidth and 99% OBW Chain 0 802.11n HT20 (Ch. 44)



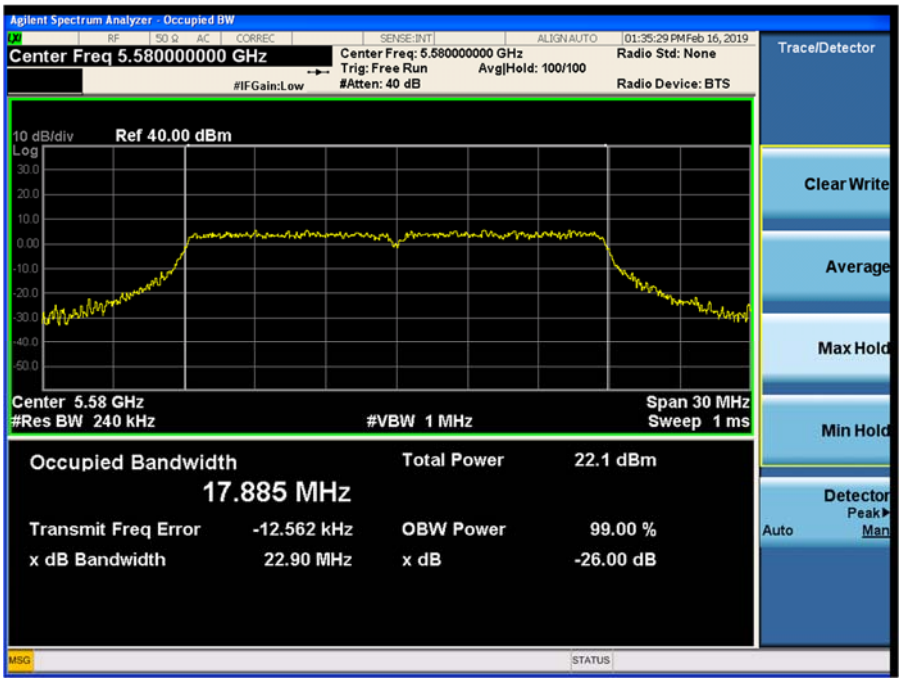
Plot 9-41. 26-dB Emission Bandwidth and 99% OBW Chain 0 802.11n HT20 (Ch. 48)

Plot 9-42. 26-dB Emission Bandwidth and 99% OBW Chain 0 802.11n HT20 (Ch. 52)

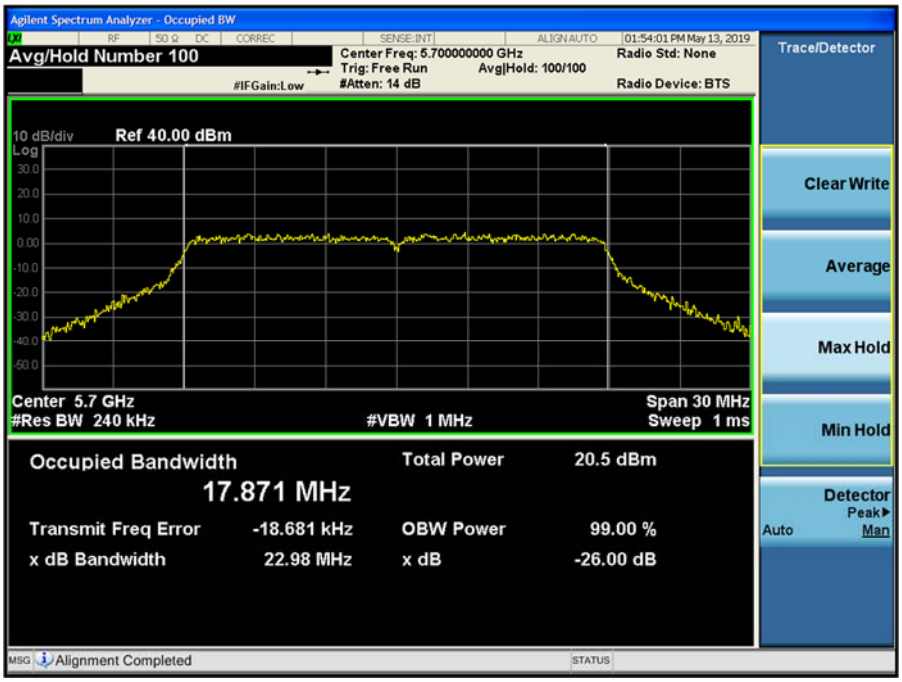
Plot 9-43. 26-dB Emission Bandwidth and 99% OBW Chain 0 802.11n HT20 (Ch. 60)

Plot 9-44. 26-dB Emission Bandwidth and 99% OBW Chain 0 802.11n HT20 (Ch. 64)

Plot 9-45. 26-dB Emission Bandwidth and 99% OBW Chain 0 802.11n HT20 (Ch. 100)



Plot 9-46. 26-dB Emission Bandwidth and 99% OBW Chain 0 802.11n HT20 (Ch. 116)



Plot 9-47. 26-dB Emission Bandwidth and 99% OBW Chain 0 802.11n HT20 (Ch. 140)